South State Street //
Corridor Study

December 2017

Table of Contents

Appendices

Prepared by

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Introduction

The State Street corridor, between Ellsworth Road and Oakbrook Drive, is a vital gateway to the city of Ann Arbor, and a key artery for both commercial and residential traffic to and from the south. The current configuration of the roadway, designed and built in the 1960's is largely optimized for vehicle throughput. However, the corridor has a history of vehicular safety concerns, and is lacking in terms of access for all users, and facilitation of non-motorized traffic. Sidewalks are absent or inconsistent along much of the corridor, and there are no cycling facilities. Further, the current configuration of the roadway allows for a minimal number of safe pedestrian crossing locations, leaving much of the area disconnected at a pedestrian scale and prompting additional vehicle trips even for short distance travel. In addition, while being optimal for vehicle throughput along the corridor, the restricted turn access along the segment between I-94 and Eisenhower Parkway inhibits access to adjacent properties, resulting in circuitous routing and in some cases lengthening vehicle trips to reach destinations.

In conjunction with the South State Street Corridor Plan and the city's Non-Motorized Transportation Plan, the South State Street Transportation Corridor Study is to develop a transportation plan which addresses existing issues and improves conditions for all users, while supporting both the existing corridor uses and the long-term land use vision for the area.

EXISTING CONDITIONS

The study area analyzed as part of this process encompasses all of State Street from Oakbrook Drive (to the north) and Ellsworth Road (to the south) within the City of Ann Arbor and Pittsfield Township. This segment of State Street services two major destinations, Briarwood Mall and Ann Arbor Municipal Airport, as well as surrounding commercial properties and residential neighborhoods. Additionally, the State Street / I-94 interchange serves as a significant access point to Ann Arbor from the surrounding region.

This segment of State Street is typically a total of four travel lanes – two in each direction. A raised median separating northbound and southbound traffic exists from Ellsworth Road to Airport Boulevard and from the eastbound exit ramp of I-94 to Eisenhower Parkway. There are several intersections within the study area, each with unique geometrical characteristics. The speed limit throughout the study area is 35 miles per hour (MPH). While sidewalks are present within some of the study area, there are several segments where no sidewalks are present. On-street bicycle lanes are present north of Eisenhower Parkway and south of Ellsworth Road. There are no sidewalks or bicycle facilities across the State Street overpass over I-94, which effectively bisects the corridor from a non-motorized travel perspective. Controlled crossings of the corridor for pedestrians occur at only two locations along the corridor, which are approximately 0.8 miles apart:

- State Street/Eisenhower Parkway
- State Street/Airport Blvd/Research Blvd

All signalized intersections within the study area operate at an overall level of service (LOS) D or better, which is typically considered acceptable in urban areas. However, several specific movements and stop-controlled intersections operate at LOS E or F. Two intersections have significant crash patterns (State Street / Airport Boulevard and State Street / Ellsworth Road), while two segments have significant crash patterns (I-94 EB Exit to I-94 WB Exit and I-94 WB Exit to Briarwood Circle). The unconventional left-turn configuration at many intersections, where traffic must enter the median, and then complete a left turn from at a severe skew angle, results in documented safety issues for motorists.

The Ann Arbor Area Transportation Authority (AAATA) currently operates three fixed routes within the study area, including Route 6 (Ellsworth), Route 24 (South Main-East), and Route 62 (UM-State).

In summary, the existing conditions within the study area are not safe or welcoming for non-motorized travelers. The State Street / I-94 interchange also serves as a barrier between the southern portion of the study area and the northern portion of the study area. Additionally, there are several geometric / operational issues within the study area that inhibit efficient vehicle travel, specifically due to inconsistent intersection geometry and accessibility.

STUDY GOALS

As part of a concerted effort to expand on Ann Arbor's Complete Streets Policy, the city identified this segment of State Street as a high-priority corridor within its Non-Motorized Plan with specific goals of improving bicycle facilities and pedestrian crossings. This study was an outgrowth of these priorities, and a total of eight (8) goals were developed early in the process with community input to determine the most appropriate alternative for this segment of State Street. The study goals include:

Goal	Description
Safety	Provide safe conditions for all travelers
Entry	Create a more attractive entry to the city
Pedestrians	Improve conditions for pedestrians along/across State Street
Bicycles	Provide a safe place for bicyclists separate from travel lanes
Transit	Enhance transit conditions through traffic flow and stop accessibility
Vehicles	Maintain reasonable traffic operations along the corridor
Land Use	Support planned land use described in the South State Street Corridor Plan
Access	Ease accessibility of corridor businesses

Alternatives

COMMON DESIGN FEATURES

In addition to the development of the study goals, the community determined three common design features to be included in each alternative. These common design features include:

Curbside Buffered Bicycle Lanes

Curbside Buffered Bicycle Lanes represent an expansion of the bicycle facilities that exist north of Eisenhower Parkway and south of Ellsworth Road. Inclusion of these facilities throughout the corridor would not only link these existing facilities, but would also elevate the design to provide a safer space for cyclists. In accordance with design standards developed by the National Association of Transportation Officials (NACTO) buffered bicycle lanes "are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. A buffered bicycle lane is allowed as per MUTCD guidelines for buffered preferential lanes (section 3D-01)."

Buffered bicycle lanes are more beneficial than conventional bicycle lanes because they provide additional distance between cyclists and vehicles, space for cyclists to pass each other without encroaching into the travel lane, and typically appeal to a wider cross-section of cyclists. Additionally, buffered bicycle lanes offer the flexibility to implement additional means of separation (i.e. bollards, curbs, landscape areas) within the existing buffer area.

Continuous Sidewalks

There are several segments along State Street within the study area where sidewalks are not present, creating a fragmented pedestrian network. Continuous sidewalks along the entire corridor were a priority for the community during the development of the study goals, and were advanced as a required common design feature across all alternatives. Newly constructed sidewalks will be designed to reflect the existing character of the study area and promote connectivity and pedestrian safety. Additionally, newly constructed sidewalks will be designed seamlessly with existing and proposed pedestrian crossings.

Limited Right-of-Way Impacts

The final common design feature desired by the community was to ensure that any right-of-way (ROW) impacts associated this project were limited to minor encroachments at intersections. As such, the alternatives developed for analysis were to be designed in a manner that the existing width of right-of-way along the State Street corridor could generally accommodate all associated features.

ALTERNATIVE #1: NARROW MEDIAN WITH DIRECT LEFT TURNS

Alternative #1 would transform State Street into a boulevard with four (4) travel lanes and a narrow median separating NB and SB travel lanes. Direct left-turns are maintained at all major intersections and select minor intersections. Traffic signals would be installed or reconfigured at Hilton/Victors Way, Waterworks, Mall Drive, EB I-94 ramp, and WB I-94 ramp. Geometric changes at select intersections would be included to improve pedestrian access and traffic flow.

ALTERNATIVE #2: NARROW MEDIAN WITH ROUNDABOUT INTERSECTIONS

Alternative #2 would transform State Street into a boulevard with four (4) travel lanes and a narrow median separating NB and SB travel lanes. Direct left-turns would be maintained at some major intersections and select minor intersections. Roundabout intersections would be installed at Airport/Research Park, Hilton/Victors Way, and Mall Drive. Geometric changes at select intersections would be included to improve pedestrian access and traffic flow.

ALTERNATIVE #3: WIDE MEDIAN WITH INDIRECT ("MICHIGAN") LEFT TURNS

Alternative #3 would transform State Street into a boulevard with four (4) travel lanes and a wide median separating NB and SB travel lanes. Indirect left-turns would be installed to replace direct left-turns at Hilton/Victors Way and Briarwood Circle, while an additional indirect left-turn would be installed south of Eisenhower Parkway. Traffic signals would be installed or reconfigured at Waterworks, EB I-94 ramp, and WB I-94 ramp. Geometric changes at select intersections would be included to improve pedestrian access and traffic flow.

Evaluation

EVALUATION CRITERIA

The alternatives were evaluated by measuring whether they improve or worsen the existing conditions of State Street. A qualitative evaluation of performance of the alternative against the study goals was used for this evaluation, with each alternative given a grade of (1) best, (2) better than existing, (3) similar to existing, or (4) worse than existing across each metric. The evaluation was conducted with community and stakeholder input to ensure the alternatives reflect the desires of the community. The metrics associated with the study goals include:

Goal	Description
Safety	Provide safe conditions for all travelers
Entry	Create a more attractive entry to the city
Pedestrians	Improve conditions for pedestrians along/across State Street
Bicycles	Provide a safe place for bicyclists separate from travel lanes
Transit	Enhance transit conditions through traffic flow and stop accessibility
Vehicles	Maintain reasonable traffic operations along the corridor
Land Use	Support planned land use described in the South State Street Corridor Plan
Access	Ease accessibility of corridor businesses

EVALUATION OF ALTERNATIVES

As illustrated in the matrix below, Alternative #1 and Alternative #3 scored well when evaluated against the goals of the study. While Alternative #1 received high scores for pedestrians, bicycles, transit, and land use, Alternative #3 received high scores for safety, entry,

and access. Alternative #2 received average scores overall, while scoring poorly for transit and vehicles. The results of the evaluation are illustrated in the matrix below:

Alternative	Evaluation Criteria							
	Safety	Entry	Pedestrians	Bicycles	Transit	Land Use	Vehicles	Access
#1: Narrow Median	⊖	⊕	✚	✚	✚	✚	⊖	⊕
#2: Roundabouts	⊕	⊕	⊕	⊕	▬	✚	▬	✚
#3: Wide Median	✚	✚	⊕	⊕	⊕	⊖	⊖	✚

✚ Best

⊕ Better Than Existing

⊖ Similar To Existing

▬ Worse Than Existing

Recommended Alternative

HYBRID SOLUTION

Following the evaluation of alternatives and community input, a recommended alternative was developed that best achieves the goals of the study. The recommended alternative is a "hybrid solution" that combines the best characteristics of Alternative #1 and Alternative #3, creating a vision for State Street that balances all modes of transportation.

The recommended alternative will transform State Street into a boulevard in most portions of the roadway, generally with four (4) travel lanes, with a wide median separating NB and SB travel lanes between I-94 and Eisenhower Parkway, and at the intersection of Airport Blvd/Research Blvd. Indirect left-turn treatments would be used at all major intersections. Traffic signals would be installed or modified at Hilton Drive/Victors Way, Briarwood Circle, EB I-94 ramp, and WB I-94 ramp. Geometric changes at select intersections are included to improve pedestrian access and traffic flow. Additionally, all three common design features would be incorporated as part of the recommended alternative.

IMPROVEMENTS

The recommended alternative represents a significant improvement to State Street within the study area. Non-motorized travel is improved by installing buffered bicycle lanes and sidewalk throughout the length of the corridor, while additional crossing locations improve non-motorized accessibility to corridor businesses and to AAATA transit stops.

Additionally, the recommended alternative improves traffic flow and access by reducing the number of locations that require merging/yielding in the median and improving left-turn access to side streets and driveways by nearly 50%. These improvements only reduce travel time by 1-2 minutes throughout the corridor in the AM and PM peak hours.

Beyond the improvements to mobility that the recommended alternative represents, landscaped medians with native plantings and trees mark a significant improvement to the aesthetics of the corridor. The medians are also able to accommodate green infrastructure treatments in the future, if so desired. These elements achieve the goal of creating a more attractive entry to the city.

Goal	Feature	No-Build Condition	Recommended Alternative
	Bike lanes and sidewalks along full corridor	NO	YES
	Number of pedestrian crossing points	2	8
	Number of left-turns requiring merging or yielding in the median	6	0
	Left-turn access to/from side streets and major driveways between I-94 and Eisenhower (% of possible movements)	50% (6 of 12)	92% (11 of 12)
	Median treatment north of I-94	Paved	Landscaped, with potential to incorporate water absorption/ rain garden features
	Total peak travel time along State Street (non-peak will be minimally affected)	AM NB: 4-5 minutes PM SB: 4-5 minutes	AM NB: 5-7 minutes PM SB: 4-6 minutes

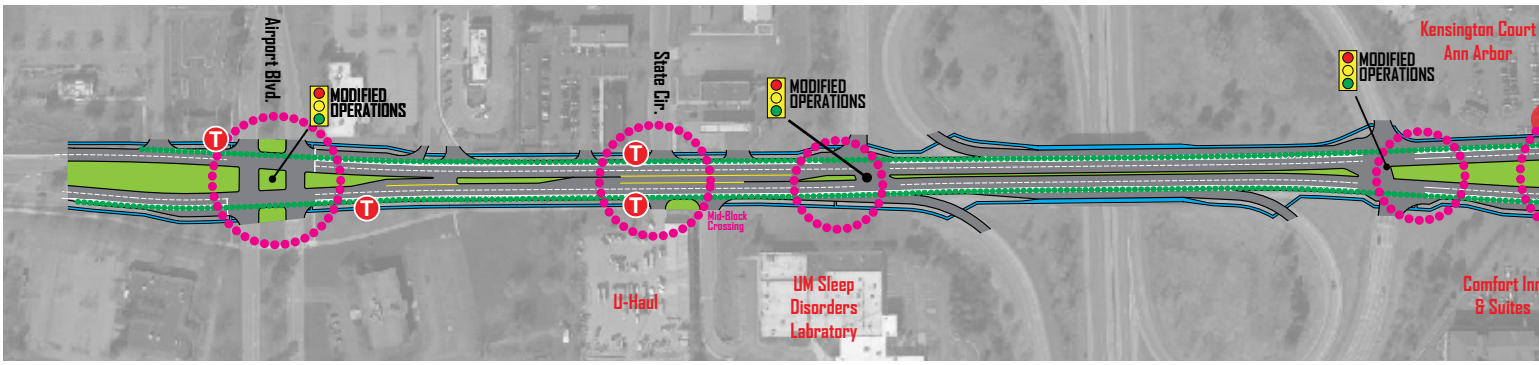
VEHICLE SAFETY IMPROVEMENTS

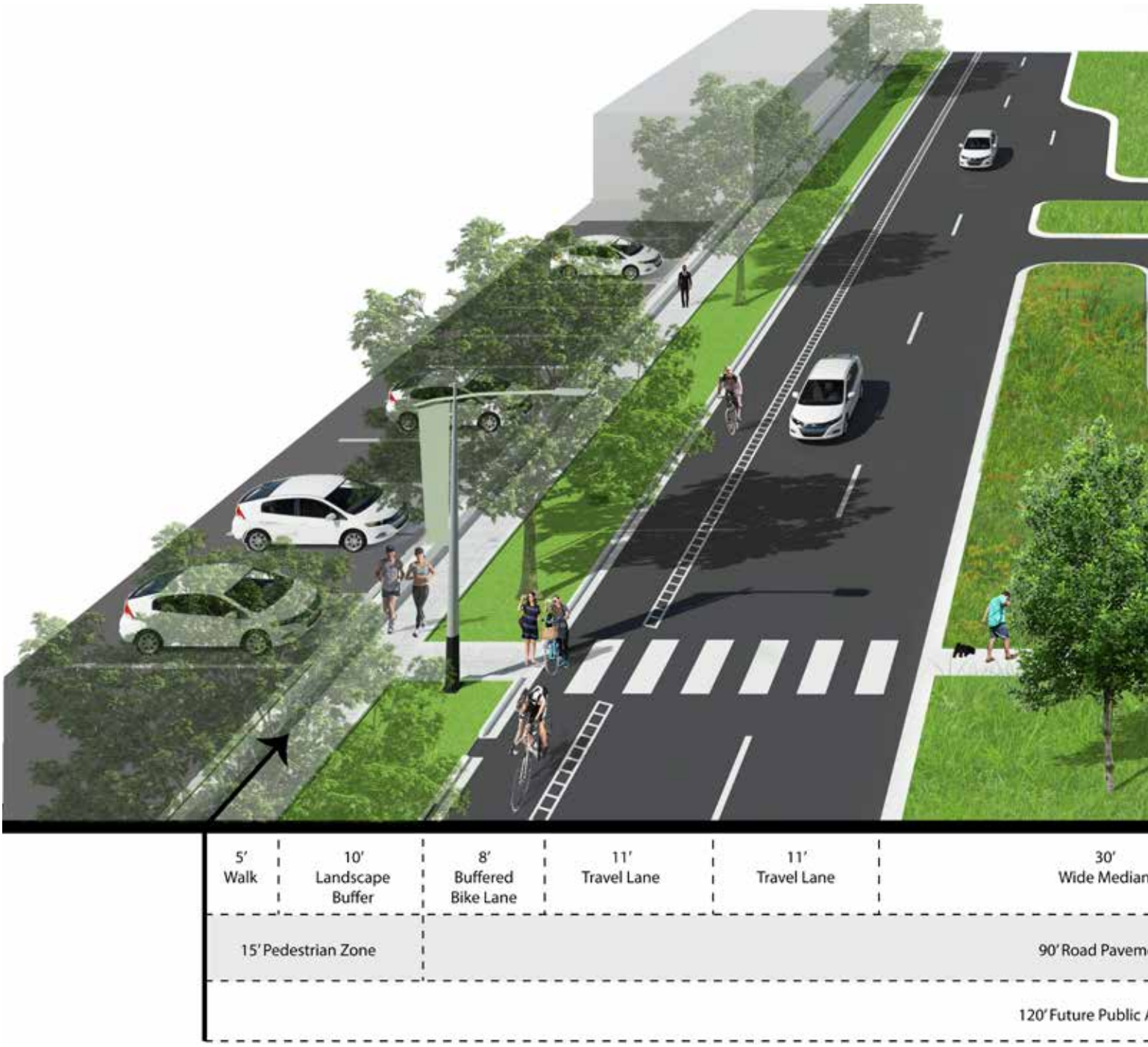
Location	5-Year Crashes	Crash Reduction From	Estimated Crash Reduction Potential
State St between I-94 EB and WB Ramps	24	Elimination of left-hand merging movements	90%
State St at Hilton/Victors Way	128	Removing direct left turn, adding signalization	40%
State St at Mall Dr	27	Removing direct left turn, adding signalization	60%

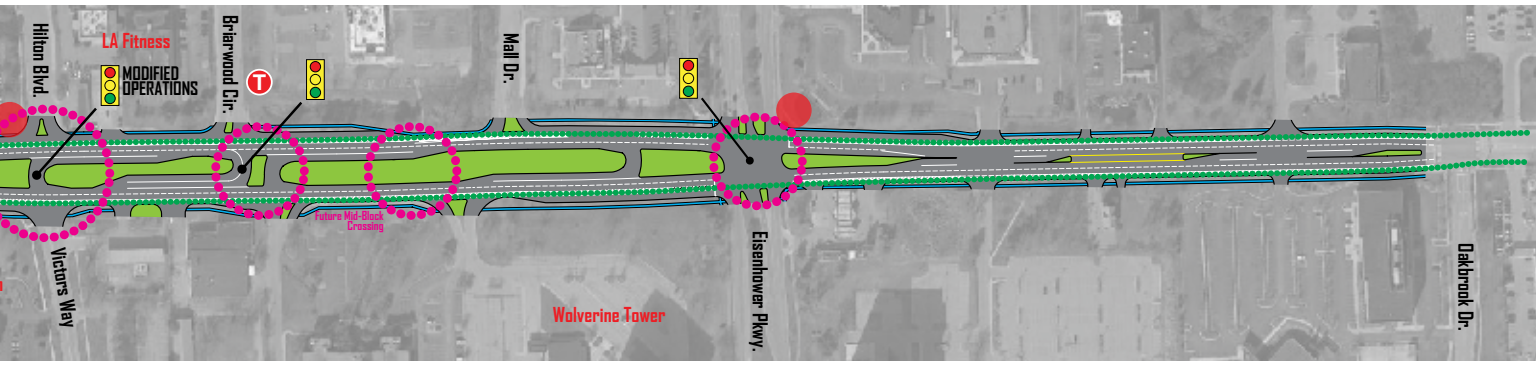
COST ESTIMATE

The following table summarizes the anticipated cost of the recommended alternative:

Roadway Construction	$22,750,000
Bridge Construction	$2,800,000
Right-of-Way Acquisition	$150,000
Design	$2,550,000
Construction Engineering	$3,850,000
ESTIMATED PROJECT COST:	**$32,100,000**


Airport Blvd.
MODIFIED OPERATIONS
State Cir.
MODIFIED OPERATIONS
MODIFIED OPERATIONS
Kensington Court Ann Arbor
Mid-Block Crossing
U-Haul
UM Sleep Disorders Labratory
Comfort Inn & Suites


5' Walk
10' Landscape Buffer
8' Buffered Bike Lane
11' Travel Lane
11' Travel Lane
30' Wide Median
15' Pedestrian Zone
90' Road Pavem
120' Future Public



	11′ Travel Lane	11′ Travel Lane	8′ Buffered Bike Lane	10′ Landscape Buffer	5′ Walk
ent				15′ Pedestrian Zone	
Access					

Community Involvement

Community involvement was a critical factor in supporting the project in terms of goals development, evaluation, and validation of the recommended alternative. This involvement was incorporated over a series of meetings designed to inform stakeholders, engage in dialogue about priorities, and rate the alternatives for how well they would help to meet community goals.

PUBLIC MEETING #1

The South State Street Corridor Study team held a public event on October 22, 2015 at the Courtyard Marriott in Ann Arbor. The event included two separate meetings. The first was a Stakeholder Roundtable which was followed by a public open house. The Stakeholder Roundtable meeting was oriented towards business and property owners along the corridor. The meeting included a presentation of the issues and opportunities found along S. State Street from Ellsworth northerly to Oakbrook Dr as well as the three alternatives under consideration. In addition to the presentation and dialogue, the stakeholders were provided comment forms and asked to provide feedback for the team's use.

The second meeting running from 4:30 to 7:30 PM was an open house format available for the general public to review materials and provide feedback. Several information boards and detailed corridor maps were available. The public was able to interact with the team in direct conversation. Citizens provided comments on the corridor maps as well as completed feedback forms. The team received 24 total response sheets combined from both the stakeholder portion of the meeting and the general public. Based on feedback obtained through dialogue, comment forms and notations on the figures available for comment, a summary of feedback was assembled. Alternative #1 (narrow median) and Alternative #3 (wide median) were identified as the most preferable alternatives by both the public and stakeholder groups, while Alternative #2 (narrow medians and roundabouts) was the least preferred alternative for both groups.

PUBLIC MEETING #2

The South State Street Corridor Study team held a public meeting on November 2, 2017 at the Courtyard Marriott in Ann Arbor. The event included two separate meetings. The first was a Stakeholder Roundtable which was followed by a public open house. The presentation materials and format of the meetings were identical. The meetings included a presentation of project goals, original alternatives, evaluation process/results, recommended alternative, and next steps.

Presentations were conducted at 5:45pm and 6:45pm, followed by questions and answers. Comment forms were provided and completed by several attendees. Attendees expressed generally favorable reactions to the recommended alternative, but identified areas of concern to be addressed during subsequent phases of the project. The following is a summary of written and verbal comments provided by attendees of the public meeting:

- Concerns regarding bike safety and the need to identify to cross-street traffic that they are crossing a bike lane
- Concerns regarding pedestrian safety, particularly when crossing the I-94 on-ramps, and the need to design safety measures for pedestrians
- Consider prioritizing pedestrian crosswalks north of the project limits (between Oakbrook and Stimson)
- Consider adding a signature architectural feature to the corridor as a gateway
- Desire to see any mid-block pedestrian crossings receive proper design treatment, including potential for flashing beacon-type approach
- Desire to improve left-turn condition for cyclists between I-94 and Eisenhower
- Desire to ensure that maintenance is properly funded for any landscaping conducted as part of the project

Next Steps

To implement the recommended alternative, the City of Ann Arbor will consider any additional community input, incorporate the project into the Transportation Improvement Program (TIP), secure environmental clearance from the federal government, secure additional federal, state, and local funding for the project, and advance the project into the final design and construction phases.

ADDITIONAL COMMUNITY INPUT

The development of the recommended alternative included several community meetings over a multi-year period to ensure the goals of the study were reflected in the final vision. However, the City of Ann Arbor is committed to engaging with the community as the project advances into the design and construction phases to ensure that specific design elements are reflective of their desires. If you have any additional feedback on the recommend alternative prior to any formal community meetings associated with the design and construction phases, please visit the City of Ann Arbor website.

TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

The Transportation Improvement Program (TIP) is a 4-year financial program that describes the schedule for obligating federal funds to state and local projects across all modes of transportation. The Washtenaw Area Transportation Study (WATS) updates the TIP for the Ann Arbor area and channels associated funding to the City of Ann Arbor for transportation projects. The city will work with WATS to ensure this project is included in the TIP and is eligible for federal funding.

ENVIRONMENTAL CLEARANCE

The project will require National Environmental Policy Act (NEPA) review given the project's proposed use of federal funds. It is anticipated that the project could qualify for a NEPA Class of Action of Categorical Exclusion, pending further consideration of potential traffic and business impacts during construction. This takes into account that the project would 1) be consistent with existing land use and zoning (including floodplain regulations), 2) make extensive use of the existing corridor for the proposed transportation improvements (vehicular and pedestrian), and 3) require only a minor amount of new right-of-way. Depending on the overall funding for the project and sequence of phases, it may be necessary to complete the NEPA process on a phase-by-phase basis due to the potential for NEPA approval to sunset if construction on later phases is delayed.

SECURE FUNDING

In addition to federal funding made available by including this project in the TIP, the city may explore additional federal, state, and local funding sources to support the design and construction of the recommended alternative. Several federal sources, i.e. Congestion Mitigation and Air Quality Improvement (CMAQ) and Transportation Investment Generating Economic Recovery (TIGER), offer annual grants that are awarded on a competitive basis. These sources can typically supplement a large portion of major transportation projects at the local level. In addition to conventional public sources, the city may also explore contributions from private industry, either via charitable contributions or through formal means, such as a Business Improvement District (BID) or Corridor Improvement Authority (CIA) that leverage taxes to support area- or corridor-wide investments.

IMPLEMENTATION PLAN

There is potential for the construction of the recommended alternative to be phased in such a way as to provide benefits to portions of the corridor as funding becomes available. The following is a potential sequencing of the project to support this approach. Estimated costs are inclusive of construction, right-of-way acquisition, design, and construction engineering. (Note: multi-phased approach may result in marginal cost increases over the total project cost estimate due to reduced economies of scale).

Phase 1: Signage/Operational Improvements – Airport Blvd/Research Park Drive

Sequence Rationale	• Low-cost safety improvement which can be implemented on existing roadway footprint
Design Elements	• Permanent signage for new indirect left turn operational strategy • Temporary delineation measures to inhibit direct left-turns within the intersection
Estimated Cost	**$100,000**

Phase 2: Reconstruct State Street from I-94 WB Ramps to Oakbrook

Sequence Rationale	• Highest-value segment in terms of improved safety and access for all users; extends existing bike lane network further south to major traffic generators
Design Elements	• Final design for full roadway reconstruction, with temporary tie-in to existing configuration at I-94 WB ramp intersection • Establish final right-of-way requirements and necessary acquisition areas • Determine feasibility of constructing permanent sidewalk along the corridor in advance of full road reconstruction
Estimated Cost	**$150,000: Phase 2A (ROW acquisition)** **$300,000: Phase 2B (Construct sidewalk if feasible)** **$15,900,000: Phase 2C (Full roadway reconstruction)**

Phase 3: Reconstruct I-94 Interchange Bridge/Ramp Intersections

Sequence Rationale	• Value of improvements south of I-94 (primarily incorporation of bike lanes) is limited until the non-motorized transportation network is completed over I-94
Design Elements	• Bridge deck replacement/reconfiguration • Reconstruction of ramp terminal intersections, including new traffic signals • Temporary tie-in to the existing configuration south of the I-94 EB ramps
Estimated Cost	**$9,450,000**

Phase 4: Reconstruct State Street from Ellsworth Road to I-94 EB Ramps

Sequence Rationale	• Value of improvements in this segment (primarily non-motorized improvements) are limited until north segments are complete
Design Elements	• Final design for full roadway reconstruction • Permanent signal modifications and signage for new operation at Airport Blvd/Research Park Drive
Estimated Cost	**$6,200,000**

South State Street Transportation Alternatives October 22nd Public Event Results

Overview:

The South State Street Transportation Study team held a public event on October 22nd, 2015 at the Courtyard Marriott in Ann Arbor. The event included two separate meetings. The first was a Stakeholder Roundtable which was followed by a public open house.

The Stakeholder Roundtable meeting was oriented towards stakeholders including business and property owners along the corridor. The meeting included a presentation of the issues and opportunities found along S. State Street from Ellsworth northerly to Oakbrook Dr. Three concepts were presented for review:

- Alternative 1: Narrow median roadway with direct left-turns
- Alternative 2: Narrow median roadway with roundabout intersections
- Alternative 3: Wide median roadway with indirect ("Michigan") left-turns

Each of these alternatives share some common design features, including incorporation of continues sidewalk and bike lanes along State Street, and bus pull-outs at transit stops. The presentation used during the meeting is attached.

In addition to the presentation and dialogue the stakeholders were provided comment forms and asked to provide feedback for the team's use. The second meeting running from 4:30 to 7:30 PM was an open house format available for the general public to review materials and provide feedback. Several information boards and detailed corridor maps were available. The public was able to interact with the team in direct conversation. Citizens provided comments on the corridor maps as well as completed feedback forms. The team received 24 total response sheets combined from both the stakeholder portion of the meeting and the general public.

Feedback:

Based on feedback obtained through dialogue, comment forms and notations on the figures available for comment, a summary of feedback was assembled. Broadly stating Alternative 1 (narrow median) and Alternative 3 (wide median) were identified as the most preferable alternatives by both the public and stakeholder groups, while Alternative 2 (narrow medians and roundabouts) was the least preferred alternative for both groups. Tables 1 and 2 present the rankings from each of these groups, respectively.

Table 1: Alternative Preference Ranking (Public)

Alternative	Average Ranking (1 being the preferred option)
1	1 (tie)
2	3
3	1 (tie)

Table 2: Alternative Preference Ranking (Stakeholder Group)

Alternative	Average Ranking (1 being the preferred option)
1	1
2	3
3	2

Stakeholders defined the pedestrian and transit improvements as their top project goals. While pedestrian and vehicular improvements were tops for the public. Land use was the least important goal as expressed by the public, while entry treatments was ranked lowest priority by the stakeholders. Tables 3 and 4 summarize the goal rankings for the public and stakeholder groups, respectively.

Table 3: Project Goals Importance (Public)
Number indicates total number of responses by goal

Goals	Most Important	Less Important
Safety	3	2
Entry	3	2
Pedestrians	7	1
Bicycles	4	2
Transit	1	3
Vehicles	6	2
Access	3	3
Land use		4

Table 4: Project Goals Importance (Stakeholder Group)
Number indicates total number of responses by goal

Goals	Most Important	Less Important
Safety	3	
Entry	1	4
Pedestrians	5	
Bicycles	3	1
Transit	5	
Vehicles	2	1
Access	2	2
Land use		2

During the discussion, the groups expressed interest in using different alternatives for north and south of the interstate. This was based on their recognition of differences between the Right of Way available and development/land use alongside of the two segments of the corridor. All Participants noted the importance of pedestrian access and improvements as a priority.

Public Comments

The following is a summary of written comments provided by attendees of the public meeting:

- “Consider cut-through traffic through mall in models, NB State to NB S Main is heavy in the evening”
- “State/ Research Park needs left turn bike lanes if #1 or #3. Get rid of weird cross state and come back. Strongly consider roundabout here. Roundabout at Ellsworth locks up due to light.”
- “Get rid of loop ramps. Make it right turn. MUCH safer for bikes and pedestrians.”
- “Building shared use path along tracks (Stimson to Ellsworth) is really important.”
- “I like the third option most since it will allow for pedestrians at an acceptable distances and does not add much more of traffic delays.”
- “Center lane north of Eisenhower must remain open since there is a tremendous amount of traffic uses it for left turn beyond the first 30 feet.”
- “Please do not restrict traffic (especially north of Eisenhower)”
- “All 3 options are a huge step forward for pedestrians and cyclists, which is very encouraging.”
- “Really, really, wish the Oakbrook cut-through could be added. From a selfish perspective, this would save time from having to use Eisenhower to go west from State.”
- “Entering State Street from 94 was fairly easy at approximately 6 PM on a Wednesday evening. However, if you didn’t know you were getting off at the main exit for Ann Arbor, it’s possible it could be passed by. It lacks the “wow” factor for identification of the City. A business traveler’s perspective.”
- “More crosswalks needed (frequent hotel stays)”
- “Stop lights at the intersections.”

Stakeholder Comments

The following is a summary of written comments provided by attendees of the stakeholder meeting:

- “Vehicular travel time is important, but behavior change is more important to accommodate all users.”
- “South of 94 alternative 1 seems more supportive of needs”
- “Shortest crossings are needed”
- “North of 94 alternative 3 seems more appealing”
- “Want on record access to pedestrians on both sides of the bridge and sidewalks full length of the corridor”
- “Bus transportation and covered stops should be #1 priority”
- “Roundabout at State and Ellsworth is often a total mess”
- “All medians should be planted and signage at entry”
- “Pedestrians should be able to cross State safely, but there is less need for pedestrians to move north-south along State”
- “Alternative 1 south of 94”
- “Alternative 3 north of 94”
- “Alternative 3 looks the best”

Alternatives Scoresheet - South State Street

Please rank the alternatives on the lines below using:

1 for Best Option
2 for Better Option
3 for Least Favored Option

_____

_____

_____

Alternative One (narrow median + direct left turn)

Alternative Two (narrow median + roundabouts)

Alternative Three (wide median)

SAFETY	ENTRY	PEDESTRIANS	BICYLES	TRANSIT	LAND USE	VEHICLES	ACCESS
Provide safe conditions, reduce potential for vehicle crashes and their severity	Create a more attractive, aesthetically pleasing, entry to the City.	Improve safety and conditions for pedestrians walking along and crossing State Street.	Provide a safe place for bicyclists separate from travel lanes.	Enhance transit conditions through traffic flow, stop locations and street treatments.	Complement planned land use and its design per the City's plan	Maintain reasonable traffic operations and travel time, reduce congestion	Ease accessibility of corridor businesses.
⊖	⊕	⊕	⊕	⊕	⊕	⊖	⊕
⊕	⊕	⊕	⊕	⊖	⊕	⊖	⊕
⊕	⊕	⊕	⊕	⊕	⊖	⊖	⊕

Scoring Guide ⊕ BEST ⊕ BETTER THAN EXISTING ⊖ SIMILAR TO EXISTING ⊖ WORSE THAN EXISTING

South State Street Transportation Study

Please fill out this sheet and turn in!

Project Goals	Which goals are most important to you?	Which goals are less important to you?
Safety: Provide safe conditions, reduce potential for vehicle crashes and their severity.		
Entry: Create a more attractive, aesthetically pleasing, entry to the City.		
Pedestrians: Improve safety and conditions for pedestrians walking along and crossing State Street.		
Bicycles: Provide a safe place for bicyclists separate from travel lanes.		
Transit: Enhance transit conditions through traffic flow, stop locations and street treatments.		
Vehicles: Maintain reasonable traffic operations and travel time, reduce congestion.		
Access: Ease accessibility of corridor businesses.		
Land Use: Complement planned land use and its design per the city's plan.		

Comments

10/20/2015

State Street Corridor Study

Project Stakeholder Meeting

October 22, 2015

PARSONS BRINCKERHOFF

LSL Planning
A SAFEbuilt. Company

SSI
surveying solutions, inc.

AGENDA

- Study Goals
- Alternatives Overview
- Performance
- Evaluation
- Next Steps

LSL Planning
A SAFEbuilt. Company

SSI surveying solutions, inc.

PARSONS BRINCKERHOFF

STUDY GOALS

- **Safety:** Provide safe conditions for all travelers
- **Entry:** Create a more attractive entry to the city
- **Pedestrians:** Improve conditions for pedestrians along/across State St
- **Bicycles:** Provide a safe place for bicyclists separate from travel lanes
- **Transit:** Enhance transit conditions through traffic flow, stop accessibility
- **Vehicles:** Maintain reasonable traffic operations along the corridor
- **Land Use:** Support planned land use described in S. State St. Corridor Plan
- **Access:** Ease accessibility of corridor businesses

LSL Planning
A SAFEbuilt. Company

SSI surveying solutions, inc.

