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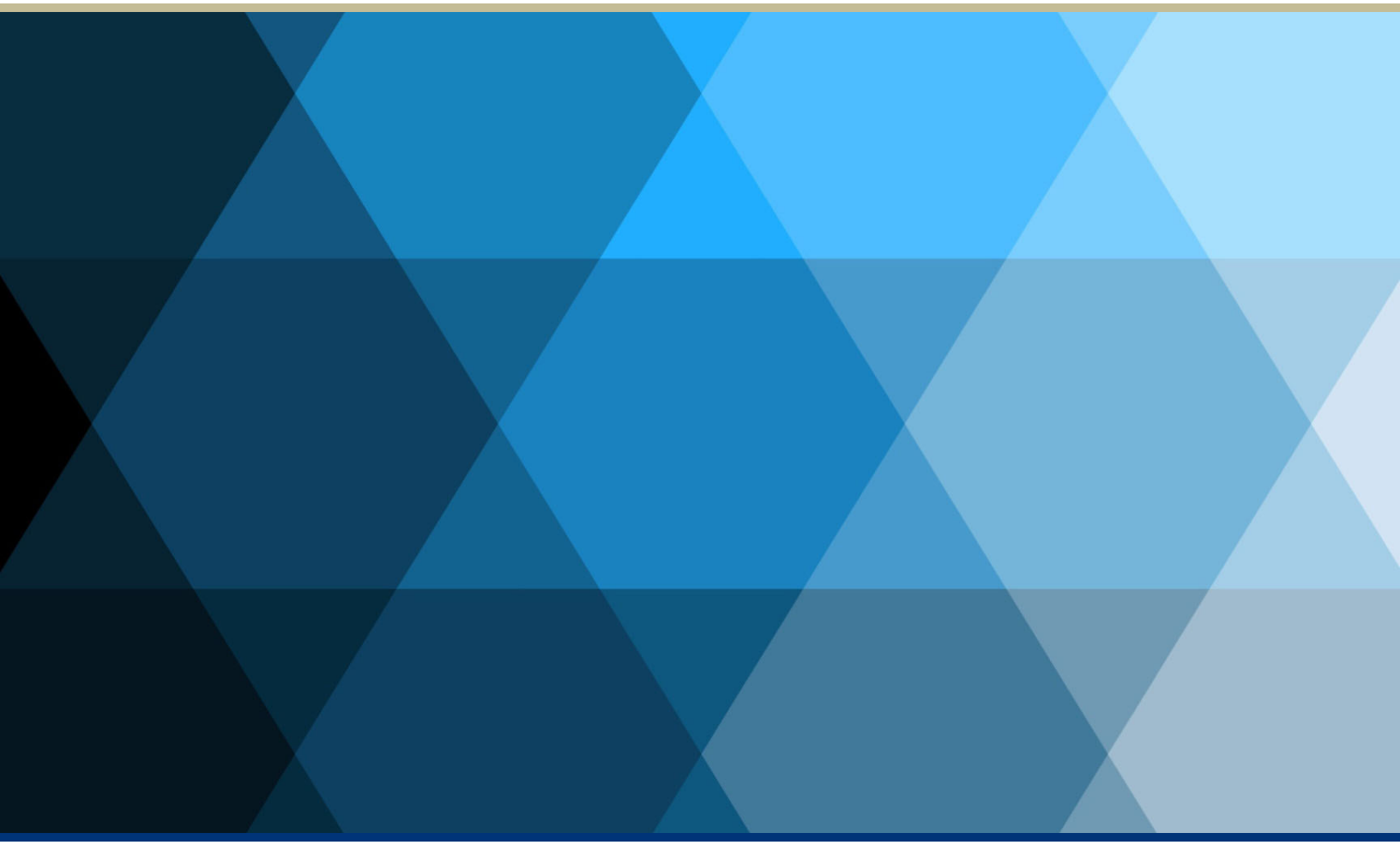
Traffic Impact and Access Study

Proposed Medical Office Building
200 Libbey Industrial Parkway
Weymouth, Massachusetts



TETRA TECH

Submitted to:
Town of Weymouth

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EXECUTIVE SUMMARY

Tetra Tech has reviewed the potential traffic impacts associated with the proposed redevelopment of 200 Libbey Industrial Parkway in Weymouth, Massachusetts. The project site consists of approximately 4.3 acres of land located on the north side of Libbey Industrial Parkway, which currently supports a 41,500± square foot industrial building. The proposed project calls for the demolition of the existing building on site and a 69,000 square foot medical office building will be constructed. The anticipated parking demands associated with the proposed development will be accommodated in a surface parking lot providing approximately 271 parking spaces.

Vehicular access to the site is currently provided by two site driveways located on the north side of Libbey Industrial Parkway. The westerly site driveway will generally remain in the same location as the existing westerly driveway and will be narrowed slightly. The easterly driveway will shift slightly to the east from the existing easterly site driveway location to better serve the proposed building. A summary of the study methodology and key findings is presented below.

Study Methodology

The study evaluates existing and future traffic operations (with and without the proposed project) at the project site driveways and key study intersections identified in consultation with the Town of Weymouth Planning staff. The study provides a detailed analysis of intersection capacity during the weekday morning and weekday evening commuter peak hours, when the combination of existing traffic on the surrounding area roadways and new traffic associated with the proposed development would be greatest.

Due to significant changes in traffic volumes and travel patterns resulting from the ongoing COVID-19 pandemic, the 2021 Existing weekday morning and weekday evening peak hour traffic volumes at the study area intersections were established based on traffic counts collected in June 2015 and October 2015. The 2015 traffic counts were grown by three percent and traffic increases associated with other background developments built and occupied since 2015 were then added to the 2021 base year traffic volumes to establish the 2021 Existing weekday morning and weekday evening peak hour volumes. The 2021 Existing peak hour traffic volumes were then projected to the future design year of 2028, by which time the proposed project is expected to be built and occupied. The 2021 Existing traffic volumes were grown by 0.5 percent per year for the seven-year forecast period (2021 to 2028) and project trips from other planned development projects expected to be built and occupied by 2028 were added to reflect the 2028 No Build (Without Project). The traffic increases associated with the currently proposed project were then added to the 2028 No Build peak hour traffic volumes to reflect the future 2028 Build (With Project) conditions.

Intersection capacity analyses were then conducted for each of the study intersections for the 2021 Existing, 2028 No Build (Without Project) and 2028 Build (With Project) weekday morning and weekday evening peak hour traffic volumes to identify existing and projected traffic deficiencies near the project site.

Future Site-Generated Traffic – Proposed Medical Office Building

Vehicle trip generation estimates for the currently proposed 69,000 square foot medical office building were developed based on data presented in the Institute of Transportation Engineers' (ITE) publication *Trip Generation Manual, 10th Edition* for the closest available land use (Land Use 720 – Medical-Dental Office Building).

The project site is approximately a half mile away from the nearest existing Massachusetts Bay Transportation Authority (MBTA) bus service, located at the corner of Middle Street and Libbey Industrial Parkway. For the purposes of this study, no credit was taken for potential vehicle trip reductions associated with alternative modes of transportation (i.e., transit, walking, biking, carpooling).

The ITE data indicates that proposed medical office building is expected to generate approximately 161 vehicle trips (126 entering trips and 35 exiting trips) during the weekday morning peak hour and 239 vehicle trips (67 entering trips and 172 exiting trips) during the weekday evening peak.

The potential traffic increases associated with the currently proposed medical office were then compared to vehicle trip estimates for the potential reuse of the existing 41,500 square foot industrial building. Based on this comparison, the proposed project would result in a net increase of approximately 132 vehicle trips (100 entering trips and 32 exiting trips) during the weekday morning peak hour and 213 vehicle trips (64 entering trips and 149 exiting trips) during the weekday evening commuter peak hours relative to the existing industrial building on site. However, for purposes of this study, and to provide a conservative assessment of potential traffic increases associated with the currently proposed medical office building, no credit was taken for vehicle trips associated with the potential reuse of the existing industrial building currently on site.

Project Trip Distribution Patterns

The project vehicle trips will be distributed to the surrounding roadway network via two proposed site driveways on Libbey Industrial Parkway, thus limiting potential traffic increases at any one driveway location. The proposed project vehicle trips were assigned to the site driveways and surrounding area roadways based on a gravity model of populations within the region and the site's proximity to other regional medical office facilities.

Intersection Capacity Analysis

To quantify potential traffic impacts associated with the proposed development, Tetra Tech conducted intersection capacity analyses at key intersections near the project site for the 2021 Existing, 2028 No Build (Without Project), and 2028 Build (With Project) weekday morning and weekday evening peak hour traffic conditions.

The capacity analyses indicate the intersection of Route 18 and Middle Street/West Street currently operates at or near capacity with an overall LOS E during both the morning and afternoon peak hours. Independent of the proposed project, it is anticipated that traffic signal timing adjustments will be implemented at this location by others as part of routine traffic signal maintenance. With optimization of the traffic signal timings for the projected future traffic volume conditions, the capacity analysis indicates that the intersection would operate at improved overall LOS D during both commuter peak hours, albeit with longer delays (LOS E/LOS F) for left turn movements at the intersection through the projected 2028 No Build and 2028 Build peak hour conditions. While protected-permissive phasing could help reduce vehicle delays for these left turn movements, MassDOT has recently replaced the previous protected-permissive phasing at this intersection with protected only phasing to address traffic safety concerns. As a result, protected-permissive phasing is not recommended, and no additional mitigation measures are proposed at this location.

The capacity analyses indicate that the intersection of Middle Street and Libbey Industrial Parkway/Tara Drive currently operates at overall LOS C with all individual lane groups operating at LOS D or better during the weekday morning and weekday evening commuter peak hours with the exception of the Libbey Industrial Parkway westbound left/through lane which currently operates at LOS E during the weekday evening peak hour. Independent of the proposed project, potential traffic increases associated with general background traffic growth and other approved development projects will further exacerbate delays at this intersection. Under 2028 No Build conditions, the intersection is expected to continue operate at overall LOS C during both peak hours, with all individual lane groups expected to continue to operate at LOS D or better with the exception of the Tara Drive eastbound approach (LOS E) and the Libbey Industrial Parkway westbound left/through lane (LOS F) during the evening peak hour. With the addition of the project trips, the intersection is expected to operate at overall LOS C during the morning peak hour and overall LOS D during the evening peak hour, with the Libbey Industrial Parkway westbound left/through lane expected to exceed capacity (volume-to capacity ratio of greater than 1.0) during the weekday evening peak hour.

One potential improvement that could increase capacity at the intersection includes widening of the Middle Street northbound approach to provide an exclusive right-turn lane. Upon implementation of this improvement, the intersection is expected to improve to overall LOS B and LOS C during the weekday morning and evening peak hours, respectively, with all movements projected to operate below capacity. The proponent is committed to funding the design of the right-turn lane improvement, as well as providing a fair share contribution toward the construction costs. Additionally, the proponent will donate the land on their property located on the southeast corner of the intersection, if needed to support the roadway widening at the intersection.

The potential traffic increases associated with the proposed project will have no noticeable impact on future traffic operations at the other study area intersections, relative to the 2028 No Build (without project) conditions.

Safety

The safety of the adjacent off-site study intersections and site driveways was evaluated as part of this study. The Libbey Industrial Parkway intersections with Middle Street and Pleasant Street have higher than average crash rates. However, recent signalization (Middle Street) and future signalization (Pleasant Street) should help to address some safety concerns at the intersections. Since the installation of the traffic signal at Middle Street, the most recent crash data indicates that the crash rate is decreasing from its prior unsignalized condition. Adequate stopping and intersection sight lines are provided at both site driveways. Any signage or plantings in front of the site will be located so that they do not obstruct the lines of sight to and from the site driveways.

Travel Demand Management Measures

To accompany the proposed redevelopment of the site, the proponent will implement a Transportation Demand Management (TDM) program to reduce automobile travel and traffic impacts associated with the proposed project.

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The project site consists of approximately 4.3± acres of land located on the north side of Libbey Industrial Parkway. The project site presently supports a 2-story, 41,500± square foot (sf) industrial building. As currently proposed, the existing industrial building will be demolished, and 69,000 sf medical office building will be constructed. A surface parking lot with 271 parking spaces will be constructed and access to the site will be provided by way of two unsignalized driveways on Libbey Industrial Parkway. The site plan is included in Appendix A.

1.2 STUDY METHODOLOGY

The traffic study methodology was developed in consultation with representatives from the Town of Weymouth Department of Planning and Community Development at a traffic scoping meeting for the project that was held virtually on December 17, 2020. The purpose of the meeting was to identify key aspects of the traffic study including the study area roadways and intersections to be reviewed, consideration of other possible area developments and background traffic growth, and analysis required to evaluate the potential project-related traffic impacts.

This Traffic Impact and Access Study (TIAS) provides a detailed analysis of existing and future traffic operations (both with and without the proposed development) during the weekday morning and weekday evening peak hours at the study area intersections (including the site driveways along Libbey Industrial Parkway) identified through consultation with Town officials.

This study was conducted in three phases. The first phase involved an inventory of existing traffic conditions in the vicinity of the site. As part of the existing conditions assessment, peak period traffic counts from 2015 were adjusted to reflect 2021 conditions for the key roadways and intersections in the vicinity of the site. A field visit was conducted to inventory roadway and intersection geometries and traffic control and to observe the general operational characteristics for each of the study area intersections. Massachusetts Department of Transportation (MassDOT) crash data for the most recent three-year period available (2015 to 2017) was also reviewed.

The second phase of the study builds upon the data collected in the first phase and establishes the framework for evaluating potential traffic impacts associated with the project. The 2021 Existing peak hour traffic volumes were then projected to the design year 2028. The future 2028 No Build (Without Project) traffic volumes were assumed to include traffic increases resulting from general background traffic growth as well as specific development projects that are planned in the area. Traffic increases associated with the redevelopment of the site were then added to the No Build traffic volumes to reflect the future 2028 Build (With Project) weekday morning and weekday evening peak hour volumes.

In the third phase of this study, the existing and projected future traffic operations at each of the study intersections were analyzed to identify potential traffic operational deficiencies and, if warranted, potential improvements to improve traffic flow.

2.0 EXISTING CONDITIONS

The effective evaluation of potential transportation impacts associated with the project requires a thorough understanding of the existing traffic conditions on the roadways and intersections in the vicinity of the project site. The existing conditions assessment consists of an inventory of the roadway and intersection geometries and traffic control devices; projection of peak period traffic volumes; field observations; safety analysis; review of pedestrian, bicycle, and transit services; and analysis of existing traffic operations.

2.1 STUDY AREA ROADWAYS

The site is located at 200 Libbey Industrial Parkway and is bounded by Libbey Industrial Parkway to the south. The project-generated traffic will travel to and from the site via the following key study area roadways.

Libbey Industrial Parkway. Libbey Industrial Parkway is classified as a local roadway and is under local (Town of Weymouth) jurisdiction. It has a generally straight alignment with a large radius horizontal curve near its intersection with Performance Drive. Libbey Industrial Parkway is accessed by Pleasant Street to the east and Middle Street to the west. Libbey Industrial Parkway generally has a two-lane cross-section, with one travel lane in each direction, but widens at its intersections with Middle Street and Pleasant Street to provide turn lanes. The posted speed limit is 30 miles per hour. Land uses along this roadway consist of industrial, medical office, religious and fitness.

Middle Street. Middle Street is classified as an urban minor arterial roadway and is generally under local jurisdiction with the exception of the bridge over Route 3 which is under MassDOT jurisdiction. Within the study area, it has one travel lane in each direction with additional lanes at its intersections with Route 18. The posted speed limit along Middle Street in the study area is 30 mph. Land use along this roadway is primarily residential with some commercial uses near the intersections with Route 18 and Route 53.

Pleasant Street. Pleasant Street is classified as an urban minor arterial roadway and is under local jurisdiction. Within the study area, Pleasant Street provides one travel lane in each direction with an additional turn lane at its intersection with Libbey Industrial Parkway. The posted speed limit along Pleasant Street in the study area is 30 mph. Land use along this roadway is primarily residential with some commercial uses near its intersections with Route 18 and Route 53. Weymouth High School is located on Pleasant Street near the intersection with Park Avenue.

Route 18 (Main Street). Route 18 in Weymouth is classified as an urban principal arterial under the jurisdiction of MassDOT. Within the study area, Route 18 typically consists of two travel lanes in each direction with additional turn lanes at its intersection with Middle Street and West Street. Route 18 runs in a north-south direction and has a generally straight alignment. Sidewalks are provided along both sides of Route 18. The posted speed limit along Route 18 is 35 mph. Land use along Route 18 within the study area is a mix of commercial uses and single-family homes.

2.2 STUDY AREA INTERSECTIONS

The study area intersections chosen for detailed analysis were determined in consultation with the Town of Weymouth Department of Planning and Community Development. The study area intersections are shown in Figure 1 and are listed below:

1. Middle Street at Libbey Industrial Parkway/Tara Drive (Signalized)
2. Libbey Industrial Parkway at Westerly Site Driveway (Unsignalized)
3. Libbey Industrial Parkway at Easterly Site Driveway (Unsignalized)
4. Pleasant Street at Libbey Industrial Parkway (Unsignalized)
5. Route 18 (Main Street) at Middle Street/West Street (Signalized)

The existing lane geometry and traffic control at each of the study intersections is documented in the capacity analysis provided in the appendix of this report and detailed for the key intersections below.

Middle Street/Libbey Industrial Parkway/Tara Drive. Libbey Industrial Parkway and Tara Drive intersect Middle Street to form a four-way, signalized intersection. Tara Drive is slightly offset from Libbey Industrial Parkway by approximately 30 feet to the south. The Middle Street northbound approach consists of a single general-purpose lane. The Middle Street southbound approach consists of two lanes: a dedicated left-turn lane and a shared through/right lane. The Libbey Industrial Parkway westbound approach consists of two lanes: a shared left/through lane and a dedicated right-turn pocket. The Tara Drive eastbound approach consists of a single, general-purpose lane. Sidewalks are provided along both sides of Middle Street and for a short distance along Libbey Industrial Parkway. Crosswalks are provided across all approaches and bicycle lanes are provided along Middle Street. Adjacent land use at the intersection consists of a single-family home, Tara Gardens Condominiums and Planet Fitness.

Pleasant Street/Libbey Industrial Parkway. Libbey Industrial Parkway intersects Pleasant Street from the west to form a three-way, unsignalized intersection. The Pleasant Street southbound approach to the intersection consists of a single travel lane. The Pleasant Street northbound approach consists of a left-turn lane and a through lane. The Libbey Industrial Parkway eastbound approach provides separate left- and right-turn lanes. Sidewalks are located on both sides of Pleasant Street and a crosswalk is provided across the Libbey Industrial Parkway approach to the intersection. Adjacent land use at the intersection consists of residential and medical (Weymouth MRI) uses.

Route 18/Middle Street/West Street. Middle Street approaches from the east and West Street approaches from the west to form a four-way, signalized intersection with Route 18 (Main Street). Each approach to the intersection consists of a left-turn lane, two through lanes and a right-turn lane. Pedestrian crosswalks and sidewalks are provided at each approach to the intersection. The existing signal phasing includes protected-only left turns for all approaches and an exclusive pedestrian phase. Land use at the intersection consists of commercial uses including a Mobil gas station, Cumberland Farms, Verizon Wireless and a medical office building.

2.3 EXISTING TRAFFIC VOLUMES

Due to the ongoing COVID-19 pandemic, no new traffic count data was collected. Instead, previous traffic count data from 2015 was used to project volumes for 2021 based on Massachusetts Department of Transportation's *Guidance on Traffic Count Data*, revised in April 2020. MassDOT's Guidance states that "traffic counts are currently at historic lows and may underrepresent a realistic existing condition." MassDOT is currently allowing the use of historical count data in place of new traffic count data with the appropriate adjustments.

Peak period intersection turning movement counts (TMCs) were previously collected in collected in June 2015 and October 2015 in the vicinity of the project site. An automatic traffic recorder (ATR) count was also collected in October 2015 in the vicinity of the project site.

2.3.1 Daily Traffic Volumes

An ATR count was conducted along Libbey Industrial Parkway in the site vicinity on Wednesday, October 7 and Thursday, October 8, 2015. The ATR data has been adjusted per the MassDOT guidance. According to the 2015 MassDOT weekday seasonal and axle correction factors, the seasonal adjustment factors for 2015 for urban local roads in October is 0.92. To provide a conservative analysis, the traffic count data was not adjusted downward. The 2015 volumes were then adjusted based on MassDOT permanent count station data for the nearest available location (Location 6255 – Route 3 north of Route 18). From 2015 to 2019, the volume at Location 6255 increased from 127,190 vehicles per day (vpd) to 130,967 vpd, an increase of nearly 2.97 percent. To be consistent with the growth along Route 3, the 2015 traffic volumes were then grown by three percent to establish the 2021 daily traffic volumes. This assumes no growth from 2019 to 2021 as the MassDOT guidance assumes 2019 volumes to be existing due to COVID-19 travel reductions.

The ATR data with growth indicates that Libbey Industrial Parkway carries a total two-way traffic volume of approximately 8,786 vehicles per day (vpd) on a typical weekday. A more detailed summary of the ATR data is presented in Table 1.

Table 1 Weekday Daily Traffic Volume Summary – Libbey Industrial Parkway

Daily (vpd)[1]	AM Peak Hour (vph)[2]	AM Peak Hour Travel Split	PM Peak Hour (vph)	PM Peak Hour Travel Split
8,786	668	65% WB	680	60% EB

Based on average of automatic traffic recorder counts collected on October 7-8, 2015, adjusted up by 3% to estimate 2021 traffic volumes.
[1]vpd = vehicles per day
[2]vph = vehicles per hour

Speed data was also collected with the ATR that was placed on Libbey Industrial Parkway. The data indicated that the average travel speeds are 37 miles per hour (mph) eastbound and 38 mph westbound. The 85th percentile speeds were measured at 41 mph and 42 mph in the eastbound and westbound directions, respectively. The ATR traffic volume and speed data are provided in Appendix B.

2.3.2 Peak Hour Traffic Volumes

The combined critical peak demand periods of site traffic and adjacent street traffic will occur during the weekday morning and weekday evening commuter peak hours. The TMCs were conducted at the Libbey Industrial Parkway intersections with Middle Street and Pleasant Street in June 2015. The Route 18/Middle Street/West Street intersection was counted in October 2015. The TMC data was collected during the typical weekday morning and weekday evening commuter “peak periods” (from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM). The turning movement counts are provided in Appendix B.

2.3.2.1 Peak Hour Volume Adjustments

Similar to the adjustments made to the ATR data, seasonal adjustments were reviewed. According to the 2015 MassDOT weekday seasonal and axle correction factors, the seasonal adjustment factors for 2015 for urban local roads and minor arterials (Libbey Industrial Parkway, Pleasant Street, and Middle Street) in June and principal arterials (Route 18) in October are 0.88 and 0.93, respectively. To provide a conservative analysis, the traffic count data were not adjusted downward.

MassDOT permanent count station data for the nearest available location (Location 6255 – Route 3 north of Route 18) was then used to adjust the 2015 traffic volumes to reflect estimated 2021 traffic volumes. From 2015 to 2019, the volume at Location 6255 increased from 127,190 vehicles per day (vpd) to

130,967 vpd, an increase of nearly 2.97 percent. To be consistent with the growth along Route 3, the 2015 traffic volumes were then grown by three percent to establish the 2021 adjusted weekday morning and weekday evening peak hour traffic volumes. This assumes no growth from 2019 to 2021 as the MassDOT guidance assumes 2019 volumes to be existing due to COVID-19 travel reductions. The seasonal adjustment and growth calculations are included in Appendix C.

2.3.2.2 Projects Constructed – 2015 to 2021

Based on consultation with the Weymouth Department of Planning and Community Development, project trips from developments constructed and occupied between 2015 and 2021 were added to the peak hour traffic volumes. The following projects were included:

- Alexan at Arbor Hills – 242 residential apartment units located off of Tall Oaks Drive
- Union Point (Southfield) – 1300 residential units were completed by the end of Fiscal Year 2020, per Southfield Redevelopment Authority Final Redevelopment Plan (January 31, 2019). Approximately 411 units were completed as of June 2015, so 889 new residential units were assumed constructed between 2015 and 2021.

The project trips from these background development projects have been estimated and were added to the 2021 adjusted volumes to comprise the 2021 Existing volumes. The background project trips calculations are provided in Appendix D. The 2021 Existing volumes will be used as a basis for analysis of existing and projected future weekday peak hour traffic operations and are presented in Figure 2 for the weekday morning and weekday evening peak hours.

2.4 PUBLIC TRANSPORTATION

The Massachusetts Bay Transportation Authority (MBTA) operates Bus Route 225 and 226 in the study area. Bus Route 226 operates closest to the site with the nearest stop from the site located at the intersection of Middle Street with Libbey Industrial Parkway (less than a half mile walk from the site). Bus Route 226 connects Columbian Square to Braintree Station on the Red Line, with a stop at the Weymouth Landing Commuter Rail Station on the Greenbush Line. Bus Route 225 connects the Quincy Center Station on the Red Line to the Weymouth Landing Commuter Rail Station. The schedule information is provided in Appendix E.

2.5 PEDESTRIAN AND BICYCLE ACCOMMODATIONS

Within the study area, sidewalks exist on both sides of Route 18. Sidewalks are generally provided on both sides of Middle Street and Pleasant Street. Dedicated bicycle accommodations are generally not provided in the study area except Route 18 in the vicinity of Middle Street and West Street and on Middle Street in the vicinity of Libbey Industrial Parkway. There are no marked shoulders along Libbey Industrial Parkway, although the travel lanes are generally very wide and could accommodate bicycles in addition to vehicular traffic. Elsewhere, variable width shoulders along study area roadways can be used for bicycle travel.

2.6 CRASH ANALYSIS

Crash data was obtained from the crash database on the MassDOT website for the latest three-year period available (January 2015 through December 2017). Based on the scoping meeting, the intersection of Route 18 at Middle Street/West Street was excluded from the crash analysis as it has been recently reconstructed as part of the MassDOT Route 18 widening project. The crash data, if any, and crash rate calculations for each study intersection are provided in Appendix F. The Libbey Industrial Parkway

intersections with Middle Street and Pleasant Street each experienced 24 to 27 crashes during the three-year study period and had crash rates that exceeded the State and District 6 average crash rates. Table 2 summarizes the crashes that were reported to have occurred at the study area intersections.

A brief description of the crash history for these locations during the three-year study period is provided below.

Middle Street/Libbey Industrial Parkway. During the three-year study period, 24 crashes were reported at the unsignalized Middle Street/Libbey Industrial Parkway/Tara Drive intersection resulting in a crash rate of 1.17 crashes per million entering vehicles. The majority of the crashes were angle collisions (19 crashes). Nearly 21 percent of the crashes occurred during the weekday morning and weekday evening peak periods. Injuries were reported for four of the crashes and two crashes involved either pedestrians or bicyclists. No fatalities were reported at this location during the three-year study period.

The intersection was reconstructed with a traffic signal between April 2017 and April 2018 based on historic aerial imagery. Based on a review of 2018 to 2020 crash data which has not yet been finalized for analysis by MassDOT (meaning this data has not yet been “closed” and is subject to change), the intersection has experienced a reduction in crash rate to approximately 0.62 crashes per million entering vehicles, which is less than the State and District 6 average crash rates for signalized intersections. This rate was calculated to provide a comparison to the previous crash rate when the intersection was unsignalized.

Pleasant Street/Libbey Industrial Parkway. During the three-year study period, 27 crashes were reported at the unsignalized Pleasant Street/Libbey Industrial Parkway intersection resulting in a crash rate of 0.94 crashes per million entering vehicles. This is higher than the State and District 6 average crash rates for unsignalized intersections. The majority of the crashes were angle collisions (19 crashes). Twenty-six percent of the crashes occurred during the weekday morning and weekday evening peak periods. Injuries were reported at seven of the crashes, including one crash involving a pedestrian. No fatalities or bicycle-related crashes were reported at this location during the three-year study period. This location is planned to be reconstructed by others in the near future and will include the implementation of traffic signal control.

Libbey Industrial Parkway/Site Driveways. During the three-year study period, one crash was reported in the vicinity of the site driveways at Libbey Industrial Parkway, resulting in a crash rate of 0.12 crashes per million entering vehicles. The lone crash was a single vehicle crash that happened during the morning peak period. No fatalities, pedestrian-related or bicycle-related crashes were reported at this location during the three-year study period.

Table 2 Crash Data Summary (2015-2017)

	Libbey Industrial Parkway at Middle Street/Tara Drive	Libbey Industrial Parkway at Pleasant Street	Libbey Industrial Parkway at Site Driveways
Year			
2015	8	11	1
2016	9	10	0
2017	7	6	0
Total	**24**	**27**	**1**
Type			
Angle	19	19	0
Rear-end	2	4	0
Head-on	1	0	0
Sideswipe	1	2	0
Single Vehicle	1	2	1
Other/Unknown	0	0	0
Total	**24**	**27**	**1**
Severity			
Property	19	20	0
Injury	4	7	0
Fatality	0	0	0
Unknown	1	0	1
Total	**24**	**27**	**1**
Non-Motorists			
Pedestrians	1	1	0
Bicyclists	1	0	0
Vehicles Only	22	26	1
Other/Unknown	0	0	0
Total	**24**	**27**	**1**
Weather			
Clear	17	19	1
Cloudy	3	3	0
Rain	4	4	0
Snow	0	1	0
Other/Unknown	0	0	0
Total	**24**	**27**	**1**
Time			
7am to 9am	2	4	1
9am to 4pm	14	12	0
4pm to 6pm	3	5	0
6pm to 7am	5	6	0
Total	**24**	**27**	**1**
Crash Rates[1]			
Statewide	0.78	0.57	0.57
District 6	0.71	0.52	0.52
Intersection	**1.17**	**0.94**	**0.12**

[1]Crash rates per million entering vehicles (MEV) calculated using MassDOT Worksheets

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3.0 FUTURE CONDITIONS

3.1 FUTURE NO BUILD CONDITIONS

The future No Build (Without Project) condition establishes the basis for evaluating the transportation impacts associated with the proposed project. The No Build condition includes the effects of general area growth, other planned development projects and planned transportation improvements expected to be completed by the Design Year of 2028.

To establish the future 2028 No Build traffic volumes, the 2021 Existing condition traffic volumes were projected to the 2028 design year, by which time the project is expected to be built and occupied. Traffic growth is primarily a function of changes in motor vehicle use and expected land development in the region. To predict a rate at which traffic on the roadways in the vicinity of the site can be expected to grow during the seven-year forecast period (2021 to 2028), both historic traffic growth and planned area developments were examined. A discussion of the development of the future No Build (Without Project) condition is provided below.

3.1.1 General Background Traffic Growth

A general background growth rate was applied to the 2021 Existing condition traffic volumes based on a review of MassDOT permanent count station data. As noted previously, Location 6255 (Route 3 north of Route 18) is the nearest permanent count station. Traffic volumes have fluctuated over the past ten years but generally have been decreasing at this count station. Based on data from 2015 to 2019, the average annual growth rate along Route 3 was -0.21 percent per year. From 2009 to 2019, the average annual growth rate was -0.70 percent per year. However, to provide a conservative assessment, an annual growth rate of 0.5 percent per year (3.6 percent total) was assumed for this study.

3.1.2 Background Development

Other planned area developments could also result in increased traffic on the surrounding area roadways. During the traffic study scoping process, the Town officials identified the following specific background developments for inclusion in the development of the future 2028 No Build conditions:

- 1345 Washington Street – Bristol/Hanover development – 270 residential units
- 655 Washington Street – 160 residential units
- Libbey Industrial Parkway (north side near Pleasant Street) – 10,000 sf industrial building expansion
- 1400 Main Street – 153 residential units plus 7,000 sf of ground floor retail space
- 1500 Main Street – 237 residential apartments plus 6,121 sf of ground floor retail space
- Union Point (Southfield) – Assume up to 2,000 residential units in place by 2028 (an additional 700 units from 2021 existing conditions)
- Quarry Site – Pleasant Street

Where available, traffic projections for each of the background development projects was taken from the traffic impact study for each project. Where no study was available, projections of vehicle trips for each project were calculated using the Institute of Transportation Engineers' *Trip Generation Manual*, *10th Edition*. The background projects' trip distribution patterns through the study area were assumed based on the projects' locations, existing traffic patterns from 2015 traffic counts, and any available distribution information from prior studies. Trip generation calculations and trip assignments for site specific development are provided in Appendix G.

3.1.3 Planned Roadway Improvements

Based on consultation with Town of Weymouth, the intersection of Libbey Industrial Parkway and Pleasant Street is slated for reconstruction soon. As part of the reconstruction, the intersection will be signalized and converted into a four-legged intersection, adding the westbound leg for use by the existing quarry currently accessed via Pleasant Street. Foundations for some of the traffic signal equipment have already been installed. As part of the traffic signalization of the intersection, the Pleasant Street northbound approach will be widened to provide a left-turn lane, two through lanes, and a short, right-turn pocket. The Pleasant Street southbound approach will provide a dedicated left-turn lane, a through lane, and a shared through/right lane. The Libbey Industrial Parkway eastbound approach will continue to provide two lanes: a shared left/through lane and a separate right-turn lane. The new Libbey Industrial Parkway westbound approach will consist of a left-turn lane, a through lane, and a right-turn lane. Sharrows will be provided along the Pleasant Street approaches and crosswalks with pedestrian activated push buttons will be provided on all approaches.

No other major planned roadway improvements within the study area need to be considered for the 2028 No Build conditions.

3.1.4 Future 2028 No Build Traffic Volumes

The 2021 Existing condition peak hour traffic volumes were grown by 0.5 percent per year over the seven-year study horizon and the project trips from the background development projects listed above were added to establish the 2028 No Build (Without Project) traffic volumes. The 2028 No Build weekday morning and weekday evening peak hour traffic volume networks are illustrated in Figure 3.

3.2 FUTURE BUILD CONDITIONS

To assess the project's transportation impacts, the overall travel demands were determined based on proposed site access as well as the anticipated trip generation, travel mode split, trip distribution and trip assignment. The project's travel demand was then added to the future 2028 No Build traffic volumes (without the proposed project) to develop the future 2028 Build condition traffic volumes (with the proposed project). A discussion of the development of the future Build condition is provided below.

3.2.1 Project-Generated Trips

To assess the project's transportation impacts, the project's overall travel demand was determined in a four-step process including trip generation, travel mode share, trip distribution and trip assignment. The following sections describe the process of translating the proposed development program into the resulting trips in each mode of travel.

Trip Generation. Trip generation estimates for the project were developed based on data presented in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition* (2017). The project will consist of 69,000 sf of medical office space. Trip estimates for the proposed medical office building were based on the ITE trip rates for Land Use 720 (Medical-Dental Office Building). The trip generation summary is provided in Table 3, along with a comparison to the existing industrial building on site.

Table 3 Trip Generation Summary

Time Period	Site Trips		
	Existing[1] (41.5 ksf Industrial)	Currently Proposed[2] (68.1 ksf Medical Office)	Net New
Weekday Daily			
Enter	103	1,282	**1,179**
Exit	103	1,282	**1,179**
Total	*206*	*2,564*	***2,358***
Weekday Morning Peak Hour			
Enter	26	126	**100**
Exit	3	35	**32**
Total	*29*	*161*	***132***
Weekday Evening Peak Hour			
Enter	3	67	**64**
Exit	23	172	**149**
Total	*26*	*239*	***213***

[1]Based on ITE *Trip Generation Manual,10th Edition* trip rates for Land Use 110 (General Light Industrial Building) applied to 41,500 sf.
[2]Based on ITE *Trip Generation Manual,10th Edition* trip rates for Land Use 720 (Medical-Dental Office Building) applied to 68,100 sf.

As shown in Table 3, the proposed medical office building is expected to generate approximately 2,564 trips on a typical weekday, including 161 trips during the morning peak hour and 239 trips during the evening peak hour. Since counts from 2015 at the site driveways were not available, the trip generation for the existing 41,500 sf industrial building was also calculated based on ITE Land Use 110 (General Light Industrial Building). By right, the project could be expected to generate approximately 206 trips on a typical weekday, including 29 trips during the morning peak hour and 26 trips during the evening peak hour. The currently proposed medical office building project would be expected to generate 132 net new trips during the weekday morning peak hour and 213 net new trips during the weekday afternoon peak hour compared to existing industrial use of the site. However, to provide a conservative analysis, no credit was taken for existing traffic generated by the site. The trip generation calculations are provided in Appendix H.

Travel Mode Share. As previously discussed under *Public Transportation,* the site is located about a half mile from the nearest MBTA bus service and there are no sidewalks along Libbey Industrial Parkway. Consequently, it is conservatively assumed that all project trips will be made by automobile.

3.2.2 Trip Distribution

For purposes of this study, it is assumed that patients in the region will typically not need to travel more than 10 miles to a medical facility to receive services due to the large number of medical facilities in Weymouth and the surrounding communities that afford patients many local choices. To estimate the distribution patterns for patients, a 10-mile radius was drawn around the sites and the cities and towns within the service area were each assigned a route (or routes, if more than one seemed appropriate) to travel to/from the site. The routes were determined based on travel patterns during peak commuting periods. The population of each of the cities and towns within the service area was determined using available US Census population data and used as a method of “weighting” the trip distribution of each of the likely routes to the site.

Trips traveling to/from the site via Route 3 to Route 18 have two options for travel routes: Route 18 north to Winter Street to Middle Street to Libbey Industrial Parkway or Route 18 south to Middle Street to Libbey

Industrial Parkway with differing entering and exiting patterns. All other routes are assumed to have the same entering and exiting patterns. The calculated trip distribution patterns are shown in Table 4.

Table 4 Trip Distribution Summary

Roadway/Direction	Entering Distribution (%)	Exiting Distribution (%)
Route 18 to/from the North	23%	38%
Route 18 to/from the South	12%	12%
West Street to/from the West	7%	7%
Middle Street to/from the North	25%	10%
Pleasant Street to/from the North	12%	12%
Pleasant Street to/from the South	21%	21%
Total	***100%***	***100%***

In general, the analysis indicates that 67 percent of project trips will arrive/depart via Middle Street and 33 percent will arrive/depart via Pleasant Street. The trip distribution is shown on Figure 4. The gravity model data and distribution analysis are included in Appendix I.

The project trips associated with the proposed medical office building were then assigned to the surrounding roadway network based on the project distribution patterns presented in Figure 4. The resulting project-related traffic volumes are presented in Figure 5 for the weekday morning and weekday evening peak hours.

3.2.3 Build (With Project) Peak Hour Traffic Volumes

The new trips associated with the proposed project were then added to the 2028 No Build (Without Project) traffic volumes. The resulting 2028 Build (With Project) weekday morning and weekday evening peak hour traffic volumes are presented in Figure 6.Table 5 provides a summary of the total entering Project trips and how they relate to the 2028 No-Build condition volumes for the for the study intersections.

Table 5 Peak Hour Traffic Volume Comparison

Intersection	AM Peak Hour			PM Peak Hour		
	2028 No-Build	Project Trips	% Change[1]	2028 No-Build	Project Trips	% Change[1]
Libbey Industrial Pkwy/Middle St.	1,553	109	**7%**	1,926	160	**8%**
Libbey Industrial Pkwy/Pleasant St.	2,751	52	**2%**	2,860	79	**3%**
Route 18/Middle St.	4,046	73	**2%**	4,478	126	**3%**

[1]Percent change is relative to the No-Build condition

When the medical office building is fully occupied, peak hour traffic levels at the Route 18/Middle Street intersection will increase by approximately 73 to 126 trips or by approximately two to three percent over No-Build levels. Similar percent increases are expected at the Pleasant Street/Libbey Industrial Parkway intersection. At the intersection of Middle Street/Libbey Industrial Parkway, traffic volume increases of 109 to 160 vehicles are expected in the morning and evening peak hours, resulting in increases of seven to eight percent over projected 2028 No Build traffic volumes. The Middle Street northbound and Libbey Industrial Parkway westbound approaches are most affected by the project.

The project Traffic Projection Model detailing the traffic volumes adjustments from the unadjusted count data through the 2028 Build condition is provided in Appendix J.

4.0 OPERATIONS ANALYSIS

In previous sections of this report, the quantity (volume) of traffic on the study area roadways was described. The following section describes the quality of traffic flow at the study area intersections for the given traffic demands. As a basis for this assessment, intersection capacity analyses were conducted at each study area intersection for the 2021 Existing, 2028 No Build (Without Project) and 2028 Build (With Project) weekday morning and weekday evening peak hour traffic conditions using Synchro 10 Intersection Capacity and Traffic Simulation Software. A discussion of the evaluation criteria and a summary of the results of the intersection capacity analyses are presented below. The detailed capacity analysis worksheets are provided in Appendix K.

4.1 METHODOLOGY

Level-of-service (LOS) is a term used to describe the quality of traffic flow on roadways or at intersections. It is an aggregate measure of travel delay, driver convenience and safety based on a comparison of a roadway facility's capacity relative to the traffic demands. Operating levels of service are reported on a scale of A to F, with A representing the best operating conditions (with little or no vehicle delay) and F representing the worst operating conditions (with long delays). The capacity analyses for the unsignalized study intersections were based on the *Highway Capacity Manual (HCM) 6th Edition*. The capacity analyses for the signalized study intersections are based on the *2000 Highway Capacity Manual (HCM),* which establishes separate level-of-service criteria for unsignalized and signalized intersections. The 2000 HCM was used since the HCM 6th Edition does not provide a methodology for signalized intersections with exclusive pedestrian phases, which are provided at some of the study intersections. The level-of-service criteria for signalized and unsignalized intersections are presented in Table 6.

Table 6 Intersection Level of Service Criteria

Level of Service[1]	Average Delay per Vehicle (Seconds)	
	Signalized Intersections	Unsignalized Intersections
A	≤10.0	≤10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	>80.0	>50.0

Source: Transportation Research Board Highway Capacity Manual (HCM) 2000 (signalized)/6th Edition (unsignalized)
[1]If the v/c is greater than 1.0, than the level-of-service designation is LOS F, regardless of delays (HCM 6th Edition only)

The results of the intersection capacity analyses for the weekday morning and weekday evening peak hours are summarized in Tables 7 and 8 for the signalized intersections for the weekday morning and evening peak hours, respectively. The results of the capacity analysis for the unsignalized study intersections are included in Tables 9 and 10 for the weekday morning and evening peak hours, respectively. Detailed summary tables and intersection capacity analysis worksheets are provided in Appendix K of this report. A brief discussion of the results of the intersection capacity analyses is presented in the following sections of this report.

4.1.1 Signalized Intersection Capacity Analysis Results

Pleasant Street/Libbey Industrial Parkway. Under 2021 Existing conditions, the unsignalized Libbey Industrial Parkway eastbound left-turn movements operate above capacity at LOS F operations during the weekday morning and evening peak hours. During the weekday evening peak hour, the Libbey Industrial Parkway eastbound right-turn movement also operates above capacity at LOS F operations under 2021 Existing conditions. The capacity analyses for the weekday morning and weekday evening peak hours indicate that the soon-to-be signalized study intersection of Pleasant Street and Libbey Industrial Parkway is expected to operate at overall LOS C during the weekday morning and evening peak hours under 2028 No Build and Build conditions. All individual lane groups are expected to operate at LOS D or better with the proposed roadway improvements in place. Since this intersection is planned to be fully reconstructed by others as part of mitigation requirements from a previous development project and the currently proposed medical office project at 200 Libbey Industrial Parkway is not expected to have a noticeable impact on operations, no additional mitigation is necessary at this location.

Route 18/Middle Street/West Street. The capacity analyses indicate that the intersection of Route 18 and Middle Street/West Street currently operates at or near capacity with an overall LOS E during both the morning and afternoon peak hours. It is anticipated that traffic signal timing optimization will be conducted at this location by others as part of routine signal maintenance, resulting in overall LOS D operations during both peak hours for the 2028 No Build and Build conditions. Most of the left turns at the intersection operate at LOS E or F under existing conditions and will continue operating at LOS E or F under 2028 No Build or Build conditions. While protected-permissive left turn phasing could help reduce vehicle delays at this intersection, this phasing was replaced with protected only phasing by MassDOT recently to address safety concerns at the intersection. As a result, permissive phasing is not recommended, and no mitigation measures are proposed at this location.

Middle Street/Libbey Industrial Parkway/Tara Drive. The capacity analyses indicate that the intersection of Middle Street and Libbey Industrial Parkway/Tara Drive currently operates at overall LOS C with all individual lane groups operating at LOS D or better during the weekday morning and weekday evening commuter peak hours with the exception of the Libbey Industrial Parkway westbound left/through lane which currently operates at LOS E during the weekday evening peak hour. Independent of the proposed project, potential traffic increases associated with general background traffic growth and other development projects will further exacerbate delays at the intersection. Under 2028 No Build conditions, the intersection is expected to continue operate at overall LOS C during both peak hours, with all individual lane groups expected to continue to operate at LOS D or better with the exception of the Tara Drive eastbound approach (LOS E) and the Libbey Industrial Parkway westbound left/through lane (LOS F) during the evening peak hour.

With the addition of the project trips, the intersection is expected to operate at overall LOS C during the morning peak hour and overall LOS D during the evening peak hour, with the Libbey Industrial Parkway westbound left/through lane expected to exceed capacity (volume-to capacity ratio of greater than 1.0) during the weekday evening peak hour. Potential measures to improve traffic operations at this intersection are discussed in the Traffic Mitigation section of this report.

4.1.2 Unsignalized Intersection Capacity Analysis Results

As shown in Tables 9 and 10, the capacity analyses for the weekday morning and weekday evening peak hours indicate that the unsignalized study intersection of Pleasant Street and Libbey Industrial Parkway currently operates with long delays on the Libbey Industrial Parkway eastbound approach and is over capacity with queues in excess of 16 vehicle lengths in the evening peak hour. As noted, this intersection is slated for reconstruction and will be signalized in the near future by others. Under the Build condition, the site driveways are expected to operate at LOS C or better with 15 seconds of delay or less during

both peak hours. Left turns into the site are expected to operate at LOS A. Queue lengths of one vehicle or less are expected on all approaches.

Table 7 Signalized Intersection Capacity Analysis Summary – Weekday AM Peak Hour

		2021 Existing					2028 No-Build					2028 Build				
Intersection	**Movement**	**v/c[1]**	**Delay[2]**	**LOS[3]**	**50th Q[4]**	**95thQ[5]**	**v/c**	**Delay**	**LOS**	**50thQ**	**95thQ**	**v/c**	**Delay**	**LOS**	**50thQ**	**95thQ**
Middle Street & Libbey Industrial Parkway	EB LTR	0.14	42.8	D	2	30	0.16	49.3	D	3	32	0.16	56.6	E	3	32
	WB LT	0.68	39.0	D	73	#323	0.79	52.8	D	98	#359	0.86	69.2	E	133	#411
	WB R	0.18	24.5	C	11	49	0.23	30.1	C	20	61	0.27	35.6	D	31	75
	NB LTR	0.88	36.3	D	187	#680	0.85	32.4	C	235	#805	0.85	33.1	C	296	#934
	SB L	0.45	14.0	B	21	114	0.48	14.0	B	25	127	0.58	15.8	B	36	156
	SB TR	0.44	12.6	B	71	317	0.44	12.4	B	88	364	0.42	12.5	B	101	374
	Intersection	**0.72**	**27.0**	**C**			**0.74**	**27.7**	**C**			**0.78**	**31.1**	**C**		
Pleasant Street & Libbey Industrial Parkway[6]	EB LT	-	-	-	-	-	0.53	51.0	D	36	99	0.49	52.4	D	44	112
	EB R	-	-	-	-	-	0.10	24.9	C	0	46	0.11	25.4	C	0	48
	WB L	-	-	-	-	-	0.27	47.1	D	12	46	0.23	49.3	D	14	49
	WB T	-	-	-	-	-	0.19	45.8	D	12	45	0.16	48.3	D	14	47
	WB R	-	-	-	-	-	0.02	41.7	D	0	0	0.02	44.4	D	0	0
	NB L	-	-	-	-	-	0.79	35.3	D	151	#457	0.84	44.1	D	193	#521
	NB T	-	-	-	-	-	0.60	13.1	B	227	533	0.59	14.1	B	232	534
	NB R	-	-	-	-	-	0.02	8.1	A	0	0	0.02	8.7	A	0	0
	SB L	-	-	-	-	-	0.18	18.4	B	3	22	0.18	21.0	C	4	21
	SB TR	-	-	-	-	-	0.80	31.8	C	300	#637	0.83	36.8	D	338	#676
	Intersection	**-**	**-**	**-**			**0.81**	**24.7**	**C**			**0.83**	**28.3**	**C**		
Route 18 (Main Street) & Middle Street/West Street	EB L	1.51	>120	F	~174	#408	0.94	104.3	F	134	#360	0.94	104.3	F	134	#360
	EB T	0.80	69.3	E	92	#213	0.87	80.7	F	100	#235	1.00	112.6	F	105	#260
	EB R	0.22	41.7	D	41	105	0.24	42.3	D	46	113	0.25	43.1	D	46	114
	WB L	1.20	>120	F	~185	#445	0.93	90.3	F	173	#434	0.94	94.5	F	176	#444
	WB T	0.76	60.1	E	126	#260	0.79	62.5	E	130	#273	0.85	69.5	E	133	#290
	WB R	0.66	41.2	D	181	#390	0.72	45.8	D	195	#442	0.73	46.0	D	204	#465
	NB L	0.54	53.3	D	85	176	0.56	54.3	D	90	192	0.56	54.3	D	90	192
	NB T	0.84	33.5	C	411	#769	0.90	41.6	D	450	#899	0.92	44.3	D	458	#911
	NB R	0.32	17.9	B	78	108	0.32	17.1	B	79	115	0.35	17.9	B	88	128
	SB L	0.78	59.8	E	158	#380	0.94	91.5	F	187	#466	0.98	96.9	F	211	#518
	SB T	0.43	18.9	B	149	324	0.53	23.9	C	197	404	0.52	23.2	C	193	400
	SB R	0.35	17.4	B	81	180	0.38	17.9	B	91	158	0.37	17.3	B	88	154
	Intersection	**0.98**	**56.1**	**E**			**1.01**	**48.1**	**D**			**1.04**	**52.1**	**D**		

[1]v/c = Volume to capacity ratio [2]Delay = Average delay per vehicle (seconds) [3]LOS = Level of Service [4]50th percentile queue (feet) [5]95th percentile queue (feet) [6]Assumes signalization by others in 2028 No Build and Build scenarios

Table 8 Signalized Intersection Capacity Analysis Summary – Weekday PM Peak Hour

		2021 Existing					2028 No-Build					2028 Build				
Intersection	**Movement**	**v/c[1]**	**Delay[2]**	**LOS[3]**	**50th Q[4]**	**95thQ[5]**	**v/c**	**Delay**	**LOS**	**50thQ**	**95thQ**	**v/c**	**Delay**	**LOS**	**50thQ**	**95thQ**
Middle Street & Libbey Industrial Parkway	EB LTR	0.01	49.4	D	0	0	0.01	61.3	E	0	0	0.01	61.3	E	0	0
	WB LT	0.87	64.9	E	120	#385	0.91	81.1	F	175	#473	1.07	119.4	F	253	#665
	WB R	0.36	32.6	C	37	85	0.47	42.4	D	77	156	0.51	40.1	D	99	202
	NB LTR	0.91	37.6	D	305	#1014	0.89	35.7	D	419	#1207	0.99	56.7	E	500	#1318
	SB L	0.44	13.0	B	20	110	0.48	13.7	B	29	124	0.60	18.7	B	38	#158
	SB TR	0.45	11.2	B	94	397	0.47	12.0	B	134	470	0.50	14.3	B	155	499
	Intersection	**0.81**	**31.7**	**C**			**0.83**	**34.4**	**C**			**0.94**	**51.7**	**D**		
Pleasant Street & Libbey Industrial Parkway	EB LT	-	-	-	-	-	0.67	49.0	D	92	#246	0.72	54.2	D	117	#295
	EB R	-	-	-	-	-	0.37	31.8	C	24	140	0.47	34.1	C	51	209
	WB L	-	-	-	-	-	0.18	38.2	D	11	45	0.19	40.5	D	13	46
	WB T	-	-	-	-	-	0.10	37.0	D	11	43	0.10	39.1	D	12	44
	WB R	-	-	-	-	-	0.02	34.1	C	0	0	0.02	36.0	D	0	0
	NB L	-	-	-	-	-	0.63	24.5	C	36	#176	0.66	31.9	C	56	#206
	NB T	-	-	-	-	-	0.54	17.4	B	195	425	0.53	18.4	B	216	446
	NB R	-	-	-	-	-	0.02	12.3	B	0	0	0.02	13.1	B	0	0
	SB L	-	-	-	-	-	0.15	15.9	B	4	24	0.15	17.5	B	5	25
	SB TR	-	-	-	-	-	0.82	29.6	C	327	#713	0.83	33.2	C	378	#771
	Intersection	**-**	**-**	**-**			**0.79**	**26.7**	**C**			**0.81**	**29.7**	**C**		
Route 18 (Main Street) & Middle Street/West Street	EB L	>1.50	>120	F	~226	#492	0.87	70.6	E	202	#478	0.87	70.6	E	202	#478
	EB T	0.96	77.0	E	109	#263	0.91	78.3	E	145	#320	0.92	80.5	F	147	#326
	EB R	0.31	31.7	C	46	119	0.43	48.2	D	74	169	0.43	48.2	D	74	169
	WB L	>1.50	>120	F	~197	#461	0.90	76.6	E	209	#499	0.93	82.8	F	226	#540
	WB T	0.79	50.2	D	86	#208	0.76	61.9	E	120	#252	0.75	59.7	E	124	#254
	WB R	0.50	26.5	C	100	244	0.53	36.9	D	149	316	0.66	40.4	D	199	#434
	NB L	0.31	39.2	D	32	95	0.69	75.6	E	57	#170	0.69	75.6	E	57	#170
	NB T	0.79	30.4	C	230	#540	0.91	50.1	D	384	#750	0.93	54.1	D	390	#762
	NB R	0.41	21.8	C	74	154	0.39	22.2	C	107	154	0.40	22.4	C	111	159
	SB L	0.74	40.9	D	131	#363	0.91	76.4	E	219	#523	0.96	87.7	F	234	#559
	SB T	0.74	22.5	C	226	#574	0.81	30.8	C	380	#787	0.82	32.1	C	387	#799
	SB R	0.35	15.2	B	55	131	0.30	11.9	B	61	109	0.31	12.4	B	63	109
	Intersection	**1.05**	**72.9**	**E**			**0.99**	**48.3**	**D**			**1.03**	**51.0**	**D**		

[1]v/c = Volume to capacity ratio [2]Delay = Average delay per vehicle (seconds) [3]LOS = Level of Service [4]50th percentile queue (feet) [5]95th percentile queue (feet)

Table 9 Unsignalized Intersection Capacity Analysis Summary – Weekday AM Peak Hour

		2021 Existing				2028 No-Build				2028 Build			
Intersection	Movement	v/c[1]	Delay[2]	LOS[3]	95th Q[4]	v/c	Delay	LOS	95th Q	v/c	Delay	LOS	95th Q
Pleasant Street & Libbey Industrial Parkway	EB L	>1.50	>120	F	7.3	-	-	-	-	-	-	-	-
	EB R	0.57	32.8	D	3.3	-	-	-	-	-	-	-	-
	NB L	0.59	18.6	C	3.9	-	-	-	-	-	-	-	-
Libbey Industrial Parkway & West Site Drive	EB L	-	-	-	-	-	-	-	-	0.05	8.8	A	0.1
	SB LR	-	-	-	-	-	-	-	-	0.05	14.6	B	0.1
Libbey Industrial Parkway & East Site Drive	EB L	-	-	-	-	-	-	-	-	0.05	8.9	A	0.1
	SB LR	-	-	-	-	-	-	-	-	0.05	14.8	B	0.2

Table 10 Unsignalized Intersection Capacity Analysis Summary – Weekday PM Peak Hour

		2021 Existing				2028 No-Build				2028 Build			
Intersection	Movement	v/c[1]	Delay[2]	LOS[3]	95th Q[4]	v/c	Delay	LOS	95th Q	v/c	Delay	LOS	95th Q
Pleasant Street & Libbey Industrial Parkway	EB L	>1.50	>120	F	16.3	-	-	-	-	-	-	-	-
	EB R	>1.50	>120	F	28.0	-	-	-	-	-	-	-	-
	NB L	0.24	12.7	B	0.9	-	-	-	-	-	-	-	-
Libbey Industrial Parkway & West Site Drive	EB L	-	-	-	-	-	-	-	-	0.02	8.3	A	0.1
	SB LR	-	-	-	-	-	-	-	-	0.21	15.2	C	0.8
Libbey Industrial Parkway & East Site Drive	EB L	-	-	-	-	-	-	-	-	0.02	8.1	A	0.1
	SB LR	-	-	-	-	-	-	-	-	0.20	14.5	B	0.7

5.0 TRAFFIC MITIGATION

Tetra Tech has identified site access and off-site improvements to be implemented as part of the proposed project to address existing and future traffic operational deficiencies and off-set the potential traffic increases associated with the proposed project. The specific site access and off-site roadway improvements to be implemented as part of the proposed project, as well as potential Transportation Demand Management measures that could be implemented to further reduce traffic increases associated with the project are described below.

5.1 SITE ACCESS IMPROVEMENTS

The existing site driveways will be reconfigured to better serve the proposed building program. The westerly site driveway will remain in the same general location as the existing westerly site driveway but will be narrowed to approximately 24 feet to provide a single 12-foot entry lane and a single 12-foot exit lane. The easterly site driveway will shift approximately 20 feet to the east from its current location and will be narrowed to approximately 24 feet to provide a single 12-foot entry lane and a single 12-foot exit lane. The curb radius on the east side of the driveway will be reduced and the driveway angle will be reconfigured to provide a more standard, 90-degree, right angle entry into the site.

5.2 OFF-SITE IMPROVEMENTS

5.2.1 Middle Street at Libbey Industrial Parkway/Tara Drive

Based on the capacity analysis presented in this report, it is anticipated that geometric and traffic control improvements will be needed to address future projected traffic operational deficiencies at the intersection of Middle Street and Libbey Industrial Parkway/Tara Drive. One potential improvement that could increase capacity, reduce delays and manage vehicles queues at this intersection would be to provide an exclusive right-turn lane on the Middle Street northbound approach. A comparison of the future traffic operations with and without this improvement is presented in Table 11.

As shown in Table 11, upon implementation of this improvement, the intersection is expected to improve to overall LOS B and LOS C during the weekday morning and evening peak hours, respectively, with all movements projected to operate below capacity.

This potential improvement would require widening of Middle Street and construction of a retaining wall on the southeast corner of the intersection, in addition to upgrades to the existing traffic signal equipment needed to accommodate the exclusive northbound right-turn lane. The improvement would also result in an encroachment onto private land (currently owned by the project proponent) and require alteration of the existing public right-of-way, and is beyond the scope of the currently proposed project to implement.

