CITY OF PATASKALA PLANNING AND ZONING COMMISSION

City Hall, Council Chambers
621 West Broad Street
Pataskala, Ohio 43062

STAFF REPORT

June 2, 2021

Code Amendment Application ZON-21-003

Applicant:	City of Pataskala
Location:	City Wide
Request:	Requesting to add Chapter 1294 – Impact Fees to the Pataskala Code pursuant to Section 1217.10 of the Pataskala Code.

Description of the Request:
The proposed amendment would create a funding mechanism to offset costs for roadway improvements made necessary from new development. There are provisions for imposition, collection, expenditure, and administration of impact fees within the proposed amendment.

Staff Summary:
Impact fees are payments required by local governments of new development for the purpose of providing new or expanded public capital facilities required to serve that development. The fees typically require payments in advance of the completion of development, are based on a methodology and calculation derived from the cost of the facility and the nature and size of the development, and are used to finance improvements offsite of, but to the benefit of the development.

Since January 2020 the City has developed the costing and methodology report based upon the draft future land use map, reviewed impact fee legislation from other communities, and collaborated with the Streets Committee to create the proposed amendment. The purpose of the proposed amendment is to establish uniform procedures for the imposition, collection and expenditure of impact fees to ensure new development contributes its fair share towards the costs of public facilities necessitated by the development. In the case of this amendment, the only public facilities impact fees would be used for are roads.

In general, impact fees will be imposed on new construction, the expansion of an existing building, or the rezoning of an existing building to a more intense use. Impact fees would not be imposed on improvements that do not increase the demand for public facilities such as fences, interior remodeling, or the replacement of a destroyed building in addition to governmental agencies or non-profit organizations. City council may waive impact fees on a project determined to have extraordinary economic development benefits.

Upon receipt of a zoning application for new development the Planning and Zoning Department will calculate the impact fee based upon the type of development (residential or non-residential), the category

of use and the fee based upon the square footage. The appropriate impact fee would then be submitted along with the application fee(s). If an applicant believes that the impact fee calculations were erroneous or in violation of a right, they may submit an independent impact fee analysis. The City Administrator may accept or reject the independent analysis. If rejected the applicant may appeal the decision to City Council.

The City may enter into a development agreement with an applicant, which provides reimbursement of impact fees in exchange for the dedication or construction of public facilities (roads) made necessary by a proposed new development. City Council will make the determination to accept or reject the development agreement.

The Finance Director will establish an impact fee fund in which all impact fees collected must be deposited. The appropriation of impact fees must be approved by City Council and may only be used for public facility improvements identified in the methodology report and will provide benefits to the new development. Impact fees may not be used for maintenance of public facilities (roads). Impact fees may be refunded, upon approval by City Council, if a zoning permit has expired, the City has not appropriated the funds within six years, or the abandonment of a new development.

The City Administration is required to prepare an annual report to City Council. This report will review the impact fees collected, appropriation of impact fees, and any recommendations for updates.

Staff Review: *The following summary does not constitute recommendations but merely conclusions and suggestions from staff.*

Following a recommendation from the Planning and Zoning Commission, the amendment will proceed to City Council for consideration.

Code Amendment Approval:
According to Section 1217.04 of the Pataskala Code, the Planning and Zoning Commission shall consider approval of a code amendment if the proposal:

1. Will be harmonious with and in accordance with the general objectives, or with any specific objective of the Comprehensive Plan and/or this Code.
2. Will be designed, constructed, operated, and maintained so as to be harmonious in appearance with the existing or intended character of the general vicinity and that such use will not change the essential character of the same area.
3. Will not be hazardous or disturbing to existing or future neighboring uses.
4. Will be served adequately by essential public facilities and services such as highways, streets, police and fire protection, drainage structures, refuse disposal, water and sewer, and schools; or that the persons or agencies responsible for the establishment of the proposed use shall be able to provide adequately any such services.
5. Will not create excessive additional requirements at public cost for public facilities and services and will not be detrimental to the economic welfare of the community.

6. Will not involve uses, activities, processes, materials, equipment and conditions of operations that will be detrimental to any persons, property or the general welfare by reason of excessive production of traffic, noise, smoke, fumes, glare, odor, air or water pollution, or potential for explosion.
7. Will have vehicular approaches to the property which shall be so designed as not to create an interference with traffic on surrounding public thoroughfares.
8. Will not result in destruction, loss, or damage of a natural, scenic, or historic feature of major importance.

Department and Agency Review

- Zoning Inspector – No Comments
- Public Service Department – No Comments
- City Engineer – No Comments
- Pataskala Utilities – No Comments
- Police Department – No Comments
- West Licking Joint Fire District – No Comments
- Southwest Licking Schools – No Comments
- Licking Heights Schools – No Comments
- Licking County Health Department – No Comments
- SWLCWSD – No Comments

Modifications:

Should the Planning and Zoning Commission choose to recommend approval of the amendment, the following modifications may be considered:

- None

Resolution:

For your convenience, the following resolution may be considered by the Planning and Zoning Commission when making a motion:

"I move to recommend approval of application number ZON-21-003 pursuant to Section 1217.10 of the Pataskala Code. ("with the following modifications" if modifications are to be placed on the approval)."

CHAPTER 1294
Impact Fees

1294.01	**Purpose and Intent**	**1294.05**	**Establishment of Impact Fee Fund; Use and Appropriation of Impact Fee Funds; and Refunds**
1294.02	**Definitions**		
1294.03	**Applicability and Exemptions**		
1294.04	**Procedures for Imposition, Calculation, Reimbursement, Credit, and Collection of Impact Fees**	**1294.06**	**Review and Adjustments**
		1294.07	**Street Impact Fee**

1294.01 PURPOSE AND INTENT

The purpose and intent of this chapter are:

(a) To establish uniform procedures for the imposition, calculation, collection, expenditure, and administration of impact fees imposed on new development;
(b) To assure new development contributes its fair and proportionate share towards the costs of public facilities reasonably necessitated by such new development;
(c) To ensure new development benefits from the provision of the public facilities provided with the proceeds of impact fees;
(d) To ensure impact fees collected pursuant to this chapter are expended only on public facilities the demand for which is generated by the new development against which the fees are assessed;
(e) To ensure impact fees assessed pursuant to this chapter are proportionate in amount to the degree of impact new development has on public facilities; and
(f) To ensure all applicable legal standards and criteria are properly incorporated in these procedures.

1294.02 DEFINITIONS

Words and terms not specifically defined below carry their normal dictionary meanings. An additional reference for zoning and development terms is The New Illustrated Book of Development Definitions, Harvey S. Moskowitz and Carl G. Lindbloom, ISBN 0-88285-144-6 or the latest edition:

(a) "Applicant." Any person who files an application with the City for a zoning permit to undertake new development within the City.
(b) "Appropriation or to appropriate." An action by the City or City Administrator to identify specific public facilities for which impact fee funds may be utilized. "Appropriation" shall include, but is limited to: inclusion of a public facility in the adopted City budget, capital improvements plan, or comprehensive plan; execution of a contract or other legal encumbrance for construction or acquisition of a public facility using impact fee funds in whole or in part;

and/or the expenditure or transfer of impact fee funds from an impact fee account for the financing of public facilities that provides or will provide a roughly proportionate benefit to new development.

(c) "Capital Improvement Plan." A schedule of public facility improvements to be undertaken by the City as determined from time to time by the City Council or as set forth in the capital budget and/or the comprehensive plan.

(d) "City." City of Pataskala, Ohio.

(e) "City Council." The Council of the City of Pataskala, Ohio.

(f) "City Administrator." The City Administrator for the City of Pataskala, Ohio or his/her designee.

(g) "Codified Ordinances." The Codified Ordinances of Pataskala, Ohio, as amended from time to time.

(h) “Comprehensive Plan” The Comprehensive Plan for the City and any subsequent plans adopted by City Council.

(i) "Credit." A reduction in the amount of an Impact Fee due pursuant to this chapter that may be granted pursuant to an approved reimbursement and validly executed development agreement between the City and an applicant, which results in the provision of excess public facility capacity sufficient to offset the impacts of the proposed new development on public facilities.

(j) “Finance Director.” The Finance Director for the City of Pataskala, Ohio or his/her designee.

(k) “Institutional.” Establishments designed to aid individuals in need of mental, therapeutic, rehabilitative counseling or other correctional services.

(l) “Light Industrial.” Establishments characterized by a mix of manufacturing (small items), service, and warehouse facilities in the same building with a wide variation in the proportion of each type of use.

(m)“Manufacturing” Establishments engaged in the mechanical or chemical transformation of materials or substances into new products, including the assembling of component parts, the creation of products, and the blending of materials, such as oils, plastics, resins, or liquors.

(n) "Impact Fee." A fee imposed on new development on a proportionate basis in connection with, and as a condition of, the issuance of a zoning permit and which is calculated to defray all or a portion of the costs of the public facilities required to accommodate new development at City-designated level of service (LOS) standards and which provides a roughly proportionate benefit to new development and is proportionate in amount to actual impact of new development on the public facilities to be funded with impact fee funds.

(o) "Methodology report." A report titled "Impact Fee Methodology and Costing Report" prepared in support of this chapter. by Strand Associates, Inc., dated May, 2021 which sets forth the methodology and rational basis for the determination of the impact of new development on public facilities; the proper and proportionate amount of the impact fee to be assessed against new development: and the mechanisms for ensuring that a rational nexus exists between the fee amount and the impact of new development on public facilities and the roughly proportionate benefits that accrue to new development paying the impact fee.

(p) "New development." Any construction, reconstruction; redevelopment, rehabilitation, structural alteration, structural enlargement, structural extension, or new use within the City that requires a zoning permit after the effective date of this chapter, including any change in zoning district of an existing building, structure, or lot that increases the demand for one or more public facility; except as otherwise provided in Section 1294.03(d).

(q) "Nonresidential." Any use or development that is not a residential use.

(r) “Office.” Establishments used primarily for conducting the affairs of a business, profession, service, industry, or government and generally furnished with desks, tables, files, computers, and communication equipment.

(s) "Planning and Zoning Code." Part 12 of the Codified Ordinances of the City of Pataskala.

(t) "Public facility." Non-site-related capital improvements to the roadway network including roadway widening, intersection improvements, and associated infrastructure that provides a roughly proportionate benefit to new development. "Public facilities" are nonrecurring and are treated as capitalized expenses according to generally accepted governmental accounting principles. "Public facilities" do not include costs associated with the operation, repair, or maintenance of public facilities.

(u) "Public facility expenditures." Amounts appropriated in connection with the planning, design, engineering, and construction of public facilities; including planning, legal, appraisal, and other costs related to the acquisition of land, financing (including the issuance of bonds or other obligations of indebtedness used to pay for public facilities), and development costs; the costs of compliance with purchasing procedures and applicable administrative and legal requirements; and all other costs necessarily incident to the provision of public facilities.

(v) "Reimbursement." Repayment of impact fees in an amount that fairly reflects the value of public facilities dedicated or constructed by an applicant.

(w) "Residential use." Any use or development that includes or results in the creation of a dwelling unit, as defined in the Codified Ordinances.

(x) “Restaurant.” Establishments where food and drink are prepared and sold for consumption within the facility or consumption outside of the facility and where ordering and pickup may take place from an automobile.

(y) “Retail.” Establishments engaged in selling or renting goods or merchandise to the general public for personal or household consumption and rendering services incidental to the sale of such goods.

(z) "Service charge." A charge against each applicant paying an impact fee, not to exceed 2% of the total impact fee assessed against the proposed new development, used solely for costs incurred in the administration of this chapter.

(aa) “Warehousing.” Establishments engaged in the receipt, storage, and/or distribution of goods, products, cargo and materials.

(bb) “Zoning Permit” A document issued by the City Administrator in accordance with the Zoning Code authorizing the use of lots, structures, uses of land and structures, and the characteristics of the uses.

1294.03 APPLICABILITY AND EXEMPTIONS

(a) Term. This chapter and the procedures established herein shall remain in effect unless and until repealed, amended, or modified by City Council.

(b) Affected Area. Impact Fees are to be imposed on new development proposed within the corporate boundaries of the City, as they exit now or as changed from time-to-time.

(c) Type of Development Affected. Except as provided in paragraph (d) below, this chapter applies to all new development and all revenue producing areas of the development

(d) Type of Development Not Affected; Exemptions. This chapter does not apply to:

1 No net increase in nonresidential development. No Impact Fee shall be imposed on any new nonresidential development that does not increase the demand for public facilities; this includes, but is not limited to, such non-revenue producing areas of a development such as storage yards, porches without sales area or merchandise displays, and all similar such areas.

2 Remodeling or improvements. No Impact Fee shall be imposed for remodeling or improvements to an existing structure provided there is no change in use and no net increase in the number of dwelling units or amount of nonresidential floor area.

3 Replacements. No Impact Fee shall be imposed on the replacement of a destroyed or partially destroyed structure provided there is no change in use and no net increase in the number of dwelling units or amount of nonresidential floor area.

4 Temporary uses. No Impact Fee shall be imposed on a temporary use, including construction trailers and offices, but only for the life of the zoning permit issued for the construction served by the trailer or office.

5 Development agreements. No Impact Fee shall be imposed on new development that is the subject of a duly executed and lawful development agreement entered into by an applicant and the City prior to the effective date of this chapter, which agreement contains provisions in conflict or inconsistent with this chapter, but only to the extent of the conflict or inconsistency.

6 Governmental uses. Prior to the application for a zoning permit, a local, regional, State or Federal governmental agency or school district may seek an exemption to this chapter by applying to City Council, who shall review all such exemption applications and shall establish a reasonable basis for the granting or denying of all such requests.

7 Other uses. No Impact Fee shall be imposed on a use, development, project, structure, building, fence, sign or other activity whether a zoning permit is required, which does not result in an increase in the demand for public facilities

8 Non-profit organizations. No Impact Fee shall be imposed on any nonprofit organization (NPO), also known as a non-business entity, not-for-profit organization, or nonprofit institution, or any other legal entity organized and operated for a collective, public or social benefit, in contrast with an entity that operates as a business aiming to generate a profit for its owners.

9 Extraordinary Economic Development. City Council may exempt all, or part of, a particular development project from Impact Fees if such project is determined, under the criteria set forth below, to create extraordinary economic development and/or employment growth.

A. The City hereby establishes a policy to encourage employment growth and economic development in order to provide a balance between jobs and housing, provide adequate income levels for its residents, and to promote balanced and orderly growth. Further, it is the intent of this section to establish a mechanism that removes potential regulatory barriers to the establishment of businesses that provide employment and economic development in the City, and it is the further specific intent of this section that the waiver provisions contained herein shall not apply to residential developments. The City specifically desires to review all applications for exemptions on an individual basis and further wants the review and approval process to be fair, consistent, and based on established criteria. Also, the process should ensure the businesses that are granted exemptions actually provide the benefits recited in this section and the due process rights of all applicants are protected.

B. In order to grant an exemption under this section, City Council shall:

i. Review the City Administrator's recommendation and the Finance Committee's recommendation, and shall;

ii. Conduct a public hearing at which the applicant may explain the elements of its application and present any further information that may assist in City Council's review, and may;

iii. Grant the requested exemption only if City Council determines:

a. The application fully meets the policies herein established; and

b. The projected employment growth is based on either existing payroll figures or other available evidence that reflects a potential annual payroll that exceeds two and one-half million dollars ($2,500,000.00) and it is recognized that this threshold may be adjusted upward based on an annual Council review; and

c. The value of the exemption or waiver is recovered in 24 months based on projected income tax revenues from the development.

iv. Enter into a written contract with the Applicant that requires the Applicant to repay the exempted Impact Fees if the conditions under which the exemption was granted are not fully and timely met.

1294.04 PROCEDURES FOR IMPOSITION, CALCULATION, REIMBURSEMENT, CREDIT, AND COLLECTION OF IMPACT FEES

(a) In General. The City Administrator must notify the applicant of the applicable Impact Fee requirements, including applicable service charges, at the time of application for a zoning permit on a form provided by the City. The City Administrator must calculate the applicable

impact fee at the time of application for a zoning permit. The City may not issue a zoning permit until the applicant has paid all impact fees due pursuant to this chapter.

(b) Non-binding Impact Fee Estimate. An applicant may request a non-binding estimate of Impact Fees due for a particular new development at any time by filing a request on a form provided for such purpose by the City; provided, however, that such estimate may be subject to change when a formal application for a zoning permit for new development is made. Such non-binding estimate is solely for the benefit of the prospective applicant and in no way binds the City or precludes it from making amendments or revisions to any provisions of this chapter or the specific impact fee implementing ordinances. No vested rights, legal entitlements, or equitable estoppel accrue by reason of a non-binding estimate. A non-binding fee estimate does not constitute a final decision and may not be appealed.

(c) Calculation.

1. Upon receipt of an application for a zoning permit, the City Administrator must determine: (a) whether the proposed new development constitutes a residential or nonresidential use; (b) the specific category of residential or nonresidential development; and (c) the amount of additional square feet of nonresidential gross floor area or the number of additional dwelling units associated with the proposed use.
2. If the application for a zoning permit involves a change in zoning district, the Impact Fee must be calculated upon the incremental increase in the public facility capacity created by the proposed change in zoning district.
3. After making these determinations, the City Administrator must calculate the applicable Impact Fee by multiplying the number of dwelling units or amount of nonresidential floor area proposed by the amount of the applicable Impact Fee per unit of development, incorporating any applicable exemptions or credits.
4. If the type of land use proposed for new development is not expressly listed in this Chapter and Impact Fee schedule, the City Administrator, in consultation with other City staff and consultants, as necessary, must:
    A. Identify the most similar land use type listed and calculate the Impact Fee based on the Impact Fee for the land use identified;
    B. Identify the broader land use category within which the specified land use would apply and calculate the Impact Fee based on the Impact Fee for that land use category; or
    C. As appropriate, determine the basis used to calculate the Impact Fee pursuant to an independent impact analysis pursuant to subsection (d) below.
    D. The City Administrator's determination must be based on a generally accepted land use classification system (e.g., the North American Industry Classification System, the Land-Based Classification Standards, and/or ITE's Trip Generation Manual) and the methodology report.
5. The calculation of Impact Fees due from a multiple-use new development must reflect the aggregated demand for each public facility generated by each land use type within the proposed new development.

6. The calculation of Impact Fees due from a phased new development must reflect the demand generated by each specific land use within the phase of development for which a separate zoning permit is requested.
7. Impact fees must be calculated based on the Impact Fee amount in effect at the time of application for a zoning permit.

(d) Independent Impact Analysis. If the applicant believes the Impact Fee calculations are in error or would violate a right that is protected by either the State or Federal constitutions, the applicant shall conduct an Impact Fee analysis. The following provisions shall apply to any independent impact analysis:

1. The applicant is responsible, at its sole expense, for conducting and preparing the independent impact analysis, which must be reviewed for approval by the City Administrator prior to payment of the fee.
2. The independent impact analysis must measure the impact that the proposed new development will have on the particular public facility at issue, must be based on the same methodologies used in the methodology report, and must be supported by professionally acceptable data and assumptions.
3. Within 60 days of submittal of the independent impact analysis, the City Administrator must provide written notice to the applicant as to whether the analysis is accepted or rejected based on the provisions of this section. If the independent impact analysis is rejected, the written notice must provide an explanation of the insufficiencies of the analysis.
4. The final decision of the City Administrator may be appealed to City Council. The filing of an appeal does not stay the imposition or the collection of the Impact Fee as calculated by the City Administrator unless a cash bond or other sufficient surety has been provided to the Finance Director. The Finance Director shall hold the bond or surety pending outcome of all available appeals. If the appeal is accompanied by a cash bond or other sufficient surety, in an amount equal to the Impact Fee calculated to be due, a zoning permit may be issued pending resolution of the final appeal.

(e) Reimbursements and Credits.

1. Eligibility for a reimbursement. The City may enter into a development agreement with an applicant, which provides for the reimbursement of Impact Fees in exchange for the dedication or construction of public facilities made necessary by a proposed new development. The City may reimburse Impact Fees already paid only for the type of facility dedicated or constructed by the applicant. Reimbursements must be made from the Impact Fee Fund. No Impact Fee may be reimbursed for a proffered public facility unless:
   A. It is included in the City's capital and operating budgets, capital improvement plan, or the methodology report; or
   B. It adds public facility capacity made necessary by and to be provided for the roughly proportionate benefit of new development.
2. Additional provisions.

A. In order to be eligible for a reimbursement, the applicant must receive approval by the City pursuant to the provisions of this chapter, prior to the issuance of a zoning permit.
B. The City shall not reimburse the applicant in an amount exceeding the amount of the Impact Fee due pursuant to this chapter.
C. The City shall not reimburse the applicant until a proffered land dedication is finalized or the construction project is at least 50% complete. Reimbursement may then occur based on the percent completion of the project on a pro rata basis.
D. If an applicant proposes to dedicate or construct public facilities valued at an amount greater than the amount of the Impact Fee due, then the development agreement may provide for reimbursements to the applicant by future developers of costs incurred over and above those reimbursed by the City.

3. Procedures for reimbursements.
   A. Application made to the City Administrator. Applications for an agreement by the City to provide a reimbursement upon completion of certain work by the applicant must be made on a form provided by the City. The application must be accompanied by a proposed development agreement developed through coordination with City staff. Upon receipt of a complete application and proposed development agreement, the City Administrator and other appropriate staff and/or consultants must review the application and proposed development agreement, as well as such other information and evidence as may be deemed relevant. The City Administrator must forward a recommendation report stating whether a reimbursement is proper, based on the provisions of this chapter, to City Council. The City Administrator's recommendation report shall assume that upon completion of the work by the applicant as set forth within the proposed development agreement the same will comply in all material ways with the proposed development agreement and City standards.
   B. City Council. Based on the City Administrator's recommendation report, the provisions of this chapter, the capital improvement plan, comprehensive plan, adopted City budget, and the methodology report, City Council shall make a final decision to accept, reject, or accept with conditions the proposed reimbursement and proposed development agreement.
   C. Appeals. Appeals from the final decision of City Council shall be made to the Court of Common Pleas of Licking County. The filing of an appeal does not stay the imposition or the collection of the Impact Fee as calculated by the City Administrator unless a cash bond or other sufficient surety has been provided to the Finance Director. The Finance Director shall hold the bond or surety pending outcome of all available appeals. If the appeal is accompanied by a cash bond or other sufficient surety, in an amount equal to the Impact Fee calculated to be due, a zoning permit may be issued pending resolution of the final appeal.
4. Calculation of the value of dedication or construction. The amount of the reimbursement to be paid by the City is to be calculated as follows:

A. Construction of facilities and provision of equipment. The reimbursement must be equal to the actual cost of construction or equipment as evidenced by receipts and other sufficient documentation or the amount of Impact Fees due pursuant to this chapter, whichever is less.

B. Dedication of land. At the option of the applicant, the reimbursement is to be based on either the assessed value of the proffered land, based on the most recent County property appraisal, or the fair market value of the land as determined by a certified property appraiser hired and paid for by the applicant. If the latter option is chosen and the City rejects the applicant's appraisal, the City may hire and pay for a second appraiser to appraise the property. If either party rejects the second appraisal, a third appraisal may be performed by an appraiser chosen by the first and second appraisers, the costs of which are to be shared equally by the City and the applicant. The third appraisal is binding on both parties. All appraisals must be consistent with generally accepted appraisal techniques and the date of valuation must be the date of transfer to the City.

5. Development agreement requirements. No reimbursement may be made except pursuant to an executed development agreement between the City and the applicant, which must include, but is not necessarily limited to; the following:
   A. The estimated cost of the public facility to be constructed or dedicated, based on the provisions of this chapter;
   B. A schedule for the initiation and completion of the construction of a public facility;
   C. The amount of the Impact Fees to be reimbursed by the City to the applicant;
   D. The schedule for making reimbursement payments to the applicant, based on the provisions of this section;
   E. Provision for reimbursements to the applicant by future developers of costs incurred over and above those reimbursed by the City pursuant to this section;
   F. The applicant's agreement to construct all public facilities in accordance with City specifications and all regulations set forth in the Codified Ordinances; and
   G. Such other terms and conditions as deemed necessary by the City.
6. Transfer and assignment. The reimbursement may be paid only to the original applicant or the applicant's legal successor in interest with a contractual right to the reimbursement.
7. Eligibility for credits for excessive dedication or construction. An applicant may be given a credit against an Impact Fee upon demonstration that, after the date of this chapter, a public facility was dedicated or constructed by the applicant with sufficient excess capacity to offset the impacts of the applicant's proposed new development. In order for a credit to be accepted, the applicant must demonstrate the dedicated or constructed public facility will reduce the overall need for public facilities and the applicant has secured a contractual right to an allocation of the excess capacity equal to the total or any portion of the Impact Fee owed by the applicant. Any approved credit must be consistent with the adopted City budget, capital improvement plan, comprehensive plan, and the methodology report.

8. Procedures for credits.
   A. Application made to the City Administrator. Applications for a credit must be made on a form provided by the City. The application must be accompanied by a development agreement executed after the effective date of this chapter, which demonstrates that excess public facility capacity has been provided by the applicant, which will provide a roughly proportionate benefit to the new development proposed by the applicant. Upon receipt of a complete application, the City Administrator and other appropriate staff and/or consultants must review the application, as well as such other information and evidence as may be deemed relevant. The City Administrator must forward a recommendation report stating whether a credit is proper, based on the provisions of this chapter, to City Council. The City Administrator's recommendation report shall assume that upon completion of the work by the applicant as set forth within the proposed development agreement the same will comply in all material ways with the proposed development agreement and City standards.
   B. City Council. Based on the City Administrator's recommendation report, the provisions of this chapter, the capital improvement plan, comprehensive plan, adopted City budget, and the methodology report, City Council must make a final decision to accept, reject, or accept with conditions the proposed credit and proposed development agreement.
   C. Appeals. Appeals from the final decision of City Council shall be made to the Court of Common Pleas of Licking County. The filing of an appeal does not stay the imposition or the collection of the Impact Fee as calculated by the City Administrator unless a cash bond or other sufficient surety has been provided to the Finance Director. The Finance Director shall hold the bond or surety pending outcome of all available appeals. If the appeal is accompanied by a cash bond or other sufficient surety, in an amount equal to the Impact Fee calculated to be due, a zoning permit may be issued pending resolution of the final appeal.

(f) Collection. The City must collect all Impact Fees and service charges in the amounts set forth in this chapter at the time of application for a zoning permit and must issue a receipt to the applicant for such payment unless:
   1. The applicant is not subject to the payment of an Impact Fee; or
   2. The applicant has filed an appeal and the appeal is accompanied by a cash bond or other sufficient surety, in an amount equal to the Impact Fee calculated to be due.

1294.05 ESTABLISHMENT OF IMPACT FEE FUND; USE AND APPROPRIATION OF IMPACT FEE PROCEEDS; AND REFUNDS

(a) Impact Fee Accounting. The Finance Director must establish an impact fee fund and all Impact Fees collected by the City must be deposited into such impact fee fund. All interest earned on monies deposited into the impact fee fund must be credited to that fund. The monies of such

impact fee fund must be accounted for separately from all other City funds. The Finance Director must establish and implement necessary accounting controls to ensure the impact fee fund is properly deposited, accounted for, and appropriated in accordance with this chapter and other applicable legal requirements.

(b) Use of Impact Fee Funds.

1. Generally. All appropriations from impact fee funds must be approved by City Council and detailed on a form provided for such purposes and filed with the City Administrator.
2. Use of funds. Impact fee funds may be used only for
   A. Public facility expenditures;
   B. The payment of principal, interest, and other financing costs on contracts, bonds, notes, or other obligations issued by, or on behalf of, the City to finance public facilities;
   C. Financing of refunds as set forth in Section 1294.06(d);
   D. Financing of reimbursements as set forth in Section 1294.04(e); or
   E. Financing the costs of updating this chapter.
3. Report. Consistent with Section 1294.06(c), prior to appropriating impact fee funds, the City Administrator must generate a written report which demonstrates such funds are being used to finance public facility capacity that provides or will provide benefits to new development that are roughly proportionate to the impact of that development. The report must be consistent with the methodology report. The written report must be presented to and accepted by City Council.
4. Restrictions on use. Impact Fees may not be appropriated for repair or maintenance of public facilities, or for operational or personnel expenses associated with the provision of public facilities. Additionally, Impact Fees must be appropriated:
   A. For the particular public facility for which they were imposed, calculated, and collected; and
   B. Within six years of the beginning of the City's fiscal year immediately succeeding the date of collection, unless such time period is extended as provided in paragraph (b)(5), below.
5. Appropriation of impact fee funds beyond six years of collection. Notwithstanding anything to the contrary, impact fee funds may be appropriated beyond six years from the beginning of the City's fiscal year immediately succeeding the date of collection, if the appropriation is for a public facility that requires more than six years to plan, design, and construct. The City must document compliance with the provisions of this paragraph.

(c) Procedure for Appropriation of Impact Fee Funds.

1. Each year, City Council must identify public facility capacity anticipated to be funded, in whole or in part, with Impact Fees. Public facility expenditures must be consistent with the methodology report, the capital improvement plan, the comprehensive plan, and the annual review described in Section 1294.07 and such other information as may be relevant to ensure compliance with this chapter.

2. City Council may include public facilities funded with Impact Fees in the City's annual budget or capital improvements plan. If included, the description of the public facility must specify the nature of the public facility, the location of the public facility, the capacity to be added and/or funded by the appropriation, the service area of the public facility, the need/demand for the public facility, and the anticipated timing of completion of the public facility.
3. Consistent with the provisions of this chapter, City Council may authorize public facilities expenditures at such other times as it deems necessary.
4. City Council must verify that adequate impact fee funds are or will be available for the particular public facility capacity.
5. Because Impact Fees must be used in a location or manner that would provide benefit to the development supplying the funds, Impact Fees must be used in the order in which they were received related to that New Development.

(d) Refunds.

1. Eligibility.
   A. Expiration or revocation of zoning permit. An applicant who has paid an Impact Fee for which construction has not begun, and the necessary zoning permit has expired or has been revoked, may apply for a refund. The refund application must be made on a form provided by the City.
   B. Failure of City to appropriate Impact Fees within time limit. An applicant may apply for a refund of Impact Fees if the City failed to appropriate the Impact Fees collected from the applicant within the time limit established in subsection (b)(4)(B) above, unless such time period is extended as provided in paragraph (b)(5) above . The refund application must be made on a form provided by the City.
   C. Abandonment of new development. An applicant, who paid an Impact Fee for which a zoning permit has been issued and pursuant to which construction has been initiated but abandoned prior to issuance of a certificate of occupancy, is eligible for a refund if the uncompleted building is completely demolished and the site is returned to the same or similar condition as before construction began.
2. Administrative fee. The City may deduct a five hundred dollar ($500.00) administrative fee from the amount of any refund granted and retain the administrative fee to defray the administrative expenses associated with processing a refund application.
3. Processing of applications for a refund.
   A. Application made to the City Administrator. Applications for a refund must be made on a form provided by the City. Upon receipt of a complete refund application, the City Administrator must review the application and documentary evidence submitted by the applicant, as well as such other information and evidence as may be deemed relevant, and must forward a report as to whether a refund is due based on the provisions of this chapter to City Council.

B. City Council. Based on the report of the City Administrator, the provisions of this chapter, and the methodology report, City Council must make a final decision to approve, approve with conditions, or deny the proposed refund.

C. Appeals. Appeals from the final decision of City Council shall be made to the Court of Common Pleas of Licking County. The filing of an appeal does not stay the imposition or the collection of the Impact Fee as calculated by the City Administrator unless a cash bond or other sufficient surety has been provided to the Finance Director. The Finance Director shall hold the bond or surety pending outcome of all available appeals. If the appeal is accompanied by a cash bond or other sufficient surety, in an amount equal to the Impact Fee calculated to be due, a zoning permit may be issued pending resolution of the final appeal.

4. Refund because of expiration or revocation. Applications for refunds due to expiration or revocation of a zoning permit must be made on a form provided by the City and made within 60 days following expiration or revocation of the zoning permit. In order for the refund application to be deemed complete, the applicant must submit: (a) evidence the person or entity applying for the refund was the initial applicant who paid the fee, or the authorized agent of the initial applicant; (b) the amount of the Impact Fees paid; and (c) documentation evidencing the expiration or revocation of the zoning permit. Failure to apply for a refund within 60 days following expiration or revocation of the zoning permit constitutes a complete and full waiver of entitlement to any refund. No interest will be paid by the City when calculating the amount of a refund pursuant to this paragraph.
5. Refund because of the City's failure to timely appropriate. Applications for refunds due to the failure of the City to timely appropriate Impact Fees must be made on a form provided by the City and made within one year following the expiration of such time limit. In order for the refund application to be deemed complete, the applicant must submit: (a) evidence the applicant is the current property owner or the authorized agent of the current property owner and (b) the amount of the Impact Fees paid; and (c) description and documentation of the City's failure to appropriate impact fee funds pursuant to subsection (b)(2) above. Interest must be paid by the City in calculating the amount of the refunds pursuant to this section.
6. Refund because of abandonment. Applications for refunds due to abandonment of a new development prior to completion must be on a form provided by the City. Failure to apply for a refund within 60 days following demolition of the structure constitutes a waiver of entitlement to a refund. No interest will be paid by the City in calculating the amount of the refund pursuant to this paragraph. The application must include: (a) evidence the person applying for the refund is the initial applicant who paid the fee, or the authorized agent of the initial applicant; (b) the amount of the Impact Fees paid; and (c) documentation evidencing the demolition of the building partially constructed pursuant to payment of the impact fees to be refunded.

1294.06 REVIEW AND ADJUSTMENTS

(a) Review.

1. The City Administrator, in coordination with all relevant and necessary City staff, must prepare and submit an annual report to City Council on the subject of Impact Fees.
2. The report may include any or all of the following:
   A. Recommendations for amendments, if appropriate, to this chapter;
   B. Proposed changes to the City Comprehensive Plan and/or an applicable ordinance or policy, including the identification of additional public facility projects anticipated to be funded wholly or partially with Impact Fees;
   C. Creation of impact fee districts, as necessary;
   D. Proposed changes to the impact fee schedule as set forth in the ordinances imposing and setting impact fees for particular public facilities;
   E. Proposed changes to level of service standards for particular public facilities;
   F. Proposed changes to any impact fee calculation methodology;
   G. Proposed changes to the population, housing, land use, persons per household or nonresidential development projections included in the methodology report and upon which the impact fee amounts have been determined; or
   H. Other data, analysis, or recommendations as the City Administrator may deem appropriate, or as may be requested by the City Council.
3. The report must include the following background data:
   A. Number of zoning permits issued by type development in each Category (Primary and Sub-Category) listed in the Impact Fee Schedule;
   B. Gross floor area of new nonresidential development, by type;
   C. Total amount of Impact Fees collected, by type of development in each Category (Primary and Sub-Category) listed in the Impact Fee Schedule;
   D. Total expenditures made from impact fee fund and the purpose for which the expenditure was made, i.e., the description, type, and location of the public facility project;
   E. When the public facility project was, or will be, initiated and completed;
   F. Whether additional impact fee funds will be appropriated for the same project in the future;
   G. Whether supplemental non-impact fee funds have been used for the project and, if so, how much;
   H. The service area of the public facility project;
   I. The total estimated cost of the project and the portion funded with impact fees;
   J. Whether the public facility project is in the City's current annual budget, capital improvements plan, or comprehensive plan;
   K. The estimated useful life of the project; and
   L. Such other facts as may be deemed relevant by the City Administrator or City Council.

4. City Council action. After reviewing the report identified herein, City Council may take such actions as it deems appropriate, including but not limited to, amending this chapter, requesting additional data or analyses, and holding public workshops and/or public hearings.

1294.07 STREET IMPACT FEE

(a) Impact Fee for Residential Development. All new residential development within the City is subject to the payment of a street impact fee payable at the time of zoning permit issuance by the City, pursuant to this chapter as follows:

Category	Impact Fee per Dwelling Unit
Single-Family/Multi-Family	$1,140.84

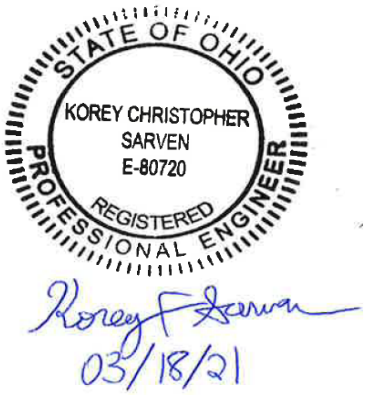
(b) Impact Fee for Nonresidential Development. All new nonresidential development within the City is subject to the payment of a street impact fee payable at the time of zoning permit issuance by the City, pursuant to this chapter as follows:

Category	Impact Fee per Square Foot
Retail/Restaurant	$2.46
Office/Institutional	$1.43
Light Industrial/Warehousing	$0.64
Manufacturing	$0.51

Report for

City of Pataskala, Ohio

Impact Fee Methodology and Costing Report



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INTRODUCTION

The City of Pataskala, Ohio (City) has completed its future comprehensive plan to determine City goals and a corresponding plan for future developments over the next 10 to 20 years. The plan has established a guide for anticipated land-use patterns, identifies important and potentially transformative projects, and serves to address growth while improving the community's quality of life.

Since the year 2000, the City has already seen a 49 percent increase in overall population. Several subdivisions are currently planned, and the population is expected to continue this upward trend. As a result, the existing roadway infrastructure will by heavily impacted by this future growth and development.

Developments throughout the City will generate more traffic throughout the entire roadway network, resulting in inadequate capacity at multiple locations. Improvements will need to be made at these locations to ensure roadway capacity is maintained for City residents. To accomplish this, the City would like to assess each development an impact fee that is based on its proportional contribution to the overall improvement needs for the entire roadway network.

The methodology to determine this "Development Impact Fee" is described as follows:

1. Traffic count data was collected at seven intersections, with an additional seven intersection counts provided by a previously completed study, for a total of fourteen intersections. Using the traffic count data collected, a model of the existing roadway network was created using Synchro10 software by Trafficware, Inc. to determine existing Level of Service and capacity levels. This provided a baseline to compare future results against.

2. Using the "Future Land Use Map" developed as part of the Pataskala Comprehensive Plan, an estimate of the anticipated residential, commercial, industrial, and mixed-use development sizes was determined.

3. Data available from the Institute of Transportation Engineers (Trip Generation, Tenth Edition) was used to determine estimates for new traffic generated by these developments.

4. Development traffic was then added onto the existing roadway network for AM and PM peak-hour analysis. Roadway and intersection operational failures were identified from this addition of traffic to the network.

5. Improvements to the roadway network model were implemented to alleviate the capacity issues and bring them to back to a satisfactory level, in accordance with Ohio Department of Transportation (ODOT) methodology.

6. Costs for the construction of these improvements were then estimated, with the cost then being allocated to the total development trips generated. This cost, henceforth, is defined as the "Development Impact Fee."

Further detail of this fee calculation is provided in Section 3–Development of Impact Fee.

SUMMARY

The Development Impact Fee developed within this report should not be used to pay for supplies, salaries, training, repairs, or administrative costs. Additionally, an impact fee cannot be imposed on a developer to address any existing deficiencies before development has occurred. The impact fees developed herein must be used to address deficiencies caused by the addition of specific developments.

The impact fee established within this report uses a 10-year design horizon life. As time passes, it may become necessary to revise and update established impact fees. This will allow the City of Pataskala and future developments meet current construction cost and traffic trends.

SECTION 1
EXISTING CONDITIONS AND OPERATIONAL ANALYSIS

1.01 DETERMINATION OF AM AND PM PEAK-HOUR OPERATIONS

Traffic count data was collected at seven intersections throughout the City of Pataskala (City). These counts were performed from 7 to 9 A.M. and 4 to 6 P.M., to establish existing AM and PM peak-hour conditions. An additional seven intersections with traffic count data were added from the *Intersection Capacity and Safety Evaluation Study* that was completed January 2020.

Table 1.01-1 show the full list of 14 intersections, as well as their data sources.

Intersection	Data Source
Refugee Road and Mink Street	February 2020 Traffic Counts
Refugee Road and Etna Parkway	February 2020 Traffic Counts
Refugee Road and Main Street	February 2020 Traffic Counts
Broad Street and Taylor Road	*Intersection Capacity and Safety Evaluation Study (January 2020)*
Broad Street and Summit Road	*Intersection Capacity and Safety Evaluation Study (January 2020)*
Broad Street and Columbia Road SW	*February 2020 Traffic Counts*
Broad Street and Main Street	*Intersection Capacity and Safety Evaluation Study (January 2020)*
Broad Street and Township Road and Hazelton Etna Road	*Intersection Capacity and Safety Evaluation Study (January 2020)*
Broad Street and Watkins Road	*Intersection Capacity and Safety Evaluation Study (January 2020)*
Havens Corner Road and Dixon Road	*February 2020 Traffic Counts*
Havens Corner Road and Taylor Road	*Intersection Capacity and Safety Evaluation Study (January 2020)*
Havens Corner Road and Summit Road	*Intersection Capacity and Safety Evaluation Study (January 2020)*
Havens Corner Road and Mink Street	February 2020 Traffic Counts
Clark State Road and Dixon Road	February 2020 Traffic Counts

Table 1.01-1 Traffic Count Intersections

From the traffic count collected, AM and PM peak-hour turning movements were determined, as well as the peak-hour factor and percentage of heavy truck traffic (further details of this information can be observed in Appendix A of this report). These parameters were input into a Synchro10 traffic model to determine the existing Level of Service (LOS) and operational conditions of each intersection, providing a baseline for comparison. Synchro10 output data is provided in Appendix B of this report.

In accordance with Ohio Department of Transportation (ODOT) *Highway Access Management Manual*, the acceptable LOS of an intersection is LOS D or better in the design year. LOS is determined using the following methods:

1. For side-street stop-controlled intersections, the highest delay for any yielding movement is used to report the overall intersection operations. This is because the average intersection delay for unsignalized intersections tends to be skewed, as through movements on the free-flowing mainline receive zero relay and would otherwise be factored into the overall average.

2. For all-way stop-controlled and signalized intersections, the overall intersection operations are reported using Highway Capacity Manual (HCM) methodology, weighting each movement based on its volume compared to the total intersection volume to calculate an average delay.

Table 1.01-2 shows standard LOS thresholds, while Table 1.01-3 shows the existing and future LOS for both the AM and PM peak-hour scenarios of the intersections analyzed.

LOS	Unsignalized Intersection (average delay, seconds)	Signalized Intersection (average delay, seconds)
A	<10	<10
B	10 to 15	10 to 20
C	>15 to 25	>20 to 35
D	>25 to 35	>35 to 55
E	>35 to 50	>55 to 80
F	>50	>80

Table 1.01-2 LOS Thresholds

Intersection	LOS (2020)		LOS (2030)		Improvement Necessary?
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	
Refugee Road/Mink Street	B	C	C	C	No
Refugee Road/Etna Parkway	B	C	B	C	No
Refugee Road/SR 310	B	A	B	B	No
Broad Street/Taylor Road	D	E	D	F	Yes
Broad Street/Summit Road	B	C	C	D	No
Broad Street/Columbia Road SW	C	D	C	E	Yes
Broad Street/Main Street	A	A	A	A	No
Broad Street/Township Road/ Hazelton Etna Road	D	E	E	F	Yes
Broad Street/Watkins Road	B	B	C	B	No
Havens Corner Road/Dixon Road	C	E	C	F	Yes
Havens Corner Road/Taylor Road	E	C	F	F	Yes
Havens Corner Road/Summit Road	D	F	F	F	Yes
Havens Corner Road/Mink Street	B	C	C	D	No
Clark State Road/Dixon Road	C	C	C	C	No

Table 1.01-3 LOS Intersections (Base Conditions with No Development)

1.02 IDENTIFICATION OF NECESSARY BASELINE IMPROVEMENTS

The results from Table 1.01-3 show that the following intersections will need to be upgraded prior to development traffic is integrated into the overall network:

- Broad Street/Taylor Road
  - Addition of right-turn-only lane on northbound and southbound approaches
  - Addition of through lane on eastbound and westbound approaches
  - Update signal timings
- Broad Street/Columbia Road SW
  - Modify intersection from side-street stop-controlled to signalized intersection
- Broad Street/Township Road/Hazelton Etna Road
  - Addition of right-turn-only lane on southbound approach
  - Addition of through lane on westbound approach
  - Update signal timings
- Havens Corner Road/Dixon Road
  - Modify intersection from side-street stop-controlled to signalized intersection
- Havens Corner Road/Taylor Road
  - Modify intersection from side-street stop-controlled to signalized intersection
- Havens Corner Road/Summit Road
  - Modify intersection from side-street stop-controlled to signalized intersection

In addition to the operational driven improvements, the *Intersection Capacity and Safety Evaluation Study (January 2020)* also identified the following intersection improvements that will need to be made for safety improvements:

- Broad Street/Summit Road
  - Addition of left-turn-only lane on northbound approach
  - Addition of left-turn-only and right-turn-only lane on southbound approach
  - Addition of through lane on eastbound and westbound approaches
  - Addition of right-turn-only lane on westbound approach
- Broad Street/Main Street
  - Extension of existing left-turn and right-turn only lanes on northbound approach
  - Addition of through lane on westbound approach
  - Update signal timings
- Broad Street/Watkins Road
  - Addition of left-turn-only lane on northbound and southbound approaches
  - Addition of right-turn-only lane on eastbound approach
  - Update signal timings

All the improvements previously listed were added into a Synchro10 model that evaluated their impacts on the base condition LOS (i.e., no development traffic). Table 1.02-1 provides the results of these intersections.

Intersection	LOS (2020-Existing)		LOS (2030-Future)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Refugee Road/Mink Street	B	C	C	C
Refugee Road/Etna Parkway	B	C	B	C
Refugee Road/SR 310	B	A	B	B
Broad Street/Taylor Road	C	C	C	C
Broad Street/Summit Road	B	B	B	C
Broad Street/Columbia Road SW	A	A	A	A
Broad Street/Main Street	A	A	A	B
Broad Street/Township Road/ Hazelton Etna Road	B	C	B	C
Broad Street/Watkins Road	B	B	C	C
Havens Corner Road/Dixon Road	A	A	A	A
Havens Corner Road/Taylor Road	B	B	B	B
Havens Corner Road/Summit Road	B	B	B	B
Havens Corner Road/Mink Street	B	C	C	D
Clark State Road/Dixon Road	C	C	C	C

Table 1.02-1 LOS Intersections (Improved Conditions with No Development)

The results of Table 1.02-1 demonstrate that all improvements made to the intersections throughout have improved the LOS to the required minimum of D or better. The costs of these improvements will not be attributed to any future development and, therefore, will not be included in the calculation of the final roadway impact fee. However, this will be considered the baseline model for comparison when developments are added in order to determine when the intersections or roadway network experiences operational failures.

SECTION 2
FUTURE DEVELOPMENT CONDITIONS AND OPERATIONAL ANALYSIS

2.01 DETERMINATION OF FUTURE DEVELOPMENT TYPES

The City has completed its process of developing a Comprehensive Plan to determine goals and guidance for development, as well as land-use patterns throughout its jurisdiction. The plan has been through several drafts during the last few years, with its most current draft dated October 13, 2020. This Comprehensive Plan was used to ensure future development traffic modeling aligned with the City's current goals.

In conjunction with the Comprehensive Plan, a Planned Development Land Use map was created showing land use types and locations. Figure 2.01-1 is a visual representation of this map.

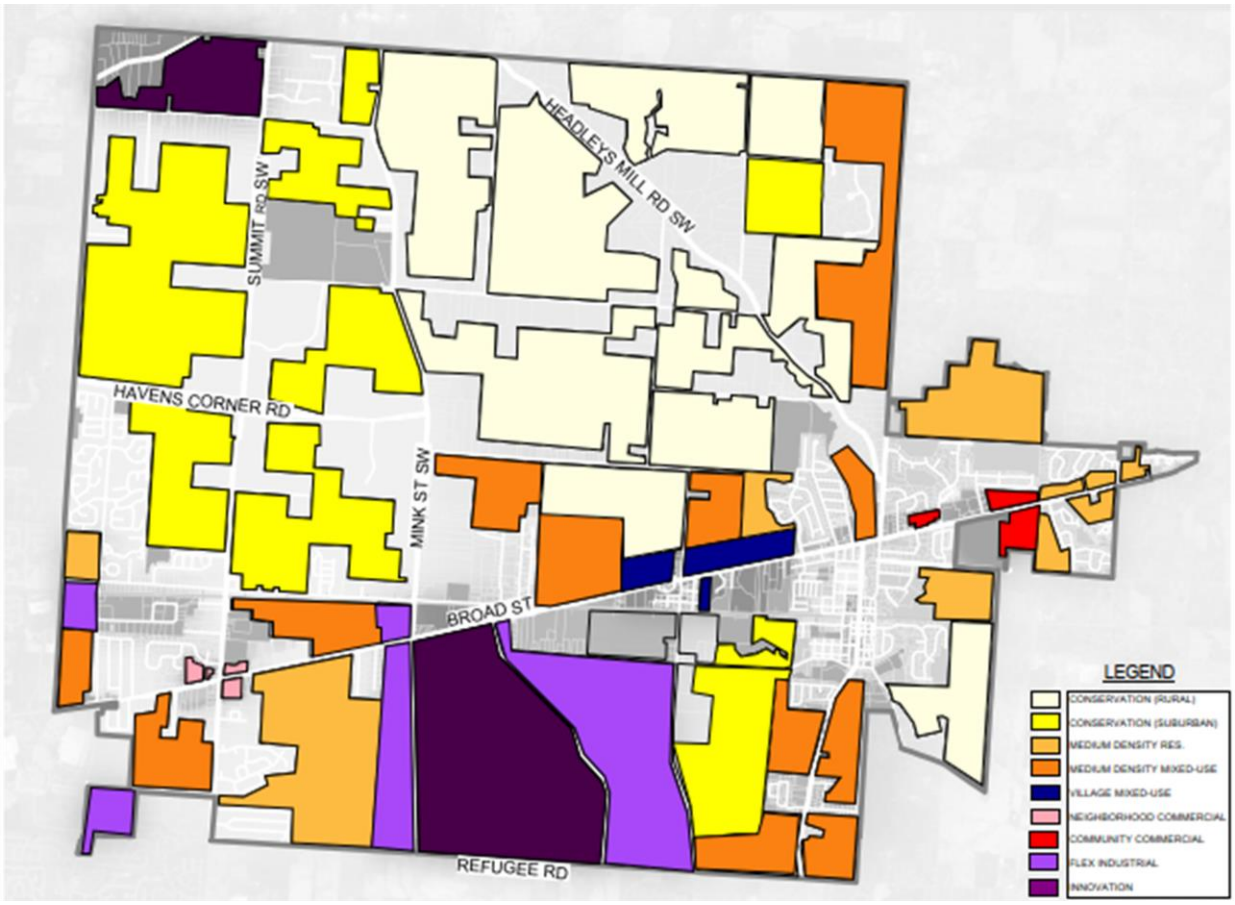

Figure 2.01-1 Planned Development Land Use Within City Limits

The land use areas shown in Figure 2.01-1 were further defined using Institute of Transportation Engineers (ITE) methodology in order to develop trip generations. Each defined area was broken into corresponding ITE land use codes, with site coverage and development intensity applied to determine applicable development sizes. Site coverage is defined as the actual amount of the land that will see development based upon City definitions of land. Table 2.01-1 is a breakdown of this data.

Planned Development	Site Coverage (%)	Development Intensity	ITE Land Use Codes
Conservation (Rural)	50	1 D.U../10 AC	Single-Family Detached Housing (210)–**100%**
Conservation (Suburban)	50	1 D.U./2 AC	Single-Family Detached Housing (210)–**100%**
Medium Density Residential	42.5	4 D.U./1 AC	Single-Family Detached Housing (210)–**100%**
Medium Density Mixed-Use	40	7.5 D.U./1 AC or 30,000 SF/AC	Single-Family Detached Housing (210)–**90%** General Office Building (710)–**5%** Shopping Center (820)–**5%**
Village Mixed-Use	40	12.5 D.U./1 AC or 30,000 SF/AC	Multifamily Housing (Low-Rise) (220)–**85%** Shopping Center (820)–**15%**
Neighborhood Commercial	40	25,000 SF/AC	General Office Building (710)–**30%** Shopping Center (820)–**70%**
Community Commercial	40	12,000 SF/AC	Single-Tenant Office Building (715)–**15%** Business Park (770)–**35%** Shopping Center (820)–**50%**
Flex Industrial	35	12,500 SF/AC	Industrial Park (130)–**100%**
Innovation	25	15,000 SF/AC	Industrial Park (130)–**30%** Manufacturing (140)–**40%** General Office Building (710)–**20%** Research and Development Center (760)–**10%**

Note: D.U. refers to “dwelling unit”
SF=square feet
AC=acres

Table 2.01-1 Planned Development Land Use Data

2.02 DETERMINATION OF FUTURE DEVELOPMENT SIZES AND TRIP GENERATION

With the planned development data defined, the next step was to determine the overall development sizes with the corresponding vehicle trips they would generate. This trip generation data is important in understanding how the addition of the traffic from the developments leads to roadway capacity degradation and failure. Development trip generation was calculated using the *ITE Trip Generation Handbook*, 10th Edition based upon the development sizes.

To further refine these trip generations, vehicle pass-by rates also needed to be determined. Pass-by trips are those that are made by vehicles already on the road, such as a driver stopping at a store on the way home from work. Where possible, these rates were determined from existing ITE sources (ITE code 820 and 930 specifically). For developments that did not have ITE based pass-by rates, a flat 20 percent adjustment was provided to account for existing traffic that would also use these developments for personal or employment reasons.

Table 2.01-2 provides a breakdown of this trip generation.

ITE Land Use Codes	Total Size	Total Vehicle Trips Generated (Daily)	Vehicle Pass-By %	Adjusted Vehicle Trips Generated (Daily)
130	4,684,875 SF	6,940	20	5,552
140	1,644,000 SF	5,355	20	4,284
210	5,543 D.U.	41,801	20	33,441
220	557 D.U.	4,170	20	3,336
710	1,769,700 SF	17,227	20	13,782
715	46,080 SF	518	20	415
760	411,000 SF	4,409	20	3,528
770	107,500 SF	1,857	20	1,486
820	1,443,100 SF	36,927	34	24,372
	Total Trips	119,204	-	90,196

Table 2.02-1 Planned Development Sizes and Trip Generation

2.03 DETERMINATION OF FUTURE DEVELOPMENT PEAK HOURS AND TRIP DISTRIBUTION

With the development sizes estimated, the next step is to determine the peak hourly traffic volume and how that is distributed throughout the City of Pataskala roadway network. Using the ITE Trip Generation Handbook, 10th Edition, A.M. and P.M. peak hour trip generations were compiled for each of the development types. Table 2.03-1 provides this breakdown.

ITE Land Use Codes	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
130	1,518	356	394	1,480
140	785	234	341	760
210	985	2,955	3,021	1,775
220	56	188	171	101
710	1,453	237	279	1,466
715	84	11	15	84
760	129	44	13	74
770	26	17	21	24
820	541	332	1,880	2,037
Total Trips	5,577	4,374	6,135	7,801

Table 2.03-1 Planned Development Peak Hour Trip Generation

These AM and PM peak-hour trips were added into Synchro10 models, with the trips being added based on proportional sizes and locations as shown in Figure 2.01-1. To determine the anticipate trip distribution for both the “In” and “Out” development traffic, the existing roadway traffic patterns were reviewed to determine current traffic trends throughout the City.

Based upon the traffic counts completed for the study, it was determined that there are ten main entry and exit points within the City limits as follows:

1. Broad Street from the west
2. Broad Street from the east
3. Mink Street from the south
4. Mink Street from the north

5. Etna Parkway from the south
6. Main Street from the south
7. Hazelton-Etna and Township Road from the north
8. Summit Road from the north
9. Dixon Road from the north
10. Havens Corner Road from the west

Through reviewing the existing traffic distribution in the AM and PM peak scenarios further, existing trip distributions were determined. It is a safe assumption that new development traffic is likely to follow a similar trip distribution when entering and exiting the City. Table 2.03-2 provides a breakdown of these trip distributions.

Entry and Exit Locations	AM Peak Hour		PM Peak Hour	
	In (%)	Out (%)	In (%)	Out (%)
Broad Street (from the west)	19	33	26	22
Broad Street (from the east)	18	8	11	19
Mink Street (from the south)	9	5	4	10
Mink Street (from the north)	6	9	8	5
Etna Parkway (from the south)	4	4	4	3
Main Street (from the south)	14	12	14	13
Hazelton-Etna/Township Road (from the north)	12	10	13	10
Summit Road (from the north)	8	5	5	7
Dixon Road (from the north)	3	5	5	5
Havens Corner Road (from the west)	7	9	10	6

Table 2.03-2 Planned Development Trip Distribution

2.04 AM AND PM PEAK-HOUR OPERATIONS WITH DEVELOPMENT TRAFFIC

With development traffic distributed amongst the AM and PM peak-hour traffic models, an analysis of the future conditions could be completed. Using the methodology described in Section 1.01, LOS was determined at all the studied intersections. For those intersections that fell below a LOS D, improvements would be necessary, and that cost should be attributed to the developments throughout.

Intersection	LOS (2020)		LOS (2030)		Improvement Necessary?
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	
Refugee Road/Mink Street	F	B	F	B	Yes
Refugee Road/Etna Parkway	F	A	F	A	Yes
Refugee Road/Main Street	F	F	F	F	Yes
Broad Street/Taylor Road	F	F	F	F	Yes
Broad Street/Summit Road	E	F	E	F	Yes
Broad Street/Columbia Road SW	F	F	F	F	Yes
Broad Street/Main Street	E	F	E	F	Yes
Broad Street/Township Road/ Hazelton Etna Road	F	F	F	F	Yes
Broad Street/Watkins Road	E	F	E	F	Yes
Havens Corner Road/Dixon Road	F	F	F	F	Yes
Havens Corner Road/Taylor Road	F	F	F	F	Yes
Havens Corner Road/Summit Road	F	F	F	F	Yes
Havens Corner Road/Mink Street	E	F	F	F	Yes
Clark State Road/Dixon Road	F	F	F	F	Yes

Table 2.04-1 LOS Intersections (Baseline Conditions with Development)

It can be observed from Table 2.04-1 that almost all the studied intersections fail to operate at a satisfactory LOS after the addition of development traffic to the City roadway network. The costs to improve these areas from their baseline definition should be incorporated into the final impact fee developers will pay.

2.05 PROPOSED IMPROVEMENTS TO ADDRESS OPERATIONAL FAILURES

With the operational failures identified, the next step was to determine the necessary improvements to the overall roadway network and intersections. Building on the previously developed Synchro10 models with development traffic distributed throughout, iterative adjustments were made until each intersection in question obtained a LOS of at least D. This included evaluating each intersection for signal upgrades, conversion to roundabout control, and addition of exclusive turning lanes. Furthermore, addition of through lanes was considered to further improve roadway capacity. Table 2.05-1 lists the improvements that were identified, as well as their limits. These can be visually observed in Figure 2.05-1 as well.

	Limits of Improvement	Improvement Type
1	Broad Street (from 0.35 miles east of Summit Road to Watkins Road)	Addition of two through lanes (one each direction)
2	Refugee Road (from Mink Street to Main Street)	Addition of two through lanes (one each direction)
3	Mink Street (from Refugee Road to approximately 0.75 miles north)	Addition of two through lanes (one each direction)
4	Mink Street (from Havens Corner Road to approximately 400 LF south)	Addition of two left-turn exclusive lanes (NB)
5	Etna Parkway (from Refugee Road to approximately 0.75 miles north)	Addition of two through lanes (one each direction)
6	Main Street (from Refugee Road to approximately 1.25 miles north)	Addition of two through lanes (one each direction)
7	Havens Corner Road (from Dixon Road to Mink Street)	Addition of two through lanes (one each direction)
8	Intersection of Refugee Road/Mink Street	Upgrade to Signalized Intersection
9	Intersection of Refugee Road/Etna Parkway	▪ Upgrade to Signalized Intersection ▪ Addition of left-turn only lanes (SB,WB,NB) ▪ Addition of right-turn only lane (NB)
10	Intersection of Refugee Road/Main Street	▪ Upgrade to Signalized Intersection ▪ Addition of left-turn only lanes (EB,SB,Dual NB) ▪ Addition of right-turn bypass lane (EB, SB)
11	Intersection of Broad Street/Mink Street	▪ Addition of left-turn only lanes (EB, Dual WB) ▪ Addition of right-turn bypass lane (EB,WB)
12	Intersection of Broad Street/ Columbia Road	▪ Addition of left-turn only lanes (All directions) ▪ Addition of right-turn only lanes (EB,SB,NB)
13	Intersection of Broad Street/Main Street	Addition of right-turn only lane (NB,EB)
14	Intersection of Broad Street Hazelton-Etna/Township Road	▪ Addition of Left-turn only lane (EB,WB) ▪ Convert right-turn only lane to bypass lane (NB)
15	Intersection of Havens Corner Road/Dixon Road	▪ Addition of right-turn only lane (WB) ▪ Addition of left-turn only lane (SB)
16	Intersection of Havens Corner Road/Taylor Avenue	Addition of left-turn only lane (WB)
17	Intersection of Havens Corner Road/ Summit Road	Addition of Left-turn only lanes (All directions, Dual NB)
18	Intersection of Havens Corner Road/Mink Street	▪ Upgrade to Signalized Intersection ▪ Addition of dual left-turn only lane (NB) ▪ Addition of Right-turn bypass lane (EB)
19	Intersection of Clark State Road/Dixon Road	Upgrade to Roundabout

Table 2.05-1 Necessary Improvements Within the City

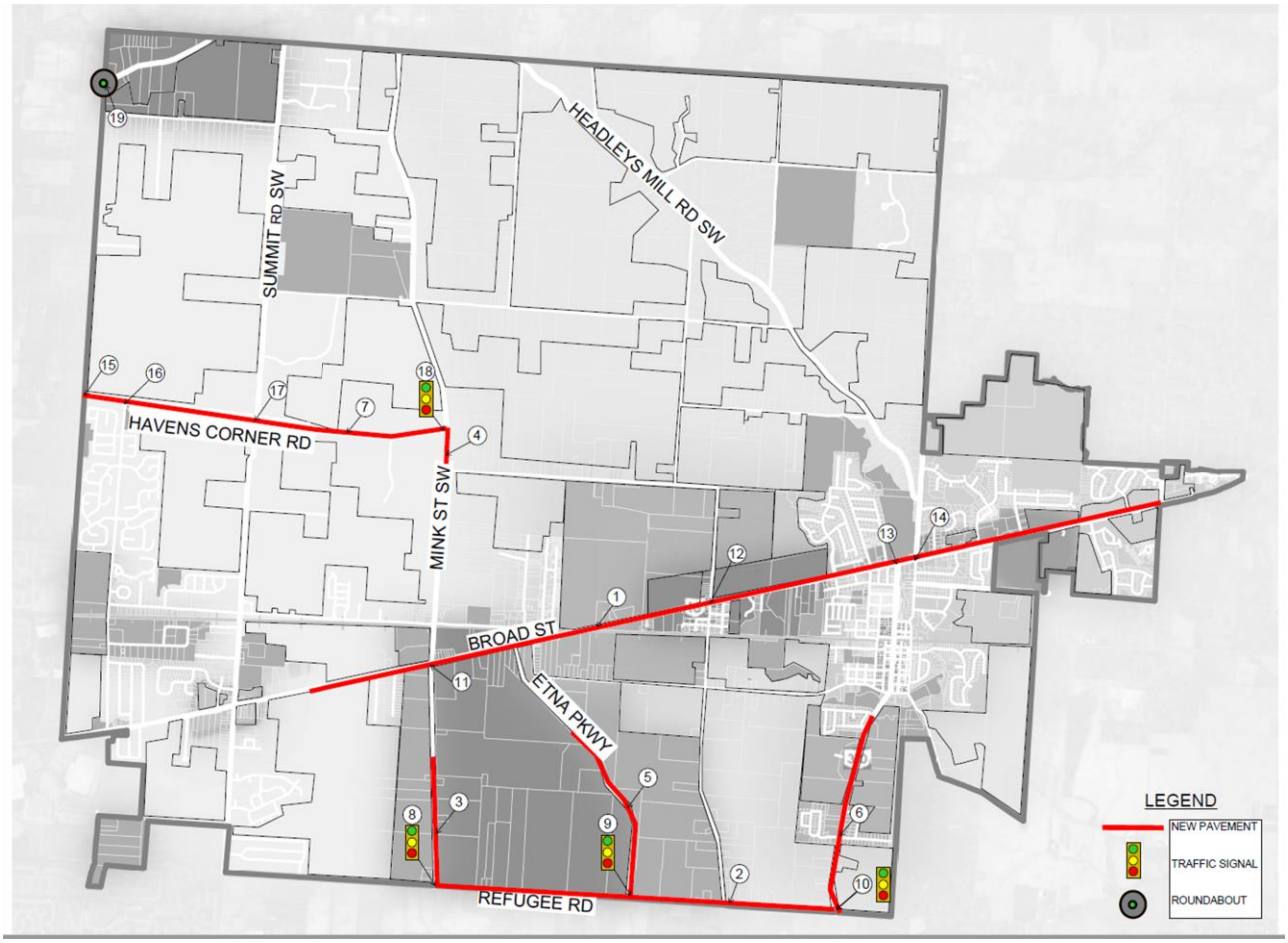

Figure 2.05-1 Necessary Improvements Within the City

2.06 AM AND PM PEAK-HOUR OPERATIONS AFTER IMPROVEMENTS

To verify that the improvements listed in Table 2.05-1 and shown visually in Figure 2.05-1 address operational failures brought on by development traffic, an additional Synchro10 model was created, incorporating these improvements. Some changes in trip distribution methodology were also applied. Larger, industrial-based development types that fall within the Flex Industrial and Innovation categories would likely not use Broad Street as their main entry and exit points. Instead, this traffic would likely use Interstate-70 and US-40, both located south of the City limits and therefore mainly use Mink Street, Etna Parkway, and Refugee Road to enter and exit the City. The improvements identified reflect this, as Refugee Road is widened into more of an industrial corridor, with similar improvements made along Mink Street and Etna Parkway to handle this influx of industrial-based traffic.

Table 2.06-1 provides the AM and PM peak-hour LOS for both the 2020 and 2030 design years.

Intersection	LOS (2020)		LOS (2030)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Refugee Road/Mink Street	B	C	B	C
Refugee Road/Etna Parkway	C	D	C	D
Refugee Road/Main Street	C	C	C	C
Broad Street/Taylor Road	D	D	D	D
Broad Street/Summit Road	D	D	D	D
Broad Street/Columbia Road SW	B	D	B	D
Broad Street/Main Street	B	B	B	B
Broad Street/Township Road/Hazelton Etna Road	D	D	D	D
Broad Street/Watkins Road	B	B	B	B
Havens Corner Road/Dixon Road	D	B	D	C
Havens Corner Road/Taylor Road	C	D	C	D
Havens Corner Road/Summit Road	C	D	C	D
Havens Corner Road/Mink Street	C	D	C	D
Clark State Road/Dixon Road	B	C	B	C

Table 2.06-1 LOS Intersections (Improvement Conditions with Development)

With all studied intersections meeting the minimum LOS of D, the current improvement alternatives are an acceptable method to address development operational failures. The final step will be to determine the overall cost of these improvements and distribute amongst all anticipated development.

SECTION 3
DEVELOPMENT OF IMPACT FEE

3.01 ESTIMATED CONSTRUCTION COSTS OF NECESSARY IMPROVEMENTS

With the necessary improvements identified to address operation failures from development, the final step was to determine estimated construction costs. Construction costs for each identified improvement was determined using current construction costing trends and recently completed work. These costs are at an estimated planning level but should provide enough contingency to fund these improvements as the need arises from future development.

- Roundabout–The estimated construction cost for a two-lane roundabout is approximately $1,250,000 (including right-of-way acquisition).
- Traffic Signal–The estimated construction cost for a new traffic signal is approximately $300,000.
- Pavement Widening and Exclusive-Use Lanes–The estimated construction cost for a new lane of pavement (assumed to be 12 feet wide) is a unit cost of $100 per lineal foot.

Table 3.01-1 compiles all the construction costs into one final sum.

Improvement Type	Unit Cost	Quantitiy	Extension
Roundabout	$1,250,000 per each	1	$1,250,000
Traffic Signal	$300,000 per each	3	$900,000
Pavement Widening and Exclusive-Use Lanes	$100 per LF	150,000	$15,000,000
	Total Estimated Construction Costs		$17,150,000

Table 3.01-1 Sum of All Improvement Construction Costs

The $16,450,000 construction cost determined above is only for costs associated with development driven improvement needs. The improvements deemed necessary from the previously completed Intersection Capacity and Safety Evaluation, as well as the baseline improvements determined in Section 1 of this report are not included in this cost and cannot be funded through the Impact Fee developed herein.

3.02 IMPACT FEE CALCULATIONS

With an estimated overall construction cost calculated, an impact fee per trip end can be generated. Using the trip generation data shown previously in Table 2.02-1, the total daily trips (adjusted for pass-by rates) for all developments is 90,196 trip ends. Therefore, the following calculation could be used:

$17,150,000 ÷ 90,196 trip ends = {$190.14 Per Trip End}

For ease of comparison purposes, the roadway impact fee developed above was then used to determine an average cost per land development size, using the overall development size and ITE land use codes provided in Table 2.02-1.

ITE Land Use Codes	Total Size	Adjusted Vehicle Trips Generated (Daily)	Trip Per Unit
130	4,684,875 SF	5,552	0.0019 trips per SF
140	1,644,000 SF	4,284	0.0026 trips per SF
210	5,543 D.U.	33,441	6.0 per trips D.U.
220	557 D.U.	3,336	6.0 per trips D.U.
710	1,769,700 SF	13,782	0.0078 trips per SF
715	46,080 SF	415	0.0090 trips per SF
760	411,000 SF	3,528	0.0086 trips per SF
770	107,500 SF	1,486	0.0138 trips per SF
820	1,443,100 SF	24,372	0.0169 trips per SF

Table 3.02-1 Calculated ITE Trips per Unit

Table 3.02-1 demonstrates the overall average trips per unit calculated for each of the ITE Land Use Codes for all the planning areas. From this information, a detailed impact fee schedule was then developed and provided below in Table 3.02-2. A graduated fee assessment is also provided based upon ranges of development sizes and types.

Development Type	Range of Development Size	Assessed Impact Fee Per Unit
Single-Family/Multi-Family Dwelling	1 D.U.	$1,140.84/D.U.
Retail/Restaurant	<10,000 SF	$5.77/SF
	10,001 SF to 25,000 SF	$5.35/SF
	25,0001 SF to 50,000 SF	$4.27/SF
	50,000 SF to 100,000 SF	$3.72/SF
	100,001 SF to 200,000 SF	$3.45/SF
	>200,000 SF	$3.21/SF
Office/Institutional	<10,000 SF	$2.16/SF
	10,001 SF to 25,000 SF	$2.06/SF
	25,0001 SF to 50,000 SF	$1.85/SF
	50,000 SF to 100,000 SF	$1.73/SF
	100,001 SF to 200,000 SF	$1.67/SF
	>200,000 SF	$1.64/SF
Light Industrial/Warehousing	<10,000 SF	$4.32/SF
	10,001 SF to 25,000 SF	$2.78/SF
	25,0001 SF to 50,000 SF	$1.99/SF
	50,000 SF to 100,000 SF	$1.43/SF
	100,001 SF to 200,000 SF	$1.02/SF
	>200,001 SF	$0.50/SF
Manufacturing	<10,000 SF	$2.92/SF
	10,001 SF to 25,000 SF	$1.45/SF
	25,0001 SF to 50,000 SF	$0.97/SF
	50,000 SF to 100,000 SF	$0.72/SF
	100,001 SF to 200,000 SF	$0.60/SF
	>200,001 SF	$0.49/SF

Table 3.02-2 Development Impact Fee Schedule of Values

3.02 CLOSING STATEMENTS

The Impact Fees established within this report should not be used to pay for supplies, salaries, training, repairs, or administrative costs. Additionally, a fee cannot be imposed on a developer to address any existing deficiencies before development. The impact fees established herein must be used to address deficiencies brought on by these future developments.

It will be important for the City to start the implementation process for impact fees by first developing and passing local ordinances. Provisions within these ordinances should be carefully drafted to withstand potential court challenges during the lifetime of the ordinance. Funds collected from the impact fees must then be segregated from any general City funds and used solely for the purposes for which the impact fee was established.

The impact fee established within the report used a 10-year design horizon life. As time passes, it may be necessary to make revisions to impact fees established in these ordinances to ensure they still meet current construction trends and methodology.

APPENDIX A
TRAFFIC COUNT DATA

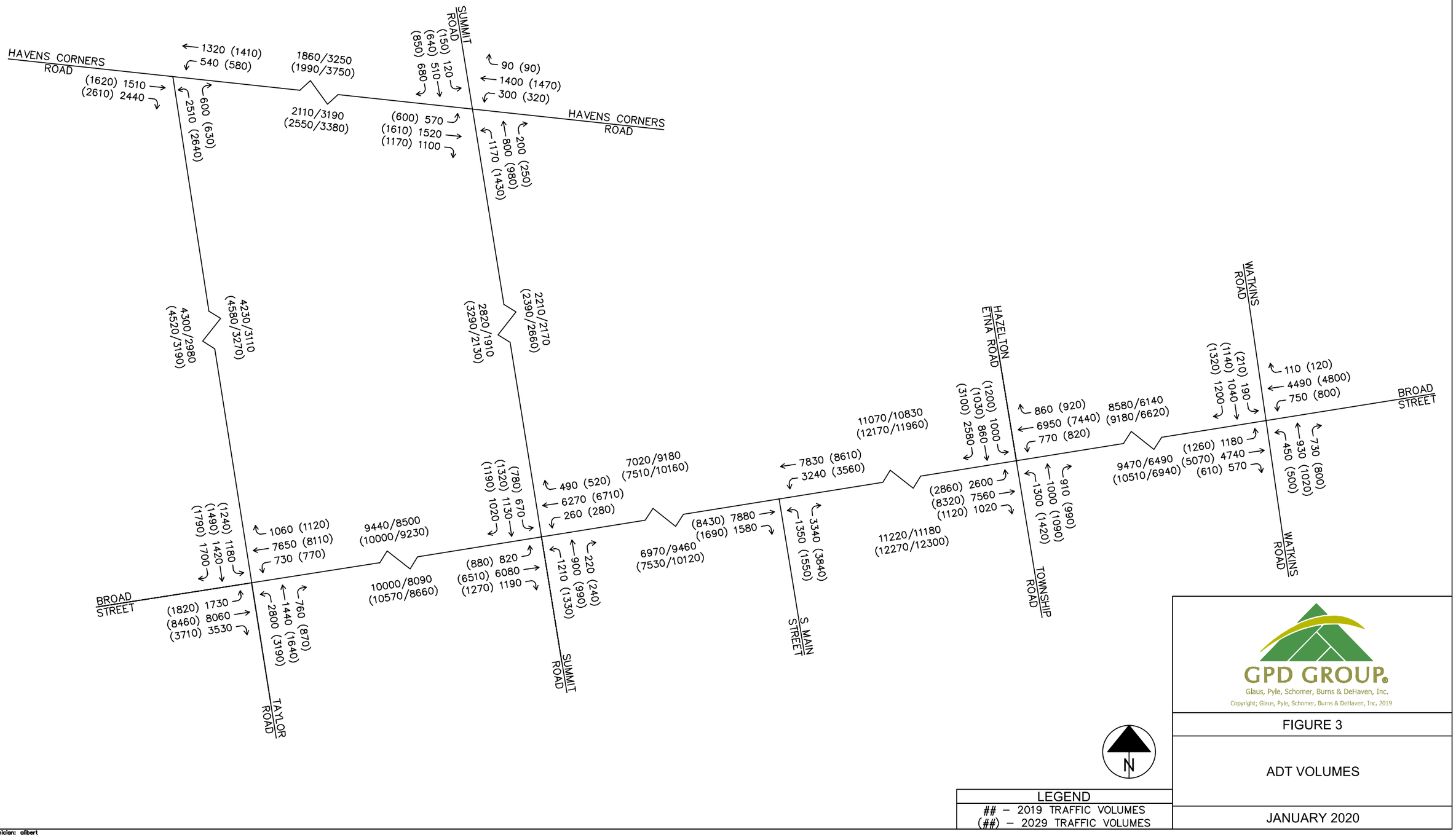

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FIGURE 3

ADT VOLUMES

JANUARY 2020

LEGEND

– 2019 TRAFFIC VOLUMES
(##) – 2029 TRAFFIC VOLUMES

N

Drawing File: O:\2019\2019056\01 - Pataskala Int. Cap. & Safety Study\Design\Traffic\Cap-Safety Study\Figures\ADT Volumes.dwg Layout: Layout1
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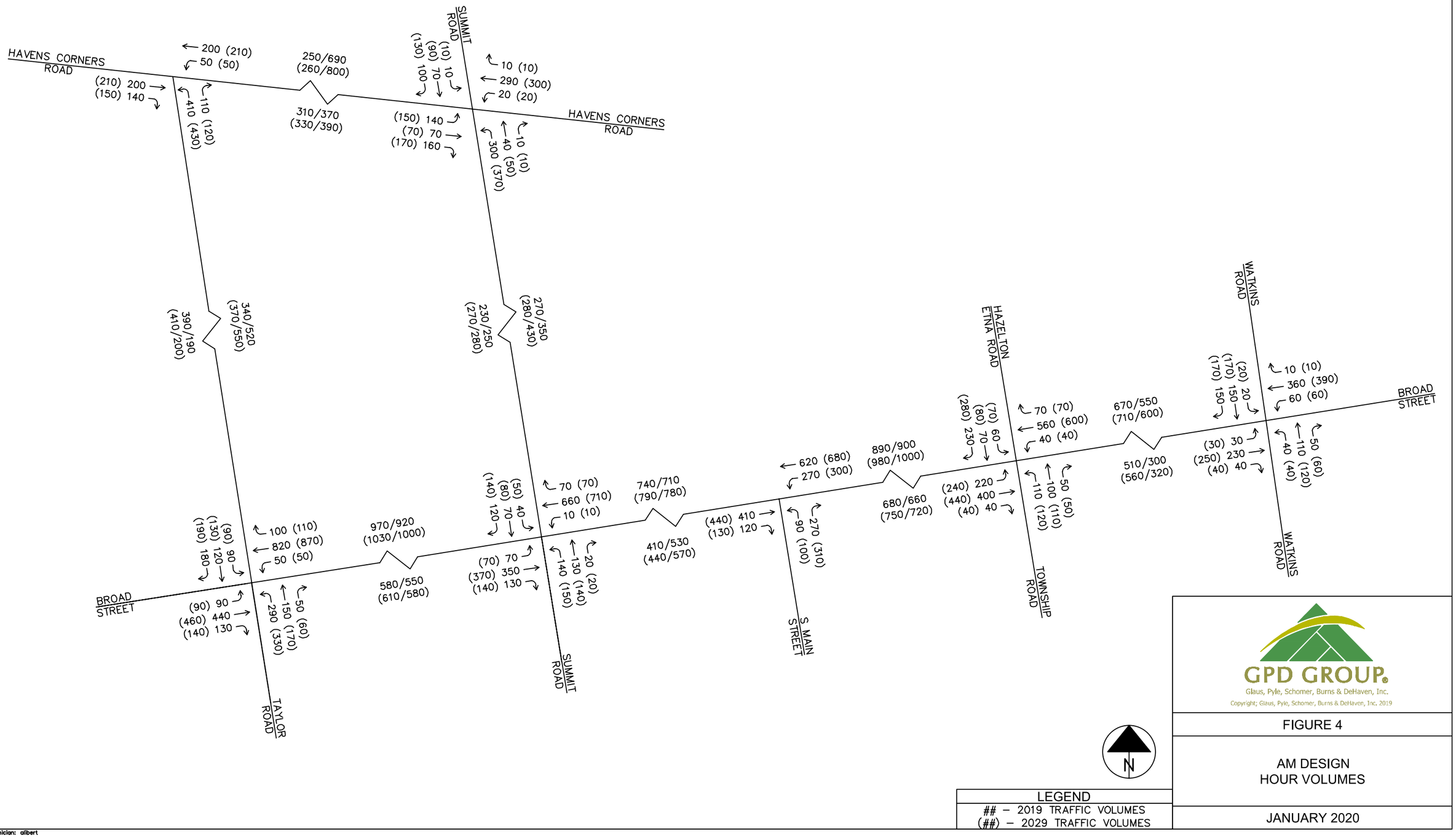

LEGEND

– 2019 TRAFFIC VOLUMES
(##) – 2029 TRAFFIC VOLUMES

N

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FIGURE 4

AM DESIGN
HOUR VOLUMES

JANUARY 2020

Drawing File: O:\2019\2019056\01 - Pataskala Int. Cap. & Safety Study\Design\Traffic\Cap-Safety Study\Figures\AM Design Hour Volumes.dwg Layout: Layout1
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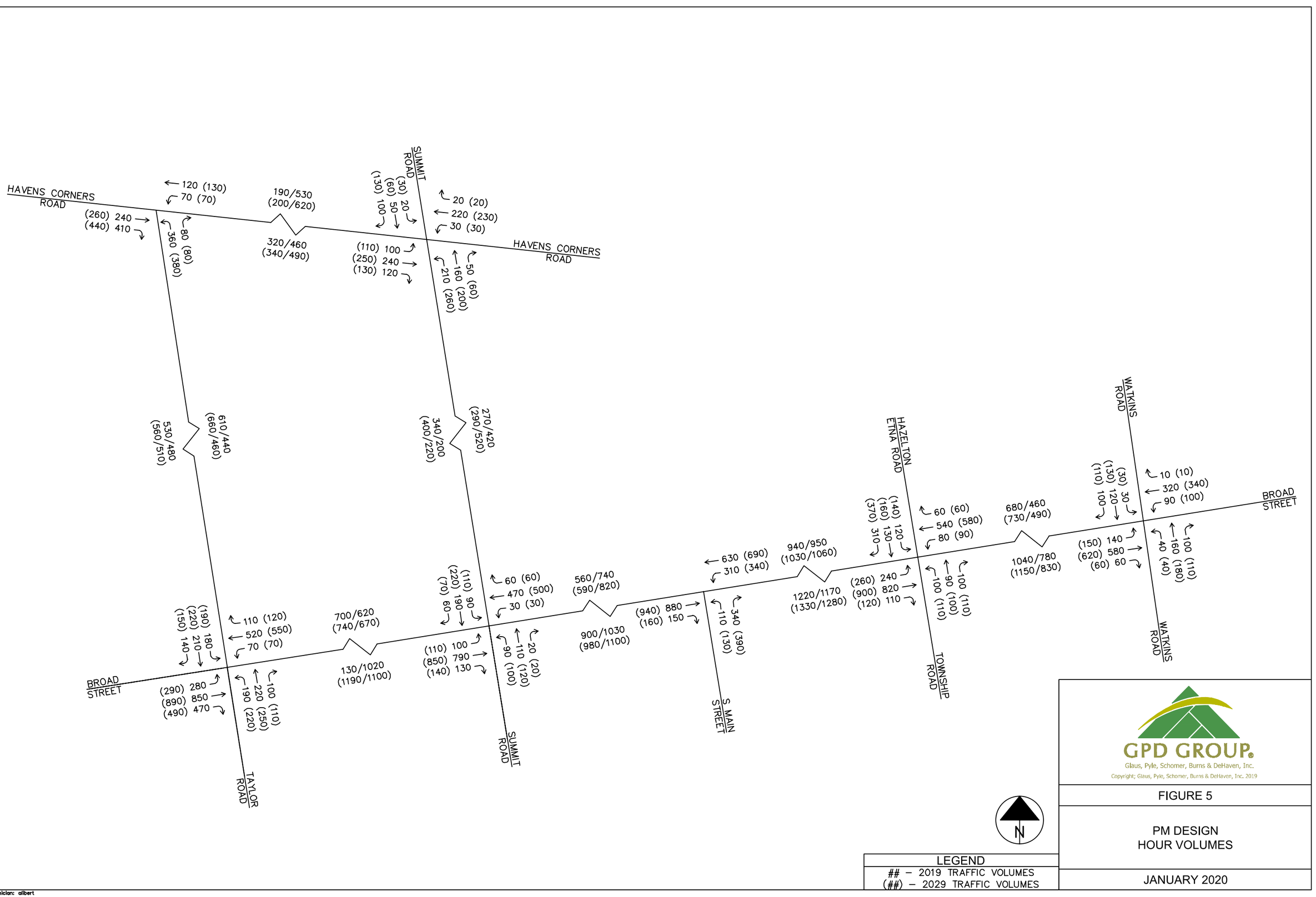

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Date: Dec 21, 2019 Time: 1:16 pm Twist: 0
Technician: alibert

1 - Havens Corners Rd & Mink St - TMC

Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750950, Location: 40.01525, -82.727535, Site Code: 1

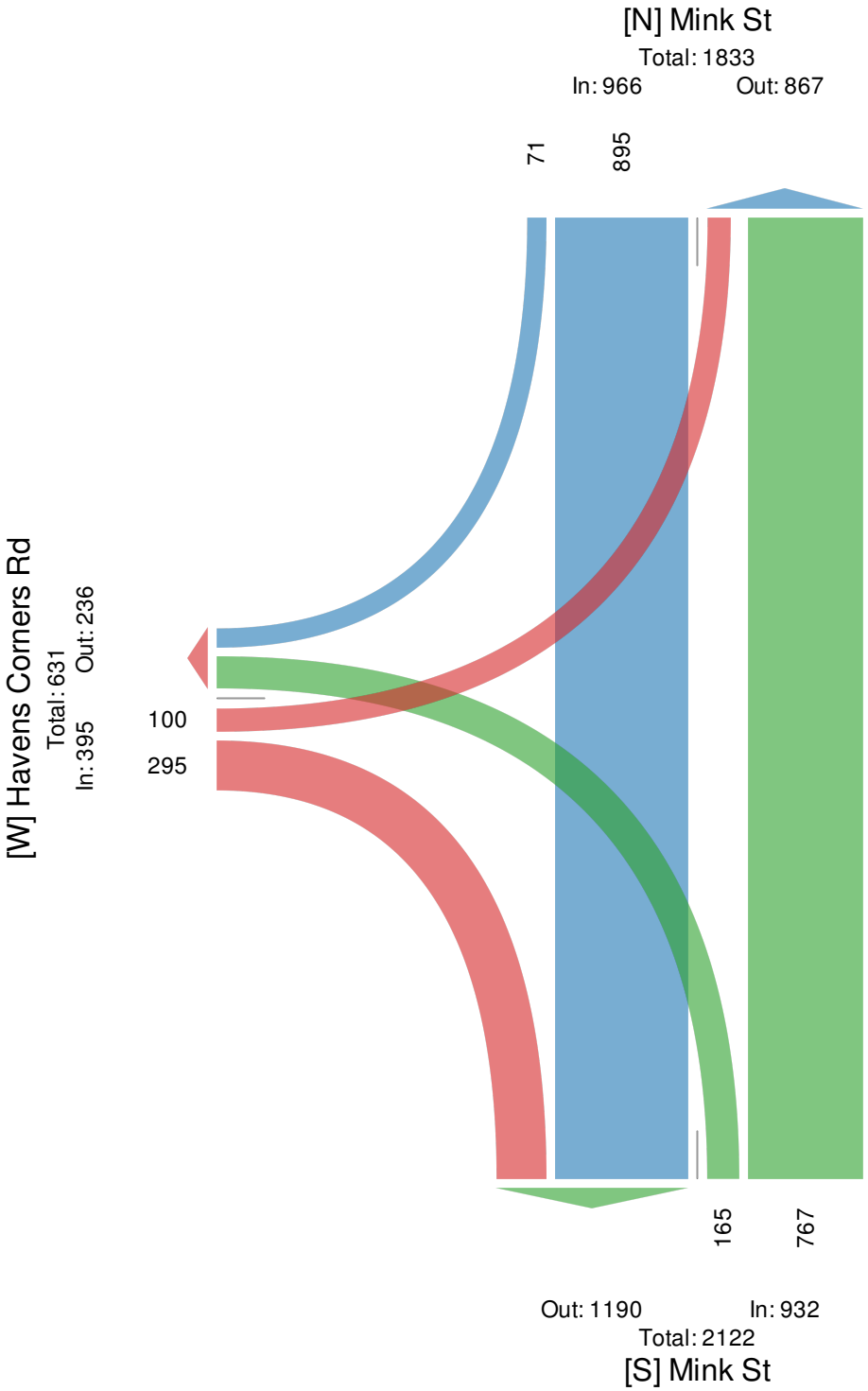
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Havens Corners Rd					Mink St					Mink St					
Direction	Eastbound					Northbound					Southbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2020-02-11 7:00AM	13	5	0	**18**	0	17	101	0	**118**	0	30	7	0	**37**	0	**173**
7:15AM	17	5	0	**22**	0	17	80	0	**97**	0	47	4	0	**51**	0	**170**
7:30AM	1	8	0	**9**	0	11	70	0	**81**	0	24	6	0	**30**	0	**120**
7:45AM	2	9	0	**11**	0	12	60	0	**72**	0	42	4	0	**46**	0	**129**
Hourly Total	33	27	0	**60**	0	57	311	0	**368**	0	143	21	0	**164**	0	**592**
8:00AM	1	11	0	**12**	0	8	58	0	**66**	0	39	5	0	**44**	0	**122**
8:15AM	6	6	0	**12**	0	16	42	0	**58**	0	33	6	0	**39**	0	**109**
8:30AM	6	6	0	**12**	0	13	47	0	**60**	0	40	4	0	**44**	0	**116**
8:45AM	3	8	0	**11**	0	9	26	0	**35**	0	35	2	0	**37**	0	**83**
Hourly Total	16	31	0	**47**	0	46	173	0	**219**	0	147	17	0	**164**	0	**430**
4:00PM	5	19	0	**24**	0	11	24	0	**35**	0	54	2	0	**56**	0	**115**
4:15PM	6	37	0	**43**	0	9	33	0	**42**	0	60	8	0	**68**	0	**153**
4:30PM	3	32	0	**35**	0	12	41	0	**53**	0	69	2	0	**71**	0	**159**
4:45PM	6	33	0	**39**	0	7	35	0	**42**	0	88	6	0	**94**	0	**175**
Hourly Total	20	121	0	**141**	0	39	133	0	**172**	0	271	18	0	**289**	0	**602**
5:00PM	8	35	0	**43**	0	5	29	0	**34**	0	78	6	0	**84**	0	**161**
5:15PM	8	35	0	**43**	0	8	44	0	**52**	0	93	2	0	**95**	0	**190**
5:30PM	7	28	0	**35**	0	1	45	0	**46**	0	90	4	0	**94**	0	**175**
5:45PM	8	18	0	**26**	0	9	32	0	**41**	0	73	3	0	**76**	0	**143**
Hourly Total	31	116	0	**147**	0	23	150	0	**173**	0	334	15	0	**349**	0	**669**
Total	100	295	0	**395**	0	165	767	0	**932**	0	895	71	0	**966**	0	**2293**
% Approach	25.3%	74.7%	0%	**-**	-	17.7%	82.3%	0%	**-**	-	92.7%	7.3%	0%	**-**	-	-
% Total	4.4%	12.9%	0%	**17.2%**	-	7.2%	33.4%	0%	**40.6%**	-	39.0%	3.1%	0%	**42.1%**	-	-
Lights and Motorcycles	97	292	0	**389**	-	163	749	0	**912**	-	873	69	0	**942**	-	2243
% Lights and Motorcycles	97.0%	99.0%	0%	**98.5%**	-	98.8%	97.7%	0%	**97.9%**	-	97.5%	97.2%	0%	**97.5%**	-	97.8%
Heavy	3	3	0	**6**	-	2	18	0	**20**	-	22	2	0	**24**	-	50
% Heavy	3.0%	1.0%	0%	**1.5%**	-	1.2%	2.3%	0%	**2.1%**	-	2.5%	2.8%	0%	**2.5%**	-	2.2%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1 - Havens Corners Rd & Mink St - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750950, Location: 40.01525, -82.727535, Site Code: 1