PARSONS BRINCKERHOFF

ALTERNATIVES OVERVIEW

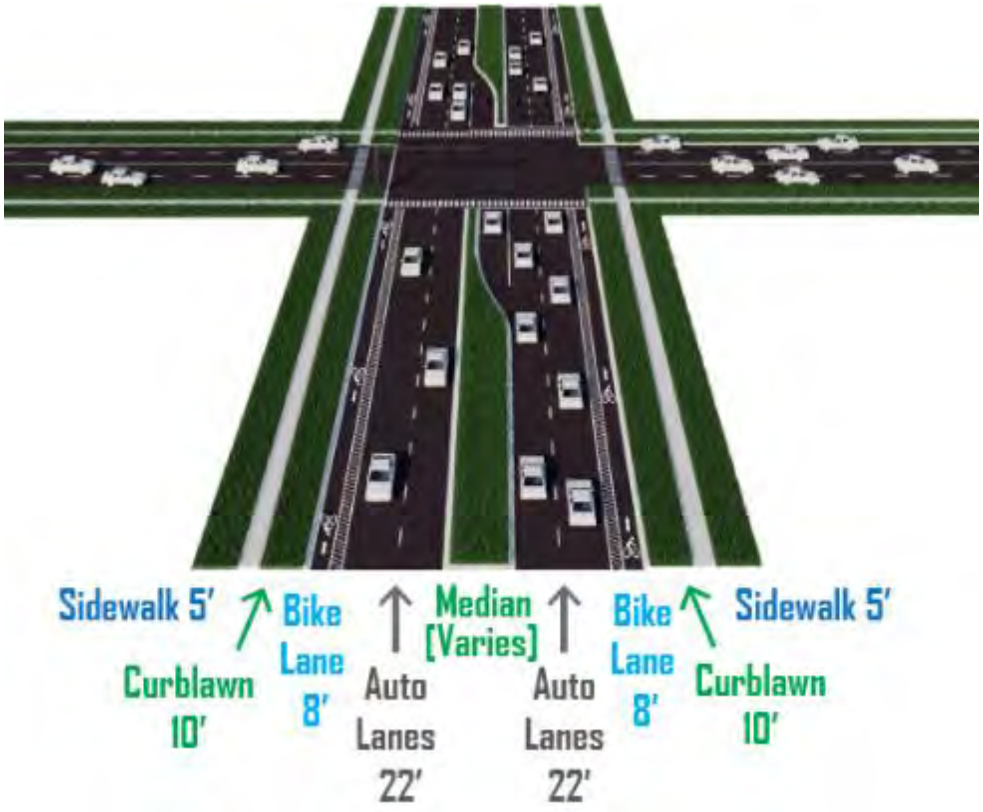
- Alternative 1: Narrow Median with Direct Left Turns
- Alternative 2: Narrow Median with Roundabout Intersections
- Alternative 3: Wide Median with Indirect ("Michigan") Left Turns

COMMON DESIGN FEATURES

- Curbside buffered bike lanes
- Continuous sidewalks
- Transit stop pull-outs (where feasible)
- No right-of-way impacts beyond minor corner encroachments

ALTERNATIVE 1 - NARROW MEDIAN

- Direct left-turns
- No u-turns
- Plantable median space



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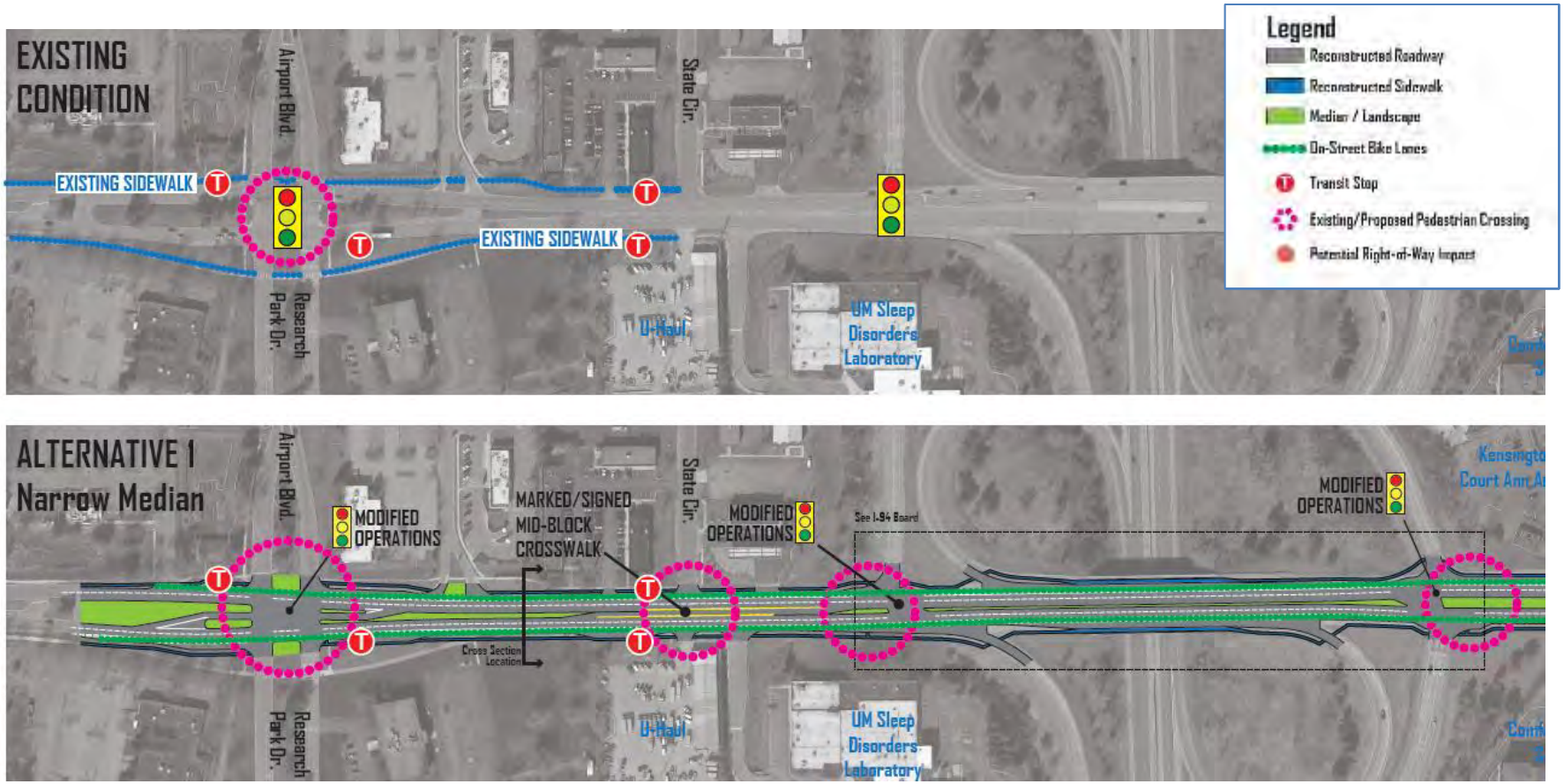
ALTERNATIVE 1 - NARROW MEDIAN



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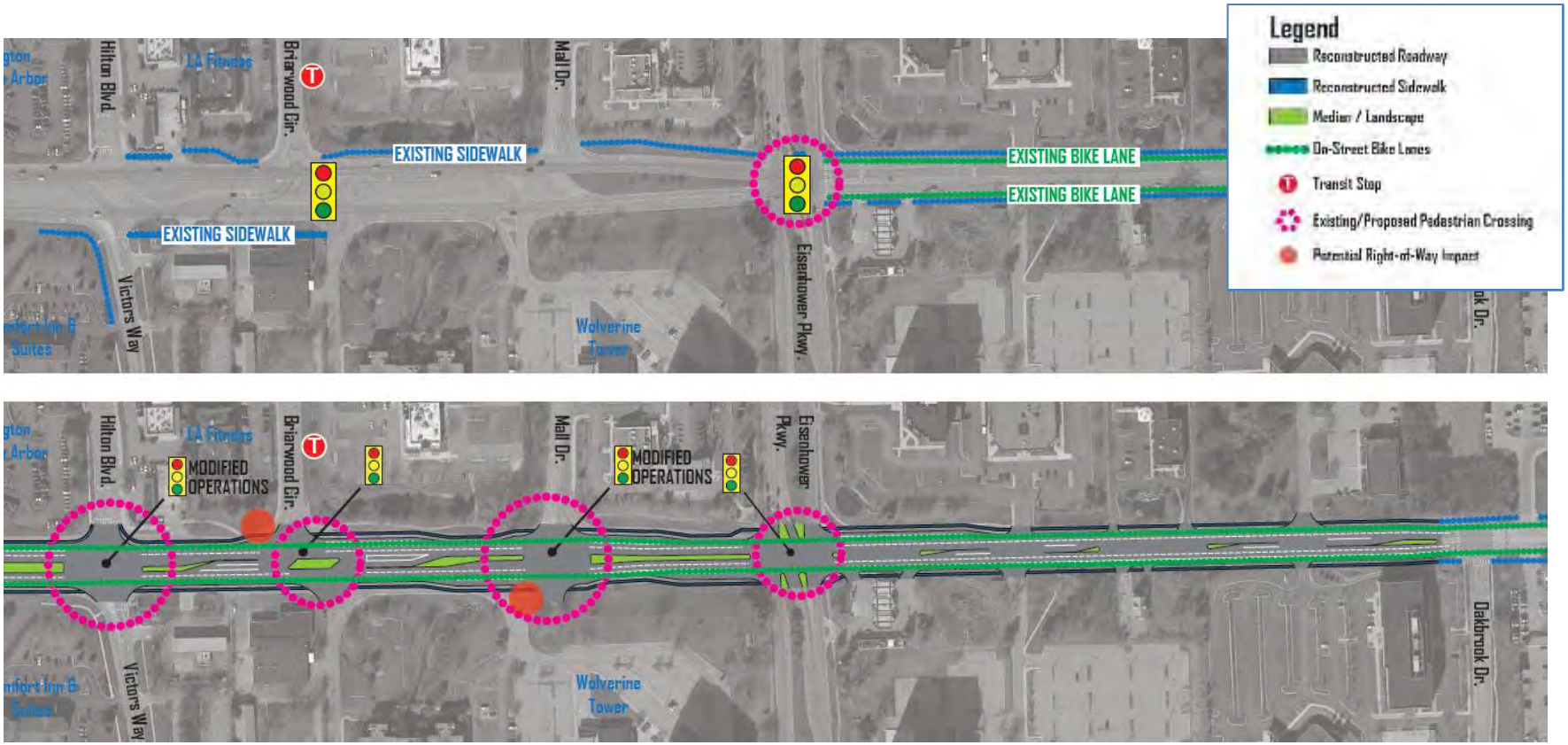
ALTERNATIVE 1 - NARROW MEDIAN



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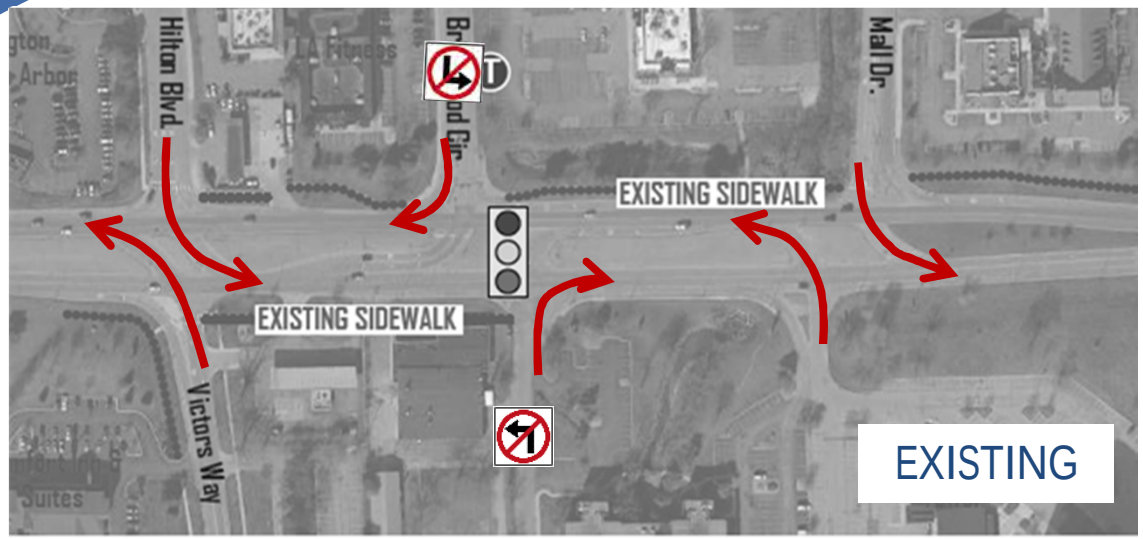
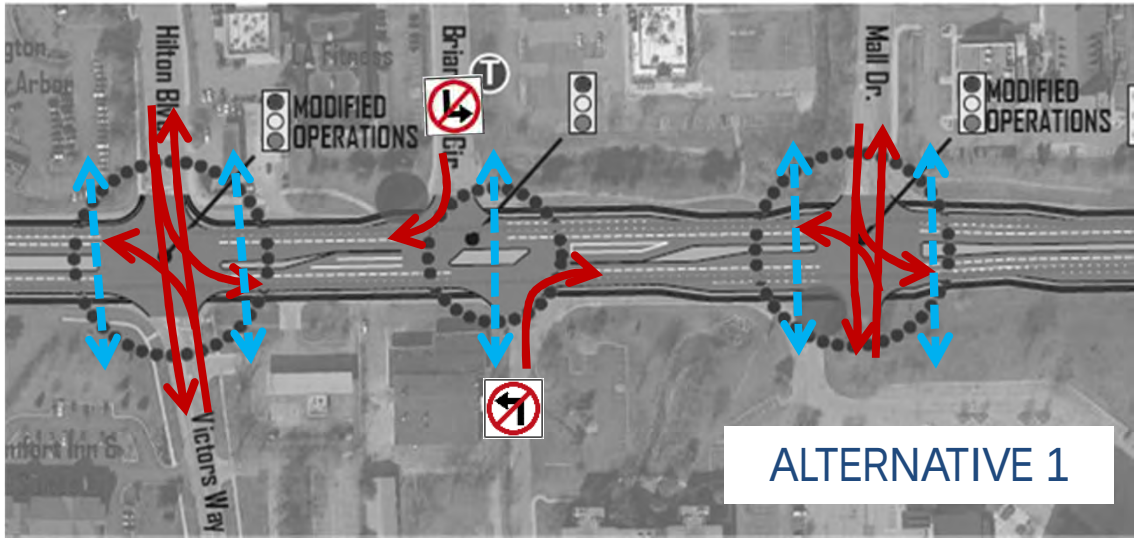
ALTERNATIVE 1 TRAFFIC MANEUVERS





Vehicle turning movement

Pedestrian movement across State St

No Turn Allowed

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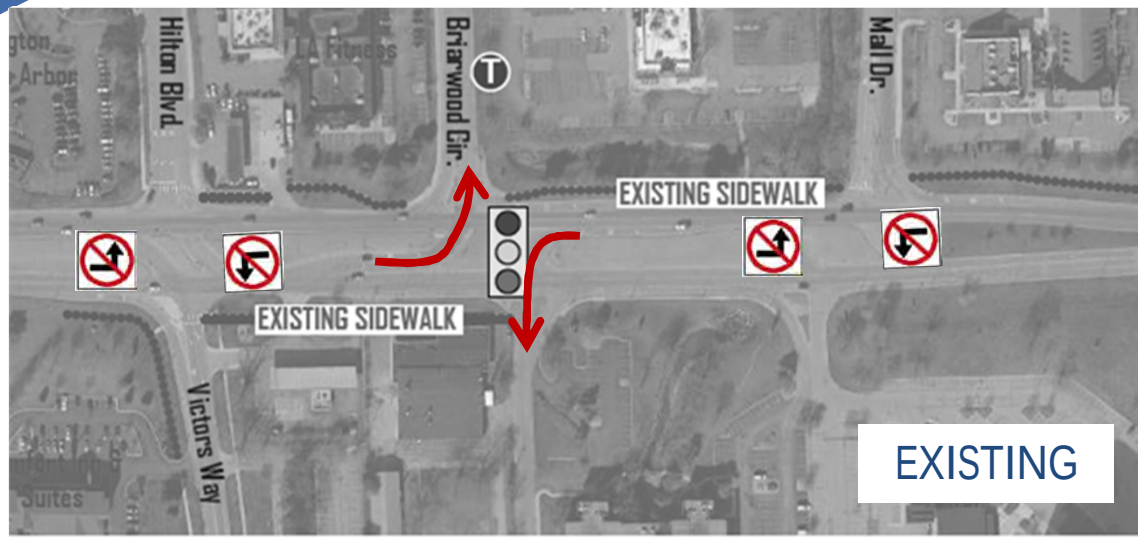
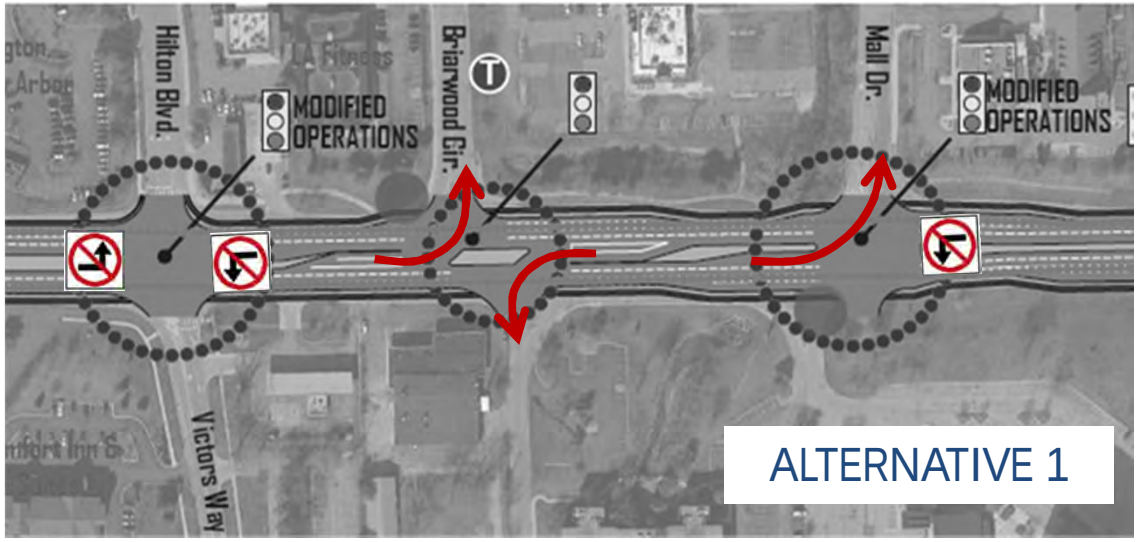
Alternative 1 Traffic Maneuvers





Vehicle turning movement

Pedestrian movement across State St

No Turn Allowed

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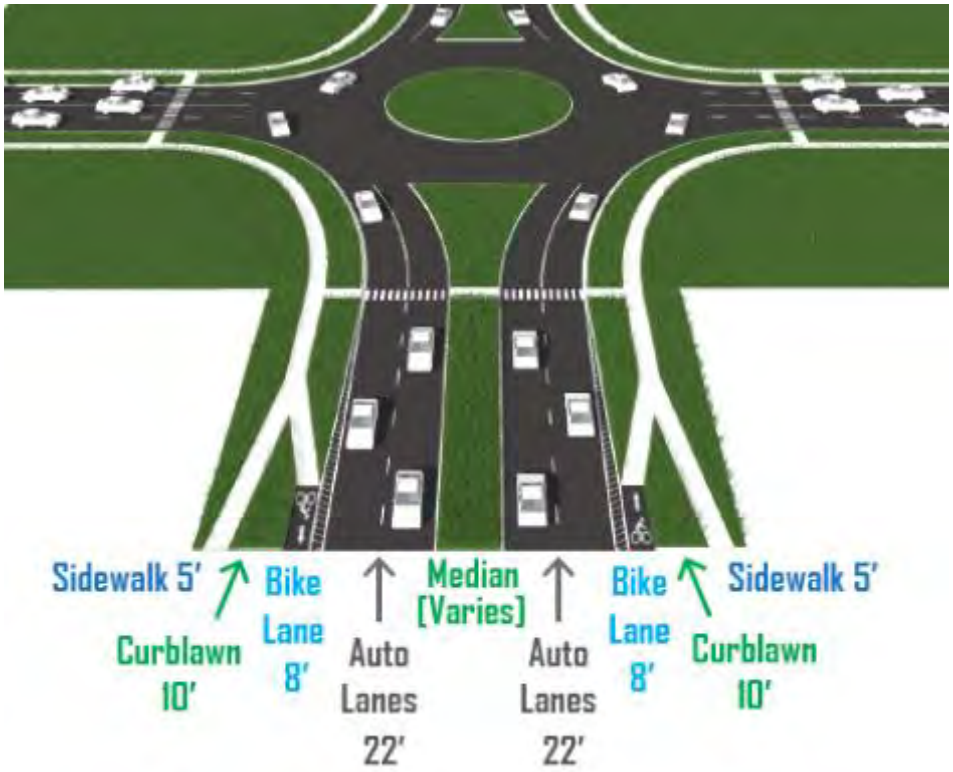
ALTERNATIVE 2 - ROUNDABOUTS

- Roundabout intersections
- Plantable narrow median space



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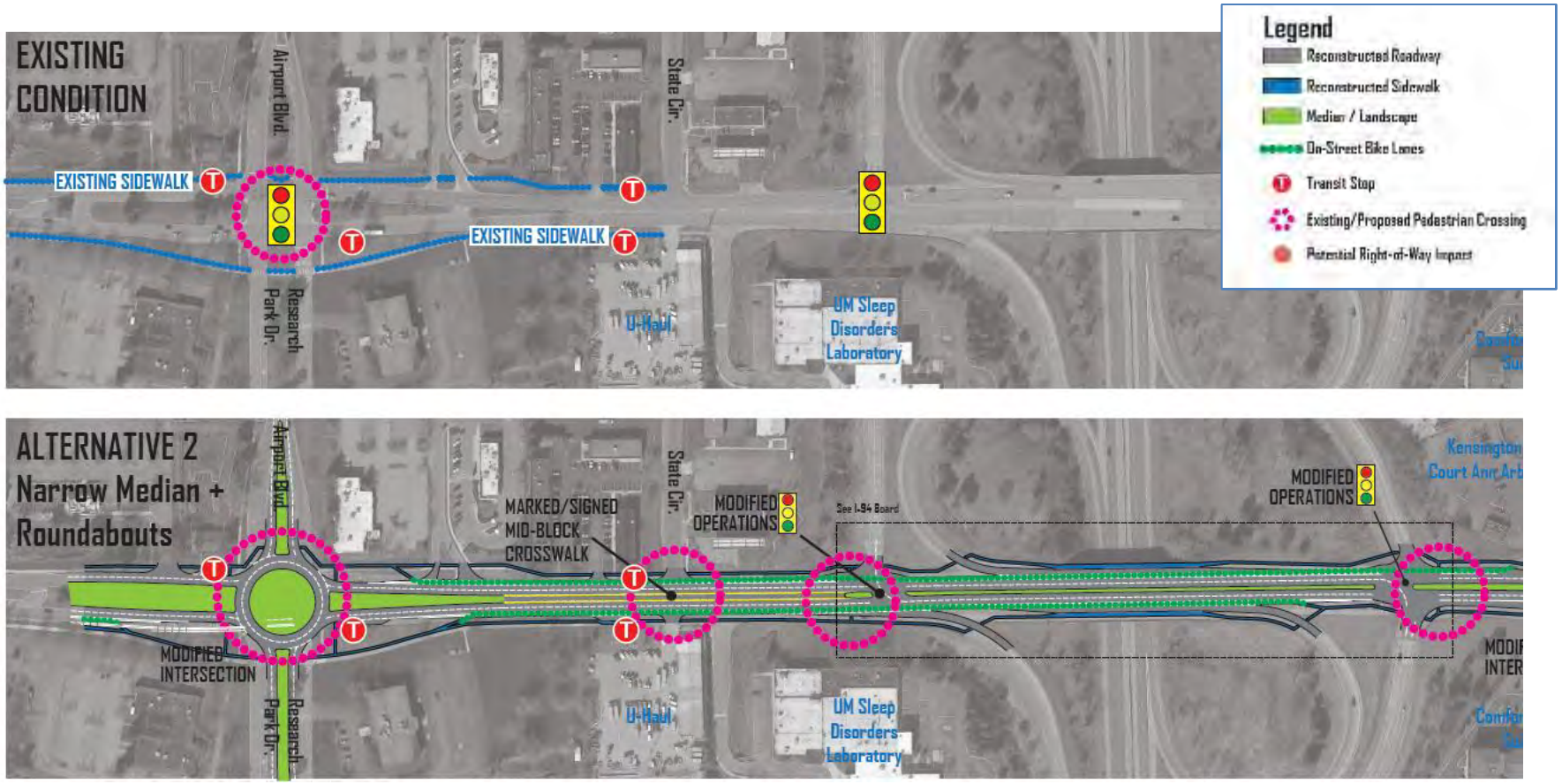
ALTERNATIVE 2 - ROUNDABOUTS



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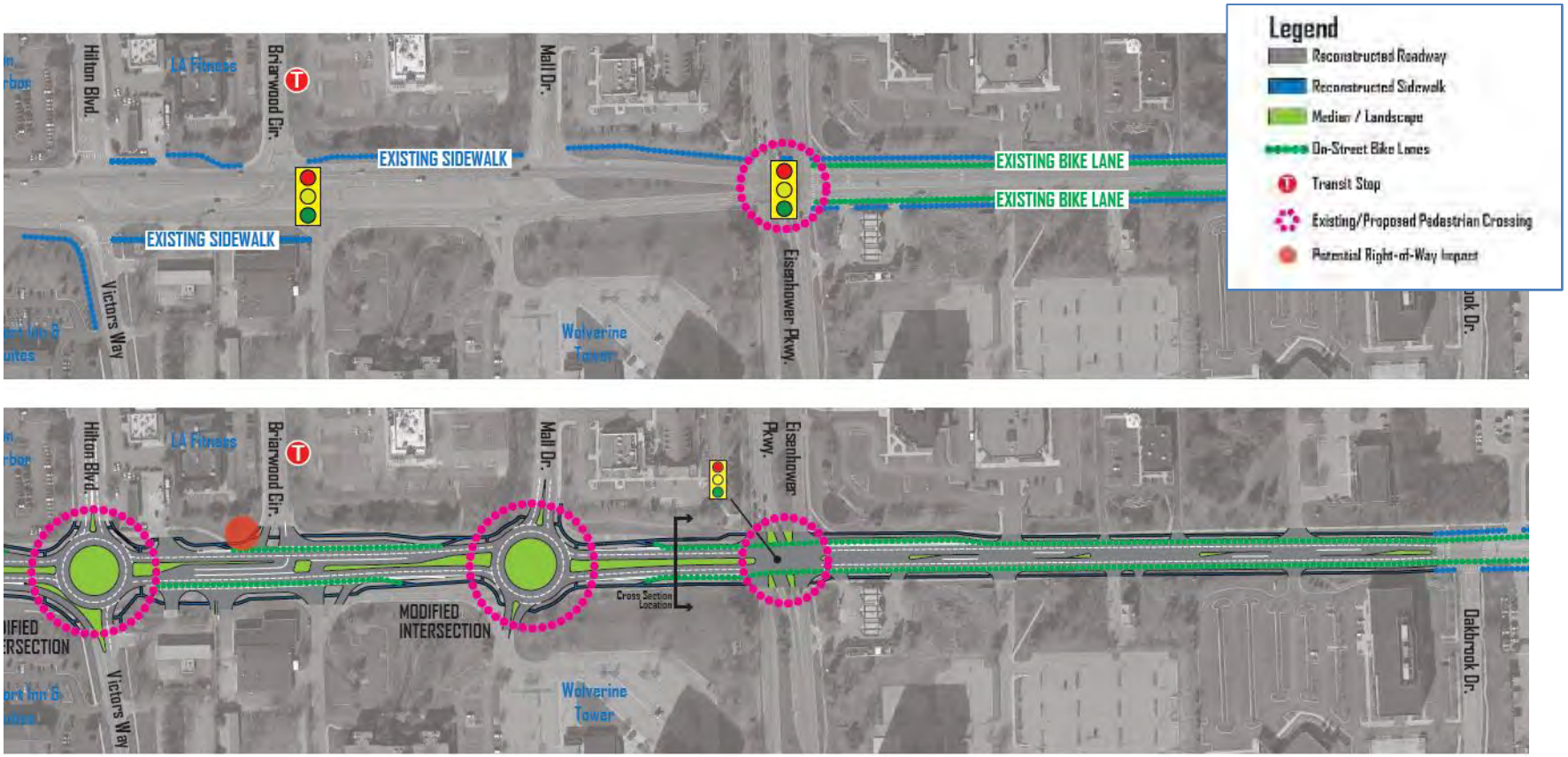
ALTERNATIVE 2 - ROUNDABOUTS



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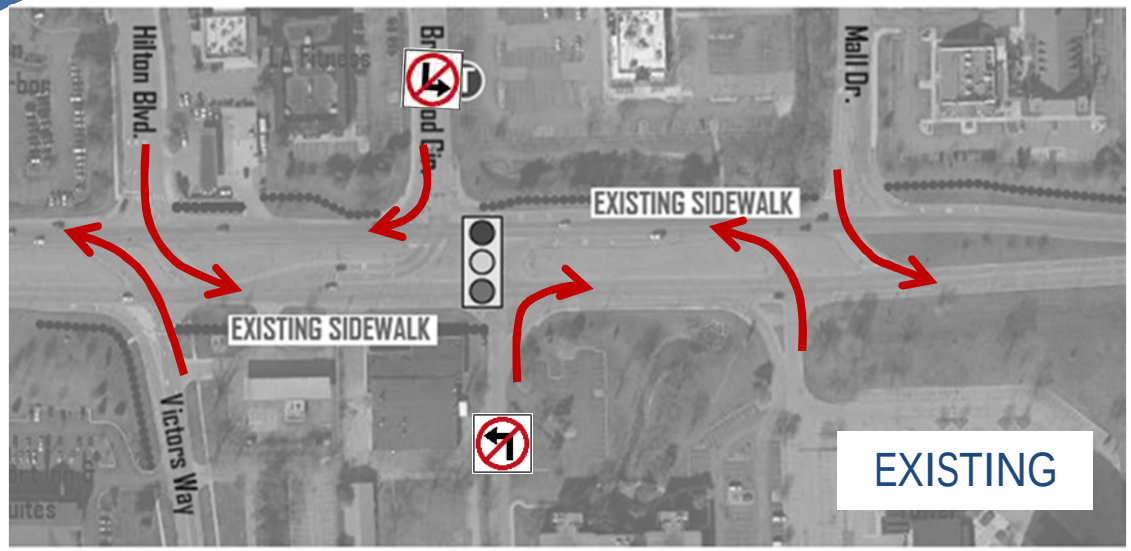
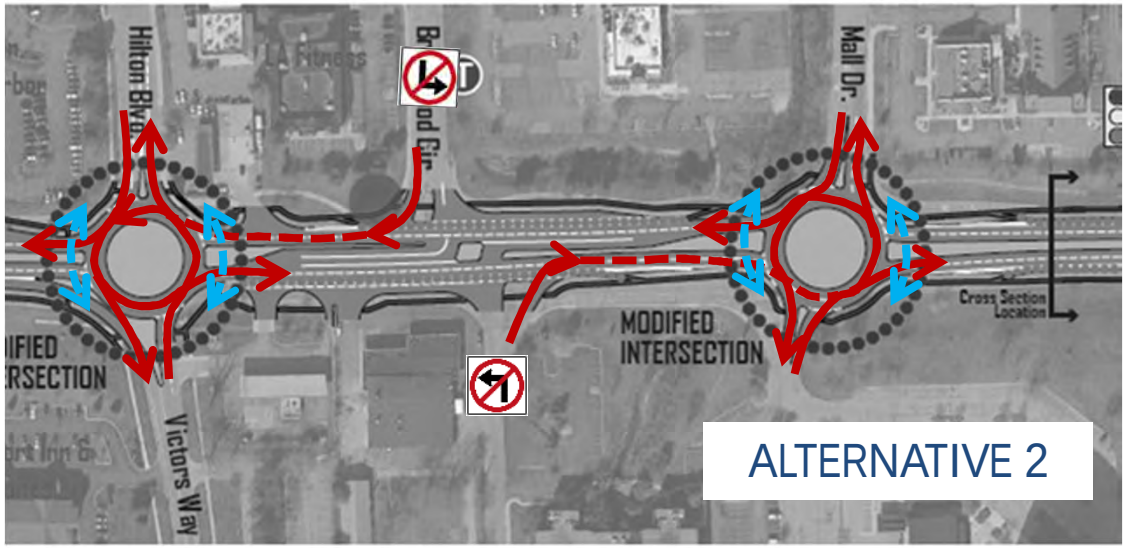
ALTERNATIVE 2 TRAFFIC MANEUVERS





Vehicle turning movement

Pedestrian movement across State St

No Turn Allowed

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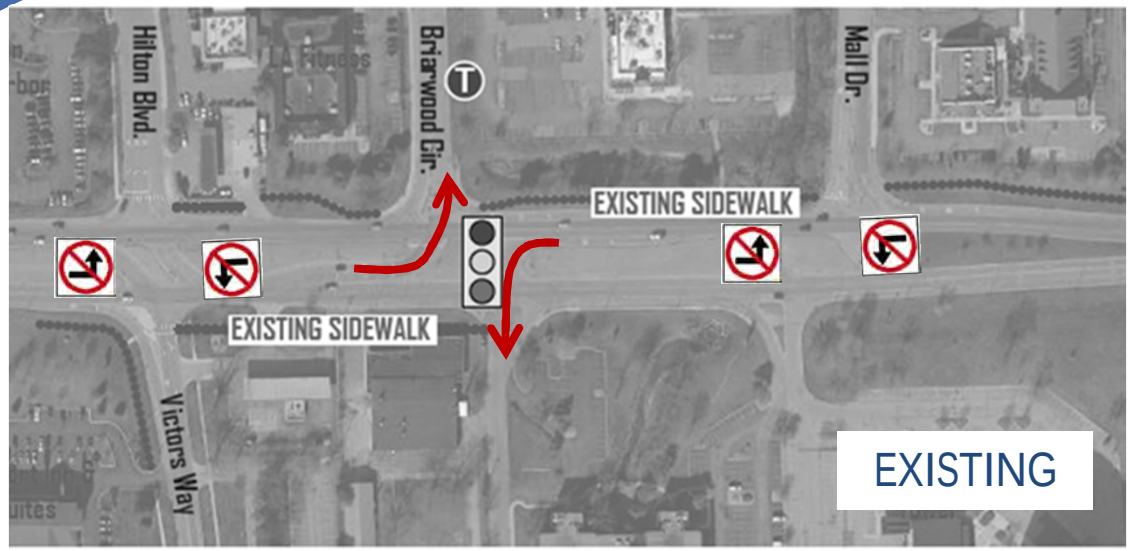
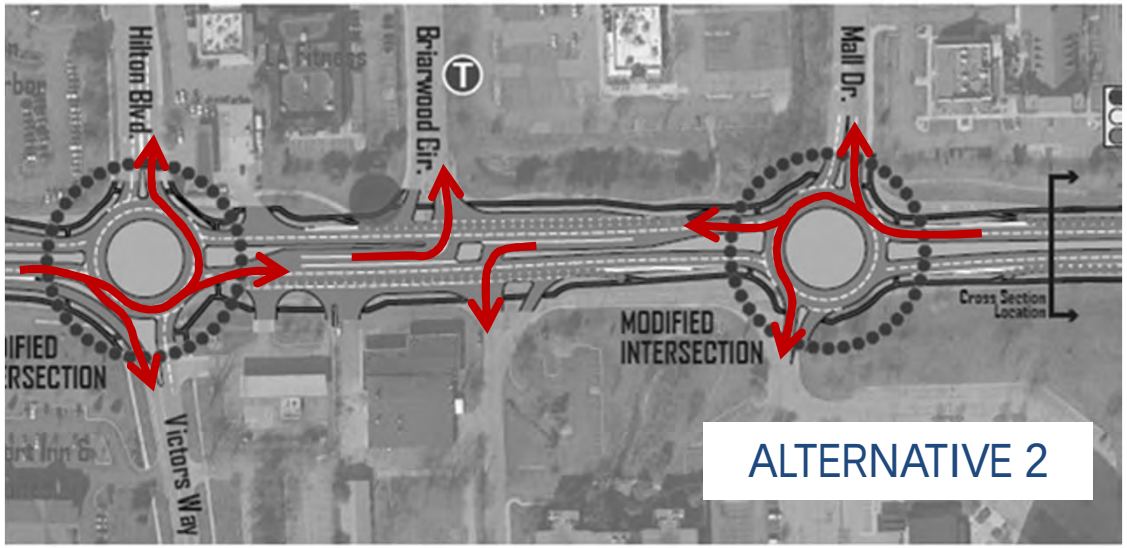
ALTERNATIVE 2 TRAFFIC MANEUVERS





Vehicle turning movement

Pedestrian movement across State St

No Turn Allowed

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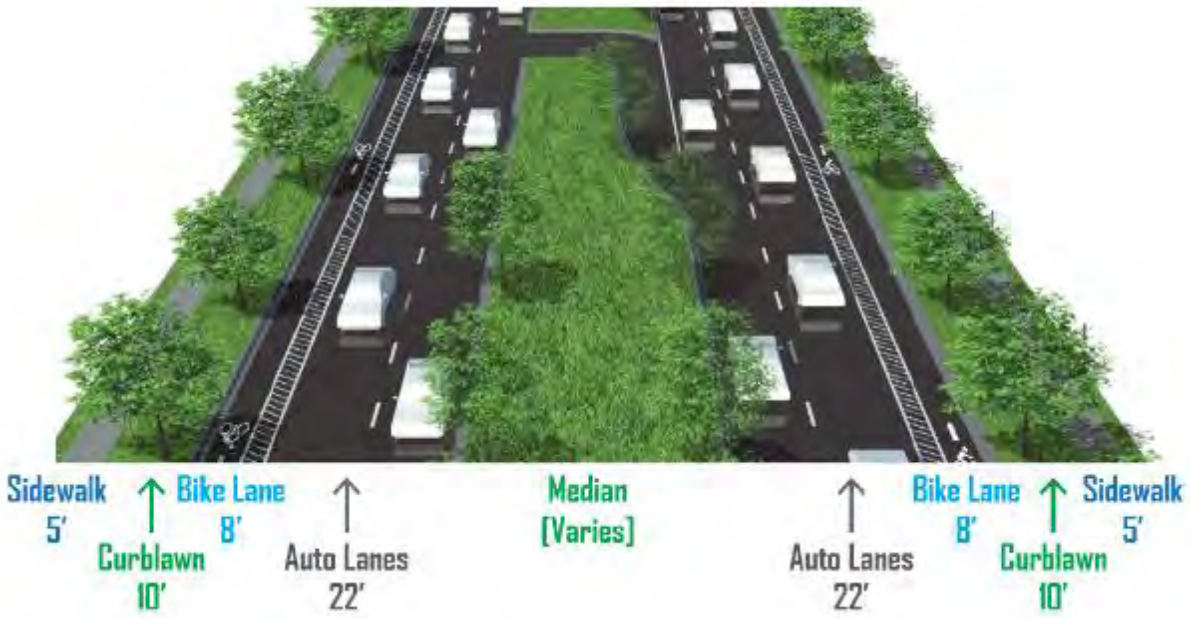
ALTERNATIVE 3 – WIDE MEDIAN