As part of the proposed project, the proponent proposes to fund the design of future improvements at the intersection Middle Street and Libbey Industrial Parkway and Tara Drive, and make a fair share contribution towards construction of these improvements, including a donation of land along their property located on the southeast corner of the intersection if needed to construct the final roadway improvement.

Table 11 Middle Street & Libbey Industrial Parkway Capacity Analysis Summary

	2028 No-Build					2028 Build					2028 Build – Mitigated				
Movement	**v/c[1]**	**Delay[2]**	**LOS[3]**	**50th Q[4]**	**95thQ[5]**	**v/c**	**Delay**	**LOS**	**50thQ**	**95thQ**	**v/c**	**Delay**	**LOS**	**50thQ**	**95thQ**
AM Peak Hour															
EB LTR	0.16	49.3	D	3	32	0.16	56.6	E	3	32	0.28	40.5	D	2	26
WB LT	0.79	52.8	D	98	#359	0.86	69.2	E	133	#411	0.69	31.3	C	70	#310
WB R	0.23	30.1	C	20	61	0.27	35.6	D	31	75	0.16	17.4	B	7	40
NB LTR	0.85	32.4	C	235	#805	0.85	32.7	C	296	#932	-	-	-	-	-
NB LT	-	-	-	-	-	-	-	-	-	-	0.72	27.2	C	100	#414
NB R	-	-	-	-	-	-	-	-	-	-	0.27	6.9	A	5	86
SB L	0.48	14.0	B	25	127	0.58	15.8	B	36	156	0.59	15.4	B	28	#195
SB TR	0.44	12.4	B	88	364	0.42	12.5	B	101	374	0.56	15.0	B	80	372
Intersection	**0.74**	**27.7**	**C**			**0.78**	**31.1**	**C**			**0.65**	**18.6**	**B**		
PM Peak Hour															
EB LTR	0.01	61.3	E	0	0	0.01	61.3	E	0	0	0.01	55.6	E	0	0
WB LT	0.91	81.1	F	175	#473	1.07	119.4	F	253	#665	0.84	52.4	D	202	#565
WB R	0.47	42.4	D	77	156	0.51	40.1	D	99	202	0.38	28.5	C	65	131
NB LTR	0.89	35.7	D	419	#1207	0.99	56.7	E	500	#1318	-	-	-	-	-
NB LT	-	-	-	-	-	-	-	-	-	-	0.83	37.2	D	293	#812
NB R	-	-	-	-	-	-	-	-	-	-	0.25	5.3	A	15	120
SB L	0.48	13.7	B	29	124	0.60	18.7	B	38	#158	0.71	28.1	C	44	#217
SB TR	0.47	12.0	B	134	470	0.50	14.3	B	155	499	0.57	18.7	B	176	533
Intersection	**0.83**	**34.4**	**C**			**0.94**	**51.7**	**D**			**0.77**	**29.4**	**C**		

[1]v/c = Volume to capacity ratio [2]Delay = Average delay per vehicle (seconds) [3]LOS = Level of Service [4]50th percentile queue (feet) [5]95th percentile queue (feet)

5.3 TRANSPORTATION DEMAND MANAGEMENT (TDM) PROGRAM

The project proponent will develop a Transportation Demand Management (TDM) program to encourage the use of alternative modes of transportation and reduce single occupancy vehicle trips to and from the site. Elements of the Transportation Demand Management Plan will be incorporated into the proposed site plan and include the following:

- **Preferential Parking -** Provide preferential parking spaces for employees who rideshare or use low-emission vehicles.
- **Electric Vehicle Charging Stations** Provide two electric vehicle charging stations within the parking lot.
- **Bicycle Accommodations –** Provide bicycle racks within the parking lot to encourage employees to bike to work.

The project proponent will also work with the future tenant of the site to explore additional TDM measures to further reduce single occupancy vehicle trips to and from the site.

6.0 SIGHT DISTANCE ANALYSIS

Tetra Tech reviewed the available sight distance at the proposed site driveways on Libbey Industrial Parkway to ensure that safe and efficient access would be provided to the project site. The available sight distance at the site driveways was determined based on procedures outlined in *A Policy On Geometric Design of Highways and Streets*, published by the American Association of State Highway and Transportation Officials (AASHTO). Tetra Tech then compared the available sight distance at the proposed driveways to the required Stopping Sight Distance and desirable Intersection Sight Distance for the anticipated travel speeds for vehicle traveling past the site. The speed data indicates that in the vicinity of the site, the 85th percentile travel speed along Libbey Industrial Parkway is approximately 41 mph in the eastbound travel direction and 42 mph in the westbound travel direction, despite the posted speed limit of 30 mph. A summary of the available and required SSD and ISD at the proposed driveway locations along Libbey Industrial Parkway is presented in Table 12.

Table 12 Sight Distance Summary

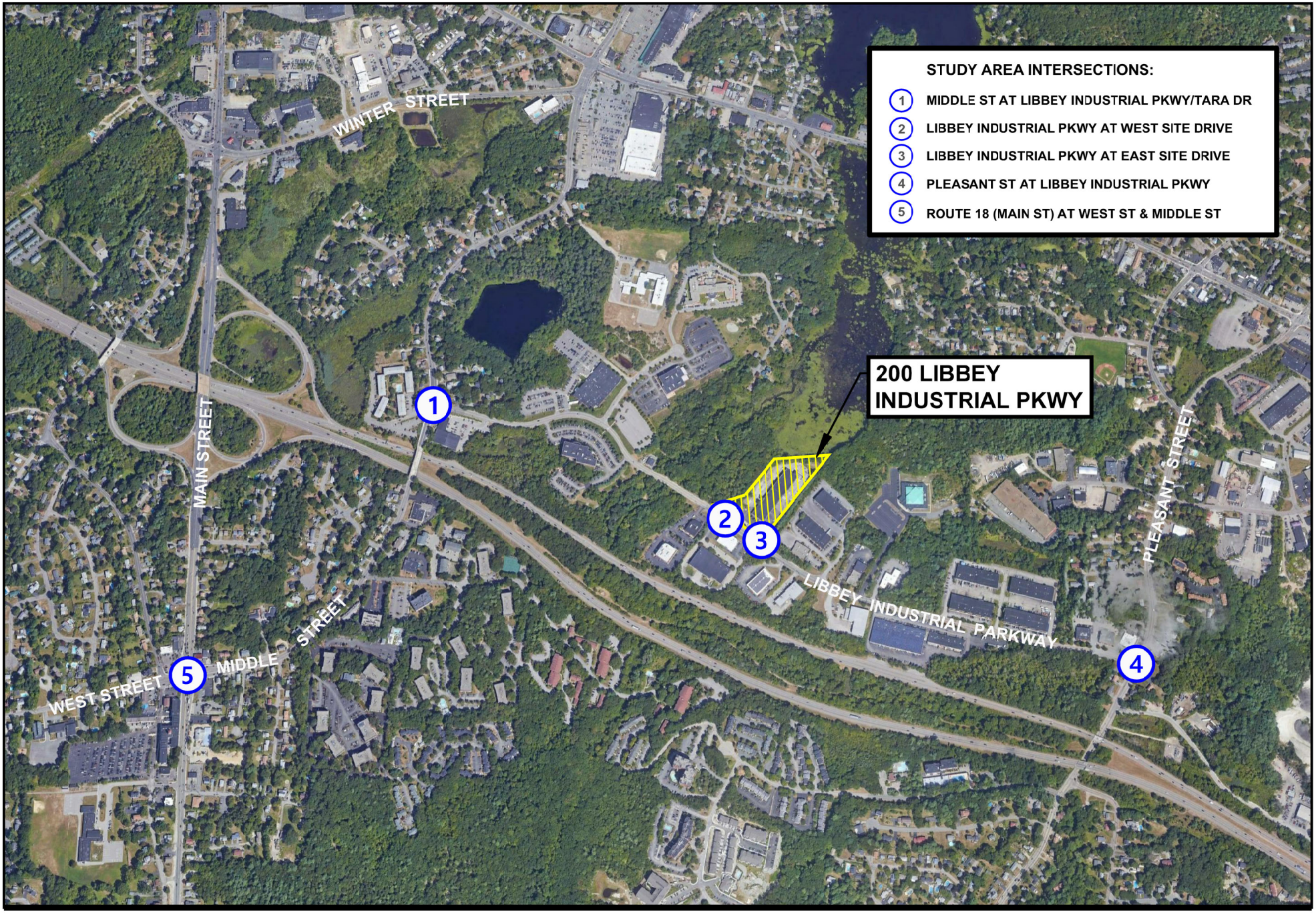
Intersection	85th Percentile Speed (mph)	Approx. Grade	AASHTO Desirable (feet)[1]	AASHTO Minimum (feet)	Measured Distance (feet)	Meets AASHTO Desirable	Meets AASHTO Minimum
Libbey Industrial Parkway/Proposed Westerly Site Driveway							
Stopping Distance							
From the West	41	0%	315	NA	+500	Yes	-
From the East	42	-3%	340	NA	+500	Yes	-
Intersection Sight Distance							
To the West	41		455	315	+500	Yes	Yes
To the East	42		465	340	+500	Yes	Yes
Libbey Industrial Parkway/Proposed Easterly Site Driveway							
Stopping Distance							
From the West	41	0%	315	NA	+500	Yes	-
From the East	42	-3%	340	NA	500	Yes	-
Intersection Sight Distance							
To the West	41		455	315	+500	Yes	Yes
To the East	42		465	340	425	No	Yes

[1]Obtained from A Policy On Geometric Design of Highways and Streets, 2018 Edition, published by the American Association of State Highway and Transportation Officials (Exhibit 3-1) for the assumed travel speeds for required stopping sight distance and desirable intersection sight distance based on roadway grades.

As shown in Table 12, the available sight distance at each of the proposed site driveways is in excess of AASHTO-required stopping sight distance and AASHTO-recommended desirable intersection sight distance for the observed 85th percentile travel speeds on Libbey Industrial Parkway assuming selective clearing of roadside vegetation and restricting on-site objects (i.e., fencing, signage, etc.) to 2 feet or less, with only one exception. The ISD looking left from the easterly site driveway was measured to be approximately 425 feet. This is slightly less than the desired ISD of 465 feet, but higher than the AASHTO minimum requirement of 340 feet. This indicates that motorists traveling along Libbey Industrial Parkway will have sufficient view of the proposed site driveways to either stop or adjust their speed, as appropriate, to react to turning movements to and from the proposed development and avoid potential collisions. This will also provide motorists waiting to exit the site driveways with sufficient view of the intersecting roadway to decide when they can safely enter onto Libbey Industrial Parkway. The sight distance calculations are included in Appendix L.

7.0 CONCLUSION

Based on the analysis presented in this report, upon implementation of the recommended site access improvements, the potential traffic increases associated with the proposed project can be safely accommodated at the site driveways with no significant impact to future traffic operations on surrounding area roadways. As part of the proposed project, the proponent will fund the design of future improvements at the intersection Middle Street and Libbey Industrial Parkway and Tara Drive, and make a fair share contribution towards construction of these improvements, including a donation of land along their property located on the southeast corner of the intersection. The proponent will also work with the future tenant of the site to develop a TDM program to minimize reliance on single-occupant vehicles and further reduce single occupancy vehicle trips to and from the site at the project site.



TETRA TECH

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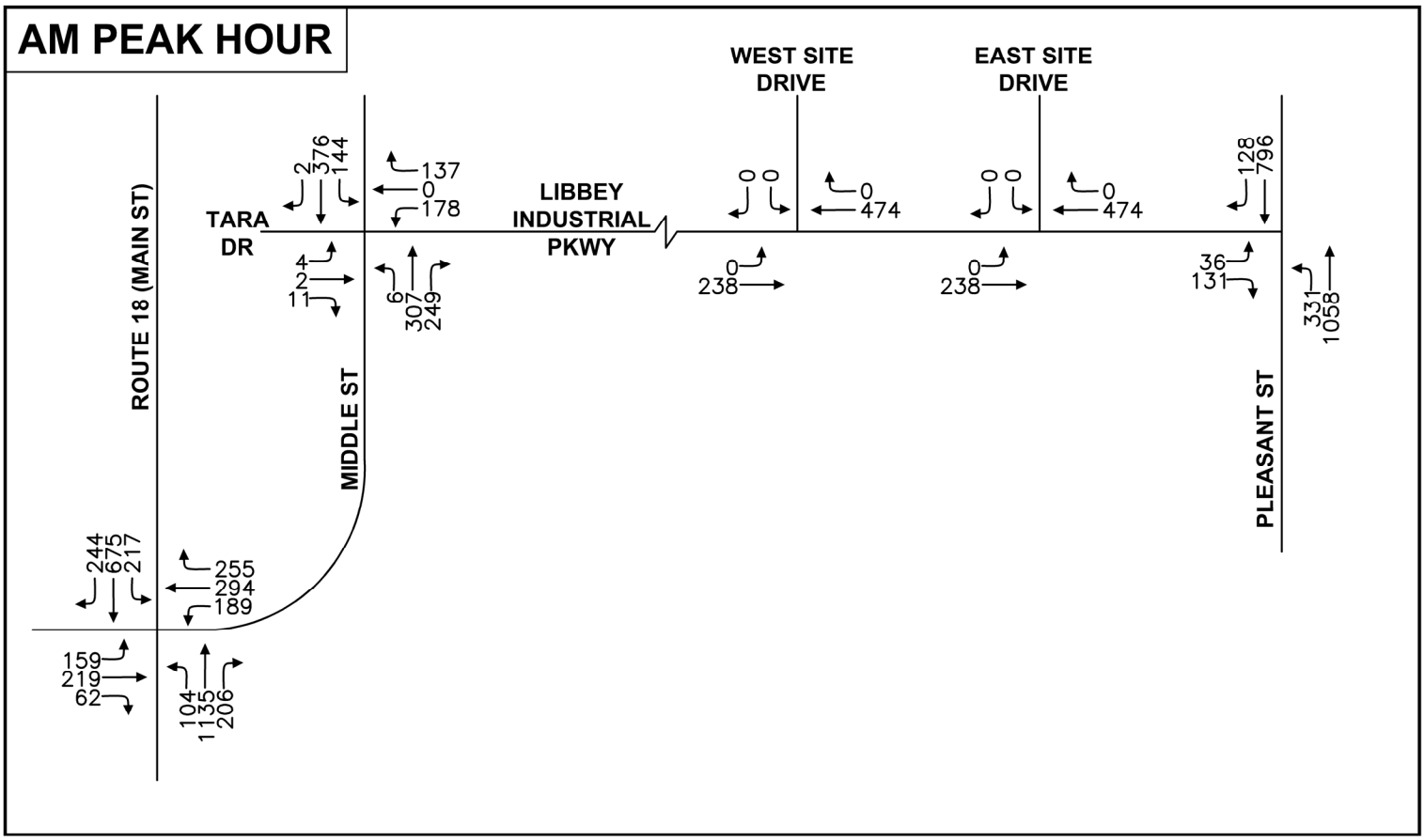
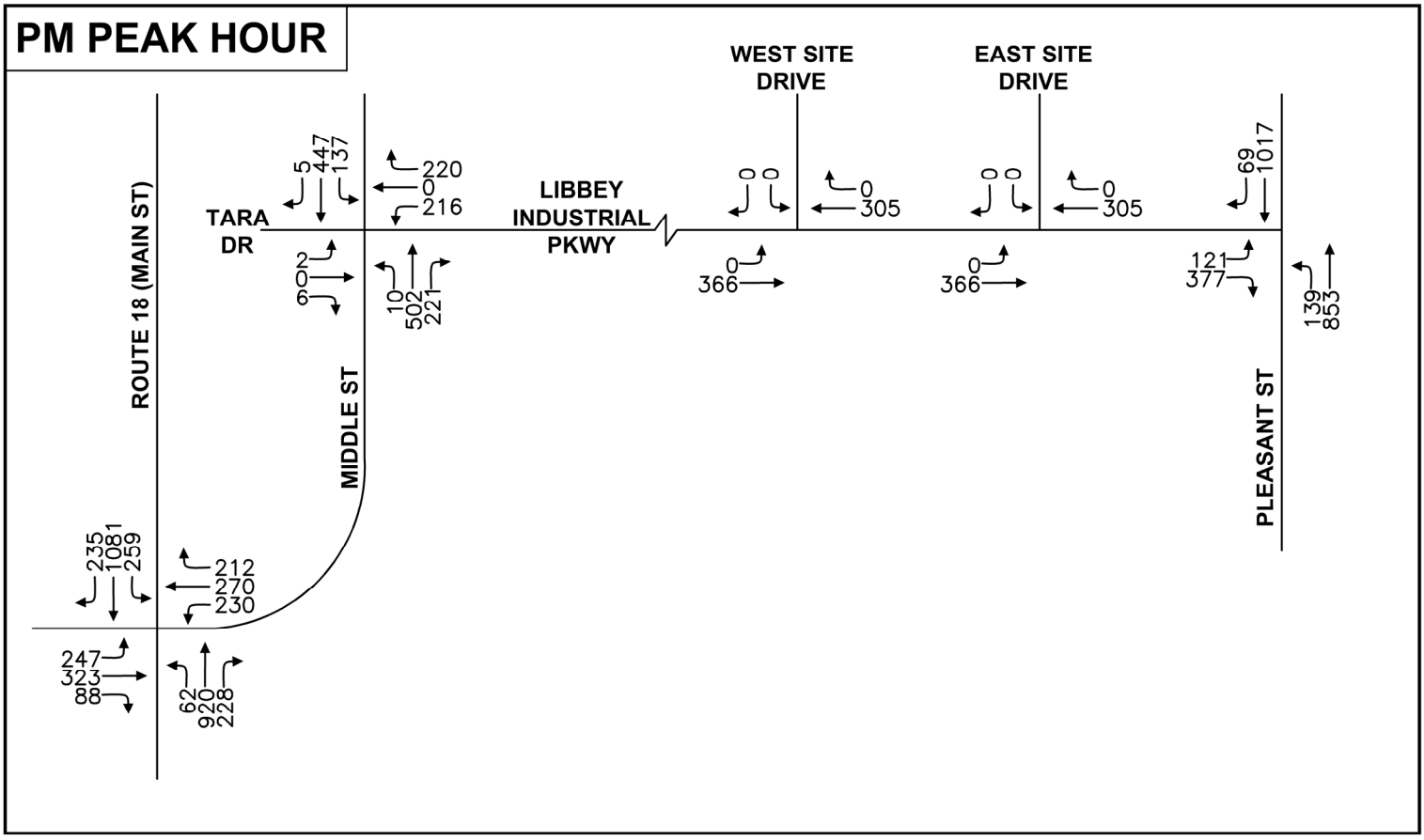
Proposed Medical Office Building
Weymouth, Massachusetts

Study Area Intersections

FIGURE
1





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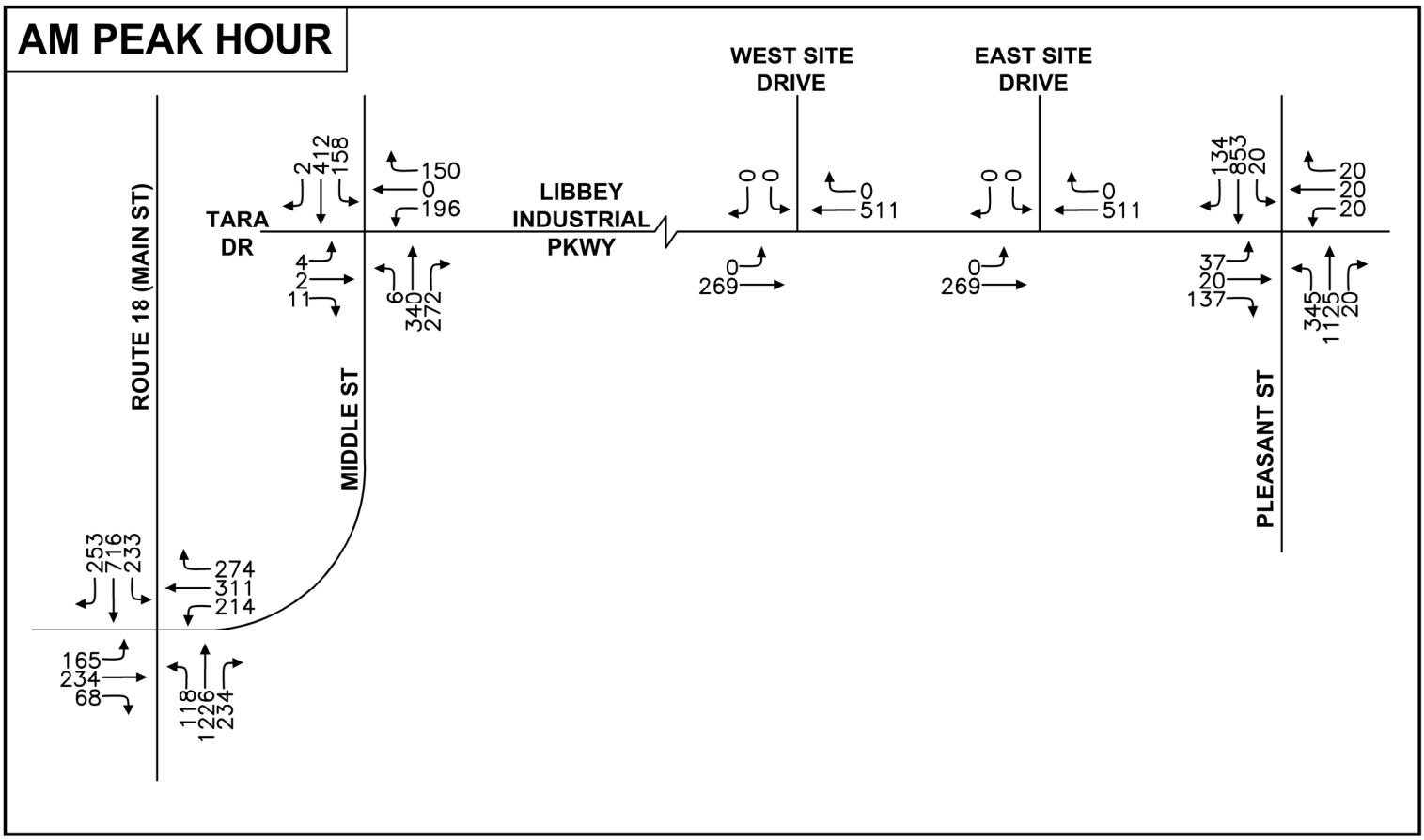
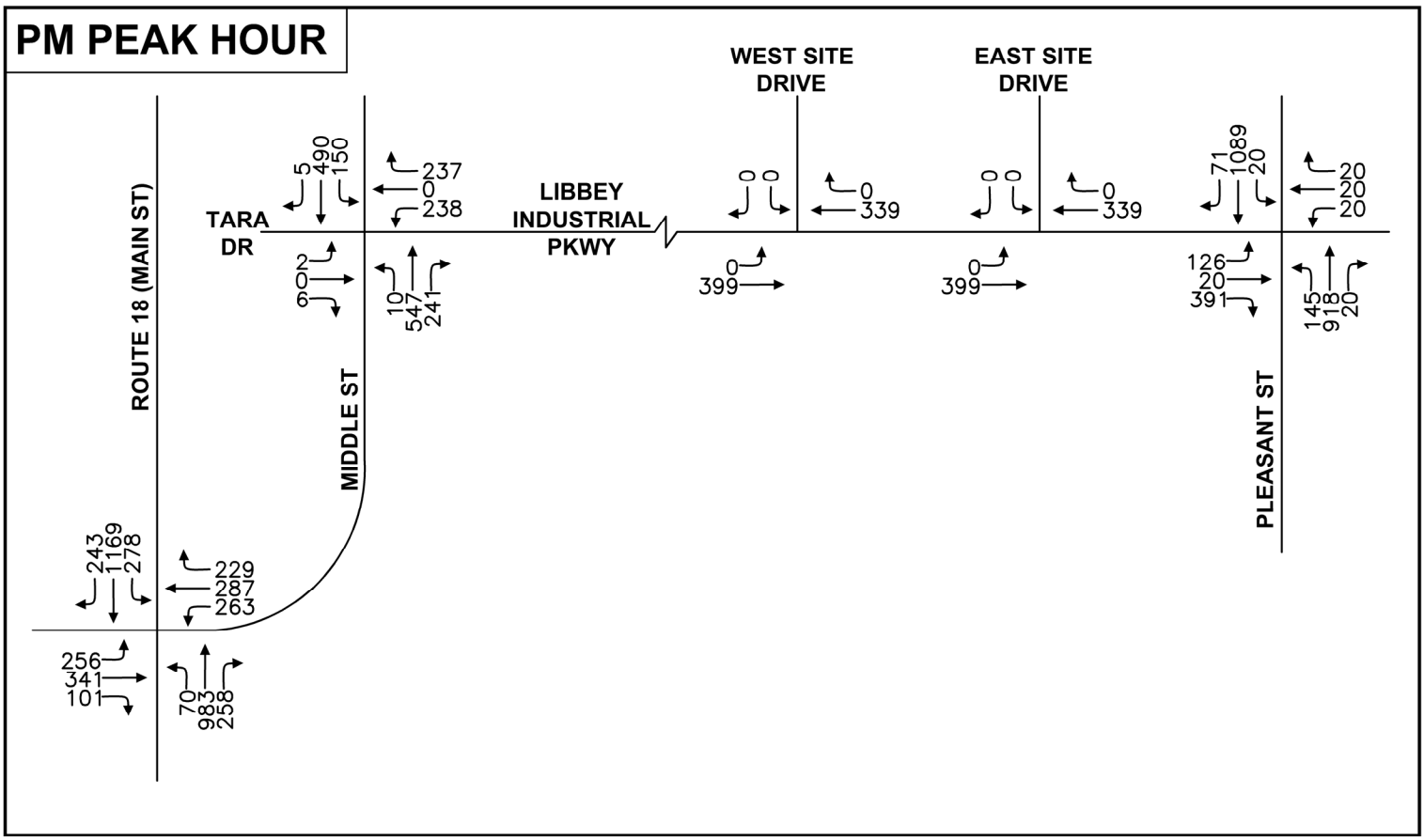
Proposed Medical Office Building
Weymouth, Massachusetts

2021 Existing Weekday Peak Hour Traffic Volumes

FIGURE **2**





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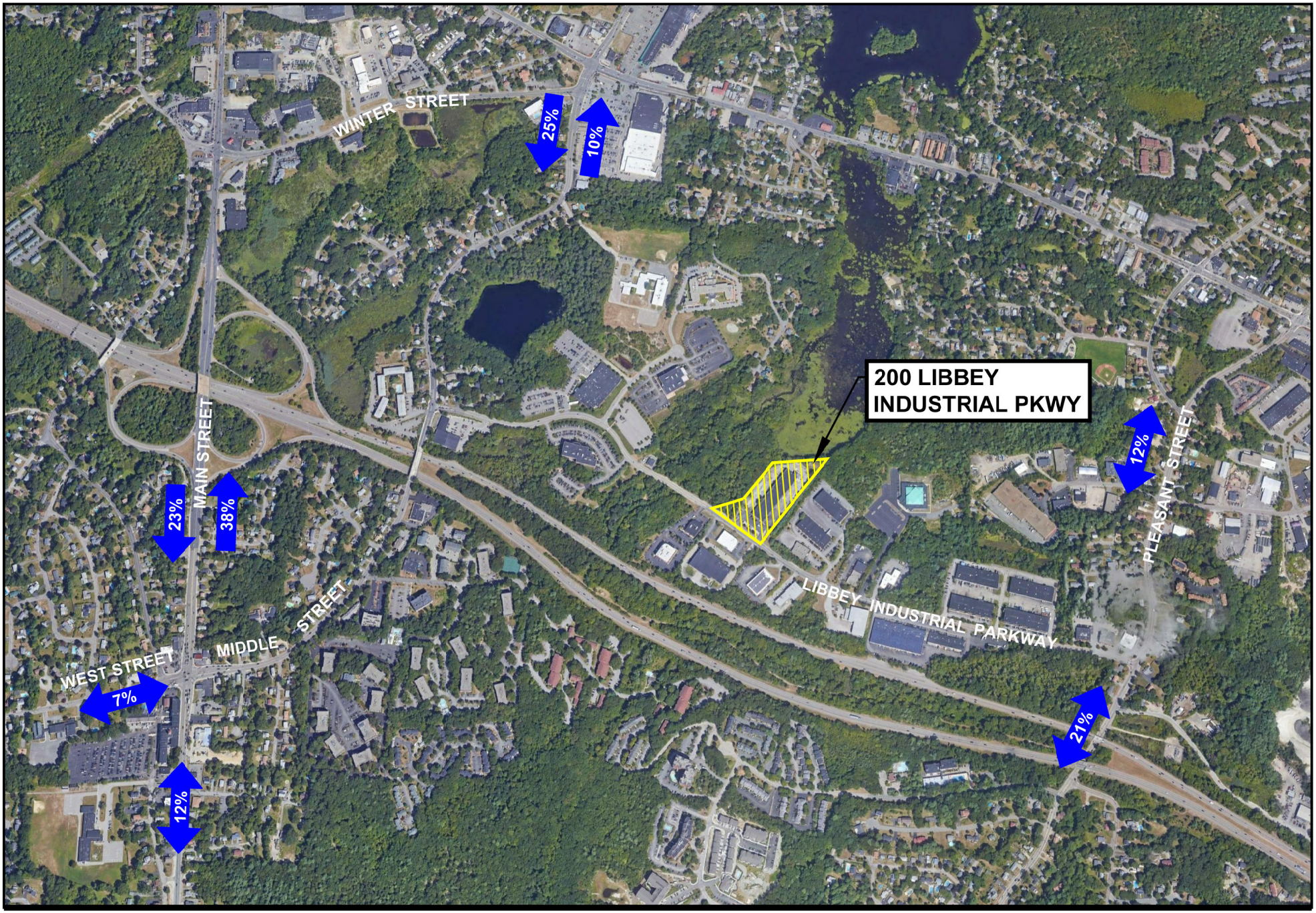
Proposed Medical Office Building
Weymouth, Massachusetts

2028 No Build Weekday Peak Hour Traffic Volumes

FIGURE **3**



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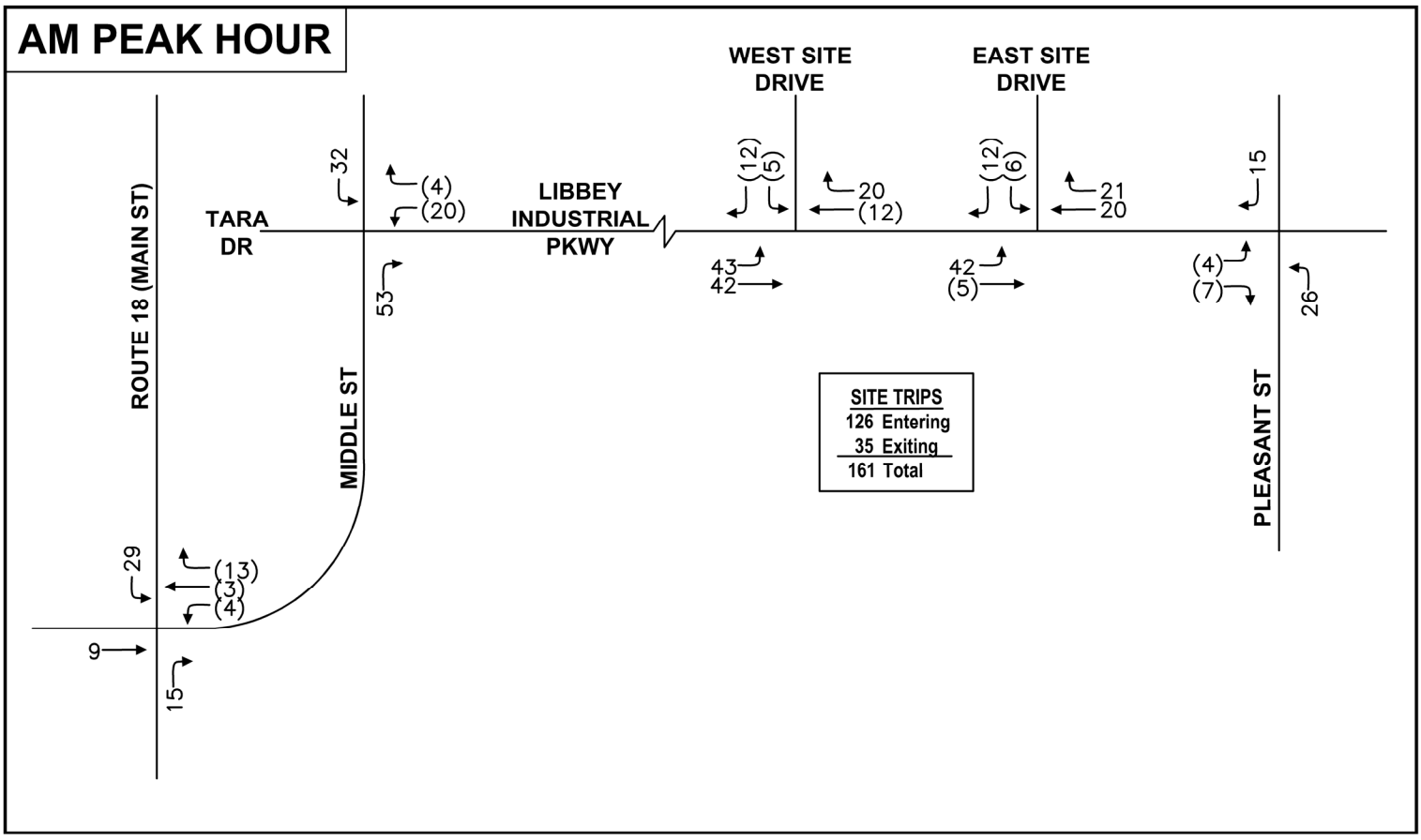
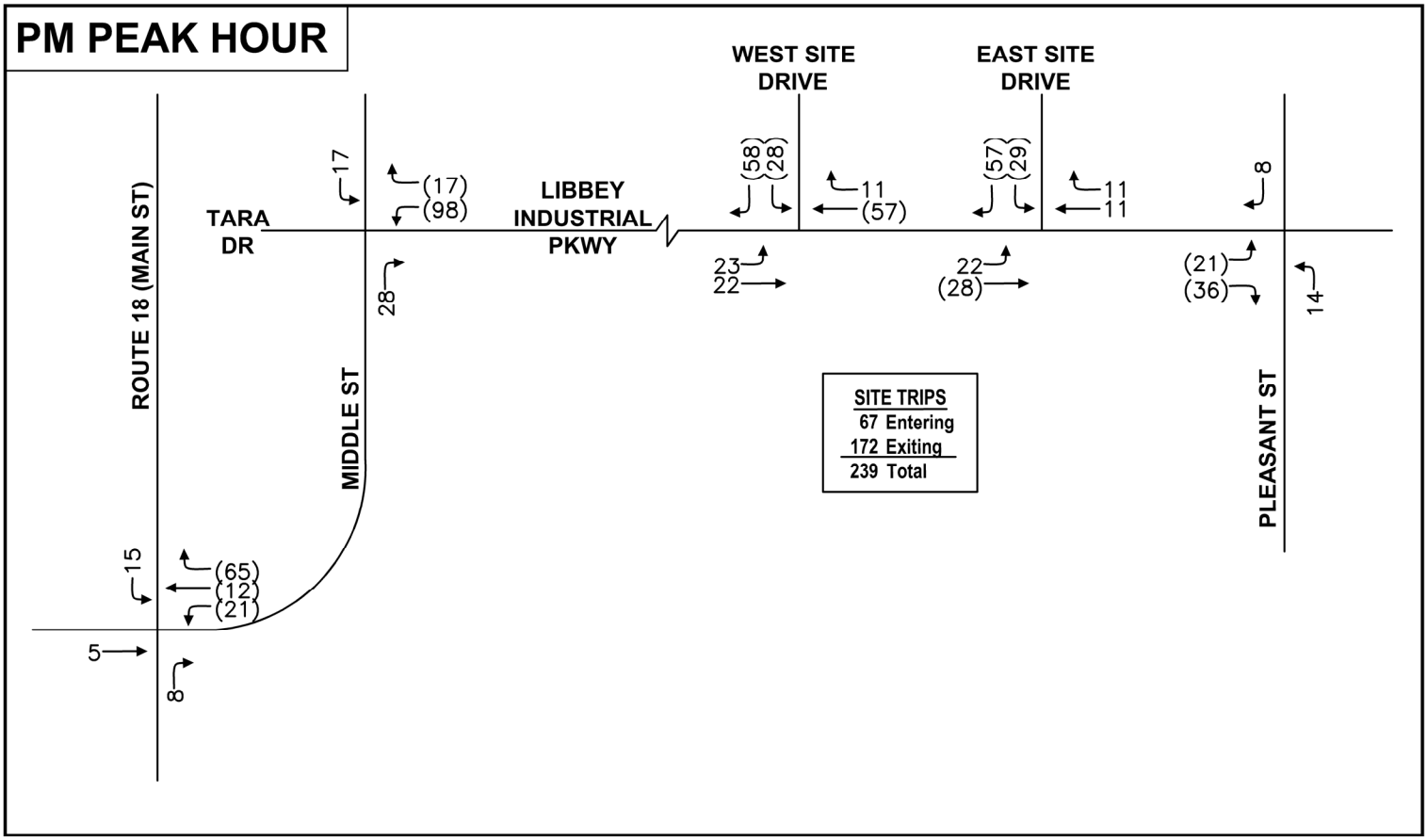
Proposed Medical Office Building
Weymouth, Massachusetts

Trip Distribution

FIGURE
4





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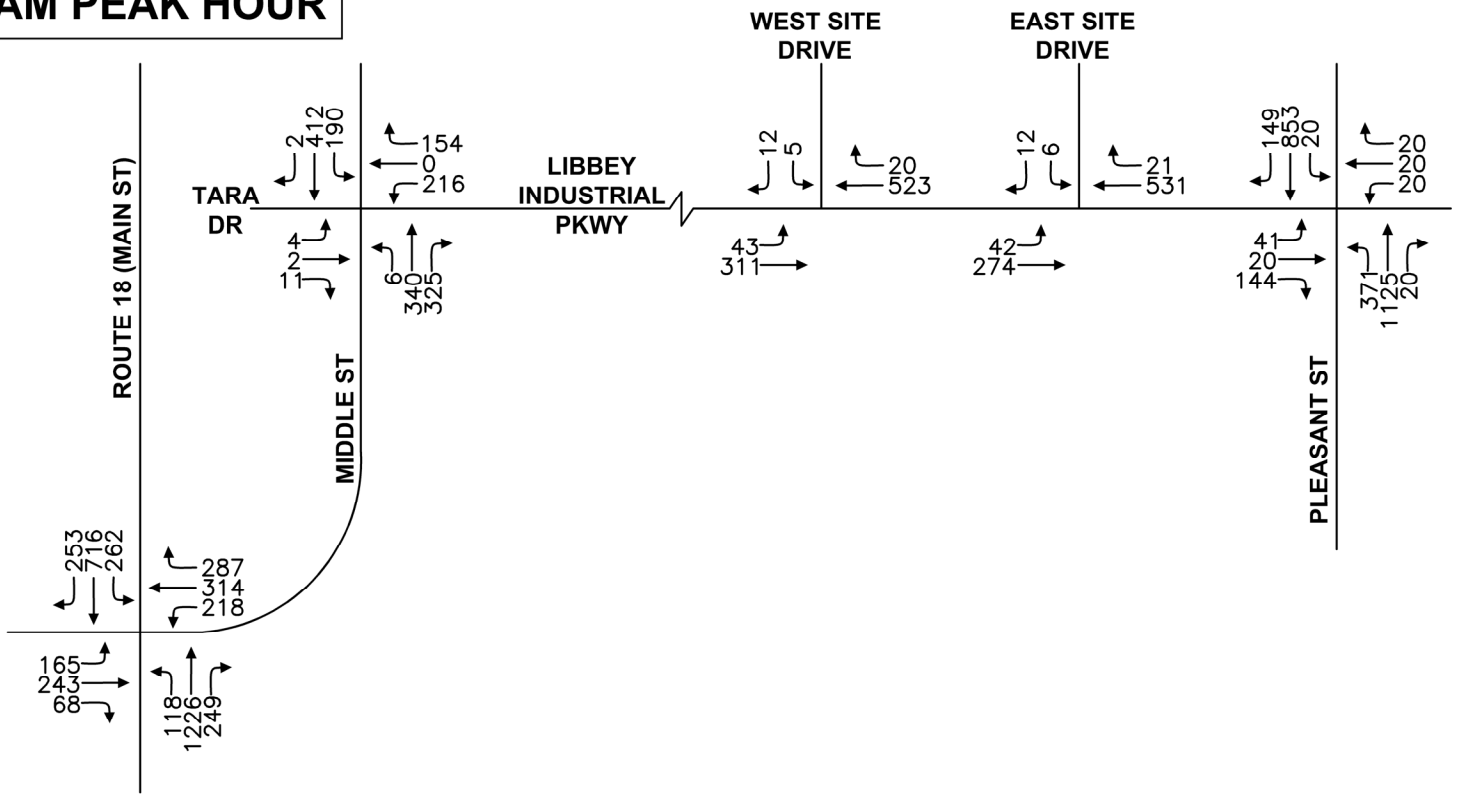
Proposed Medical Office Building
Weymouth, Massachusetts

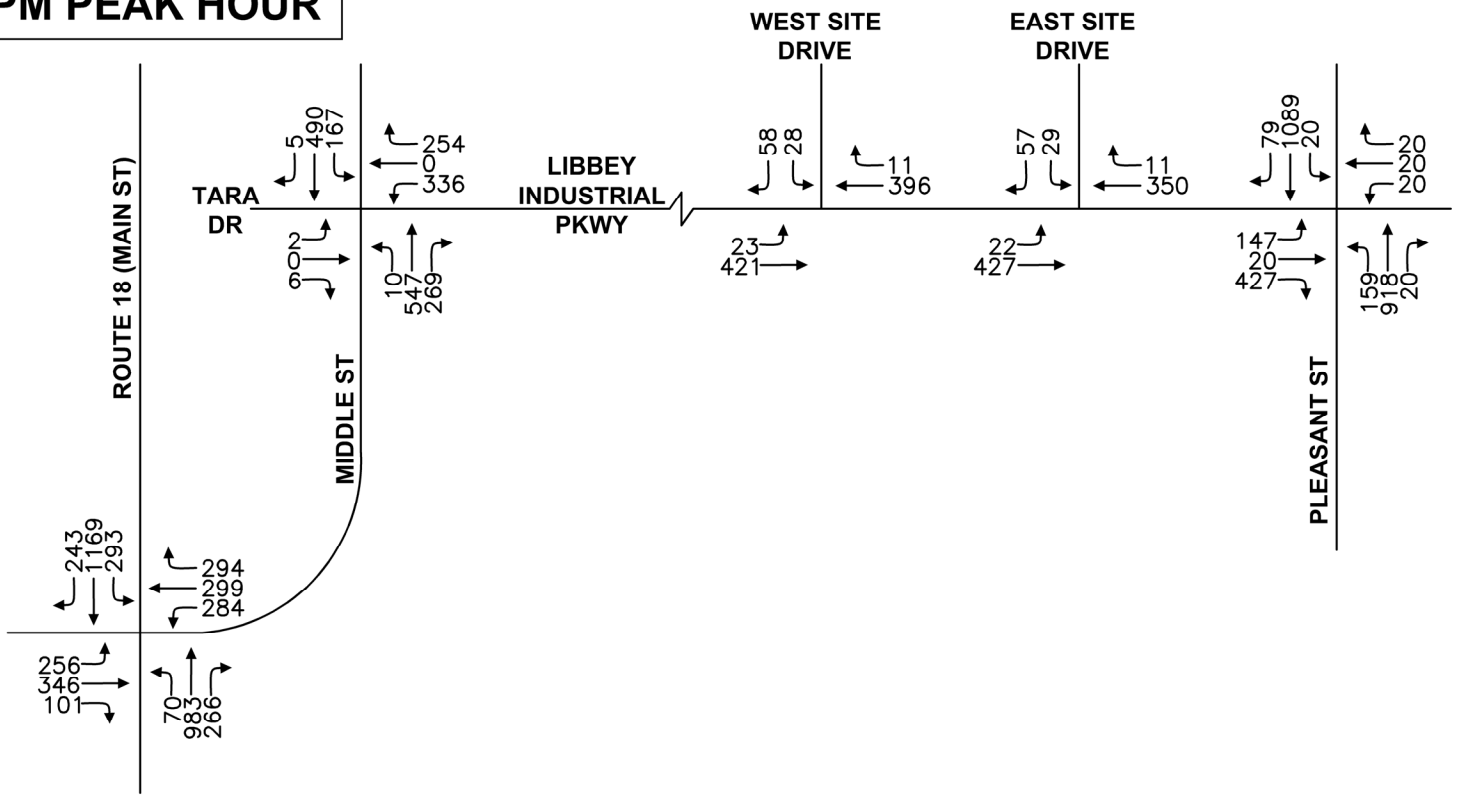
FIGURE
5

Project Trips

AM PEAK HOUR



PM PEAK HOUR



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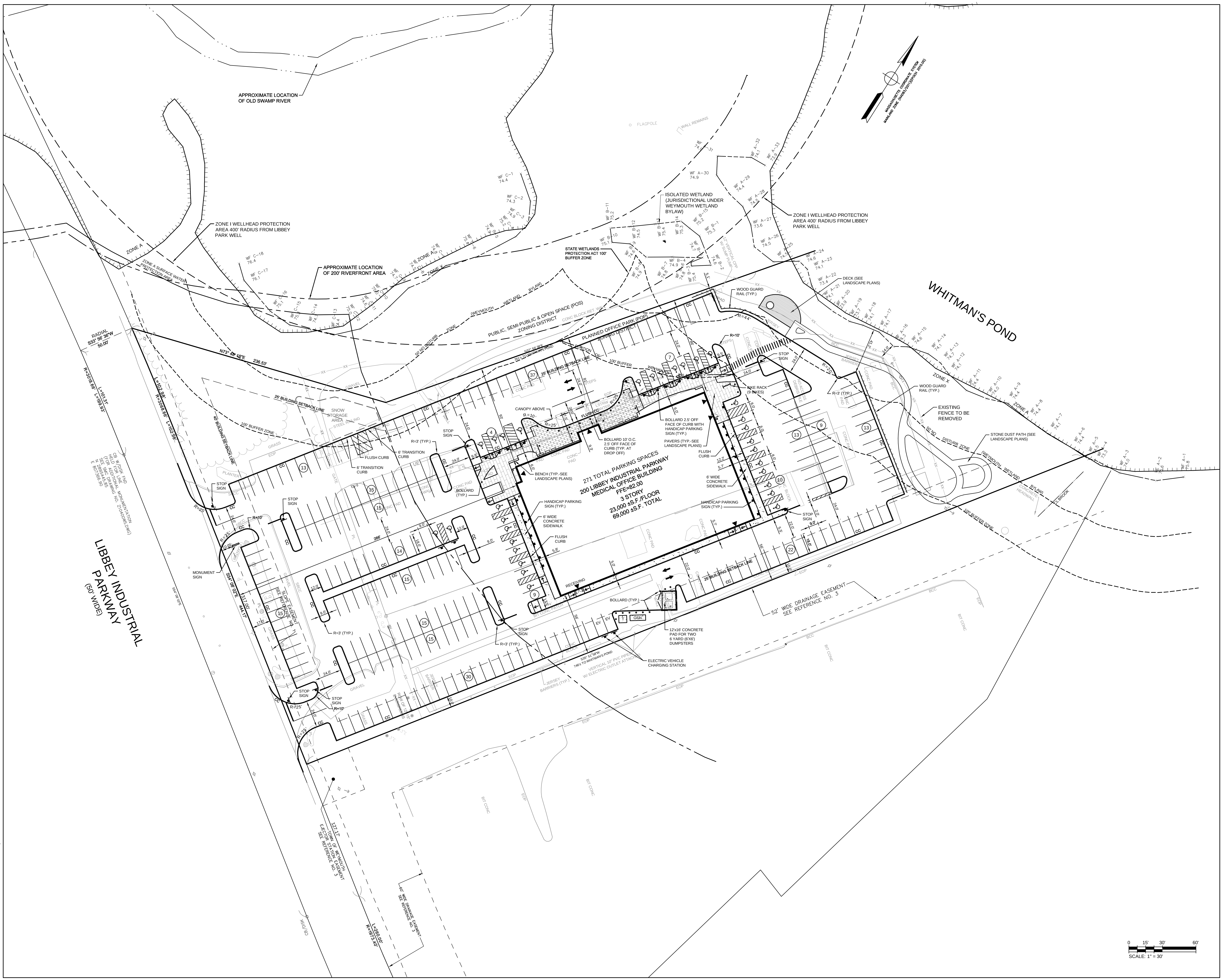
Proposed Medical Office Building
Weymouth, Massachusetts

2028 Build Weekday Peak Hour Traffic Volumes

FIGURE **6**

Appendix A

Site Plan



2/9/2021 - P:\42892\143-42892-20004\CAD\SheetFiles\C-3 Layout Plan.DWG - PAPPAS, JUD

DEVELOPER:
FOXROCK 200 LIBBEY, LLC
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Issuance Schedule

Number	Date	Description
1	2/11/21	SUBMIT TO BZA

NORTH

PROGRAMMING
NOT FOR CONSTRUCTION

SITE LAYOUT PLAN

FoxRock 200 Libbey, LLC

Medical Office Building
200 Libbey Industrial Parkway
Weymouth, MA

Scale: Date Issued: February 3, 2021

C-3

Project Number: 143-42892-20004

Appendix B

Traffic Count Data

Libby Industrial Parkway
at #169 Libbey Parkway
City, State: Weymouth, MA
Client: TTR/C.Jones

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154694 B Class
Site Code: 14342892-15007
Date Start: 07-Oct-15

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/07/1														
5	0	8	5	0	1	0	0	0	0	0	0	0	0	14
01:00	1	9	5	1	0	1	0	0	0	0	0	0	0	17
02:00	0	8	1	0	1	1	0	0	0	0	0	0	0	11
03:00	0	13	1	1	0	1	0	0	0	0	0	0	0	16
04:00	0	11	4	2	2	0	0	0	0	0	0	0	0	19
05:00	0	48	14	0	12	0	0	0	0	0	0	0	0	74
06:00	3	61	32	3	12	3	0	2	1	0	0	0	0	117
07:00	0	138	52	2	12	1	0	3	1	0	0	0	0	209
08:00	1	171	51	1	11	6	0	2	4	0	0	0	0	247
09:00	1	161	48	2	18	4	0	2	5	0	0	0	0	241
10:00	3	152	50	1	10	2	0	0	10	0	0	0	0	228
11:00	4	169	56	3	25	7	1	2	4	0	0	0	0	271
12 PM	0	197	53	5	17	4	1	3	7	0	0	0	0	287
13:00	5	196	60	1	21	8	1	1	3	0	0	0	0	296
14:00	2	198	76	2	26	3	0	1	8	0	0	0	0	316
15:00	1	245	112	5	33	0	0	1	6	0	0	0	0	403
16:00	1	247	69	1	15	0	0	2	0	0	0	0	0	335
17:00	3	278	50	0	13	1	0	0	0	0	0	0	0	345
18:00	1	225	54	0	22	0	1	0	0	0	0	0	0	303
19:00	0	183	33	1	10	0	0	0	0	0	0	0	0	227
20:00	0	99	33	0	6	0	0	1	0	0	0	0	0	139
21:00	0	58	12	0	4	0	0	0	0	0	0	0	0	74
22:00	0	58	5	0	1	0	0	0	0	0	0	0	0	64
23:00	0	27	6	1	0	0	0	0	0	1	0	0	0	35
Total	26	2960	882	32	272	42	4	20	49	1	0	0	0	4288
Percent	0.6%	69.0%	20.6%	0.7%	6.3%	1.0%	0.1%	0.5%	1.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	11:00	06:00	11:00	11:00	11:00	07:00	10:00					11:00
Vol.	4	171	56	3	25	7	1	3	10					271
PM Peak	13:00	17:00	15:00	12:00	15:00	13:00	12:00	12:00	14:00	23:00				15:00
Vol.	5	278	112	5	33	8	1	3	8	1				403

Libby Industrial Parkway
at #169 Libbey Parkway
City, State: Weymouth, MA
Client: TTR/C.Jones

PRECISION
D A T A
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P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154694 B Class
Site Code: 14342892-15007
Date Start: 07-Oct-15

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/08/1														
5	0	13	4	1	0	0	0	0	0	0	0	0	0	18
01:00	0	21	1	1	0	0	0	0	0	0	0	0	0	23
02:00	0	9	3	1	2	0	0	0	0	0	0	0	0	15
03:00	1	13	1	1	0	1	0	0	0	0	0	0	0	17
04:00	0	15	3	1	3	0	0	1	0	0	0	0	0	23
05:00	0	46	19	0	11	0	0	0	1	0	0	0	0	77
06:00	5	75	23	2	15	1	0	1	1	0	0	0	0	123
07:00	1	141	57	2	24	0	0	2	1	0	0	0	0	228
08:00	2	154	43	1	11	7	0	2	2	0	0	0	0	222
09:00	0	154	49	4	18	8	1	0	5	0	0	0	0	239
10:00	1	192	49	3	10	8	0	0	3	0	0	0	0	266
11:00	1	162	59	3	30	5	1	2	2	0	0	0	0	265
12 PM	2	189	44	0	17	11	0	3	4	1	0	0	0	271
13:00	1	212	58	0	15	6	0	3	4	0	0	0	0	299
14:00	3	235	75	1	31	9	1	3	3	0	0	0	0	361
15:00	0	240	98	7	30	5	0	5	1	0	0	0	0	386
16:00	2	277	52	0	27	2	0	1	0	0	0	0	0	361
17:00	1	247	59	0	21	1	0	0	0	0	0	0	0	329
18:00	0	235	38	1	18	0	0	2	0	0	0	0	0	294
19:00	0	168	43	1	13	0	0	0	0	0	0	0	0	225
20:00	0	108	37	0	7	0	0	0	0	0	0	0	0	152
21:00	0	64	17	1	2	1	0	0	0	0	0	0	0	85
22:00	0	50	6	0	2	0	0	0	1	0	0	0	0	59
23:00	0	39	5	0	2	0	0	0	0	0	0	0	0	46
Total	20	3059	843	31	309	65	3	25	28	1	0	0	0	4384
Percent	0.5%	69.8%	19.2%	0.7%	7.0%	1.5%	0.1%	0.6%	0.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	10:00	11:00	09:00	11:00	09:00	09:00	07:00	09:00					10:00
Vol.	5	192	59	4	30	8	1	2	5					266
PM Peak	14:00	16:00	15:00	15:00	14:00	12:00	14:00	15:00	12:00	12:00				15:00
Vol.	3	277	98	7	31	11	1	5	4	1				386
Total		6019	1725	63	581	107	7	45	77	2	0	0	0	8672

Libby Industrial Parkway
at #169 Libbey Parkway
City, State: Weymouth, MA
Client: TTR/C.Jones

PRECISION
D A T A
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P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154694 B Class
Site Code: 14342892-15007
Date Start: 07-Oct-15

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/07/1														
5	0	4	2	0	0	0	0	0	0	0	0	0	0	6
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	2	3	1	0	0	0	0	0	0	0	0	0	6
03:00	0	8	2	1	0	0	0	0	0	0	0	0	0	11
04:00	0	39	10	2	3	1	0	0	0	0	0	0	0	55
05:00	2	52	23	1	15	2	0	0	5	0	0	0	0	100
06:00	2	97	59	5	31	1	2	0	5	0	0	0	0	202
07:00	1	221	86	0	42	1	3	0	5	0	0	0	0	359
08:00	0	242	120	4	38	2	0	1	3	0	0	0	0	410
09:00	0	168	89	1	33	1	1	2	5	0	0	0	0	300
10:00	1	160	75	2	29	3	2	2	8	0	0	0	0	282
11:00	2	130	84	5	31	1	1	1	5	0	0	0	0	260
12 PM	3	174	82	3	25	4	1	1	8	0	0	0	0	301
13:00	1	151	68	2	25	5	0	1	4	0	0	0	0	257
14:00	4	141	74	1	20	0	0	2	3	0	0	0	0	245
15:00	1	139	65	3	24	0	0	1	0	0	0	0	0	233
16:00	1	137	73	0	33	3	0	0	0	0	0	0	0	247
17:00	0	180	73	0	18	0	0	1	0	0	0	0	0	272
18:00	0	176	65	0	20	0	0	0	0	0	0	0	0	261
19:00	0	96	42	0	14	1	0	0	0	0	0	0	0	153
20:00	0	54	25	0	9	0	0	0	0	0	0	0	0	88
21:00	1	61	19	0	4	0	0	0	0	0	0	0	0	85
22:00	1	30	9	0	4	0	0	0	0	0	0	0	0	44
23:00	0	9	5	1	0	0	0	0	0	0	0	0	0	15
Total	20	2472	1153	32	418	25	10	12	51	0	0	0	0	4193
Percent	0.5%	59.0%	27.5%	0.8%	10.0%	0.6%	0.2%	0.3%	1.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	08:00	08:00	06:00	07:00	10:00	07:00	09:00	10:00					08:00
Vol.	2	242	120	5	42	3	3	2	8					410
PM Peak	14:00	17:00	12:00	12:00	16:00	13:00	12:00	14:00	12:00					12:00
Vol.	4	180	82	3	33	5	1	2	8					301

Libby Industrial Parkway
at #169 Libbey Parkway
City, State: Weymouth, MA
Client: TTR/C.Jones

PRECISION
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INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