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



1 - Havens Corners Rd & Mink St - TMC

Tue Feb 11, 2020
AM Peak (7 AM - 8 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750950, Location: 40.01525, -82.727535, Site Code: 1

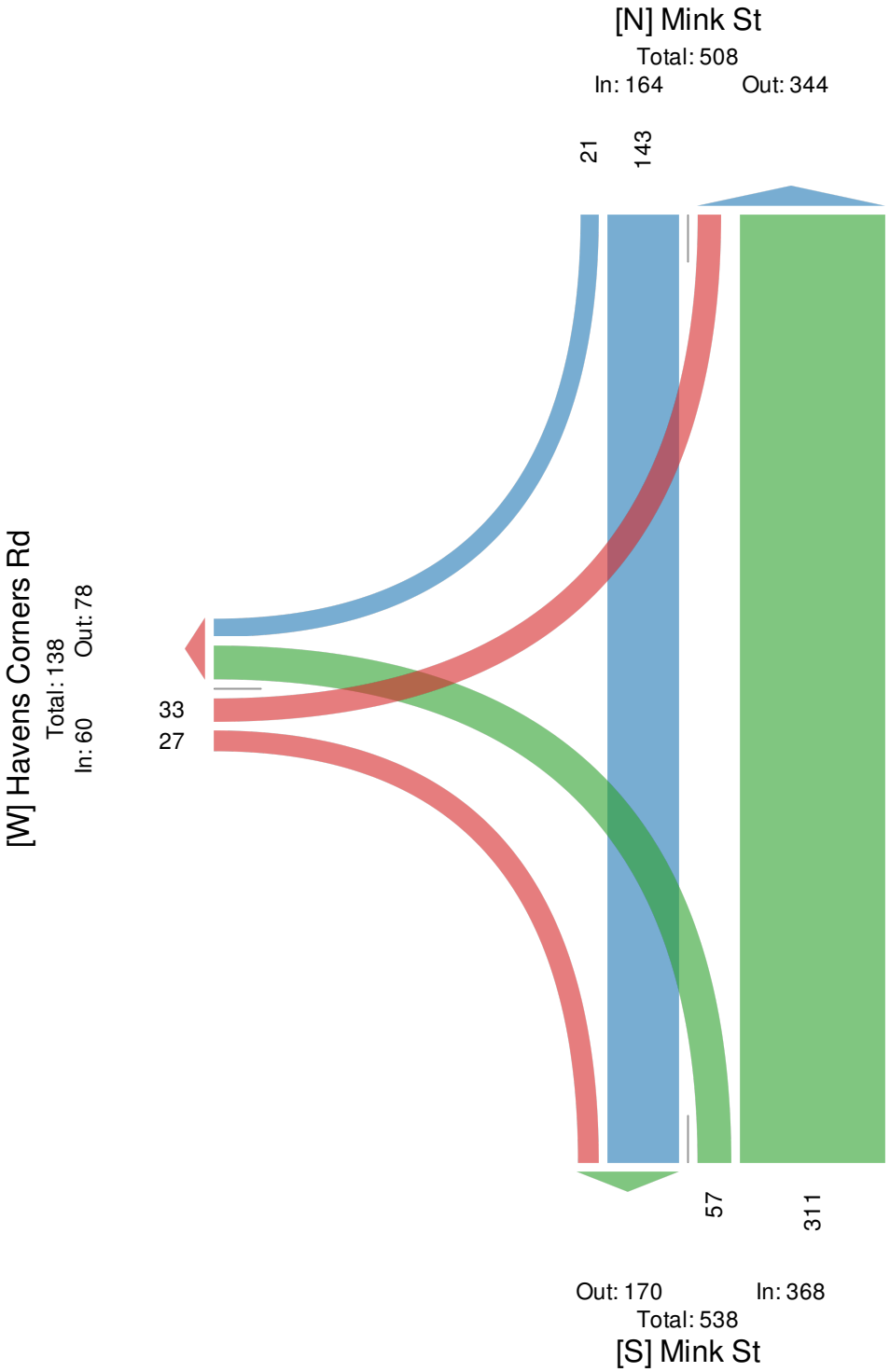
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Havens Corners Rd					Mink St					Mink St					
Direction	Eastbound					Northbound					Southbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2020-02-11 7:00AM	13	5	0	**18**	0	17	101	0	**118**	0	30	7	0	**37**	0	**173**
7:15AM	17	5	0	**22**	0	17	80	0	**97**	0	47	4	0	**51**	0	**170**
7:30AM	1	8	0	**9**	0	11	70	0	**81**	0	24	6	0	**30**	0	**120**
7:45AM	2	9	0	**11**	0	12	60	0	**72**	0	42	4	0	**46**	0	**129**
Total	33	27	0	**60**	0	57	311	0	**368**	0	143	21	0	**164**	0	**592**
% Approach	55.0%	45.0%	0%	**-**	-	15.5%	84.5%	0%	**-**	-	87.2%	12.8%	0%	**-**	-	-
% Total	5.6%	4.6%	0%	**10.1%**	-	9.6%	52.5%	0%	**62.2%**	-	24.2%	3.5%	0%	**27.7%**	-	-
PHF	0.485	0.750	-	**0.682**	-	0.838	0.770	-	**0.780**	-	0.761	0.750	-	**0.804**	-	0.855
Lights and Motorcycles	32	26	0	**58**	-	56	303	0	**359**	-	141	19	0	**160**	-	577
% Lights and Motorcycles	97.0%	96.3%	0%	**96.7%**	-	98.2%	97.4%	0%	**97.6%**	-	98.6%	90.5%	0%	**97.6%**	-	97.5%
Heavy	1	1	0	**2**	-	1	8	0	**9**	-	2	2	0	**4**	-	15
% Heavy	3.0%	3.7%	0%	**3.3%**	-	1.8%	2.6%	0%	**2.4%**	-	1.4%	9.5%	0%	**2.4%**	-	2.5%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1 - Havens Corners Rd & Mink St - TMC
Tue Feb 11, 2020
AM Peak (7 AM - 8 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750950, Location: 40.01525, -82.727535, Site Code: 1

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



1 - Havens Corners Rd & Mink St - TMC

Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750950, Location: 40.01525, -82.727535, Site Code: 1

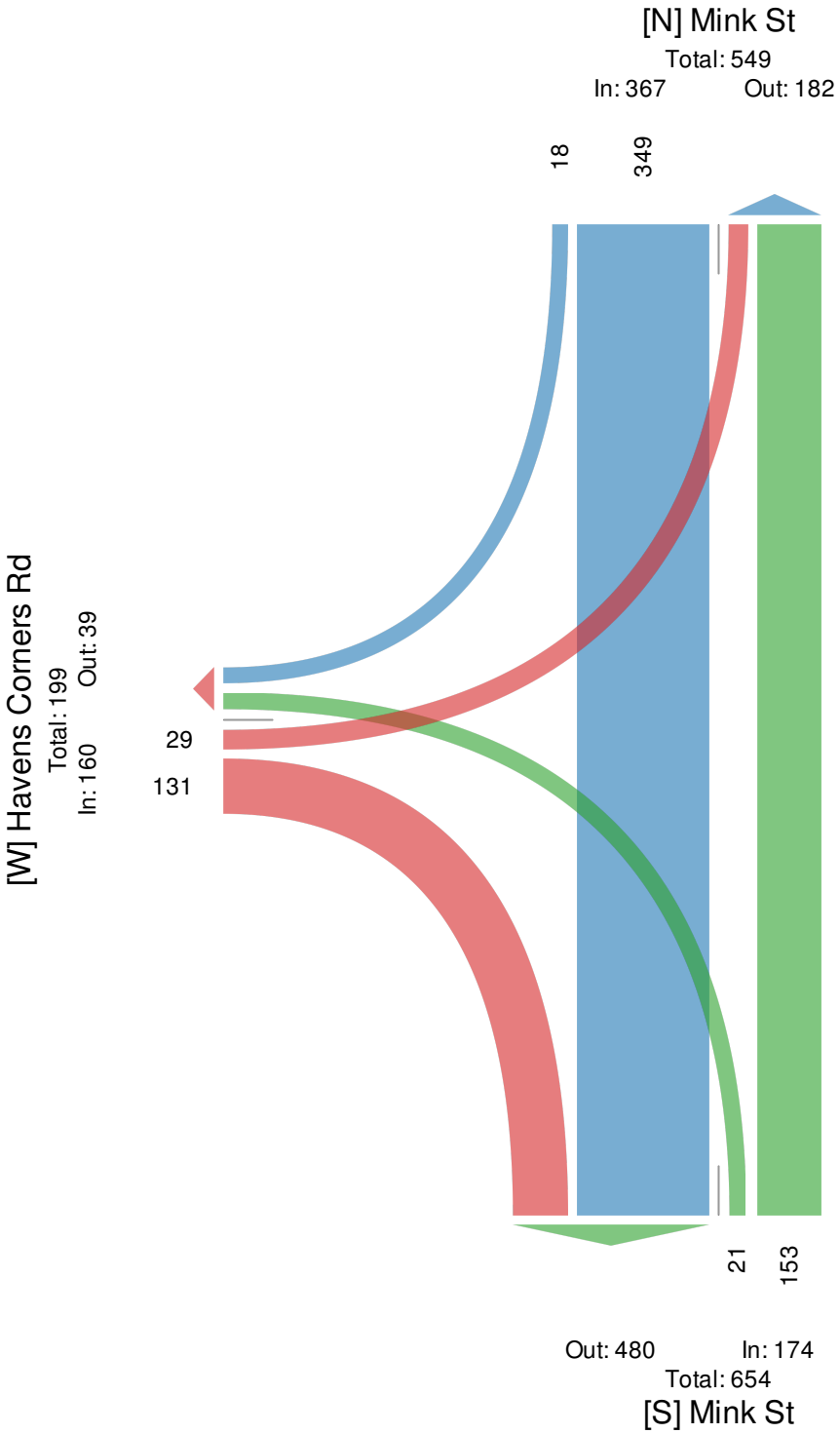
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Havens Corners Rd					Mink St					Mink St					
Direction	Eastbound					Northbound					Southbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2020-02-11 4:45PM	6	33	0	**39**	0	7	35	0	**42**	0	88	6	0	**94**	0	**175**
5:00PM	8	35	0	**43**	0	5	29	0	**34**	0	78	6	0	**84**	0	**161**
5:15PM	8	35	0	**43**	0	8	44	0	**52**	0	93	2	0	**95**	0	**190**
5:30PM	7	28	0	**35**	0	1	45	0	**46**	0	90	4	0	**94**	0	**175**
Total	29	131	0	**160**	0	21	153	0	**174**	0	349	18	0	**367**	0	**701**
% Approach	18.1%	81.9%	0%	-	-	12.1%	87.9%	0%	-	-	95.1%	4.9%	0%	-	-	-
% Total	4.1%	18.7%	0%	**22.8%**	-	3.0%	21.8%	0%	**24.8%**	-	49.8%	2.6%	0%	**52.4%**	-	-
PHF	0.906	0.936	-	**0.930**	-	0.656	0.850	-	**0.837**	-	0.938	0.750	-	**0.966**	-	0.922
Lights and Motorcycles	28	130	0	**158**	-	21	150	0	**171**	-	341	18	0	**359**	-	688
% Lights and Motorcycles	96.6%	99.2%	0%	**98.8%**	-	100%	98.0%	0%	**98.3%**	-	97.7%	100%	0%	**97.8%**	-	98.1%
Heavy	1	1	0	**2**	-	0	3	0	**3**	-	8	0	0	**8**	-	13
% Heavy	3.4%	0.8%	0%	**1.3%**	-	0%	2.0%	0%	**1.7%**	-	2.3%	0%	0%	**2.2%**	-	1.9%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1 - Havens Corners Rd & Mink St - TMC
Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750950, Location: 40.01525, -82.727535, Site Code: 1

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



2 - Havens Corners Rd & Dixon Rd - TMC

Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750918, Location: 40.018271, -82.77023, Site Code: 2

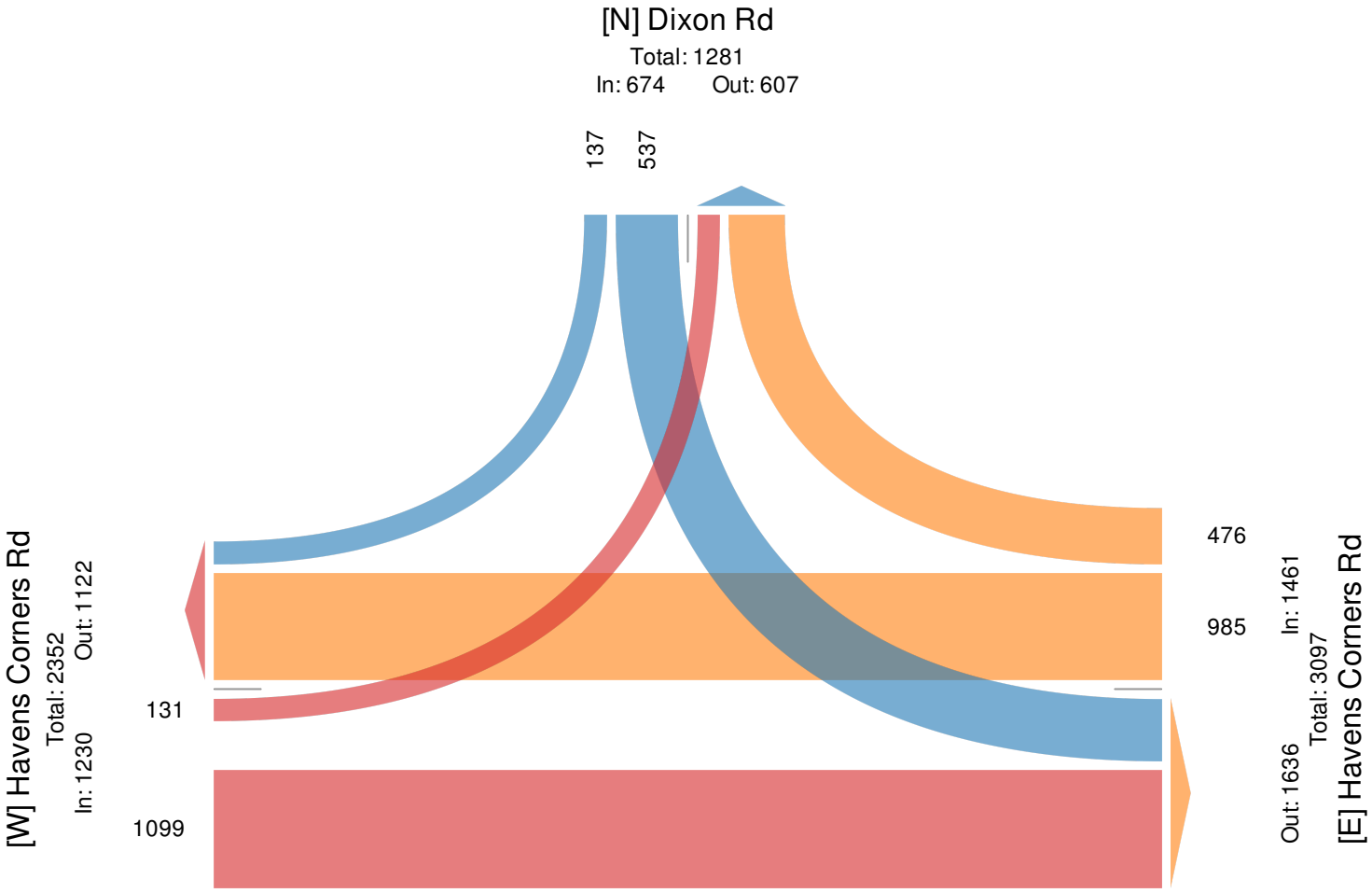
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Havens Corners Rd					Havens Corners Rd					Dixon Rd					
Direction	Eastbound					Westbound					Southbound					
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	App	Ped*	Int
2020-02-11 7:00AM	15	93	0	**108**	0	92	27	0	**119**	0	5	4	0	**9**	0	**236**
7:15AM	11	24	0	**35**	0	113	43	0	**156**	0	9	6	0	**15**	0	**206**
7:30AM	15	30	0	**45**	0	87	52	0	**139**	0	16	7	0	**23**	0	**207**
7:45AM	16	27	0	**43**	0	58	24	0	**82**	0	25	6	0	**31**	0	**156**
Hourly Total	57	174	0	**231**	0	350	146	0	**496**	0	55	23	0	**78**	0	**805**
8:00AM	4	31	0	**35**	0	77	36	0	**113**	0	39	12	0	**51**	0	**199**
8:15AM	5	22	0	**27**	0	63	31	0	**94**	0	30	15	0	**45**	0	**166**
8:30AM	8	37	0	**45**	0	79	16	0	**95**	0	51	10	0	**61**	0	**201**
8:45AM	7	50	0	**57**	0	44	18	0	**62**	0	32	1	0	**33**	0	**152**
Hourly Total	24	140	0	**164**	0	263	101	0	**364**	0	152	38	0	**190**	0	**718**
4:00PM	4	77	0	**81**	0	33	7	0	**40**	0	27	9	0	**36**	0	**157**
4:15PM	7	110	0	**117**	0	46	18	0	**64**	0	42	9	0	**51**	0	**232**
4:30PM	4	96	0	**100**	0	38	19	0	**57**	0	47	7	0	**54**	0	**211**
4:45PM	5	96	0	**101**	0	49	30	0	**79**	0	53	6	0	**59**	0	**239**
Hourly Total	20	379	0	**399**	0	166	74	0	**240**	0	169	31	0	**200**	0	**839**
5:00PM	10	113	0	**123**	0	53	39	0	**92**	0	38	8	0	**46**	0	**261**
5:15PM	9	111	0	**120**	0	49	44	0	**93**	0	41	12	0	**53**	0	**266**
5:30PM	8	112	0	**120**	0	64	46	0	**110**	0	49	18	0	**67**	0	**297**
5:45PM	3	70	0	**73**	0	40	26	0	**66**	0	33	7	0	**40**	0	**179**
Hourly Total	30	406	0	**436**	0	206	155	0	**361**	0	161	45	0	**206**	0	**1003**
Total	131	1099	0	**1230**	0	985	476	0	**1461**	0	537	137	0	**674**	0	**3365**
% Approach	10.7%	89.3%	0%	**-**	-	67.4%	32.6%	0%	**-**	-	79.7%	20.3%	0%	**-**	-	-
% Total	3.9%	32.7%	0%	**36.6%**	-	29.3%	14.1%	0%	**43.4%**	-	16.0%	4.1%	0%	**20.0%**	-	-
Lights and Motorcycles	129	1072	0	**1201**	-	968	474	0	**1442**	-	533	130	0	**663**	-	3306
% Lights and Motorcycles	98.5%	97.5%	0%	**97.6%**	-	98.3%	99.6%	0%	**98.7%**	-	99.3%	94.9%	0%	**98.4%**	-	98.2%
Heavy	2	27	0	**29**	-	17	2	0	**19**	-	4	7	0	**11**	-	59
% Heavy	1.5%	2.5%	0%	**2.4%**	-	1.7%	0.4%	0%	**1.3%**	-	0.7%	5.1%	0%	**1.6%**	-	1.8%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2 - Havens Corners Rd & Dixon Rd - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750918, Location: 40.018271, -82.77023, Site Code: 2

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



2 - Havens Corners Rd & Dixon Rd - TMC

Tue Feb 11, 2020
AM Peak (7 AM - 8 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750918, Location: 40.018271, -82.77023, Site Code: 2

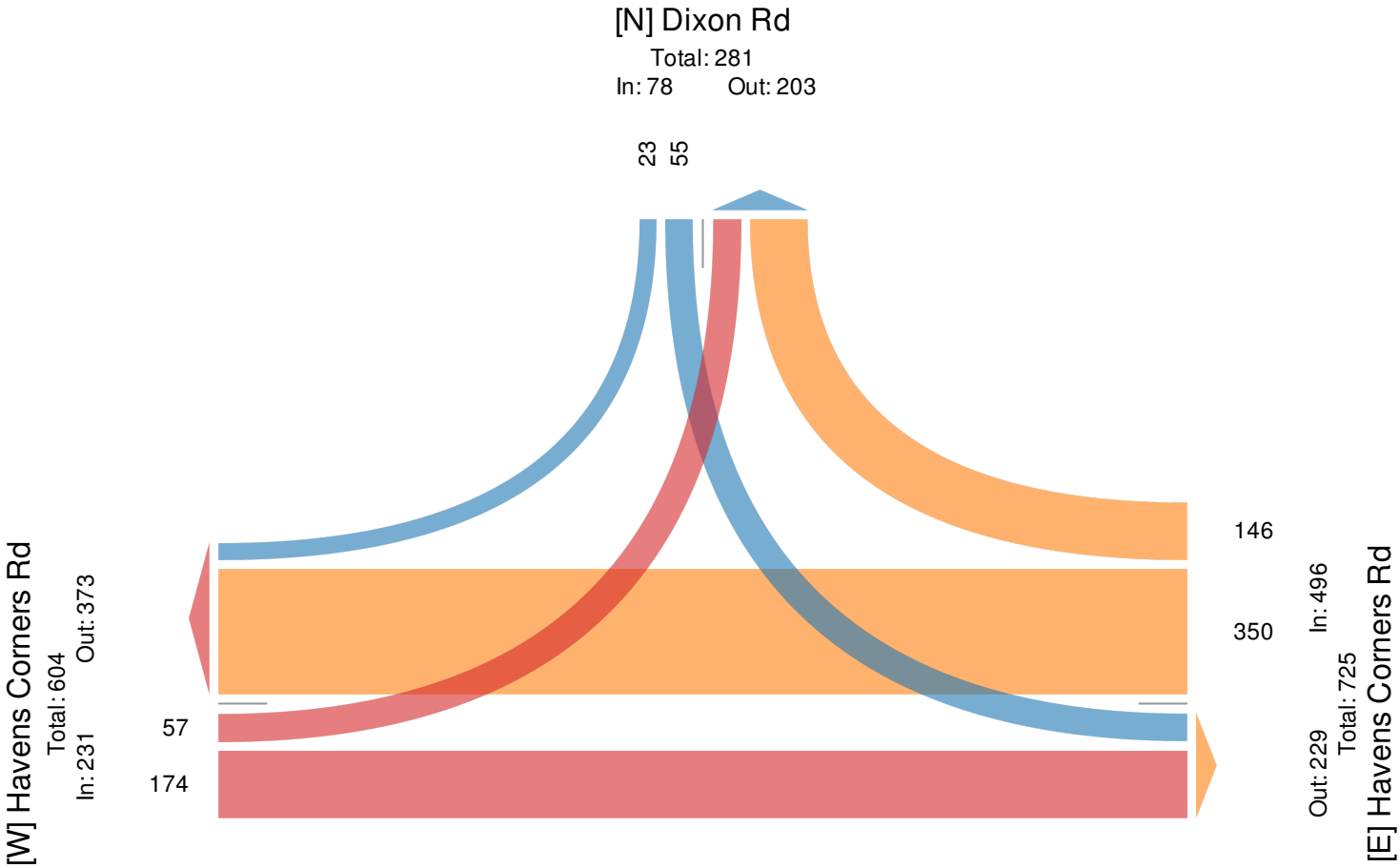
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Havens Corners Rd					Havens Corners Rd					Dixon Rd					
Direction	Eastbound					Westbound					Southbound					
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	App	Ped*	Int
2020-02-11 7:00AM	15	93	0	**108**	0	92	27	0	**119**	0	5	4	0	**9**	0	**236**
7:15AM	11	24	0	**35**	0	113	43	0	**156**	0	9	6	0	**15**	0	**206**
7:30AM	15	30	0	**45**	0	87	52	0	**139**	0	16	7	0	**23**	0	**207**
7:45AM	16	27	0	**43**	0	58	24	0	**82**	0	25	6	0	**31**	0	**156**
Total	57	174	0	**231**	0	350	146	0	**496**	0	55	23	0	**78**	0	**805**
% Approach	24.7%	75.3%	0%	**-**	-	70.6%	29.4%	0%	**-**	-	70.5%	29.5%	0%	**-**	-	-
% Total	7.1%	21.6%	0%	**28.7%**	-	43.5%	18.1%	0%	**61.6%**	-	6.8%	2.9%	0%	**9.7%**	-	-
PHF	0.891	0.468	-	**0.535**	-	0.774	0.702	-	**0.795**	-	0.550	0.821	-	**0.629**	-	0.853
Lights and Motorcycles	56	170	0	**226**	-	340	146	0	**486**	-	55	22	0	**77**	-	789
% Lights and Motorcycles	98.2%	97.7%	0%	**97.8%**	-	97.1%	100%	0%	**98.0%**	-	100%	95.7%	0%	**98.7%**	-	98.0%
Heavy	1	4	0	**5**	-	10	0	0	**10**	-	0	1	0	**1**	-	16
% Heavy	1.8%	2.3%	0%	**2.2%**	-	2.9%	0%	0%	**2.0%**	-	0%	4.3%	0%	**1.3%**	-	2.0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2 - Havens Corners Rd & Dixon Rd - TMC
Tue Feb 11, 2020
AM Peak (7 AM - 8 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750918, Location: 40.018271, -82.77023, Site Code: 2

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



2 - Havens Corners Rd & Dixon Rd - TMC

Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750918, Location: 40.018271, -82.77023, Site Code: 2

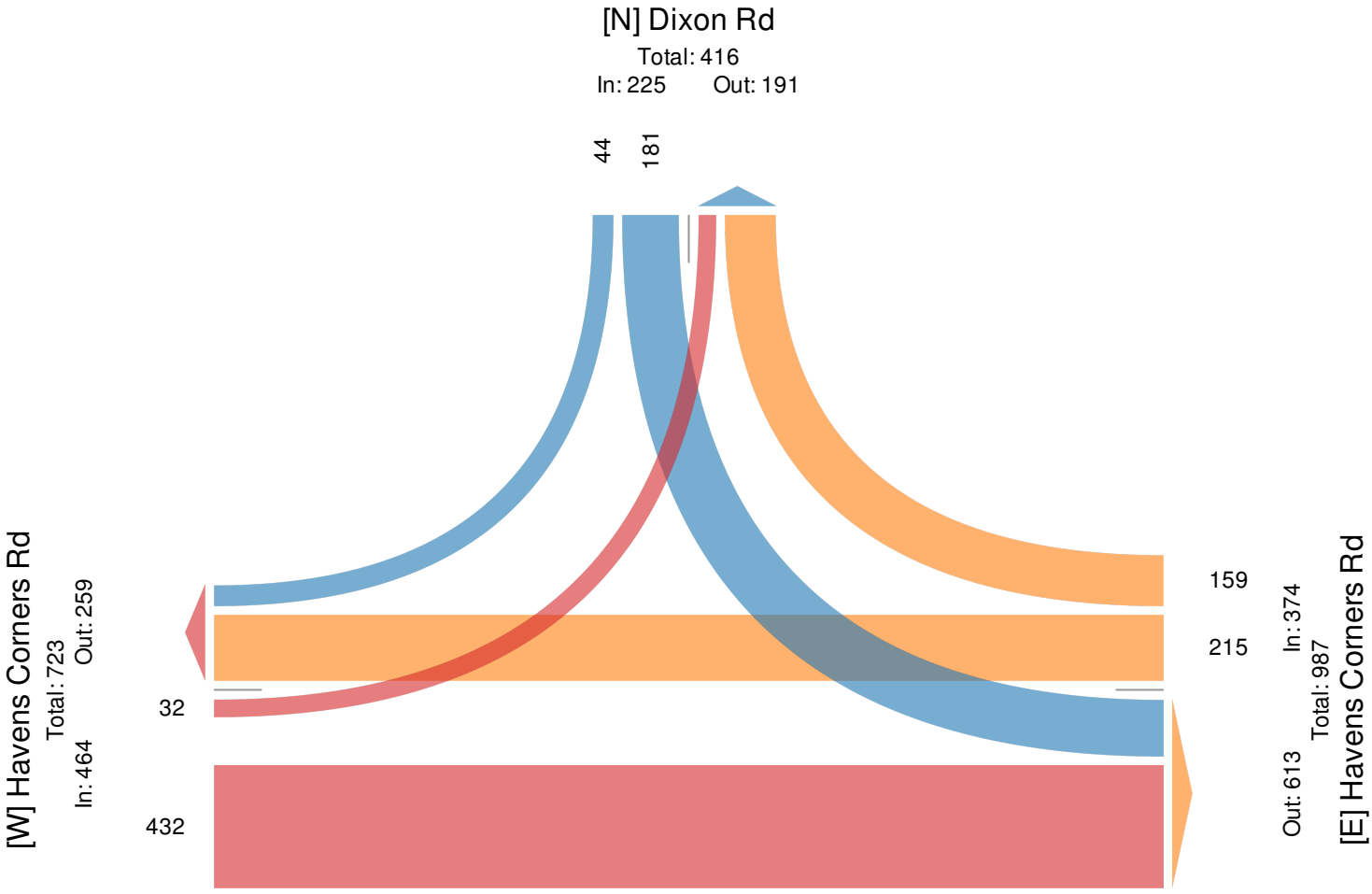
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Havens Corners Rd					Havens Corners Rd					Dixon Rd					
Direction	Eastbound					Westbound					Southbound					
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	App	Ped*	Int
2020-02-11 4:45PM	5	96	0	**101**	0	49	30	0	**79**	0	53	6	0	**59**	0	**239**
5:00PM	10	113	0	**123**	0	53	39	0	**92**	0	38	8	0	**46**	0	**261**
5:15PM	9	111	0	**120**	0	49	44	0	**93**	0	41	12	0	**53**	0	**266**
5:30PM	8	112	0	**120**	0	64	46	0	**110**	0	49	18	0	**67**	0	**297**
Total	32	432	0	**464**	0	215	159	0	**374**	0	181	44	0	**225**	0	**1063**
% Approach	6.9%	93.1%	0%	**-**	-	57.5%	42.5%	0%	**-**	-	80.4%	19.6%	0%	**-**	-	-
% Total	3.0%	40.6%	0%	**43.7%**	-	20.2%	15.0%	0%	**35.2%**	-	17.0%	4.1%	0%	**21.2%**	-	-
PHF	0.800	0.956	-	**0.943**	-	0.840	0.864	-	**0.850**	-	0.854	0.611	-	**0.840**	-	0.895
Lights and Motorcycles	32	426	0	**458**	-	215	159	0	**374**	-	179	44	0	**223**	-	1055
% Lights and Motorcycles	100%	98.6%	0%	**98.7%**	-	100%	100%	0%	**100%**	-	98.9%	100%	0%	**99.1%**	-	99.2%
Heavy	0	6	0	**6**	-	0	0	0	**0**	-	2	0	0	**2**	-	8
% Heavy	0%	1.4%	0%	**1.3%**	-	0%	0%	0%	**0%**	-	1.1%	0%	0%	**0.9%**	-	0.8%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2 - Havens Corners Rd & Dixon Rd - TMC
Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750918, Location: 40.018271, -82.77023, Site Code: 2

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



3 - Dixon Rd & Clark State Rd - TMC

Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750922, Location: 40.046274, -82.767905, Site Code: 3

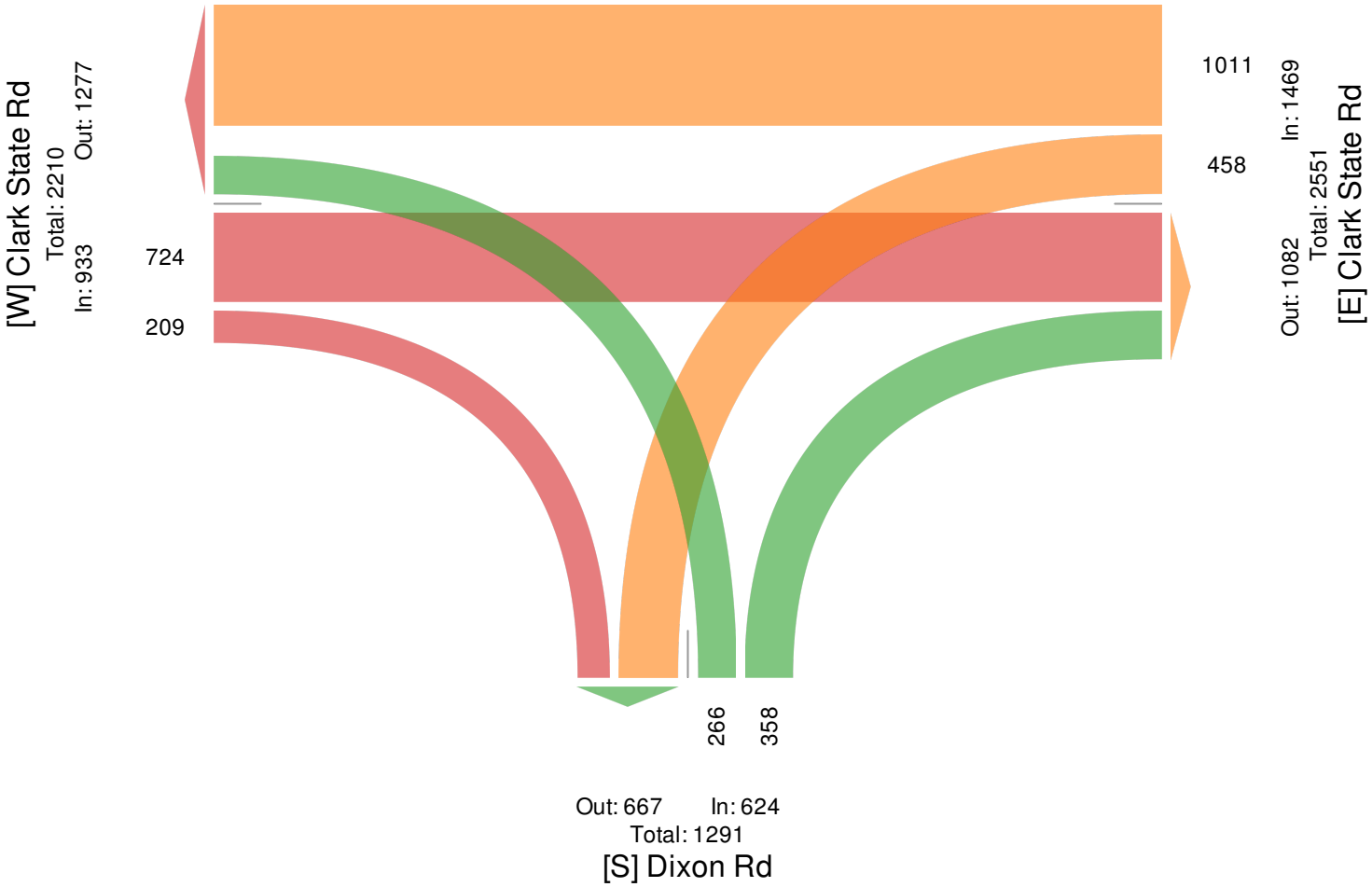
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Clark State Rd					Clark State Rd					Dixon Rd					
Direction	Eastbound					Westbound					Northbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
2020-02-11 7:00AM	31	3	0	**34**	0	3	60	0	**63**	0	18	21	0	**39**	0	**136**
7:15AM	37	3	0	**40**	0	11	88	0	**99**	0	32	31	0	**63**	0	**202**
7:30AM	48	5	0	**53**	0	15	87	0	**102**	0	26	33	0	**59**	0	**214**
7:45AM	35	11	0	**46**	0	24	63	0	**87**	0	18	33	0	**51**	0	**184**
Hourly Total	151	22	0	**173**	0	53	298	0	**351**	0	94	118	0	**212**	0	**736**
8:00AM	38	14	0	**52**	0	30	53	0	**83**	0	24	19	0	**43**	0	**178**
8:15AM	25	13	0	**38**	0	31	74	0	**105**	0	25	24	0	**49**	0	**192**
8:30AM	24	15	0	**39**	0	33	66	0	**99**	0	11	15	0	**26**	0	**164**
8:45AM	28	13	0	**41**	0	22	52	0	**74**	0	7	19	0	**26**	0	**141**
Hourly Total	115	55	0	**170**	0	116	245	0	**361**	0	67	77	0	**144**	0	**675**
4:00PM	58	10	0	**68**	0	29	45	0	**74**	0	3	10	0	**13**	0	**155**
4:15PM	62	17	0	**79**	0	39	64	0	**103**	0	4	12	0	**16**	0	**198**
4:30PM	62	16	0	**78**	0	37	63	0	**100**	0	5	15	0	**20**	0	**198**
4:45PM	64	17	0	**81**	0	45	52	0	**97**	0	10	19	0	**29**	0	**207**
Hourly Total	246	60	0	**306**	0	150	224	0	**374**	0	22	56	0	**78**	0	**758**
5:00PM	56	23	0	**79**	0	26	72	0	**98**	0	14	28	0	**42**	0	**219**
5:15PM	63	14	0	**77**	0	44	73	0	**117**	0	22	26	0	**48**	0	**242**
5:30PM	49	25	0	**74**	0	37	56	0	**93**	0	31	21	0	**52**	0	**219**
5:45PM	44	10	0	**54**	0	32	43	0	**75**	0	16	32	0	**48**	0	**177**
Hourly Total	212	72	0	**284**	0	139	244	0	**383**	0	83	107	0	**190**	0	**857**
Total	724	209	0	**933**	0	458	1011	0	**1469**	0	266	358	0	**624**	0	**3026**
% Approach	77.6%	22.4%	0%	-	-	31.2%	68.8%	0%	-	-	42.6%	57.4%	0%	-	-	-
% Total	23.9%	6.9%	0%	**30.8%**	-	15.1%	33.4%	0%	**48.5%**	-	8.8%	11.8%	0%	**20.6%**	-	-
Lights and Motorcycles	702	205	0	**907**	-	455	985	0	**1440**	-	263	356	0	**619**	-	2966
% Lights and Motorcycles	97.0%	98.1%	0%	**97.2%**	-	99.3%	97.4%	0%	**98.0%**	-	98.9%	99.4%	0%	**99.2%**	-	98.0%
Heavy	22	4	0	**26**	-	3	26	0	**29**	-	3	2	0	**5**	-	60
% Heavy	3.0%	1.9%	0%	**2.8%**	-	0.7%	2.6%	0%	**2.0%**	-	1.1%	0.6%	0%	**0.8%**	-	2.0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3 - Dixon Rd & Clark State Rd - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750922, Location: 40.046274, -82.767905, Site Code: 3

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



3 - Dixon Rd & Clark State Rd - TMC

Tue Feb 11, 2020
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750922, Location: 40.046274, -82.767905, Site Code: 3

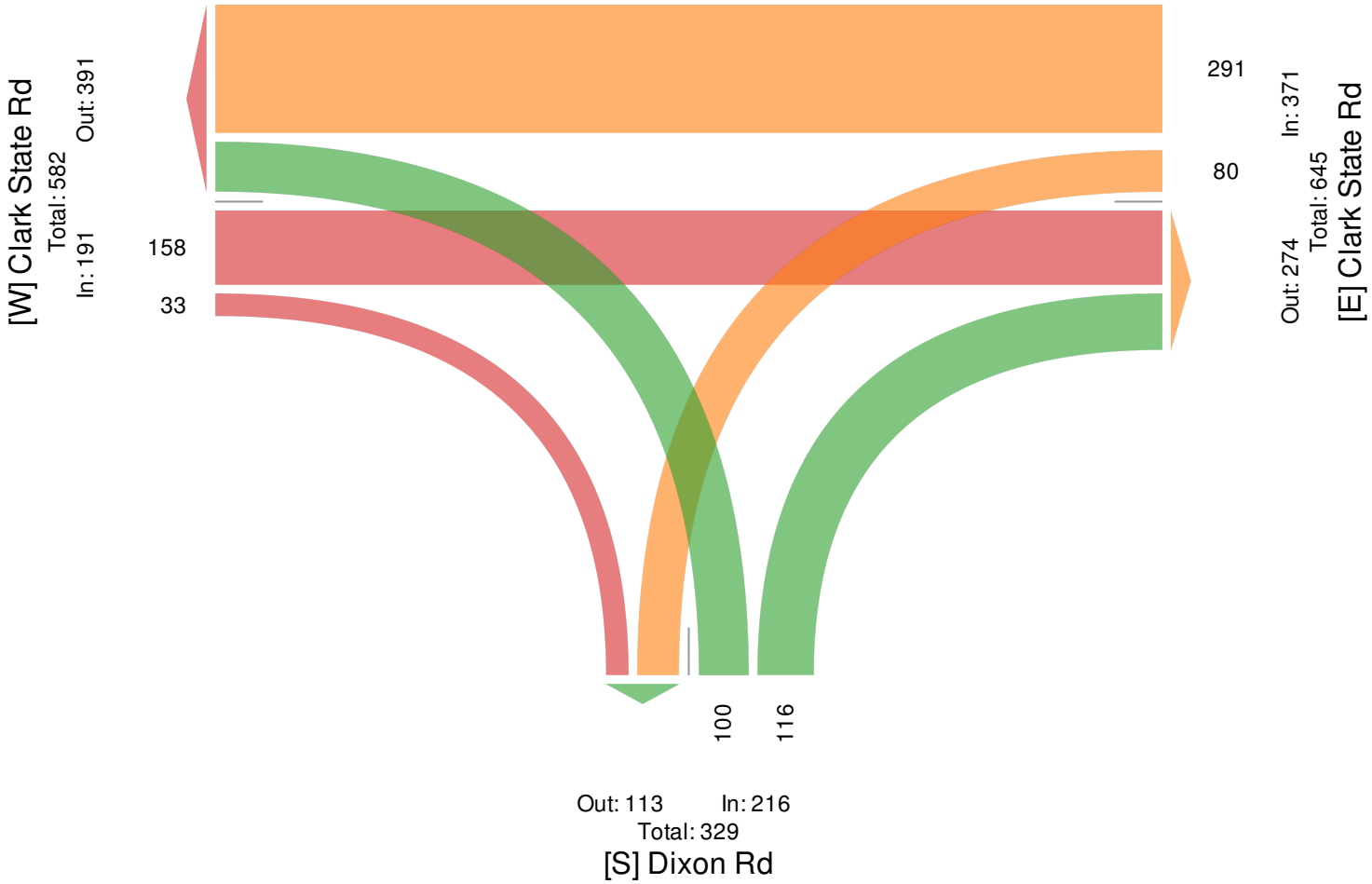
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Clark State Rd					Clark State Rd					Dixon Rd					
Direction	Eastbound					Westbound					Northbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
2020-02-11 7:15AM	37	3	0	**40**	0	11	88	0	**99**	0	32	31	0	**63**	0	**202**
7:30AM	48	5	0	**53**	0	15	87	0	**102**	0	26	33	0	**59**	0	**214**
7:45AM	35	11	0	**46**	0	24	63	0	**87**	0	18	33	0	**51**	0	**184**
8:00AM	38	14	0	**52**	0	30	53	0	**83**	0	24	19	0	**43**	0	**178**
Total	158	33	0	**191**	0	80	291	0	**371**	0	100	116	0	**216**	0	**778**
% Approach	82.7%	17.3%	0%	**-**	-	21.6%	78.4%	0%	**-**	-	46.3%	53.7%	0%	**-**	-	-
% Total	20.3%	4.2%	0%	**24.6%**	-	10.3%	37.4%	0%	**47.7%**	-	12.9%	14.9%	0%	**27.8%**	-	-
PHF	0.823	0.589	-	**0.901**	-	0.667	0.827	-	**0.909**	-	0.781	0.879	-	**0.857**	-	0.909
Lights and Motorcycles	149	33	0	**182**	-	80	277	0	**357**	-	97	115	0	**212**	-	751
% Lights and Motorcycles	94.3%	100%	0%	**95.3%**	-	100%	95.2%	0%	**96.2%**	-	97.0%	99.1%	0%	**98.1%**	-	96.5%
Heavy	9	0	0	**9**	-	0	14	0	**14**	-	3	1	0	**4**	-	27
% Heavy	5.7%	0%	0%	**4.7%**	-	0%	4.8%	0%	**3.8%**	-	3.0%	0.9%	0%	**1.9%**	-	3.5%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3 - Dixon Rd & Clark State Rd - TMC
Tue Feb 11, 2020
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750922, Location: 40.046274, -82.767905, Site Code: 3

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



3 - Dixon Rd & Clark State Rd - TMC

Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750922, Location: 40.046274, -82.767905, Site Code: 3

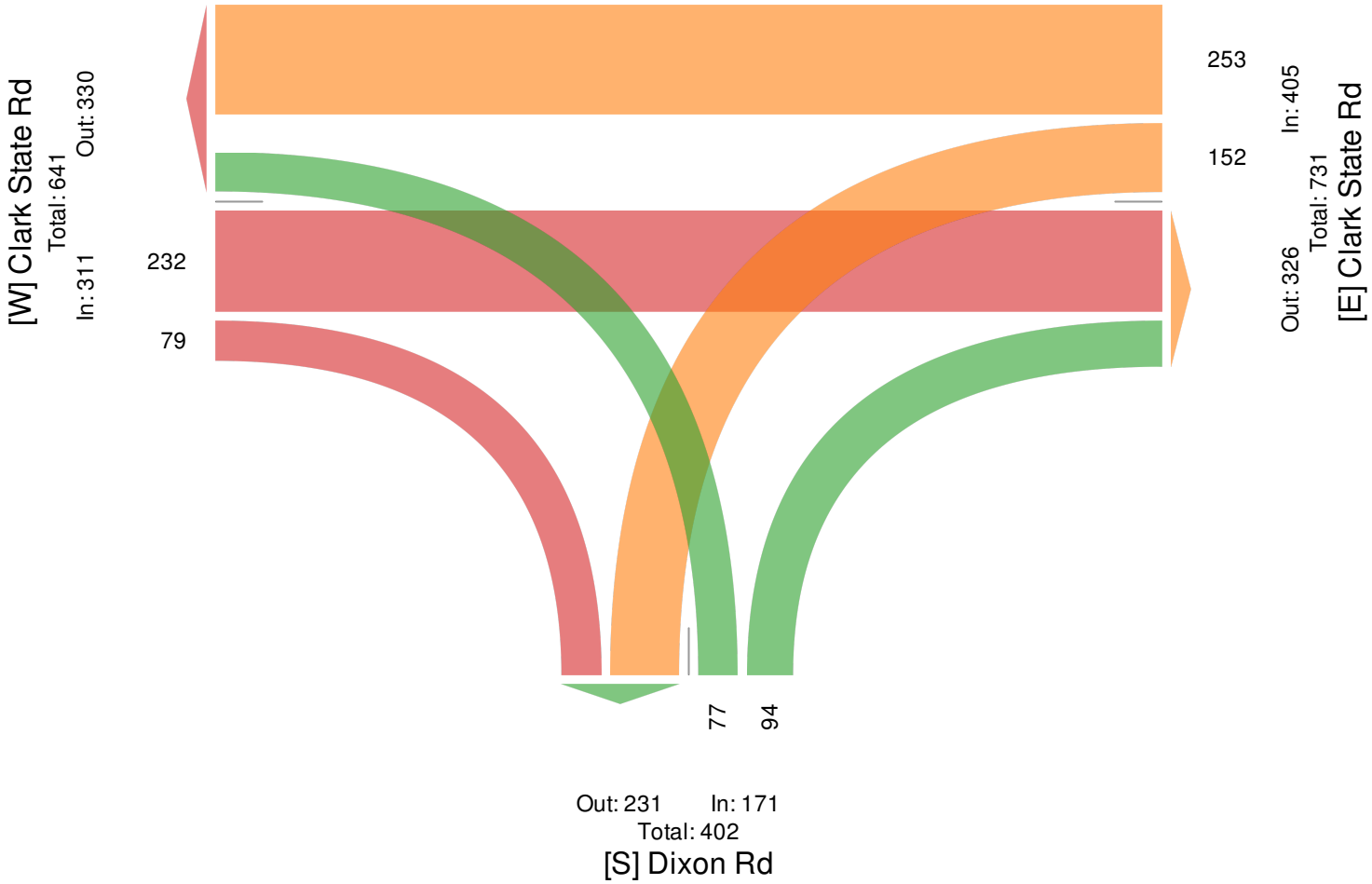
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Clark State Rd					Clark State Rd					Dixon Rd					
Direction	Eastbound					Westbound					Northbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
2020-02-11 4:45PM	64	17	0	**81**	0	45	52	0	**97**	0	10	19	0	**29**	0	**207**
5:00PM	56	23	0	**79**	0	26	72	0	**98**	0	14	28	0	**42**	0	**219**
5:15PM	63	14	0	**77**	0	44	73	0	**117**	0	22	26	0	**48**	0	**242**
5:30PM	49	25	0	**74**	0	37	56	0	**93**	0	31	21	0	**52**	0	**219**
Total	232	79	0	**311**	0	152	253	0	**405**	0	77	94	0	**171**	0	**887**
% Approach	74.6%	25.4%	0%	**-**	-	37.5%	62.5%	0%	**-**	-	45.0%	55.0%	0%	**-**	-	-
% Total	26.2%	8.9%	0%	**35.1%**	-	17.1%	28.5%	0%	**45.7%**	-	8.7%	10.6%	0%	**19.3%**	-	-
PHF	0.906	0.790	-	**0.960**	-	0.844	0.866	-	**0.865**	-	0.621	0.839	-	**0.822**	-	0.916
Lights and Motorcycles	231	77	0	**308**	-	150	249	0	**399**	-	77	93	0	**170**	-	877
% Lights and Motorcycles	99.6%	97.5%	0%	**99.0%**	-	98.7%	98.4%	0%	**98.5%**	-	100%	98.9%	0%	**99.4%**	-	98.9%
Heavy	1	2	0	**3**	-	2	4	0	**6**	-	0	1	0	**1**	-	10
% Heavy	0.4%	2.5%	0%	**1.0%**	-	1.3%	1.6%	0%	**1.5%**	-	0%	1.1%	0%	**0.6%**	-	1.1%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3 - Dixon Rd & Clark State Rd - TMC
Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750922, Location: 40.046274, -82.767905, Site Code: 3

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



4 - Columbia Rd & Broad St - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750929, Location: 39.999544, -82.696678, Site Code: 4

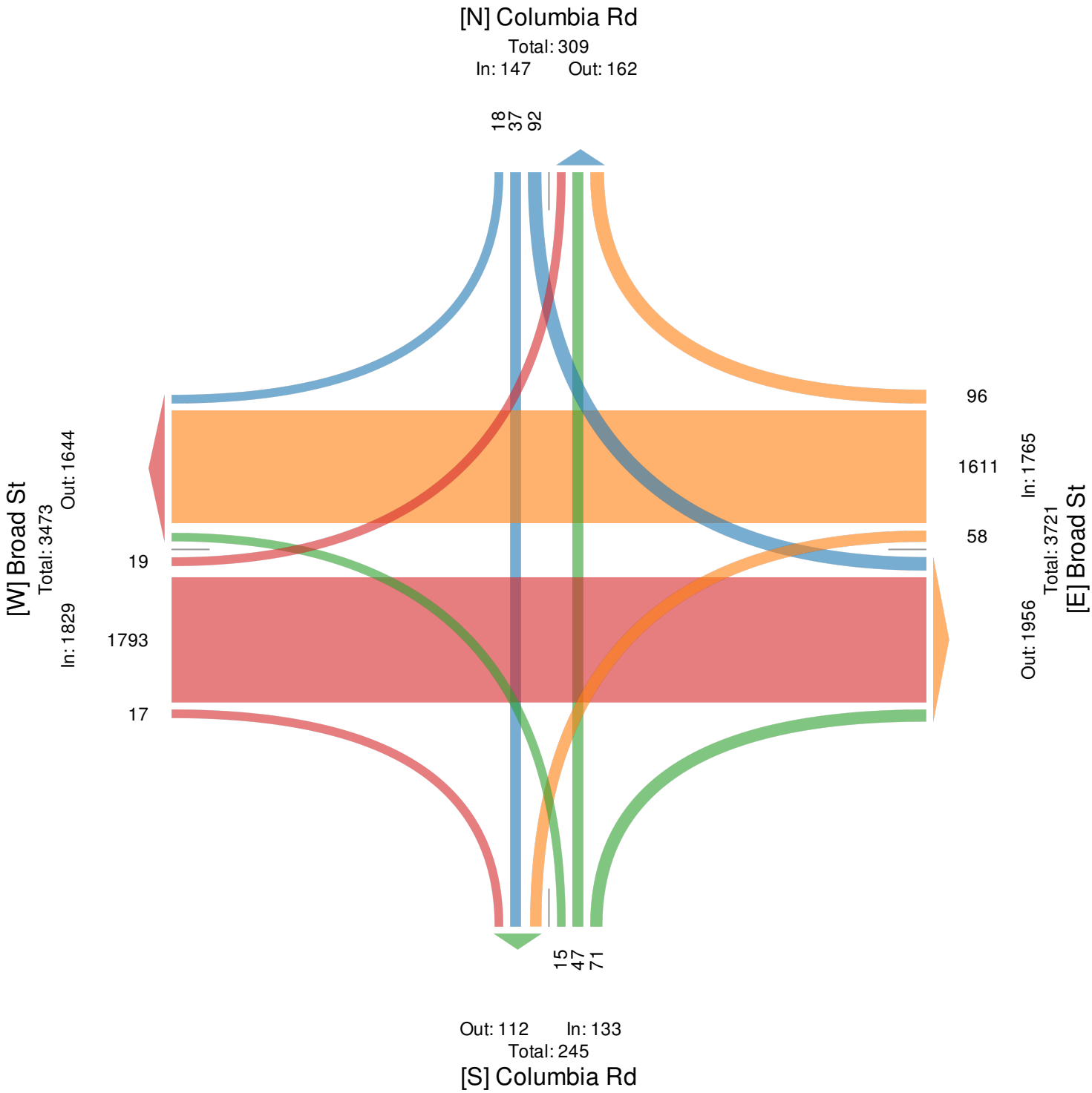
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Broad St						Broad St						Columbia Rd						Columbia Rd						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2020-02-11 7:00AM	0	51	0	0	**51**	0	2	144	11	0	**157**	0	0	7	2	0	**9**	0	2	2	0	0	**4**	0	**221**
7:15AM	0	63	0	0	**63**	0	4	128	10	0	**142**	0	0	3	4	0	**7**	0	1	1	1	0	**3**	0	**215**
7:30AM	1	59	1	0	**61**	0	1	133	2	0	**136**	0	3	7	2	0	**12**	0	0	0	1	0	**1**	0	**210**
7:45AM	1	81	0	0	**82**	0	2	99	5	0	**106**	0	0	3	6	0	**9**	0	1	0	0	0	**1**	0	**198**
Hourly Total	2	254	1	0	**257**	0	9	504	28	0	**541**	0	3	20	14	0	**37**	0	4	3	2	0	**9**	0	**844**
8:00AM	1	53	0	0	**54**	0	5	109	4	0	**118**	0	1	7	4	0	**12**	0	2	2	2	0	**6**	0	**190**
8:15AM	0	51	0	0	**51**	0	4	120	8	0	**132**	0	1	7	2	0	**10**	0	4	2	1	0	**7**	0	**200**
8:30AM	0	62	0	0	**62**	0	3	106	4	0	**113**	0	1	0	2	0	**3**	0	2	1	1	0	**4**	0	**182**
8:45AM	2	102	1	0	**105**	0	2	99	6	0	**107**	0	0	3	3	0	**6**	0	6	0	0	0	**6**	0	**224**
Hourly Total	3	268	1	0	**272**	0	14	434	22	0	**470**	0	3	17	11	0	**31**	0	14	5	4	0	**23**	0	**796**
4:00PM	1	153	2	0	**156**	0	4	106	8	0	**118**	0	0	1	5	0	**6**	0	7	4	1	0	**12**	0	**292**
4:15PM	3	154	5	0	**162**	0	3	75	9	0	**87**	0	4	3	5	0	**12**	0	8	1	0	0	**9**	0	**270**
4:30PM	3	166	2	0	**171**	0	1	86	7	0	**94**	0	0	3	10	0	**13**	0	9	4	1	0	**14**	0	**292**
4:45PM	2	163	0	0	**165**	0	7	83	6	0	**96**	0	3	0	8	0	**11**	0	14	3	0	0	**17**	0	**289**
Hourly Total	9	636	9	0	**654**	0	15	350	30	0	**395**	0	7	7	28	0	**42**	0	38	12	2	0	**52**	0	**1143**
5:00PM	1	179	1	0	**181**	0	7	87	3	0	**97**	0	1	0	6	0	**7**	0	4	6	1	0	**11**	0	**296**
5:15PM	2	174	2	0	**178**	0	2	89	3	0	**94**	0	1	1	2	0	**4**	0	14	4	5	0	**23**	0	**299**
5:30PM	0	168	3	0	**171**	0	4	62	4	0	**70**	0	0	2	4	0	**6**	0	8	5	3	0	**16**	0	**263**
5:45PM	2	114	0	0	**116**	0	7	85	6	0	**98**	0	0	0	6	0	**6**	0	10	2	1	0	**13**	0	**233**
Hourly Total	5	635	6	0	**646**	0	20	323	16	0	**359**	0	2	3	18	0	**23**	0	36	17	10	0	**63**	0	**1091**
Total	19	1793	17	0	**1829**	0	58	1611	96	0	**1765**	0	15	47	71	0	**133**	0	92	37	18	0	**147**	0	**3874**
% Approach	1.0%	98.0%	0.9%	0%	**-**	-	3.3%	91.3%	5.4%	0%	**-**	-	11.3%	35.3%	53.4%	0%	**-**	-	62.6%	25.2%	12.2%	0%	**-**	-	-
% Total	0.5%	46.3%	0.4%	0%	**47.2%**	-	1.5%	41.6%	2.5%	0%	**45.6%**	-	0.4%	1.2%	1.8%	0%	**3.4%**	-	2.4%	1.0%	0.5%	0%	**3.8%**	-	-
Lights and Motorcycles	15	1727	15	0	**1757**	-	57	1551	96	0	**1704**	-	15	46	67	0	**128**	-	92	37	16	0	**145**	-	3734
% Lights and Motorcycles	78.9%	96.3%	88.2%	0%	**96.1%**	-	98.3%	96.3%	100%	0%	**96.5%**	-	100%	97.9%	94.4%	0%	**96.2%**	-	100%	100%	88.9%	0%	**98.6%**	-	96.4%
Heavy	4	66	2	0	**72**	-	1	60	0	0	**61**	-	0	1	4	0	**5**	-	0	0	2	0	**2**	-	140
% Heavy	21.1%	3.7%	11.8%	0%	**3.9%**	-	1.7%	3.7%	0%	0%	**3.5%**	-	0%	2.1%	5.6%	0%	**3.8%**	-	0%	0%	11.1%	0%	**1.4%**	-	3.6%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4 - Columbia Rd & Broad St - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750929, Location: 39.999544, -82.696678, Site Code: 4

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



4 - Columbia Rd & Broad St - TMC
Tue Feb 11, 2020
AM Peak (7 AM - 8 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750929, Location: 39.999544, -82.696678, Site Code: 4

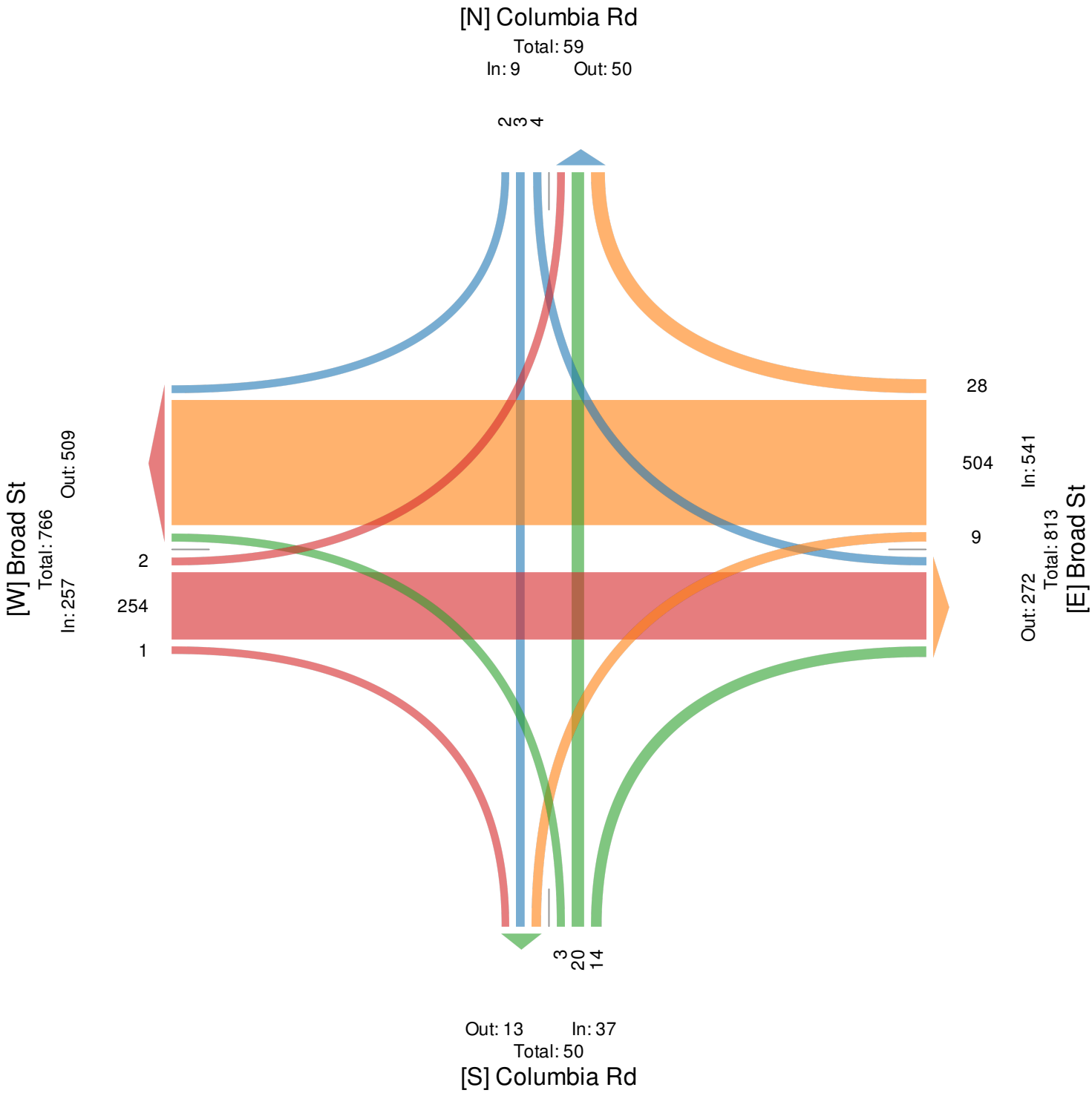
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Broad St						Broad St						Columbia Rd						Columbia Rd						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2020-02-11 7:00AM	0	51	0	0	**51**	0	2	144	11	0	**157**	0	0	7	2	0	**9**	0	2	2	0	0	**4**	0	**221**
7:15AM	0	63	0	0	**63**	0	4	128	10	0	**142**	0	0	3	4	0	**7**	0	1	1	1	0	**3**	0	**215**
7:30AM	1	59	1	0	**61**	0	1	133	2	0	**136**	0	3	7	2	0	**12**	0	0	0	1	0	**1**	0	**210**
7:45AM	1	81	0	0	**82**	0	2	99	5	0	**106**	0	0	3	6	0	**9**	0	1	0	0	0	**1**	0	**198**
Total	2	254	1	0	**257**	0	9	504	28	0	**541**	0	3	20	14	0	**37**	0	4	3	2	0	**9**	0	**844**
% Approach	0.8%	98.8%	0.4%	0%	**-**	-	1.7%	93.2%	5.2%	0%	**-**	-	8.1%	54.1%	37.8%	0%	**-**	-	44.4%	33.3%	22.2%	0%	**-**	-	**-**
% Total	0.2%	30.1%	0.1%	0%	**30.5%**	-	1.1%	59.7%	3.3%	0%	**64.1%**	-	0.4%	2.4%	1.7%	0%	**4.4%**	-	0.5%	0.4%	0.2%	0%	**1.1%**	-	**-**
PHF	0.500	0.784	0.250	-	**0.784**	-	0.563	0.875	0.636	-	**0.861**	-	0.250	0.714	0.583	-	**0.771**	-	0.500	0.375	0.500	-	**0.563**	-	0.955
Lights and Motorcycles	1	231	0	0	**232**	-	9	490	28	0	**527**	-	3	19	13	0	**35**	-	4	3	2	0	**9**	-	803
% Lights and Motorcycles	50.0%	90.9%	0%	0%	**90.3%**	-	100%	97.2%	100%	0%	**97.4%**	-	100%	95.0%	92.9%	0%	**94.6%**	-	100%	100%	100%	0%	**100%**	-	95.1%
Heavy	1	23	1	0	**25**	-	0	14	0	0	**14**	-	0	1	1	0	**2**	-	0	0	0	0	**0**	-	41
% Heavy	50.0%	9.1%	100%	0%	**9.7%**	-	0%	2.8%	0%	0%	**2.6%**	-	0%	5.0%	7.1%	0%	**5.4%**	-	0%	0%	0%	0%	**0%**	-	4.9%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4 - Columbia Rd & Broad St - TMC
Tue Feb 11, 2020
AM Peak (7 AM - 8 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750929, Location: 39.999544, -82.696678, Site Code: 4

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



4 - Columbia Rd & Broad St - TMC

Tue Feb 11, 2020
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750929, Location: 39.999544, -82.696678, Site Code: 4

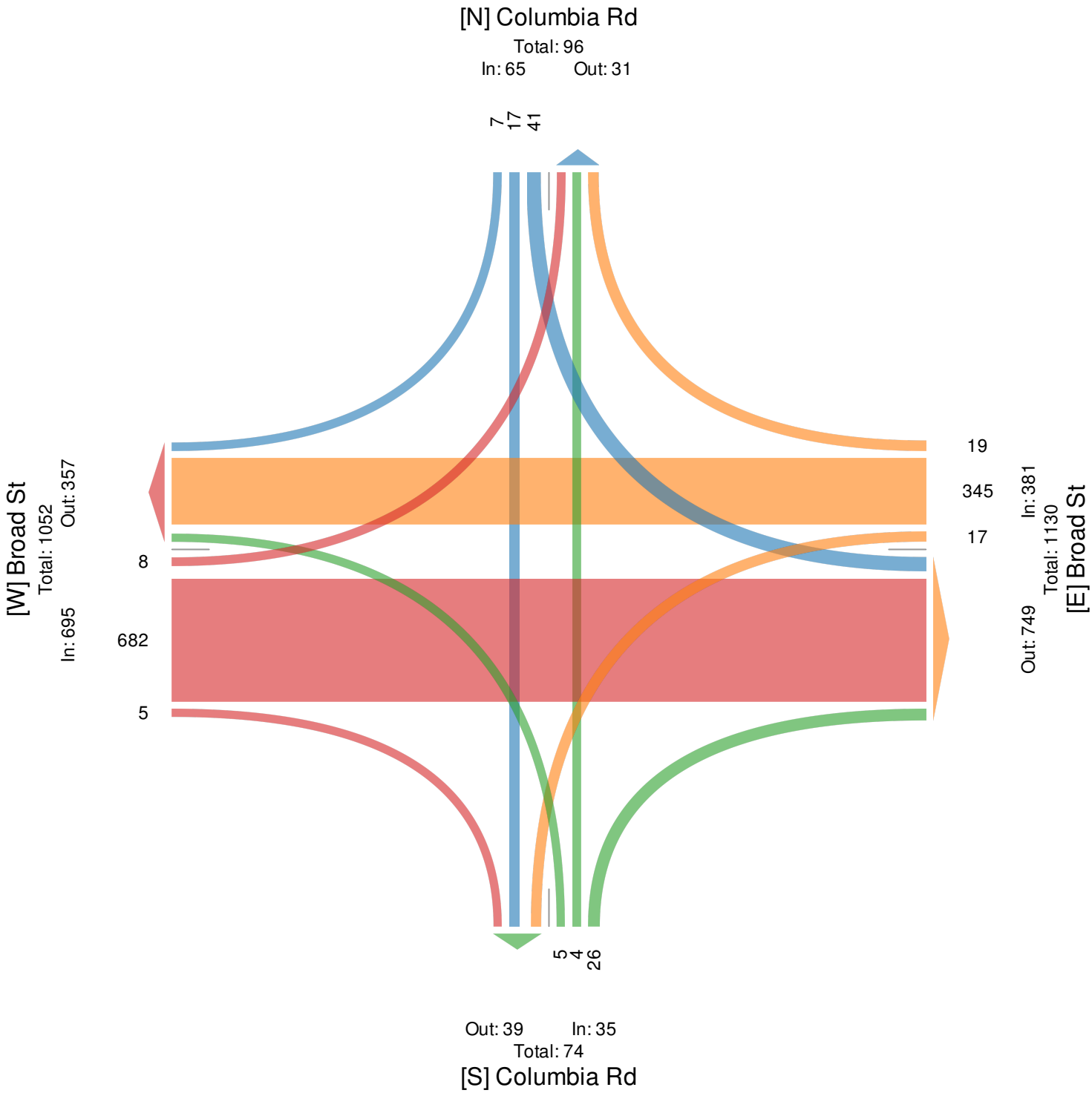
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Broad St						Broad St						Columbia Rd						Columbia Rd						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2020-02-11 4:30PM	3	166	2	0	**171**	0	1	86	7	0	**94**	0	0	3	10	0	**13**	0	9	4	1	0	**14**	0	**292**
4:45PM	2	163	0	0	**165**	0	7	83	6	0	**96**	0	3	0	8	0	**11**	0	14	3	0	0	**17**	0	**289**
5:00PM	1	179	1	0	**181**	0	7	87	3	0	**97**	0	1	0	6	0	**7**	0	4	6	1	0	**11**	0	**296**
5:15PM	2	174	2	0	**178**	0	2	89	3	0	**94**	0	1	1	2	0	**4**	0	14	4	5	0	**23**	0	**299**
Total	8	682	5	0	**695**	0	17	345	19	0	**381**	0	5	4	26	0	**35**	0	41	17	7	0	**65**	0	**1176**
% Approach	1.2%	98.1%	0.7%	0%	**-**	-	4.5%	90.6%	5.0%	0%	**-**	-	14.3%	11.4%	74.3%	0%	**-**	-	63.1%	26.2%	10.8%	0%	**-**	-	**-**
% Total	0.7%	58.0%	0.4%	0%	**59.1%**	-	1.4%	29.3%	1.6%	0%	**32.4%**	-	0.4%	0.3%	2.2%	0%	**3.0%**	-	3.5%	1.4%	0.6%	0%	**5.5%**	-	**-**
PHF	0.667	0.953	0.625	-	**0.960**	-	0.607	0.969	0.679	-	**0.982**	-	0.417	0.333	0.650	-	**0.673**	-	0.732	0.708	0.350	-	**0.707**	-	0.983
Lights and Motorcycles	8	670	5	0	**683**	-	16	334	19	0	**369**	-	5	4	24	0	**33**	-	41	17	6	0	**64**	-	1149
% Lights and Motorcycles	100%	98.2%	100%	0%	**98.3%**	-	94.1%	96.8%	100%	0%	**96.9%**	-	100%	100%	92.3%	0%	**94.3%**	-	100%	100%	85.7%	0%	**98.5%**	-	97.7%
Heavy	0	12	0	0	**12**	-	1	11	0	0	**12**	-	0	0	2	0	**2**	-	0	0	1	0	**1**	-	27
% Heavy	0%	1.8%	0%	0%	**1.7%**	-	5.9%	3.2%	0%	0%	**3.1%**	-	0%	0%	7.7%	0%	**5.7%**	-	0%	0%	14.3%	0%	**1.5%**	-	2.3%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4 - Columbia Rd & Broad St - TMC
Tue Feb 11, 2020
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750929, Location: 39.999544, -82.696678, Site Code: 4

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



5 - Mink St & Refugee Rd - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750932, Location: 39.974115, -82.728785, Site Code: 5

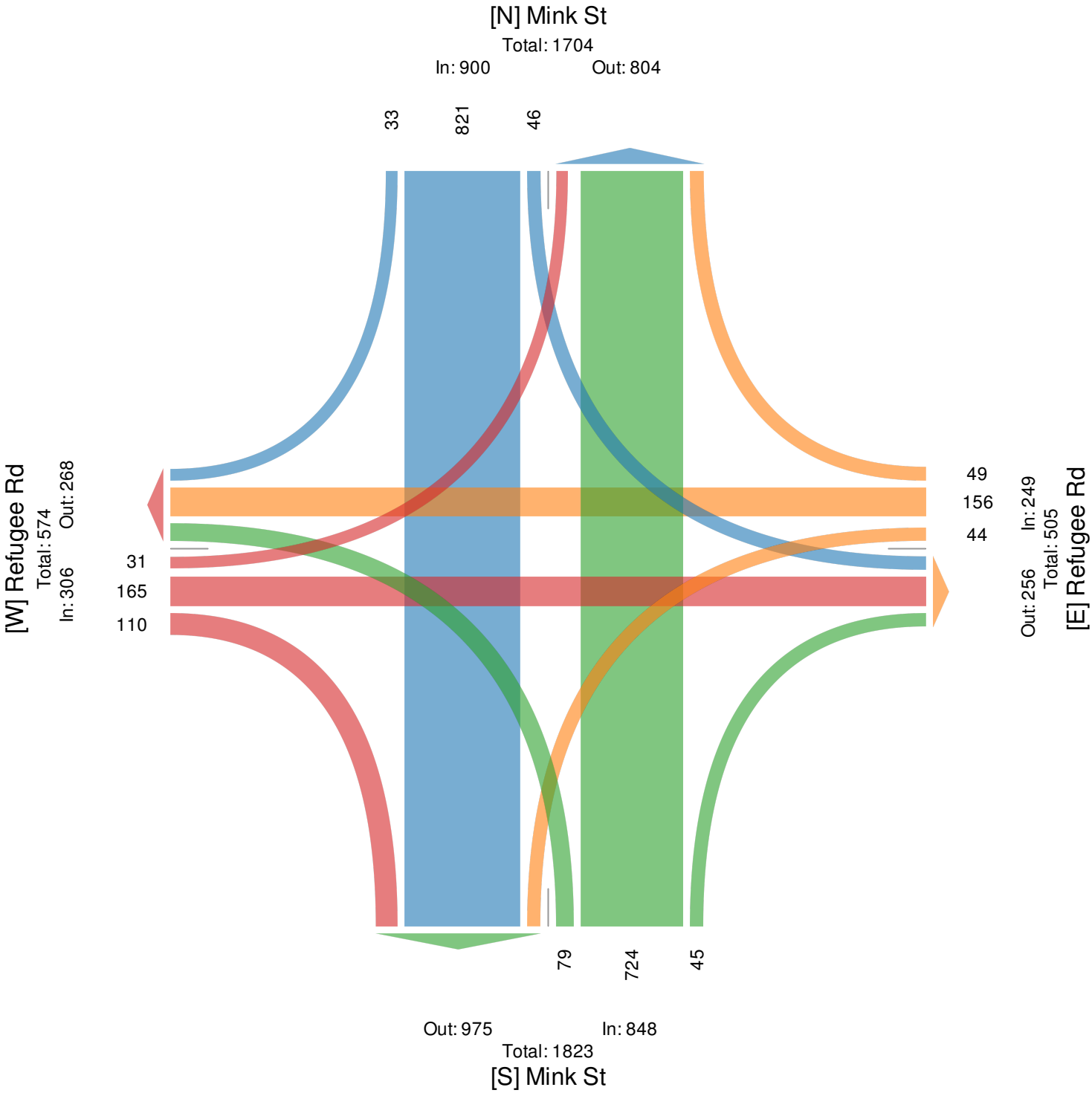
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Refugee Rd						Refugee Rd						Mink St						Mink St						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2020-02-11 7:00AM	4	10	7	0	**21**	0	4	11	6	0	**21**	0	3	65	3	0	**71**	0	1	32	4	0	**37**	0	**150**
7:15AM	1	10	10	0	**21**	0	4	14	1	0	**19**	0	4	58	0	0	**62**	0	2	44	1	0	**47**	0	**149**
7:30AM	3	8	7	0	**18**	0	2	6	2	0	**10**	0	1	71	1	0	**73**	0	1	38	1	0	**40**	0	**141**
7:45AM	2	8	5	0	**15**	0	1	9	5	0	**15**	0	9	65	1	0	**75**	0	2	39	1	0	**42**	0	**147**
Hourly Total	10	36	29	0	**75**	0	11	40	14	0	**65**	0	17	259	5	0	**281**	0	6	153	7	0	**166**	0	**587**
8:00AM	2	14	3	0	**19**	0	5	10	4	0	**19**	0	5	52	8	0	**65**	0	2	28	2	0	**32**	0	**135**
8:15AM	0	5	3	0	**8**	0	6	17	4	0	**27**	0	5	49	6	0	**60**	0	2	24	0	0	**26**	0	**121**
8:30AM	1	1	1	0	**3**	0	2	9	3	0	**14**	0	8	51	1	0	**60**	0	3	21	1	0	**25**	0	**102**
8:45AM	2	6	3	0	**11**	0	3	7	1	0	**11**	0	3	31	0	0	**34**	0	3	21	1	0	**25**	0	**81**
Hourly Total	5	26	10	0	**41**	0	16	43	12	0	**71**	0	21	183	15	0	**219**	0	10	94	4	0	**108**	0	**439**
4:00PM	1	17	7	0	**25**	0	1	7	3	0	**11**	0	5	28	1	0	**34**	0	1	62	2	0	**65**	0	**135**
4:15PM	3	13	8	0	**24**	0	4	6	1	0	**11**	0	3	38	3	0	**44**	0	4	56	1	0	**61**	0	**140**
4:30PM	2	10	10	0	**22**	0	0	10	3	0	**13**	0	3	39	2	0	**44**	0	6	70	2	0	**78**	0	**157**
4:45PM	1	8	6	0	**15**	0	5	9	3	0	**17**	0	8	33	4	0	**45**	0	9	56	7	0	**72**	0	**149**
Hourly Total	7	48	31	0	**86**	0	10	32	10	0	**52**	0	19	138	10	0	**167**	0	20	244	12	0	**276**	0	**581**
5:00PM	3	13	8	0	**24**	0	2	13	4	0	**19**	0	5	35	4	0	**44**	0	3	77	6	0	**86**	0	**173**
5:15PM	4	18	11	0	**33**	0	1	10	4	0	**15**	0	6	41	4	0	**51**	0	2	98	0	0	**100**	0	**199**
5:30PM	2	16	11	0	**29**	0	4	9	3	0	**16**	0	5	37	4	0	**46**	0	4	94	2	0	**100**	0	**191**
5:45PM	0	8	10	0	**18**	0	0	9	2	0	**11**	0	6	31	3	0	**40**	0	1	61	2	0	**64**	0	**133**
Hourly Total	9	55	40	0	**104**	0	7	41	13	0	**61**	0	22	144	15	0	**181**	0	10	330	10	0	**350**	0	**696**
Total	31	165	110	0	**306**	0	44	156	49	0	**249**	0	79	724	45	0	**848**	0	46	821	33	0	**900**	0	**2303**
% Approach	10.1%	53.9%	35.9%	0%	**-**	-	17.7%	62.7%	19.7%	0%	**-**	-	9.3%	85.4%	5.3%	0%	**-**	-	5.1%	91.2%	3.7%	0%	**-**	-	-
% Total	1.3%	7.2%	4.8%	0%	**13.3%**	-	1.9%	6.8%	2.1%	0%	**10.8%**	-	3.4%	31.4%	2.0%	0%	**36.8%**	-	2.0%	35.6%	1.4%	0%	**39.1%**	-	-
Lights and Motorcycles	29	161	109	0	**299**	-	41	155	48	0	**244**	-	78	708	45	0	**831**	-	46	802	32	0	**880**	-	2254
% Lights and Motorcycles	93.5%	97.6%	99.1%	0%	**97.7%**	-	93.2%	99.4%	98.0%	0%	**98.0%**	-	98.7%	97.8%	100%	0%	**98.0%**	-	100%	97.7%	97.0%	0%	**97.8%**	-	97.9%
Heavy	2	4	1	0	**7**	-	3	1	1	0	**5**	-	1	16	0	0	**17**	-	0	19	1	0	**20**	-	49
% Heavy	6.5%	2.4%	0.9%	0%	**2.3%**	-	6.8%	0.6%	2.0%	0%	**2.0%**	-	1.3%	2.2%	0%	0%	**2.0%**	-	0%	2.3%	3.0%	0%	**2.2%**	-	2.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5 - Mink St & Refugee Rd - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750932, Location: 39.974115, -82.728785, Site Code: 5

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



5 - Mink St & Refugee Rd - TMC

Tue Feb 11, 2020
AM Peak (7 AM - 8 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750932, Location: 39.974115, -82.728785, Site Code: 5

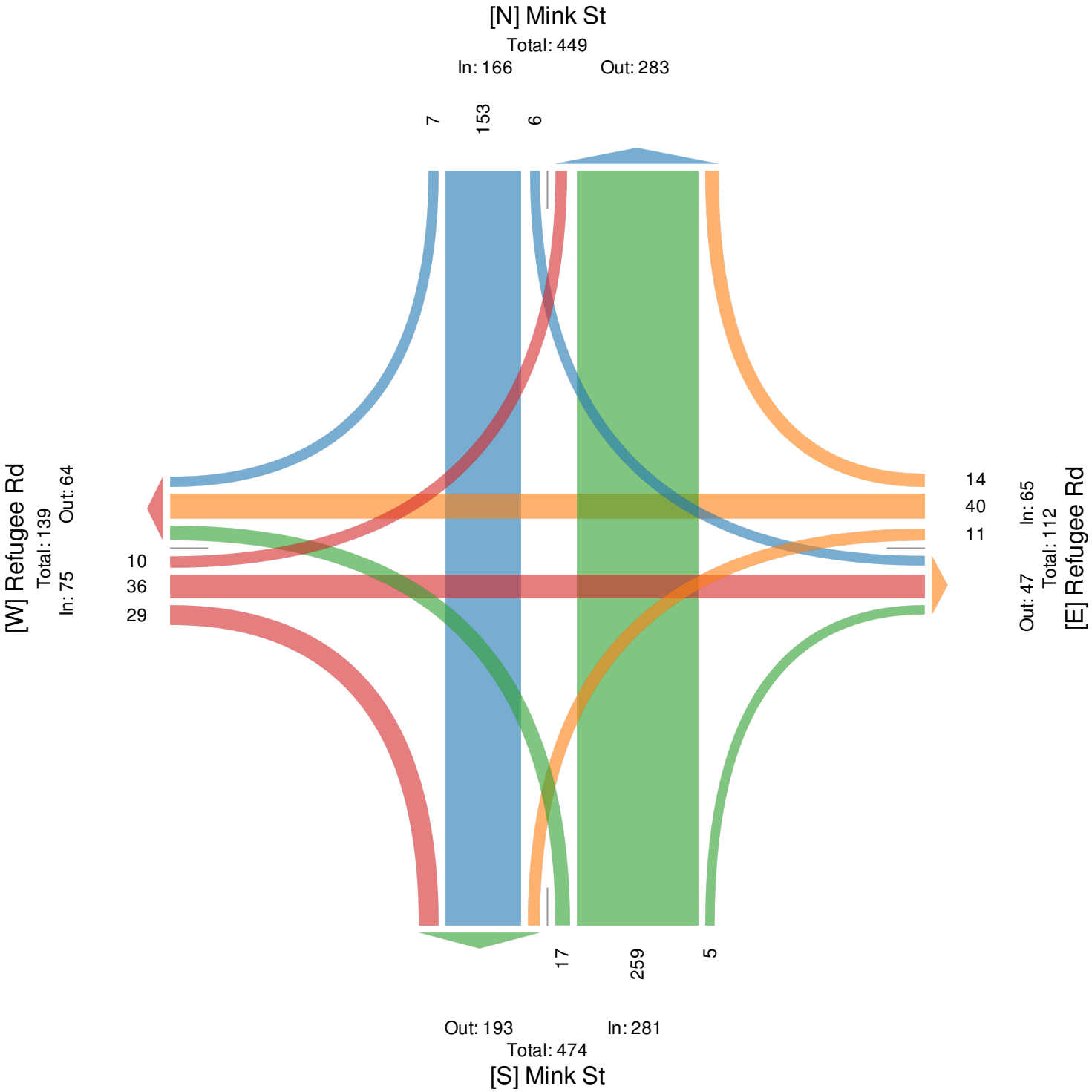
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Refugee Rd						Refugee Rd						Mink St						Mink St						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2020-02-11 7:00AM	4	10	7	0	**21**	0	4	11	6	0	**21**	0	3	65	3	0	**71**	0	1	32	4	0	**37**	0	**150**
7:15AM	1	10	10	0	**21**	0	4	14	1	0	**19**	0	4	58	0	0	**62**	0	2	44	1	0	**47**	0	**149**
7:30AM	3	8	7	0	**18**	0	2	6	2	0	**10**	0	1	71	1	0	**73**	0	1	38	1	0	**40**	0	**141**
7:45AM	2	8	5	0	**15**	0	1	9	5	0	**15**	0	9	65	1	0	**75**	0	2	39	1	0	**42**	0	**147**
Total	10	36	29	0	**75**	0	11	40	14	0	**65**	0	17	259	5	0	**281**	0	6	153	7	0	**166**	0	**587**
% Approach	13.3%	48.0%	38.7%	0%	-	-	16.9%	61.5%	21.5%	0%	-	-	6.0%	92.2%	1.8%	0%	-	-	3.6%	92.2%	4.2%	0%	-	-	-
% Total	1.7%	6.1%	4.9%	0%	**12.8%**	-	1.9%	6.8%	2.4%	0%	**11.1%**	-	2.9%	44.1%	0.9%	0%	**47.9%**	-	1.0%	26.1%	1.2%	0%	**28.3%**	-	-
PHF	0.625	0.900	0.725	-	**0.893**	-	0.688	0.714	0.583	-	**0.774**	-	0.472	0.912	0.417	-	**0.937**	-	0.750	0.869	0.438	-	**0.883**	-	0.978
Lights and Motorcycles	9	34	29	0	**72**	-	10	40	14	0	**64**	-	17	257	5	0	**279**	-	6	148	6	0	**160**	-	575
% Lights and Motorcycles	90.0%	94.4%	100%	0%	**96.0%**	-	90.9%	100%	100%	0%	**98.5%**	-	100%	99.2%	100%	0%	**99.3%**	-	100%	96.7%	85.7%	0%	**96.4%**	-	98.0%
Heavy	1	2	0	0	**3**	-	1	0	0	0	**1**	-	0	2	0	0	**2**	-	0	5	1	0	**6**	-	12
% Heavy	10.0%	5.6%	0%	0%	**4.0%**	-	9.1%	0%	0%	0%	**1.5%**	-	0%	0.8%	0%	0%	**0.7%**	-	0%	3.3%	14.3%	0%	**3.6%**	-	2.0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5 - Mink St & Refugee Rd - TMC
Tue Feb 11, 2020
AM Peak (7 AM - 8 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750932, Location: 39.974115, -82.728785, Site Code: 5

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



5 - Mink St & Refugee Rd - TMC

Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750932, Location: 39.974115, -82.728785, Site Code: 5

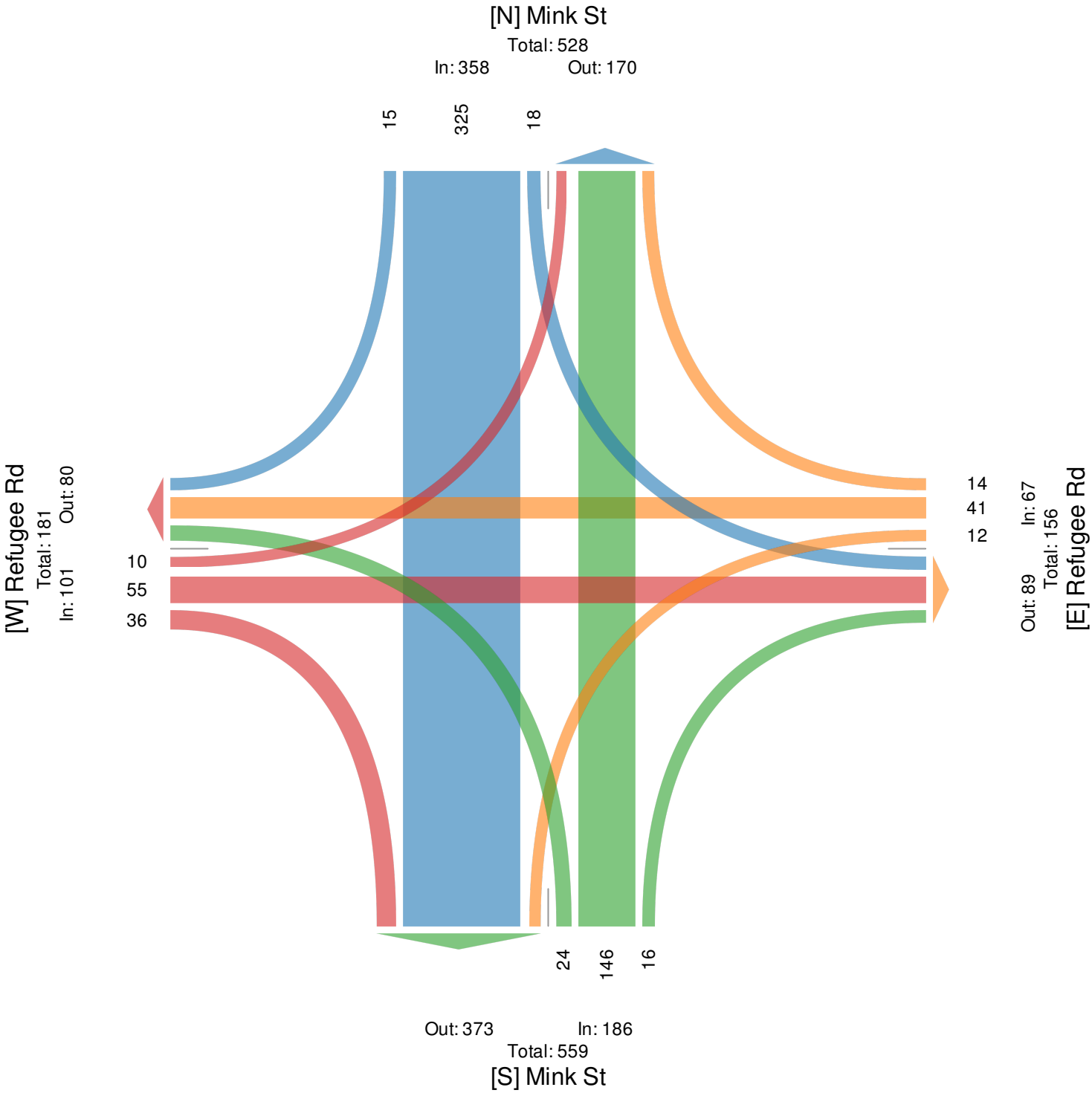
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Refugee Rd						Refugee Rd						Mink St						Mink St						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2020-02-11 4:45PM	1	8	6	0	**15**	0	5	9	3	0	**17**	0	8	33	4	0	**45**	0	9	56	7	0	**72**	0	**149**
5:00PM	3	13	8	0	**24**	0	2	13	4	0	**19**	0	5	35	4	0	**44**	0	3	77	6	0	**86**	0	**173**
5:15PM	4	18	11	0	**33**	0	1	10	4	0	**15**	0	6	41	4	0	**51**	0	2	98	0	0	**100**	0	**199**
5:30PM	2	16	11	0	**29**	0	4	9	3	0	**16**	0	5	37	4	0	**46**	0	4	94	2	0	**100**	0	**191**
Total	10	55	36	0	**101**	0	12	41	14	0	**67**	0	24	146	16	0	**186**	0	18	325	15	0	**358**	0	**712**
% Approach	9.9%	54.5%	35.6%	0%	**-**	-	17.9%	61.2%	20.9%	0%	**-**	-	12.9%	78.5%	8.6%	0%	**-**	-	5.0%	90.8%	4.2%	0%	**-**	-	**-**
% Total	1.4%	7.7%	5.1%	0%	**14.2%**	-	1.7%	5.8%	2.0%	0%	**9.4%**	-	3.4%	20.5%	2.2%	0%	**26.1%**	-	2.5%	45.6%	2.1%	0%	**50.3%**	-	**-**
PHF	0.625	0.764	0.818	-	**0.765**	-	0.600	0.788	0.875	-	**0.882**	-	0.750	0.890	1.000	-	**0.912**	-	0.500	0.829	0.536	-	**0.895**	-	0.894
Lights and Motorcycles	10	55	36	0	**101**	-	12	40	14	0	**66**	-	24	144	16	0	**184**	-	18	321	15	0	**354**	-	705
% Lights and Motorcycles	100%	100%	100%	0%	**100%**	-	100%	97.6%	100%	0%	**98.5%**	-	100%	98.6%	100%	0%	**98.9%**	-	100%	98.8%	100%	0%	**98.9%**	-	99.0%
Heavy	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	2	0	0	**2**	-	0	4	0	0	**4**	-	7
% Heavy	0%	0%	0%	0%	**0%**	-	0%	2.4%	0%	0%	**1.5%**	-	0%	1.4%	0%	0%	**1.1%**	-	0%	1.2%	0%	0%	**1.1%**	-	1.0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5 - Mink St & Refugee Rd - TMC
Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750932, Location: 39.974115, -82.728785, Site Code: 5