- Indirect (“Michigan”) left turns
- Plantable wide median space



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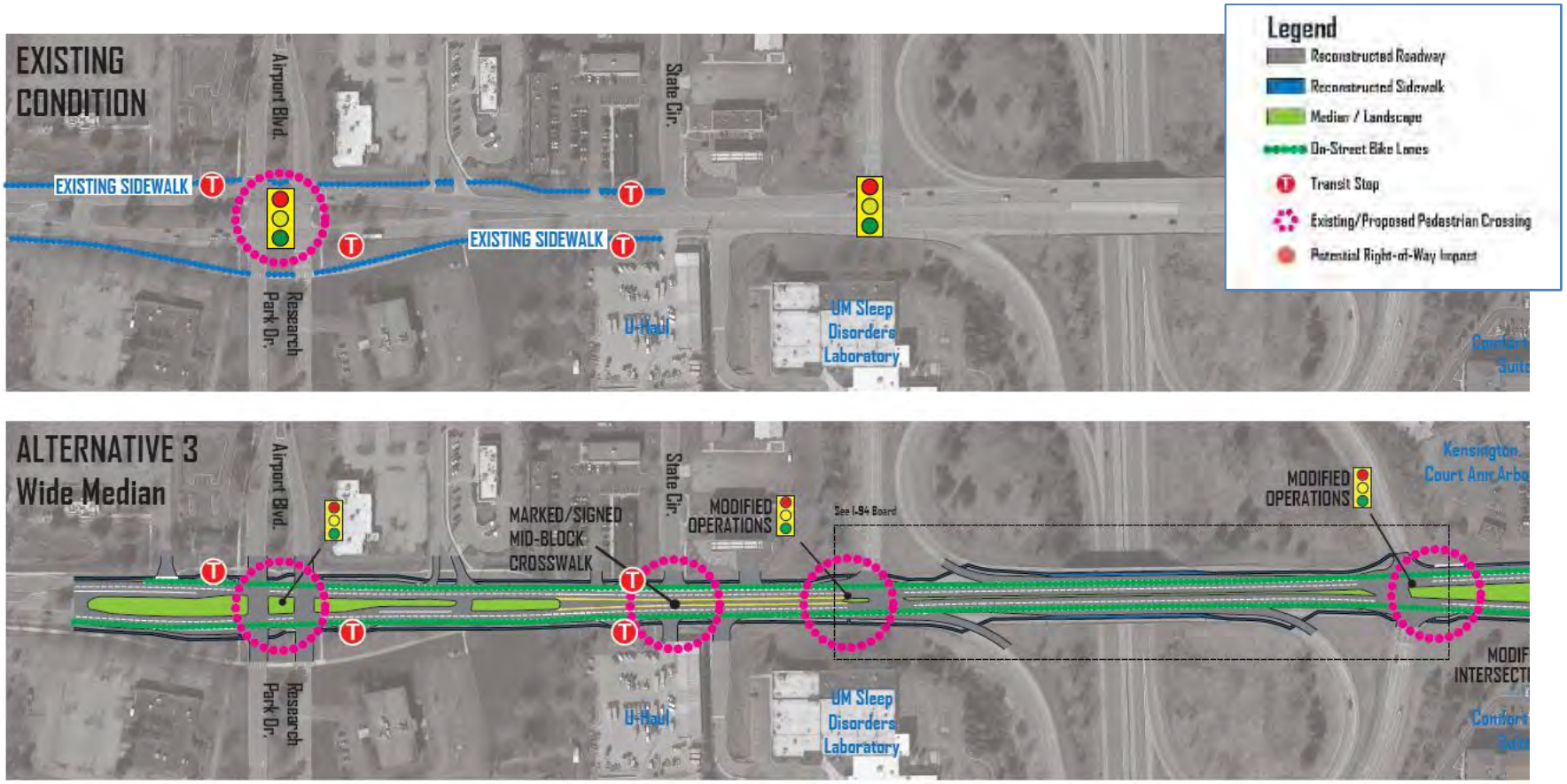
ALTERNATIVE 3 – WIDE MEDIAN



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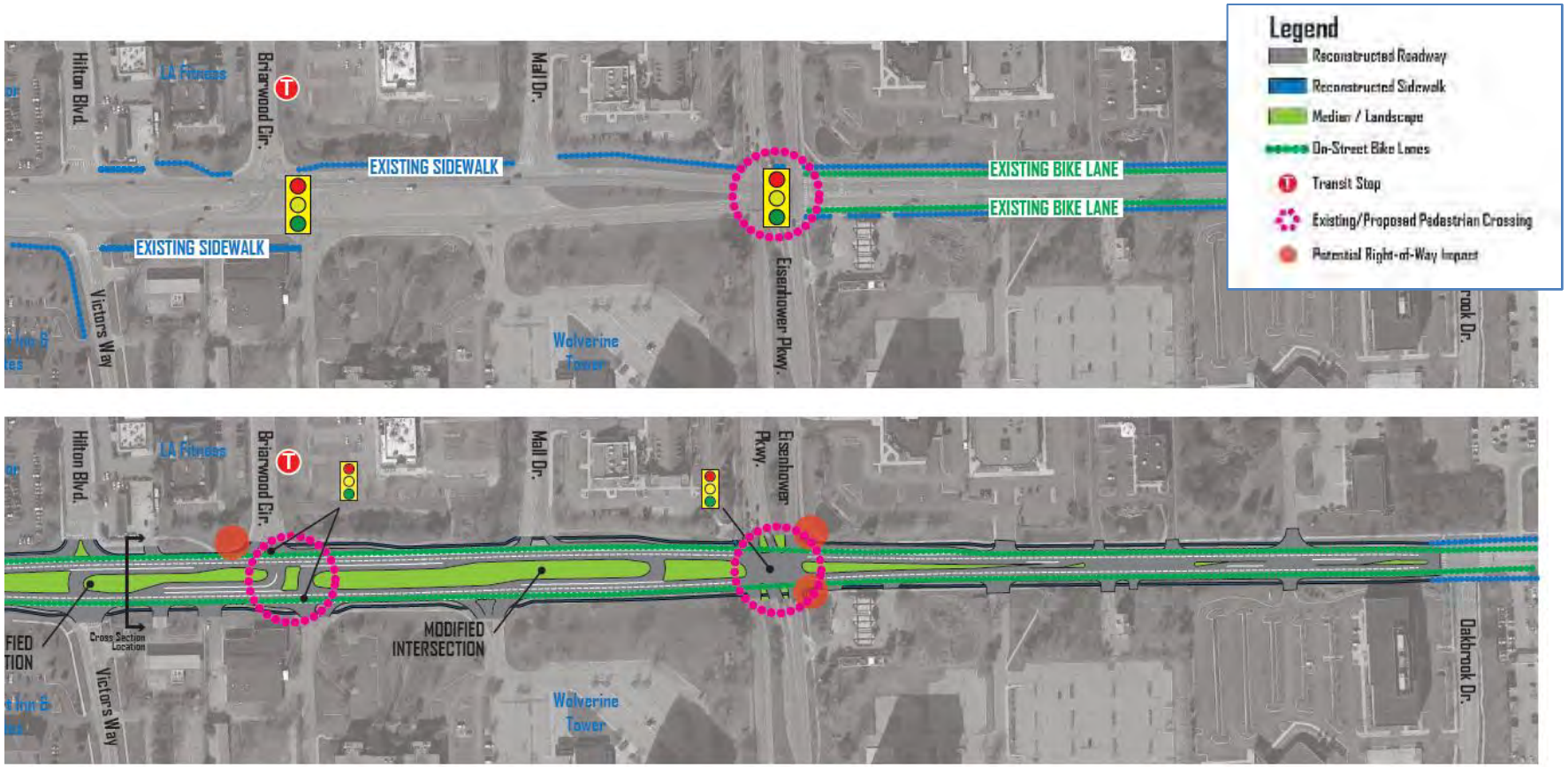
ALTERNATIVE 3 – WIDE MEDIAN



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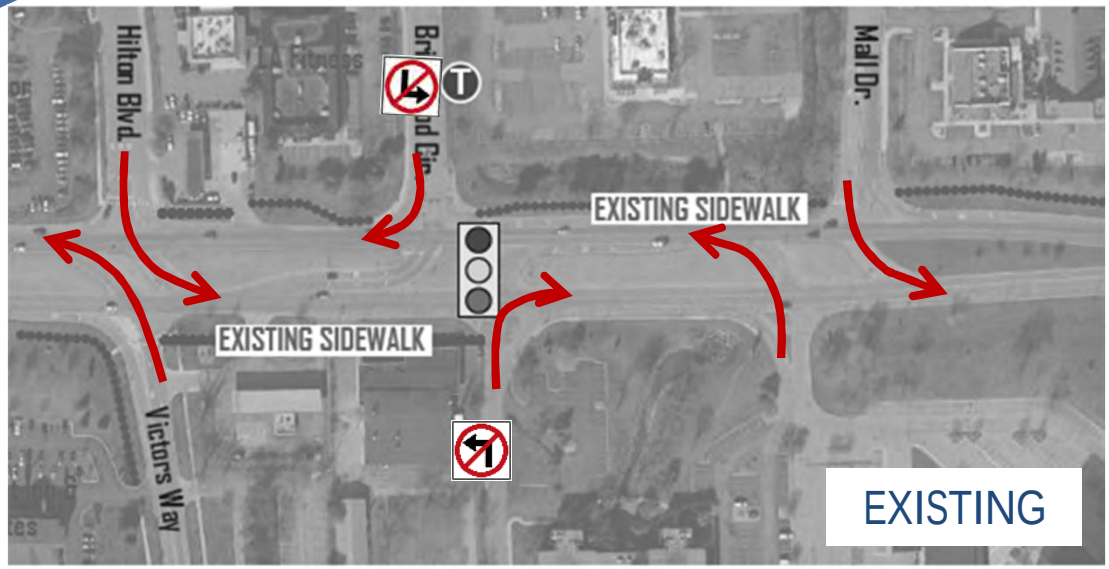
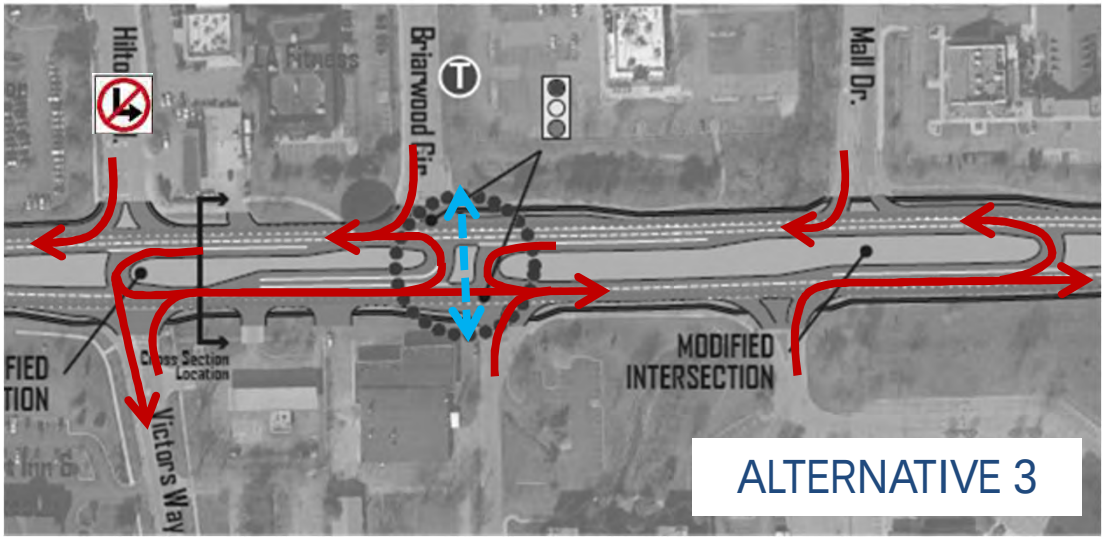
Alternative 3 Traffic Maneuvers





Vehicle turning movement

Pedestrian movement across State St

No Turn Allowed

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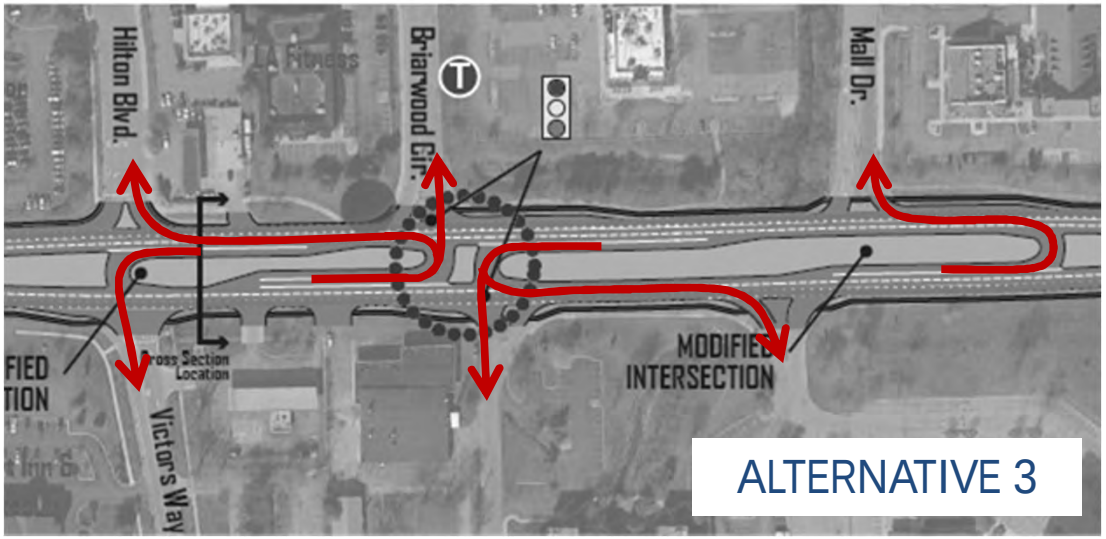
ALTERNATIVE 3 TRAFFIC MANEUVERS



Vehicle turning movement

Pedestrian movement across State St

No Turn Allowed

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Travel Time Performance

2035 Projected Conditions

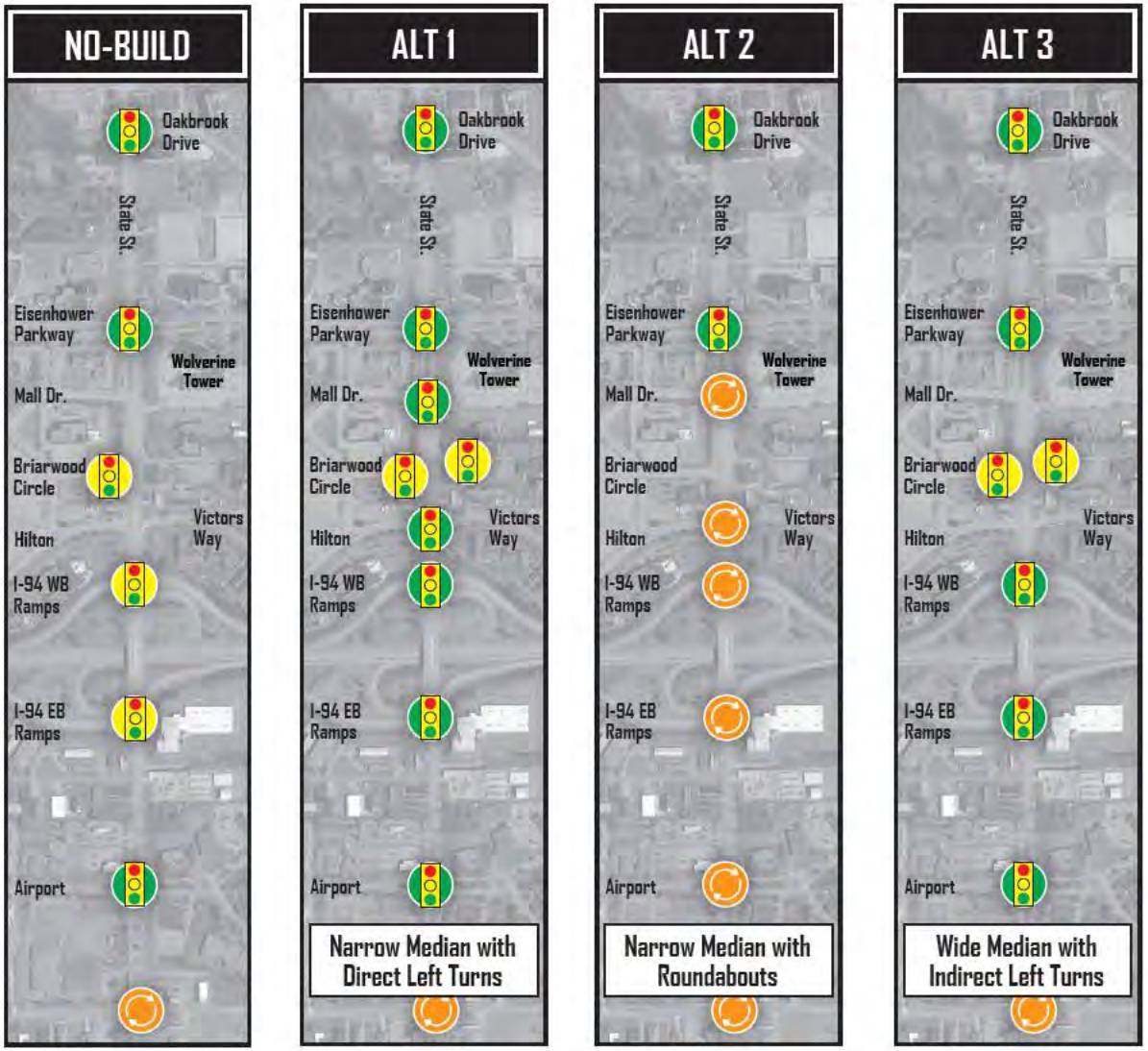
INTERSECTION TRAFFIC CONTROLS

- Traffic Signal
- Partial Traffic Signal (not all movements signalized)
- Roundabout

Estimated Travel Time Comparison

2035	AM PEAK		PM PEAK	
	NB	SB	NB	SB
No-Build	4-5	3-4	3-4	3-4
ALT 1	4-5	3-4	3-4	5-6
ALT 2	9-10	4-5	6-7	>10
ALT 3	4-5	3-4	3-4	4-5

(in minutes)



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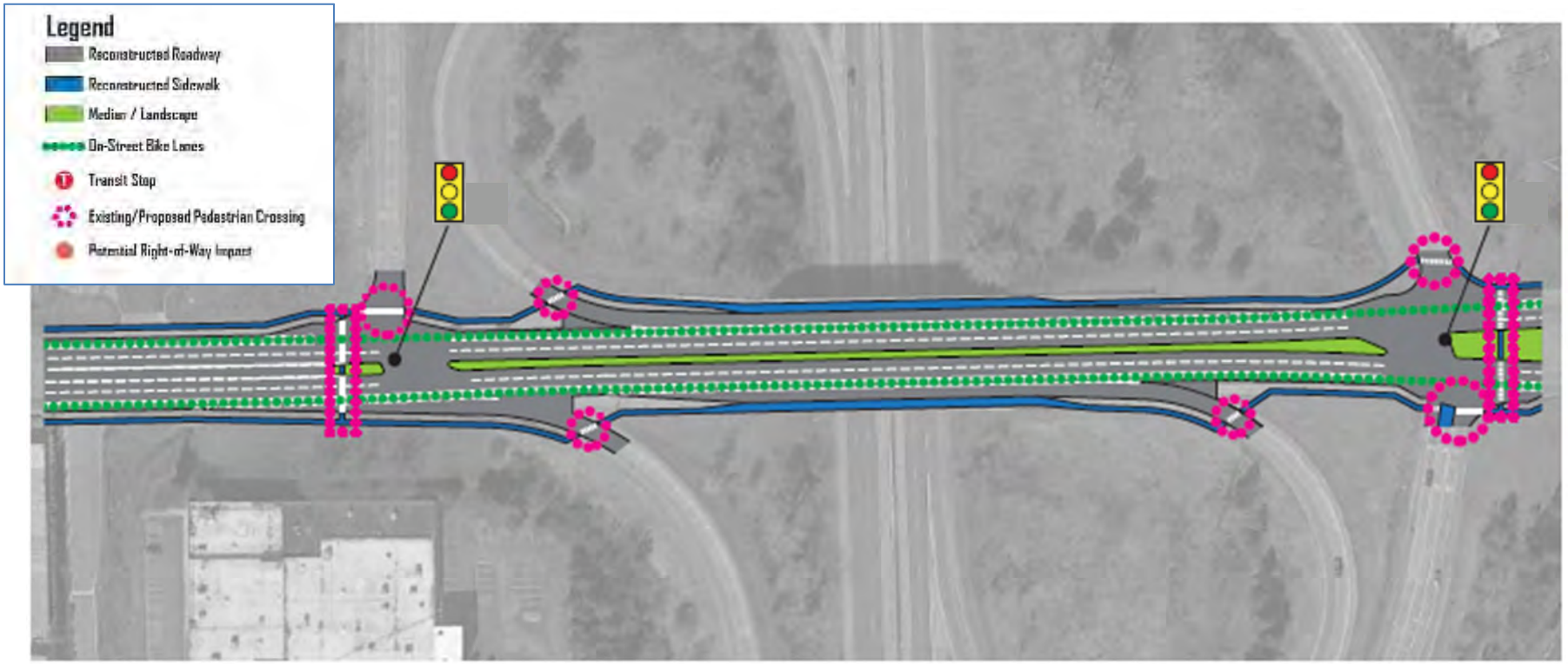
I-94 INTERCHANGE OPTIONS

Alternative A: Narrow Median Configuration



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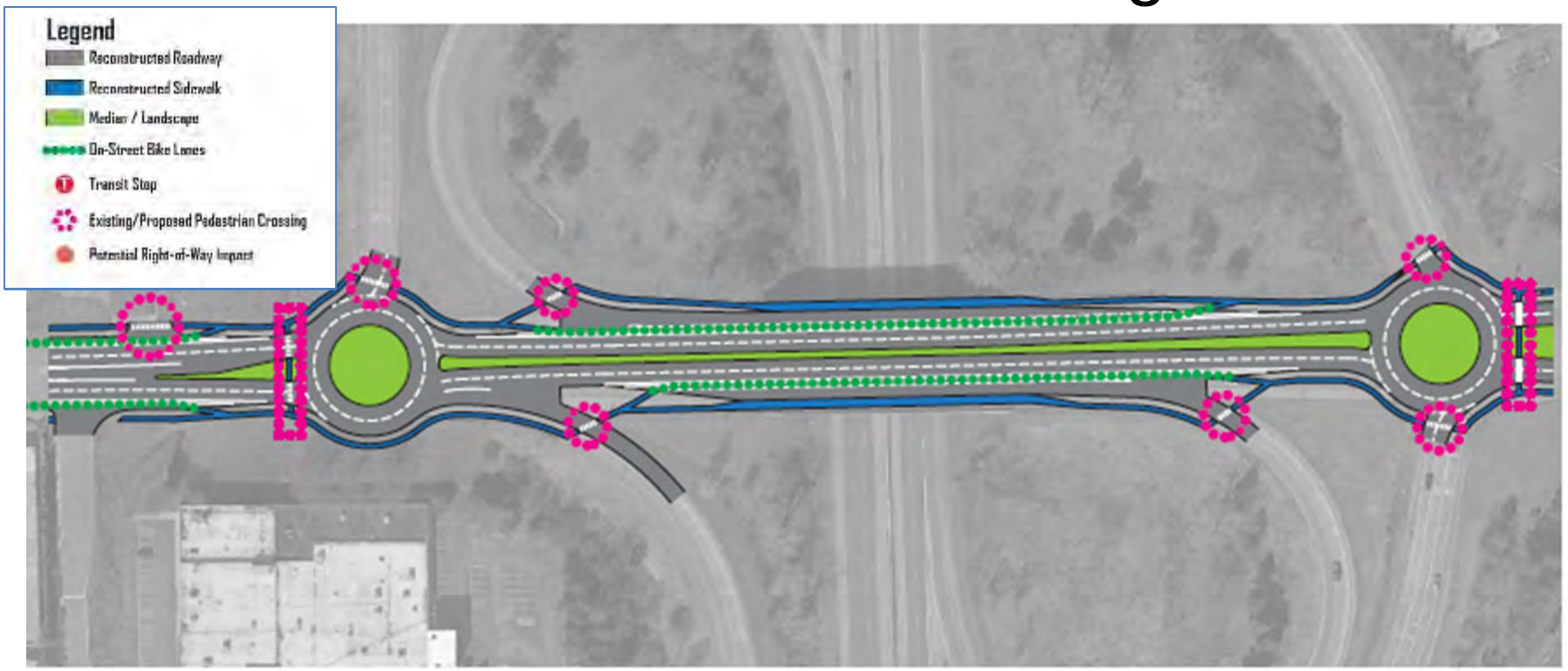
I-94 INTERCHANGE OPTIONS

Alternative A: Roundabout Configuration



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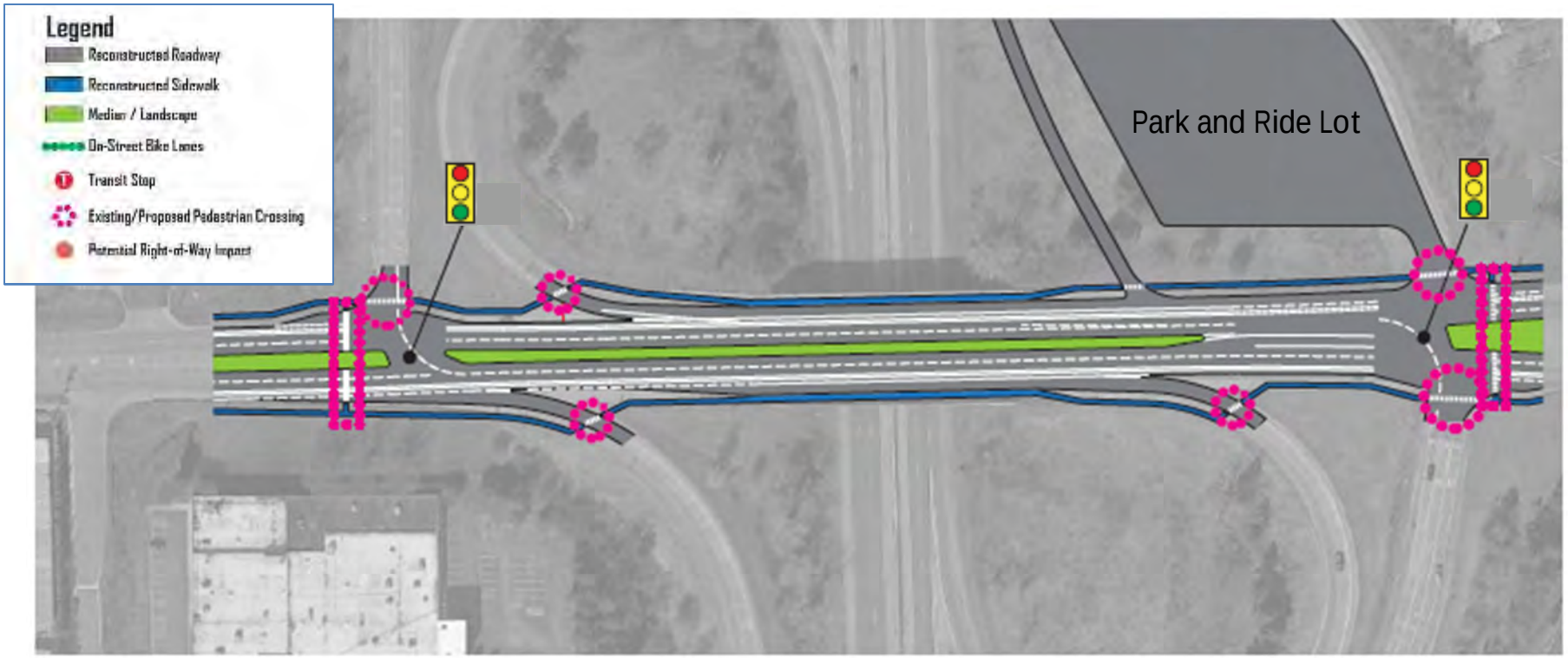
I-94 INTERCHANGE OPTIONS

Alternative A: Park-and-Ride Option



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Alternatives were scored based on how well they achieve the project goals

	SAFETY Provide safe conditions, reduce potential for vehicle crashes and their severity	ENTRY Create a more attractive, aesthetically pleasing, entry to the City.	PEDESTRIANS Improve safety and conditions for pedestrians walking along and crossing State Street.	BICYLES Provide a safe place for bicyclists separate from travel lanes.	TRANSIT Enhance transit conditions through traffic flow, stop locations and street treatments.	LAND USE Complement planned land use and its design per the City's plan	VEHICLES Maintain reasonable traffic operations and travel time, reduce congestion	ACCESS Ease accessibility of corridor businesses.
Alternative One (narrow median + direct left turn) 	−	+	+	+	+	+	−	+
Alternative Two (narrow median + roundabouts) 	+	+	+	+	−	+	−	+
Alternative Three (wide median) 	+	+	+	+	+	−	−	+

Scoring Guide: + BEST; + BETTER THAN EXISTING; − SIMILAR TO EXISTING; − WORSE THAN EXISTING

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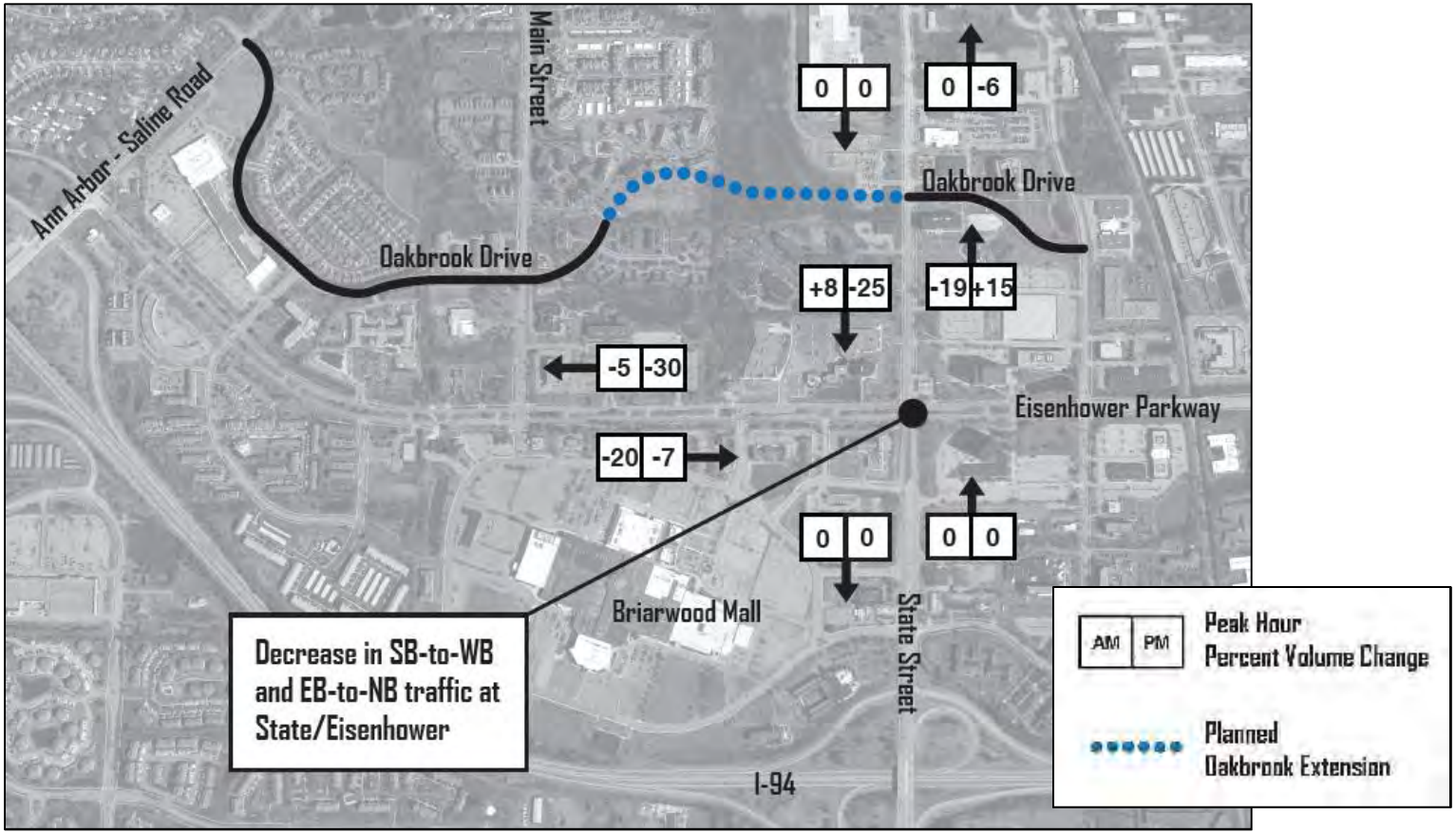
PLANNED OAKBROOK EXTENSION



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GIVE US YOUR FEEDBACK!