154694 B Class
Site Code: 14342892-15007
Date Start: 07-Oct-15

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
10/08/1														
5	0	5	2	0	1	0	0	0	0	0	0	0	0	8
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	3	2	1	0	0	0	0	0	0	0	0	0	6
03:00	0	16	0	0	0	0	0	0	0	0	0	0	0	16
04:00	0	40	9	1	0	0	0	1	0	0	0	0	0	51
05:00	0	54	24	1	20	0	0	1	6	0	0	0	0	106
06:00	2	103	47	6	32	3	2	0	2	0	0	0	0	197
07:00	0	208	83	3	41	0	2	3	1	0	0	0	0	341
08:00	0	245	116	2	32	1	3	2	3	0	0	0	0	404
09:00	2	176	80	6	25	5	2	0	5	0	0	0	0	301
10:00	0	156	86	3	26	7	4	1	2	0	0	0	0	285
11:00	1	124	74	5	30	4	2	1	2	0	0	0	0	243
12 PM	0	163	72	0	41	3	2	1	4	0	0	0	0	286
13:00	0	163	65	2	17	8	1	3	1	0	0	0	0	260
14:00	3	162	104	1	26	6	4	0	2	0	0	0	0	308
15:00	0	138	86	1	29	2	0	0	0	0	0	0	0	256
16:00	0	162	77	0	25	0	0	4	0	0	0	0	0	268
17:00	0	158	71	0	28	0	0	1	0	0	0	0	0	258
18:00	1	145	47	1	25	0	0	0	0	0	0	0	0	219
19:00	0	93	33	0	10	0	0	0	0	0	0	0	0	136
20:00	0	67	27	0	13	0	0	0	0	0	0	0	0	107
21:00	0	42	16	0	3	0	0	0	0	0	0	0	0	61
22:00	1	28	12	0	5	0	0	0	0	0	0	0	0	46
23:00	0	17	6	0	2	0	0	0	0	0	0	0	0	25
Total	10	2471	1139	33	431	39	22	18	28	0	0	0	0	4191
Percent	0.2%	59.0%	27.2%	0.8%	10.3%	0.9%	0.5%	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	08:00	06:00	07:00	10:00	10:00	07:00	05:00					08:00
Vol.	2	245	116	6	41	7	4	3	6					404
PM Peak	14:00	12:00	14:00	13:00	12:00	13:00	14:00	16:00	12:00					14:00
Vol.	3	163	104	2	41	8	4	4	4					308
Total		4943	2292	65	849	64	32	30	79	0	0	0	0	8384

Libby Industrial Parkway
at #169 Libbey Parkway
City, State: Weymouth, MA
Client: TTR/C.Jones

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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154694 B Speed
Site Code: 14342892-15007
Date Start: 07-Oct-15

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/07/ 15	0	0	0	0	3	5	4	2	0	0	0	0	0	14	43	39
01:00	0	0	0	1	3	6	5	1	1	0	0	0	0	17	43	38
02:00	0	0	0	0	2	2	5	2	0	0	0	0	0	11	44	40
03:00	0	0	1	0	3	6	4	1	1	0	0	0	0	16	43	38
04:00	**1**	0	1	2	6	3	2	4	0	0	0	0	0	19	45	35
05:00	0	1	**2**	7	13	35	10	6	0	0	0	0	0	74	41	36
06:00	1	**3**	1	3	34	39	28	5	**3**	0	0	0	0	117	42	36
07:00	0	0	0	3	**54**	103	43	6	0	0	0	0	0	209	41	37
08:00	1	0	0	4	27	**127**	**72**	**13**	1	0	**1**	0	**1**	**247**	42	38
09:00	0	1	0	**16**	41	117	58	6	1	**1**	0	0	0	241	41	37
10:00	3	4	2	6	51	102	49	10	1	0	0	0	0	228	41	36
11:00	3	**3**	2	11	61	113	67	11	0	0	0	0	0	271	41	36
12 PM	0	3	1	14	64	**143**	50	12	0	0	0	0	0	287	40	36
13:00	**5**	2	**3**	**22**	**71**	109	**78**	6	0	0	0	0	0	296	41	36
14:00	0	3	2	16	68	134	76	**17**	0	0	0	0	0	**316**	42	37
15:00	0	**4**	1	**29**	**108**	157	93	10	**1**	0	0	0	0	**403**	41	36
16:00	0	0	**2**	8	38	**178**	93	**16**	0	0	0	0	0	335	42	38
17:00	0	0	1	9	61	150	**112**	11	1	0	0	0	0	345	42	38
18:00	0	2	2	10	66	147	62	13	1	0	0	0	0	303	41	37
19:00	0	0	2	15	73	93	40	4	0	0	0	0	0	227	40	36
20:00	0	0	0	8	51	57	18	4	1	0	0	0	0	139	39	36
21:00	0	0	0	4	18	36	14	2	0	0	0	0	0	74	40	36
22:00	0	0	0	5	16	22	17	3	0	0	0	**1**	0	64	42	37
23:00	0	0	0	1	6	16	11	1	0	0	0	0	0	35	42	38
Total	14	26	23	194	938	1900	1011	166	12	1	1	1	1	4288		
%	0.3%	0.6%	0.5%	4.5%	21.9%	44.3%	23.6%	3.9%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	04:00	06:00	05:00	09:00	07:00	08:00	08:00	08:00	06:00	09:00	08:00		08:00	08:00		
Vol.	1	3	2	16	54	127	72	13	3	1	1		1	247		
Midday Peak	13:00	11:00	13:00	13:00	13:00	12:00	13:00	14:00						14:00		
Vol.	5	3	3	22	71	143	78	17						316		
PM Peak		15:00	16:00	15:00	15:00	16:00	17:00	16:00	15:00			22:00		15:00		
Vol.		4	2	29	108	178	112	16	1			1		403		

% iles

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	2911
Percent in Pace :	67.9%
Number of Vehicles > 35 MPH :	2713
Percent of Vehicles > 35 MPH :	63.3%
Mean Speed(Average) :	37 MPH

Libby Industrial Parkway
at #169 Libbey Parkway
City, State: Weymouth, MA
Client: TTR/C.Jones

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154694 B Speed
Site Code: 14342892-15007
Date Start: 07-Oct-15

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/08/ 15	0	0	0	0	4	10	3	0	0	**1**	0	0	0	18	41	38
01:00	0	0	0	0	1	11	7	3	0	1	0	0	0	23	44	40
02:00	0	0	0	2	1	5	4	2	1	0	0	0	0	15	45	39
03:00	0	0	0	1	7	4	4	1	0	0	0	0	0	17	42	36
04:00	0	1	0	1	3	7	5	5	1	0	0	0	0	23	46	39
05:00	1	1	1	5	14	22	27	5	1	0	0	0	0	77	42	37
06:00	**2**	**6**	**9**	5	25	46	27	3	0	0	0	0	0	123	41	34
07:00	2	1	1	3	32	**125**	53	10	1	0	0	0	0	228	41	37
08:00	0	1	2	6	27	104	**66**	**13**	**3**	0	0	0	0	222	42	38
09:00	1	1	3	**8**	**37**	124	58	6	1	0	0	0	0	**239**	41	37
10:00	0	1	4	18	49	123	60	10	1	0	0	0	0	266	41	37
11:00	1	**4**	4	10	57	115	66	8	0	0	0	0	0	265	41	36
12 PM	**2**	0	**5**	11	62	126	56	8	1	0	0	0	0	271	41	36
13:00	0	0	1	8	71	129	**72**	**15**	**3**	0	0	0	0	299	42	37
14:00	2	0	2	**19**	**85**	**167**	70	14	1	**1**	0	0	0	**361**	41	37
15:00	0	**4**	3	**15**	**92**	**172**	81	17	0	**1**	**1**	0	0	**386**	41	37
16:00	0	2	0	9	67	154	**108**	**19**	2	0	0	0	0	361	42	38
17:00	0	2	**8**	12	70	144	75	15	**3**	0	0	0	0	329	41	37
18:00	0	0	1	9	60	161	51	11	1	0	0	0	0	294	40	37
19:00	**1**	0	0	9	53	115	43	3	1	0	0	0	0	225	40	36
20:00	0	0	3	6	44	65	28	4	2	0	0	0	0	152	41	36
21:00	0	0	0	3	16	41	19	5	1	0	0	0	0	85	42	38
22:00	0	0	0	2	19	16	20	2	0	0	0	0	0	59	42	37
23:00	0	0	0	1	16	14	14	1	0	0	0	0	0	46	41	37
Total	12	24	47	163	912	2000	1017	180	24	4	1	0	0	4384		
%	0.3%	0.5%	1.1%	3.7%	20.8%	45.6%	23.2%	4.1%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak	06:00	06:00	06:00	09:00	09:00	07:00	08:00	08:00	08:00	00:00				09:00		
Vol.	2	6	9	8	37	125	66	13	3	1				239		
Midday Peak	12:00	11:00	12:00	14:00	14:00	14:00	13:00	13:00	13:00	14:00				14:00		
Vol.	2	4	5	19	85	167	72	15	3	1				361		
PM Peak	19:00	15:00	17:00	15:00	15:00	15:00	16:00	16:00	17:00	15:00	15:00			15:00		
Vol.	1	4	8	15	92	172	108	19	3	1	1			386		

% iles

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	43 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3017
Percent in Pace :	68.8%
Number of Vehicles > 35 MPH :	2826
Percent of Vehicles > 35 MPH :	64.5%
Mean Speed(Average) :	37 MPH

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WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/07/ 15	0	0	0	0	2	1	1	1	0	**1**	0	0	0	6	54	41
01:00	0	0	0	0	0	0	0	1	0	0	0	0	0	1	48	47
02:00	0	0	0	0	1	2	3	0	0	0	0	0	0	6	42	39
03:00	0	0	0	1	1	3	4	0	2	0	0	0	0	11	49	40
04:00	0	0	0	0	7	15	15	10	**7**	1	0	0	0	55	48	42
05:00	**2**	1	0	2	14	47	22	12	0	0	0	0	0	100	43	38
06:00	0	**2**	1	6	35	84	63	10	1	0	0	0	0	202	42	38
07:00	1	1	1	6	37	133	**154**	24	2	0	0	0	0	359	43	39
08:00	0	2	1	**9**	49	**168**	146	**30**	4	1	0	0	0	**410**	43	39
09:00	0	0	**3**	6	**53**	111	95	29	3	0	0	0	0	300	43	38
10:00	0	1	6	10	57	124	65	16	3	0	0	0	0	282	42	37
11:00	**4**	3	2	8	50	106	75	13	0	**1**	0	0	0	262	42	37
12 PM	1	**5**	**3**	8	**54**	**150**	63	15	**2**	0	0	0	0	**301**	41	37
13:00	0	3	1	**10**	49	126	56	10	1	1	0	0	0	257	41	37
14:00	0	4	1	2	29	111	**77**	**20**	0	0	0	0	**1**	245	42	38
15:00	**1**	2	1	3	19	94	92	17	2	**2**	0	0	0	233	43	39
16:00	0	3	**2**	5	13	93	98	**28**	**5**	0	0	0	0	247	43	40
17:00	0	**4**	0	2	30	**107**	**105**	21	2	0	0	**1**	0	**272**	43	39
18:00	0	0	1	5	**55**	107	79	10	4	0	0	0	0	261	42	38
19:00	0	0	0	**8**	35	60	44	4	1	1	0	0	0	153	42	37
20:00	0	0	0	0	15	40	28	5	0	0	0	0	0	88	42	38
21:00	0	0	0	4	15	36	22	6	1	1	0	0	0	85	42	38
22:00	0	0	0	1	8	13	17	3	2	0	0	0	0	44	43	39
23:00	0	0	0	0	3	6	4	1	1	0	0	0	0	15	43	39
Total	9	31	23	96	631	1737	1328	286	43	9	0	1	1	4195		
%	0.2%	0.7%	0.5%	2.3%	15.0%	41.4%	31.7%	6.8%	1.0%	0.2%	0.0%	0.0%	0.0%			
AM Peak	05:00	06:00	09:00	08:00	09:00	08:00	07:00	08:00	04:00	00:00				08:00		
Vol.	2	2	3	9	53	168	154	30	7	1				410		
Midday Peak	11:00	12:00	12:00	13:00	12:00	12:00	14:00	14:00	12:00	11:00			14:00	12:00		
Vol.	4	5	3	10	54	150	77	20	2	1			1	301		
PM Peak	15:00	17:00	16:00	19:00	18:00	17:00	17:00	16:00	16:00	15:00		17:00		17:00		
Vol.	1	4	2	8	55	107	105	28	5	2		1		272		

% iles	
15th Percentile :	32 MPH
50th Percentile :	37 MPH
85th Percentile :	42 MPH
95th Percentile :	46 MPH

Stats	
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3065
Percent in Pace :	73.1%
Number of Vehicles > 35 MPH :	3058
Percent of Vehicles > 35 MPH :	72.9%
Mean Speed(Average) :	38 MPH

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154694 B Speed
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Date Start: 07-Oct-15

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
10/08/ 15	0	0	0	0	0	5	3	0	0	0	0	0	0	8	42	39
01:00	0	0	0	0	0	1	1	1	0	0	0	0	0	3	46	42
02:00	0	0	0	0	0	3	3	0	0	0	0	0	0	6	42	40
03:00	0	0	0	0	2	7	6	1	0	0	0	0	0	16	42	39
04:00	0	0	0	2	2	17	14	13	3	0	0	0	0	51	47	41
05:00	1	0	0	4	13	36	39	11	1	0	0	**1**	0	106	43	39
06:00	0	1	1	**13**	36	94	42	9	1	0	0	0	0	197	41	37
07:00	0	**2**	0	5	41	144	**124**	**24**	1	0	0	0	0	341	42	39
08:00	0	2	**3**	7	**77**	**166**	124	19	**4**	**2**	0	0	0	**404**	42	38
09:00	**2**	0	2	12	59	124	83	17	2	0	0	0	0	301	42	37
10:00	0	1	1	3	36	131	98	13	2	0	0	0	0	285	42	38
11:00	0	4	1	**9**	46	92	75	**16**	1	0	0	0	0	244	42	38
12 PM	0	2	2	8	**57**	129	72	15	1	0	0	0	0	286	42	37
13:00	**1**	2	**4**	3	38	117	77	15	2	0	**1**	0	0	260	42	38
14:00	0	**7**	1	5	30	**139**	**108**	15	**3**	0	0	0	0	**308**	42	38
15:00	0	**3**	0	2	26	**105**	96	20	**3**	0	**1**	0	0	256	43	39
16:00	0	2	0	**6**	**31**	84	113	**29**	2	0	0	**1**	0	**268**	43	39
17:00	0	3	2	2	24	82	**116**	26	2	**1**	0	0	0	258	43	40
18:00	0	2	**3**	2	30	94	72	15	0	0	1	0	0	219	42	38
19:00	0	0	0	0	23	67	36	9	1	0	0	0	0	136	42	38
20:00	0	1	1	0	19	52	26	6	1	0	1	0	0	107	42	38
21:00	0	0	0	0	12	27	18	4	0	0	0	0	0	61	42	38
22:00	0	0	0	0	7	25	14	0	0	0	0	0	0	46	41	38
23:00	0	0	0	0	2	14	6	2	1	0	0	0	0	25	43	39
Total	4	32	21	83	611	1755	1366	280	31	3	4	2	0	4192		
%	0.1%	0.8%	0.5%	2.0%	14.6%	41.9%	32.6%	6.7%	0.7%	0.1%	0.1%	0.0%	0.0%			
AM Peak	09:00	07:00	08:00	06:00	08:00	08:00	07:00	07:00	08:00	08:00		05:00		08:00		
Vol.	2	2	3	13	77	166	124	24	4	2		1		404		
Midday Peak	13:00	14:00	13:00	11:00	12:00	14:00	14:00	11:00	14:00		13:00			14:00		
Vol.	1	7	4	9	57	139	108	16	3		1			308		
PM Peak		15:00	18:00	16:00	16:00	15:00	17:00	16:00	15:00	17:00	15:00	16:00		16:00		
Vol.		3	3	6	31	105	116	29	3	1	1	1		268		

% iles	
15th Percentile :	32 MPH
50th Percentile :	37 MPH
85th Percentile :	42 MPH
95th Percentile :	45 MPH

Stats	
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3121
Percent in Pace :	74.5%
Number of Vehicles > 35 MPH :	3090
Percent of Vehicles > 35 MPH :	73.7%
Mean Speed(Average) :	38 MPH

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154694 B Volume
Site Code: 14342892-15007
Date Start: 07-Oct-15

Start	EB				WB				Combined				07-Oct-15
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	6		78		1		75		7		153		
12:15	4		72		3		70		7		142		
12:30	3		68		2		83		5		151		
12:45	1	14	69	287	0	6	73	301	1	20	142	588	
01:00	3		82		1		64		4		146		
01:15	3		69		0		68		3		137		
01:30	4		67		0		62		4		129		
01:45	7	17	78	296	0	1	63	257	7	18	141	553	
02:00	7		68		2		55		9		123		
02:15	2		80		2		59		4		139		
02:30	0		87		1		65		1		152		
02:45	2	11	81	316	1	6	66	245	3	17	147	561	
03:00	5		100		1		59		6		159		
03:15	4		82		0		59		4		141		
03:30	5		126		1		62		6		188		
03:45	2	16	95	403	9	11	53	233	11	27	148	636	
04:00	2		89		8		78		10		167		
04:15	3		88		13		52		16		140		
04:30	7		77		13		46		20		123		
04:45	7	19	81	335	21	55	71	247	28	74	152	582	
05:00	12		100		24		101		36		201		
05:15	19		75		26		64		45		139		
05:30	19		84		28		52		47		136		
05:45	24	74	86	345	22	100	55	272	46	174	141	617	
06:00	31		75		32		67		63		142		
06:15	22		81		40		40		62		121		
06:30	29		68		65		81		94		149		
06:45	35	117	79	303	65	202	73	261	100	319	152	564	
07:00	52		68		71		52		123		120		
07:15	58		49		76		37		134		86		
07:30	44		71		98		33		142		104		
07:45	55	209	39	227	114	359	31	153	169	568	70	380	
08:00	56		39		119		24		175		63		
08:15	58		37		120		18		178		55		
08:30	58		31		92		23		150		54		
08:45	75	247	32	139	79	410	23	88	154	657	55	227	
09:00	54		18		84		28		138		46		
09:15	56		16		88		22		144		38		
09:30	62		24		55		17		117		41		
09:45	69	241	16	74	73	300	18	85	142	541	34	159	
10:00	60		21		73		16		133		37		
10:15	52		15		63		11		115		26		
10:30	53		17		64		8		117		25		
10:45	63	228	11	64	82	282	9	44	145	510	20	108	
11:00	74		10		67		3		141		13		
11:15	64		8		73		2		137		10		
11:30	54		10		63		5		117		15		
11:45	79	271	7	35	59	262	5	15	138	533	12	50	
Total	1464		2824		1994		2201		3458		5025		
Percent	42.3%		56.2%		57.7%		43.8%						
Day Total		4288				4195				8483			
Peak	11:00	-	03:00	-	07:30	-	12:00	-	07:45	-	03:15	-	-	-
Vol.	271	-	403	-	451	-	301	-	672	-	644	-	-	-
P.H.F.	0.858		0.800		0.940		0.907		0.944		0.856			

Libby Industrial Parkway
at #169 Libbey Parkway
City, State: Weymouth, MA
Client: TTR/C.Jones

PRECISION
D A T A
INDUSTRIES, LLC
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154694 B Volume
Site Code: 14342892-15007
Date Start: 07-Oct-15

Start	EB				WB				Combined				08-Oct-15
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	8		73		3		76		11		149		
12:15	3		62		3		58		6		120		
12:30	3		74		1		70		4		144		
12:45	4	18	62	271	1	8	82	286	5	26	144	557	
01:00	6		76		1		67		7		143		
01:15	5		66		2		64		7		130		
01:30	7		76		0		68		7		144		
01:45	5	23	81	299	0	3	61	260	5	26	142	559	
02:00	6		88		2		83		8		171		
02:15	2		85		1		68		3		153		
02:30	4		79		2		75		6		154		
02:45	3	15	109	361	1	6	82	308	4	21	191	669	
03:00	4		95		1		70		5		165		
03:15	5		93		3		64		8		157		
03:30	3		100		7		65		10		165		
03:45	5	17	98	386	5	16	57	256	10	33	155	642	
04:00	3		83		14		59		17		142		
04:15	7		90		12		67		19		157		
04:30	6		96		14		71		20		167		
04:45	7	23	92	361	11	51	71	268	18	74	163	629	
05:00	10		93		31		82		41		175		
05:15	19		89		22		71		41		160		
05:30	16		68		27		56		43		124		
05:45	32	77	79	329	26	106	49	258	58	183	128	587	
06:00	28		70		32		59		60		129		
06:15	18		81		42		47		60		128		
06:30	38		55		54		69		92		124		
06:45	39	123	88	294	69	197	44	219	108	320	132	513	
07:00	71		51		82		53		153		104		
07:15	56		67		64		35		120		102		
07:30	47		55		107		30		154		85		
07:45	54	228	52	225	88	341	18	136	142	569	70	361	
08:00	57		48		110		45		167		93		
08:15	44		38		117		19		161		57		
08:30	49		38		83		16		132		54		
08:45	72	222	28	152	94	404	27	107	166	626	55	259	
09:00	70		26		81		13		151		39		
09:15	51		22		79		22		130		44		
09:30	52		17		69		17		121		34		
09:45	66	239	20	85	72	301	9	61	138	540	29	146	
10:00	65		13		75		14		140		27		
10:15	65		19		80		13		145		32		
10:30	68		20		56		6		124		26		
10:45	68	266	7	59	74	285	13	46	142	551	20	105	
11:00	48		19		51		7		99		26		
11:15	79		12		68		6		147		18		
11:30	67		11		59		8		126		19		
11:45	71	265	4	46	66	244	4	25	137	509	8	71	
Total	1516		2868		1962		2230		3478		5098		
Percent	43.6%		56.3%		56.4%		43.7%						
Day Total		4384				4192				8576			
Peak	10:00	-	02:45	-	07:30	-	02:00	-	08:00	-	02:45	-	-	-
Vol.	266	-	397	-	422	-	308	-	626	-	678	-	-	-
P.H.F.	0.978		0.911		0.902		0.928		0.937		0.887			

N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

PRECISION DATA INDUSTRIES, LLC
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File Name : 154509 A
Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Middle Street From North				Libbey Industrial Parkway From East				Middle Street From South				Tara Drive From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	1	63	38	0	24	0	36	0	57	54	0	0	5	1	1	0	280
07:15 AM	0	54	33	0	27	0	29	0	56	68	1	0	3	1	2	0	274
07:30 AM	0	80	20	0	32	0	37	0	54	88	0	0	0	1	1	0	313
07:45 AM	0	64	32	0	25	0	44	0	69	91	0	0	5	0	2	0	332
Total	1	261	123	0	108	0	146	0	236	301	1	0	13	3	6	0	1199
08:00 AM	0	89	29	0	30	0	47	0	45	73	2	0	3	1	0	0	319
08:15 AM	0	114	50	0	35	0	37	0	58	67	1	0	3	1	2	0	368
08:30 AM	1	72	29	0	33	0	40	0	55	76	1	0	2	0	2	0	311
08:45 AM	1	88	30	0	27	0	41	0	82	77	2	0	3	0	0	0	351
Total	2	363	138	0	125	0	165	0	240	293	6	0	11	2	4	0	1349
Grand Total	3	624	261	0	233	0	311	0	476	594	7	0	24	5	10	0	2548
Apprch %	0.3	70.3	29.4	0	42.8	0	57.2	0	44.2	55.2	0.6	0	61.5	12.8	25.6	0	
Total %	0.1	24.5	10.2	0	9.1	0	12.2	0	18.7	23.3	0.3	0	0.9	0.2	0.4	0	
Cars	3	602	255	0	225	0	279	0	450	567	7	0	24	5	10	0	2427
% Cars	100	96.5	97.7	0	96.6	0	89.7	0	94.5	95.5	100	0	100	100	100	0	95.3
Heavy Vehicles	0	22	6	0	8	0	32	0	26	27	0	0	0	0	0	0	121
% Heavy Vehicles	0	3.5	2.3	0	3.4	0	10.3	0	5.5	4.5	0	0	0	0	0	0	4.7

	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	89	29	0	118	30	0	47	0	77	45	73	2	0	120	3	1	0	0	4	319
08:15 AM	0	114	50	0	164	35	0	37	0	72	58	67	1	0	126	3	1	2	0	6	368
08:30 AM	1	72	29	0	102	33	0	40	0	73	55	76	1	0	132	2	0	2	0	4	311
08:45 AM	1	88	30	0	119	27	0	41	0	68	82	77	2	0	161	3	0	0	0	3	351
Total Volume	2	363	138	0	503	125	0	165	0	290	240	293	6	0	539	11	2	4	0	17	1349
% App. Total	0.4	72.2	27.4	0		43.1	0	56.9	0		44.5	54.4	1.1	0		64.7	11.8	23.5	0		
PHF	.500	.796	.690	.000	.767	.893	.000	.878	.000	.942	.732	.951	.750	.000	.837	.917	.500	.500	.000	.708	.916
Cars	2	348	135	0	485	118	0	149	0	267	224	284	6	0	514	11	2	4	0	17	1283
% Cars	100	95.9	97.8	0	96.4	94.4	0	90.3	0	92.1	93.3	96.9	100	0	95.4	100	100	100	0	100	95.1
Heavy Vehicles	0	15	3	0	18	7	0	16	0	23	16	9	0	0	25	0	0	0	0	0	66
% Heavy Vehicles	0	4.1	2.2	0	3.6	5.6	0	9.7	0	7.9	6.7	3.1	0	0	4.6	0	0	0	0	0	4.9

N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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File Name : 154509 A
Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

Groups Printed- Cars

	Middle Street From North				Libbey Industrial Parkway From East				Middle Street From South				Tara Drive From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	1	62	37	0	24	0	31	0	56	47	0	0	5	1	1	0	265
07:15 AM	0	52	33	0	27	0	21	0	53	67	1	0	3	1	2	0	260
07:30 AM	0	77	19	0	31	0	36	0	52	84	0	0	0	1	1	0	301
07:45 AM	0	63	31	0	25	0	42	0	65	85	0	0	5	0	2	0	318
Total	1	254	120	0	107	0	130	0	226	283	1	0	13	3	6	0	1144
08:00 AM	0	87	28	0	28	0	42	0	42	72	2	0	3	1	0	0	305
08:15 AM	0	108	48	0	32	0	36	0	55	65	1	0	3	1	2	0	351
08:30 AM	1	67	29	0	32	0	37	0	51	72	1	0	2	0	2	0	294
08:45 AM	1	86	30	0	26	0	34	0	76	75	2	0	3	0	0	0	333
Total	2	348	135	0	118	0	149	0	224	284	6	0	11	2	4	0	1283
Grand Total	3	602	255	0	225	0	279	0	450	567	7	0	24	5	10	0	2427
Apprch %	0.3	70	29.7	0	44.6	0	55.4	0	43.9	55.4	0.7	0	61.5	12.8	25.6	0	
Total %	0.1	24.8	10.5	0	9.3	0	11.5	0	18.5	23.4	0.3	0	1	0.2	0.4	0	

	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	87	28	0	115	28	0	42	0	70	42	72	2	0	116	3	1	0	0	4	305
08:15 AM	0	108	48	0	156	32	0	36	0	68	55	65	1	0	121	3	1	2	0	6	351
08:30 AM	1	67	29	0	97	32	0	37	0	69	51	72	1	0	124	2	0	2	0	4	294
08:45 AM	1	86	30	0	117	26	0	34	0	60	76	75	2	0	153	3	0	0	0	3	333
Total Volume	2	348	135	0	485	118	0	149	0	267	224	284	6	0	514	11	2	4	0	17	1283
% App. Total	0.4	71.8	27.8	0		44.2	0	55.8	0		43.6	55.3	1.2	0		64.7	11.8	23.5	0		
PHF	.500	.806	.703	.000	.777	.922	.000	.887	.000	.954	.737	.947	.750	.000	.840	.917	.500	.500	.000	.708	.914

N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
City, State: Weymouth, MA
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PRECISION DATA INDUSTRIES, LLC
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File Name : 154509 A
Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

Groups Printed- Heavy Vehicles

	Middle Street From North				Libbey Industrial Parkway From East				Middle Street From South				Tara Drive From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	1	1	0	0	0	5	0	1	7	0	0	0	0	0	0	15
07:15 AM	0	2	0	0	0	0	8	0	3	1	0	0	0	0	0	0	14
07:30 AM	0	3	1	0	1	0	1	0	2	4	0	0	0	0	0	0	12
07:45 AM	0	1	1	0	0	0	2	0	4	6	0	0	0	0	0	0	14
Total	0	7	3	0	1	0	16	0	10	18	0	0	0	0	0	0	55
08:00 AM	0	2	1	0	2	0	5	0	3	1	0	0	0	0	0	0	14
08:15 AM	0	6	2	0	3	0	1	0	3	2	0	0	0	0	0	0	17
08:30 AM	0	5	0	0	1	0	3	0	4	4	0	0	0	0	0	0	17
08:45 AM	0	2	0	0	1	0	7	0	6	2	0	0	0	0	0	0	18
Total	0	15	3	0	7	0	16	0	16	9	0	0	0	0	0	0	66
Grand Total	0	22	6	0	8	0	32	0	26	27	0	0	0	0	0	0	121
Apprch %	0	78.6	21.4	0	20	0	80	0	49.1	50.9	0	0	0	0	0	0	
Total %	0	18.2	5	0	6.6	0	26.4	0	21.5	22.3	0	0	0	0	0	0	

	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	2	1	0	3	2	0	5	0	7	3	1	0	0	4	0	0	0	0	0	14
08:15 AM	0	6	2	0	8	3	0	1	0	4	3	2	0	0	5	0	0	0	0	0	17
08:30 AM	0	5	0	0	5	1	0	3	0	4	4	4	0	0	8	0	0	0	0	0	17
08:45 AM	0	2	0	0	2	1	0	7	0	8	6	2	0	0	8	0	0	0	0	0	18
Total Volume	0	15	3	0	18	7	0	16	0	23	16	9	0	0	25	0	0	0	0	0	66
% App. Total	0	83.3	16.7	0		30.4	0	69.6	0		64	36	0	0		0	0	0	0		
PHF	.000	.625	.375	.000	.563	.583	.000	.571	.000	.719	.667	.563	.000	.000	.781	.000	.000	.000	.000	.000	.917

N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
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Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

Groups Printed- Peds and Bikes

	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5
Grand Total	0	0	0	0	0	0	0	0	0	5	0	0	0	0	1	0	0	0	1	0	7
Apprch %	0	0	0	0	0	0	0	0	0	100	0	0	0	0	100	0	0	0	100	0	
Total %	0	0	0	0	0	0	0	0	0	71.4	0	0	0	0	14.3	0	0	0	14.3	0	

	Middle Street From North						Libbey Industrial Parkway From East						Middle Street From South						Tara Drive From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 08:00 AM																									
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	5
% App. Total	0	0	0	0	0		0	0	0	0	100		0	0	0	0	0		0	0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.417	.417	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.417

N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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Site Code : 42892140
Start Date : 6/17/2015
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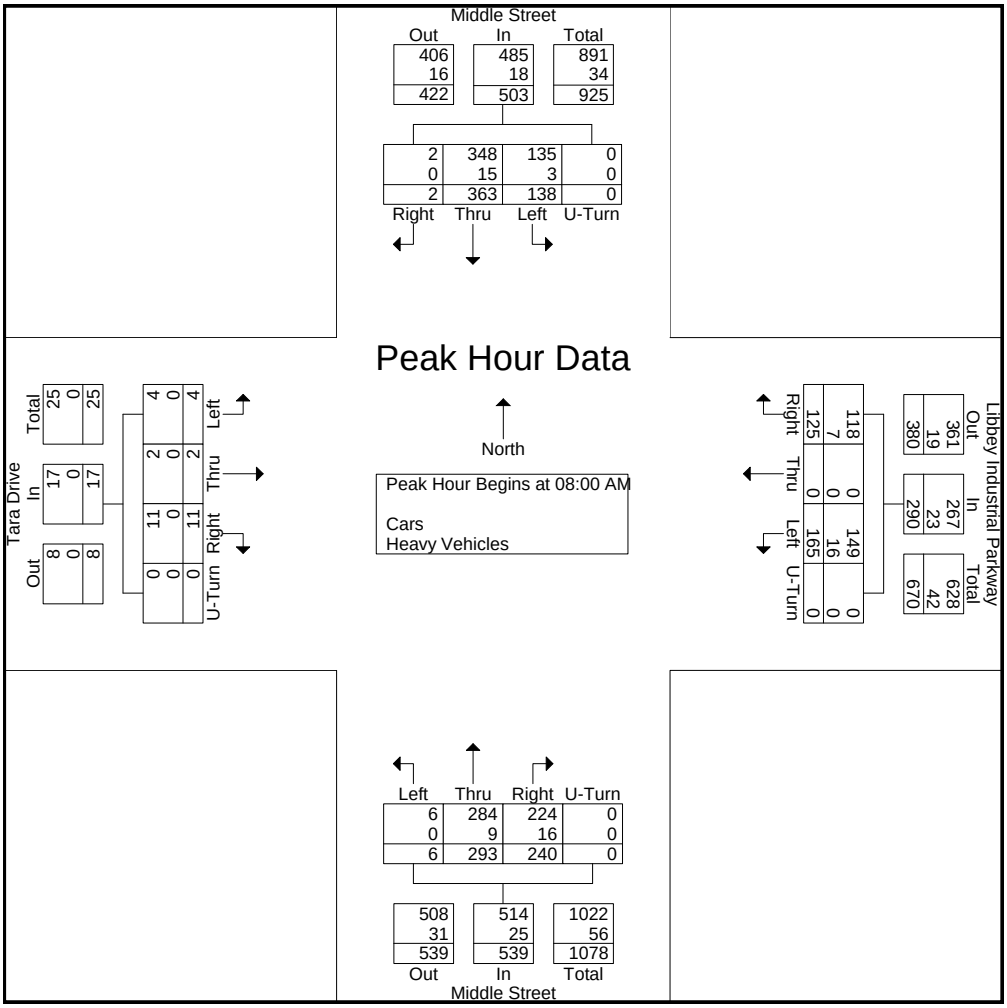
	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	89	29	0	118	30	0	47	0	77	45	73	2	0	120	3	1	0	0	4	319
08:15 AM	0	114	50	0	164	35	0	37	0	72	58	67	1	0	126	3	1	2	0	6	368
08:30 AM	1	72	29	0	102	33	0	40	0	73	55	76	1	0	132	2	0	2	0	4	311
08:45 AM	1	88	30	0	119	27	0	41	0	68	82	77	2	0	161	3	0	0	0	3	351
Total Volume	2	363	138	0	503	125	0	165	0	290	240	293	6	0	539	11	2	4	0	17	1349
% App. Total	0.4	72.2	27.4	0		43.1	0	56.9	0		44.5	54.4	1.1	0		64.7	11.8	23.5	0		
PHF	.500	.796	.690	.000	.767	.893	.000	.878	.000	.942	.732	.951	.750	.000	.837	.917	.500	.500	.000	.708	.916
Cars	2	348	135	0	485	118	0	149	0	267	224	284	6	0	514	11	2	4	0	17	1283
% Cars	100	95.9	97.8	0	96.4	94.4	0	90.3	0	92.1	93.3	96.9	100	0	95.4	100	100	100	0	100	95.1
Heavy Vehicles	0	15	3	0	18	7	0	16	0	23	16	9	0	0	25	0	0	0	0	0	66
% Heavy Vehicles	0	4.1	2.2	0	3.6	5.6	0	9.7	0	7.9	6.7	3.1	0	0	4.6	0	0	0	0	0	4.9



N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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File Name : 154509 AA
Site Code : 42892140
Start Date : 6/17/2015
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Groups Printed- Cars - Heavy Vehicles

	Middle Street From North				Libbey Industrial Parkway From East				Middle Street From South				Tara Drive From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	2	117	34	0	60	0	49	0	58	90	1	0	2	0	0	0	413
04:15 PM	2	89	40	0	44	0	54	0	57	110	6	0	0	1	0	0	403
04:30 PM	3	82	28	0	37	2	70	0	49	117	4	0	0	1	2	0	395
04:45 PM	0	101	32	0	48	0	43	0	51	103	5	0	2	0	0	0	385
Total	7	389	134	0	189	2	216	0	215	420	16	0	4	2	2	0	1596
05:00 PM	2	111	33	0	72	0	66	0	58	142	3	0	2	0	0	0	489
05:15 PM	1	101	32	0	44	0	52	0	53	118	2	0	2	0	1	0	406
05:30 PM	2	116	28	0	46	0	45	0	45	121	0	0	0	0	1	0	404
05:45 PM	2	113	36	0	33	0	42	0	43	87	2	0	1	0	3	0	362
Total	7	441	129	0	195	0	205	0	199	468	7	0	5	0	5	0	1661
Grand Total	14	830	263	0	384	2	421	0	414	888	23	0	9	2	7	0	3257
Apprch %	1.3	75	23.8	0	47.6	0.2	52.2	0	31.2	67	1.7	0	50	11.1	38.9	0	
Total %	0.4	25.5	8.1	0	11.8	0.1	12.9	0	12.7	27.3	0.7	0	0.3	0.1	0.2	0	
Cars	14	813	257	0	380	2	412	0	399	877	22	0	9	2	7	0	3194
% Cars	100	98	97.7	0	99	100	97.9	0	96.4	98.8	95.7	0	100	100	100	0	98.1
Heavy Vehicles	0	17	6	0	4	0	9	0	15	11	1	0	0	0	0	0	63
% Heavy Vehicles	0	2	2.3	0	1	0	2.1	0	3.6	1.2	4.3	0	0	0	0	0	1.9

	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	101	32	0	133	48	0	43	0	91	51	103	5	0	159	2	0	0	0	2	385
05:00 PM	2	111	33	0	146	72	0	66	0	138	58	142	3	0	203	2	0	0	0	2	489
05:15 PM	1	101	32	0	134	44	0	52	0	96	53	118	2	0	173	2	0	1	0	3	406
05:30 PM	2	116	28	0	146	46	0	45	0	91	45	121	0	0	166	0	0	1	0	1	404
Total Volume	5	429	125	0	559	210	0	206	0	416	207	484	10	0	701	6	0	2	0	8	1684
% App. Total	0.9	76.7	22.4	0		50.5	0	49.5	0		29.5	69	1.4	0		75	0	25	0		
PHF	.625	.925	.947	.000	.957	.729	.000	.780	.000	.754	.892	.852	.500	.000	.863	.750	.000	.500	.000	.667	.861
Cars	5	421	122	0	548	210	0	204	0	414	195	479	10	0	684	6	0	2	0	8	1654
% Cars	100	98.1	97.6	0	98.0	100	0	99.0	0	99.5	94.2	99.0	100	0	97.6	100	0	100	0	100	98.2
Heavy Vehicles	0	8	3	0	11	0	0	2	0	2	12	5	0	0	17	0	0	0	0	0	30
% Heavy Vehicles	0	1.9	2.4	0	2.0	0	0	1.0	0	0.5	5.8	1.0	0	0	2.4	0	0	0	0	0	1.8

N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
City, State: Weymouth, MA
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File Name : 154509 AA
Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

Groups Printed- Cars

	Middle Street From North				Libbey Industrial Parkway From East				Middle Street From South				Tara Drive From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	2	114	33	0	59	0	45	0	57	88	1	0	2	0	0	0	401
04:15 PM	2	88	39	0	43	0	54	0	57	110	6	0	0	1	0	0	400
04:30 PM	3	79	27	0	35	2	67	0	47	113	4	0	0	1	2	0	380
04:45 PM	0	98	31	0	48	0	43	0	48	102	5	0	2	0	0	0	377
Total	7	379	130	0	185	2	209	0	209	413	16	0	4	2	2	0	1558
05:00 PM	2	110	33	0	72	0	66	0	52	140	3	0	2	0	0	0	480
05:15 PM	1	98	31	0	44	0	50	0	52	118	2	0	2	0	1	0	399
05:30 PM	2	115	27	0	46	0	45	0	43	119	0	0	0	0	1	0	398
05:45 PM	2	111	36	0	33	0	42	0	43	87	1	0	1	0	3	0	359
Total	7	434	127	0	195	0	203	0	190	464	6	0	5	0	5	0	1636
Grand Total	14	813	257	0	380	2	412	0	399	877	22	0	9	2	7	0	3194
Apprch %	1.3	75	23.7	0	47.9	0.3	51.9	0	30.7	67.6	1.7	0	50	11.1	38.9	0	
Total %	0.4	25.5	8	0	11.9	0.1	12.9	0	12.5	27.5	0.7	0	0.3	0.1	0.2	0	

	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	98	31	0	129	48	0	43	0	91	48	102	5	0	155	2	0	0	0	2	377
05:00 PM	2	110	33	0	145	72	0	66	0	138	52	140	3	0	195	2	0	0	0	2	480
05:15 PM	1	98	31	0	130	44	0	50	0	94	52	118	2	0	172	2	0	1	0	3	399
05:30 PM	2	115	27	0	144	46	0	45	0	91	43	119	0	0	162	0	0	1	0	1	398
Total Volume	5	421	122	0	548	210	0	204	0	414	195	479	10	0	684	6	0	2	0	8	1654
% App. Total	0.9	76.8	22.3	0		50.7	0	49.3	0		28.5	70	1.5	0		75	0	25	0		
PHF	.625	.915	.924	.000	.945	.729	.000	.773	.000	.750	.938	.855	.500	.000	.877	.750	.000	.500	.000	.667	.861

N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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File Name : 154509 AA
Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

Groups Printed- Heavy Vehicles

	Middle Street From North				Libbey Industrial Parkway From East				Middle Street From South				Tara Drive From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	3	1	0	1	0	4	0	1	2	0	0	0	0	0	0	12
04:15 PM	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	3
04:30 PM	0	3	1	0	2	0	3	0	2	4	0	0	0	0	0	0	15
04:45 PM	0	3	1	0	0	0	0	0	3	1	0	0	0	0	0	0	8
Total	0	10	4	0	4	0	7	0	6	7	0	0	0	0	0	0	38
05:00 PM	0	1	0	0	0	0	0	0	6	2	0	0	0	0	0	0	9
05:15 PM	0	3	1	0	0	0	2	0	1	0	0	0	0	0	0	0	7
05:30 PM	0	1	1	0	0	0	0	0	2	2	0	0	0	0	0	0	6
05:45 PM	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
Total	0	7	2	0	0	0	2	0	9	4	1	0	0	0	0	0	25
Grand Total	0	17	6	0	4	0	9	0	15	11	1	0	0	0	0	0	63
Apprch %	0	73.9	26.1	0	30.8	0	69.2	0	55.6	40.7	3.7	0	0	0	0	0	
Total %	0	27	9.5	0	6.3	0	14.3	0	23.8	17.5	1.6	0	0	0	0	0	

	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	3	1	0	4	2	0	3	0	5	2	4	0	0	6	0	0	0	0	0	15
04:45 PM	0	3	1	0	4	0	0	0	0	0	3	1	0	0	4	0	0	0	0	0	8
05:00 PM	0	1	0	0	1	0	0	0	0	0	6	2	0	0	8	0	0	0	0	0	9
05:15 PM	0	3	1	0	4	0	0	2	0	2	1	0	0	0	1	0	0	0	0	0	7
Total Volume	0	10	3	0	13	2	0	5	0	7	12	7	0	0	19	0	0	0	0	0	39
% App. Total	0	76.9	23.1	0		28.6	0	71.4	0		63.2	36.8	0	0		0	0	0	0		
PHF	.000	.833	.750	.000	.813	.250	.000	.417	.000	.350	.500	.438	.000	.000	.594	.000	.000	.000	.000	.000	.650

N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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Site Code : 42892140
Start Date : 6/17/2015
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Groups Printed- Peds and Bikes

	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	4
04:30 PM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	0	5	2	0	0	0	0	0	0	0	0	0	8
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	3
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	1	6
Grand Total	1	0	0	0	0	0	0	0	0	5	2	0	0	1	0	0	0	0	4	1	14
Apprch %	100	0	0	0	0	0	0	0	0	100	66.7	0	0	33.3	0	0	0	0	80	20	
Total %	7.1	0	0	0	0	0	0	0	0	35.7	14.3	0	0	7.1	0	0	0	0	28.6	7.1	

	Middle Street From North						Libbey Industrial Parkway From East						Middle Street From South						Tara Drive From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:00 PM																									
04:00 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	3	3	1	0	0	0	0	1	0	0	0	0	0	0	4
04:30 PM	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	0	0	1	0	0	0	0	5	5	2	0	0	0	0	2	0	0	0	0	0	0	8
% App. Total	100	0	0	0	0		0	0	0	0	100		100	0	0	0	0		0	0	0	0	0		
PHF	.250	.000	.000	.000	.000	.250	.000	.000	.000	.000	.417	.417	.500	.000	.000	.000	.000	.500	.000	.000	.000	.000	.000	.000	.500

N/S: Middle Street
E/W: Libbey Industrial Pkwy/ Tara Drive
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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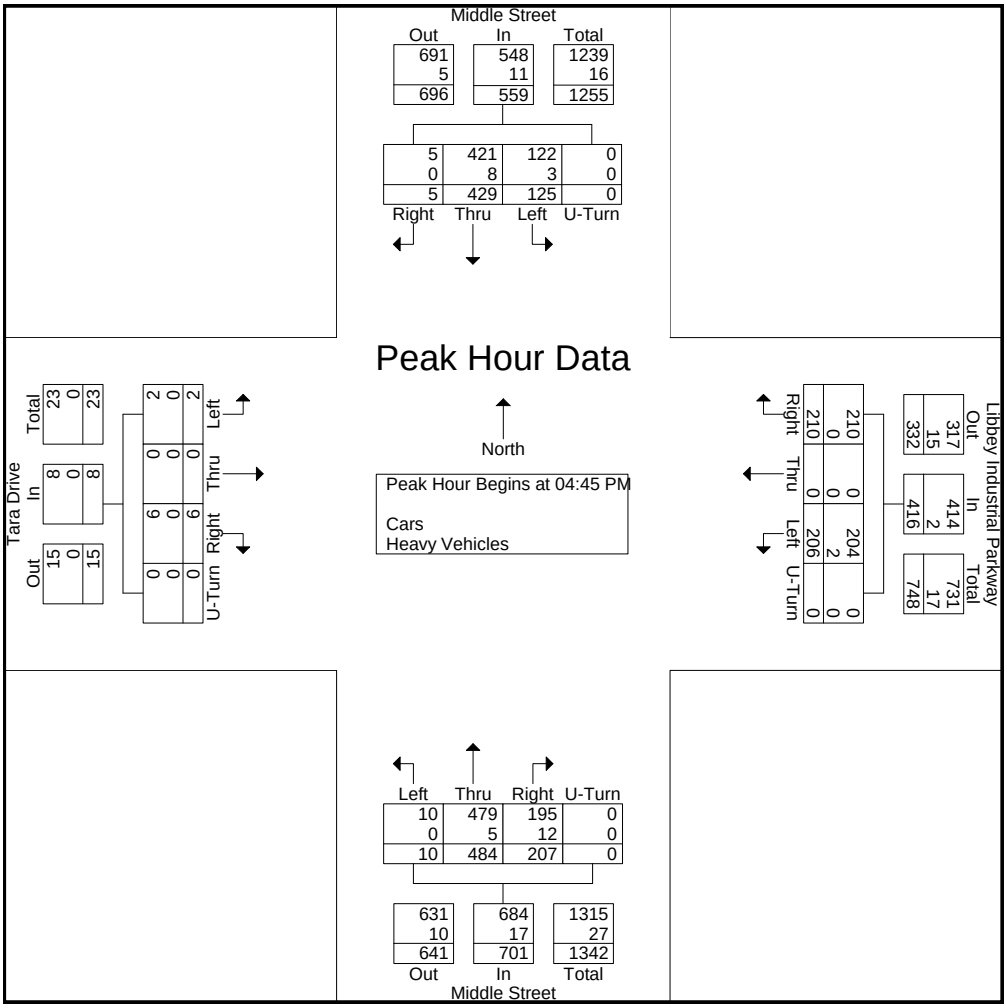
	Middle Street From North					Libbey Industrial Parkway From East					Middle Street From South					Tara Drive From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	101	32	0	133	48	0	43	0	91	51	103	5	0	159	2	0	0	0	2	385
05:00 PM	2	111	33	0	146	72	0	66	0	138	58	142	3	0	203	2	0	0	0	2	489
05:15 PM	1	101	32	0	134	44	0	52	0	96	53	118	2	0	173	2	0	1	0	3	406
05:30 PM	2	116	28	0	146	46	0	45	0	91	45	121	0	0	166	0	0	1	0	1	404
Total Volume	5	429	125	0	559	210	0	206	0	416	207	484	10	0	701	6	0	2	0	8	1684
% App. Total	0.9	76.7	22.4	0		50.5	0	49.5	0		29.5	69	1.4	0		75	0	25	0		
PHF	.625	.925	.947	.000	.957	.729	.000	.780	.000	.754	.892	.852	.500	.000	.863	.750	.000	.500	.000	.667	.861
Cars	5	421	122	0	548	210	0	204	0	414	195	479	10	0	684	6	0	2	0	8	1654
% Cars	100	98.1	97.6	0	98.0	100	0	99.0	0	99.5	94.2	99.0	100	0	97.6	100	0	100	0	100	98.2
Heavy Vehicles	0	8	3	0	11	0	0	2	0	2	12	5	0	0	17	0	0	0	0	0	30
% Heavy Vehicles	0	1.9	2.4	0	2.0	0	0	1.0	0	0.5	5.8	1.0	0	0	2.4	0	0	0	0	0	1.8



N/S: Pleasant Street
E/W: Driveway/ Libbey Industrial Pkwy
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 154509 B
Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Pleasant Street From North				Driveway From East				Pleasant Street From South				Libbey Industrial Parkway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	19	237	0	0	0	0	0	0	0	174	65	0	41	0	9	0	545
07:15 AM	24	217	0	0	1	0	0	0	0	263	61	0	33	0	4	0	603
07:30 AM	29	140	0	0	0	0	0	0	0	260	95	0	19	0	9	0	552
07:45 AM	52	162	0	0	0	0	0	0	0	252	85	0	30	0	13	0	594
Total	124	756	0	0	1	0	0	0	0	949	306	0	123	0	35	0	2294
08:00 AM	28	153	0	0	0	0	0	0	0	229	96	0	24	0	8	0	538
08:15 AM	44	164	0	0	0	0	0	0	0	213	82	0	39	0	18	0	560
08:30 AM	32	159	0	0	0	0	0	0	0	176	85	0	23	0	14	0	489
08:45 AM	41	154	0	0	0	0	0	0	0	198	80	0	42	0	11	0	526
Total	145	630	0	0	0	0	0	0	0	816	343	0	128	0	51	0	2113
Grand Total	269	1386	0	0	1	0	0	0	0	1765	649	0	251	0	86	0	4407
Apprch %	16.3	83.7	0	0	100	0	0	0	0	73.1	26.9	0	74.5	0	25.5	0	
Total %	6.1	31.4	0	0	0	0	0	0	0	40	14.7	0	5.7	0	2	0	
Cars	260	1284	0	0	1	0	0	0	0	1659	611	0	224	0	77	0	4116
% Cars	96.7	92.6	0	0	100	0	0	0	0	94	94.1	0	89.2	0	89.5	0	93.4
Heavy Vehicles	9	102	0	0	0	0	0	0	0	106	38	0	27	0	9	0	291
% Heavy Vehicles	3.3	7.4	0	0	0	0	0	0	0	6	5.9	0	10.8	0	10.5	0	6.6

	Pleasant Street From North					Driveway From East					Pleasant Street From South					Libbey Industrial Parkway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	19	237	0	0	256	0	0	0	0	0	0	174	65	0	239	41	0	9	0	50	545
07:15 AM	24	217	0	0	241	1	0	0	0	1	0	263	61	0	324	33	0	4	0	37	603
07:30 AM	29	140	0	0	169	0	0	0	0	0	0	260	95	0	355	19	0	9	0	28	552
07:45 AM	52	162	0	0	214	0	0	0	0	0	0	252	85	0	337	30	0	13	0	43	594
Total Volume	124	756	0	0	880	1	0	0	0	1	0	949	306	0	1255	123	0	35	0	158	2294
% App. Total	14.1	85.9	0	0		100	0	0	0		0	75.6	24.4	0		77.8	0	22.2	0		
PHF	.596	.797	.000	.000	.859	.250	.000	.000	.000	.250	.000	.902	.805	.000	.884	.750	.000	.673	.000	.790	.951
Cars	120	708	0	0	828	1	0	0	0	1	0	891	289	0	1180	116	0	31	0	147	2156
% Cars	96.8	93.7	0	0	94.1	100	0	0	0	100	0	93.9	94.4	0	94.0	94.3	0	88.6	0	93.0	94.0
Heavy Vehicles	4	48	0	0	52	0	0	0	0	0	0	58	17	0	75	7	0	4	0	11	138
% Heavy Vehicles	3.2	6.3	0	0	5.9	0	0	0	0	0	0	6.1	5.6	0	6.0	5.7	0	11.4	0	7.0	6.0

N/S: Pleasant Street
E/W: Driveway/ Libbey Industrial Pkwy
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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Groups Printed- Cars

	Pleasant Street From North				Driveway From East				Pleasant Street From South				Libbey Industrial Parkway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	18	219	0	0	0	0	0	0	0	165	57	0	39	0	8	0	506
07:15 AM	24	206	0	0	1	0	0	0	0	249	57	0	31	0	4	0	572
07:30 AM	27	130	0	0	0	0	0	0	0	245	91	0	17	0	9	0	519
07:45 AM	51	153	0	0	0	0	0	0	0	232	84	0	29	0	10	0	559
Total	120	708	0	0	1	0	0	0	0	891	289	0	116	0	31	0	2156
08:00 AM	28	143	0	0	0	0	0	0	0	214	92	0	18	0	7	0	502
08:15 AM	42	150	0	0	0	0	0	0	0	199	76	0	33	0	15	0	515
08:30 AM	30	145	0	0	0	0	0	0	0	169	83	0	20	0	14	0	461
08:45 AM	40	138	0	0	0	0	0	0	0	186	71	0	37	0	10	0	482
Total	140	576	0	0	0	0	0	0	0	768	322	0	108	0	46	0	1960
Grand Total	260	1284	0	0	1	0	0	0	0	1659	611	0	224	0	77	0	4116
Apprch %	16.8	83.2	0	0	100	0	0	0	0	73.1	26.9	0	74.4	0	25.6	0	
Total %	6.3	31.2	0	0	0	0	0	0	0	40.3	14.8	0	5.4	0	1.9	0	

	Pleasant Street From North					Driveway From East					Pleasant Street From South					Libbey Industrial Parkway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	18	219	0	0	237	0	0	0	0	0	0	165	57	0	222	39	0	8	0	47	506
07:15 AM	24	206	0	0	230	1	0	0	0	1	0	249	57	0	306	31	0	4	0	35	572
07:30 AM	27	130	0	0	157	0	0	0	0	0	0	245	91	0	336	17	0	9	0	26	519
07:45 AM	51	153	0	0	204	0	0	0	0	0	0	232	84	0	316	29	0	10	0	39	559
Total Volume	120	708	0	0	828	1	0	0	0	1	0	891	289	0	1180	116	0	31	0	147	2156
% App. Total	14.5	85.5	0	0		100	0	0	0		0	75.5	24.5	0		78.9	0	21.1	0		
PHF	.588	.808	.000	.000	.873	.250	.000	.000	.000	.250	.000	.895	.794	.000	.878	.744	.000	.775	.000	.782	.942

N/S: Pleasant Street
E/W: Driveway/ Libbey Industrial Pkwy
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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Groups Printed- Heavy Vehicles

	Pleasant Street From North				Driveway From East				Pleasant Street From South				Libbey Industrial Parkway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	1	18	0	0	0	0	0	0	0	9	8	0	2	0	1	0	39
07:15 AM	0	11	0	0	0	0	0	0	0	14	4	0	2	0	0	0	31
07:30 AM	2	10	0	0	0	0	0	0	0	15	4	0	2	0	0	0	33
07:45 AM	1	9	0	0	0	0	0	0	0	20	1	0	1	0	3	0	35
Total	4	48	0	0	0	0	0	0	0	58	17	0	7	0	4	0	138
08:00 AM	0	10	0	0	0	0	0	0	0	15	4	0	6	0	1	0	36
08:15 AM	2	14	0	0	0	0	0	0	0	14	6	0	6	0	3	0	45
08:30 AM	2	14	0	0	0	0	0	0	0	7	2	0	3	0	0	0	28
08:45 AM	1	16	0	0	0	0	0	0	0	12	9	0	5	0	1	0	44
Total	5	54	0	0	0	0	0	0	0	48	21	0	20	0	5	0	153
Grand Total	9	102	0	0	0	0	0	0	0	106	38	0	27	0	9	0	291
Apprch %	8.1	91.9	0	0	0	0	0	0	0	73.6	26.4	0	75	0	25	0	
Total %	3.1	35.1	0	0	0	0	0	0	0	36.4	13.1	0	9.3	0	3.1	0	

	Pleasant Street From North					Driveway From East					Pleasant Street From South					Libbey Industrial Parkway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	10	0	0	10	0	0	0	0	0	0	15	4	0	19	6	0	1	0	7	36
08:15 AM	2	14	0	0	16	0	0	0	0	0	0	14	6	0	20	6	0	3	0	9	45
08:30 AM	2	14	0	0	16	0	0	0	0	0	0	7	2	0	9	3	0	0	0	3	28
08:45 AM	1	16	0	0	17	0	0	0	0	0	0	12	9	0	21	5	0	1	0	6	44
Total Volume	5	54	0	0	59	0	0	0	0	0	0	48	21	0	69	20	0	5	0	25	153
% App. Total	8.5	91.5	0	0		0	0	0	0		0	69.6	30.4	0		80	0	20	0		
PHF	.625	.844	.000	.000	.868	.000	.000	.000	.000	.000	.000	.800	.583	.000	.821	.833	.000	.417	.000	.694	.850

N/S: Pleasant Street
E/W: Driveway/ Libbey Industrial Pkwy
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Groups Printed- Peds and Bikes

	Pleasant Street From North					Driveway From East					Pleasant Street From South					Libbey Industrial Parkway From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Apprch %	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

	Pleasant Street From North						Driveway From East						Pleasant Street From South						Libbey Industrial Parkway From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:00 AM																									
07:00 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% App. Total	50	50	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
PHF	.250	.250	.000	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500