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



6 - SR 310 & Refugee Rd - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750942, Location: 39.971789, -82.68189

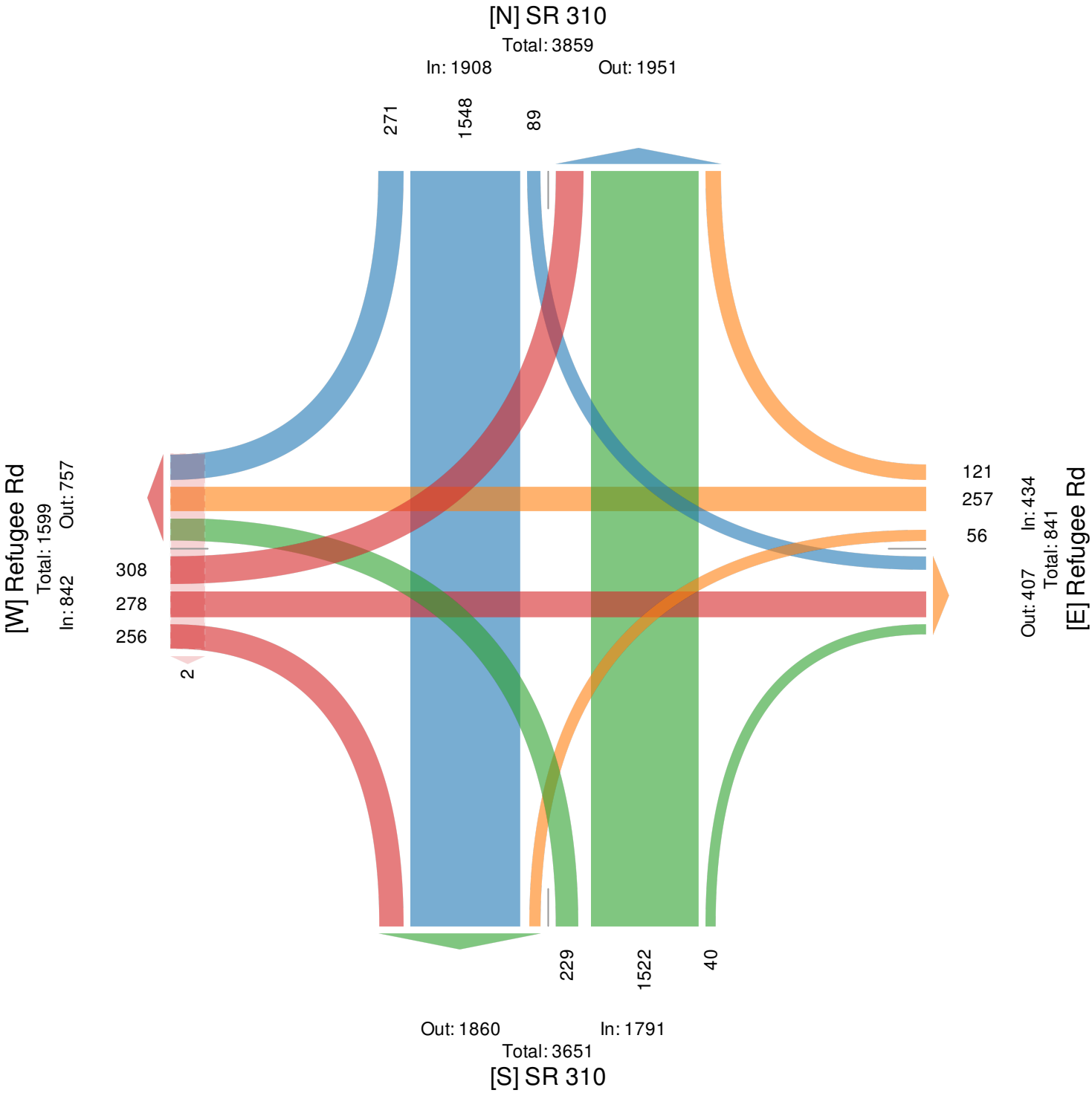
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg / Direction	Refugee Rd Eastbound						Refugee Rd Westbound						SR 310 Northbound						SR 310 Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2020-02-11 7:00AM	12	6	8	0	**26**	0	9	13	5	0	**27**	0	14	53	1	0	**68**	0	8	130	11	0	**149**	0	**270**
7:15AM	10	5	10	0	**25**	2	9	21	11	0	**41**	0	22	77	1	0	**100**	0	3	110	9	0	**122**	0	**288**
7:30AM	8	6	10	0	**24**	0	1	14	6	0	**21**	0	21	80	4	0	**105**	0	2	97	11	0	**110**	0	**260**
7:45AM	8	7	10	0	**25**	0	5	22	5	0	**32**	0	20	57	1	0	**78**	0	2	88	14	0	**104**	0	**239**
Hourly Total	38	24	38	0	**100**	2	24	70	27	0	**121**	0	77	267	7	0	**351**	0	15	425	45	0	**485**	0	**1057**
8:00AM	10	7	25	0	**42**	0	2	30	5	0	**37**	0	30	57	1	0	**88**	0	3	84	24	0	**111**	0	**278**
8:15AM	35	14	43	0	**92**	0	5	34	12	0	**51**	0	32	76	1	0	**109**	0	2	91	27	0	**120**	0	**372**
8:30AM	20	3	12	0	**35**	0	3	5	1	0	**9**	0	10	64	2	0	**76**	0	3	108	18	0	**129**	0	**249**
8:45AM	33	14	0	0	**47**	0	3	19	18	0	**40**	0	7	91	2	0	**100**	0	4	88	26	0	**118**	0	**305**
Hourly Total	98	38	80	0	**216**	0	13	88	36	0	**137**	0	79	288	6	0	**373**	0	12	371	95	0	**478**	0	**1204**
4:00PM	20	24	15	0	**59**	0	3	11	6	0	**20**	0	12	104	3	0	**119**	0	7	85	12	0	**104**	0	**302**
4:15PM	21	29	17	0	**67**	0	0	20	7	0	**27**	0	4	122	1	0	**127**	0	7	93	13	0	**113**	0	**334**
4:30PM	28	38	18	0	**84**	0	2	12	5	0	**19**	0	10	123	6	0	**139**	0	6	90	24	0	**120**	0	**362**
4:45PM	19	16	16	0	**51**	0	5	12	7	0	**24**	0	9	121	6	0	**136**	0	5	96	15	0	**116**	0	**327**
Hourly Total	88	107	66	0	**261**	0	10	55	25	0	**90**	0	35	470	16	0	**521**	0	25	364	64	0	**453**	0	**1325**
5:00PM	19	32	13	0	**64**	0	1	9	6	0	**16**	0	6	129	2	0	**137**	0	10	98	15	0	**123**	0	**340**
5:15PM	20	20	7	0	**47**	0	2	18	6	0	**26**	0	12	137	3	0	**152**	0	14	99	18	0	**131**	0	**356**
5:30PM	21	36	35	0	**92**	0	1	8	9	0	**18**	0	13	109	3	0	**125**	0	2	117	18	0	**137**	0	**372**
5:45PM	24	21	17	0	**62**	0	5	9	12	0	**26**	0	7	122	3	0	**132**	0	11	74	16	0	**101**	0	**321**
Hourly Total	84	109	72	0	**265**	0	9	44	33	0	**86**	0	38	497	11	0	**546**	0	37	388	67	0	**492**	0	**1389**
Total	308	278	256	0	**842**	2	56	257	121	0	**434**	0	229	1522	40	0	**1791**	0	89	1548	271	0	**1908**	0	**4975**
% Approach	36.6%	33.0%	30.4%	0%	-	-	12.9%	59.2%	27.9%	0%	-	-	12.8%	85.0%	2.2%	0%	-	-	4.7%	81.1%	14.2%	0%	-	-	-
% Total	6.2%	5.6%	5.1%	0%	**16.9%**	-	1.1%	5.2%	2.4%	0%	**8.7%**	-	4.6%	30.6%	0.8%	0%	**36.0%**	-	1.8%	31.1%	5.4%	0%	**38.4%**	-	-
Lights and Motorcycles	300	277	250	0	**827**	-	54	257	121	0	**432**	-	219	1471	40	0	**1730**	-	88	1486	262	0	**1836**	-	4825
% Lights and Motorcycles	97.4%	99.6%	97.7%	0%	**98.2%**	-	96.4%	100%	100%	0%	**99.5%**	-	95.6%	96.6%	100%	0%	**96.6%**	-	98.9%	96.0%	96.7%	0%	**96.2%**	-	97.0%
Heavy	8	1	6	0	**15**	-	2	0	0	0	**2**	-	10	51	0	0	**61**	-	1	62	9	0	**72**	-	150
% Heavy	2.6%	0.4%	2.3%	0%	**1.8%**	-	3.6%	0%	0%	0%	**0.5%**	-	4.4%	3.4%	0%	0%	**3.4%**	-	1.1%	4.0%	3.3%	0%	**3.8%**	-	3.0%
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

6 - SR 310 & Refugee Rd - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750942, Location: 39.971789, -82.68189

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



6 - SR 310 & Refugee Rd - TMC
Tue Feb 11, 2020
AM Peak (8 AM - 9 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750942, Location: 39.971789, -82.68189

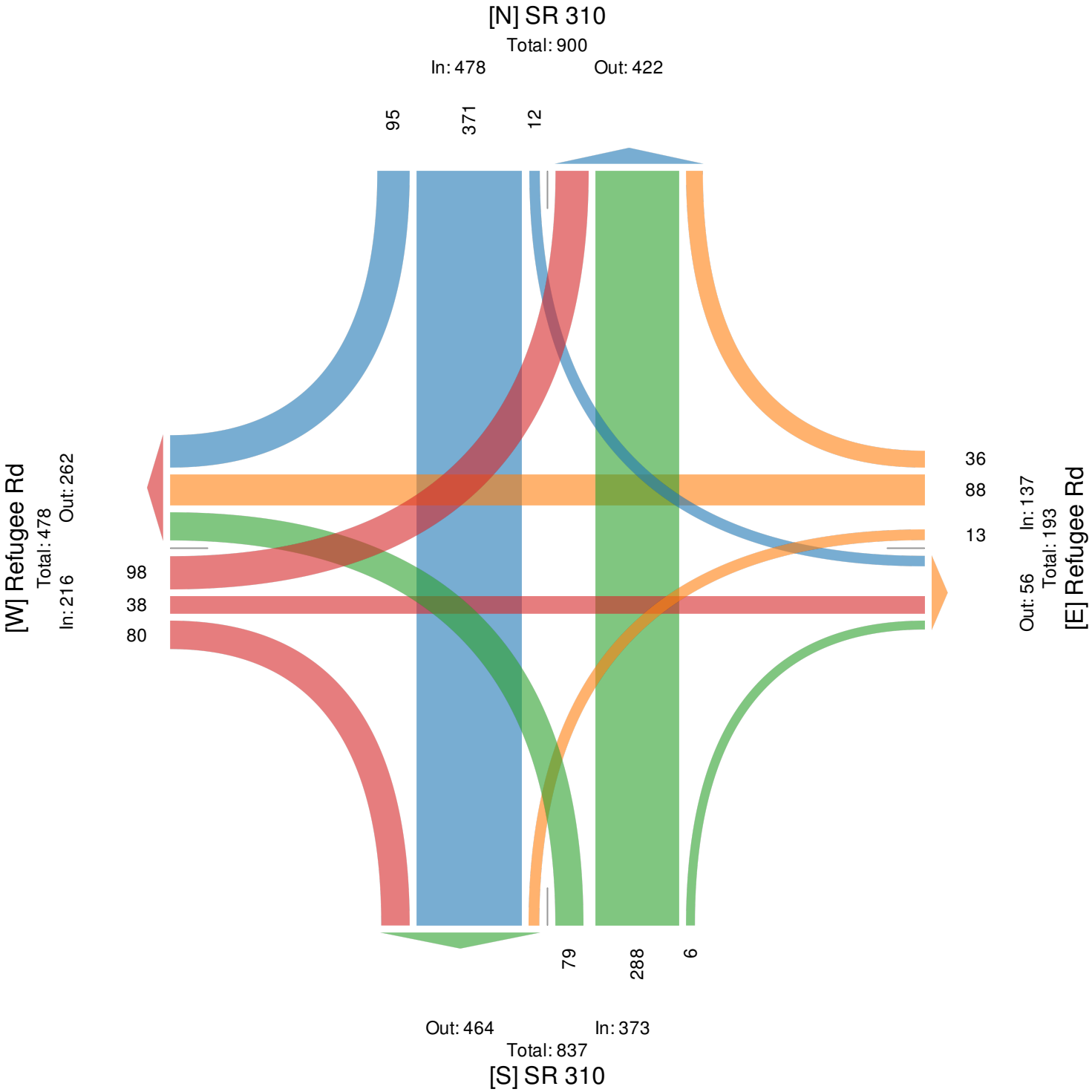
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Refugee Rd						Refugee Rd						SR 310						SR 310						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2020-02-11 8:00AM	10	7	25	0	**42**	0	2	30	5	0	**37**	0	30	57	1	0	**88**	0	3	84	24	0	**111**	0	**278**
8:15AM	35	14	43	0	**92**	0	5	34	12	0	**51**	0	32	76	1	0	**109**	0	2	91	27	0	**120**	0	**372**
8:30AM	20	3	12	0	**35**	0	3	5	1	0	**9**	0	10	64	2	0	**76**	0	3	108	18	0	**129**	0	**249**
8:45AM	33	14	0	0	**47**	0	3	19	18	0	**40**	0	7	91	2	0	**100**	0	4	88	26	0	**118**	0	**305**
Total	98	38	80	0	**216**	0	13	88	36	0	**137**	0	79	288	6	0	**373**	0	12	371	95	0	**478**	0	**1204**
% Approach	45.4%	17.6%	37.0%	0%	**-**	-	9.5%	64.2%	26.3%	0%	**-**	-	21.2%	77.2%	1.6%	0%	**-**	-	2.5%	77.6%	19.9%	0%	**-**	-	-
% Total	8.1%	3.2%	6.6%	0%	**17.9%**	-	1.1%	7.3%	3.0%	0%	**11.4%**	-	6.6%	23.9%	0.5%	0%	**31.0%**	-	1.0%	30.8%	7.9%	0%	**39.7%**	-	-
PHF	0.700	0.679	0.465	-	**0.587**	-	0.650	0.647	0.500	-	**0.672**	-	0.617	0.791	0.750	-	**0.856**	-	0.750	0.859	0.880	-	**0.926**	-	0.809
Lights and Motorcycles	92	38	75	0	**205**	-	12	88	36	0	**136**	-	74	265	6	0	**345**	-	12	341	86	0	**439**	-	1125
% Lights and Motorcycles	93.9%	100%	93.8%	0%	**94.9%**	-	92.3%	100%	100%	0%	**99.3%**	-	93.7%	92.0%	100%	0%	**92.5%**	-	100%	91.9%	90.5%	0%	**91.8%**	-	93.4%
Heavy	6	0	5	0	**11**	-	1	0	0	0	**1**	-	5	23	0	0	**28**	-	0	30	9	0	**39**	-	79
% Heavy	6.1%	0%	6.3%	0%	**5.1%**	-	7.7%	0%	0%	0%	**0.7%**	-	6.3%	8.0%	0%	0%	**7.5%**	-	0%	8.1%	9.5%	0%	**8.2%**	-	6.6%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

6 - SR 310 & Refugee Rd - TMC
Tue Feb 11, 2020
AM Peak (8 AM - 9 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750942, Location: 39.971789, -82.68189

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



6 - SR 310 & Refugee Rd - TMC

Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750942, Location: 39.971789, -82.68189

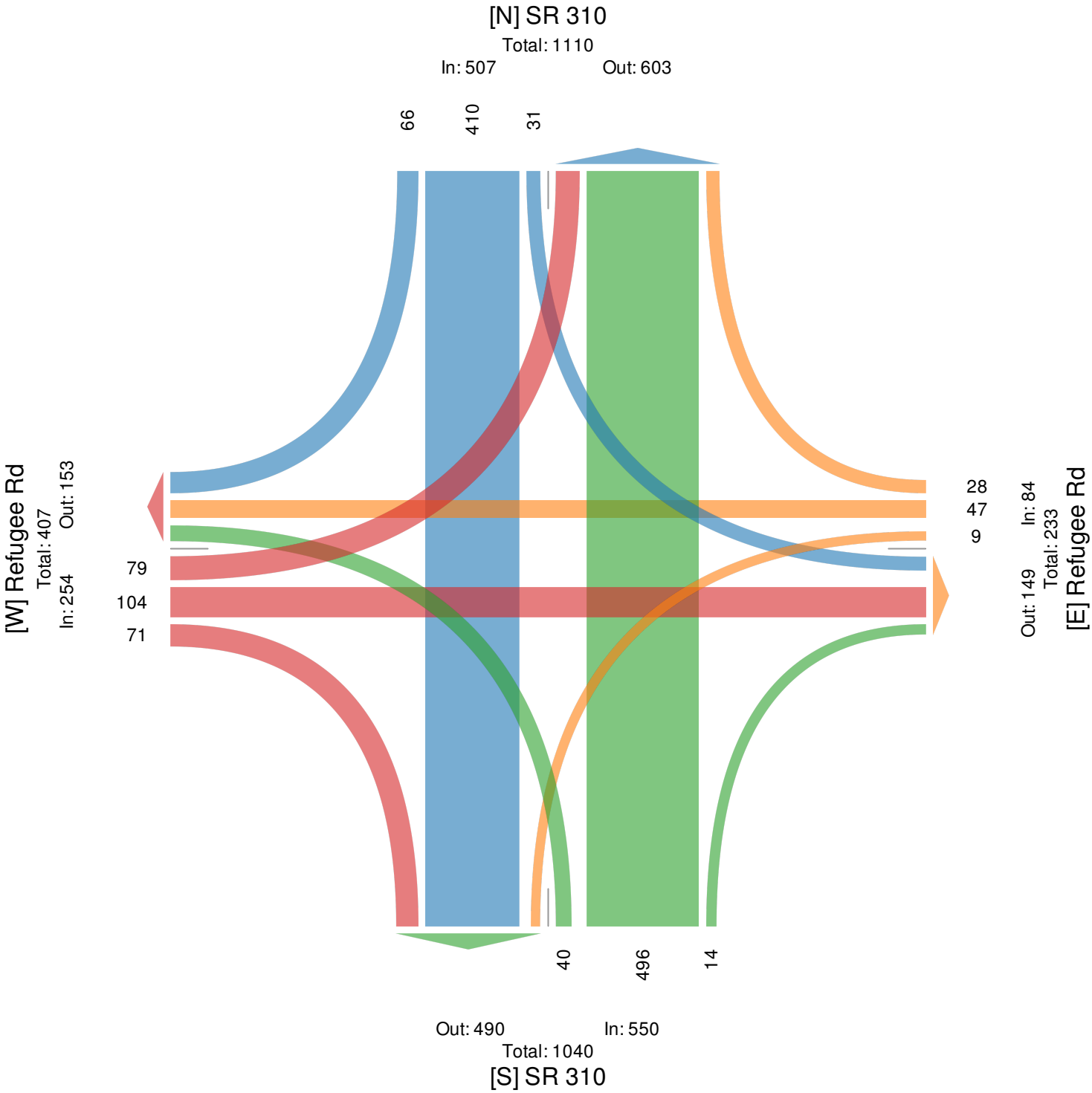
Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Refugee Rd						Refugee Rd						SR 310						SR 310						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2020-02-11 4:45PM	19	16	16	0	**51**	0	5	12	7	0	**24**	0	9	121	6	0	**136**	0	5	96	15	0	**116**	0	**327**
5:00PM	19	32	13	0	**64**	0	1	9	6	0	**16**	0	6	129	2	0	**137**	0	10	98	15	0	**123**	0	**340**
5:15PM	20	20	7	0	**47**	0	2	18	6	0	**26**	0	12	137	3	0	**152**	0	14	99	18	0	**131**	0	**356**
5:30PM	21	36	35	0	**92**	0	1	8	9	0	**18**	0	13	109	3	0	**125**	0	2	117	18	0	**137**	0	**372**
Total	79	104	71	0	**254**	0	9	47	28	0	**84**	0	40	496	14	0	**550**	0	31	410	66	0	**507**	0	**1395**
% Approach	31.1%	40.9%	28.0%	0%	-	-	10.7%	56.0%	33.3%	0%	-	-	7.3%	90.2%	2.5%	0%	-	-	6.1%	80.9%	13.0%	0%	-	-	-
% Total	5.7%	7.5%	5.1%	0%	**18.2%**	-	0.6%	3.4%	2.0%	0%	**6.0%**	-	2.9%	35.6%	1.0%	0%	**39.4%**	-	2.2%	29.4%	4.7%	0%	**36.3%**	-	-
PHF	0.940	0.722	0.507		**0.690**	-	0.450	0.653	0.778		**0.808**	-	0.769	0.905	0.583		**0.905**	-	0.554	0.876	0.917		**0.925**	-	0.938
Lights and Motorcycles	79	104	71	0	**254**	-	9	47	28	0	**84**	-	39	491	14	0	**544**	-	31	405	66	0	**502**	-	1384
% Lights and Motorcycles	100%	100%	100%	0%	**100%**	-	100%	100%	100%	0%	**100%**	-	97.5%	99.0%	100%	0%	**98.9%**	-	100%	98.8%	100%	0%	**99.0%**	-	99.2%
Heavy	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1	5	0	0	**6**	-	0	5	0	0	**5**	-	11
% Heavy	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	2.5%	1.0%	0%	0%	**1.1%**	-	0%	1.2%	0%	0%	**1.0%**	-	0.8%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

6 - SR 310 & Refugee Rd - TMC
Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750942, Location: 39.971789, -82.68189

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US



7 - Etna Pkwy & Refugee Rd - TMC

Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750944, Location: 39.973029, -82.706084, Site Code: 7

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Refugee Rd						Refugee Rd						Etna Pkwy						Etna Pkwy						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2020-02-11 7:00AM	0	8	2	0	**10**	0	4	19	20	0	**43**	0	1	15	1	0	**17**	0	6	32	0	0	**38**	0	**108**
7:15AM	2	9	6	0	**17**	0	4	19	18	0	**41**	0	0	15	1	0	**16**	0	4	41	0	0	**45**	0	**119**
7:30AM	1	9	1	0	**11**	0	2	11	18	0	**31**	0	0	5	1	0	**6**	0	8	20	0	0	**28**	0	**76**
7:45AM	0	6	2	0	**8**	0	6	13	15	0	**34**	0	1	15	0	0	**16**	0	6	25	0	0	**31**	0	**89**
Hourly Total	3	32	11	0	**46**	0	16	62	71	0	**149**	0	2	50	3	0	**55**	0	24	118	0	0	**142**	0	**392**
8:00AM	1	17	3	0	**21**	0	9	20	15	0	**44**	0	0	9	3	0	**12**	0	7	31	0	0	**38**	0	**115**
8:15AM	1	16	3	0	**20**	0	5	26	23	0	**54**	0	1	5	1	0	**7**	0	12	35	1	0	**48**	0	**129**
8:30AM	1	1	2	0	**4**	0	2	14	15	0	**31**	0	0	10	2	0	**12**	0	2	31	0	0	**33**	0	**80**
8:45AM	0	7	3	0	**10**	0	3	11	15	0	**29**	0	0	4	0	0	**4**	0	3	37	0	0	**40**	0	**83**
Hourly Total	3	41	11	0	**55**	0	19	71	68	0	**158**	0	1	28	6	0	**35**	0	24	134	1	0	**159**	0	**407**
4:00PM	0	14	2	0	**16**	0	1	9	8	0	**18**	0	1	19	9	0	**29**	0	18	21	0	0	**39**	0	**102**
4:15PM	0	21	0	0	**21**	0	6	9	6	0	**21**	0	2	23	13	0	**38**	0	31	25	0	0	**56**	0	**136**
4:30PM	0	15	4	0	**19**	0	7	13	4	0	**24**	0	1	41	21	0	**63**	0	25	31	1	0	**57**	0	**163**
4:45PM	0	18	2	0	**20**	0	7	14	10	0	**31**	0	2	34	11	0	**47**	0	25	25	0	0	**50**	0	**148**
Hourly Total	0	68	8	0	**76**	0	21	45	28	0	**94**	0	6	117	54	0	**177**	0	99	102	1	0	**202**	0	**549**
5:00PM	0	16	1	0	**17**	0	0	15	6	0	**21**	0	4	44	15	0	**63**	0	30	18	0	0	**48**	0	**149**
5:15PM	1	21	2	0	**24**	0	2	13	8	0	**23**	0	3	30	10	0	**43**	0	24	22	0	0	**46**	0	**136**
5:30PM	0	27	1	0	**28**	0	5	14	10	0	**29**	0	2	39	5	0	**46**	0	41	34	1	0	**76**	0	**179**
5:45PM	0	8	1	0	**9**	0	1	7	8	0	**16**	0	1	28	4	0	**33**	0	26	30	3	0	**59**	0	**117**
Hourly Total	1	72	5	0	**78**	0	8	49	32	0	**89**	0	10	141	34	0	**185**	0	121	104	4	0	**229**	0	**581**
Total	7	213	35	0	**255**	0	64	227	199	0	**490**	0	19	336	97	0	**452**	0	268	458	6	0	**732**	0	**1929**
% Approach	2.7%	83.5%	13.7%	0%	-	-	13.1%	46.3%	40.6%	0%	-	-	4.2%	74.3%	21.5%	0%	-	-	36.6%	62.6%	0.8%	0%	-	-	-
% Total	0.4%	11.0%	1.8%	0%	**13.2%**	-	3.3%	11.8%	10.3%	0%	**25.4%**	-	1.0%	17.4%	5.0%	0%	**23.4%**	-	13.9%	23.7%	0.3%	0%	**37.9%**	-	-
Lights and Motorcycles	7	208	35	0	**250**	-	64	222	196	0	**482**	-	19	320	96	0	**435**	-	268	435	6	0	**709**	-	1876
% Lights and Motorcycles	100%	97.7%	100%	0%	**98.0%**	-	100%	97.8%	98.5%	0%	**98.4%**	-	100%	95.2%	99.0%	0%	**96.2%**	-	100%	95.0%	100%	0%	**96.9%**	-	97.3%
Heavy	0	5	0	0	**5**	-	0	5	3	0	**8**	-	0	16	1	0	**17**	-	0	23	0	0	**23**	-	53
% Heavy	0%	2.3%	0%	0%	**2.0%**	-	0%	2.2%	1.5%	0%	**1.6%**	-	0%	4.8%	1.0%	0%	**3.8%**	-	0%	5.0%	0%	0%	**3.1%**	-	2.7%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

7 - Etna Pkwy & Refugee Rd - TMC
Tue Feb 11, 2020
Full Length (7 AM-9 AM, 4 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750944, Location: 39.973029, -82.706084, Site Code: 7

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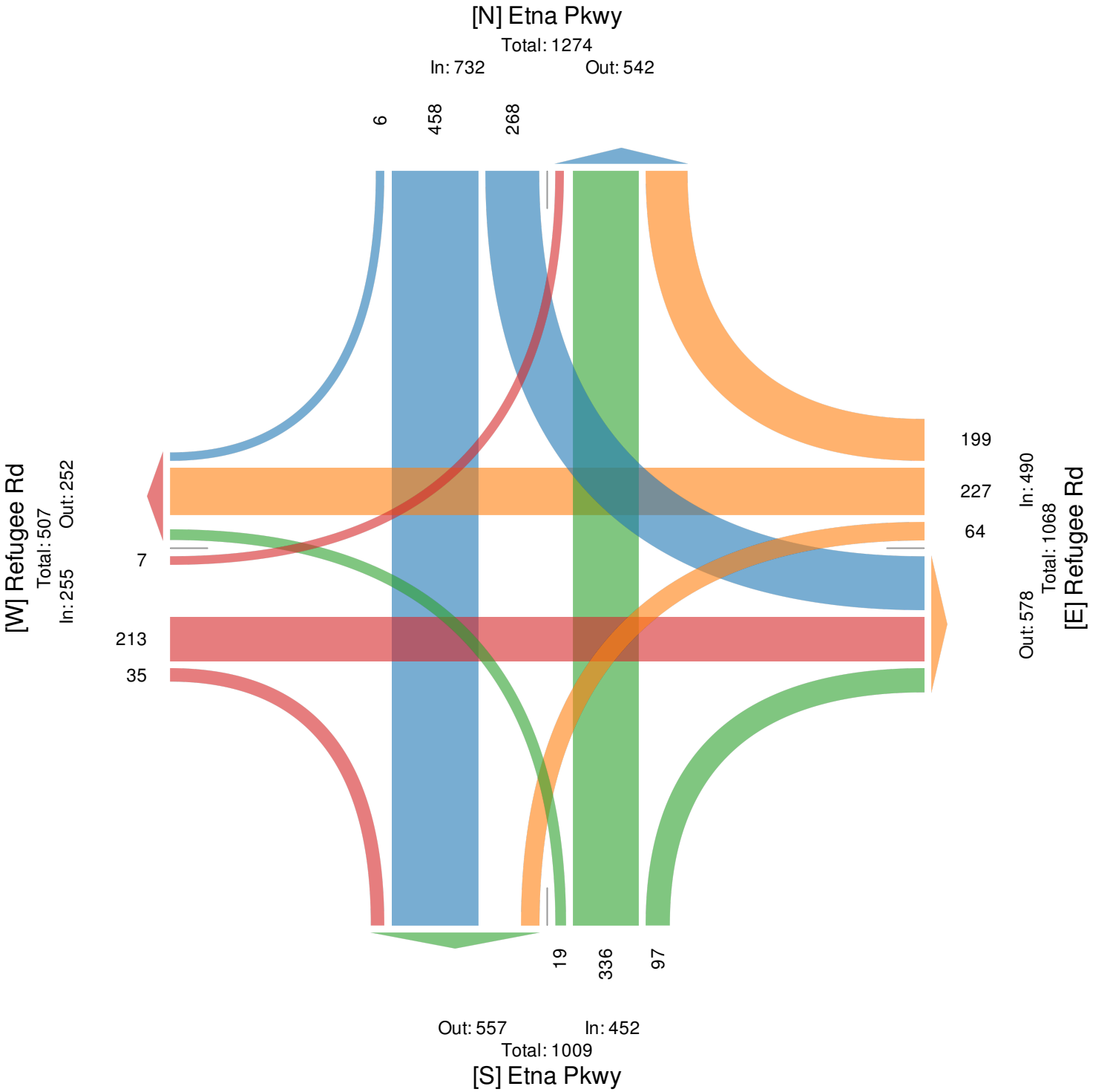
88 W. Church Street, Newark, OH, 43055, US



7 - Etna Pkwy & Refugee Rd - TMC

Tue Feb 11, 2020
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750944, Location: 39.973029, -82.706084, Site Code: 7

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Refugee Rd						Refugee Rd						Etna Pkwy						Etna Pkwy						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2020-02-11 7:45AM	0	6	2	0	**8**	0	6	13	15	0	**34**	0	1	15	0	0	**16**	0	6	25	0	0	**31**	0	**89**
8:00AM	1	17	3	0	**21**	0	9	20	15	0	**44**	0	0	9	3	0	**12**	0	7	31	0	0	**38**	0	**115**
8:15AM	1	16	3	0	**20**	0	5	26	23	0	**54**	0	1	5	1	0	**7**	0	12	35	1	0	**48**	0	**129**
8:30AM	1	1	2	0	**4**	0	2	14	15	0	**31**	0	0	10	2	0	**12**	0	2	31	0	0	**33**	0	**80**
Total	3	40	10	0	**53**	0	22	73	68	0	**163**	0	2	39	6	0	**47**	0	27	122	1	0	**150**	0	**413**
% Approach	5.7%	75.5%	18.9%	0%	**-**	-	13.5%	44.8%	41.7%	0%	**-**	-	4.3%	83.0%	12.8%	0%	**-**	-	18.0%	81.3%	0.7%	0%	**-**	-	**-**
% Total	0.7%	9.7%	2.4%	0%	**12.8%**	-	5.3%	17.7%	16.5%	0%	**39.5%**	-	0.5%	9.4%	1.5%	0%	**11.4%**	-	6.5%	29.5%	0.2%	0%	**36.3%**	-	**-**
PHF	0.750	0.588	0.833	-	**0.631**	-	0.611	0.702	0.739	-	**0.755**	-	0.500	0.650	0.500	-	**0.734**	-	0.563	0.871	0.250	-	**0.781**	-	0.800
Lights and Motorcycles	3	37	10	0	**50**	-	22	71	67	0	**160**	-	2	32	6	0	**40**	-	27	112	1	0	**140**	-	390
% Lights and Motorcycles	100%	92.5%	100%	0%	**94.3%**	-	100%	97.3%	98.5%	0%	**98.2%**	-	100%	82.1%	100%	0%	**85.1%**	-	100%	91.8%	100%	0%	**93.3%**	-	94.4%
Heavy	0	3	0	0	**3**	-	0	2	1	0	**3**	-	0	7	0	0	**7**	-	0	10	0	0	**10**	-	23
% Heavy	0%	7.5%	0%	0%	**5.7%**	-	0%	2.7%	1.5%	0%	**1.8%**	-	0%	17.9%	0%	0%	**14.9%**	-	0%	8.2%	0%	0%	**6.7%**	-	5.6%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

7 - Etna Pkwy & Refugee Rd - TMC
Tue Feb 11, 2020
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750944, Location: 39.973029, -82.706084, Site Code: 7

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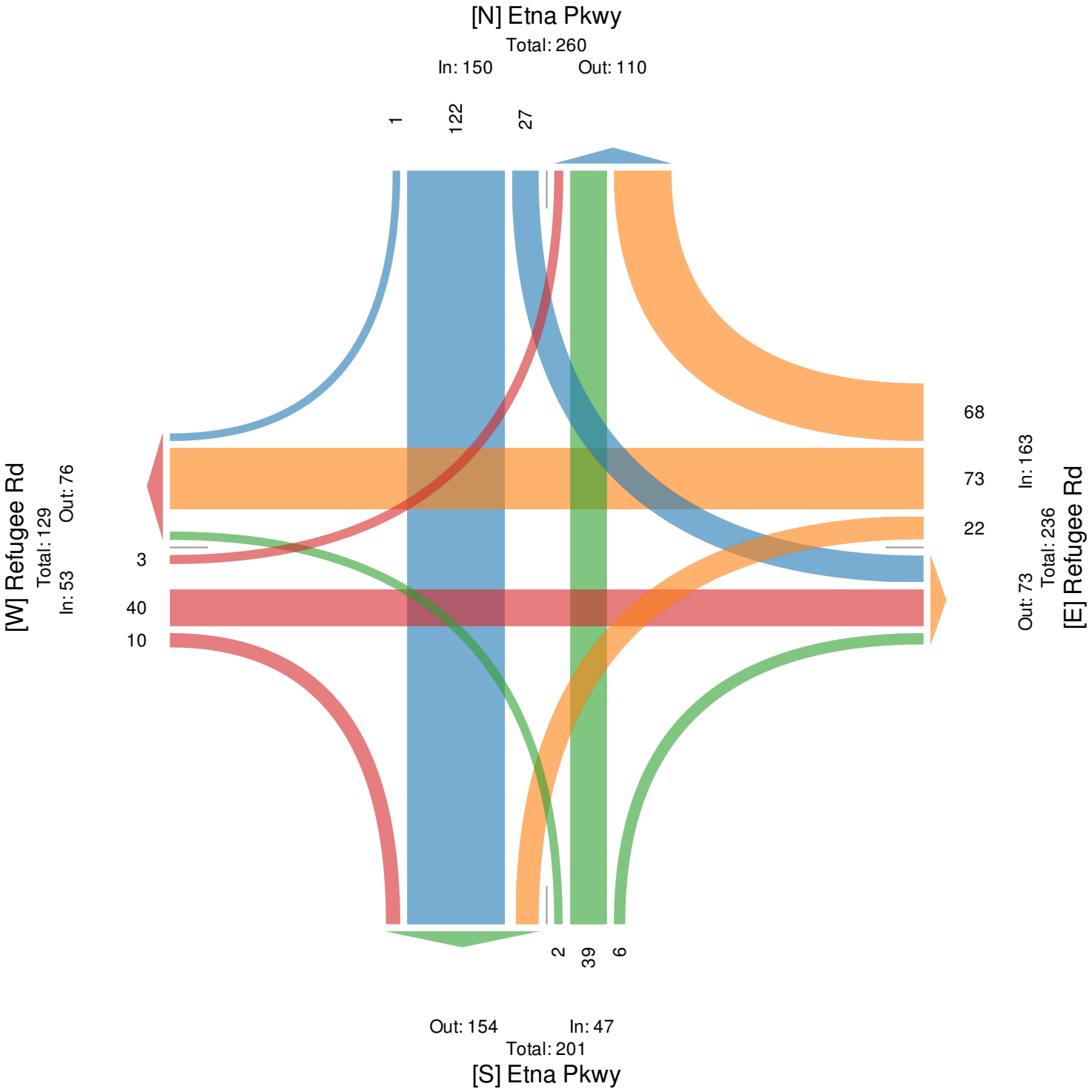

7 - Etna Pkwy & Refugee Rd - TMC

Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750944, Location: 39.973029, -82.706084, Site Code: 7

Provided by: Smart Services, Inc.
88 W. Church Street, Newark, OH, 43055, US

Leg	Refugee Rd						Refugee Rd						Etna Pkwy						Etna Pkwy						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2020-02-11 4:45PM	0	18	2	0	**20**	0	7	14	10	0	**31**	0	2	34	11	0	**47**	0	25	25	0	0	**50**	0	**148**
5:00PM	0	16	1	0	**17**	0	0	15	6	0	**21**	0	4	44	15	0	**63**	0	30	18	0	0	**48**	0	**149**
5:15PM	1	21	2	0	**24**	0	2	13	8	0	**23**	0	3	30	10	0	**43**	0	24	22	0	0	**46**	0	**136**
5:30PM	0	27	1	0	**28**	0	5	14	10	0	**29**	0	2	39	5	0	**46**	0	41	34	1	0	**76**	0	**179**
Total	1	82	6	0	**89**	0	14	56	34	0	**104**	0	11	147	41	0	**199**	0	120	99	1	0	**220**	0	**612**
% Approach	1.1%	92.1%	6.7%	0%	**-**	-	13.5%	53.8%	32.7%	0%	**-**	-	5.5%	73.9%	20.6%	0%	**-**	-	54.5%	45.0%	0.5%	0%	**-**	-	**-**
% Total	0.2%	13.4%	1.0%	0%	**14.5%**	-	2.3%	9.2%	5.6%	0%	**17.0%**	-	1.8%	24.0%	6.7%	0%	**32.5%**	-	19.6%	16.2%	0.2%	0%	**35.9%**	-	**-**
PHF	0.250	0.759	0.750	-	**0.795**	-	0.500	0.933	0.850	-	**0.839**	-	0.688	0.835	0.683	-	**0.790**	-	0.732	0.728	0.250	-	**0.724**	-	0.855
Lights and Motorcycles	1	82	6	0	**89**	-	14	55	34	0	**103**	-	11	143	41	0	**195**	-	120	96	1	0	**217**	-	604
% Lights and Motorcycles	100%	100%	100%	0%	**100%**	-	100%	98.2%	100%	0%	**99.0%**	-	100%	97.3%	100%	0%	**98.0%**	-	100%	97.0%	100%	0%	**98.6%**	-	98.7%
Heavy	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	4	0	0	**4**	-	0	3	0	0	**3**	-	8
% Heavy	0%	0%	0%	0%	**0%**	-	0%	1.8%	0%	0%	**1.0%**	-	0%	2.7%	0%	0%	**2.0%**	-	0%	3.0%	0%	0%	**1.4%**	-	1.3%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

7 - Etna Pkwy & Refugee Rd - TMC
Tue Feb 11, 2020
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians)
All Movements
ID: 750944, Location: 39.973029, -82.706084, Site Code: 7

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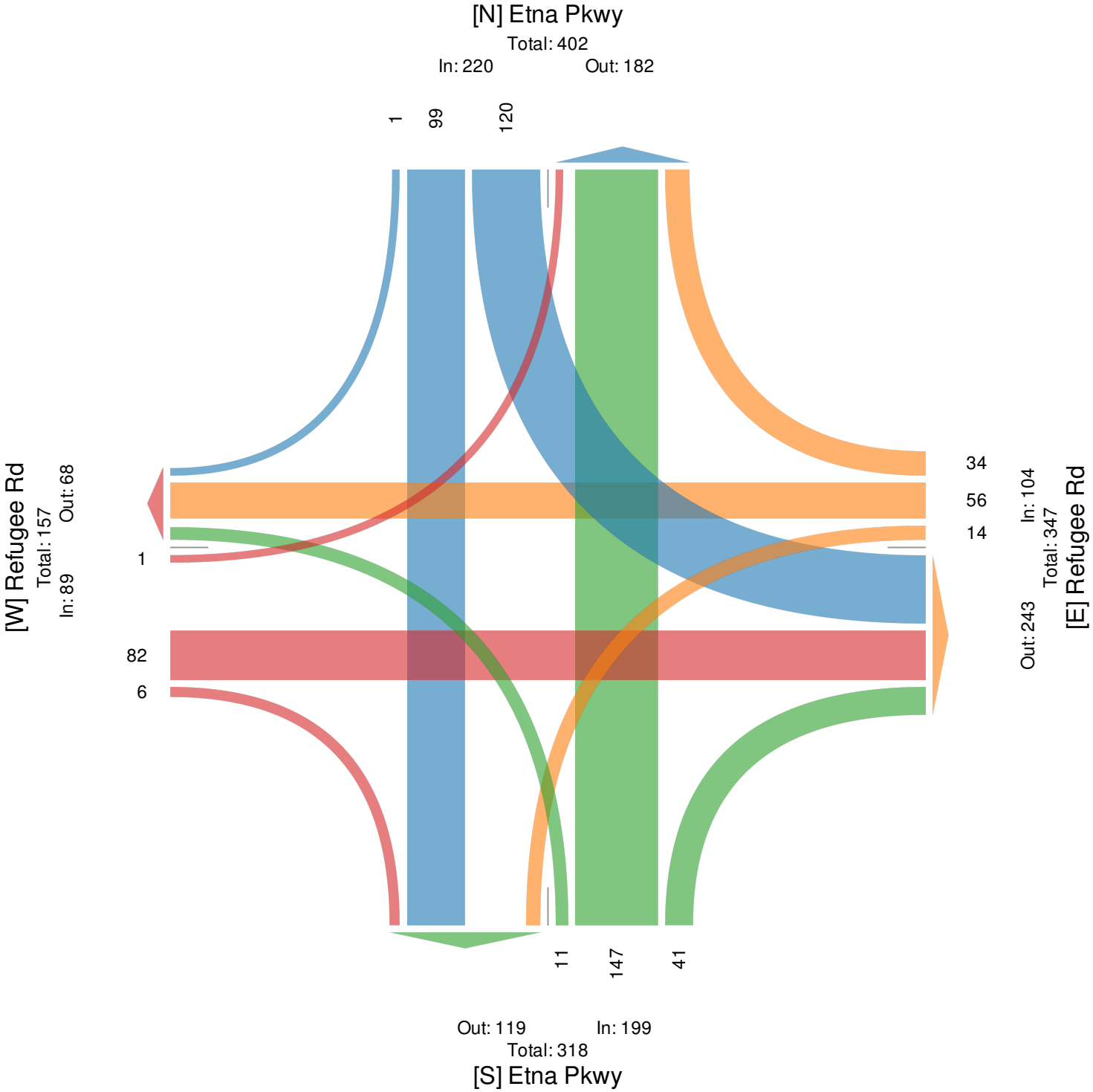


APPENDIX B
AM AND PM SYNCHRO OUTPUTS (EXISTING CONDITIONS)

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Future Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	6	6	6	2	2	2	15	15	15	7	7	7
Mvmt Flow	4	50	13	28	91	85	3	49	8	34	153	1

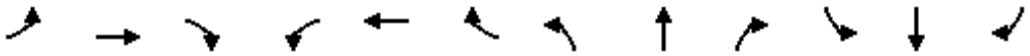
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	369	285	154	312	281	53	154	0	0	57	0	0
Stage 1	222	222	-	59	59	-	-	-	-	-	-	-
Stage 2	147	63	-	253	222	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.25	-	-	4.17	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.335	-	-	2.263	-	-
Pot Cap-1 Maneuver	580	618	882	641	627	1014	1351	-	-	1516	-	-
Stage 1	771	712	-	953	846	-	-	-	-	-	-	-
Stage 2	846	835	-	751	720	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	461	601	882	579	610	1014	1351	-	-	1516	-	-
Mov Cap-2 Maneuver	461	601	-	579	610	-	-	-	-	-	-	-
Stage 1	769	694	-	951	844	-	-	-	-	-	-	-
Stage 2	690	833	-	670	702	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	11.9	0.3	1.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1351	-	-	628	725	1516	-	-
HCM Lane V/C Ratio	0.002	-	-	0.105	0.281	0.022	-	-
HCM Control Delay (s)	7.7	0	-	11.4	11.9	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1.2	0.1	-	-

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

04/20/2020



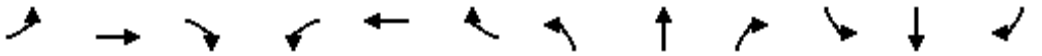
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Future Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1885	1885	1885	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	121	47	99	16	109	44	98	356	7	15	458	117
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	5	5	5	1	1	1	8	8	8	8	8	8
Cap, veh/h	229	76	122	92	266	99	231	779	14	79	835	209
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	611	359	572	80	1250	468	240	1263	23	15	1355	339
Grp Volume(v), veh/h	267	0	0	169	0	0	461	0	0	590	0	0
Grp Sat Flow(s),veh/h/ln	1542	0	0	1797	0	0	1527	0	0	1708	0	0
Q Serve(g_s), s	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.4	0.0	0.0	4.3	0.0	0.0	7.1	0.0	0.0	10.5	0.0	0.0
Prop In Lane	0.45		0.37	0.09		0.26	0.21		0.02	0.03		0.20
Lane Grp Cap(c), veh/h	427	0	0	457	0	0	1024	0	0	1123	0	0
V/C Ratio(X)	0.63	0.00	0.00	0.37	0.00	0.00	0.45	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	621	0	0	695	0	0	1024	0	0	1123	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	18.0	0.0	0.0	5.2	0.0	0.0	5.9	0.0	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.5	0.0	0.0	1.4	0.0	0.0	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	1.5	0.0	0.0	1.4	0.0	0.0	2.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	0.0	0.0	18.5	0.0	0.0	6.7	0.0	0.0	7.7	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		267			169			461			590	
Approach Delay, s/veh		20.9			18.5			6.7			7.7	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		15.7		37.0		15.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5				
Max Q Clear Time (g_c+I1), s		9.1		10.4		12.5		6.3				
Green Ext Time (p_c), s		2.8		0.8		3.3		0.6				

Intersection Summary		
HCM 6th Ctrl Delay		11.0
HCM 6th LOS		B

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Future Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	478	141	54	891	109	315	163	54	98	130	196
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	1192	532	389	1131	504	433	401	340	395	297	251
Arrive On Green	0.08	0.34	0.34	0.06	0.32	0.32	0.13	0.21	0.21	0.08	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	98	478	141	54	891	109	315	163	54	98	130	196
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.7	8.0	5.1	1.5	17.8	3.9	10.5	5.8	2.2	3.5	4.9	9.2
Cycle Q Clear(g_c), s	2.7	8.0	5.1	1.5	17.8	3.9	10.5	5.8	2.2	3.5	4.9	9.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	284	1192	532	389	1131	504	433	401	340	395	297	251
V/C Ratio(X)	0.35	0.40	0.27	0.14	0.79	0.22	0.73	0.41	0.16	0.25	0.44	0.78
Avail Cap(c_a), veh/h	603	2135	952	441	1542	688	433	648	549	449	600	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	19.9	18.9	15.7	24.2	19.4	23.8	26.3	24.9	24.0	29.6	31.5
Incr Delay (d2), s/veh	0.7	0.2	0.3	0.2	2.0	0.2	6.0	0.7	0.2	0.3	1.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.0	1.8	0.6	6.8	1.4	5.3	2.6	0.8	1.4	2.2	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	20.1	19.2	15.9	26.1	19.7	29.8	27.0	25.1	24.3	30.7	36.7
LnGrp LOS	B	C	B	B	C	B	C	C	C	C	C	D
Approach Vol, veh/h		717			1054			532			424	
Approach Delay, s/veh		19.6			24.9			28.5			32.0	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	32.3	11.7	22.2	13.1	31.0	16.0	17.9
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	3.5	10.0	5.5	7.8	4.7	19.8	12.5	11.2
Green Ext Time (p_c), s	0.0	3.4	0.1	0.9	0.2	5.0	0.0	1.1

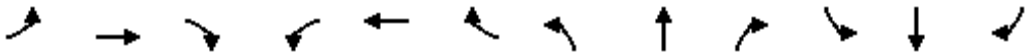
Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Future Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	380	141	11	717	76	152	141	22	43	76	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	479	1653	605	612	2306	1028	292	317	50	246	376	318
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	684	2547	932	881	3554	1585	1176	1580	246	1223	1870	1585
Grp Volume(v), veh/h	76	264	257	11	717	76	152	0	163	43	76	130
Grp Sat Flow(s),veh/h/ln	684	1777	1703	881	1777	1585	1176	0	1826	1223	1870	1585
Q Serve(g_s), s	4.1	4.6	4.7	0.4	6.7	1.3	9.3	0.0	5.9	2.4	2.5	5.4
Cycle Q Clear(g_c), s	10.8	4.6	4.7	5.1	6.7	1.3	11.8	0.0	5.9	8.3	2.5	5.4
Prop In Lane	1.00		0.55	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	479	1153	1105	612	2306	1028	292	0	367	246	376	318
V/C Ratio(X)	0.16	0.23	0.23	0.02	0.31	0.07	0.52	0.00	0.44	0.18	0.20	0.41
Avail Cap(c_a), veh/h	479	1153	1105	612	2306	1028	523	0	726	486	744	630
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.2	5.4	5.5	6.5	5.8	4.9	30.0	0.0	26.4	30.0	25.0	26.2
Incr Delay (d2), s/veh	0.7	0.5	0.5	0.1	0.4	0.1	1.4	0.0	0.8	0.3	0.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.2	1.2	0.1	1.7	0.3	2.6	0.0	2.5	0.7	1.1	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.9	5.9	6.0	6.6	6.2	5.0	31.4	0.0	27.2	30.3	25.3	27.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	C	C
Approach Vol, veh/h		597			804			315			249	
Approach Delay, s/veh		6.3			6.1			29.2			27.1	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		20.2		55.0		20.2				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		12.8		13.8		8.7		10.3				
Green Ext Time (p_c), s		3.7		1.3		5.2		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			12.5									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	254	1	9	504	28	3	20	14	4	3	2
Future Vol, veh/h	2	254	1	9	504	28	3	20	14	4	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	10	10	10	3	3	3	5	5	5	0	0	0
Mvmt Flow	2	265	1	9	525	29	3	21	15	4	3	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	554	0	0	266	0	0	830	842	266	846	828	540
Stage 1	-	-	-	-	-	-	270	270	-	558	558	-
Stage 2	-	-	-	-	-	-	560	572	-	288	270	-
Critical Hdwy	4.2	-	-	4.13	-	-	7.15	6.55	6.25	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.227	-	-	3.545	4.045	3.345	3.5	4	3.3
Pot Cap-1 Maneuver	977	-	-	1292	-	-	286	297	765	284	309	546
Stage 1	-	-	-	-	-	-	729	680	-	518	515	-
Stage 2	-	-	-	-	-	-	508	499	-	724	690	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	977	-	-	1292	-	-	280	293	765	261	305	546
Mov Cap-2 Maneuver	-	-	-	-	-	-	280	293	-	261	305	-
Stage 1	-	-	-	-	-	-	728	679	-	517	510	-
Stage 2	-	-	-	-	-	-	498	494	-	687	689	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	15.5	16.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	380	977	-	-	1292	-	-	312
HCM Lane V/C Ratio	0.101	0.002	-	-	0.007	-	-	0.03
HCM Control Delay (s)	15.5	8.7	0	-	7.8	0	-	16.9
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

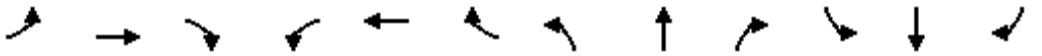
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	410	120	270	620	90	270
Future Volume (veh/h)	410	120	270	620	90	270
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	446	130	293	674	98	293
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1453	420	648	2491	333	472
Arrive On Green	0.53	0.53	0.22	1.00	0.19	0.19
Sat Flow, veh/h	2813	786	1781	3647	1781	1585
Grp Volume(v), veh/h	290	286	293	674	98	293
Grp Sat Flow(s),veh/h/ln	1777	1729	1781	1777	1781	1585
Q Serve(g_s), s	8.2	8.3	6.4	0.0	4.3	14.3
Cycle Q Clear(g_c), s	8.2	8.3	6.4	0.0	4.3	14.3
Prop In Lane		0.45	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	949	924	648	2491	333	472
V/C Ratio(X)	0.31	0.31	0.45	0.27	0.29	0.62
Avail Cap(c_a), veh/h	949	924	747	2491	396	528
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh	11.7	11.7	6.0	0.0	31.5	27.2
Incr Delay (d2), s/veh	0.8	0.9	0.4	0.2	0.5	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.2	1.6	0.1	1.8	12.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.5	12.6	6.5	0.2	32.0	29.1
LnGrp LOS	B	B	A	A	C	C
Approach Vol, veh/h	576			967	391	
Approach Delay, s/veh	12.5			2.1	29.8	
Approach LOS	B			A	C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.0	53.2		21.8		68.2
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	15.0	39.9		20.0		59.9
Max Q Clear Time (g_c+I1), s	8.4	10.3		16.3		2.0
Green Ext Time (p_c), s	0.5	1.8		0.5		2.6

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Future Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	239	435	43	43	609	76	120	109	54	65	76	250
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	481	1570	154	569	1379	172	351	335	284	348	314	266
Arrive On Green	0.20	0.96	0.96	0.05	0.43	0.43	0.07	0.18	0.18	0.06	0.17	0.17
Sat Flow, veh/h	1781	3268	322	1781	3180	396	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	239	236	242	43	340	345	120	109	54	65	76	250
Grp Sat Flow(s),veh/h/ln	1781	1777	1812	1781	1777	1799	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	6.8	0.6	0.6	1.1	12.1	12.1	4.9	4.6	2.6	2.6	3.2	14.0
Cycle Q Clear(g_c), s	6.8	0.6	0.6	1.1	12.1	12.1	4.9	4.6	2.6	2.6	3.2	14.0
Prop In Lane	1.00		0.18	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	481	853	871	569	770	780	351	335	284	348	314	266
V/C Ratio(X)	0.50	0.28	0.28	0.08	0.44	0.44	0.34	0.33	0.19	0.19	0.24	0.94
Avail Cap(c_a), veh/h	490	853	871	661	770	780	424	335	284	441	314	266
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	0.9	0.9	12.2	17.9	17.9	27.8	32.2	31.4	27.7	32.5	37.0
Incr Delay (d2), s/veh	0.8	0.8	0.8	0.1	1.8	1.8	0.6	0.6	0.3	0.3	0.4	39.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.4	0.4	0.4	5.0	5.1	2.1	2.1	1.0	1.1	1.4	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	1.7	1.7	12.3	19.7	19.7	28.4	32.7	31.7	28.0	32.9	76.2
LnGrp LOS	B	A	A	B	B	B	C	C	C	C	C	E
Approach Vol, veh/h		717			728			283			391	
Approach Delay, s/veh		5.1			19.2			30.7			59.8	
Approach LOS		A			B			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	48.3	10.3	21.0	14.5	44.1	11.4	20.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 9.3	34.9	* 10	15.1	* 9.3	34.9	* 10	15.1
Max Q Clear Time (g_c+I1), s	3.1	2.6	4.6	6.6	8.8	14.1	6.9	16.0
Green Ext Time (p_c), s	0.0	2.9	0.0	0.4	0.0	4.1	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

04/20/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Future Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	250	43	65	391	11	43	120	54	22	163	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	601	1181	1001	704	1143	32	152	300	135	277	210	210
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	983	1870	1585	1086	1810	51	1054	1222	550	1211	858	858
Grp Volume(v), veh/h	33	250	43	65	0	402	43	0	174	22	0	326
Grp Sat Flow(s),veh/h/ln	983	1870	1585	1086	0	1861	1054	0	1771	1211	0	1716
Q Serve(g_s), s	1.5	5.1	0.9	2.4	0.0	9.1	3.6	0.0	7.4	1.4	0.0	15.9
Cycle Q Clear(g_c), s	10.6	5.1	0.9	7.6	0.0	9.1	19.5	0.0	7.4	8.8	0.0	15.9
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	601	1181	1001	704	0	1175	152	0	435	277	0	421
V/C Ratio(X)	0.05	0.21	0.04	0.09	0.00	0.34	0.28	0.00	0.40	0.08	0.00	0.77
Avail Cap(c_a), veh/h	601	1181	1001	704	0	1175	244	0	589	383	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.3	7.1	6.3	8.7	0.0	7.8	40.7	0.0	28.4	32.1	0.0	31.6
Incr Delay (d2), s/veh	0.2	0.4	0.1	0.3	0.0	0.8	1.0	0.0	0.6	0.1	0.0	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.6	0.3	0.5	0.0	2.9	0.9	0.0	2.9	0.4	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.5	7.5	6.4	8.9	0.0	8.6	41.7	0.0	29.0	32.2	0.0	36.3
LnGrp LOS	B	A	A	A	A	A	D	A	C	C	A	D
Approach Vol, veh/h		326			467			217			348	
Approach Delay, s/veh		7.6			8.6			31.5			36.0	
Approach LOS		A			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		62.8		27.2		62.8		27.2				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		12.6		21.5		11.1		17.9				
Green Ext Time (p_c), s		1.5		0.6		2.5		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			19.1									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	57	174	350	146	55	23
Future Vol, veh/h	57	174	350	146	55	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	67	205	412	172	65	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	584	0	-	0	837	498
Stage 1	-	-	-	-	498	-
Stage 2	-	-	-	-	339	-
Critical Hdwy	4.12	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.218	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	991	-	-	-	338	574
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	724	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	991	-	-	-	312	574
Mov Cap-2 Maneuver	-	-	-	-	312	-
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	724	-

Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	18.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	991	-	-	-	361
HCM Lane V/C Ratio	0.068	-	-	-	0.254
HCM Control Delay (s)	8.9	0	-	-	18.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1

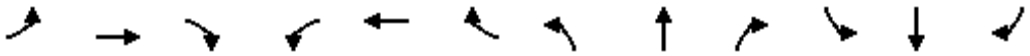
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	140	50	200	410	110
Future Volume (veh/h)	200	140	50	200	410	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	217	152	54	217	446	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	557	472	188	447	552	148
Arrive On Green	0.30	0.30	0.30	0.30	0.40	0.40
Sat Flow, veh/h	1870	1585	200	1501	1365	367
Grp Volume(v), veh/h	217	152	271	0	567	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1701	0	1736	0
Q Serve(g_s), s	3.1	2.5	0.3	0.0	9.7	0.0
Cycle Q Clear(g_c), s	3.1	2.5	4.0	0.0	9.7	0.0
Prop In Lane		1.00	0.20		0.79	0.21
Lane Grp Cap(c), veh/h	557	472	635	0	701	0
V/C Ratio(X)	0.39	0.32	0.43	0.00	0.81	0.00
Avail Cap(c_a), veh/h	1758	1490	1663	0	2512	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	9.4	9.1	9.7	0.0	8.8	0.0
Incr Delay (d2), s/veh	0.4	0.4	0.5	0.0	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.5	0.9	0.0	1.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.8	9.5	10.1	0.0	11.1	0.0
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	369			271	567	
Approach Delay, s/veh	9.7			10.1	11.1	
Approach LOS	A			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		15.5		18.0		15.5
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		31.5		48.5		31.5
Max Q Clear Time (g_c+I1), s		5.1		11.7		6.0
Green Ext Time (p_c), s		1.5		1.8		1.4

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Future Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	76	174	22	315	11	326	43	11	11	76	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	303	136	229	125	583	20	603	58	14	119	251	330
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	483	402	675	51	1723	58	1181	167	40	33	717	940
Grp Volume(v), veh/h	402	0	0	348	0	0	380	0	0	196	0	0
Grp Sat Flow(s),veh/h/ln	1560	0	0	1832	0	0	1388	0	0	1690	0	0
Q Serve(g_s), s	2.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.3	0.0	0.0	5.4	0.0	0.0	8.1	0.0	0.0	3.0	0.0	0.0
Prop In Lane	0.38		0.43	0.06		0.03	0.86		0.03	0.06		0.56
Lane Grp Cap(c), veh/h	668	0	0	728	0	0	676	0	0	700	0	0
V/C Ratio(X)	0.60	0.00	0.00	0.48	0.00	0.00	0.56	0.00	0.00	0.28	0.00	0.00
Avail Cap(c_a), veh/h	1767	0	0	2167	0	0	1603	0	0	1929	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.0	0.0	0.0	9.5	0.0	0.0	9.8	0.0	0.0	8.4	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.5	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	1.2	0.0	0.0	1.3	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.9	0.0	0.0	10.0	0.0	0.0	10.5	0.0	0.0	8.6	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		402			348			380			196	
Approach Delay, s/veh		10.9			10.0			10.5			8.6	
Approach LOS		B			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		17.5		17.9		17.5		17.9				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		40.5		38.5		40.5		38.5				
Max Q Clear Time (g_c+I1), s		9.3		10.1		7.4		5.0				
Green Ext Time (p_c), s		2.6		2.3		1.8		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			10.2									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Future Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	3	3	3
Mvmt Flow	38	0	31	0	0	0	66	362	0	0	166	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	672	672	178	688	684	362	190	0	0	362	0	0
Stage 1	178	178	-	494	494	-	-	-	-	-	-	-
Stage 2	494	494	-	194	190	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.12	6.52	6.22	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.518	4.018	3.318	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	368	376	862	360	371	683	1384	-	-	1191	-	-
Stage 1	821	750	-	557	546	-	-	-	-	-	-	-
Stage 2	555	545	-	808	743	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	351	353	862	331	349	683	1384	-	-	1191	-	-
Mov Cap-2 Maneuver	351	353	-	331	349	-	-	-	-	-	-	-
Stage 1	772	750	-	524	513	-	-	-	-	-	-	-
Stage 2	522	512	-	779	743	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	0	1.2	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1384	-	-	479	-	1191	-	-
HCM Lane V/C Ratio	0.048	-	-	0.146	-	-	-	-
HCM Control Delay (s)	7.7	0	-	13.8	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	-	0	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	158	33	80	291	100	116
Future Vol, veh/h	158	33	80	291	100	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	174	36	88	320	110	127

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	210	0	688	192
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	496	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1349	-	412	850
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	612	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1349	-	379	850
Mov Cap-2 Maneuver	-	-	-	-	379	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	564	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	540	-	-	1349	-
HCM Lane V/C Ratio	0.44	-	-	0.065	-
HCM Control Delay (s)	16.8	-	-	7.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Future Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	4	4	4	2	2	2	1	1	1	4	4	4
Mvmt Flow	10	37	30	11	41	14	17	264	5	6	156	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	500	475	160	506	476	267	163	0	0	269	0	0
Stage 1	172	172	-	301	301	-	-	-	-	-	-	-
Stage 2	328	303	-	205	175	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.12	6.52	6.22	4.11	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.518	4.018	3.318	2.209	-	-	2.236	-	-
Pot Cap-1 Maneuver	478	485	880	477	488	772	1422	-	-	1283	-	-
Stage 1	825	753	-	708	665	-	-	-	-	-	-	-
Stage 2	681	660	-	797	754	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	432	476	880	427	479	772	1422	-	-	1283	-	-
Mov Cap-2 Maneuver	432	476	-	427	479	-	-	-	-	-	-	-
Stage 1	813	749	-	698	656	-	-	-	-	-	-	-
Stage 2	618	651	-	729	750	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	13.1	0.5	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1422	-	-	569	510	1283	-	-
HCM Lane V/C Ratio	0.012	-	-	0.135	0.13	0.005	-	-
HCM Control Delay (s)	7.6	0	-	12.3	13.1	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.4	0	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Future Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	4	4	4	2	2	2	1	1	1	4	4	4
Mvmt Flow	11	39	31	11	43	15	22	338	7	8	200	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	636	610	205	642	611	342	209	0	0	345	0	0
Stage 1	221	221	-	386	386	-	-	-	-	-	-	-
Stage 2	415	389	-	256	225	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.12	6.52	6.22	4.11	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.518	4.018	3.318	2.209	-	-	2.236	-	-
Pot Cap-1 Maneuver	388	407	831	387	409	701	1368	-	-	1203	-	-
Stage 1	777	717	-	637	610	-	-	-	-	-	-	-
Stage 2	611	605	-	749	718	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	341	396	831	337	398	701	1368	-	-	1203	-	-
Mov Cap-2 Maneuver	341	396	-	337	398	-	-	-	-	-	-	-
Stage 1	761	711	-	624	598	-	-	-	-	-	-	-
Stage 2	543	593	-	676	712	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	15.1	0.5	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1368	-	-	483	426	1203	-	-
HCM Lane V/C Ratio	0.016	-	-	0.168	0.163	0.007	-	-
HCM Control Delay (s)	7.7	0	-	14	15.1	8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.6	0	-	-

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Future Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	6	6	6	2	2	2	15	15	15	7	7	7
Mvmt Flow	4	53	13	29	97	90	3	54	8	37	169	1

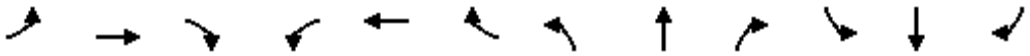
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	402	312	170	341	308	58	170	0	0	62	0	0
Stage 1	244	244	-	64	64	-	-	-	-	-	-	-
Stage 2	158	68	-	277	244	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.25	-	-	4.17	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.335	-	-	2.263	-	-
Pot Cap-1 Maneuver	552	596	864	613	606	1008	1332	-	-	1510	-	-
Stage 1	751	697	-	947	842	-	-	-	-	-	-	-
Stage 2	835	830	-	729	704	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	430	579	864	549	588	1008	1332	-	-	1510	-	-
Mov Cap-2 Maneuver	430	579	-	549	588	-	-	-	-	-	-	-
Stage 1	749	678	-	945	840	-	-	-	-	-	-	-
Stage 2	671	828	-	644	685	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	12.4	0.3	1.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1332	-	-	605	704	1510	-	-
HCM Lane V/C Ratio	0.002	-	-	0.116	0.307	0.025	-	-
HCM Control Delay (s)	7.7	0	-	11.7	12.4	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1.3	0.1	-	-

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

04/20/2020



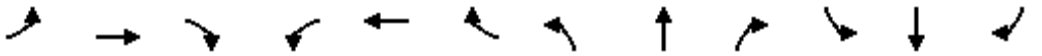
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Future Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1885	1885	1885	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	128	50	105	17	115	47	114	416	9	17	536	137
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	5	5	5	1	1	1	8	8	8	8	8	8
Cap, veh/h	234	79	127	92	277	105	222	750	15	78	823	206
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	613	355	571	80	1246	472	230	1231	25	15	1352	339
Grp Volume(v), veh/h	283	0	0	179	0	0	539	0	0	690	0	0
Grp Sat Flow(s),veh/h/ln	1540	0	0	1798	0	0	1486	0	0	1706	0	0
Q Serve(g_s), s	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.0	0.0	0.0	4.6	0.0	0.0	9.6	0.0	0.0	14.0	0.0	0.0
Prop In Lane	0.45		0.37	0.09		0.26	0.21		0.02	0.02		0.20
Lane Grp Cap(c), veh/h	440	0	0	474	0	0	987	0	0	1108	0	0
V/C Ratio(X)	0.64	0.00	0.00	0.38	0.00	0.00	0.55	0.00	0.00	0.62	0.00	0.00
Avail Cap(c_a), veh/h	614	0	0	687	0	0	987	0	0	1108	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	17.9	0.0	0.0	5.9	0.0	0.0	6.8	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	0.0	0.5	0.0	0.0	2.2	0.0	0.0	2.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.0	1.6	0.0	0.0	2.0	0.0	0.0	2.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	0.0	0.0	18.4	0.0	0.0	8.1	0.0	0.0	9.5	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		283			179			539			690	
Approach Delay, s/veh		21.0			18.4			8.1			9.5	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		16.4		37.0		16.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5				
Max Q Clear Time (g_c+I1), s		11.6		11.0		16.0		6.6				
Green Ext Time (p_c), s		3.5		0.9		3.9		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			11.9									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Future Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	502	148	59	963	117	362	188	62	103	137	205
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	1235	551	389	1184	528	420	401	340	370	305	258
Arrive On Green	0.08	0.35	0.35	0.06	0.33	0.33	0.13	0.21	0.21	0.08	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	103	502	148	59	963	117	362	188	62	103	137	205
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.9	8.7	5.5	1.7	20.1	4.3	10.5	7.1	2.6	3.8	5.4	10.1
Cycle Q Clear(g_c), s	2.9	8.7	5.5	1.7	20.1	4.3	10.5	7.1	2.6	3.8	5.4	10.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	272	1235	551	389	1184	528	420	401	340	370	305	258
V/C Ratio(X)	0.38	0.41	0.27	0.15	0.81	0.22	0.86	0.47	0.18	0.28	0.45	0.79
Avail Cap(c_a), veh/h	574	2048	913	432	1479	660	420	622	527	418	576	488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	20.1	19.1	15.7	24.8	19.5	27.3	27.8	26.1	24.9	30.7	32.7
Incr Delay (d2), s/veh	0.9	0.2	0.3	0.2	2.9	0.2	16.7	0.9	0.3	0.4	1.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.2	1.9	0.6	7.9	1.5	3.6	3.1	1.0	1.6	2.4	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.9	20.3	19.3	15.8	27.7	19.7	44.0	28.7	26.3	25.3	31.7	38.1
LnGrp LOS	B	C	B	B	C	B	D	C	C	C	C	D
Approach Vol, veh/h		753			1139			612			445	
Approach Delay, s/veh		20.0			26.2			37.5			33.2	
Approach LOS		B			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	34.4	11.8	22.9	13.2	33.3	16.0	18.7
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	3.7	10.7	5.8	9.1	4.9	22.1	12.5	12.1
Green Ext Time (p_c), s	0.0	3.6	0.1	1.1	0.2	4.9	0.0	1.1

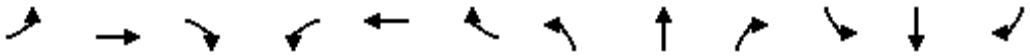
Intersection Summary	
HCM 6th Ctrl Delay	28.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Future Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	411	153	12	775	82	169	157	24	52	91	155
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	431	1599	589	564	2234	997	304	358	55	262	422	358
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	644	2543	936	847	3554	1585	1134	1585	242	1203	1870	1585
Grp Volume(v), veh/h	82	286	278	12	775	82	169	0	181	52	91	155
Grp Sat Flow(s),veh/h/ln	644	1777	1702	847	1777	1585	1134	0	1827	1203	1870	1585
Q Serve(g_s), s	5.4	5.5	5.6	0.5	8.0	1.6	11.1	0.0	6.6	3.0	3.1	6.5
Cycle Q Clear(g_c), s	13.4	5.5	5.6	6.1	8.0	1.6	14.1	0.0	6.6	9.6	3.1	6.5
Prop In Lane	1.00		0.55	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	431	1117	1070	564	2234	997	304	0	412	262	422	358
V/C Ratio(X)	0.19	0.26	0.26	0.02	0.35	0.08	0.56	0.00	0.44	0.20	0.22	0.43
Avail Cap(c_a), veh/h	431	1117	1070	564	2234	997	485	0	704	454	721	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.0	6.4	6.4	7.8	6.8	5.6	30.2	0.0	25.8	30.0	24.5	25.8
Incr Delay (d2), s/veh	1.0	0.6	0.6	0.1	0.4	0.2	1.6	0.0	0.7	0.4	0.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.6	1.6	0.1	2.2	0.4	3.0	0.0	2.8	0.9	1.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	6.9	7.0	7.8	7.3	5.8	31.8	0.0	26.6	30.3	24.7	26.6
LnGrp LOS	B	A	A	A	A	A	C	A	C	C	C	C
Approach Vol, veh/h		646			869			350			298	
Approach Delay, s/veh		7.5			7.1			29.1			26.7	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		22.6		55.0		22.6				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		15.4		16.1		10.0		11.6				
Green Ext Time (p_c), s		4.1		1.4		5.7		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			13.5									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	254	1	9	504	28	3	20	14	4	3	2
Future Vol, veh/h	2	254	1	9	504	28	3	20	14	4	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	10	10	10	3	3	3	5	5	5	0	0	0
Mvmt Flow	2	286	1	10	567	32	3	23	16	5	3	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	599	0	0	287	0	0	897	910	287	913	894	583
Stage 1	-	-	-	-	-	-	291	291	-	603	603	-
Stage 2	-	-	-	-	-	-	606	619	-	310	291	-
Critical Hdwy	4.2	-	-	4.13	-	-	7.15	6.55	6.25	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.227	-	-	3.545	4.045	3.345	3.5	4	3.3
Pot Cap-1 Maneuver	940	-	-	1269	-	-	257	271	745	256	283	516
Stage 1	-	-	-	-	-	-	710	666	-	489	492	-
Stage 2	-	-	-	-	-	-	479	476	-	705	675	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	940	-	-	1269	-	-	251	267	745	231	279	516
Mov Cap-2 Maneuver	-	-	-	-	-	-	251	267	-	231	279	-
Stage 1	-	-	-	-	-	-	708	664	-	488	486	-
Stage 2	-	-	-	-	-	-	468	470	-	664	673	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	16.7	18.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	350	940	-	-	1269	-	-	282
HCM Lane V/C Ratio	0.122	0.002	-	-	0.008	-	-	0.037
HCM Control Delay (s)	16.7	8.8	0	-	7.9	0	-	18.3
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

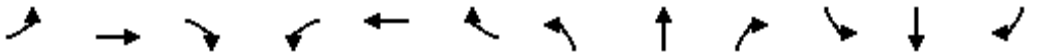
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	410	120	270	620	90	270
Future Volume (veh/h)	410	120	270	620	90	270
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	481	141	317	728	114	343
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1378	401	603	2404	376	514
Arrive On Green	0.51	0.51	0.23	1.00	0.21	0.21
Sat Flow, veh/h	2808	791	1781	3647	1781	1585
Grp Volume(v), veh/h	314	308	317	728	114	343
Grp Sat Flow(s),veh/h/ln	1777	1728	1781	1777	1781	1585
Q Serve(g_s), s	9.5	9.6	7.7	0.0	4.9	16.8
Cycle Q Clear(g_c), s	9.5	9.6	7.7	0.0	4.9	16.8
Prop In Lane		0.46	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	902	877	603	2404	376	514
V/C Ratio(X)	0.35	0.35	0.53	0.30	0.30	0.67
Avail Cap(c_a), veh/h	902	877	698	2404	396	532
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.83	0.83	1.00	1.00
Uniform Delay (d), s/veh	13.2	13.3	7.2	0.0	29.9	26.2
Incr Delay (d2), s/veh	1.1	1.1	0.6	0.3	0.4	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	3.7	2.0	0.1	2.1	14.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.3	14.4	7.8	0.3	30.4	29.2
LnGrp LOS	B	B	A	A	C	C
Approach Vol, veh/h	622			1045	457	
Approach Delay, s/veh	14.3			2.6	29.5	
Approach LOS	B			A	C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.2	50.8		24.0		66.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	15.0	39.9		20.0		59.9
Max Q Clear Time (g_c+I1), s	9.7	11.6		18.8		2.0
Green Ext Time (p_c), s	0.5	1.9		0.2		2.8

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Future Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	258	470	47	47	657	82	132	120	60	80	93	305
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	459	1539	153	549	1342	167	345	338	286	350	314	266
Arrive On Green	0.21	0.94	0.94	0.05	0.42	0.42	0.08	0.18	0.18	0.07	0.17	0.17
Sat Flow, veh/h	1781	3264	325	1781	3180	396	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	258	255	262	47	367	372	132	120	60	80	93	305
Grp Sat Flow(s),veh/h/ln	1781	1777	1812	1781	1777	1799	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	7.6	1.0	1.0	1.3	13.5	13.6	5.4	5.1	2.9	3.2	3.9	15.1
Cycle Q Clear(g_c), s	7.6	1.0	1.0	1.3	13.5	13.6	5.4	5.1	2.9	3.2	3.9	15.1
Prop In Lane	1.00		0.18	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	459	838	854	549	750	759	345	338	286	350	314	266
V/C Ratio(X)	0.56	0.30	0.31	0.09	0.49	0.49	0.38	0.35	0.21	0.23	0.30	1.15
Avail Cap(c_a), veh/h	459	838	854	637	750	759	406	338	286	434	314	266
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	1.4	1.4	12.7	18.9	19.0	27.6	32.3	31.4	27.7	32.8	37.5
Incr Delay (d2), s/veh	1.5	0.9	0.9	0.1	2.3	2.3	0.7	0.6	0.4	0.3	0.5	100.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.5	0.5	0.5	5.7	5.8	2.3	2.3	1.1	1.4	1.8	13.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.1	2.3	2.2	12.8	21.2	21.2	28.3	32.9	31.8	28.0	33.3	138.2
LnGrp LOS	B	A	A	B	C	C	C	C	C	C	C	F
Approach Vol, veh/h		775			786			312			478	
Approach Delay, s/veh		5.9			20.7			30.7			99.4	
Approach LOS		A			C			C			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	47.5	10.8	21.2	15.0	43.1	11.9	20.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 9.3	34.9	* 10	15.1	* 9.3	34.9	* 10	15.1
Max Q Clear Time (g_c+I1), s	3.3	3.0	5.2	7.1	9.6	15.6	7.4	17.1
Green Ext Time (p_c), s	0.0	3.2	0.1	0.4	0.0	4.4	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	33.1
HCM 6th LOS	C

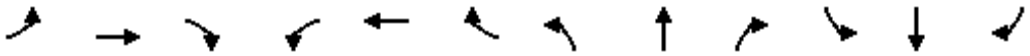
Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Future Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	270	47	70	423	12	48	133	60	24	181	181
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	545	1136	963	655	1099	31	155	329	148	294	231	231
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	954	1870	1585	1063	1810	51	1020	1221	551	1190	858	858
Grp Volume(v), veh/h	35	270	47	70	0	435	48	0	193	24	0	362
Grp Sat Flow(s),veh/h/ln	954	1870	1585	1063	0	1861	1020	0	1771	1190	0	1716
Q Serve(g_s), s	1.8	6.0	1.1	2.9	0.0	10.8	4.1	0.0	8.0	1.5	0.0	17.6
Cycle Q Clear(g_c), s	12.5	6.0	1.1	8.9	0.0	10.8	21.7	0.0	8.0	9.6	0.0	17.6
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	545	1136	963	655	0	1130	155	0	477	294	0	462
V/C Ratio(X)	0.06	0.24	0.05	0.11	0.00	0.38	0.31	0.00	0.40	0.08	0.00	0.78
Avail Cap(c_a), veh/h	545	1136	963	655	0	1130	220	0	588	369	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.3	8.1	7.2	10.1	0.0	9.1	40.5	0.0	27.0	30.9	0.0	30.4
Incr Delay (d2), s/veh	0.2	0.5	0.1	0.3	0.0	1.0	1.1	0.0	0.6	0.1	0.0	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.0	0.3	0.6	0.0	3.6	1.0	0.0	3.2	0.4	0.0	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.5	8.6	7.2	10.5	0.0	10.0	41.6	0.0	27.5	31.0	0.0	36.1
LnGrp LOS	B	A	A	B	A	B	D	A	C	C	A	D
Approach Vol, veh/h		352			505			241			386	
Approach Delay, s/veh		8.8			10.1			30.3			35.8	
Approach LOS		A			B			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.7		29.3		60.7		29.3				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		14.5		23.7		12.8		19.6				
Green Ext Time (p_c), s		1.7		0.5		2.7		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			19.8									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	57	174	350	146	55	23
Future Vol, veh/h	57	174	350	146	55	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	72	221	445	186	69	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	631	0	-	0	903	538
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	365	-
Critical Hdwy	4.12	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.218	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	951	-	-	-	309	545
Stage 1	-	-	-	-	587	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	951	-	-	-	282	545
Mov Cap-2 Maneuver	-	-	-	-	282	-
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	704	-

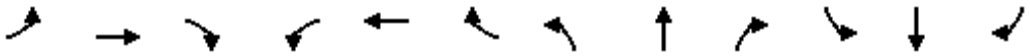
Approach	EB	WB	SB
HCM Control Delay, s	2.2	0	20.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	951	-	-	-	329
HCM Lane V/C Ratio	0.076	-	-	-	0.296
HCM Control Delay (s)	9.1	0	-	-	20.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	140	50	200	410	110
Future Volume (veh/h)	200	140	50	200	410	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	235	164	59	217	472	127
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	541	458	189	419	575	155
Arrive On Green	0.29	0.29	0.29	0.29	0.42	0.42
Sat Flow, veh/h	1870	1585	217	1449	1366	367
Grp Volume(v), veh/h	235	164	276	0	600	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1665	0	1736	0
Q Serve(g_s), s	3.5	2.8	1.0	0.0	10.6	0.0
Cycle Q Clear(g_c), s	3.5	2.8	4.5	0.0	10.6	0.0
Prop In Lane		1.00	0.21		0.79	0.21
Lane Grp Cap(c), veh/h	541	458	608	0	731	0
V/C Ratio(X)	0.43	0.36	0.45	0.00	0.82	0.00
Avail Cap(c_a), veh/h	1706	1446	1586	0	2438	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	10.0	9.7	10.3	0.0	8.8	0.0
Incr Delay (d2), s/veh	0.6	0.5	0.5	0.0	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.6	1.0	0.0	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.5	10.2	10.8	0.0	11.2	0.0
LnGrp LOS	B	B	B	A	B	A
Approach Vol, veh/h	399			276	600	
Approach Delay, s/veh	10.4			10.8	11.2	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		15.5		19.0		15.5
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		31.5		48.5		31.5
Max Q Clear Time (g_c+I1), s		5.5		12.6		6.5
Green Ext Time (p_c), s		1.6		2.0		1.5

Intersection Summary	
HCM 6th Ctrl Delay	10.9
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Future Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	164	82	188	23	340	12	408	54	14	14	97	139
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	259	125	223	89	623	21	588	61	16	86	318	417
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	464	347	619	51	1731	59	1064	141	36	35	728	956
Grp Volume(v), veh/h	434	0	0	375	0	0	476	0	0	250	0	0
Grp Sat Flow(s),veh/h/ln	1429	0	0	1841	0	0	1241	0	0	1719	0	0
Q Serve(g_s), s	6.0	0.0	0.0	0.0	0.0	0.0	13.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	14.7	0.0	0.0	8.7	0.0	0.0	18.8	0.0	0.0	5.3	0.0	0.0
Prop In Lane	0.38		0.43	0.06		0.03	0.86		0.03	0.06		0.56
Lane Grp Cap(c), veh/h	606	0	0	733	0	0	665	0	0	821	0	0
V/C Ratio(X)	0.72	0.00	0.00	0.51	0.00	0.00	0.72	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	1131	0	0	1427	0	0	998	0	0	1279	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.5	0.0	0.0	13.9	0.0	0.0	13.7	0.0	0.0	10.1	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	0.0	0.6	0.0	0.0	1.5	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	0.0	2.7	0.0	0.0	3.6	0.0	0.0	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	0.0	0.0	14.4	0.0	0.0	15.1	0.0	0.0	10.3	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		434			375			476			250	
Approach Delay, s/veh		17.1			14.4			15.1			10.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		25.0		29.1		25.0		29.1				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		40.5		38.5		40.5		38.5				
Max Q Clear Time (g_c+I1), s		16.7		20.8		10.7		7.3				
Green Ext Time (p_c), s		2.8		2.9		2.0		1.3				

Intersection Summary												
HCM 6th Ctrl Delay			14.7									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Future Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	3	3	3
Mvmt Flow	41	0	33	0	0	0	85	463	0	0	213	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	862	862	229	878	877	463	244	0	0	463	0	0
Stage 1	229	229	-	633	633	-	-	-	-	-	-	-
Stage 2	633	633	-	245	244	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.12	6.52	6.22	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.518	4.018	3.318	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	274	292	808	268	287	599	1322	-	-	1093	-	-
Stage 1	772	713	-	468	473	-	-	-	-	-	-	-
Stage 2	466	472	-	759	704	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	256	267	808	240	262	599	1322	-	-	1093	-	-
Mov Cap-2 Maneuver	256	267	-	240	262	-	-	-	-	-	-	-
Stage 1	705	713	-	427	432	-	-	-	-	-	-	-
Stage 2	425	431	-	728	704	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.1	0	1.2	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1322	-	-	370	-	1093	-	-
HCM Lane V/C Ratio	0.064	-	-	0.2	-	-	-	-
HCM Control Delay (s)	7.9	0	-	17.1	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	-	0	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	158	33	80	291	100	116
Future Vol, veh/h	158	33	80	291	100	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	184	38	93	339	116	135

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	222	0	728	203
Stage 1	-	-	-	-	203	-
Stage 2	-	-	-	-	525	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1335	-	390	838
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	593	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1335	-	356	838
Mov Cap-2 Maneuver	-	-	-	-	356	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	542	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	18.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	515	-	-	1335	-
HCM Lane V/C Ratio	0.489	-	-	0.07	-
HCM Control Delay (s)	18.5	-	-	7.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.7	-	-	0.2	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Future Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	2	2	2	1	1	1	1	1	1
Mvmt Flow	11	62	40	13	46	16	27	164	18	20	365	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	672	650	374	692	649	173	382	0	0	182	0	0
Stage 1	414	414	-	227	227	-	-	-	-	-	-	-
Stage 2	258	236	-	465	422	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	372	391	677	358	389	871	1182	-	-	1399	-	-
Stage 1	620	597	-	776	716	-	-	-	-	-	-	-
Stage 2	751	713	-	578	588	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	320	374	677	285	372	871	1182	-	-	1399	-	-
Mov Cap-2 Maneuver	320	374	-	285	372	-	-	-	-	-	-	-
Stage 1	605	586	-	757	698	-	-	-	-	-	-	-
Stage 2	672	695	-	477	577	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	16.1	1	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1182	-	-	436	398	1399	-	-
HCM Lane V/C Ratio	0.023	-	-	0.26	0.189	0.014	-	-
HCM Control Delay (s)	8.1	0	-	16.1	16.1	7.6	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.7	0	-	-

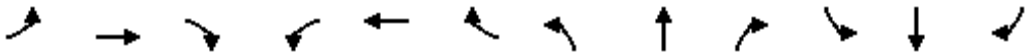
Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Future Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	1	1	1
Mvmt Flow	1	95	7	16	65	40	13	171	48	140	115	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	670	641	116	668	617	195	116	0	0	219	0	0
Stage 1	396	396	-	221	221	-	-	-	-	-	-	-
Stage 2	274	245	-	447	396	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	373	395	942	373	407	849	1473	-	-	1356	-	-
Stage 1	633	607	-	784	722	-	-	-	-	-	-	-
Stage 2	736	707	-	593	606	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	279	348	942	267	359	849	1473	-	-	1356	-	-
Mov Cap-2 Maneuver	279	348	-	267	359	-	-	-	-	-	-	-
Stage 1	627	540	-	776	715	-	-	-	-	-	-	-
Stage 2	631	700	-	431	539	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.9	17	0.4	4.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1473	-	-	362	419	1356	-	-
HCM Lane V/C Ratio	0.009	-	-	0.286	0.289	0.103	-	-
HCM Control Delay (s)	7.5	0	-	18.9	17	8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.2	1.2	0.3	-	-