- Talk one-on-one with our team
- Provide input on which study goals are most important to you
- Rate and provide feedback on the project alternatives

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NEXT STEPS

- Project team will use analysis and feedback to select a recommended alternative
- Further preliminary design will be conducted
- Recommended alternative will be presented at subsequent meetings in early 2016

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State Street Corridor Study

Recommended Alternative Review

November 2, 2017

AGENDA

- Process Overview
  - Project Goals
  - Alternatives Considered
  - Evaluation
- Recommended Alternative Overview
  - Design Features
  - Traffic Operations
  - Key Feature Improvements
- Next Steps

STUDY GOALS

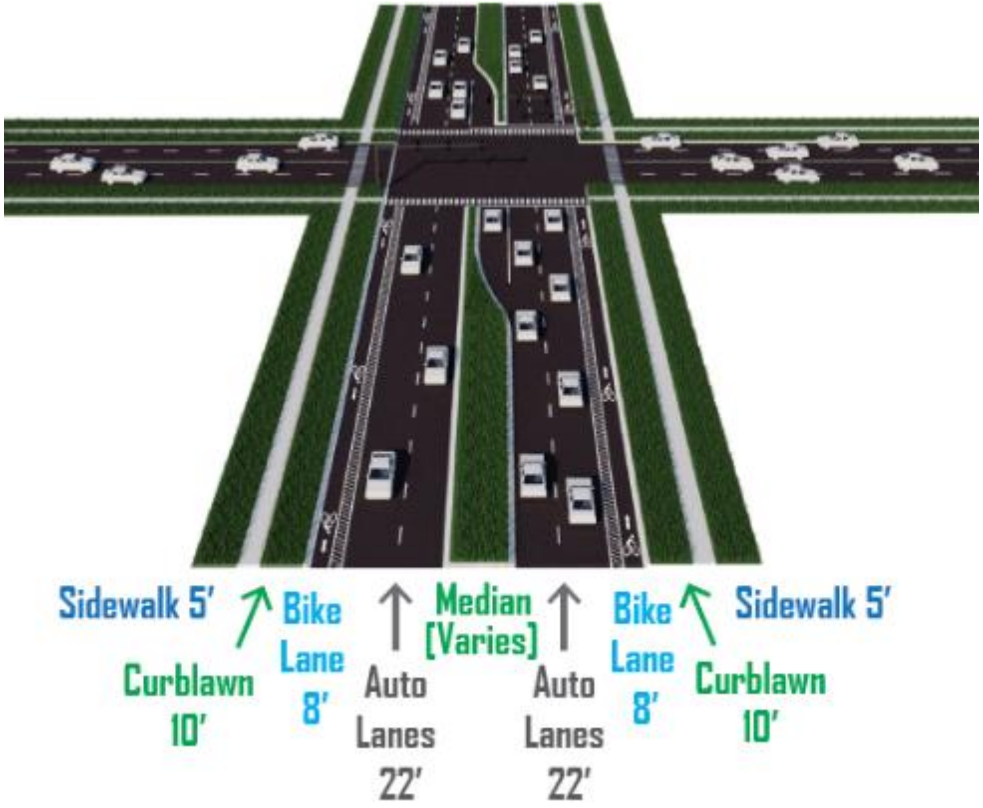
- **Safety:** Provide safe conditions for all travelers
- **Entry:** Create a more attractive entry to the city
- **Pedestrians:** Improve conditions for pedestrians along/across State St
- **Bicycles:** Provide a safe place for bicyclists separate from travel lanes
- **Transit:** Enhance transit conditions through traffic flow, stop accessibility
- **Vehicles:** Maintain reasonable traffic operations along the corridor
- **Land Use:** Support planned land use described in S. State St. Corridor Plan
- **Access:** Ease accessibility of corridor businesses

ALTERNATIVES OVERVIEW

- Alternative 1: Narrow Median with Direct Left Turns
- Alternative 2: Narrow Median with Roundabout Intersections
- Alternative 3: Wide Median with Indirect (“Michigan”) Left Turns

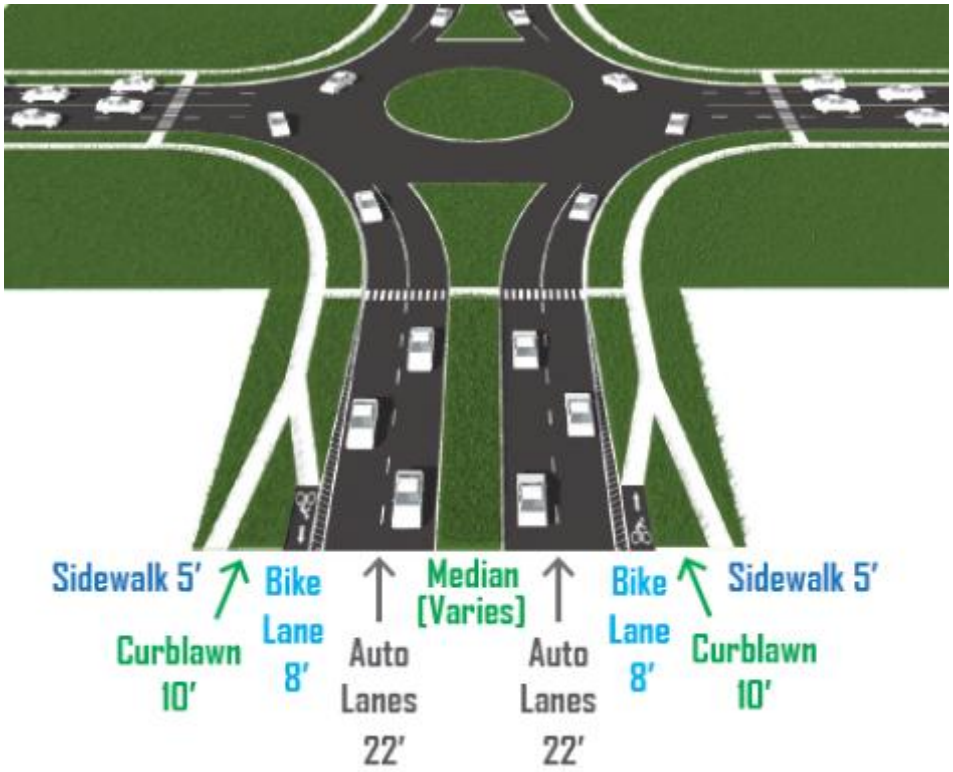
Alternative 1 - Narrow Median

- Direct left-turns
- No u-turns
- Plantable median space



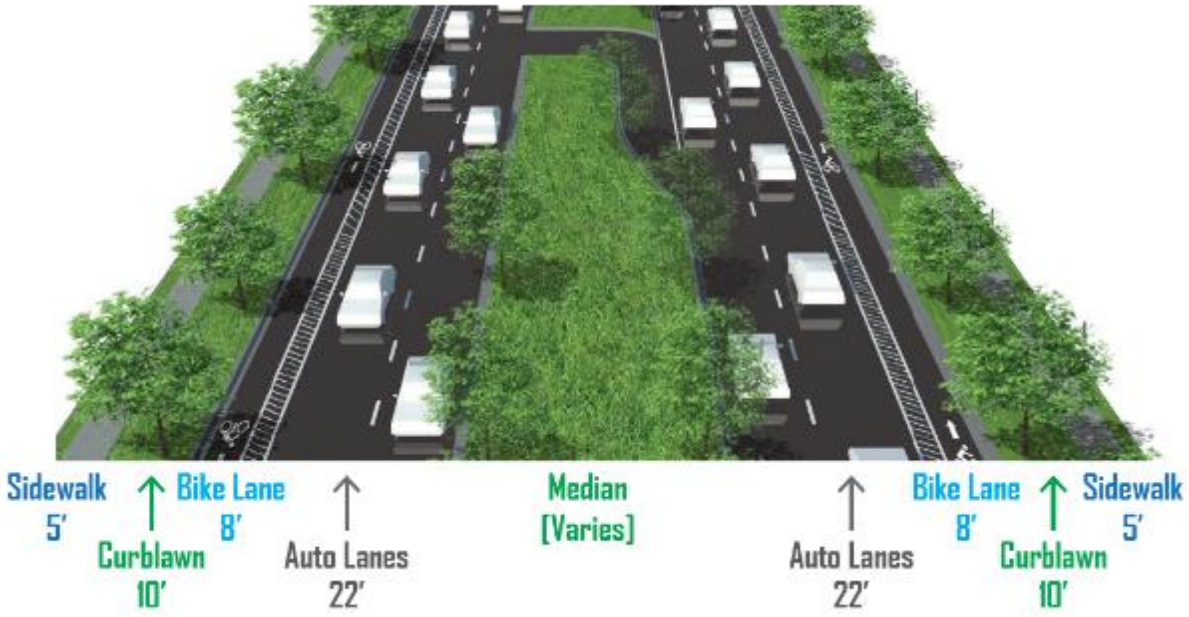
ALTERNATIVE 2 - ROUNDABOUTS

- Roundabout intersections
- Plantable narrow median space



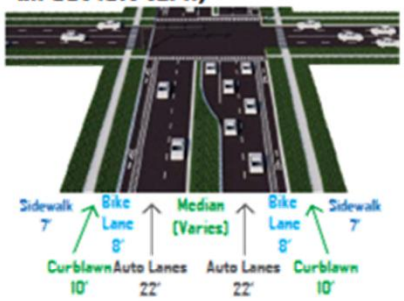
Alternative 3 – Wide Median

- Indirect ("Michigan") left turns
- Plantable wide median space

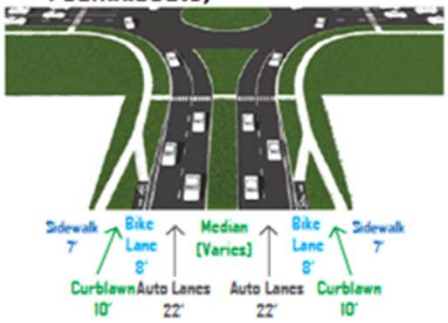


ALTERNATIVE SCORING

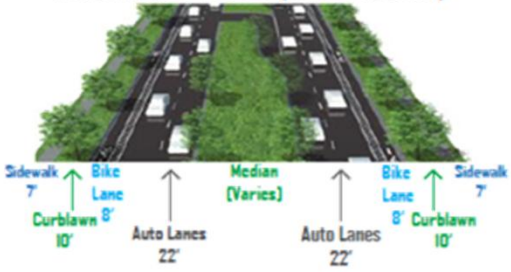
Alternative One (narrow median + direct left turn)



Alternative Two (narrow median + roundabouts)



Alternative Three (wide median)



	SAFETY	ENTRY	PEDESTRIANS	BICYLES	TRANSIT	LAND USE	VEHICLES	ACCESS
Alternative One (narrow median + direct left turn)	−	+	+	+	+	+	−	+
Alternative Two (narrow median + roundabouts)	+	+	+	+	−	+	−	+
Alternative Three (wide median)	+	+	+	+	+	−	−	+

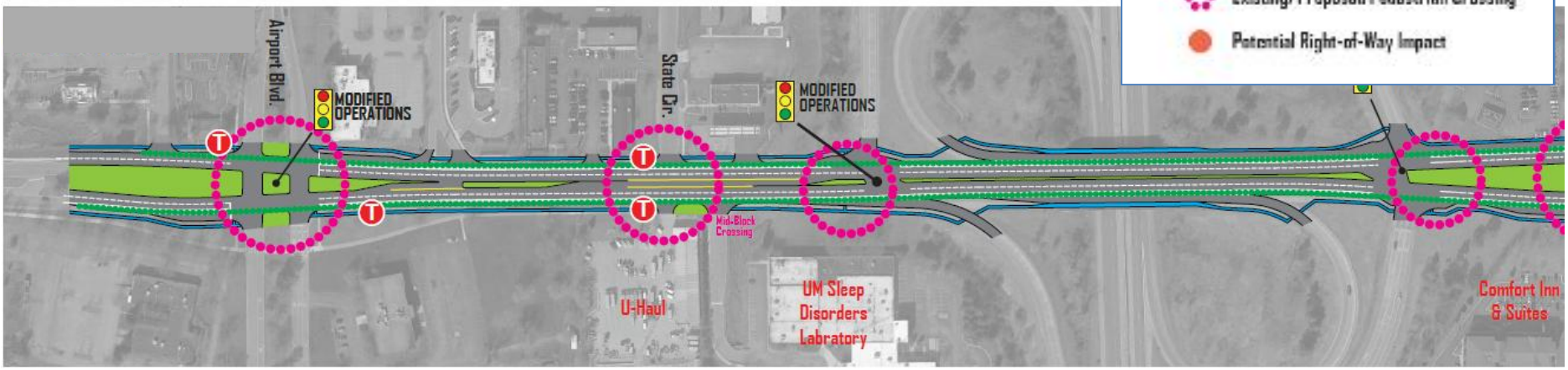
Scoring Guide: + BEST; + BETTER THAN EXISTING; − SIMILAR TO EXISTING; − WORSE THAN EXISTING

RECOMMENDED ALTERNATIVE

- A hybrid solution drawing from narrow and wide median alternatives
- Common non-motorized elements throughout the corridor:
  - Buffered bike lanes
    - Bike lane configuration across I-94 similar to Ann Arbor-Saline Road
  - Continuous sidewalks on both sides of the corridor

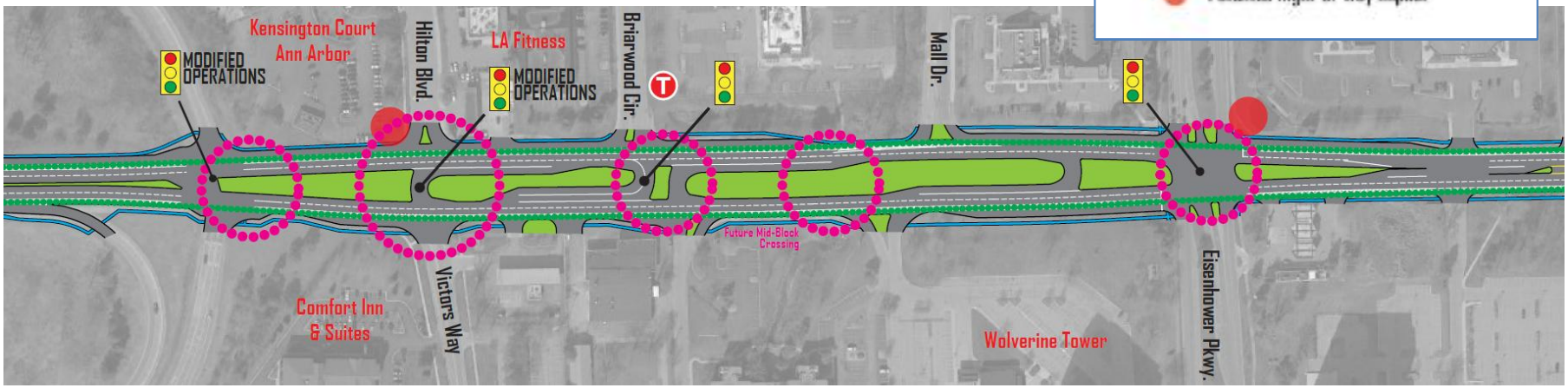
State Street – Recommended Alternative

- All indirect left turns at Airport/Research diverted to east and west crossovers
- Geometric improvements to discourage direct left turns at Airport/Research
- Desired potential mid-block crossing near State Circle, coinciding with transit stops
- Full signalization of ramp intersections (both directions of State Street stop)

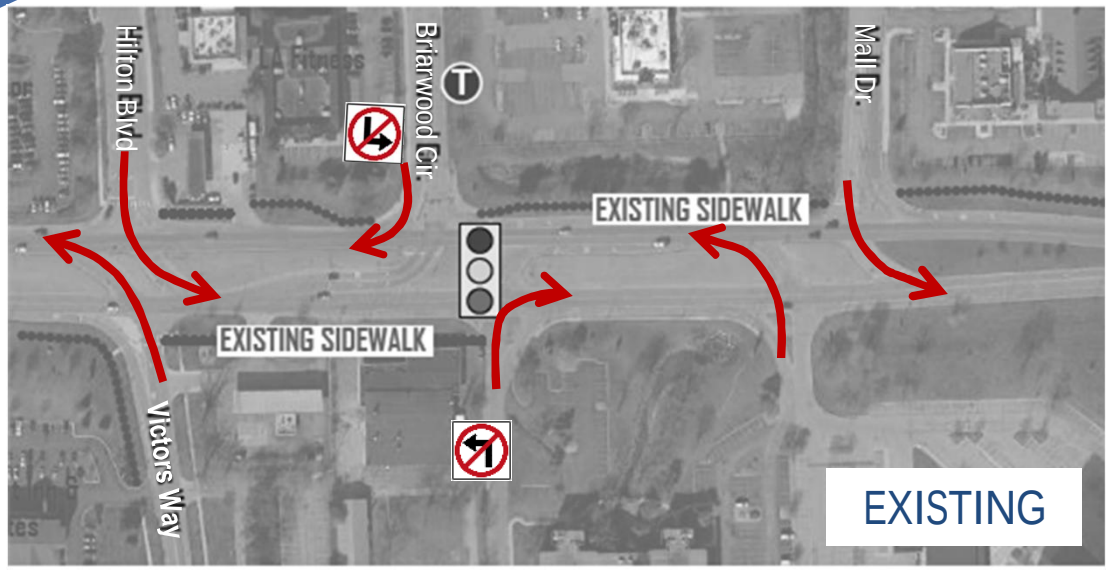


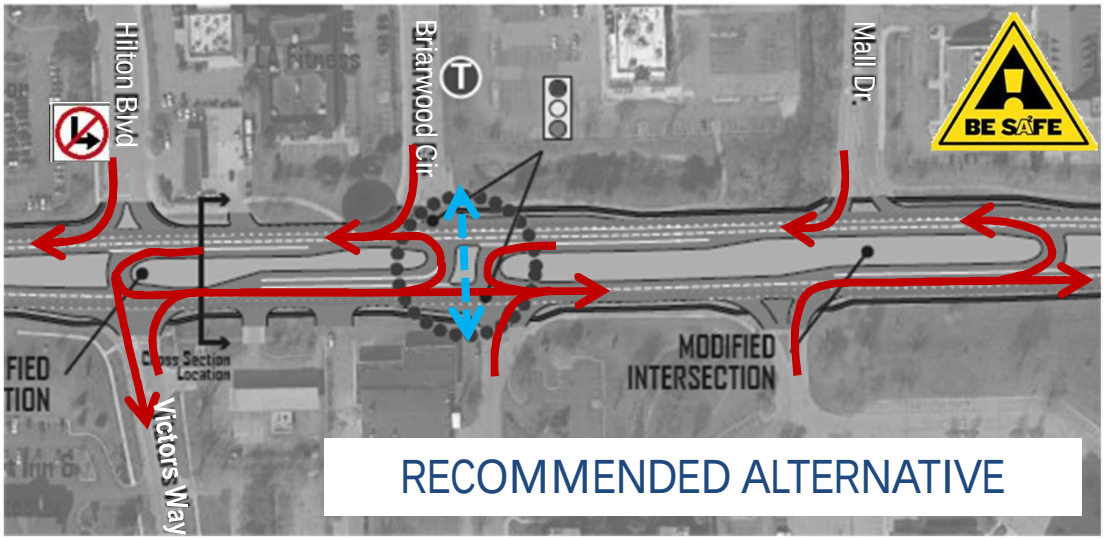
State Street – Recommended Alternative

- Indirect left-turns; accommodates all driveway movements
- Addition of two traffic signals; split direction signals minimize impact on State St.
- New pedestrian crossings:
  - Briarwood Circle
  - Hilton/Victors
  - I-94 WB Ramps
  - Potential for additional mid-block crossing south of Mall Drive



Recommended Alternative Traffic Maneuvers



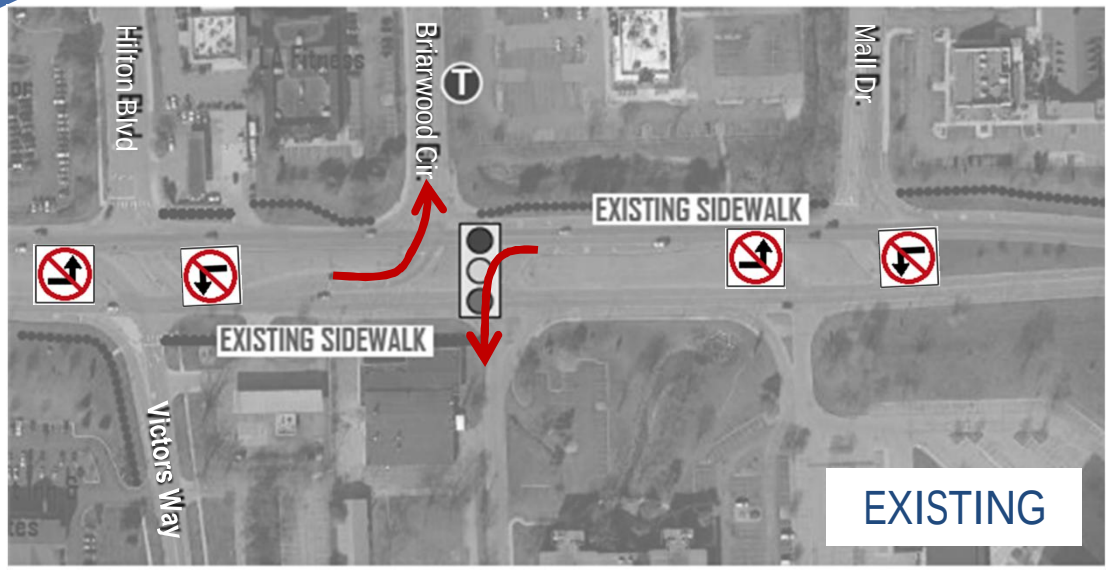


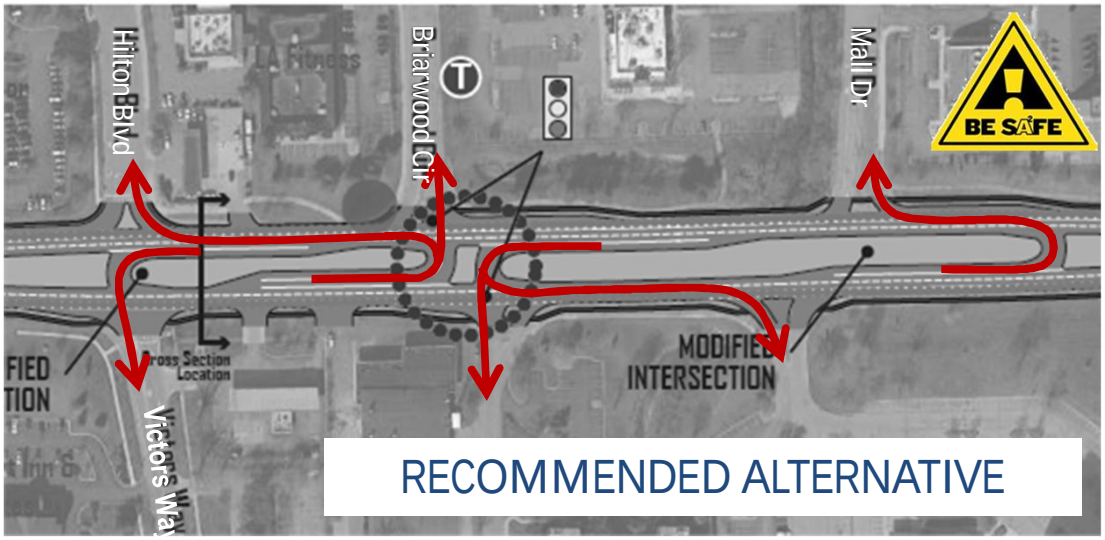
Vehicle turning movement

Pedestrian movement across State St

No Turn Allowed

Recommended Alternative Traffic Maneuvers





Vehicle turning movement

Pedestrian movement across State St

No Turn Allowed

ANIMATION OF RECOMMENDED ALT.

South State Street Corridor

Recommended Alternative: 2040 AM Peak

RECOMMENDED ALTERNATIVE IMPROVEMENTS

Goal	Feature	No-Build Condition	Recommended Alternative
	Bike lanes and sidewalks along full corridor	NO	YES
	Number of pedestrian crossing points	2	8
	Number of left-turns requiring merging or yielding in the median	6	0
	Left-turn access to/from side streets and major driveways between I-94 and Eisenhower (% of possible movements)	50% (6 of 12)	92% (11 of 12)
	Median treatment north of I-94	Paved	Landscaped, with potential to incorporate water absorption/rain garden features
	Total end-to-end peak travel time along State Street *(non-peak will be minimally affected)*		
	AM Northbound	4-5 minutes	5-7 minutes
	PM Southbound	4-5 minutes	4-6 minutes

Vehicle Safety Improvements

Location	5-Year Crashes	Crash Reduction From	Estimated Crash Reduction Potential
State St between I-94 EB and WB Ramps	24	Elimination of left-hand merging movements	90%
State St at Hilton/Victors Way	128	Removing direct left turn, adding signalization	40%
State St at Mall Dr	27	Removing direct left turn, adding signalization	60%

COST ESTIMATE

ITEM	COST
Roadway Removal and Construction	$16,600,000
Bridge Deck Replacement	$4,100,000
Design and Construction Administration	$6,700,000
TOTAL (City Costs)	$27,400,000

Note: preliminary design-level cost estimate, includes 20% contingency.

Next Steps

- Consider public feedback
- Secure funding
- Incorporate in the Transportation Improvement Program (TIP)
- Conduct final design and construction

Share with us your thoughts!

State Street Corridor Study

Recommended Alternative Review

THINK IT UP
JOT IT DOWN

COURTYARD® Marriott®
Make room for a little fun.™

- State St. major entry point to city
  - attractive architecture
  - potential art options
  - high maintenance free landscape

THINK IT UP
JOT IT DOWN

COURTYARD® Marriott®
Make room for a little fun.™

MAINTAINED LANDSCAPING

I 94

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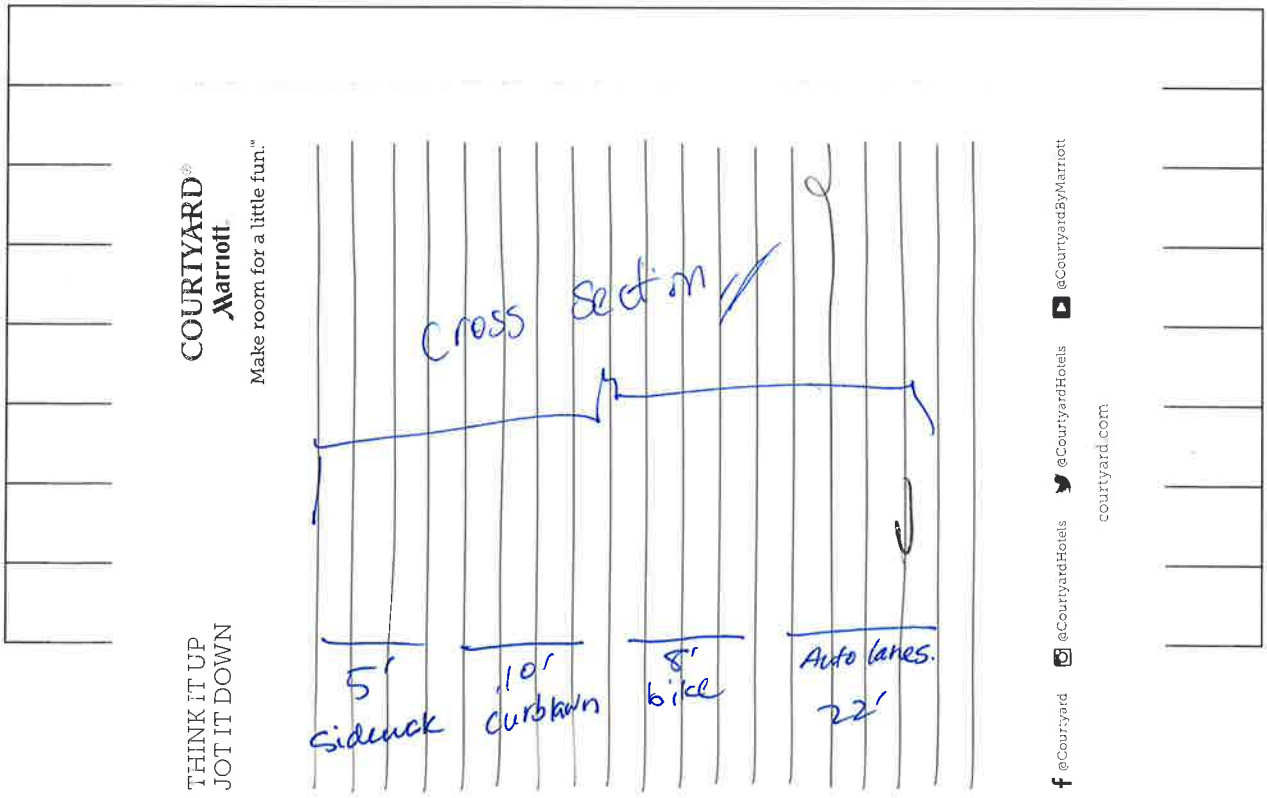
State Street Corridor Study

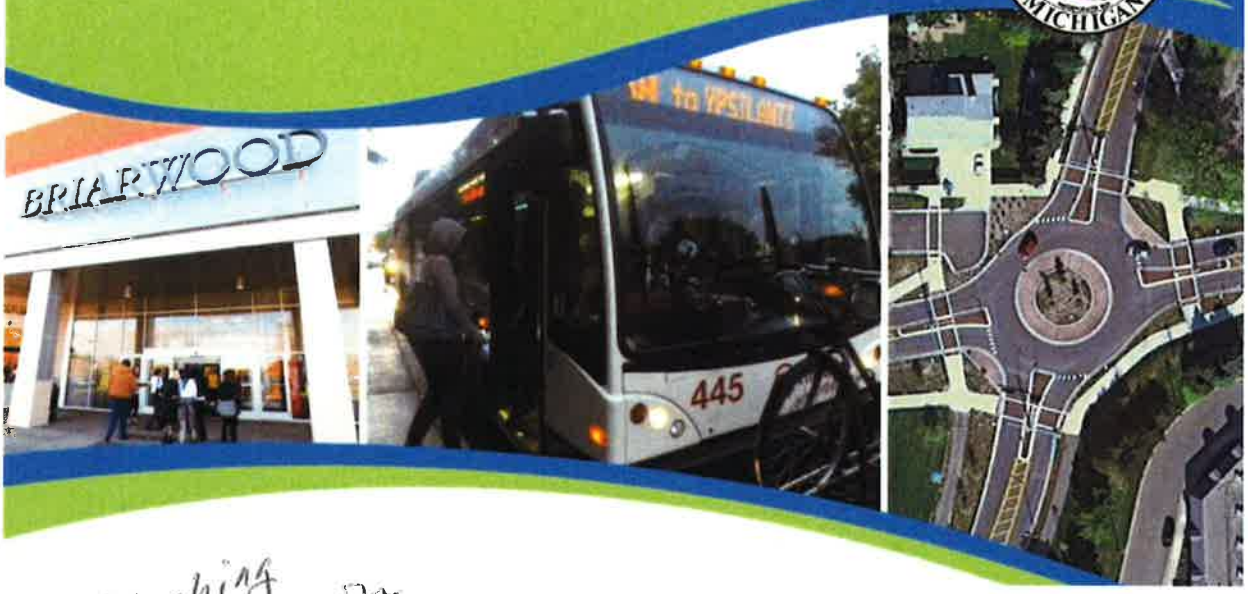
Recommended Alternative Review

Your Comment



State Street Corridor Study

Recommended Alternative Review



flashing beacon

Your Comment

"Hawks" are poor choices for the pedestrian crossings. Regular lights are better.

State Street Corridor Study

Recommended Alternative Review

Your Comment

Vast improvement over existing.
Architectu should be emphasized.

State Street Corridor Study

Recommended Alternative Review

Your Comment

make Airport Drive one way West
trim fir trees and shrubs
sidewalks by S State on west side
ban left turns from State circle
fix pothole by exit near VA Tunnel
get better flow on S State - Ellsworth
roundabouts, too many cars try
to go through at 1 time.

Bus on west circle

Increase right turn cycle rate
for Research Park to north on State
try to divert traffic off of State

State Street Corridor Study

Recommended Alternative Review

Your Comment

(these are already in the S. State St. plan)

Please consider prioritizing pedestrian crosswalks between Oakbrook and Stimson / With the recent addition of the UM South Athletic Campus, as well as the McKinley State St. Village apartments, as well as the hotel to be developed across from the lacross stadium, there is already a need for such crossings, and is only expected to increase.

State Street Corridor Study

Recommended Alternative Review

Your Comment

Session 1

Scott and Eli —

a) thank you, well done!

b) please consider, as "low hanging fruit" eliminating the ashphalt medians at Hilton Blvd and Victors Way - even if it's just a surface that is 1) more attractive and 2) lets storm water through - drain!

again - thank you - looking forward to beginning the project

Jeffrey Archer

State Street Corridor Study

Recommended Alternative Review

Your Comment

- Thank you for revitalizing this project
- Please consider pedestrians crossing at stoplights only on State St.
- Thank you for ruling out alternative #2 w/roundabouts & proposing the blended version
- Thank you for not proposing further road diets
- Scott was a very effective & impartial speaker.

State Street Corridor Study

Recommended Alternative Review

Your Comment

- Need better crossing options at on-ramps
- Left turn movements for bikes are not good. Drivers would not stand for pushing the button two times.
cyclists shouldn't either

State Street Corridor Study

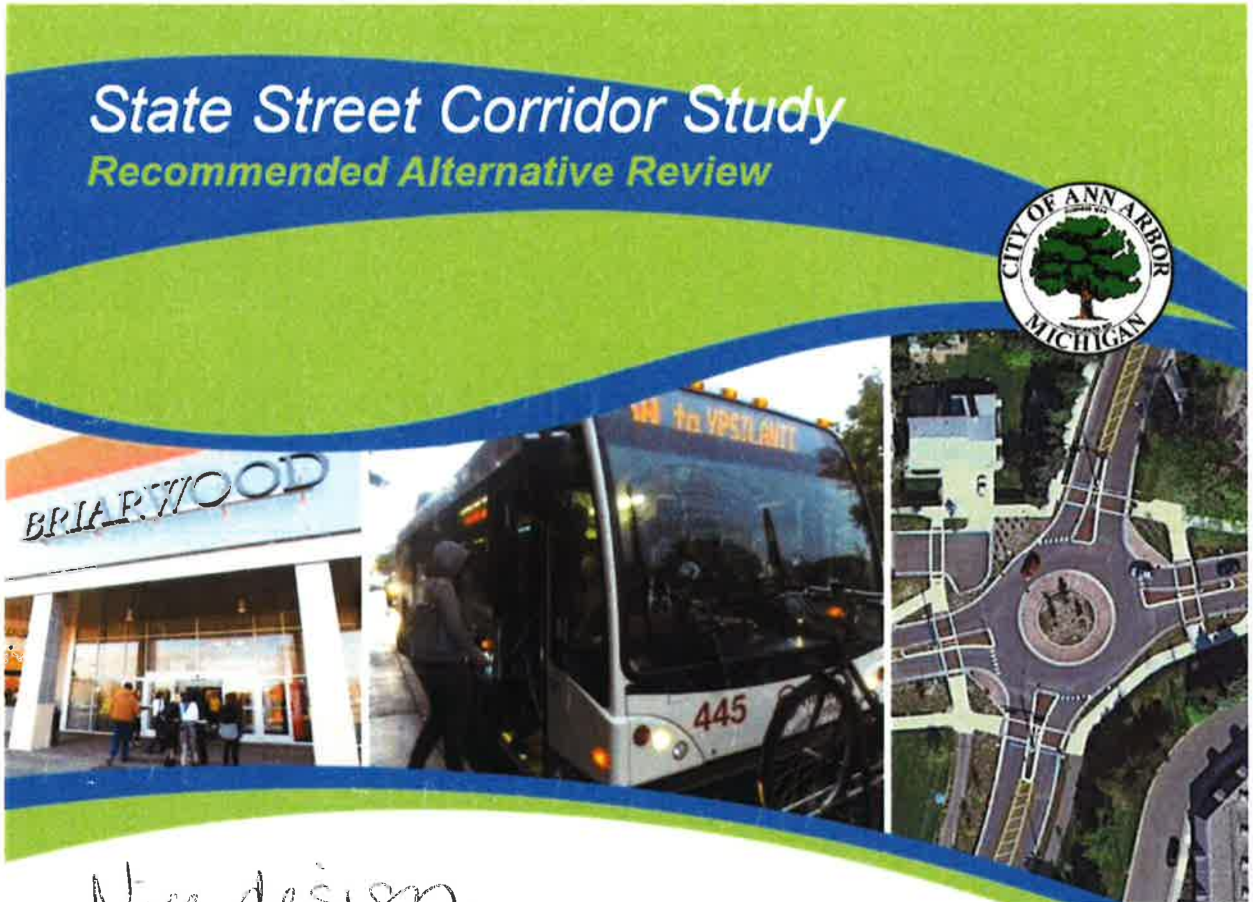
Recommended Alternative Review

Your Comment

(1) bike lanes south of eisenhower will be a big win

(2) im concerned that for a project that's costing $26m you haven't done anything to improve safety for bikes making left turns on + off state street. it's terrible today + this doesn't improve it.

(3) Crossing the on- + off- ramps to I-94 on a bike is a nightmare today. I am disappointed that there are no improvements - the pedestrian sidewalk is safer than today, but not the on street bike path.



Nice design.

3 concerns

Your Comment

(1) Ped. crossings without user activated flashing lights (RRFB) will not be effective. High speeds, many out of town users, confusion, will lead to no one stopping at just a paint crosswalk or rear-end collision if someone stops - and swerve arounds into pe[...]

(2) Bikes in high danger from perpendicular streets b/c people roll out into road over bike lane b/f stopping to look. There are so many of these crossing points in a short area. How will you add signage + paint + such to make it super obvious that cars have to stop back at the sign first. Eg. [⟺ bike Xing] signs. [STOP HERE]

Cont →

(3)

There must be serious, awesome highly designed signs to warn cars of ppl crossing sidewalk on the highway ramp. Just an old fashioned ped crossing sign won't work

Statements were made here about how the city would of course use safety + best practices but we have seen many cases where budget was the deciding factor not safety. Many ideal "tools in the toolbox" are not being used now b/c they cost $. This must be different b/c of extreme speeds, novice users, etc

State Street Corridor Study

Stakeholder Meeting – Recommended Alternative Review

November 2, 2017

Name	Organization	Email Address
J.M. SIMPSON	—	hrtalentmgr@gmail.com
JEFF HAUPTMAN	OXFORD	jeff@oxfordcompanies.com
G. Krapchl	Ward 4	gkrapchl@aol.com
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Vicki Green	—	vkaygreen@sbcglobal.net
PETER HOUK	WBWC	Petehouk@gmail.com
JESS LETAW	ANN ARBOR YIMBY	JLETAW@UMICH.EDU
David & Carol Diephuis	residents	cdiephuis@comcast.net
RON EMANS	Resident	

State Street Corridor Study

Public Meeting – Recommended Alternative Review

November 2, 2017

Name	Organization	Email Address
Diane Giannola	Resident	dgiannola@SBcGlobal.net
Robert Klingler	working area	rmk0850@gmail.com
Leo Ostruszka	Resident & Commute thru Corridor	

State Street Corridor Study

Stakeholder Meeting – Recommended Alternative Review

November 2, 2017

Name	Organization	Email Address
Richard Brown	Sierra Club	dickbrown27@hotmail.com

SOUTH STATE STREET CORRIDOR STUDY

Traffic Analysis Technical Report

Prepared for:
City of Ann Arbor, Michigan

Prepared by:
WSP

Table of Contents

Table of Figures

List of Tables

1 Background

The purpose of this report is to detail the methodology and findings of the traffic analysis for the South State Street Corridor transportation project within Ann Arbor, Michigan. As part of this project, traffic conditions along State Street were analyzed between Ellsworth Road and Oakbrook Drive. There are two municipalities included in the project, which include the City of Ann Arbor and Pittsfield Township. Washtenaw County and the Michigan Department of Transportation (MDOT) are also among the project partners. This report summarizes the existing traffic conditions along the corridor as well as a future year (2035) conditions and the development of a preferred alternative to address the existing and future needs of the corridor.