N/S: Pleasant Street
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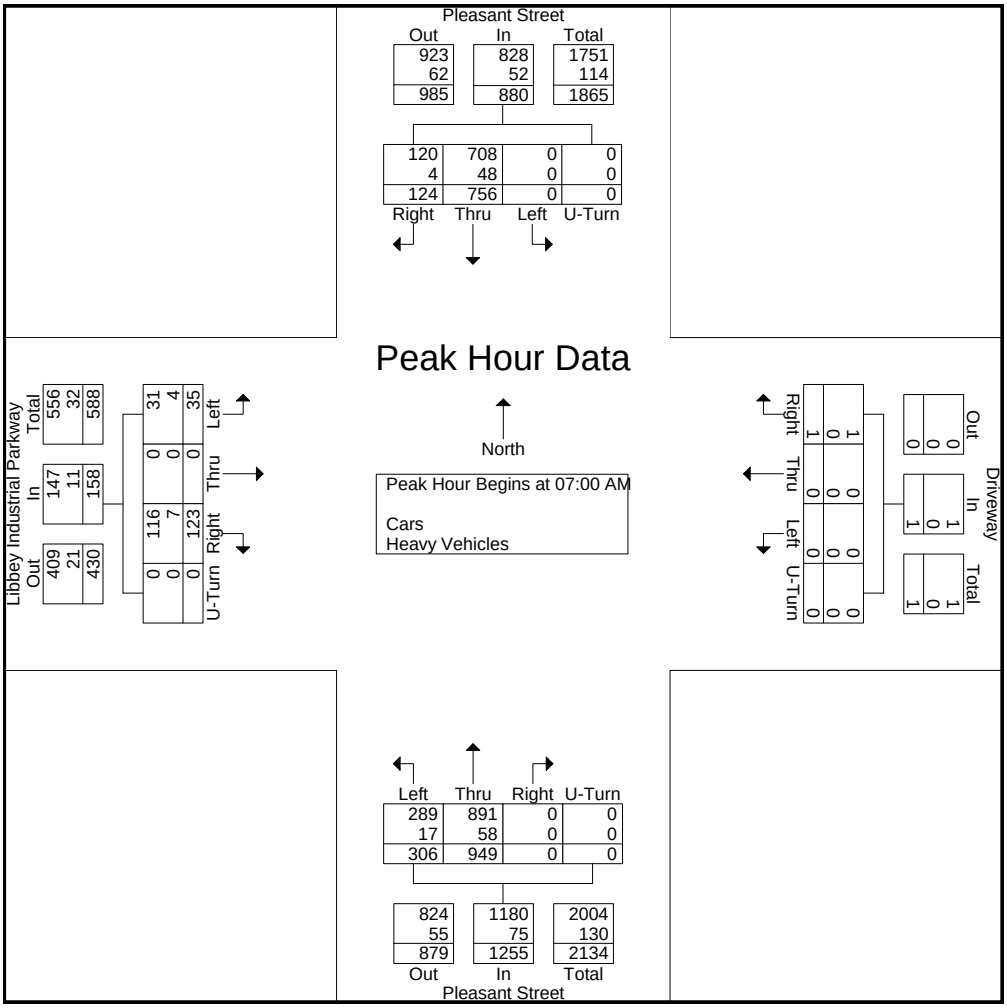
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	19	237	0	0	256	0	0	0	0	0	0	174	65	0	239	41	0	9	0	50	545
07:15 AM	24	217	0	0	241	1	0	0	0	1	0	263	61	0	324	33	0	4	0	37	603
07:30 AM	29	140	0	0	169	0	0	0	0	0	0	260	95	0	355	19	0	9	0	28	552
07:45 AM	52	162	0	0	214	0	0	0	0	0	0	252	85	0	337	30	0	13	0	43	594
Total Volume	124	756	0	0	880	1	0	0	0	1	0	949	306	0	1255	123	0	35	0	158	2294
% App. Total	14.1	85.9	0	0		100	0	0	0		0	75.6	24.4	0		77.8	0	22.2	0		
PHF	.596	.797	.000	.000	.859	.250	.000	.000	.000	.250	.000	.902	.805	.000	.884	.750	.000	.673	.000	.790	.951
Cars	120	708	0	0	828	1	0	0	0	1	0	891	289	0	1180	116	0	31	0	147	2156
% Cars	96.8	93.7	0	0	94.1	100	0	0	0	100	0	93.9	94.4	0	94.0	94.3	0	88.6	0	93.0	94.0
Heavy Vehicles	4	48	0	0	52	0	0	0	0	0	0	58	17	0	75	7	0	4	0	11	138
% Heavy Vehicles	3.2	6.3	0	0	5.9	0	0	0	0	0	0	6.1	5.6	0	6.0	5.7	0	11.4	0	7.0	6.0



N/S: Pleasant Street
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Groups Printed- Cars - Heavy Vehicles

	Pleasant Street From North				Driveway From East				Pleasant Street From South				Libbey Industrial Parkway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	19	217	0	0	0	0	0	0	0	178	29	0	85	0	24	0	552
04:15 PM	9	213	0	0	0	0	0	0	0	194	43	0	94	0	26	0	579
04:30 PM	14	229	1	0	0	0	0	0	0	194	22	0	82	0	36	2	580
04:45 PM	19	242	0	0	1	0	0	0	2	203	34	0	69	0	25	0	595
Total	61	901	1	0	1	0	0	0	2	769	128	0	330	0	111	2	2306
05:00 PM	25	227	0	0	0	0	0	0	1	198	28	0	105	0	28	0	612
05:15 PM	17	241	0	0	2	0	0	0	0	206	22	0	66	0	23	0	577
05:30 PM	15	233	1	0	0	1	0	0	0	174	27	0	89	0	34	0	574
05:45 PM	20	190	0	0	0	0	0	0	0	184	31	0	66	0	27	0	518
Total	77	891	1	0	2	1	0	0	1	762	108	0	326	0	112	0	2281
Grand Total	138	1792	2	0	3	1	0	0	3	1531	236	0	656	0	223	2	4587
Apprch %	7.1	92.8	0.1	0	75	25	0	0	0.2	86.5	13.3	0	74.5	0	25.3	0.2	
Total %	3	39.1	0	0	0.1	0	0	0	0.1	33.4	5.1	0	14.3	0	4.9	0	
Cars	137	1721	2	0	3	1	0	0	3	1511	232	0	636	0	218	2	4466
% Cars	99.3	96	100	0	100	100	0	0	100	98.7	98.3	0	97	0	97.8	100	97.4
Heavy Vehicles	1	71	0	0	0	0	0	0	0	20	4	0	20	0	5	0	121
% Heavy Vehicles	0.7	4	0	0	0	0	0	0	0	1.3	1.7	0	3	0	2.2	0	2.6

	Pleasant Street From North					Driveway From East					Pleasant Street From South					Libbey Industrial Parkway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	9	213	0	0	222	0	0	0	0	0	0	194	43	0	237	94	0	26	0	120	579
04:30 PM	14	229	1	0	244	0	0	0	0	0	0	194	22	0	216	82	0	36	2	120	580
04:45 PM	19	242	0	0	261	1	0	0	0	1	2	203	34	0	239	69	0	25	0	94	595
05:00 PM	25	227	0	0	252	0	0	0	0	0	1	198	28	0	227	105	0	28	0	133	612
Total Volume	67	911	1	0	979	1	0	0	0	1	3	789	127	0	919	350	0	115	2	467	2366
% App. Total	6.8	93.1	0.1	0		100	0	0	0		0.3	85.9	13.8	0		74.9	0	24.6	0.4		
PHF	.670	.941	.250	.000	.938	.250	.000	.000	.000	.250	.375	.972	.738	.000	.961	.833	.000	.799	.250	.878	.967
Cars	66	879	1	0	946	1	0	0	0	1	3	778	127	0	908	340	0	111	2	453	2308
% Cars	98.5	96.5	100	0	96.6	100	0	0	0	100	100	98.6	100	0	98.8	97.1	0	96.5	100	97.0	97.5
Heavy Vehicles	1	32	0	0	33	0	0	0	0	0	0	11	0	0	11	10	0	4	0	14	58
% Heavy Vehicles	1.5	3.5	0	0	3.4	0	0	0	0	0	0	1.4	0	0	1.2	2.9	0	3.5	0	3.0	2.5

N/S: Pleasant Street
E/W: Driveway/ Libbey Industrial Pkwy
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

PRECISION DATA INDUSTRIES, LLC
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File Name : 154509 BB
Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

Groups Printed- Cars

	Pleasant Street From North				Driveway From East				Pleasant Street From South				Libbey Industrial Parkway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	19	205	0	0	0	0	0	0	0	174	26	0	82	0	24	0	530
04:15 PM	9	203	0	0	0	0	0	0	0	189	43	0	90	0	25	0	559
04:30 PM	14	220	1	0	0	0	0	0	0	191	22	0	82	0	34	2	566
04:45 PM	18	235	0	0	1	0	0	0	2	201	34	0	67	0	25	0	583
Total	60	863	1	0	1	0	0	0	2	755	125	0	321	0	108	2	2238
05:00 PM	25	221	0	0	0	0	0	0	1	197	28	0	101	0	27	0	600
05:15 PM	17	234	0	0	2	0	0	0	0	204	21	0	63	0	22	0	563
05:30 PM	15	224	1	0	0	1	0	0	0	173	27	0	86	0	34	0	561
05:45 PM	20	179	0	0	0	0	0	0	0	182	31	0	65	0	27	0	504
Total	77	858	1	0	2	1	0	0	1	756	107	0	315	0	110	0	2228
Grand Total	137	1721	2	0	3	1	0	0	3	1511	232	0	636	0	218	2	4466
Apprch %	7.4	92.5	0.1	0	75	25	0	0	0.2	86.5	13.3	0	74.3	0	25.5	0.2	
Total %	3.1	38.5	0	0	0.1	0	0	0	0.1	33.8	5.2	0	14.2	0	4.9	0	

	Pleasant Street From North					Driveway From East					Pleasant Street From South					Libbey Industrial Parkway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	14	220	1	0	235	0	0	0	0	0	0	191	22	0	213	82	0	34	2	118	566
04:45 PM	18	235	0	0	253	1	0	0	0	1	2	201	34	0	237	67	0	25	0	92	583
05:00 PM	25	221	0	0	246	0	0	0	0	0	1	197	28	0	226	101	0	27	0	128	600
05:15 PM	17	234	0	0	251	2	0	0	0	2	0	204	21	0	225	63	0	22	0	85	563
Total Volume	74	910	1	0	985	3	0	0	0	3	3	793	105	0	901	313	0	108	2	423	2312
% App. Total	7.5	92.4	0.1	0		100	0	0	0		0.3	88	11.7	0		74	0	25.5	0.5		
PHF	.740	.968	.250	.000	.973	.375	.000	.000	.000	.375	.375	.972	.772	.000	.950	.775	.000	.794	.250	.826	.963

N/S: Pleasant Street
E/W: Driveway/ Libbey Industrial Pkwy
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

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File Name : 154509 BB
Site Code : 42892140
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Page No : 1

Groups Printed- Heavy Vehicles

	Pleasant Street From North				Driveway From East				Pleasant Street From South				Libbey Industrial Parkway From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	12	0	0	0	0	0	0	0	4	3	0	3	0	0	0	22
04:15 PM	0	10	0	0	0	0	0	0	0	5	0	0	4	0	1	0	20
04:30 PM	0	9	0	0	0	0	0	0	0	3	0	0	0	0	2	0	14
04:45 PM	1	7	0	0	0	0	0	0	0	2	0	0	2	0	0	0	12
Total	1	38	0	0	0	0	0	0	0	14	3	0	9	0	3	0	68
05:00 PM	0	6	0	0	0	0	0	0	0	1	0	0	4	0	1	0	12
05:15 PM	0	7	0	0	0	0	0	0	0	2	1	0	3	0	1	0	14
05:30 PM	0	9	0	0	0	0	0	0	0	1	0	0	3	0	0	0	13
05:45 PM	0	11	0	0	0	0	0	0	0	2	0	0	1	0	0	0	14
Total	0	33	0	0	0	0	0	0	0	6	1	0	11	0	2	0	53
Grand Total	1	71	0	0	0	0	0	0	0	20	4	0	20	0	5	0	121
Apprch %	1.4	98.6	0	0	0	0	0	0	0	83.3	16.7	0	80	0	20	0	
Total %	0.8	58.7	0	0	0	0	0	0	0	16.5	3.3	0	16.5	0	4.1	0	

	Pleasant Street From North					Driveway From East					Pleasant Street From South					Libbey Industrial Parkway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	12	0	0	12	0	0	0	0	0	0	4	3	0	7	3	0	0	0	3	22
04:15 PM	0	10	0	0	10	0	0	0	0	0	0	5	0	0	5	4	0	1	0	5	20
04:30 PM	0	9	0	0	9	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	14
04:45 PM	1	7	0	0	8	0	0	0	0	0	0	2	0	0	2	2	0	0	0	2	12
Total Volume	1	38	0	0	39	0	0	0	0	0	0	14	3	0	17	9	0	3	0	12	68
% App. Total	2.6	97.4	0	0		0	0	0	0		0	82.4	17.6	0		75	0	25	0		
PHF	.250	.792	.000	.000	.813	.000	.000	.000	.000	.000	.000	.700	.250	.000	.607	.563	.000	.375	.000	.600	.773

N/S: Pleasant Street
E/W: Driveway/ Libbey Industrial Pkwy
City, State: Weymouth, MA
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File Name : 154509 BB
Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

Groups Printed- Peds and Bikes

	Pleasant Street From North					Driveway From East					Pleasant Street From South					Libbey Industrial Parkway From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	1	5
05:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	4
Grand Total	0	1	0	0	0	0	0	0	1	1	0	4	0	0	0	0	0	0	0	2	9
Apprch %	0	100	0	0	0	0	0	0	50	50	0	100	0	0	0	0	0	0	0	100	
Total %	0	11.1	0	0	0	0	0	0	11.1	11.1	0	44.4	0	0	0	0	0	0	0	22.2	

	Pleasant Street From North						Driveway From East						Pleasant Street From South						Libbey Industrial Parkway From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:15 PM																									
04:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	2	0	0	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	1	1	2	0	3	0	0	0	3	0	0	0	0	1	1	6
% App. Total	0	0	0	0	0		0	0	0	50	50		0	100	0	0	0		0	0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.500	.000	.375	.000	.000	.000	.375	.000	.000	.000	.000	.250	.250	.500

N/S: Pleasant Street
E/W: Driveway/ Libbey Industrial Pkwy
City, State: Weymouth, MA
Client: Tetra Tech/ N. Doherty

PRECISION DATA INDUSTRIES, LLC
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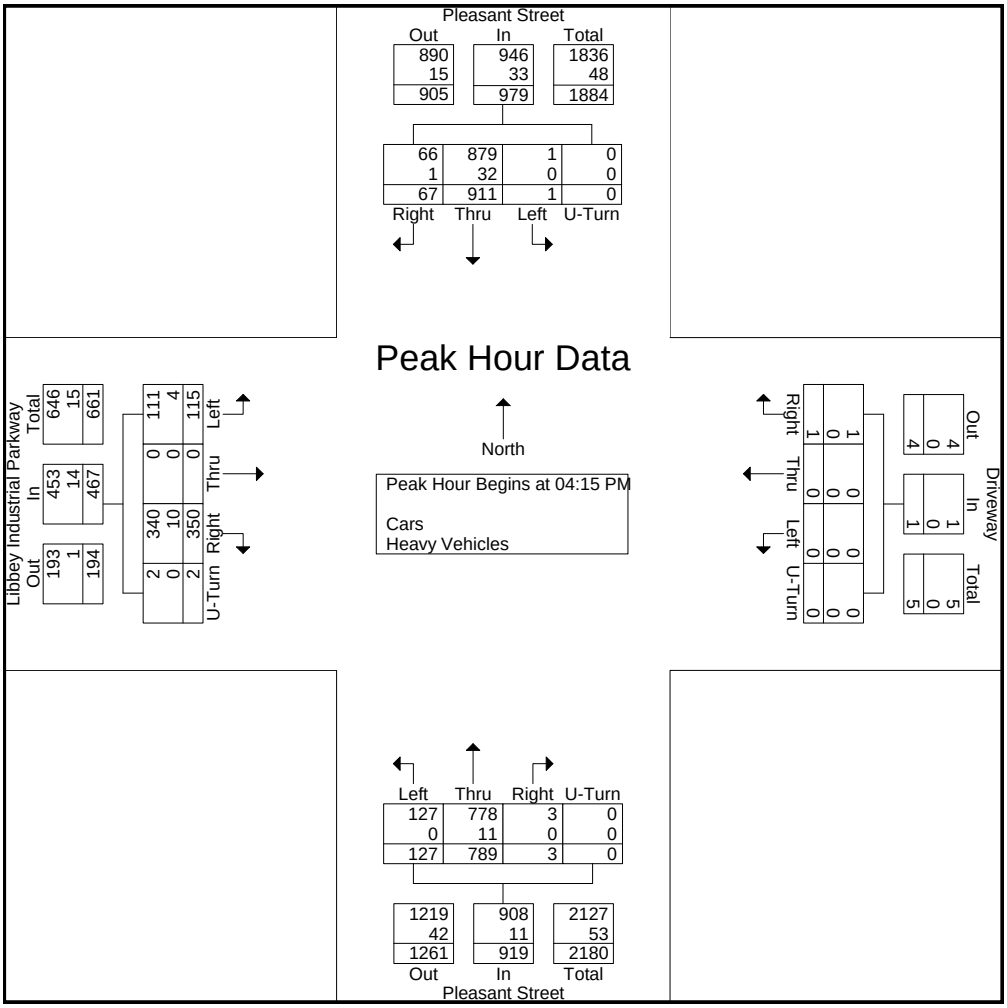
File Name : 154509 BB
Site Code : 42892140
Start Date : 6/17/2015
Page No : 1

	Pleasant Street From North					Driveway From East					Pleasant Street From South					Libbey Industrial Parkway From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	9	213	0	0	222	0	0	0	0	0	0	194	43	0	237	94	0	26	0	120	579
04:30 PM	14	229	1	0	244	0	0	0	0	0	0	194	22	0	216	82	0	36	2	120	580
04:45 PM	19	242	0	0	261	1	0	0	0	1	2	203	34	0	239	69	0	25	0	94	595
05:00 PM	25	227	0	0	252	0	0	0	0	0	1	198	28	0	227	105	0	28	0	133	612
Total Volume	67	911	1	0	979	1	0	0	0	1	3	789	127	0	919	350	0	115	2	467	2366
% App. Total	6.8	93.1	0.1	0		100	0	0	0		0.3	85.9	13.8	0		74.9	0	24.6	0.4		
PHF	.670	.941	.250	.000	.938	.250	.000	.000	.000	.250	.375	.972	.738	.000	.961	.833	.000	.799	.250	.878	.967
Cars	66	879	1	0	946	1	0	0	0	1	3	778	127	0	908	340	0	111	2	453	2308
% Cars	98.5	96.5	100	0	96.6	100	0	0	0	100	100	98.6	100	0	98.8	97.1	0	96.5	100	97.0	97.5
Heavy Vehicles	1	32	0	0	33	0	0	0	0	0	0	11	0	0	11	10	0	4	0	14	58
% Heavy Vehicles	1.5	3.5	0	0	3.4	0	0	0	0	0	0	1.4	0	0	1.2	2.9	0	3.5	0	3.0	2.5



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N/S: Main Street (Route 18)
E/W: Middle Street/ West Street
City, State: Weymouth, MA
Client: Tetra Tech/ C. Jones

File Name : 154694 A
Site Code : 14342892
Start Date : 10/7/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Main Street (Route 18) From North				Middle Street From East				Main Street (Route 18) From South				West Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	32	179	29	0	60	52	40	0	18	304	18	0	17	30	29	0	808
07:15 AM	36	177	44	0	50	40	59	0	47	321	28	0	16	28	33	0	879
07:30 AM	39	129	37	0	40	56	47	0	32	318	28	0	5	33	38	0	802
07:45 AM	53	165	58	0	50	67	41	0	47	261	23	0	17	45	30	0	857
Total	160	650	168	0	200	215	187	0	144	1204	97	0	55	136	130	0	3346
08:00 AM	67	164	42	0	75	78	41	0	44	254	21	0	17	52	45	0	900
08:15 AM	57	154	49	1	75	71	53	0	57	300	38	0	15	64	35	0	969
08:30 AM	60	162	60	0	44	66	47	0	47	257	16	0	10	51	44	0	864
08:45 AM	65	168	61	2	54	58	44	0	51	217	18	0	14	47	42	0	841
Total	249	648	212	3	248	273	185	0	199	1028	93	0	56	214	166	0	3574
Grand Total	409	1298	380	3	448	488	372	0	343	2232	190	0	111	350	296	0	6920
Apprch %	19.6	62.1	18.2	0.1	34.3	37.3	28.4	0	12.4	80.7	6.9	0	14.7	46.2	39.1	0	
Total %	5.9	18.8	5.5	0	6.5	7.1	5.4	0	5	32.3	2.7	0	1.6	5.1	4.3	0	
Cars	382	1209	354	3	417	476	354	0	324	2155	183	0	103	332	285	0	6577
% Cars	93.4	93.1	93.2	100	93.1	97.5	95.2	0	94.5	96.6	96.3	0	92.8	94.9	96.3	0	95
Heavy Vehicles	27	89	26	0	31	12	18	0	19	77	7	0	8	18	11	0	343
% Heavy Vehicles	6.6	6.9	6.8	0	6.9	2.5	4.8	0	5.5	3.4	3.7	0	7.2	5.1	3.7	0	5

	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	53	**165**	58	0	276	50	67	41	0	158	47	261	23	0	331	**17**	45	30	0	92	857
08:00 AM	**67**	164	42	0	273	**75**	**78**	41	0	194	44	254	21	0	319	17	52	**45**	0	**114**	900
08:15 AM	57	154	49	**1**	261	75	71	**53**	0	**199**	**57**	**300**	**38**	0	**395**	15	**64**	35	0	114	**969**
08:30 AM	60	162	**60**	0	**282**	44	66	47	0	157	47	257	16	0	320	10	51	44	0	105	864
Total Volume	237	645	209	1	1092	244	282	182	0	708	195	1072	98	0	1365	59	212	154	0	425	3590
% App. Total	21.7	59.1	19.1	0.1		34.5	39.8	25.7	0		14.3	78.5	7.2	0		13.9	49.9	36.2	0		
PHF	.884	.977	.871	.250	.968	.813	.904	.858	.000	.889	.855	.893	.645	.000	.864	.868	.828	.856	.000	.932	.926
Cars	217	597	192	1	1007	228	275	169	0	672	182	1030	93	0	1305	55	203	147	0	405	3389
% Cars	91.6	92.6	91.9	100	92.2	93.4	97.5	92.9	0	94.9	93.3	96.1	94.9	0	95.6	93.2	95.8	95.5	0	95.3	94.4
Heavy Vehicles	20	48	17	0	85	16	7	13	0	36	13	42	5	0	60	4	9	7	0	20	201
% Heavy Vehicles	8.4	7.4	8.1	0	7.8	6.6	2.5	7.1	0	5.1	6.7	3.9	5.1	0	4.4	6.8	4.2	4.5	0	4.7	5.6

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City, State: Weymouth, MA
Client: Tetra Tech/ C. Jones

File Name : 154694 A
Site Code : 14342892
Start Date : 10/7/2015
Page No : 1

Groups Printed- Cars

	Main Street (Route 18) From North				Middle Street From East				Main Street (Route 18) From South				West Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	31	174	28	0	54	51	40	0	17	293	17	0	15	27	29	0	776
07:15 AM	34	169	43	0	46	40	58	0	46	311	27	0	16	27	32	0	849
07:30 AM	38	119	35	0	38	54	45	0	30	308	28	0	5	32	38	0	770
07:45 AM	50	149	52	0	46	64	40	0	45	253	22	0	14	44	30	0	809
Total	153	611	158	0	184	209	183	0	138	1165	94	0	50	130	129	0	3204
08:00 AM	64	157	41	0	70	76	40	0	39	243	21	0	16	48	44	0	859
08:15 AM	51	150	45	1	71	71	48	0	55	288	35	0	15	62	32	0	924
08:30 AM	52	141	54	0	41	64	41	0	43	246	15	0	10	49	41	0	797
08:45 AM	62	150	56	2	51	56	42	0	49	213	18	0	12	43	39	0	793
Total	229	598	196	3	233	267	171	0	186	990	89	0	53	202	156	0	3373
Grand Total	382	1209	354	3	417	476	354	0	324	2155	183	0	103	332	285	0	6577
Apprch %	19.6	62.1	18.2	0.2	33.4	38.2	28.4	0	12.2	81	6.9	0	14.3	46.1	39.6	0	
Total %	5.8	18.4	5.4	0	6.3	7.2	5.4	0	4.9	32.8	2.8	0	1.6	5	4.3	0	

	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	50	149	52	0	251	46	64	40	0	150	45	253	22	0	320	14	44	30	0	88	809
08:00 AM	**64**	**157**	41	0	**262**	70	**76**	40	0	186	39	243	21	0	303	**16**	48	**44**	0	108	859
08:15 AM	51	150	45	**1**	247	**71**	71	**48**	0	**190**	**55**	**288**	**35**	0	**378**	15	**62**	32	0	**109**	**924**
08:30 AM	52	141	**54**	0	247	41	64	41	0	146	43	246	15	0	304	10	49	41	0	100	797
Total Volume	217	597	192	1	1007	228	275	169	0	672	182	1030	93	0	1305	55	203	147	0	405	3389
% App. Total	21.5	59.3	19.1	0.1		33.9	40.9	25.1	0		13.9	78.9	7.1	0		13.6	50.1	36.3	0		
PHF	.848	.951	.889	.250	.961	.803	.905	.880	.000	.884	.827	.894	.664	.000	.863	.859	.819	.835	.000	.929	.917

PRECISION
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N/S: Main Street (Route 18)
E/W: Middle Street/ West Street
City, State: Weymouth, MA
Client: Tetra Tech/ C. Jones

File Name : 154694 A
Site Code : 14342892
Start Date : 10/7/2015
Page No : 1

Groups Printed- Heavy Vehicles

	Main Street (Route 18) From North				Middle Street From East				Main Street (Route 18) From South				West Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	1	5	1	0	6	1	0	0	1	11	1	0	2	3	0	0	32
07:15 AM	2	8	1	0	4	0	1	0	1	10	1	0	0	1	1	0	30
07:30 AM	1	10	2	0	2	2	2	0	2	10	0	0	0	1	0	0	32
07:45 AM	3	16	6	0	4	3	1	0	2	8	1	0	3	1	0	0	48
Total	7	39	10	0	16	6	4	0	6	39	3	0	5	6	1	0	142
08:00 AM	3	7	1	0	5	2	1	0	5	11	0	0	1	4	1	0	41
08:15 AM	6	4	4	0	4	0	5	0	2	12	3	0	0	2	3	0	45
08:30 AM	8	21	6	0	3	2	6	0	4	11	1	0	0	2	3	0	67
08:45 AM	3	18	5	0	3	2	2	0	2	4	0	0	2	4	3	0	48
Total	20	50	16	0	15	6	14	0	13	38	4	0	3	12	10	0	201
Grand Total	27	89	26	0	31	12	18	0	19	77	7	0	8	18	11	0	343
Apprch %	19	62.7	18.3	0	50.8	19.7	29.5	0	18.4	74.8	6.8	0	21.6	48.6	29.7	0	
Total %	7.9	25.9	7.6	0	9	3.5	5.2	0	5.5	22.4	2	0	2.3	5.2	3.2	0	

	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	3	16	**6**	0	25	4	**3**	1	0	8	2	8	1	0	11	**3**	1	0	0	4	48
08:00 AM	3	7	1	0	11	**5**	2	1	0	8	**5**	11	0	0	16	1	**4**	1	0	**6**	41
08:15 AM	6	4	4	0	14	4	0	5	0	9	2	**12**	**3**	0	**17**	0	2	**3**	0	5	45
08:30 AM	**8**	**21**	6	0	**35**	3	2	**6**	0	**11**	4	11	1	0	16	0	2	3	0	5	**67**
Total Volume	20	48	17	0	85	16	7	13	0	36	13	42	5	0	60	4	9	7	0	20	201
% App. Total	23.5	56.5	20	0		44.4	19.4	36.1	0		21.7	70	8.3	0		20	45	35	0		
PHF	.625	.571	.708	.000	.607	.800	.583	.542	.000	.818	.650	.875	.417	.000	.882	.333	.563	.583	.000	.833	.750

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N/S: Main Street (Route 18)
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City, State: Weymouth, MA
Client: Tetra Tech/ C. Jones

File Name : 154694 A
Site Code : 14342892
Start Date : 10/7/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4
Grand Total	0	0	0	1	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	6
Apprch %	0	0	0	100	0	0	0	0	0	0	0	0	0	20	80	0	0	0	0	0	
Total %	0	0	0	16.7	0	0	0	0	0	0	0	0	0	16.7	66.7	0	0	0	0	0	

	Main Street (Route 18) From North						Middle Street From East						Main Street (Route 18) From South						West Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:30 AM																									
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	**3**	0	0	0	0	0	0	**3**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	0	0	0	0	0	0	4
% App. Total	0	0	0	0	0		0	0	0	0	0		0	0	0	25	75		0	0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.333	.000	.000	.000	.000	.000	.000	.333

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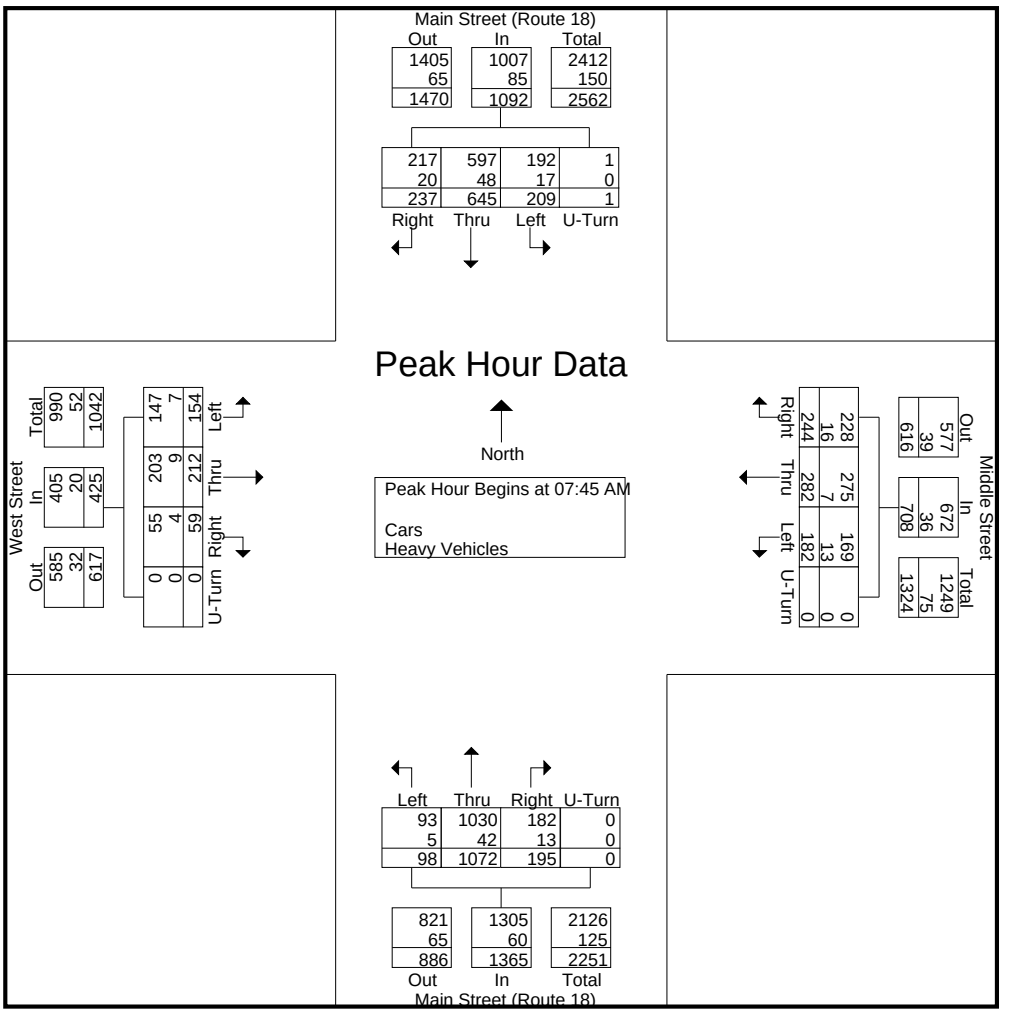
N/S: Main Street (Route 18)
E/W: Middle Street/ West Street
City, State: Weymouth, MA
Client: Tetra Tech/ C. Jones

File Name : 154694 A
Site Code : 14342892
Start Date : 10/7/2015
Page No : 1

	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	53	**165**	58	0	276	50	67	41	0	158	47	261	23	0	331	**17**	45	30	0	92	857
08:00 AM	**67**	164	42	0	273	**75**	**78**	41	0	194	44	254	21	0	319	17	52	**45**	0	**114**	900
08:15 AM	57	154	49	**1**	261	75	71	**53**	0	**199**	**57**	**300**	**38**	0	**395**	15	**64**	35	0	114	**969**
08:30 AM	60	162	**60**	0	**282**	44	66	47	0	157	47	257	16	0	320	10	51	44	0	105	864
Total Volume	237	645	209	1	1092	244	282	182	0	708	195	1072	98	0	1365	59	212	154	0	425	3590
% App. Total	21.7	59.1	19.1	0.1		34.5	39.8	25.7	0		14.3	78.5	7.2	0		13.9	49.9	36.2	0		
PHF	.884	.977	.871	.250	.968	.813	.904	.858	.000	.889	.855	.893	.645	.000	.864	.868	.828	.856	.000	.932	.926
Cars	217	597	192	1	1007	228	275	169	0	672	182	1030	93	0	1305	55	203	147	0	405	3389
% Cars	91.6	92.6	91.9	100	92.2	93.4	97.5	92.9	0	94.9	93.3	96.1	94.9	0	95.6	93.2	95.8	95.5	0	95.3	94.4
Heavy Vehicles	20	48	17	0	85	16	7	13	0	36	13	42	5	0	60	4	9	7	0	20	201
% Heavy Vehicles	8.4	7.4	8.1	0	7.8	6.6	2.5	7.1	0	5.1	6.7	3.9	5.1	0	4.4	6.8	4.2	4.5	0	4.7	5.6



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N/S: Main Street (Route 18)
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City, State: Weymouth, MA
Client: Tetra Tech/ C. Jones

File Name : 154694 AA
Site Code : 14342892
Start Date : 10/7/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Main Street (Route 18) From North				Middle Street From East				Main Street (Route 18) From South				West Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	58	241	74	1	55	68	54	0	54	184	12	0	18	78	77	0	974
04:15 PM	54	260	56	1	43	60	54	0	51	199	25	0	15	59	54	0	931
04:30 PM	59	226	55	1	56	58	45	0	54	211	13	0	25	77	66	0	946
04:45 PM	67	235	59	4	52	75	42	0	52	227	26	0	14	82	45	0	980
Total	238	962	244	7	206	261	195	0	211	821	76	0	72	296	242	0	3831
05:00 PM	61	256	59	0	53	51	60	0	50	223	11	0	28	75	86	0	1013
05:15 PM	43	255	65	0	58	75	65	0	54	202	10	0	26	76	59	0	988
05:30 PM	57	273	61	0	41	59	51	0	62	223	11	0	15	77	50	0	980
05:45 PM	48	264	78	0	39	58	50	0	55	200	15	0	10	86	45	0	948
Total	209	1048	263	0	191	243	226	0	221	848	47	0	79	314	240	0	3929
Grand Total	447	2010	507	7	397	504	421	0	432	1669	123	0	151	610	482	0	7760
Apprch %	15	67.7	17.1	0.2	30	38.1	31.8	0	19.4	75	5.5	0	12.1	49.1	38.8	0	
Total %	5.8	25.9	6.5	0.1	5.1	6.5	5.4	0	5.6	21.5	1.6	0	1.9	7.9	6.2	0	
Cars	426	1967	495	7	388	494	411	0	427	1639	122	0	151	604	475	0	7606
% Cars	95.3	97.9	97.6	100	97.7	98	97.6	0	98.8	98.2	99.2	0	100	99	98.5	0	98
Heavy Vehicles	21	43	12	0	9	10	10	0	5	30	1	0	0	6	7	0	154
% Heavy Vehicles	4.7	2.1	2.4	0	2.3	2	2.4	0	1.2	1.8	0.8	0	0	1	1.5	0	2

	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**67**	235	59	**4**	365	52	**75**	42	0	169	52	**227**	**26**	0	**305**	14	**82**	45	0	141	980
05:00 PM	61	256	59	0	376	53	51	60	0	164	50	223	11	0	284	**28**	75	**86**	0	**189**	**1013**
05:15 PM	43	255	**65**	0	363	**58**	75	**65**	0	**198**	54	202	10	0	266	26	76	59	0	161	988
05:30 PM	57	**273**	61	0	**391**	41	59	51	0	151	**62**	223	11	0	296	15	77	50	0	142	980
Total Volume	228	1019	244	4	1495	204	260	218	0	682	218	875	58	0	1151	83	310	240	0	633	3961
% App. Total	15.3	68.2	16.3	0.3		29.9	38.1	32	0		18.9	76	5	0		13.1	49	37.9	0		
PHF	.851	.933	.938	.250	.956	.879	.867	.838	.000	.861	.879	.964	.558	.000	.943	.741	.945	.698	.000	.837	.978
Cars	220	998	237	4	1459	200	258	214	0	672	214	855	58	0	1127	83	306	237	0	626	3884
% Cars	96.5	97.9	97.1	100	97.6	98.0	99.2	98.2	0	98.5	98.2	97.7	100	0	97.9	100	98.7	98.8	0	98.9	98.1
Heavy Vehicles	8	21	7	0	36	4	2	4	0	10	4	20	0	0	24	0	4	3	0	7	77
% Heavy Vehicles	3.5	2.1	2.9	0	2.4	2.0	0.8	1.8	0	1.5	1.8	2.3	0	0	2.1	0	1.3	1.3	0	1.1	1.9

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Client: Tetra Tech/ C. Jones

File Name : 154694 AA
Site Code : 14342892
Start Date : 10/7/2015
Page No : 1

Groups Printed- Cars

	Main Street (Route 18) From North				Middle Street From East				Main Street (Route 18) From South				West Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	53	237	74	1	54	67	52	0	54	181	12	0	18	77	75	0	955
04:15 PM	52	255	54	1	40	55	52	0	51	196	25	0	15	59	53	0	908
04:30 PM	55	222	53	1	55	56	43	0	54	209	13	0	25	76	65	0	927
04:45 PM	66	229	55	4	49	74	40	0	52	220	26	0	14	80	44	0	953
Total	226	943	236	7	198	252	187	0	211	806	76	0	72	292	237	0	3743
05:00 PM	57	253	58	0	53	51	60	0	48	218	11	0	28	74	85	0	996
05:15 PM	43	251	64	0	57	75	64	0	53	197	10	0	26	75	58	0	973
05:30 PM	54	265	60	0	41	58	50	0	61	220	11	0	15	77	50	0	962
05:45 PM	46	255	77	0	39	58	50	0	54	198	14	0	10	86	45	0	932
Total	200	1024	259	0	190	242	224	0	216	833	46	0	79	312	238	0	3863
Grand Total	426	1967	495	7	388	494	411	0	427	1639	122	0	151	604	475	0	7606
Apprch %	14.7	67.9	17.1	0.2	30	38.2	31.8	0	19.5	74.9	5.6	0	12.3	49.1	38.6	0	
Total %	5.6	25.9	6.5	0.1	5.1	6.5	5.4	0	5.6	21.5	1.6	0	2	7.9	6.2	0	

	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**66**	229	55	**4**	354	49	74	40	0	163	52	**220**	**26**	0	**298**	14	**80**	44	0	138	953
05:00 PM	57	253	58	0	368	53	51	60	0	164	48	218	11	0	277	**28**	74	**85**	0	**187**	**996**
05:15 PM	43	251	**64**	0	358	**57**	**75**	**64**	0	**196**	53	197	10	0	260	26	75	58	0	159	973
05:30 PM	54	**265**	60	0	**379**	41	58	50	0	149	**61**	220	11	0	292	15	77	50	0	142	962
Total Volume	220	998	237	4	1459	200	258	214	0	672	214	855	58	0	1127	83	306	237	0	626	3884
% App. Total	15.1	68.4	16.2	0.3		29.8	38.4	31.8	0		19	75.9	5.1	0		13.3	48.9	37.9	0		
PHF	.833	.942	.926	.250	.962	.877	.860	.836	.000	.857	.877	.972	.558	.000	.945	.741	.956	.697	.000	.837	.975

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Groups Printed- Heavy Vehicles

	Main Street (Route 18) From North				Middle Street From East				Main Street (Route 18) From South				West Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	5	4	0	0	1	1	2	0	0	3	0	0	0	1	2	0	19
04:15 PM	2	5	2	0	3	5	2	0	0	3	0	0	0	0	1	0	23
04:30 PM	4	4	2	0	1	2	2	0	0	2	0	0	0	1	1	0	19
04:45 PM	1	6	4	0	3	1	2	0	0	7	0	0	0	2	1	0	27
Total	12	19	8	0	8	9	8	0	0	15	0	0	0	4	5	0	88
05:00 PM	4	3	1	0	0	0	0	0	2	5	0	0	0	1	1	0	17
05:15 PM	0	4	1	0	1	0	1	0	1	5	0	0	0	1	1	0	15
05:30 PM	3	8	1	0	0	1	1	0	1	3	0	0	0	0	0	0	18
05:45 PM	2	9	1	0	0	0	0	0	1	2	1	0	0	0	0	0	16
Total	9	24	4	0	1	1	2	0	5	15	1	0	0	2	2	0	66
Grand Total	21	43	12	0	9	10	10	0	5	30	1	0	0	6	7	0	154
Apprch %	27.6	56.6	15.8	0	31	34.5	34.5	0	13.9	83.3	2.8	0	0	46.2	53.8	0	
Total %	13.6	27.9	7.8	0	5.8	6.5	6.5	0	3.2	19.5	0.6	0	0	3.9	4.5	0	

	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**5**	4	0	0	9	1	1	**2**	0	4	0	3	0	0	3	0	1	**2**	0	**3**	19
04:15 PM	2	5	2	0	9	**3**	**5**	2	0	**10**	0	3	0	0	3	0	0	1	0	1	23
04:30 PM	4	4	2	0	10	1	2	2	0	5	0	2	0	0	2	0	1	1	0	2	19
04:45 PM	1	**6**	**4**	0	**11**	3	1	2	0	6	0	**7**	0	0	**7**	0	**2**	1	0	3	**27**
Total Volume	12	19	8	0	39	8	9	8	0	25	0	15	0	0	15	0	4	5	0	9	88
% App. Total	30.8	48.7	20.5	0		32	36	32	0		0	100	0	0		0	44.4	55.6	0		
PHF	.600	.792	.500	.000	.886	.667	.450	1.00	.000	.625	.000	.536	.000	.000	.536	.000	.500	.625	.000	.750	.815

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Main Street (Route 18)
E/W: Middle Street/ West Street
City, State: Weymouth, MA
Client: Tetra Tech/ C. Jones

File Name : 154694 AA
Site Code : 14342892
Start Date : 10/7/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	3
Grand Total	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	5
Apprch %	0	0	0	100	0	100	0	0	0	0	0	0	0	50	50	0	0	0	0	100	
Total %	0	0	0	20	0	20	0	0	0	0	0	0	0	20	20	0	0	0	0	20	

	Main Street (Route 18) From North						Middle Street From East						Main Street (Route 18) From South						West Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:30 PM																									
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	**1**	**1**	**2**
Total Volume	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	1	1	4
% App. Total	0	0	0	100	0		0	0	0	0	0		0	0	0	50	50		0	0	0	0	100		
PHF	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.500	.000	.000	.000	.000	.250	.250	.500

PRECISION
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N/S: Main Street (Route 18)
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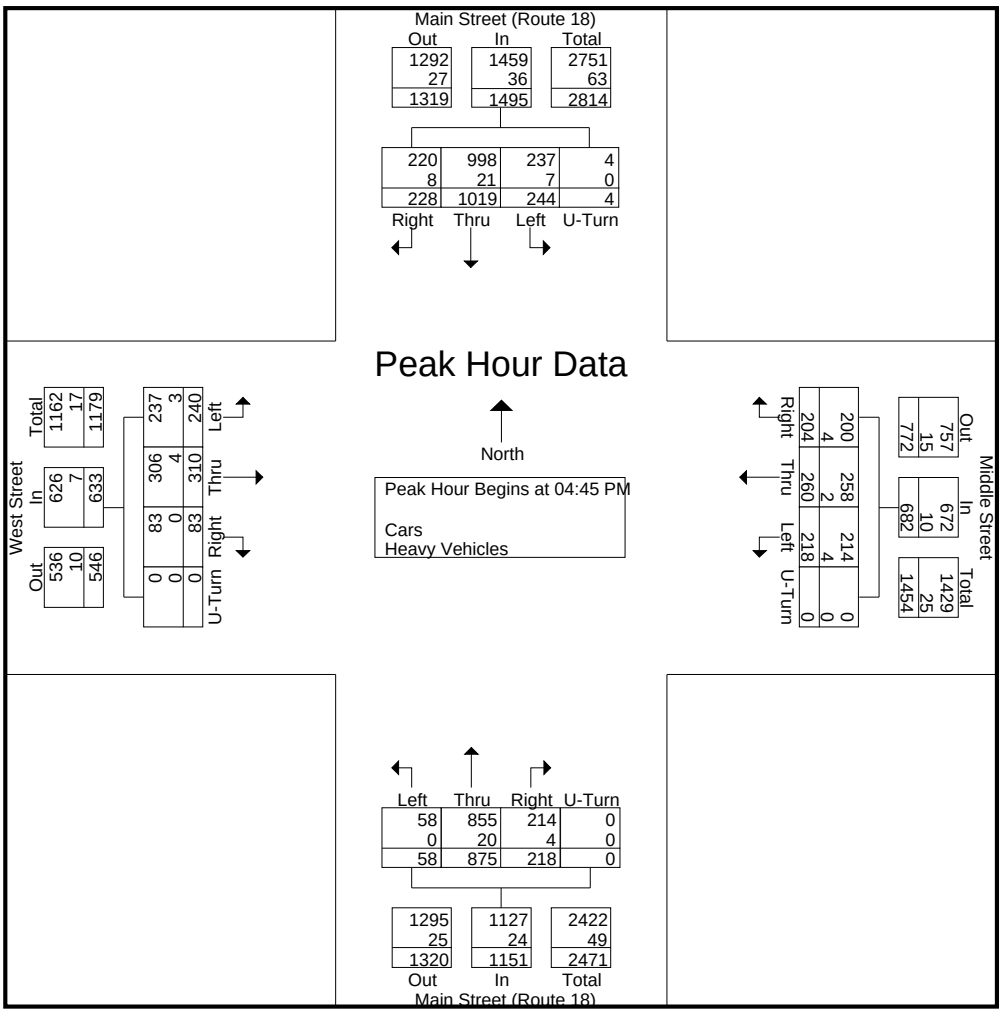
	Main Street (Route 18) From North					Middle Street From East					Main Street (Route 18) From South					West Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**67**	235	59	**4**	365	52	**75**	42	0	169	52	**227**	**26**	0	**305**	14	**82**	45	0	141	980
05:00 PM	61	256	59	0	376	53	51	60	0	164	50	223	11	0	284	**28**	75	**86**	0	**189**	**1013**
05:15 PM	43	255	**65**	0	363	**58**	75	**65**	0	**198**	54	202	10	0	266	26	76	59	0	161	988
05:30 PM	57	**273**	61	0	**391**	41	59	51	0	151	**62**	223	11	0	296	15	77	50	0	142	980
Total Volume	228	1019	244	4	1495	204	260	218	0	682	218	875	58	0	1151	83	310	240	0	633	3961
% App. Total	15.3	68.2	16.3	0.3		29.9	38.1	32	0		18.9	76	5	0		13.1	49	37.9	0		
PHF	.851	.933	.938	.250	.956	.879	.867	.838	.000	.861	.879	.964	.558	.000	.943	.741	.945	.698	.000	.837	.978
Cars	220	998	237	4	1459	200	258	214	0	672	214	855	58	0	1127	83	306	237	0	626	3884
% Cars	96.5	97.9	97.1	100	97.6	98.0	99.2	98.2	0	98.5	98.2	97.7	100	0	97.9	100	98.7	98.8	0	98.9	98.1
Heavy Vehicles	8	21	7	0	36	4	2	4	0	10	4	20	0	0	24	0	4	3	0	7	77
% Heavy Vehicles	3.5	2.1	2.9	0	2.4	2.0	0.8	1.8	0	1.5	1.8	2.3	0	0	2.1	0	1.3	1.3	0	1.1	1.9



Appendix C

Seasonal Adjustment Data and Growth Rate Calculations

Massachusetts Highway Department
Statewide Traffic Data Collection
2015 Weekday Seasonal Factors

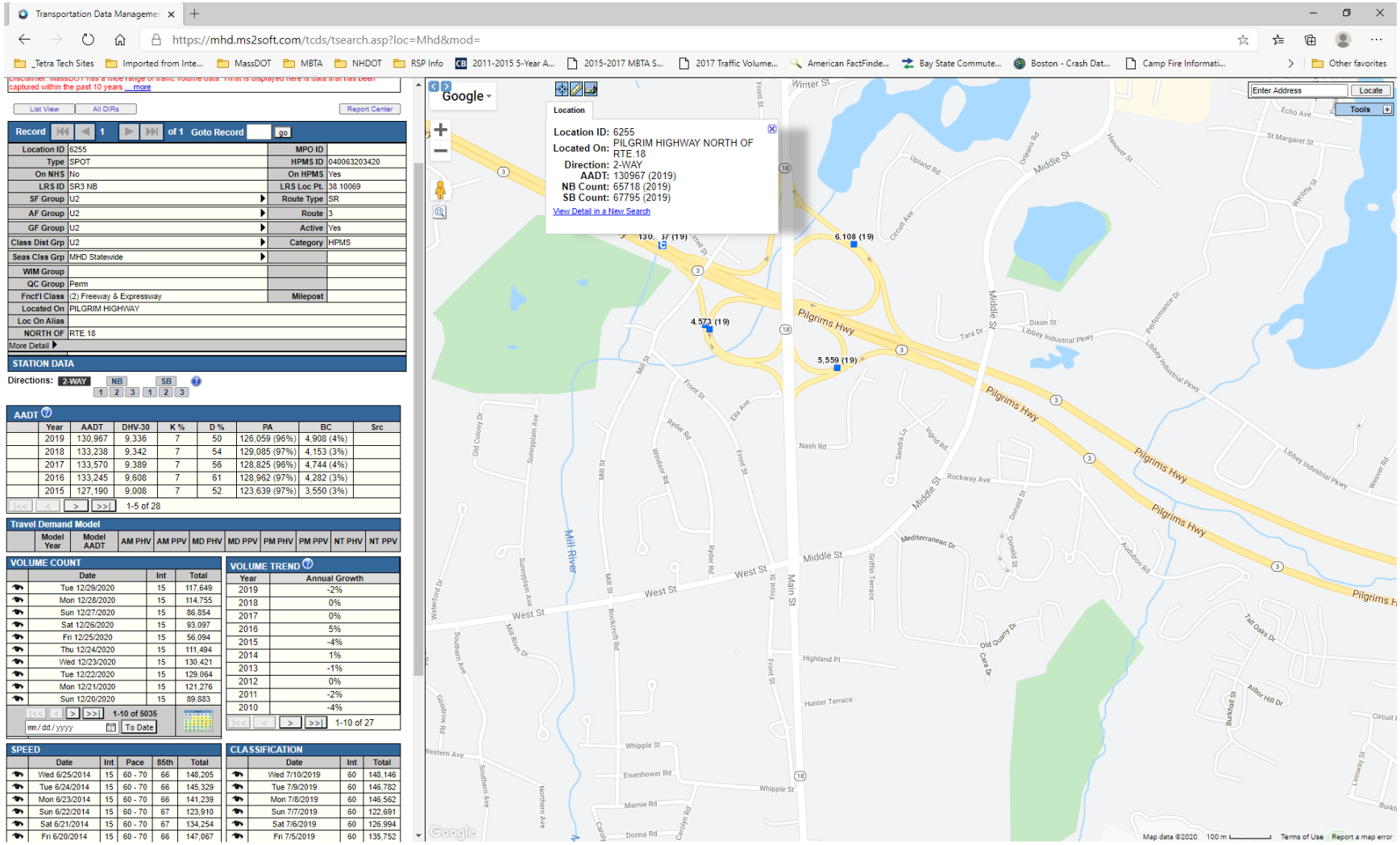
Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.24	1.26	1.21	1.09	0.98	0.96	0.88	0.88	1.02	1.02	1.04	1.09	0.90
R2	1.14	1.09	1.06	1.00	0.94	0.90	0.89	0.87	0.94	0.94	1.01	0.99	0.98
R3	1.12	1.16	1.07	0.98	0.93	0.90	0.91	0.89	0.95	0.95	0.95	1.02	0.96
R4-R7	1.15	1.11	1.10	1.04	0.93	0.91	0.88	0.89	0.92	0.94	1.01	1.04	0.93
U1-Boston	1.02	1.15	0.98	0.97	0.95	0.92	0.91	0.90	0.94	0.92	0.97	0.96	0.95
U1-Essex	1.09	1.17	1.04	1.01	0.95	0.91	0.87	0.88	0.93	0.94	0.99	1.01	0.92
U1-Southeast	1.16	1.25	1.07	0.99	0.93	0.89	0.86	0.85	0.91	0.93	0.98	0.98	0.94
U1-West	1.03	1.04	1.00	0.95	0.91	0.91	0.91	0.91	0.91	0.90	0.95	0.98	0.93
U1-Worcester	1.07	1.39	1.09	1.02	0.97	0.93	0.92	0.91	0.96	0.97	1.00	1.03	0.91
U2	1.12	1.20	1.03	0.97	0.92	0.89	0.87	0.87	0.91	0.93	0.98	0.99	0.96
U3	1.05	1.09	1.01	0.96	0.92	0.91	0.90	0.91	0.94	0.93	0.97	0.97	0.95
U4-U7	1.10	1.09	1.01	0.96	0.92	0.88	0.90	0.90	0.90	0.92	0.96	0.97	0.93

Round off:
0-999 = 10
>1000 = 100

U = Urban
R= Rural

1 - Interstate
2 - Freeway and Expressway
3 - Other Principal Arterial
4 - Minor Arterial
5 - Major Collector
6 - Minor Collector
7 - Local Road and Street

2/1/2021



Location 6255 – Route 3 North of Route 18

Background Growth Rate Calculations
MassDOT Permanent Count Station Data

Background Growth Rate Calculations:

Station 6255		
Year		**AADT**
	2009	139,494
Growth Rate		***-3.64%***
	2010	134,418
Growth Rate		***-1.82%***
	2011	131,978
Growth Rate		***-0.88%***
	2012	132,053
Growth Rate		***-0.59%***
	2013	131,271
Growth Rate		***1.03%***
	2014	132,623
Growth Rate		***-4.10%***
	2015	127,190
Growth Rate		***4.76%***
	2016	133,245
Growth Rate		***0.24%***
	2017	133,570
Growth Rate		***-0.25%***
	2018	133,238
Growth Rate		***-1.70%***
	2019	130,967
Avg 2009 to 2019		**-0.69%**
Avg 2015 to 2019		***-0.21%***