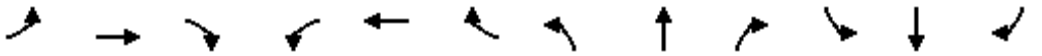
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Future Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	84	111	76	10	50	30	43	528	15	33	436	70
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	185	167	98	102	234	126	122	1009	28	111	897	138
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	399	789	463	81	1105	593	66	1691	46	49	1504	232
Grp Volume(v), veh/h	271	0	0	90	0	0	586	0	0	539	0	0
Grp Sat Flow(s),veh/h/ln	1650	0	0	1778	0	0	1804	0	0	1786	0	0
Q Serve(g_s), s	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	0.0	2.0	0.0	0.0	8.6	0.0	0.0	7.8	0.0	0.0
Prop In Lane	0.31		0.28	0.11		0.33	0.07		0.03	0.06		0.13
Lane Grp Cap(c), veh/h	450	0	0	462	0	0	1158	0	0	1146	0	0
V/C Ratio(X)	0.60	0.00	0.00	0.19	0.00	0.00	0.51	0.00	0.00	0.47	0.00	0.00
Avail Cap(c_a), veh/h	726	0	0	752	0	0	1158	0	0	1146	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	15.3	0.0	0.0	5.6	0.0	0.0	5.4	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.2	0.0	0.0	1.6	0.0	0.0	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	0.6	0.0	0.0	1.6	0.0	0.0	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	0.0	0.0	15.6	0.0	0.0	7.1	0.0	0.0	6.8	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		271			90			586			539	
Approach Delay, s/veh		18.6			15.6			7.1			6.8	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.5		14.5		32.5		14.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		28.0		18.0		28.0		18.0				
Max Q Clear Time (g_c+I1), s		10.6		9.2		9.8		4.0				
Green Ext Time (p_c), s		3.2		0.9		2.9		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			9.6									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Future Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	304	924	511	76	565	120	207	239	109	196	228	152
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	471	1403	626	266	1154	515	325	332	281	307	290	246
Arrive On Green	0.14	0.39	0.39	0.07	0.32	0.32	0.12	0.18	0.18	0.09	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	304	924	511	76	565	120	207	239	109	196	228	152
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.7	19.2	25.9	2.4	11.5	5.0	8.6	10.9	5.5	8.4	10.6	8.1
Cycle Q Clear(g_c), s	9.7	19.2	25.9	2.4	11.5	5.0	8.6	10.9	5.5	8.4	10.6	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	471	1403	626	266	1154	515	325	332	281	307	290	246
V/C Ratio(X)	0.64	0.66	0.82	0.29	0.49	0.23	0.64	0.72	0.39	0.64	0.79	0.62
Avail Cap(c_a), veh/h	627	1846	823	288	1333	595	325	561	475	307	519	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.4	22.3	24.3	18.6	24.4	22.2	27.8	35.0	32.7	29.1	36.6	35.6
Incr Delay (d2), s/veh	1.5	0.5	4.9	0.6	0.3	0.2	4.1	3.0	0.9	4.4	4.7	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	7.2	9.9	1.0	4.5	1.8	3.9	5.1	2.1	3.8	5.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.9	22.8	29.2	19.2	24.7	22.4	31.9	37.9	33.6	33.5	41.3	38.1
LnGrp LOS	B	C	C	B	C	C	C	D	C	C	D	D
Approach Vol, veh/h		1739			761			555			576	
Approach Delay, s/veh		23.9			23.8			34.8			37.8	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	41.8	14.0	21.5	19.2	35.5	16.0	19.5
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	4.4	27.9	10.4	12.9	11.7	13.5	10.6	12.6
Green Ext Time (p_c), s	0.0	7.6	0.0	1.4	0.6	3.6	0.0	1.4

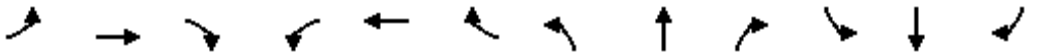
Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Future Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	109	859	141	33	511	65	98	120	22	98	207	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	572	1935	318	369	2251	1004	230	338	62	285	412	349
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	837	3055	502	563	3554	1585	1107	1538	282	1246	1870	1585
Grp Volume(v), veh/h	109	500	500	33	511	65	98	0	142	98	207	65
Grp Sat Flow(s),veh/h/ln	837	1777	1780	563	1777	1585	1107	0	1820	1246	1870	1585
Q Serve(g_s), s	4.9	11.0	11.1	2.4	4.7	1.2	6.6	0.0	5.1	5.6	7.5	2.6
Cycle Q Clear(g_c), s	9.7	11.0	11.1	13.5	4.7	1.2	14.0	0.0	5.1	10.6	7.5	2.6
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	572	1125	1127	369	2251	1004	230	0	400	285	412	349
V/C Ratio(X)	0.19	0.44	0.44	0.09	0.23	0.06	0.43	0.00	0.35	0.34	0.50	0.19
Avail Cap(c_a), veh/h	572	1125	1127	369	2251	1004	416	0	706	495	726	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.1	7.2	7.2	10.6	6.0	5.4	32.5	0.0	25.4	29.9	26.4	24.4
Incr Delay (d2), s/veh	0.7	1.3	1.3	0.5	0.2	0.1	1.3	0.0	0.5	0.7	1.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	3.2	3.2	0.3	1.3	0.3	1.8	0.0	2.2	1.7	3.3	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.9	8.5	8.5	11.1	6.3	5.5	33.8	0.0	26.0	30.6	27.3	24.7
LnGrp LOS	A	A	A	B	A	A	C	A	C	C	C	C
Approach Vol, veh/h		1109			609			240			370	
Approach Delay, s/veh		8.5			6.5			29.1			27.7	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		22.1		55.0		22.1				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		13.1		16.0		15.5		12.6				
Green Ext Time (p_c), s		7.5		0.9		3.8		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			13.2									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	8	682	5	17	345	19	5	4	26	41	17	7
Future Vol, veh/h	8	682	5	17	345	19	5	4	26	41	17	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	3	3	3	6	6	6	2	2	2
Mvmt Flow	8	696	5	17	352	19	5	4	27	42	17	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	371	0	0	701	0	0	1123	1120	699	1126	1113	362
Stage 1	-	-	-	-	-	-	715	715	-	396	396	-
Stage 2	-	-	-	-	-	-	408	405	-	730	717	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.16	6.56	6.26	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.554	4.054	3.354	3.518	4.018	3.318
Pot Cap-1 Maneuver	1188	-	-	891	-	-	180	203	433	182	208	683
Stage 1	-	-	-	-	-	-	415	429	-	629	604	-
Stage 2	-	-	-	-	-	-	612	592	-	414	434	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1188	-	-	891	-	-	162	196	433	164	201	683
Mov Cap-2 Maneuver	-	-	-	-	-	-	162	196	-	164	201	-
Stage 1	-	-	-	-	-	-	410	424	-	622	590	-
Stage 2	-	-	-	-	-	-	574	578	-	381	429	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	17.9	34
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	314	1188	-	-	891	-	-	189
HCM Lane V/C Ratio	0.114	0.007	-	-	0.019	-	-	0.351
HCM Control Delay (s)	17.9	8.1	0	-	9.1	0	-	34
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.4	0	-	-	0.1	-	-	1.5

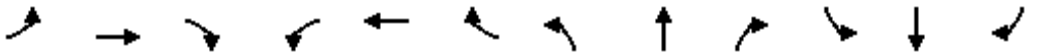
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	150	310	630	110	340
Future Volume (veh/h)	880	150	310	630	110	340
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	957	163	337	685	120	370
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1677	285	456	2563	297	444
Arrive On Green	0.55	0.55	0.23	1.00	0.17	0.17
Sat Flow, veh/h	3131	517	1781	3647	1781	1585
Grp Volume(v), veh/h	560	560	337	685	120	370
Grp Sat Flow(s),veh/h/ln	1777	1777	1781	1777	1781	1585
Q Serve(g_s), s	18.5	18.6	7.5	0.0	5.4	15.0
Cycle Q Clear(g_c), s	18.5	18.6	7.5	0.0	5.4	15.0
Prop In Lane		0.29	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	981	981	456	2563	297	444
V/C Ratio(X)	0.57	0.57	0.74	0.27	0.40	0.83
Avail Cap(c_a), veh/h	981	981	650	2563	297	444
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh	13.2	13.2	9.8	0.0	33.5	30.4
Incr Delay (d2), s/veh	2.4	2.4	2.3	0.2	0.9	12.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	7.3	2.1	0.1	2.4	17.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.6	15.6	12.1	0.2	34.4	43.2
LnGrp LOS	B	B	B	A	C	D
Approach Vol, veh/h	1120			1022	490	
Approach Delay, s/veh	15.6			4.1	41.0	
Approach LOS	B			A	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.2	54.8		20.0		70.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	20.0	39.9		15.0		64.9
Max Q Clear Time (g_c+I1), s	9.5	20.6		17.0		2.0
Green Ext Time (p_c), s	0.8	3.8		0.0		2.6

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Future Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	261	891	120	87	587	65	109	98	109	130	141	337
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	447	1285	173	364	1207	133	356	414	351	423	418	354
Arrive On Green	0.21	0.82	0.82	0.07	0.37	0.37	0.07	0.22	0.22	0.07	0.22	0.22
Sat Flow, veh/h	1781	3147	424	1781	3226	357	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	261	503	508	87	323	329	109	98	109	130	141	337
Grp Sat Flow(s),veh/h/ln	1781	1777	1794	1781	1777	1806	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	8.6	10.8	10.8	2.6	12.5	12.6	4.1	3.9	5.2	5.0	5.7	18.9
Cycle Q Clear(g_c), s	8.6	10.8	10.8	2.6	12.5	12.6	4.1	3.9	5.2	5.0	5.7	18.9
Prop In Lane	1.00		0.24	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	726	733	364	665	675	356	414	351	423	418	354
V/C Ratio(X)	0.58	0.69	0.69	0.24	0.49	0.49	0.31	0.24	0.31	0.31	0.34	0.95
Avail Cap(c_a), veh/h	447	726	733	385	665	675	371	418	354	434	418	354
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	5.9	5.9	15.1	21.5	21.6	24.1	28.8	29.3	24.2	29.4	34.5
Incr Delay (d2), s/veh	1.5	4.1	4.1	0.3	2.5	2.5	0.5	0.3	0.5	0.4	0.5	35.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.8	2.8	1.0	5.4	5.5	1.7	1.7	2.0	2.1	2.5	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.5	10.0	10.0	15.4	24.1	24.1	24.6	29.1	29.8	24.6	29.8	69.8
LnGrp LOS	B	B	A	B	C	C	C	C	C	C	C	E
Approach Vol, veh/h		1272			739			316			608	
Approach Delay, s/veh		11.1			23.1			27.8			50.9	
Approach LOS		B			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	41.9	11.4	24.8	15.0	38.8	11.2	25.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 7.3	34.9	* 7.3	20.1	* 9.3	32.9	* 7.3	20.1
Max Q Clear Time (g_c+I1), s	4.6	12.8	7.0	7.2	10.6	14.6	6.1	20.9
Green Ext Time (p_c), s	0.0	6.8	0.0	0.6	0.0	3.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

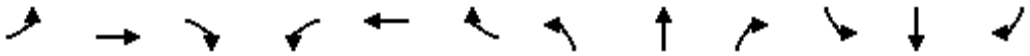
Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Future Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	630	65	98	348	11	43	174	109	33	130	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	675	1240	1051	448	1195	38	180	230	144	148	201	169
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1022	1870	1585	750	1803	57	1141	1075	674	1096	940	788
Grp Volume(v), veh/h	152	630	65	98	0	359	43	0	283	33	0	239
Grp Sat Flow(s),veh/h/ln	1022	1870	1585	750	0	1860	1141	0	1749	1096	0	1728
Q Serve(g_s), s	6.6	15.4	1.3	6.9	0.0	7.3	3.2	0.0	13.7	2.6	0.0	11.4
Cycle Q Clear(g_c), s	13.8	15.4	1.3	22.3	0.0	7.3	14.6	0.0	13.7	16.3	0.0	11.4
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.39	1.00		0.46
Lane Grp Cap(c), veh/h	675	1240	1051	448	0	1233	180	0	374	148	0	370
V/C Ratio(X)	0.23	0.51	0.06	0.22	0.00	0.29	0.24	0.00	0.76	0.22	0.00	0.65
Avail Cap(c_a), veh/h	675	1240	1051	448	0	1233	315	0	581	278	0	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.2	7.7	5.3	13.4	0.0	6.3	38.9	0.0	33.2	40.8	0.0	32.3
Incr Delay (d2), s/veh	0.8	1.5	0.1	1.1	0.0	0.6	0.7	0.0	3.1	0.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.7	0.3	1.1	0.0	2.2	0.9	0.0	5.6	0.7	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.0	9.2	5.4	14.5	0.0	6.9	39.6	0.0	36.3	41.6	0.0	34.2
LnGrp LOS	B	A	A	B	A	A	D	A	D	D	A	C
Approach Vol, veh/h		847			457			326			272	
Approach Delay, s/veh		9.1			8.6			36.7			35.1	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		65.6		24.4		65.6		24.4				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		17.4		16.6		24.3		18.3				
Green Ext Time (p_c), s		4.9		1.3		2.5		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			17.4									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	432	215	159	181	44
Future Vol, veh/h	32	432	215	159	181	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	0	0	1	1
Mvmt Flow	36	480	239	177	201	49

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	416	0	-	0	880	328
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	552	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1148	-	-	-	319	716
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	579	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1148	-	-	-	305	716
Mov Cap-2 Maneuver	-	-	-	-	305	-
Stage 1	-	-	-	-	701	-
Stage 2	-	-	-	-	579	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	38.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1148	-	-	-	344
HCM Lane V/C Ratio	0.031	-	-	-	0.727
HCM Control Delay (s)	8.2	0	-	-	38.9
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	5.5

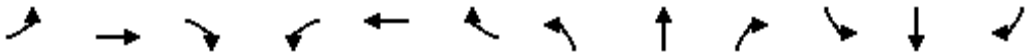
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	410	70	120	360	80
Future Volume (veh/h)	240	410	70	120	360	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	261	446	76	130	391	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	685	580	261	376	485	108
Arrive On Green	0.37	0.37	0.37	0.37	0.34	0.34
Sat Flow, veh/h	1870	1585	318	1027	1422	316
Grp Volume(v), veh/h	261	446	206	0	479	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1344	0	1742	0
Q Serve(g_s), s	3.5	8.5	0.1	0.0	8.5	0.0
Cycle Q Clear(g_c), s	3.5	8.5	3.6	0.0	8.5	0.0
Prop In Lane		1.00	0.37		0.82	0.18
Lane Grp Cap(c), veh/h	685	580	636	0	594	0
V/C Ratio(X)	0.38	0.77	0.32	0.00	0.81	0.00
Avail Cap(c_a), veh/h	1068	905	882	0	1046	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	8.0	9.5	7.7	0.0	10.2	0.0
Incr Delay (d2), s/veh	0.3	2.2	0.3	0.0	2.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.6	0.5	0.0	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.3	11.7	8.0	0.0	12.9	0.0
LnGrp LOS	A	B	A	A	B	A
Approach Vol, veh/h	707			206	479	
Approach Delay, s/veh	10.5			8.0	12.9	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		18.0		16.1		18.0
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		19.5		20.5		19.5
Max Q Clear Time (g_c+I1), s		10.5		10.5		5.6
Green Ext Time (p_c), s		2.0		1.1		1.0

Intersection Summary	
HCM 6th Ctrl Delay	10.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Future Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	109	261	130	33	239	22	228	174	54	22	54	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	355	159	135	584	50	384	235	65	130	218	358
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	264	952	427	99	1568	135	701	653	182	88	607	996
Grp Volume(v), veh/h	500	0	0	294	0	0	456	0	0	185	0	0
Grp Sat Flow(s),veh/h/ln	1642	0	0	1802	0	0	1536	0	0	1691	0	0
Q Serve(g_s), s	6.1	0.0	0.0	0.0	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.0	0.0	0.0	4.9	0.0	0.0	10.8	0.0	0.0	3.2	0.0	0.0
Prop In Lane	0.22		0.26	0.11		0.07	0.50		0.12	0.12		0.59
Lane Grp Cap(c), veh/h	719	0	0	769	0	0	684	0	0	706	0	0
V/C Ratio(X)	0.70	0.00	0.00	0.38	0.00	0.00	0.67	0.00	0.00	0.26	0.00	0.00
Avail Cap(c_a), veh/h	1093	0	0	1171	0	0	1008	0	0	1059	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.4	0.0	0.0	9.6	0.0	0.0	11.6	0.0	0.0	9.5	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.3	0.0	0.0	1.1	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	1.2	0.0	0.0	2.2	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	0.0	0.0	9.9	0.0	0.0	12.8	0.0	0.0	9.7	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	B	A	A	A	A	A
Approach Vol, veh/h		500			294			456			185	
Approach Delay, s/veh		12.6			9.9			12.8			9.7	
Approach LOS		B			A			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		20.8		20.3		20.8		20.3				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		25.1		23.9		25.1		23.9				
Max Q Clear Time (g_c+I1), s		13.0		12.8		6.9		5.2				
Green Ext Time (p_c), s		2.3		2.0		1.4		0.8				

Intersection Summary												
HCM 6th Ctrl Delay			11.7									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Future Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	142	0	0	0	0	23	166	0	0	379	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	601	601	389	672	611	166	399	0	0	166	0	0
Stage 1	389	389	-	212	212	-	-	-	-	-	-	-
Stage 2	212	212	-	460	399	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	414	415	661	370	409	878	1160	-	-	1412	-	-
Stage 1	637	610	-	790	727	-	-	-	-	-	-	-
Stage 2	792	729	-	581	602	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	407	406	661	265	400	878	1160	-	-	1412	-	-
Mov Cap-2 Maneuver	407	406	-	265	400	-	-	-	-	-	-	-
Stage 1	623	610	-	773	711	-	-	-	-	-	-	-
Stage 2	775	713	-	445	602	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.3	0	1	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1160	-	-	406	-	1412	-	-
HCM Lane V/C Ratio	0.02	-	-	0.428	-	-	-	-
HCM Control Delay (s)	8.2	0	-	20.3	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.1	-	0	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	79	152	253	77	94
Future Vol, veh/h	232	79	152	253	77	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	252	86	165	275	84	102

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	338	0	900	295
Stage 1	-	-	-	-	295	-
Stage 2	-	-	-	-	605	-
Critical Hdwy	-	-	4.12	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.218	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1221	-	310	747
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	547	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1221	-	260	747
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	459	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	21.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	405	-	-	1221	-
HCM Lane V/C Ratio	0.459	-	-	0.135	-
HCM Control Delay (s)	21.2	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.3	-	-	0.5	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Future Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	2	2	2	1	1	1	1	1	1
Mvmt Flow	12	66	43	14	49	17	35	210	23	26	467	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	855	833	478	877	833	222	489	0	0	233	0	0
Stage 1	530	530	-	292	292	-	-	-	-	-	-	-
Stage 2	325	303	-	585	541	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	281	307	591	269	304	818	1079	-	-	1340	-	-
Stage 1	536	530	-	716	671	-	-	-	-	-	-	-
Stage 2	692	667	-	497	521	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	228	288	591	196	285	818	1079	-	-	1340	-	-
Mov Cap-2 Maneuver	228	288	-	196	285	-	-	-	-	-	-	-
Stage 1	516	516	-	690	646	-	-	-	-	-	-	-
Stage 2	603	642	-	392	507	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.1	21.1	1.1	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1079	-	-	342	302	1340	-	-
HCM Lane V/C Ratio	0.032	-	-	0.352	0.264	0.019	-	-
HCM Control Delay (s)	8.4	0	-	21.1	21.1	7.7	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	1	0.1	-	-

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Future Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	1	1	1
Mvmt Flow	1	101	7	17	69	42	14	190	53	155	128	1

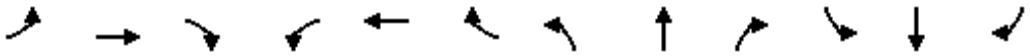
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	739	710	129	738	684	217	129	0	0	243	0	0
Stage 1	439	439	-	245	245	-	-	-	-	-	-	-
Stage 2	300	271	-	493	439	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	336	361	926	335	372	825	1457	-	-	1329	-	-
Stage 1	601	582	-	761	705	-	-	-	-	-	-	-
Stage 2	713	689	-	560	580	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	240	312	926	224	321	825	1457	-	-	1329	-	-
Mov Cap-2 Maneuver	240	312	-	224	321	-	-	-	-	-	-	-
Stage 1	594	509	-	753	697	-	-	-	-	-	-	-
Stage 2	603	681	-	389	507	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.6	19.6	0.4	4.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1457	-	-	325	374	1329	-	-
HCM Lane V/C Ratio	0.01	-	-	0.338	0.343	0.117	-	-
HCM Control Delay (s)	7.5	0	-	21.6	19.6	8.1	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.4	1.5	0.4	-	-

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

04/20/2020



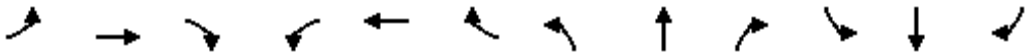
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Future Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	89	117	80	10	53	32	50	617	17	39	510	82
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	176	167	99	91	238	129	116	1030	27	105	916	142
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	409	779	461	75	1108	601	72	1670	44	54	1485	230
Grp Volume(v), veh/h	286	0	0	95	0	0	684	0	0	631	0	0
Grp Sat Flow(s),veh/h/ln	1649	0	0	1784	0	0	1786	0	0	1770	0	0
Q Serve(g_s), s	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.7	0.0	0.0	2.4	0.0	0.0	11.8	0.0	0.0	10.7	0.0	0.0
Prop In Lane	0.31		0.28	0.11		0.34	0.07		0.02	0.06		0.13
Lane Grp Cap(c), veh/h	443	0	0	458	0	0	1174	0	0	1163	0	0
V/C Ratio(X)	0.65	0.00	0.00	0.21	0.00	0.00	0.58	0.00	0.00	0.54	0.00	0.00
Avail Cap(c_a), veh/h	638	0	0	664	0	0	1174	0	0	1163	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.8	0.0	0.0	17.4	0.0	0.0	6.2	0.0	0.0	6.0	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	0.0	0.2	0.0	0.0	2.1	0.0	0.0	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.0	0.8	0.0	0.0	2.5	0.0	0.0	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.4	0.0	0.0	17.6	0.0	0.0	8.3	0.0	0.0	7.8	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		286			95			684			631	
Approach Delay, s/veh		21.4			17.6			8.3			7.8	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.5		16.0		37.5		16.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+I1), s		13.8		10.7		12.7		4.4				
Green Ext Time (p_c), s		4.1		0.8		3.7		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			10.8									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

04/20/2020



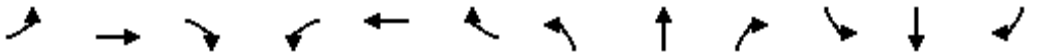
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Future Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	323	979	542	81	599	127	238	275	125	207	242	161
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	469	1449	646	255	1186	529	310	341	289	277	301	255
Arrive On Green	0.14	0.41	0.41	0.07	0.33	0.33	0.11	0.18	0.18	0.09	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	323	979	542	81	599	127	238	275	125	207	242	161
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	10.6	21.3	29.1	2.7	12.8	5.5	10.5	13.3	6.6	8.5	11.8	9.0
Cycle Q Clear(g_c), s	10.6	21.3	29.1	2.7	12.8	5.5	10.5	13.3	6.6	8.5	11.8	9.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	469	1449	646	255	1186	529	310	341	289	277	301	255
V/C Ratio(X)	0.69	0.68	0.84	0.32	0.51	0.24	0.77	0.81	0.43	0.75	0.80	0.63
Avail Cap(c_a), veh/h	600	1760	785	273	1271	567	310	534	453	277	495	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	22.9	25.2	19.3	25.2	22.8	30.0	37.1	34.3	31.8	38.2	37.0
Incr Delay (d2), s/veh	2.3	0.8	6.8	0.7	0.3	0.2	11.1	5.0	1.0	10.6	5.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	8.1	11.5	1.1	5.0	2.0	5.3	6.4	0.1	4.7	5.7	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.2	23.7	32.0	20.0	25.6	23.0	41.1	42.1	35.3	42.4	43.2	39.6
LnGrp LOS	B	C	C	C	C	C	D	D	D	D	D	D
Approach Vol, veh/h		1844			807			638			610	
Approach Delay, s/veh		25.3			24.6			40.4			42.0	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	44.7	14.0	22.7	20.1	37.7	16.0	20.7
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	4.7	31.1	10.5	15.3	12.6	14.8	12.5	13.8
Green Ext Time (p_c), s	0.0	7.4	0.0	1.5	0.6	3.8	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Future Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	117	927	153	35	552	70	109	133	24	116	246	78
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	521	1860	307	319	2165	966	234	385	69	310	467	396
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	802	3053	504	522	3554	1585	1056	1542	278	1230	1870	1585
Grp Volume(v), veh/h	117	539	541	35	552	70	109	0	157	116	246	78
Grp Sat Flow(s),veh/h/ln	802	1777	1780	522	1777	1585	1056	0	1820	1230	1870	1585
Q Serve(g_s), s	6.3	13.6	13.7	3.2	5.8	1.4	8.0	0.0	5.7	6.9	9.1	3.1
Cycle Q Clear(g_c), s	12.1	13.6	13.7	16.9	5.8	1.4	17.1	0.0	5.7	12.5	9.1	3.1
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	521	1083	1084	319	2165	966	234	0	454	310	467	396
V/C Ratio(X)	0.22	0.50	0.50	0.11	0.25	0.07	0.47	0.00	0.35	0.37	0.53	0.20
Avail Cap(c_a), veh/h	521	1083	1084	319	2165	966	364	0	679	462	698	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.0	8.8	8.8	13.5	7.2	6.4	33.3	0.0	24.7	29.8	26.0	23.7
Incr Delay (d2), s/veh	1.0	1.6	1.6	0.7	0.3	0.1	1.4	0.0	0.5	0.7	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	4.3	4.3	0.4	1.7	0.4	2.1	0.0	2.4	2.0	4.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	10.4	10.4	14.2	7.5	6.5	34.8	0.0	25.1	30.6	26.9	24.0
LnGrp LOS	B	B	B	B	A	A	C	A	C	C	C	C
Approach Vol, veh/h		1197			657			266			440	
Approach Delay, s/veh		10.5			7.8			29.1			27.3	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		25.1		55.0		25.1				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		15.7		19.1		18.9		14.5				
Green Ext Time (p_c), s		8.4		0.9		4.1		1.8				

Intersection Summary												
HCM 6th Ctrl Delay			14.6									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	8	682	5	17	345	19	5	4	26	41	17	7
Future Vol, veh/h	8	682	5	17	345	19	5	4	26	41	17	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	3	3	3	6	6	6	2	2	2
Mvmt Flow	9	752	6	19	380	21	6	5	29	46	19	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	401	0	0	758	0	0	1215	1212	755	1219	1205	391
Stage 1	-	-	-	-	-	-	773	773	-	429	429	-
Stage 2	-	-	-	-	-	-	442	439	-	790	776	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.16	6.56	6.26	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.554	4.054	3.354	3.518	4.018	3.318
Pot Cap-1 Maneuver	1158	-	-	849	-	-	155	179	402	157	184	658
Stage 1	-	-	-	-	-	-	386	403	-	604	584	-
Stage 2	-	-	-	-	-	-	587	571	-	383	407	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1158	-	-	849	-	-	136	171	402	138	176	658
Mov Cap-2 Maneuver	-	-	-	-	-	-	136	171	-	138	176	-
Stage 1	-	-	-	-	-	-	381	398	-	596	567	-
Stage 2	-	-	-	-	-	-	544	554	-	346	402	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	20	44.9
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	280	1158	-	-	849	-	-	161
HCM Lane V/C Ratio	0.142	0.008	-	-	0.022	-	-	0.457
HCM Control Delay (s)	20	8.1	0	-	9.3	0	-	44.9
HCM Lane LOS	C	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	150	310	630	110	340
Future Volume (veh/h)	880	150	310	630	110	340
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1033	176	364	740	140	432
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1646	280	441	2563	297	460
Arrive On Green	0.54	0.54	0.25	1.00	0.17	0.17
Sat Flow, veh/h	3131	517	1781	3647	1781	1585
Grp Volume(v), veh/h	604	605	364	740	140	432
Grp Sat Flow(s),veh/h/ln	1777	1777	1781	1777	1781	1585
Q Serve(g_s), s	21.2	21.3	8.3	0.0	6.4	15.0
Cycle Q Clear(g_c), s	21.2	21.3	8.3	0.0	6.4	15.0
Prop In Lane		0.29	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	963	963	441	2563	297	460
V/C Ratio(X)	0.63	0.63	0.82	0.29	0.47	0.94
Avail Cap(c_a), veh/h	963	963	617	2563	297	460
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	14.3	14.3	11.9	0.0	33.9	31.1
Incr Delay (d2), s/veh	3.1	3.1	5.1	0.2	1.2	27.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	8.5	3.9	0.1	2.8	21.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.4	17.4	16.9	0.2	35.1	58.3
LnGrp LOS	B	B	B	A	D	E
Approach Vol, veh/h	1209			1104	572	
Approach Delay, s/veh	17.4			5.7	52.6	
Approach LOS	B			A	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	16.1	53.9		20.0		70.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	20.0	39.9		15.0		64.9
Max Q Clear Time (g_c+I1), s	10.3	23.3		17.0		2.0
Green Ext Time (p_c), s	0.8	4.0		0.0		2.9

Intersection Summary	
HCM 6th Ctrl Delay	19.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

04/20/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Future Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	282	963	129	94	634	70	120	108	120	159	172	411
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	427	1278	171	338	1203	133	332	404	343	418	418	354
Arrive On Green	0.21	0.81	0.81	0.07	0.37	0.37	0.07	0.22	0.22	0.08	0.22	0.22
Sat Flow, veh/h	1781	3150	422	1781	3227	356	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	282	543	549	94	349	355	120	108	120	159	172	411
Grp Sat Flow(s),veh/h/ln	1781	1777	1794	1781	1777	1806	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.3	13.3	13.4	2.8	13.8	13.8	4.6	4.3	5.8	6.2	7.1	20.1
Cycle Q Clear(g_c), s	9.3	13.3	13.4	2.8	13.8	13.8	4.6	4.3	5.8	6.2	7.1	20.1
Prop In Lane	1.00		0.24	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	427	721	728	338	662	673	332	404	343	418	418	354
V/C Ratio(X)	0.66	0.75	0.75	0.28	0.53	0.53	0.36	0.27	0.35	0.38	0.41	1.16
Avail Cap(c_a), veh/h	427	721	728	357	662	673	345	418	354	418	418	354
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.0	6.3	6.3	15.5	22.0	22.0	24.6	29.3	29.9	24.5	29.9	35.0
Incr Delay (d2), s/veh	2.5	4.9	4.9	0.4	3.0	2.9	0.7	0.4	0.6	0.6	0.7	99.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.2	3.2	1.1	6.0	6.1	1.9	1.9	2.2	2.6	3.2	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	11.2	11.2	15.9	25.0	25.0	25.3	29.7	30.5	25.1	30.5	134.2
LnGrp LOS	B	B	B	B	C	C	C	C	C	C	C	F
Approach Vol, veh/h		1374			798			348			742	
Approach Delay, s/veh		12.5			23.9			28.4			86.8	
Approach LOS		B			C			C			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	41.6	12.0	24.4	15.0	38.6	11.4	25.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 7.3	34.9	* 7.3	20.1	* 9.3	32.9	* 7.3	20.1
Max Q Clear Time (g_c+I1), s	4.8	15.4	8.2	7.8	11.3	15.8	6.6	22.1
Green Ext Time (p_c), s	0.0	7.1	0.0	0.7	0.0	3.9	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

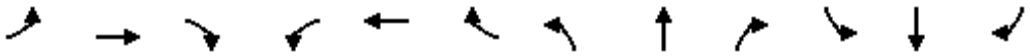
Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Future Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	164	681	70	106	376	12	48	193	121	36	145	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	626	1202	1019	392	1159	37	185	251	158	151	220	184
Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	996	1870	1585	712	1802	58	1113	1075	674	1066	942	786
Grp Volume(v), veh/h	164	681	70	106	0	388	48	0	314	36	0	266
Grp Sat Flow(s),veh/h/ln	996	1870	1585	712	0	1860	1113	0	1749	1066	0	1729
Q Serve(g_s), s	8.0	18.4	1.5	8.8	0.0	8.5	3.7	0.0	15.1	2.9	0.0	12.5
Cycle Q Clear(g_c), s	16.5	18.4	1.5	27.3	0.0	8.5	16.2	0.0	15.1	18.0	0.0	12.5
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.39	1.00		0.45
Lane Grp Cap(c), veh/h	626	1202	1019	392	0	1196	185	0	409	151	0	404
V/C Ratio(X)	0.26	0.57	0.07	0.27	0.00	0.32	0.26	0.00	0.77	0.24	0.00	0.66
Avail Cap(c_a), veh/h	626	1202	1019	392	0	1196	295	0	581	255	0	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.0	9.0	6.0	16.7	0.0	7.3	38.6	0.0	32.2	40.6	0.0	31.2
Incr Delay (d2), s/veh	1.0	1.9	0.1	1.7	0.0	0.7	0.7	0.0	3.9	0.8	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.9	0.4	1.4	0.0	2.7	1.0	0.0	6.2	0.8	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	11.0	6.1	18.4	0.0	8.0	39.3	0.0	36.1	41.4	0.0	33.0
LnGrp LOS	B	B	A	B	A	A	D	A	D	D	A	C
Approach Vol, veh/h		915			494			362			302	
Approach Delay, s/veh		10.8			10.2			36.5			34.0	
Approach LOS		B			B			D			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		63.9		26.1		63.9		26.1				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		20.4		18.2		29.3		20.0				
Green Ext Time (p_c), s		5.4		1.4		2.7		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			18.5									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	12

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	432	215	159	181	44
Future Vol, veh/h	32	432	215	159	181	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	0	0	1	1
Mvmt Flow	38	518	258	191	213	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	449	0	-	0	948	354
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	594	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1117	-	-	-	291	692
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	554	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1117	-	-	-	277	692
Mov Cap-2 Maneuver	-	-	-	-	277	-
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	554	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	56.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1117	-	-	-	314
HCM Lane V/C Ratio	0.034	-	-	-	0.844
HCM Control Delay (s)	8.3	0	-	-	56.1
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	7.4

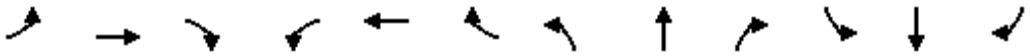
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	410	70	120	360	80
Future Volume (veh/h)	240	410	70	120	360	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	282	481	82	141	415	92
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	708	600	248	364	500	111
Arrive On Green	0.38	0.38	0.38	0.38	0.35	0.35
Sat Flow, veh/h	1870	1585	303	961	1423	316
Grp Volume(v), veh/h	282	481	223	0	508	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1264	0	1742	0
Q Serve(g_s), s	4.1	10.0	0.2	0.0	9.9	0.0
Cycle Q Clear(g_c), s	4.1	10.0	4.3	0.0	9.9	0.0
Prop In Lane		1.00	0.37		0.82	0.18
Lane Grp Cap(c), veh/h	708	600	611	0	612	0
V/C Ratio(X)	0.40	0.80	0.36	0.00	0.83	0.00
Avail Cap(c_a), veh/h	985	835	784	0	965	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	8.4	10.3	8.1	0.0	11.0	0.0
Incr Delay (d2), s/veh	0.4	3.9	0.4	0.0	3.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.3	0.7	0.0	2.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.8	14.2	8.5	0.0	14.5	0.0
LnGrp LOS	A	B	A	A	B	A
Approach Vol, veh/h	763			223	508	
Approach Delay, s/veh	12.2			8.5	14.5	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		19.5		17.5		19.5
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		19.5		20.5		19.5
Max Q Clear Time (g_c+I1), s		12.0		11.9		6.3
Green Ext Time (p_c), s		2.0		1.1		1.1

Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Future Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	117	282	141	35	253	23	285	217	68	28	70	139
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	188	350	161	115	577	49	401	247	74	118	251	415
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	280	937	430	103	1542	131	717	594	178	99	604	996
Grp Volume(v), veh/h	540	0	0	311	0	0	570	0	0	237	0	0
Grp Sat Flow(s),veh/h/ln	1647	0	0	1777	0	0	1489	0	0	1698	0	0
Q Serve(g_s), s	9.1	0.0	0.0	0.0	0.0	0.0	13.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	15.7	0.0	0.0	6.6	0.0	0.0	18.8	0.0	0.0	5.0	0.0	0.0
Prop In Lane	0.22		0.26	0.11		0.07	0.50		0.12	0.12		0.59
Lane Grp Cap(c), veh/h	699	0	0	741	0	0	723	0	0	784	0	0
V/C Ratio(X)	0.77	0.00	0.00	0.42	0.00	0.00	0.79	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	863	0	0	916	0	0	779	0	0	846	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.9	0.0	0.0	12.4	0.0	0.0	14.0	0.0	0.0	10.4	0.0	0.0
Incr Delay (d2), s/veh	3.5	0.0	0.0	0.4	0.0	0.0	5.1	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	0.0	2.0	0.0	0.0	5.0	0.0	0.0	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.4	0.0	0.0	12.7	0.0	0.0	19.2	0.0	0.0	10.6	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		540			311			570			237	
Approach Delay, s/veh		18.4			12.7			19.2			10.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		25.1		27.3		25.1		27.3				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		25.1		23.9		25.1		23.9				
Max Q Clear Time (g_c+I1), s		17.7		20.8		8.6		7.0				
Green Ext Time (p_c), s		1.9		1.1		1.4		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			16.5									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Future Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	151	0	0	0	0	29	213	0	0	486	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	770	770	499	845	782	213	511	0	0	213	0	0
Stage 1	499	499	-	271	271	-	-	-	-	-	-	-
Stage 2	271	271	-	574	511	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	319	332	574	283	326	827	1054	-	-	1357	-	-
Stage 1	555	545	-	735	685	-	-	-	-	-	-	-
Stage 2	737	687	-	504	537	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	311	322	574	175	316	827	1054	-	-	1357	-	-
Mov Cap-2 Maneuver	311	322	-	175	316	-	-	-	-	-	-	-
Stage 1	538	545	-	712	664	-	-	-	-	-	-	-
Stage 2	714	666	-	364	537	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.5	0	1	0
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1054	-	-	320	-	1357	-	-
HCM Lane V/C Ratio	0.028	-	-	0.576	-	-	-	-
HCM Control Delay (s)	8.5	0	-	30.5	0	0	-	-
HCM Lane LOS	A	A	-	D	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.4	-	0	-	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	79	152	253	77	94
Future Vol, veh/h	232	79	152	253	77	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	267	91	175	292	89	108

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	358	0	955	313
Stage 1	-	-	-	-	313	-
Stage 2	-	-	-	-	642	-
Critical Hdwy	-	-	4.12	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.218	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1201	-	288	730
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	526	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1201	-	238	730
Mov Cap-2 Maneuver	-	-	-	-	238	-
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	434	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	24.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	378	-	-	1201	-
HCM Lane V/C Ratio	0.521	-	-	0.146	-
HCM Control Delay (s)	24.4	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.9	-	-	0.5	-

APPENDIX C
AM AND PM SYNCHRO OUTPUTS (BASELINE IMPROVEMENTS)

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Future Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	4	4	4	2	2	2	1	1	1	4	4	4
Mvmt Flow	10	37	30	11	41	14	17	264	5	6	156	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	500	475	160	506	476	267	163	0	0	269	0	0
Stage 1	172	172	-	301	301	-	-	-	-	-	-	-
Stage 2	328	303	-	205	175	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.12	6.52	6.22	4.11	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.518	4.018	3.318	2.209	-	-	2.236	-	-
Pot Cap-1 Maneuver	478	485	880	477	488	772	1422	-	-	1283	-	-
Stage 1	825	753	-	708	665	-	-	-	-	-	-	-
Stage 2	681	660	-	797	754	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	432	476	880	427	479	772	1422	-	-	1283	-	-
Mov Cap-2 Maneuver	432	476	-	427	479	-	-	-	-	-	-	-
Stage 1	813	749	-	698	656	-	-	-	-	-	-	-
Stage 2	618	651	-	729	750	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	13.1	0.5	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1422	-	-	569	510	1283	-	-
HCM Lane V/C Ratio	0.012	-	-	0.135	0.13	0.005	-	-
HCM Control Delay (s)	7.6	0	-	12.3	13.1	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.4	0	-	-

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Future Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	6	6	6	2	2	2	15	15	15	7	7	7
Mvmt Flow	4	50	13	28	91	85	3	49	8	34	153	1

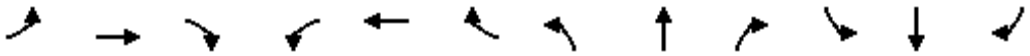
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	369	285	154	312	281	53	154	0	0	57	0	0
Stage 1	222	222	-	59	59	-	-	-	-	-	-	-
Stage 2	147	63	-	253	222	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.25	-	-	4.17	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.335	-	-	2.263	-	-
Pot Cap-1 Maneuver	580	618	882	641	627	1014	1351	-	-	1516	-	-
Stage 1	771	712	-	953	846	-	-	-	-	-	-	-
Stage 2	846	835	-	751	720	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	461	601	882	579	610	1014	1351	-	-	1516	-	-
Mov Cap-2 Maneuver	461	601	-	579	610	-	-	-	-	-	-	-
Stage 1	769	694	-	951	844	-	-	-	-	-	-	-
Stage 2	690	833	-	670	702	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	11.9	0.3	1.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1351	-	-	628	725	1516	-	-
HCM Lane V/C Ratio	0.002	-	-	0.105	0.281	0.022	-	-
HCM Control Delay (s)	7.7	0	-	11.4	11.9	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1.2	0.1	-	-

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

04/20/2020



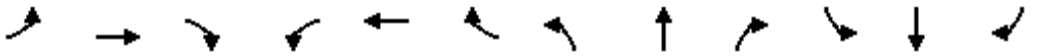
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Future Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1885	1885	1885	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	121	47	99	16	109	44	98	356	7	15	458	117
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	5	5	5	1	1	1	8	8	8	8	8	8
Cap, veh/h	229	76	122	92	266	99	231	779	14	79	835	209
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	611	359	572	80	1250	468	240	1263	23	15	1355	339
Grp Volume(v), veh/h	267	0	0	169	0	0	461	0	0	590	0	0
Grp Sat Flow(s),veh/h/ln	1542	0	0	1797	0	0	1527	0	0	1708	0	0
Q Serve(g_s), s	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.4	0.0	0.0	4.3	0.0	0.0	7.1	0.0	0.0	10.5	0.0	0.0
Prop In Lane	0.45		0.37	0.09		0.26	0.21		0.02	0.03		0.20
Lane Grp Cap(c), veh/h	427	0	0	457	0	0	1024	0	0	1123	0	0
V/C Ratio(X)	0.63	0.00	0.00	0.37	0.00	0.00	0.45	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	621	0	0	695	0	0	1024	0	0	1123	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	18.0	0.0	0.0	5.2	0.0	0.0	5.9	0.0	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.5	0.0	0.0	1.4	0.0	0.0	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	1.5	0.0	0.0	1.4	0.0	0.0	2.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	0.0	0.0	18.5	0.0	0.0	6.7	0.0	0.0	7.7	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		267			169			461			590	
Approach Delay, s/veh		20.9			18.5			6.7			7.7	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		15.7		37.0		15.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5				
Max Q Clear Time (g_c+I1), s		9.1		10.4		12.5		6.3				
Green Ext Time (p_c), s		2.8		0.8		3.3		0.6				

Intersection Summary		
HCM 6th Ctrl Delay		11.0
HCM 6th LOS		B

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Future Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	478	141	54	891	109	315	163	54	98	130	196
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	1192	532	389	1131	504	433	401	340	395	297	251
Arrive On Green	0.08	0.34	0.34	0.06	0.32	0.32	0.13	0.21	0.21	0.08	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	98	478	141	54	891	109	315	163	54	98	130	196
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.7	8.0	5.1	1.5	17.8	3.9	10.5	5.8	2.2	3.5	4.9	9.2
Cycle Q Clear(g_c), s	2.7	8.0	5.1	1.5	17.8	3.9	10.5	5.8	2.2	3.5	4.9	9.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	284	1192	532	389	1131	504	433	401	340	395	297	251
V/C Ratio(X)	0.35	0.40	0.27	0.14	0.79	0.22	0.73	0.41	0.16	0.25	0.44	0.78
Avail Cap(c_a), veh/h	603	2135	952	441	1542	688	433	648	549	449	600	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	19.9	18.9	15.7	24.2	19.4	23.8	26.3	24.9	24.0	29.6	31.5
Incr Delay (d2), s/veh	0.7	0.2	0.3	0.2	2.0	0.2	6.0	0.7	0.2	0.3	1.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.0	1.8	0.6	6.8	1.4	5.3	2.6	0.8	1.4	2.2	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	20.1	19.2	15.9	26.1	19.7	29.8	27.0	25.1	24.3	30.7	36.7
LnGrp LOS	B	C	B	B	C	B	C	C	C	C	C	D
Approach Vol, veh/h		717			1054			532			424	
Approach Delay, s/veh		19.6			24.9			28.5			32.0	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	32.3	11.7	22.2	13.1	31.0	16.0	17.9
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	3.5	10.0	5.5	7.8	4.7	19.8	12.5	11.2
Green Ext Time (p_c), s	0.0	3.4	0.1	0.9	0.2	5.0	0.0	1.1

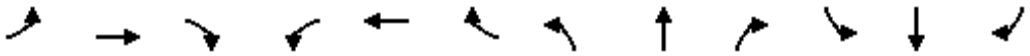
Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

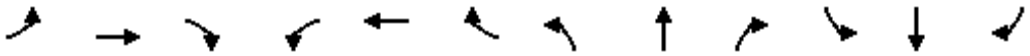
04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Future Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	380	141	11	717	76	152	141	22	43	76	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	479	1653	605	612	2306	1028	292	317	50	246	376	318
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	684	2547	932	881	3554	1585	1176	1580	246	1223	1870	1585
Grp Volume(v), veh/h	76	264	257	11	717	76	152	0	163	43	76	130
Grp Sat Flow(s),veh/h/ln	684	1777	1703	881	1777	1585	1176	0	1826	1223	1870	1585
Q Serve(g_s), s	4.1	4.6	4.7	0.4	6.7	1.3	9.3	0.0	5.9	2.4	2.5	5.4
Cycle Q Clear(g_c), s	10.8	4.6	4.7	5.1	6.7	1.3	11.8	0.0	5.9	8.3	2.5	5.4
Prop In Lane	1.00		0.55	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	479	1153	1105	612	2306	1028	292	0	367	246	376	318
V/C Ratio(X)	0.16	0.23	0.23	0.02	0.31	0.07	0.52	0.00	0.44	0.18	0.20	0.41
Avail Cap(c_a), veh/h	479	1153	1105	612	2306	1028	523	0	726	486	744	630
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.2	5.4	5.5	6.5	5.8	4.9	30.0	0.0	26.4	30.0	25.0	26.2
Incr Delay (d2), s/veh	0.7	0.5	0.5	0.1	0.4	0.1	1.4	0.0	0.8	0.3	0.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.2	1.2	0.1	1.7	0.3	2.6	0.0	2.5	0.7	1.1	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.9	5.9	6.0	6.6	6.2	5.0	31.4	0.0	27.2	30.3	25.3	27.0
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	C	C
Approach Vol, veh/h		597			804			315			249	
Approach Delay, s/veh		6.3			6.1			29.2			27.1	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		20.2		55.0		20.2				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		12.8		13.8		8.7		10.3				
Green Ext Time (p_c), s		3.7		1.3		5.2		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			12.5									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	254	1	9	504	28	3	20	14	4	3	2
Future Volume (veh/h)	2	254	1	9	504	28	3	20	14	4	3	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1826	1826	1826	1900	1900	1900
Adj Flow Rate, veh/h	2	265	1	9	525	29	3	21	15	4	3	2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	5	5	5	0	0	0
Cap, veh/h	87	828	3	91	824	45	101	239	155	252	176	87
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	2	1739	7	8	1730	94	38	1005	652	536	739	364
Grp Volume(v), veh/h	268	0	0	563	0	0	39	0	0	9	0	0
Grp Sat Flow(s),veh/h/ln	1748	0	0	1833	0	0	1696	0	0	1640	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.0	0.0	0.0	9.7	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.0
Prop In Lane	0.01		0.00	0.02		0.05	0.08		0.38	0.44		0.22
Lane Grp Cap(c), veh/h	919	0	0	960	0	0	496	0	0	514	0	0
V/C Ratio(X)	0.29	0.00	0.00	0.59	0.00	0.00	0.08	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	1662	0	0	1739	0	0	695	0	0	702	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.8	0.0	0.0	8.3	0.0	0.0	12.5	0.0	0.0	12.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	2.2	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.0	0.0	0.0	8.9	0.0	0.0	12.5	0.0	0.0	12.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		268			563			39			9	
Approach Delay, s/veh		7.0			8.9			12.5			12.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		15.0		27.0		15.0				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		38.0		15.0		38.0		15.0				
Max Q Clear Time (g_c+I1), s		6.0		2.7		11.7		2.2				
Green Ext Time (p_c), s		1.5		0.1		3.5		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			8.5									
HCM 6th LOS			A									

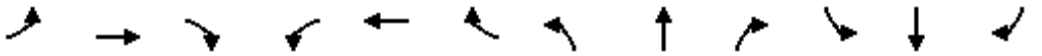
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	410	120	270	620	90	270
Future Volume (veh/h)	410	120	270	620	90	270
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	446	130	293	674	98	293
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1453	420	648	2491	333	472
Arrive On Green	0.53	0.53	0.22	1.00	0.19	0.19
Sat Flow, veh/h	2813	786	1781	3647	1781	1585
Grp Volume(v), veh/h	290	286	293	674	98	293
Grp Sat Flow(s),veh/h/ln	1777	1729	1781	1777	1781	1585
Q Serve(g_s), s	8.2	8.3	6.4	0.0	4.3	14.3
Cycle Q Clear(g_c), s	8.2	8.3	6.4	0.0	4.3	14.3
Prop In Lane		0.45	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	949	924	648	2491	333	472
V/C Ratio(X)	0.31	0.31	0.45	0.27	0.29	0.62
Avail Cap(c_a), veh/h	949	924	747	2491	396	528
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh	11.7	11.7	6.0	0.0	31.5	27.2
Incr Delay (d2), s/veh	0.8	0.9	0.4	0.2	0.5	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.2	1.6	0.1	1.8	12.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.5	12.6	6.5	0.2	32.0	29.1
LnGrp LOS	B	B	A	A	C	C
Approach Vol, veh/h	576			967	391	
Approach Delay, s/veh	12.5			2.1	29.8	
Approach LOS	B			A	C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.0	53.2		21.8		68.2
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	15.0	39.9		20.0		59.9
Max Q Clear Time (g_c+I1), s	8.4	10.3		16.3		2.0
Green Ext Time (p_c), s	0.5	1.8		0.5		2.6

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Future Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	239	435	43	43	609	76	120	109	54	65	76	250
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	481	1570	154	569	1379	172	351	335	284	348	314	266
Arrive On Green	0.20	0.96	0.96	0.05	0.43	0.43	0.07	0.18	0.18	0.06	0.17	0.17
Sat Flow, veh/h	1781	3268	322	1781	3180	396	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	239	236	242	43	340	345	120	109	54	65	76	250
Grp Sat Flow(s),veh/h/ln	1781	1777	1812	1781	1777	1799	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	6.8	0.6	0.6	1.1	12.1	12.1	4.9	4.6	2.6	2.6	3.2	14.0
Cycle Q Clear(g_c), s	6.8	0.6	0.6	1.1	12.1	12.1	4.9	4.6	2.6	2.6	3.2	14.0
Prop In Lane	1.00		0.18	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	481	853	871	569	770	780	351	335	284	348	314	266
V/C Ratio(X)	0.50	0.28	0.28	0.08	0.44	0.44	0.34	0.33	0.19	0.19	0.24	0.94
Avail Cap(c_a), veh/h	490	853	871	661	770	780	424	335	284	441	314	266
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.1	0.9	0.9	12.2	17.9	17.9	27.8	32.2	31.4	27.7	32.5	37.0
Incr Delay (d2), s/veh	0.8	0.8	0.8	0.1	1.8	1.8	0.6	0.6	0.3	0.3	0.4	39.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.4	0.4	0.4	5.0	5.1	2.1	2.1	1.0	1.1	1.4	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	1.7	1.7	12.3	19.7	19.7	28.4	32.7	31.7	28.0	32.9	76.2
LnGrp LOS	B	A	A	B	B	B	C	C	C	C	C	E
Approach Vol, veh/h		717			728			283			391	
Approach Delay, s/veh		5.1			19.2			30.7			59.8	
Approach LOS		A			B			C			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	48.3	10.3	21.0	14.5	44.1	11.4	20.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 9.3	34.9	* 10	15.1	* 9.3	34.9	* 10	15.1
Max Q Clear Time (g_c+I1), s	3.1	2.6	4.6	6.6	8.8	14.1	6.9	16.0
Green Ext Time (p_c), s	0.0	2.9	0.0	0.4	0.0	4.1	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

04/20/2020

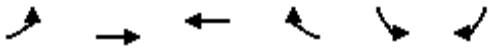
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Future Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	250	43	65	391	11	43	120	54	22	163	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	601	1181	1001	704	1143	32	152	300	135	277	210	210
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	983	1870	1585	1086	1810	51	1054	1222	550	1211	858	858
Grp Volume(v), veh/h	33	250	43	65	0	402	43	0	174	22	0	326
Grp Sat Flow(s),veh/h/ln	983	1870	1585	1086	0	1861	1054	0	1771	1211	0	1716
Q Serve(g_s), s	1.5	5.1	0.9	2.4	0.0	9.1	3.6	0.0	7.4	1.4	0.0	15.9
Cycle Q Clear(g_c), s	10.6	5.1	0.9	7.6	0.0	9.1	19.5	0.0	7.4	8.8	0.0	15.9
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	601	1181	1001	704	0	1175	152	0	435	277	0	421
V/C Ratio(X)	0.05	0.21	0.04	0.09	0.00	0.34	0.28	0.00	0.40	0.08	0.00	0.77
Avail Cap(c_a), veh/h	601	1181	1001	704	0	1175	244	0	589	383	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.3	7.1	6.3	8.7	0.0	7.8	40.7	0.0	28.4	32.1	0.0	31.6
Incr Delay (d2), s/veh	0.2	0.4	0.1	0.3	0.0	0.8	1.0	0.0	0.6	0.1	0.0	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.6	0.3	0.5	0.0	2.9	0.9	0.0	2.9	0.4	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.5	7.5	6.4	8.9	0.0	8.6	41.7	0.0	29.0	32.2	0.0	36.3
LnGrp LOS	B	A	A	A	A	A	D	A	C	C	A	D
Approach Vol, veh/h		326			467			217			348	
Approach Delay, s/veh		7.6			8.6			31.5			36.0	
Approach LOS		A			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		62.8		27.2		62.8		27.2				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		12.6		21.5		11.1		17.9				
Green Ext Time (p_c), s		1.5		0.6		2.5		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			19.1									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	174	350	146	55	23
Future Volume (veh/h)	57	174	350	146	55	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	67	205	412	172	65	27
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	242	572	579	242	233	97
Arrive On Green	0.46	0.46	0.46	0.46	0.19	0.19
Sat Flow, veh/h	151	1237	1253	523	1212	503
Grp Volume(v), veh/h	272	0	0	584	93	0
Grp Sat Flow(s),veh/h/ln	1388	0	0	1776	1734	0
Q Serve(g_s), s	0.4	0.0	0.0	6.9	1.2	0.0
Cycle Q Clear(g_c), s	7.3	0.0	0.0	6.9	1.2	0.0
Prop In Lane	0.25			0.29	0.70	0.29
Lane Grp Cap(c), veh/h	814	0	0	821	333	0
V/C Ratio(X)	0.33	0.00	0.00	0.71	0.28	0.00
Avail Cap(c_a), veh/h	1664	0	0	1876	1232	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.5	0.0	0.0	5.6	9.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.3	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.7	0.0	0.0	6.8	9.4	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		272	584		93	
Approach Delay, s/veh		4.7	6.8		9.4	
Approach LOS		A	A		A	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		16.5		9.5	16.5
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		27.5		18.5	27.5
Max Q Clear Time (g_c+I1), s		9.3		3.2	8.9
Green Ext Time (p_c), s		1.4		0.2	3.2

Intersection Summary	
HCM 6th Ctrl Delay	6.4
HCM 6th LOS	A

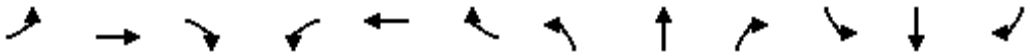
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	140	50	200	410	110
Future Volume (veh/h)	200	140	50	200	410	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	217	152	54	217	446	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	557	472	188	447	552	148
Arrive On Green	0.30	0.30	0.30	0.30	0.40	0.40
Sat Flow, veh/h	1870	1585	200	1501	1365	367
Grp Volume(v), veh/h	217	152	271	0	567	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1701	0	1736	0
Q Serve(g_s), s	3.1	2.5	0.3	0.0	9.7	0.0
Cycle Q Clear(g_c), s	3.1	2.5	4.0	0.0	9.7	0.0
Prop In Lane		1.00	0.20		0.79	0.21
Lane Grp Cap(c), veh/h	557	472	635	0	701	0
V/C Ratio(X)	0.39	0.32	0.43	0.00	0.81	0.00
Avail Cap(c_a), veh/h	1758	1490	1663	0	2512	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	9.4	9.1	9.7	0.0	8.8	0.0
Incr Delay (d2), s/veh	0.4	0.4	0.5	0.0	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.5	0.9	0.0	1.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.8	9.5	10.1	0.0	11.1	0.0
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	369			271	567	
Approach Delay, s/veh	9.7			10.1	11.1	
Approach LOS	A			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		15.5		18.0		15.5
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		31.5		48.5		31.5
Max Q Clear Time (g_c+I1), s		5.1		11.7		6.0
Green Ext Time (p_c), s		1.5		1.8		1.4

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Future Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	76	174	22	315	11	326	43	11	11	76	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	303	136	229	125	583	20	603	58	14	119	251	330
Arrive On Green	0.34	0.34	0.34	0.34	0.34	0.34	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	483	402	675	51	1723	58	1181	167	40	33	717	940
Grp Volume(v), veh/h	402	0	0	348	0	0	380	0	0	196	0	0
Grp Sat Flow(s),veh/h/ln	1560	0	0	1832	0	0	1388	0	0	1690	0	0
Q Serve(g_s), s	2.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.3	0.0	0.0	5.4	0.0	0.0	8.1	0.0	0.0	3.0	0.0	0.0
Prop In Lane	0.38		0.43	0.06		0.03	0.86		0.03	0.06		0.56
Lane Grp Cap(c), veh/h	668	0	0	728	0	0	676	0	0	700	0	0
V/C Ratio(X)	0.60	0.00	0.00	0.48	0.00	0.00	0.56	0.00	0.00	0.28	0.00	0.00
Avail Cap(c_a), veh/h	1767	0	0	2167	0	0	1603	0	0	1929	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.0	0.0	0.0	9.5	0.0	0.0	9.8	0.0	0.0	8.4	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.5	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	1.2	0.0	0.0	1.3	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.9	0.0	0.0	10.0	0.0	0.0	10.5	0.0	0.0	8.6	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		402			348			380			196	
Approach Delay, s/veh		10.9			10.0			10.5			8.6	
Approach LOS		B			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		17.5		17.9		17.5		17.9				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		40.5		38.5		40.5		38.5				
Max Q Clear Time (g_c+I1), s		9.3		10.1		7.4		5.0				
Green Ext Time (p_c), s		2.6		2.3		1.8		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			10.2									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Future Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	3	3	3
Mvmt Flow	38	0	31	0	0	0	66	362	0	0	166	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	672	672	178	688	684	362	190	0	0	362	0	0
Stage 1	178	178	-	494	494	-	-	-	-	-	-	-
Stage 2	494	494	-	194	190	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.12	6.52	6.22	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.518	4.018	3.318	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	368	376	862	360	371	683	1384	-	-	1191	-	-
Stage 1	821	750	-	557	546	-	-	-	-	-	-	-
Stage 2	555	545	-	808	743	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	351	353	862	331	349	683	1384	-	-	1191	-	-
Mov Cap-2 Maneuver	351	353	-	331	349	-	-	-	-	-	-	-
Stage 1	772	750	-	524	513	-	-	-	-	-	-	-
Stage 2	522	512	-	779	743	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	0	1.2	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1384	-	-	479	-	1191	-	-
HCM Lane V/C Ratio	0.048	-	-	0.146	-	-	-	-
HCM Control Delay (s)	7.7	0	-	13.8	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	-	0	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	158	33	80	291	100	116
Future Vol, veh/h	158	33	80	291	100	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	174	36	88	320	110	127

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	210	0	688	192
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	496	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1349	-	412	850
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	612	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1349	-	379	850
Mov Cap-2 Maneuver	-	-	-	-	379	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	564	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	540	-	-	1349	-
HCM Lane V/C Ratio	0.44	-	-	0.065	-
HCM Control Delay (s)	16.8	-	-	7.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Future Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	4	4	4	2	2	2	1	1	1	4	4	4
Mvmt Flow	11	39	31	12	43	15	22	330	6	8	195	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	622	596	200	628	597	333	204	0	0	336	0	0
Stage 1	216	216	-	377	377	-	-	-	-	-	-	-
Stage 2	406	380	-	251	220	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.12	6.52	6.22	4.11	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.518	4.018	3.318	2.209	-	-	2.236	-	-
Pot Cap-1 Maneuver	396	414	836	395	416	709	1374	-	-	1212	-	-
Stage 1	782	720	-	644	616	-	-	-	-	-	-	-
Stage 2	618	610	-	753	721	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	349	403	836	345	405	709	1374	-	-	1212	-	-
Mov Cap-2 Maneuver	349	403	-	345	405	-	-	-	-	-	-	-
Stage 1	766	715	-	631	604	-	-	-	-	-	-	-
Stage 2	551	598	-	681	716	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	14.9	0.5	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1374	-	-	491	432	1212	-	-
HCM Lane V/C Ratio	0.016	-	-	0.164	0.161	0.006	-	-
HCM Control Delay (s)	7.7	0	-	13.8	14.9	8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.6	0	-	-

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Future Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	6	6	6	2	2	2	15	15	15	7	7	7
Mvmt Flow	4	53	13	29	96	89	3	54	8	37	168	1

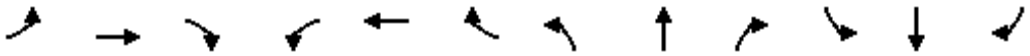
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	400	311	169	340	307	58	169	0	0	62	0	0
Stage 1	243	243	-	64	64	-	-	-	-	-	-	-
Stage 2	157	68	-	276	243	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.25	-	-	4.17	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.335	-	-	2.263	-	-
Pot Cap-1 Maneuver	553	597	865	614	607	1008	1333	-	-	1510	-	-
Stage 1	752	697	-	947	842	-	-	-	-	-	-	-
Stage 2	836	830	-	730	705	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	431	580	865	551	589	1008	1333	-	-	1510	-	-
Mov Cap-2 Maneuver	431	580	-	551	589	-	-	-	-	-	-	-
Stage 1	750	678	-	945	840	-	-	-	-	-	-	-
Stage 2	674	828	-	645	686	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	12.3	0.3	1.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1333	-	-	606	705	1510	-	-
HCM Lane V/C Ratio	0.002	-	-	0.115	0.303	0.025	-	-
HCM Control Delay (s)	7.7	0	-	11.7	12.3	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1.3	0.1	-	-

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

04/20/2020



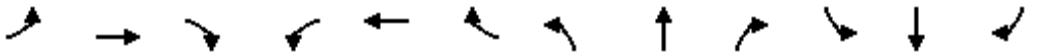
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Future Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1885	1885	1885	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	127	49	104	17	114	47	112	409	9	17	527	135
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	5	5	5	1	1	1	8	8	8	8	8	8
Cap, veh/h	234	78	126	92	274	105	223	755	15	79	825	207
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	615	354	572	81	1242	475	231	1237	25	15	1352	339
Grp Volume(v), veh/h	280	0	0	178	0	0	530	0	0	679	0	0
Grp Sat Flow(s),veh/h/ln	1541	0	0	1798	0	0	1494	0	0	1706	0	0
Q Serve(g_s), s	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.9	0.0	0.0	4.6	0.0	0.0	9.2	0.0	0.0	13.5	0.0	0.0
Prop In Lane	0.45		0.37	0.10		0.26	0.21		0.02	0.03		0.20
Lane Grp Cap(c), veh/h	438	0	0	471	0	0	994	0	0	1111	0	0
V/C Ratio(X)	0.64	0.00	0.00	0.38	0.00	0.00	0.53	0.00	0.00	0.61	0.00	0.00
Avail Cap(c_a), veh/h	616	0	0	689	0	0	994	0	0	1111	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	17.9	0.0	0.0	5.8	0.0	0.0	6.7	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	0.0	0.5	0.0	0.0	2.1	0.0	0.0	2.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.0	1.5	0.0	0.0	1.9	0.0	0.0	2.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	0.0	0.0	18.5	0.0	0.0	7.8	0.0	0.0	9.2	0.0	0.0
LnGrp LOS	C	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		280			178			530			679	
Approach Delay, s/veh		21.0			18.5			7.8			9.2	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		16.2		37.0		16.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5				
Max Q Clear Time (g_c+I1), s		11.2		10.9		15.5		6.6				
Green Ext Time (p_c), s		3.4		0.9		3.8		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			11.7									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Future Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	502	148	57	936	114	359	186	62	103	137	205
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	276	1219	544	385	1163	519	424	404	342	375	306	259
Arrive On Green	0.08	0.34	0.34	0.06	0.33	0.33	0.13	0.22	0.22	0.08	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	103	502	148	57	936	114	359	186	62	103	137	205
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.9	8.7	5.4	1.6	19.3	4.2	10.5	7.0	2.6	3.7	5.3	10.0
Cycle Q Clear(g_c), s	2.9	8.7	5.4	1.6	19.3	4.2	10.5	7.0	2.6	3.7	5.3	10.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	276	1219	544	385	1163	519	424	404	342	375	306	259
V/C Ratio(X)	0.37	0.41	0.27	0.15	0.80	0.22	0.85	0.46	0.18	0.27	0.45	0.79
Avail Cap(c_a), veh/h	582	2071	924	431	1496	667	424	629	533	424	582	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	20.2	19.1	15.8	24.7	19.6	26.7	27.4	25.7	24.6	30.3	32.3
Incr Delay (d2), s/veh	0.8	0.2	0.3	0.2	2.6	0.2	14.8	0.8	0.3	0.4	1.0	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.2	1.9	0.6	7.5	1.5	3.2	3.1	1.0	1.5	2.4	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	20.4	19.4	16.0	27.2	19.8	41.5	28.2	26.0	24.9	31.4	37.7
LnGrp LOS	B	C	B	B	C	B	D	C	C	C	C	D
Approach Vol, veh/h		753			1107			607			445	
Approach Delay, s/veh		20.0			25.9			35.8			32.8	
Approach LOS		B			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	33.7	11.8	22.8	13.2	32.5	16.0	18.6
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	3.6	10.7	5.7	9.0	4.9	21.3	12.5	12.0
Green Ext Time (p_c), s	0.0	3.6	0.1	1.1	0.2	5.0	0.0	1.1

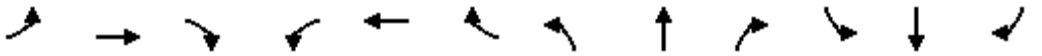
Intersection Summary	
HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

04/20/2020



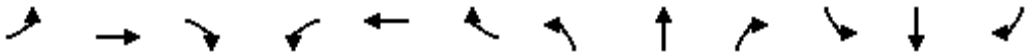
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Future Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	81	407	151	12	768	81	167	155	24	48	84	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	440	1614	592	573	2254	1005	304	346	54	255	410	347
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	649	2546	934	851	3554	1585	1154	1581	245	1205	1870	1585
Grp Volume(v), veh/h	81	283	275	12	768	81	167	0	179	48	84	143
Grp Sat Flow(s),veh/h/ln	649	1777	1702	851	1777	1585	1154	0	1826	1205	1870	1585
Q Serve(g_s), s	5.1	5.3	5.4	0.5	7.8	1.5	10.7	0.0	6.5	2.8	2.8	6.0
Cycle Q Clear(g_c), s	12.9	5.3	5.4	5.9	7.8	1.5	13.5	0.0	6.5	9.3	2.8	6.0
Prop In Lane	1.00		0.55	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	440	1127	1080	573	2254	1005	304	0	400	255	410	347
V/C Ratio(X)	0.18	0.25	0.26	0.02	0.34	0.08	0.55	0.00	0.45	0.19	0.21	0.41
Avail Cap(c_a), veh/h	440	1127	1080	573	2254	1005	499	0	710	460	727	616
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	6.1	6.1	7.4	6.6	5.4	30.1	0.0	26.0	30.0	24.6	25.8
Incr Delay (d2), s/veh	0.9	0.5	0.6	0.1	0.4	0.2	1.6	0.0	0.8	0.4	0.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.5	1.5	0.1	2.1	0.4	2.9	0.0	2.8	0.8	1.2	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.5	6.7	6.7	7.5	7.0	5.6	31.6	0.0	26.8	30.4	24.8	26.6
LnGrp LOS	B	A	A	A	A	A	C	A	C	C	C	C
Approach Vol, veh/h		639			861			346			275	
Approach Delay, s/veh		7.2			6.9			29.1			26.7	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		21.9		55.0		21.9				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		14.9		15.5		9.8		11.3				
Green Ext Time (p_c), s		4.0		1.4		5.7		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			13.2									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	254	1	9	504	28	3	20	14	4	3	2
Future Volume (veh/h)	2	254	1	9	504	28	3	20	14	4	3	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1826	1826	1826	1900	1900	1900
Adj Flow Rate, veh/h	2	283	1	10	562	31	3	23	16	5	3	2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	5	5	5	0	0	0
Cap, veh/h	87	828	3	91	823	45	100	242	154	278	157	77
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	2	1740	6	9	1729	94	36	1015	647	628	661	322
Grp Volume(v), veh/h	286	0	0	603	0	0	42	0	0	10	0	0
Grp Sat Flow(s),veh/h/ln	1748	0	0	1832	0	0	1698	0	0	1612	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.3	0.0	0.0	10.7	0.0	0.0	0.8	0.0	0.0	0.2	0.0	0.0
Prop In Lane	0.01		0.00	0.02		0.05	0.07		0.38	0.50		0.20
Lane Grp Cap(c), veh/h	919	0	0	960	0	0	496	0	0	512	0	0
V/C Ratio(X)	0.31	0.00	0.00	0.63	0.00	0.00	0.08	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	1662	0	0	1739	0	0	695	0	0	698	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.9	0.0	0.0	8.6	0.0	0.0	12.5	0.0	0.0	12.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	2.5	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.1	0.0	0.0	9.3	0.0	0.0	12.6	0.0	0.0	12.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		286			603			42			10	
Approach Delay, s/veh		7.1			9.3			12.6			12.3	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.0		15.0		27.0		15.0				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		38.0		15.0		38.0		15.0				
Max Q Clear Time (g_c+I1), s		6.3		2.8		12.7		2.2				
Green Ext Time (p_c), s		1.6		0.1		3.8		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			8.8									
HCM 6th LOS			A									

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	410	120	270	620	90	270
Future Volume (veh/h)	410	120	270	620	90	270
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	477	140	314	721	112	338
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1387	404	606	2411	373	509
Arrive On Green	0.51	0.51	0.22	1.00	0.21	0.21
Sat Flow, veh/h	2807	791	1781	3647	1781	1585
Grp Volume(v), veh/h	311	306	314	721	112	338
Grp Sat Flow(s),veh/h/ln	1777	1728	1781	1777	1781	1585
Q Serve(g_s), s	9.3	9.5	7.6	0.0	4.8	16.6
Cycle Q Clear(g_c), s	9.3	9.5	7.6	0.0	4.8	16.6
Prop In Lane		0.46	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	908	883	606	2411	373	509
V/C Ratio(X)	0.34	0.35	0.52	0.30	0.30	0.66
Avail Cap(c_a), veh/h	908	883	704	2411	396	529
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.84	0.84	1.00	1.00
Uniform Delay (d), s/veh	13.0	13.1	7.1	0.0	30.0	26.4
Incr Delay (d2), s/veh	1.0	1.1	0.6	0.3	0.4	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.6	2.0	0.1	2.0	14.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	14.1	7.7	0.3	30.5	29.4
LnGrp LOS	B	B	A	A	C	C
Approach Vol, veh/h	617			1035	450	
Approach Delay, s/veh	14.1			2.5	29.6	
Approach LOS	B			A	C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.1	51.1		23.8		66.2
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	15.0	39.9		20.0		59.9
Max Q Clear Time (g_c+I1), s	9.6	11.5		18.6		2.0
Green Ext Time (p_c), s	0.5	1.9		0.3		2.8

Intersection Summary	
HCM 6th Ctrl Delay	11.7
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

04/20/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Future Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	256	465	47	47	651	81	130	118	59	78	91	300
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	463	1541	155	551	1346	167	345	337	286	350	314	266
Arrive On Green	0.21	0.95	0.95	0.05	0.42	0.42	0.08	0.18	0.18	0.07	0.17	0.17
Sat Flow, veh/h	1781	3260	328	1781	3181	395	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	256	253	259	47	363	369	130	118	59	78	91	300
Grp Sat Flow(s),veh/h/ln	1781	1777	1811	1781	1777	1799	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	7.5	1.0	1.0	1.3	13.3	13.4	5.3	5.0	2.9	3.2	3.8	15.1
Cycle Q Clear(g_c), s	7.5	1.0	1.0	1.3	13.3	13.4	5.3	5.0	2.9	3.2	3.8	15.1
Prop In Lane	1.00		0.18	1.00		0.22	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	463	840	856	551	752	761	345	337	286	350	314	266
V/C Ratio(X)	0.55	0.30	0.30	0.09	0.48	0.48	0.38	0.35	0.21	0.22	0.29	1.13
Avail Cap(c_a), veh/h	463	840	856	640	752	761	408	337	286	435	314	266
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	1.3	1.3	12.7	18.8	18.8	27.6	32.3	31.4	27.7	32.8	37.5
Incr Delay (d2), s/veh	1.3	0.9	0.8	0.1	2.2	2.2	0.7	0.6	0.4	0.3	0.5	94.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.5	0.5	0.5	5.6	5.7	2.3	2.2	1.1	1.3	1.7	12.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	2.2	2.2	12.7	21.0	21.0	28.3	32.9	31.8	28.0	33.3	131.6
LnGrp LOS	B	A	A	B	C	C	C	C	C	C	C	F
Approach Vol, veh/h		768			779			307			469	
Approach Delay, s/veh		5.8			20.5			30.7			95.3	
Approach LOS		A			C			C			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	47.6	10.7	21.1	15.0	43.2	11.8	20.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 9.3	34.9	* 10	15.1	* 9.3	34.9	* 10	15.1
Max Q Clear Time (g_c+I1), s	3.3	3.0	5.2	7.0	9.5	15.4	7.3	17.1
Green Ext Time (p_c), s	0.0	3.2	0.1	0.4	0.0	4.3	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	32.1
HCM 6th LOS	C

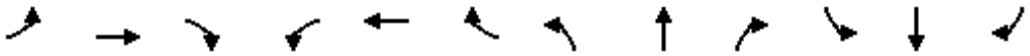
Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

04/20/2020



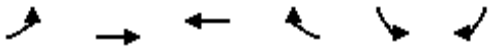
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Future Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	35	268	47	70	419	12	48	132	60	24	179	179
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	551	1140	966	659	1103	32	156	325	148	292	229	229
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	957	1870	1585	1065	1809	52	1023	1217	553	1191	858	858
Grp Volume(v), veh/h	35	268	47	70	0	431	48	0	192	24	0	358
Grp Sat Flow(s),veh/h/ln	957	1870	1585	1065	0	1861	1023	0	1771	1191	0	1716
Q Serve(g_s), s	1.7	5.9	1.1	2.9	0.0	10.6	4.1	0.0	8.0	1.5	0.0	17.4
Cycle Q Clear(g_c), s	12.3	5.9	1.1	8.8	0.0	10.6	21.5	0.0	8.0	9.5	0.0	17.4
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	551	1140	966	659	0	1134	156	0	473	292	0	458
V/C Ratio(X)	0.06	0.24	0.05	0.11	0.00	0.38	0.31	0.00	0.41	0.08	0.00	0.78
Avail Cap(c_a), veh/h	551	1140	966	659	0	1134	222	0	588	370	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.1	8.0	7.1	10.0	0.0	8.9	40.5	0.0	27.1	31.0	0.0	30.5
Incr Delay (d2), s/veh	0.2	0.5	0.1	0.3	0.0	1.0	1.1	0.0	0.6	0.1	0.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.9	0.3	0.6	0.0	3.5	1.0	0.0	3.2	0.4	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.3	8.5	7.2	10.3	0.0	9.9	41.6	0.0	27.7	31.1	0.0	36.1
LnGrp LOS	B	A	A	B	A	A	D	A	C	C	A	D
Approach Vol, veh/h		350			501			240			382	
Approach Delay, s/veh		8.7			10.0			30.5			35.8	
Approach LOS		A			A			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		60.9		29.1		60.9		29.1				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		14.3		23.5		12.6		19.4				
Green Ext Time (p_c), s		1.7		0.6		2.7		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			19.7									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	174	350	146	55	23
Future Volume (veh/h)	57	174	350	146	55	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	72	219	441	184	68	28
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	236	568	604	252	225	93
Arrive On Green	0.48	0.48	0.48	0.48	0.18	0.18
Sat Flow, veh/h	145	1177	1253	523	1216	501
Grp Volume(v), veh/h	291	0	0	625	97	0
Grp Sat Flow(s),veh/h/ln	1322	0	0	1776	1734	0
Q Serve(g_s), s	0.6	0.0	0.0	7.6	1.3	0.0
Cycle Q Clear(g_c), s	8.2	0.0	0.0	7.6	1.3	0.0
Prop In Lane	0.25			0.29	0.70	0.29
Lane Grp Cap(c), veh/h	804	0	0	857	321	0
V/C Ratio(X)	0.36	0.00	0.00	0.73	0.30	0.00
Avail Cap(c_a), veh/h	1555	0	0	1806	1186	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.4	0.0	0.0	5.6	9.5	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	1.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.3	0.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.7	0.0	0.0	6.8	10.0	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		291	625		97	
Approach Delay, s/veh		4.7	6.8		10.0	
Approach LOS		A	A		B	

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		17.5		9.5	17.5
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		27.5		18.5	27.5
Max Q Clear Time (g_c+I1), s		10.2		3.3	9.6
Green Ext Time (p_c), s		1.5		0.2	3.5

Intersection Summary	
HCM 6th Ctrl Delay	6.5
HCM 6th LOS	A

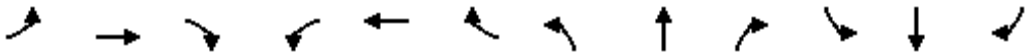
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	140	50	200	410	110
Future Volume (veh/h)	200	140	50	200	410	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	233	163	58	233	468	126
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	543	460	185	431	572	154
Arrive On Green	0.29	0.29	0.29	0.29	0.42	0.42
Sat Flow, veh/h	1870	1585	205	1482	1365	368
Grp Volume(v), veh/h	233	163	291	0	595	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1687	0	1736	0
Q Serve(g_s), s	3.5	2.8	1.2	0.0	10.4	0.0
Cycle Q Clear(g_c), s	3.5	2.8	4.7	0.0	10.4	0.0
Prop In Lane		1.00	0.20		0.79	0.21
Lane Grp Cap(c), veh/h	543	460	616	0	727	0
V/C Ratio(X)	0.43	0.35	0.47	0.00	0.82	0.00
Avail Cap(c_a), veh/h	1714	1452	1609	0	2449	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	9.9	9.6	10.3	0.0	8.8	0.0
Incr Delay (d2), s/veh	0.5	0.5	0.6	0.0	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.6	1.0	0.0	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.4	10.1	10.8	0.0	11.2	0.0
LnGrp LOS	B	B	B	A	B	A
Approach Vol, veh/h	396			291	595	
Approach Delay, s/veh	10.3			10.8	11.2	
Approach LOS	B			B	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		15.5		18.9		15.5
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		31.5		48.5		31.5
Max Q Clear Time (g_c+I1), s		5.5		12.4		6.7
Green Ext Time (p_c), s		1.6		2.0		1.5

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Future Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	81	186	23	337	12	401	53	13	14	95	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	126	224	94	615	21	596	61	15	91	310	405
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	469	356	629	51	1730	59	1087	144	35	36	727	952
Grp Volume(v), veh/h	430	0	0	372	0	0	467	0	0	245	0	0
Grp Sat Flow(s),veh/h/ln	1454	0	0	1841	0	0	1265	0	0	1714	0	0
Q Serve(g_s), s	5.0	0.0	0.0	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.2	0.0	0.0	8.1	0.0	0.0	16.6	0.0	0.0	4.9	0.0	0.0
Prop In Lane	0.38		0.43	0.06		0.03	0.86		0.03	0.06		0.56
Lane Grp Cap(c), veh/h	616	0	0	731	0	0	672	0	0	806	0	0
V/C Ratio(X)	0.70	0.00	0.00	0.51	0.00	0.00	0.70	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	1219	0	0	1529	0	0	1080	0	0	1368	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.4	0.0	0.0	13.1	0.0	0.0	12.8	0.0	0.0	9.7	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.6	0.0	0.0	1.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.0	2.4	0.0	0.0	3.1	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.9	0.0	0.0	13.6	0.0	0.0	14.1	0.0	0.0	9.9	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		430			372			467			245	
Approach Delay, s/veh		15.9			13.6			14.1			9.9	
Approach LOS		B			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.4		27.0		23.4		27.0				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		40.5		38.5		40.5		38.5				
Max Q Clear Time (g_c+I1), s		15.2		18.6		10.1		6.9				
Green Ext Time (p_c), s		2.8		2.9		2.0		1.3				

Intersection Summary												
HCM 6th Ctrl Delay			13.8									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Future Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	3	3	3
Mvmt Flow	40	0	33	0	0	0	83	452	0	0	208	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	842	842	224	858	857	452	239	0	0	452	0	0
Stage 1	224	224	-	618	618	-	-	-	-	-	-	-
Stage 2	618	618	-	240	239	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.12	6.52	6.22	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.518	4.018	3.318	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	283	300	813	277	295	608	1328	-	-	1103	-	-
Stage 1	776	716	-	477	481	-	-	-	-	-	-	-
Stage 2	475	479	-	763	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	265	275	813	249	271	608	1328	-	-	1103	-	-
Mov Cap-2 Maneuver	265	275	-	249	271	-	-	-	-	-	-	-
Stage 1	712	716	-	437	441	-	-	-	-	-	-	-
Stage 2	436	439	-	732	708	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	0	1.2	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1328	-	-	380	-	1103	-	-
HCM Lane V/C Ratio	0.062	-	-	0.193	-	-	-	-
HCM Control Delay (s)	7.9	0	-	16.7	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	-	0	-	-

Intersection	
Int Delay, s/veh	5.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	158	33	80	291	100	116
Future Vol, veh/h	158	33	80	291	100	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	182	38	92	336	115	134

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	220	0	721	201
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	520	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1337	-	394	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	597	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1337	-	361	840
Mov Cap-2 Maneuver	-	-	-	-	361	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	546	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	18.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	520	-	-	1337	-
HCM Lane V/C Ratio	0.479	-	-	0.069	-
HCM Control Delay (s)	18.1	-	-	7.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Future Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	2	2	2	1	1	1	1	1	1
Mvmt Flow	11	62	40	13	46	16	27	164	18	20	365	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	672	650	374	692	649	173	382	0	0	182	0	0
Stage 1	414	414	-	227	227	-	-	-	-	-	-	-
Stage 2	258	236	-	465	422	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	372	391	677	358	389	871	1182	-	-	1399	-	-
Stage 1	620	597	-	776	716	-	-	-	-	-	-	-
Stage 2	751	713	-	578	588	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	320	374	677	285	372	871	1182	-	-	1399	-	-
Mov Cap-2 Maneuver	320	374	-	285	372	-	-	-	-	-	-	-
Stage 1	605	586	-	757	698	-	-	-	-	-	-	-
Stage 2	672	695	-	477	577	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	16.1	1	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1182	-	-	436	398	1399	-	-
HCM Lane V/C Ratio	0.023	-	-	0.26	0.189	0.014	-	-
HCM Control Delay (s)	8.1	0	-	16.1	16.1	7.6	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.7	0	-	-

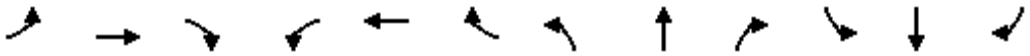
Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Future Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	1	1	1
Mvmt Flow	1	95	7	16	65	40	13	171	48	140	115	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	670	641	116	668	617	195	116	0	0	219	0	0
Stage 1	396	396	-	221	221	-	-	-	-	-	-	-
Stage 2	274	245	-	447	396	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	373	395	942	373	407	849	1473	-	-	1356	-	-
Stage 1	633	607	-	784	722	-	-	-	-	-	-	-
Stage 2	736	707	-	593	606	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	279	348	942	267	359	849	1473	-	-	1356	-	-
Mov Cap-2 Maneuver	279	348	-	267	359	-	-	-	-	-	-	-
Stage 1	627	540	-	776	715	-	-	-	-	-	-	-
Stage 2	631	700	-	431	539	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.9	17	0.4	4.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1473	-	-	362	419	1356	-	-
HCM Lane V/C Ratio	0.009	-	-	0.286	0.289	0.103	-	-
HCM Control Delay (s)	7.5	0	-	18.9	17	8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.2	1.2	0.3	-	-



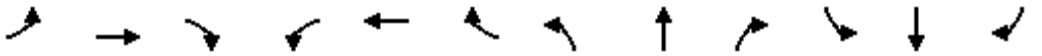
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Future Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	84	111	76	10	50	30	43	528	15	33	436	70
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	185	167	98	102	234	126	122	1009	28	111	897	138
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	399	789	463	81	1105	593	66	1691	46	49	1504	232
Grp Volume(v), veh/h	271	0	0	90	0	0	586	0	0	539	0	0
Grp Sat Flow(s),veh/h/ln	1650	0	0	1778	0	0	1804	0	0	1786	0	0
Q Serve(g_s), s	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	0.0	2.0	0.0	0.0	8.6	0.0	0.0	7.8	0.0	0.0
Prop In Lane	0.31		0.28	0.11		0.33	0.07		0.03	0.06		0.13
Lane Grp Cap(c), veh/h	450	0	0	462	0	0	1158	0	0	1146	0	0
V/C Ratio(X)	0.60	0.00	0.00	0.19	0.00	0.00	0.51	0.00	0.00	0.47	0.00	0.00
Avail Cap(c_a), veh/h	726	0	0	752	0	0	1158	0	0	1146	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	15.3	0.0	0.0	5.6	0.0	0.0	5.4	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.2	0.0	0.0	1.6	0.0	0.0	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	0.6	0.0	0.0	1.6	0.0	0.0	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	0.0	0.0	15.6	0.0	0.0	7.1	0.0	0.0	6.8	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		271			90			586			539	
Approach Delay, s/veh		18.6			15.6			7.1			6.8	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.5		14.5		32.5		14.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		28.0		18.0		28.0		18.0				
Max Q Clear Time (g_c+I1), s		10.6		9.2		9.8		4.0				
Green Ext Time (p_c), s		3.2		0.9		2.9		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			9.6									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Future Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	304	924	511	76	565	120	207	239	109	196	228	152
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	471	1403	626	266	1154	515	325	332	281	307	290	246
Arrive On Green	0.14	0.39	0.39	0.07	0.32	0.32	0.12	0.18	0.18	0.09	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	304	924	511	76	565	120	207	239	109	196	228	152
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.7	19.2	25.9	2.4	11.5	5.0	8.6	10.9	5.5	8.4	10.6	8.1
Cycle Q Clear(g_c), s	9.7	19.2	25.9	2.4	11.5	5.0	8.6	10.9	5.5	8.4	10.6	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	471	1403	626	266	1154	515	325	332	281	307	290	246
V/C Ratio(X)	0.64	0.66	0.82	0.29	0.49	0.23	0.64	0.72	0.39	0.64	0.79	0.62
Avail Cap(c_a), veh/h	627	1846	823	288	1333	595	325	561	475	307	519	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.4	22.3	24.3	18.6	24.4	22.2	27.8	35.0	32.7	29.1	36.6	35.6
Incr Delay (d2), s/veh	1.5	0.5	4.9	0.6	0.3	0.2	4.1	3.0	0.9	4.4	4.7	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	7.2	9.9	1.0	4.5	1.8	3.9	5.1	2.1	3.8	5.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.9	22.8	29.2	19.2	24.7	22.4	31.9	37.9	33.6	33.5	41.3	38.1
LnGrp LOS	B	C	C	B	C	C	C	D	C	C	D	D
Approach Vol, veh/h		1739			761			555			576	
Approach Delay, s/veh		23.9			23.8			34.8			37.8	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	41.8	14.0	21.5	19.2	35.5	16.0	19.5
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	4.4	27.9	10.4	12.9	11.7	13.5	10.6	12.6
Green Ext Time (p_c), s	0.0	7.6	0.0	1.4	0.6	3.6	0.0	1.4

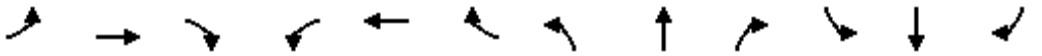
Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