2 Existing Operations Analysis

This chapter details the analysis of the existing roadway network and presents the existing intersection performance, which will provide a baseline from which to understand the impact of different design alternatives in subsequent chapters.

2.1 Study Area

The geographic limits of the modeling efforts include nine primary study intersections along State Street between Ellsworth Road to Oakbrook Drive. The following is a complete list of intersections analyzed in the study area from north to south (see Figure 1).

1. State Street and Oakbrook Drive
2. State Street and Eisenhower Parkway
3. State Street and Mall Drive / Wolverine Tower
4. State Street and Briarwood Circle / Waterworks Plaza
5. State Street and Hilton Boulevard / Victors Way
6. State Street and I-94 WB Exit
7. State Street and I-94 EB Exit
8. State Street and Airport Boulevard
9. State Street and Ellsworth Road

Figure 1: Study Intersections

2.2 Data Collection

This section describes the data collected for the study including traffic counts, speed limits, intersection geometries, existing signal timings, and crash data.

2.2.1 Intersection geometry, speed limits, signal timings

Intersection geometry, speed limits, and signal timings were obtained from Synchro models provided by MDOT and verified through field survey. Generally, State Street is four lanes, with two lanes in each direction. There is a raised median from Ellsworth Road to Airport Boulevard and from I-94 EB Exit to Eisenhower Parkway. The geometry at each of the primary study intersections vary and are described below. The speed limit along State Street within the study corridor is 35 miles per hour (mph).

Oakbrook Drive – Northbound State Street has one through lane and one through/right-turn only lane. Southbound State Street has two though lanes and one southbound left-turn-only lane at the intersection. The left-turn only lane is a two-way-left-turn-lane (TWLTL). Oakbrook Drive at State Street has one right-turn-only lane and one left-turn-only lane at the intersection for the westbound approach. The left-turn lane is approximately 200 feet in length. The signal operates with a shared northbound/southbound though movement with a permissive southbound left-turn movement. The westbound approach is an actuated right and left-turn movement.

Eisenhower Parkway – State Street at Eisenhower Parkway has two through lanes and one right-turn-only lane in both directions. Southbound State Street also has a bike lane between the through and right-turn only lane. The northbound right-turn lane is a continuous lane while the southbound right-turn lane is approximately 340 feet. Eastbound Eisenhower Parkway has two through lanes and one right-turn-only lane and one left-turn-only lane at this intersection. The left-turn and right-turn lanes extend approximately 300 feet. Westbound Eisenhower Parkway has one through lane and one through/right-turn-only lane and two left-turn-only lanes. The westbound left-turn lanes extend approximately 300 feet. The signal operates with a northbound / southbound phase, next is the leading eastbound and westbound left-turn movement followed by the eastbound / westbound through movement. Northbound and southbound right-turn movements overlap with the left-turn movement.

Mall Drive **/ Wolverine Tower**– Southbound and northbound State Street have two through lanes and one continuous right-turn-only lane. Eastbound Mall Drive and westbound Wolverine Tower have one through/right-turn-only lane and one right-turn-only lanes. The eastbound and westbound approaches are stop-controlled while southbound and northbound are free-flowing.

Briarwood Circle / Waterworks Plaza – Southbound State Street has two through lanes and one right-turn-only lane. The southbound right-turn lane extends approximately 175 feet. Eastbound Briarwood Circle has one right-turn-only lane. The westbound approach consists of two left-turn-only lanes from northbound State Street. The left-turn lanes extend approximately 180 feet. The signal operates with a southbound through phase then a westbound through phase. The eastbound right-turn movement is stop-controlled and not controlled by the signal.

At Waterworks Plaza, northbound State Street has two through lanes and one right-turn-only lane. The northbound right-turn lane extends approximately 160 feet. Westbound Waterworks Plaza has one

right-turn-only lane. The eastbound approach consists of one U-turn lane and one left-turn-only lane from southbound State Street. The left-turn lane extends approximately 230 feet. Westbound Waterworks Plaza and the eastbound cross-over traffic are stop-controlled. Northbound State Street is free-flowing.

Hilton Boulevard / Victors Way – Northbound and southbound State Street each have two through lanes and one right-turn-only lane. Both right-turn lanes extend approximately 100 feet. Eastbound Hilton Boulevard has one through lane and two right-turn-only lanes. The through lane has a storage length of approximately 100 feet. Westbound Victors Way has one through/right-turn-only lane and one through lane. The through lane extends approximately 180 feet. Hilton Boulevard and Victors Way are stop-controlled while State Street is free-flow.

Westbound I-94 Exit – Northbound State Street has two through lanes. Westbound I-94 Exit has two right-turn-only lanes and one left-turn-only lane. The right-turn lanes extend approximately 625 feet down the exit ramp. The signal operates with a northbound phase followed by the westbound phase.

Eastbound I-94 Exit – Southbound State Street has two through lanes. Eastbound I-94 Exit has one right-turn-only lane and one left-turn-only lane. The right-turn lanes extend approximately 380 feet down the exit ramp. The signal operates with a southbound phase followed by the eastbound phase.

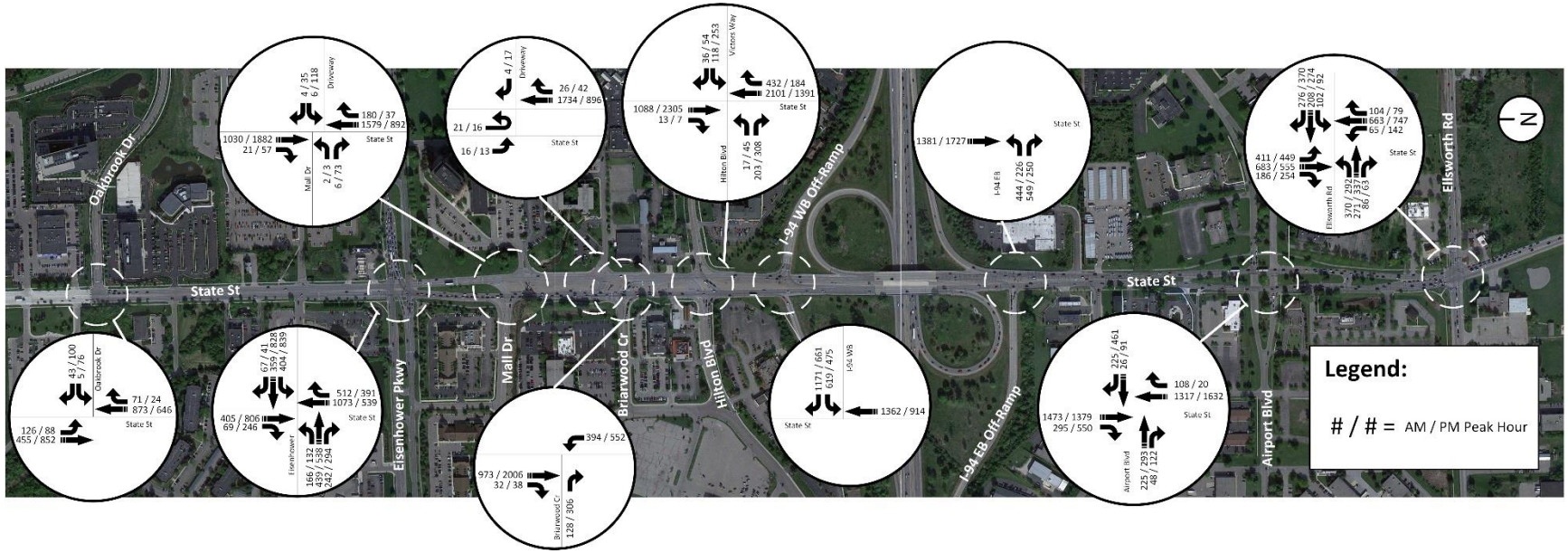
Airport Boulevard – Northbound and southbound State Street have two through lanes and one right-turn-only lane. Eastbound Airport Boulevard has two through lanes and one right-turn-only lane. Westbound Airport Boulevard has one through lane and two right-turn-only lanes. The signal operates with a northbound / southbound phase followed by an eastbound / westbound phase. There are no direct left-turns allowed at this intersection.

Ellsworth Road – Southbound State Street has one through/left-turn-only lane, one through lane, and one by-pass right-turn-only lane. Northbound State Street has one through/left-turn only lane and one through/right-turn-only lane. Eastbound and westbound Ellsworth Road each have one through/left-turn-only lane and one through/right-turn-only lane. This intersection is a roundabout with two circulating lanes. Each approach is yield controlled.

2.2.2 Vehicle Counts

Existing AM and PM peak hour traffic volumes were collected in the field in the month of October, 2014. Figure 2 illustrates the existing AM and PM peak hour volumes.

Figure 2: Existing Traffic Volumes



2.2.3 Pedestrian and Bicycle Counts

Existing AM and PM peak hour pedestrian and bicycle volumes were collected in the field in the month of October, 2014. Figure 3 thru 5 illustrates the existing AM and PM peak hour volumes.

Figure 3: Existing Pedestrian Peak Hour Volumes

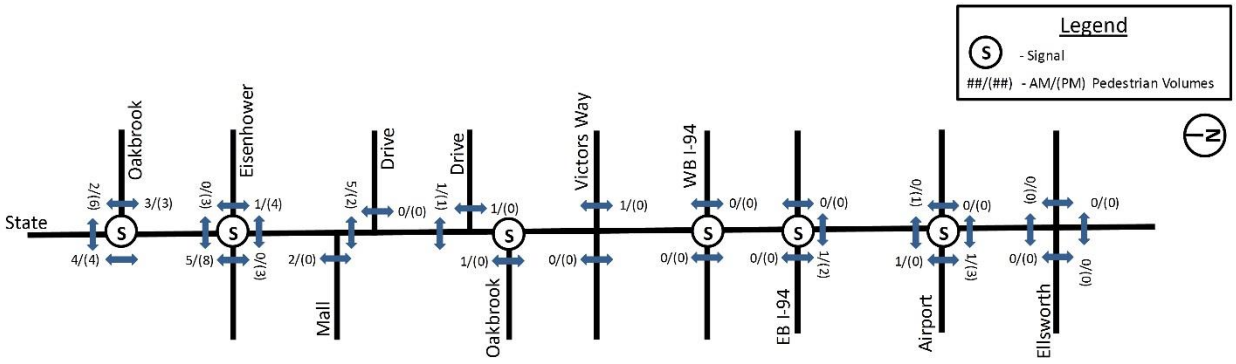


Figure 4: Existing Bicycle Peak Hour Volumes on Sidewalk

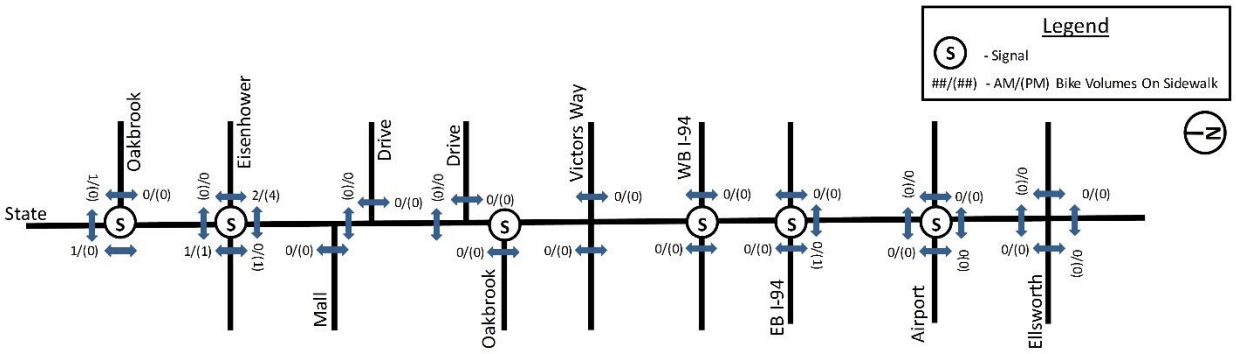
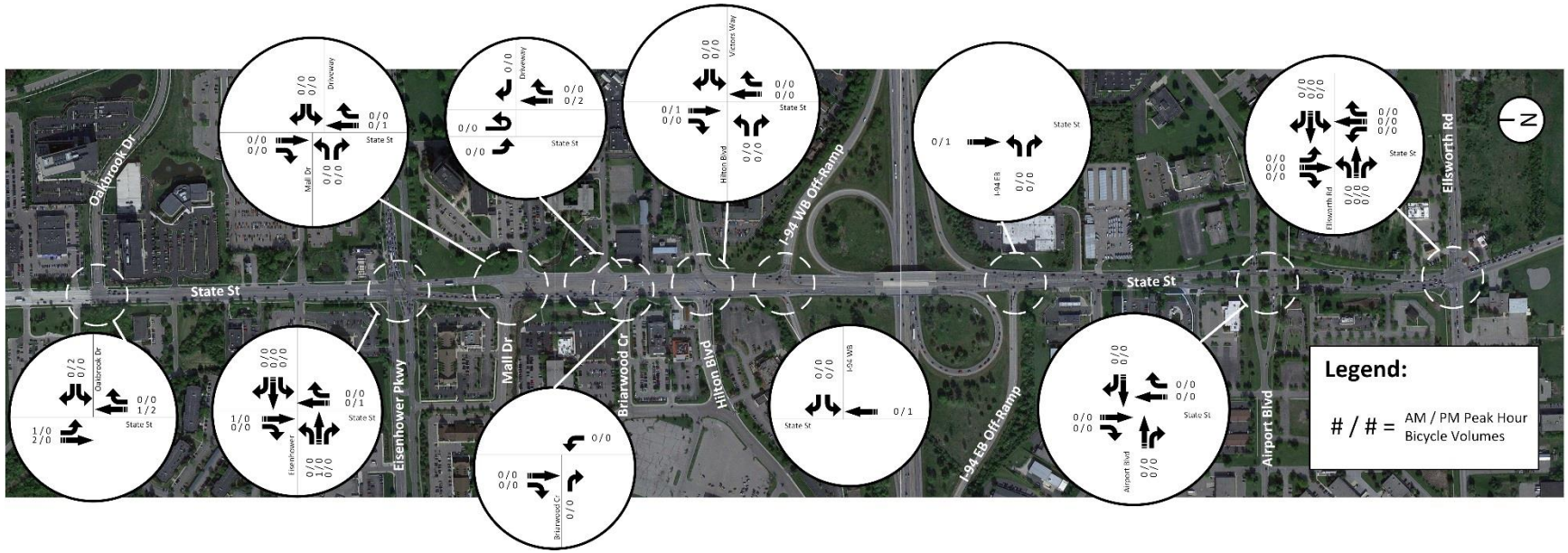


Figure 5: Existing Bicycle Peak Hour Volumes on Roadway



2.2.4 Bus Transit

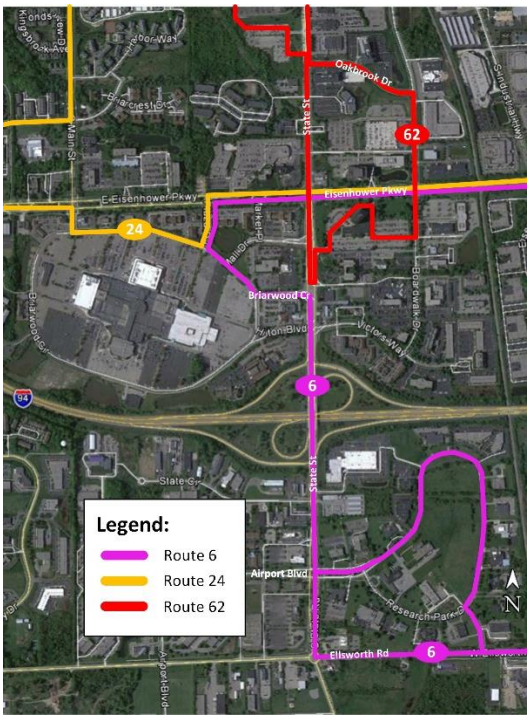
Bus transit data, including routes and schedule, was obtained from the website of the Ann Arbor Area Transportation Authority (www.theride.org). The following routes operated along State Street at the time of the analysis:

AAATA Route 6 – Ellsworth: This route is one of highest ridership routes for AAATA and runs from Ypsilanti to downtown Ann Arbor. Within the study area, Route 6 stays along State Street between Ellsworth and Briarwood Circle. Headways for this route are every 30 minutes.

AAATA Route 24 – South Main – East: This route services downtown Ann Arbor, south Main Street, Briarwood Mall and St. Joseph Hospital / Washtenaw Community College. This route crosses State Street while on Eisenhower Parkway. Headways for this route are every 30 minutes.

AAATA Route 62 – Wolverine Tower Shuttle: This route services Wolverine Tower and two park and ride lots from State Street. The route is along State Street between Oakbrook Drive and Mall Drive. Headways for this route are every 10 minutes. Figure 6 illustrates the bus routes within the study area.

Figure 6: Transit Routes



2.2.5 Crash Data

Crash data was obtained from the website *http://www.michigantrafficcrashfacts.org* for crashes along State Street between Ellsworth Road and Oakbrook Drive. Each study intersection was analyzed with a 150-foot radius. The time period for the analysis was 60 months (5 years) from January 1, 2009 to December 31, 2013.

2.3 Operations Analysis

2.3.1 Methodology

2.3.1.1 Preliminary Alternative Screening

Software/Analysis Tools

A model of each of each of the preliminary alternatives for each of the two analysis periods was prepared using Synchro/SimTraffic version 8.0 (Synchro). Synchro, developed by Trafficware, Inc., is a traffic capacity analysis software package capable of quickly modeling and optimizing traffic signal timings. Synchro optimizes splits, cycle lengths, and offsets, seeking to reduce stops and delays. Program features allow for complex and non-standard phasing, multiple intersections sharing a single controller, and analysis of closely-spaced intersections.

SimTraffic is the simulation component of the Synchro/SimTraffic software package. It is designed to simulate the models created in Synchro. The primary purpose of SimTraffic is to check and fine-tune traffic signal operations and to serve as a calibration tool for the validation of the Synchro model. When using the SimTraffic simulation model, it is important to carry out a calibration and validation process to assure that the model is replicating field conditions as closely as possible. Calibration involves adjustment of various driver behavior parameters such as vehicle headways, familiarity with paths, lane change and assignment, spillback potential and others. Validation involves comparison of the calibrated model output with real-world data, such as volume counts, queuing, travel time, delay, and flow density. Calibration continues until the model is successfully validated based on the data chosen.

In the alternatives that included roundabouts, the delay was calculated using Sidra version 6.0. Sidra, developed by Sidra Solutions, is a traffic capacity analysis software package capable of quickly modeling intersection capacity and level of service. Sidra is a micro-analytical evaluation tool that employs lane-by-lane and vehicle drive cycle models. This analysis methodology allows it be an excellent tool for evaluating a multitude of roundabout designs.

Intersection Measures of Effectiveness

In order to understand current performance of the roadway network on an intersection-by-intersection basis, an intersection capacity analysis was conducted for existing conditions during all two evaluation periods. Intersection capacity analysis is the traditional form of measuring operational performance, as intersections control the flow of most roadways. Intersection capacity is a function of a calculated delay experienced by the average vehicle due to the intersection control. Intersection delay can then be equated to level of service, which is an intuitive scale of “grades” from A to F that measure how a roadway is operating. The level of service is defined in terms of delay, and is a measure of driver discomfort, frustration, and lost travel time.

Network-Wide Measures of Effectiveness

In addition to examining intersection statistics, it is useful to evaluate network-wide statistics in some cases to determine relative benefits of enhanced intersection timing for the network as a whole. For

instance, while the benefits of improved corridor progression might not be accurately reflected in values of intersection delay, both Synchro and SimTraffic provide statistics, such as average speeds, total stops, total travel time, and total delay, that can be used to comparatively evaluate alternatives. While these statistics are typically of little use as stand-alone values, they provide a way to compare overall network performance amongst different alternatives (such as before and after scenarios).

Travel time to travel the length of State Street was estimated from Synchro and Sidra to compare the existing and preliminary alternatives. Travel time comparison provides a useful point of comparison between alternatives with varying traffic control schemes that intersection LOS in not able to fully capture.

2.3.1.2 Recommended Alternative

VISSIM 7.00-06 software was used for the traffic operations analysis of the existing, future no-build condition and the recommended alternative. VISSIM is a microsimulation model where traffic movements are explicitly modeled based on geometric parameters, traffic volumes, vehicle types, intersection control, and driver behavior and interaction. VISSIM assesses the roadway network in a dynamic fashion, instead of analyzing each intersection or each roadway segment in isolation. VISSIM can provide measures of effectiveness (MOEs) such as vehicle delay, travel time, queuing, and fuel consumption on a network-wide basis, so that the effects of improvements at a single location may be measured throughout the network. This ability makes VISSIM an ideal tool for testing and comparing alternatives to determine the most effective combination of elements in facilitating traffic flow. In addition, the sensitivity of the VISSIM model allows the user to test more subtle changes to the roadway system, such as adjustments in traffic signalization, changes in transit operations, laneage, and others. The assumptions that went into developing the microsimulation model are as follows:

Vehicle Fleet Composition: The vehicle fleet composition (cars versus heavy vehicles) was made up of 98-percent cars / 2-percent trucks for AM and 99 percent cars / 1 percent trucks for PM based on the traffic count data. The makeup of the vehicle fleet for both the passenger cars and commercial vehicle classes in VISSIM were set to the default North American vehicle models and distributions, as issued by the VISSIM software vendor PTV Americas in January 2010.

Driver Behavior: The default VISSIM driver behavior parameters were left in place and unadjusted everywhere except the roundabout at Ellsworth. The Wiedemann 74 car-following model defaults were utilized which are specifically oriented towards urban surface street driving parameters, versus the Wiedemann 99-car following model that is specifically oriented towards freeway driving and is the other car following model supported within VISSIM. Wiedemann's traffic flow model is based on the assumption that there are basically four different driving states for a driver, stated as follows.

Free driving: No influence of preceding vehicles can be observed. In this state, the driver seeks to reach and maintain his desired speed. In reality, the speed in free driving will vary due to imperfect throttle control. It will always oscillate around the desired speed.

Approaching: Process of the driver adapting his speed to the lower speed of a preceding vehicle. While approaching, the driver decelerates, so that there is no difference in speed once he reaches the desired safety distance.

Following: The driver follows the preceding car without consciously decelerating or accelerating. He keeps the safety distance more or less constant. However, again due to imperfect throttle control, the difference in speed oscillates around zero.

Braking: Driver applies medium to high deceleration rates if distance to the preceding falls below the desired safety distance. This can happen if the driver of the preceding vehicle abruptly changes his speed or the driver of a third vehicle changes lanes to squeeze in between two vehicles.

The driver behavior inside the roundabout was adjusted to make vehicles more aggressive by lowering safety distances to allow vehicles to accept smaller gaps in the traffic stream based on field observation.

Seed Interval: A seed interval is the amount of time the model is run in advance of summarizing measures of effectiveness (MOEs) in order to load the network and reach a state of equilibrium flow (vehicles in = vehicles out). A 900-second (15-minute) seed interval was used for both the AM and PM peak hour models. This ensures that the appropriate level of traffic is on the roadway network at the time the measures of effectiveness begin recording in the model.

Model Validation: For this project, volume served was chosen as the primary validation measure. A comparison of the traffic count data and the VISSIM volume served was conducted to assure that actual volume levels observed in the field were being replicated by the VISSIM model. The greater of +/-10-percent or +/-20 vehicles was considered a reasonable threshold for model validation. The queue length report was also reviewed to ensure that queuing and delays were consistent with what was witnessed during the field reviews.

Transit: All transit routes through the study area were coded into the VISSIM models with appropriate headways and stop locations. Dwell time for transit stops was assumed to be 20-seconds with a 2-second standard deviation.

Measure of Effectiveness Summaries: VISSIM is capable of reporting several MOEs. For the purposes of this analysis, delay and level of service were recorded for each intersection (approach, movement, and overall). Queue lengths (average and 95th-percentile) were summarized for each signalized intersection along State Street. Each time the model is run, these MOEs are summarized and can vary based on the random number seed utilized. Since the MOEs vary slightly with different random number seeds, much like how traffic can vary day by day, the VISSIM models were run a total of ten times (ten different random number seeds) and then the MOEs were averaged. Tables 1 and 2 display the level of service (LOS) criteria for signalized and unsignalized intersections, respectively.

Table 1: Level of Service Definitions for Signalized Intersections

Level-of-Service	Description	Average Control Delay Per Vehicle (seconds)
A	Operations with very low control delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low control delay occurring with good progression and/or short cycle lengths.	> 10.0 and ≤ 20.0
C	Operations with average control delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 and ≤ 35.0
D	Operations with longer control delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 and ≤ 55.0
E	Operations with high control delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered the limit of acceptable delay.	> 55.0 and ≤ 80.0
F	Operation with control delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: 2010 Highway Capacity Manual

Table 2: Level of Service Definitions for Unsignalized Intersections

Level-of-Service	Description	Average Control Delay Per Vehicle (seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delays.	> 10.0 and ≤ 15.0
C	Average traffic delays.	> 15.0 and ≤ 25.0
D	Long traffic delays.	> 25.0 and ≤35.0
E	Very long traffic delays.	> 35.0 and ≤ 50.0
F	Demand exceeds capacity resulting in extreme delays and queuing.	> 50.0

Source: 2010 Highway Capacity Manual

2.3.2 Delay and Level of Service Results

The following section summarizes the various MOE results obtained from the AM and PM peak hour microsimulation models for all intersections in the study area. Table 3 summarizes the approach and intersection delay and levels of service for each of the study intersections.

Table 3: Existing AM and PM Peak Hour Delay and Levels of Service

Intersection	Eastbound*	Westbound*	Northbound*	Southbound*	Total*
AM Peak Hour					
Oakbrook	N/A	11.7 / B	2.9 / A	3.2 / A	3.3 / A
Eisenhower	31.8 / C	35.1 / D	27.2 / C	21.1 / C	29.2 / C
Mall/Wolverine[1]	7.9 / A	7.9 / A	N/A	N/A	7.9 / A
Waterworks[1]	18.2 / C	6.7 / A	N/A	N/A	17.2 / C
Briarwood	11.2 /B	18.9 / B	N/A	8.2 / A	11.1 / B
Hilton/Victors Way[1]	9.1 / A	31.3 / D	N/A	N/A	18.3 / C
I-94 WB Off Ramp	N/A	34.1 / C	15.2 / B	N/A	25.8 / C
I-94 EB Off Ramp	28.9 / C	N/A	N/A	10.9 / B	18.5 / B
Airport	**67.3 / E**	**64.4 / E**	5.9 / A	7.6 / A	15.4 / B
Ellsworth[1]	24.1 / C	29.2 / D	24.9 / C	8.5 / A	19.4 / C
PM Peak Hour					
Oakbrook	N/A	18.6 / B	6.1 / A	5.0 / A	6.8 / A
Eisenhower	**57.0 / E**	**66.1 / E**	24.6 / C	31.5 / C	48.0 / D
Mall/Wolverine[1]	16.8 / C	10.9 / B	N/A	N/A	12.8 / B
Waterworks[1]	13.9 / B	6.2 / A	N/A	N/A	11.2 / B
Briarwood	**131.6 / F**	28.0 / C	N/A	16.3 / B	30.4 / C
Hilton/Victors Way[1]	21.4 / C	**520.5 / F**	N/A	N/A	**227.5 / F**
I-94 WB Off Ramp	N/A	30.6 / C	17.5 / B	N/A	24.7 / C
I-94 EB Off Ramp	36.2 / D	N/A	N/A	6.5 / A	12.9 / B
Airport	33.4 / C	24.1 / C	26.5 / C	29.8 / C	28.2 / C
Ellsworth[1]	23.2 / C	**54.1 / F**	**46.1 / E**	14.0 / B	32.1 / D

** Delay (seconds per vehicle) / Level of Service*

[1] Unsignalized intersection

In urban areas, LOS A through D is typically considered acceptable. As shown in the table, all of the signalized locations operate at an overall level of service (LOS) D or better with the exception of Victors Way, which is stop-controlled and operating at a LOS F during the PM peak hour.

The intersection of Eisenhower Parkway and State Street has failing east and west approaches during the PM peak hour. Both eastbound and westbound Eisenhower operate at LOS E during the PM peak hour.

The intersection of Airport Boulevard and State Street has failing east and west approaches. In the AM peak hour both approaches are operating at LOS E. This is most likely due to large cycle lengths and the majority of green time is being given to the north/south movements.

In the PM peak, eastbound Briarwood is experiencing a LOS F. This is due to the increased traffic to and from the Briarwood Mall. Also, during the PM peak the westbound traffic on Victors Way is experiencing large delays. This is due to the large amount of conflicting traffic and the two-stage left-turning movement vehicles must navigate.

The intersection of Ellsworth and State Street is operating at an overall LOS D during the PM peak hour. This is due to the large delays on the westbound and northbound approaches. This delay is occurring due to large traffic volumes and the small number of acceptable gaps in the circulating lane.

2.4 Crash Analysis

A crash analysis was performed to determine whether any discernable crash patterns could be identified in the study area.

2.4.1 Crash Definitions

The crash summaries define crashes by six types and four injury severity classifications. The definitions of the crash types are taken directly from the State of Michigan *UD-10 Traffic Crash Report Manual,* revised in 2016. The manual was produced and distributed by the Michigan Department of State Police, and the Office of Highway Safety Planning. The crash types are based on the intended direction of travel, regardless of point(s) of impact or direction vehicles ultimately face after the crash.

- Single Motor Vehicle: A single or multiple unit crash which involves only one motor vehicle as defined in the manual. This includes those cases in which a motor vehicle was: 1) the only traffic unit; and 2) the only motor vehicle involved in a collision with a bicyclist, pedestrian, animal, railroad train, or any other non-motorized object. Any motorized (i.e., self-propelled) vehicle or device is considered a “motor vehicle” even though the vehicle or device may not be defined as a motor vehicle on the Michigan Motor Vehicle Code or other applicable legislation.
- Head On: The intended direction of travel of both vehicles must be towards each other. The directions that the vehicles are facing when they come to rest, or the points of impact on the vehicles, are not the determining factors.
- Head On Left Turn: When two vehicles are approaching head on and at least one is attempting to turn left.

- Angle: This will be marked when the intended direction of travel is basically perpendicular for both drivers and there is a side impact of approximately 90 degrees. If the side impact takes place during a "Head On-Left Turn," "Rear-end-Left Turn," or "Rear-end-Right Turn," it is not an "Angle".
- Rear-end: When the vehicles are traveling in the same direction with one behind the other. Area of damage on the vehicles is not the determining factor. Any crash involving any vehicle backing into another is not considered a "rear-end" crash.
- Sideswipe: Vehicles traveling in the same direction, or vehicles traveling in opposite directions, making side contact or if a vehicle spins out of control and makes contact with another vehicle traveling in the same direction. "Sideswipe" differs from "Angle" in that a sideswipe is a glancing impact and should not in itself stop the forward movement of the vehicle. An angle crash is a more direct impact and may stop the forward movement of one vehicle.
- Other/Unknown: The crash does not fit in one of the other selections.

The definitions of the injury severity classification are taken directly from the State of Michigan *UD-10 Traffic Crash Report Manual*, revised 2016.

- Fatal Injury (K): Any injury that results in death due to a motor vehicle traffic crash.
- Incapacitating Injury (A): Any injury, other than fatal, which prevents the injured person from walking, driving, or normally continuing the activities which he or she was capable of performing prior to the motor vehicle traffic crash.
- Non-incapacitating Evident Injury (B): Any injury, other than fatal and incapacitating, which is evident at the scene of the crash.
- Possible Injury (C): Any injury reported or claimed which is not a fatal, incapacitating, or non-incapacitating evident injury.

2.4.2 Intersection Crash Summaries

This section summarizes the crash data collected for each of the study intersections during the five-year analysis period.

Table 4 summarizes the total number of crashes at each study intersection for the analysis period. Crash frequency per year and crash rate per million entering vehicles were calculated and compared to the Southeast Michigan Council of Governments (SEMCOG) critical frequency and crash rate. The 95% confidence critical spot crash rate was calculated for each intersection. The crash rate normalizes crash frequency based on exposure (number of vehicles traversing the intersection). The ADT used for the crash rate calculations was obtained from the 24-hour approach counts available on the SEMCOG website. Intersections that have crash frequency and/or crash rate higher than critical values are highlighted in red.

Table 4: Intersection Crash Analysis

Intersection	# Crashes						Crash Frequency	ADT	Crash Rate*	Fatal	Injury	Pedestrian	Bicycle	Crash Type							
	2013	2012	2011	2010	2009	Total Crashes								Single Vehicle	Head-on	Head-on/Left Turn	Angle	Rear-end	Sideswipe Same	Sideswipe Opposite	Other
State at Oakbrook	6	1	3	0	3	13	2.6	22,490	0.3	0	0	0	0	1	0	1	3	7	0	1	0
State at Eisenhower	30	24	23	23	19	119	23.8	59,580	1.1	0	17	1	0	3	0	2	33	56	22	0	3
State at Mall Drive	6	5	5	5	6	27	5.4	37,500	0.39	0	5	0	0	1	0	0	15	9	2	0	0
State at Briarwood	7	10	10	13	11	51	10.2	45,080	0.6	0	5	0	0	0	0	0	6	35	9	1	0
State at Hilton	27	21	29	35	16	128	25.6	47,550	1.48	0	11	1	0	3	0	1	31	69	21	0	3
State at I-94 WB Exit	6	5	10	10	14	45	9.0	50,010	0.5	0	6	0	0	2	1	0	1	36	4	0	1
State at I-94 EB Exit	3	8	9	3	7	30	6.0	41,610	0.4	0	4	0	0	4	0	0	1	17	6	0	2
State at Airport Blvd	25	31	15	13	5	89	17.8	32,800	1.5	0	13	0	0	2	0	1	29	30	24	0	3
State at Ellsworth	62	16	15	17	18	128	25.6	48,610	1.4	0	15	0	0	6	0	0	39	58	21	2	2

** Crash Rate is the average number of crashes per million entering vehicles*

T

The four intersections shown in red above had a crash rate higher than their corresponding critical crash rate. The State Street and Hilton Blvd/Victors Way intersection is the only location to fail both the frequency and rate tests. These four intersections are described in more detail in the following.

State Street and Mall Drive - There were a total of 27 crashes in the 60 months at this location. The critical crash rate for this location was .36 when compared to its rate of .39. The predominant crash types were angle (7) and rear-ends (9). These may be result of congestion (stop-and-go traffic) at the intersection as well as the unprotected left turn movement for the east bound and westbound approaches.

State Street and Hilton Boulevard/Victors Way - There were a total of 128 crashes in the 60 months at this location. The crash rate and frequency for this location is respectively .39 and 25.6 when compared to its critical values of .33 and 8.8. The predominant crash types were rear-ends (68), angle (31), and sideswipe-same (21). These may be result of congestion (stop-and-go traffic) at the intersection as well as the dual left-turn lanes in the median for the eastbound and westbound approaches. The large westbound left turn movement coupled with two-way stop control seems to be contributing to the large angle crashes at this location.

State Street and Airport Boulevard - There were a total of 89 crashes in 60 months at this location. The critical crash rate for this location was 1.2 when compared to its rate of 1.5. The predominant crash types were rear-ends (30), angle (29), and sideswipe-same (24). These may be result of congestion (stop-and-go traffic) at the intersection as well as the dual right-turn lanes for the eastbound approach. Of the 89 crashes, 56 of the crashes occurred in 2012 and 2013. The increased crash rate is correlated to the increased traffic generated by the new Costco built on Airport Blvd.

State Street and Ellsworth Road - There were a total of 128 crashes in 60 months at this location. The critical crash rate for this location was 1.28 when compared to its rate of 1.4. The predominant crash types were rear-ends (58), angle (39), and sideswipe-same (21). Of the 128 crashes, 62 occurred in the year 2013. October 4th, 2013 this intersection was converted from a signalized intersection to a roundabout. In the approximately three months after the conversion in 2013, 42 crashes occurred with 29 of those being angle crashes. It is likely that the some of the 29 angle crashes were incorrectly categorized and are sideswipe-same direction crashes. These crashes have a smaller angle of collision and are generally result in less severe injuries. The increase of crashes especially with angle/sideswipe-same crashes is most likely correlated with driver unfamiliarity with roundabout operations.

2.4.3 Segment Crash Summaries

A segment crash analysis was also summarized for each of the study segments along State Street.

Table 5 summarizes the total number of crashes within each of the study segments for the five-year analysis period. Crash frequencies per year and crash rate per million miles traveled per year were calculated. The ADT used for the crash rate calculations was obtained from the 24-hour approach counts available on the SEMCOG website. Segments that have higher crash frequency and/or crash rate are highlighted in red.