Conservatively use 0.5% per year from 2021 to 2028

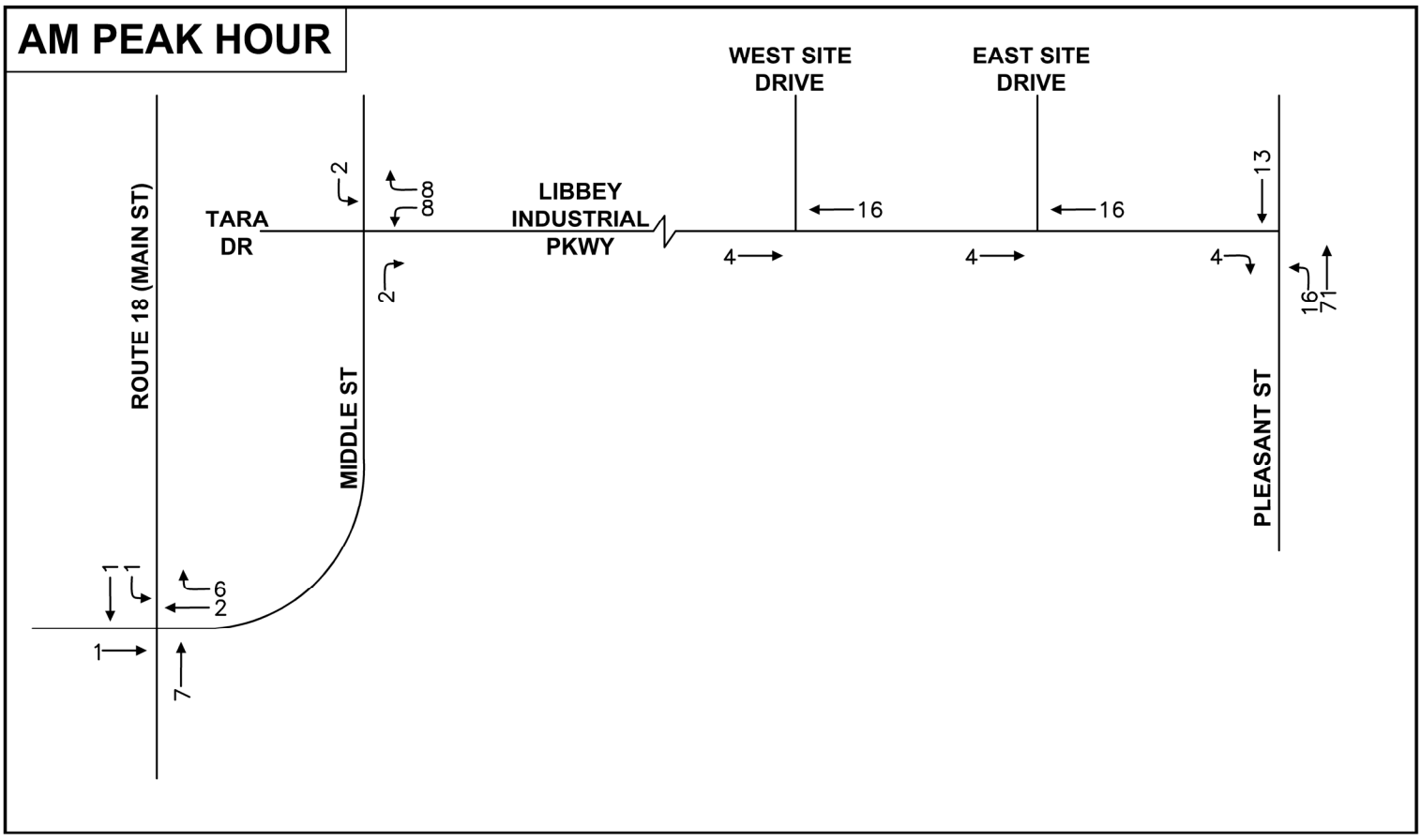
2015-2019 Growth	***2.97%***

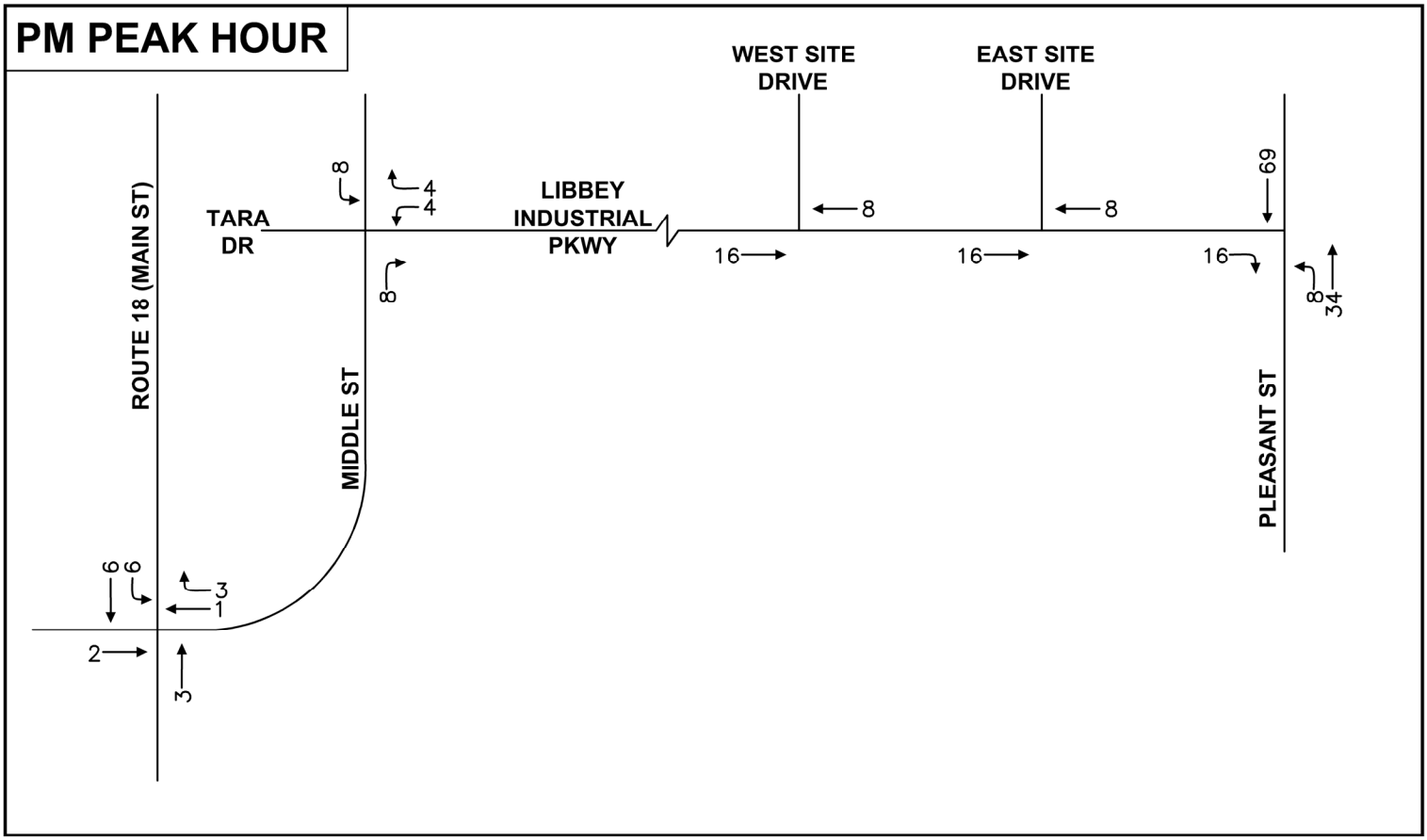
Use 3% for 2015 to 2021 Adjustment

Source: http://mhd.ms2soft.com/tcds/tsearch.asp?loc=Mhd&mod=tcds

Appendix D

Background Project Trips – Existing





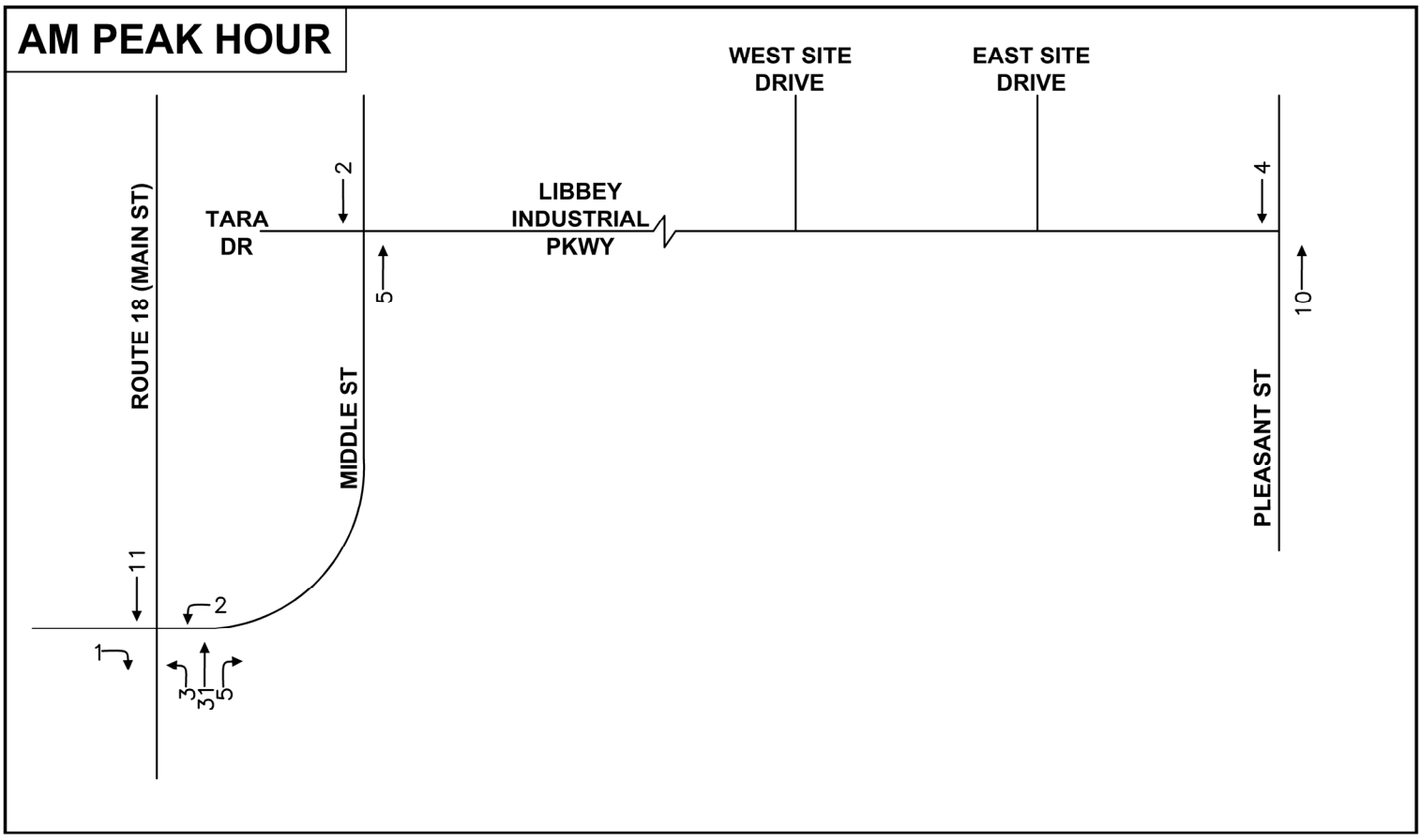
TETRA TECH

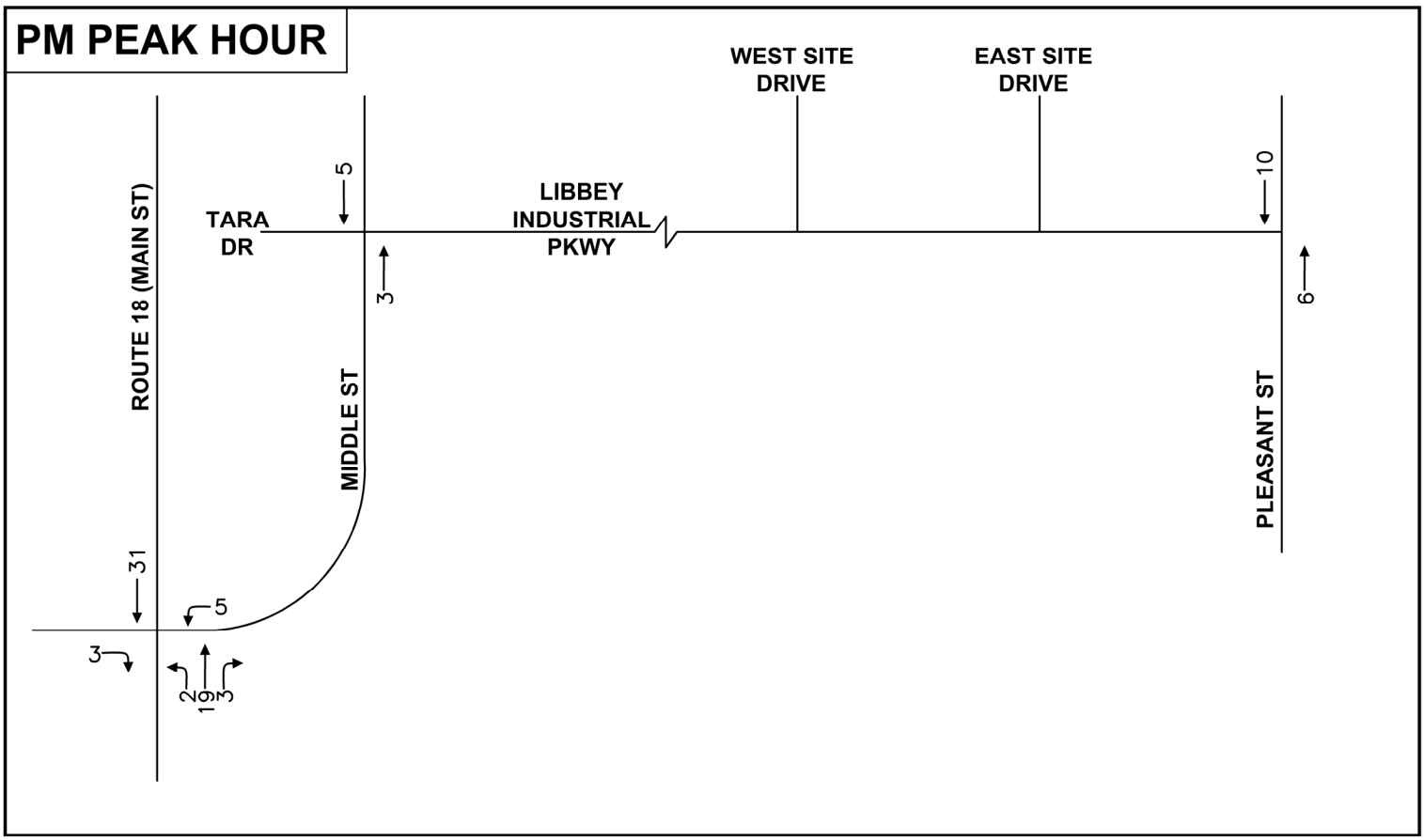
NOT TO SCALE

Proposed Medical Office Building
Weymouth, Massachusetts

Background Project Trips
Alexan at Arbor Hills

FIGURE
D1





TETRA TECH

NOT TO SCALE

Proposed Medical Office Building
Weymouth, Massachusetts

Background Project Trips
Southfield - 2015 to 2021

FIGURE
D2

2021 Southfield Residential - Assume 889 New Units

Land Use Code 220 - Multifamily Housing (Low-Rise)						Size:	489	DWELLING UNITS
Time Period	R^2 Value	Use Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total
Weekday Daily	0.96	Equation	T=7.56(x)-40.86	7.32	50%	1828	1828	3656
AM Street Peak Hour	0.90	Equation	Ln(T)=.95ln(x)-0.51	0.46	23%	49	166	215
PM Street Peak Hour	0.86	Equation	Ln(T)=0.89Ln(x)-0.02	0.56	63%	153	90	243
Saturday Daily	0.93	Equation	T=14.01x-521.69	8.14	50%	3165	3164	6329
Saturday Peak Hour of Generator	0.92	Equation	T=1.08x-33.24	0.7	54%	267	228	495
Sunday Daily	0.96	Equation	T=10.13X-341.89	6.28	50%	2306	2306	4612
Sunday Peak Hour of Generator	0.93	Equation	T=1.12X-40.41	0.67	50%	254	253	507

Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.
Source: *Trip Generation*, *Tenth Edition*, (Institute of Transportation Engineers, 2017).

Land Use Code 252- Senior Adult Housing - Attached						Size:	300	DWELLINGS
Time Period	R^2 Value	Use Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total
Weekday Daily	0.99	Equation	T=4.02(x)-25.37	3.7	50%	591	590	1181
AM Street Peak Hour	0.98	Equation	T=.20(x)-0.18	0.2	35%	21	39	60
PM Street Peak Hour	0.96	Equation	T=.24(x)+2.26	0.26	55%	41	33	74
Saturday Daily	0.99	Equation	T=3.97(x)-60.09	3.23	50%	566	565	1131
Saturday Peak Hour	0.99	Equation	T=.35(x)+1.67	0.33	62%	66	41	107

Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.
Source: *Trip Generation*, *Tenth Edition*, (Institute of Transportation Engineers, 2017).
Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.
Source: *Trip Generation*, *Tenth Edition*, (Institute of Transportation Engineers, 2017).

Land Use Code 210 - Single-Family Detached Housing						Size:	100	DWELLINGS
Time Period	R^2 Value	Use Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total
Weekday Daily	0.95	Equation	Ln(T)=.92ln(x)+2.71	9.44	50%	520	520	1040
AM Street Peak Hour	0.89	Equation	T=.71(x)+4.80	0.74	25%	19	57	76
PM Street Peak Hour	0.92	Equation	Ln(T)=.96ln(x)+.20	0.99	63%	64	38	102
Saturday Daily	0.91	Equation	Ln(T)=.94ln(x)+2.56	9.54	50%	491	490	981
Saturday Peak Hour	0.87	Equation	T=.84(x)+17.99	0.93	54%	55	47	102

Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.
Source: *Trip Generation*, *Tenth Edition*, (Institute of Transportation Engineers, 2017).

Total Residential

Weekday Daily						2939	2938	5877
AM Street Peak Hour						89	262	351
PM Street Peak Hour						258	161	419

Appendix E

Public Transportation Data

225•226

Effective December 20, 2020

225 Weymouth Landing - Quincy Center Station

226 Columbian Square- Braintree Station

Serving

- 1000 Southern Artery
- Fore River Shipyard
- East Braintree
- Shaw Street
- Lincoln Square
- Red Line

Massachusetts Bay Transportation Authority

massDOT Massachusetts Department of Transportation

Information 617-222-3200 • 1-800-392-6100
(TTY) 617-222-5146 • www.mbta.com

225 Weekday

Inbound			Outbound		
Leave Weymouth Landing	Arrive Howard/ Quincy Ave.	Arrive Quincy Center Station	Leave Quincy Center Station	Arrive Howard/ Quincy Ave.	Arrive Weymouth Landing
b 5:30A	5:34A	5:49A	b 5:10A	5:14A	5:26A
b 5:50	5:54	6:09	b 5:30	5:34	5:46
6:11	6:15	6:31	b 5:52	5:56	6:08
b 6:23	6:27	6:43	6:00	6:08	6:20
6:35	6:42	6:59	b 6:13	6:17	6:29
b 6:47	6:54	7:10	6:23	6:31	6:43
6:59	7:06	7:23	b 6:37	6:41	6:53
b 7:11	7:18	7:34	6:47	6:55	7:07
7:24	7:31	7:49	b 7:03	7:07	7:19
b 7:38	7:45	8:01	7:14	7:22	7:34
.....	bq 7:55	8:11	b 7:27	7:34	7:46
7:52	7:59	8:17	7:40	7:50	8:02
.....	bq 8:02	8:18	b 7:53	8:01	8:13
b 8:05	8:12	8:28	8:06	8:16	8:28
.....	bq 8:23	8:39	b 8:21	8:29	8:41
8:18	8:25	8:43	8:32	8:43	8:55
b 8:31	8:38	8:54	b 8:47	8:57	9:09
8:44	8:51	9:09	8:58	9:09	9:21
b 8:58	9:05	9:21	b 9:15	9:25	9:37
9:12	9:19	9:37	9:43	9:54	10:06
b 9:26	9:33	9:49	b 10:11	10:21	10:33
9:40	9:47	10:05	10:36	10:47	10:59
b 10:09	10:16	10:32	b 11:04	11:14	11:26
10:37	10:44	11:00	11:34	11:46	11:59
b 11:05	11:12	11:28			
11:35	11:42	11:58	**b 12:04P**	**12:15P**	**12:28P**
			12:34	**12:46**	**12:59**
b 12:05P	**12:12P**	**12:28P**	**b 1:04**	**1:15**	**1:28**
12:35	**12:42**	**12:58**	**1:34**	**1:46**	**1:59**
b 1:05	**1:12**	**1:28**	**b 2:02**	**2:13**	**2:27**
1:35	**1:42**	**1:58**	**2:32**	**2:45**	**2:59**
b 2:05	**2:12**	**2:28**	**b 3:02**	**3:13**	**3:27**
2:35	**2:42**	**2:58**	**3:30**	**3:44**	**3:58**
b 3:03	**3:10**	**3:26**	**b 3:45**	**3:59**	**4:13**
3:31	**3:36**	**3:52**	**3:59**	**4:13**	**4:27**
b 4:02	**4:07**	**4:23**	**b 4:12**	**4:26**	**4:40**
4:18	**4:23**	**4:39**	**4:24**	**4:38**	**4:52**
b 4:32	**4:37**	**4:52**	**b 4:36**	**4:50**	**5:04**
4:45	**4:50**	**5:06**	**4:48**	**5:02**	**5:17**
b 4:57	**5:02**	**5:17**	**b 5:00**	**5:14**	**5:29**
5:09	**5:14**	**5:30**	**5:12**	**5:26**	**5:41**
b 5:21	**5:26**	**5:41**	**b 5:24**	**5:38**	**5:53**
5:33	**5:38**	**5:54**	**5:36**	**5:50**	**6:05**
b 5:45	**5:50**	**6:05**	**b 5:48**	**6:01**	**6:16**
5:57	**6:02**	**6:18**	**6:00**	**6:11**	**6:26**
b 6:09	**6:14**	**6:29**	**b 6:12**	**6:22**	**6:37**
6:21	**6:26**	**6:49**	**6:24**	**6:35**	**6:50**
b 6:32	**6:37**	**6:52**	**b 6:36**	**6:46**	**7:01**
6:43	**6:48**	**7:03**	**6:48**	**6:59**	**7:14**
b 6:54	**6:59**	**7:11**	**b 7:00**	**7:10**	**7:25**
7:05	**7:09**	**7:21**	**7:24**	**7:35**	**7:50**
b 7:18	**7:22**	**7:34**	**b 8:12**	**8:19**	**8:34**
7:53	**7:57**	**8:09**	**8:59**	**9:10**	**9:25**
b 8:38	**8:42**	**8:54**	**b 9:47**	**9:54**	**10:08**
9:28	**9:32**	**9:44**	**10:32**	**10:42**	**10:54**
b 10:12	**10:16**	**10:28**	**b 11:35**	**11:40**	**11:52**
11:00	**11:04**	**11:14**			
b 11:57	12:01A	12:11A			

Route 225
Weymouth Landing - Quincy Center Station

226 Weekday

Inbound			Outbound		
Leave Columbian Square	Arrive Weymouth Landing	Arrive Braintree Station	Leave Braintree Station	Arrive Weymouth Landing	Arrive Columbian Square
6:20A	6:28A	6:38A	5:45A	5:52A	6:05A
6:50	6:58	7:13	6:25	6:32	6:45
7:30	7:41	7:56	6:55	7:02	7:15
8:00	8:11	8:26	7:25	7:33	7:50
8:35	8:46	9:01	8:01	8:11	8:28
9:05	9:16	9:31	8:35	8:43	9:01
9:50	10:01	10:16	9:20	9:28	9:46
10:50	11:00	11:13	10:20	10:28	10:46
11:50	**12:00N**	**12:13P**	11:20	11:28	11:46
12:50P	**1:00P**	**1:13P**	**12:20P**	**12:28P**	**12:46P**
1:50	**2:00**	**2:13**	**1:20**	**1:28**	**1:46**
2:50	**3:00**	**3:13**	**2:20**	**2:28**	**2:46**
3:50	**4:01**	**4:15**	**3:17**	**3:25**	**3:44**
4:35	**4:46**	**5:00**	**3:55**	**4:05**	**4:24**
5:05	**5:17**	**5:32**	**4:26**	**4:36**	**4:55**
5:45	**5:57**	**6:10**	**5:08**	**5:19**	**5:38**
6:15	**6:26**	**6:39**	**5:40**	**5:51**	**6:10**
6:48	**6:59**	**7:12**	**6:15**	**6:26**	**6:43**
7:16	**7:26**	**7:39**	**6:45**	**6:55**	**7:12**
8:10	**8:20**	**8:33**	**7:43**	**7:51**	**8:06**
9:04	**9:14**	**9:27**	**8:37**	**8:45**	**9:00**
9:58	**10:07**	**10:17**	**9:31**	**9:39**	**9:54**
10:44	**10:53**	**11:03**	**10:21**	**10:28**	**10:40**
11:30	**11:39**	**11:49**	**11:07**	**11:14**	**11:26**

b - Via Quincy Ave, omits Southern Artery and Scammell St.
q - Originates at Quintree Mall

Route 226
Columbian Square- Braintree Station

225 Saturday

Inbound			Outbound		
Leave Weymouth Landing	Arrive Howard/ Quincy Ave.	Arrive Quincy Center Station	Leave Quincy Center Station	Arrive Howard/ Quincy Ave.	Arrive Weymouth Landing
b 6:30A	6:36A	6:48A	b 6:05A	6:11A	6:23A
7:30	7:36	7:51	7:05	7:13	7:25
b 8:30	8:36	8:50	b 8:00	8:09	8:22
9:00	9:06	9:21	8:30	8:40	8:53
b 9:30	9:36	9:50	b 9:00	9:09	9:22
10:00	10:06	10:21	9:30	9:40	9:53
b 10:30	10:36	10:53	b 10:00	10:09	10:22
11:00	11:06	11:23	10:30	10:40	10:53
b 11:30	11:36	11:53	b 11:00	11:09	11:24
			11:30	11:40	11:55
12:00N	**12:06P**	**12:23P**			
b 12:30P	**12:36**	**12:53**	**b 12:00N**	**12:09P**	**12:24P**
1:00	**1:06**	**1:23**	**12:30P**	**12:40**	**12:55**
b 1:30	**1:36**	**1:53**	**b 1:00**	**1:09**	**1:24**
2:00	**2:06**	**2:23**	**1:30**	**1:40**	**1:55**
b 2:20	**2:26**	**2:43**	**b 1:50**	**1:59**	**2:14**
2:40	**2:46**	**3:03**	**2:10**	**2:20**	**2:35**
b 3:00	**3:06**	**3:23**	**b 2:30**	**2:39**	**2:54**
3:20	**3:26**	**3:41**	**2:50**	**3:00**	**3:15**
b 3:40	**3:45**	**3:59**	**b 3:10**	**3:19**	**3:33**
4:00	**4:05**	**4:20**	**3:30**	**3:39**	**3:53**
b 4:20	**4:25**	**4:39**	**b 3:50**	**3:58**	**4:12**
4:40	**4:45**	**5:00**	**4:10**	**4:19**	**4:33**
b 5:00	**5:05**	**5:19**	**b 4:30**	**4:38**	**4:52**
5:20	**5:25**	**5:40**	**4:50**	**4:59**	**5:13**
b 5:40	**5:45**	**5:59**	**b 5:10**	**5:18**	**5:32**
6:05	**6:10**	**6:25**	**5:35**	**5:44**	**5:58**
b 6:35	**6:40**	**6:54**	**b 6:05**	**6:13**	**6:27**
7:05	**7:10**	**7:22**	**6:35**	**6:44**	**6:58**
b 8:05	**8:10**	**8:21**	**b 7:35**	**7:42**	**7:55**
9:05	**9:10**	**9:22**	**8:35**	**8:44**	**8:57**
b 10:05	**10:10**	**10:20**	**b 9:35**	**9:42**	**9:55**
11:00	**11:05**	**11:16**	**10:35**	**10:44**	**10:57**
b 11:55	12:00M	12:10A	**b 11:30**	**11:36**	**11:47**

226 Saturday

Inbound			Outbound		
Leave Columbian Square	Arrive Weymouth Landing	Arrive Braintree Station	Leave Braintree Station	Arrive Weymouth Landing	Arrive Columbian Square
7:00A	7:12A	7:21A	6:35A	6:42A	6:52A
7:50	8:02	8:11	7:25	7:32	7:44
8:40	8:52	9:01	8:15	8:23	8:35
9:35	9:48	9:58	9:10	9:18	9:30
10:35	10:48	10:58	10:05	10:13	10:25
11:35	11:48	11:58	11:05	11:16	11:30
12:35P	**12:49P**	**1:00P**	**12:05P**	**12:16P**	**12:30P**
1:35	**1:49**	**2:00**	**1:05**	**1:16**	**1:30**
2:35	**2:49**	**3:00**	**2:05**	**2:16**	**2:30**
3:35	**3:49**	**4:00**	**3:05**	**3:16**	**3:30**
4:35	**4:49**	**5:00**	**4:05**	**4:16**	**4:30**
5:35	**5:49**	**6:00**	**5:05**	**5:16**	**5:30**
6:35	**6:48**	**6:57**	**6:05**	**6:16**	**6:30**
7:35	**7:48**	**7:57**	**7:05**	**7:13**	**7:25**

225 Sunday

Inbound			Outbound		
Leave Weymouth Landing	Arrive Howard/ Quincy Ave.	Arrive Quincy Center Station	Leave Quincy Center Station	Arrive Howard/ Quincy Ave.	Arrive Weymouth Landing
7:50A	7:56A	8:10A	7:20A	7:27A	7:38A
8:50	8:56	9:10	8:20	8:27	8:38
9:50	9:56	10:10	9:20	9:29	9:40
10:50	10:57	11:13	10:20	10:30	10:41
11:50	11:57	**12:13P**	11:20	11:30	11:41
12:50P	**12:57P**	**1:13P**	**12:20P**	**12:30P**	**12:41P**
1:50	**1:56**	**2:12**	**1:20**	**1:30**	**1:41**
2:50	**2:56**	**3:11**	**2:20**	**2:30**	**2:41**
3:50	**3:56**	**4:11**	**3:20**	**3:31**	**3:42**
4:50	**4:56**	**5:11**	**4:20**	**4:31**	**4:42**
5:50	**5:56**	**6:11**	**5:20**	**5:31**	**5:42**
6:50	**6:55**	**7:08**	**6:20**	**6:31**	**6:42**
7:50	**7:54**	**8:07**	**7:20**	**7:30**	**7:40**
8:50	**8:54**	**9:07**	**8:20**	**8:28**	**8:38**
9:50	**9:54**	**10:07**	**9:20**	**9:28**	**9:38**
10:50	**10:54**	**11:06**	**10:20**	**10:28**	**10:38**
11:50	**11:54**	12:04A	**11:20**	**11:27**	**11:37**

NO Route 226 service on Sundays

All buses are accessible to persons with disabilities

Fare	Local Bus	Bus + Bus	Subway	Bus + Subway
CharlieCard	$1.70	$1.70	$2.40	$2.40
CharlieTicket	$1.70	$1.70	$2.40	$4.10*
Cash-on-Board	$1.70	$3.40	$2.40	$4.10
Student/Youth**	$0.85	$0.85	$1.10	$1.10
Senior/TAP***	$0.85	$0.85	$1.10	$1.10

FREE FARES: Children 11 and under ride free when accompanied by a paying customer; Blind Access CharlieCard holders ride free and if using a guide, the guide rides free.
* Transfers Subway to Silver Line SL4 or SL5 pay $2.40
** Requires Student CharlieCard or Youth CharlieCard. Student CharlieCards available to students through participating middle and high schools. Youth CharlieCards available through community partners across Greater Boston.
*** Requires Senior/TAP CharlieCard, available to Medicare cardholders, seniors 65+, and persons with disabilities.

Winter 2021 Holidays
12/25/20 & 1/1/21 Sun; 1/18/21 & 2/15/21: Sat

Appendix F

Crash Data

MassDOT Crash Data

Middle Street at Libbey Industrial Parkway

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	First Harmful Event	Manner of Collision	Road Surface Condition	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions
4018653	WEYMOUTH	02/03/2015	Property damage only (none injured)	3:30 PM	Collision with motor vehicle in traffic	Angle	Snow	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Clear
4027770	WEYMOUTH	03/14/2015	Property damage only (none injured)	1:01 PM	Collision with motor vehicle in traffic	Rear-end	Wet	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car)	V1: W / V2: W / V3: W	Rain
4047593	WEYMOUTH	05/29/2015	Property damage only (none injured)	12:43 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Entering traffic lane / V2: Travelling straight ahead / V3: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car) / V3:(Light truck(van, mini-van, pickup, sport utility))	V1: W / V2: N / V3: S	Clear
4090042	WEYMOUTH	09/09/2015	Property damage only (none injured)	3:52 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Travelling straight ahead / V2: Turning right	V1:(Single-unit truck (2-axle, 6-tires)) / V2:(Passenger car)	V1: E / V2: N	Clear
4115864	WEYMOUTH	11/07/2015	Non-fatal injury	12:29 PM	Collision with motor vehicle in traffic	Sideswipe, opposite direction	Dry	V1: Slowing or stopped in traffic / V2: Parked / V3: Turning right	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility)) / V3:(Passenger car)	V1: W / V2: Not Reported / V3: E	Clear
4115909	WEYMOUTH	11/22/2015	Property damage only (none injured)	7:13 PM	Collision with motor vehicle in traffic	Angle	Wet	V1: Turning left / V2: Turning right	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: S	Rain
4131270	WEYMOUTH	12/16/2015	Property damage only (none injured)	3:20 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: N	Clear
4131308	WEYMOUTH	12/04/2015	Property damage only (none injured)	2:47 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: W	Clear
4171337	WEYMOUTH	03/09/2016	Property damage only (none injured)	6:23 PM	Collision with motor vehicle in traffic	Head-on	Dry	V1: Entering traffic lane / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: W	Cloudy
4171396	WEYMOUTH	03/03/2016	Not Reported	5:32 PM	Collision with parked motor vehicle	Angle	Dry	V1: Backing / V2: Parked	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: Not Reported	Clear
4219437	WEYMOUTH	07/11/2016	Property damage only (none injured)	6:23 PM	Collision with motor vehicle in traffic	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Turning left	V1:(Passenger car) / V2:(Unknown heavy truck, cannot classify)	V1: W / V2: W	Clear
4219551	WEYMOUTH	07/11/2016	Property damage only (none injured)	5:45 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: W	Clear
4225631	WEYMOUTH	07/22/2016	Property damage only (none injured)	7:56 AM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: W	Clear
4240935	WEYMOUTH	08/31/2016	Property damage only (none injured)	11:21 AM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: W	Clear
4299843	WEYMOUTH	12/05/2016	Property damage only (none injured)	9:38 AM	Collision with motor vehicle in traffic	Angle	Wet	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: E	Rain
4299956	WEYMOUTH	12/02/2016	Non-fatal injury	8:17 AM	Collision with motor vehicle in traffic	Angle	Dry	V1: Travelling straight ahead / V2: Entering traffic lane	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: W	Clear
4305293	WEYMOUTH	12/29/2016	Property damage only (none injured)	11:48 AM	Collision with motor vehicle in traffic	Angle	Wet	V1: Travelling straight ahead / V2: Turning left	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: N / V2: W	Cloudy
4319538	WEYMOUTH	01/07/2017	Property damage only (none injured)	10:24 AM	Collision with motor vehicle in traffic	Angle	Ice	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: E	Cloudy
4319806	WEYMOUTH	01/30/2017	Property damage only (none injured)	6:24 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: E	Clear/Other
4346773	WEYMOUTH	03/15/2017	Property damage only (none injured)	11:00 AM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: E	Clear
4358580	WEYMOUTH	04/18/2017	Non-fatal injury	3:58 PM	Collision with pedalcycle (bicycle, tricycle, unicycle, pedal car)	Angle	Dry	V1: Turning right	V1:(Passenger car)	V1: W	Clear
4370883	WEYMOUTH	05/23/2017	Property damage only (none injured)	6:32 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Entering traffic lane / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: N	Clear
4431163	WEYMOUTH	09/23/2017	Property damage only (none injured)	4:43 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: N	Clear
4463557	WEYMOUTH	11/16/2017	Non-fatal injury	2:02 PM	Collision with pedestrian	Single vehicle crash	Wet	V1: Turning right	V1:(Passenger car)	V1: S	Rain/Cloudy
4493093	WEYMOUTH	01/24/2018	Property damage only (none injured)	10:40 AM	Collision with parked motor vehicle	Angle	Dry	V1: Parked / V2: Turning right	V1:(Other e.g. farm equipment) / V2:(Passenger car)	V1: N / V2: N	Clear
4521373	WEYMOUTH	03/05/2018	Property damage only (none injured)	8:24 AM	Collision with motor vehicle in traffic	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car) / V3:(Unknown heavy truck, cannot classify)	V1: N / V2: N / V3: N	Cloudy
4533384	WEYMOUTH	04/04/2018	Property damage only (none injured)	8:23 PM	Collision with parked motor vehicle	Rear-end	Wet	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Rain
4607222	WEYMOUTH	09/12/2018	Non-fatal injury	12:18 AM	Collision with motor vehicle in traffic	Rear-end	Wet	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Fog, smog, smoke/Cloudy
4607238	WEYMOUTH	09/18/2018	Property damage only (none injured)	8:30 PM	Collision with motor vehicle in traffic	Rear-end	Wet	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Clear
4616665	WEYMOUTH	10/22/2018	Non-fatal injury	2:48 PM	Collision with motor vehicle in traffic	Rear-end	Dry	V1: Travelling straight ahead / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car)	V1: N / V2: N / V3: N	Cloudy
4687302	WEYMOUTH	03/19/2019	Property damage only (none injured)	6:31 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: N	Clear
4744239	WEYMOUTH	08/05/2019	Property damage only (none injured)	12:53 PM	Collision with motor vehicle in traffic	Sideswipe, same direction	Dry	V2: Overtaking/passing / V1: Turning right	V2:(Light truck(van, mini-van, pickup, sport utility)) / V1:(Tractor/semi-trailer)	V2: E / V1: E	Clear
4868151	WEYMOUTH	07/28/2020	Property damage only (none injured)	2:37 PM	Collision with motor vehicle in traffic	Rear-end	Wet	V1: Slowing or stopped in traffic / V2: Travelling straight ahead / V3: Travelling straight ahead / V4: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car) / V4:(Passenger car)	V1: N / V2: N / V3: N / V4: N	Rain
4868261	WEYMOUTH	07/11/2020	Property damage only (none injured)	12:18 PM	Collision with motor vehicle in traffic	Rear-end	Dry	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Clear
4882660	WEYMOUTH	09/04/2020	Property damage only (none injured)	1:25 PM	Collision with motor vehicle in traffic	Sideswipe, same direction	Dry	V2: Changing lanes / V1: Slowing or stopped in traffic	V2:(Passenger car) / V1:(Single-unit truck (3-or-more axles))	V2: N / V1: N	Clear
4892506	WEYMOUTH	10/02/2020	Property damage only (none injured)	10:47 AM	Collision with motor vehicle in traffic	Rear-end	Dry	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Cloudy/Unknown
4892525	WEYMOUTH	10/13/2020	Property damage only (none injured)	11:48 AM	Collision with motor vehicle in traffic	Rear-end	Wet	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Cloudy/Rain

Pleasant Street at Libbey Industrial Parkway

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	First Harmful Event	Manner of Collision	Road Surface Condition	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions
4001771	WEYMOUTH	01/23/2015	Property damage only (none injured)	2:58 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: S	Clear
4018702	WEYMOUTH	02/25/2015	Property damage only (none injured)	6:49 AM	Collision with motor vehicle in traffic	Angle	Snow	V1: Entering traffic lane / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: W	Snow
4047147	WEYMOUTH	05/20/2015	Property damage only (none injured)	4:12 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Travelling straight ahead / V2: Entering traffic lane	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: E	Clear
4047152	WEYMOUTH	05/01/2015	Property damage only (none injured)	4:11 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Tractor/semi-trailer)	V1: E / V2: S	Clear
4060964	WEYMOUTH	06/30/2015	Property damage only (none injured)	2:27 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: S	Clear
4061343	WEYMOUTH	06/01/2015	Property damage only (none injured)	12:22 PM	Collision with motor vehicle in traffic	Angle	Wet	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Bus (seats for 16 or more, including driver))	V1: E / V2: S	Cloudy/Rain
4107771	WEYMOUTH	10/17/2015	Property damage only (none injured)	3:13 PM	Collision with motor vehicle in traffic	Rear-end	Dry	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Cloudy
4107803	WEYMOUTH	10/05/2015	Property damage only (none injured)	5:37 AM	Collision with motor vehicle in traffic	Angle	Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Single-unit truck (3-or-more axles))	V1: S / V2: N	Clear
4108191	WEYMOUTH	10/17/2015	Non-fatal injury	12:21 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: S	Cloudy
4131273	WEYMOUTH	12/17/2015	Non-fatal injury	4:02 PM	Collision with motor vehicle in traffic	Angle	Wet	V1: Entering traffic lane / V2: Travelling straight ahead	V1:(Tractor/semi-trailer) / V2:(Passenger car)	V1: E / V2: N	Cloudy/Rain
4131301	WEYMOUTH	12/03/2015	Property damage only (none injured)	9:24 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Slowing or stopped in traffic / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: E	Clear
4131343	WEYMOUTH	01/06/2016	Property damage only (none injured)	7:56 AM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: N / V2: S	Clear
4158633	WEYMOUTH	02/29/2016	Property damage only (none injured)	6:29 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Backing / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: N	Clear
4196824	WEYMOUTH	05/02/2016	Non-fatal injury	10:52 AM	Collision with motor vehicle in traffic	Rear-end	Wet	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Rain
4196839	WEYMOUTH	05/09/2016	Property damage only (none injured)	7:16 AM	Collision with motor vehicle in traffic	Rear-end	Dry	V1: Travelling straight ahead / V2: Slowing or stopped in traffic / V3: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car)	V1: S / V2: S / V3: S	Clear
4196858	WEYMOUTH	05/19/2016	Property damage only (none injured)	3:22 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: S / V2: N	Clear
4196873	WEYMOUTH	05/03/2016	Property damage only (none injured)	2:38 PM	Collision with motor vehicle in traffic	Sideswipe, opposite direction	Wet	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: S	Cloudy
4240929	WEYMOUTH	08/29/2016	Non-fatal injury	1:57 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: E	Clear
4255963	WEYMOUTH	09/20/2016	Property damage only (none injured)	12:38 PM	Collision with motor vehicle in traffic	Rear-end	Dry	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Clear
4294728	WEYMOUTH	11/05/2016	Non-fatal injury	1:57 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: N	Clear
4299950	WEYMOUTH	12/15/2016	Property damage only (none injured)	5:14 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning right / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Clear
4319598	WEYMOUTH	01/25/2017	Non-fatal injury	8:50 AM	Collision with pedestrian	Single vehicle crash	Dry	V1: Turning right	V1:(Passenger car)	V1: E	Clear
4371182	WEYMOUTH	05/27/2017	Property damage only (none injured)	7:48 PM	Collision with curb	Single vehicle crash	Dry	V1: Travelling straight ahead	V1:(Passenger car)	V1: E	Clear
4431141	WEYMOUTH	09/12/2017	Non-fatal injury	8:56 AM	Collision with motor vehicle in traffic	Sideswipe, same direction	Dry	V1: Turning left / V2: Turning right	V1:(Passenger car) / V2:(Tractor/semi-trailer)	V1: S / V2: S	Clear
4431176	WEYMOUTH	09/26/2017	Property damage only (none injured)	3:01 PM	Collision with motor vehicle in traffic	Angle	Dry	V1: Travelling straight ahead / V2: Entering traffic lane	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Clear
4463907	WEYMOUTH	11/13/2017	Property damage only (none injured)	5:03 PM	Collision with motor vehicle in traffic	Angle	Wet	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: E	Rain
4463913	WEYMOUTH	11/27/2017	Property damage only (none injured)	6:54 AM	Collision with motor vehicle in traffic	Angle	Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Truck/trailer) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: E / V2: S	Clear

200 Libbey Site Drive at Libbey Industrial Parkway

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	First Harmful Event	Manner of Collision	Road Surface Condition	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions
4001735	WEYMOUTH	01/19/2015	Unknown	8:01 AM	Collision with utility pole	Single vehicle crash	Ice	V1: Travelling straight ahead	V1:(Passenger car)	V1: E	Clear

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : WEYMOUTH COUNT DATE : 6/17/2015

DISTRICT : 6 UNSIGNALIZED : X SIGNALIZED :

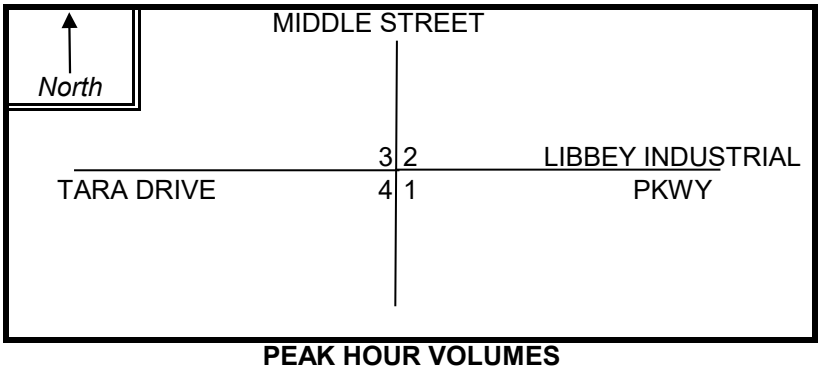
~ INTERSECTION DATA ~

MAJOR STREET : MIDDLE STREET

MINOR STREET(S) : LIBBEY INDUSTRIAL PARKWAY

TARA DRIVE

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4		Total Peak Hourly Approach Volume
DIRECTION :	NB	WB	SB	EB		
PEAK HOURLY VOLUMES (PM) :	701	416	559	8		1,684

" K " FACTOR : **0.09**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **18,711**

TOTAL # OF CRASHES : 24

OF YEARS : 3

AVERAGE # OF CRASHES PER YEAR (**A**) : **8.00**

CRASH RATE CALCULATION : **1.17**

$$\text{RATE} = \frac{(\text{A} * 1{,}000{,}000)}{(\text{V} * 365)}$$

Comments : Intersection crash rate higher than State and District averages.
Intersection has since been signalized.

Project Title & Date: Proposed Medical Office Building, 200 Libbey Industrial Parkway, February 2021

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : WEYMOUTH COUNT DATE : 6/17/2015

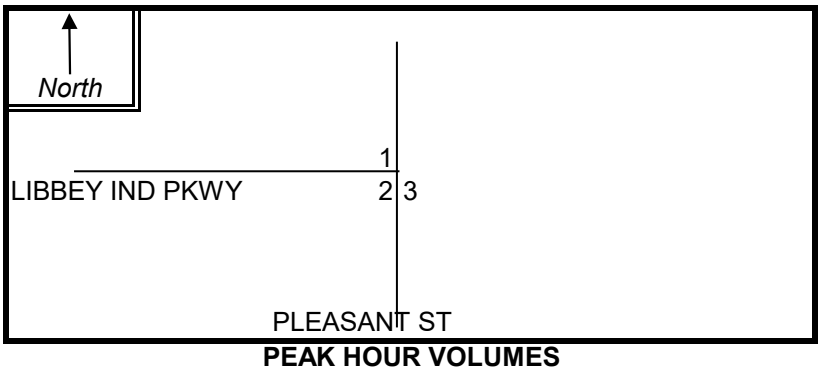
DISTRICT : 6 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : PLEASANT STREET

MINOR STREET(S) : LIBBEY INDUSTRIAL PARKWAY

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3			Total Peak Hourly Approach Volume
DIRECTION :	SB	EB	NB			
PEAK HOURLY VOLUMES (PM) :	979	467	919			2,365

" K " FACTOR : **0.09**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **26,278**

TOTAL # OF CRASHES : 27

OF YEARS : 3

AVERAGE # OF CRASHES PER YEAR (**A**) : **9.00**

CRASH RATE CALCULATION : **0.94**

$$\text{RATE} = \frac{(\text{A} * 1{,}000{,}000)}{(\text{V} * 365)}$$

Comments : Intersection crash rate higher than State and District 6 averages.

Project Title & Date: Proposed Medical Office Building, 200 Libbey Industrial Parkway, February 2021

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : WEYMOUTH COUNT DATE : 6/17/2015

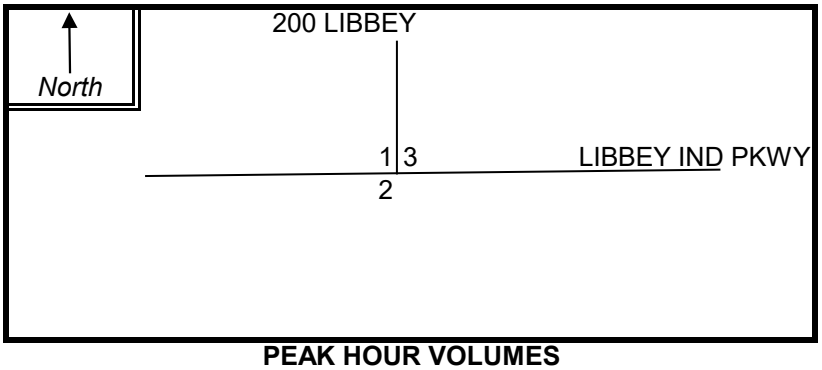
DISTRICT : 6 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : LIBBEY INDUSTRIAL PARKWAY

MINOR STREET(S) : 200 SITE DRIVE

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3			Total Peak Hourly Approach Volume
DIRECTION :	SB	EB	WB			
PEAK HOURLY VOLUMES (PM) :	0	467	194			661

" K " FACTOR : **0.09**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **7,344**

TOTAL # OF CRASHES : 1

OF YEARS : 3

AVERAGE # OF CRASHES PER YEAR (**A**) : **0.33**

CRASH RATE CALCULATION : **0.12**

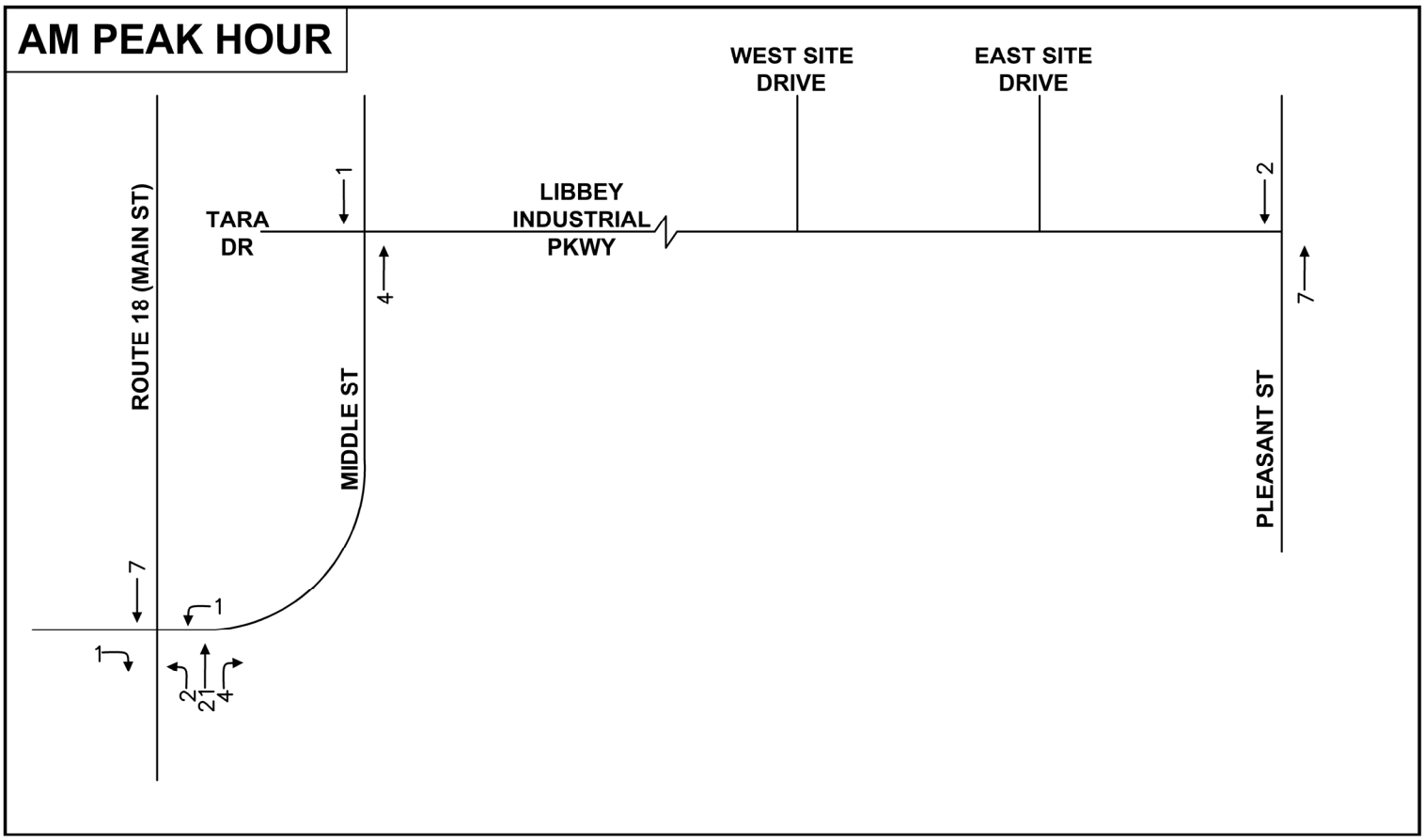
$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

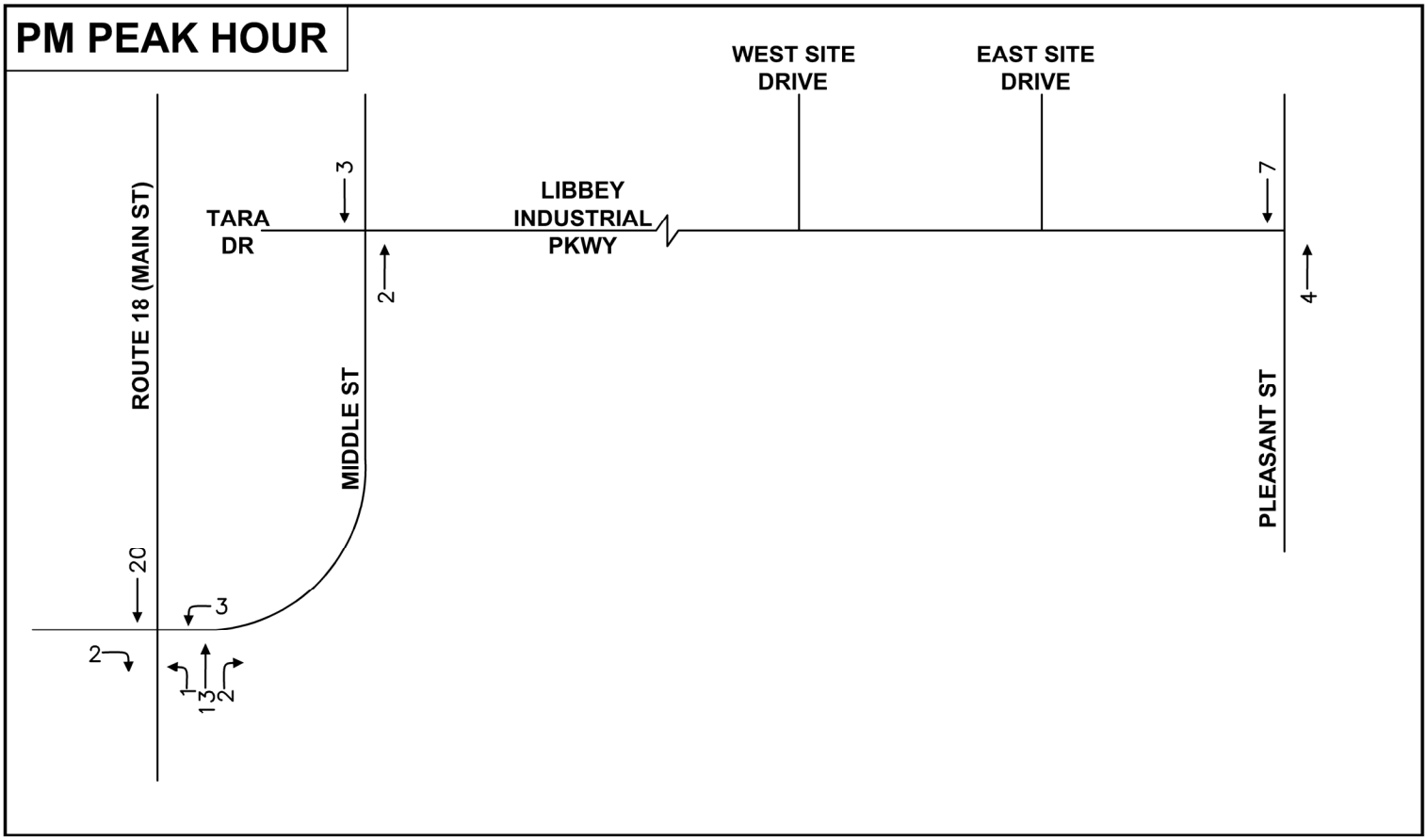
Comments : Intersection crash rate is below State and District 6 averages.