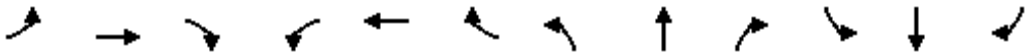
04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Future Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	109	859	141	33	511	65	98	120	22	98	207	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	572	1935	318	369	2251	1004	230	338	62	285	412	349
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	837	3055	502	563	3554	1585	1107	1538	282	1246	1870	1585
Grp Volume(v), veh/h	109	500	500	33	511	65	98	0	142	98	207	65
Grp Sat Flow(s),veh/h/ln	837	1777	1780	563	1777	1585	1107	0	1820	1246	1870	1585
Q Serve(g_s), s	4.9	11.0	11.1	2.4	4.7	1.2	6.6	0.0	5.1	5.6	7.5	2.6
Cycle Q Clear(g_c), s	9.7	11.0	11.1	13.5	4.7	1.2	14.0	0.0	5.1	10.6	7.5	2.6
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	572	1125	1127	369	2251	1004	230	0	400	285	412	349
V/C Ratio(X)	0.19	0.44	0.44	0.09	0.23	0.06	0.43	0.00	0.35	0.34	0.50	0.19
Avail Cap(c_a), veh/h	572	1125	1127	369	2251	1004	416	0	706	495	726	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.1	7.2	7.2	10.6	6.0	5.4	32.5	0.0	25.4	29.9	26.4	24.4
Incr Delay (d2), s/veh	0.7	1.3	1.3	0.5	0.2	0.1	1.3	0.0	0.5	0.7	1.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	3.2	3.2	0.3	1.3	0.3	1.8	0.0	2.2	1.7	3.3	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.9	8.5	8.5	11.1	6.3	5.5	33.8	0.0	26.0	30.6	27.3	24.7
LnGrp LOS	A	A	A	B	A	A	C	A	C	C	C	C
Approach Vol, veh/h		1109			609			240			370	
Approach Delay, s/veh		8.5			6.5			29.1			27.7	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		22.1		55.0		22.1				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		13.1		16.0		15.5		12.6				
Green Ext Time (p_c), s		7.5		0.9		3.8		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			13.2									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	682	5	17	345	19	5	4	26	41	17	7
Future Volume (veh/h)	8	682	5	17	345	19	5	4	26	41	17	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1811	1811	1811	1870	1870	1870
Adj Flow Rate, veh/h	8	696	5	17	352	19	5	4	27	42	17	7
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	6	6	6	2	2	2
Cap, veh/h	89	880	6	103	804	42	115	76	281	341	126	39
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	6	1844	13	28	1686	88	74	319	1180	847	529	163
Grp Volume(v), veh/h	709	0	0	388	0	0	36	0	0	66	0	0
Grp Sat Flow(s),veh/h/ln	1863	0	0	1803	0	0	1573	0	0	1539	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	13.5	0.0	0.0	5.9	0.0	0.0	0.7	0.0	0.0	1.2	0.0	0.0
Prop In Lane	0.01		0.01	0.04		0.05	0.14		0.75	0.64		0.11
Lane Grp Cap(c), veh/h	975	0	0	949	0	0	471	0	0	506	0	0
V/C Ratio(X)	0.73	0.00	0.00	0.41	0.00	0.00	0.08	0.00	0.00	0.13	0.00	0.00
Avail Cap(c_a), veh/h	1764	0	0	1685	0	0	653	0	0	684	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.3	0.0	0.0	7.3	0.0	0.0	12.5	0.0	0.0	12.7	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	0.0	1.3	0.0	0.0	0.2	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	0.0	0.0	7.6	0.0	0.0	12.6	0.0	0.0	12.8	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		709			388			36			66	
Approach Delay, s/veh		10.3			7.6			12.6			12.8	
Approach LOS		B			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		27.1		15.0		27.1		15.0				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		38.0		15.0		38.0		15.0				
Max Q Clear Time (g_c+I1), s		15.5		2.7		7.9		3.2				
Green Ext Time (p_c), s		4.6		0.1		2.3		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			9.6									
HCM 6th LOS			A									

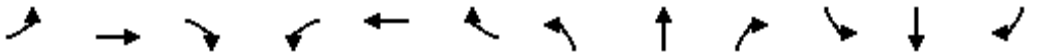
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	150	310	630	110	340
Future Volume (veh/h)	880	150	310	630	110	340
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	957	163	337	685	120	370
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1677	285	456	2563	297	444
Arrive On Green	0.55	0.55	0.23	1.00	0.17	0.17
Sat Flow, veh/h	3131	517	1781	3647	1781	1585
Grp Volume(v), veh/h	560	560	337	685	120	370
Grp Sat Flow(s),veh/h/ln	1777	1777	1781	1777	1781	1585
Q Serve(g_s), s	18.5	18.6	7.5	0.0	5.4	15.0
Cycle Q Clear(g_c), s	18.5	18.6	7.5	0.0	5.4	15.0
Prop In Lane		0.29	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	981	981	456	2563	297	444
V/C Ratio(X)	0.57	0.57	0.74	0.27	0.40	0.83
Avail Cap(c_a), veh/h	981	981	650	2563	297	444
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh	13.2	13.2	9.8	0.0	33.5	30.4
Incr Delay (d2), s/veh	2.4	2.4	2.3	0.2	0.9	12.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	7.3	2.1	0.1	2.4	17.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.6	15.6	12.1	0.2	34.4	43.2
LnGrp LOS	B	B	B	A	C	D
Approach Vol, veh/h	1120			1022	490	
Approach Delay, s/veh	15.6			4.1	41.0	
Approach LOS	B			A	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.2	54.8		20.0		70.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	20.0	39.9		15.0		64.9
Max Q Clear Time (g_c+I1), s	9.5	20.6		17.0		2.0
Green Ext Time (p_c), s	0.8	3.8		0.0		2.6

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Future Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	261	891	120	87	587	65	109	98	109	130	141	337
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	447	1285	173	364	1207	133	356	414	351	423	418	354
Arrive On Green	0.21	0.82	0.82	0.07	0.37	0.37	0.07	0.22	0.22	0.07	0.22	0.22
Sat Flow, veh/h	1781	3147	424	1781	3226	357	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	261	503	508	87	323	329	109	98	109	130	141	337
Grp Sat Flow(s),veh/h/ln	1781	1777	1794	1781	1777	1806	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	8.6	10.8	10.8	2.6	12.5	12.6	4.1	3.9	5.2	5.0	5.7	18.9
Cycle Q Clear(g_c), s	8.6	10.8	10.8	2.6	12.5	12.6	4.1	3.9	5.2	5.0	5.7	18.9
Prop In Lane	1.00		0.24	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	726	733	364	665	675	356	414	351	423	418	354
V/C Ratio(X)	0.58	0.69	0.69	0.24	0.49	0.49	0.31	0.24	0.31	0.31	0.34	0.95
Avail Cap(c_a), veh/h	447	726	733	385	665	675	371	418	354	434	418	354
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	5.9	5.9	15.1	21.5	21.6	24.1	28.8	29.3	24.2	29.4	34.5
Incr Delay (d2), s/veh	1.5	4.1	4.1	0.3	2.5	2.5	0.5	0.3	0.5	0.4	0.5	35.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.8	2.8	1.0	5.4	5.5	1.7	1.7	2.0	2.1	2.5	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.5	10.0	10.0	15.4	24.1	24.1	24.6	29.1	29.8	24.6	29.8	69.8
LnGrp LOS	B	B	A	B	C	C	C	C	C	C	C	E
Approach Vol, veh/h		1272			739			316			608	
Approach Delay, s/veh		11.1			23.1			27.8			50.9	
Approach LOS		B			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	41.9	11.4	24.8	15.0	38.8	11.2	25.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 7.3	34.9	* 7.3	20.1	* 9.3	32.9	* 7.3	20.1
Max Q Clear Time (g_c+I1), s	4.6	12.8	7.0	7.2	10.6	14.6	6.1	20.9
Green Ext Time (p_c), s	0.0	6.8	0.0	0.6	0.0	3.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

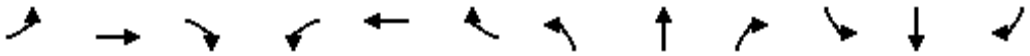
Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

04/20/2020



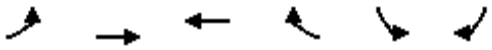
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Future Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	630	65	98	348	11	43	174	109	33	130	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	675	1240	1051	448	1195	38	180	230	144	148	201	169
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1022	1870	1585	750	1803	57	1141	1075	674	1096	940	788
Grp Volume(v), veh/h	152	630	65	98	0	359	43	0	283	33	0	239
Grp Sat Flow(s),veh/h/ln	1022	1870	1585	750	0	1860	1141	0	1749	1096	0	1728
Q Serve(g_s), s	6.6	15.4	1.3	6.9	0.0	7.3	3.2	0.0	13.7	2.6	0.0	11.4
Cycle Q Clear(g_c), s	13.8	15.4	1.3	22.3	0.0	7.3	14.6	0.0	13.7	16.3	0.0	11.4
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.39	1.00		0.46
Lane Grp Cap(c), veh/h	675	1240	1051	448	0	1233	180	0	374	148	0	370
V/C Ratio(X)	0.23	0.51	0.06	0.22	0.00	0.29	0.24	0.00	0.76	0.22	0.00	0.65
Avail Cap(c_a), veh/h	675	1240	1051	448	0	1233	315	0	581	278	0	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.2	7.7	5.3	13.4	0.0	6.3	38.9	0.0	33.2	40.8	0.0	32.3
Incr Delay (d2), s/veh	0.8	1.5	0.1	1.1	0.0	0.6	0.7	0.0	3.1	0.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.7	0.3	1.1	0.0	2.2	0.9	0.0	5.6	0.7	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.0	9.2	5.4	14.5	0.0	6.9	39.6	0.0	36.3	41.6	0.0	34.2
LnGrp LOS	B	A	A	B	A	A	D	A	D	D	A	C
Approach Vol, veh/h		847			457			326			272	
Approach Delay, s/veh		9.1			8.6			36.7			35.1	
Approach LOS		A			A			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		65.6		24.4		65.6		24.4				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		17.4		16.6		24.3		18.3				
Green Ext Time (p_c), s		4.9		1.3		2.5		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			17.4									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	432	215	159	181	44
Future Volume (veh/h)	32	432	215	159	181	44
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1900	1900	1885	1900
Adj Flow Rate, veh/h	36	480	239	177	201	49
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	0	0	1	0
Cap, veh/h	404	1004	578	428	0	0
Arrive On Green	0.57	0.57	0.57	0.57	0.00	0.00
Sat Flow, veh/h	65	1761	1014	751	0	0
Grp Volume(v), veh/h	516	0	0	416	0	0
Grp Sat Flow(s),veh/h/ln	1825	0	0	1765	0	0
Q Serve(g_s), s	0.0	0.0	0.0	1.4	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	0.0	1.4	0.0	0.0
Prop In Lane	0.07			0.43	0.00	0.00
Lane Grp Cap(c), veh/h	1409	0	0	1007	0	0
V/C Ratio(X)	0.37	0.00	0.00	0.41	0.00	0.00
Avail Cap(c_a), veh/h	4202	0	0	3791	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.3	0.0	0.0	1.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	1.5	0.0	0.0	1.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		516	416		0	
Approach Delay, s/veh		1.5	1.5		0.0	
Approach LOS		A	A			

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		10.5		0.0	10.5
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		22.5		18.5	22.5
Max Q Clear Time (g_c+I1), s		3.7		0.0	3.4
Green Ext Time (p_c), s		2.7		0.0	2.1

Intersection Summary	
HCM 6th Ctrl Delay	1.5
HCM 6th LOS	A

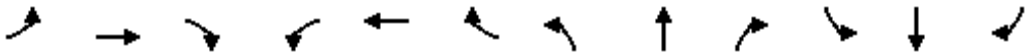
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	410	70	120	360	80
Future Volume (veh/h)	240	410	70	120	360	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	261	446	76	130	391	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	685	580	261	376	485	108
Arrive On Green	0.37	0.37	0.37	0.37	0.34	0.34
Sat Flow, veh/h	1870	1585	318	1027	1422	316
Grp Volume(v), veh/h	261	446	206	0	479	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1344	0	1742	0
Q Serve(g_s), s	3.5	8.5	0.1	0.0	8.5	0.0
Cycle Q Clear(g_c), s	3.5	8.5	3.6	0.0	8.5	0.0
Prop In Lane		1.00	0.37		0.82	0.18
Lane Grp Cap(c), veh/h	685	580	636	0	594	0
V/C Ratio(X)	0.38	0.77	0.32	0.00	0.81	0.00
Avail Cap(c_a), veh/h	1068	905	882	0	1046	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	8.0	9.5	7.7	0.0	10.2	0.0
Incr Delay (d2), s/veh	0.3	2.2	0.3	0.0	2.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.6	0.5	0.0	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.3	11.7	8.0	0.0	12.9	0.0
LnGrp LOS	A	B	A	A	B	A
Approach Vol, veh/h	707			206	479	
Approach Delay, s/veh	10.5			8.0	12.9	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		18.0		16.1		18.0
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		19.5		20.5		19.5
Max Q Clear Time (g_c+I1), s		10.5		10.5		5.6
Green Ext Time (p_c), s		2.0		1.1		1.0

Intersection Summary	
HCM 6th Ctrl Delay	10.9
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Future Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	109	261	130	33	239	22	228	174	54	22	54	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	355	159	135	584	50	384	235	65	130	218	358
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	264	952	427	99	1568	135	701	653	182	88	607	996
Grp Volume(v), veh/h	500	0	0	294	0	0	456	0	0	185	0	0
Grp Sat Flow(s),veh/h/ln	1642	0	0	1802	0	0	1536	0	0	1691	0	0
Q Serve(g_s), s	6.1	0.0	0.0	0.0	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.0	0.0	0.0	4.9	0.0	0.0	10.8	0.0	0.0	3.2	0.0	0.0
Prop In Lane	0.22		0.26	0.11		0.07	0.50		0.12	0.12		0.59
Lane Grp Cap(c), veh/h	719	0	0	769	0	0	684	0	0	706	0	0
V/C Ratio(X)	0.70	0.00	0.00	0.38	0.00	0.00	0.67	0.00	0.00	0.26	0.00	0.00
Avail Cap(c_a), veh/h	1093	0	0	1171	0	0	1008	0	0	1059	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.4	0.0	0.0	9.6	0.0	0.0	11.6	0.0	0.0	9.5	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.3	0.0	0.0	1.1	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	1.2	0.0	0.0	2.2	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	0.0	0.0	9.9	0.0	0.0	12.8	0.0	0.0	9.7	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	B	A	A	A	A	A
Approach Vol, veh/h		500			294			456			185	
Approach Delay, s/veh		12.6			9.9			12.8			9.7	
Approach LOS		B			A			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		20.8		20.3		20.8		20.3				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		25.1		23.9		25.1		23.9				
Max Q Clear Time (g_c+I1), s		13.0		12.8		6.9		5.2				
Green Ext Time (p_c), s		2.3		2.0		1.4		0.8				

Intersection Summary												
HCM 6th Ctrl Delay			11.7									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Future Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	142	0	0	0	0	23	166	0	0	379	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	601	601	389	672	611	166	399	0	0	166	0	0
Stage 1	389	389	-	212	212	-	-	-	-	-	-	-
Stage 2	212	212	-	460	399	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	414	415	661	370	409	878	1160	-	-	1412	-	-
Stage 1	637	610	-	790	727	-	-	-	-	-	-	-
Stage 2	792	729	-	581	602	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	407	406	661	265	400	878	1160	-	-	1412	-	-
Mov Cap-2 Maneuver	407	406	-	265	400	-	-	-	-	-	-	-
Stage 1	623	610	-	773	711	-	-	-	-	-	-	-
Stage 2	775	713	-	445	602	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.3	0	1	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1160	-	-	406	-	1412	-	-
HCM Lane V/C Ratio	0.02	-	-	0.428	-	-	-	-
HCM Control Delay (s)	8.2	0	-	20.3	0	0	-	-
HCM Lane LOS	A	A	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.1	-	0	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	79	152	253	77	94
Future Vol, veh/h	232	79	152	253	77	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	252	86	165	275	84	102

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	338	0	900	295
Stage 1	-	-	-	-	295	-
Stage 2	-	-	-	-	605	-
Critical Hdwy	-	-	4.12	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.218	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1221	-	310	747
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	547	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1221	-	260	747
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	459	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	21.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	405	-	-	1221	-
HCM Lane V/C Ratio	0.459	-	-	0.135	-
HCM Control Delay (s)	21.2	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.3	-	-	0.5	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Future Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	2	2	2	1	1	1	1	1	1
Mvmt Flow	12	65	42	14	48	17	34	205	22	25	456	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	834	812	467	854	811	216	477	0	0	227	0	0
Stage 1	517	517	-	284	284	-	-	-	-	-	-	-
Stage 2	317	295	-	570	527	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	290	315	600	279	313	824	1090	-	-	1347	-	-
Stage 1	545	537	-	723	676	-	-	-	-	-	-	-
Stage 2	698	673	-	506	528	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	237	296	600	206	294	824	1090	-	-	1347	-	-
Mov Cap-2 Maneuver	237	296	-	206	294	-	-	-	-	-	-	-
Stage 1	525	524	-	697	652	-	-	-	-	-	-	-
Stage 2	610	649	-	402	515	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.4	20.4	1.1	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1090	-	-	351	312	1347	-	-
HCM Lane V/C Ratio	0.031	-	-	0.339	0.253	0.019	-	-
HCM Control Delay (s)	8.4	0	-	20.4	20.4	7.7	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	1	0.1	-	-

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Future Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	1	1	1
Mvmt Flow	1	100	7	17	68	42	14	188	52	153	127	1

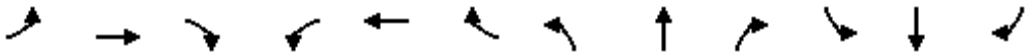
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	731	702	128	729	676	214	128	0	0	240	0	0
Stage 1	434	434	-	242	242	-	-	-	-	-	-	-
Stage 2	297	268	-	487	434	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	340	365	927	340	376	829	1458	-	-	1333	-	-
Stage 1	604	585	-	764	707	-	-	-	-	-	-	-
Stage 2	716	691	-	564	583	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	244	316	927	230	326	829	1458	-	-	1333	-	-
Mov Cap-2 Maneuver	244	316	-	230	326	-	-	-	-	-	-	-
Stage 1	597	512	-	756	699	-	-	-	-	-	-	-
Stage 2	607	683	-	394	511	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.2	19.2	0.4	4.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1458	-	-	330	380	1333	-	-
HCM Lane V/C Ratio	0.01	-	-	0.329	0.334	0.115	-	-
HCM Control Delay (s)	7.5	0	-	21.2	19.2	8.1	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.4	1.4	0.4	-	-

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Future Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	88	116	79	10	52	31	49	607	17	38	502	81
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	188	172	101	101	243	130	122	991	27	111	881	137
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	402	786	460	77	1109	593	69	1677	45	52	1491	231
Grp Volume(v), veh/h	283	0	0	93	0	0	673	0	0	621	0	0
Grp Sat Flow(s),veh/h/ln	1648	0	0	1779	0	0	1791	0	0	1774	0	0
Q Serve(g_s), s	5.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	7.6	0.0	0.0	2.0	0.0	0.0	10.8	0.0	0.0	9.9	0.0	0.0
Prop In Lane	0.31		0.28	0.11		0.33	0.07		0.03	0.06		0.13
Lane Grp Cap(c), veh/h	461	0	0	474	0	0	1140	0	0	1129	0	0
V/C Ratio(X)	0.61	0.00	0.00	0.20	0.00	0.00	0.59	0.00	0.00	0.55	0.00	0.00
Avail Cap(c_a), veh/h	719	0	0	746	0	0	1140	0	0	1129	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.3	0.0	0.0	15.2	0.0	0.0	6.2	0.0	0.0	6.0	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.2	0.0	0.0	2.3	0.0	0.0	1.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	0.6	0.0	0.0	2.2	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	0.0	0.0	15.4	0.0	0.0	8.4	0.0	0.0	7.9	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		283			93			673			621	
Approach Delay, s/veh		18.7			15.4			8.4			7.9	
Approach LOS		B			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.5		14.9		32.5		14.9				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		28.0		18.0		28.0		18.0				
Max Q Clear Time (g_c+I1), s		12.8		9.6		11.9		4.0				
Green Ext Time (p_c), s		3.6		0.9		3.4		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			10.4									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

04/20/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Future Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	320	970	536	80	593	126	235	273	124	205	240	160
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	469	1440	642	257	1180	526	312	340	288	279	300	254
Arrive On Green	0.14	0.41	0.41	0.07	0.33	0.33	0.11	0.18	0.18	0.09	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	320	970	536	80	593	126	235	273	124	205	240	160
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	10.4	20.9	28.5	2.7	12.5	5.4	10.4	13.1	6.5	8.5	11.6	8.8
Cycle Q Clear(g_c), s	10.4	20.9	28.5	2.7	12.5	5.4	10.4	13.1	6.5	8.5	11.6	8.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	469	1440	642	257	1180	526	312	340	288	279	300	254
V/C Ratio(X)	0.68	0.67	0.83	0.31	0.50	0.24	0.75	0.80	0.43	0.73	0.80	0.63
Avail Cap(c_a), veh/h	604	1774	791	275	1281	572	312	539	457	279	499	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	22.8	25.0	19.2	25.1	22.7	29.5	36.8	34.1	31.3	37.9	36.8
Incr Delay (d2), s/veh	2.1	0.7	6.4	0.7	0.3	0.2	9.8	4.7	1.0	9.6	5.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	7.9	11.2	1.0	4.9	2.0	5.1	6.3	2.5	4.5	5.6	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.9	23.5	31.5	19.9	25.4	23.0	39.4	41.4	35.1	40.9	42.9	39.3
LnGrp LOS	B	C	C	B	C	C	D	D	D	D	D	D
Approach Vol, veh/h		1826			799			632			605	
Approach Delay, s/veh		25.0			24.5			39.4			41.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	44.2	14.0	22.5	19.9	37.3	16.0	20.5
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	4.7	30.5	10.5	15.1	12.4	14.5	12.4	13.6
Green Ext Time (p_c), s	0.0	7.5	0.0	1.5	0.6	3.8	0.0	1.4

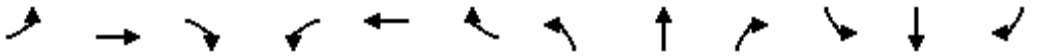
Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

04/20/2020



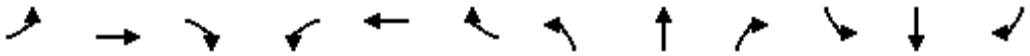
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Future Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	919	151	35	547	70	108	132	24	114	242	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	526	1869	307	325	2174	969	233	380	69	307	461	391
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	806	3055	502	527	3554	1585	1062	1540	280	1231	1870	1585
Grp Volume(v), veh/h	116	534	536	35	547	70	108	0	156	114	242	76
Grp Sat Flow(s),veh/h/ln	806	1777	1780	527	1777	1585	1062	0	1820	1231	1870	1585
Q Serve(g_s), s	6.2	13.3	13.3	3.2	5.6	1.4	7.8	0.0	5.6	6.7	8.9	3.0
Cycle Q Clear(g_c), s	11.8	13.3	13.3	16.5	5.6	1.4	16.7	0.0	5.6	12.3	8.9	3.0
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	526	1087	1089	325	2174	969	233	0	449	307	461	391
V/C Ratio(X)	0.22	0.49	0.49	0.11	0.25	0.07	0.46	0.00	0.35	0.37	0.52	0.19
Avail Cap(c_a), veh/h	526	1087	1089	325	2174	969	369	0	682	465	701	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	8.6	8.6	13.2	7.1	6.3	33.2	0.0	24.8	29.8	26.0	23.8
Incr Delay (d2), s/veh	1.0	1.6	1.6	0.7	0.3	0.1	1.4	0.0	0.5	0.7	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	4.2	4.2	0.4	1.6	0.4	2.0	0.0	2.4	2.0	3.9	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.8	10.2	10.2	13.9	7.4	6.4	34.7	0.0	25.2	30.6	26.9	24.0
LnGrp LOS	B	B	B	B	A	A	C	A	C	C	C	C
Approach Vol, veh/h		1186			652			264			432	
Approach Delay, s/veh		10.3			7.6			29.1			27.4	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		24.8		55.0		24.8				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		15.3		18.7		18.5		14.3				
Green Ext Time (p_c), s		8.3		0.9		4.1		1.8				

Intersection Summary												
HCM 6th Ctrl Delay			14.5									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	8	682	5	17	345	19	5	4	26	41	17	7
Future Volume (veh/h)	8	682	5	17	345	19	5	4	26	41	17	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1811	1811	1811	1870	1870	1870
Adj Flow Rate, veh/h	9	745	5	19	377	21	6	4	29	46	19	8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	6	6	6	2	2	2
Cap, veh/h	86	922	6	101	840	45	114	71	265	323	122	38
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	6	1844	12	30	1679	91	88	314	1167	835	535	169
Grp Volume(v), veh/h	759	0	0	417	0	0	39	0	0	73	0	0
Grp Sat Flow(s),veh/h/ln	1863	0	0	1800	0	0	1570	0	0	1540	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Cycle Q Clear(g_c), s	15.1	0.0	0.0	6.5	0.0	0.0	0.9	0.0	0.0	1.5	0.0	0.0
Prop In Lane	0.01		0.01	0.05		0.05	0.15		0.74	0.63		0.11
Lane Grp Cap(c), veh/h	1014	0	0	986	0	0	451	0	0	483	0	0
V/C Ratio(X)	0.75	0.00	0.00	0.42	0.00	0.00	0.09	0.00	0.00	0.15	0.00	0.00
Avail Cap(c_a), veh/h	1686	0	0	1608	0	0	624	0	0	654	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.3	0.0	0.0	7.1	0.0	0.0	13.5	0.0	0.0	13.7	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	0.0	1.4	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.4	0.0	0.0	7.4	0.0	0.0	13.6	0.0	0.0	13.8	0.0	0.0
LnGrp LOS	B	A	A	A	A	A	B	A	A	B	A	A
Approach Vol, veh/h		759			417			39			73	
Approach Delay, s/veh		10.4			7.4			13.6			13.8	
Approach LOS		B			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.0		15.0		29.0		15.0				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		38.0		15.0		38.0		15.0				
Max Q Clear Time (g_c+I1), s		17.1		2.9		8.5		3.5				
Green Ext Time (p_c), s		5.0		0.1		2.5		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			9.7									
HCM 6th LOS			A									

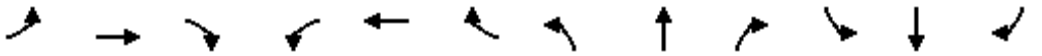
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	150	310	630	110	340
Future Volume (veh/h)	880	150	310	630	110	340
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1023	174	361	733	138	425
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1650	280	444	2563	297	459
Arrive On Green	0.54	0.54	0.25	1.00	0.17	0.17
Sat Flow, veh/h	3132	516	1781	3647	1781	1585
Grp Volume(v), veh/h	598	599	361	733	138	425
Grp Sat Flow(s),veh/h/ln	1777	1777	1781	1777	1781	1585
Q Serve(g_s), s	20.8	20.9	8.2	0.0	6.3	15.0
Cycle Q Clear(g_c), s	20.8	20.9	8.2	0.0	6.3	15.0
Prop In Lane		0.29	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	965	965	444	2563	297	459
V/C Ratio(X)	0.62	0.62	0.81	0.29	0.46	0.93
Avail Cap(c_a), veh/h	965	965	621	2563	297	459
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	14.2	14.2	11.6	0.0	33.9	31.1
Incr Delay (d2), s/veh	3.0	3.0	4.6	0.2	1.1	25.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	8.3	3.6	0.1	2.7	21.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.2	17.2	16.2	0.2	35.0	56.1
LnGrp LOS	B	B	B	A	D	E
Approach Vol, veh/h	1197			1094	563	
Approach Delay, s/veh	17.2			5.5	50.9	
Approach LOS	B			A	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	16.0	54.0		20.0		70.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	20.0	39.9		15.0		64.9
Max Q Clear Time (g_c+I1), s	10.2	22.9		17.0		2.0
Green Ext Time (p_c), s	0.8	4.0		0.0		2.8

Intersection Summary		
HCM 6th Ctrl Delay		19.4
HCM 6th LOS		B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Future Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	279	954	128	93	628	70	118	107	118	157	170	404
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	429	1279	172	341	1202	134	333	404	342	419	418	354
Arrive On Green	0.21	0.81	0.81	0.07	0.37	0.37	0.07	0.22	0.22	0.08	0.22	0.22
Sat Flow, veh/h	1781	3149	422	1781	3224	359	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	279	538	544	93	346	352	118	107	118	157	170	404
Grp Sat Flow(s),veh/h/ln	1781	1777	1794	1781	1777	1806	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.3	13.0	13.0	2.8	13.6	13.7	4.5	4.3	5.7	6.1	7.0	20.1
Cycle Q Clear(g_c), s	9.3	13.0	13.0	2.8	13.6	13.7	4.5	4.3	5.7	6.1	7.0	20.1
Prop In Lane	1.00		0.24	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	429	722	729	341	663	673	333	404	342	419	418	354
V/C Ratio(X)	0.65	0.75	0.75	0.27	0.52	0.52	0.35	0.26	0.34	0.37	0.41	1.14
Avail Cap(c_a), veh/h	429	722	729	361	663	673	347	418	354	419	418	354
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.68	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	6.2	6.2	15.4	22.0	22.0	24.6	29.3	29.9	24.5	29.9	35.0
Incr Delay (d2), s/veh	2.4	4.8	4.7	0.4	2.9	2.9	0.6	0.3	0.6	0.6	0.6	92.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.2	3.2	1.1	5.9	6.0	1.9	1.9	2.2	2.5	3.1	16.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	11.0	11.0	15.8	24.9	24.9	25.2	29.7	30.5	25.1	30.5	126.9
LnGrp LOS	B	B	B	B	C	C	C	C	C	C	C	F
Approach Vol, veh/h		1361			791			343			731	
Approach Delay, s/veh		12.2			23.8			28.4			82.6	
Approach LOS		B			C			C			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	41.7	12.0	24.3	15.0	38.7	11.3	25.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 7.3	34.9	* 7.3	20.1	* 9.3	32.9	* 7.3	20.1
Max Q Clear Time (g_c+I1), s	4.8	15.0	8.1	7.7	11.3	15.7	6.5	22.1
Green Ext Time (p_c), s	0.0	7.1	0.0	0.7	0.0	3.9	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

04/20/2020

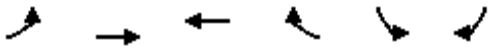
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Future Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	675	70	105	372	12	48	191	120	36	143	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	632	1206	1022	398	1161	37	185	249	157	151	218	183
Arrive On Green	0.64	0.64	0.64	0.64	0.64	0.64	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	999	1870	1585	715	1802	58	1116	1074	675	1068	940	789
Grp Volume(v), veh/h	163	675	70	105	0	384	48	0	311	36	0	263
Grp Sat Flow(s),veh/h/ln	999	1870	1585	715	0	1860	1116	0	1749	1068	0	1728
Q Serve(g_s), s	7.9	18.1	1.5	8.6	0.0	8.3	3.7	0.0	14.9	2.9	0.0	12.4
Cycle Q Clear(g_c), s	16.2	18.1	1.5	26.7	0.0	8.3	16.1	0.0	14.9	17.9	0.0	12.4
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.39	1.00		0.46
Lane Grp Cap(c), veh/h	632	1206	1022	398	0	1199	185	0	406	151	0	401
V/C Ratio(X)	0.26	0.56	0.07	0.26	0.00	0.32	0.26	0.00	0.77	0.24	0.00	0.66
Avail Cap(c_a), veh/h	632	1206	1022	398	0	1199	297	0	581	258	0	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.8	8.9	5.9	16.3	0.0	7.2	38.6	0.0	32.3	40.6	0.0	31.3
Incr Delay (d2), s/veh	1.0	1.9	0.1	1.6	0.0	0.7	0.7	0.0	3.8	0.8	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.8	0.4	1.4	0.0	2.6	1.0	0.0	6.2	0.8	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	10.8	6.1	17.9	0.0	7.9	39.3	0.0	36.1	41.4	0.0	33.1
LnGrp LOS	B	B	A	B	A	A	D	A	D	D	A	C
Approach Vol, veh/h		908			489			359			299	
Approach Delay, s/veh		10.6			10.0			36.5			34.1	
Approach LOS		B			B			D			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		64.0		26.0		64.0		26.0				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		20.1		18.1		28.7		19.9				
Green Ext Time (p_c), s		5.3		1.4		2.7		1.0				

Intersection Summary		
HCM 6th Ctrl Delay		18.4
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	432	215	159	181	44
Future Volume (veh/h)	32	432	215	159	181	44
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1900	1900	1885	1900
Adj Flow Rate, veh/h	38	514	256	189	211	51
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	0	0	1	0
Cap, veh/h	387	1041	600	443	0	0
Arrive On Green	0.59	0.59	0.59	0.59	0.00	0.00
Sat Flow, veh/h	62	1763	1015	750	0	0
Grp Volume(v), veh/h	552	0	0	445	0	0
Grp Sat Flow(s),veh/h/ln	1825	0	0	1765	0	0
Q Serve(g_s), s	0.0	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	1.9	0.0	0.0	1.5	0.0	0.0
Prop In Lane	0.07			0.42	0.00	0.00
Lane Grp Cap(c), veh/h	1428	0	0	1042	0	0
V/C Ratio(X)	0.39	0.00	0.00	0.43	0.00	0.00
Avail Cap(c_a), veh/h	4001	0	0	3614	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.3	0.0	0.0	1.2	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	1.5	0.0	0.0	1.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		552	445		0	
Approach Delay, s/veh		1.5	1.5		0.0	
Approach LOS		A	A			

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		11.0		0.0	11.0
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		22.5		18.5	22.5
Max Q Clear Time (g_c+I1), s		3.9		0.0	3.5
Green Ext Time (p_c), s		3.0		0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	1.5
HCM 6th LOS	A

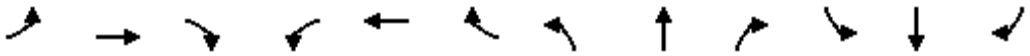
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	410	70	120	360	80
Future Volume (veh/h)	240	410	70	120	360	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	279	477	81	140	411	91
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	706	598	249	368	497	110
Arrive On Green	0.38	0.38	0.38	0.38	0.35	0.35
Sat Flow, veh/h	1870	1585	304	974	1424	315
Grp Volume(v), veh/h	279	477	221	0	503	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1278	0	1742	0
Q Serve(g_s), s	4.0	9.8	0.2	0.0	9.7	0.0
Cycle Q Clear(g_c), s	4.0	9.8	4.2	0.0	9.7	0.0
Prop In Lane		1.00	0.37		0.82	0.18
Lane Grp Cap(c), veh/h	706	598	617	0	609	0
V/C Ratio(X)	0.40	0.80	0.36	0.00	0.83	0.00
Avail Cap(c_a), veh/h	997	845	798	0	976	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	8.3	10.1	8.1	0.0	10.9	0.0
Incr Delay (d2), s/veh	0.4	3.6	0.4	0.0	3.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.2	0.6	0.0	2.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.7	13.8	8.4	0.0	14.1	0.0
LnGrp LOS	A	B	A	A	B	A
Approach Vol, veh/h	756			221	503	
Approach Delay, s/veh	11.9			8.4	14.1	
Approach LOS	B			A	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		19.3		17.3		19.3
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		19.5		20.5		19.5
Max Q Clear Time (g_c+I1), s		11.8		11.7		6.2
Green Ext Time (p_c), s		2.0		1.1		1.1

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

04/20/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Future Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	279	140	35	256	23	281	214	67	27	68	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	190	350	161	116	578	49	402	248	74	118	249	412
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	278	938	431	102	1550	131	721	602	179	95	604	1001
Grp Volume(v), veh/h	535	0	0	314	0	0	562	0	0	231	0	0
Grp Sat Flow(s),veh/h/ln	1647	0	0	1782	0	0	1502	0	0	1700	0	0
Q Serve(g_s), s	8.5	0.0	0.0	0.0	0.0	0.0	12.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	15.1	0.0	0.0	6.6	0.0	0.0	17.7	0.0	0.0	4.8	0.0	0.0
Prop In Lane	0.22		0.26	0.11		0.07	0.50		0.12	0.12		0.59
Lane Grp Cap(c), veh/h	700	0	0	743	0	0	724	0	0	778	0	0
V/C Ratio(X)	0.76	0.00	0.00	0.42	0.00	0.00	0.78	0.00	0.00	0.30	0.00	0.00
Avail Cap(c_a), veh/h	885	0	0	941	0	0	804	0	0	867	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.5	0.0	0.0	12.1	0.0	0.0	13.7	0.0	0.0	10.2	0.0	0.0
Incr Delay (d2), s/veh	3.1	0.0	0.0	0.4	0.0	0.0	4.4	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	0.0	1.9	0.0	0.0	4.6	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	0.0	0.0	12.5	0.0	0.0	18.1	0.0	0.0	10.5	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		535			314			562			231	
Approach Delay, s/veh		17.6			12.5			18.1			10.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		24.6		26.5		24.6		26.5				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		25.1		23.9		25.1		23.9				
Max Q Clear Time (g_c+I1), s		17.1		19.7		8.6		6.8				
Green Ext Time (p_c), s		2.0		1.3		1.4		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			15.8									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Future Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	150	0	0	0	0	29	208	0	0	474	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	752	752	486	827	764	208	498	0	0	208	0	0
Stage 1	486	486	-	266	266	-	-	-	-	-	-	-
Stage 2	266	266	-	561	498	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	328	340	583	291	334	832	1066	-	-	1363	-	-
Stage 1	565	553	-	739	689	-	-	-	-	-	-	-
Stage 2	742	691	-	512	544	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	320	329	583	183	324	832	1066	-	-	1363	-	-
Mov Cap-2 Maneuver	320	329	-	183	324	-	-	-	-	-	-	-
Stage 1	547	553	-	716	668	-	-	-	-	-	-	-
Stage 2	719	670	-	374	544	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.1	0	1	0
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1066	-	-	327	-	1363	-	-
HCM Lane V/C Ratio	0.027	-	-	0.558	-	-	-	-
HCM Control Delay (s)	8.5	0	-	29.1	0	0	-	-
HCM Lane LOS	A	A	-	D	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.2	-	0	-	-

Intersection	
Int Delay, s/veh	6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	79	152	253	77	94
Future Vol, veh/h	232	79	152	253	77	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	265	90	173	289	88	107

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	355	0	945	310
Stage 1	-	-	-	-	310	-
Stage 2	-	-	-	-	635	-
Critical Hdwy	-	-	4.12	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.218	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1204	-	292	732
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	530	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1204	-	242	732
Mov Cap-2 Maneuver	-	-	-	-	242	-
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	439	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	23.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	383	-	-	1204	-
HCM Lane V/C Ratio	0.51	-	-	0.144	-
HCM Control Delay (s)	23.8	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.8	-	-	0.5	-

APPENDIX D
ITE TRIP GENERATION

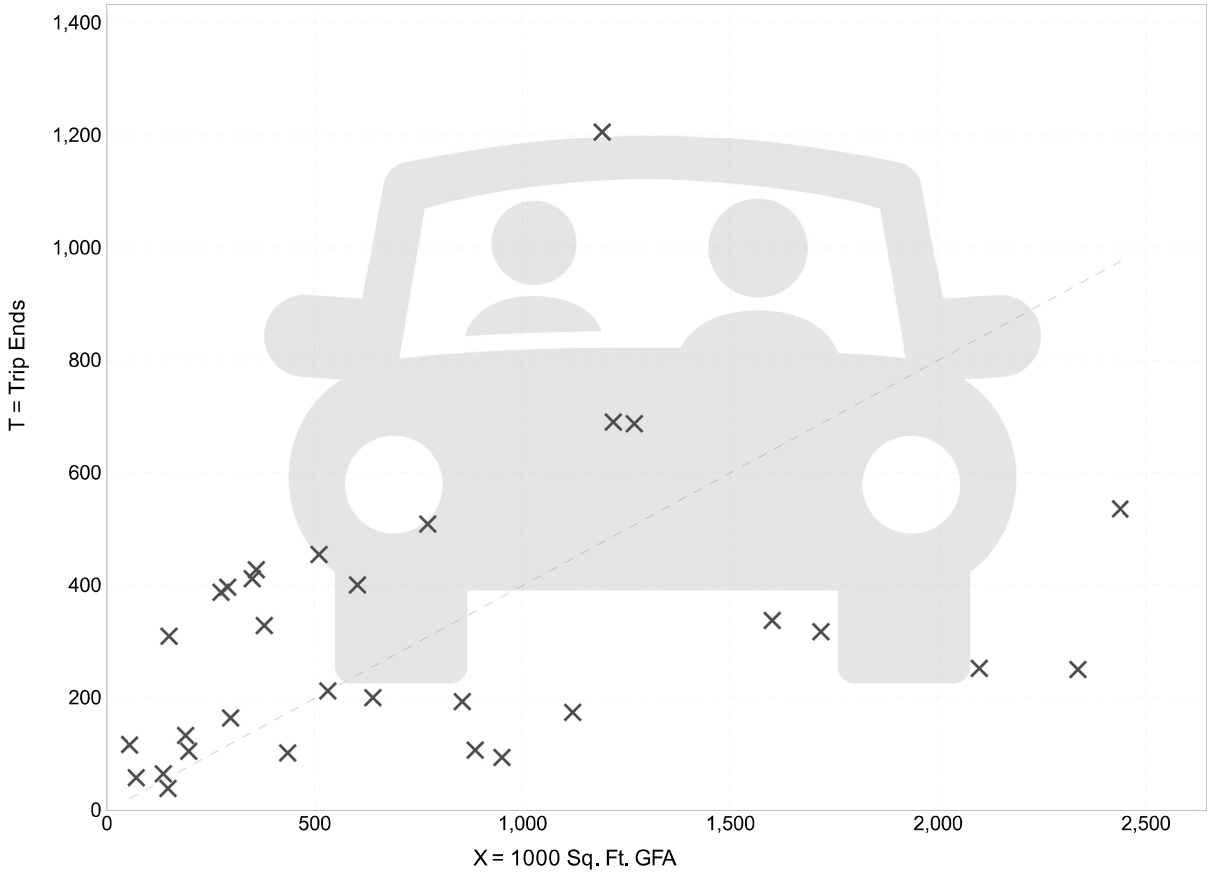
Industrial Park
(130)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. 1000 Sq. Ft. GFA: 776
Directional Distribution: 81% entering, 19% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.40	0.10 - 2.13	0.37

Data Plot and Equation



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Industrial Park
(130)

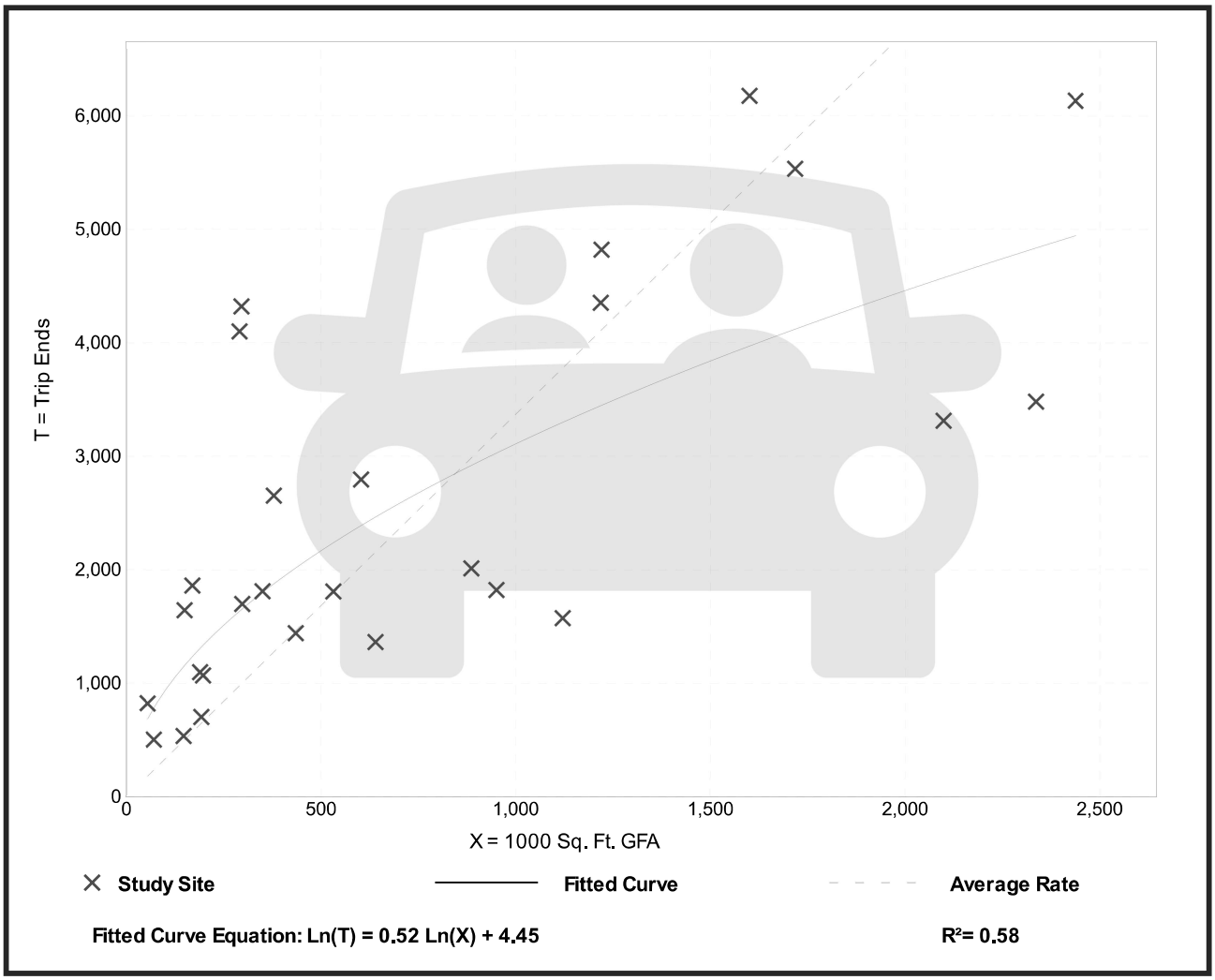
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 27
Avg. 1000 Sq. Ft. GFA: 762
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.37	1.41 - 14.98	2.60

Data Plot and Equation



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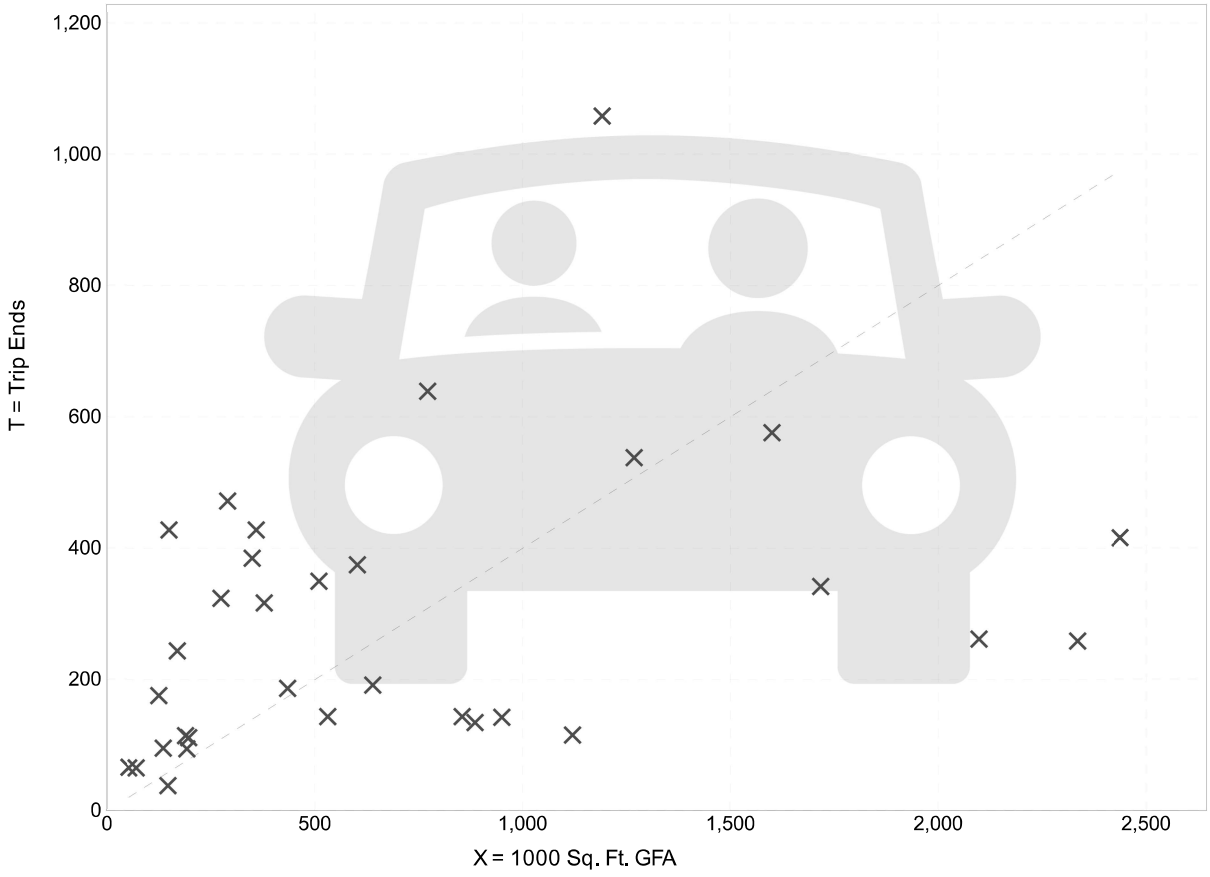
Industrial Park
(130)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 32
Avg. 1000 Sq. Ft. GFA: 720
Directional Distribution: 21% entering, 79% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.40	0.10 - 2.85	0.41

Data Plot and Equation



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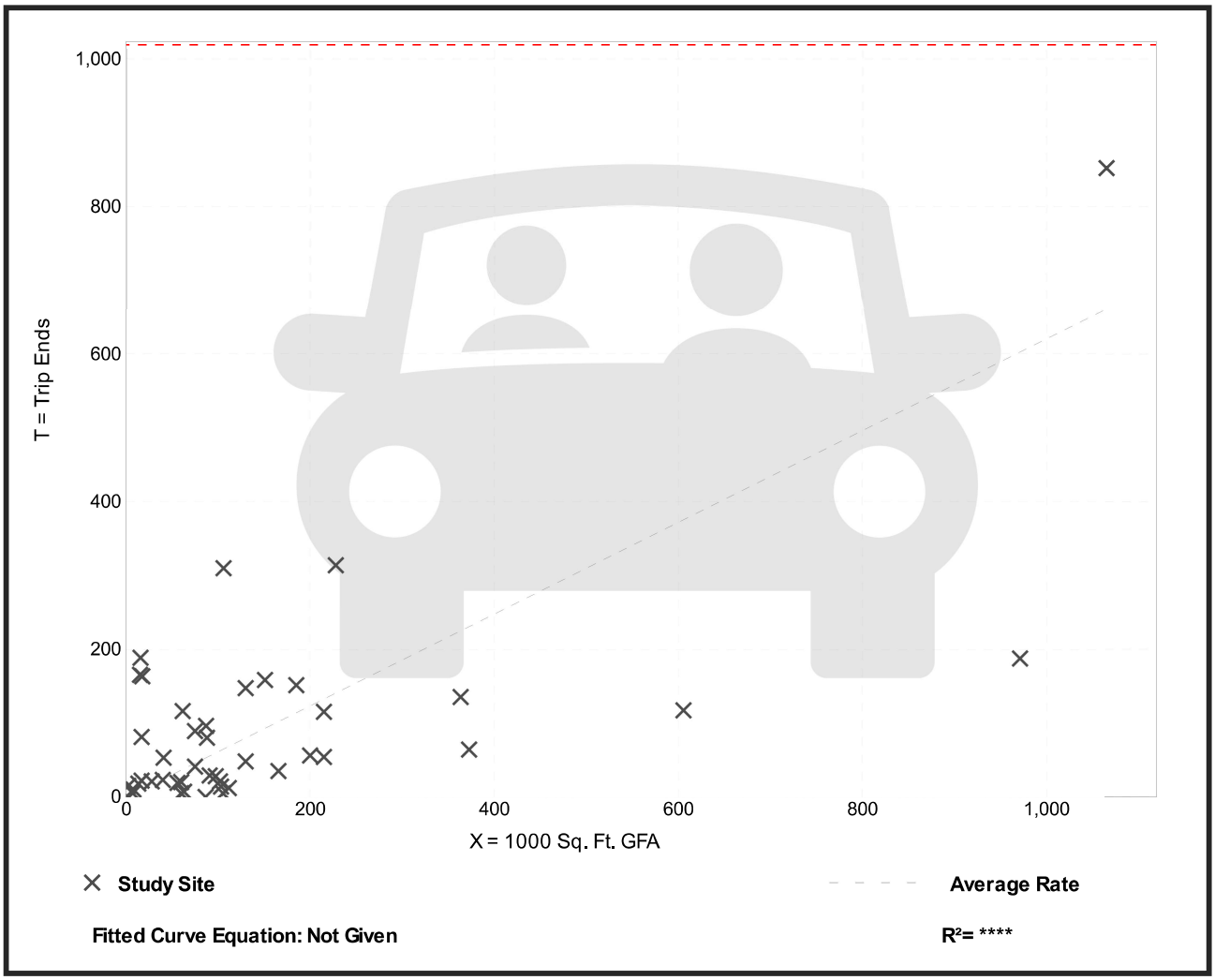
Manufacturing
(140)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 45
Avg. 1000 Sq. Ft. GFA: 149
Directional Distribution: 77% entering, 23% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.62	0.01 - 11.93	1.03

Data Plot and Equation



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Manufacturing
(140)

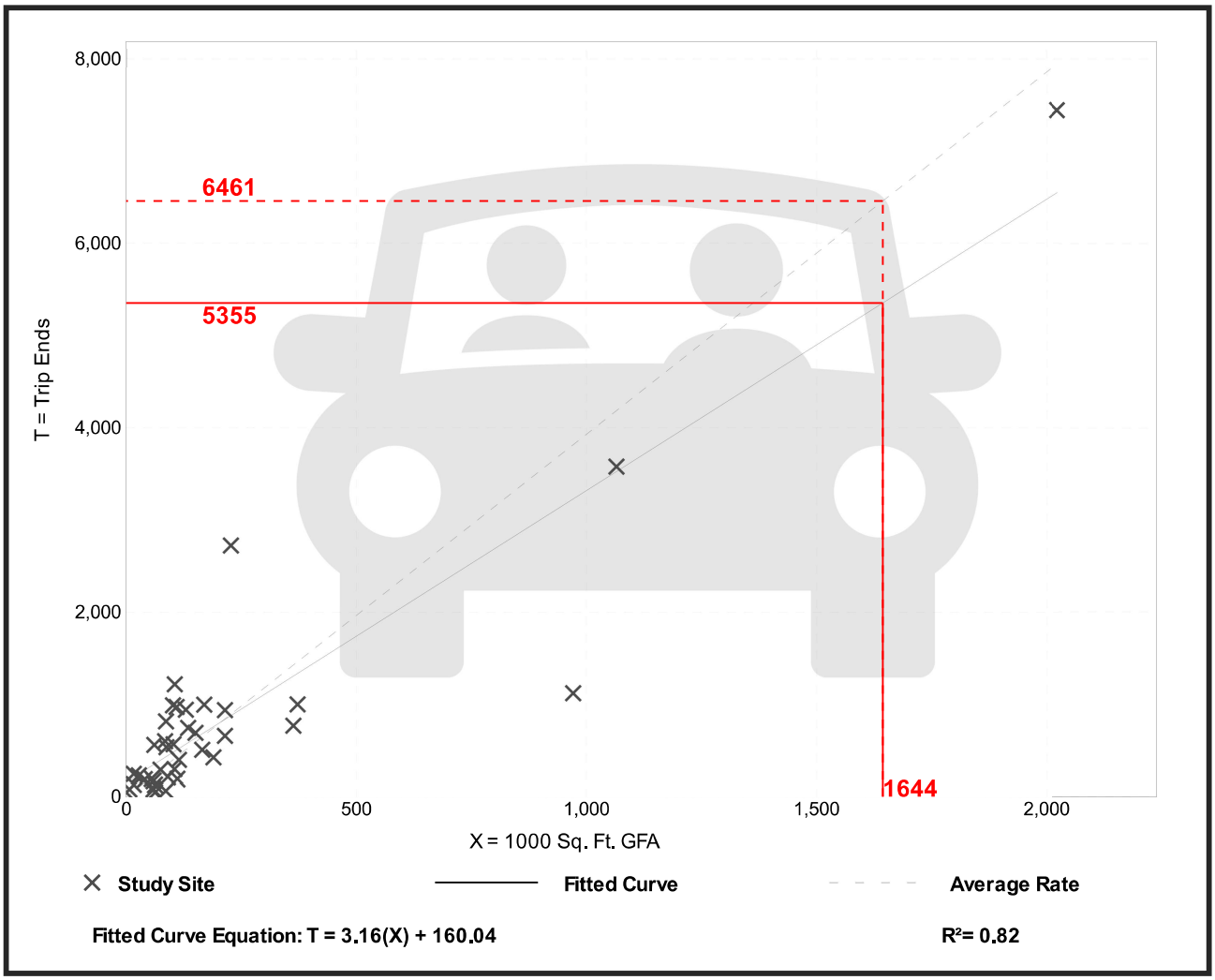
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 39
Avg. 1000 Sq. Ft. GFA: 209
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.93	0.83 - 49.50	2.62

Data Plot and Equation



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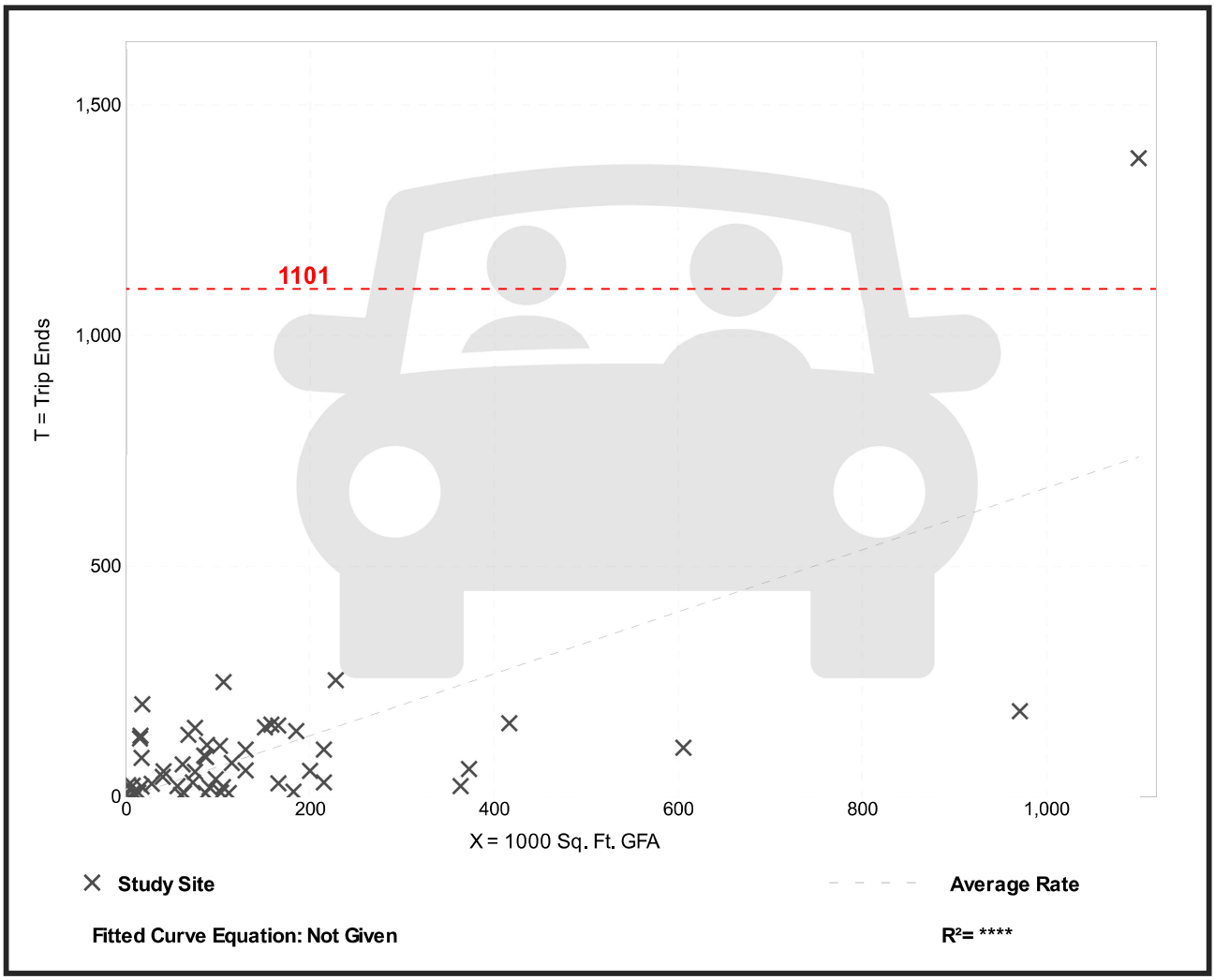
Manufacturing
(140)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 52
Avg. 1000 Sq. Ft. GFA: 152
Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.67	0.07 - 11.37	0.94

Data Plot and Equation



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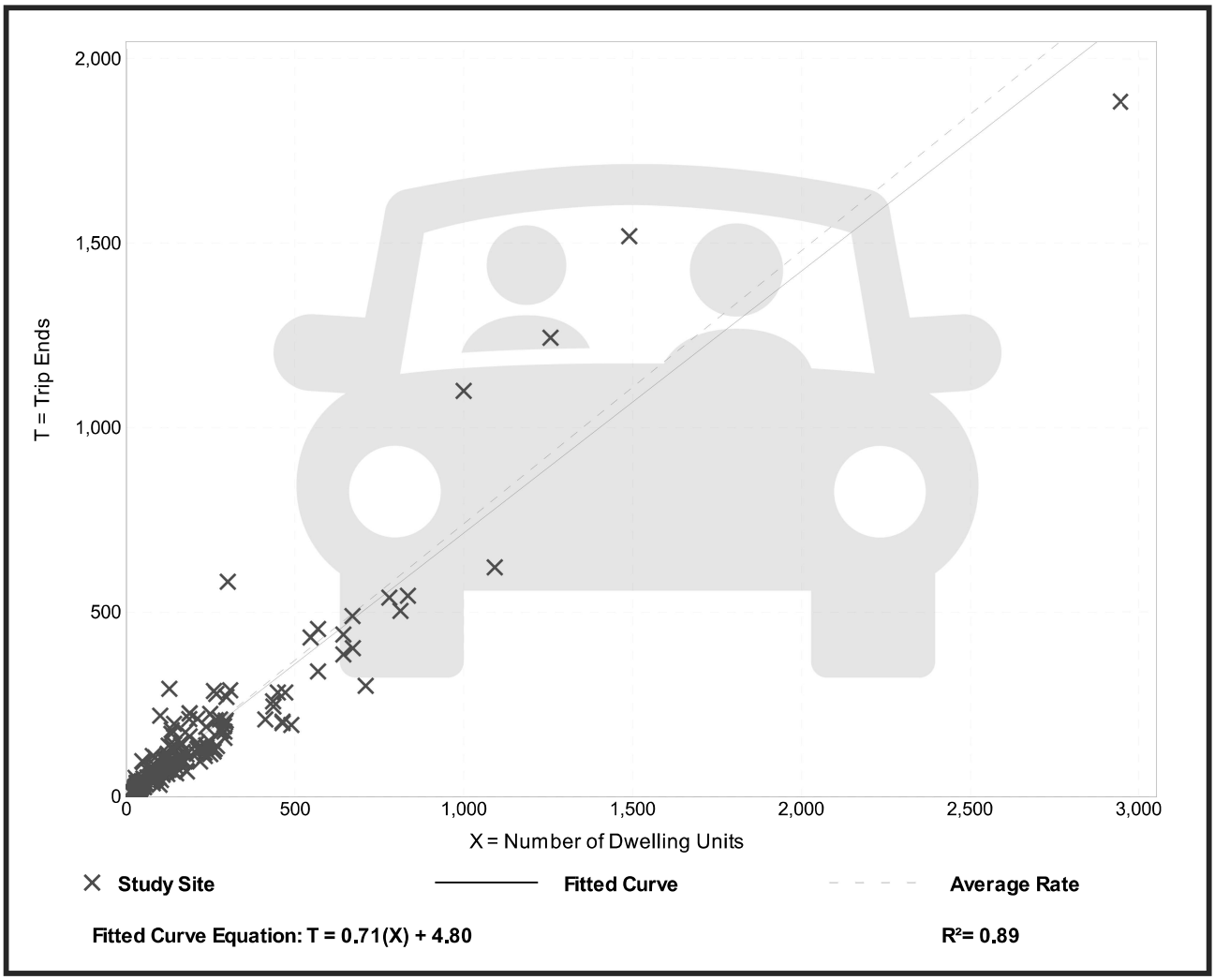
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 173
Avg. Num. of Dwelling Units: 219
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



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Single-Family Detached Housing
(210)

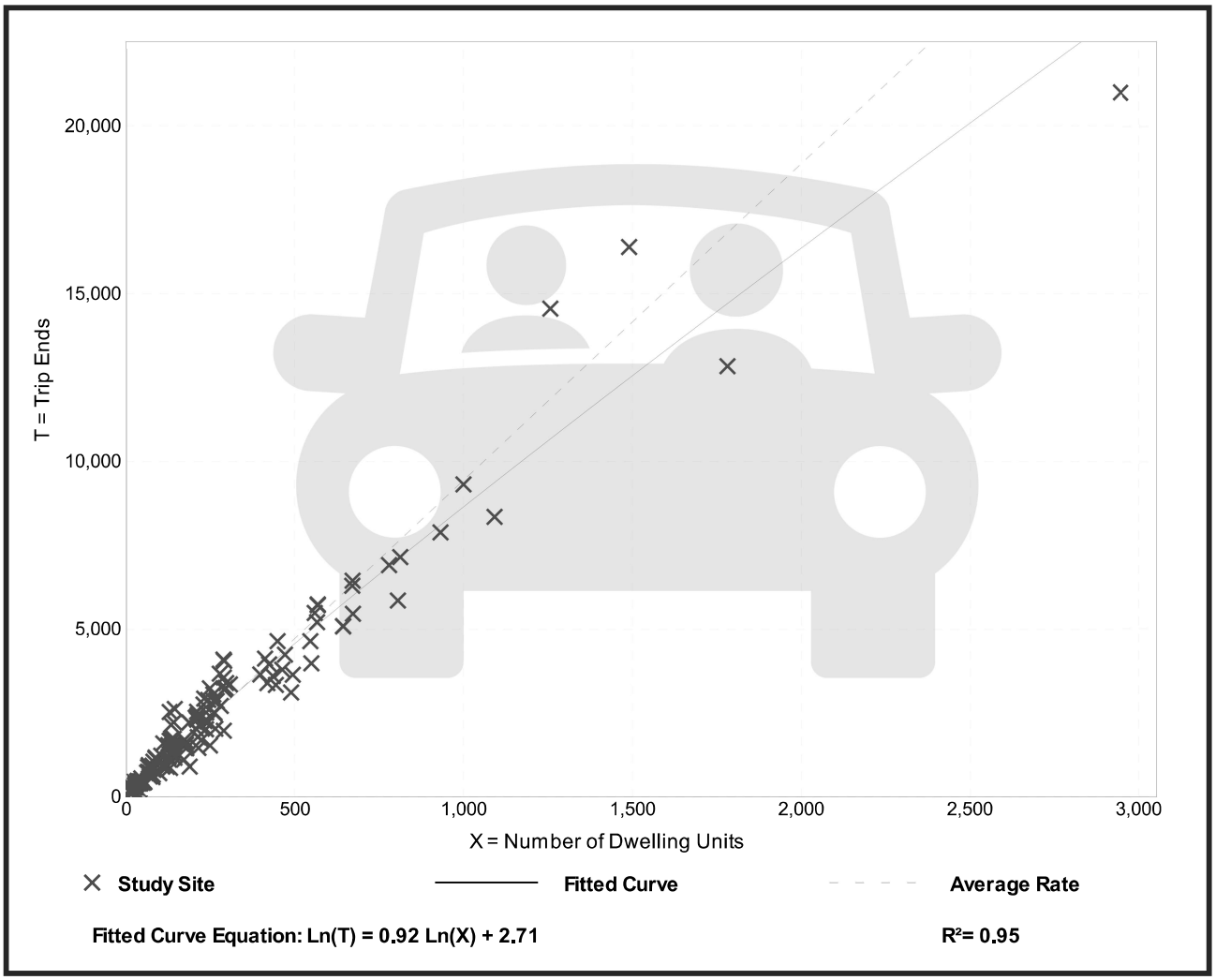
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



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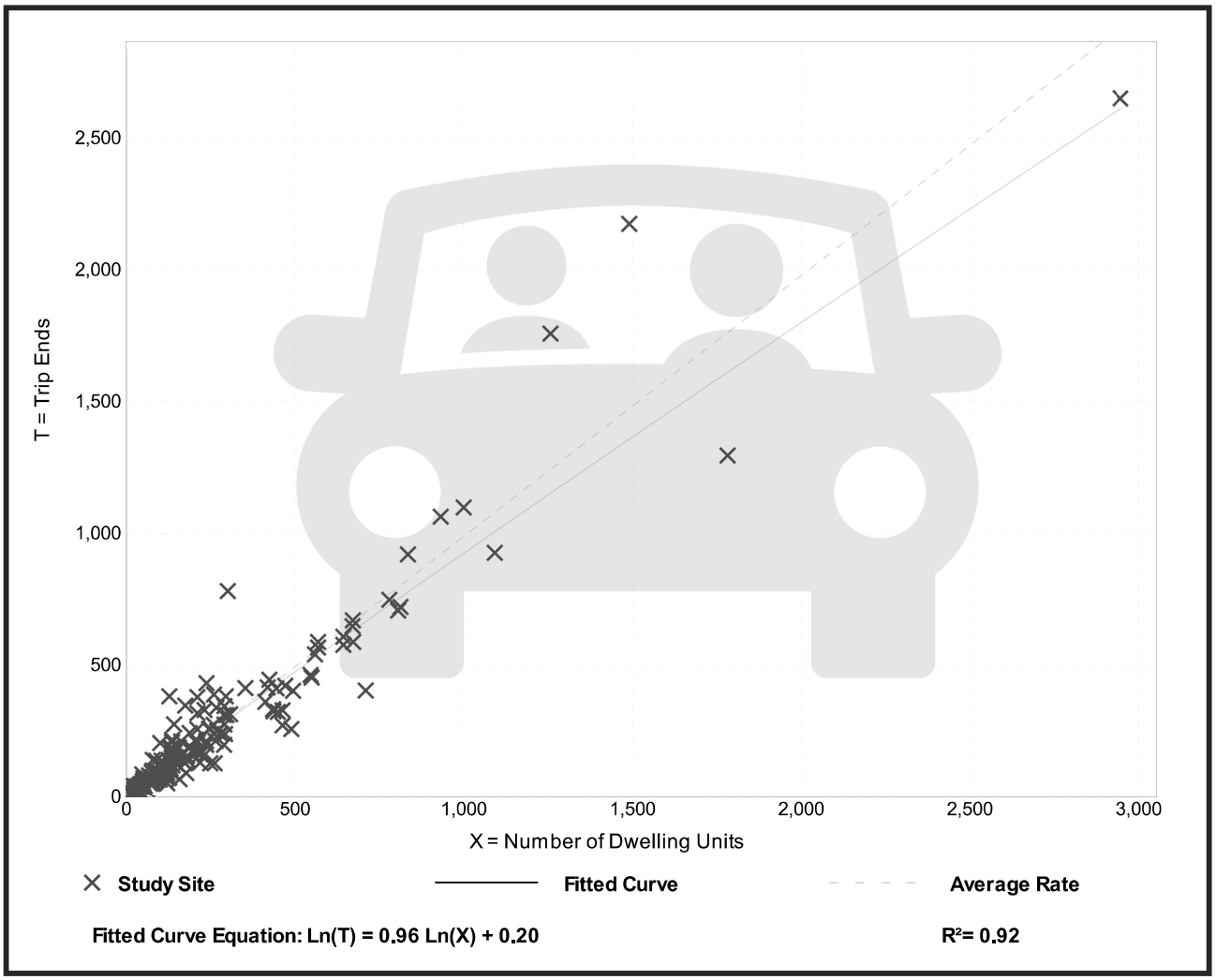
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 190
Avg. Num. of Dwelling Units: 242
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



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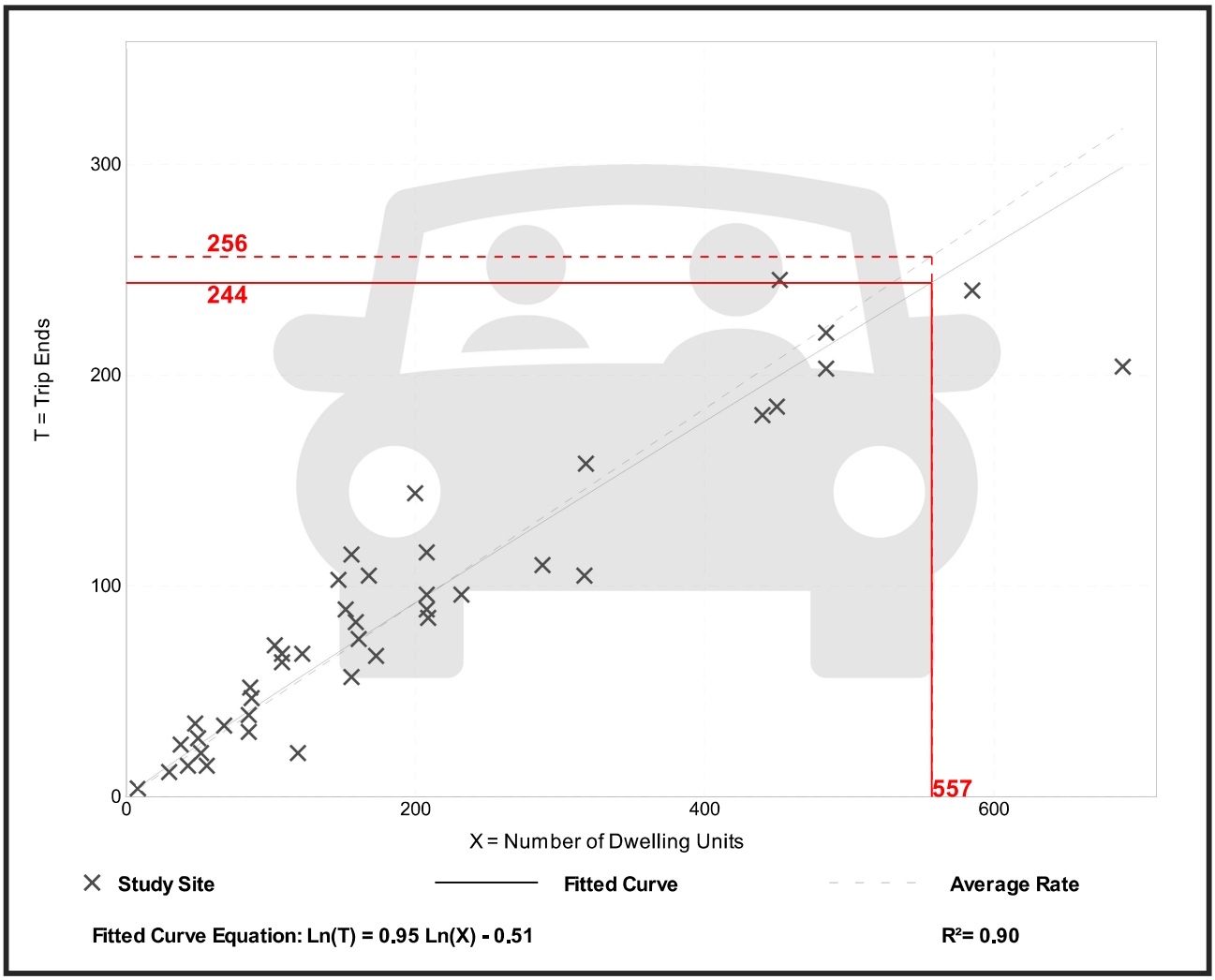
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 42
Avg. Num. of Dwelling Units: 199
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



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Multifamily Housing (Low-Rise)
(220)

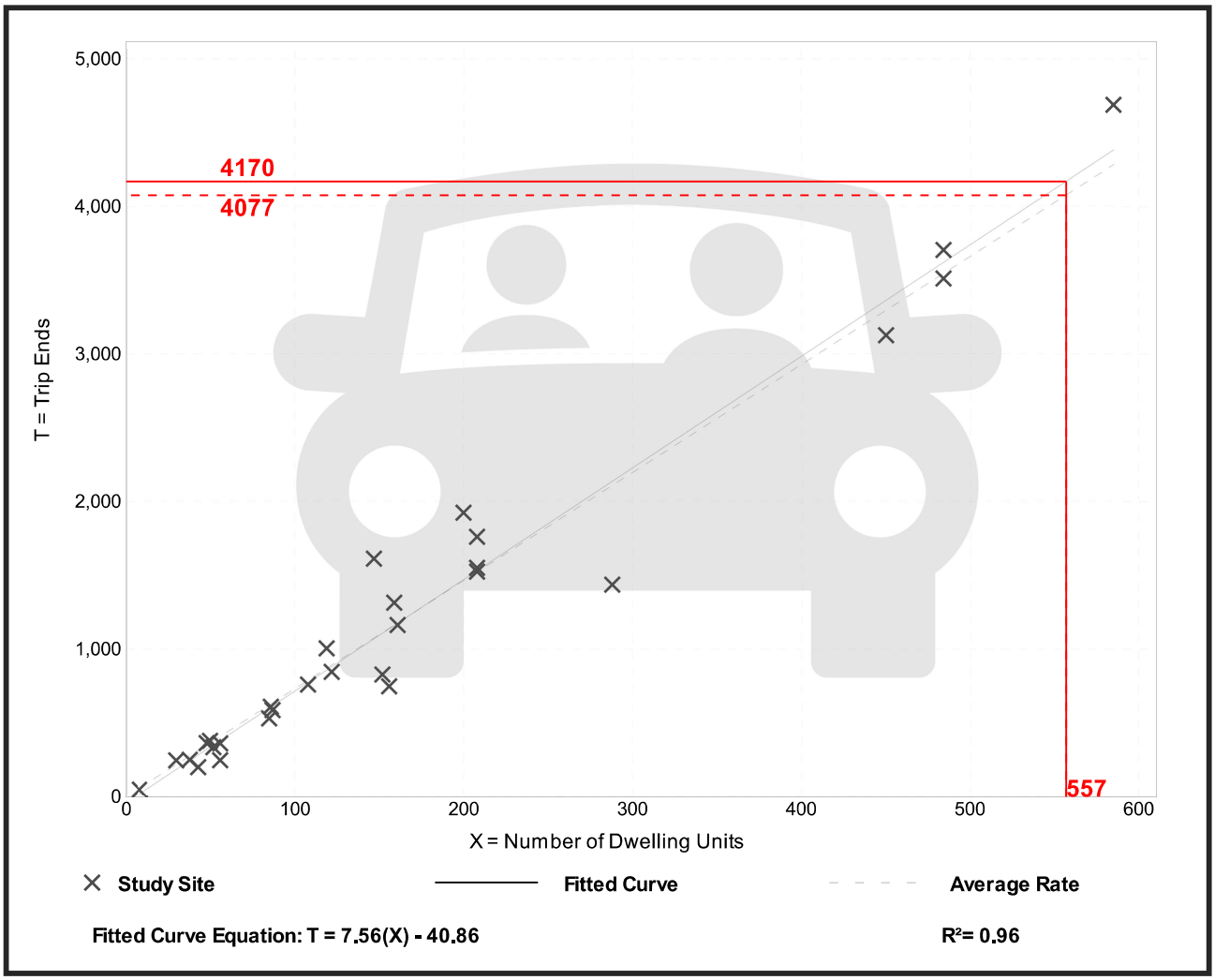
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 29
Avg. Num. of Dwelling Units: 168
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.32	4.45 - 10.97	1.31

Data Plot and Equation



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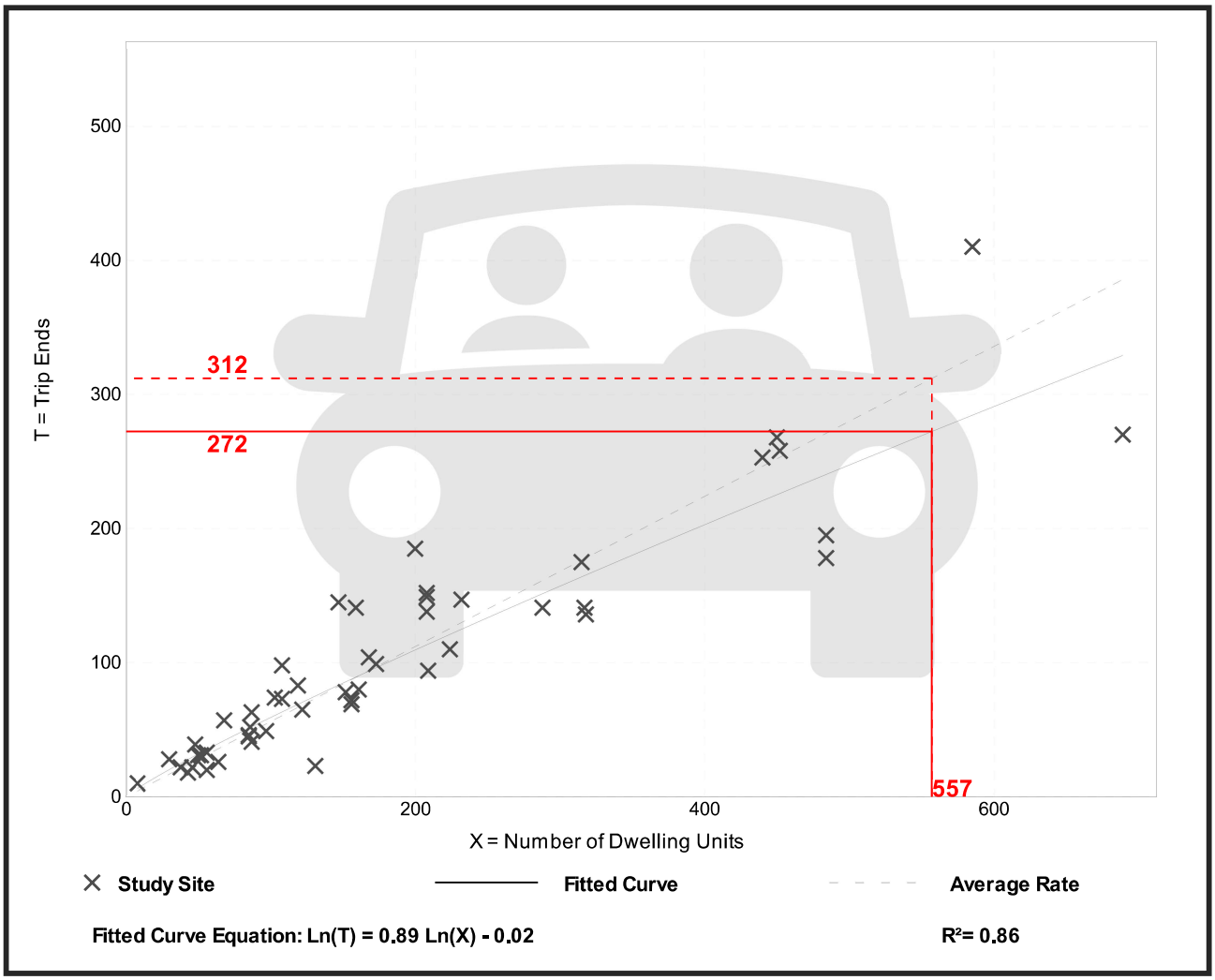
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 50
Avg. Num. of Dwelling Units: 187
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



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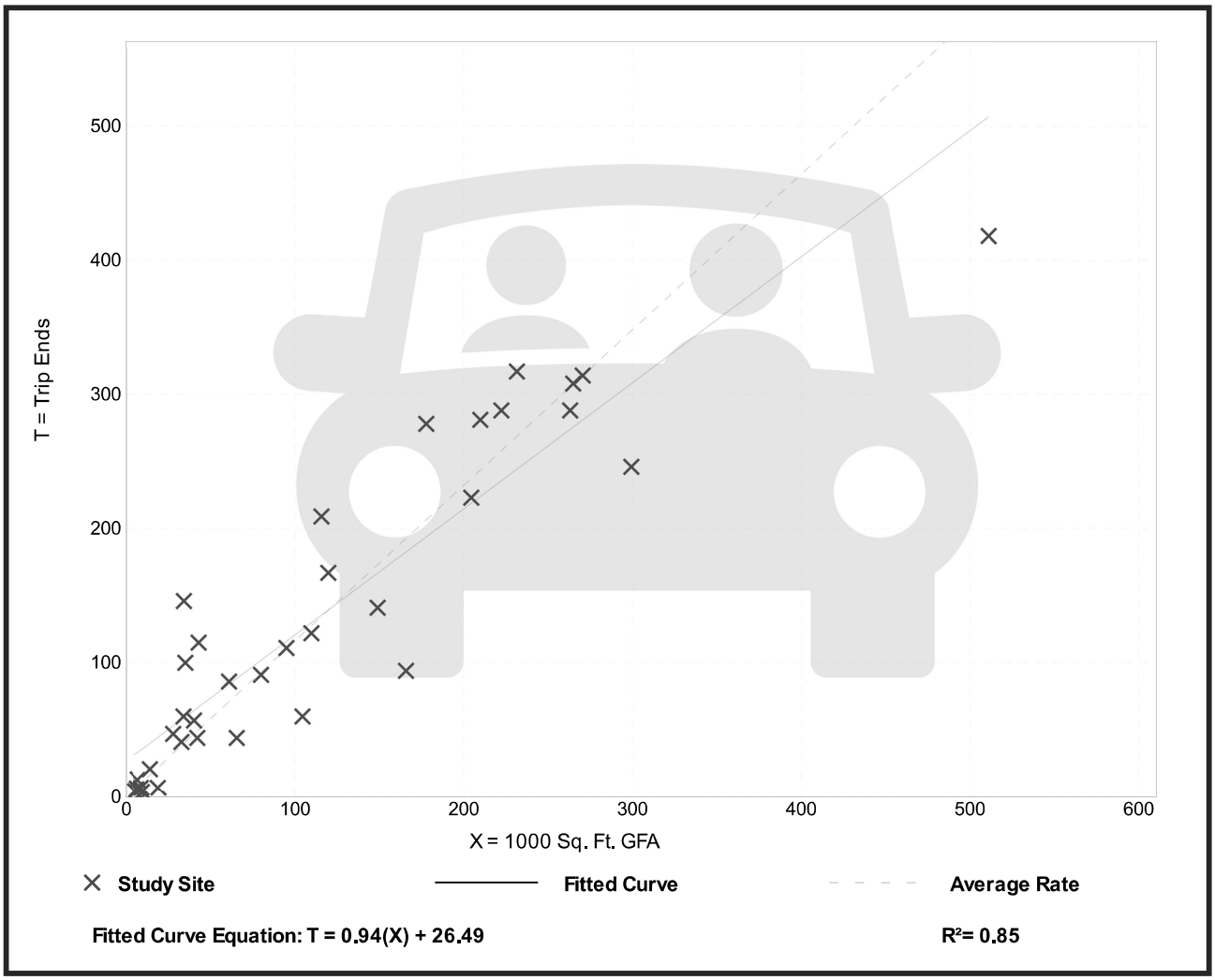
General Office Building
(710)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 35
Avg. 1000 Sq. Ft. GFA: 117
Directional Distribution: 86% entering, 14% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.16	0.37 - 4.23	0.47

Data Plot and Equation



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General Office Building
(710)

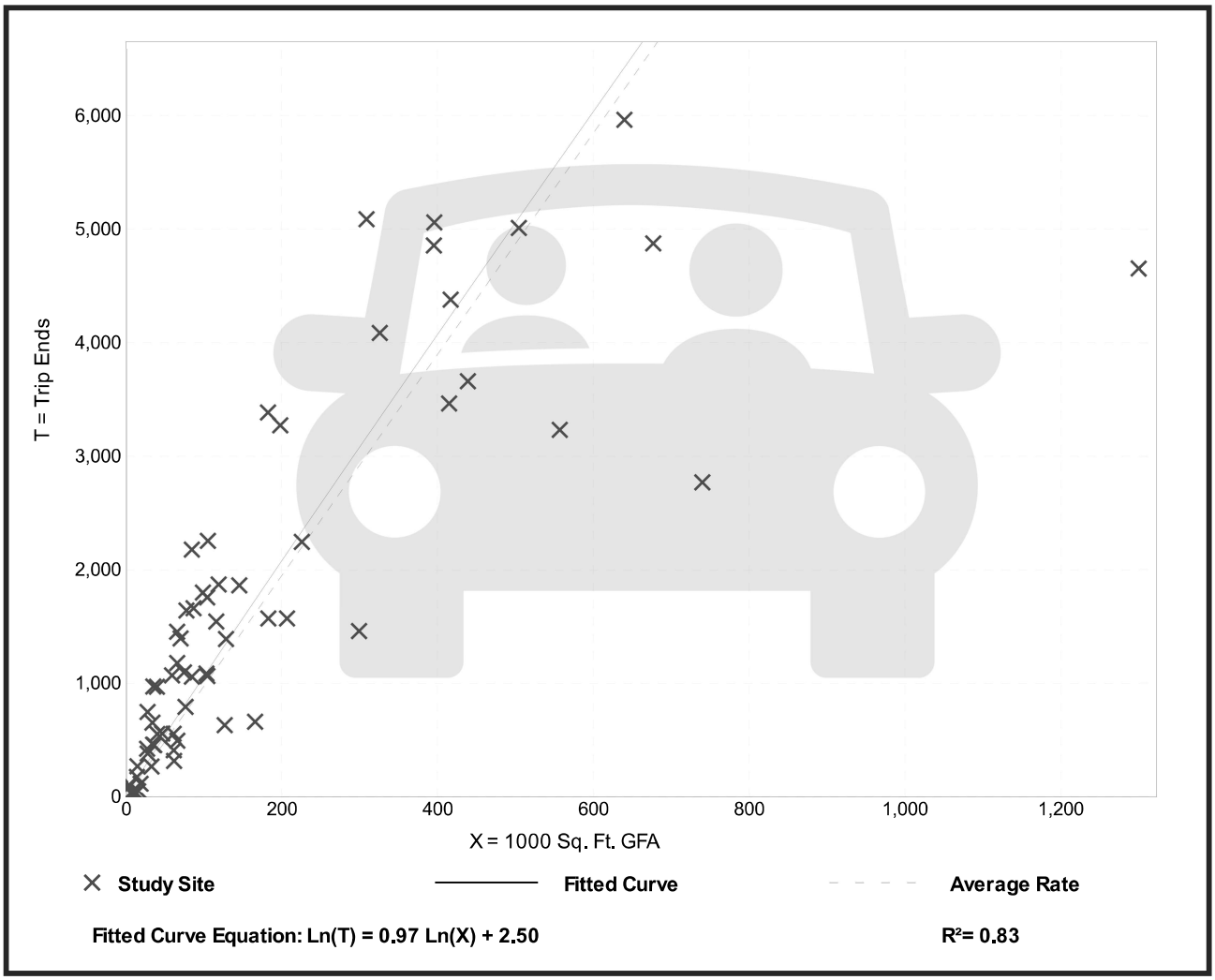
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 66
Avg. 1000 Sq. Ft. GFA: 171
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.74	2.71 - 27.56	5.15