Table 5: Segment Crash Analysis

Intersection	Segment Length (Miles)	# Crashes						Crash Frequency	ADT	Crash Rate*	Fatal	Injury	Pedestrian	Bicycle	Crash Type							
		2013	2012	2011	2010	2009	Total Crashes								Single Vehicle	Head-on	Head-on/Left Turn	Angle	Rear-end	Sideswipe Same	Sideswipe Opposite	Other
Ellsworth to Airport	0.18	5	3	2	6	4	20	4.0	32,200	1.9	0	2	0	0	1	0	0	2	13	4	0	0
Airport to I-94 EB	0.24	9	10	6	11	8	44	8.8	34,100	3.0	0	7	1	0	2	1	1	15	18	6	0	1
I-94 EB to I-94 WB	0.22	22	28	18	6	9	83	16.6	35,200	6.0	0	12	0	0	3	1	0	8	53	16	0	2
I-94 WB to Hilton	0.08	0	0	1	0	0	1	0.2	46,600	0.15	0	0	0	0	0	0	0	0	1	0	0	0
Hilton to Briarwood	0.08	0	1	0	0	1	2	0.4	46,600	0.29	0	1	0	0	0	0	0	1	0	1	0	0
Briarwood to Mall	0.11	0	3	1	2	2	8	1.6	46,600	0.86	0	1	0	0	0	0	0	3	4	1	0	0
Mall to Eisenhower	0.1	0	2	3	1	0	6	1.2	46,600	0.71	0	1	0	0	0	0	0	1	3	2	0	0
Eisenhower to Oakbrook	0.29	6	4	5	3	4	22	4.4	20,700	2.0	0	2	0	1	2	0	0	7	9	4	0	0

** Crash Rate is number of crashes per million vehicles*

The segment shown in red above have been identified as a dangerous location. State Street from I-94 EB exit to I-94 WB exit had a crash rate higher than the corresponding critical value. This segment are described in more detail in the following.

State Street: I-94 EB Exit to I-94 WB Exit- There was a total of 83 crashes in 60 months at this location. The critical crash rate for this segment was 4.99 when compared to its rate of 6.0. The predominant crash types were rear-ends (53) and sideswipe same direction (16). The rear-end crashes are likely occurring along this segment due to congestion (stop-and-go traffic). The sideswipe same direction crashes may be occurring due to the large left-turning movement from the I-94 exits that merge with free-flowing State Street traffic.

2.4.4 Non-motorized Crash Summaries

Three (3) pedestrian crashes and one (1) bicycle crash occurred in the State Street corridor within the five years of crash history. The pedestrian crashes resulted in two B-injuries and one C-injury. The one bicycle crash resulted in a C-injury. Figure 7 illustrates the locations of pedestrian and bicycle crashes.

The bicycle crash occurred on southbound State Street south of Oakbrook Drive. The bicyclist was traveling southbound in the bike lane when a northbound vehicle making a left turn into a drive struck the bicycle. Poor bicyclist visibility during night time hours may have been a contributing factor in this crash.

The pedestrian crash at Eisenhower was due to a right turn on red northbound motorist not yielding to a westbound pedestrian in the crosswalk. Contributing factors to this crash may be the limited visibility in front of the pickup truck involved and the reduced height of the pedestrian being in a wheelchair.

The remaining pedestrian crashes that occurred at Hilton Blvd. and State Circle are due pedestrian movements across State Street not occurring at a designated crossing. Each pedestrian was stated to have made quick crossing maneuvers during heavy traffic conditions. These crashes expose the lack of crossing opportunities along the State Street corridor.

2.4.5 Fatal Crash Summaries

In the 60 months analyzed there were zero fatal accidents along the State Street study area.

Figure 7: Pedestrian and Bicycle Crash Locations

3 Future Conditions Analysis

At the outset of the project, the Washtenaw Area Transportation Study (WATS) travel demand model was intended to be utilized for the South State Street Corridor Study; however, in reviewing expected growth rates from 2015 to 2035, it was found that some areas had decreases in traffic volumes along the corridor. After reviewing the model inputs, it was found that the population and employment estimates were not reflective of the City of Ann Arbor Master Plan. In discussions held with the City of Ann Arbor on June 12, 2015, it was determined to move forward with applying assumptions regarding population and employment growth to the broader regional model maintained by the Southeast Michigan Council of Governments (SEMCOG).

From the SEMCOG website, employment is expected to grow from 123,753 jobs in 2015 to 145,900 jobs in 2035. That is an increase in 24,311 jobs in the City of Ann Arbor, or 19.6%. Currently, there are 16,000 jobs along the South State Street corridor between Oakbrook Road and Ellsworth Road along State Street, this is approximately 13% of the jobs in the City. In reviewing the City of Ann Arbor Master Plan and estimates by SEMCOG, it was estimated that an additional 2,500 jobs would be added to the study corridor. Below is an illustration of the number of current jobs in each of the quadrants in 2015 and the proposed number of jobs in 2035 with the additional 2,500 jobs.

Table 6: Additional Jobs added to the Study Area

Area	Jobs in 2015	Jobs in 2040
North of Eisenhower, south of Oakbrook	4,800	5,550
South of Eisenhower, north of I-94	6,800	7,875
South of I-94 and north of Ellsworth	4,400	5,075

In addition, it was estimated from the Master Plan, that an additional 125 housing units would be added to the area north of Eisenhower and south of Oakbrook Drive.

To take into account this expected growth, the SEMCOG travel demand forecasting model was utilized. The first step was to take the 2015 employment and population estimates for the areas surrounding the South State Street corridor and copy those into the 2035 estimates. Then, those estimates were increased by the number of new jobs and population given the information from Table 6 above. The ITE Trip Generation Manual was utilized to determine the number of vehicular trips expected for each job and each housing unit. Below is a table summarizing the number of trips added to the study area.

Table 7: Future 2035 Additional Peak Period Trips within the Study Area

Area	AM			PM		
	Total Trips	Inbound	Outbound	Total Trips	Inbound	Outbound
North of Eisenhower, south of Oakbrook	441	345	96	416	92	324
South of Eisenhower, north of I-94	514	452	62	458	55	403
South of I-94 and north of Ellsworth	345	304	41	310	37	273
Total	**1300**	**1101**	**199**	**1184**	**184**	**1000**

These trips were added to the SEMCOG model and then the model was rerun. The additional growth outside of the study area was also taken into account (i.e. trips going through the study area).

Figures 9 and 10 depict the growths applied to the existing counts to determine the 2035 volumes depicted in Figure 11. In growth rate figures, a negative growth was determined for Eisenhower and Ellsworth in the PM peak hour. These negative growth rates were applied.

3.1 Oakbrook Extension

A planned improvement along the State Street Corridor is the Oakbrook Drive extension to the west as depicted in Figure 8 below. The Oakbrook extension was modelled in the SEMCOG travel demand model and the potential impacts were estimated. The extension is forecasted to be used as a bypass of the Eisenhower and State Street intersection. Therefore, the southbound to westbound and eastbound to northbound movements at the intersection of Eisenhower and State Street are forecasted to decrease. State Street volumes are only anticipated to increase from Eisenhower to Oakbrook Drive. The impacts were deemed to be of minimal impact to the State Street corridor and the intersection with Eisenhower. Therefore, these traffic impacts were not included in the analysis.

Figure 8: Traffic Impact of Oakbrook Extension

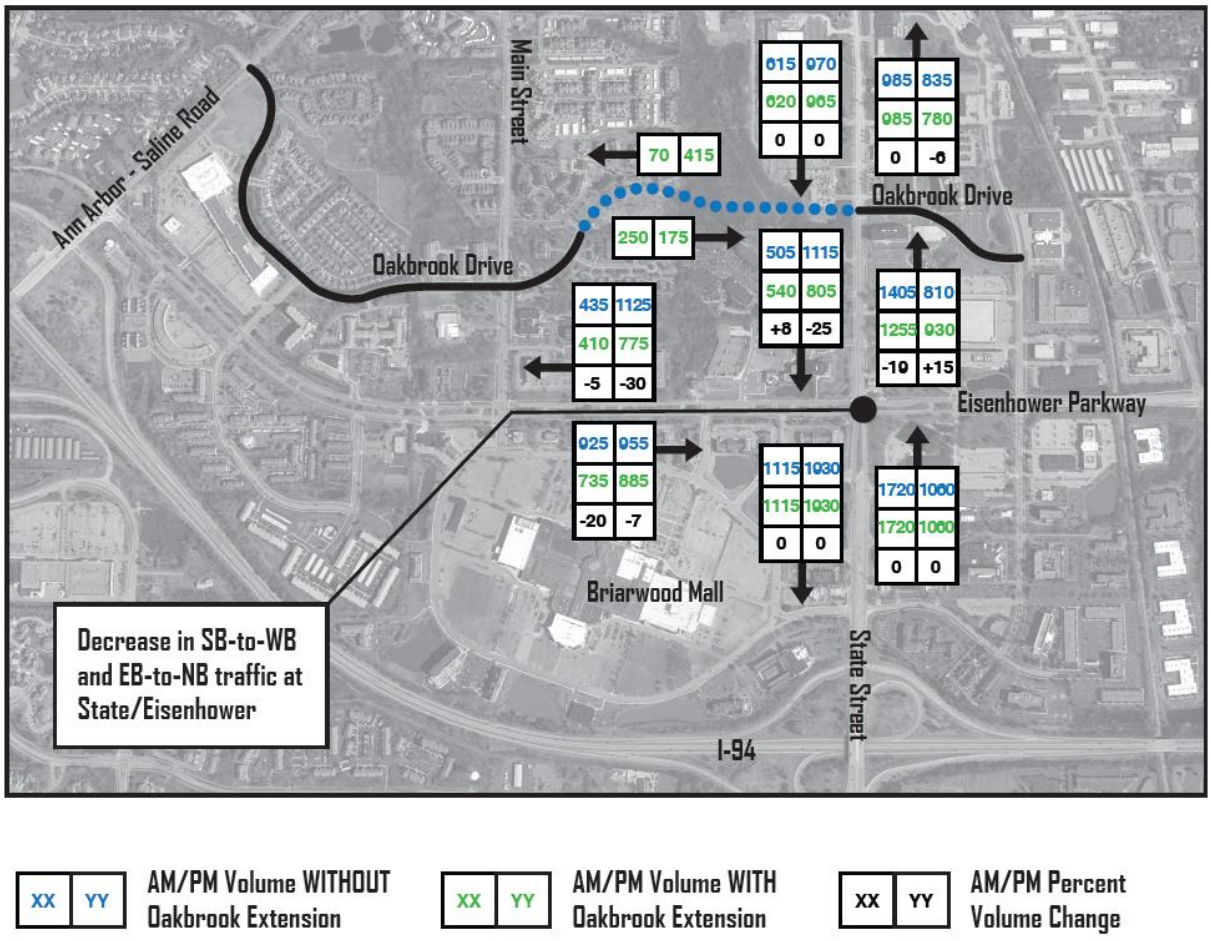
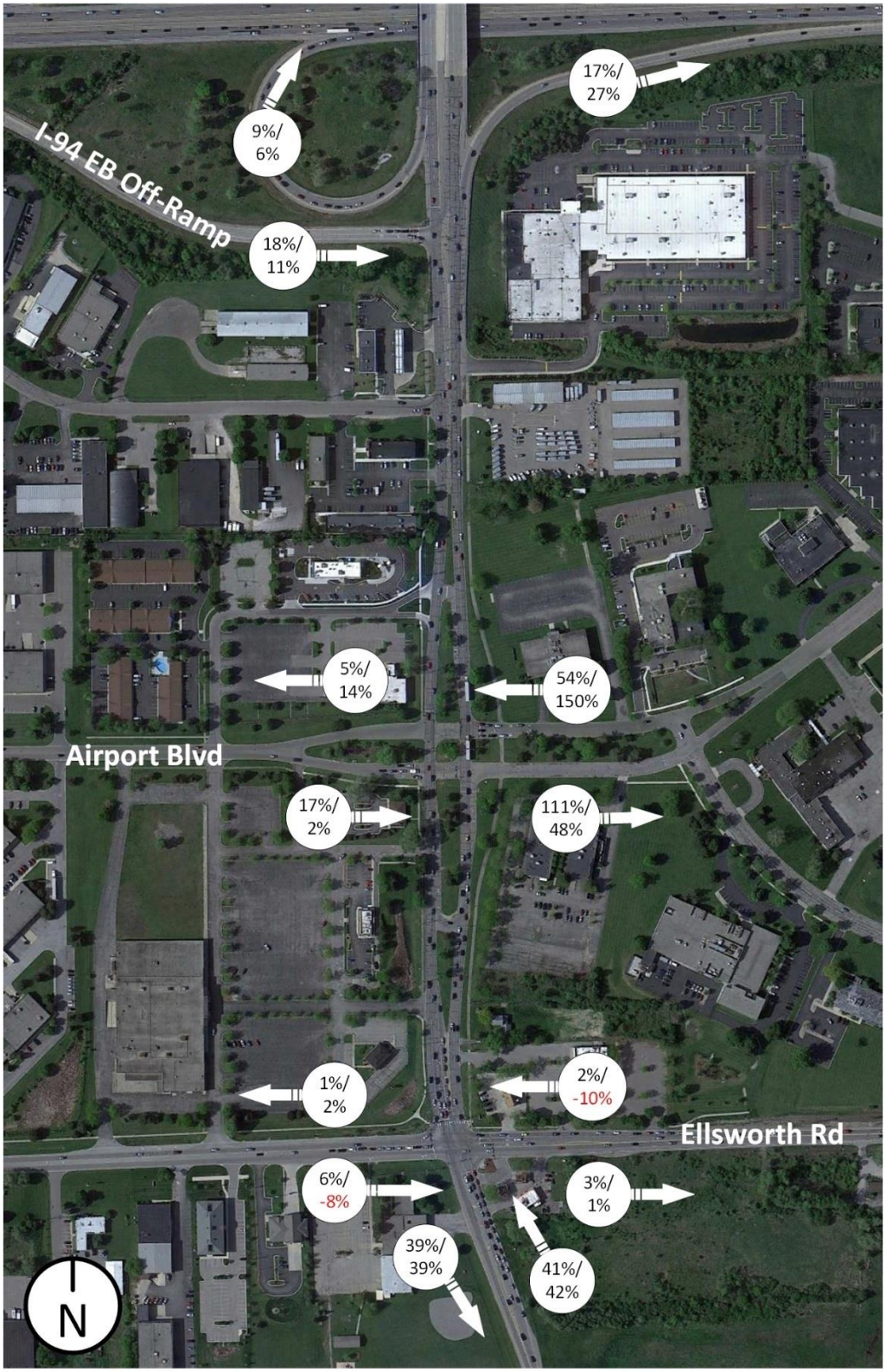
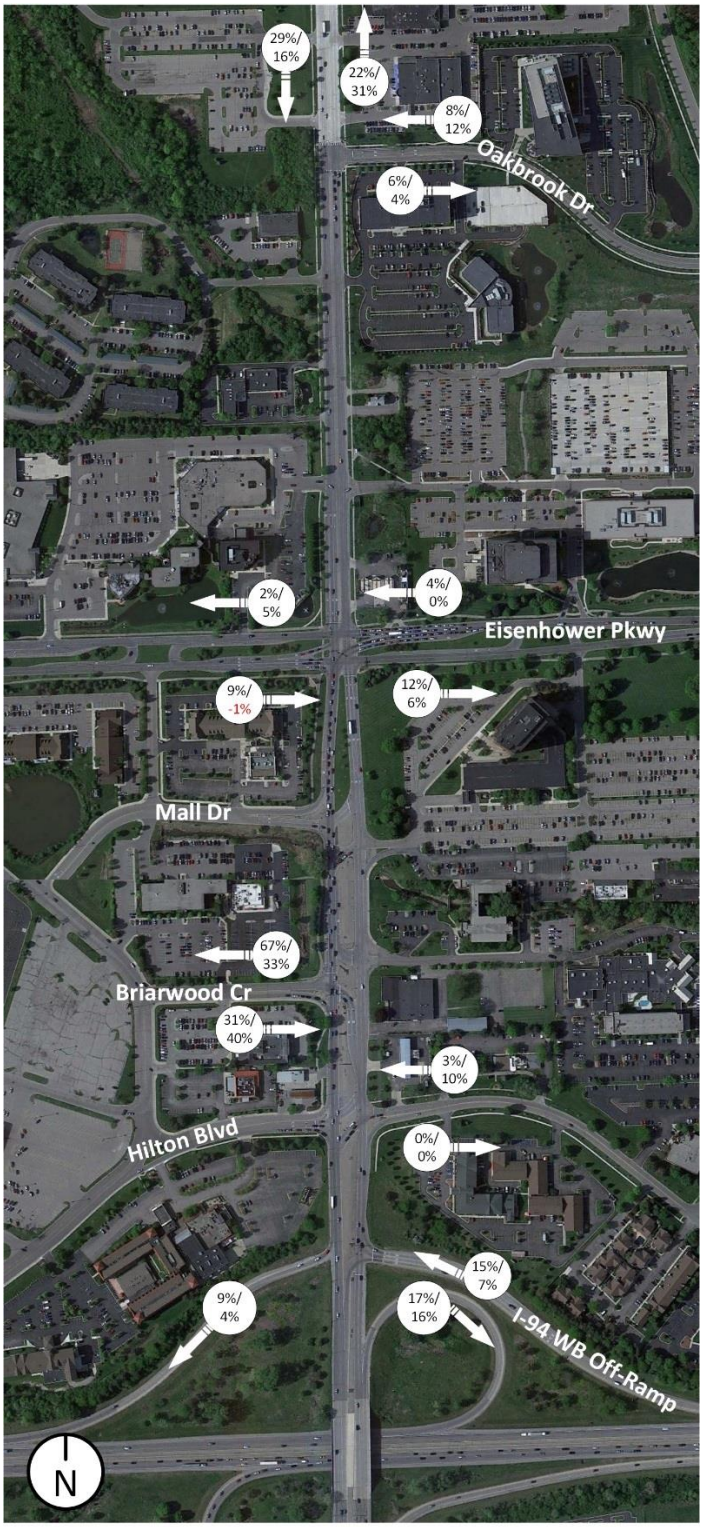


Figure 9: Growth Rate from Ellsworth to I-94



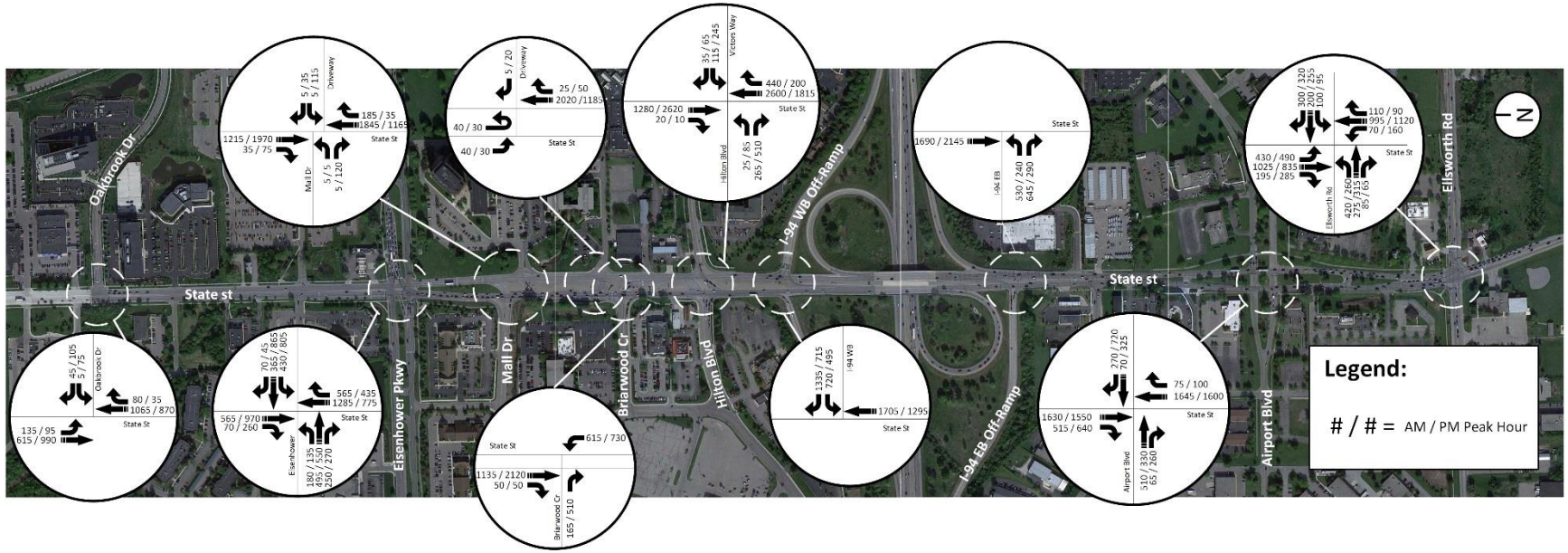
X/X= AM/PM Percent Growth/Decline

Figure 10: Growth Rate from I-94 to Oakbrook



X/X= AM/PM Percent Growth/Decline

Figure 11: 2035 AM and PM Peak Hour Traffic Volumes



3.1.1 Future No-Build Delay and Level of Service Results

The following section summarizes the various MOE results obtained from the AM and PM peak hour microsimulation models for all intersections in the study area. In the future No-Build models no geometric improvements were made although signal timing improvements were implemented to gain the greatest performance with the existing geometrics.

Table 8 summarizes the approach and intersection delay and levels of service for each of the study intersections.

Table 8: 2035 Future No-Build AM and PM Peak Hour Delay and Levels of Service

Intersection	Eastbound*	Westbound*	Northbound*	Southbound*	Total*
AM Peak Hour					
Oakbrook	N/A	15.0 / B	1.4 / A	2.8 / A	2.4 / A
Eisenhower	34.4 / C	41.6 / D	28.0 / C	18.4 / B	30.8 / C
Mall/Wolverine[1]	9.3 / A	10.8 / B	N/A	N/A	10.1 / B
Waterworks[1]	30.0 / D	6.8 / A	N/A	N/A	28.1 / D
Briarwood	5.2 / A	31.4 / C	N/A	12.1 / B	17.2 / B
Hilton/Victors Way[1]	20.6 / C	**90.8 / F**	N/A	N/A	**44.8 / E**
I-94 WB Off Ramp	N/A	**73.8 / E**	19.8 / B	N/A	47.7 / D
I-94 EB Off Ramp	**76.8 / E**	N/A	N/A	13.3 / B	39.7 / D
Airport	43.6 / D	**61.4 / E**	6.6 / A	8.7 / A	16.1 / B
Ellsworth[1]	**93.6 / F**	**111.5 / F**	**61.2 / F**	8.5 / A	**53.5 / F**
PM Peak Hour					
Oakbrook	N/A	23.8 / B	2.0 / A	4.5 / A	5.2 / A
Eisenhower	33.5 / C	43.6 / D	22.9 / C	27.4 / C	33.0 / C
Mall/Wolverine[1]	20.8 / C	14.4 / B	N/A	N/A	17.3 / C
Waterworks[1]	14.0 / B	6.3 / A	N/A	N/A	11.5 / B
Briarwood	**79.5 / E**	40.3 / D	N/A	13.1 / B	28.6 / C
Hilton/Victors Way[1]	**164.8 / F**	**568.9 / F**	N/A	N/A	**277.5 / F**
I-94 WB Off Ramp	N/A	40.5 / D	21.6 / C	N/A	31.0 / C
I-94 EB Off Ramp	46.4 / D	N/A	N/A	9.3 / A	17.0 / B
Airport	35.0 / C	48.6 / D	10.8 / B	23.9 / C	26.2 / C
Ellsworth[1]	**40.0 / E**	**83.7 / F**	**66.5 / F**	9.4 / A	**42.6 / E**

** Delay (seconds per vehicle) / Level of Service*

[1] Unsignalized intersection

The future No-Build model results are showing an increase in delay and degradation of LOS in both peak periods. In the AM peak, Hilton/Victors Way and Ellsworth had LOS of E and F respectively. The I-94 off ramps are also starting to break down with LOS E on each of the ramp approaches. From observing the model, large northbound queues and delay were the main reason for the increased delay seen in the model during the AM peak period.

Conversely, in the PM peak period southbound State Street is anticipated to experience significant congestion. The large southbound volume and congestion increased delays seen on several side streets. Eastbound Briarwood and the stop controlled approaches of Hilton/Victors Way saw significant increased delays, with LOS E and F. Ellsworth continues to operate poorly with LOS E, with large delays on the all legs except southbound.

4 Goal Identification and Evaluation Criteria

With more than 40,000 vehicles a day that traverse South State Street, impacts to vehicular traffic have to be considered in conjunction with other modes, including transit and non-motorized. Currently, most of the intersections along the corridor are not conventional in that they either provide direct access into an area, but not out of an area. A driveway you may use to enter the mall or an office complex in the northern part of the corridor may not always be used for the reverse maneuver. These connections can create confusion for drivers new to the area and also limit opportunities for safe pedestrian crossings. Within the southern portion of the corridor, there is a mixture of direct and indirect left-turns, which could also lead to driver confusion.

The City of Ann Arbor and Washtenaw County have been encouraging more non-motorized travel as a means to promote a healthy lifestyle, but also to reduce dependence on motorized transportation, improve safety and reduce congestion. The City of Ann Arbor has a "Complete Streets" policy to ensure that all new roadways consider all users of a facility, this corridor is no exception. Given the mix of land uses around the corridor and connections from north to south, all users need to be considered when looking at alternatives.

Currently it is difficult to navigate the corridor whether by walking or bicycling. The *Non-Motorized Plan* has listed South State Street as a second tier priority with a long-term goal of on-street bike lanes. A high priority major mid-block crossing is shown near Briarwood Mall.

A total of eight goals were identified that shaped the development of preliminary alternatives to improve corridor operations and safety for all users. These goals were developed with public and stakeholder input. The goals are as follows:

1. Safety: Provide safe conditions for all travelers
2. Entry: Create a more attractive entry to the city
3. Pedestrians: Improve conditions for pedestrians along/across State Street
4. Bicycles: Provide a safe place for bicyclists separate from travel lanes
5. Transit: Enhance transit conditions through traffic flow and stop accessibility
6. Vehicles: Maintain reasonable traffic operations along the corridor
7. Land Use: Support planned land use described in the South State Street Corridor Plan
8. Access: Ease accessibility of corridor businesses

5 Preliminary Alternatives Considered

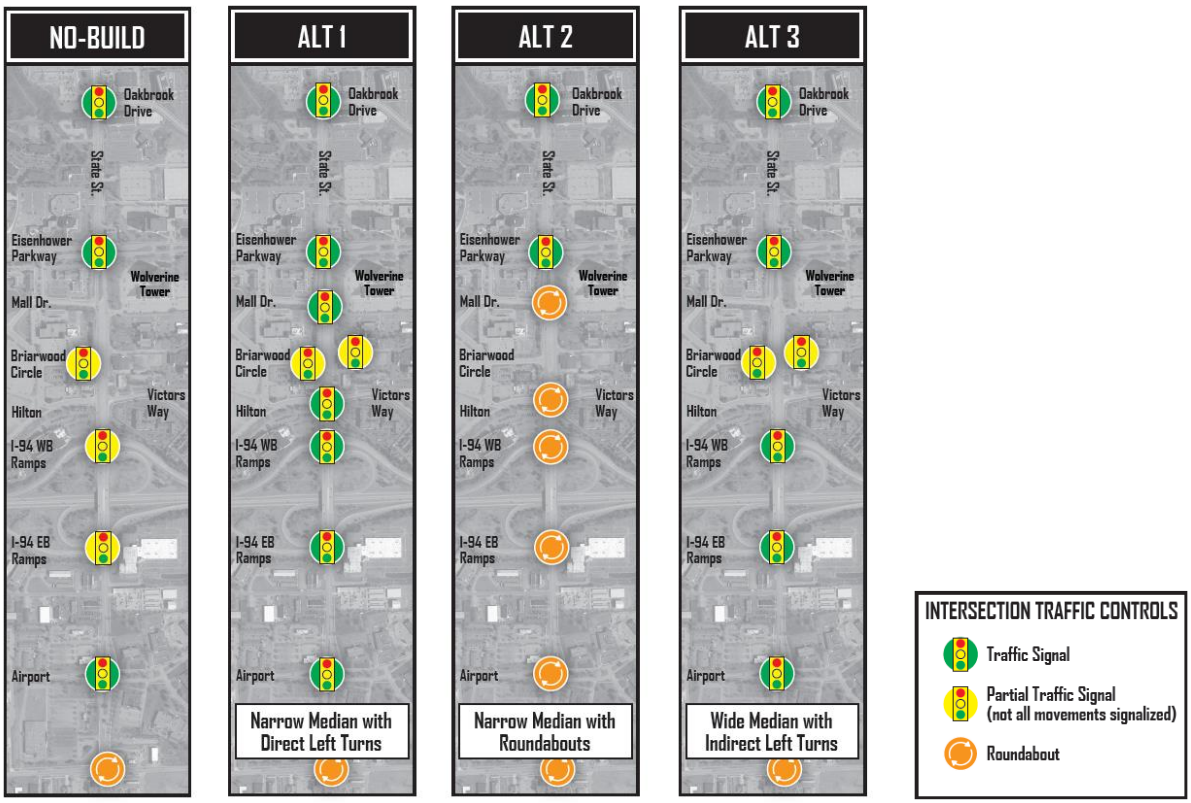
Several alternatives were considered which involved a variety of laneage configurations along the corridor. Throughout the process, it was determined from the Steering Committee that LOS D or better was desirable for future year intersection operations, but LOS E was acceptable for the overall intersection operations if necessary to achieve broader study goals. In each of the alternatives, the intersection of Ellsworth and State Street was excluded from any design changes due to this intersection being under the jurisdiction of Pittsfield Township and the recent construction of this intersection to a roundabout configuration.

5.1 Common Design Features

In accordance with the goals defined in section 4, four common design features were included in each alternative. Curbside buffered bike lanes are included the full length of the corridor to satisfy the bicyclist needs. Continuous sidewalks along the entire corridor to promote north/south connectivity and promote pedestrian safety. Transit stop pull-outs (where feasible) are included in each alternative to further enhance transit and minimize impacts on vehicular traffic. All alternatives were designed with no right-of-way impacts beyond minor corner encroachments.

Figure 12 below describes the traffic controls at each intersection for all three of the considered alternatives.

Figure 12: Alternative Intersection Traffic Control



5.2 Preliminary Alternatives

5.2.1 Alternative 1: Narrow Median with Direct Left-Turns

The main design consideration of this alternative was to install a narrow median with direct left-turns at each of the major intersections and minor intersections. The previously unsignalized intersections of Hilton/Victors Way, Waterworks, and Mall/Wolverine Tower will be signalized. Hilton/Victors Way and Mall/Wolverine intersections are to be realigned to allow all protected left-turns out of the surrounding developments. The intersection of Waterworks Plaza and State Street keeps its existing access and geometry but will be signalized to allow for a pedestrian crossing. Both eastbound and westbound I-94 ramp intersections will become fully signalized to remove the current left-turn merging movement that occurs on the bridge. Airport and State Street is redesigned allowing full access and direct left-turning movements from each approach.

5.2.2 Alternative 2: Narrow Median with Roundabouts

Similar to Alternative 1, this design also calls for a narrow median. Instead of signalized intersection with direct-lefts to provide access to the surrounding development, this alternative proposes the installation of roundabouts at multiple locations. This alternative proposes roundabouts at Airport, both I-94 intersections, Hilton/Victors Way and Mall/Wolverine Tower.

5.2.3 Alternative 3: Wide Median with Indirect Left-Turns

This alternative relies on indirect left-turns to provide access. The stop-controlled left-turns from Hilton/Victors Way and Mall/Wolverine Tower would be removed. Two new crossover locations are proposed. A north to south crossover south of Eisenhower and a south to north crossover at Hilton/Victors Way is proposed. The intersection of Waterworks plaza and State Street would be partially signalized to allow for a pedestrian crossing. Similar to Alternative 1, both of the I-94 intersections will become fully signalized to remove the uncontrolled left-turn merge. Airport and State Street would remain the same geometry.

5.3 Preliminary Alternative Analysis

Each of the three alternatives was analyzed using the screening methodology identified in Section 2.3. Figures 13 and 14 illustrate the overall intersection LOS results during the AM and PM peak hours, respectively.

In order to provide a more easily comparable measure, estimated peak period travel time along the corridor was calculated using the free-flow travel time combined with estimated approach delay at each controlled approach along the route. Table 9 summarizes the estimated travel time by alternative.

Figure 13: Alternative Operations Analysis- AM Peak

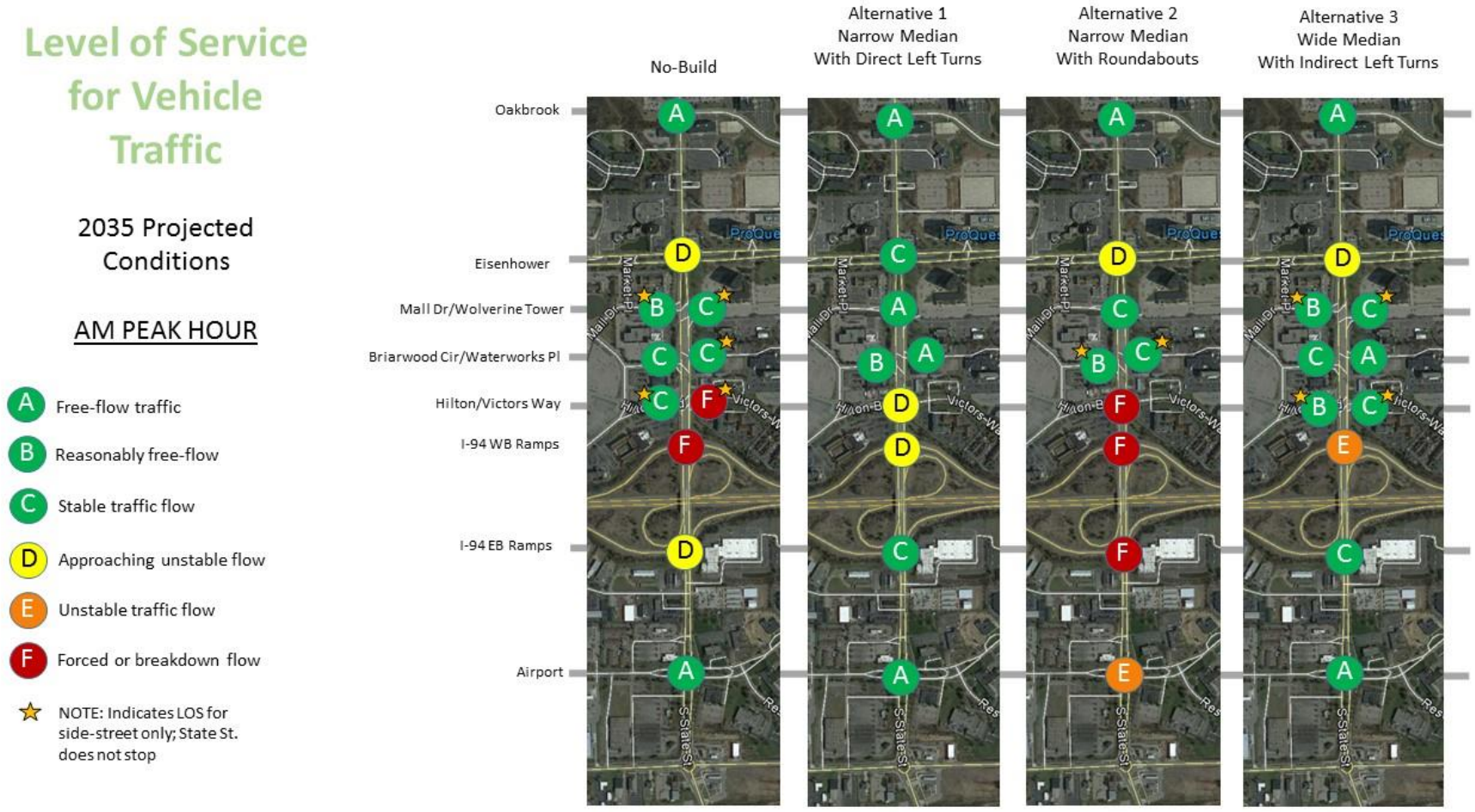


Figure 14: Alternative Operations Analysis- PM Peak

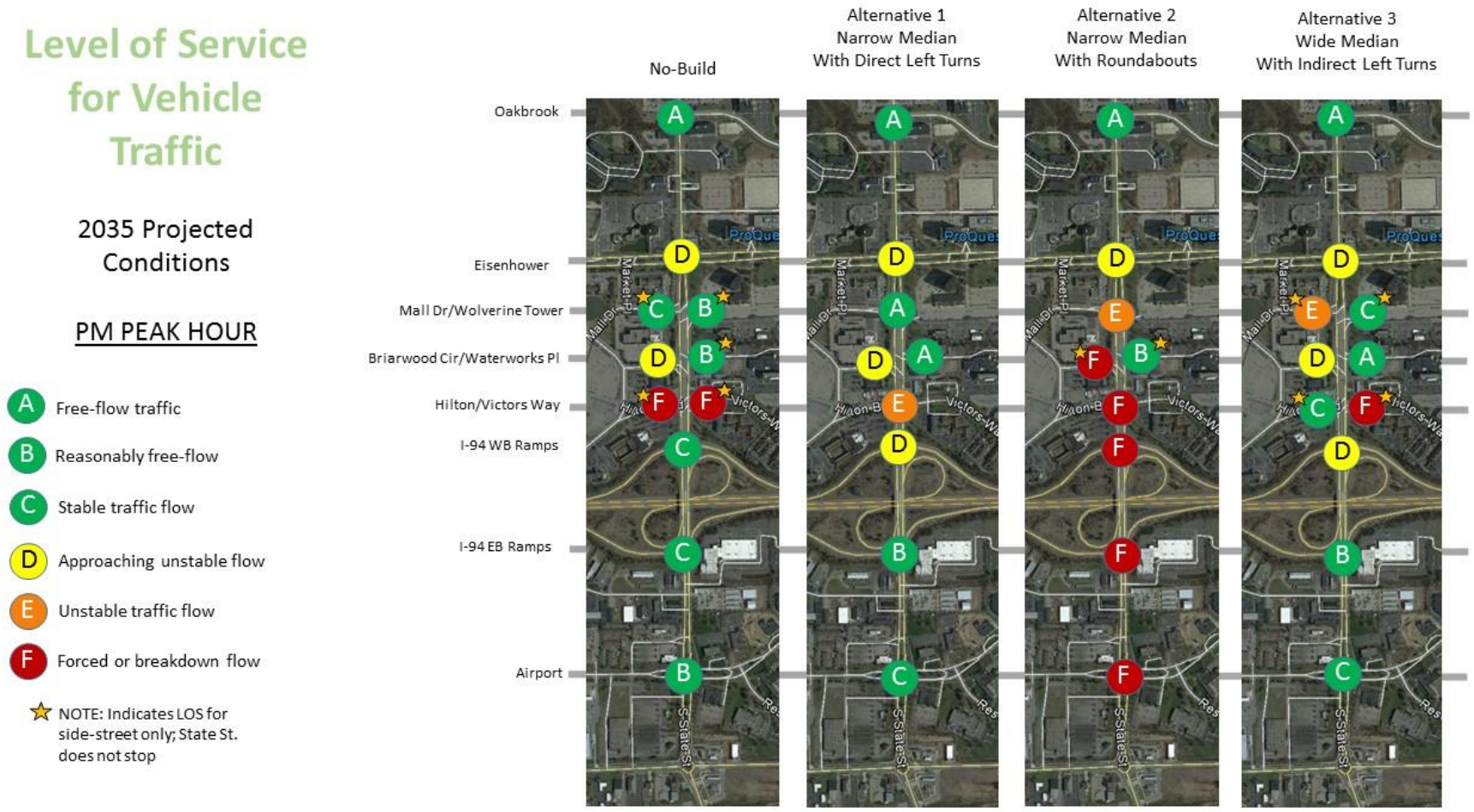


Table 9: 2035 Estimated Peak Period Travel Time - State Street

Alternative	Estimated Travel Time (Minutes)			
	AM Peak Period		PM Peak Period	
	NB	SB	NB	SB
No-Build	4-5	3-4	3-4	3-4
Alt. 1: Narrow Median with Direct Left-Turns	4-5	3-4	3-4	5-6
Alt. 2: Narrow Median with Roundabouts	9-10	4-5	6-7	>10
Alt. 3: Wide Median with Indirect Left-Turns	4-5	3-4	3-4	4-5

As illustrated in Table 9, the relative travel times between alternatives were found to be largely comparable to the No-Build condition, with the exception of Alternative 2. Under this scenario, the operation of the proposed roundabouts is projected so severely impact peak-period traffic flow, greatly increasing travel time over other alternatives.