Project Title & Date: Proposed Medical Office Building, 200 Libbey Industrial Parkway, February 2021

Appendix G

Background Project Trips Calculations – No-Build





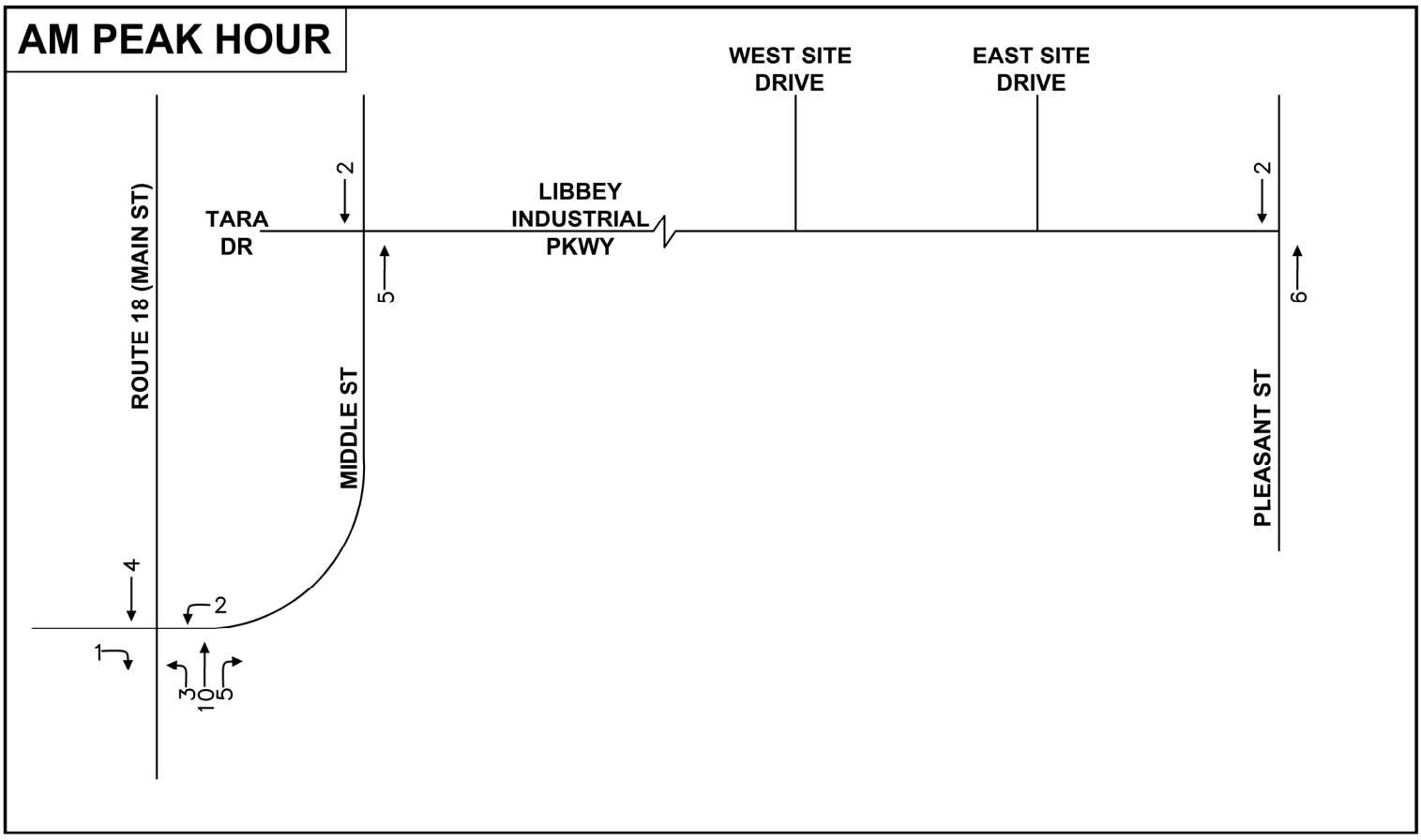
TETRA TECH

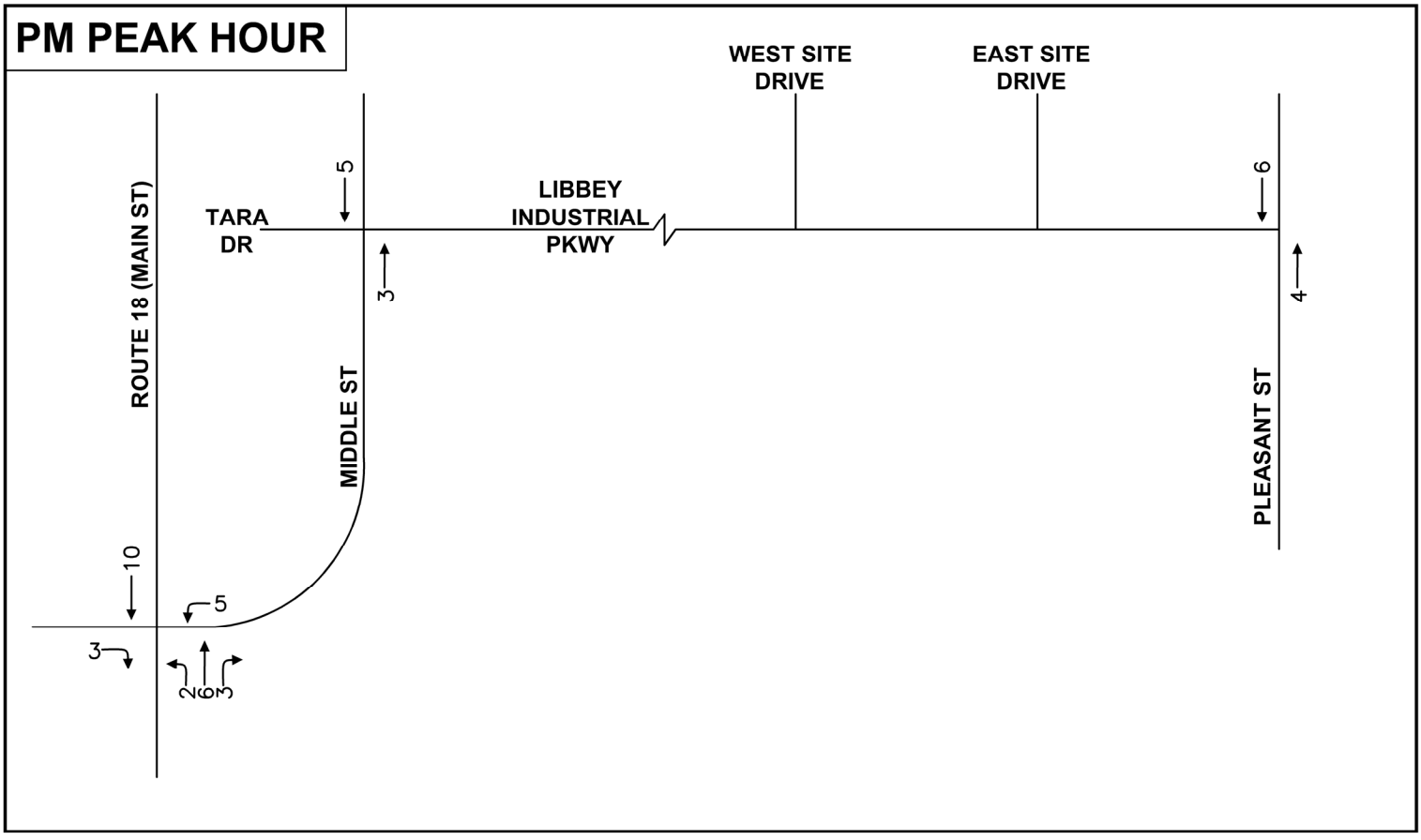
NOT TO SCALE

Proposed Medical Office Building
Weymouth, Massachusetts

Background Project Trips
Southfield - 2021 to 2028

FIGURE
G1





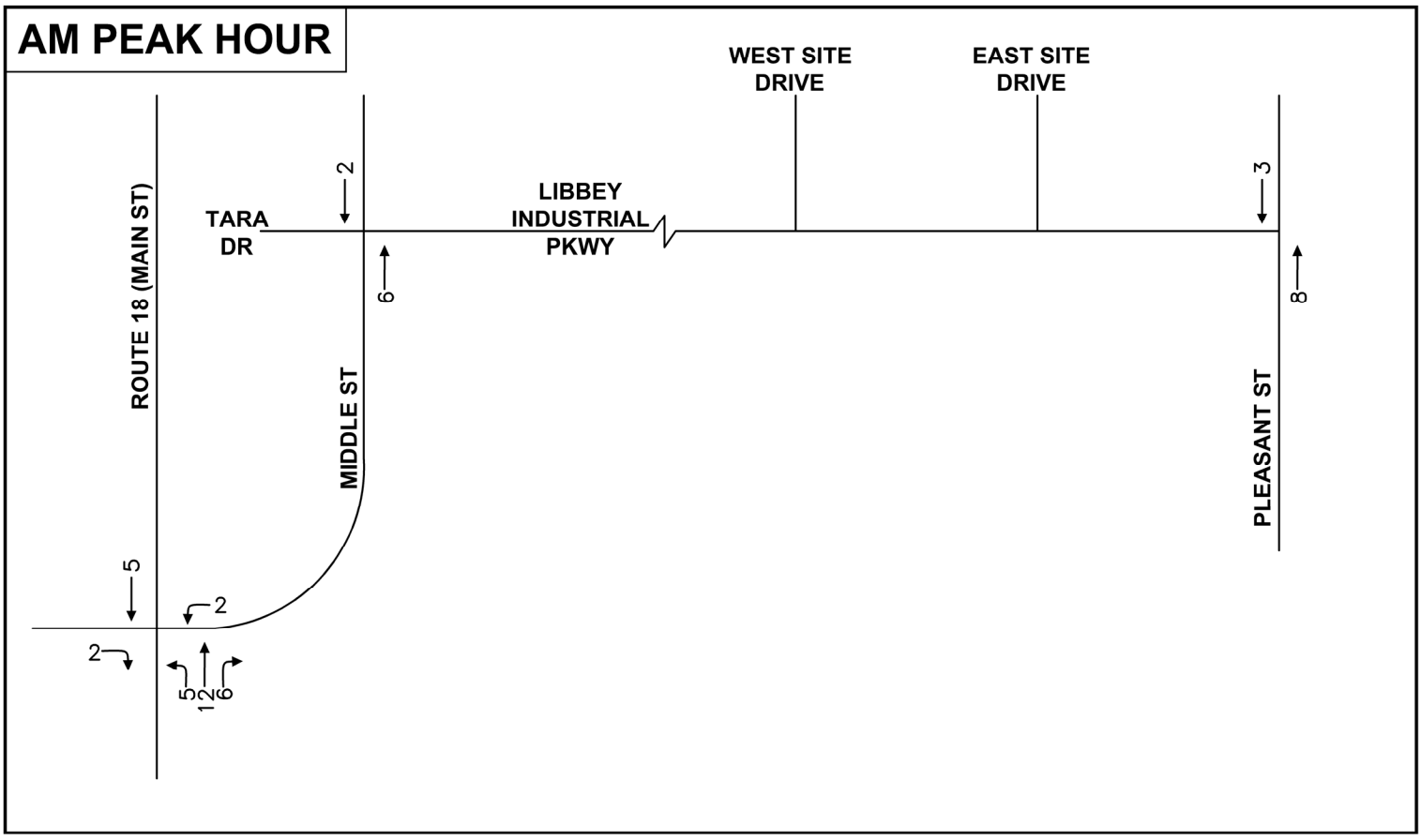
TETRA TECH

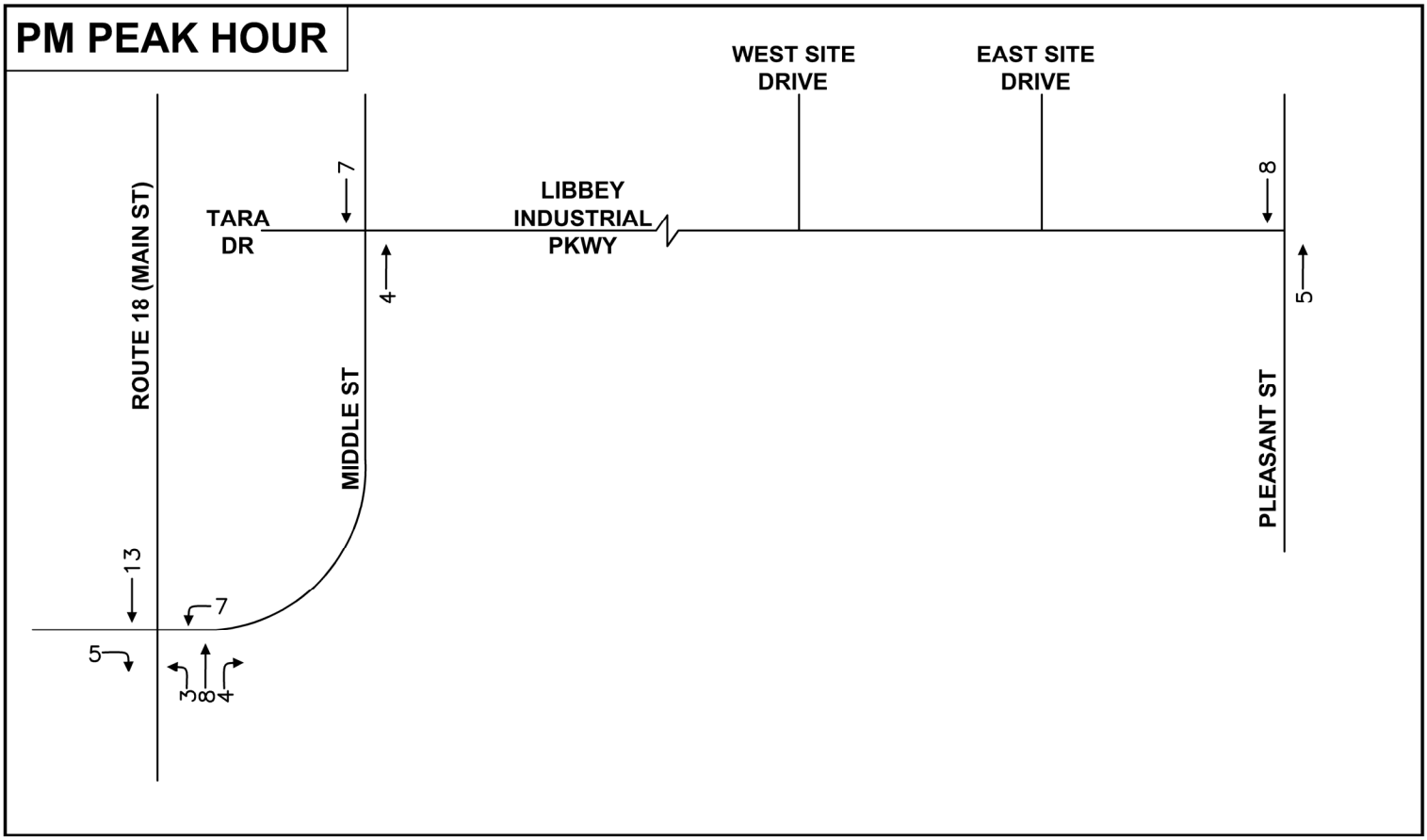
NOT TO SCALE

Proposed Medical Office Building
Weymouth, Massachusetts

Background Project Trips
1400 Main Street

FIGURE
G2





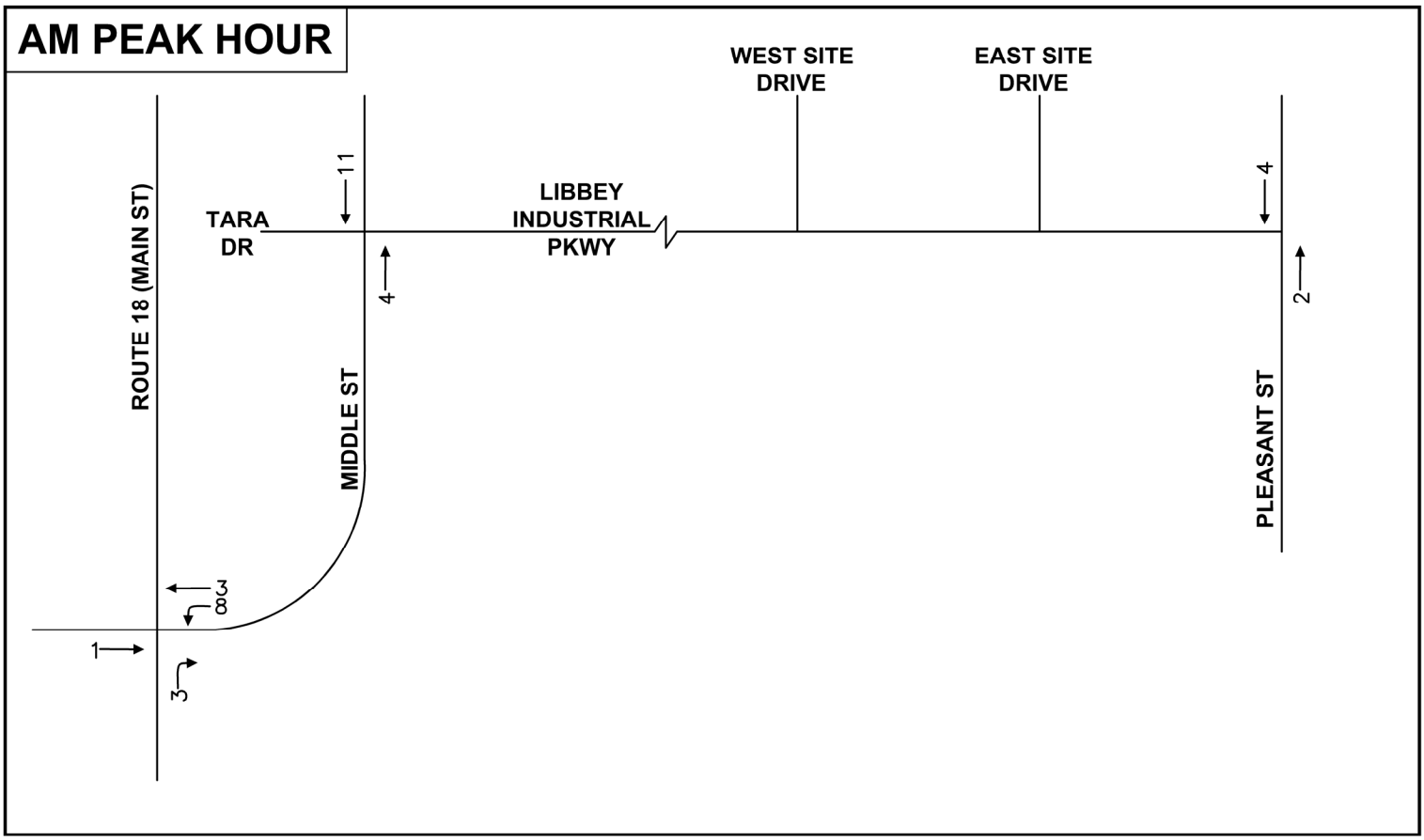
TETRA TECH

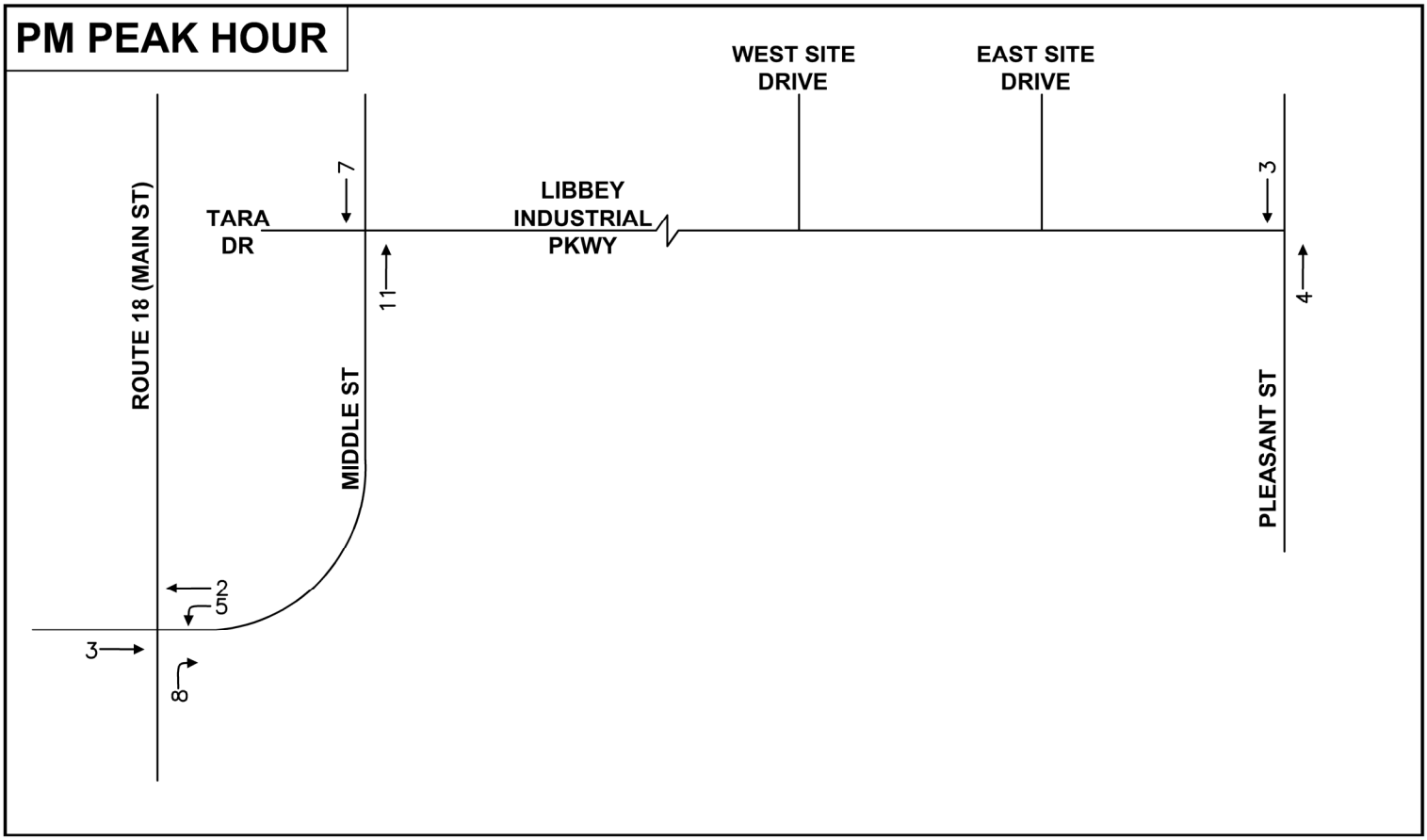
NOT TO SCALE

Proposed Medical Office Building
Weymouth, Massachusetts

Background Project Trips
1500 Main Street

FIGURE
G3





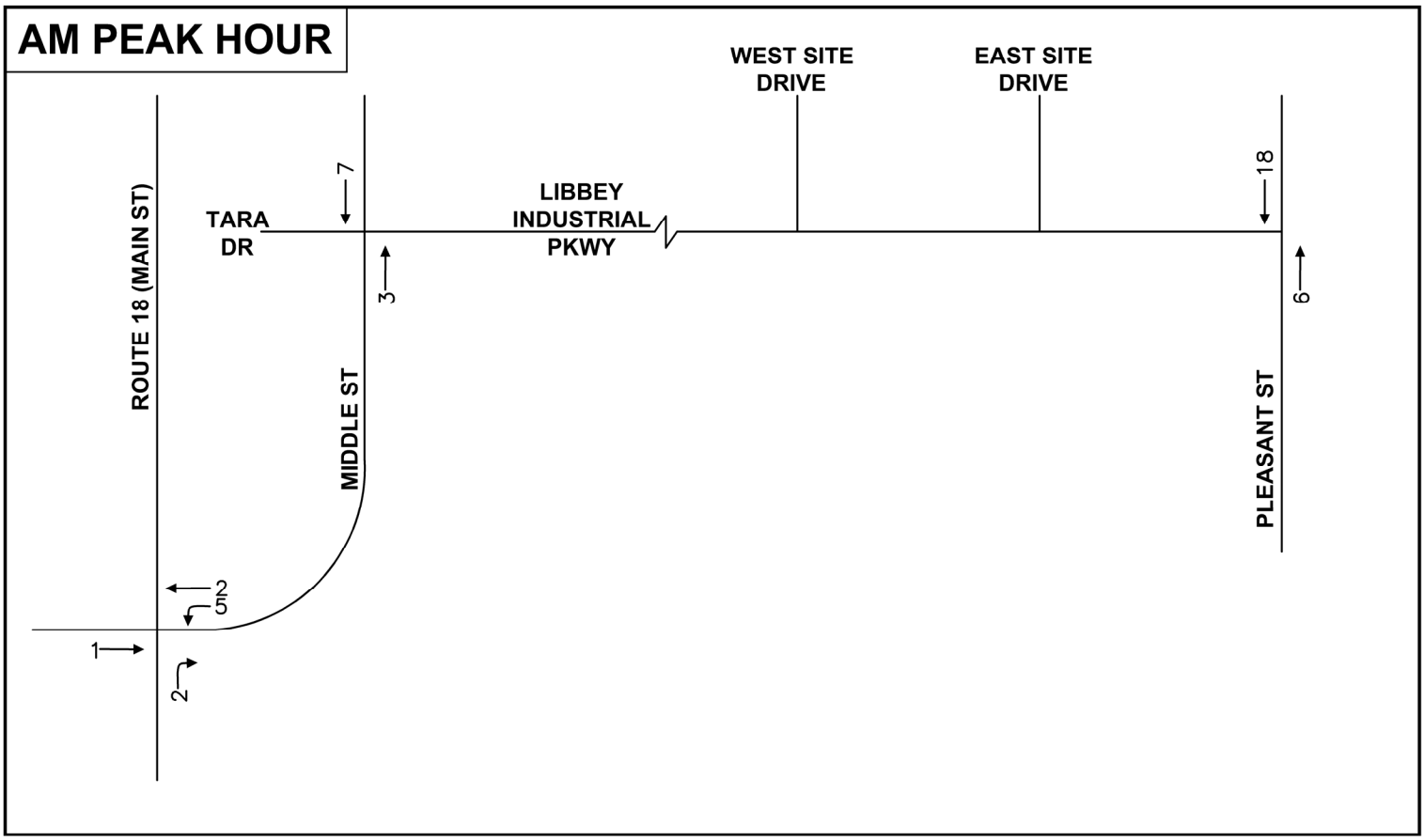
TETRA TECH

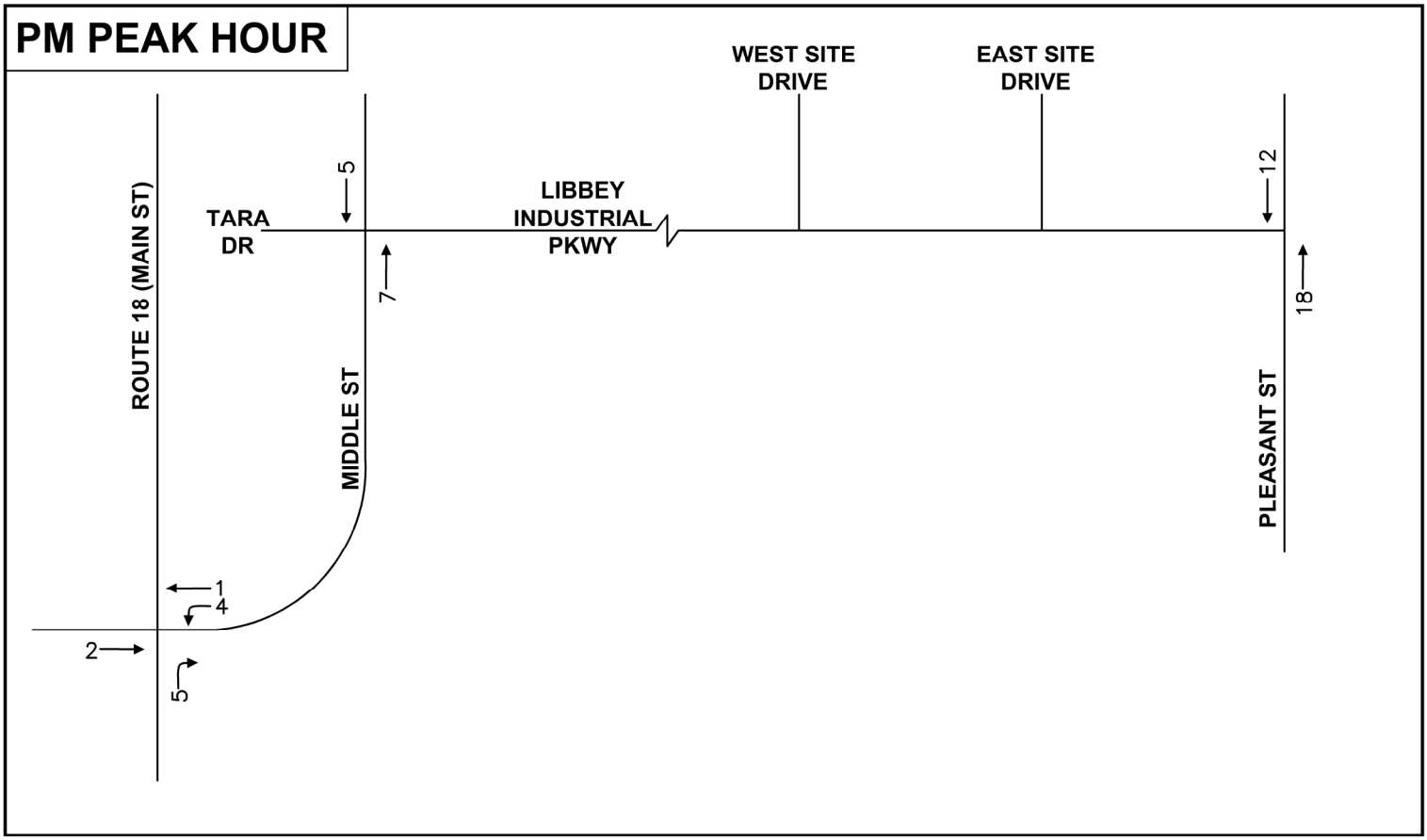
NOT TO SCALE

Proposed Medical Office Building
Weymouth, Massachusetts

Background Project Trips
655 Washington Street

FIGURE
G4





TETRA TECH

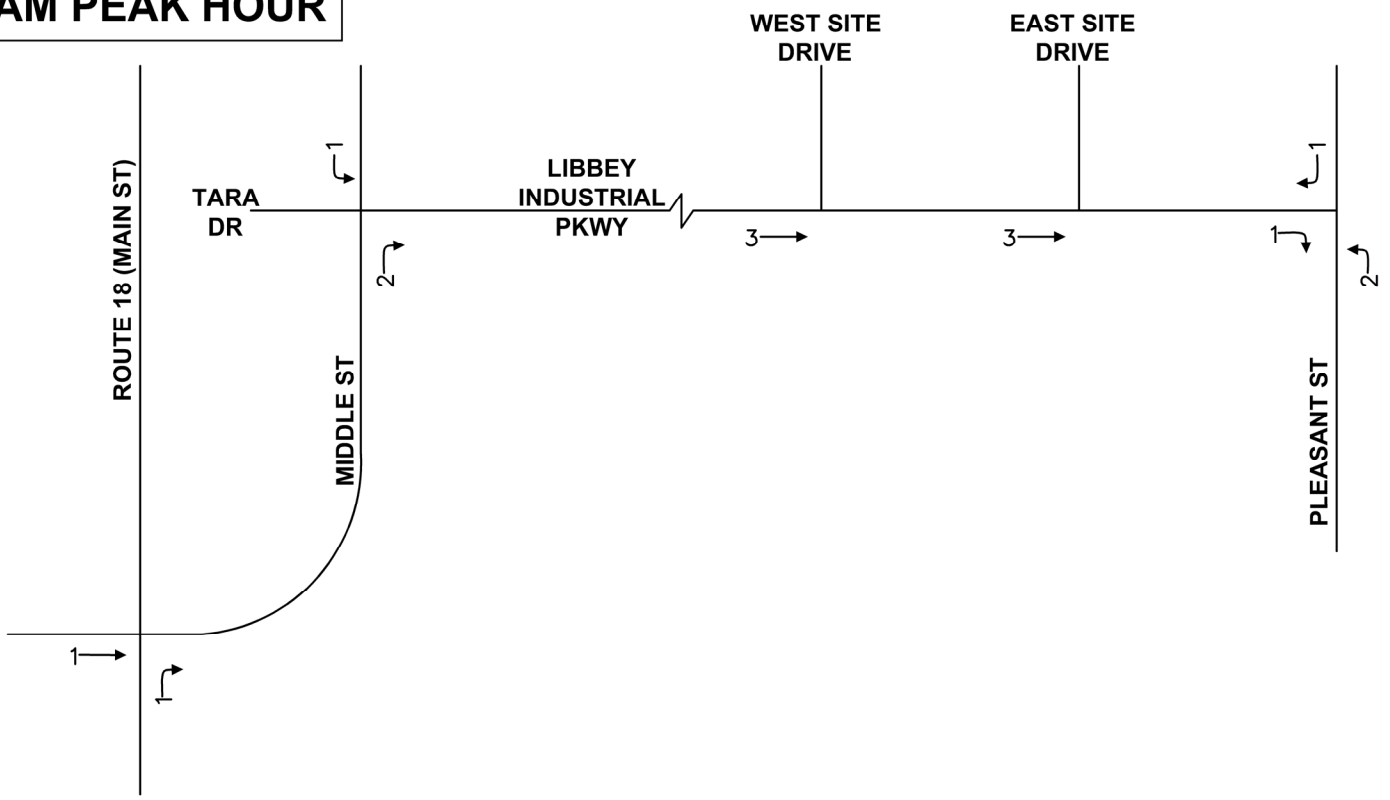
NOT TO SCALE

Proposed Medical Office Building
Weymouth, Massachusetts

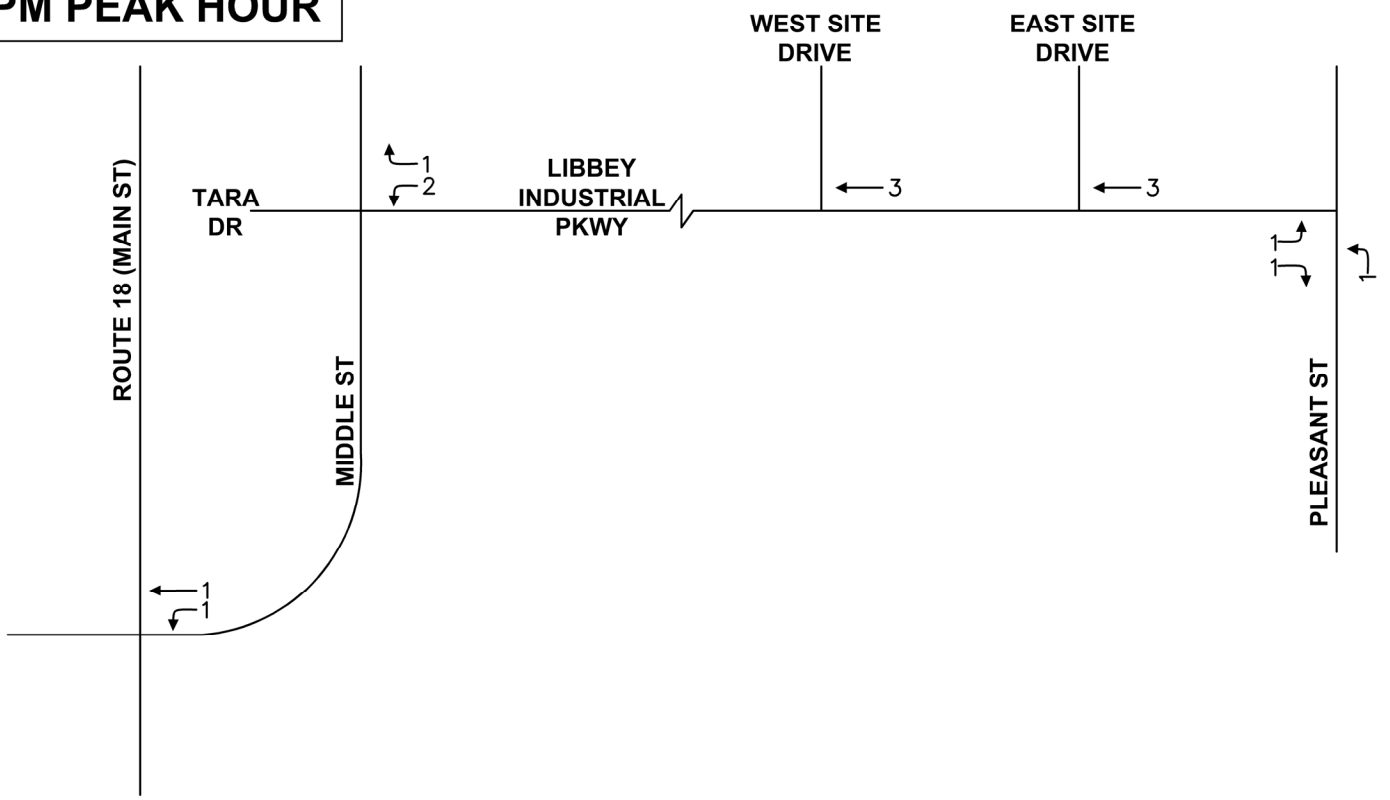
Background Project Trips
1345 Washington Street

FIGURE
G5

AM PEAK HOUR



PM PEAK HOUR



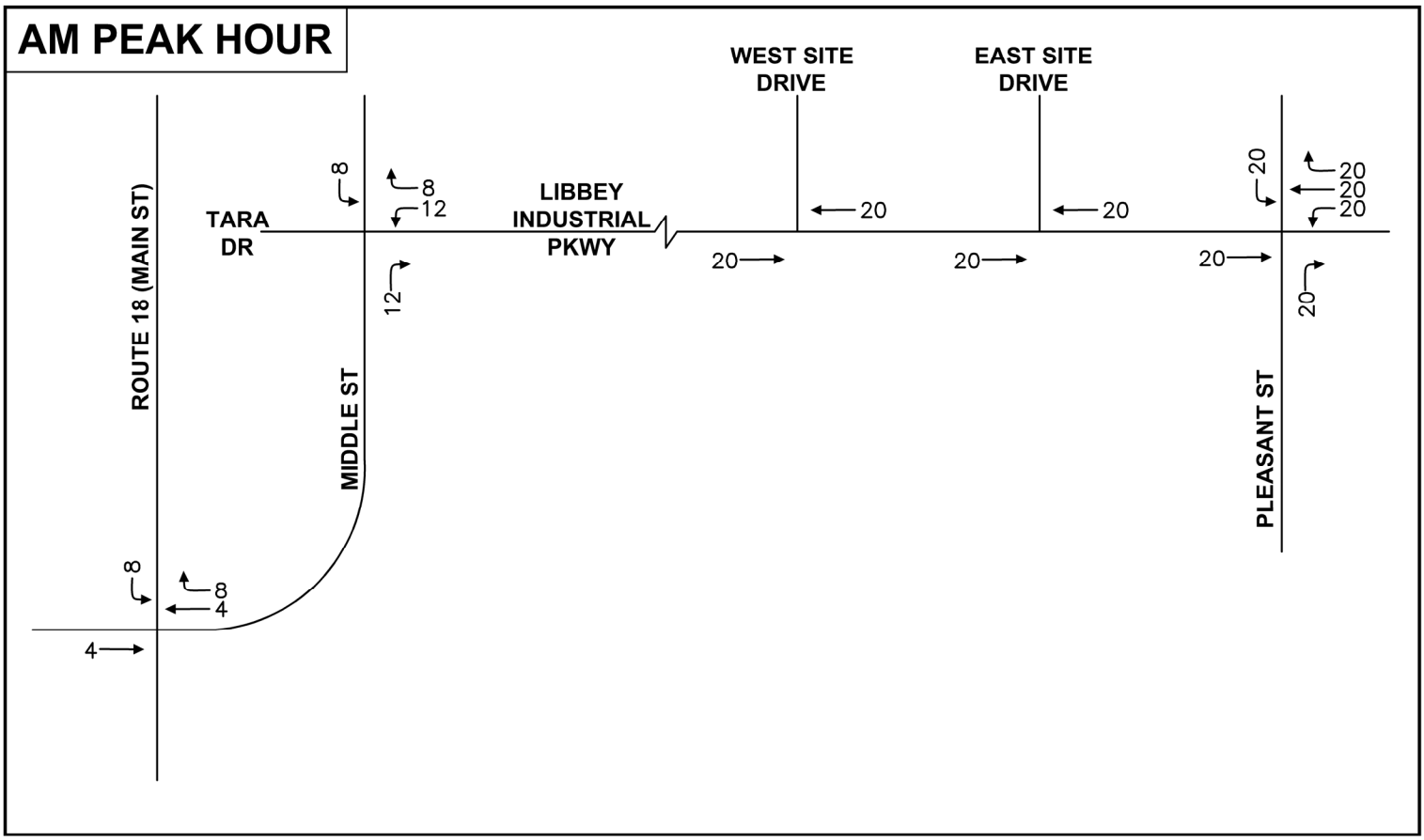
TETRA TECH

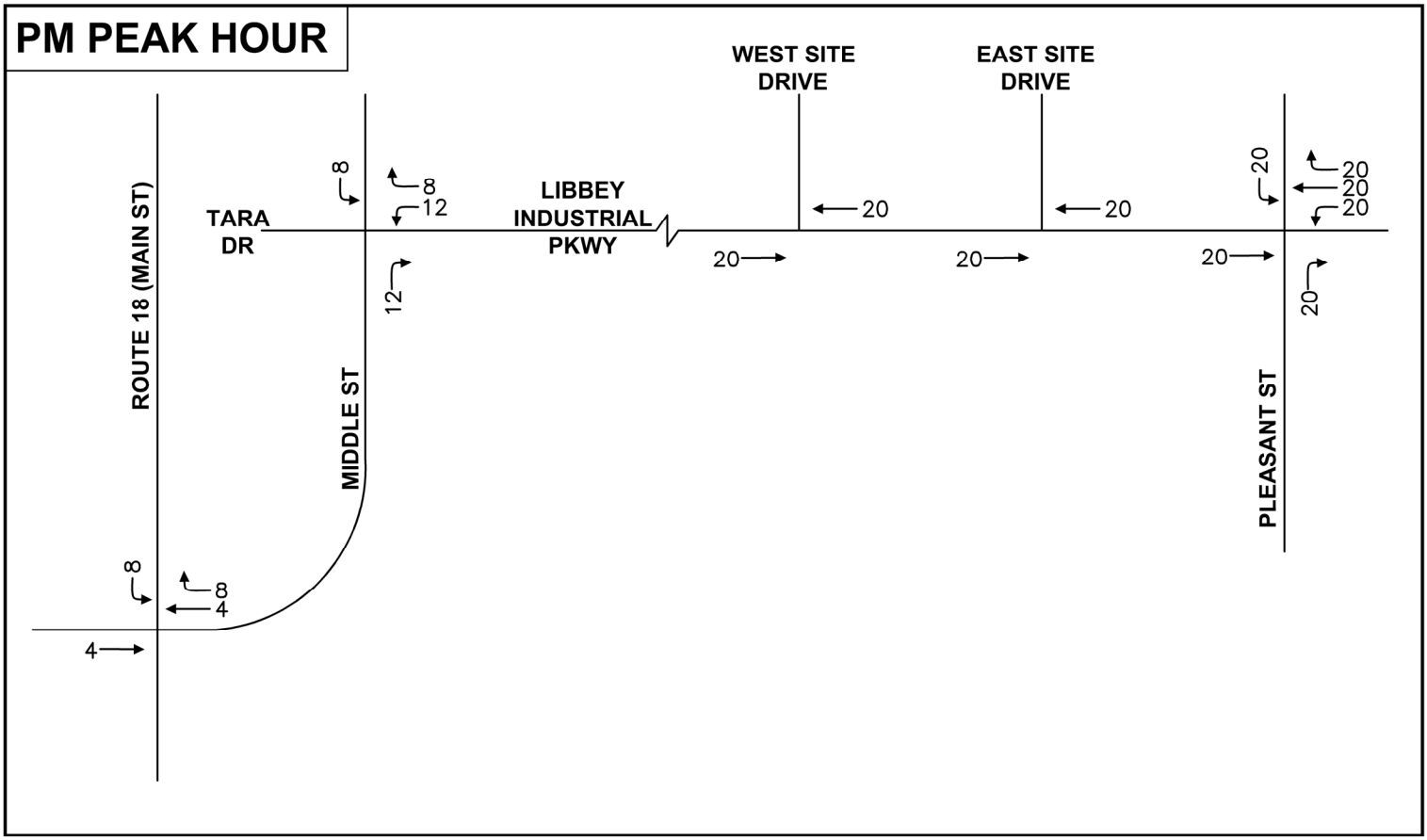
NOT TO SCALE

Proposed Medical Office Building
Weymouth, Massachusetts

Background Project Trips
Libbey Industrial 10KSF

FIGURE
G6





TETRA TECH

NOT TO SCALE

Proposed Medical Office Building
Weymouth, Massachusetts

Background Project Trips
Quarry

FIGURE
G7

2028 Southfield Residential - Assume 700 New Units

Land Use Code 220 - Multifamily Housing (Low-Rise)						Size:	400	DWELLING UNITS
Time Period	R^2 Value	Use Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total
Weekday Daily	0.96	Equation	T=7.56(x)-40.86	7.32	50%	1492	1491	2983
AM Street Peak Hour	0.90	Equation	Ln(T)=.95ln(x)-0.51	0.46	23%	41	137	178
PM Street Peak Hour	0.86	Equation	Ln(T)=0.89Ln(x)-0.02	0.56	63%	128	75	203
Saturday Daily	0.93	Equation	T=14.01x-521.69	8.14	50%	2541	2541	5082
Saturday Peak Hour of Generator	0.92	Equation	T=1.08x-33.24	0.7	54%	215	184	399
Sunday Daily	0.96	Equation	T=10.13X-341.89	6.28	50%	1855	1855	3710
Sunday Peak Hour of Generator	0.93	Equation	T=1.12X-40.41	0.67	50%	204	204	408

Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.
Source: *Trip Generation* , *Tenth Edition* , (Institute of Transportation Engineers, 2017).

Land Use Code 252- Senior Adult Housing - Attached						Size:	300	DWELLINGS
Time Period	R^2 Value	Use Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total
Weekday Daily	0.99	Equation	T=4.02(x)-25.37	3.7	50%	591	590	1181
AM Street Peak Hour	0.98	Equation	T=.20(x)-0.18	0.2	35%	21	39	60
PM Street Peak Hour	0.96	Equation	T=.24(x)+2.26	0.26	55%	41	33	74
Saturday Daily	0.99	Equation	T=3.97(x)-60.09	3.23	50%	566	565	1131
Saturday Peak Hour	0.99	Equation	T=.35(x)+1.67	0.33	62%	66	41	107

Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.
Source: *Trip Generation* , *Tenth Edition* , (Institute of Transportation Engineers, 2017).

Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.
Source: *Trip Generation* , *Tenth Edition* , (Institute of Transportation Engineers, 2017).

Total Residential

Weekday Daily						2083	2081	4164
AM Street Peak Hour						62	176	238
PM Street Peak Hour						169	108	277

655 Washington Street - 160 Units Residential

Land Use Code 221 - Multifamily Housing (Mid-Rise) Setting/Location : General Urban/Suburban

Land Use Code 221 - Multifamily Housing (Mid-Rise)						Size:	160	DWELLINGS
Time Period	R^2 Value	Use Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total
Weekday Daily	0.77	Equation	T=5.45(X)-1.75	5.44	50%	435	435	870
AM Street Peak Hour	0.67	Rate	Ln(T)=.98Ln(x)-.98	0.36	26%	15	43	58
PM Street Peak Hour	0.72	Rate	Ln(T)=.96Ln(x)-0.63	0.44	61%	43	27	70
Saturday Daily	0.73	Rate	T=3.04(x)+417.11	4.91	50%	393	393	786
Saturday Peak Hour	0.89	Equation	T=0.42(X)+6.73	0.44	49%	36	38	74
Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.								
Source: *Trip Generation* , *Tenth Edition* , (Institute of Transportation Engineers, 2017).								

1345 Washington Street - 270 Units Residential

Land Use Code 221 - Multifamily Housing (Mid-Rise) Setting/Location : General Urban/Suburban

Land Use Code 221 - Multifamily Housing (Mid-Rise)						Size:	270	DWELLINGS
Time Period	R^2 Value	Use Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total
Weekday Daily	0.77	Equation	T=5.45(X)-1.75	5.44	50%	735	735	1470
AM Street Peak Hour	0.67	Rate	Ln(T)=.98Ln(x)-.98	0.36	26%	25	72	97
PM Street Peak Hour	0.72	Rate	Ln(T)=.96Ln(x)-0.63	0.44	61%	73	46	119
Saturday Daily	0.73	Rate	T=3.04(x)+417.11	4.91	50%	663	663	1326
Saturday Peak Hour	0.89	Equation	T=0.42(X)+6.73	0.44	49%	59	61	120
Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.								
Source: *Trip Generation* , *Tenth Edition* , (Institute of Transportation Engineers, 2017).								

Libbey Industrial - North Side - 10 KSF Industrial

Land Use Code 110 - General Light Industry						Size:	10	KSF
Time Period	R^2 Value	Use Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total
Weekday Daily	0.54	Rate	T=3.79X+57.96	4.96	50%	25	25	50
AM Street Peak Hour	0.52	Rate	Ln(T)=0.74LN(X)+.39	0.7	88%	6	1	7
PM Street Peak Hour	0.52	Rate	Ln(T)=0.69LN(X)+.43	0.63	13%	1	5	6
Saturday Daily		Rate		1.99	50%	10	10	20
Saturday Peak Hour of Generator		Rate		0.41	47%	2	2	4
Sunday Daily		Rate		5	50%	25	25	50
Sunday Peak Hour of Generator		Rate		0.69	48%	3	4	7

Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.
Source: *Trip Generation* , *Tenth Edition* , (Institute of Transportation Engineers, 2017).

Appendix H

Project Trip Generation Calculations

Land Use Code 720 - Medical Office Building						Size:	69	KSF. GFA		
Time Period	R^2 Value	Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total	Equation	Rate
Weekday Daily	0.95	Equation	T=38.42X-87.62	34.8	50%	1282	1282	2564	2564.00	2402.00
AM Street Peak Hour	0.80	Equation	Ln(T)=0.89Ln(X)+1.31	2.78	78%	126	35	161	161.00	192.00
PM Street Peak Hour	0.73	Rate	T=3.39X+2.02	3.46	28%	67	172	239	236.00	239.00
Saturday Daily		Rate		8.57	50%	296	296	592		592.00
Saturday Peak Hour	0.78	Equation	T=4.94X-50.78	3.1	57%	165	125	290	290.00	214.00

Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.

Source: *Trip Generation*, Tenth *Edition*, (Institute of Transportation Engineers, 2017).

Land Use Code 110 - General Light Industry						Size:	41.5	KSF		
Time Period	R^2 Value	Use Equation or Rate?	Equation	Rate	Percent Enter	In	Out	Total	Equation	Rate
Weekday Daily	0.54	Rate	T=3.79X+57.96	4.96	50%	103	103	206	215.00	206.00
AM Street Peak Hour	0.52	Rate	Ln(T)=0.74LN(X)+.39	0.7	88%	26	3	29	23.00	29.00
PM Street Peak Hour	0.52	Rate	Ln(T)=0.69LN(X)+.43	0.63	13%	3	23	26	20.00	26.00
Saturday Daily		Rate		1.99	50%	42	41	83		83.00
Saturday Peak Hour of Generator		Rate		0.41	47%	8	9	17		17.00
Sunday Daily		Rate		5	50%	104	104	208		208.00
Sunday Peak Hour of Generator		Rate		0.69	48%	14	15	29		29.00

Note: If R^2 is greater than or equal to 0.75 the equation is used to calculate trips, otherwise the rate is used.
Source: *Trip Generation* , *Tenth Edition* , (Institute of Transportation Engineers, 2017).

Appendix I

Project Trip Distribution Calculations

LIBBEY INDUSTRIAL PARKWAY - WEYMOUTH, MA
MEDICAL OFFICE GRAVITY MODEL FOR TRIP DISTRIBUTION

Job. No. 143-42892-20004

								Northern Communities		Southern Communities					Eastern Communities			Western Communities				Weymouth								
City/Town	COUNTY	STATE	Total Population	Area Adjustment Factor	Competing Factor	Total Adjusted Population	Portion	Route 3 (From North)	Route 53 (From North)	Route 3 (From South)	Route 53 (From South)	Route 18 (From South)	Park Street (From West)	Pine Street (From South)	Route 53 (From South)	Middle Street (From North)	Pleasant Street (From North)	Route 3 (From North)	Route 53 (From North)	West Street (From West)	Route 18 (From West)	Route 18 (From South)	West Street (From West)	Pine Street (From South)	Park Ave (From West)	Union Street (From South)	Route 53 (From North)	Middle Street (From North)	Pleasant Street (From North)	TOTAL
Weymouth	Norfolk	MA	56,734	0.90	1.00	51,061	10.33%															15%	5%	5%		15%	15%	30%	15%	100%
Quincy	Norfolk	MA	94,207	1.00	0.70	65,945	13.34%	75%	25%																					100%
Milton	Norfolk	MA	27,572	1.00	0.70	19,300	3.90%	100%																						100%
Boston[1]	Suffolk	MA	684,379																											
Dorchester	Suffolk	MA	130,032	0.70	0.50	45,511	9.21%	100%																						100%
Hyde Park	Suffolk	MA	41,063	0.40	0.50	8,213	1.66%	100%																						100%
Mattapan	Suffolk	MA	27,375	0.90	0.50	12,319	2.49%	100%																						100%
Roxbury	Suffolk	MA	54,750	0.06	0.50	1,643	0.33%	100%																						100%
Abington	Plymouth	MA	16,436	1.00	0.70	11,505	2.33%					100%																		100%
Brockton	Plymouth	MA	95,594	0.90	0.70	60,224	12.18%					60%	40%																	100%
East Bridgewater	Plymouth	MA	14,466	0.20	0.70	2,025	0.41%					100%																		100%
Whitman	Plymouth	MA	15,056	1.00	0.70	10,539	2.13%					100%																		100%
Rockland	Plymouth	MA	17,953	1.00	1.00	17,953	3.63%			25%		25%		50%																100%
Pembroke	Plymouth	MA	18,380	0.05	1.00	919	0.19%			100%																				100%
Hanson	Plymouth	MA	10,777	0.50	1.00	5,389	1.09%							100%																100%
Hanover	Plymouth	MA	14,459	1.00	1.00	14,459	2.92%			80%				20%																100%
Norwell	Plymouth	MA	11,054	1.00	1.00	11,054	2.24%			50%	50%																			100%
Marshfield	Plymouth	MA	25,838	0.05	1.00	1,292	0.26%			100%																				100%
Hingham	Plymouth	MA	23,652	1.00	1.00	23,652	4.78%								40%		60%													100%
Cohasset	Norfolk	MA	8,484	1.00	1.00	8,484	1.72%								50%		50%													100%
Scituate	Plymouth	MA	18,720	0.75	1.00	14,040	2.84%								60%		40%													100%
Hull	Plymouth	MA	10,455	1.00	1.00	10,455	2.11%								50%		50%													100%
Avon	Norfolk	MA	4,500	1.00	0.70	3,150	0.64%													50%	50%									100%
Holbrook	Norfolk	MA	11,045	1.00	0.90	9,941	2.01%													50%	50%									100%
Randolph	Norfolk	MA	34,064	1.00	0.70	23,845	4.82%											10%		70%	20%									100%
Braintree	Norfolk	MA	37,220	1.00	0.90	33,498	6.78%											40%	30%	30%										100%
Canton	Norfolk	MA	23,369	0.85	0.70	13,905	2.81%											100%												100%
Stoughton	Norfolk	MA	28,639	0.70	0.70	14,033	2.84%											100%												100%
TOTAL			**871,894**			**494,352**	**100%**	**27.6%**	**3.3%**	**4.8%**	**1.1%**	**13.1%**	**4.9%**	**3.5%**	**5.5%**		**5.9%**	**8.8%**	**2.0%**	**6.7%**	**2.3%**	**1.5%**	**0.5%**	**0.5%**		**1.5%**	**1.5%**	**3.1%**	**1.5%**	**100%**
									30.9%					**27.4%**			**11.5%**				**19.9%**								**10.3%**	**100%**

Source: U.S. Census Bureau, 2015-2019 5-Year American Community Survey

[1]The 2019 populations for Dorchester, Hyde Park, Mattapan and Roxbury were estimated by applying their individual proportions relative to the entire Boston population for 2013-2017 ACS (obtained from BPDA Reserch Division Analysis) *for the 2013-2017 American Community Survey* to the 2015-2019 ACS population for Boston.