Data Plot and Equation



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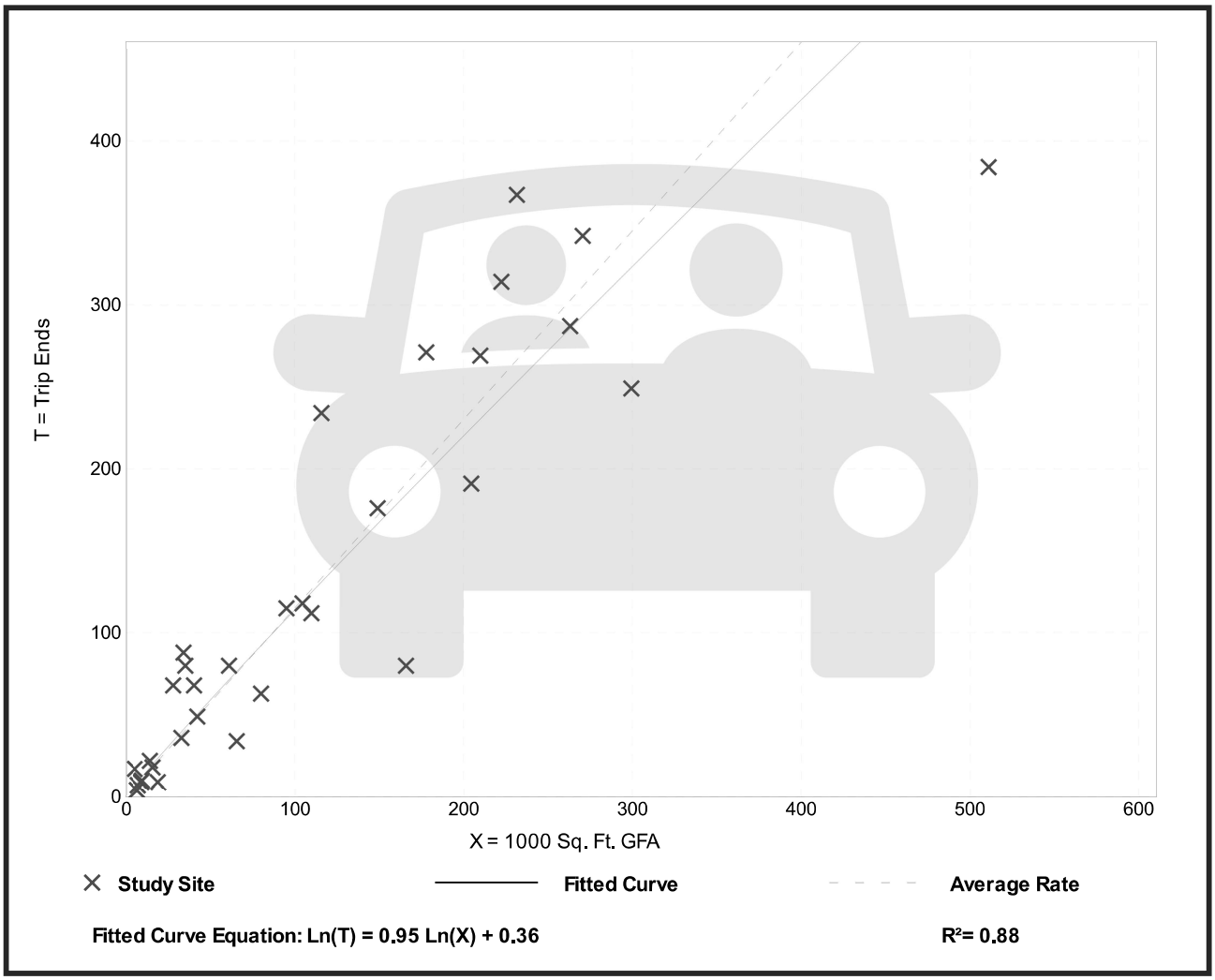
General Office Building
(710)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 32
Avg. 1000 Sq. Ft. GFA: 114
Directional Distribution: 16% entering, 84% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.15	0.47 - 3.23	0.42

Data Plot and Equation



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Single Tenant Office Building
(715)

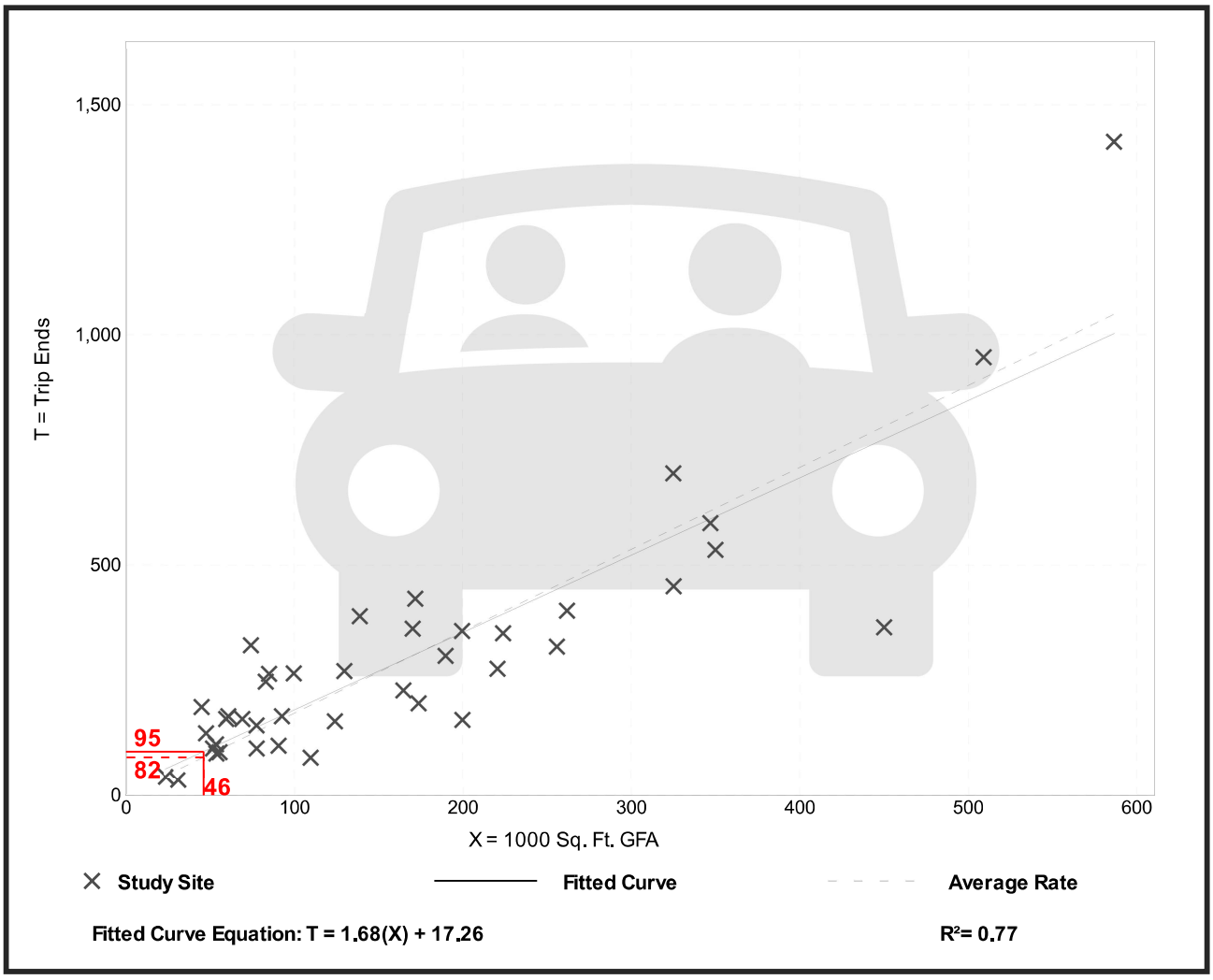
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 41
Avg. 1000 Sq. Ft. GFA: 168
Directional Distribution: 89% entering, 11% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.78	0.75 - 4.37	0.67

Data Plot and Equation



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Single Tenant Office Building
(715)

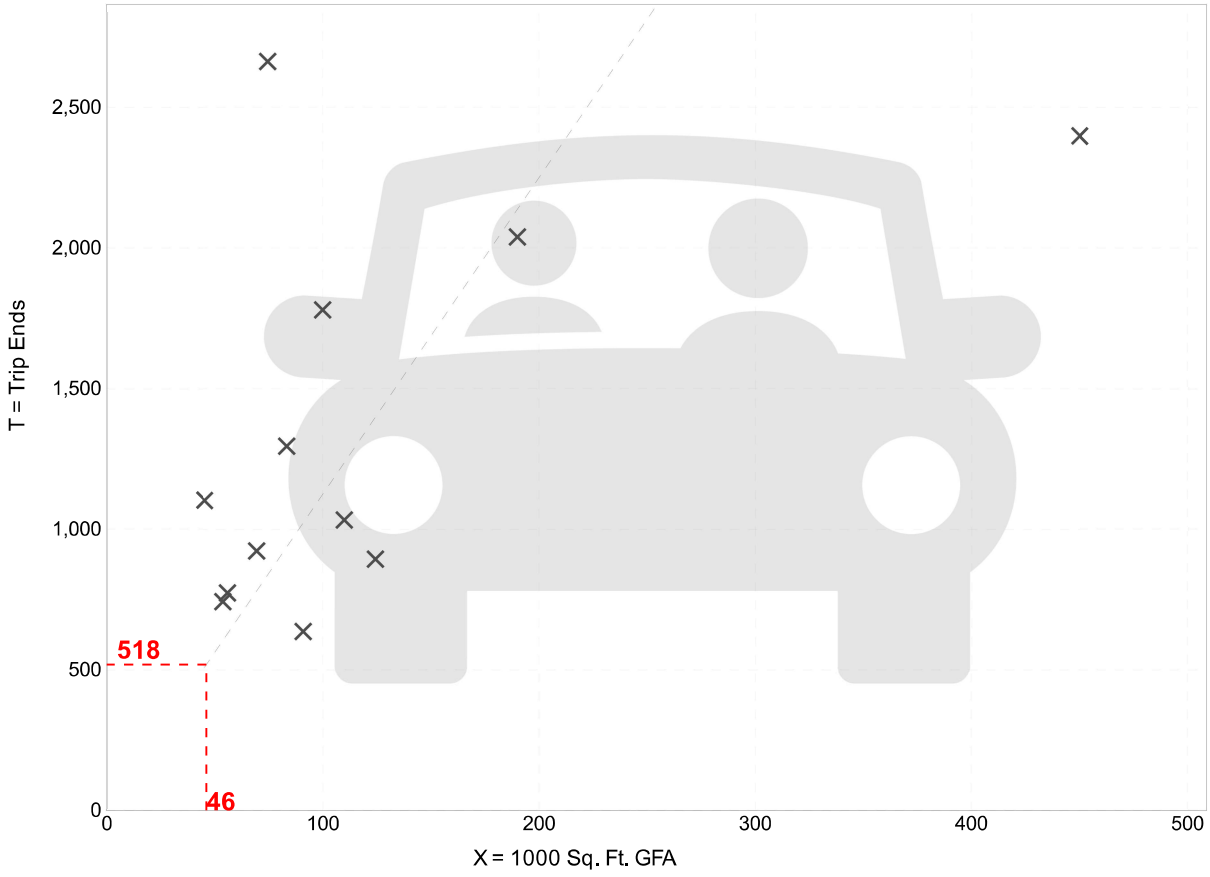
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 12
Avg. 1000 Sq. Ft. GFA: 121
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
11.25	5.33 - 35.68	7.71

Data Plot and Equation



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Single Tenant Office Building
(715)

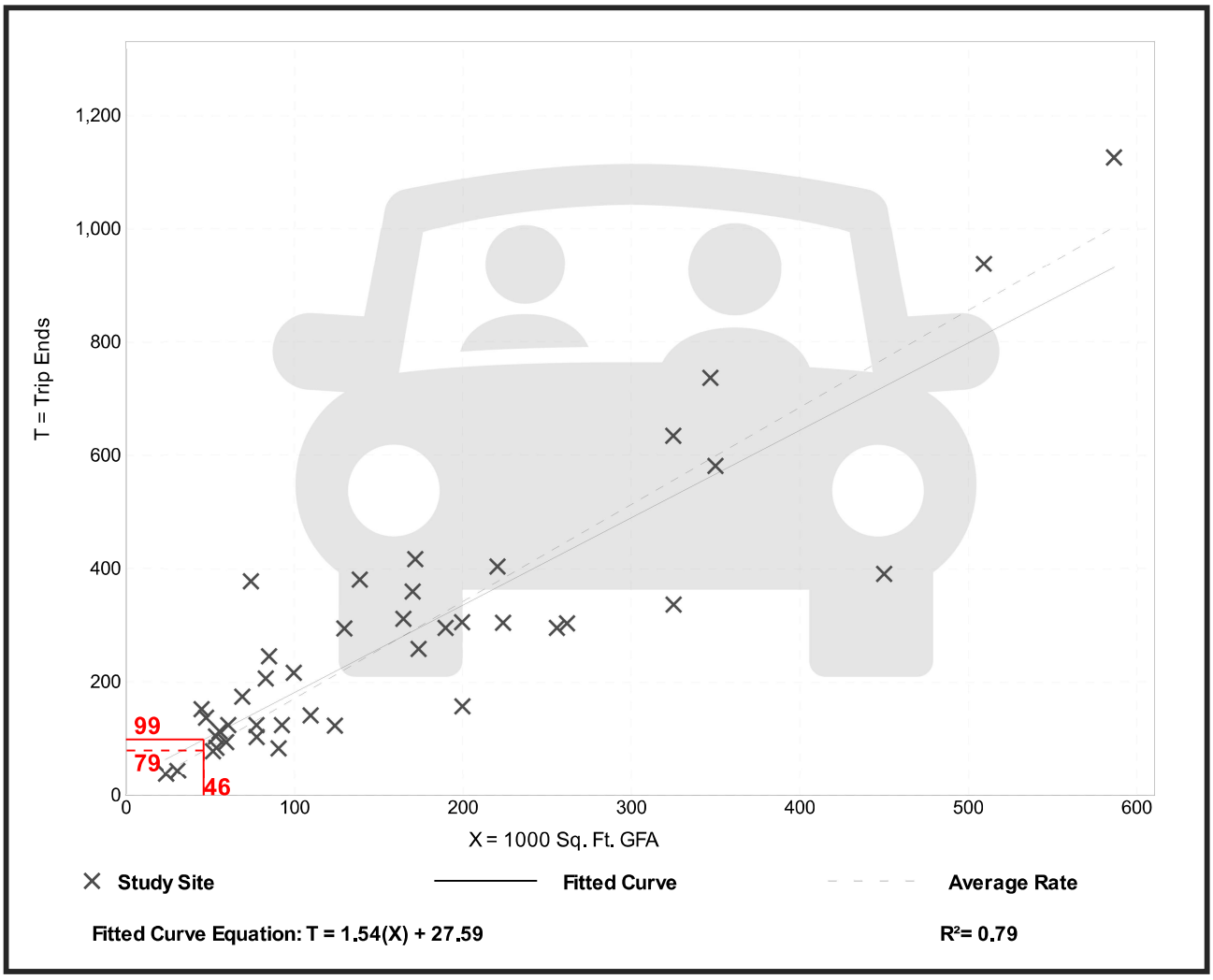
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 41
Avg. 1000 Sq. Ft. GFA: 168
Directional Distribution: 15% entering, 85% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.71	0.79 - 5.07	0.64

Data Plot and Equation



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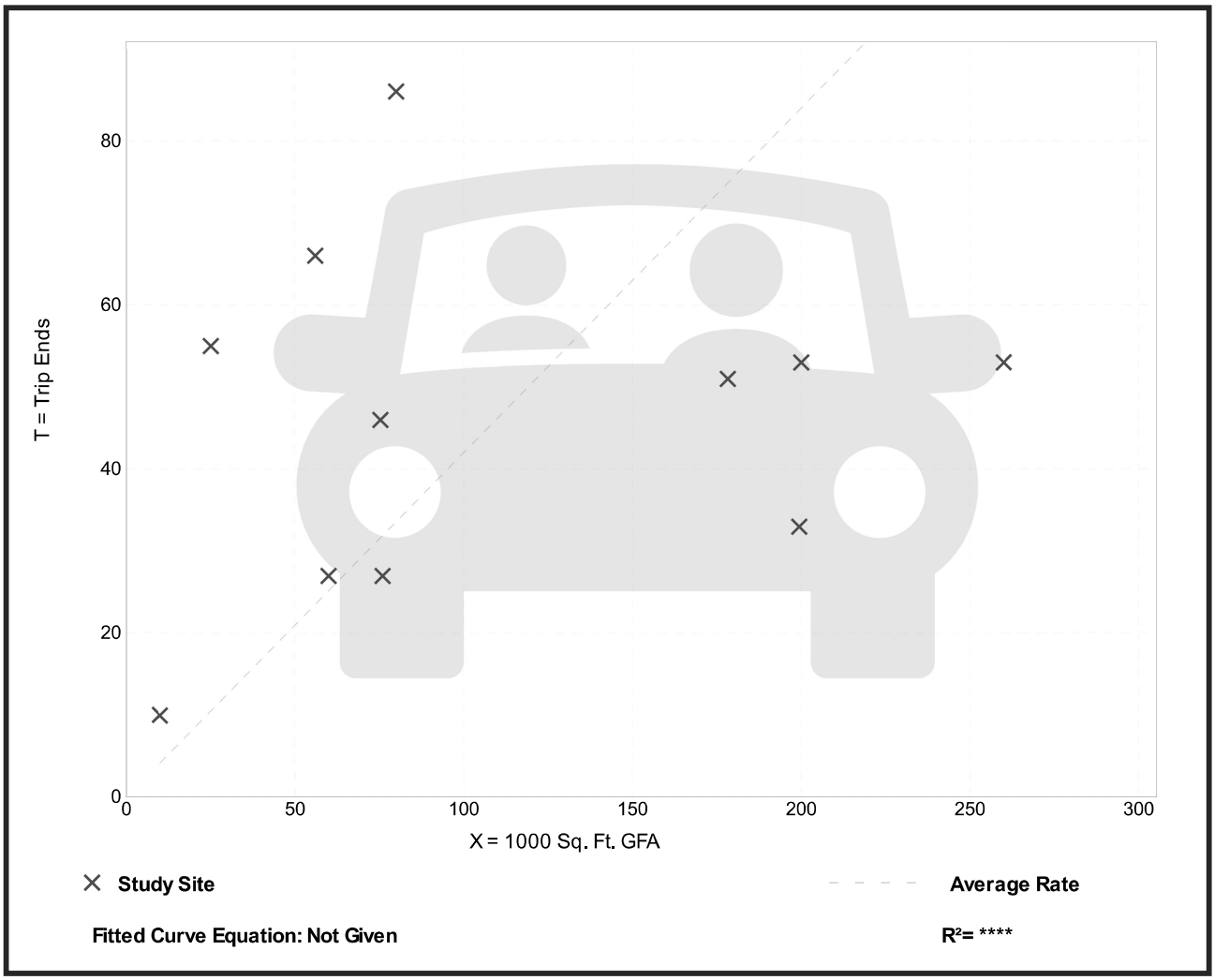
Research and Development Center
(760)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 11
Avg. 1000 Sq. Ft. GFA: 111
Directional Distribution: 75% entering, 25% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.42	0.17 - 2.19	0.41

Data Plot and Equation



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Research and Development Center
(760)

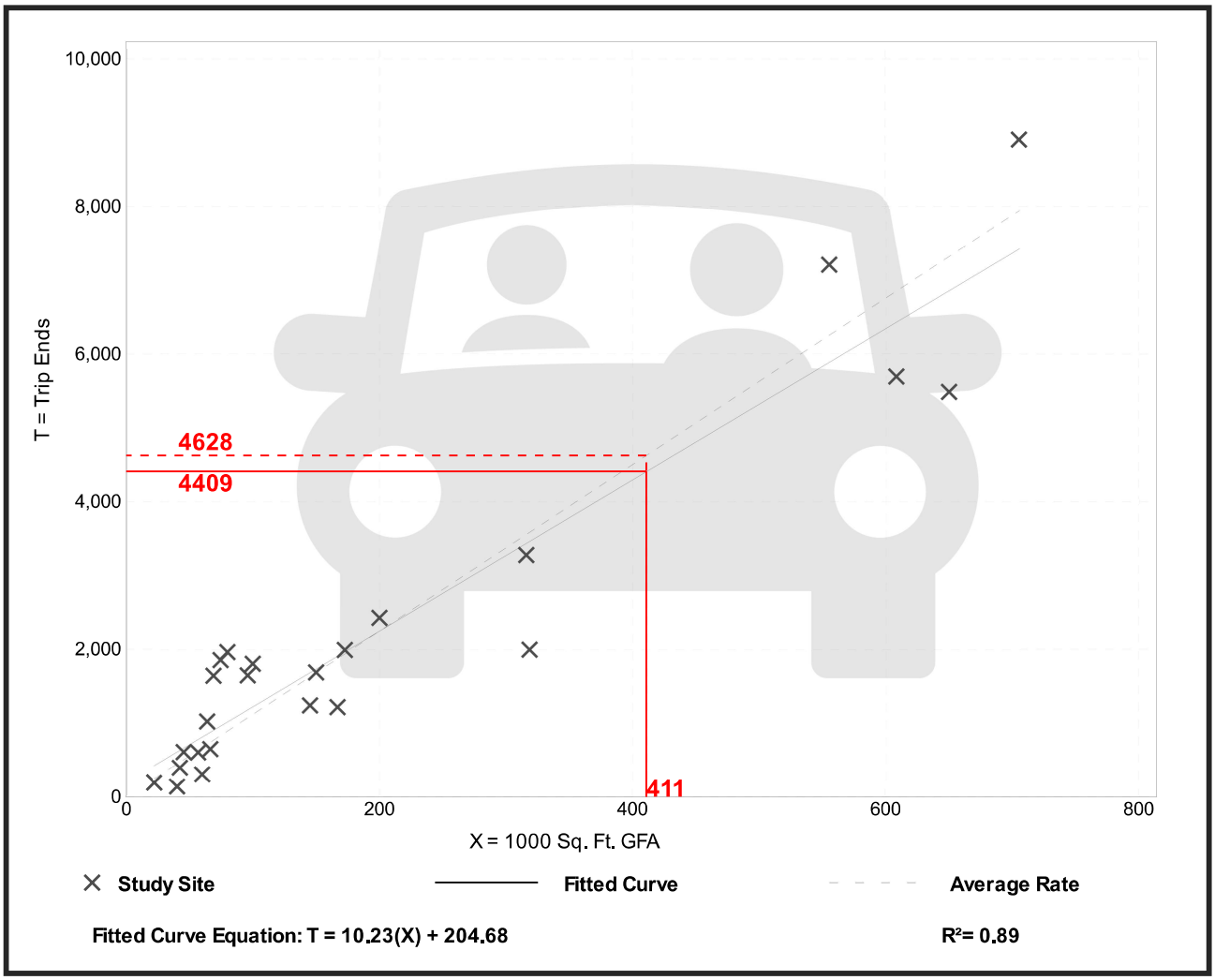
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 24
Avg. 1000 Sq. Ft. GFA: 200
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
11.26	3.48 - 24.95	4.07

Data Plot and Equation



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Research and Development Center
(760)

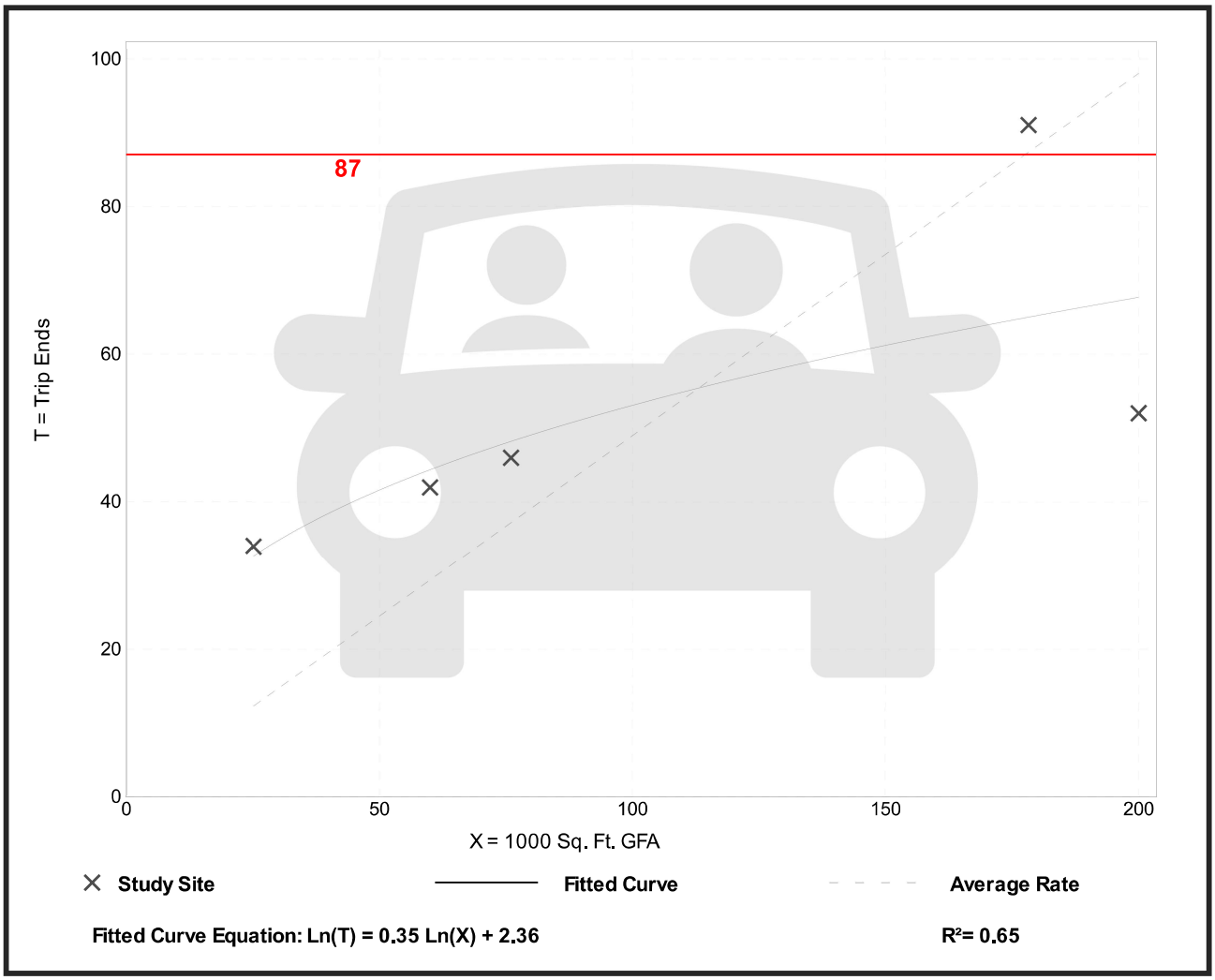
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. 1000 Sq. Ft. GFA: 108
Directional Distribution: 15% entering, 85% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.49	0.26 - 1.35	0.28

Data Plot and Equation

Caution – Small Sample Size



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Business Park
(770)

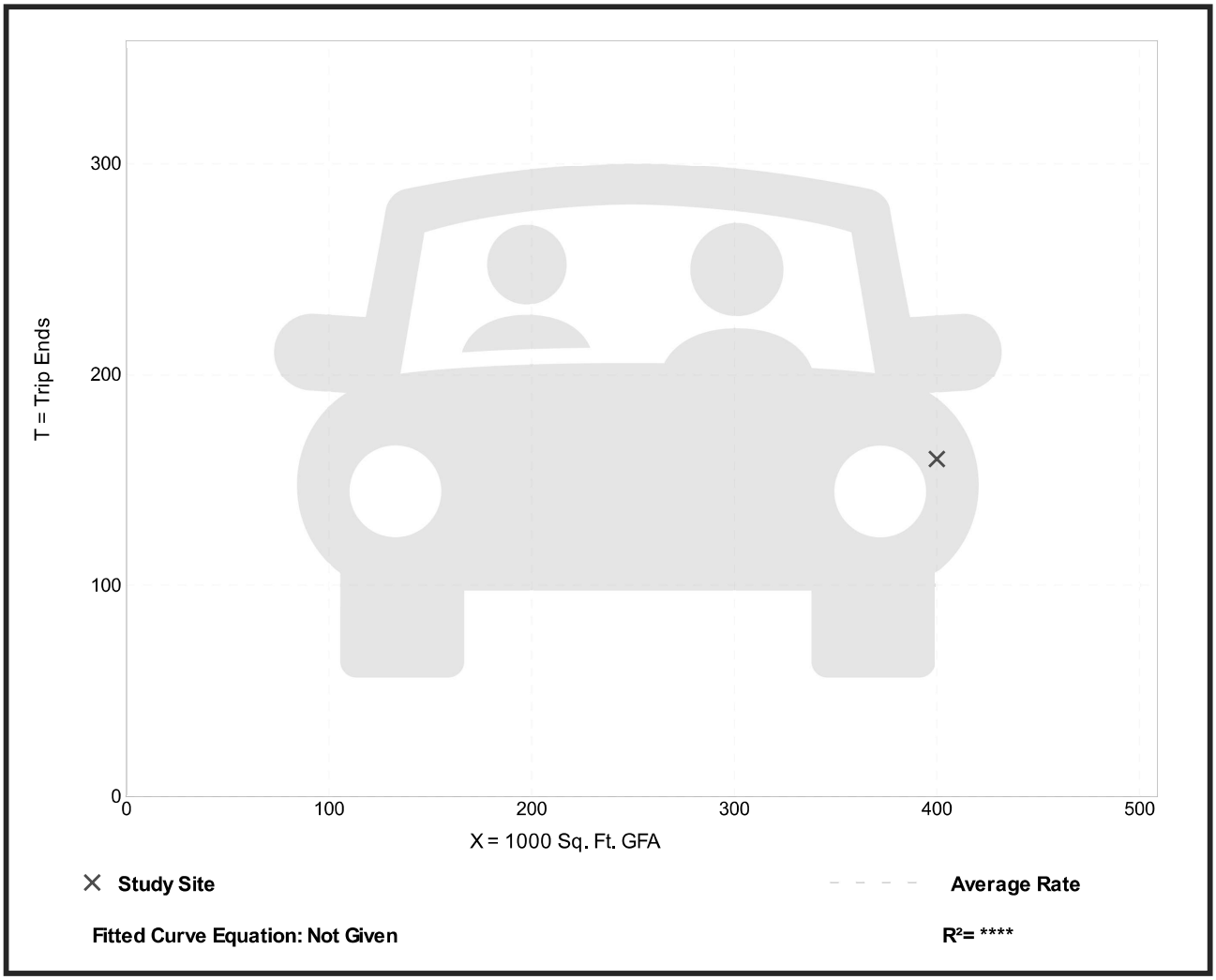
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 400
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.40	0.40 - 0.40	*

Data Plot and Equation

Caution – Small Sample Size



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Business Park
(770)

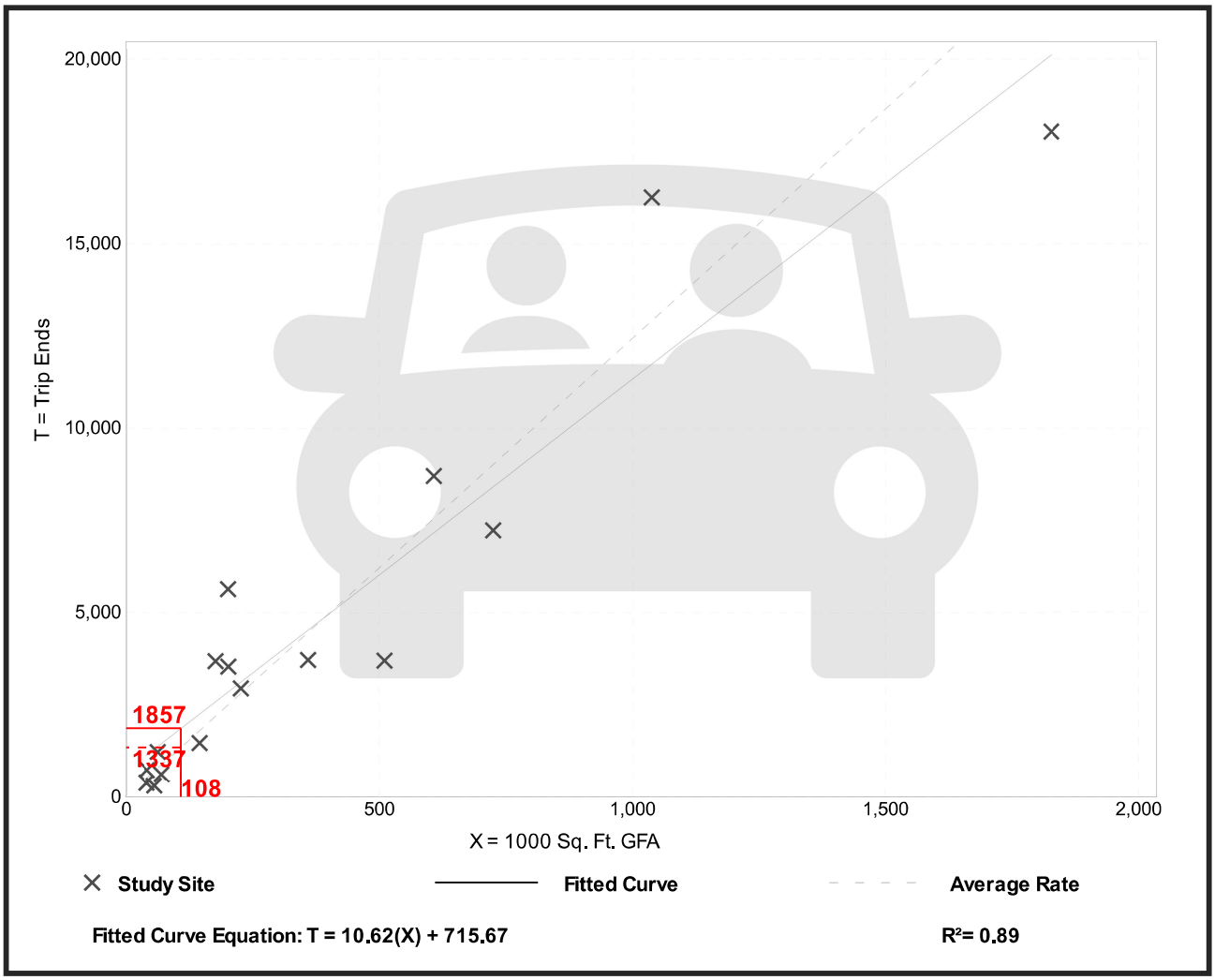
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 16
Avg. 1000 Sq. Ft. GFA: 393
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
12.44	5.56 - 27.97	4.51

Data Plot and Equation



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Business Park
(770)

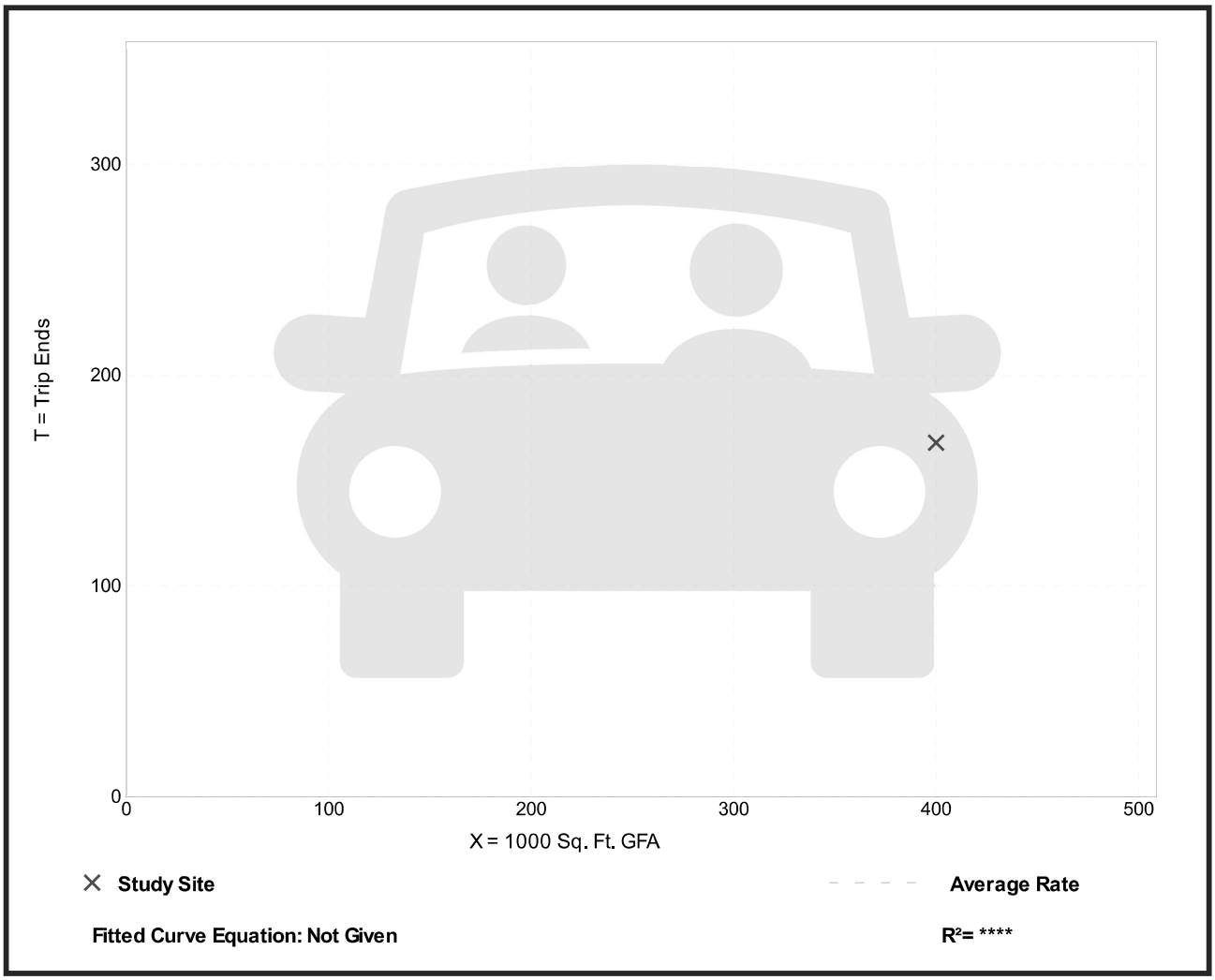
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 1
Avg. 1000 Sq. Ft. GFA: 400
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.42	0.42 - 0.42	*

Data Plot and Equation

Caution – Small Sample Size



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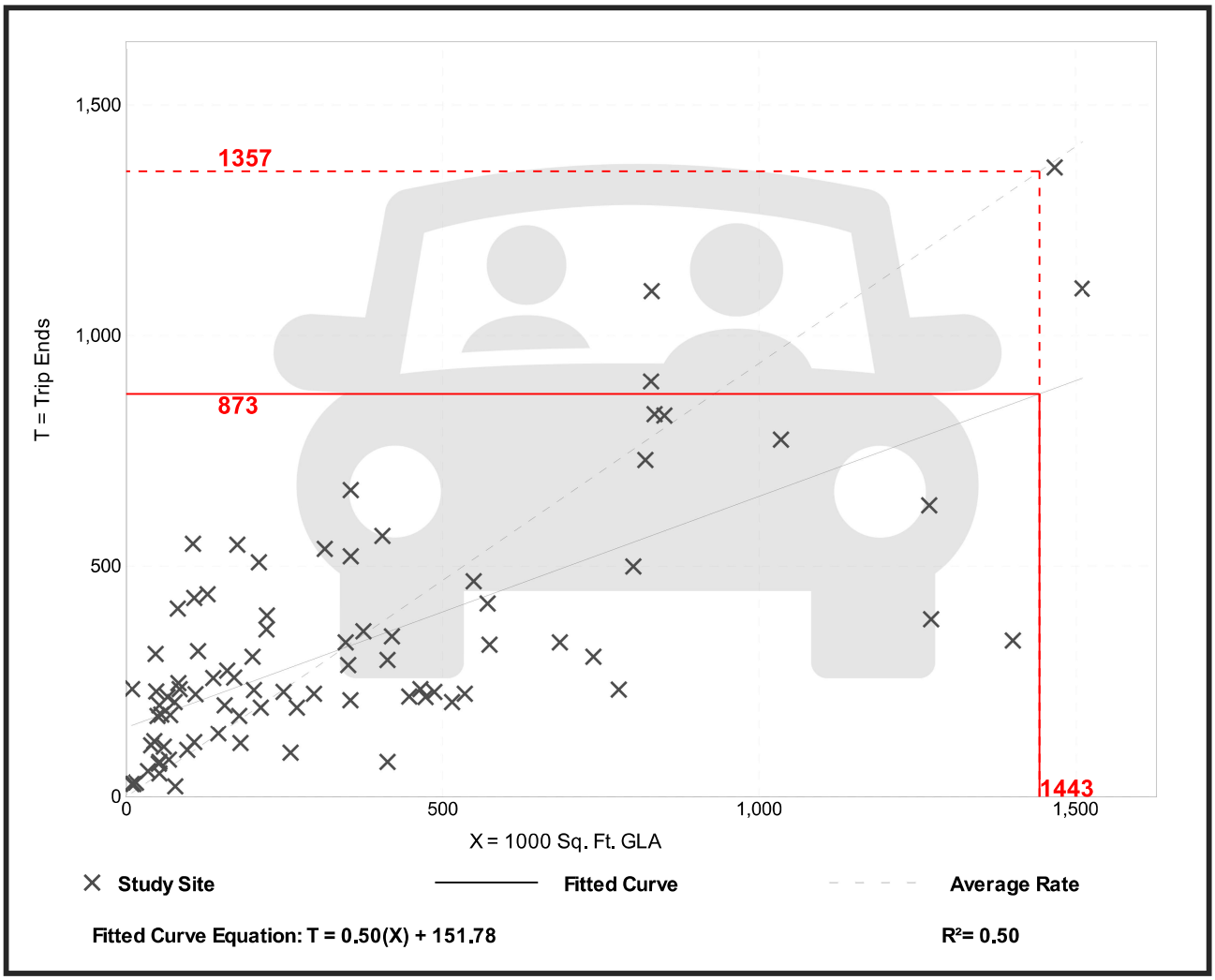
Shopping Center
(820)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 84
Avg. 1000 Sq. Ft. GLA: 351
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
0.94	0.18 - 23.74	0.87

Data Plot and Equation



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Shopping Center
(820)

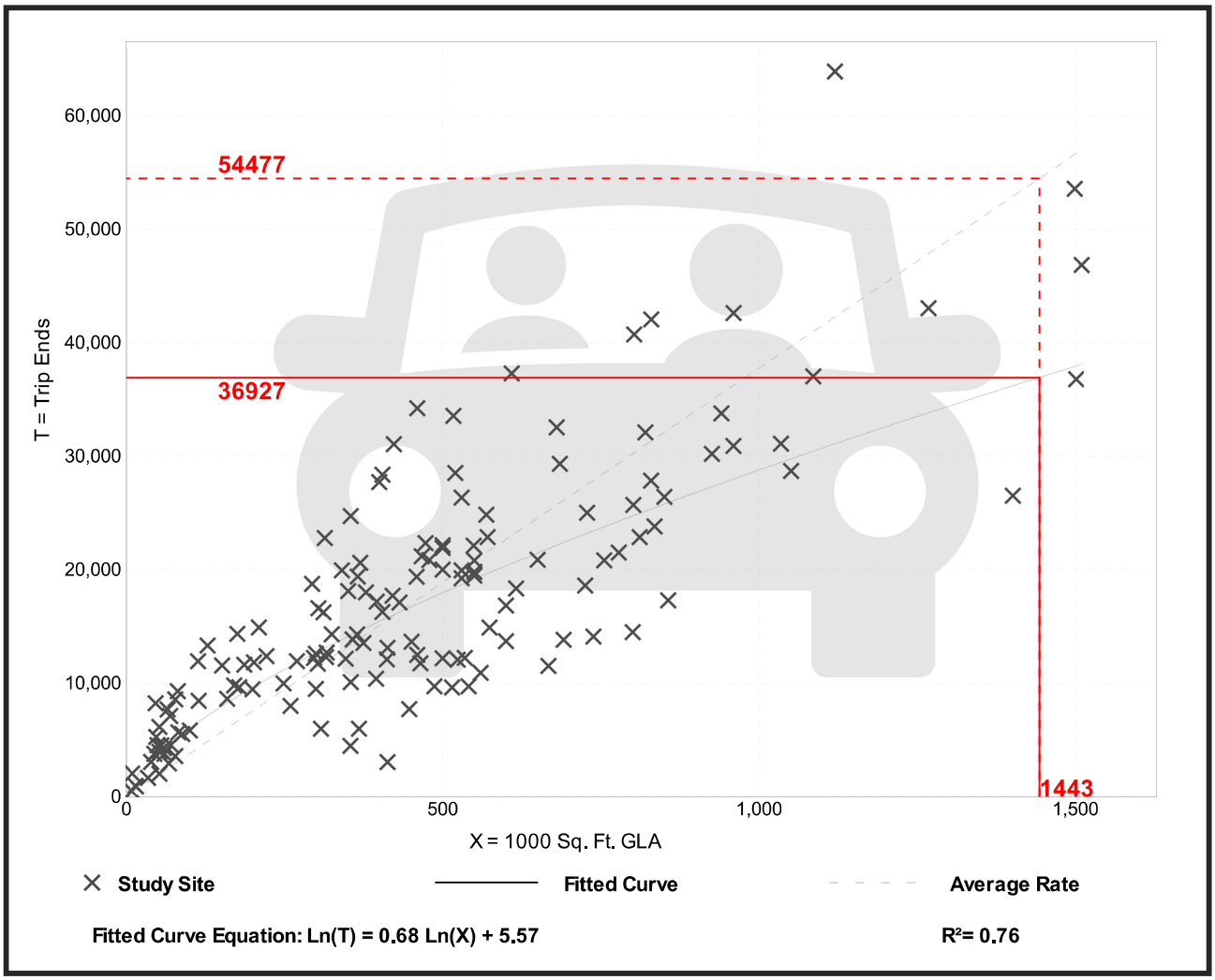
Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 147
Avg. 1000 Sq. Ft. GLA: 453
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
37.75	7.42 - 207.98	16.41

Data Plot and Equation



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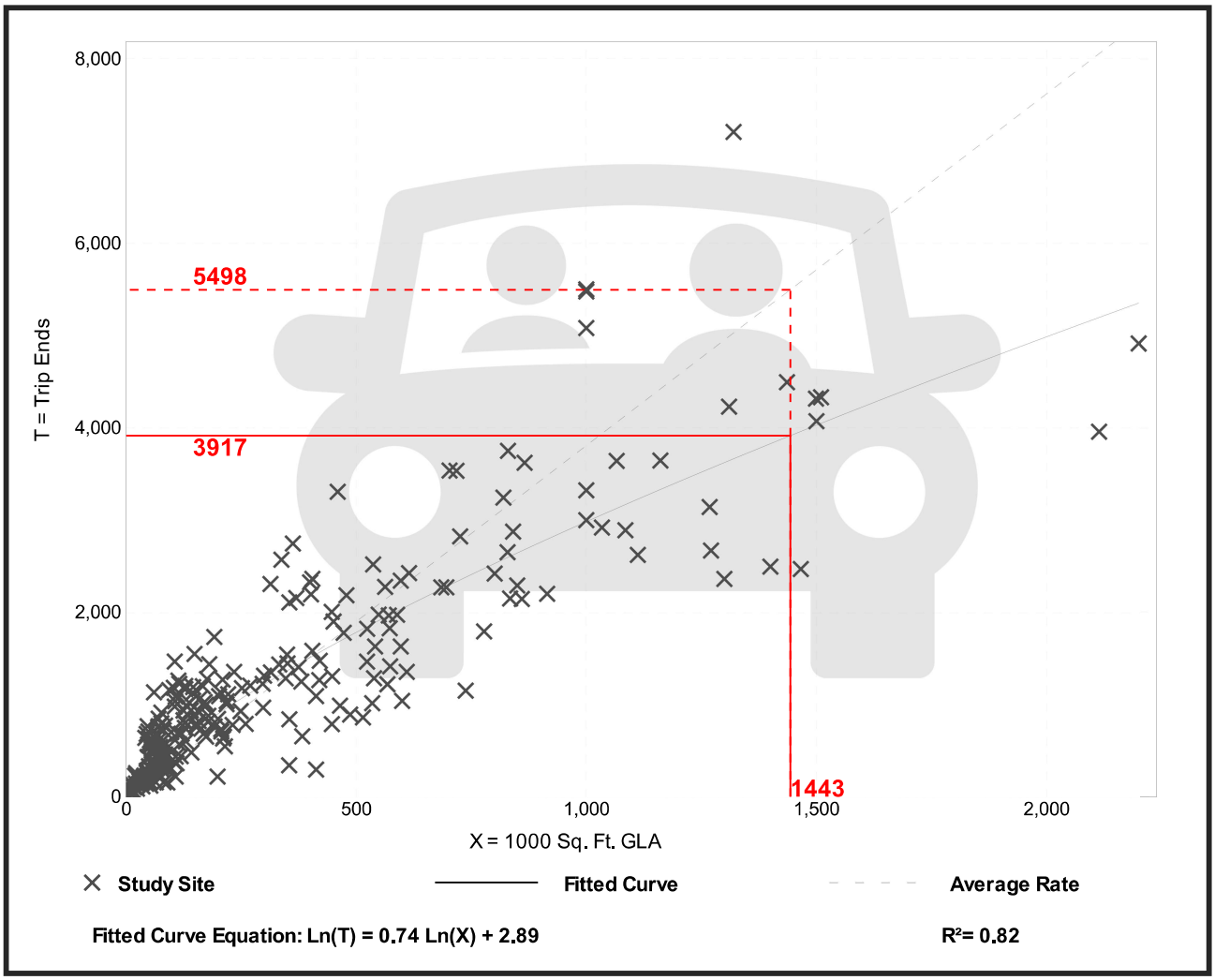
Shopping Center
(820)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 261
Avg. 1000 Sq. Ft. GLA: 327
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
3.81	0.74 - 18.69	2.04

Data Plot and Equation



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APPENDIX E
AM AND PM SYNCHRO OUTPUTS (WITH DEVELOPMENT TRAFFIC)

HCM 6th TWSC
24: Mink St SW & Refugee Rd SW

02/24/2021

Intersection	
Int Delay, s/veh	167.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Future Vol, veh/h	10	36	29	49	40	201	17	473	230	286	307	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	4	4	4	2	2	2	1	1	1	4	4	4
Mvmt Flow	10	37	30	50	41	205	17	483	235	292	313	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1659	1653	317	1569	1539	601	320	0	0	718	0	0
Stage 1	901	901	-	635	635	-	-	-	-	-	-	-
Stage 2	758	752	-	934	904	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.12	6.52	6.22	4.11	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.518	4.018	3.318	2.209	-	-	2.236	-	-
Pot Cap-1 Maneuver	77	97	719	90	116	500	1246	-	-	874	-	-
Stage 1	330	354	-	467	472	-	-	-	-	-	-	-
Stage 2	396	415	-	319	356	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	16	56	719	~ 29	67	500	1246	-	-	874	-	-
Mov Cap-2 Maneuver	16	56	-	~ 29	67	-	-	-	-	-	-	-
Stage 1	322	210	-	456	461	-	-	-	-	-	-	-
Stage 2	208	405	-	150	211	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 355.3	$ 870.7	0.2	5.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1246	-	-	57	108	874	-	-
HCM Lane V/C Ratio	0.014	-	-	1.343	2.74	0.334	-	-
HCM Control Delay (s)	7.9	0	-	$ 355.3	$ 870.7	11.2	0	-
HCM Lane LOS	A	A	-	F	F	B	A	-
HCM 95th %tile Q(veh)	0	-	-	6.7	27.5	1.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2516.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Future Vol, veh/h	120	369	69	101	212	360	73	94	49	63	134	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	6	6	6	2	2	2	15	15	15	7	7	7
Mvmt Flow	158	484	91	133	278	473	100	129	67	87	184	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1107	765	195	1020	743	163	206	0	0	196	0	0
Stage 1	369	369	-	363	363	-	-	-	-	-	-	-
Stage 2	738	396	-	657	380	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.25	-	-	4.17	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.335	-	-	2.263	-	-
Pot Cap-1 Maneuver	184	~ 329	836	215	343	882	1291	-	-	1347	-	-
Stage 1	643	614	-	656	625	-	-	-	-	-	-	-
Stage 2	403	597	-	454	614	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 10	~ 278	836	-	290	882	1291	-	-	1347	-	-
Mov Cap-2 Maneuver	~ 10	~ 278	-	-	290	-	-	-	-	-	-	-
Stage 1	586	569	-	598	570	-	-	-	-	-	-	-
Stage 2	~ 87	544	-	~ 56	569	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	7577.4		2.7	2.3
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1291	-	-	42	-	1347	-	-
HCM Lane V/C Ratio	0.078	-	-	17.438	-	0.064	-	-
HCM Control Delay (s)	8	0	-	$ 7577.4	-	7.9	0	-
HCM Lane LOS	A	A	-	F	-	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	89.4	-	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

02/24/2021

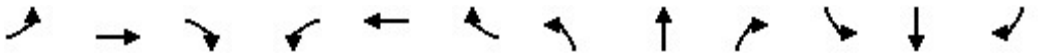
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Future Volume (veh/h)	127	78	375	25	162	55	609	404	16	33	529	126
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1885	1885	1885	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	157	96	463	31	200	68	752	499	20	41	653	156
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	5	5	5	1	1	1	8	8	8	8	8	8
Cap, veh/h	164	73	301	95	384	121	257	107	4	88	738	171
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	296	238	976	93	1245	394	299	198	8	46	1362	317
Grp Volume(v), veh/h	716	0	0	299	0	0	1271	0	0	850	0	0
Grp Sat Flow(s),veh/h/ln	1510	0	0	1732	0	0	505	0	0	1725	0	0
Q Serve(g_s), s	10.3	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.5	0.0	0.0	8.2	0.0	0.0	32.5	0.0	0.0	26.7	0.0	0.0
Prop In Lane	0.22		0.65	0.10		0.23	0.59		0.02	0.05		0.18
Lane Grp Cap(c), veh/h	539	0	0	600	0	0	369	0	0	997	0	0
V/C Ratio(X)	1.33	0.00	0.00	0.50	0.00	0.00	3.44	0.00	0.00	0.85	0.00	0.00
Avail Cap(c_a), veh/h	539	0	0	600	0	0	369	0	0	997	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.8	0.0	0.0	17.2	0.0	0.0	19.5	0.0	0.0	12.4	0.0	0.0
Incr Delay (d2), s/veh	160.6	0.0	0.0	0.6	0.0	0.0	1106.3	0.0	0.0	9.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.3	0.0	0.0	2.8	0.0	0.0	118.1	0.0	0.0	8.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	182.4	0.0	0.0	17.8	0.0	0.0	1125.7	0.0	0.0	21.6	0.0	0.0
LnGrp LOS	F	A	A	B	A	A	F	A	A	C	A	A
Approach Vol, veh/h		716			299			1271			850	
Approach Delay, s/veh		182.4			17.8			1125.7			21.6	
Approach LOS		F			B			F			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		23.0		37.0		23.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5				
Max Q Clear Time (g_c+I1), s		34.5		20.5		28.7		10.2				
Green Ext Time (p_c), s		0.0		0.0		1.9		1.0				

Intersection Summary		
HCM 6th Ctrl Delay		505.4
HCM 6th LOS		F

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Future Volume (veh/h)	115	1316	130	50	1984	173	290	150	50	194	120	303
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	1430	141	54	2157	188	315	163	54	211	130	329
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	1483	661	163	1446	645	385	449	380	395	415	352
Arrive On Green	0.06	0.42	0.42	0.05	0.41	0.41	0.09	0.24	0.24	0.08	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	125	1430	141	54	2157	188	315	163	54	211	130	329
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	4.5	43.8	6.4	1.9	45.5	8.9	10.5	8.1	3.0	8.5	6.5	22.8
Cycle Q Clear(g_c), s	4.5	43.8	6.4	1.9	45.5	8.9	10.5	8.1	3.0	8.5	6.5	22.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	1483	661	163	1446	645	385	449	380	395	415	352
V/C Ratio(X)	0.72	0.96	0.21	0.33	1.49	0.29	0.82	0.36	0.14	0.53	0.31	0.93
Avail Cap(c_a), veh/h	385	1489	664	186	1446	645	385	452	383	395	419	355
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	31.7	20.8	26.0	33.1	22.3	35.4	35.3	33.4	32.5	36.3	42.7
Incr Delay (d2), s/veh	5.5	15.6	0.2	1.2	225.1	0.2	13.0	0.5	0.2	1.4	0.4	31.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	20.3	2.3	0.8	63.0	3.3	4.4	3.7	1.2	0.9	3.0	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	47.4	21.0	27.1	258.2	22.5	48.5	35.8	33.6	33.9	36.8	74.0
LnGrp LOS	C	D	C	C	F	C	D	D	C	C	D	E
Approach Vol, veh/h		1696			2399			532			670	
Approach Delay, s/veh		44.0			234.6			43.1			54.1	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	52.8	14.0	32.3	13.8	51.7	16.0	30.3
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	3.9	45.8	10.5	10.1	6.5	47.5	12.5	24.8
Green Ext Time (p_c), s	0.0	0.8	0.0	0.9	0.2	0.0	0.0	0.1

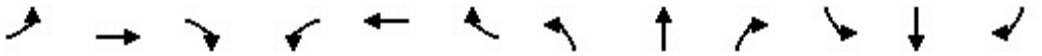
Intersection Summary	
HCM 6th Ctrl Delay	131.5
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Future Volume (veh/h)	165	1225	164	82	1839	156	227	183	146	75	80	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	192	1425	191	95	2139	181	271	219	175	95	102	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	1741	231	137	1962	875	388	308	246	200	599	507
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	157	3153	418	313	3554	1585	1091	963	769	990	1870	1585
Grp Volume(v), veh/h	192	797	819	95	2139	181	271	0	394	95	102	186
Grp Sat Flow(s),veh/h/ln	157	1777	1795	313	1777	1585	1091	0	1732	990	1870	1585
Q Serve(g_s), s	0.0	32.2	33.2	15.6	48.8	5.1	21.0	0.0	17.7	8.3	3.5	8.0
Cycle Q Clear(g_c), s	48.8	32.2	33.2	48.8	48.8	5.1	24.5	0.0	17.7	26.0	3.5	8.0
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	81	981	991	137	1962	875	388	0	554	200	599	507
V/C Ratio(X)	2.36	0.81	0.83	0.70	1.09	0.21	0.70	0.00	0.71	0.47	0.17	0.37
Avail Cap(c_a), veh/h	81	981	991	137	1962	875	408	0	586	218	633	536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	16.1	16.3	39.7	19.8	10.0	30.4	0.0	26.4	37.9	21.6	23.1
Incr Delay (d2), s/veh	646.9	7.3	7.9	25.4	49.7	0.5	4.9	0.0	3.8	1.7	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.3	12.4	13.0	2.9	29.3	1.6	5.8	0.0	7.5	2.0	1.5	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	691.1	23.4	24.2	65.1	69.5	10.5	35.3	0.0	30.2	39.6	21.7	23.6
LnGrp LOS	F	C	C	E	F	B	D	A	C	D	C	C
Approach Vol, veh/h		1808			2415			665			383	
Approach Delay, s/veh		94.7			64.9			32.3			27.1	
Approach LOS		F			E			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		33.4		55.0		33.4				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		50.8		26.5		50.8		28.0				
Green Ext Time (p_c), s		0.0		1.2		0.0		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			68.2									
HCM 6th LOS			E									

HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

02/24/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	254	1	9	504	28	3	20	14	4	3	2
Future Volume (veh/h)	2	1131	52	168	2513	29	246	21	164	6	4	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1826	1826	1826	1900	1900	1900
Adj Flow Rate, veh/h	2	1178	54	175	2618	30	256	22	171	6	4	2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	5	5	5	0	0	0
Cap, veh/h	56	972	45	98	713	8	279	17	129	225	142	57
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	0	1663	76	67	1220	14	834	72	557	617	615	246
Grp Volume(v), veh/h	1234	0	0	2823	0	0	449	0	0	12	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	0	1301	0	0	1462	0	0	1479	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	14.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	38.0	0.0	0.0	38.0	0.0	0.0	15.0	0.0	0.0	0.3	0.0	0.0
Prop In Lane	0.00		0.04	0.06		0.01	0.57		0.38	0.50		0.17
Lane Grp Cap(c), veh/h	1073	0	0	819	0	0	424	0	0	424	0	0
V/C Ratio(X)	1.15	0.00	0.00	3.45	0.00	0.00	1.06	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	1073	0	0	819	0	0	424	0	0	424	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.5	0.0	0.0	14.0	0.0	0.0	26.5	0.0	0.0	19.4	0.0	0.0
Incr Delay (d2), s/veh	78.7	0.0	0.0	1103.9	0.0	0.0	59.8	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	34.4	0.0	0.0	259.3	0.0	0.0	12.9	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.2	0.0	0.0	1117.9	0.0	0.0	86.4	0.0	0.0	19.4	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F	A	A	B	A	A
Approach Vol, veh/h		1234			2823			449			12	
Approach Delay, s/veh		93.2			1117.9			86.4			19.4	
Approach LOS		F			F			F			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		20.0		45.0		20.0				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		38.0		15.0		38.0		15.0				
Max Q Clear Time (g_c+I1), s		40.0		17.0		40.0		2.3				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			732.6									
HCM 6th LOS			F									

HCM 6th Signalized Intersection Summary
5: Hazelton Etna Rd SW & Broad St

02/24/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	410	120	270	620	90	270
Future Volume (veh/h)	1205	218	270	2459	300	270
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1401	254	314	2860	375	338
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1394	249	342	2365	396	586
Arrive On Green	0.46	0.46	0.29	1.00	0.22	0.22
Sat Flow, veh/h	3106	538	1781	3647	1781	1585
Grp Volume(v), veh/h	818	837	314	2860	375	338
Grp Sat Flow(s),veh/h/ln	1777	1774	1781	1777	1781	1585
Q Serve(g_s), s	41.2	41.7	11.0	0.0	18.7	15.4
Cycle Q Clear(g_c), s	41.2	41.7	11.0	0.0	18.7	15.4
Prop In Lane		0.30	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	822	821	342	2365	396	586
V/C Ratio(X)	0.99	1.02	0.92	1.21	0.95	0.58
Avail Cap(c_a), veh/h	822	821	377	2365	396	586
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	24.1	24.2	21.1	0.0	34.5	22.7
Incr Delay (d2), s/veh	30.0	36.6	3.6	94.5	32.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.5	24.1	5.5	31.1	11.3	14.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.1	60.8	24.7	94.5	66.4	24.2
LnGrp LOS	D	F	C	F	E	C
Approach Vol, veh/h	1655			3174	713	
Approach Delay, s/veh	57.5			87.6	46.4	
Approach LOS	E			F	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	18.2	46.8		25.0		65.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	15.0	39.9		20.0		59.9
Max Q Clear Time (g_c+I1), s	13.0	43.7		20.7		2.0
Green Ext Time (p_c), s	0.2	0.0		0.0		32.7

Intersection Summary	
HCM 6th Ctrl Delay	73.3
HCM 6th LOS	E

AM PEAK - 2020

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

02/24/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Future Volume (veh/h)	678	737	40	143	1549	177	110	195	119	134	171	1080
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	737	801	43	155	1684	192	120	212	129	146	186	1174
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	1559	84	486	1377	154	244	289	245	285	314	266
Arrive On Green	0.21	0.91	0.91	0.08	0.43	0.43	0.07	0.15	0.15	0.09	0.17	0.17
Sat Flow, veh/h	1781	3430	184	1781	3221	361	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	737	415	429	155	916	960	120	212	129	146	186	1174
Grp Sat Flow(s),veh/h/ln	1781	1777	1837	1781	1777	1805	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.3	3.6	3.6	4.3	38.5	38.5	5.0	9.7	6.7	6.1	8.3	15.1
Cycle Q Clear(g_c), s	9.3	3.6	3.6	4.3	38.5	38.5	5.0	9.7	6.7	6.1	8.3	15.1
Prop In Lane	1.00		0.10	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	808	835	486	759	772	244	289	245	285	314	266
V/C Ratio(X)	2.79	0.51	0.51	0.32	1.21	1.24	0.49	0.73	0.53	0.51	0.59	4.41
Avail Cap(c_a), veh/h	264	808	835	535	759	772	314	314	266	332	314	266
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.21	0.21	0.21	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	2.4	2.4	12.2	25.8	25.8	29.1	36.3	35.0	28.7	34.6	37.5
Incr Delay (d2), s/veh	808.2	0.5	0.5	0.4	105.2	120.6	1.5	7.9	1.8	1.4	3.0	1545.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	62.2	0.9	0.9	1.6	37.1	40.9	2.2	5.0	2.6	2.6	3.9	119.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	829.7	2.9	2.9	12.5	131.0	146.3	30.6	44.2	36.8	30.1	37.6	1582.7
LnGrp LOS	F	A	A	B	F	F	C	D	D	C	D	F
Approach Vol, veh/h		1581			2031			461			1506	
Approach Delay, s/veh		388.3			129.2			38.6			1241.4	
Approach LOS		F			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	46.0	12.6	18.8	15.0	43.6	11.4	20.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 9.3	34.9	* 10	15.1	* 9.3	34.9	* 10	15.1
Max Q Clear Time (g_c+I1), s	6.3	5.6	8.1	11.7	11.3	40.5	7.0	17.1
Green Ext Time (p_c), s	0.1	5.7	0.1	0.5	0.0	0.0	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	495.3
HCM 6th LOS	F

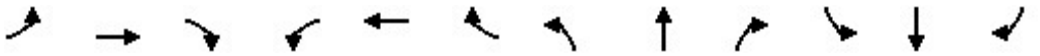
Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Future Volume (veh/h)	30	530	40	60	1226	10	40	110	50	20	150	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	576	43	65	1333	11	43	120	54	22	163	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	1181	1001	456	1169	10	152	300	135	277	210	210
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	406	1870	1585	804	1852	15	1054	1222	550	1211	858	858
Grp Volume(v), veh/h	33	576	43	65	0	1344	43	0	174	22	0	326
Grp Sat Flow(s),veh/h/ln	406	1870	1585	804	0	1868	1054	0	1771	1211	0	1716
Q Serve(g_s), s	0.0	14.8	0.9	4.2	0.0	56.8	3.6	0.0	7.4	1.4	0.0	15.9
Cycle Q Clear(g_c), s	56.8	14.8	0.9	19.0	0.0	56.8	19.5	0.0	7.4	8.8	0.0	15.9
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	80	1181	1001	456	0	1179	152	0	435	277	0	421
V/C Ratio(X)	0.41	0.49	0.04	0.14	0.00	1.14	0.28	0.00	0.40	0.08	0.00	0.77
Avail Cap(c_a), veh/h	80	1181	1001	456	0	1179	244	0	589	383	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.0	8.8	6.3	13.9	0.0	16.6	40.7	0.0	28.4	32.1	0.0	31.6
Incr Delay (d2), s/veh	15.0	1.4	0.1	0.7	0.0	73.6	1.0	0.0	0.6	0.1	0.0	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	4.8	0.3	0.7	0.0	40.7	0.9	0.0	2.9	0.4	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.0	10.3	6.4	14.5	0.0	90.2	41.7	0.0	29.0	32.2	0.0	36.3
LnGrp LOS	E	B	A	B	A	F	D	A	C	C	A	D
Approach Vol, veh/h		652			1409			217			348	
Approach Delay, s/veh		12.5			86.7			31.5			36.0	
Approach LOS		B			F			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		62.8		27.2		62.8		27.2				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		58.8		21.5		58.8		17.9				
Green Ext Time (p_c), s		0.0		0.6		0.0		1.4				

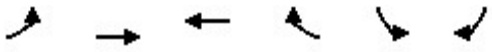
Intersection Summary		
HCM 6th Ctrl Delay		57.0
HCM 6th LOS		E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
42: Havens Corner Rd & Dixon Rd

02/24/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	174	350	146	55	23
Future Volume (veh/h)	58	527	718	372	259	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	68	620	845	438	305	32
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	83	403	669	347	376	39
Arrive On Green	0.58	0.58	0.58	0.58	0.23	0.23
Sat Flow, veh/h	0	700	1161	602	1602	168
Grp Volume(v), veh/h	688	0	0	1283	338	0
Grp Sat Flow(s),veh/h/ln	700	0	0	1762	1775	0
Q Serve(g_s), s	0.0	0.0	0.0	27.5	8.6	0.0
Cycle Q Clear(g_c), s	27.5	0.0	0.0	27.5	8.6	0.0
Prop In Lane	0.10			0.34	0.90	0.09
Lane Grp Cap(c), veh/h	486	0	0	1016	417	0
V/C Ratio(X)	1.41	0.00	0.00	1.26	0.81	0.00
Avail Cap(c_a), veh/h	486	0	0	1016	688	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.4	0.0	0.0	10.1	17.2	0.0
Incr Delay (d2), s/veh	198.5	0.0	0.0	126.4	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	29.5	0.0	0.0	39.5	3.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	212.9	0.0	0.0	136.5	21.1	0.0
LnGrp LOS	F	A	A	F	C	A
Approach Vol, veh/h		688	1283		338	
Approach Delay, s/veh		212.9	136.5		21.1	
Approach LOS		F	F		C	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			32.0		15.7	32.0
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			27.5		18.5	27.5
Max Q Clear Time (g_c+I1), s			29.5		10.6	29.5
Green Ext Time (p_c), s			0.0		0.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	142.3
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
39: Taylor Rd & Havens Corner Rd

02/24/2021

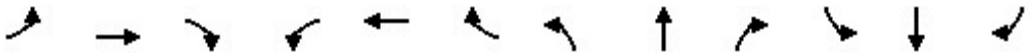
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	140	50	200	410	110
Future Volume (veh/h)	680	217	140	763	441	118
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	739	236	152	829	479	128
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	869	736	86	243	531	142
Arrive On Green	0.46	0.46	0.46	0.46	0.39	0.39
Sat Flow, veh/h	1870	1585	53	524	1368	366
Grp Volume(v), veh/h	739	236	981	0	608	0
Grp Sat Flow(s),veh/h/ln	1870	1585	577	0	1736	0
Q Serve(g_s), s	23.7	6.4	7.8	0.0	22.4	0.0
Cycle Q Clear(g_c), s	23.7	6.4	31.5	0.0	22.4	0.0
Prop In Lane		1.00	0.15		0.79	0.21
Lane Grp Cap(c), veh/h	869	736	329	0	674	0
V/C Ratio(X)	0.85	0.32	2.98	0.00	0.90	0.00
Avail Cap(c_a), veh/h	869	736	329	0	1241	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	16.1	11.4	22.3	0.0	19.5	0.0
Incr Delay (d2), s/veh	8.1	0.2	899.7	0.0	4.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	1.7	87.1	0.0	7.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.2	11.7	922.0	0.0	24.3	0.0
LnGrp LOS	C	B	F	A	C	A
Approach Vol, veh/h	975			981	608	
Approach Delay, s/veh	21.1			922.0	24.3	
Approach LOS	C			F	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		37.0		30.8		37.0
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		31.5		48.5		31.5
Max Q Clear Time (g_c+I1), s		25.7		24.4		33.5
Green Ext Time (p_c), s		2.6		2.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	366.6
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Future Volume (veh/h)	196	528	161	20	766	404	411	160	15	353	114	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	213	574	175	22	833	439	447	174	16	384	124	164
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	186	55	47	522	272	436	143	13	431	119	157
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	134	413	122	15	1161	604	860	335	31	860	278	367
Grp Volume(v), veh/h	962	0	0	1294	0	0	637	0	0	672	0	0
Grp Sat Flow(s),veh/h/ln	668	0	0	1780	0	0	1226	0	0	1505	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	40.5	0.0	0.0	40.5	0.0	0.0	38.5	0.0	0.0	38.5	0.0	0.0
Prop In Lane	0.22		0.18	0.02		0.34	0.70		0.03	0.57		0.24
Lane Grp Cap(c), veh/h	350	0	0	842	0	0	592	0	0	707	0	0
V/C Ratio(X)	2.75	0.00	0.00	1.54	0.00	0.00	1.08	0.00	0.00	0.95	0.00	0.00
Avail Cap(c_a), veh/h	350	0	0	842	0	0	592	0	0	707	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.5	0.0	0.0	25.8	0.0	0.0	28.0	0.0	0.0	26.6	0.0	0.0
Incr Delay (d2), s/veh	796.4	0.0	0.0	247.9	0.0	0.0	58.9	0.0	0.0	22.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	84.4	0.0	0.0	73.5	0.0	0.0	21.5	0.0	0.0	16.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	822.9	0.0	0.0	273.7	0.0	0.0	86.9	0.0	0.0	49.1	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F	A	A	D	A	A
Approach Vol, veh/h		962			1294			637			672	
Approach Delay, s/veh		822.9			273.7			86.9			49.1	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	46.0	44.0	46.0	44.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	40.5	38.5	40.5	38.5
Max Q Clear Time (g_c+I1), s	42.5	40.5	42.5	40.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	346.2
HCM 6th LOS	F

HCM 6th TWSC
25: Mink St SW & Havens Corner Rd

02/24/2021

Intersection	
Int Delay, s/veh	12.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Future Vol, veh/h	55	0	819	4	7	1	851	645	3	0	392	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	3	3	3
Mvmt Flow	64	0	952	5	8	1	990	750	3	0	456	97

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3241	3238	505	3713	3285	752	553	0	0	753	0	0
Stage 1	505	505	-	2732	2732	-	-	-	-	-	-	-
Stage 2	2736	2733	-	981	553	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.12	6.52	6.22	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.518	4.018	3.318	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	~ 6	9	~ 565	~ 2	9	410	1017	-	-	852	-	-
Stage 1	548	539	-	28	43	-	-	-	-	-	-	-
Stage 2	~ 28	43	-	300	514	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	~ 565	-	0	410	1017	-	-	852	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	548	539	-	28	0	-	-	-	-	-	-	-
Stage 2	-	0	-	-	514	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			24	0
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1017	-	-	-	-	852	-	-
HCM Lane V/C Ratio	0.973	-	-	-	-	-	-	-
HCM Control Delay (s)	42.3	0	-	-	-	0	-	-
HCM Lane LOS	E	A	-	-	-	A	-	-
HCM 95th %tile Q(veh)	17.6	-	-	-	-	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	31

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	158	33	80	291	100	116
Future Vol, veh/h	158	33	252	291	100	334
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	174	36	277	320	110	367

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	210	0	1066	192
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	874	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1349	-	246	850
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	408	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1349	-	185	850
Mov Cap-2 Maneuver	-	-	-	-	185	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	306	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	78.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	465	-	-	1349	-
HCM Lane V/C Ratio	1.026	-	-	0.205	-
HCM Control Delay (s)	78.6	-	-	8.4	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	14.1	-	-	0.8	-

HCM 6th TWSC
24: Mink St SW & Refugee Rd SW

02/24/2021

Intersection	
Int Delay, s/veh	307.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	36	29	11	40	14	17	259	5	6	153	7
Future Vol, veh/h	10	36	29	49	40	201	17	473	230	286	307	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	4	4	4	2	2	2	1	1	1	4	4	4
Mvmt Flow	11	39	31	53	43	215	18	507	246	306	329	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1740	1734	333	1646	1615	630	337	0	0	753	0	0
Stage 1	945	945	-	666	666	-	-	-	-	-	-	-
Stage 2	795	789	-	980	949	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.12	6.52	6.22	4.11	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.518	4.018	3.318	2.209	-	-	2.236	-	-
Pot Cap-1 Maneuver	67	87	704	79	104	482	1228	-	-	848	-	-
Stage 1	312	338	-	449	457	-	-	-	-	-	-	-
Stage 2	378	399	-	301	339	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 10	47	704	~ 17	56	482	1228	-	-	848	-	-
Mov Cap-2 Maneuver	~ 10	47	-	~ 17	56	-	-	-	-	-	-	-
Stage 1	304	188	-	437	445	-	-	-	-	-	-	-
Stage 2	184	389	-	127	188	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 636.8	$ 1609.4	0.2	5.5
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1228	-	-	42	72	848	-	-
HCM Lane V/C Ratio	0.015	-	-	1.913	4.315	0.361	-	-
HCM Control Delay (s)	8	0	-	$ 636.8	$ 1609.4	11.6	0	-
HCM Lane LOS	A	A	-	F	F	B	A	-
HCM 95th %tile Q(veh)	0	-	-	8.4	33.3	1.7	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
26: Etna Pkwy & Refugee Rd SW

02/24/2021

Intersection	
Int Delay, s/veh	1469.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	40	10	22	73	68	2	39	6	27	122	1
Future Vol, veh/h	120	369	69	101	212	360	73	94	49	63	134	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	6	6	6	2	2	2	15	15	15	7	7	7
Mvmt Flow	158	484	91	133	278	473	96	123	64	83	176	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1076	732	187	987	710	155	197	0	0	187	0	0
Stage 1	353	353	-	347	347	-	-	-	-	-	-	-
Stage 2	723	379	-	640	363	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.12	6.52	6.22	4.25	-	-	4.17	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.518	4.018	3.318	2.335	-	-	2.263	-	-
Pot Cap-1 Maneuver	193	~ 343	845	226	359	891	1302	-	-	1358	-	-
Stage 1	656	624	-	669	635	-	-	-	-	-	-	-
Stage 2	411	608	-	464	625	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 18	~ 293	845	-	307	891	1302	-	-	1358	-	-
Mov Cap-2 Maneuver	~ 18	~ 293	-	-	307	-	-	-	-	-	-	-
Stage 1	602	581	-	613	582	-	-	-	-	-	-	-
Stage 2	~ 92	558	-	~ 64	582	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	4370.7		2.7	2.3
HCM LOS	F	-		

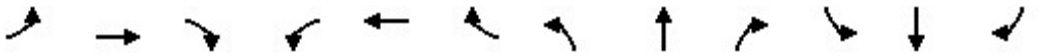
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1302	-	-	70	-	1358	-	-
HCM Lane V/C Ratio	0.074	-	-	10.463	-	0.061	-	-
HCM Control Delay (s)	8	0	-	$ 4370.7	-	7.8	0	-
HCM Lane LOS	A	A	-	F	-	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	86	-	0.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Future Volume (veh/h)	127	78	375	25	162	55	609	404	16	33	529	126
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1885	1885	1885	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	165	101	486	32	210	71	789	524	21	43	686	163
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	5	5	5	1	1	1	8	8	8	8	8	8
Cap, veh/h	164	72	297	95	384	121	236	93	4	88	738	171
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	295	232	964	93	1246	393	260	172	7	47	1363	315
Grp Volume(v), veh/h	752	0	0	313	0	0	1334	0	0	892	0	0
Grp Sat Flow(s),veh/h/ln	1492	0	0	1732	0	0	439	0	0	1725	0	0
Q Serve(g_s), s	9.8	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.5	0.0	0.0	8.7	0.0	0.0	32.5	0.0	0.0	29.4	0.0	0.0
Prop In Lane	0.22		0.65	0.10		0.23	0.59		0.02	0.05		0.18
Lane Grp Cap(c), veh/h	533	0	0	600	0	0	333	0	0	997	0	0
V/C Ratio(X)	1.41	0.00	0.00	0.52	0.00	0.00	4.00	0.00	0.00	0.89	0.00	0.00
Avail Cap(c_a), veh/h	533	0	0	600	0	0	333	0	0	997	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.8	0.0	0.0	17.4	0.0	0.0	19.4	0.0	0.0	13.1	0.0	0.0
Incr Delay (d2), s/veh	195.6	0.0	0.0	0.8	0.0	0.0	1358.7	0.0	0.0	12.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	35.2	0.0	0.0	3.0	0.0	0.0	130.0	0.0	0.0	10.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	217.5	0.0	0.0	18.2	0.0	0.0	1378.1	0.0	0.0	25.2	0.0	0.0
LnGrp LOS	F	A	A	B	A	A	F	A	A	C	A	A
Approach Vol, veh/h		752			313			1334			892	
Approach Delay, s/veh		217.5			18.2			1378.1			25.2	
Approach LOS		F			B			F			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		37.0		23.0		37.0		23.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5				
Max Q Clear Time (g_c+I1), s		34.5		20.5		31.4		10.7				
Green Ext Time (p_c), s		0.0		0.0		0.6		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			616.9									
HCM 6th LOS			F									

AM PEAK - 2030

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

02/24/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Future Volume (veh/h)	115	1316	130	50	1984	173	290	150	50	194	120	303
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	131	1502	148	57	2264	197	331	171	57	221	137	346
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	1482	661	156	1448	646	378	450	381	388	417	353
Arrive On Green	0.06	0.42	0.42	0.05	0.41	0.41	0.09	0.24	0.24	0.08	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	131	1502	148	57	2264	197	331	171	57	221	137	346
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	4.7	46.8	6.7	2.0	45.7	9.4	10.5	8.6	3.2	8.5	6.9	24.4
Cycle Q Clear(g_c), s	4.7	46.8	6.7	2.0	45.7	9.4	10.5	8.6	3.2	8.5	6.9	24.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	173	1482	661	156	1448	646	378	450	381	388	417	353
V/C Ratio(X)	0.76	1.01	0.22	0.36	1.56	0.30	0.88	0.38	0.15	0.57	0.33	0.98
Avail Cap(c_a), veh/h	383	1482	661	177	1448	646	378	450	381	388	417	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.4	32.7	21.0	26.3	33.2	22.5	36.8	35.6	33.6	33.3	36.6	43.4
Incr Delay (d2), s/veh	6.5	26.8	0.2	1.4	256.8	0.3	19.9	0.5	0.2	2.0	0.5	42.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	23.8	2.5	0.8	69.6	3.5	5.9	3.9	1.2	1.3	3.2	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	59.5	21.2	27.7	290.1	22.8	56.7	36.1	33.7	35.2	37.0	85.7
LnGrp LOS	C	F	C	C	F	C	E	D	C	D	D	F
Approach Vol, veh/h		1781			2518			559			704	
Approach Delay, s/veh		54.3			263.2			48.1			60.4	
Approach LOS		D			F			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	53.0	14.0	32.5	13.8	51.9	16.0	30.5
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	4.0	48.8	10.5	10.6	6.7	47.7	12.5	26.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9	0.2	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	149.0
HCM 6th LOS	F

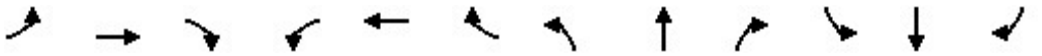
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

AM PEAK - 2030

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

02/24/2021



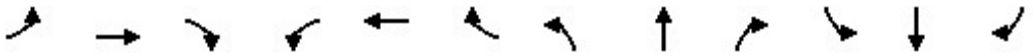
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	350	130	10	660	70	140	130	20	40	70	120
Future Volume (veh/h)	165	1225	164	82	1839	156	227	183	146	75	80	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	188	1398	187	94	2099	178	259	209	167	86	91	167
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	83	1780	236	151	2005	894	386	294	235	196	571	484
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.56	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	164	3154	418	322	3554	1585	1121	963	769	1007	1870	1585
Grp Volume(v), veh/h	188	782	803	94	2099	178	259	0	376	86	91	167
Grp Sat Flow(s),veh/h/ln	164	1777	1795	322	1777	1585	1121	0	1732	1007	1870	1585
Q Serve(g_s), s	0.0	29.6	30.5	18.3	48.8	4.8	19.0	0.0	16.7	7.2	3.1	7.1
Cycle Q Clear(g_c), s	48.8	29.6	30.5	48.8	48.8	4.8	22.0	0.0	16.7	23.8	3.1	7.1
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	83	1003	1013	151	2005	894	386	0	528	196	571	484
V/C Ratio(X)	2.26	0.78	0.79	0.62	1.05	0.20	0.67	0.00	0.71	0.44	0.16	0.35
Avail Cap(c_a), veh/h	83	1003	1013	151	2005	894	431	0	599	237	647	548
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	14.7	14.9	36.6	18.8	9.2	30.0	0.0	26.7	37.3	22.0	23.3
Incr Delay (d2), s/veh	602.6	6.0	6.4	17.6	33.6	0.5	3.5	0.0	3.4	1.5	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	11.0	11.5	2.6	24.8	1.5	5.2	0.0	7.0	1.8	1.3	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	645.9	20.7	21.2	54.2	52.5	9.7	33.5	0.0	30.1	38.8	22.1	23.8
LnGrp LOS	F	C	C	D	F	A	C	A	C	D	C	C
Approach Vol, veh/h		1773			2371			635			344	
Approach Delay, s/veh		87.2			49.3			31.5			27.1	
Approach LOS		F			D			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		31.5		55.0		31.5				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		50.8		24.0		50.8		25.8				
Green Ext Time (p_c), s		0.0		1.8		0.0		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			58.7									
HCM 6th LOS			E									

HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	254	1	9	504	28	3	20	14	4	3	2
Future Volume (veh/h)	2	1131	52	168	2513	29	246	21	164	6	4	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1826	1826	1826	1900	1900	1900
Adj Flow Rate, veh/h	2	1237	57	184	2749	32	269	23	179	7	4	2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	5	5	5	0	0	0
Cap, veh/h	56	972	45	98	706	8	280	16	128	239	129	51
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	0	1663	77	68	1208	14	835	71	556	665	558	222
Grp Volume(v), veh/h	1296	0	0	2965	0	0	471	0	0	13	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	0	1290	0	0	1463	0	0	1446	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	14.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	38.0	0.0	0.0	38.0	0.0	0.0	15.0	0.0	0.0	0.4	0.0	0.0
Prop In Lane	0.00		0.04	0.06		0.01	0.57		0.38	0.54		0.15
Lane Grp Cap(c), veh/h	1073	0	0	813	0	0	425	0	0	419	0	0
V/C Ratio(X)	1.21	0.00	0.00	3.65	0.00	0.00	1.11	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	1073	0	0	813	0	0	425	0	0	419	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.5	0.0	0.0	14.0	0.0	0.0	26.5	0.0	0.0	19.4	0.0	0.0
Incr Delay (d2), s/veh	102.6	0.0	0.0	1194.5	0.0	0.0	76.8	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	41.6	0.0	0.0	277.9	0.0	0.0	15.0	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	117.1	0.0	0.0	1208.6	0.0	0.0	103.3	0.0	0.0	19.4	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F	A	A	B	A	A
Approach Vol, veh/h		1296			2965			471			13	
Approach Delay, s/veh		117.1			1208.6			103.3			19.4	
Approach LOS		F			F			F			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		20.0		45.0		20.0				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		38.0		15.0		38.0		15.0				
Max Q Clear Time (g_c+I1), s		40.0		17.0		40.0		2.4				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			797.5									
HCM 6th LOS			F									

HCM 6th Signalized Intersection Summary
5: Hazelton Etna Rd SW & Broad St

02/24/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	410	120	270	620	90	270
Future Volume (veh/h)	1205	218	270	2459	300	270
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1375	249	308	2806	342	308
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1448	259	337	2398	379	557
Arrive On Green	0.48	0.48	0.28	1.00	0.21	0.21
Sat Flow, veh/h	3106	538	1781	3647	1781	1585
Grp Volume(v), veh/h	803	821	308	2806	342	308
Grp Sat Flow(s),veh/h/ln	1777	1774	1781	1777	1781	1585
Q Serve(g_s), s	38.6	40.3	10.2	0.0	16.8	14.1
Cycle Q Clear(g_c), s	38.6	40.3	10.2	0.0	16.8	14.1
Prop In Lane		0.30	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	854	852	337	2398	379	557
V/C Ratio(X)	0.94	0.96	0.91	1.17	0.90	0.55
Avail Cap(c_a), veh/h	854	852	387	2398	396	572
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	22.2	22.6	20.7	0.0	34.5	23.5
Incr Delay (d2), s/veh	19.3	23.0	3.2	77.0	22.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.1	20.5	5.5	25.6	9.4	12.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.5	45.6	23.9	77.0	57.2	24.6
LnGrp LOS	D	D	C	F	E	C
Approach Vol, veh/h	1624			3114	650	
Approach Delay, s/veh	43.6			71.7	41.7	
Approach LOS	D			E	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	17.5	48.4		24.2		65.8
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	15.0	39.9		20.0		59.9
Max Q Clear Time (g_c+I1), s	12.2	42.3		18.8		2.0
Green Ext Time (p_c), s	0.3	0.0		0.3		31.2

Intersection Summary	
HCM 6th Ctrl Delay	59.6
HCM 6th LOS	E

AM PEAK - 2030

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

02/24/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Future Volume (veh/h)	678	737	40	143	1549	177	110	195	119	134	171	1080
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	774	841	46	163	1768	202	126	223	136	153	195	1233
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	1545	85	469	1366	153	246	288	244	284	314	266
Arrive On Green	0.21	0.90	0.90	0.08	0.42	0.42	0.08	0.15	0.15	0.09	0.17	0.17
Sat Flow, veh/h	1781	3426	187	1781	3221	361	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	774	436	451	163	960	1010	126	223	136	153	195	1233
Grp Sat Flow(s),veh/h/ln	1781	1777	1837	1781	1777	1805	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.3	4.2	4.2	4.5	38.2	38.2	5.3	10.3	7.1	6.4	8.7	15.1
Cycle Q Clear(g_c), s	9.3	4.2	4.2	4.5	38.2	38.2	5.3	10.3	7.1	6.4	8.7	15.1
Prop In Lane	1.00		0.10	1.00		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	801	828	469	754	766	246	288	244	284	314	266
V/C Ratio(X)	2.93	0.54	0.54	0.35	1.27	1.32	0.51	0.77	0.56	0.54	0.62	4.64
Avail Cap(c_a), veh/h	264	801	828	517	754	766	310	314	266	324	314	266
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.28	0.28	0.28	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.4	2.6	2.6	12.4	25.9	25.9	29.0	36.6	35.2	28.7	34.8	37.5
Incr Delay (d2), s/veh	871.9	0.7	0.7	0.4	133.3	152.8	1.7	10.6	2.1	1.6	3.7	1645.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	66.8	1.0	1.1	1.7	42.7	47.5	2.3	5.4	2.8	2.8	4.2	127.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	893.3	3.4	3.3	12.8	159.2	178.7	30.7	47.2	37.4	30.3	38.5	1682.4
LnGrp LOS	F	A	A	B	F	F	C	D	D	C	D	F
Approach Vol, veh/h		1661			2133			485			1581	
Approach Delay, s/veh		418.0			157.2			40.1			1319.8	
Approach LOS		F			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	45.7	13.0	18.8	15.0	43.3	11.7	20.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 9.3	34.9	* 10	15.1	* 9.3	34.9	* 10	15.1
Max Q Clear Time (g_c+I1), s	6.5	6.2	8.4	12.3	11.3	40.2	7.3	17.1
Green Ext Time (p_c), s	0.1	6.1	0.1	0.5	0.0	0.0	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	535.1
HCM 6th LOS	F