6 Recommended Alternative

A final vision for the corridor was developed after evaluating each of the preliminary alternatives against the goals of the study, including consideration of traffic operations and safety performance, as well as after input from both public and Steering Committee meetings. The Recommended Alternative balanced all modes of transportation along the corridor, including non-motorized, transit, and vehicular traffic. This vision combined Alternatives 1 and 3, with the narrow boulevard from south of I-94 and the wide boulevard north of I-94.

Several minor changes were developed to improve vehicle operations. First, at the intersection of Airport and State Street, the original narrow boulevard design called for this intersection to be direct left-turns. Further analysis showed keeping the existing indirect-left design provide ample capacity. It was recommended that the crossover to the south of Airport be removed and all left-turning vehicles will utilize the east and west crossovers on Airport.

The I-94 intersections will be fully signalized as was called for in both Alternatives 1 and 2. Although, it was anticipated that due to the increased signalization there could be excessive queuing on the westbound I-94 off ramp. To mitigate this issue, the westbound ramp laneage was changed to one left-turn-only lane, one left and right-turn lane, and one right-turn-only lane. The extra capacity for the left-turning vehicles was found to keep the queuing similar to existing conditions.

In the northern half of the corridor, a wide boulevard would be installed with new crossovers south of Eisenhower and at Hilton/Victors Way. Originally, the intersection of Hilton/Victors Way was to be unsignalized. It was found that the intersection needed to be signalized to reduce delay for vehicles on the minor street. Figure 15 illustrates the final geometry and traffic control of the Recommended Alternative.

6.1 Recommended Alternative Delay and LOS

A final VISSIM analysis was conducted for the Recommended Alternative for the year 2035 to ensure that traffic would operate acceptably. This section summarizes the various MOE results obtained from the AM and PM peak hour microsimulation models for all intersections in the study area. Table 10 summarizes the approach and intersection delay and levels of service for each of the study intersections.

Figure 15: Recommended Alternative Design

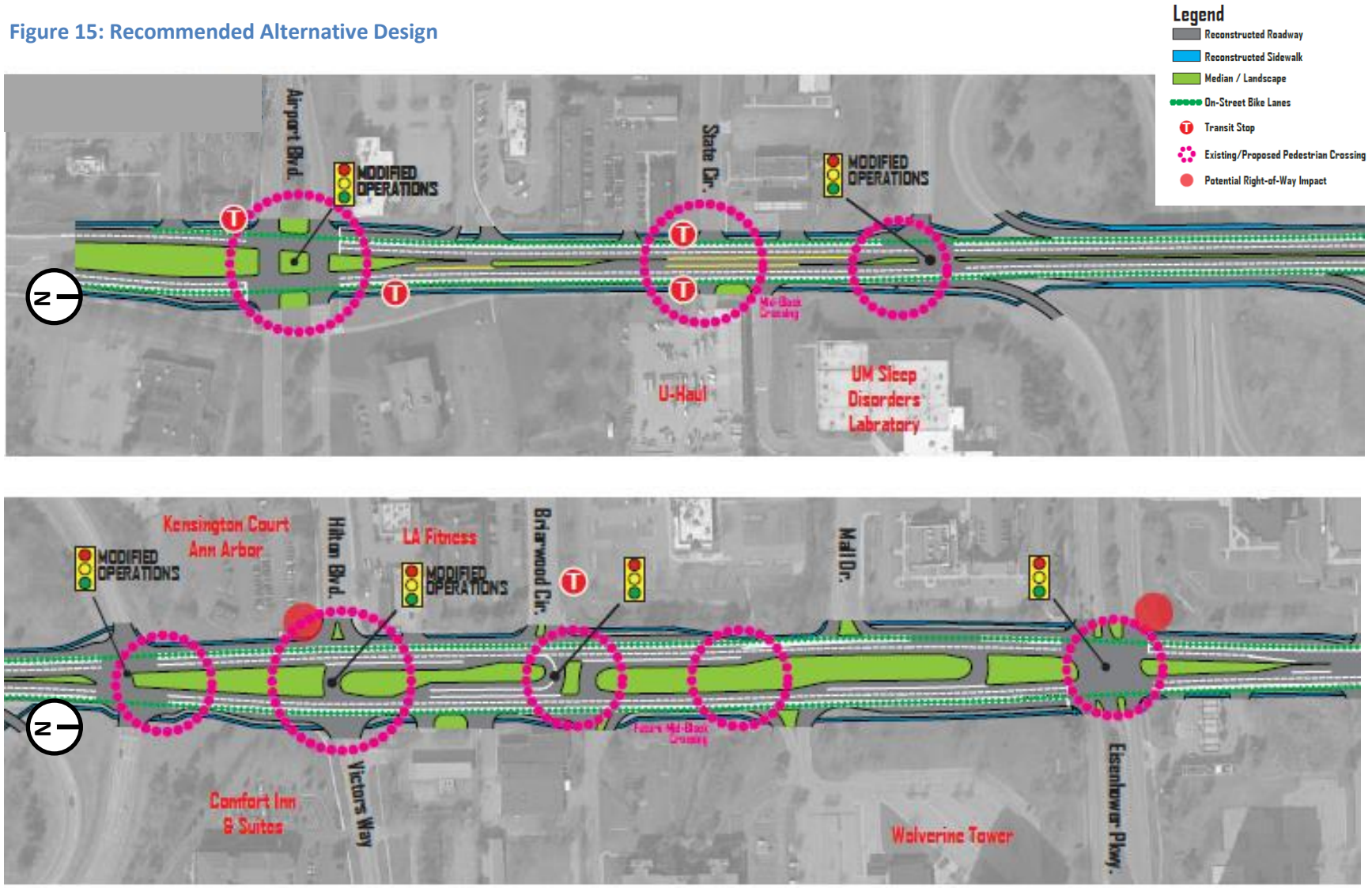


Table 10: Recommended Alternative AM and PM Peak Hour Delay and Levels of Service

Intersection	Eastbound*	Westbound*	Northbound*	Southbound*	Total*
AM Peak Hour					
Oakbrook	N/A	15.5 / B	1.0 / A	2.8 / A	**2.1 / A**
Eisenhower	34.3 / C	44.7 / D	28.4 / B	18.5 / B	**31.7 / C**
Mall/Wolverine[1]	8.9 / A	14.5 / B	N/A	N/A	**12.0 / B**
Waterworks	88.1 / F	16.3 / B	3.8 / A	N/A	**11.2 / B**
Briarwood	9.9 / A	38.0 / C	N/A	5.5 / A	**17.6 / B**
Hilton/Victors Way	14.5 / B	**69.2 / E**	2.8 / A	2.4 / A	**5.9 / A**
I-94 WB Off Ramp	N/A	**76.0 / E**	21.2 / B	13.5 / B	**39.2 / D**
I-94 EB Off Ramp	**92.3 / F**	N/A	18.3 / B	13.5 / B	**35.3 / D**
Airport	38.8 / D	40.1 / D	14.7 / B	12.8 / B	**16.1 / B**
Ellsworth[1]	34.5 / D	**148.3 / F**	**58.7 / F**	7.8 / A	**48.7 / E**
PM Peak Hour					
Oakbrook	N/A	23.9 / B	1.1 / A	4.4 / A	**4.7 / A**
Eisenhower	45.5 / D	39.9 / D	19.7 / B	42.8 / D	**37.1 / D**
Mall/Wolverine[1]	19.7 / C	21.8 / C	N/A	N/A	**22.1 / C**
Waterworks	39.9 / C	11.0 / B	3.3 / A	N/A	**4.7 / A**
Briarwood	**94.8 / F**	39.6 / D	N/A	32.0 / C	**43.0 / D**
Hilton/Victors Way	**126.1 / F**	54.2 / D	8.1 / A	22.7 / C	**28.6 / C**
I-94 WB Off Ramp	N/A	**57.1 / E**	11.8 / B	8.2 / A	**19.4 / B**
I-94 EB Off Ramp	44.2 / D	N/A	6.1 / A	6.5 / A	**10.6 / B**
Airport	25.9 / C	28.6 / C	15.2 / B	19.8 / B	**20.1 / C**
Ellsworth[1]	22.8 / C	**48.9 / E**	**85.3 / F**	13.0 / B	**39.9 / E**

** Delay (seconds per vehicle) / Level of Service*

[1] Unsignalized intersection – side-street approach only

As shown, under the Recommended Alternative all intersections are anticipated to operate at an overall LOS D or better with the exception of Ellsworth and State Street (LOS E).

In the AM peak, westbound Victors Way is anticipated to experience LOS E. This is an improvement from the LOS F that is expected under the future No-Build condition. The delay at this location is due to the large northbound volume that demands the majority of the green time and impacts of queuing from downstream intersections.

Both of the I-94 ramp intersections are expected to operate at an overall LOS D, however, the ramp movements for both intersections are anticipated to operate at LOS E and F in the AM peak period. These ramp movements are expected to operate similarly to the future No-Build condition and may require ramp capacity improvements in the future to improve the LOS and/or reduce queuing impacts.

In the PM peak period, eastbound Briarwood and Hilton are expected to experience significant delays. Westbound Victors Way is anticipated to improve from a LOS F to LOS D during the PM peak. The intersection LOS of the proposed Hilton/Victors Way intersection improved from LOS F in the future No-Build condition to LOS C.

6.2 Highway Safety Manual

The Highway Safety Manual was used to quantify the potential impacts on expected crash rates of the preferred alternative. The Highway Safety Manual (HSM) was published by the American Association of State Highway and Transportation Officials (AASHTO) in 2010 as a means to quantitatively estimate crash frequency and/or severity at a given location. The manual contains four parts. The analysis presented here will utilize Part C – Predictive Method.

Each proposed modification's expected crash frequency was compared to the existing crash frequency. The expected crash rate is calculated by utilizing crash modification factors (CMF) that are available on the website www.cmfclearinghouse.org. According to the Clearinghouse, a CMF is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site. CMFs that are less than 1.0 represent a crash decrease and a crash increase if larger than 1.0. If an alternative has more than one countermeasure being applied, then several CMFs may be multiplied together to obtain an effective CMF. CMFs can be combined as long as each CMF is applicable to the same criteria, e.g., crash severity and crash type. Additionally, CMFs are developed from an existing location with certain characteristics (i.e. signalized/stop-controlled, rural/urban, AADT, etc) so the conditions that the CMF is being applied to should be representative of the study characteristics. Each modification's countermeasure(s) were assigned a CMF and applied to the correct locations along the corridor.

A CMF was only utilized if the star quality rating was three or above on the CMF Clearinghouse website. The star quality rating indicates the quality or confidence in the results of the study producing the CMF. While the reviewers applied an objective set of criteria, the star quality rating still results in an exercise in judgment and a degree of subjectivity. The star rating is based on a scale (one to five), where a five indicates the highest or most reliable rating. In some instances, the CMF clearinghouse doesn't contain a countermeasure for a treatment/modification. In these instances, either a literature review or traffic engineering judgement was applied.

The proposed modifications that were examined include:

- Replace direct left-turn with right-turn/U-turn
- Installation of traffic signal
- Replace permissive-left-turn with a protected-left-turn

The replacement of the direct left movements at the intersections of Hilton/Victors Way and Mall/Wolverine with right-turns/U-turns is expected to reduce all crashes by 20 percent. In addition, installing traffic signals at these two intersections will further reduce high severity crashes. Installing a traffic signal is expected to reduce angle crashes by 66 percent. These two improvements will significantly reduce the number of high severity angle crash and side-swipe same crashes due to the unsignalized and unprotected left-turn maneuver vehicles perform today. During the five-year analysis period, a total of 128 crashes could be attributed to the unsignalized intersection of Hilton/Victors Way. Therefore, a reduction of 43 crashes or an annual reduction of 8.6 crashes per year could be expected with 3.4 of the crashes consisting of angle crashes. Similarly, at Mall/Wolverine Drive at total of 27

crashes could be attributed to this location. Therefore, a reduction of 13 crashes or an annual reduction of 2.6 crashes per year could be expected.

Fully signalizing the I-94 intersections will allow for a protected left-turning movement that currently must complete a merging maneuver to enter the traffic stream. This merging maneuver occurs in a short distance that often forces vehicles to make sudden stops or make aggressive attempts to merge with traffic. State Street between the I-94 intersections had a total of 8 angle and 16 sideswipe-same crashes over the five-year study period. Replacing a permissive left-turning movement with a protected movement reduces left-turn crashes by 97.9 percent. This CMF was developed using traditional four leg intersections where the conflicting traffic stream is traveling in the opposite direction of left turning vehicles. The existing left turning I-94 ramp traffic doesn't conflict with the opposite traffic stream as it doesn't exist. Although, these vehicles must merge uncontrolled with the traffic stream to their right. The type of crashes that would occur during this left-turn maneuver are angle and sideswipe-same crashes, therefore, the CMF of 2.1 percent was assumed applicable. This improvement at the each of the I-94 intersections would result in a reduction of 23 crashes over five years or an annual crash reduction of 4.6, virtually eliminating left-turn collisions at these locations. Table 11 summarizes these results.

Table 11: Reduced Crashes

Intersection	Applicable Crashes	CMF 1	CMF 2	Annual Crash Reduction
Mall/Wolverine	27	.8%	.33%	2.6
Hilton/Victors Way	128	.8%	.33%	8.6
Segment				
Between I-94 Ramps	24	.021%	N/A	4.6

APPENDIX A

Traffic Counts

Traffic Data Collection

Traffic Data Collection

7504 Sawgrass Drive
www.tdccounts.com
Washington, Michigan, United States 48094
Ph. (586) 786-5407
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60' Degs.
Video VCU: SCU 24L

Count Name: State&Oakbrook
Site Code: TMC 1
Start Date: 10/07/2014

Turning Movement Data

Start Time	S. State Street Southbound				Westbound St. Westbound				S. State Street Northbound				
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
7:00 AM	69	5	0	74	8	1	1	9	5	169	0	174	257
7:15 AM	61	7	0	68	6	0	0	6	13	209	0	222	296
7:30 AM	90	18	1	108	10	0	1	10	15	243	0	258	376
7:45 AM	119	33	1	152	10	0	0	10	12	225	2	237	399
Hourly Total	339	63	2	402	34	1	2	35	45	846	2	891	1328
8:00 AM	104	29	2	133	9	3	3	12	25	199	1	224	369
8:15 AM	114	33	1	147	7	0	0	7	21	223	0	244	398
8:30 AM	118	31	1	149	17	2	0	19	13	226	0	239	407
8:45 AM	134	38	1	172	19	2	0	21	17	183	0	200	393
Hourly Total	470	131	5	601	52	7	3	59	76	831	1	907	1567
9:00 AM	0	0	0	0	0	0	0	0	0	3	0	3	3
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	3	0	3	3
11:00 AM	119	12	3	131	18	6	0	24	5	152	0	157	312
11:15 AM	133	18	0	151	16	8	2	24	6	163	1	169	344
11:30 AM	135	20	0	155	16	10	0	26	8	153	0	161	342
11:45 AM	160	23	1	183	27	8	3	35	12	168	0	180	398
Hourly Total	547	73	4	620	77	32	5	109	31	636	1	667	1396
12:00 PM	159	19	0	178	25	20	4	45	11	168	0	179	402
12:15 PM	147	18	0	165	13	19	0	32	6	160	0	166	363
12:30 PM	161	19	0	180	21	10	0	31	14	190	0	204	415
12:45 PM	166	23	0	189	20	17	1	37	8	161	0	169	395
Hourly Total	633	79	0	712	79	66	5	145	39	679	0	718	1575
1:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	1	0	0	1	0	0	0	0	0	0	0	0	1
4:00 PM	212	5	1	217	19	17	1	36	5	150	0	155	408
4:15 PM	230	9	0	239	22	16	0	38	8	146	0	154	431
4:30 PM	213	13	1	226	37	21	0	58	6	137	0	143	427
4:45 PM	206	15	0	221	16	25	1	41	5	153	0	158	420
Hourly Total	861	42	2	903	94	79	2	173	24	586	0	610	1686
5:00 PM	238	19	0	257	34	28	1	62	6	154	1	160	479
5:15 PM	190	35	2	225	28	13	0	41	8	174	0	182	448
5:30 PM	218	19	0	237	22	10	4	32	5	165	2	170	439
5:45 PM	223	16	2	239	13	8	1	21	5	166	0	171	431
Hourly Total	869	89	4	958	97	59	6	156	24	659	3	683	1797
6:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Grand Total	3721	477	17	4198	433	244	23	677	239	4240	7	4479	9354
Approach %	88.6	11.4	-	-	64.0	36.0	-	-	5.3	94.7	-	-	-
Total %	39.8	5.1	-	44.9	4.6	2.6	-	7.2	2.6	45.3	-	47.9	-
Lights	3592	469	-	4061	388	238	-	626	234	4119	-	4353	9040
% Lights	96.5	98.3	-	96.7	89.6	97.5	-	92.5	97.9	97.1	-	97.2	96.6
Buses	48	2	-	50	28	1	-	29	0	16	-	16	95
% Buses	1.3	0.4	-	1.2	6.5	0.4	-	4.3	0.0	0.4	-	0.4	1.0
Single-Unit Trucks	69	4	-	73	8	4	-	12	3	88	-	91	176
% Single-Unit Trucks	1.9	0.8	-	1.7	1.8	1.6	-	1.8	1.3	2.1	-	2.0	1.9
Articulated Trucks	7	1	-	8	0	1	-	1	1	9	-	10	19
% Articulated Trucks	0.2	0.2	-	0.2	0.0	0.4	-	0.1	0.4	0.2	-	0.2	0.2
Bicycles on Road	5	1	-	6	9	0	-	9	1	8	-	9	24
% Bicycles on Road	0.1	0.2	-	0.1	2.1	0.0	-	1.3	0.4	0.2	-	0.2	0.3
Bicycles on Crosswalk	-	-	1	-	-	-	2	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	5.9	-	-	-	8.7	-	-	-	0.0	-	-
Pedestrians	-	-	16	-	-	-	21	-	-	-	7	-	-
% Pedestrians	-	-	94.1	-	-	-	91.3	-	-	-	100.0	-	-

Traffic Data Collection
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Reliable Traffic Data

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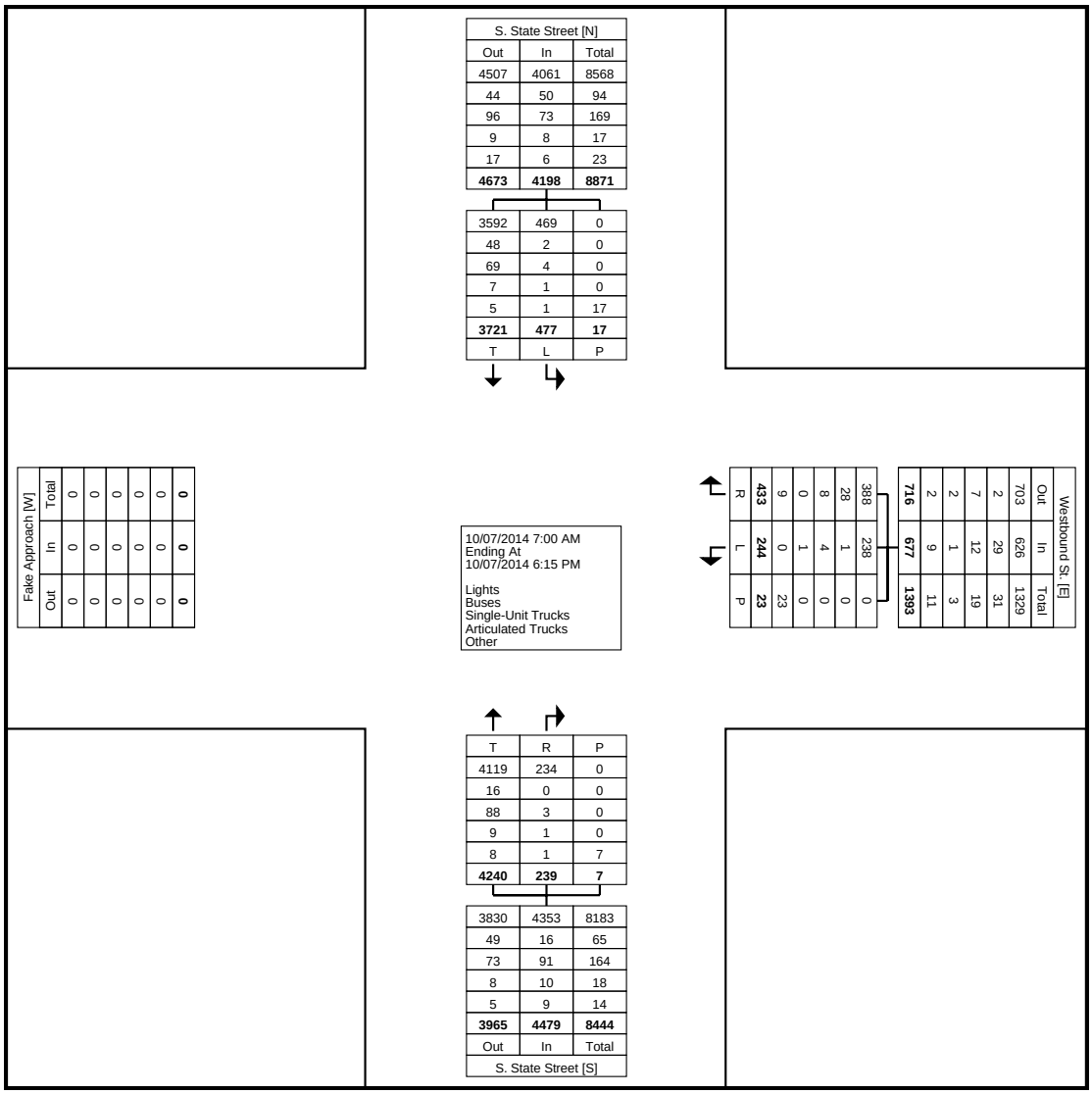
Corridor: S. State Street
Weather: Pt. Cldy. 60' Degs.
Video VCU: SCU 24L

Count Name: State&Oakbrook
Site Code: TMC 1
Start Date: 10/07/2014



Turning Movement Data Plot

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Video VCU: SCU 24L

Count Name: State&Oakbrook
Site Code: TMC 1
Start Date: 10/07/2014

Turning Movement Peak Hour Data (7:45 AM)

Start Time	S. State Street Southbound				Westbound St. Westbound				S. State Street Northbound				
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
7:45 AM	119	33	1	152	10	0	0	10	12	225	2	237	399
8:00 AM	104	29	2	133	9	3	3	12	25	199	1	224	369
8:15 AM	114	33	1	147	7	0	0	7	21	223	0	244	398
8:30 AM	118	31	1	149	17	2	0	19	13	226	0	239	407
Total	455	126	5	581	43	5	3	48	71	873	3	944	1573
Approach %	78.3	21.7	-	-	89.6	10.4	-	-	7.5	92.5	-	-	-
Total %	28.9	8.0	-	36.9	2.7	0.3	-	3.1	4.5	55.5	-	60.0	-
PHF	0.956	0.955	-	0.956	0.632	0.417	-	0.632	0.710	0.966	-	0.967	0.966
Lights	437	123	-	560	34	5	-	39	71	852	-	923	1522
% Lights	96.0	97.6	-	96.4	79.1	100.0	-	81.3	100.0	97.6	-	97.8	96.8
Buses	13	0	-	13	7	0	-	7	0	3	-	3	23
% Buses	2.9	0.0	-	2.2	16.3	0.0	-	14.6	0.0	0.3	-	0.3	1.5
Single-Unit Trucks	3	2	-	5	2	0	-	2	0	15	-	15	22
% Single-Unit Trucks	0.7	1.6	-	0.9	4.7	0.0	-	4.2	0.0	1.7	-	1.6	1.4
Articulated Trucks	0	0	-	0	0	0	-	0	0	2	-	2	2
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.2	-	0.2	0.1
Bicycles on Road	2	1	-	3	0	0	-	0	0	1	-	1	4
% Bicycles on Road	0.4	0.8	-	0.5	0.0	0.0	-	0.0	0.0	0.1	-	0.1	0.3
Bicycles on Crosswalk	-	-	1	-	-	-	1	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	20.0	-	-	-	33.3	-	-	-	0.0	-	-
Pedestrians	-	-	4	-	-	-	2	-	-	-	3	-	-
% Pedestrians	-	-	80.0	-	-	-	66.7	-	-	-	100.0	-	-

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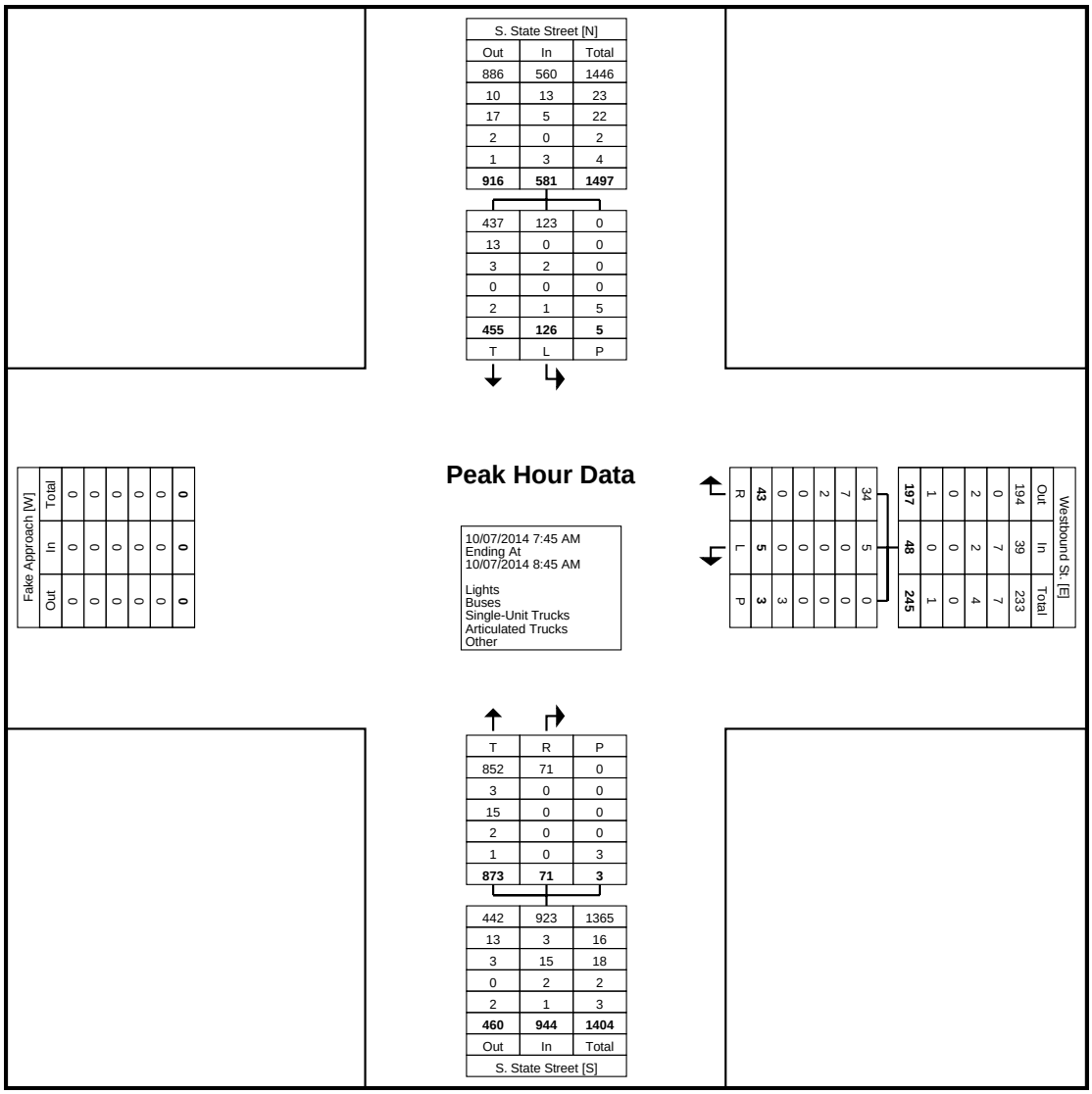

Turning Movement Peak Hour Data Plot (7:45 AM)

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Video VCU: SCU 24L

Count Name: State&Oakbrook
Site Code: TMC 1
Start Date: 10/07/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	S. State Street Southbound				Westbound St. Westbound				S. State Street Northbound				
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
11:00 AM	119	12	3	131	18	6	0	24	5	152	0	157	312
11:15 AM	133	18	0	151	16	8	2	24	6	163	1	169	344
11:30 AM	135	20	0	155	16	10	0	26	8	153	0	161	342
11:45 AM	160	23	1	183	27	8	3	35	12	168	0	180	398
Total	547	73	4	620	77	32	5	109	31	636	1	667	1396
Approach %	88.2	11.8	-	-	70.6	29.4	-	-	4.6	95.4	-	-	-
Total %	39.2	5.2	-	44.4	5.5	2.3	-	7.8	2.2	45.6	-	47.8	-
PHF	0.855	0.793	-	0.847	0.713	0.800	-	0.779	0.646	0.946	-	0.926	0.877
Lights	517	72	-	589	68	30	-	98	27	612	-	639	1326
% Lights	94.5	98.6	-	95.0	88.3	93.8	-	89.9	87.1	96.2	-	95.8	95.0
Buses	10	1	-	11	6	0	-	6	0	1	-	1	18
% Buses	1.8	1.4	-	1.8	7.8	0.0	-	5.5	0.0	0.2	-	0.1	1.3
Single-Unit Trucks	19	0	-	19	3	2	-	5	3	20	-	23	47
% Single-Unit Trucks	3.5	0.0	-	3.1	3.9	6.3	-	4.6	9.7	3.1	-	3.4	3.4
Articulated Trucks	1	0	-	1	0	0	-	0	1	2	-	3	4
% Articulated Trucks	0.2	0.0	-	0.2	0.0	0.0	-	0.0	3.2	0.3	-	0.4	0.3
Bicycles on Road	0	0	-	0	0	0	-	0	0	1	-	1	1
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.2	-	0.1	0.1
Bicycles on Crosswalk	-	-	0	-	-	-	1	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	0.0	-	-	-	20.0	-	-	-	0.0	-	-
Pedestrians	-	-	4	-	-	-	4	-	-	-	1	-	-
% Pedestrians	-	-	100.0	-	-	-	80.0	-	-	-	100.0	-	-

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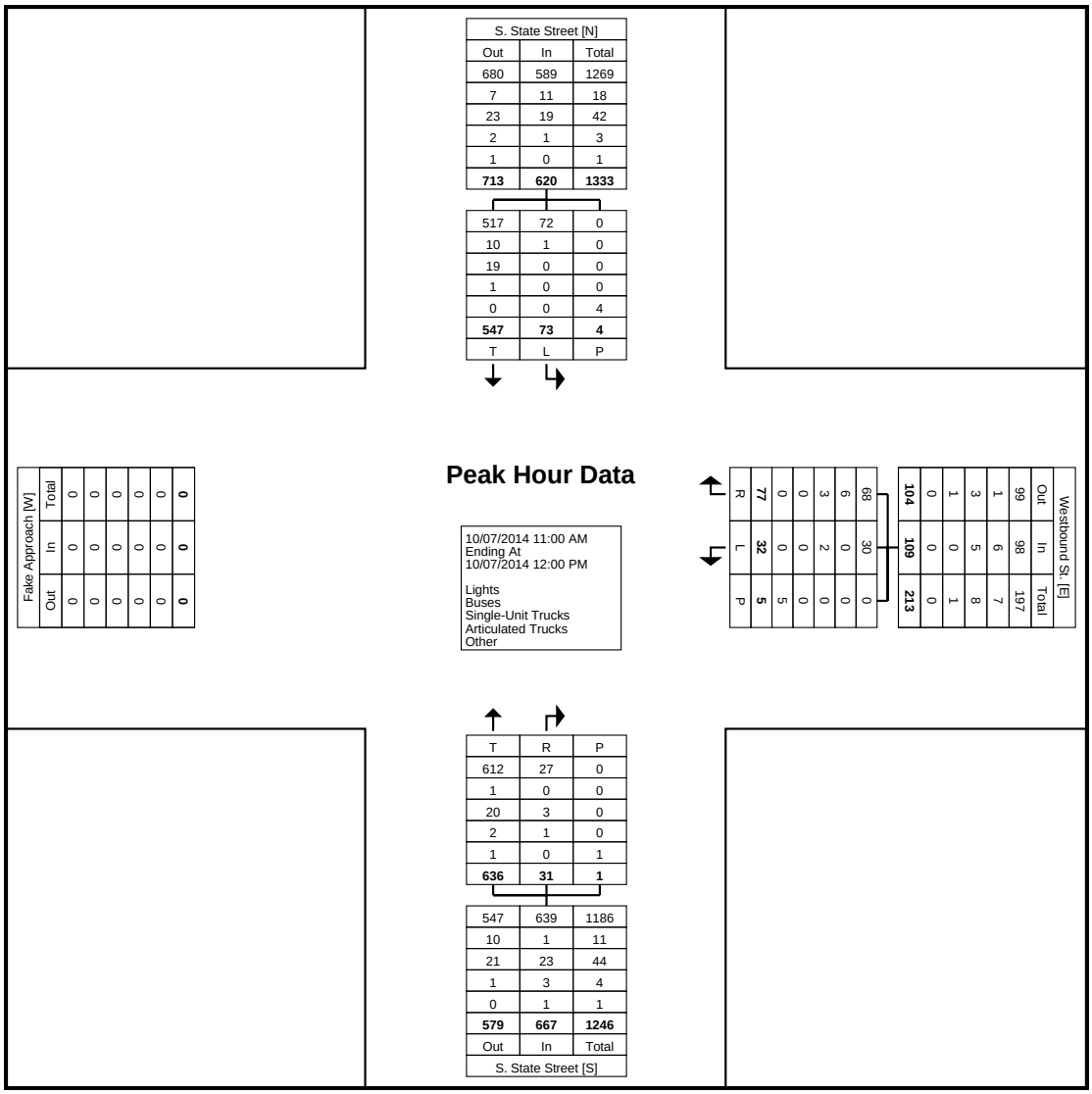

Turning Movement Peak Hour Data Plot (11:00 AM)

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Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60' Degs.
Video VCU: SCU 24L