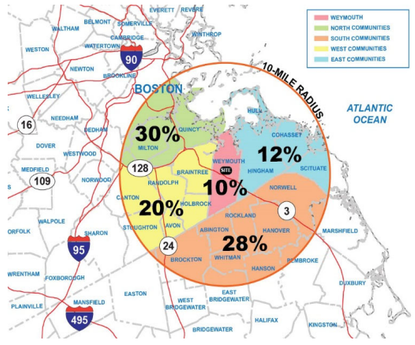
Route	Due Diligence	Adjusted
iddle Street to/from North	10%	10%
ddle Street to/from South	60%	54%
ısant Street to/from North	10%	15%
sant Street to/from South	20%	21%
Total	**100%**	**100%**

NOTES:
-Based on googlemaps for Tuesday, September 29, 2015 between 7:45 am and 9:00 am
(Adjusted assumes that half of the traffic along Rt 3 to/from the south uses Middle Street via Exit 16-Route 18, one-third of the Rt 18 to/from south traffic uses Middle Street and one-third of Park Ave traffic uses Middle Street to/from south)
(Adjusted assumes that half of the traffic along Rt 3 to/from the south uses Pleasant Street via Exit 15-Derby Street, two-thirds of the Rt 18 to/from south traffic uses Pleasant Street and one-third of Park Ave traffic uses Pleasant Street to/from south)

City/Neighborhood	2013-2017 ACS Population*	% of Total Population	2019 Population (Estimated)
Boston	**669,158**		**684,379**
Dorchester	125,947	19%	130,032
Hyde Park	37,094	6%	41,063
Mattapan	25,586	4%	27,375
Roxbury	52,944	8%	54,750

Source: U.S. Census, 2013-2017 American Community Survey, BPDA Research Division Analysis

Boston Competing Factor
Quincy Competing Factor
Brockton Competing Factor
Norwood Competing Factor



			Summary (Regional Distribution)											
City/Town	COUNTY	STATE	Route 3 (From North)	Route 3 (From South)	Route 53 (From North)	Route 53 (From South)	Route 18 (From South)	Middle Street (From North)	West Street (From West)	Pleasant Street (From North)	Pine Street (From South)	Park Ave (From West)	Union Street (From South)	TOTAL
Weymouth	Norfolk	MA			15%		15%	30%	5%	15%	5%		15%	**100%**
Quincy	Norfolk	MA	75%		25%									**100%**
Milton	Norfolk	MA	100%											**100%**
Boston[1]	Suffolk	MA												
Dorchester	Suffolk	MA	100%											**100%**
Hyde Park	Suffolk	MA	100%											**100%**
Mattapan	Suffolk	MA	100%											**100%**
Roxbury	Suffolk	MA	100%											**100%**
Abington	Plymouth	MA					100%							**100%**
Brockton	Plymouth	MA					60%					40%		**100%**
East Bridgewater	Plymouth	MA					100%							**100%**
Whitman	Plymouth	MA					100%							**100%**
Rockland	Plymouth	MA		25%			25%				50%			**100%**
Pembroke	Plymouth	MA		100%										**100%**
Hanson	Plymouth	MA									100%			**100%**
Hanover	Plymouth	MA		80%							20%			**100%**
Norwell	Plymouth	MA		50%		50%								**100%**
Marshfield	Plymouth	MA		100%										**100%**
Hingham	Plymouth	MA				40%				60%				**100%**
Cohasset	Norfolk	MA				50%				50%				**100%**
Scituate	Plymouth	MA				60%				40%				**100%**
Hull	Plymouth	MA				50%				50%				**100%**
Avon	Norfolk	MA					50%		50%					**100%**
Holbrook	Norfolk	MA					50%		50%					**100%**
Randolph	Norfolk	MA	10%				20%		70%					**100%**
Braintree	Norfolk	MA	40%		30%				30%					**100%**
Canton	Norfolk	MA	100%											**100%**
Stoughton	Norfolk	MA	100%											**100%**
		TOTAL	36.4%	4.8%	6.9%	6.7%	16.9%	3.1%	7.2%	7.5%	4.0%	4.9%	1.5%	100%
		SAY	**36%**	**5%**	**7%**	**7%**	**17%**	**3%**	**7%**	**8%**	**4%**	**5%**	**1%**	**100%**

Regional Origin/Destination	Regional Assignment	Local Approach Route Assignment						Local Trip Distribution (Approach)					
		Middle Street (From North)	Middle Street (From South)	Pleasant Street (From North)	Pleasant Street (From South)	Pine Street (From South)	Total	Middle Street (From North)	Middle Street (From South)	Pleasant Street (From North)	Pleasant Street (From South)	Pine Street (From South)	Total
Route 3 (From North)	36.4%	40%	60%				**100%**	15%	22%				**36%**
Route 3 (From South)	4.8%		20%			80%	**100%**		1%			4%	**5%**
Route 53 (From North)	6.9%	100%					**100%**	7%					**7%**
Route 53 (From South)	6.7%			75%		25%	**100%**			5%		2%	**7%**
Route 18 (From South)	16.9%		60%		40%		**100%**		10%		7%		**17%**
Middle Street (From North)	3.1%	100%					**100%**	3%					**3%**
West Street (From West)	7.2%		100%				**100%**		7%				**7%**
Pleasant Street (From North)	7.5%			100%			**100%**			7%			**7%**
Pine Street (From South)	4.0%					100%	**100%**					4%	**4%**
Park Avenue (From West)	4.9%		40%		60%		**100%**		2%		3%		**5%**
Union Street (From South)	1.5%		25%		75%		**100%**		0%		1%		**2%**
Total	**100.0%**							**24.6%**	**42.6%**	**12.5%**	**10.9%**	**9.5%**	**100%**
							SAY	**25%**	**42%**	**12%**	**11%**	**10%**	**100%**

Regional Origin/Destination	Regional Assignment	Local Departure Route Assignment						Local Trip Distribution (Departure)					
		Middle Street (From North)	Middle Street (From South)	Pleasant Street (From North)	Pleasant Street (From South)	Pine Street (From South)	Total	Middle Street (From North)	Middle Street (From South)	Pleasant Street (From North)	Pleasant Street (From South)	Pine Street (From South)	Total
Route 3 (From North)	36.4%		100%				**100%**		36%				**36%**
Route 3 (From South)	4.8%		20%			80%	**100%**		1%			4%	**5%**
Route 53 (From North)	6.9%	100%					**100%**	7%					**7%**
Route 53 (From South)	6.7%			75%		25%	**100%**			5%		2%	**7%**
Route 18 (From South)	16.9%		60%		40%		**100%**		10%		7%		**17%**
Middle Street (From North)	3.1%	100%					**100%**	3%					**3%**
West Street (From West)	7.2%		100%				**100%**		7%				**7%**
Pleasant Street (From North)	7.5%			100%			**100%**			7%			**7%**
Pine Street (From South)	4.0%					100%	**100%**					4%	**4%**
Park Avenue (From West)	4.9%		40%		60%		**100%**		2%		3%		**5%**
Union Street (From South)	1.5%		25%		75%		**100%**		0%		1%		**2%**
Total	**100.0%**							**10.0%**	**57.1%**	**12.5%**	**10.9%**	**9.5%**	**100%**
							SAY	**10%**	**57%**	**12%**	**11%**	**10%**	**100%**

Appendix J

Traffic Projection Model

Traffic Projection Model
200 Libbey Industrial Parkway - Weymouth

		AM Raw Data	2015 Seasonally-Adjusted AM Peak Hour	2015-2021 Growth	Southfield Entering Distribution	Southfield Exiting Distribution	Southfield AM Trips	Alexan AM Trips	**2021 Existing AM Peak Hour**	2028 AM Peak Hour Volumes (2021 grown to 2028)	1345 Washington AM Trips	655 Washington AM Trips	Quarry AM Trips	1400 Main AM Trips	1500 Main AM Trips	Libbey Industrial AM Trips	Southfield Entering Distribution	Southfield Exiting Distribution	Southfield AM Trips	**2028 No-Build AM Peak Hour**	Inbound Trip Distribution	Outbound Trip Distribution	AM Project Trips - 200 Libbey	**2028 Build AM Peak Hour**
1 Middle Street & Tara Drive/Libbey Industrial Parkway																								
	NBL	6	6	0			0		6	6									0	6			0	6
	NBT	293	293	9		2%	5		307	318	3	4		5	6			2%	4	340			0	340
	NBR	240	240	7			0	2	249	258			12			2			0	272	42%		53	325
	SBL	138	138	4			0	2	144	149			8			1			0	158	25%		32	190
	SBT	363	363	11	2%		2		376	389	7	11		2	2		2%		1	412			0	412
	SBR	2	2	0			0		2	2									0	2			0	2
	EBL	4	4	0			0		4	4									0	4			0	4
	EBT	2	2	0			0		2	2									0	2			0	2
	EBR	11	11	0			0		11	11									0	11			0	11
	WBL	165	165	5			0	8	178	184			12						0	196		57%	20	216
	WBT	0	0	0			0		0	0									0	0			0	0
	WBR	125	125	4			0	8	137	142			8						0	150		10%	4	154
		1,349	**1,349**	**40**			**7**	**20**	**1416**	**1,465**	**10**	**15**	**40**	**7**	**8**	**3**			**5**	**1,553**	**67%**	**67%**	**109**	**1,662**
2 Pleasant Street & Libbey Industrial Parkway																								
	NBL	306	306	9			0	16	331	343						2			0	345	21%		26	371
	NBT	949	949	28		4%	10	71	1058	1096	6	2		6	8			4%	7	1125			0	1125
	NBR						0						20						0	20			0	20
	SBL						0						20						0	20			0	20
	SBT	756	756	23	4%		4	13	796	824	18	4		2	3		4%		2	853			0	853
	SBR	124	124	4			0		128	133						1			0	134	12%		15	149
	EBL	35	35	1			0		36	37									0	37		12%	4	41
	EBT						0						20						0	20			0	20
	EBR	123	123	4			0	4	131	136						1			0	137		21%	7	144
	WBL						0						20						0	20			0	20
	WBT						0						20						0	20			0	20
	WBR						0						20						0	20			0	20
		2,293	**2,293**	**69**			**14**	**104**	**2,480**	**2,569**	**24**	**6**	**120**	**8**	**11**	**4**			**9**	**2,751**	**33%**	**33%**	**52**	**2,803**
5 Route 18 & Middle Street																								
	NBL	98	98	3		1%	3		104	108				3	5			1%	2	118			0	118
	NBT	1072	1072	32		12%	31	7	1142	1183				10	12			12%	21	1226			0	1226
	NBR	195	195	6		2%	5		206	213	2	3		5	6	1		2%	4	234	12%		15	249
	SBL	210	210	6			0	1	217	225			8						0	233	23%		29	262
	SBT	645	645	19	12%		11	1	676	700				4	5		12%		7	716			0	716
	SBR	237	237	7			0		244	253									0	253			0	253
	EBL	154	154	5			0		159	165									0	165			0	165
	EBT	212	212	6			0	1	219	227	1	1	4			1			0	234	7%		9	243
	EBR	59	59	2	1%		1		62	64				1	2		1%		1	68			0	68
	WBL	182	182	5	2%		2		189	196	5	8		2	2		2%		1	214		12%	4	218
	WBT	282	282	8			0	2	292	302	2	3	4						0	311		7%	3	314
	WBR	244	244	7			0	6	257	266			8						0	274		38%	13	287
		3,590	**3,590**	**106**			**53**	**18**	**3767**	**3,902**	**10**	**15**	**24**	**25**	**32**	**2**			**36**	**4,046**	**42%**	**57%**	**73**	**4,119**
10 Libbey Industrial Parkway & #200 Libbey Driveway (West)																								
	SBL	0	0	0			0		0	0									0	0		16%	5	5
	SBR	0	0	0			0		0	0									0	0		34%	12	12
	EBL	0	0	0			0		0	0									0	0	34%		43	43
	EBT	227	227	7			0	4	238	246			20			3			0	269	33%		42	311
	WBT	445	445	13			0	16	474	491			20						0	511		33%	12	523
	WBR	0	0	0			0		0	0									0	0	16%		20	20
		672	**672**	**20**			**0**	**20**	**712**	**737**	**0**	**0**	**40**	**0**	**0**	**3**			**0**	**780**	**83%**	**83%**	**134**	**914**
11 Libbey Industrial Parkway & #200 Libbey Driveway (East)																								
	SBL	0	0	0			0		0	0									0	0		17%	6	6
	SBR	0	0	0			0		0	0									0	0		33%	12	12
	EBL	0	0	0			0		0	0									0	0	33%		42	42
	EBT	227	227	7			0	4	238	246			20			3			0	269		16%	5	274
	WBT	445	445	13			0	16	474	491			20						0	511	16%		20	531
	WBR	0	0	0			0		0	0									0	0	17%		21	21
		672	**672**	**20**			**0**	**20**	**712**	**737**	**0**	**0**	**40**	**0**	**0**	**3**			**0**	**780**	**66%**	**66%**	**106**	**886**

Seasonal Adjustment Factors	
June	1.00
October	1.00

General Background Growth Rate	
2015-2021	**1.03**
2021-2028	**1.036**

Site AM Trip Generation	
Enter	**126**
Exit	**35**

Southfield - 2021 AM Trip Generation	
Enter	**89**
Exit	**262**

Southfield - 2028 AM Trip Generation	
Enter	**62**
Exit	**176**

Traffic Projection Model
200 Libbey Industrial Parkway - Weymouth

		PM Raw Data	2015 Seasonally-Adjusted PM Peak Hour	2015-2021 Growth	Southfield Entering Distribution	Southfield Exiting Distribution	Southfield PM Trips	Alexan PM Trips	**2021 Existing PM Peak Hour**	2028 PM Peak Hour Volumes (2021 grown to 2028)	1345 Washington PM Trips	655 Washington PM Trips	Quarry PM Trips	1400 Main PM Trips	1500 Main PM Trips	Libbey Industrial PM Trips	Southfield Entering Distribution	Southfield Exiting Distribution	Southfield PM Trips	**2028 No-Build PM Peak Hour**	Inbound Trip Distribution	Outbound Trip Distribution	PM Project Trips - 200 Libbey	**2028 Build PM Peak Hour**
1 Middle Street & Tara Drive/Libbey Industrial Parkway																								
	NBL	10	10	0			0		10	10			0						0	10			0	10
	NBT	484	484	15		2%	3		502	520	7	11	0	3	4			2%	2	547			0	547
	NBR	207	207	6			0	8	221	229			12						0	241	42%		28	269
	SBL	125	125	4			0	8	137	142			8						0	150	25%		17	167
	SBT	429	429	13	2%		5		447	463	5	7	0	5	7		2%		3	490			0	490
	SBR	5	5	0			0		5	5			0						0	5			0	5
	EBL	2	2	0			0		2	2			0						0	2			0	2
	EBT	0	0	0			0		0	0			0						0	0			0	0
	EBR	6	6	0			0		6	6			0						0	6			0	6
	WBL	206	206	6			0	4	216	224			12			2			0	238		57%	98	336
	WBT	0	0	0			0		0	0			0						0	0			0	0
	WBR	210	210	6			0	4	220	228			8			1			0	237		10%	17	254
		1,684	**1,684**	**50**			**8**	**24**	**1,766**	**1,829**	**12**	**18**	**40**	**8**	**11**	**3**	**0**	**0**	**5**	**1,926**	**67%**	**67%**	**160**	**2,086**
2 Pleasant Street & Libbey Industrial Parkway																								
	NBL	127	127	4			0	8	139	144			0			1			0	145	21%		14	159
	NBT	789	789	24		4%	6	34	853	883	18	4	0	4	5			4%	4	918			0	918
	NBR						0		0	0			20						0	20			0	20
	SBL						0		0	0			20						0	20			0	20
	SBT	911	911	27	4%		10	69	1017	1053	12	3	0	6	8		4%		7	1089			0	1089
	SBR	67	67	2			0		69	71			0						0	71	12%		8	79
	EBL	117	117	4			0		121	125			0			1			0	126		12%	21	147
	EBT						0		0	0			20						0	20			0	20
	EBR	350	350	11			0	16	377	390			0			1			0	391		21%	36	427
	WBL						0		0	0			20						0	20			0	20
	WBT						0		0	0			20						0	20			0	20
	WBR						0		0	0			20						0	20			0	20
		2,361	**2,361**	**72**			**16**	**127**	**2,576**	**2,666**	**30**	**7**	**120**	**10**	**13**	**3**	**0**	**0**	**11**	**2,860**	**33%**	**33%**	**79**	**2,939**
5 Route 18 & Middle Street																								
	NBL	58	58	2		1%	2		62	64			0	2	3			1%	1	70			0	70
	NBT	875	875	26		12%	19	3	923	956			0	6	8			12%	13	983			0	983
	NBR	218	218	7		2%	3		228	236	5	8	0	3	4			2%	2	258	12%		8	266
	SBL	248	248	7			0	6	261	270			8						0	278	23%		15	293
	SBT	1019	1019	31	12%		31	6	1087	1126			0	10	13		12%		20	1169			0	1169
	SBR	228	228	7			0		235	243			0						0	243			0	243
	EBL	240	240	7			0		247	256			0						0	256			0	256
	EBT	310	310	9			0	2	321	332	2	3	4						0	341	7%		5	346
	EBR	83	83	2	1%		3		88	91			0	3	5		1%		2	101			0	101
	WBL	218	218	7	2%		5		230	238	4	5	0	5	7	1	2%		3	263		12%	21	284
	WBT	260	260	8			0	1	269	279	1	2	4			1			0	287		7%	12	299
	WBR	204	204	6			0	3	213	221			8						0	229		38%	65	294
		3,961	**3,961**	**119**			**63**	**21**	**4,164**	**4,312**	**12**	**18**	**24**	**29**	**40**	**2**	**0**	**0**	**41**	**4,478**	**42%**	**57%**	**126**	**4,604**
10 Libbey Industrial Parkway & #200 Libbey Driveway (West)																								
	SBL	0	0	0			0		0	0			0						0	0		16%	28	28
	SBR	0	0	0			0		0	0			0						0	0		34%	58	58
	EBL	0	0	0			0		0	0			0						0	0	34%		23	23
	EBT	340	340	10			0	16	366	379			20						0	399	33%		22	421
	WBT	288	288	9			0	8	305	316			20			3			0	339		33%	57	396
	WBR	0	0	0			0		0	0			0						0	0	16%		11	11
		628	**628**	**19**			**0**	**24**	**671**	**695**	**0**	**0**	**40**	**0**	**0**	**3**	**0**	**0**	**0**	**738**	**83%**	**83%**	**199**	**937**
11 Libbey Industrial Parkway & #200 Libbey Driveway (East)																								
	SBL	0	0	0			0		0	0			0						0	0		17%	29	29
	SBR	0	0	0			0		0	0			0						0	0		33%	57	57
	EBL	0	0	0			0		0	0			0						0	0	33%		22	22
	EBT	340	340	10			0	16	366	379			20						0	399		16%	28	427
	WBT	288	288	9			0	8	305	316			20			3			0	339	16%		11	350
	WBR	0	0	0			0		0	0			0						0	0	17%		11	11
		628	**628**	**19**			**0**	**24**	**671**	**695**	**0**	**0**	**40**	**0**	**0**	**3**	**0**	**0**	**0**	**738**	**66%**	**66%**	**158**	**896**

Seasonal Adjustment Factors

June	1.00
October	1.00

General Background Growth Rate

2015-2021	**1.03**
2021-2028	**1.036**

Site PM Trip Generation

Enter	**67**
Exit	**172**

Southfield - 2021 PM Trip Generation

Enter	**258**
Exit	**161**

Southfield - 2028 PM Trip Generation

Enter	**169**
Exit	**108**

Appendix K

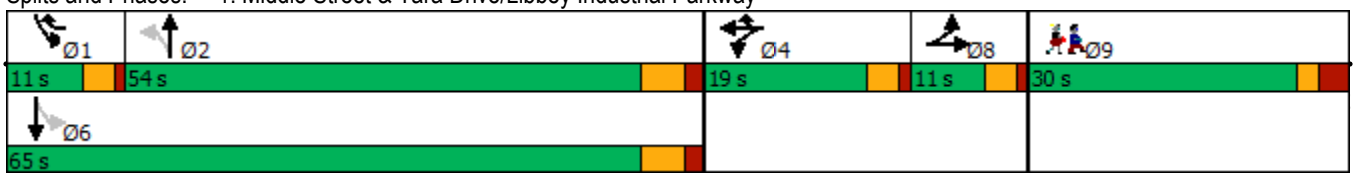
Capacity Analysis Worksheets

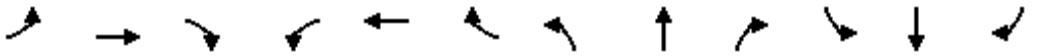
2021 Existing

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations								
Traffic Volume (vph)	2	0	137	6	307	144	376	
Future Volume (vph)	2	0	137	6	307	144	376	
Lane Group Flow (vph)	18	193	149	0	612	157	411	
Turn Type	NA	NA	pt+ov	Perm	NA	pm+pt	NA	
Protected Phases	8	4	4 1		2	1	6	9
Permitted Phases				2		6		
Detector Phase	8	4	4 1	2	2	1	6	
Switch Phase								
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	11.0		13.0	13.0	11.0	13.0	30.0
Total Split (s)	11.0	19.0		54.0	54.0	11.0	65.0	30.0
Total Split (%)	8.8%	15.2%		43.2%	43.2%	8.8%	52.0%	24%
Maximum Green (s)	7.0	15.0		48.0	48.0	7.0	59.0	25.0
Yellow Time (s)	3.0	3.0		4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	1.0	1.0		2.0	2.0	1.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0			6.0	4.0	6.0	
Lead/Lag				Lag	Lag	Lead		
Lead-Lag Optimize?								
Vehicle Extension (s)	2.6	2.6		2.6	2.6	2.6	2.6	3.0
Recall Mode	None	None		Min	Min	None	Min	None
Walk Time (s)								7.0
Flash Dont Walk (s)								18.0
Pedestrian Calls (#/hr)								5
v/c Ratio	0.10	0.63	0.27		0.83	0.41	0.40	
Control Delay	31.0	46.3	8.3		32.1	13.9	13.5	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	31.0	46.3	8.3		32.1	13.9	13.5	
Queue Length 50th (ft)	2	73	11		187	21	71	
Queue Length 95th (ft)	30	#323	49		#680	114	317	
Internal Link Dist (ft)	363	897			2156		619	
Turn Bay Length (ft)			75			200		
Base Capacity (vph)	175	305	559		1080	386	1382	
Starvation Cap Reductn	0	0	0		0	0	0	
Spillback Cap Reductn	0	0	0		0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	
Reduced v/c Ratio	0.10	0.63	0.27		0.57	0.41	0.30	

Intersection Summary
Cycle Length: 125
Actuated Cycle Length: 81
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Middle Street & Tara Drive/Libbey Industrial Parkway





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	2	11	178	0	137	6	307	249	144	376	2
Future Volume (vph)	4	2	11	178	0	137	6	307	249	144	376	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	10	10	11	12	12	12	10	11	11
Total Lost time (s)		4.0			4.0	4.0		6.0		4.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	1.00		0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.91			1.00	0.85		0.94		1.00	1.00	
Flt Protected		0.99			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1767			1532	1473		1678		1651	1765	
Flt Permitted		0.99			0.95	1.00		0.99		0.26	1.00	
Satd. Flow (perm)		1767			1532	1473		1670		456	1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	2	12	193	0	149	7	334	271	157	409	2
RTOR Reduction (vph)	0	12	0	0	0	79	0	22	0	0	0	0
Lane Group Flow (vph)	0	6	0	0	193	70	0	590	0	157	411	0
Confl. Peds. (#/hr)									5	5		
Heavy Vehicles (%)	0%	0%	0%	10%	0%	6%	0%	3%	7%	2%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	1	1	1	0	0	0
Turn Type	Split	NA		Split	NA	pt+ov	Perm	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		2.2			16.2	23.7		35.2		46.7	46.7	
Effective Green, g (s)		2.2			16.2	23.7		35.2		46.7	46.7	
Actuated g/C Ratio		0.03			0.19	0.27		0.40		0.53	0.53	
Clearance Time (s)		4.0			4.0			6.0		4.0	6.0	
Vehicle Extension (s)		2.6			2.6			2.6		2.6	2.6	
Lane Grp Cap (vph)		44			284	399		673		346	944	
v/s Ratio Prot		c0.00			c0.13	0.05				0.04	c0.23	
v/s Ratio Perm								c0.35		0.20		
v/c Ratio		0.14			0.68	0.18		0.88		0.45	0.44	
Uniform Delay, d1		41.6			33.1	24.3		24.0		13.3	12.3	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.2			5.9	0.2		12.2		0.7	0.3	
Delay (s)		42.8			39.0	24.5		36.3		14.0	12.6	
Level of Service		D			D	C		D		B	B	
Approach Delay (s)		42.8			32.7			36.3			13.0	
Approach LOS		D			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	87.3	Sum of lost time (s)	23.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	70.4

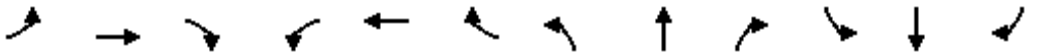
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	131	331	1058	796	128
Future Vol, veh/h	36	131	331	1058	796	128
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	200	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	88	88	86	86
Heavy Vehicles, %	11	6	6	6	6	3
Mvmt Flow	46	166	376	1202	926	149

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2955	1001	1075	0	-	0
Stage 1	1001	-	-	-	-	-
Stage 2	1954	-	-	-	-	-
Critical Hdwy	6.51	6.26	4.16	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.354	2.254	-	-	-
Pot Cap-1 Maneuver	~ 15	290	634	-	-	-
Stage 1	342	-	-	-	-	-
Stage 2	114	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 6	290	634	-	-	-
Mov Cap-2 Maneuver	~ 6	-	-	-	-	-
Stage 1	139	-	-	-	-	-
Stage 2	114	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 920.6	4.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	634	-	6	290	-	-
HCM Lane V/C Ratio	0.593	-	7.595	0.572	-	-
HCM Control Delay (s)	18.6	-	$ 4151	32.8	-	-
HCM Lane LOS	C	-	F	D	-	-
HCM 95th %tile Q(veh)	3.9	-	7.3	3.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



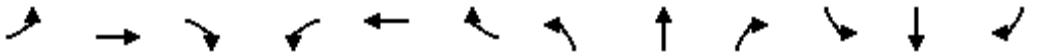
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	219	62	189	294	255	104	1135	206	217	675	244
Future Volume (vph)	159	219	62	189	294	255	104	1135	206	217	675	244
Lane Group Flow (vph)	171	235	67	212	330	287	121	1320	240	224	696	252
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Detector Phase	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Switch Phase												
Minimum Initial (s)	3.0	4.0		3.0	4.0		4.0	8.0		4.0	8.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	15.0		10.0	15.0	
Total Split (s)	12.0	13.0		17.0	18.0		21.0	61.0		26.0	66.0	
Total Split (%)	8.0%	8.7%		11.3%	12.0%		14.0%	40.7%		17.3%	44.0%	
Maximum Green (s)	5.0	7.0		10.0	12.0		15.0	55.0		20.0	60.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-3.5	-4.0		-3.5	-4.0		-4.0	-4.0		-4.0	-4.0	
Total Lost Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	1.46	0.77	0.22	1.16	0.73	0.63	0.52	0.81	0.28	0.75	0.42	0.31
Control Delay	289.9	72.2	44.4	164.6	62.5	45.8	59.6	33.3	12.7	64.2	19.9	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	289.9	72.2	44.4	164.6	62.5	45.8	59.6	33.3	12.7	64.2	19.9	14.9
Queue Length 50th (ft)	~174	92	41	~185	126	181	85	411	78	158	149	81
Queue Length 95th (ft)	#408	#213	105	#445	#260	#390	176	#769	108	#380	324	180
Internal Link Dist (ft)		167			271			617			1828	
Turn Bay Length (ft)	125		50	90		275	75		75	315		90
Base Capacity (vph)	117	306	339	182	450	460	264	1659	853	307	1680	809
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.46	0.77	0.20	1.16	0.73	0.62	0.46	0.80	0.28	0.73	0.41	0.31

Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 121.9
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 18 & Middle Street

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	33.0
Total Split (s)	33.0
Total Split (%)	22%
Maximum Green (s)	28.0
Yellow Time (s)	2.0
All-Red Time (s)	3.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	4
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	219	62	189	294	255	104	1135	206	217	675	244
Future Volume (vph)	159	219	62	189	294	255	104	1135	206	217	675	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			0%			-2%			9%	
Total Lost time (s)	3.5	2.0	6.0	3.5	2.0	6.0	2.0	2.0	6.0	2.0	2.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	3355	1459	1631	3388	1459	1678	3389	1474	1543	3115	1380
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1662	3355	1459	1631	3388	1459	1678	3389	1474	1543	3115	1380
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.86	0.86	0.86	0.97	0.97	0.97
Adj. Flow (vph)	171	235	67	212	330	287	121	1320	240	224	696	252
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	171	235	67	212	330	287	121	1320	240	224	696	252
Heavy Vehicles (%)	5%	4%	7%	7%	3%	7%	5%	4%	7%	8%	7%	8%
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Actuated Green, G (s)	5.1	7.1	26.0	10.1	12.1	37.7	12.9	54.5	64.6	19.6	61.2	66.3
Effective Green, g (s)	8.6	11.1	26.0	13.6	16.1	37.7	16.9	58.5	64.6	23.6	65.2	66.3
Actuated g/C Ratio	0.07	0.09	0.21	0.11	0.13	0.30	0.13	0.46	0.51	0.19	0.52	0.53
Clearance Time (s)	7.0	6.0		7.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	113	295	301	176	433	436	225	1574	756	289	1613	726
v/s Ratio Prot	c0.10	0.07	0.05	c0.13	c0.10	0.20	0.07	c0.39	0.16	c0.15	0.22	0.18
v/s Ratio Perm												
v/c Ratio	1.51	0.80	0.22	1.20	0.76	0.66	0.54	0.84	0.32	0.78	0.43	0.35
Uniform Delay, d1	58.7	56.3	41.5	56.2	53.0	38.5	50.9	29.6	17.8	48.6	18.8	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	271.0	13.0	0.1	133.6	7.0	2.7	2.5	3.9	0.1	11.2	0.1	0.1
Delay (s)	329.7	69.3	41.7	189.7	60.1	41.2	53.3	33.5	17.9	59.8	18.9	17.4
Level of Service	F	E	D	F	E	D	D	C	B	E	B	B
Approach Delay (s)		159.5			86.7			32.7			26.4	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	56.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	125.9	Sum of lost time (s)	30.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	238	474	0	0	0
Future Vol, veh/h	0	238	474	0	0	0
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, %	2	2	2	2	2	2
Mvmt Flow	0	259	515	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	515	0	-	0	774	515
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1051	-	-	-	367	560
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	784	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1051	-	-	-	367	560
Mov Cap-2 Maneuver	-	-	-	-	367	-
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	784	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1051	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	238	474	0	0	0
Future Vol, veh/h	0	238	474	0	0	0
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	-1	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	259	515	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	515	0	-	0	774	515
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1051	-	-	-	367	560
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	784	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1051	-	-	-	367	560
Mov Cap-2 Maneuver	-	-	-	-	367	-
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	784	-

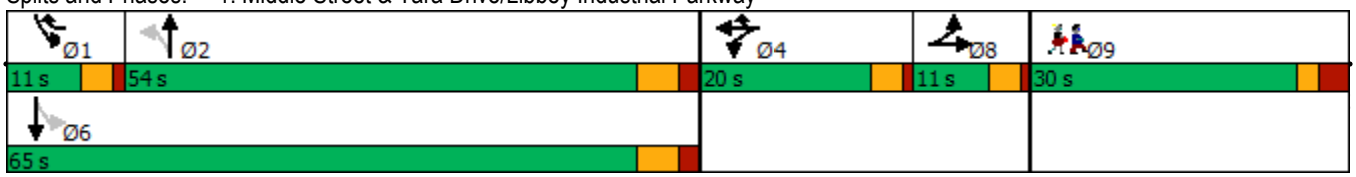
Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

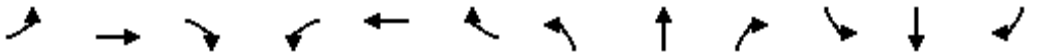
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1051	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations								
Traffic Volume (vph)	0	0	220	10	502	137	447	
Future Volume (vph)	0	0	220	10	502	137	447	
Lane Group Flow (vph)	9	235	239	0	797	149	491	
Turn Type	NA	NA	pt+ov	Perm	NA	pm+pt	NA	
Protected Phases	8	4	4 1		2	1	6	9
Permitted Phases				2		6		
Detector Phase	8	4	4 1	2	2	1	6	
Switch Phase								
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	11.0		13.0	13.0	11.0	13.0	30.0
Total Split (s)	11.0	20.0		54.0	54.0	11.0	65.0	30.0
Total Split (%)	8.7%	15.9%		42.9%	42.9%	8.7%	51.6%	24%
Maximum Green (s)	7.0	16.0		48.0	48.0	7.0	59.0	25.0
Yellow Time (s)	3.0	3.0		4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	1.0	1.0		2.0	2.0	1.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0			6.0	4.0	6.0	
Lead/Lag				Lag	Lag	Lead		
Lead-Lag Optimize?								
Vehicle Extension (s)	2.6	2.6		2.6	2.6	2.6	2.6	3.0
Recall Mode	None	None		Min	Min	None	Min	None
Walk Time (s)								7.0
Flash Dont Walk (s)								18.0
Pedestrian Calls (#/hr)								5
v/c Ratio	0.03	0.80	0.43		0.85	0.39	0.42	
Control Delay	0.2	60.0	12.4		31.2	12.5	12.4	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	0.2	60.0	12.4		31.2	12.5	12.4	
Queue Length 50th (ft)	0	120	37		305	20	94	
Queue Length 95th (ft)	0	#385	85		#1014	110	397	
Internal Link Dist (ft)	363	897			2156		619	
Turn Bay Length (ft)			75			200		
Base Capacity (vph)	261	293	554		936	378	1166	
Starvation Cap Reductn	0	0	0		0	0	0	
Spillback Cap Reductn	0	0	0		0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	
Reduced v/c Ratio	0.03	0.80	0.43		0.85	0.39	0.42	

Intersection Summary
Cycle Length: 126
Actuated Cycle Length: 93.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Middle Street & Tara Drive/Libbey Industrial Parkway





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	6	216	0	220	10	502	221	137	447	5
Future Volume (vph)	2	0	6	216	0	220	10	502	221	137	447	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	10	10	11	12	12	12	10	11	11
Total Lost time (s)		4.0			4.0	4.0		6.0		4.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	1.00		1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.90			1.00	0.85		0.96		1.00	1.00	
Flt Protected		0.99			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1738			1668	1561		1770		1651	1798	
Flt Permitted		0.99			0.95	1.00		0.99		0.24	1.00	
Satd. Flow (perm)		1738			1668	1561		1757		422	1798	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	7	235	0	239	11	546	240	149	486	5
RTOR Reduction (vph)	0	9	0	0	0	109	0	10	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	235	130	0	787	0	149	491	0
Confl. Peds. (#/hr)							3			3		
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	1%	6%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	1	1	1	0	0	0
Turn Type	Split	NA		Split	NA	pt+ov	Perm	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		1.0			16.4	23.6		49.3		60.5	60.5	
Effective Green, g (s)		1.0			16.4	23.6		49.3		60.5	60.5	
Actuated g/C Ratio		0.01			0.16	0.23		0.49		0.60	0.60	
Clearance Time (s)		4.0			4.0			6.0		4.0	6.0	
Vehicle Extension (s)		2.6			2.6			2.6		2.6	2.6	
Lane Grp Cap (vph)		17			271	366		861		341	1081	
v/s Ratio Prot		c0.00			c0.14	0.08				0.03	c0.27	
v/s Ratio Perm								c0.45		0.23		
v/c Ratio		0.01			0.87	0.36		0.91		0.44	0.45	
Uniform Delay, d1		49.3			41.0	32.2		23.7		12.3	11.0	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.1			23.9	0.5		14.0		0.7	0.2	
Delay (s)		49.4			64.9	32.6		37.6		13.0	11.2	
Level of Service		D			E	C		D		B	B	
Approach Delay (s)		49.4			48.6			37.6			11.6	
Approach LOS		D			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	23.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	145.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	121	377	139	853	1017	69
Future Vol, veh/h	121	377	139	853	1017	69
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	200	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	96	96	94	94
Heavy Vehicles, %	4	3	0	1	4	2
Mvmt Flow	138	428	145	889	1082	73

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2299	1120	1156	0	-	0
Stage 1	1120	-	-	-	-	-
Stage 2	1179	-	-	-	-	-
Critical Hdwy	6.44	6.23	4.1	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.327	2.2	-	-	-
Pot Cap-1 Maneuver	~ 42	~ 250	612	-	-	-
Stage 1	309	-	-	-	-	-
Stage 2	289	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 32	~ 250	612	-	-	-
Mov Cap-2 Maneuver	~ 32	-	-	-	-	-
Stage 1	235	-	-	-	-	-
Stage 2	289	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 703.3	1.8	0
HCM LOS	F		

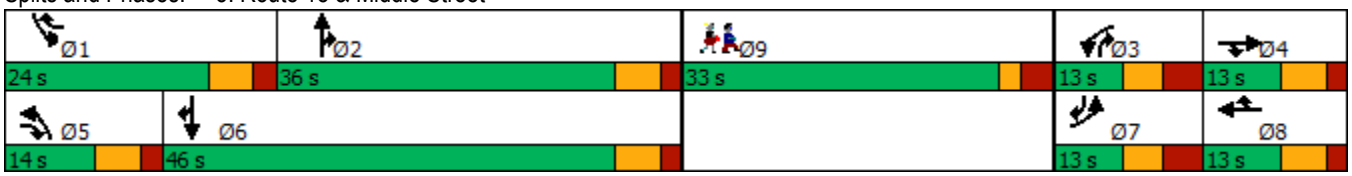
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	612	-	32	250	-	-
HCM Lane V/C Ratio	0.237	-	4.297	1.714	-	-
HCM Control Delay (s)	12.7	-	$ 1735.5	$ 372	-	-
HCM Lane LOS	B	-	F	F	-	-
HCM 95th %tile Q(veh)	0.9	-	16.3	28	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	247	323	88	230	270	212	62	920	228	259	1081	235
Future Volume (vph)	247	323	88	230	270	212	62	920	228	259	1081	235
Lane Group Flow (vph)	294	385	105	267	314	247	66	979	243	270	1126	245
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Detector Phase	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Switch Phase												
Minimum Initial (s)	3.0	4.0		3.0	4.0		4.0	8.0		4.0	8.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	15.0		10.0	15.0	
Total Split (s)	13.0	13.0		13.0	13.0		14.0	36.0		24.0	46.0	
Total Split (%)	10.9%	10.9%		10.9%	10.9%		11.8%	30.3%		20.2%	38.7%	
Maximum Green (s)	6.0	7.0		6.0	7.0		8.0	30.0		18.0	40.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-3.5	-4.0		-3.5	-4.0		-4.0	-4.0		-4.0	-4.0	
Total Lost Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	1.62	0.92	0.30	1.48	0.75	0.48	0.30	0.75	0.34	0.71	0.71	0.30
Control Delay	335.3	69.3	35.2	278.2	52.8	30.5	43.7	31.4	17.6	45.6	23.9	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	335.3	69.3	35.2	278.2	52.8	30.5	43.7	31.4	17.6	45.6	23.9	12.4
Queue Length 50th (ft)	~226	109	46	~197	86	100	32	230	74	131	226	55
Queue Length 95th (ft)	#492	#263	119	#461	#208	244	95	#540	154	#363	#574	131
Internal Link Dist (ft)		167			271			617			1828	
Turn Bay Length (ft)	125		50	90		275	75		75	315		90
Base Capacity (vph)	181	420	362	180	420	524	233	1299	720	393	1594	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.62	0.92	0.29	1.48	0.75	0.47	0.28	0.75	0.34	0.69	0.71	0.30

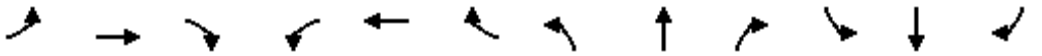
Intersection Summary
Cycle Length: 119
Actuated Cycle Length: 92
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 18 & Middle Street



Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	33.0
Total Split (s)	33.0
Total Split (%)	28%
Maximum Green (s)	28.0
Yellow Time (s)	2.0
All-Red Time (s)	3.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	4
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	247	323	88	230	270	212	62	920	228	259	1081	235
Future Volume (vph)	247	323	88	230	270	212	62	920	228	259	1081	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			0%			-2%			9%	
Total Lost time (s)	3.5	2.0	6.0	3.5	2.0	6.0	2.0	2.0	6.0	2.0	2.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1728	3455	1561	1711	3455	1531	1762	3455	1546	1618	3267	1434
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1728	3455	1561	1711	3455	1531	1762	3455	1546	1618	3267	1434
Peak-hour factor, PHF	0.84	0.84	0.84	0.86	0.86	0.86	0.94	0.94	0.94	0.96	0.96	0.96
Adj. Flow (vph)	294	385	105	267	314	247	66	979	243	270	1126	245
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	294	385	105	267	314	247	66	979	243	270	1126	245
Heavy Vehicles (%)	1%	1%	0%	2%	1%	2%	0%	2%	2%	3%	2%	4%
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Actuated Green, G (s)	6.1	7.1	20.7	6.1	7.1	30.8	7.6	30.5	36.6	17.7	40.6	46.7
Effective Green, g (s)	9.6	11.1	20.7	9.6	11.1	30.8	11.6	34.5	36.6	21.7	44.6	46.7
Actuated g/C Ratio	0.10	0.12	0.22	0.10	0.12	0.32	0.12	0.36	0.38	0.23	0.47	0.49
Clearance Time (s)	7.0	6.0		7.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	173	400	337	171	400	492	213	1245	591	366	1522	699
v/s Ratio Prot	c0.17	c0.11	0.07	0.16	0.09	0.16	0.04	0.28	0.16	c0.17	c0.34	0.17
v/s Ratio Perm												
v/c Ratio	1.70	0.96	0.31	1.56	0.79	0.50	0.31	0.79	0.41	0.74	0.74	0.35
Uniform Delay, d1	43.1	42.1	31.5	43.1	41.1	26.2	38.4	27.3	21.7	34.4	20.8	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	338.3	34.9	0.2	279.1	9.0	0.3	0.8	3.1	0.2	6.6	1.7	0.1
Delay (s)	381.3	77.0	31.7	322.2	50.2	26.5	39.2	30.4	21.8	40.9	22.5	15.2
Level of Service	F	E	C	F	D	C	D	C	C	D	C	B
Approach Delay (s)		185.1			130.8			29.2			24.4	
Approach LOS		F			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	72.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	95.7	Sum of lost time (s)	30.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	366	305	0	0	0
Future Vol, veh/h	0	366	305	0	0	0
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, %	2	2	2	2	2	2
Mvmt Flow	0	398	332	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	332	0	-	0	730	332
Stage 1	-	-	-	-	332	-
Stage 2	-	-	-	-	398	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1227	-	-	-	389	710
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	678	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1227	-	-	-	389	710
Mov Cap-2 Maneuver	-	-	-	-	389	-
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	678	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1227	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	366	305	0	0	0
Future Vol, veh/h	0	366	305	0	0	0
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	-1	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	398	332	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	332	0	-	0	730	332
Stage 1	-	-	-	-	332	-
Stage 2	-	-	-	-	398	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1227	-	-	-	389	710
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	678	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1227	-	-	-	389	710
Mov Cap-2 Maneuver	-	-	-	-	389	-
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	678	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

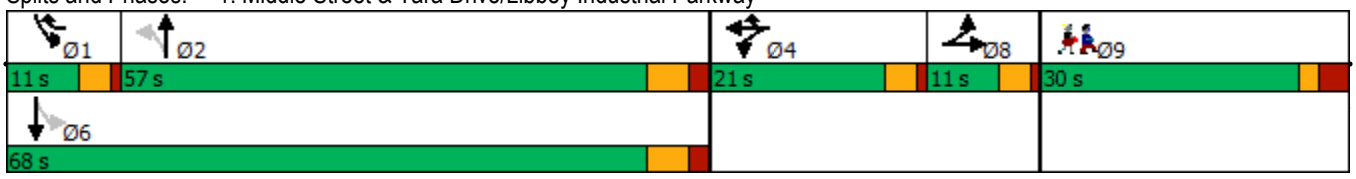
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1227	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

2028 No Build

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations								
Traffic Volume (vph)	2	0	150	6	340	158	412	
Future Volume (vph)	2	0	150	6	340	158	412	
Lane Group Flow (vph)	18	213	163	0	673	172	450	
Turn Type	NA	NA	pt+ov	Perm	NA	pm+pt	NA	
Protected Phases	8	4	4 1		2	1	6	9
Permitted Phases				2		6		
Detector Phase	8	4	4 1	2	2	1	6	
Switch Phase								
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	11.0		13.0	13.0	11.0	13.0	30.0
Total Split (s)	11.0	21.0		57.0	57.0	11.0	68.0	30.0
Total Split (%)	8.5%	16.2%		43.8%	43.8%	8.5%	52.3%	23%
Maximum Green (s)	7.0	17.0		51.0	51.0	7.0	62.0	25.0
Yellow Time (s)	3.0	3.0		4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	1.0	1.0		2.0	2.0	1.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0			6.0	4.0	6.0	
Lead/Lag				Lag	Lag	Lead		
Lead-Lag Optimize?								
Vehicle Extension (s)	2.6	2.6		2.6	2.6	2.6	2.6	3.0
Recall Mode	None	None		Min	Min	None	Min	None
Walk Time (s)								7.0
Flash Dont Walk (s)								18.0
Pedestrian Calls (#/hr)								5
v/c Ratio	0.12	0.73	0.32		0.80	0.44	0.42	
Control Delay	33.1	55.4	10.5		30.1	14.6	13.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	33.1	55.4	10.5		30.1	14.6	13.7	
Queue Length 50th (ft)	3	98	20		235	25	88	
Queue Length 95th (ft)	32	#359	61		#805	127	364	
Internal Link Dist (ft)	363	897			2156		619	
Turn Bay Length (ft)			75			200		
Base Capacity (vph)	149	290	511		966	392	1220	
Starvation Cap Reductn	0	0	0		0	0	0	
Spillback Cap Reductn	0	0	0		0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	
Reduced v/c Ratio	0.12	0.73	0.32		0.70	0.44	0.37	

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 93.3
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Middle Street & Tara Drive/Libbey Industrial Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	2	11	196	0	150	6	340	272	158	412	2
Future Volume (vph)	4	2	11	196	0	150	6	340	272	158	412	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	10	10	11	12	12	12	10	11	11
Total Lost time (s)		4.0			4.0	4.0		6.0		4.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	1.00		0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.91			1.00	0.85		0.94		1.00	1.00	
Flt Protected		0.99			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1767			1532	1473		1680		1651	1765	
Flt Permitted		0.99			0.95	1.00		1.00		0.27	1.00	
Satd. Flow (perm)		1767			1532	1473		1673		473	1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	2	12	213	0	163	7	370	296	172	448	2
RTOR Reduction (vph)	0	12	0	0	0	78	0	19	0	0	0	0
Lane Group Flow (vph)	0	6	0	0	213	85	0	654	0	172	450	0
Confl. Peds. (#/hr)									5	5		
Heavy Vehicles (%)	0%	0%	0%	10%	0%	6%	0%	3%	7%	2%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	1	1	1	0	0	0
Turn Type	Split	NA		Split	NA	pt+ov	Perm	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		2.3			17.7	25.0		46.0		57.3	57.3	
Effective Green, g (s)		2.3			17.7	25.0		46.0		57.3	57.3	
Actuated g/C Ratio		0.02			0.18	0.25		0.46		0.57	0.57	
Clearance Time (s)		4.0			4.0			6.0		4.0	6.0	
Vehicle Extension (s)		2.6			2.6			2.6		2.6	2.6	
Lane Grp Cap (vph)		40			271	368		770		357	1012	
v/s Ratio Prot		c0.00			c0.14	0.06				0.04	c0.25	
v/s Ratio Perm								c0.39		0.24		
v/c Ratio		0.16			0.79	0.23		0.85		0.48	0.44	
Uniform Delay, d1		47.8			39.3	29.8		23.9		13.2	12.2	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.4			13.5	0.3		8.6		0.8	0.2	
Delay (s)		49.3			52.8	30.1		32.4		14.0	12.4	
Level of Service		D			D	C		C		B	B	
Approach Delay (s)		49.3			43.0			32.4			12.9	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	23.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Lane Configurations												
Traffic Volume (vph)	37	20	137	20	20	20	345	1125	20	20	853	
Future Volume (vph)	37	20	137	20	20	20	345	1125	20	20	853	
Lane Group Flow (vph)	0	62	149	22	22	22	375	1223	22	22	1073	
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases	7	4	5		8	1	5	2	2	1	6	9
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	5	8	8	1	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	7.0	4.0	4.0	4.0	4.0	4.0	10.0	10.0	4.0	10.0	4.0
Minimum Split (s)	11.0	12.5	10.5	9.5	9.5	10.5	10.5	15.5	15.5	10.5	15.5	30.0
Total Split (s)	11.0	20.9	31.6	9.9	9.9	11.6	31.6	67.5	67.5	11.6	47.5	30.0
Total Split (%)	8.5%	16.1%	24.3%	7.6%	7.6%	8.9%	24.3%	51.9%	51.9%	8.9%	36.5%	23%
Maximum Green (s)	4.0	15.4	25.1	4.4	4.4	5.1	25.1	62.0	62.0	5.1	42.0	24.0
Yellow Time (s)	3.5	4.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	3.5	1.5	3.5	1.5	1.5	3.5	3.5	1.5	1.5	3.5	1.5	4.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Lead/Lag	Lead		Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None
Walk Time (s)												7.0
Flash Dont Walk (s)												17.0
Pedestrian Calls (#/hr)												5
v/c Ratio		0.40	0.21	0.22	0.16	0.07	0.74	0.54	0.03	0.15	0.79	
Control Delay		52.8	4.8	50.0	46.6	0.3	32.7	14.6	0.1	14.0	32.9	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		52.8	4.8	50.0	46.6	0.3	32.7	14.6	0.1	14.0	32.9	
Queue Length 50th (ft)		36	0	12	12	0	151	227	0	3	300	
Queue Length 95th (ft)		99	46	46	45	0	#457	533	0	22	#637	
Internal Link Dist (ft)		2665			182			871			1142	
Turn Bay Length (ft)			200	105		150	170		40	140		
Base Capacity (vph)		172	695	98	137	338	510	2273	669	149	1386	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.36	0.21	0.22	0.16	0.07	0.74	0.54	0.03	0.15	0.77	

Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 101.2
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Pleasant Street & Libbey Industrial Parkway/Quarry

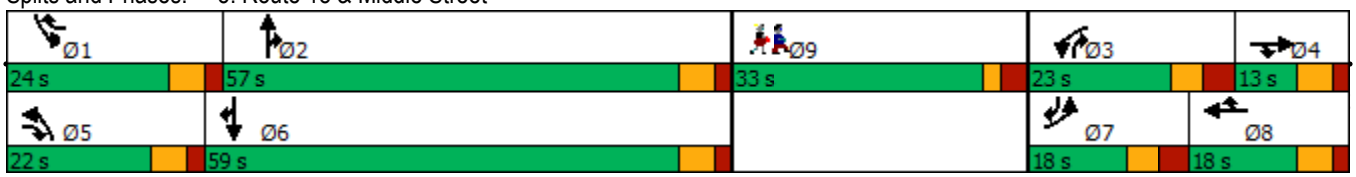
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	20	137	20	20	20	345	1125	20	20	853	134
Future Volume (vph)	37	20	137	20	20	20	345	1125	20	20	853	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	10	10	11	10
Total Lost time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1349	1473	1026	1080	918	1646	3292	887	991	3228	
Flt Permitted		0.79	1.00	0.72	1.00	1.00	0.11	1.00	1.00	0.23	1.00	
Satd. Flow (perm)		1102	1473	774	1080	918	190	3292	887	239	3228	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	22	149	22	22	22	375	1223	22	22	927	146
RTOR Reduction (vph)	0	0	98	0	0	19	0	0	8	0	8	0
Lane Group Flow (vph)	0	62	51	22	22	3	375	1223	14	22	1065	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	11%	70%	6%	70%	70%	70%	6%	6%	70%	70%	6%	3%
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases	7	4	5		8	1	5	2	2	1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		11.8	37.6	11.8	11.8	14.7	77.9	68.5	68.5	48.5	45.6	
Effective Green, g (s)		11.8	37.6	11.8	11.8	14.7	77.9	68.5	68.5	48.5	45.6	
Actuated g/C Ratio		0.11	0.34	0.11	0.11	0.13	0.71	0.62	0.62	0.44	0.41	
Clearance Time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		117	501	82	115	122	474	2042	550	124	1333	
v/s Ratio Prot			0.02		0.02	0.00	c0.18	0.37	0.02	0.00	0.33	
v/s Ratio Perm		c0.06	0.01	0.03		0.00	c0.37			0.07		
v/c Ratio		0.53	0.10	0.27	0.19	0.02	0.79	0.60	0.02	0.18	0.80	
Uniform Delay, d1		46.7	24.9	45.3	44.9	41.6	26.6	12.7	8.1	17.7	28.4	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.3	0.1	1.8	0.8	0.1	8.8	0.5	0.0	0.7	3.4	
Delay (s)		51.0	24.9	47.1	45.8	41.7	35.3	13.1	8.1	18.4	31.8	
Level of Service		D	C	D	D	D	D	B	A	B	C	
Approach Delay (s)		32.6			44.8			18.2			31.6	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	30.5
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	234	68	214	311	274	118	1226	234	233	716	253
Future Volume (vph)	165	234	68	214	311	274	118	1226	234	233	716	253
Lane Group Flow (vph)	179	254	74	233	338	298	128	1333	254	253	778	275
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Detector Phase	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Switch Phase												
Minimum Initial (s)	3.0	4.0		3.0	4.0		4.0	8.0		4.0	8.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	15.0		10.0	15.0	
Total Split (s)	18.0	13.0		23.0	18.0		22.0	57.0		24.0	59.0	
Total Split (%)	12.0%	8.7%		15.3%	12.0%		14.7%	38.0%		16.0%	39.3%	
Maximum Green (s)	11.0	7.0		16.0	12.0		16.0	51.0		18.0	53.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-3.5	-4.0		-3.5	-4.0		-4.0	-4.0		-4.0	-4.0	
Total Lost Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.91	0.84	0.24	0.90	0.76	0.70	0.54	0.88	0.29	0.91	0.51	0.34
Control Delay	99.4	79.9	44.2	86.6	64.7	50.1	59.7	39.4	11.8	86.1	25.4	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.4	79.9	44.2	86.6	64.7	50.1	59.7	39.4	11.8	86.1	25.4	13.9
Queue Length 50th (ft)	134	100	46	173	130	195	90	450	79	187	197	91
Queue Length 95th (ft)	#360	#235	113	#434	#273	#442	192	#899	115	#466	404	158
Internal Link Dist (ft)		167			271			617			1828	
Turn Bay Length (ft)	125		50	90		275	75		75	315		90
Base Capacity (vph)	196	301	345	259	443	428	273	1523	879	277	1517	819
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.84	0.21	0.90	0.76	0.70	0.47	0.88	0.29	0.91	0.51	0.34

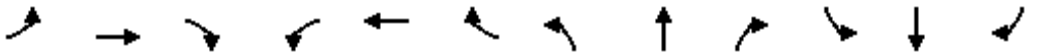
Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 123.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 18 & Middle Street



Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	33.0
Total Split (s)	33.0
Total Split (%)	22%
Maximum Green (s)	28.0
Yellow Time (s)	2.0
All-Red Time (s)	3.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	4
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	234	68	214	311	274	118	1226	234	233	716	253
Future Volume (vph)	165	234	68	214	311	274	118	1226	234	233	716	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			0%			-2%			9%	
Total Lost time (s)	3.5	2.0	6.0	3.5	2.0	6.0	2.0	2.0	6.0	2.0	2.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	3355	1459	1631	3388	1459	1678	3389	1474	1543	3115	1380
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1662	3355	1459	1631	3388	1459	1678	3389	1474	1543	3115	1380
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	254	74	233	338	298	128	1333	254	253	778	275
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	179	254	74	233	338	298	128	1333	254	253	778	275
Heavy Vehicles (%)	5%	4%	7%	7%	3%	7%	5%	4%	7%	8%	7%	8%
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Actuated Green, G (s)	11.1	7.1	26.6	16.2	12.2	36.4	13.5	51.5	67.7	18.2	56.2	67.3
Effective Green, g (s)	14.6	11.1	26.6	19.7	16.2	36.4	17.5	55.5	67.7	22.2	60.2	67.3
Actuated g/C Ratio	0.11	0.09	0.21	0.15	0.13	0.29	0.14	0.43	0.53	0.17	0.47	0.53
Clearance Time (s)	7.0	6.0		7.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	190	291	304	251	430	416	230	1474	782	268	1469	727
v/s Ratio Prot	0.11	0.08	0.05	c0.14	c0.10	0.20	0.08	c0.39	0.17	c0.16	0.25	0.20
v/s Ratio Perm												
v/c Ratio	0.94	0.87	0.24	0.93	0.79	0.72	0.56	0.90	0.32	0.94	0.53	0.38
Uniform Delay, d1	56.1	57.6	42.1	53.3	54.0	41.0	51.4	33.6	17.0	52.1	23.7	17.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.2	23.2	0.2	37.0	8.5	4.8	2.9	8.0	0.1	39.4	0.2	0.1
Delay (s)	104.3	80.7	42.3	90.3	62.5	45.8	54.3	41.6	17.1	91.5	23.9	17.9
Level of Service	F	F	D	F	E	D	D	D	B	F	C	B
Approach Delay (s)		83.4			64.2			38.9			35.7	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	127.6	Sum of lost time (s)	30.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	269	511	0	0	0
Future Vol, veh/h	0	269	511	0	0	0
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, %	2	2	2	2	2	2
Mvmt Flow	0	292	555	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	555	0	-	0	847	555
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	292	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1015	-	-	-	332	531
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	758	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1015	-	-	-	332	531
Mov Cap-2 Maneuver	-	-	-	-	332	-
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	758	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1015	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	269	511	0	0	0
Future Vol, veh/h	0	269	511	0	0	0
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	-1	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	292	555	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	555	0	-	0	847	555
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	292	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1015	-	-	-	332	531
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	758	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1015	-	-	-	332	531
Mov Cap-2 Maneuver	-	-	-	-	332	-
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	758	-

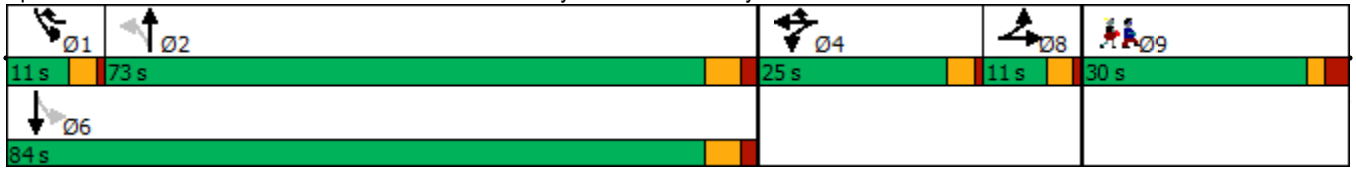
Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

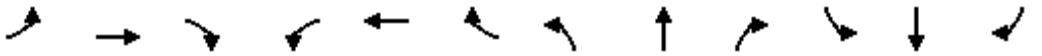
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1015	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations								
Traffic Volume (vph)	0	0	237	10	547	150	490	
Future Volume (vph)	0	0	237	10	547	150	490	
Lane Group Flow (vph)	9	259	258	0	868	163	538	
Turn Type	NA	NA	pt+ov	Perm	NA	pm+pt	NA	
Protected Phases	8	4	4 1		2	1	6	9
Permitted Phases				2		6		
Detector Phase	8	4	4 1	2	2	1	6	
Switch Phase								
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	11.0		13.0	13.0	11.0	13.0	30.0
Total Split (s)	11.0	25.0		73.0	73.0	11.0	84.0	30.0
Total Split (%)	7.3%	16.7%		48.7%	48.7%	7.3%	56.0%	20%
Maximum Green (s)	7.0	21.0		67.0	67.0	7.0	78.0	25.0
Yellow Time (s)	3.0	3.0		4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	1.0	1.0		2.0	2.0	1.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0			6.0	4.0	6.0	
Lead/Lag				Lag	Lag	Lead		
Lead-Lag Optimize?								
Vehicle Extension (s)	2.6	2.6		2.6	2.6	2.6	2.6	3.0
Recall Mode	None	None		Min	Min	None	Min	None
Walk Time (s)								7.0
Flash Dont Walk (s)								18.0
Pedestrian Calls (#/hr)								5
v/c Ratio	0.04	0.85	0.51		0.84	0.44	0.44	
Control Delay	0.4	72.7	21.3		30.9	13.5	12.9	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	0.4	72.7	21.3		30.9	13.5	12.9	
Queue Length 50th (ft)	0	175	77		419	29	134	
Queue Length 95th (ft)	0	#473	156		#1207	124	470	
Internal Link Dist (ft)	363	897			2156		619	
Turn Bay Length (ft)			75			200		
Base Capacity (vph)	214	303	510		1028	370	1217	
Starvation Cap Reductn	0	0	0		0	0	0	
Spillback Cap Reductn	0	0	0		0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	
Reduced v/c Ratio	0.04	0.85	0.51		0.84	0.44	0.44	

Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 117.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Middle Street & Tara Drive/Libbey Industrial Parkway





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	6	238	0	237	10	547	241	150	490	5
Future Volume (vph)	2	0	6	238	0	237	10	547	241	150	490	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	10	10	11	12	12	12	10	11	11
Total Lost time (s)		4.0			4.0	4.0		6.0		4.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	1.00		1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.90			1.00	0.85		0.96		1.00	1.00	
Flt Protected		0.99			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1738			1668	1561		1770		1651	1798	
Flt Permitted		0.99			0.95	1.00		0.99		0.25	1.00	
Satd. Flow (perm)		1738			1668	1561		1757		427	1798	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	7	259	0	258	11	595	262	163	533	5
RTOR Reduction (vph)	0	9	0	0	0	91	0	9	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	259	167	0	859	0	163	538	0
Confl. Peds. (#/hr)							3			3		
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	1%	6%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	1	1	1	0	0	0
Turn Type	Split	NA		Split	NA	pt+ov	Perm	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		1.1			21.3	28.4		68.2		79.3	79.3	
Effective Green, g (s)		1.1			21.3	28.4		68.2		79.3	79.3	
Actuated g/C Ratio		0.01			0.17	0.23		0.55		0.64	0.64	
Clearance Time (s)		4.0			4.0			6.0		4.0	6.0	
Vehicle Extension (s)		2.6			2.6			2.6		2.6	2.6	
Lane Grp Cap (vph)		15			285	355		961		341	1144	
v/s Ratio Prot		c0.00			c0.16	0.11				0.03	c0.30	
v/s Ratio Perm								c0.49		0.28		
v/c Ratio		0.01			0.91	0.47		0.89		0.48	0.47	
Uniform Delay, d1		61.2			50.7	41.6		25.0		12.9	11.8	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.1			30.4	0.8		10.6		0.8	0.2	
Delay (s)		61.3			81.1	42.4		35.7		13.7	12.0	
Level of Service		E			F	D		D		B	B	
Approach Delay (s)		61.3			61.8			35.7			12.4	
Approach LOS		E			E			D			B	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	124.6	Sum of lost time (s)	23.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		

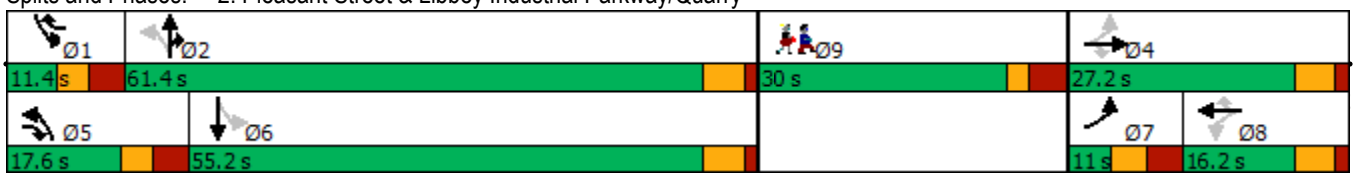
c Critical Lane Group

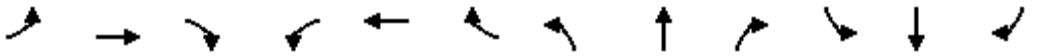
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Lane Configurations												
Traffic Volume (vph)	126	20	391	20	20	20	145	918	20	20	1089	
Future Volume (vph)	126	20	391	20	20	20	145	918	20	20	1089	
Lane Group Flow (vph)	0	159	425	22	22	22	158	998	22	22	1261	
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases	7	4	5		8	1	5	2	2	1	6	9
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	5	8	8	1	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	7.0	4.0	4.0	4.0	4.0	4.0	10.0	10.0	4.0	10.0	4.0
Minimum Split (s)	11.0	12.5	10.5	9.5	9.5	10.5	10.5	15.5	15.5	10.5	15.5	30.0
Total Split (s)	11.0	27.2	17.6	16.2	16.2	11.4	17.6	61.4	61.4	11.4	55.2	30.0
Total Split (%)	8.5%	20.9%	13.5%	12.5%	12.5%	8.8%	13.5%	47.2%	47.2%	8.8%	42.5%	23%
Maximum Green (s)	4.0	21.7	11.1	10.7	10.7	4.9	11.1	55.9	55.9	4.9	49.7	24.0
Yellow Time (s)	3.5	4.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	3.5	1.5	3.5	1.5	1.5	3.5	3.5	1.5	1.5	3.5	1.5	4.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Lead/Lag	Lead		Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None
Walk Time (s)												7.0
Flash Dont Walk (s)												17.0
Pedestrian Calls (#/hr)												5
v/c Ratio		0.63	0.54	0.17	0.10	0.06	0.60	0.50	0.04	0.14	0.81	
Control Delay		52.4	8.1	42.9	39.5	0.3	27.5	17.2	0.1	13.2	30.1	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		52.4	8.1	42.9	39.5	0.3	27.5	17.2	0.1	13.2	30.1	
Queue Length 50th (ft)		92	24	11	11	0	36	195	0	4	327	
Queue Length 95th (ft)		#246	140	45	43	0	#176	425	0	24	#713	
Internal Link Dist (ft)		2665			182			871			1142	
Turn Bay Length (ft)			200	105		150	170		40	140		
Base Capacity (vph)		253	794	127	227	375	267	1978	587	162	1610	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.63	0.54	0.17	0.10	0.06	0.59	0.50	0.04	0.14	0.78	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 104.3
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Pleasant Street & Libbey Industrial Parkway/Quarry