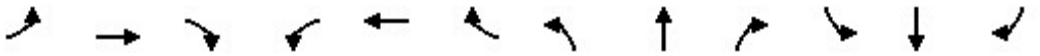
Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Future Volume (veh/h)	30	530	40	60	1226	10	40	110	50	20	150	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	605	46	68	1399	11	46	126	57	23	171	171
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	1160	983	422	1149	9	154	313	142	285	220	220
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	382	1870	1585	781	1853	15	1039	1219	552	1201	858	858
Grp Volume(v), veh/h	34	605	46	68	0	1410	46	0	183	23	0	342
Grp Sat Flow(s),veh/h/ln	382	1870	1585	781	0	1868	1039	0	1771	1201	0	1716
Q Serve(g_s), s	0.0	16.4	1.0	4.8	0.0	55.8	3.9	0.0	7.7	1.5	0.0	16.7
Cycle Q Clear(g_c), s	55.8	16.4	1.0	21.2	0.0	55.8	20.5	0.0	7.7	9.2	0.0	16.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	80	1160	983	422	0	1158	154	0	455	285	0	440
V/C Ratio(X)	0.42	0.52	0.05	0.16	0.00	1.22	0.30	0.00	0.40	0.08	0.00	0.78
Avail Cap(c_a), veh/h	80	1160	983	422	0	1158	233	0	588	376	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.0	9.6	6.7	15.5	0.0	17.1	40.6	0.0	27.7	31.5	0.0	31.1
Incr Delay (d2), s/veh	15.7	1.7	0.1	0.8	0.0	105.9	1.1	0.0	0.6	0.1	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	5.4	0.3	0.8	0.0	50.8	1.0	0.0	3.0	0.4	0.0	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	11.3	6.8	16.4	0.0	123.0	41.7	0.0	28.3	31.7	0.0	36.1
LnGrp LOS	E	B	A	B	A	F	D	A	C	C	A	D
Approach Vol, veh/h		685			1478			229			365	
Approach Delay, s/veh		13.4			118.1			31.0			35.8	
Approach LOS		B			F			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		61.8		28.2		61.8		28.2				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		57.8		22.5		57.8		18.7				
Green Ext Time (p_c), s		0.0		0.6		0.0		1.4				

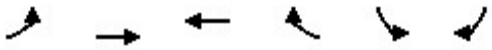
Intersection Summary		
HCM 6th Ctrl Delay		74.0
HCM 6th LOS		E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
42: Havens Corner Rd & Dixon Rd

02/24/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	174	350	146	55	23
Future Volume (veh/h)	58	527	718	372	259	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	72	651	887	460	320	33
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	82	383	662	343	390	40
Arrive On Green	0.57	0.57	0.57	0.57	0.24	0.24
Sat Flow, veh/h	0	671	1160	602	1605	165
Grp Volume(v), veh/h	723	0	0	1347	354	0
Grp Sat Flow(s),veh/h/ln	671	0	0	1762	1775	0
Q Serve(g_s), s	0.0	0.0	0.0	27.5	9.1	0.0
Cycle Q Clear(g_c), s	27.5	0.0	0.0	27.5	9.1	0.0
Prop In Lane	0.10			0.34	0.90	0.09
Lane Grp Cap(c), veh/h	465	0	0	1005	432	0
V/C Ratio(X)	1.56	0.00	0.00	1.34	0.82	0.00
Avail Cap(c_a), veh/h	465	0	0	1005	681	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.6	0.0	0.0	10.4	17.3	0.0
Incr Delay (d2), s/veh	260.6	0.0	0.0	160.0	4.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	36.3	0.0	0.0	48.8	3.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	275.2	0.0	0.0	170.4	21.7	0.0
LnGrp LOS	F	A	A	F	C	A
Approach Vol, veh/h		723	1347		354	
Approach Delay, s/veh		275.2	170.4		21.7	
Approach LOS		F	F		C	

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			32.0		16.2	32.0
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			27.5		18.5	27.5
Max Q Clear Time (g_c+I1), s			29.5		11.1	29.5
Green Ext Time (p_c), s			0.0		0.6	0.0

Intersection Summary	
HCM 6th Ctrl Delay	179.9
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
39: Taylor Rd & Havens Corner Rd

02/24/2021

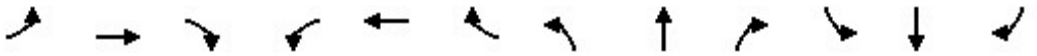
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	140	50	200	410	110
Future Volume (veh/h)	680	217	140	763	441	118
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	776	248	160	871	503	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	845	716	73	165	554	149
Arrive On Green	0.45	0.45	0.45	0.45	0.41	0.41
Sat Flow, veh/h	1870	1585	29	365	1367	367
Grp Volume(v), veh/h	776	248	1031	0	639	0
Grp Sat Flow(s),veh/h/ln	1870	1585	395	0	1736	0
Q Serve(g_s), s	27.1	7.1	4.4	0.0	24.2	0.0
Cycle Q Clear(g_c), s	27.1	7.1	31.5	0.0	24.2	0.0
Prop In Lane		1.00	0.16		0.79	0.21
Lane Grp Cap(c), veh/h	845	716	238	0	703	0
V/C Ratio(X)	0.92	0.35	4.33	0.00	0.91	0.00
Avail Cap(c_a), veh/h	845	716	238	0	1207	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	17.9	12.4	22.5	0.0	19.5	0.0
Incr Delay (d2), s/veh	14.9	0.3	1510.1	0.0	5.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	2.0	101.6	0.0	8.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.9	12.7	1532.6	0.0	25.4	0.0
LnGrp LOS	C	B	F	A	C	A
Approach Vol, veh/h	1024			1031	639	
Approach Delay, s/veh	28.0			1532.6	25.4	
Approach LOS	C			F	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		37.0		32.8		37.0
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		31.5		48.5		31.5
Max Q Clear Time (g_c+I1), s		29.1		26.2		33.5
Green Ext Time (p_c), s		1.3		2.1		0.0

Intersection Summary	
HCM 6th Ctrl Delay	603.2
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Future Volume (veh/h)	196	528	161	20	766	404	411	160	15	353	114	151
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	224	603	184	23	874	461	469	183	17	403	130	172
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	182	54	48	522	272	436	143	13	431	119	157
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	134	404	120	15	1160	604	860	335	31	860	277	367
Grp Volume(v), veh/h	1011	0	0	1358	0	0	669	0	0	705	0	0
Grp Sat Flow(s),veh/h/ln	657	0	0	1780	0	0	1226	0	0	1504	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	40.5	0.0	0.0	40.5	0.0	0.0	38.5	0.0	0.0	38.5	0.0	0.0
Prop In Lane	0.22		0.18	0.02		0.34	0.70		0.03	0.57		0.24
Lane Grp Cap(c), veh/h	345	0	0	842	0	0	593	0	0	706	0	0
V/C Ratio(X)	2.93	0.00	0.00	1.61	0.00	0.00	1.13	0.00	0.00	1.00	0.00	0.00
Avail Cap(c_a), veh/h	345	0	0	842	0	0	593	0	0	706	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.7	0.0	0.0	25.8	0.0	0.0	28.0	0.0	0.0	27.4	0.0	0.0
Incr Delay (d2), s/veh	877.7	0.0	0.0	281.7	0.0	0.0	77.8	0.0	0.0	33.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	91.1	0.0	0.0	81.4	0.0	0.0	24.6	0.0	0.0	20.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	904.4	0.0	0.0	307.5	0.0	0.0	105.8	0.0	0.0	60.9	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F	A	A	E	A	A
Approach Vol, veh/h		1011			1358			669			705	
Approach Delay, s/veh		904.4			307.5			105.8			60.9	
Approach LOS		F			F			F			E	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		46.0		44.0		46.0		44.0				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		40.5		38.5		40.5		38.5				
Max Q Clear Time (g_c+I1), s		42.5		40.5		42.5		40.5				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		386.2
HCM 6th LOS		F

HCM 6th TWSC
25: Mink St SW & Havens Corner Rd

02/24/2021

Intersection	
Int Delay, s/veh	18.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	33	0	27	0	0	0	57	311	0	0	143	21
Future Vol, veh/h	55	0	819	4	7	1	851	645	3	0	392	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	3	3	3
Mvmt Flow	67	0	1000	5	9	1	1039	788	4	0	479	101

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3403	3400	530	3898	3448	790	580	0	0	792	0	0
Stage 1	530	530	-	2868	2868	-	-	-	-	-	-	-
Stage 2	2873	2870	-	1030	580	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.12	6.52	6.22	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.518	4.018	3.318	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	~ 4	7	~ 547	~ 2	~ 7	390	~ 994	-	-	824	-	-
Stage 1	531	525	-	23	37	-	-	-	-	-	-	-
Stage 2	~ 23	36	-	282	500	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	~ 547	-	0	390	~ 994	-	-	824	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	531	525	-	23	0	-	-	-	-	-	-	-
Stage 2	-	0	-	-	500	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			34.8	0
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	~ 994	-	-	-	-	824	-	-
HCM Lane V/C Ratio	1.045	-	-	-	-	-	-	-
HCM Control Delay (s)	61.3	0	-	-	-	0	-	-
HCM Lane LOS	F	A	-	-	-	A	-	-
HCM 95th %tile Q(veh)	22.8	-	-	-	-	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
43: Dixon Rd & Clark State Rd

02/24/2021

Intersection	
Int Delay, s/veh	46.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	158	33	80	291	100	116
Future Vol, veh/h	158	33	252	291	100	334
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	4	4	2	2
Mvmt Flow	182	38	291	336	115	385

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	220	0	1119	201
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	918	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1337	-	229	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	389	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1337	-	168	840
Mov Cap-2 Maneuver	-	-	-	-	168	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	285	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	119.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	437	-	-	1337	-
HCM Lane V/C Ratio	1.146	-	-	0.217	-
HCM Control Delay (s)	119.1	-	-	8.4	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	18.3	-	-	0.8	-

HCM 6th TWSC
24: Mink St SW & Refugee Rd SW

02/24/2021

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Future Vol, veh/h	10	55	36	147	41	106	24	242	128	452	787	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	2	2	2	1	1	1	1	1	1
Mvmt Flow	12	65	42	173	48	125	34	340	180	635	1105	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2971	2974	1116	2937	2894	430	1126	0	0	520	0	0
Stage 1	2386	2386	-	498	498	-	-	-	-	-	-	-
Stage 2	585	588	-	2439	2396	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	~ 9	~ 14	255	~ 9	~ 16	625	624	-	-	1051	-	-
Stage 1	46	67	-	554	544	-	-	-	-	-	-	-
Stage 2	501	499	-	~ 43	65	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	255	-	0	625	624	-	-	1051	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	42	0	-	510	501	-	-	-	-	-	-	-
Stage 2	333	460	-	-	0	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.7	4.9
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	624	-	-	-	-	1051	-	-
HCM Lane V/C Ratio	0.054	-	-	-	-	0.604	-	-
HCM Control Delay (s)	11.1	0	-	-	-	13.5	0	-
HCM Lane LOS	B	A	-	-	-	B	A	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-	4.2	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
26: Etna Pkwy & Refugee Rd SW

02/24/2021

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Future Vol, veh/h	11	550	74	108	122	335	83	188	151	237	128	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	1	1	1
Mvmt Flow	13	672	90	132	149	409	106	240	193	303	164	115

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1656	1473	222	1758	1434	337	279	0	0	433	0	0
Stage 1	828	828	-	549	549	-	-	-	-	-	-	-
Stage 2	828	645	-	1209	885	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	79	~ 128	823	~ 67	~ 134	707	1284	-	-	1132	-	-
Stage 1	368	~ 389	-	522	518	-	-	-	-	-	-	-
Stage 2	368	~ 471	-	224	364	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 77	823	-	~ 81	707	1284	-	-	1132	-	-
Mov Cap-2 Maneuver	-	~ 77	-	-	~ 81	-	-	-	-	-	-	-
Stage 1	327	~ 264	-	464	460	-	-	-	-	-	-	-
Stage 2	93	~ 418	-	-	247	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1.6	4.9
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1284	-	-	-	-	1132	-	-
HCM Lane V/C Ratio	0.083	-	-	-	-	0.268	-	-
HCM Control Delay (s)	8.1	0	-	-	-	9.3	0	-
HCM Lane LOS	A	A	-	-	-	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	-	-	1.1	-	-

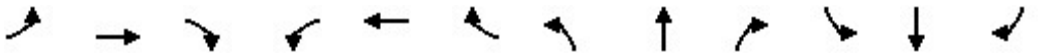
Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

PM PEAK - 2020

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Future Volume (veh/h)	106	203	671	27	131	70	532	716	36	69	576	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	113	216	714	29	139	74	566	762	38	73	613	111
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	120	123	371	106	357	172	261	227	11	124	709	123
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	145	377	1133	101	1090	525	331	445	22	104	1392	242
Grp Volume(v), veh/h	1043	0	0	242	0	0	1366	0	0	797	0	0
Grp Sat Flow(s),veh/h/ln	1655	0	0	1715	0	0	798	0	0	1738	0	0
Q Serve(g_s), s	12.3	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.0	0.0	0.0	5.7	0.0	0.0	28.0	0.0	0.0	22.6	0.0	0.0
Prop In Lane	0.11		0.68	0.12		0.31	0.41		0.03	0.09		0.14
Lane Grp Cap(c), veh/h	614	0	0	635	0	0	499	0	0	956	0	0
V/C Ratio(X)	1.70	0.00	0.00	0.38	0.00	0.00	2.74	0.00	0.00	0.83	0.00	0.00
Avail Cap(c_a), veh/h	614	0	0	635	0	0	499	0	0	956	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	14.4	0.0	0.0	17.0	0.0	0.0	12.0	0.0	0.0
Incr Delay (d2), s/veh	321.2	0.0	0.0	0.4	0.0	0.0	787.8	0.0	0.0	8.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	60.9	0.0	0.0	1.8	0.0	0.0	114.3	0.0	0.0	7.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	340.6	0.0	0.0	14.8	0.0	0.0	804.9	0.0	0.0	20.4	0.0	0.0
LnGrp LOS	F	A	A	B	A	A	F	A	A	C	A	A
Approach Vol, veh/h		1043			242			1366			797	
Approach Delay, s/veh		340.6			14.8			804.9			20.4	
Approach LOS		F			B			F			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.5		22.5		32.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		28.0		18.0		28.0		18.0				
Max Q Clear Time (g_c+I1), s		30.0		20.0		24.6		7.7				
Green Ext Time (p_c), s		0.0		0.0		1.7		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			427.7									
HCM 6th LOS			F									

PM PEAK - 2020

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

02/24/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Future Volume (veh/h)	346	2169	470	70	1718	182	190	220	100	388	210	300
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	376	2358	511	76	1867	198	207	239	109	422	228	326
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	379	1489	664	163	1059	472	324	444	376	327	411	348
Arrive On Green	0.18	0.42	0.42	0.06	0.30	0.30	0.09	0.24	0.24	0.07	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	376	2358	511	76	1867	198	207	239	109	422	228	326
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	19.9	47.5	31.4	3.3	33.8	11.4	10.3	12.7	6.4	8.5	12.3	22.9
Cycle Q Clear(g_c), s	19.9	47.5	31.4	3.3	33.8	11.4	10.3	12.7	6.4	8.5	12.3	22.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	379	1489	664	163	1059	472	324	444	376	327	411	348
V/C Ratio(X)	0.99	1.58	0.77	0.47	1.76	0.42	0.64	0.54	0.29	1.29	0.55	0.94
Avail Cap(c_a), veh/h	379	1489	664	175	1059	472	324	445	377	327	412	349
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	33.0	28.3	29.8	39.8	31.9	31.2	37.8	35.4	42.0	39.3	43.5
Incr Delay (d2), s/veh	43.9	265.8	5.5	2.1	347.4	0.6	4.2	1.3	0.4	152.0	1.6	31.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.6	73.6	12.5	1.4	64.9	4.4	4.7	5.9	2.5	18.9	5.8	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.1	298.7	33.7	31.8	387.2	32.5	35.4	39.1	35.8	194.0	40.9	75.4
LnGrp LOS	E	F	C	C	F	C	D	D	D	F	D	E
Approach Vol, veh/h		3245			2141			555			976	
Approach Delay, s/veh		231.5			341.8			37.1			118.6	
Approach LOS		F			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	53.7	14.0	32.4	27.0	40.0	16.0	30.4
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	5.3	49.5	10.5	14.7	21.9	35.8	12.3	24.9
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	234.1
HCM 6th LOS	F

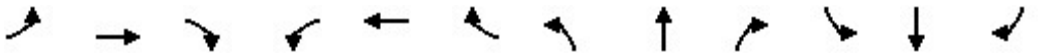
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

PM PEAK - 2020

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

02/24/2021



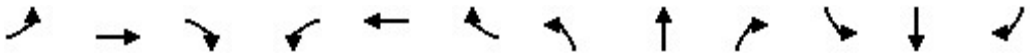
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Future Volume (veh/h)	211	2258	194	112	1765	143	114	130	85	124	197	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	229	2454	211	122	1918	155	124	141	92	135	214	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	112	1974	167	88	2115	943	274	282	184	265	499	423
Arrive On Green	0.60	0.60	0.60	0.60	0.60	0.60	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	200	3316	281	111	3554	1585	1080	1057	690	1147	1870	1585
Grp Volume(v), veh/h	229	1298	1367	122	1918	155	124	0	233	135	214	85
Grp Sat Flow(s),veh/h/ln	200	1777	1820	111	1777	1585	1080	0	1746	1147	1870	1585
Q Serve(g_s), s	9.9	48.8	48.8	0.0	38.9	3.6	8.8	0.0	9.3	9.2	7.8	3.4
Cycle Q Clear(g_c), s	48.8	48.8	48.8	48.8	38.9	3.6	16.6	0.0	9.3	18.5	7.8	3.4
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	112	1058	1083	88	2115	943	274	0	466	265	499	423
V/C Ratio(X)	2.04	1.23	1.26	1.39	0.91	0.16	0.45	0.00	0.50	0.51	0.43	0.20
Avail Cap(c_a), veh/h	112	1058	1083	88	2115	943	379	0	637	377	682	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.9	16.6	16.6	41.0	14.6	7.4	31.7	0.0	25.4	33.2	24.9	23.3
Incr Delay (d2), s/veh	499.8	110.9	125.3	230.7	7.1	0.4	1.2	0.0	0.8	1.5	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.7	46.8	52.3	7.3	13.4	1.0	2.3	0.0	3.8	2.6	3.4	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	539.7	127.5	141.9	271.7	21.7	7.8	32.9	0.0	26.3	34.8	25.5	23.5
LnGrp LOS	F	F	F	F	C	A	C	A	C	C	C	C
Approach Vol, veh/h		2894			2195			357			434	
Approach Delay, s/veh		166.9			34.6			28.6			28.0	
Approach LOS		F			C			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		27.0		55.0		27.0				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		50.8		18.6		50.8		20.5				
Green Ext Time (p_c), s		0.0		1.4		0.0		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			98.9									
HCM 6th LOS			F									

HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	8	682	5	17	345	19	5	4	26	41	17	7
Future Volume (veh/h)	8	3092	142	361	1959	21	301	5	315	43	18	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1811	1811	1811	1870	1870	1870
Adj Flow Rate, veh/h	8	3155	145	368	1999	21	307	5	321	44	18	7
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	6	6	6	2	2	2
Cap, veh/h	56	1038	48	132	376	4	249	3	174	252	95	29
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1	1775	81	116	643	7	723	12	756	700	411	125
Grp Volume(v), veh/h	3308	0	0	2388	0	0	633	0	0	69	0	0
Grp Sat Flow(s),veh/h/ln	1858	0	0	766	0	0	1490	0	0	1237	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	12.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	38.0	0.0	0.0	38.0	0.0	0.0	15.0	0.0	0.0	2.4	0.0	0.0
Prop In Lane	0.00		0.04	0.15		0.01	0.48		0.51	0.64		0.10
Lane Grp Cap(c), veh/h	1142	0	0	512	0	0	426	0	0	376	0	0
V/C Ratio(X)	2.90	0.00	0.00	4.67	0.00	0.00	1.49	0.00	0.00	0.18	0.00	0.00
Avail Cap(c_a), veh/h	1142	0	0	512	0	0	426	0	0	376	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.4	0.0	0.0	15.7	0.0	0.0	26.3	0.0	0.0	20.1	0.0	0.0
Incr Delay (d2), s/veh	856.3	0.0	0.0	1653.8	0.0	0.0	230.7	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	283.2	0.0	0.0	241.1	0.0	0.0	33.2	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	870.7	0.0	0.0	1669.5	0.0	0.0	257.0	0.0	0.0	20.3	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F	A	A	C	A	A
Approach Vol, veh/h		3308			2388			633			69	
Approach Delay, s/veh		870.7			1669.5			257.0			20.3	
Approach LOS		F			F			F			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		45.0		20.0		45.0		20.0				
Change Period (Y+Rc), s		7.0		5.0		7.0		5.0				
Max Green Setting (Gmax), s		38.0		15.0		38.0		15.0				
Max Q Clear Time (g_c+I1), s		40.0		17.0		40.0		4.4				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			1099.0									
HCM 6th LOS			F									

HCM 6th Signalized Intersection Summary
5: Hazelton Etna Rd SW & Broad St

02/24/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	150	310	630	110	340
Future Volume (veh/h)	3019	330	310	2047	245	340
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3282	359	337	2225	266	370
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1631	175	368	2563	297	521
Arrive On Green	0.50	0.50	0.32	1.00	0.17	0.17
Sat Flow, veh/h	3331	348	1781	3647	1781	1585
Grp Volume(v), veh/h	1774	1867	337	2225	266	370
Grp Sat Flow(s),veh/h/ln	1777	1808	1781	1777	1781	1585
Q Serve(g_s), s	45.3	45.3	12.0	0.0	13.2	15.0
Cycle Q Clear(g_c), s	45.3	45.3	12.0	0.0	13.2	15.0
Prop In Lane		0.19	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	895	911	368	2563	297	521
V/C Ratio(X)	1.98	2.05	0.92	0.87	0.90	0.71
Avail Cap(c_a), veh/h	895	911	476	2563	297	521
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	22.3	22.3	21.5	0.0	36.7	26.5
Incr Delay (d2), s/veh	445.8	476.5	2.4	0.4	27.5	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	127.6	137.6	5.6	0.1	7.8	16.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	468.2	498.9	23.9	0.4	64.3	31.0
LnGrp LOS	F	F	C	A	E	C
Approach Vol, veh/h	3641			2562	636	
Approach Delay, s/veh	483.9			3.5	44.9	
Approach LOS	F			A	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.6	50.4		20.0		70.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	20.0	39.9		15.0		64.9
Max Q Clear Time (g_c+I1), s	14.0	47.3		17.0		2.0
Green Ext Time (p_c), s	0.5	0.0		0.0		18.1

Intersection Summary	
HCM 6th Ctrl Delay	263.1
HCM 6th LOS	F

PM PEAK - 2020

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

02/24/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Future Volume (veh/h)	1190	2009	110	176	1115	175	100	240	253	308	278	1152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1293	2184	120	191	1212	190	109	261	275	335	302	1252
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	1358	74	224	1152	180	234	402	341	301	418	354
Arrive On Green	0.21	0.79	0.79	0.08	0.37	0.37	0.07	0.21	0.21	0.08	0.22	0.22
Sat Flow, veh/h	1781	3427	187	1781	3080	480	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	1293	1122	1182	191	696	706	109	261	275	335	302	1252
Grp Sat Flow(s),veh/h/ln	1781	1777	1837	1781	1777	1784	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.3	35.7	35.7	5.9	33.7	33.7	4.2	11.5	14.8	7.3	13.5	20.1
Cycle Q Clear(g_c), s	9.3	35.7	35.7	5.9	33.7	33.7	4.2	11.5	14.8	7.3	13.5	20.1
Prop In Lane	1.00		0.10	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	704	728	224	665	667	234	402	341	301	418	354
V/C Ratio(X)	4.90	1.59	1.62	0.85	1.05	1.06	0.47	0.65	0.81	1.11	0.72	3.54
Avail Cap(c_a), veh/h	264	704	728	224	665	667	249	418	354	301	418	354
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	9.3	9.3	21.3	28.2	28.2	25.7	32.2	33.6	33.0	32.4	35.0
Incr Delay (d2), s/veh	1754.2	268.1	281.2	25.4	48.2	51.1	1.4	3.3	12.6	86.3	6.1	1148.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	131.6	55.8	60.3	3.8	22.2	22.8	1.8	5.4	6.7	10.2	6.6	120.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1774.2	277.4	290.5	46.7	76.3	79.2	27.1	35.6	46.1	119.3	38.4	1183.5
LnGrp LOS	F	F	F	D	F	F	C	D	D	F	D	F
Approach Vol, veh/h		3597			1593			645			1889	
Approach Delay, s/veh		819.8			74.1			38.6			811.7	
Approach LOS		F			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	40.8	12.0	24.2	15.0	38.8	11.2	25.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 7.3	34.9	* 7.3	20.1	* 9.3	32.9	* 7.3	20.1
Max Q Clear Time (g_c+I1), s	7.9	37.7	9.3	16.8	11.3	35.7	6.2	22.1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	598.8
HCM 6th LOS	F

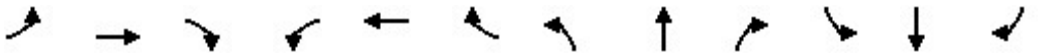
Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Future Volume (veh/h)	140	1719	60	90	878	10	40	160	100	30	120	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	1868	65	98	954	11	43	174	109	33	130	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	256	1240	1051	80	1223	14	180	230	144	148	201	169
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	582	1870	1585	230	1845	21	1141	1075	674	1096	940	788
Grp Volume(v), veh/h	152	1868	65	98	0	965	43	0	283	33	0	239
Grp Sat Flow(s),veh/h/ln	582	1870	1585	230	0	1867	1141	0	1749	1096	0	1728
Q Serve(g_s), s	22.2	59.6	1.3	0.0	0.0	32.5	3.2	0.0	13.7	2.6	0.0	11.4
Cycle Q Clear(g_c), s	54.7	59.6	1.3	59.6	0.0	32.5	14.6	0.0	13.7	16.3	0.0	11.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.39	1.00		0.46
Lane Grp Cap(c), veh/h	256	1240	1051	80	0	1237	180	0	374	148	0	370
V/C Ratio(X)	0.59	1.51	0.06	1.22	0.00	0.78	0.24	0.00	0.76	0.22	0.00	0.65
Avail Cap(c_a), veh/h	256	1240	1051	80	0	1237	315	0	581	278	0	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.7	15.2	5.3	45.0	0.0	10.6	38.9	0.0	33.2	40.8	0.0	32.3
Incr Delay (d2), s/veh	9.8	232.3	0.1	173.0	0.0	4.9	0.7	0.0	3.1	0.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	96.3	0.3	5.5	0.0	10.6	0.9	0.0	5.6	0.7	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.5	247.5	5.4	218.0	0.0	15.5	39.6	0.0	36.3	41.6	0.0	34.2
LnGrp LOS	D	F	A	F	A	B	D	A	D	D	A	C
Approach Vol, veh/h		2085			1063			326			272	
Approach Delay, s/veh		224.8			34.2			36.7			35.1	
Approach LOS		F			C			D			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		65.6		24.4		65.6		24.4				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		61.6		16.6		61.6		18.3				
Green Ext Time (p_c), s		0.0		1.3		0.0		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			140.6									
HCM 6th LOS			F									

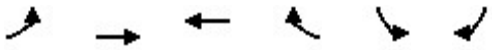
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

PM PEAK - 2020

HCM 6th Signalized Intersection Summary
42: Havens Corner Rd & Dixon Rd

02/24/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	432	215	159	181	44
Future Volume (veh/h)	36	995	628	467	485	46
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1900	1900	1885	1900
Adj Flow Rate, veh/h	40	1106	698	519	539	51
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	0	0	1	0
Cap, veh/h	181	1437	815	606	0	0
Arrive On Green	0.81	0.81	0.81	0.81	0.00	0.00
Sat Flow, veh/h	25	1785	1012	753	0	0
Grp Volume(v), veh/h	1146	0	0	1217	0	0
Grp Sat Flow(s),veh/h/ln	1810	0	0	1765	0	0
Q Serve(g_s), s	0.0	0.0	0.0	10.0	0.0	0.0
Cycle Q Clear(g_c), s	7.0	0.0	0.0	10.0	0.0	0.0
Prop In Lane	0.03			0.43	0.00	0.00
Lane Grp Cap(c), veh/h	1618	0	0	1421	0	0
V/C Ratio(X)	0.71	0.00	0.00	0.86	0.00	0.00
Avail Cap(c_a), veh/h	1904	0	0	1717	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.1	0.0	0.0	1.4	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	3.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	1.5	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.1	0.0	0.0	5.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		1146	1217		0	
Approach Delay, s/veh		2.1	5.3		0.0	
Approach LOS		A	A			

Timer - Assigned Phs		4		6	8
Phs Duration (G+Y+Rc), s		23.1		0.0	23.1
Change Period (Y+Rc), s		4.5		4.5	4.5
Max Green Setting (Gmax), s		22.5		18.5	22.5
Max Q Clear Time (g_c+I1), s		9.0		0.0	12.0
Green Ext Time (p_c), s		7.4		0.0	6.6

Intersection Summary	
HCM 6th Ctrl Delay	3.8
HCM 6th LOS	A

HCM 6th Signalized Intersection Summary
39: Taylor Rd & Havens Corner Rd

02/24/2021

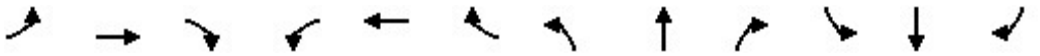
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	410	70	120	360	80
Future Volume (veh/h)	961	556	208	806	395	108
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	1045	604	226	876	429	117
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	794	673	94	67	487	133
Arrive On Green	0.42	0.42	0.42	0.42	0.36	0.36
Sat Flow, veh/h	1870	1585	0	159	1361	371
Grp Volume(v), veh/h	1045	604	1102	0	547	0
Grp Sat Flow(s),veh/h/ln	1870	1585	159	0	1735	0
Q Serve(g_s), s	19.5	16.3	0.0	0.0	13.6	0.0
Cycle Q Clear(g_c), s	19.5	16.3	19.5	0.0	13.6	0.0
Prop In Lane		1.00	0.21		0.78	0.21
Lane Grp Cap(c), veh/h	794	673	162	0	621	0
V/C Ratio(X)	1.32	0.90	6.81	0.00	0.88	0.00
Avail Cap(c_a), veh/h	794	673	162	0	774	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	13.2	12.3	15.2	0.0	13.8	0.0
Incr Delay (d2), s/veh	151.4	14.9	2629.7	0.0	9.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	38.0	6.0	118.7	0.0	5.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	164.6	27.2	2644.9	0.0	23.6	0.0
LnGrp LOS	F	C	F	A	C	A
Approach Vol, veh/h	1649			1102	547	
Approach Delay, s/veh	114.3			2644.9	23.6	
Approach LOS	F			F	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		25.0		21.0		25.0
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		19.5		20.5		19.5
Max Q Clear Time (g_c+I1), s		21.5		15.6		21.5
Green Ext Time (p_c), s		0.0		0.9		0.0

Intersection Summary		
HCM 6th Ctrl Delay	944.8	
HCM 6th LOS	F	

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Future Volume (veh/h)	144	934	130	35	832	456	286	258	58	471	87	261
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	157	1015	141	38	904	496	311	280	63	512	95	284
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	425	57	72	472	254	350	239	53	359	49	147
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	125	1017	137	26	1129	608	656	599	134	665	123	369
Grp Volume(v), veh/h	1313	0	0	1438	0	0	654	0	0	891	0	0
Grp Sat Flow(s),veh/h/ln	1279	0	0	1763	0	0	1389	0	0	1157	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	25.1	0.0	0.0	25.1	0.0	0.0	23.9	0.0	0.0	23.9	0.0	0.0
Prop In Lane	0.12		0.11	0.03		0.34	0.48		0.10	0.57		0.32
Lane Grp Cap(c), veh/h	602	0	0	799	0	0	642	0	0	555	0	0
V/C Ratio(X)	2.18	0.00	0.00	1.80	0.00	0.00	1.02	0.00	0.00	1.60	0.00	0.00
Avail Cap(c_a), veh/h	602	0	0	799	0	0	642	0	0	555	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.2	0.0	0.0	18.4	0.0	0.0	19.7	0.0	0.0	20.1	0.0	0.0
Incr Delay (d2), s/veh	536.3	0.0	0.0	364.6	0.0	0.0	40.4	0.0	0.0	280.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	96.1	0.0	0.0	89.3	0.0	0.0	14.4	0.0	0.0	49.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	554.5	0.0	0.0	383.1	0.0	0.0	60.1	0.0	0.0	300.6	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F	A	A	F	A	A
Approach Vol, veh/h		1313			1438			654			891	
Approach Delay, s/veh		554.5			383.1			60.1			300.6	
Approach LOS		F			F			E			F	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	30.6	29.4	30.6	29.4
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	25.1	23.9	25.1	23.9
Max Q Clear Time (g_c+I1), s	27.1	25.9	27.1	25.9
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	369.2
HCM 6th LOS	F

HCM 6th TWSC
25: Mink St SW & Havens Corner Rd

02/24/2021

Intersection	
Int Delay, s/veh	66

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Future Vol, veh/h	68	133	1109	4	1	0	1026	459	6	1	748	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	2	2	2
Mvmt Flow	74	145	1205	4	1	0	1115	499	7	1	813	77

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3587	3590	852	4262	3625	503	890	0	0	506	0	0
Stage 1	854	854	-	2733	2733	-	-	-	-	-	-	-
Stage 2	2733	2736	-	1529	892	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 3	~ 6	~ 361	~ 1	5	569	~ 761	-	-	1059	-	-
Stage 1	355	377	-	28	43	-	-	-	-	-	-	-
Stage 2	~ 28	~ 44	-	147	360	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	~ 361	-	0	569	~ 761	-	-	1059	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	355	376	-	28	0	-	-	-	-	-	-	-
Stage 2	-	0	-	-	359	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			160.4	0
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	~ 761	-	-	-	-	1059	-	-
HCM Lane V/C Ratio	1.465	-	-	-	-	0.001	-	-
HCM Control Delay (s)	233.2	0	-	-	-	8.4	0	-
HCM Lane LOS	F	A	-	-	-	A	A	-
HCM 95th %tile Q(veh)	52.3	-	-	-	-	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
43: Dixon Rd & Clark State Rd

02/24/2021

Intersection	
Int Delay, s/veh	113.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	79	152	253	77	94
Future Vol, veh/h	232	79	435	253	77	367
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	252	86	473	275	84	399

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	338	0	1516	295
Stage 1	-	-	-	-	295	-
Stage 2	-	-	-	-	1221	-
Critical Hdwy	-	-	4.12	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.218	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1221	-	132	747
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	280	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1221	-	~ 72	747
Mov Cap-2 Maneuver	-	-	-	-	~ 72	-
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	152	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.2	$ 360.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	284	-	-	1221	-
HCM Lane V/C Ratio	1.699	-	-	0.387	-
HCM Control Delay (s)	$ 360.6	-	-	9.8	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	30.7	-	-	1.9	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
24: Mink St SW & Refugee Rd SW

02/24/2021

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	55	36	12	41	14	24	146	16	18	325	15
Future Vol, veh/h	10	55	36	147	41	106	24	242	128	452	787	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	2	2	2	1	1	1	1	1	1
Mvmt Flow	12	65	42	173	48	125	28	286	151	533	928	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2507	2496	937	2475	2430	362	946	0	0	437	0	0
Stage 1	2003	2003	-	418	418	-	-	-	-	-	-	-
Stage 2	504	493	-	2057	2012	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.12	6.52	6.22	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.518	4.018	3.318	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	20	~ 29	324	~ 20	~ 32	683	730	-	-	1128	-	-
Stage 1	78	105	-	612	591	-	-	-	-	-	-	-
Stage 2	554	550	-	~ 72	103	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	324	-	0	683	730	-	-	1128	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	74	0	-	580	560	-	-	-	-	-	-	-
Stage 2	392	521	-	-	0	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.6	4
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	730	-	-	-	-	1128	-	-
HCM Lane V/C Ratio	0.039	-	-	-	-	0.473	-	-
HCM Control Delay (s)	10.1	0	-	-	-	11	0	-
HCM Lane LOS	B	A	-	-	-	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-	2.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
26: Etna Pkwy & Refugee Rd SW

02/24/2021

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	82	6	14	56	34	11	147	41	120	99	1
Future Vol, veh/h	11	550	74	108	122	335	83	188	151	237	128	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	1	1	1	2	2	2	1	1	1
Mvmt Flow	13	672	90	132	149	409	101	230	184	289	156	110

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1592	1405	211	1694	1368	322	266	0	0	414	0	0
Stage 1	789	789	-	524	524	-	-	-	-	-	-	-
Stage 2	803	616	-	1170	844	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.11	6.51	6.21	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.509	4.009	3.309	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	88	~ 141	834	~ 74	~ 147	721	1298	-	-	1150	-	-
Stage 1	387	~ 405	-	538	532	-	-	-	-	-	-	-
Stage 2	380	~ 485	-	236	381	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 89	834	-	~ 92	721	1298	-	-	1150	-	-
Mov Cap-2 Maneuver	-	~ 89	-	-	~ 92	-	-	-	-	-	-	-
Stage 1	347	~ 284	-	482	477	-	-	-	-	-	-	-
Stage 2	101	~ 435	-	-	267	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1.6	4.8
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1298	-	-	-	-	1150	-	-
HCM Lane V/C Ratio	0.078	-	-	-	-	0.252	-	-
HCM Control Delay (s)	8	0	-	-	-	9.2	0	-
HCM Lane LOS	A	A	-	-	-	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	-	-	1	-	-

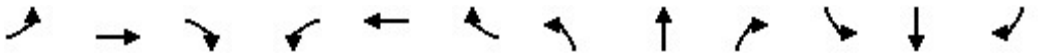
Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

PM PEAK - 2030

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Future Volume (veh/h)	106	203	671	27	131	70	532	716	36	69	576	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	118	227	750	30	146	78	594	800	40	77	643	116
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	121	123	372	106	356	172	246	206	10	126	706	123
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	147	376	1138	100	1087	526	301	405	20	107	1388	241
Grp Volume(v), veh/h	1095	0	0	254	0	0	1434	0	0	836	0	0
Grp Sat Flow(s),veh/h/ln	1661	0	0	1713	0	0	726	0	0	1735	0	0
Q Serve(g_s), s	11.9	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	18.0	0.0	0.0	6.1	0.0	0.0	28.0	0.0	0.0	24.9	0.0	0.0
Prop In Lane	0.11		0.68	0.12		0.31	0.41		0.03	0.09		0.14
Lane Grp Cap(c), veh/h	616	0	0	634	0	0	462	0	0	955	0	0
V/C Ratio(X)	1.78	0.00	0.00	0.40	0.00	0.00	3.10	0.00	0.00	0.88	0.00	0.00
Avail Cap(c_a), veh/h	616	0	0	634	0	0	462	0	0	955	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.4	0.0	0.0	14.5	0.0	0.0	17.0	0.0	0.0	12.5	0.0	0.0
Incr Delay (d2), s/veh	356.4	0.0	0.0	0.4	0.0	0.0	952.3	0.0	0.0	11.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	67.1	0.0	0.0	1.9	0.0	0.0	127.1	0.0	0.0	8.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	375.8	0.0	0.0	14.9	0.0	0.0	969.3	0.0	0.0	23.6	0.0	0.0
LnGrp LOS	F	A	A	B	A	A	F	A	A	C	A	A
Approach Vol, veh/h		1095			254			1434			836	
Approach Delay, s/veh		375.8			14.9			969.3			23.6	
Approach LOS		F			B			F			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.5		22.5		32.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		28.0		18.0		28.0		18.0				
Max Q Clear Time (g_c+I1), s		30.0		20.0		26.9		8.1				
Green Ext Time (p_c), s		0.0		0.0		0.6		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			504.3									
HCM 6th LOS			F									

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

02/24/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Future Volume (veh/h)	346	2169	470	70	1718	182	190	220	100	388	210	300
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	395	2475	536	80	1961	208	217	251	114	443	240	342
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	379	1486	663	164	1058	472	316	445	377	319	412	349
Arrive On Green	0.18	0.42	0.42	0.06	0.30	0.30	0.09	0.24	0.24	0.07	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	395	2475	536	80	1961	208	217	251	114	443	240	342
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	20.1	47.5	33.7	3.4	33.8	12.0	10.5	13.4	6.7	8.5	13.0	24.3
Cycle Q Clear(g_c), s	20.1	47.5	33.7	3.4	33.8	12.0	10.5	13.4	6.7	8.5	13.0	24.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	379	1486	663	164	1058	472	316	445	377	319	412	349
V/C Ratio(X)	1.04	1.67	0.81	0.49	1.85	0.44	0.69	0.56	0.30	1.39	0.58	0.98
Avail Cap(c_a), veh/h	379	1486	663	175	1058	472	316	445	377	319	412	349
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	33.0	29.0	29.8	39.8	32.2	31.9	38.1	35.5	41.9	39.6	44.0
Incr Delay (d2), s/veh	57.7	302.5	7.4	2.2	387.5	0.6	6.1	1.6	0.4	193.9	2.1	42.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.2	81.0	13.7	1.5	70.8	4.6	5.1	6.3	2.6	22.0	6.1	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.1	335.5	36.4	32.0	427.4	32.9	38.0	39.7	36.0	235.8	41.7	86.5
LnGrp LOS	F	F	D	C	F	C	D	D	D	F	D	F
Approach Vol, veh/h		3406			2249			582			1025	
Approach Delay, s/veh		260.3			376.8			38.3			140.5	
Approach LOS		F			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	53.7	14.0	32.5	27.0	40.0	16.0	30.5
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	46.8	8.5	* 27	20.1	33.8	10.5	* 25
Max Q Clear Time (g_c+I1), s	5.4	49.5	10.5	15.4	22.1	35.8	12.5	26.3
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	261.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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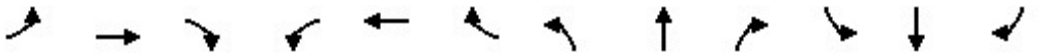
HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Future Volume (veh/h)	211	2258	194	112	1765	143	114	130	85	124	197	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	241	2577	221	128	2014	163	130	148	97	142	225	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	95	1944	164	86	2083	929	278	293	192	268	520	441
Arrive On Green	0.59	0.59	0.59	0.59	0.59	0.59	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	181	3316	280	97	3554	1585	1066	1055	691	1135	1870	1585
Grp Volume(v), veh/h	241	1363	1435	128	2014	163	130	0	245	142	225	89
Grp Sat Flow(s),veh/h/ln	181	1777	1820	97	1777	1585	1066	0	1746	1135	1870	1585
Q Serve(g_s), s	3.7	48.8	48.8	0.0	45.1	3.9	9.5	0.0	9.8	10.0	8.2	3.6
Cycle Q Clear(g_c), s	48.8	48.8	48.8	48.8	45.1	3.9	17.7	0.0	9.8	19.8	8.2	3.6
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	95	1041	1067	86	2083	929	278	0	486	268	520	441
V/C Ratio(X)	2.55	1.31	1.35	1.48	0.97	0.18	0.47	0.00	0.50	0.53	0.43	0.20
Avail Cap(c_a), veh/h	95	1041	1067	86	2083	929	364	0	627	360	672	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.5	17.2	17.2	41.6	16.5	7.9	31.9	0.0	25.2	33.5	24.7	23.0
Incr Delay (d2), s/veh	726.7	146.0	161.6	267.8	13.3	0.4	1.2	0.0	0.8	1.6	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.9	56.8	62.8	8.1	17.3	1.2	2.4	0.0	4.0	2.8	3.6	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	768.2	163.2	178.9	309.5	29.8	8.4	33.2	0.0	26.0	35.2	25.2	23.2
LnGrp LOS	F	F	F	F	C	A	C	A	C	D	C	C
Approach Vol, veh/h		3039			2305			375			456	
Approach Delay, s/veh		218.6			43.8			28.5			27.9	
Approach LOS		F			D			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		28.3		55.0		28.3				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		48.8		29.9		48.8		29.9				
Max Q Clear Time (g_c+I1), s		50.8		19.7		50.8		21.8				
Green Ext Time (p_c), s		0.0		1.4		0.0		1.3				

Intersection Summary												
HCM 6th Ctrl Delay			127.7									
HCM 6th LOS			F									

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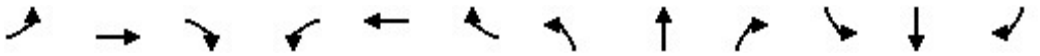
HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	682	5	17	345	19	5	4	26	41	17	7
Future Volume (veh/h)	8	3092	142	361	1959	21	301	5	315	43	18	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1811	1811	1811	1870	1870	1870
Adj Flow Rate, veh/h	9	3313	152	387	2099	22	322	5	338	46	19	8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	6	6	6	2	2	2
Cap, veh/h	56	1038	48	132	371	4	249	3	175	250	95	31
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1	1775	81	117	635	7	723	11	759	692	414	136
Grp Volume(v), veh/h	3474	0	0	2508	0	0	665	0	0	73	0	0
Grp Sat Flow(s),veh/h/ln	1858	0	0	758	0	0	1493	0	0	1242	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	12.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	38.0	0.0	0.0	38.0	0.0	0.0	15.0	0.0	0.0	2.6	0.0	0.0
Prop In Lane	0.00		0.04	0.15		0.01	0.48		0.51	0.63		0.11
Lane Grp Cap(c), veh/h	1142	0	0	507	0	0	427	0	0	377	0	0
V/C Ratio(X)	3.04	0.00	0.00	4.95	0.00	0.00	1.56	0.00	0.00	0.19	0.00	0.00
Avail Cap(c_a), veh/h	1142	0	0	507	0	0	427	0	0	377	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	14.4	0.0	0.0	15.9	0.0	0.0	26.3	0.0	0.0	20.1	0.0	0.0
Incr Delay (d2), s/veh	921.7	0.0	0.0	1780.3	0.0	0.0	262.6	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	304.0	0.0	0.0	256.7	0.0	0.0	37.0	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	936.2	0.0	0.0	1796.2	0.0	0.0	288.9	0.0	0.0	20.4	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F	A	A	C	A	A
Approach Vol, veh/h		3474			2508			665			73	
Approach Delay, s/veh		936.2			1796.2			288.9			20.4	
Approach LOS		F			F			F			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	45.0	20.0	45.0	20.0
Change Period (Y+Rc), s	7.0	5.0	7.0	5.0
Max Green Setting (Gmax), s	38.0	15.0	38.0	15.0
Max Q Clear Time (g_c+I1), s	40.0	17.0	40.0	4.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	1183.2
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
5: Hazelton Etna Rd SW & Broad St

02/24/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	150	310	630	110	340
Future Volume (veh/h)	3019	330	310	2047	245	340
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3446	377	354	2336	280	388
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1602	172	384	2563	297	535
Arrive On Green	0.49	0.49	0.34	1.00	0.17	0.17
Sat Flow, veh/h	3331	348	1781	3647	1781	1585
Grp Volume(v), veh/h	1862	1961	354	2336	280	388
Grp Sat Flow(s),veh/h/ln	1777	1808	1781	1777	1781	1585
Q Serve(g_s), s	44.5	44.5	12.8	0.0	14.0	15.0
Cycle Q Clear(g_c), s	44.5	44.5	12.8	0.0	14.0	15.0
Prop In Lane		0.19	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	879	895	384	2563	297	535
V/C Ratio(X)	2.12	2.19	0.92	0.91	0.94	0.73
Avail Cap(c_a), veh/h	879	895	476	2563	297	535
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	22.7	22.7	21.0	0.0	37.1	26.2
Incr Delay (d2), s/veh	507.1	539.9	2.8	0.6	37.3	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	140.4	151.0	5.8	0.2	9.0	16.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	529.8	562.6	23.8	0.6	74.4	31.0
LnGrp LOS	F	F	C	A	E	C
Approach Vol, veh/h	3823			2690	668	
Approach Delay, s/veh	546.6			3.7	49.2	
Approach LOS	F			A	D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	20.4	49.6		20.0		70.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	20.0	39.9		15.0		64.9
Max Q Clear Time (g_c+I1), s	14.8	46.5		17.0		2.0
Green Ext Time (p_c), s	0.5	0.0		0.0		20.4

Intersection Summary	
HCM 6th Ctrl Delay	297.0
HCM 6th LOS	F

PM PEAK - 2030

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

02/24/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Future Volume (veh/h)	1190	2009	110	176	1115	175	100	240	253	308	278	1152
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1358	2293	126	201	1273	200	114	274	289	352	317	1315
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	1356	74	224	1150	179	231	403	342	293	418	354
Arrive On Green	0.21	0.79	0.79	0.08	0.37	0.37	0.07	0.22	0.22	0.08	0.22	0.22
Sat Flow, veh/h	1781	3427	187	1781	3080	481	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	1358	1178	1241	201	731	742	114	274	289	352	317	1315
Grp Sat Flow(s),veh/h/ln	1781	1777	1837	1781	1777	1784	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	9.3	35.6	35.6	6.2	33.6	33.6	4.4	12.1	15.7	7.3	14.3	20.1
Cycle Q Clear(g_c), s	9.3	35.6	35.6	6.2	33.6	33.6	4.4	12.1	15.7	7.3	14.3	20.1
Prop In Lane	1.00		0.10	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	703	727	224	663	666	231	403	342	293	418	354
V/C Ratio(X)	5.14	1.68	1.71	0.90	1.10	1.11	0.49	0.68	0.85	1.20	0.76	3.71
Avail Cap(c_a), veh/h	264	703	727	224	663	666	244	418	354	293	418	354
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	9.4	9.4	21.4	28.2	28.2	25.9	32.4	33.9	32.8	32.7	35.0
Incr Delay (d2), s/veh	1864.9	305.0	318.8	33.5	65.9	70.8	1.6	4.2	16.6	118.6	7.9	1228.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	139.7	62.9	67.8	4.5	25.4	26.4	1.9	5.8	7.4	12.5	7.1	128.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1885.0	314.4	328.2	54.9	94.1	99.0	27.5	36.7	50.5	151.4	40.5	1263.5
LnGrp LOS	F	F	F	D	F	F	C	D	D	F	D	F
Approach Vol, veh/h		3777			1674			677			1984	
Approach Delay, s/veh		883.6			91.5			41.0			870.8	
Approach LOS		F			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	40.7	12.0	24.3	15.0	38.7	11.3	25.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 7.3	34.9	* 7.3	20.1	* 9.3	32.9	* 7.3	20.1
Max Q Clear Time (g_c+I1), s	8.2	37.6	9.3	17.7	11.3	35.6	6.4	22.1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	646.7
HCM 6th LOS	F

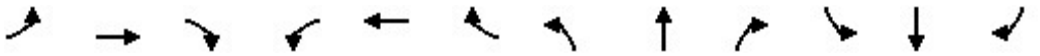
Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Future Volume (veh/h)	140	1719	60	90	878	10	40	160	100	30	120	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	1962	68	103	1002	11	46	183	114	34	137	114
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	1223	1037	80	1208	13	182	240	149	149	210	175
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	556	1870	1585	209	1846	20	1129	1078	672	1082	944	785
Grp Volume(v), veh/h	160	1962	68	103	0	1013	46	0	297	34	0	251
Grp Sat Flow(s),veh/h/ln	556	1870	1585	209	0	1867	1129	0	1749	1082	0	1729
Q Serve(g_s), s	21.9	58.9	1.4	0.0	0.0	36.9	3.5	0.0	14.3	2.7	0.0	11.9
Cycle Q Clear(g_c), s	58.9	58.9	1.4	58.9	0.0	36.9	15.4	0.0	14.3	17.0	0.0	11.9
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.38	1.00		0.45
Lane Grp Cap(c), veh/h	216	1223	1037	80	0	1221	182	0	389	149	0	385
V/C Ratio(X)	0.74	1.60	0.07	1.29	0.00	0.83	0.25	0.00	0.76	0.23	0.00	0.65
Avail Cap(c_a), veh/h	216	1223	1037	80	0	1221	306	0	581	268	0	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.7	15.6	5.6	45.0	0.0	11.8	38.8	0.0	32.8	40.7	0.0	31.8
Incr Delay (d2), s/veh	20.5	275.6	0.1	195.9	0.0	6.6	0.7	0.0	3.4	0.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	110.1	0.4	6.0	0.0	12.6	0.9	0.0	5.9	0.7	0.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.2	291.2	5.7	240.9	0.0	18.4	39.5	0.0	36.1	41.5	0.0	33.7
LnGrp LOS	E	F	A	F	A	B	D	A	D	D	A	C
Approach Vol, veh/h		2190			1116			343			285	
Approach Delay, s/veh		265.1			38.9			36.6			34.6	
Approach LOS		F			D			D			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		64.9		25.1		64.9		25.1				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 49		29.9		* 49		29.9				
Max Q Clear Time (g_c+I1), s		60.9		17.4		60.9		19.0				
Green Ext Time (p_c), s		0.0		1.3		0.0		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			164.3									
HCM 6th LOS			F									

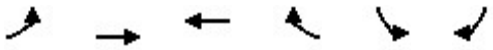
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

PM PEAK - 2030

HCM 6th Signalized Intersection Summary
42: Havens Corner Rd & Dixon Rd

02/24/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	432	215	159	181	44
Future Volume (veh/h)	36	995	628	467	485	46
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1900	1900	1885	1900
Adj Flow Rate, veh/h	42	1161	733	545	566	54
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	0	0	1	0
Cap, veh/h	172	1426	825	614	0	0
Arrive On Green	0.82	0.82	0.82	0.82	0.00	0.00
Sat Flow, veh/h	24	1749	1012	752	0	0
Grp Volume(v), veh/h	1203	0	0	1278	0	0
Grp Sat Flow(s),veh/h/ln	1773	0	0	1765	0	0
Q Serve(g_s), s	0.9	0.0	0.0	11.8	0.0	0.0
Cycle Q Clear(g_c), s	12.7	0.0	0.0	11.8	0.0	0.0
Prop In Lane	0.03			0.43	0.00	0.00
Lane Grp Cap(c), veh/h	1599	0	0	1439	0	0
V/C Ratio(X)	0.75	0.00	0.00	0.89	0.00	0.00
Avail Cap(c_a), veh/h	1778	0	0	1627	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.2	0.0	0.0	1.5	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.0	0.0	5.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	2.4	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.8	0.0	0.0	7.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		1203	1278		0	
Approach Delay, s/veh		2.8	7.4		0.0	
Approach LOS		A	A			

Timer - Assigned Phs			4		6	8
Phs Duration (G+Y+Rc), s			24.4		0.0	24.4
Change Period (Y+Rc), s			4.5		4.5	4.5
Max Green Setting (Gmax), s			22.5		18.5	22.5
Max Q Clear Time (g_c+I1), s			14.7		0.0	13.8
Green Ext Time (p_c), s			5.2		0.0	6.1

Intersection Summary		
HCM 6th Ctrl Delay	5.2	
HCM 6th LOS	A	

HCM 6th Signalized Intersection Summary
39: Taylor Rd & Havens Corner Rd

02/24/2021

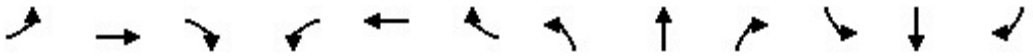
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	410	70	120	360	80
Future Volume (veh/h)	961	556	208	806	395	108
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	1097	635	237	920	451	123
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	778	659	92	56	505	138
Arrive On Green	0.42	0.42	0.42	0.42	0.37	0.37
Sat Flow, veh/h	1870	1585	0	134	1361	371
Grp Volume(v), veh/h	1097	635	1157	0	575	0
Grp Sat Flow(s),veh/h/ln	1870	1585	134	0	1735	0
Q Serve(g_s), s	19.5	18.3	0.0	0.0	14.6	0.0
Cycle Q Clear(g_c), s	19.5	18.3	19.5	0.0	14.6	0.0
Prop In Lane		1.00	0.20		0.78	0.21
Lane Grp Cap(c), veh/h	778	659	148	0	644	0
V/C Ratio(X)	1.41	0.96	7.81	0.00	0.89	0.00
Avail Cap(c_a), veh/h	778	659	148	0	758	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	13.7	13.4	16.4	0.0	13.9	0.0
Incr Delay (d2), s/veh	192.5	26.2	3078.8	0.0	11.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	46.4	8.6	127.3	0.0	5.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	206.2	39.6	3095.2	0.0	25.5	0.0
LnGrp LOS	F	D	F	A	C	A
Approach Vol, veh/h	1732			1157	575	
Approach Delay, s/veh	145.1			3095.2	25.5	
Approach LOS	F			F	C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		25.0		21.9		25.0
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		19.5		20.5		19.5
Max Q Clear Time (g_c+I1), s		21.5		16.6		21.5
Green Ext Time (p_c), s		0.0		0.8		0.0

Intersection Summary		
HCM 6th Ctrl Delay		1110.6
HCM 6th LOS		F

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

02/24/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Future Volume (veh/h)	144	934	130	35	832	456	286	258	58	471	87	261
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	164	1066	148	40	950	520	326	294	66	538	99	298
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	422	57	73	472	254	351	237	53	359	49	147
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.42	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	125	1009	137	26	1129	607	659	595	134	665	122	368
Grp Volume(v), veh/h	1378	0	0	1510	0	0	686	0	0	935	0	0
Grp Sat Flow(s),veh/h/ln	1271	0	0	1762	0	0	1388	0	0	1155	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	25.1	0.0	0.0	25.1	0.0	0.0	23.9	0.0	0.0	23.9	0.0	0.0
Prop In Lane	0.12		0.11	0.03		0.34	0.48		0.10	0.58		0.32
Lane Grp Cap(c), veh/h	599	0	0	799	0	0	641	0	0	555	0	0
V/C Ratio(X)	2.30	0.00	0.00	1.89	0.00	0.00	1.07	0.00	0.00	1.69	0.00	0.00
Avail Cap(c_a), veh/h	599	0	0	799	0	0	641	0	0	555	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.3	0.0	0.0	18.4	0.0	0.0	19.7	0.0	0.0	20.1	0.0	0.0
Incr Delay (d2), s/veh	590.5	0.0	0.0	405.5	0.0	0.0	55.7	0.0	0.0	316.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	104.5	0.0	0.0	98.3	0.0	0.0	17.1	0.0	0.0	55.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	608.8	0.0	0.0	423.9	0.0	0.0	75.4	0.0	0.0	336.3	0.0	0.0
LnGrp LOS	F	A	A	F	A	A	F	A	A	F	A	A
Approach Vol, veh/h		1378			1510			686			935	
Approach Delay, s/veh		608.8			423.9			75.4			336.3	
Approach LOS		F			F			E			F	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		30.6		29.4		30.6		29.4				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		25.1		23.9		25.1		23.9				
Max Q Clear Time (g_c+I1), s		27.1		25.9		27.1		25.9				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		409.2
HCM 6th LOS		F

HCM 6th TWSC
25: Mink St SW & Havens Corner Rd

02/24/2021

Intersection	
Int Delay, s/veh	82.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	29	131	0	0	0	0	21	153	0	0	349	18
Future Vol, veh/h	68	133	1109	4	1	0	1026	459	6	1	748	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	2	2	2	2	2	2	2	2	2
Mvmt Flow	78	152	1266	5	1	0	1171	524	7	1	854	81

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3767	3770	895	4476	3807	528	935	0	0	531	0	0
Stage 1	897	897	-	2870	2870	-	-	-	-	-	-	-
Stage 2	2870	2873	-	1606	937	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	~ 2	~ 4	~ 341	~ 1	4	550	~ 732	-	-	1036	-	-
Stage 1	336	360	-	23	37	-	-	-	-	-	-	-
Stage 2	~ 23	~ 37	-	132	343	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	0	~ 341	-	0	550	~ 732	-	-	1036	-	-
Mov Cap-2 Maneuver	-	0	-	-	0	-	-	-	-	-	-	-
Stage 1	336	359	-	23	0	-	-	-	-	-	-	-
Stage 2	-	0	-	-	342	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			201.2	0
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	~ 732	-	-	-	-	1036	-	-
HCM Lane V/C Ratio	1.6	-	-	-	-	0.001	-	-
HCM Control Delay (s)	292.3	0	-	-	-	8.5	0	-
HCM Lane LOS	F	A	-	-	-	A	A	-
HCM 95th %tile Q(veh)	62	-	-	-	-	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
43: Dixon Rd & Clark State Rd

02/24/2021

Intersection	
Int Delay, s/veh	157.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	79	152	253	77	94
Future Vol, veh/h	232	79	435	253	77	367
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	265	90	496	289	88	419

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	355	0	1591	310
Stage 1	-	-	-	-	310	-
Stage 2	-	-	-	-	1281	-
Critical Hdwy	-	-	4.12	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.218	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1204	-	119	732
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	262	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1204	-	~ 61	732
Mov Cap-2 Maneuver	-	-	-	-	~ 61	-
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	133	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.4	$ 501
HCM LOS			F

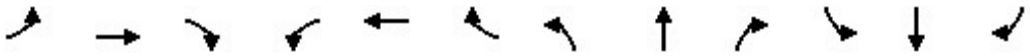
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	252	-	-	1204	-
HCM Lane V/C Ratio	2.011	-	-	0.412	-
HCM Control Delay (s)	$ 501	-	-	10.1	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	37	-	-	2.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX F
AM AND PM SYNCHRO OUTPUTS (IMPROVED DEVELOPMENT TRAFFIC)

HCM 6th Signalized Intersection Summary
24: Mink St SW & Refugee Rd SW

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	36	29	11	40	14	17	259	5	6	153	7
Future Volume (veh/h)	10	36	29	70	40	239	17	678	224	219	966	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1870	1870	1870	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	10	37	30	71	41	244	17	692	229	223	986	7
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	4	4	4	2	2	2	1	1	1	4	4	4
Cap, veh/h	82	237	191	242	123	287	65	1734	566	320	1431	11
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.68	0.68	0.68	0.68	0.68	0.68
Sat Flow, veh/h	90	1192	959	822	619	1442	22	2547	831	365	2101	15
Grp Volume(v), veh/h	30	0	47	112	0	244	506	0	432	459	0	757
Grp Sat Flow(s),veh/h/ln	737	0	1503	1441	0	1442	1834	0	1566	810	0	1672
Q Serve(g_s), s	0.2	0.0	1.9	3.5	0.0	12.2	0.0	0.0	9.1	26.8	0.0	19.8
Cycle Q Clear(g_c), s	12.4	0.0	1.9	5.4	0.0	12.2	8.8	0.0	9.1	35.9	0.0	19.8
Prop In Lane	0.33		0.64	0.63		1.00	0.03		0.53	0.49		0.01
Lane Grp Cap(c), veh/h	211	0	299	365	0	287	1298	0	1066	623	0	1139
V/C Ratio(X)	0.14	0.00	0.16	0.31	0.00	0.85	0.39	0.00	0.40	0.74	0.00	0.66
Avail Cap(c_a), veh/h	278	0	367	432	0	352	1298	0	1066	623	0	1139
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.89	0.00	0.89	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	0.0	24.8	26.3	0.0	29.0	5.2	0.0	5.3	11.3	0.0	7.0
Incr Delay (d2), s/veh	0.3	0.0	0.2	0.4	0.0	13.7	0.9	0.0	1.1	7.6	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.7	1.6	0.0	4.8	2.9	0.0	2.6	5.3	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	0.0	25.1	26.7	0.0	42.6	6.1	0.0	6.4	19.0	0.0	10.0
LnGrp LOS	C	A	C	C	A	D	A	A	A	B	A	B
Approach Vol, veh/h		77			356			938			1216	
Approach Delay, s/veh		25.1			37.6			6.2			13.4	
Approach LOS		C			D			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.6		19.4		55.6		19.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		47.7		18.3		47.7		18.3				
Max Q Clear Time (g_c+I1), s		11.1		14.4		37.9		14.2				
Green Ext Time (p_c), s		7.7		0.1		5.6		0.7				

Intersection Summary												
HCM 6th Ctrl Delay			14.5									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
26: Etna Pkwy & Refugee Rd SW

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	42	11	23	77	71	2	43	7	36	134	1
Future Volume (veh/h)	206	215	67	233	104	283	206	594	233	95	234	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1870	1870	1870	1678	1678	1678	1796	1796	1796
Adj Flow Rate, veh/h	258	269	84	291	130	354	258	742	291	119	292	68
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	6	6	6	2	2	2	15	15	15	7	7	7
Cap, veh/h	339	354	112	398	822	733	405	922	411	251	732	168
Arrive On Green	0.29	0.29	0.29	0.12	0.46	0.46	0.09	0.29	0.29	0.07	0.27	0.27
Sat Flow, veh/h	858	1236	392	1781	1777	1585	1598	3188	1422	1711	2757	632
Grp Volume(v), veh/h	273	0	338	291	130	354	258	742	291	119	179	181
Grp Sat Flow(s),veh/h/ln	908	0	1577	1781	1777	1585	1598	1594	1422	1711	1706	1682
Q Serve(g_s), s	21.5	0.0	14.6	8.4	3.2	11.6	6.9	16.2	13.7	3.7	6.5	6.6
Cycle Q Clear(g_c), s	21.5	0.0	14.6	8.4	3.2	11.6	6.9	16.2	13.7	3.7	6.5	6.6
Prop In Lane	0.94		0.25	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	354	0	452	398	822	733	405	922	411	251	453	446
V/C Ratio(X)	0.77	0.00	0.75	0.73	0.16	0.48	0.64	0.80	0.71	0.47	0.40	0.41
Avail Cap(c_a), veh/h	354	0	452	398	822	733	405	922	411	251	453	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	24.3	17.2	11.7	13.9	20.6	24.7	23.8	19.7	22.6	22.7
Incr Delay (d2), s/veh	9.9	0.0	6.6	6.8	0.1	0.5	3.3	7.4	9.8	1.4	2.6	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	5.5	3.5	1.0	3.4	3.2	6.2	5.1	1.4	2.6	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	0.0	30.9	23.9	11.8	14.4	23.9	32.1	33.7	21.1	25.2	25.4
LnGrp LOS	D	A	C	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		611			775			1291			479	
Approach Delay, s/veh		33.7			17.6			30.8			24.2	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	26.2	13.2	26.0	11.4	24.4		39.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	21.7	8.7	21.5	6.9	19.9		34.7				
Max Q Clear Time (g_c+I1), s	5.7	18.2	10.4	23.5	8.9	8.6		13.6				
Green Ext Time (p_c), s	0.0	1.8	0.0	0.0	0.0	1.3		2.6				

Intersection Summary			
HCM 6th Ctrl Delay		27.1	
HCM 6th LOS		C	

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Future Volume (veh/h)	105	104	463	14	185	36	464	703	7	12	991	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1885	1885	1885	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	130	128	0	17	228	44	573	868	9	15	1223	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	5	5	5	1	1	1	8	8	8	8	8	8
Cap, veh/h	303	539		55	271	50	657	1816	19	337	1431	
Arrive On Green	0.06	0.30	0.00	0.18	0.18	0.18	0.12	0.53	0.53	0.02	0.42	0.00
Sat Flow, veh/h	1739	1826	1547	54	1480	276	3291	3432	36	1697	3385	1510
Grp Volume(v), veh/h	130	128	0	289	0	0	573	428	449	15	1223	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1810	0	0	1646	1692	1775	1697	1692	1510
Q Serve(g_s), s	5.1	4.5	0.0	5.6	0.0	0.0	7.9	13.6	13.6	0.4	27.9	0.0
Cycle Q Clear(g_c), s	5.1	4.5	0.0	13.2	0.0	0.0	7.9	13.6	13.6	0.4	27.9	0.0
Prop In Lane	1.00		1.00	0.06		0.15	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	303	539		375	0	0	657	895	939	337	1431	
V/C Ratio(X)	0.43	0.24		0.77	0.00	0.00	0.87	0.48	0.48	0.04	0.85	
Avail Cap(c_a), veh/h	303	593		428	0	0	740	895	939	406	1431	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.9	22.8	0.0	33.9	0.0	0.0	17.9	12.7	12.7	13.6	22.3	0.0
Incr Delay (d2), s/veh	1.0	0.2	0.0	7.4	0.0	0.0	10.2	1.8	1.7	0.1	6.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.8	0.0	6.0	0.0	0.0	3.2	4.5	4.7	0.1	10.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	23.0	0.0	41.2	0.0	0.0	28.2	14.5	14.4	13.7	28.9	0.0
LnGrp LOS	C	C		D	A	A	C	B	B	B	C	
Approach Vol, veh/h		258	A		289			1450			1238	A
Approach Delay, s/veh		24.4			41.2			19.9			28.8	
Approach LOS		C			D			B			C	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	49.7		29.7	15.1	40.6	9.6	20.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	43.8		27.7	12.7	36.1	5.1	18.1				
Max Q Clear Time (g_c+I1), s	2.4	15.6		6.5	9.9	29.9	7.1	15.2				
Green Ext Time (p_c), s	0.0	5.0		0.5	0.6	3.7	0.0	0.4				

Intersection Summary			
HCM 6th Ctrl Delay		25.5	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Future Volume (veh/h)	123	1124	130	50	1457	131	290	150	50	296	120	237
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	1222	141	54	1584	142	315	163	54	322	130	258
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	1657	739	232	1617	721	337	306	260	340	323	274
Arrive On Green	0.06	0.47	0.47	0.05	0.46	0.46	0.09	0.16	0.16	0.10	0.17	0.17
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	134	1222	141	54	1584	142	315	163	54	322	130	258
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	4.3	30.7	5.7	1.7	48.2	5.9	9.9	8.8	3.2	10.9	6.8	17.7
Cycle Q Clear(g_c), s	4.3	30.7	5.7	1.7	48.2	5.9	9.9	8.8	3.2	10.9	6.8	17.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	1657	739	232	1617	721	337	306	260	340	323	274
V/C Ratio(X)	0.74	0.74	0.19	0.23	0.98	0.20	0.94	0.53	0.21	0.95	0.40	0.94
Avail Cap(c_a), veh/h	184	1657	739	253	1617	721	337	306	260	340	323	274
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	23.9	17.2	18.4	29.4	17.9	41.1	42.1	39.8	40.7	40.4	44.9
Incr Delay (d2), s/veh	14.3	1.8	0.1	0.5	17.7	0.1	32.8	1.8	0.4	35.1	0.8	38.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	12.1	2.1	0.7	22.3	2.1	6.8	4.2	1.3	6.7	3.2	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	25.6	17.3	18.9	47.1	18.1	73.9	43.8	40.2	75.8	41.2	83.7
LnGrp LOS	D	C	B	B	D	B	E	D	D	E	D	F
Approach Vol, veh/h		1497			1780			532			710	
Approach Delay, s/veh		26.1			43.9			61.3			72.3	
Approach LOS		C			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	57.4	16.4	23.5	13.8	56.2	15.4	24.5
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.0	50.0	10.9	* 18	7.0	50.0	9.9	* 19
Max Q Clear Time (g_c+I1), s	3.7	32.7	12.9	10.8	6.3	50.2	11.9	19.7
Green Ext Time (p_c), s	0.0	7.9	0.0	0.5	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	44.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	375	139	11	706	75	154	143	22	47	82	140
Future Volume (veh/h)	284	904	215	21	1237	166	245	197	93	60	82	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	309	983	234	23	1345	180	266	214	101	65	89	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	253	2014	478	325	2512	1121	228	216	102	74	337	285
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	342	2849	676	459	3554	1585	1120	1201	567	1065	1870	1585
Grp Volume(v), veh/h	309	612	605	23	1345	180	266	0	315	65	89	170
Grp Sat Flow(s),veh/h/ln	342	1777	1749	459	1777	1585	1120	0	1768	1065	1870	1585
Q Serve(g_s), s	52.9	15.4	15.5	2.4	17.8	3.8	13.9	0.0	17.8	0.2	4.1	9.9
Cycle Q Clear(g_c), s	70.7	15.4	15.5	17.9	17.8	3.8	18.0	0.0	17.8	18.0	4.1	9.9
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	253	1256	1236	325	2512	1121	228	0	318	74	337	285
V/C Ratio(X)	1.22	0.49	0.49	0.07	0.54	0.16	1.17	0.00	0.99	0.87	0.26	0.60
Avail Cap(c_a), veh/h	253	1256	1236	325	2512	1121	228	0	318	74	337	285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	6.5	6.6	10.6	6.9	4.8	45.2	0.0	40.9	50.0	35.3	37.7
Incr Delay (d2), s/veh	130.6	1.4	1.4	0.4	0.8	0.3	112.4	0.0	47.5	63.4	0.4	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.2	4.5	4.5	0.2	5.0	1.0	12.7	0.0	11.7	2.9	1.9	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	161.7	7.9	7.9	11.0	7.7	5.1	157.7	0.0	88.4	113.4	35.7	41.0
LnGrp LOS	F	A	A	B	A	A	F	A	F	F	D	D
Approach Vol, veh/h		1526			1548			581			324	
Approach Delay, s/veh		39.1			7.5			120.1			54.1	
Approach LOS		D			A			F			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		76.9		23.1		76.9		23.1				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		70.7		18.0		70.7		18.0				
Max Q Clear Time (g_c+I1), s		72.7		20.0		19.9		20.0				
Green Ext Time (p_c), s		0.0		0.0		14.1		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			39.8									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	254	1	9	504	28	3	20	14	4	3	2
Future Volume (veh/h)	2	606	199	165	1143	28	273	20	216	4	3	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1826	1826	1826	1900	1900	1900
Adj Flow Rate, veh/h	2	631	207	172	1191	29	284	21	225	4	3	2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	5	5	5	0	0	0
Cap, veh/h	261	1772	790	482	2096	51	360	312	265	209	181	153
Arrive On Green	0.00	0.53	0.53	0.07	0.60	0.60	0.08	0.17	0.17	0.01	0.10	0.10
Sat Flow, veh/h	1668	3328	1485	1767	3517	86	1739	1826	1547	1810	1900	1610
Grp Volume(v), veh/h	2	631	207	172	597	623	284	21	225	4	3	2
Grp Sat Flow(s),veh/h/ln	1668	1664	1485	1767	1763	1840	1739	1826	1547	1810	1900	1610
Q Serve(g_s), s	0.0	8.8	6.1	3.2	16.5	16.6	6.5	0.8	11.3	0.2	0.1	0.1
Cycle Q Clear(g_c), s	0.0	8.8	6.1	3.2	16.5	16.6	6.5	0.8	11.3	0.2	0.1	0.1
Prop In Lane	1.00		1.00	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	1772	790	482	1050	1097	360	312	265	209	181	153
V/C Ratio(X)	0.01	0.36	0.26	0.36	0.57	0.57	0.79	0.07	0.85	0.02	0.02	0.01
Avail Cap(c_a), veh/h	361	1772	790	584	1050	1097	360	445	377	313	428	362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.5	10.8	10.2	7.3	9.9	9.9	31.9	27.8	32.2	32.4	32.8	32.8
Incr Delay (d2), s/veh	0.0	0.6	0.8	0.4	2.2	2.1	11.1	0.1	12.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.8	1.9	1.0	5.5	5.8	6.1	0.3	4.9	0.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.5	11.4	11.0	7.7	12.1	12.0	43.0	27.9	44.2	32.5	32.8	32.8
LnGrp LOS	A	B	B	A	B	B	D	C	D	C	C	C
Approach Vol, veh/h		840			1392			530			9	
Approach Delay, s/veh		11.3			11.5			42.9			32.7	
Approach LOS		B			B			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	47.1	4.9	18.2	4.7	52.2	11.0	12.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	27.6	5.0	19.5	5.0	32.5	6.5	18.0
Max Q Clear Time (g_c+I1), s	5.2	10.8	2.2	13.3	2.0	18.6	8.5	2.1
Green Ext Time (p_c), s	0.2	4.3	0.0	0.4	0.0	6.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
5: Hazelton Etna Rd SW & Broad St

02/25/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	439	128	289	683	104	311
Future Volume (veh/h)	696	128	289	1179	104	395
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	757	139	314	1282	113	429
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1478	659	575	2363	297	927
Arrive On Green	0.42	0.42	0.17	0.67	0.17	0.17
Sat Flow, veh/h	3647	1585	1781	3647	1781	2790
Grp Volume(v), veh/h	757	139	314	1282	113	429
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1395
Q Serve(g_s), s	9.5	3.4	4.9	11.3	3.4	7.3
Cycle Q Clear(g_c), s	9.5	3.4	4.9	11.3	3.4	7.3
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1478	659	575	2363	297	927
V/C Ratio(X)	0.51	0.21	0.55	0.54	0.38	0.46
Avail Cap(c_a), veh/h	1478	659	636	2363	297	927
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.48	0.48	0.98	0.98
Uniform Delay (d), s/veh	13.0	11.2	7.6	5.3	22.2	15.8
Incr Delay (d2), s/veh	1.3	0.7	0.4	0.4	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.1	1.3	2.6	1.4	6.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.3	11.9	8.0	5.7	23.0	16.2
LnGrp LOS	B	B	A	A	C	B
Approach Vol, veh/h	896			1596	542	
Approach Delay, s/veh	13.9			6.2	17.6	
Approach LOS	B			A	B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	14.9	30.1		15.0		45.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	12.0	22.9		10.0		39.9
Max Q Clear Time (g_c+I1), s	6.9	11.5		9.3		13.3
Green Ext Time (p_c), s	0.4	2.4		0.2		5.7

Intersection Summary	
HCM 6th Ctrl Delay	10.5
HCM 6th LOS	B

AM PEAK - 2020

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Future Volume (veh/h)	462	499	40	266	760	70	110	187	225	60	279	526
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	502	542	43	289	826	76	120	203	0	65	303	572
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	666	1886	148	885	1138	105	280	595		430	578	490
Arrive On Green	0.15	0.52	0.52	0.07	0.35	0.35	0.06	0.32	0.00	0.05	0.31	0.31
Sat Flow, veh/h	3456	4827	379	3456	3290	303	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	502	381	204	289	446	456	120	203	0	65	303	572
Grp Sat Flow(s),veh/h/ln	1728	1702	1802	1728	1777	1816	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	10.9	7.6	7.7	6.4	26.3	26.3	5.5	10.0	0.0	2.9	16.0	37.1
Cycle Q Clear(g_c), s	10.9	7.6	7.7	6.4	26.3	26.3	5.5	10.0	0.0	2.9	16.0	37.1
Prop In Lane	1.00		0.21	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	666	1330	704	885	615	628	280	595		430	578	490
V/C Ratio(X)	0.75	0.29	0.29	0.33	0.73	0.73	0.43	0.34		0.15	0.52	1.17
Avail Cap(c_a), veh/h	770	1330	704	885	615	628	280	595		443	578	490
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	0.94	0.94	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	19.4	19.4	22.4	34.3	34.3	26.9	31.3	0.0	25.8	34.2	41.5
Incr Delay (d2), s/veh	3.4	0.5	1.0	0.2	7.3	7.2	1.0	0.3	0.0	0.2	0.9	95.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	2.9	3.2	2.6	12.4	12.6	2.4	4.5	0.0	1.2	7.3	27.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	19.9	20.4	22.6	41.6	41.5	27.8	31.6	0.0	25.9	35.0	136.9
LnGrp LOS	C	B	C	C	D	D	C	C		C	D	F
Approach Vol, veh/h		1087			1191			323	A		940	
Approach Delay, s/veh		23.4			36.9			30.2			96.4	
Approach LOS		C			D			C			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	52.0	10.9	43.1	19.4	46.6	12.0	42.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 8.3	46.9	* 7.1	37.3	* 17	37.9	* 7.3	37.1
Max Q Clear Time (g_c+I1), s	8.4	9.7	4.9	12.0	12.9	28.3	7.5	39.1
Green Ext Time (p_c), s	0.0	4.0	0.0	1.1	0.8	3.9	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	47.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Future Volume (veh/h)	30	233	40	60	370	10	40	110	50	20	150	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	253	43	65	402	11	43	120	54	22	163	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	529	842	143	620	979	27	219	315	142	345	221	221
Arrive On Green	0.54	0.54	0.54	0.54	0.54	0.54	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	973	1558	265	1083	1812	50	1054	1222	550	1211	858	858
Grp Volume(v), veh/h	33	0	296	65	0	413	43	0	174	22	0	326
Grp Sat Flow(s),veh/h/ln	973	0	1823	1083	0	1861	1054	0	1771	1211	0	1716
Q Serve(g_s), s	1.1	0.0	4.9	1.9	0.0	7.2	2.1	0.0	4.4	0.8	0.0	9.6
Cycle Q Clear(g_c), s	8.3	0.0	4.9	6.8	0.0	7.2	11.7	0.0	4.4	5.3	0.0	9.6
Prop In Lane	1.00		0.15	1.00		0.03	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	529	0	985	620	0	1006	219	0	457	345	0	442
V/C Ratio(X)	0.06	0.00	0.30	0.10	0.00	0.41	0.20	0.00	0.38	0.06	0.00	0.74
Avail Cap(c_a), veh/h	529	0	985	620	0	1006	329	0	641	471	0	621
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.9	0.0	6.9	8.8	0.0	7.5	24.1	0.0	16.8	19.0	0.0	18.7
Incr Delay (d2), s/veh	0.2	0.0	0.8	0.3	0.0	1.2	0.4	0.0	0.5	0.1	0.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.3	0.4	0.0	2.0	0.5	0.0	1.5	0.2	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.2	0.0	7.7	9.2	0.0	8.7	24.5	0.0	17.3	19.0	0.0	21.5
LnGrp LOS	B	A	A	A	A	A	C	A	B	B	A	C
Approach Vol, veh/h		329			478			217			348	
Approach Delay, s/veh		8.0			8.8			18.7			21.4	
Approach LOS		A			A			B			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.7		19.3		35.7		19.3				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 24		19.9		* 24		19.9				
Max Q Clear Time (g_c+I1), s		10.3		13.7		9.2		11.6				
Green Ext Time (p_c), s		1.3		0.5		2.1		1.1				

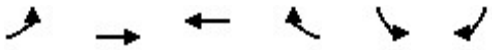
Intersection Summary		
HCM 6th Ctrl Delay		13.4
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
42: Havens Corner Rd & Dixon Rd

02/25/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	174	350	146	55	23
Future Volume (veh/h)	57	1344	1051	459	512	25
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	67	1581	1236	540	602	29
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	78	1596	2079	927	584	519
Arrive On Green	0.58	0.58	0.58	0.58	0.32	0.32
Sat Flow, veh/h	66	2812	3647	1585	1795	1598
Grp Volume(v), veh/h	780	868	1236	540	602	29
Grp Sat Flow(s),veh/h/ln	1176	1617	1777	1585	1795	1598
Q Serve(g_s), s	36.4	48.0	22.1	21.4	32.5	1.2
Cycle Q Clear(g_c), s	58.5	48.0	22.1	21.4	32.5	1.2
Prop In Lane	0.09			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	727	946	2079	927	584	519
V/C Ratio(X)	1.07	0.92	0.59	0.58	1.03	0.06
Avail Cap(c_a), veh/h	727	946	2079	927	584	519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	18.6	13.2	13.1	33.8	23.2
Incr Delay (d2), s/veh	54.8	13.5	0.5	0.9	45.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.7	17.6	7.3	21.4	20.1	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	76.4	32.0	13.7	14.0	79.4	23.2
LnGrp LOS	F	C	B	B	F	C
Approach Vol, veh/h		1648	1776		631	
Approach Delay, s/veh		53.1	13.8		76.8	
Approach LOS		D	B		E	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	63.0	37.0	63.0
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	58.5	32.5	58.5
Max Q Clear Time (g_c+I1), s	60.5	34.5	24.1
Green Ext Time (p_c), s	0.0	0.0	12.9

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
39: Taylor Rd & Havens Corner Rd

02/25/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	140	50	200	410	110
Future Volume (veh/h)	1613	354	82	1158	466	113
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1753	385	89	1259	507	123
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1959	874	125	1959	545	485
Arrive On Green	0.55	0.55	0.55	0.55	0.31	0.31
Sat Flow, veh/h	3647	1585	188	3647	1781	1585
Grp Volume(v), veh/h	1753	385	89	1259	507	123
Grp Sat Flow(s),veh/h/ln	1777	1585	188	1777	1781	1585
Q Serve(g_s), s	30.5	10.1	8.0	17.2	19.3	4.1
Cycle Q Clear(g_c), s	30.5	10.1	38.5	17.2	19.3	4.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1959	874	125	1959	545	485
V/C Ratio(X)	0.90	0.44	0.71	0.64	0.93	0.25
Avail Cap(c_a), veh/h	1959	874	125	1959	548	488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	9.3	34.0	10.9	23.5	18.3
Incr Delay (d2), s/veh	5.8	0.4	17.6	0.7	22.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	2.5	2.0	4.8	10.1	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.7	9.6	51.6	11.6	46.3	18.5
LnGrp LOS	B	A	D	B	D	B
Approach Vol, veh/h	2138			1348	630	
Approach Delay, s/veh	17.9			14.3	40.9	
Approach LOS	B			B	D	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		44.0		25.9		44.0
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		38.5		21.5		38.5
Max Q Clear Time (g_c+I1), s		32.5		21.3		40.5
Green Ext Time (p_c), s		5.0		0.1		0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Future Volume (veh/h)	271	1361	166	20	1047	54	462	231	12	52	70	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	295	1479	180	22	1138	59	502	251	13	57	76	161
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	298	1980	238	182	2131	110	497	458	24	249	139	294
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	468	3193	385	300	3437	178	2218	1763	91	1115	534	1132
Grp Volume(v), veh/h	295	816	843	22	588	609	502	0	264	57	0	237
Grp Sat Flow(s),veh/h/ln	468	1777	1801	300	1777	1838	1109	0	1854	1115	0	1667
Q Serve(g_s), s	32.4	24.2	25.1	4.2	14.1	14.1	10.3	0.0	9.2	3.5	0.0	9.2
Cycle Q Clear(g_c), s	46.5	24.2	25.1	29.3	14.1	14.1	19.5	0.0	9.2	12.7	0.0	9.2
Prop In Lane	1.00		0.21	1.00		0.10	1.00		0.05	1.00		0.68
Lane Grp Cap(c), veh/h	298	1102	1117	182	1102	1140	497	0	482	249	0	433
V/C Ratio(X)	0.99	0.74	0.75	0.12	0.53	0.53	1.01	0.00	0.55	0.23	0.00	0.55
Avail Cap(c_a), veh/h	298	1102	1117	182	1102	1140	497	0	482	249	0	433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.4	10.0	10.2	20.6	8.1	8.1	34.3	0.0	23.9	29.4	0.0	23.9
Incr Delay (d2), s/veh	49.8	4.5	4.8	1.4	1.9	1.8	43.2	0.0	1.3	0.5	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	7.3	7.7	0.3	4.0	4.1	7.1	0.0	3.7	0.9	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.2	14.5	14.9	22.0	9.9	9.9	77.5	0.0	25.3	29.9	0.0	25.4
LnGrp LOS	E	B	B	C	A	A	F	A	C	C	A	C
Approach Vol, veh/h		1954			1219			766			294	
Approach Delay, s/veh		24.0			10.1			59.5			26.3	
Approach LOS		C			B			E			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.0		24.0		51.0		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		46.5		19.5		46.5		19.5				
Max Q Clear Time (g_c+I1), s		48.5		21.5		31.3		14.7				
Green Ext Time (p_c), s		0.0		0.0		6.5		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			26.6									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
25: Mink St SW & Havens Corner Rd

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	0	27	0	0	0	57	311	0	0	143	21
Future Volume (veh/h)	37	169	1192	2	194	0	632	317	1	0	164	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	43	197	0	2	211	0	735	369	1	0	191	52
Peak Hour Factor	0.86	0.86	0.86	0.92	0.92	0.92	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	3	3	3
Cap, veh/h	58	282		3	297	0	1638	1325	4	0	1958	519
Arrive On Green	0.09	0.09	0.00	0.08	0.08	0.00	0.71	0.71	0.71	0.00	0.71	0.71
Sat Flow, veh/h	612	2976	1572	33	3706	0	2206	1864	5	0	2848	731
Grp Volume(v), veh/h	128	112	0	114	99	0	735	0	370	0	120	123
Grp Sat Flow(s),veh/h/ln	1825	1763	1572	1869	1777	0	1103	0	1869	0	1763	1724
Q Serve(g_s), s	8.2	7.3	0.0	7.2	6.5	0.0	18.7	0.0	8.6	0.0	2.5	2.7
Cycle Q Clear(g_c), s	8.2	7.3	0.0	7.2	6.5	0.0	21.3	0.0	8.6	0.0	2.5	2.7
Prop In Lane	0.34		1.00	0.02		0.00	1.00		0.00	0.00		0.42
Lane Grp Cap(c), veh/h	173	167		153	146	0	1638	0	1328	0	1253	1225
V/C Ratio(X)	0.74	0.67		0.74	0.68	0.00	0.45	0.00	0.28	0.00	0.10	0.10
Avail Cap(c_a), veh/h	798	771		280	267	0	1638	0	1328	0	1253	1225
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	52.5	0.0	53.8	53.5	0.0	8.7	0.0	6.3	0.0	5.4	5.4
Incr Delay (d2), s/veh	6.1	4.5	0.0	7.0	5.4	0.0	0.9	0.0	0.5	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	3.3	0.0	3.7	3.1	0.0	3.7	0.0	2.8	0.0	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.0	57.0	0.0	60.8	58.9	0.0	9.6	0.0	6.8	0.0	5.5	5.6
LnGrp LOS	E	E		E	E	A	A	A	A	A	A	A
Approach Vol, veh/h		240	A		213			1105			243	
Approach Delay, s/veh		58.1			59.9			8.7			5.6	
Approach LOS		E			E			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		89.8		15.9		89.8		14.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		36.0		52.5		36.0		18.0				
Max Q Clear Time (g_c+I1), s		23.3		10.2		4.7		9.2				
Green Ext Time (p_c), s		4.6		1.2		1.2		0.7				

Intersection Summary		
HCM 6th Ctrl Delay		20.9
HCM 6th LOS		C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Roundabout
43: Dixon Rd & Clark State Rd

02/25/2021

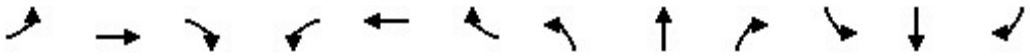
Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	210	877	583
Demand Flow Rate, veh/h	221	912	594
Vehicles Circulating, veh/h	583	112	183
Vehicles Exiting, veh/h	441	665	621
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	8.4	14.9	9.2
Approach LOS	A	B	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	221	912	594
Cap Entry Lane, veh/h	761	1231	1145
Entry HV Adj Factor	0.952	0.962	0.981
Flow Entry, veh/h	210	877	583
Cap Entry, veh/h	724	1184	1124
V/C Ratio	0.290	0.741	0.519
Control Delay, s/veh	8.4	14.9	9.2
LOS	A	B	A
95th %tile Queue, veh	1	7	3

HCM 6th Signalized Intersection Summary
24: Mink St SW & Refugee Rd SW

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	36	29	11	40	14	17	259	5	6	153	7
Future Volume (veh/h)	10	36	29	70	40	239	17	678	224	219	966	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1870	1870	1870	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	11	39	31	75	43	256	18	726	240	235	1035	8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	4	4	4	2	2	2	1	1	1	4	4	4
Cap, veh/h	84	237	191	248	126	298	65	1713	558	307	1383	11
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.67	0.67	0.67	0.67	0.67	0.67
Sat Flow, veh/h	90	1150	926	819	608	1442	23	2543	829	349	2054	17
Grp Volume(v), veh/h	31	0	50	118	0	256	530	0	454	473	0	805
Grp Sat Flow(s),veh/h/ln	658	0	1508	1428	0	1442	1828	0	1566	747	0	1672
Q Serve(g_s), s	0.2	0.0	2.1	3.7	0.0	12.8	0.0	0.0	10.0	34.9	0.0	22.7
Cycle Q Clear(g_c), s	13.0	0.0	2.1	5.8	0.0	12.8	9.6	0.0	10.0	44.9	0.0	22.7
Prop In Lane	0.36		0.61	0.64		1.00	0.03		0.53	0.50		0.01
Lane Grp Cap(c), veh/h	201	0	311	373	0	298	1281	0	1055	575	0	1126
V/C Ratio(X)	0.15	0.00	0.16	0.32	0.00	0.86	0.41	0.00	0.43	0.82	0.00	0.71
Avail Cap(c_a), veh/h	256	0	368	429	0	352	1281	0	1055	575	0	1126
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.87	0.00	0.87	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.6	0.0	24.4	26.0	0.0	28.7	5.6	0.0	5.6	14.3	0.0	7.7
Incr Delay (d2), s/veh	0.3	0.0	0.2	0.4	0.0	14.9	1.0	0.0	1.3	12.5	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.7	1.7	0.0	5.1	3.2	0.0	2.9	6.9	0.0	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	0.0	24.7	26.4	0.0	43.6	6.6	0.0	6.9	26.8	0.0	11.6
LnGrp LOS	C	A	C	C	A	D	A	A	A	C	A	B
Approach Vol, veh/h		81			374			984			1278	
Approach Delay, s/veh		24.8			38.2			6.7			17.2	
Approach LOS		C			D			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		55.0		20.0		55.0		20.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		47.7		18.3		47.7		18.3				
Max Q Clear Time (g_c+I1), s		12.0		15.0		46.9		14.8				
Green Ext Time (p_c), s		8.2		0.1		0.6		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			16.5									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
26: Etna Pkwy & Refugee Rd SW

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	42	11	23	77	71	2	43	7	36	134	1
Future Volume (veh/h)	206	215	67	233	104	283	206	594	233	95	234	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1870	1870	1870	1678	1678	1678	1796	1796	1796
Adj Flow Rate, veh/h	270	282	88	306	136	371	270	780	306	125	307	71
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	6	6	6	2	2	2	15	15	15	7	7	7
Cap, veh/h	336	352	111	381	822	733	398	922	411	242	732	167
Arrive On Green	0.29	0.29	0.29	0.12	0.46	0.46	0.09	0.29	0.29	0.07	0.27	0.27
Sat Flow, veh/h	845	1229	389	1781	1777	1585	1598	3188	1422	1711	2760	629
Grp Volume(v), veh/h	283	0	357	306	136	371	270	780	306	125	188	190
Grp Sat Flow(s),veh/h/ln	885	0	1578	1781	1777	1585	1598	1594	1422	1711	1706	1683
Q Serve(g_s), s	21.5	0.0	15.7	8.7	3.3	12.3	6.9	17.3	14.6	3.9	6.8	7.0
Cycle Q Clear(g_c), s	21.5	0.0	15.7	8.7	3.3	12.3	6.9	17.3	14.6	3.9	6.8	7.0
Prop In Lane	0.96		0.25	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	347	0	452	381	822	733	398	922	411	242	453	447
V/C Ratio(X)	0.81	0.00	0.79	0.80	0.17	0.51	0.68	0.85	0.74	0.52	0.42	0.43
Avail Cap(c_a), veh/h	347	0	452	381	822	733	398	922	411	242	453	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.9	0.0	24.7	17.9	11.7	14.1	21.3	25.1	24.1	20.1	22.7	22.8
Incr Delay (d2), s/veh	13.5	0.0	9.0	11.7	0.1	0.6	4.6	9.4	11.5	1.9	2.8	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	0.0	6.1	4.1	1.1	3.6	3.5	6.8	5.5	1.5	2.7	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	0.0	33.7	29.6	11.8	14.7	25.9	34.5	35.7	22.0	25.5	25.8
LnGrp LOS	D	A	C	C	B	B	C	C	D	C	C	C
Approach Vol, veh/h		640			813			1356			503	
Approach Delay, s/veh		37.0			19.8			33.1			24.7	
Approach LOS		D			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	26.2	13.2	26.0	11.4	24.4		39.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	21.7	8.7	21.5	6.9	19.9		34.7				
Max Q Clear Time (g_c+I1), s	5.9	19.3	10.7	23.5	8.9	9.0		14.3				
Green Ext Time (p_c), s	0.0	1.4	0.0	0.0	0.0	1.4		2.7				

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

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HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	38	80	13	88	36	79	288	6	12	371	95
Future Volume (veh/h)	105	104	463	14	185	36	464	703	7	12	991	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1885	1885	1885	1781	1781	1781	1781	1781	1781
Adj Flow Rate, veh/h	136	135	0	18	240	47	601	911	9	16	1285	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	5	5	5	1	1	1	8	8	8	8	8	8
Cap, veh/h	291	544		54	279	53	664	1824	18	322	1381	
Arrive On Green	0.06	0.30	0.00	0.19	0.19	0.19	0.14	0.53	0.53	0.02	0.41	0.00
Sat Flow, veh/h	1739	1826	1547	55	1475	279	3291	3434	34	1697	3385	1510
Grp Volume(v), veh/h	136	135	0	305	0	0	601	449	471	16	1285	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1808	0	0	1646	1692	1775	1697	1692	1510
Q Serve(g_s), s	5.1	5.0	0.0	6.5	0.0	0.0	10.4	15.0	15.0	0.5	32.0	0.0
Cycle Q Clear(g_c), s	5.1	5.0	0.0	14.5	0.0	0.0	10.4	15.0	15.0	0.5	32.0	0.0
Prop In Lane	1.00		1.00	0.06		0.15	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	291	544		386	0	0	664	899	943	322	1381	
V/C Ratio(X)	0.47	0.25		0.79	0.00	0.00	0.90	0.50	0.50	0.05	0.93	
Avail Cap(c_a), veh/h	291	572		413	0	0	672	899	943	387	1381	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.6	23.5	0.0	34.9	0.0	0.0	22.7	13.2	13.2	14.8	25.0	0.0
Incr Delay (d2), s/veh	1.2	0.2	0.0	9.5	0.0	0.0	15.7	2.0	1.9	0.1	12.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	2.0	0.0	6.8	0.0	0.0	4.7	5.1	5.3	0.2	13.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	23.8	0.0	44.4	0.0	0.0	38.4	15.2	15.1	14.8	37.4	0.0
LnGrp LOS	C	C		D	A	A	D	B	B	B	D	
Approach Vol, veh/h		271	A		305			1521			1301	A
Approach Delay, s/veh		25.3			44.4			24.3			37.1	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.1	51.5		30.9	17.0	40.6	9.6	21.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	43.8		27.7	12.7	36.1	5.1	18.1				
Max Q Clear Time (g_c+I1), s	2.5	17.0		7.0	12.4	34.0	7.1	16.5				
Green Ext Time (p_c), s	0.0	5.3		0.5	0.1	1.5	0.0	0.2				

Intersection Summary			
HCM 6th Ctrl Delay		31.1	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

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HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	440	130	50	820	100	290	150	50	90	120	180
Future Volume (veh/h)	123	1124	130	50	1457	131	290	150	50	296	120	237
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	140	1283	148	57	1663	150	331	171	57	338	137	270
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1653	737	220	1617	721	331	306	260	334	323	274
Arrive On Green	0.06	0.47	0.47	0.05	0.45	0.45	0.09	0.16	0.16	0.10	0.17	0.17
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	140	1283	148	57	1663	150	331	171	57	338	137	270
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	4.5	33.2	6.1	1.8	50.0	6.3	9.9	9.2	3.4	10.9	7.2	18.7
Cycle Q Clear(g_c), s	4.5	33.2	6.1	1.8	50.0	6.3	9.9	9.2	3.4	10.9	7.2	18.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	1653	737	220	1617	721	331	306	260	334	323	274
V/C Ratio(X)	0.79	0.78	0.20	0.26	1.03	0.21	1.00	0.56	0.22	1.01	0.42	0.99
Avail Cap(c_a), veh/h	179	1653	737	240	1617	721	331	306	260	334	323	274
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	24.6	17.3	19.3	30.0	18.0	41.9	42.3	39.9	41.3	40.6	45.3
Incr Delay (d2), s/veh	20.6	2.4	0.1	0.6	30.0	0.1	49.3	2.3	0.4	52.3	0.9	50.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	13.1	2.2	0.7	25.8	2.3	8.7	4.4	1.4	8.6	3.4	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	27.0	17.5	19.9	60.0	18.2	91.3	44.5	40.3	93.7	41.4	95.5
LnGrp LOS	D	C	B	B	F	B	F	D	D	F	D	F
Approach Vol, veh/h		1571			1870			559			745	
Approach Delay, s/veh		27.8			55.4			71.8			84.7	
Approach LOS		C			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	57.3	16.4	23.5	13.8	56.2	15.4	24.5
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.0	50.0	10.9	* 18	7.0	50.0	9.9	* 19
Max Q Clear Time (g_c+I1), s	3.8	35.2	12.9	11.2	6.5	52.0	11.9	20.7
Green Ext Time (p_c), s	0.0	7.7	0.0	0.5	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	52.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	375	139	11	706	75	154	143	22	47	82	140
Future Volume (veh/h)	284	904	215	21	1237	166	245	197	93	60	82	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	324	1032	245	24	1412	189	280	225	106	68	94	178
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	2016	477	306	2512	1121	223	216	102	72	337	285
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	317	2852	674	433	3554	1585	1107	1202	566	1049	1870	1585
Grp Volume(v), veh/h	324	642	635	24	1412	189	280	0	331	68	94	178
Grp Sat Flow(s),veh/h/ln	317	1777	1749	433	1777	1585	1107	0	1768	1049	1870	1585
Q Serve(g_s), s	51.4	16.6	16.7	2.7	19.3	4.0	13.7	0.0	18.0	0.0	4.3	10.4
Cycle Q Clear(g_c), s	70.7	16.6	16.7	19.4	19.3	4.0	18.0	0.0	18.0	18.0	4.3	10.4
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	235	1256	1237	306	2512	1121	223	0	318	72	337	285
V/C Ratio(X)	1.38	0.51	0.51	0.08	0.56	0.17	1.25	0.00	1.04	0.94	0.28	0.62
Avail Cap(c_a), veh/h	235	1256	1237	306	2512	1121	223	0	318	72	337	285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	6.7	6.7	11.2	7.1	4.9	45.4	0.0	41.0	50.0	35.4	37.9
Incr Delay (d2), s/veh	194.5	1.5	1.5	0.5	0.9	0.3	145.6	0.0	61.2	86.8	0.4	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.3	4.9	4.9	0.3	5.4	1.0	14.5	0.0	13.0	3.4	2.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	226.7	8.2	8.3	11.7	8.0	5.2	191.0	0.0	102.2	136.8	35.8	42.1
LnGrp LOS	F	A	A	B	A	A	F	A	F	F	D	D
Approach Vol, veh/h		1601			1625			611			340	
Approach Delay, s/veh		52.4			7.8			142.9			59.3	
Approach LOS		D			A			F			E	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		76.9		23.1		76.9		23.1				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		70.7		18.0		70.7		18.0				
Max Q Clear Time (g_c+I1), s		72.7		20.0		21.4		20.0				
Green Ext Time (p_c), s		0.0		0.0		15.3		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			48.8									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	254	1	9	504	28	3	20	14	4	3	2
Future Volume (veh/h)	2	606	199	165	1143	28	273	20	216	4	3	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1856	1856	1856	1826	1826	1826	1900	1900	1900
Adj Flow Rate, veh/h	2	663	218	180	1250	31	299	22	236	4	3	2
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	10	10	10	3	3	3	5	5	5	0	0	0
Cap, veh/h	241	1739	776	465	2071	51	370	325	275	216	194	164
Arrive On Green	0.00	0.52	0.52	0.07	0.59	0.59	0.08	0.18	0.18	0.01	0.10	0.10
Sat Flow, veh/h	1668	3328	1485	1767	3515	87	1739	1826	1547	1810	1900	1610
Grp Volume(v), veh/h	2	663	218	180	627	654	299	22	236	4	3	2
Grp Sat Flow(s),veh/h/ln	1668	1664	1485	1767	1763	1840	1739	1826	1547	1810	1900	1610
Q Serve(g_s), s	0.0	9.5	6.6	3.5	18.1	18.2	6.5	0.8	11.8	0.2	0.1	0.1
Cycle Q Clear(g_c), s	0.0	9.5	6.6	3.5	18.1	18.2	6.5	0.8	11.8	0.2	0.1	0.1
Prop In Lane	1.00		1.00	1.00		0.05	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	241	1739	776	465	1038	1084	370	325	275	216	194	164
V/C Ratio(X)	0.01	0.38	0.28	0.39	0.60	0.60	0.81	0.07	0.86	0.02	0.02	0.01
Avail Cap(c_a), veh/h	341	1739	776	561	1038	1084	370	445	377	319	428	362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.1	11.4	10.7	7.7	10.5	10.5	31.8	27.4	31.9	31.9	32.3	32.3
Incr Delay (d2), s/veh	0.0	0.6	0.9	0.5	2.6	2.5	12.5	0.1	13.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.1	2.1	1.1	6.2	6.4	3.4	0.3	5.2	0.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.1	12.0	11.6	8.2	13.1	13.0	44.3	27.4	45.3	32.0	32.3	32.3
LnGrp LOS	B	B	B	A	B	B	D	C	D	C	C	C
Approach Vol, veh/h		883			1461			557			9	
Approach Delay, s/veh		11.9			12.4			44.1			32.2	
Approach LOS		B			B			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	46.3	4.9	18.7	4.7	51.6	11.0	12.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	27.6	5.0	19.5	5.0	32.5	6.5	18.0
Max Q Clear Time (g_c+I1), s	5.5	11.5	2.2	13.8	2.0	20.2	8.5	2.1
Green Ext Time (p_c), s	0.2	4.4	0.0	0.4	0.0	6.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	18.4
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
5: Hazelton Etna Rd SW & Broad St

02/25/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	439	128	289	683	104	311
Future Volume (veh/h)	696	128	289	1179	104	395
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	794	146	330	1346	119	451
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1477	659	563	2363	297	928
Arrive On Green	0.42	0.42	0.33	1.00	0.17	0.17
Sat Flow, veh/h	3647	1585	1781	3647	1781	2790
Grp Volume(v), veh/h	794	146	330	1346	119	451
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1395
Q Serve(g_s), s	10.1	3.6	5.4	0.0	3.6	7.7
Cycle Q Clear(g_c), s	10.1	3.6	5.4	0.0	3.6	7.7
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1477	659	563	2363	297	928
V/C Ratio(X)	0.54	0.22	0.59	0.57	0.40	0.49
Avail Cap(c_a), veh/h	1477	659	624	2363	297	928
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.50	0.50	0.97	0.97
Uniform Delay (d), s/veh	13.2	11.3	6.2	0.0	22.3	15.9
Incr Delay (d2), s/veh	1.4	0.8	0.6	0.5	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	1.2	1.1	0.2	1.4	6.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.6	12.1	6.7	0.5	23.2	16.3
LnGrp LOS	B	B	A	A	C	B
Approach Vol, veh/h	940			1676	570	
Approach Delay, s/veh	14.2			1.7	17.8	
Approach LOS	B			A	B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.0	30.0		15.0		45.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	12.0	22.9		10.0		39.9
Max Q Clear Time (g_c+I1), s	7.4	12.1		9.7		2.0
Green Ext Time (p_c), s	0.4	2.5		0.1		6.4

Intersection Summary	
HCM 6th Ctrl Delay	8.3
HCM 6th LOS	A

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	400	40	40	560	70	110	100	50	60	70	230
Future Volume (veh/h)	462	499	40	266	760	70	110	187	225	60	279	526
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	527	570	46	304	867	80	126	213	0	68	318	600
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	652	1884	151	864	1122	104	270	594		422	578	490
Arrive On Green	0.16	0.52	0.52	0.07	0.34	0.34	0.06	0.32	0.00	0.05	0.31	0.31
Sat Flow, veh/h	3456	4819	386	3456	3289	303	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	527	401	215	304	468	479	126	213	0	68	318	600
Grp Sat Flow(s),veh/h/ln	1728	1702	1801	1728	1777	1816	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	11.5	8.1	8.2	6.8	28.3	28.3	5.8	10.5	0.0	3.0	17.0	37.1
Cycle Q Clear(g_c), s	11.5	8.1	8.2	6.8	28.3	28.3	5.8	10.5	0.0	3.0	17.0	37.1
Prop In Lane	1.00		0.21	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	652	1330	704	864	606	620	270	594		422	578	490
V/C Ratio(X)	0.81	0.30	0.31	0.35	0.77	0.77	0.47	0.36		0.16	0.55	1.22
Avail Cap(c_a), veh/h	739	1330	704	864	606	620	270	594		434	578	490
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	0.93	0.93	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	19.5	19.5	22.9	35.4	35.4	27.1	31.5	0.0	25.8	34.5	41.5
Incr Delay (d2), s/veh	5.6	0.5	1.0	0.2	9.3	9.1	1.2	0.3	0.0	0.2	1.1	118.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	3.1	3.4	2.8	13.6	13.8	2.5	4.8	0.0	1.3	7.8	30.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.1	20.0	20.6	23.1	44.6	44.4	28.3	31.9	0.0	26.0	35.6	159.6
LnGrp LOS	C	C	C	C	D	D	C	C		C	D	F
Approach Vol, veh/h		1143			1251			339	A		986	
Approach Delay, s/veh		24.8			39.3			30.5			110.4	
Approach LOS		C			D			C			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	52.0	11.0	43.0	20.0	46.0	12.0	42.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 8.3	46.9	* 7.1	37.3	* 17	37.9	* 7.3	37.1
Max Q Clear Time (g_c+I1), s	8.8	10.2	5.0	12.5	13.5	30.3	7.8	39.1
Green Ext Time (p_c), s	0.0	4.2	0.0	1.1	0.8	3.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	52.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	230	40	60	360	10	40	110	50	20	150	150
Future Volume (veh/h)	30	233	40	60	370	10	40	110	50	20	150	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	266	46	68	422	11	46	126	57	23	171	171
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	500	822	142	592	960	25	221	328	148	353	231	231
Arrive On Green	0.53	0.53	0.53	0.53	0.53	0.53	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	955	1553	269	1067	1815	47	1039	1219	552	1201	858	858
Grp Volume(v), veh/h	34	0	312	68	0	433	46	0	183	23	0	342
Grp Sat Flow(s),veh/h/ln	955	0	1822	1067	0	1862	1039	0	1771	1201	0	1716
Q Serve(g_s), s	1.2	0.0	5.4	2.1	0.0	7.8	2.3	0.0	4.6	0.9	0.0	10.0
Cycle Q Clear(g_c), s	9.1	0.0	5.4	7.5	0.0	7.8	12.3	0.0	4.6	5.5	0.0	10.0
Prop In Lane	1.00		0.15	1.00		0.03	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	500	0	964	592	0	985	221	0	476	353	0	462
V/C Ratio(X)	0.07	0.00	0.32	0.11	0.00	0.44	0.21	0.00	0.38	0.07	0.00	0.74
Avail Cap(c_a), veh/h	500	0	964	592	0	985	318	0	641	464	0	621
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.7	0.0	7.4	9.5	0.0	7.9	24.0	0.0	16.4	18.6	0.0	18.4
Incr Delay (d2), s/veh	0.3	0.0	0.9	0.4	0.0	1.4	0.5	0.0	0.5	0.1	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.4	0.4	0.0	2.2	0.5	0.0	1.5	0.2	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	0.0	8.2	9.9	0.0	9.4	24.4	0.0	16.9	18.7	0.0	21.6
LnGrp LOS	B	A	A	A	A	A	C	A	B	B	A	C
Approach Vol, veh/h		346			501			229			365	
Approach Delay, s/veh		8.5			9.4			18.4			21.4	
Approach LOS		A			A			B			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		35.1		19.9		35.1		19.9				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 24		19.9		* 24		19.9				
Max Q Clear Time (g_c+I1), s		11.1		14.3		9.8		12.0				
Green Ext Time (p_c), s		1.4		0.5		2.2		1.1				

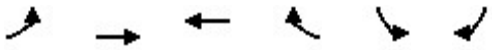
Intersection Summary												
HCM 6th Ctrl Delay			13.7									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
42: Havens Corner Rd & Dixon Rd

02/25/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	174	350	146	55	23
Future Volume (veh/h)	57	1344	1051	459	512	25
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1885	1885
Adj Flow Rate, veh/h	70	1660	1298	567	632	31
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	1	1
Cap, veh/h	75	1549	2079	927	584	519
Arrive On Green	0.58	0.58	0.58	0.58	0.32	0.32
Sat Flow, veh/h	61	2733	3647	1585	1795	1598
Grp Volume(v), veh/h	808	922	1298	567	632	31
Grp Sat Flow(s),veh/h/ln	1092	1617	1777	1585	1795	1598
Q Serve(g_s), s	34.6	55.0	23.9	23.1	32.5	1.3
Cycle Q Clear(g_c), s	58.5	55.0	23.9	23.1	32.5	1.3
Prop In Lane	0.09			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	678	946	2079	927	584	519
V/C Ratio(X)	1.19	0.97	0.62	0.61	1.08	0.06
Avail Cap(c_a), veh/h	678	946	2079	927	584	519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.9	20.0	13.6	13.4	33.8	23.2
Incr Delay (d2), s/veh	100.8	23.2	0.6	1.2	61.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	32.9	22.2	7.8	22.6	22.7	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	122.7	43.2	14.2	14.6	95.5	23.3
LnGrp LOS	F	D	B	B	F	C
Approach Vol, veh/h		1730	1865		663	
Approach Delay, s/veh		80.3	14.3		92.1	
Approach LOS		F	B		F	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	63.0	37.0	63.0
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	58.5	32.5	58.5
Max Q Clear Time (g_c+I1), s	60.5	34.5	25.9
Green Ext Time (p_c), s	0.0	0.0	13.6

Intersection Summary	
HCM 6th Ctrl Delay	53.2
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
39: Taylor Rd & Havens Corner Rd

02/25/2021

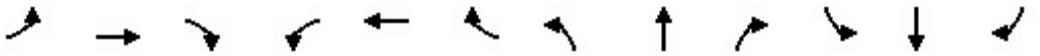
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	200	140	50	200	410	110
Future Volume (veh/h)	1613	354	82	1158	466	113
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1841	404	94	1322	532	129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1955	872	114	1955	547	487
Arrive On Green	0.55	0.55	0.55	0.55	0.31	0.31
Sat Flow, veh/h	3647	1585	169	3647	1781	1585
Grp Volume(v), veh/h	1841	404	94	1322	532	129
Grp Sat Flow(s),veh/h/ln	1777	1585	169	1777	1781	1585
Q Serve(g_s), s	33.9	10.8	4.6	18.7	20.7	4.3
Cycle Q Clear(g_c), s	33.9	10.8	38.5	18.7	20.7	4.3
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1955	872	114	1955	547	487
V/C Ratio(X)	0.94	0.46	0.82	0.68	0.97	0.26
Avail Cap(c_a), veh/h	1955	872	114	1955	547	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.7	9.5	34.7	11.3	24.0	18.3
Incr Delay (d2), s/veh	9.9	0.4	36.6	0.9	31.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	2.7	2.6	5.2	12.0	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.6	9.9	71.3	12.2	55.4	18.6
LnGrp LOS	C	A	E	B	E	B
Approach Vol, veh/h	2245			1416	661	
Approach Delay, s/veh	21.9			16.2	48.2	
Approach LOS	C			B	D	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		44.0		26.0		44.0
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		38.5		21.5		38.5
Max Q Clear Time (g_c+I1), s		35.9		22.7		40.5
Green Ext Time (p_c), s		2.4		0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		24.0
HCM 6th LOS		C

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	70	160	20	290	10	300	40	10	10	70	100
Future Volume (veh/h)	271	1361	166	20	1047	54	462	231	12	52	70	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	309	1553	189	23	1195	62	527	264	14	59	80	169
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	280	1981	238	166	2131	110	477	458	24	239	139	294
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	442	3194	384	277	3437	178	2194	1760	93	1101	535	1131
Grp Volume(v), veh/h	309	855	887	23	617	640	527	0	278	59	0	249
Grp Sat Flow(s),veh/h/ln	442	1777	1801	277	1777	1838	1097	0	1854	1101	0	1667
Q Serve(g_s), s	31.3	26.4	27.7	5.1	15.2	15.2	9.8	0.0	9.8	3.7	0.0	9.7
Cycle Q Clear(g_c), s	46.5	26.4	27.7	32.7	15.2	15.2	19.5	0.0	9.8	13.5	0.0	9.7
Prop In Lane	1.00		0.21	1.00		0.10	1.00		0.05	1.00		0.68
Lane Grp Cap(c), veh/h	280	1102	1117	166	1102	1140	477	0	482	239	0	433
V/C Ratio(X)	1.10	0.78	0.79	0.14	0.56	0.56	1.10	0.00	0.58	0.25	0.00	0.57
Avail Cap(c_a), veh/h	280	1102	1117	166	1102	1140	477	0	482	239	0	433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.2	10.4	10.7	22.9	8.3	8.3	34.6	0.0	24.2	30.0	0.0	24.1
Incr Delay (d2), s/veh	84.1	5.4	5.9	1.7	2.1	2.0	72.7	0.0	1.7	0.5	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	8.1	8.6	0.4	4.3	4.5	8.8	0.0	4.0	0.9	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	111.3	15.8	16.5	24.7	10.4	10.3	107.3	0.0	25.9	30.6	0.0	26.0
LnGrp LOS	F	B	B	C	B	B	F	A	C	C	A	C
Approach Vol, veh/h		2051			1280			805			308	
Approach Delay, s/veh		30.5			10.6			79.2			26.9	
Approach LOS		C			B			E			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		51.0		24.0		51.0		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		46.5		19.5		46.5		19.5				
Max Q Clear Time (g_c+I1), s		48.5		21.5		34.7		15.5				
Green Ext Time (p_c), s		0.0		0.0		5.9		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			33.3									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
25: Mink St SW & Havens Corner Rd

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	0	27	0	0	0	57	311	0	0	143	21
Future Volume (veh/h)	37	169	1192	2	194	0	632	317	1	0	164	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	45	206	0	2	221	0	772	387	1	0	200	55
Peak Hour Factor	0.86	0.86	0.86	0.92	0.92	0.92	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	3	3	3
Cap, veh/h	60	293		3	308	0	1604	1313	3	0	1935	519
Arrive On Green	0.10	0.10	0.00	0.09	0.09	0.00	0.70	0.70	0.70	0.00	0.70	0.70
Sat Flow, veh/h	612	2976	1572	31	3708	0	2182	1865	5	0	2841	737
Grp Volume(v), veh/h	134	117	0	120	103	0	772	0	388	0	126	129
Grp Sat Flow(s),veh/h/ln	1825	1763	1572	1869	1777	0	1091	0	1869	0	1763	1723
Q Serve(g_s), s	8.6	7.7	0.0	7.5	6.8	0.0	21.0	0.0	9.3	0.0	2.7	2.9
Cycle Q Clear(g_c), s	8.6	7.7	0.0	7.5	6.8	0.0	23.9	0.0	9.3	0.0	2.7	2.9
Prop In Lane	0.34		1.00	0.02		0.00	1.00		0.00	0.00		0.43
Lane Grp Cap(c), veh/h	180	173		159	151	0	1604	0	1316	0	1241	1213
V/C Ratio(X)	0.75	0.67		0.75	0.68	0.00	0.48	0.00	0.29	0.00	0.10	0.11
Avail Cap(c_a), veh/h	798	771		280	267	0	1604	0	1316	0	1241	1213
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	52.2	0.0	53.7	53.3	0.0	9.5	0.0	6.6	0.0	5.7	5.7
Incr Delay (d2), s/veh	6.1	4.5	0.0	7.0	5.4	0.0	1.0	0.0	0.6	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	3.5	0.0	3.8	3.3	0.0	4.2	0.0	3.1	0.0	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.7	56.7	0.0	60.6	58.7	0.0	10.5	0.0	7.2	0.0	5.8	5.9
LnGrp LOS	E	E		E	E	A	B	A	A	A	A	A
Approach Vol, veh/h		251	A		223			1160			255	
Approach Delay, s/veh		57.8			59.7			9.4			5.8	
Approach LOS		E			E			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		89.0		16.3		89.0		14.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		36.0		52.5		36.0		18.0				
Max Q Clear Time (g_c+I1), s		25.9		10.6		4.9		9.5				
Green Ext Time (p_c), s		4.3		1.2		1.2		0.7				

Intersection Summary		
HCM 6th Ctrl Delay	21.3	
HCM 6th LOS	C	

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Roundabout
43: Dixon Rd & Clark State Rd

02/25/2021

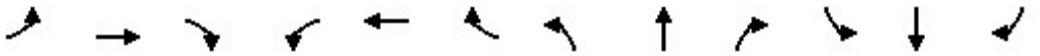
Intersection	
Intersection Delay, s/veh	13.5
Intersection LOS	B

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	220	921	611
Demand Flow Rate, veh/h	231	958	623
Vehicles Circulating, veh/h	613	117	191
Vehicles Exiting, veh/h	462	697	653
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	9.0	16.9	9.8
Approach LOS	A	C	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	231	958	623
Cap Entry Lane, veh/h	738	1225	1136
Entry HV Adj Factor	0.952	0.961	0.981
Flow Entry, veh/h	220	921	611
Cap Entry, veh/h	703	1177	1114
V/C Ratio	0.313	0.782	0.549
Control Delay, s/veh	9.0	16.9	9.8
LOS	A	C	A
95th %tile Queue, veh	1	9	3

HCM 6th Signalized Intersection Summary
24: Mink St SW & Refugee Rd SW

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	55	36	12	41	14	24	146	16	18	325	15
Future Volume (veh/h)	10	55	36	229	41	87	24	392	110	518	1830	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	11	62	40	257	46	98	27	440	124	582	2056	17
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	1	1	1
Cap, veh/h	74	346	204	267	88	187	80	1389	431	633	2654	22
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	171	1914	1126	1077	484	1032	55	1906	592	853	3641	30
Grp Volume(v), veh/h	59	0	54	257	0	144	254	0	337	582	1010	1063
Grp Sat Flow(s),veh/h/ln	1684	0	1526	1077	0	1516	943	0	1609	853	1791	1880
Q Serve(g_s), s	0.0	0.0	3.0	15.1	0.0	8.6	6.4	0.0	7.2	65.7	35.0	35.3
Cycle Q Clear(g_c), s	8.6	0.0	3.0	18.1	0.0	8.6	41.7	0.0	7.2	72.9	35.0	35.3
Prop In Lane	0.19		0.74	1.00		0.68	0.11		0.37	1.00		0.02
Lane Grp Cap(c), veh/h	348	0	276	267	0	274	728	0	1173	633	1306	1370
V/C Ratio(X)	0.17	0.00	0.20	0.96	0.00	0.52	0.35	0.00	0.29	0.92	0.77	0.78
Avail Cap(c_a), veh/h	348	0	276	267	0	274	728	0	1173	633	1306	1370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.99	0.00	0.99	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	0.0	34.8	44.3	0.0	37.1	6.6	0.0	4.6	18.3	8.4	8.5
Incr Delay (d2), s/veh	0.2	0.0	0.3	44.4	0.0	1.8	1.3	0.0	0.6	20.7	4.5	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.1	9.4	0.0	3.1	1.6	0.0	2.2	13.8	9.8	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	0.0	35.1	88.7	0.0	38.9	7.9	0.0	5.3	39.1	12.9	12.8
LnGrp LOS	C	A	D	F	A	D	A	A	A	D	B	B
Approach Vol, veh/h		113			401			591			2655	
Approach Delay, s/veh		35.0			70.8			6.4			18.6	
Approach LOS		C			E			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		77.4		22.6		77.4		22.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		72.9		18.1		72.9		18.1				
Max Q Clear Time (g_c+I1), s		43.7		10.6		74.9		20.1				
Green Ext Time (p_c), s		5.2		0.3		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			22.8									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
26: Etna Pkwy & Refugee Rd SW

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	82	6	14	56	34	11	147	41	120	99	1
Future Volume (veh/h)	61	405	217	505	71	90	78	672	681	365	506	209
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	71	471	252	587	83	105	91	781	0	424	588	243
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	1	1	1	2	2	2	1	1	1
Cap, veh/h	103	470	248	605	738	659	584	1323		653	959	396
Arrive On Green	0.23	0.23	0.23	0.13	0.41	0.41	0.05	0.37	0.00	0.07	0.39	0.39
Sat Flow, veh/h	240	2006	1058	3483	1791	1598	3456	3554	1585	3483	2472	1020
Grp Volume(v), veh/h	428	0	366	587	83	105	91	781	0	424	426	405
Grp Sat Flow(s),veh/h/ln	1765	0	1539	1742	1791	1598	1728	1777	1585	1742	1791	1702
Q Serve(g_s), s	17.5	0.0	21.1	11.2	2.6	3.7	1.4	15.9	0.0	5.9	17.2	17.2
Cycle Q Clear(g_c), s	21.1	0.0	21.1	11.2	2.6	3.7	1.4	15.9	0.0	5.9	17.2	17.2
Prop In Lane	0.17		0.69	1.00		1.00	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	460	0	361	605	738	659	584	1323		653	695	660
V/C Ratio(X)	0.93	0.00	1.02	0.97	0.11	0.16	0.16	0.59		0.65	0.61	0.61
Avail Cap(c_a), veh/h	460	0	361	605	738	659	604	1323		653	695	660
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.38	0.00	0.38	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	0.0	34.5	23.5	16.3	16.6	16.9	22.7	0.0	20.4	22.1	22.1
Incr Delay (d2), s/veh	12.4	0.0	33.2	29.1	0.1	0.1	0.1	1.9	0.0	2.3	4.0	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	0.0	10.5	6.4	0.9	1.2	0.5	6.2	0.0	2.6	7.1	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.1	0.0	67.7	52.6	16.4	16.8	17.1	24.7	0.0	22.7	26.1	26.4
LnGrp LOS	D	A	F	D	B	B	B	C		C	C	C
Approach Vol, veh/h		794			775			872	A		1255	
Approach Delay, s/veh		56.6			43.8			23.9			25.0	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	10.4	38.0	16.0	25.6	9.0	39.4		41.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.9	33.5	11.5	21.1	5.0	34.4		37.1
Max Q Clear Time (g_c+I1), s	7.9	17.9	13.2	23.1	3.4	19.2		5.7
Green Ext Time (p_c), s	0.0	4.1	0.0	0.0	0.0	4.0		0.9

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Future Volume (veh/h)	91	235	937	10	166	28	459	1342	15	31	1163	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	97	250	0	11	177	30	488	1428	16	33	1237	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	268	458		41	220	36	702	2205	25	249	1980	
Arrive On Green	0.06	0.24	0.00	0.14	0.14	0.14	0.08	0.61	0.61	0.03	0.55	0.00
Sat Flow, veh/h	1810	1900	1610	43	1532	251	3483	3628	41	1795	3582	1598
Grp Volume(v), veh/h	97	250	0	218	0	0	488	705	739	33	1237	0
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1826	0	0	1742	1791	1878	1795	1791	1598
Q Serve(g_s), s	4.9	12.7	0.0	4.5	0.0	0.0	6.2	28.0	28.1	0.9	26.0	0.0
Cycle Q Clear(g_c), s	4.9	12.7	0.0	12.7	0.0	0.0	6.2	28.0	28.1	0.9	26.0	0.0
Prop In Lane	1.00		1.00	0.05		0.14	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	268	458		297	0	0	702	1089	1141	249	1980	
V/C Ratio(X)	0.36	0.55		0.73	0.00	0.00	0.70	0.65	0.65	0.13	0.62	
Avail Cap(c_a), veh/h	268	1112		915	0	0	899	1089	1141	278	1980	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.6	36.6	0.0	45.8	0.0	0.0	15.6	14.0	14.0	12.2	16.8	0.0
Incr Delay (d2), s/veh	0.8	1.0	0.0	3.5	0.0	0.0	1.6	3.0	2.8	0.2	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.7	0.0	5.8	0.0	0.0	2.2	10.2	10.7	0.3	9.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.4	37.6	0.0	49.3	0.0	0.0	17.3	16.9	16.8	12.5	18.3	0.0
LnGrp LOS	D	D		D	A	A	B	B	B	B	B	
Approach Vol, veh/h		347	A		218			1932			1270	A
Approach Delay, s/veh		37.3			49.3			17.0			18.2	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.7	71.5		31.0	13.7	65.4	10.7	20.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	67.0		64.5	15.5	56.5	6.2	53.8				
Max Q Clear Time (g_c+I1), s	2.9	30.1		14.7	8.2	28.0	6.9	14.7				
Green Ext Time (p_c), s	0.0	11.1		1.3	1.1	9.1	0.0	1.1				

Intersection Summary			
HCM 6th Ctrl Delay		21.1	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Future Volume (veh/h)	340	1985	470	70	1252	152	190	220	100	571	210	241
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	370	2158	511	76	1361	165	207	239	109	621	228	262
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	398	2199	682	152	1536	477	352	270	229	773	390	331
Arrive On Green	0.18	0.43	0.43	0.05	0.30	0.30	0.11	0.14	0.14	0.18	0.21	0.21
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	370	2158	511	76	1361	165	207	239	109	621	228	262
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	20.2	51.9	33.7	3.6	31.6	10.1	12.1	15.6	7.9	18.0	13.7	19.5
Cycle Q Clear(g_c), s	20.2	51.9	33.7	3.6	31.6	10.1	12.1	15.6	7.9	18.0	13.7	19.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	398	2199	682	152	1536	477	352	270	229	773	390	331
V/C Ratio(X)	0.93	0.98	0.75	0.50	0.89	0.35	0.59	0.89	0.48	0.80	0.58	0.79
Avail Cap(c_a), veh/h	452	2199	682	161	1536	477	401	296	251	1417	714	605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	35.0	29.8	32.8	41.5	34.0	38.8	52.3	48.9	34.6	44.4	46.7
Incr Delay (d2), s/veh	24.3	15.0	4.6	2.5	6.6	0.4	1.7	24.4	1.5	2.0	1.4	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.5	22.9	13.4	1.6	13.6	3.9	5.4	9.1	3.2	7.7	6.4	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	50.0	34.4	35.3	48.1	34.4	40.6	76.7	50.5	36.6	45.8	51.0
LnGrp LOS	E	D	C	D	D	C	D	E	D	D	D	D
Approach Vol, veh/h		3039			1602			555			1111	
Approach Delay, s/veh		48.5			46.1			58.1			41.9	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	59.8	27.8	23.5	29.5	43.6	19.8	31.5
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	53.6	45.5	* 20	26.4	34.3	17.7	* 48
Max Q Clear Time (g_c+I1), s	5.6	53.9	20.0	17.6	22.2	33.6	14.1	21.5
Green Ext Time (p_c), s	0.0	0.0	2.3	0.4	0.5	0.5	0.2	2.2

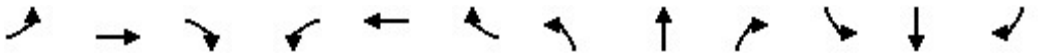
Intersection Summary	
HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

02/25/2021



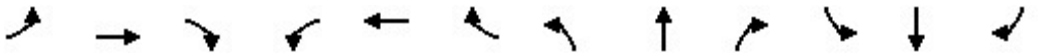
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Future Volume (veh/h)	250	1902	337	57	1062	153	157	150	71	98	190	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	272	2067	366	62	1154	166	171	163	77	107	207	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	293	2106	362	65	2468	1101	179	243	115	154	379	321
Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	416	3032	521	140	3554	1585	1097	1201	567	1140	1870	1585
Grp Volume(v), veh/h	272	1185	1248	62	1154	166	171	0	240	107	207	75
Grp Sat Flow(s),veh/h/ln	416	1777	1777	140	1777	1585	1097	0	1768	1140	1870	1585
Q Serve(g_s), s	60.2	67.3	76.4	0.0	16.2	3.9	11.4	0.0	13.8	8.5	10.9	4.4
Cycle Q Clear(g_c), s	76.4	67.3	76.4	76.4	16.2	3.9	22.3	0.0	13.8	22.3	10.9	4.4
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	293	1234	1234	65	2468	1101	179	0	358	154	379	321
V/C Ratio(X)	0.93	0.96	1.01	0.95	0.47	0.15	0.96	0.00	0.67	0.70	0.55	0.23
Avail Cap(c_a), veh/h	293	1234	1234	65	2468	1101	179	0	358	154	379	321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	15.4	16.8	55.0	7.6	5.7	51.2	0.0	40.5	51.5	39.3	36.7
Incr Delay (d2), s/veh	36.9	17.7	28.4	97.0	0.6	0.3	54.1	0.0	4.7	12.8	1.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.3	25.8	32.2	3.4	4.9	1.1	7.4	0.0	6.4	3.5	5.1	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.7	33.2	45.2	152.0	8.2	6.0	105.3	0.0	45.2	64.3	40.9	37.1
LnGrp LOS	E	C	F	F	A	A	F	A	D	E	D	D
Approach Vol, veh/h		2705			1382			411			389	
Approach Delay, s/veh		42.1			14.4			70.2			46.6	
Approach LOS		D			B			E			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		82.6		27.4		82.6		27.4				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		76.4		22.3		76.4		22.3				
Max Q Clear Time (g_c+I1), s		78.4		24.3		78.4		24.3				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			37.0									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	682	5	17	345	19	5	4	26	41	17	7
Future Volume (veh/h)	8	1538	444	479	1375	19	455	4	623	41	17	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1811	1811	1811	1870	1870	1870
Adj Flow Rate, veh/h	8	1569	453	489	1403	19	464	4	636	42	17	7
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	6	6	6	2	2	2
Cap, veh/h	200	1779	793	558	2162	964	844	415	619	196	232	197
Arrive On Green	0.01	0.50	0.50	0.12	0.61	0.61	0.13	0.23	0.23	0.03	0.12	0.12
Sat Flow, veh/h	1781	3554	1585	3428	3526	1572	3346	1811	2701	1781	1870	1585
Grp Volume(v), veh/h	8	1569	453	489	1403	19	464	4	636	42	17	7
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1714	1763	1572	1673	1811	1351	1781	1870	1585
Q Serve(g_s), s	0.3	59.2	30.0	14.8	38.3	0.7	17.6	0.3	34.4	3.1	1.2	0.6
Cycle Q Clear(g_c), s	0.3	59.2	30.0	14.8	38.3	0.7	17.6	0.3	34.4	3.1	1.2	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	200	1779	793	558	2162	964	844	415	619	196	232	197
V/C Ratio(X)	0.04	0.88	0.57	0.88	0.65	0.02	0.55	0.01	1.03	0.21	0.07	0.04
Avail Cap(c_a), veh/h	242	1779	793	859	2162	964	878	415	619	207	232	197
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	33.5	26.2	46.0	18.6	11.4	46.4	44.6	57.8	55.2	58.1	57.8
Incr Delay (d2), s/veh	0.1	6.7	3.0	6.7	1.5	0.0	0.7	0.0	43.1	0.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	25.9	11.9	9.5	15.1	0.3	7.2	0.1	15.4	1.4	0.6	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	40.2	29.2	52.7	20.2	11.4	47.0	44.7	100.9	55.8	58.2	57.9
LnGrp LOS	B	D	C	D	C	B	D	D	F	E	E	E
Approach Vol, veh/h		2030			1911			1104			66	
Approach Delay, s/veh		37.7			28.4			78.1			56.6	
Approach LOS		D			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.8	79.6	8.7	38.9	5.9	96.5	24.5	23.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	61.0	5.1	34.4	5.0	87.5	21.5	18.0
Max Q Clear Time (g_c+I1), s	16.8	61.2	5.1	36.4	2.3	40.3	19.6	3.2
Green Ext Time (p_c), s	1.5	0.0	0.0	0.0	0.0	13.8	0.4	0.0

Intersection Summary	
HCM 6th Ctrl Delay	43.2
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
5: Hazelton Etna Rd SW & Broad St

02/25/2021

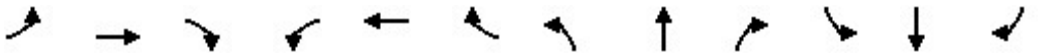
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	150	310	630	110	340
Future Volume (veh/h)	1427	150	310	1196	110	441
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1551	163	337	1300	120	479
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1981	884	380	2661	223	708
Arrive On Green	0.56	0.56	0.13	0.75	0.13	0.13
Sat Flow, veh/h	3647	1585	1781	3647	1781	2790
Grp Volume(v), veh/h	1551	163	337	1300	120	479
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1395
Q Serve(g_s), s	27.4	4.1	7.9	11.6	5.1	10.0
Cycle Q Clear(g_c), s	27.4	4.1	7.9	11.6	5.1	10.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1981	884	380	2661	223	708
V/C Ratio(X)	0.78	0.18	0.89	0.49	0.54	0.68
Avail Cap(c_a), veh/h	1981	884	463	2661	223	708
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.60	0.60	0.97	0.97
Uniform Delay (d), s/veh	13.9	8.7	20.1	4.0	32.8	26.9
Incr Delay (d2), s/veh	3.2	0.5	10.5	0.4	2.5	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	1.3	4.4	2.7	2.3	9.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.1	9.2	30.6	4.4	35.3	29.4
LnGrp LOS	B	A	C	A	D	C
Approach Vol, veh/h	1714			1637	599	
Approach Delay, s/veh	16.3			9.8	30.6	
Approach LOS	B			A	C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.3	49.7		15.0		65.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	14.0	40.9		10.0		59.9
Max Q Clear Time (g_c+I1), s	9.9	29.4		12.0		13.6
Green Ext Time (p_c), s	0.4	5.5		0.0		6.2

Intersection Summary	
HCM 6th Ctrl Delay	15.8
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Future Volume (veh/h)	671	1037	110	360	759	60	100	270	453	120	433	657
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	729	1127	120	391	825	65	109	293	0	130	471	714
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	800	1810	193	613	1056	83	188	539		338	545	813
Arrive On Green	0.16	0.39	0.39	0.09	0.32	0.32	0.06	0.29	0.00	0.06	0.29	0.29
Sat Flow, veh/h	3456	4686	499	3456	3337	263	1781	1870	1585	1781	1870	2790
Grp Volume(v), veh/h	729	818	429	391	439	451	109	293	0	130	471	714
Grp Sat Flow(s),veh/h/ln	1728	1702	1781	1728	1777	1823	1781	1870	1585	1781	1870	1395
Q Serve(g_s), s	16.6	23.3	23.3	9.0	26.9	26.9	5.1	15.9	0.0	6.1	28.6	29.3
Cycle Q Clear(g_c), s	16.6	23.3	23.3	9.0	26.9	26.9	5.1	15.9	0.0	6.1	28.6	29.3
Prop In Lane	1.00		0.28	1.00		0.14	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	800	1315	688	613	562	577	188	539		338	545	813
V/C Ratio(X)	0.91	0.62	0.62	0.64	0.78	0.78	0.58	0.54		0.38	0.86	0.88
Avail Cap(c_a), veh/h	874	1315	688	669	562	577	190	606		338	609	909
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.72	1.00	1.00	1.00	0.82	0.82	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	29.8	29.8	25.2	37.2	37.2	31.6	36.0	0.0	28.6	40.3	40.5
Incr Delay (d2), s/veh	9.9	1.6	3.1	1.8	10.3	10.1	3.5	0.7	0.0	0.7	11.4	9.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	9.6	10.4	3.8	13.1	13.4	2.3	7.3	0.0	2.7	14.6	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	31.4	32.8	26.9	47.6	47.3	35.1	36.7	0.0	29.3	51.7	49.6
LnGrp LOS	D	C	C	C	D	D	D	D		C	D	D
Approach Vol, veh/h		1976			1281			402	A		1315	
Approach Delay, s/veh		33.4			41.2			36.3			48.3	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.1	51.4	12.0	39.5	25.4	43.1	11.6	39.9
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 13	40.1	* 7.3	38.9	* 22	31.1	* 7.1	39.1
Max Q Clear Time (g_c+I1), s	11.0	25.3	8.1	17.9	18.6	28.9	7.1	31.3
Green Ext Time (p_c), s	0.4	7.1	0.0	1.6	1.1	1.2	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	39.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Future Volume (veh/h)	140	589	60	90	326	10	40	160	100	30	120	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	640	65	98	354	11	43	174	109	33	130	109
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	622	991	101	373	1070	33	231	239	149	199	209	175
Arrive On Green	0.59	0.59	0.59	0.59	0.59	0.59	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1017	1670	170	743	1804	56	1141	1075	674	1096	940	788
Grp Volume(v), veh/h	152	0	705	98	0	365	43	0	283	33	0	239
Grp Sat Flow(s),veh/h/ln	1017	0	1840	743	0	1860	1141	0	1749	1096	0	1728
Q Serve(g_s), s	5.3	0.0	15.2	6.0	0.0	6.0	2.1	0.0	9.0	1.7	0.0	7.5
Cycle Q Clear(g_c), s	11.3	0.0	15.2	21.2	0.0	6.0	9.6	0.0	9.0	10.7	0.0	7.5
Prop In Lane	1.00		0.09	1.00		0.03	1.00		0.39	1.00		0.46
Lane Grp Cap(c), veh/h	622	0	1091	373	0	1103	231	0	388	199	0	384
V/C Ratio(X)	0.24	0.00	0.65	0.26	0.00	0.33	0.19	0.00	0.73	0.17	0.00	0.62
Avail Cap(c_a), veh/h	622	0	1091	373	0	1103	320	0	525	284	0	519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.0	0.0	8.1	15.0	0.0	6.2	25.4	0.0	21.7	26.7	0.0	21.1
Incr Delay (d2), s/veh	0.9	0.0	3.0	1.7	0.0	0.8	0.4	0.0	3.4	0.4	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	4.1	1.0	0.0	1.5	0.5	0.0	3.4	0.4	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.0	0.0	11.0	16.8	0.0	7.0	25.8	0.0	25.0	27.0	0.0	22.7
LnGrp LOS	A	A	B	B	A	A	C	A	C	C	A	C
Approach Vol, veh/h		857			463			326			272	
Approach Delay, s/veh		10.8			9.1			25.1			23.3	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		41.6		18.4		41.6		18.4				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 31		18.0		* 31		18.0				
Max Q Clear Time (g_c+I1), s		17.2		11.6		23.2		12.7				
Green Ext Time (p_c), s		4.2		0.8		1.5		0.6				

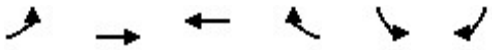
Intersection Summary		
HCM 6th Ctrl Delay		14.6
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
42: Havens Corner Rd & Dixon Rd

02/25/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	432	215	159	181	44
Future Volume (veh/h)	33	1779	1531	750	735	45
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1900	1900	1885	1885
Adj Flow Rate, veh/h	37	1977	1701	833	817	50
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	0	0	1	1
Cap, veh/h	113	2262	2279	1017	960	440
Arrive On Green	0.63	0.63	0.63	0.63	0.28	0.28
Sat Flow, veh/h	128	3676	3705	1610	3483	1598
Grp Volume(v), veh/h	37	1977	1701	833	817	50
Grp Sat Flow(s),veh/h/ln	128	1791	1805	1610	1742	1598
Q Serve(g_s), s	27.5	43.9	31.8	38.2	21.5	2.3
Cycle Q Clear(g_c), s	59.2	43.9	31.8	38.2	21.5	2.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	113	2262	2279	1017	960	440
V/C Ratio(X)	0.33	0.87	0.75	0.82	0.85	0.11
Avail Cap(c_a), veh/h	113	2262	2279	1017	1796	824
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	14.7	12.4	13.6	33.2	26.2
Incr Delay (d2), s/veh	1.7	4.1	1.4	5.4	2.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	14.3	9.9	32.2	8.5	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.7	18.8	13.8	19.0	35.4	26.3
LnGrp LOS	C	B	B	B	D	C
Approach Vol, veh/h		2014	2534		867	
Approach Delay, s/veh		19.1	15.5		34.9	
Approach LOS		B	B		C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	65.6	31.2	65.6
Change Period (Y+Rc), s	4.5	4.5	4.5
Max Green Setting (Gmax), s	61.1	49.9	61.1
Max Q Clear Time (g_c+I1), s	61.2	23.5	40.2
Green Ext Time (p_c), s	0.0	3.2	15.3

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
39: Taylor Rd & Havens Corner Rd

02/25/2021

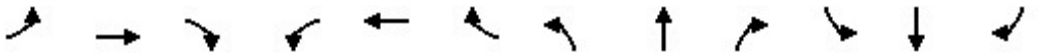
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	410	70	120	360	80
Future Volume (veh/h)	1740	811	142	1948	439	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1891	882	154	2117	477	100
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2375	1059	94	2375	429	382
Arrive On Green	0.67	0.67	0.67	0.67	0.24	0.24
Sat Flow, veh/h	3647	1585	100	3647	1781	1585
Grp Volume(v), veh/h	1891	882	154	2117	477	100
Grp Sat Flow(s),veh/h/ln	1777	1585	100	1777	1781	1585
Q Serve(g_s), s	41.5	45.8	32.0	53.8	26.5	5.6
Cycle Q Clear(g_c), s	41.5	45.8	73.5	53.8	26.5	5.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2375	1059	94	2375	429	382
V/C Ratio(X)	0.80	0.83	1.63	0.89	1.11	0.26
Avail Cap(c_a), veh/h	2375	1059	94	2375	429	382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.9	13.7	50.1	15.0	41.8	33.8
Incr Delay (d2), s/veh	2.0	5.8	326.3	4.7	77.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	13.9	11.1	17.6	20.1	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.9	19.5	376.4	19.7	119.1	34.2
LnGrp LOS	B	B	F	B	F	C
Approach Vol, veh/h	2773			2271	577	
Approach Delay, s/veh	16.4			43.9	104.4	
Approach LOS	B			D	F	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	79.0	31.0	79.0
Change Period (Y+Rc), s	5.5	4.5	5.5
Max Green Setting (Gmax), s	73.5	26.5	73.5
Max Q Clear Time (g_c+I1), s	47.8	28.5	75.5
Green Ext Time (p_c), s	19.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	36.5
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

02/25/2021



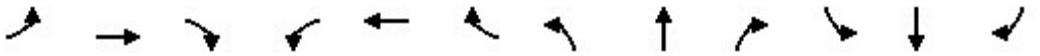
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Future Volume (veh/h)	146	1666	135	30	1721	35	400	227	57	201	50	303
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	159	1811	147	33	1871	38	435	247	62	218	54	329
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	1750	140	120	1870	38	465	469	118	319	74	452
Arrive On Green	0.52	0.52	0.52	0.52	0.52	0.52	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	235	3332	267	224	3562	72	1940	1443	362	1070	228	1391
Grp Volume(v), veh/h	159	954	1004	33	930	979	435	0	309	218	0	383
Grp Sat Flow(s),veh/h/ln	235	1777	1822	224	1777	1857	970	0	1805	1070	0	1620
Q Serve(g_s), s	0.0	31.5	31.5	0.0	31.3	31.5	7.0	0.0	8.4	11.1	0.0	12.5
Cycle Q Clear(g_c), s	31.5	31.5	31.5	31.5	31.3	31.5	19.5	0.0	8.4	19.5	0.0	12.5
Prop In Lane	1.00		0.15	1.00		0.04	1.00		0.20	1.00		0.86
Lane Grp Cap(c), veh/h	120	933	957	120	933	975	465	0	587	319	0	526
V/C Ratio(X)	1.32	1.02	1.05	0.27	1.00	1.00	0.94	0.00	0.53	0.68	0.00	0.73
Avail Cap(c_a), veh/h	120	933	957	120	933	975	465	0	587	319	0	526
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.0	14.3	14.3	30.0	14.2	14.3	28.2	0.0	16.5	24.9	0.0	17.9
Incr Delay (d2), s/veh	192.7	35.3	43.0	5.6	28.8	29.7	26.4	0.0	0.9	5.9	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	16.8	19.3	0.6	15.1	16.1	4.5	0.0	2.8	3.1	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	222.7	49.6	57.2	35.6	43.0	44.0	54.6	0.0	17.4	30.9	0.0	22.9
LnGrp LOS	F	F	F	D	D	F	D	A	B	C	A	C
Approach Vol, veh/h		2117			1942			744			601	
Approach Delay, s/veh		66.2			43.4			39.1			25.8	
Approach LOS		E			D			D			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		24.0		36.0		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		19.5		31.5		19.5				
Max Q Clear Time (g_c+I1), s		33.5		21.5		33.5		21.5				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			49.8									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
25: Mink St SW & Havens Corner Rd

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	131	0	0	0	0	21	153	0	0	349	18
Future Volume (veh/h)	45	482	1239	1	227	0	1293	182	4	0	361	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	524	0	1	247	0	1405	198	4	0	392	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	639		1	317	0	1723	1156	23	0	2089	186
Arrive On Green	0.19	0.19	0.00	0.09	0.09	0.00	0.63	0.63	0.63	0.00	0.63	0.63
Sat Flow, veh/h	299	3362	1598	14	3726	0	2709	1827	37	0	3395	293
Grp Volume(v), veh/h	306	267	0	133	115	0	1405	0	202	0	210	217
Grp Sat Flow(s),veh/h/ln	1870	1791	1598	1870	1777	0	903	0	1864	0	1777	1818
Q Serve(g_s), s	23.8	21.3	0.0	10.5	9.5	0.0	67.4	0.0	6.7	0.0	7.4	7.5
Cycle Q Clear(g_c), s	23.8	21.3	0.0	10.5	9.5	0.0	74.9	0.0	6.7	0.0	7.4	7.5
Prop In Lane	0.16		1.00	0.01		0.00	1.00		0.02	0.00		0.16
Lane Grp Cap(c), veh/h	355	340		163	155	0	1723	0	1179	0	1124	1150
V/C Ratio(X)	0.86	0.78		0.82	0.74	0.00	0.82	0.00	0.17	0.00	0.19	0.19
Avail Cap(c_a), veh/h	555	531		224	213	0	1723	0	1179	0	1124	1150
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	58.8	57.8	0.0	67.3	66.8	0.0	27.1	0.0	11.3	0.0	11.5	11.5
Incr Delay (d2), s/veh	8.3	4.0	0.0	15.0	8.6	0.0	4.4	0.0	0.3	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	9.7	0.0	5.7	4.7	0.0	13.7	0.0	2.7	0.0	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.2	61.8	0.0	82.2	75.4	0.0	31.5	0.0	11.7	0.0	11.8	11.8
LnGrp LOS	E	E		F	E	A	C	A	B	A	B	B
Approach Vol, veh/h		573	A		248			1607			427	
Approach Delay, s/veh		64.7			79.1			29.0			11.8	
Approach LOS		E			E			C			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		99.4		33.0		99.4		17.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		74.0		44.5		74.0		18.0				
Max Q Clear Time (g_c+I1), s		76.9		25.8		9.5		12.5				
Green Ext Time (p_c), s		0.0		2.7		2.2		0.6				

Intersection Summary		
HCM 6th Ctrl Delay		37.9
HCM 6th LOS		D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Roundabout
43: Dixon Rd & Clark State Rd

02/25/2021

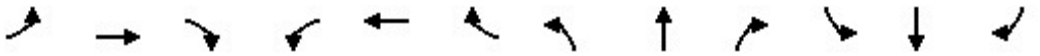
Intersection	
Intersection Delay, s/veh	18.2
Intersection LOS	C

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	338	1035	814
Demand Flow Rate, veh/h	342	1055	822
Vehicles Circulating, veh/h	775	85	255
Vehicles Exiting, veh/h	365	992	862
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	15.3	19.5	17.8
Approach LOS	C	C	C

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	342	1055	822
Cap Entry Lane, veh/h	626	1265	1064
Entry HV Adj Factor	0.990	0.981	0.990
Flow Entry, veh/h	338	1035	814
Cap Entry, veh/h	620	1241	1054
V/C Ratio	0.546	0.834	0.773
Control Delay, s/veh	15.3	19.5	17.8
LOS	C	C	C
95th %tile Queue, veh	3	11	8

HCM 6th Signalized Intersection Summary
24: Mink St SW & Refugee Rd SW

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	55	36	12	41	14	24	146	16	18	325	15
Future Volume (veh/h)	10	55	36	229	41	87	24	392	110	518	1830	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	12	65	42	270	48	103	28	462	130	611	2159	18
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	2	2	2	1	1	1	1	1	1
Cap, veh/h	74	336	200	263	87	187	74	1336	423	613	2654	22
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	170	1854	1106	1057	482	1034	46	1833	580	831	3640	30
Grp Volume(v), veh/h	61	0	58	270	0	151	259	0	361	611	1061	1116
Grp Sat Flow(s),veh/h/ln	1600	0	1530	1057	0	1516	848	0	1611	831	1791	1880
Q Serve(g_s), s	0.1	0.0	3.2	14.9	0.0	9.1	8.9	0.0	7.8	65.1	39.4	39.6
Cycle Q Clear(g_c), s	9.1	0.0	3.2	18.1	0.0	9.1	48.6	0.0	7.8	72.9	39.4	39.6
Prop In Lane	0.20		0.72	1.00		0.68	0.11		0.36	1.00		0.02
Lane Grp Cap(c), veh/h	333	0	277	263	0	274	658	0	1175	613	1306	1370
V/C Ratio(X)	0.18	0.00	0.21	1.03	0.00	0.55	0.39	0.00	0.31	1.00	0.81	0.81
Avail Cap(c_a), veh/h	333	0	277	263	0	274	658	0	1175	613	1306	1370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.99	0.00	0.99	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	0.0	34.9	44.6	0.0	37.2	8.0	0.0	4.7	21.2	9.0	9.0
Incr Delay (d2), s/veh	0.3	0.0	0.4	61.9	0.0	2.3	1.8	0.0	0.7	35.6	5.6	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	1.2	10.8	0.0	3.3	1.7	0.0	2.4	19.2	11.2	11.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.9	0.0	35.2	106.5	0.0	39.6	9.8	0.0	5.4	56.8	14.6	14.5
LnGrp LOS	C	A	D	F	A	D	A	A	A	E	B	B
Approach Vol, veh/h		119			421			620			2788	
Approach Delay, s/veh		35.1			82.5			7.2			23.8	
Approach LOS		D			F			A			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		77.4		22.6		77.4		22.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		72.9		18.1		72.9		18.1				
Max Q Clear Time (g_c+I1), s		50.6		11.1		74.9		20.1				
Green Ext Time (p_c), s		5.2		0.3		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			27.8									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
26: Etna Pkwy & Refugee Rd SW

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	82	6	14	56	34	11	147	41	120	99	1
Future Volume (veh/h)	61	405	217	505	71	90	78	672	681	365	506	209
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	74	494	265	617	87	110	95	820	0	446	618	255
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	1	1	1	2	2	2	1	1	1
Cap, veh/h	103	469	248	605	738	659	560	1323		628	958	395
Arrive On Green	0.23	0.23	0.23	0.13	0.41	0.41	0.05	0.37	0.00	0.07	0.39	0.39
Sat Flow, veh/h	241	1999	1060	3483	1791	1598	3456	3554	1585	3483	2473	1020
Grp Volume(v), veh/h	448	0	385	617	87	110	95	820	0	446	447	426
Grp Sat Flow(s),veh/h/ln	1761	0	1538	1742	1791	1598	1728	1777	1585	1742	1791	1702
Q Serve(g_s), s	17.7	0.0	21.1	11.5	2.7	3.9	1.5	16.9	0.0	5.9	18.4	18.4
Cycle Q Clear(g_c), s	21.1	0.0	21.1	11.5	2.7	3.9	1.5	16.9	0.0	5.9	18.4	18.4
Prop In Lane	0.17		0.69	1.00		1.00	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	459	0	361	605	738	659	560	1323		628	694	659
V/C Ratio(X)	0.98	0.00	1.07	1.02	0.12	0.17	0.17	0.62		0.71	0.64	0.65
Avail Cap(c_a), veh/h	459	0	361	605	738	659	577	1323		628	694	659
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.23	0.00	0.23	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	0.0	34.5	23.8	16.3	16.7	17.2	23.1	0.0	21.9	22.5	22.5
Incr Delay (d2), s/veh	14.8	0.0	42.9	41.7	0.1	0.1	0.1	2.2	0.0	3.7	4.6	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	0.0	11.4	7.7	1.0	1.3	0.5	6.6	0.0	2.9	7.6	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.9	0.0	77.4	65.4	16.4	16.8	17.3	25.2	0.0	25.7	27.1	27.3
LnGrp LOS	D	A	F	F	B	B	B	C		C	C	C
Approach Vol, veh/h		833			814			915	A		1319	
Approach Delay, s/veh		62.6			53.6			24.4			26.7	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	10.4	38.0	16.0	25.6	9.0	39.4		41.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.9	33.5	11.5	21.1	5.0	34.4		37.1
Max Q Clear Time (g_c+I1), s	7.9	18.9	13.5	23.1	3.5	20.4		5.9
Green Ext Time (p_c), s	0.0	4.2	0.0	0.0	0.0	4.1		1.0

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
35: Hazelton Etna Rd SW & Refugee Rd SW

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	104	71	9	47	28	40	496	14	31	410	66
Future Volume (veh/h)	91	235	937	10	166	28	459	1342	15	31	1163	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	102	262	0	11	185	31	513	1499	17	35	1299	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	266	466		40	228	37	674	2189	25	231	1954	
Arrive On Green	0.06	0.25	0.00	0.15	0.15	0.15	0.09	0.60	0.60	0.03	0.55	0.00
Sat Flow, veh/h	1810	1900	1610	41	1536	250	3483	3628	41	1795	3582	1598
Grp Volume(v), veh/h	102	262	0	227	0	0	513	740	776	35	1299	0
Grp Sat Flow(s),veh/h/ln	1810	1900	1610	1827	0	0	1742	1791	1878	1795	1791	1598
Q Serve(g_s), s	5.2	13.4	0.0	4.7	0.0	0.0	6.7	31.0	31.0	0.9	28.7	0.0
Cycle Q Clear(g_c), s	5.2	13.4	0.0	13.3	0.0	0.0	6.7	31.0	31.0	0.9	28.7	0.0
Prop In Lane	1.00		1.00	0.05		0.14	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	266	466		306	0	0	674	1081	1133	231	1954	
V/C Ratio(X)	0.38	0.56		0.74	0.00	0.00	0.76	0.68	0.69	0.15	0.66	
Avail Cap(c_a), veh/h	266	1104		909	0	0	854	1081	1133	258	1954	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.6	36.7	0.0	45.9	0.0	0.0	18.2	14.9	14.9	13.2	18.0	0.0
Incr Delay (d2), s/veh	0.9	1.1	0.0	3.6	0.0	0.0	3.1	3.5	3.4	0.3	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.0	0.0	6.1	0.0	0.0	3.3	11.4	12.0	0.3	10.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	37.8	0.0	49.4	0.0	0.0	21.3	18.4	18.2	13.5	19.8	0.0
LnGrp LOS	D	D		D	A	A	C	B	B	B	B	
Approach Vol, veh/h		364	A		227			2029			1334	A
Approach Delay, s/veh		37.4			49.4			19.1			19.6	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	71.5		31.7	14.3	65.0	10.7	21.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	67.0		64.5	15.5	56.5	6.2	53.8				
Max Q Clear Time (g_c+I1), s	2.9	33.0		15.4	8.7	30.7	7.2	15.3				
Green Ext Time (p_c), s	0.0	11.8		1.3	1.1	9.4	0.0	1.2				

Intersection Summary			
HCM 6th Ctrl Delay		22.7	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
18: Taylor Rd & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	850	470	70	520	110	190	220	100	180	210	140
Future Volume (veh/h)	340	1985	470	70	1252	152	190	220	100	571	210	241
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	388	2265	536	80	1429	173	217	251	114	652	240	275
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	410	2472	767	137	1747	542	300	275	233	681	404	342
Arrive On Green	0.19	0.48	0.48	0.05	0.34	0.34	0.09	0.15	0.15	0.16	0.22	0.22
Sat Flow, veh/h	1781	5106	1585	1781	5106	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	388	2265	536	80	1429	173	217	251	114	652	240	275
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1781	1702	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	25.4	60.8	39.0	4.3	37.8	11.9	13.5	19.5	9.8	23.3	17.1	24.3
Cycle Q Clear(g_c), s	25.4	60.8	39.0	4.3	37.8	11.9	13.5	19.5	9.8	23.3	17.1	24.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	410	2472	767	137	1747	542	300	275	233	681	404	342
V/C Ratio(X)	0.95	0.92	0.70	0.58	0.82	0.32	0.72	0.91	0.49	0.96	0.59	0.80
Avail Cap(c_a), veh/h	439	2508	778	141	1747	542	300	285	241	681	414	351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.9	35.4	29.7	37.2	44.4	35.9	50.1	62.1	58.0	43.9	52.1	55.0
Incr Delay (d2), s/veh	28.8	5.9	2.7	5.7	3.2	0.3	8.3	31.2	1.6	24.5	2.2	12.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.1	24.9	15.2	2.0	15.9	4.7	1.6	11.6	4.0	12.3	8.3	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.7	41.2	32.5	42.9	47.6	36.2	58.4	93.3	59.5	68.4	54.3	67.4
LnGrp LOS	E	D	C	D	D	D	E	F	E	E	D	E
Approach Vol, veh/h		3189			1682			582			1167	
Approach Delay, s/veh		43.4			46.2			73.7			65.3	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	77.8	29.2	27.2	34.6	56.8	19.0	37.4
Change Period (Y+Rc), s	6.9	6.2	5.5	* 5.5	6.9	6.2	5.5	* 5.5
Max Green Setting (Gmax), s	7.1	72.6	23.7	* 23	30.1	49.6	13.5	* 33
Max Q Clear Time (g_c+I1), s	6.3	62.8	25.3	21.5	27.4	39.8	15.5	26.3
Green Ext Time (p_c), s	0.0	8.8	0.0	0.2	0.3	6.3	0.0	1.3

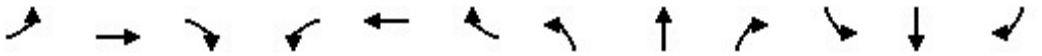
Intersection Summary	
HCM 6th Ctrl Delay	50.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
13: Summit Rd SW & Broad St

02/25/2021



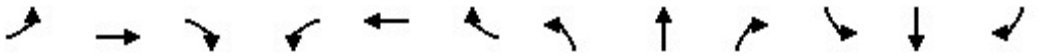
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	790	130	30	470	60	90	110	20	90	190	60
Future Volume (veh/h)	250	1902	337	57	1062	153	157	150	71	98	190	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	285	2171	385	65	1212	175	179	171	81	112	217	79
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	275	2106	362	65	2468	1101	172	243	115	145	379	321
Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	390	3032	522	124	3554	1585	1083	1200	568	1128	1870	1585
Grp Volume(v), veh/h	285	1245	1311	65	1212	175	179	0	252	112	217	79
Grp Sat Flow(s),veh/h/ln	390	1777	1776	124	1777	1585	1083	0	1768	1128	1870	1585
Q Serve(g_s), s	59.0	76.4	76.4	0.0	17.4	4.2	10.8	0.0	14.6	7.7	11.5	4.6
Cycle Q Clear(g_c), s	76.4	76.4	76.4	76.4	17.4	4.2	22.3	0.0	14.6	22.3	11.5	4.6
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	275	1234	1234	65	2468	1101	172	0	358	145	379	321
V/C Ratio(X)	1.04	1.01	1.06	0.99	0.49	0.16	1.04	0.00	0.70	0.77	0.57	0.25
Avail Cap(c_a), veh/h	275	1234	1234	65	2468	1101	172	0	358	145	379	321
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	16.8	16.8	55.0	7.8	5.8	51.7	0.0	40.8	52.3	39.5	36.8
Incr Delay (d2), s/veh	64.4	27.8	43.9	109.3	0.7	0.3	80.3	0.0	6.1	22.6	2.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	31.9	37.5	3.7	5.3	1.2	8.5	0.0	6.8	4.0	5.4	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.9	44.6	60.7	164.3	8.5	6.1	132.0	0.0	46.8	74.9	41.6	37.2
LnGrp LOS	F	F	F	F	A	A	F	A	D	E	D	D
Approach Vol, veh/h		2841			1452			431			408	
Approach Delay, s/veh		57.3			15.2			82.2			49.9	
Approach LOS		E			B			F			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		82.6		27.4		82.6		27.4				
Change Period (Y+Rc), s		6.2		5.1		6.2		5.1				
Max Green Setting (Gmax), s		76.4		22.3		76.4		22.3				
Max Q Clear Time (g_c+I1), s		78.4		24.3		78.4		24.3				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			46.9									
HCM 6th LOS			D									

HCM 6th Signalized Intersection Summary
10: Columbia Rd SW & Broad St

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	682	5	17	345	19	5	4	26	41	17	7
Future Volume (veh/h)	8	1538	444	479	1375	19	455	4	623	41	17	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1811	1811	1811	1870	1870	1870
Adj Flow Rate, veh/h	9	1648	476	513	1473	20	488	4	668	44	18	8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	3	3	3	6	6	6	2	2	2
Cap, veh/h	183	1720	767	581	2154	961	850	415	619	192	224	190
Arrive On Green	0.01	0.48	0.48	0.14	0.61	0.61	0.14	0.23	0.23	0.03	0.12	0.12
Sat Flow, veh/h	1781	3554	1585	3428	3526	1572	3346	1811	2701	1781	1870	1585
Grp Volume(v), veh/h	9	1648	476	513	1473	20	488	4	668	44	18	8
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1714	1763	1572	1673	1811	1351	1781	1870	1585
Q Serve(g_s), s	0.4	66.9	33.2	17.1	41.9	0.8	18.6	0.3	34.4	3.2	1.3	0.7
Cycle Q Clear(g_c), s	0.4	66.9	33.2	17.1	41.9	0.8	18.6	0.3	34.4	3.2	1.3	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	183	1720	767	581	2154	961	850	415	619	192	224	190
V/C Ratio(X)	0.05	0.96	0.62	0.88	0.68	0.02	0.57	0.01	1.08	0.23	0.08	0.04
Avail Cap(c_a), veh/h	224	1720	767	830	2154	961	865	415	619	200	224	190
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	37.2	28.5	49.5	19.5	11.5	46.6	44.6	57.8	55.7	58.7	58.4
Incr Delay (d2), s/veh	0.1	13.8	3.8	8.1	1.8	0.0	0.9	0.0	59.1	0.6	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	30.9	13.3	10.0	16.5	0.3	7.6	0.1	16.7	1.5	0.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	51.1	32.3	57.7	21.3	11.5	47.5	44.7	116.9	56.3	58.8	58.5
LnGrp LOS	C	D	C	E	C	B	D	D	F	E	E	E
Approach Vol, veh/h		2133			2006			1160			70	
Approach Delay, s/veh		46.8			30.5			87.4			57.2	
Approach LOS		D			C			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.1	77.1	8.9	38.9	6.1	96.1	25.3	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	61.0	5.1	34.4	5.0	87.5	21.5	18.0
Max Q Clear Time (g_c+I1), s	19.1	68.9	5.2	36.4	2.4	43.9	20.6	3.3
Green Ext Time (p_c), s	1.5	0.0	0.0	0.0	0.0	14.7	0.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	49.6
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
5: Hazelton Etna Rd SW & Broad St

02/25/2021

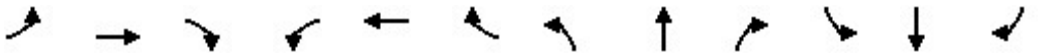
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	880	150	310	630	110	340
Future Volume (veh/h)	1427	150	310	1196	110	441
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1629	171	354	1365	126	503
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1907	850	395	2661	223	767
Arrive On Green	0.54	0.54	0.15	0.75	0.13	0.13
Sat Flow, veh/h	3647	1585	1781	3647	1781	2790
Grp Volume(v), veh/h	1629	171	354	1365	126	503
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1395
Q Serve(g_s), s	31.4	4.5	9.7	12.5	5.3	10.0
Cycle Q Clear(g_c), s	31.4	4.5	9.7	12.5	5.3	10.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1907	850	395	2661	223	767
V/C Ratio(X)	0.85	0.20	0.90	0.51	0.57	0.66
Avail Cap(c_a), veh/h	1907	850	439	2661	223	767
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.50	0.50	0.97	0.97
Uniform Delay (d), s/veh	15.9	9.6	22.3	4.1	33.0	25.7
Incr Delay (d2), s/veh	5.1	0.5	11.2	0.4	3.2	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	1.5	7.5	2.9	2.4	9.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.0	10.2	33.5	4.5	36.2	27.6
LnGrp LOS	C	B	C	A	D	C
Approach Vol, veh/h	1800			1719	629	
Approach Delay, s/veh	20.0			10.4	29.4	
Approach LOS	B			B	C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	17.0	48.0		15.0		65.0
Change Period (Y+Rc), s	5.0	5.1		5.0		5.1
Max Green Setting (Gmax), s	14.0	40.9		10.0		59.9
Max Q Clear Time (g_c+I1), s	11.7	33.4		12.0		14.5
Green Ext Time (p_c), s	0.3	4.4		0.0		6.7

Intersection Summary	
HCM 6th Ctrl Delay	17.4
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
1: Township Rd/Hazelton Etna Rd SW & Broad St

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	820	110	80	540	60	100	90	100	120	130	310
Future Volume (veh/h)	671	1037	110	360	759	60	100	270	453	120	433	657
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	766	1184	126	411	866	68	114	308	0	137	494	750
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	800	1725	184	597	947	74	188	560		341	563	840
Arrive On Green	0.19	0.37	0.37	0.10	0.28	0.28	0.06	0.30	0.00	0.06	0.30	0.30
Sat Flow, veh/h	3456	4686	499	3456	3338	262	1781	1870	1585	1781	1870	2790
Grp Volume(v), veh/h	766	860	450	411	461	473	114	308	0	137	494	750
Grp Sat Flow(s),veh/h/ln	1728	1702	1781	1728	1777	1823	1781	1870	1585	1781	1870	1395
Q Serve(g_s), s	20.8	25.6	25.6	10.0	30.1	30.1	5.3	16.6	0.0	6.4	30.1	30.8
Cycle Q Clear(g_c), s	20.8	25.6	25.6	10.0	30.1	30.1	5.3	16.6	0.0	6.4	30.1	30.8
Prop In Lane	1.00		0.28	1.00		0.14	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	800	1253	655	597	504	517	188	560		341	563	840
V/C Ratio(X)	0.96	0.69	0.69	0.69	0.91	0.91	0.61	0.55		0.40	0.88	0.89
Avail Cap(c_a), veh/h	800	1253	655	629	504	517	188	606		341	609	909
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.68	0.68	1.00	1.00	1.00	0.80	0.80	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	32.1	32.1	27.8	41.6	41.6	31.2	35.2	0.0	27.9	39.8	40.1
Incr Delay (d2), s/veh	16.9	2.1	4.0	3.0	23.6	23.1	4.4	0.7	0.0	0.8	13.0	10.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.9	10.7	11.5	4.3	16.2	16.6	2.5	7.6	0.0	2.8	15.6	11.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	34.2	36.0	30.7	65.1	64.7	35.6	36.0	0.0	28.7	52.8	50.7
LnGrp LOS	D	C	D	C	E	E	D	D		C	D	D
Approach Vol, veh/h		2076			1345			422	A		1381	
Approach Delay, s/veh		40.5			54.5			35.9			49.3	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.9	49.3	12.0	40.8	28.0	39.2	11.8	41.0
Change Period (Y+Rc), s	* 5.7	5.1	* 4.7	4.9	* 5.7	5.1	* 4.7	4.9
Max Green Setting (Gmax), s	* 13	40.1	* 7.3	38.9	* 22	31.1	* 7.1	39.1
Max Q Clear Time (g_c+I1), s	12.0	27.6	8.4	18.6	22.8	32.1	7.3	32.8
Green Ext Time (p_c), s	0.2	6.7	0.0	1.7	0.0	0.0	0.0	3.3

Intersection Summary	
HCM 6th Ctrl Delay	46.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: Watkins Rd SW & Broad St

02/25/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	580	60	90	320	10	40	160	100	30	120	100
Future Volume (veh/h)	140	589	60	90	326	10	40	160	100	30	120	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	672	68	103	372	11	46	183	114	34	137	114
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	597	977	99	340	1057	31	232	248	155	199	217	181
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1000	1671	169	719	1807	53	1129	1078	672	1082	944	785
Grp Volume(v), veh/h	160	0	740	103	0	383	46	0	297	34	0	251
Grp Sat Flow(s),veh/h/ln	1000	0	1840	719	0	1861	1129	0	1749	1082	0	1729
Q Serve(g_s), s	6.0	0.0	16.8	7.0	0.0	6.5	2.3	0.0	9.4	1.8	0.0	7.8
Cycle Q Clear(g_c), s	12.4	0.0	16.8	23.7	0.0	6.5	10.1	0.0	9.4	11.2	0.0	7.8
Prop In Lane	1.00		0.09	1.00		0.03	1.00		0.38	1.00		0.45
Lane Grp Cap(c), veh/h	597	0	1076	340	0	1088	232	0	403	199	0	398
V/C Ratio(X)	0.27	0.00	0.69	0.30	0.00	0.35	0.20	0.00	0.74	0.17	0.00	0.63
Avail Cap(c_a), veh/h	597	0	1076	340	0	1088	311	0	525	274	0	519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.8	0.0	8.7	16.9	0.0	6.5	25.4	0.0	21.4	26.6	0.0	20.8
Incr Delay (d2), s/veh	1.1	0.0	3.6	2.3	0.0	0.9	0.4	0.0	3.9	0.4	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	4.7	1.1	0.0	1.7	0.6	0.0	3.6	0.4	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.9	0.0	12.2	19.2	0.0	7.4	25.8	0.0	25.3	27.0	0.0	22.4
LnGrp LOS	B	A	B	B	A	A	C	A	C	C	A	C
Approach Vol, veh/h		900			486			343			285	
Approach Delay, s/veh		12.0			9.9			25.4			23.0	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		41.1		18.9		41.1		18.9				
Change Period (Y+Rc), s		* 6		5.1		* 6		5.1				
Max Green Setting (Gmax), s		* 31		18.0		* 31		18.0				
Max Q Clear Time (g_c+I1), s		18.8		12.1		25.7		13.2				
Green Ext Time (p_c), s		4.2		0.8		1.2		0.6				

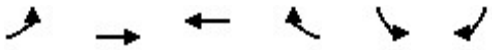
Intersection Summary		
HCM 6th Ctrl Delay		15.3
HCM 6th LOS		B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
42: Havens Corner Rd & Dixon Rd

02/25/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	432	215	159	181	44
Future Volume (veh/h)	33	1779	1531	750	735	45
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1885	1885	1900	1900	1885	1885
Adj Flow Rate, veh/h	38	2076	1786	875	858	52
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	0	0	1	1
Cap, veh/h	101	2225	2242	1000	1001	459
Arrive On Green	0.62	0.62	0.62	0.62	0.29	0.29
Sat Flow, veh/h	113	3676	3705	1610	3483	1598
Grp Volume(v), veh/h	38	2076	1786	875	858	52
Grp Sat Flow(s),veh/h/ln	113	1791	1805	1610	1742	1598
Q Serve(g_s), s	24.6	51.4	36.5	44.4	22.9	2.4
Cycle Q Clear(g_c), s	61.1	51.4	36.5	44.4	22.9	2.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	101	2225	2242	1000	1001	459
V/C Ratio(X)	0.37	0.93	0.80	0.87	0.86	0.11
Avail Cap(c_a), veh/h	101	2225	2242	1000	1767	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	16.8	14.0	15.5	33.1	25.8
Incr Delay (d2), s/veh	2.3	8.0	2.1	8.8	2.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	18.1	11.9	35.4	9.1	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.4	24.8	16.1	24.2	35.4	25.9
LnGrp LOS	D	C	B	C	D	C
Approach Vol, veh/h		2114	2661		910	
Approach Delay, s/veh		25.1	18.8		34.8	
Approach LOS		C	B		C	

Timer - Assigned Phs		4		6		8
Phs Duration (G+Y+Rc), s		65.6		32.8		65.6
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		61.1		49.9		61.1
Max Q Clear Time (g_c+I1), s		63.1		24.9		46.4
Green Ext Time (p_c), s		0.0		3.4		12.1

Intersection Summary	
HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
39: Taylor Rd & Havens Corner Rd

02/25/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	410	70	120	360	80
Future Volume (veh/h)	1740	811	142	1948	439	92
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1986	926	162	2223	501	105
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2375	1059	87	2375	429	382
Arrive On Green	0.67	0.67	0.67	0.67	0.24	0.24
Sat Flow, veh/h	3647	1585	87	3647	1781	1585
Grp Volume(v), veh/h	1986	926	162	2223	501	105
Grp Sat Flow(s),veh/h/ln	1777	1585	87	1777	1781	1585
Q Serve(g_s), s	46.2	51.3	27.3	61.0	26.5	5.9
Cycle Q Clear(g_c), s	46.2	51.3	73.5	61.0	26.5	5.9
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2375	1059	87	2375	429	382
V/C Ratio(X)	0.84	0.87	1.86	0.94	1.17	0.27
Avail Cap(c_a), veh/h	2375	1059	87	2375	429	382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.7	14.6	51.6	16.2	41.8	33.9
Incr Delay (d2), s/veh	2.8	8.3	428.9	7.9	97.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.7	16.1	12.7	20.8	22.5	2.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.5	22.8	480.5	24.0	139.6	34.3
LnGrp LOS	B	C	F	C	F	C
Approach Vol, veh/h	2912			2385	606	
Approach Delay, s/veh	18.5			55.0	121.4	
Approach LOS	B			E	F	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		79.0		31.0		79.0
Change Period (Y+Rc), s		5.5		4.5		5.5
Max Green Setting (Gmax), s		73.5		26.5		73.5
Max Q Clear Time (g_c+I1), s		53.3		28.5		75.5
Green Ext Time (p_c), s		16.9		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	43.8
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
17: Summit Rd SW & Havens Corner Rd

02/25/2021

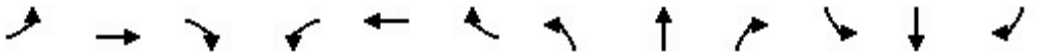
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	240	120	30	220	20	210	160	50	20	50	100
Future Volume (veh/h)	146	1666	135	30	1721	35	400	227	57	201	50	303
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	167	1901	154	34	1964	40	457	259	65	229	57	346
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	1889	151	96	2919	59	526	452	113	526	72	436
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	214	3333	266	204	5151	105	2769	1443	362	2048	229	1391
Grp Volume(v), veh/h	167	1001	1054	34	1297	707	457	0	324	229	0	403
Grp Sat Flow(s),veh/h/ln	214	1777	1822	204	1702	1851	923	0	1805	1024	0	1620
Q Serve(g_s), s	22.4	41.9	42.5	0.0	20.0	20.1	6.4	0.0	11.3	7.9	0.0	17.1
Cycle Q Clear(g_c), s	42.5	41.9	42.5	42.5	20.0	20.1	23.5	0.0	11.3	19.2	0.0	17.1
Prop In Lane	1.00		0.15	1.00		0.06	1.00		0.20	1.00		0.86
Lane Grp Cap(c), veh/h	160	1007	1033	96	1929	1049	526	0	566	526	0	508
V/C Ratio(X)	1.04	0.99	1.02	0.35	0.67	0.67	0.87	0.00	0.57	0.44	0.00	0.79
Avail Cap(c_a), veh/h	160	1007	1033	96	1929	1049	526	0	566	526	0	508
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.0	16.1	16.3	37.5	11.4	11.4	35.8	0.0	21.5	29.6	0.0	23.5
Incr Delay (d2), s/veh	82.9	27.0	33.3	9.9	1.9	3.5	14.5	0.0	1.4	0.6	0.0	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	19.0	21.5	0.8	5.8	6.7	3.3	0.0	4.3	1.8	0.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	115.9	43.2	49.5	47.4	13.3	14.8	50.3	0.0	22.9	30.1	0.0	32.0
LnGrp LOS	F	D	F	D	B	B	D	A	C	C	A	C
Approach Vol, veh/h		2222			2038			781			632	
Approach Delay, s/veh		51.6			14.4			38.9			31.3	
Approach LOS		D			B			D			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.0		28.0		47.0		28.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		42.5		23.5		42.5		23.5				
Max Q Clear Time (g_c+I1), s		44.5		25.5		44.5		21.2				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.8				

Intersection Summary												
HCM 6th Ctrl Delay			34.2									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary
25: Mink St SW & Havens Corner Rd

02/25/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	131	0	0	0	0	21	153	0	0	349	18
Future Volume (veh/h)	45	482	1239	1	227	0	1293	182	4	0	361	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	51	550	0	1	259	0	1476	208	5	0	412	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	2	2	2
Cap, veh/h	59	667		1	329	0	1649	1130	27	0	2049	183
Arrive On Green	0.20	0.20	0.00	0.09	0.09	0.00	0.62	0.62	0.62	0.00	0.62	0.62
Sat Flow, veh/h	297	3364	1598	13	3727	0	2655	1819	44	0	3393	295
Grp Volume(v), veh/h	321	280	0	139	121	0	1476	0	213	0	221	228
Grp Sat Flow(s),veh/h/ln	1870	1791	1598	1870	1777	0	885	0	1862	0	1777	1817
Q Serve(g_s), s	24.9	22.3	0.0	11.0	9.9	0.0	81.4	0.0	7.3	0.0	8.1	8.2
Cycle Q Clear(g_c), s	24.9	22.3	0.0	11.0	9.9	0.0	89.5	0.0	7.3	0.0	8.1	8.2
Prop In Lane	0.16		1.00	0.01		0.00	1.00		0.02	0.00		0.16
Lane Grp Cap(c), veh/h	371	355		169	161	0	1649	0	1157	0	1104	1129
V/C Ratio(X)	0.87	0.79		0.82	0.75	0.00	0.90	0.00	0.18	0.00	0.20	0.20
Avail Cap(c_a), veh/h	555	531		224	213	0	1649	0	1157	0	1104	1129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	58.2	57.1	0.0	67.0	66.5	0.0	31.7	0.0	12.2	0.0	12.3	12.3
Incr Delay (d2), s/veh	9.3	4.6	0.0	16.7	9.8	0.0	8.0	0.0	0.4	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	10.2	0.0	6.1	5.0	0.0	16.8	0.0	2.9	0.0	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.5	61.7	0.0	83.7	76.4	0.0	39.7	0.0	12.5	0.0	12.7	12.7
LnGrp LOS	E	E		F	E	A	D	A	B	A	B	B
Approach Vol, veh/h		601	A		260			1689			449	
Approach Delay, s/veh		64.8			80.3			36.3			12.7	
Approach LOS		E			F			D			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		97.7		34.2		97.7		18.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		74.0		44.5		74.0		18.0				
Max Q Clear Time (g_c+I1), s		91.5		26.9		10.2		13.0				
Green Ext Time (p_c), s		0.0		2.8		2.4		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			42.3									
HCM 6th LOS			D									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Roundabout
43: Dixon Rd & Clark State Rd

02/25/2021

Intersection	
Intersection Delay, s/veh	21.9
Intersection LOS	C

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	355	1087	855
Demand Flow Rate, veh/h	359	1109	864
Vehicles Circulating, veh/h	814	89	268
Vehicles Exiting, veh/h	384	1043	905
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	17.6	23.7	21.3
Approach LOS	C	C	C

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	359	1109	864
Cap Entry Lane, veh/h	602	1260	1050
Entry HV Adj Factor	0.990	0.980	0.990
Flow Entry, veh/h	355	1087	855
Cap Entry, veh/h	595	1235	1039
V/C Ratio	0.597	0.880	0.823
Control Delay, s/veh	17.6	23.7	21.3
LOS	C	C	C
95th %tile Queue, veh	4	13	10