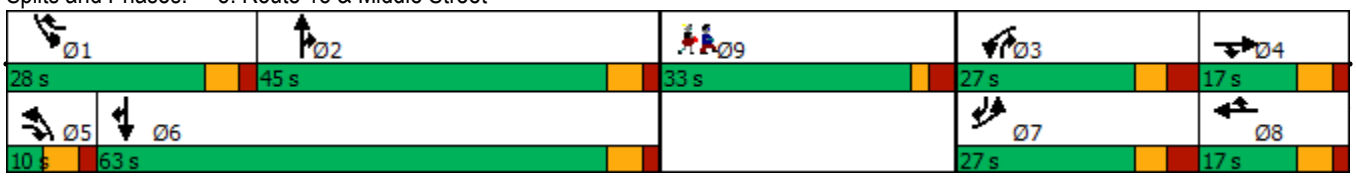
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	20	391	20	20	20	145	918	20	20	1089	71
Future Volume (vph)	126	20	391	20	20	20	145	918	20	20	1089	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	10	10	11	10
Total Lost time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1556	1516	1026	1080	918	1745	3455	887	991	3324	
Flt Permitted		0.74	1.00	0.56	1.00	1.00	0.08	1.00	1.00	0.24	1.00	
Satd. Flow (perm)		1201	1516	606	1080	918	153	3455	887	254	3324	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	22	425	22	22	22	158	998	22	22	1184	77
RTOR Reduction (vph)	0	0	258	0	0	17	0	0	10	0	3	0
Lane Group Flow (vph)	0	159	167	22	22	5	158	998	12	22	1258	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	70%	3%	70%	70%	70%	0%	1%	70%	70%	4%	2%
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases	7	4	5		8	1	5	2	2	1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		22.0	32.9	22.0	22.0	24.8	69.0	59.7	59.7	54.4	51.6	
Effective Green, g (s)		22.0	32.9	22.0	22.0	24.8	69.0	59.7	59.7	54.4	51.6	
Actuated g/C Ratio		0.20	0.29	0.20	0.20	0.22	0.62	0.53	0.53	0.49	0.46	
Clearance Time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		236	446	119	212	203	249	1844	473	142	1534	
v/s Ratio Prot			0.04		0.02	0.00	c0.06	c0.29	0.01	0.00	c0.38	
v/s Ratio Perm		c0.13	0.07	0.04		0.00	0.33			0.07		
v/c Ratio		0.67	0.37	0.18	0.10	0.02	0.63	0.54	0.02	0.15	0.82	
Uniform Delay, d1		41.6	31.3	37.4	36.8	34.0	19.3	17.1	12.3	15.4	26.1	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		7.4	0.5	0.8	0.2	0.0	5.2	0.3	0.0	0.5	3.6	
Delay (s)		49.0	31.8	38.2	37.0	34.1	24.5	17.4	12.3	15.9	29.6	
Level of Service		D	C	D	D	C	C	B	B	B	C	
Approach Delay (s)		36.5			36.4			18.3			29.4	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	111.8	Sum of lost time (s)	30.5
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	341	101	263	287	229	70	983	258	278	1169	243
Future Volume (vph)	256	341	101	263	287	229	70	983	258	278	1169	243
Lane Group Flow (vph)	278	371	110	286	312	249	76	1068	280	302	1271	264
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Detector Phase	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Switch Phase												
Minimum Initial (s)	3.0	4.0		3.0	4.0		4.0	8.0		4.0	8.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	15.0		10.0	15.0	
Total Split (s)	27.0	17.0		27.0	17.0		10.0	45.0		28.0	63.0	
Total Split (%)	18.0%	11.3%		18.0%	11.3%		6.7%	30.0%		18.7%	42.0%	
Maximum Green (s)	20.0	11.0		20.0	11.0		4.0	39.0		22.0	57.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-3.5	-4.0		-3.5	-4.0		-4.0	-4.0		-4.0	-4.0	
Total Lost Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.84	0.88	0.41	0.87	0.74	0.51	0.66	0.88	0.34	0.88	0.78	0.27
Control Delay	70.9	75.6	53.5	75.2	64.4	40.9	84.6	47.8	15.9	74.1	31.1	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	75.6	53.5	75.2	64.4	40.9	84.6	47.8	15.9	74.1	31.1	8.0
Queue Length 50th (ft)	202	145	74	209	120	149	57	384	107	219	380	61
Queue Length 95th (ft)	#478	#320	169	#499	#252	316	#170	#750	154	#523	#787	109
Internal Link Dist (ft)		167			271			617			1828	
Turn Bay Length (ft)	125		50	90		275	75		75	315		90
Base Capacity (vph)	332	423	268	328	423	488	115	1213	821	343	1628	972
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.88	0.41	0.87	0.74	0.51	0.66	0.88	0.34	0.88	0.78	0.27

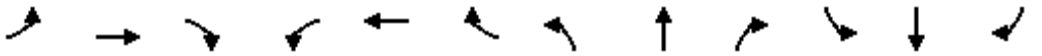
Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 123.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 18 & Middle Street



Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	33.0
Total Split (s)	33.0
Total Split (%)	22%
Maximum Green (s)	28.0
Yellow Time (s)	2.0
All-Red Time (s)	3.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	4
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	341	101	263	287	229	70	983	258	278	1169	243
Future Volume (vph)	256	341	101	263	287	229	70	983	258	278	1169	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			0%			-2%			9%	
Total Lost time (s)	3.5	2.0	6.0	3.5	2.0	6.0	2.0	2.0	6.0	2.0	2.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1728	3455	1561	1711	3455	1531	1762	3455	1546	1618	3267	1434
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1728	3455	1561	1711	3455	1531	1762	3455	1546	1618	3267	1434
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	278	371	110	286	312	249	76	1068	280	302	1271	264
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	278	371	110	286	312	249	76	1068	280	302	1271	264
Heavy Vehicles (%)	1%	1%	0%	2%	1%	2%	0%	2%	2%	3%	2%	4%
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Actuated Green, G (s)	20.2	11.1	21.1	20.2	11.1	39.3	4.0	39.4	59.6	22.2	57.6	77.8
Effective Green, g (s)	23.7	15.1	21.1	23.7	15.1	39.3	8.0	43.4	59.6	26.2	61.6	77.8
Actuated g/C Ratio	0.19	0.12	0.17	0.19	0.12	0.31	0.06	0.34	0.47	0.21	0.48	0.61
Clearance Time (s)	7.0	6.0		7.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	321	409	258	318	409	471	110	1176	722	332	1578	875
v/s Ratio Prot	0.16	c0.11	0.07	c0.17	0.09	0.16	0.04	c0.31	0.18	c0.19	0.39	0.18
v/s Ratio Perm												
v/c Ratio	0.87	0.91	0.43	0.90	0.76	0.53	0.69	0.91	0.39	0.91	0.81	0.30
Uniform Delay, d1	50.4	55.5	47.8	50.7	54.5	36.4	58.5	40.1	22.1	49.5	27.9	11.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.3	22.8	0.4	25.8	7.4	0.5	17.1	10.0	0.1	26.9	2.9	0.1
Delay (s)	70.6	78.3	48.2	76.6	61.9	36.9	75.6	50.1	22.2	76.4	30.8	11.9
Level of Service	E	E	D	E	E	D	E	D	C	E	C	B
Approach Delay (s)		71.1			59.5			46.0			35.6	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	48.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	127.5	Sum of lost time (s)	30.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	399	339	0	0	0
Future Vol, veh/h	0	399	339	0	0	0
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, %	2	2	2	2	2	2
Mvmt Flow	0	434	368	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	368	0	-	0	802	368
Stage 1	-	-	-	-	368	-
Stage 2	-	-	-	-	434	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1191	-	-	-	353	677
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1191	-	-	-	353	677
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	653	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1191	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	399	339	0	0	0
Future Vol, veh/h	0	399	339	0	0	0
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	-1	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	434	368	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	368	0	-	0	802	368
Stage 1	-	-	-	-	368	-
Stage 2	-	-	-	-	434	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1191	-	-	-	353	677
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1191	-	-	-	353	677
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	700	-
Stage 2	-	-	-	-	653	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

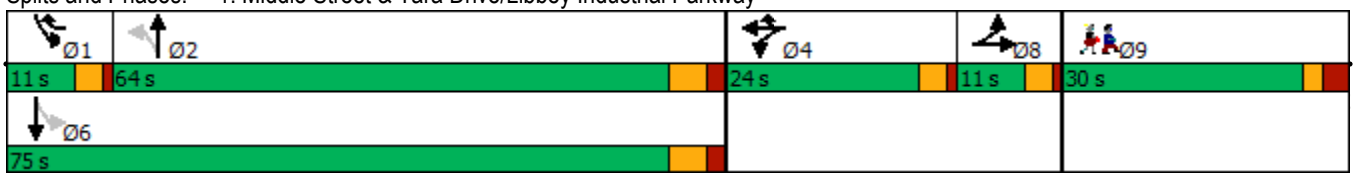
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1191	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

2028 Build

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations								
Traffic Volume (vph)	2	0	154	6	340	190	412	
Future Volume (vph)	2	0	154	6	340	190	412	
Lane Group Flow (vph)	18	235	167	0	730	207	450	
Turn Type	NA	NA	pt+ov	Perm	NA	pm+pt	NA	
Protected Phases	8	4	4 1		2	1	6	9
Permitted Phases				2		6		
Detector Phase	8	4	4 1	2	2	1	6	
Switch Phase								
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	11.0		13.0	13.0	11.0	13.0	30.0
Total Split (s)	11.0	24.0		64.0	64.0	11.0	75.0	30.0
Total Split (%)	7.9%	17.1%		45.7%	45.7%	7.9%	53.6%	21%
Maximum Green (s)	7.0	20.0		58.0	58.0	7.0	69.0	25.0
Yellow Time (s)	3.0	3.0		4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	1.0	1.0		2.0	2.0	1.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0			6.0	4.0	6.0	
Lead/Lag				Lag	Lag	Lead		
Lead-Lag Optimize?								
Vehicle Extension (s)	2.6	2.6		2.6	2.6	2.6	2.6	3.0
Recall Mode	None	None		Min	Min	None	Min	None
Walk Time (s)								7.0
Flash Dont Walk (s)								18.0
Pedestrian Calls (#/hr)								5
v/c Ratio	0.14	0.81	0.35		0.81	0.53	0.40	
Control Delay	36.2	65.9	13.3		30.4	17.7	13.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	36.2	65.9	13.3		30.4	17.7	13.7	
Queue Length 50th (ft)	3	133	31		296	36	101	
Queue Length 95th (ft)	32	#411	75		#934	156	374	
Internal Link Dist (ft)	363	897			2156		619	
Turn Bay Length (ft)			75			200		
Base Capacity (vph)	128	289	480		929	387	1153	
Starvation Cap Reductn	0	0	0		0	0	0	
Spillback Cap Reductn	0	0	0		0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	
Reduced v/c Ratio	0.14	0.81	0.35		0.79	0.53	0.39	

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 107.9
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Middle Street & Tara Drive/Libbey Industrial Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	2	11	216	0	154	6	340	325	190	412	2
Future Volume (vph)	4	2	11	216	0	154	6	340	325	190	412	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	10	10	11	12	12	12	10	11	11
Total Lost time (s)		4.0			4.0	4.0		6.0		4.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	1.00		0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.91			1.00	0.85		0.93		1.00	1.00	
Flt Protected		0.99			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1767			1532	1473		1665		1651	1765	
Flt Permitted		0.99			0.95	1.00		1.00		0.27	1.00	
Satd. Flow (perm)		1767			1532	1473		1659		472	1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	2	12	235	0	167	7	370	353	207	448	2
RTOR Reduction (vph)	0	12	0	0	0	71	0	20	0	0	0	0
Lane Group Flow (vph)	0	6	0	0	235	96	0	710	0	207	450	0
Confl. Peds. (#/hr)									5	5		
Heavy Vehicles (%)	0%	0%	0%	10%	0%	6%	0%	3%	7%	2%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	1	1	1	0	0	0
Turn Type	Split	NA		Split	NA	pt+ov	Perm	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		2.5			20.4	27.6		57.6		68.8	68.8	
Effective Green, g (s)		2.5			20.4	27.6		57.6		68.8	68.8	
Actuated g/C Ratio		0.02			0.18	0.24		0.50		0.60	0.60	
Clearance Time (s)		4.0			4.0			6.0		4.0	6.0	
Vehicle Extension (s)		2.6			2.6			2.6		2.6	2.6	
Lane Grp Cap (vph)		38			272	354		833		357	1059	
v/s Ratio Prot		c0.00			c0.15	0.06				c0.04	0.25	
v/s Ratio Perm								c0.43		0.31		
v/c Ratio		0.16			0.86	0.27		0.85		0.58	0.42	
Uniform Delay, d1		55.0			45.8	35.3		24.8		13.9	12.3	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.6			23.4	0.3		8.3		2.0	0.2	
Delay (s)		56.6			69.2	35.6		33.1		15.8	12.5	
Level of Service		E			E	D		C		B	B	
Approach Delay (s)		56.6			55.2			33.1			13.5	
Approach LOS		E			E			C			B	

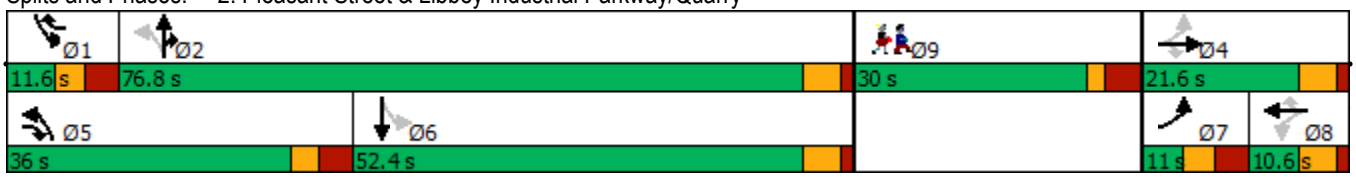
Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	23.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

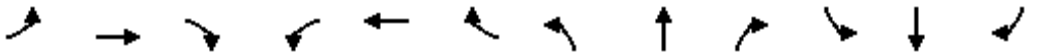
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Lane Configurations												
Traffic Volume (vph)	41	20	144	20	20	20	371	1125	20	20	853	
Future Volume (vph)	41	20	144	20	20	20	371	1125	20	20	853	
Lane Group Flow (vph)	0	67	157	22	22	22	403	1223	22	22	1089	
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases	7	4	5		8	1	5	2	2	1	6	9
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	5	8	8	1	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	7.0	4.0	4.0	4.0	4.0	4.0	10.0	10.0	4.0	10.0	4.0
Minimum Split (s)	11.0	12.5	10.5	9.5	9.5	10.5	10.5	15.5	15.5	10.5	15.5	30.0
Total Split (s)	11.0	21.6	36.0	10.6	10.6	11.6	36.0	76.8	76.8	11.6	52.4	30.0
Total Split (%)	7.9%	15.4%	25.7%	7.6%	7.6%	8.3%	25.7%	54.9%	54.9%	8.3%	37.4%	21%
Maximum Green (s)	4.0	16.1	29.5	5.1	5.1	5.1	29.5	71.3	71.3	5.1	46.9	24.0
Yellow Time (s)	3.5	4.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	3.5	1.5	3.5	1.5	1.5	3.5	3.5	1.5	1.5	3.5	1.5	4.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Lead/Lag	Lead		Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None
Walk Time (s)												7.0
Flash Dont Walk (s)												17.0
Pedestrian Calls (#/hr)												5
v/c Ratio		0.46	0.21	0.22	0.15	0.06	0.79	0.56	0.03	0.16	0.82	
Control Delay		59.5	4.6	53.9	50.6	0.3	39.8	14.4	0.1	14.8	37.2	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		59.5	4.6	53.9	50.6	0.3	39.8	14.4	0.1	14.8	37.2	
Queue Length 50th (ft)		44	0	14	14	0	193	232	0	4	338	
Queue Length 95th (ft)		112	48	49	47	0	#521	534	0	21	#676	
Internal Link Dist (ft)		2665			182			871			1142	
Turn Bay Length (ft)			200	105		150	170		40	140		
Base Capacity (vph)		157	740	102	144	341	507	2196	648	139	1343	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.43	0.21	0.22	0.15	0.06	0.79	0.56	0.03	0.16	0.81	

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 114.5
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Pleasant Street & Libbey Industrial Parkway/Quarry





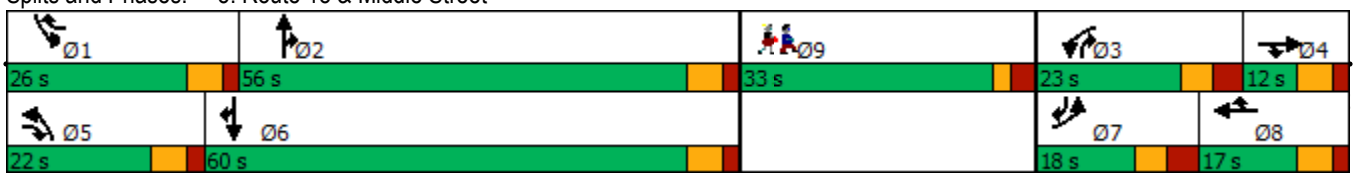
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	20	144	20	20	20	371	1125	20	20	853	149
Future Volume (vph)	41	20	144	20	20	20	371	1125	20	20	853	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	10	10	11	10
Total Lost time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected		0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1363	1473	1026	1080	918	1646	3292	887	991	3222	
Flt Permitted		0.78	1.00	0.71	1.00	1.00	0.10	1.00	1.00	0.23	1.00	
Satd. Flow (perm)		1106	1473	771	1080	918	172	3292	887	239	3222	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	22	157	22	22	22	403	1223	22	22	927	162
RTOR Reduction (vph)	0	0	99	0	0	19	0	0	8	0	9	0
Lane Group Flow (vph)	0	67	58	22	22	3	403	1223	14	22	1080	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	11%	70%	6%	70%	70%	70%	6%	6%	70%	70%	6%	3%
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases	7	4	5		8	1	5	2	2	1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		15.3	45.1	15.3	15.3	18.3	85.9	76.4	76.4	52.6	49.6	
Effective Green, g (s)		15.3	45.1	15.3	15.3	18.3	85.9	76.4	76.4	52.6	49.6	
Actuated g/C Ratio		0.13	0.37	0.13	0.13	0.15	0.70	0.63	0.63	0.43	0.41	
Clearance Time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		138	544	96	135	137	480	2059	555	121	1308	
v/s Ratio Prot			0.03		0.02	0.00	c0.20	0.37	0.02	0.00	0.34	
v/s Ratio Perm		c0.06	0.01	0.03		0.00	c0.39			0.07		
v/c Ratio		0.49	0.11	0.23	0.16	0.02	0.84	0.59	0.02	0.18	0.83	
Uniform Delay, d1		49.7	25.3	48.1	47.7	44.3	31.9	13.6	8.7	20.2	32.4	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.7	0.1	1.2	0.6	0.1	12.2	0.5	0.0	0.7	4.4	
Delay (s)		52.4	25.4	49.3	48.3	44.4	44.1	14.1	8.7	21.0	36.8	
Level of Service		D	C	D	D	D	D	B	A	C	D	
Approach Delay (s)		33.5			47.3			21.4			36.5	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	122.1	Sum of lost time (s)	30.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	243	68	218	314	287	118	1226	249	262	716	253
Future Volume (vph)	165	243	68	218	314	287	118	1226	249	262	716	253
Lane Group Flow (vph)	179	264	74	237	341	312	128	1333	271	285	778	275
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Detector Phase	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Switch Phase												
Minimum Initial (s)	3.0	4.0		3.0	4.0		4.0	8.0		4.0	8.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	15.0		10.0	15.0	
Total Split (s)	18.0	12.0		23.0	17.0		22.0	56.0		26.0	60.0	
Total Split (%)	12.0%	8.0%		15.3%	11.3%		14.7%	37.3%		17.3%	40.0%	
Maximum Green (s)	11.0	6.0		16.0	11.0		16.0	50.0		20.0	54.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-3.5	-4.0		-3.5	-4.0		-4.0	-4.0		-4.0	-4.0	
Total Lost Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.91	0.97	0.25	0.92	0.82	0.71	0.54	0.89	0.31	0.94	0.50	0.33
Control Delay	99.4	102.9	45.1	89.3	70.2	49.8	59.7	41.3	12.5	88.8	24.6	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.4	102.9	45.1	89.3	70.2	49.8	59.7	41.3	12.5	88.8	24.6	13.4
Queue Length 50th (ft)	134	105	46	176	133	204	90	458	88	211	193	88
Queue Length 95th (ft)	#360	#260	114	#444	#290	#465	192	#911	128	#518	400	154
Internal Link Dist (ft)		167			271			617			1828	
Turn Bay Length (ft)	125		50	90		275	75		75	315		90
Base Capacity (vph)	196	273	334	259	415	441	273	1495	867	302	1543	830
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.97	0.22	0.92	0.82	0.71	0.47	0.89	0.31	0.94	0.50	0.33

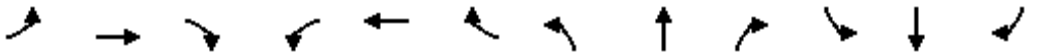
Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 123.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 18 & Middle Street



Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	33.0
Total Split (s)	33.0
Total Split (%)	22%
Maximum Green (s)	28.0
Yellow Time (s)	2.0
All-Red Time (s)	3.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	4
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	243	68	218	314	287	118	1226	249	262	716	253
Future Volume (vph)	165	243	68	218	314	287	118	1226	249	262	716	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			0%			-2%			9%	
Total Lost time (s)	3.5	2.0	6.0	3.5	2.0	6.0	2.0	2.0	6.0	2.0	2.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	3355	1459	1631	3388	1459	1678	3389	1474	1543	3115	1380
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1662	3355	1459	1631	3388	1459	1678	3389	1474	1543	3115	1380
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	264	74	237	341	312	128	1333	271	285	778	275
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	179	264	74	237	341	312	128	1333	271	285	778	275
Heavy Vehicles (%)	5%	4%	7%	7%	3%	7%	5%	4%	7%	8%	7%	8%
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Actuated Green, G (s)	11.1	6.1	25.6	16.2	11.2	37.4	13.5	50.5	66.7	20.2	57.2	68.3
Effective Green, g (s)	14.6	10.1	25.6	19.7	15.2	37.4	17.5	54.5	66.7	24.2	61.2	68.3
Actuated g/C Ratio	0.11	0.08	0.20	0.15	0.12	0.29	0.14	0.43	0.52	0.19	0.48	0.54
Clearance Time (s)	7.0	6.0		7.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	190	265	292	251	403	427	230	1447	770	292	1494	738
v/s Ratio Prot	0.11	0.08	0.05	c0.15	c0.10	0.21	0.08	c0.39	0.18	c0.18	0.25	0.20
v/s Ratio Perm												
v/c Ratio	0.94	1.00	0.25	0.94	0.85	0.73	0.56	0.92	0.35	0.98	0.52	0.37
Uniform Delay, d1	56.1	58.7	43.0	53.4	55.1	40.6	51.4	34.5	17.8	51.4	23.0	17.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.2	53.8	0.2	41.1	14.5	5.5	2.9	9.8	0.1	45.5	0.2	0.1
Delay (s)	104.3	112.6	43.1	94.5	69.5	46.0	54.3	44.3	17.9	96.9	23.2	17.3
Level of Service	F	F	D	F	E	D	D	D	B	F	C	B
Approach Delay (s)		99.8			67.9			40.9			37.7	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	127.6	Sum of lost time (s)	30.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	311	523	20	5	12
Future Vol, veh/h	43	311	523	20	5	12
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, %	2	2	2	2	2	2
Mvmt Flow	47	338	568	22	5	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	590	0	-	0	1011	579
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	432	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	985	-	-	-	265	515
Stage 1	-	-	-	-	560	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	985	-	-	-	249	515
Mov Cap-2 Maneuver	-	-	-	-	249	-
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	655	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	985	-	-	-	392
HCM Lane V/C Ratio	0.047	-	-	-	0.047
HCM Control Delay (s)	8.8	0	-	-	14.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	42	274	531	21	6	12
Future Vol, veh/h	42	274	531	21	6	12
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	-1	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	298	577	23	7	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	600	0	-	0	979	589
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	390	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	977	-	-	-	277	508
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	684	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	977	-	-	-	261	508
Mov Cap-2 Maneuver	-	-	-	-	261	-
Stage 1	-	-	-	-	523	-
Stage 2	-	-	-	-	684	-

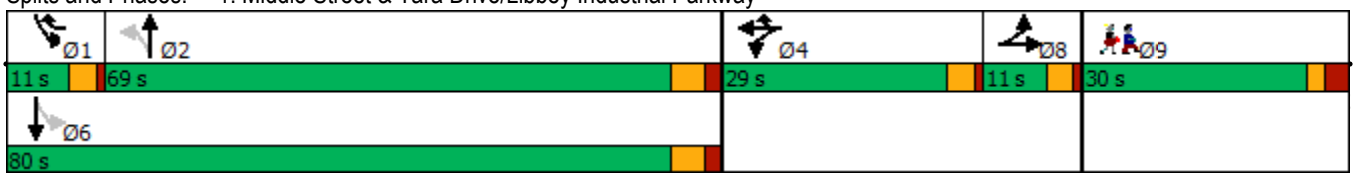
Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	14.8
HCM LOS			B

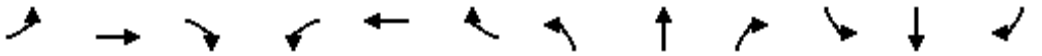
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	977	-	-	-	386
HCM Lane V/C Ratio	0.047	-	-	-	0.051
HCM Control Delay (s)	8.9	0	-	-	14.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations								
Traffic Volume (vph)	0	0	254	10	547	167	490	
Future Volume (vph)	0	0	254	10	547	167	490	
Lane Group Flow (vph)	9	365	276	0	898	182	538	
Turn Type	NA	NA	pt+ov	Perm	NA	pm+pt	NA	
Protected Phases	8	4	4 1		2	1	6	9
Permitted Phases				2		6		
Detector Phase	8	4	4 1	2	2	1	6	
Switch Phase								
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	11.0		13.0	13.0	11.0	13.0	30.0
Total Split (s)	11.0	29.0		69.0	69.0	11.0	80.0	30.0
Total Split (%)	7.3%	19.3%		46.0%	46.0%	7.3%	53.3%	20%
Maximum Green (s)	7.0	25.0		63.0	63.0	7.0	74.0	25.0
Yellow Time (s)	3.0	3.0		4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	1.0	1.0		2.0	2.0	1.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0			6.0	4.0	6.0	
Lead/Lag				Lag	Lag	Lead		
Lead-Lag Optimize?								
Vehicle Extension (s)	2.6	2.6		2.6	2.6	2.6	2.6	3.0
Recall Mode	None	None		Min	Min	None	Min	None
Walk Time (s)								7.0
Flash Dont Walk (s)								18.0
Pedestrian Calls (#/hr)								5
v/c Ratio	0.04	1.01	0.51		0.93	0.55	0.47	
Control Delay	0.4	96.1	24.5		42.3	19.6	15.2	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay	0.4	96.1	24.5		42.3	19.6	15.2	
Queue Length 50th (ft)	0	253	99		500	38	155	
Queue Length 95th (ft)	0	#665	202		#1318	#158	499	
Internal Link Dist (ft)	363	897			2156		619	
Turn Bay Length (ft)			75			200		
Base Capacity (vph)	214	361	543		964	328	1154	
Starvation Cap Reductn	0	0	0		0	0	0	
Spillback Cap Reductn	0	0	0		0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	
Reduced v/c Ratio	0.04	1.01	0.51		0.93	0.55	0.47	

Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 117.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Middle Street & Tara Drive/Libbey Industrial Parkway





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	6	336	0	254	10	547	269	167	490	5
Future Volume (vph)	2	0	6	336	0	254	10	547	269	167	490	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	10	10	11	12	12	12	10	11	11
Total Lost time (s)		4.0			4.0	4.0		6.0		4.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00	1.00		1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00		1.00		1.00	1.00	
Frt		0.90			1.00	0.85		0.96		1.00	1.00	
Flt Protected		0.99			0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1738			1668	1561		1762		1651	1798	
Flt Permitted		0.99			0.95	1.00		0.99		0.22	1.00	
Satd. Flow (perm)		1738			1668	1561		1749		382	1798	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	7	365	0	276	11	595	292	182	533	5
RTOR Reduction (vph)	0	9	0	0	0	68	0	10	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	365	208	0	888	0	182	538	0
Confl. Peds. (#/hr)							3			3		
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	1%	6%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	1	1	1	0	0	0
Turn Type	Split	NA		Split	NA	pt+ov	Perm	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4 1		2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		1.1			25.4	32.5		64.1		75.2	75.2	
Effective Green, g (s)		1.1			25.4	32.5		64.1		75.2	75.2	
Actuated g/C Ratio		0.01			0.20	0.26		0.51		0.60	0.60	
Clearance Time (s)		4.0			4.0			6.0		4.0	6.0	
Vehicle Extension (s)		2.6			2.6			2.6		2.6	2.6	
Lane Grp Cap (vph)		15			340	407		899		302	1085	
v/s Ratio Prot		c0.00			c0.22	0.13				c0.03	0.30	
v/s Ratio Perm								c0.51		0.33		
v/c Ratio		0.01			1.07	0.51		0.99		0.60	0.50	
Uniform Delay, d1		61.2			49.6	39.3		29.9		15.8	14.0	
Progression Factor		1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.1			69.8	0.9		26.8		3.0	0.3	
Delay (s)		61.3			119.4	40.1		56.7		18.7	14.3	
Level of Service		E			F	D		E		B	B	
Approach Delay (s)		61.3			85.2			56.7			15.4	
Approach LOS		E			F			E			B	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	124.6	Sum of lost time (s)	23.0
Intersection Capacity Utilization	110.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Lane Configurations												
Traffic Volume (vph)	147	20	427	20	20	20	159	918	20	20	1089	
Future Volume (vph)	147	20	427	20	20	20	159	918	20	20	1089	
Lane Group Flow (vph)	0	182	464	22	22	22	173	998	22	22	1270	
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases	7	4	5		8	1	5	2	2	1	6	9
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	5	8	8	1	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	4.0	7.0	4.0	4.0	4.0	4.0	4.0	10.0	10.0	4.0	10.0	4.0
Minimum Split (s)	11.0	12.5	10.5	9.5	9.5	10.5	10.5	15.5	15.5	10.5	15.5	30.0
Total Split (s)	11.0	31.0	20.2	20.0	20.0	11.6	20.2	67.4	67.4	11.6	58.8	30.0
Total Split (%)	7.9%	22.1%	14.4%	14.3%	14.3%	8.3%	14.4%	48.1%	48.1%	8.3%	42.0%	21%
Maximum Green (s)	4.0	25.5	13.7	14.5	14.5	5.1	13.7	61.9	61.9	5.1	53.3	24.0
Yellow Time (s)	3.5	4.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	2.0
All-Red Time (s)	3.5	1.5	3.5	1.5	1.5	3.5	3.5	1.5	1.5	3.5	1.5	4.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Lead/Lag	Lead		Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	None
Walk Time (s)												7.0
Flash Dont Walk (s)												17.0
Pedestrian Calls (#/hr)												5
v/c Ratio		0.67	0.58	0.18	0.09	0.05	0.63	0.50	0.04	0.14	0.82	
Control Delay		56.2	11.0	45.0	41.0	0.2	32.0	18.1	0.1	14.1	33.4	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		56.2	11.0	45.0	41.0	0.2	32.0	18.1	0.1	14.1	33.4	
Queue Length 50th (ft)		117	51	13	12	0	56	216	0	5	378	
Queue Length 95th (ft)		#295	209	46	44	0	#206	446	0	25	#771	
Internal Link Dist (ft)		2665			182			871			1142	
Turn Bay Length (ft)			200	105		150	170		40	140		
Base Capacity (vph)		271	808	123	242	408	282	1992	583	162	1563	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.67	0.57	0.18	0.09	0.05	0.61	0.50	0.04	0.14	0.81	

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 114.7
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Pleasant Street & Libbey Industrial Parkway/Quarry

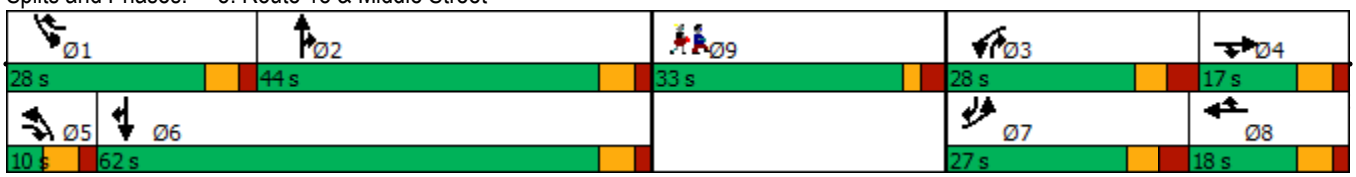
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	20	427	20	20	20	159	918	20	20	1089	79
Future Volume (vph)	147	20	427	20	20	20	159	918	20	20	1089	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	10	10	11	10
Total Lost time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1571	1516	1026	1080	918	1745	3455	887	991	3321	
Flt Permitted		0.74	1.00	0.51	1.00	1.00	0.08	1.00	1.00	0.25	1.00	
Satd. Flow (perm)		1207	1516	550	1080	918	143	3455	887	260	3321	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	160	22	464	22	22	22	173	998	22	22	1184	86
RTOR Reduction (vph)	0	0	238	0	0	17	0	0	10	0	3	0
Lane Group Flow (vph)	0	182	226	22	22	5	173	998	12	22	1267	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	70%	3%	70%	70%	70%	0%	1%	70%	70%	4%	2%
Turn Type	pm+pt	NA	pm+ov	Perm	NA	pm+ov	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases	7	4	5		8	1	5	2	2	1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		25.8	39.0	25.8	25.8	28.8	75.7	66.2	66.2	59.0	56.0	
Effective Green, g (s)		25.8	39.0	25.8	25.8	28.8	75.7	66.2	66.2	59.0	56.0	
Actuated g/C Ratio		0.21	0.32	0.21	0.21	0.24	0.62	0.54	0.54	0.48	0.46	
Clearance Time (s)		5.5	6.5	5.5	5.5	6.5	6.5	5.5	5.5	6.5	5.5	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		254	483	115	227	216	261	1868	479	143	1519	
v/s Ratio Prot			0.05		0.02	0.00	c0.07	0.29	0.01	0.00	c0.38	
v/s Ratio Perm		c0.15	0.10	0.04		0.01	0.34			0.07		
v/c Ratio		0.72	0.47	0.19	0.10	0.02	0.66	0.53	0.02	0.15	0.83	
Uniform Delay, d1		44.9	33.4	39.7	38.9	36.0	25.7	18.1	13.1	17.0	29.1	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		9.3	0.7	0.8	0.2	0.0	6.2	0.3	0.0	0.5	4.1	
Delay (s)		54.2	34.1	40.5	39.1	36.0	31.9	18.4	13.1	17.5	33.2	
Level of Service		D	C	D	D	D	C	B	B	B	C	
Approach Delay (s)		39.8			38.6			20.3			33.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	122.4	Sum of lost time (s)	30.5
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	346	101	284	299	294	70	983	266	293	1169	243
Future Volume (vph)	256	346	101	284	299	294	70	983	266	293	1169	243
Lane Group Flow (vph)	278	376	110	309	325	320	76	1068	289	318	1271	264
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Detector Phase	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Switch Phase												
Minimum Initial (s)	3.0	4.0		3.0	4.0		4.0	8.0		4.0	8.0	
Minimum Split (s)	10.0	10.0		10.0	10.0		10.0	15.0		10.0	15.0	
Total Split (s)	27.0	17.0		28.0	18.0		10.0	44.0		28.0	62.0	
Total Split (%)	18.0%	11.3%		18.7%	12.0%		6.7%	29.3%		18.7%	41.3%	
Maximum Green (s)	20.0	11.0		21.0	12.0		4.0	38.0		22.0	56.0	
Yellow Time (s)	3.5	4.0		3.5	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-3.5	-4.0		-3.5	-4.0		-4.0	-4.0		-4.0	-4.0	
Total Lost Time (s)	3.5	2.0		3.5	2.0		2.0	2.0		2.0	2.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.84	0.89	0.41	0.90	0.72	0.64	0.66	0.90	0.35	0.93	0.79	0.27
Control Delay	70.9	77.1	53.5	78.3	62.3	44.3	84.6	50.4	16.1	81.5	32.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	77.1	53.5	78.3	62.3	44.3	84.6	50.4	16.1	81.5	32.2	8.4
Queue Length 50th (ft)	202	147	74	226	124	199	57	390	111	234	387	63
Queue Length 95th (ft)	#478	#326	169	#540	#254	#434	#170	#762	159	#559	#799	109
Internal Link Dist (ft)		167			271			617			1828	
Turn Bay Length (ft)	125		50	90		275	75		75	315		90
Base Capacity (vph)	332	423	268	342	451	500	115	1185	821	343	1601	961
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.89	0.41	0.90	0.72	0.64	0.66	0.90	0.35	0.93	0.79	0.27

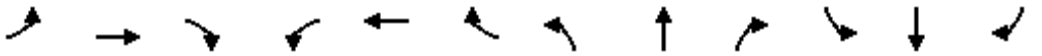
Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 123.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 18 & Middle Street



Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	33.0
Total Split (s)	33.0
Total Split (%)	22%
Maximum Green (s)	28.0
Yellow Time (s)	2.0
All-Red Time (s)	3.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	21.0
Pedestrian Calls (#/hr)	4
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	346	101	284	299	294	70	983	266	293	1169	243
Future Volume (vph)	256	346	101	284	299	294	70	983	266	293	1169	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			0%			-2%			9%	
Total Lost time (s)	3.5	2.0	6.0	3.5	2.0	6.0	2.0	2.0	6.0	2.0	2.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1728	3455	1561	1711	3455	1531	1762	3455	1546	1618	3267	1434
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1728	3455	1561	1711	3455	1531	1762	3455	1546	1618	3267	1434
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	278	376	110	309	325	320	76	1068	289	318	1271	264
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	278	376	110	309	325	320	76	1068	289	318	1271	264
Heavy Vehicles (%)	1%	1%	0%	2%	1%	2%	0%	2%	2%	3%	2%	4%
Turn Type	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	7	4	4 5	3	8	8 1	5	2	2 3	1	6	6 7
Permitted Phases												
Actuated Green, G (s)	20.2	11.1	21.1	21.2	12.1	40.3	4.0	38.4	59.6	22.2	56.6	76.8
Effective Green, g (s)	23.7	15.1	21.1	24.7	16.1	40.3	8.0	42.4	59.6	26.2	60.6	76.8
Actuated g/C Ratio	0.19	0.12	0.17	0.19	0.13	0.32	0.06	0.33	0.47	0.21	0.48	0.60
Clearance Time (s)	7.0	6.0		7.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	321	409	258	331	436	483	110	1148	722	332	1552	863
v/s Ratio Prot	0.16	c0.11	0.07	c0.18	0.09	0.21	0.04	c0.31	0.19	c0.20	0.39	0.18
v/s Ratio Perm												
v/c Ratio	0.87	0.92	0.43	0.93	0.75	0.66	0.69	0.93	0.40	0.96	0.82	0.31
Uniform Delay, d1	50.4	55.6	47.8	50.6	53.7	37.7	58.5	41.1	22.2	50.1	28.7	12.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.3	24.9	0.4	32.2	6.0	2.6	17.1	12.9	0.1	37.6	3.3	0.1
Delay (s)	70.6	80.5	48.2	82.8	59.7	40.4	75.6	54.1	22.4	87.7	32.1	12.4
Level of Service	E	F	D	F	E	D	E	D	C	F	C	B
Approach Delay (s)		72.3			60.7			48.8			38.8	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	127.5	Sum of lost time (s)	30.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	23	421	396	11	28	58
Future Vol, veh/h	23	421	396	11	28	58
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, %	2	2	2	2	2	2
Mvmt Flow	25	458	430	12	30	63

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	442	0	-	0	944	436
Stage 1	-	-	-	-	436	-
Stage 2	-	-	-	-	508	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1118	-	-	-	291	620
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	604	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1118	-	-	-	282	620
Mov Cap-2 Maneuver	-	-	-	-	282	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	604	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1118	-	-	-	446
HCM Lane V/C Ratio	0.022	-	-	-	0.21
HCM Control Delay (s)	8.3	0	-	-	15.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	427	350	11	29	57
Future Vol, veh/h	22	427	350	11	29	57
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	-1	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	464	380	12	32	62

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	392	0	-	0	898	386
Stage 1	-	-	-	-	386	-
Stage 2	-	-	-	-	512	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1167	-	-	-	310	662
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1167	-	-	-	301	662
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	602	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	14.5
HCM LOS			B

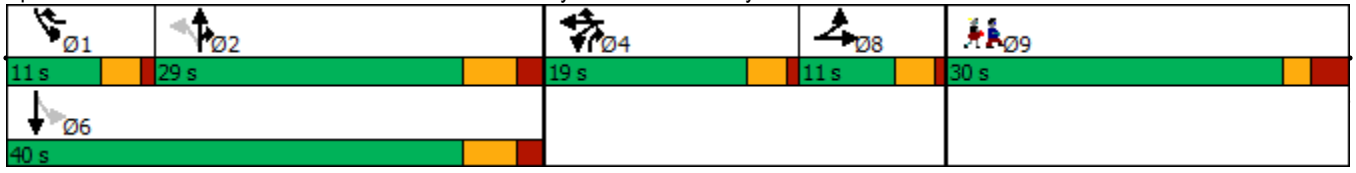
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1167	-	-	-	471
HCM Lane V/C Ratio	0.02	-	-	-	0.198
HCM Control Delay (s)	8.1	0	-	-	14.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

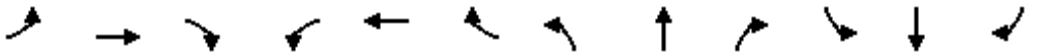
2028 Build with Mitigation

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	2	0	154	6	340	325	190	412	
Future Volume (vph)	2	0	154	6	340	325	190	412	
Lane Group Flow (vph)	18	235	167	0	377	353	207	450	
Turn Type	NA	NA	pt+ov	Perm	NA	pt+ov	pm+pt	NA	
Protected Phases	8	4	4 1		2	2 4	1	6	9
Permitted Phases				2			6		
Detector Phase	8	4	4 1	2	2	2 4	1	6	
Switch Phase									
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	11.0	11.0		13.0	13.0		11.0	13.0	30.0
Total Split (s)	11.0	19.0		29.0	29.0		11.0	40.0	30.0
Total Split (%)	11.0%	19.0%		29.0%	29.0%		11.0%	40.0%	30%
Maximum Green (s)	7.0	15.0		23.0	23.0		7.0	34.0	25.0
Yellow Time (s)	3.0	3.0		4.0	4.0		3.0	4.0	2.0
All-Red Time (s)	1.0	1.0		2.0	2.0		1.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0			6.0		4.0	6.0	
Lead/Lag				Lag	Lag		Lead		
Lead-Lag Optimize?									
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6	3.0
Recall Mode	None	None		Min	Min		None	Min	None
Walk Time (s)									7.0
Flash Dont Walk (s)									18.0
Pedestrian Calls (#/hr)									5
v/c Ratio	0.08	0.62	0.24		0.66	0.34	0.51	0.50	
Control Delay	23.8	35.3	5.3		28.7	3.7	18.7	16.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	23.8	35.3	5.3		28.7	3.7	18.7	16.7	
Queue Length 50th (ft)	2	70	7		100	5	28	80	
Queue Length 95th (ft)	26	#310	40		#414	86	#195	372	
Internal Link Dist (ft)	363	897			2156			619	
Turn Bay Length (ft)			75			100	200		
Base Capacity (vph)	213	377	693		664	1007	408	986	
Starvation Cap Reductn	0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.08	0.62	0.24		0.57	0.35	0.51	0.46	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 64.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Middle Street & Tara Drive/Libbey Industrial Parkway





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	2	11	216	0	154	6	340	325	190	412	2
Future Volume (vph)	4	2	11	216	0	154	6	340	325	190	412	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	10	10	11	12	11	11	10	11	11
Total Lost time (s)		4.0			4.0	4.0		6.0	6.0	4.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frt		0.91			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1767			1532	1473		1775	1453	1650	1765	
Flt Permitted		0.99			0.95	1.00		0.99	1.00	0.30	1.00	
Satd. Flow (perm)		1767			1532	1473		1758	1453	515	1765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	2	12	235	0	167	7	370	353	207	448	2
RTOR Reduction (vph)	0	12	0	0	0	88	0	0	116	0	0	0
Lane Group Flow (vph)	0	6	0	0	235	79	0	377	237	207	450	0
Confl. Peds. (#/hr)									5	5		
Heavy Vehicles (%)	0%	0%	0%	10%	0%	6%	0%	3%	7%	2%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	1	1	1	0	0	0
Turn Type	Split	NA		Split	NA	pt+ov	Perm	NA	pt+ov	pm+pt	NA	
Protected Phases	8	8		4	4	4 1		2	2 4	1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		0.9			15.9	23.3		21.3	43.2	32.7	32.7	
Effective Green, g (s)		0.9			15.9	23.3		21.3	43.2	32.7	32.7	
Actuated g/C Ratio		0.01			0.22	0.32		0.30	0.60	0.46	0.46	
Clearance Time (s)		4.0			4.0			6.0		4.0	6.0	
Vehicle Extension (s)		2.6			2.6			2.6		2.6	2.6	
Lane Grp Cap (vph)		22			339	478		522	875	352	804	
v/s Ratio Prot		c0.00			c0.15	0.05			0.16	0.06	c0.25	
v/s Ratio Perm								c0.21		0.21		
v/c Ratio		0.28			0.69	0.16		0.72	0.27	0.59	0.56	
Uniform Delay, d1		35.1			25.7	17.3		22.6	6.8	13.3	14.2	
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		5.4			5.7	0.1		4.7	0.1	2.2	0.7	
Delay (s)		40.5			31.3	17.4		27.2	6.9	15.4	15.0	
Level of Service		D			C	B		C	A	B	B	
Approach Delay (s)		40.5			25.5			17.4			15.1	
Approach LOS		D			C			B			B	

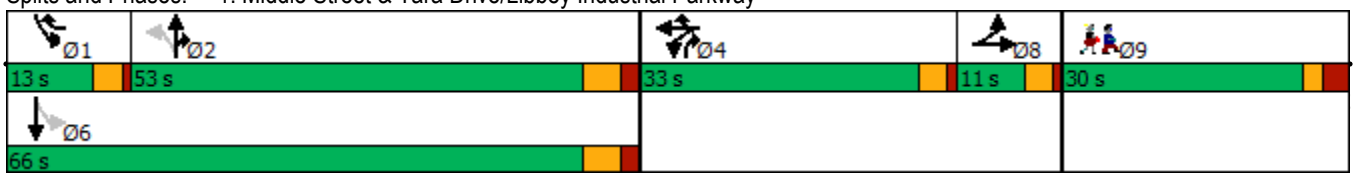
Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	71.7	Sum of lost time (s)	23.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	0	0	254	10	547	269	167	490	
Future Volume (vph)	0	0	254	10	547	269	167	490	
Lane Group Flow (vph)	9	365	276	0	606	292	182	538	
Turn Type	NA	NA	pt+ov	Perm	NA	pt+ov	pm+pt	NA	
Protected Phases	8	4	4 1		2	2 4	1	6	9
Permitted Phases				2			6		
Detector Phase	8	4	4 1	2	2	2 4	1	6	
Switch Phase									
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	11.0	11.0		13.0	13.0		11.0	13.0	30.0
Total Split (s)	11.0	33.0		53.0	53.0		13.0	66.0	30.0
Total Split (%)	7.9%	23.6%		37.9%	37.9%		9.3%	47.1%	21%
Maximum Green (s)	7.0	29.0		47.0	47.0		9.0	60.0	25.0
Yellow Time (s)	3.0	3.0		4.0	4.0		3.0	4.0	2.0
All-Red Time (s)	1.0	1.0		2.0	2.0		1.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0			6.0		4.0	6.0	
Lead/Lag				Lag	Lag		Lead		
Lead-Lag Optimize?									
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6	3.0
Recall Mode	None	None		Min	Min		None	Min	None
Walk Time (s)									7.0
Flash Dont Walk (s)									18.0
Pedestrian Calls (#/hr)									5
v/c Ratio	0.04	0.78	0.40		0.77	0.26	0.65	0.53	
Control Delay	0.2	49.7	14.4		35.2	4.1	27.0	19.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	0.2	49.7	14.4		35.2	4.1	27.0	19.7	
Queue Length 50th (ft)	0	202	65		293	15	44	176	
Queue Length 95th (ft)	0	#565	131		#812	120	#217	533	
Internal Link Dist (ft)	363	897			2156			619	
Turn Bay Length (ft)			75			100	200		
Base Capacity (vph)	234	468	689		813	1081	281	1044	
Starvation Cap Reductn	0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.04	0.78	0.40		0.75	0.27	0.65	0.52	

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 105.6
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Middle Street & Tara Drive/Libbey Industrial Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	6	336	0	254	10	547	269	167	490	5
Future Volume (vph)	2	0	6	336	0	254	10	547	269	167	490	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	10	10	11	12	11	10	10	11	11
Total Lost time (s)		4.0			4.0	4.0		6.0	6.0	4.0	6.0	
Lane Util. Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frt		0.90			1.00	0.85		1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1738			1668	1561		1810	1416	1651	1798	
Flt Permitted		0.99			0.95	1.00		0.99	1.00	0.16	1.00	
Satd. Flow (perm)		1738			1668	1561		1790	1416	278	1798	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	7	365	0	276	11	595	292	182	533	5
RTOR Reduction (vph)	0	9	0	0	0	70	0	0	40	0	0	0
Lane Group Flow (vph)	0	0	0	0	365	206	0	606	252	182	538	0
Confl. Peds. (#/hr)							3			3		
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	1%	6%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	1	1	1	0	0	0
Turn Type	Split	NA		Split	NA	pt+ov	Perm	NA	pt+ov	pm+pt	NA	
Protected Phases	8	8		4	4	4 1		2	2 4	1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		1.1			29.6	38.8		46.4	82.0	59.6	59.6	
Effective Green, g (s)		1.1			29.6	38.8		46.4	82.0	59.6	59.6	
Actuated g/C Ratio		0.01			0.26	0.34		0.41	0.73	0.53	0.53	
Clearance Time (s)		4.0			4.0			6.0		4.0	6.0	
Vehicle Extension (s)		2.6			2.6			2.6		2.6	2.6	
Lane Grp Cap (vph)		16			436	535		734	1026	258	947	
v/s Ratio Prot		c0.00			c0.22	0.13			0.18	c0.06	0.30	
v/s Ratio Perm								c0.34		0.31		
v/c Ratio		0.01			0.84	0.38		0.83	0.25	0.71	0.57	
Uniform Delay, d1		55.5			39.5	28.1		29.7	5.2	20.1	18.1	
Progression Factor		1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			12.9	0.4		7.4	0.1	8.0	0.7	
Delay (s)		55.6			52.4	28.5		37.2	5.3	28.1	18.7	
Level of Service		E			D	C		D	A	C	B	
Approach Delay (s)		55.6			42.1			26.8			21.1	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	113.1	Sum of lost time (s)	23.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Appendix L

Sight Distance Calculations

Location: Proposed #200 west driveway @ Libbey Industrial Parkway

STOPPING SIGHT DISTANCE FROM THE WEST

Inputs

V=speed, mph	V=	41	**(85th percentile speed)**
G=percent of grade/100	G=	0	**(whole number)**
t=brake reaction time (2.5 sec)	t=	2.5	
a=deceleration rate, ft/sec^2	a=	11.2	

Calculations

Brake Reaction Distance	1.47Vt	151 feet	
Braking Distance	$V^2/30((a/32.2)+G)$	161.1 feet	**Measured**
Stopping Sight Distance =	$1.47Vt + V^2/30[(a/32.2)+G]$	**312 feet**	**>500**

STOPPING SIGHT DISTANCE FROM THE EAST

Inputs

V=speed, mph	V=	42	**(85th percentile speed)**
G=percent of grade/100	G=	-3	**(whole number)**
t=brake reaction time (2.5 sec)	t=	2.5	
a=deceleration rate, ft/sec^2	a=	11.2	

Calculations

Brake Reaction Distance	1.47Vt	154 feet	
Braking Distance	$V^2/30((a/32.2)+G)$	185.0 feet	**Measured**
Stopping Sight Distance =	$1.47Vt + V^2/30[(a/32.2)+G]$	**339 feet**	**>500**

Source: *A Policy on Geometric Design of Highways and Streets, 2011, Sixth Edition,* prepared by AASHTO, p. 3-4 to 3-5.

INTERSECTION SIGHT DISTANCE - RIGHT FROM PROPOSED DRIVEWAY (MINOR APPROACH) - To the West

Inputs

V= design speed, mph	V=	41	**(85th percentile speed)**
t=time gap for minor road vehicle to enter the major road	t=	7.50	**(assumes passenger car)**

Calculations

Int. Sight Distance =	1.47Vt	**452 feet**	**Measured** **Right >500**

Design Vehicle	Time Gap[1], t (sec) for Grades </=3%	Grade of Minor Approach	Number of Additional Lanes to Cross	Adjusted Time Gap, t (sec)
passenger car	7.5	0%	0	7.50
single-unit truck	9.5	0%	0	9.50
combination truck	11.5	0%	0	11.50

INTERSECTION SIGHT DISTANCE - LEFT FROM PROPOSED DRIVEWAY (MINOR APPROACH) - To the East

Inputs

V= design speed, mph	V=	42	**(85th percentile speed)**
t=time gap for minor road vehicle to enter the major road	t=	7.50	**(assumes passenger car)**

Calculations

Int. Sight Distance =	1.47Vt	**463 feet**	**Measured** **Left >500**

Design Vehicle	Time Gap[1], t (sec) for Grades </=3%	Grade of Minor Approach	Number of Additional Lanes to Cross	Adjusted Time Gap, t (sec)
passenger car	7.5	0%	0	7.50
single-unit truck	9.5	0%	0	9.50
combination truck	11.5	0%	0	11.50

Notes:

1.Time Gap values are applicable for major roads with grades 3 percent or less and no median and a minor street approach with a grade of 3 percent or less. Otherwise, the table values should be adjusted as follows

*If the minor street has an upward grade of more than 3 percent than add 0.2 sec. to t for each percent grade

**Increase t by .5 seconds (for passenger cars) or 0.7 seconds (for trucks) for every additional lane from the left, in excess of one, to be crossed by the turning vehicle

***If the major approach is a divided highway with a median not wide enough to store the design vehicle, then the median width should be converted to equivalent lanes.

Location: Proposed #200 east driveway @ Libbey Industrial Parkway

STOPPING SIGHT DISTANCE FROM THE WEST

Inputs

V=speed, mph	V=	41	**(85th percentile speed)**
G=percent of grade/100	G=	0	**(whole number)**
t=brake reaction time (2.5 sec)	t=	2.5	
a=deceleration rate, ft/sec^2	a=	11.2	

Calculations

Brake Reaction Distance	1.47Vt	151 feet	
Braking Distance	$V^2/30((a/32.2)+G)$	161.1 feet	**Measured**
Stopping Sight Distance =	$1.47Vt + V^2/30[(a/32.2)+G]$	**312 feet**	**>500**

STOPPING SIGHT DISTANCE FROM THE EAST

Inputs

V=speed, mph	V=	42	**(85th percentile speed)**
G=percent of grade/100	G=	-3	**(whole number)**
t=brake reaction time (2.5 sec)	t=	2.5	
a=deceleration rate, ft/sec^2	a=	11.2	

Calculations

Brake Reaction Distance	1.47Vt	154 feet	
Braking Distance	$V^2/30((a/32.2)+G)$	185.0 feet	**Measured**
Stopping Sight Distance =	$1.47Vt + V^2/30[(a/32.2)+G]$	**339 feet**	**450**

Source: *A Policy on Geometric Design of Highways and Streets, 2011, Sixth Edition,* prepared by AASHTO, p. 3-4 to 3-5.

INTERSECTION SIGHT DISTANCE - RIGHT FROM PROPOSED DRIVEWAY (MINOR APPROACH) - To the West

Inputs

V= design speed, mph	V=	41	**(85th percentile speed)**
t=time gap for minor road vehicle to enter the major road	t=	7.50	**(assumes passenger car)**

Calculations

Int. Sight Distance =	1.47Vt	**452 feet**	**Measured** **Right >500**

Design Vehicle	Time Gap[1], t (sec) for Grades </=3%	Grade of Minor Approach	Number of Additional Lanes to Cross	Adjusted Time Gap, t (sec)
passenger car	7.5	0%	0	7.50
single-unit truck	9.5	0%	0	9.50
combination truck	11.5	0%	0	11.50

INTERSECTION SIGHT DISTANCE - LEFT FROM PROPOSED DRIVEWAY (MINOR APPROACH) - To the East

Inputs

V= design speed, mph	V=	42	**(85th percentile speed)**
t=time gap for minor road vehicle to enter the major road	t=	7.50	**(assumes passenger car)**

Calculations

Int. Sight Distance =	1.47Vt	**463 feet**	**Measured** **Left 425** (with vegetation removal)

Design Vehicle	Time Gap[1], t (sec) for Grades </=3%	Grade of Minor Approach	Number of Additional Lanes to Cross	Adjusted Time Gap, t (sec)
passenger car	7.5	0%	0	7.50
single-unit truck	9.5	0%	0	9.50
combination truck	11.5	0%	0	11.50

Notes:

1.Time Gap values are applicable for major roads with grades 3 percent or less and no median and a minor street approach with a grade of 3 percent or less. Otherwise, the table values should be adjusted as follows

*If the minor street has an upward grade of more than 3 percent than add 0.2 sec. to t for each percent grade

**Increase t by .5 seconds (for passenger cars) or 0.7 seconds (for trucks) for every additional lane from the left, in excess of one, to be crossed by the turning vehicle

***If the major approach is a divided highway with a median not wide enough to store the design vehicle, then the median width should be converted to equivalent lanes.

TETRA TECH

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