Count Name: State&Oakbrook
Site Code: TMC 1
Start Date: 10/07/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	S. State Street Southbound				Westbound St. Westbound				S. State Street Northbound				
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
12:00 PM	159	19	0	178	25	20	4	45	11	168	0	179	402
12:15 PM	147	18	0	165	13	19	0	32	6	160	0	166	363
12:30 PM	161	19	0	180	21	10	0	31	14	190	0	204	415
12:45 PM	166	23	0	189	20	17	1	37	8	161	0	169	395
Total	633	79	0	712	79	66	5	145	39	679	0	718	1575
Approach %	88.9	11.1	-	-	54.5	45.5	-	-	5.4	94.6	-	-	-
Total %	40.2	5.0	-	45.2	5.0	4.2	-	9.2	2.5	43.1	-	45.6	-
PHF	0.953	0.859	-	0.942	0.790	0.825	-	0.806	0.696	0.893	-	0.880	0.949
Lights	604	77	-	681	71	63	-	134	38	652	-	690	1505
% Lights	95.4	97.5	-	95.6	89.9	95.5	-	92.4	97.4	96.0	-	96.1	95.6
Buses	7	0	-	7	0	0	-	0	0	0	-	0	7
% Buses	1.1	0.0	-	1.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.4
Single-Unit Trucks	18	1	-	19	2	2	-	4	0	22	-	22	45
% Single-Unit Trucks	2.8	1.3	-	2.7	2.5	3.0	-	2.8	0.0	3.2	-	3.1	2.9
Articulated Trucks	3	1	-	4	0	1	-	1	0	3	-	3	8
% Articulated Trucks	0.5	1.3	-	0.6	0.0	1.5	-	0.7	0.0	0.4	-	0.4	0.5
Bicycles on Road	1	0	-	1	6	0	-	6	1	2	-	3	10
% Bicycles on Road	0.2	0.0	-	0.1	7.6	0.0	-	4.1	2.6	0.3	-	0.4	0.6
Bicycles on Crosswalk	-	-	0	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	-	-	0	-	-	-	5	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	100.0	-	-	-	-	-	-

Traffic Data Collection
7504 Sawgrass Drive
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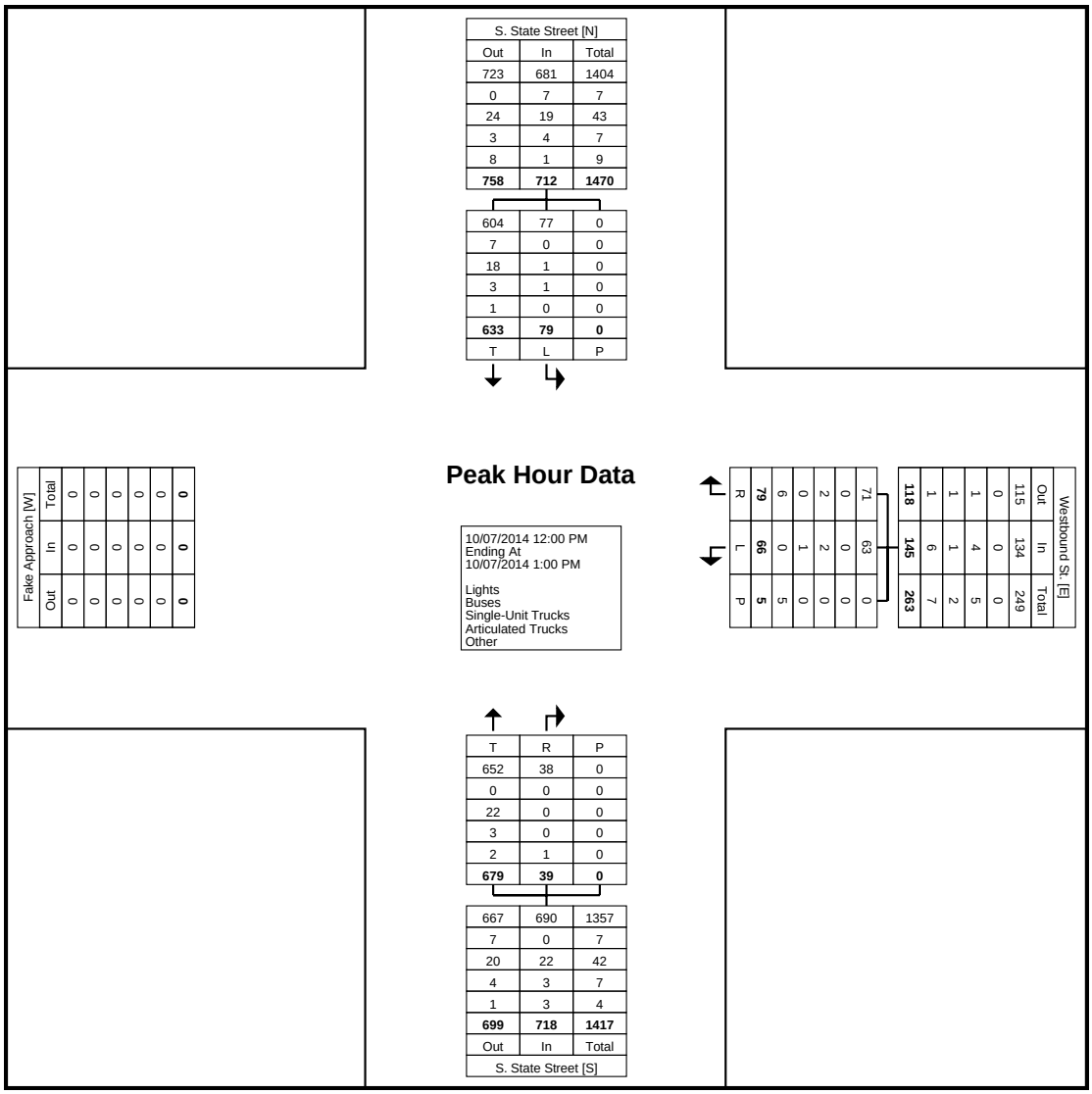
Ph. (586) 786-5407
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60' Degs.
Video VCU: SCU 24L

Count Name: State&Oakbrook
Site Code: TMC 1
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (12:00 PM)

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Corridor: S. State Street
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Video VCU: SCU 24L

Count Name: State&Oakbrook
Site Code: TMC 1
Start Date: 10/07/2014

Turning Movement Peak Hour Data (5:00 PM)

Start Time	S. State Street Southbound				Westbound St. Westbound				S. State Street Northbound				
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
5:00 PM	238	19	0	257	34	28	1	62	6	154	1	160	479
5:15 PM	190	35	2	225	28	13	0	41	8	174	0	182	448
5:30 PM	218	19	0	237	22	10	4	32	5	165	2	170	439
5:45 PM	223	16	2	239	13	8	1	21	5	166	0	171	431
Total	869	89	4	958	97	59	6	156	24	659	3	683	1797
Approach %	90.7	9.3	-	-	62.2	37.8	-	-	3.5	96.5	-	-	-
Total %	48.4	5.0	-	53.3	5.4	3.3	-	8.7	1.3	36.7	-	38.0	-
PHF	0.913	0.636	-	0.932	0.713	0.527	-	0.629	0.750	0.947	-	0.938	0.938
Lights	856	89	-	945	91	59	-	150	24	649	-	673	1768
% Lights	98.5	100.0	-	98.6	93.8	100.0	-	96.2	100.0	98.5	-	98.5	98.4
Buses	5	0	-	5	4	0	-	4	0	2	-	2	11
% Buses	0.6	0.0	-	0.5	4.1	0.0	-	2.6	0.0	0.3	-	0.3	0.6
Single-Unit Trucks	8	0	-	8	0	0	-	0	0	6	-	6	14
% Single-Unit Trucks	0.9	0.0	-	0.8	0.0	0.0	-	0.0	0.0	0.9	-	0.9	0.8
Articulated Trucks	0	0	-	0	0	0	-	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	0	-	0	2	0	-	2	0	2	-	2	4
% Bicycles on Road	0.0	0.0	-	0.0	2.1	0.0	-	1.3	0.0	0.3	-	0.3	0.2
Bicycles on Crosswalk	-	-	0	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	0.0	-	-	-	0.0	-	-	-	0.0	-	-
Pedestrians	-	-	4	-	-	-	6	-	-	-	3	-	-
% Pedestrians	-	-	100.0	-	-	-	100.0	-	-	-	100.0	-	-

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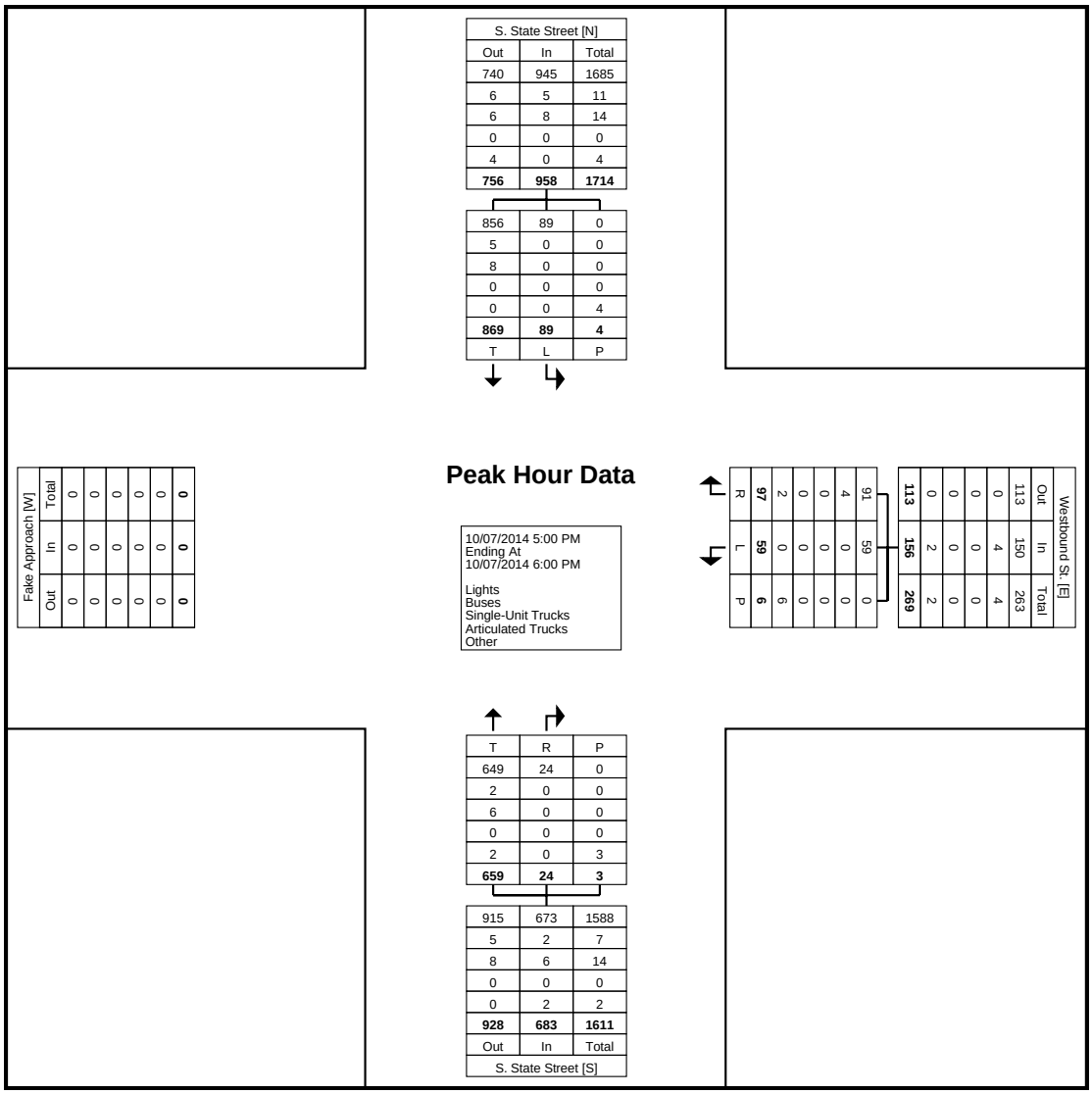
Count Name: State&Oakbrook
Site Code: TMC 1
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (5:00 PM)

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TDC
Traffic Data Collection

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy 60's Degs.
Video VCU: SCU 1US & 34O

Count Name: StateSt&Eisenhower
Site Code: TMC 2
Start Date: 10/07/2014

Turning Movement Data

Start Time	S State Street. Southbound					Eisenhower Pkwy. Westbound					S. State Street. Northbound					Eisenhower Pkwy. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	17	70	0	2	87	5	36	73	1	114	58	203	0	0	261	32	41	15	0	88	550
7:15 AM	10	66	0	0	76	13	66	77	0	156	76	214	0	0	290	34	70	30	0	134	656
7:30 AM	18	85	0	1	103	19	61	85	1	165	137	269	0	2	406	50	73	27	0	150	824
7:45 AM	22	89	0	0	111	11	85	91	0	187	142	255	0	1	397	50	95	39	0	184	879
Hourly Total	67	310	0	3	377	48	248	326	2	622	413	941	0	3	1354	166	279	111	0	556	2909
8:00 AM	12	90	0	0	102	15	85	119	0	219	126	259	0	0	385	53	101	40	0	194	900
8:15 AM	16	94	0	2	110	18	79	92	0	189	131	281	0	1	412	65	116	40	0	221	932
8:30 AM	19	90	0	2	109	23	110	102	0	235	113	254	0	1	367	74	127	47	0	248	959
8:45 AM	20	112	0	2	132	15	122	110	0	247	111	261	0	1	372	61	115	42	0	218	969
Hourly Total	67	386	0	6	453	71	396	423	0	890	481	1055	0	3	1536	253	459	169	0	881	3760
9:00 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2
11:00 AM	34	104	0	0	138	11	118	88	0	217	84	134	0	0	218	46	82	35	0	163	736
11:15 AM	51	111	0	1	162	11	125	74	0	210	86	141	0	1	227	57	99	38	0	194	793
11:30 AM	48	121	0	2	169	10	182	119	1	311	96	140	0	3	236	56	111	40	2	207	923
11:45 AM	56	153	0	1	209	13	160	128	0	301	112	160	0	0	272	57	112	42	1	211	993
Hourly Total	189	489	0	4	678	45	585	409	1	1039	378	575	0	4	953	216	404	155	3	775	3445
12:00 PM	59	152	0	2	211	17	215	106	0	338	105	124	0	2	229	60	168	47	0	275	1053
12:15 PM	62	145	0	2	207	10	161	109	1	280	97	157	0	0	254	79	140	60	0	279	1020
12:30 PM	50	148	0	8	198	19	168	90	0	277	117	174	0	0	291	70	143	72	0	285	1051
12:45 PM	56	143	1	1	200	20	156	110	0	286	135	150	0	2	285	79	148	53	1	280	1051
Hourly Total	227	588	1	13	816	66	700	415	1	1181	454	605	0	4	1059	288	599	232	1	1119	4175
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	44	209	0	0	253	14	181	172	1	367	67	108	0	2	175	80	129	25	3	234	1029
4:15 PM	53	191	0	1	244	12	134	183	0	329	101	115	0	0	216	52	112	36	1	200	989
4:30 PM	48	243	0	3	291	9	188	206	1	403	83	132	0	1	215	83	102	26	2	211	1120
4:45 PM	60	218	0	2	278	7	186	220	0	413	104	135	0	1	239	71	126	41	0	238	1168
Hourly Total	205	861	0	6	1066	42	689	781	2	1512	355	490	0	4	845	286	469	128	6	883	4306
5:00 PM	67	197	0	4	264	6	217	204	0	427	87	129	0	4	216	88	144	34	3	266	1173
5:15 PM	58	154	0	1	212	13	227	214	1	454	100	138	0	1	238	69	144	29	0	242	1146
5:30 PM	61	237	0	2	298	15	198	201	2	414	100	137	0	2	237	66	124	28	1	218	1167
5:45 PM	57	201	0	0	258	9	124	148	1	281	103	154	0	0	257	57	123	29	0	209	1005
Hourly Total	243	789	0	7	1032	43	766	767	4	1576	390	558	0	7	948	280	535	120	4	935	4491
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Grand Total	998	3423	1	39	4422	316	3384	3121	10	6821	2471	4225	0	25	6696	1489	2746	915	14	5150	23089
Approach %	22.6	77.4	0.0	-	-	4.6	49.6	45.8	-	-	36.9	63.1	0.0	-	-	28.9	53.3	17.8	-	-	-
Total %	4.3	14.8	0.0	-	19.2	1.4	14.7	13.5	-	29.5	10.7	18.3	0.0	-	29.0	6.4	11.9	4.0	-	22.3	-
Lights	976	3308	1	-	4285	308	3315	3054	-	6677	2410	4129	0	-	6539	1471	2652	892	-	5015	22516
% Lights	97.8	96.6	100.0	-	96.9	97.5	98.0	97.9	-	97.9	97.5	97.7	-	-	97.7	98.8	96.6	97.5	-	97.4	97.5
Buses	5	45	0	-	50	2	42	16	-	60	15	15	0	-	30	1	65	2	-	68	208
% Buses	0.5	1.3	0.0	-	1.1	0.6	1.2	0.5	-	0.9	0.6	0.4	-	-	0.4	0.1	2.4	0.2	-	1.3	0.9
Single-Unit Trucks	16	59	0	-	75	6	23	26	-	55	34	67	0	-	101	13	27	21	-	61	292
% Single-Unit Trucks	1.6	1.7	0.0	-	1.7	1.9	0.7	0.8	-	0.8	1.4	1.6	-	-	1.5	0.9	1.0	2.3	-	1.2	1.3
Articulated Trucks	1	8	0	-	9	0	4	25	-	29	12	12	0	-	24	3	1	0	-	4	66
% Articulated Trucks	0.1	0.2	0.0	-	0.2	0.0	0.1	0.8	-	0.4	0.5	0.3	-	-	0.4	0.2	0.0	0.0	-	0.1	0.3
Bicycles on Road	0	3	0	-	3	0	0	0	-	0	0	2	0	-	2	1	1	0	-	2	7
% Bicycles on Road	0.0	0.1	0.0	-	0.1	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.1	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	4	-	-	-	-	2	-	-	-	-	8	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	10.3	-	-	-	-	20.0	-	-	-	-	32.0	-	-	-	-	7.1	-	-
Pedestrians	-	-	-	35	-	-	-	-	8	-	-	-	-	17	-	-	-	-	13	-	-
% Pedestrians	-	-	-	89.7	-	-	-	-	80.0	-	-	-	-	68.0	-	-	-	-	92.9	-	-

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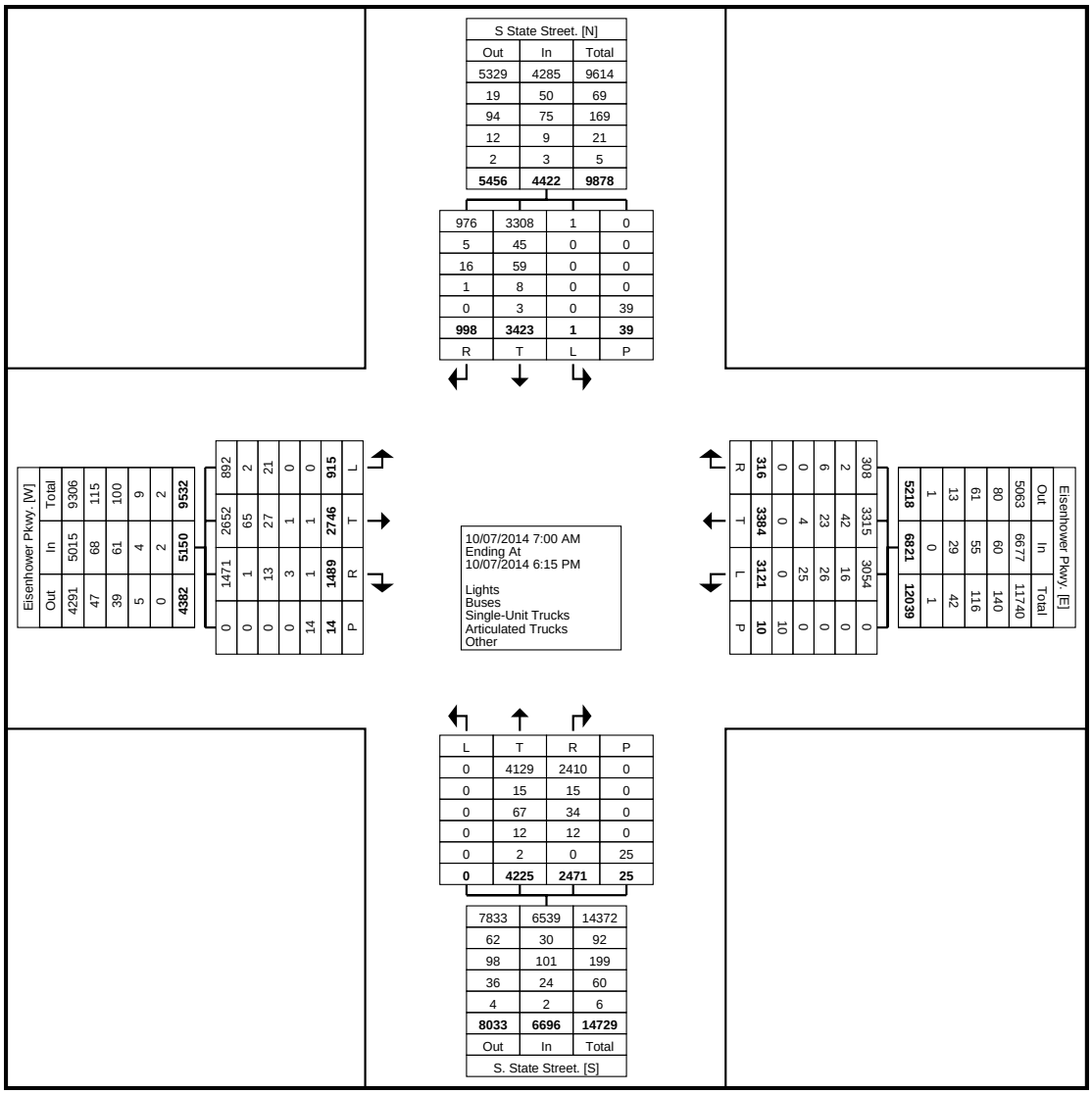
Video VCU: SCU 1US & 34O

Count Name: StateSt&Eisenhower
Site Code: TMC 2
Start Date: 10/07/2014



Turning Movement Data Plot

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Count Name: StateSt&Eisenhower
Site Code: TMC 2
Start Date: 10/07/2014

Turning Movement Peak Hour Data (8:00 AM)

Start Time	S State Street. Southbound					Eisenhower Pkwy. Westbound					S. State Street. Northbound					Eisenhower Pkwy. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
8:00 AM	12	90	0	0	102	15	85	119	0	219	126	259	0	0	385	53	101	40	0	194	900
8:15 AM	16	94	0	2	110	18	79	92	0	189	131	281	0	1	412	65	116	40	0	221	932
8:30 AM	19	90	0	2	109	23	110	102	0	235	113	254	0	1	367	74	127	47	0	248	959
8:45 AM	20	112	0	2	132	15	122	110	0	247	111	261	0	1	372	61	115	42	0	218	969
Total	67	386	0	6	453	71	396	423	0	890	481	1055	0	3	1536	253	459	169	0	881	3760
Approach %	14.8	85.2	0.0	-	-	8.0	44.5	47.5	-	-	31.3	68.7	0.0	-	-	28.7	52.1	19.2	-	-	-
Total %	1.8	10.3	0.0	-	12.0	1.9	10.5	11.3	-	23.7	12.8	28.1	0.0	-	40.9	6.7	12.2	4.5	-	23.4	-
PHF	0.838	0.862	0.000	-	0.858	0.772	0.811	0.889	-	0.901	0.918	0.939	0.000	-	0.932	0.855	0.904	0.899	-	0.888	0.970
Lights	64	371	0	-	435	70	385	412	-	867	470	1030	0	-	1500	253	435	166	-	854	3656
% Lights	95.5	96.1	-	-	96.0	98.6	97.2	97.4	-	97.4	97.7	97.6	-	-	97.7	100.0	94.8	98.2	-	96.9	97.2
Buses	2	8	0	-	10	0	8	1	-	9	0	4	0	-	4	0	19	1	-	20	43
% Buses	3.0	2.1	-	-	2.2	0.0	2.0	0.2	-	1.0	0.0	0.4	-	-	0.3	0.0	4.1	0.6	-	2.3	1.1
Single-Unit Trucks	1	6	0	-	7	1	2	3	-	6	9	18	0	-	27	0	4	2	-	6	46
% Single-Unit Trucks	1.5	1.6	-	-	1.5	1.4	0.5	0.7	-	0.7	1.9	1.7	-	-	1.8	0.0	0.9	1.2	-	0.7	1.2
Articulated Trucks	0	0	0	-	0	0	1	7	-	8	2	3	0	-	5	0	0	0	-	0	13
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.3	1.7	-	0.9	0.4	0.3	-	-	0.3	0.0	0.0	0.0	-	0.0	0.3
Bicycles on Road	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	2
% Bicycles on Road	0.0	0.3	-	-	0.2	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.2	0.0	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	16.7	-	-	-	-	-	-	-	-	-	66.7	-	-	-	-	-	-	-
Pedestrians	-	-	-	5	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	83.3	-	-	-	-	-	-	-	-	-	33.3	-	-	-	-	-	-	-

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Count Name: StateSt&Eisenhower
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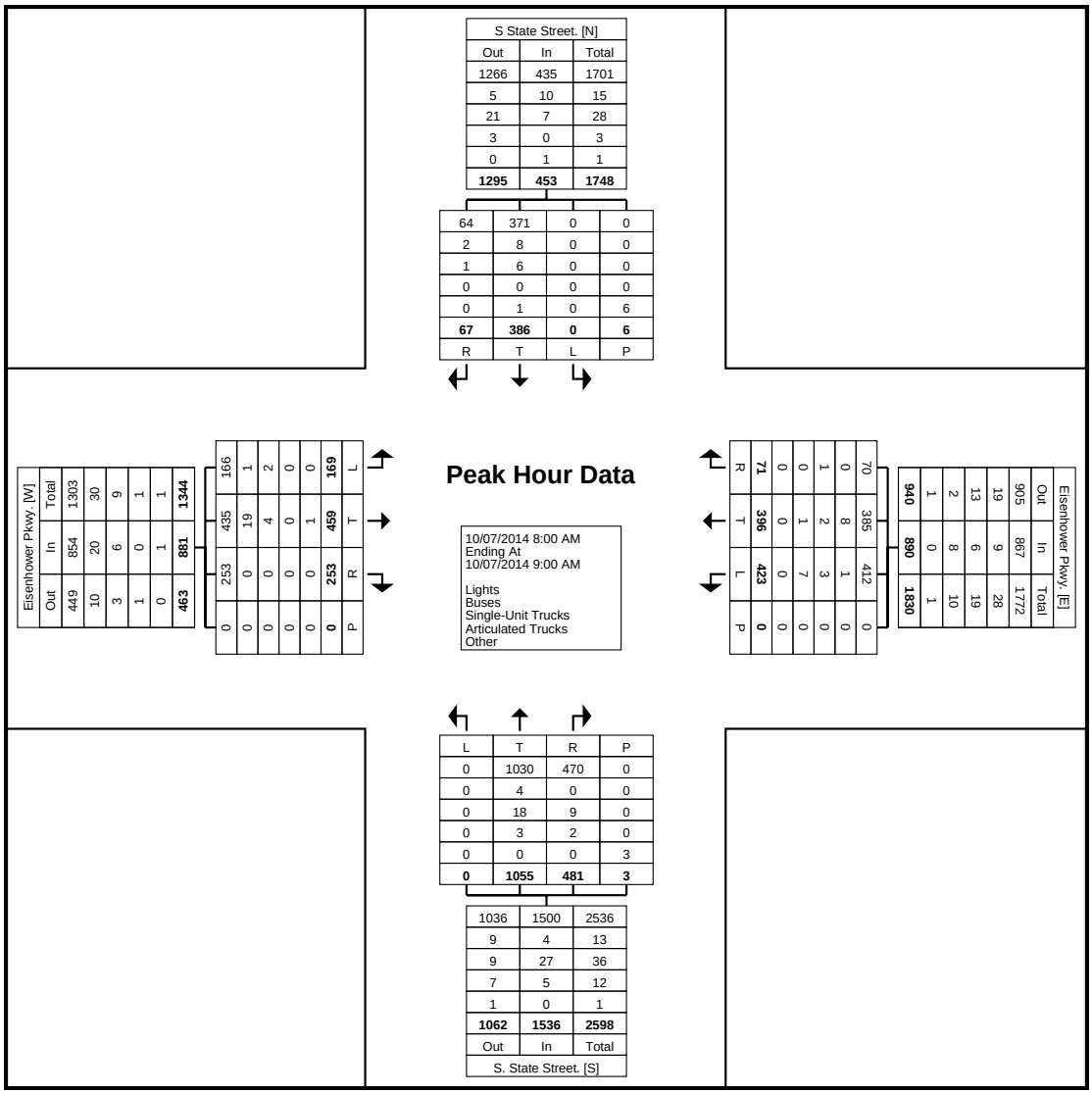
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (8:00 AM)

Traffic Data Collection

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Count Name: StateSt&Eisenhower
Site Code: TMC 2
Start Date: 10/07/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	S State Street. Southbound					Eisenhower Pkwy. Westbound					S. State Street. Northbound					Eisenhower Pkwy. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	34	104	0	0	138	11	118	88	0	217	84	134	0	0	218	46	82	35	0	163	736
11:15 AM	51	111	0	1	162	11	125	74	0	210	86	141	0	1	227	57	99	38	0	194	793
11:30 AM	48	121	0	2	169	10	182	119	1	311	96	140	0	3	236	56	111	40	2	207	923
11:45 AM	56	153	0	1	209	13	160	128	0	301	112	160	0	0	272	57	112	42	1	211	993
Total	189	489	0	4	678	45	585	409	1	1039	378	575	0	4	953	216	404	155	3	775	3445
Approach %	27.9	72.1	0.0	-	-	4.3	56.3	39.4	-	-	39.7	60.3	0.0	-	-	27.9	52.1	20.0	-	-	-
Total %	5.5	14.2	0.0	-	19.7	1.3	17.0	11.9	-	30.2	11.0	16.7	0.0	-	27.7	6.3	11.7	4.5	-	22.5	-
PHF	0.844	0.799	0.000	-	0.811	0.865	0.804	0.799	-	0.835	0.844	0.898	0.000	-	0.876	0.947	0.902	0.923	-	0.918	0.867
Lights	178	460	0	-	638	42	575	395	-	1012	357	554	0	-	911	212	390	147	-	749	3310
% Lights	94.2	94.1	-	-	94.1	93.3	98.3	96.6	-	97.4	94.4	96.3	-	-	95.6	98.1	96.5	94.8	-	96.6	96.1
Buses	1	10	0	-	11	0	5	6	-	11	3	0	0	-	3	0	7	0	-	7	32
% Buses	0.5	2.0	-	-	1.6	0.0	0.9	1.5	-	1.1	0.8	0.0	-	-	0.3	0.0	1.7	0.0	-	0.9	0.9
Single-Unit Trucks	10	17	0	-	27	3	5	7	-	15	12	17	0	-	29	2	6	8	-	16	87
% Single-Unit Trucks	5.3	3.5	-	-	4.0	6.7	0.9	1.7	-	1.4	3.2	3.0	-	-	3.0	0.9	1.5	5.2	-	2.1	2.5
Articulated Trucks	0	2	0	-	2	0	0	1	-	1	6	4	0	-	10	2	1	0	-	3	16
% Articulated Trucks	0.0	0.4	-	-	0.3	0.0	0.0	0.2	-	0.1	1.6	0.7	-	-	1.0	0.9	0.2	0.0	-	0.4	0.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	25.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	3	-	-	-	-	1	-	-	-	-	4	-	-	-	-	3	-	-
% Pedestrians	-	-	-	75.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Traffic Data Collection
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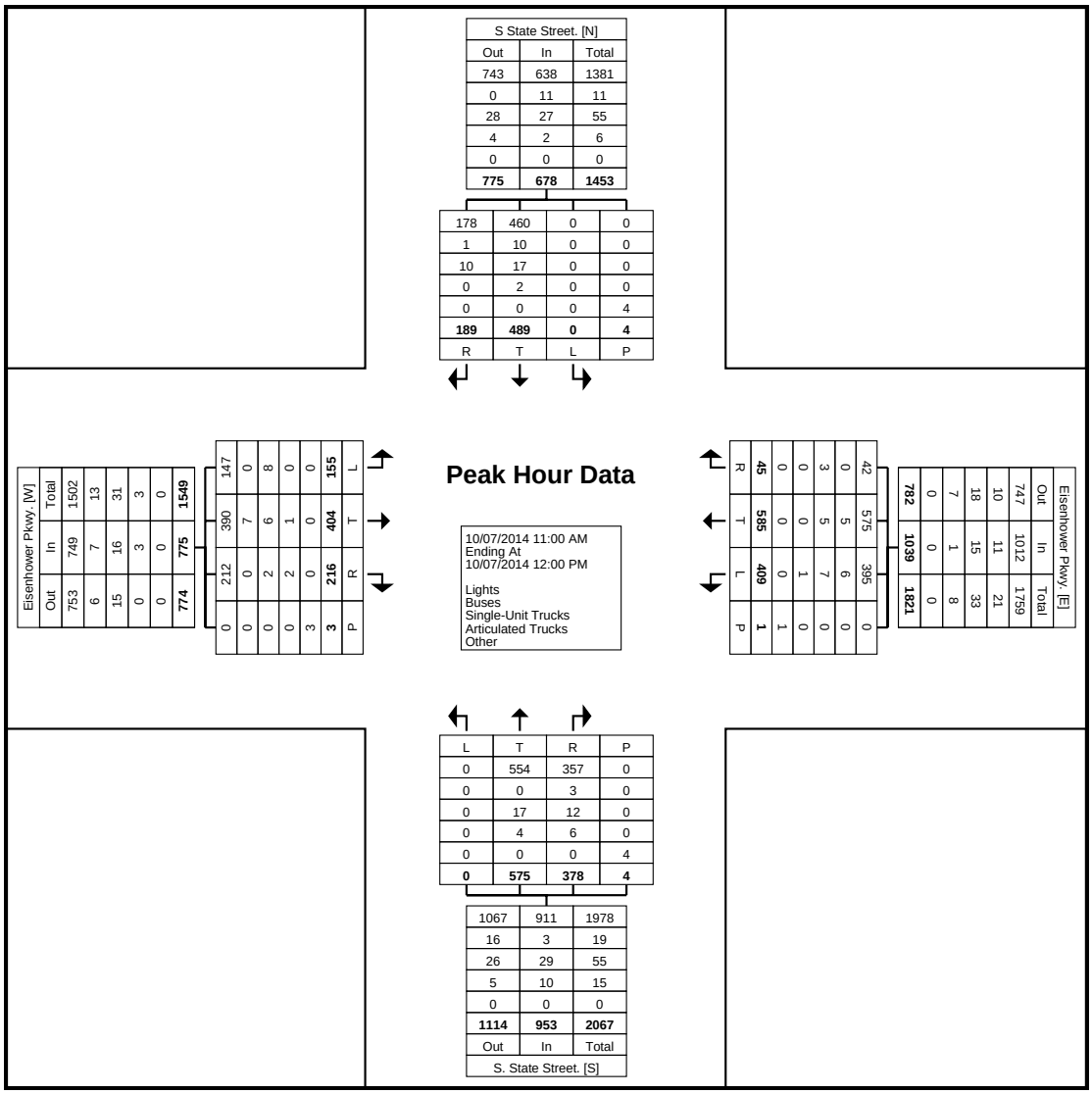
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy 60's Degs.
Video VCU: SCU 1US & 34O

Count Name: StateSt&Eisenhower
Site Code: TMC 2
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (11:00 AM)

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy 60's Degs.
Video VCU: SCU 1US & 34O

Count Name: StateSt&Eisenhower
Site Code: TMC 2
Start Date: 10/07/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	S State Street. Southbound					Eisenhower Pkwy. Westbound					S. State Street. Northbound					Eisenhower Pkwy. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
12:00 PM	59	152	0	2	211	17	215	106	0	338	105	124	0	2	229	60	168	47	0	275	1053
12:15 PM	62	145	0	2	207	10	161	109	1	280	97	157	0	0	254	79	140	60	0	279	1020
12:30 PM	50	148	0	8	198	19	168	90	0	277	117	174	0	0	291	70	143	72	0	285	1051
12:45 PM	56	143	1	1	200	20	156	110	0	286	135	150	0	2	285	79	148	53	1	280	1051
Total	227	588	1	13	816	66	700	415	1	1181	454	605	0	4	1059	288	599	232	1	1119	4175
Approach %	27.8	72.1	0.1	-	-	5.6	59.3	35.1	-	-	42.9	57.1	0.0	-	-	25.7	53.5	20.7	-	-	-
Total %	5.4	14.1	0.0	-	19.5	1.6	16.8	9.9	-	28.3	10.9	14.5	0.0	-	25.4	6.9	14.3	5.6	-	26.8	-
PHF	0.915	0.967	0.250	-	0.967	0.825	0.814	0.943	-	0.874	0.841	0.869	0.000	-	0.910	0.911	0.891	0.806	-	0.982	0.991
Lights	222	561	1	-	784	63	685	397	-	1145	443	586	0	-	1029	282	584	226	-	1092	4050
% Lights	97.8	95.4	100.0	-	96.1	95.5	97.9	95.7	-	97.0	97.6	96.9	-	-	97.2	97.9	97.5	97.4	-	97.6	97.0
Buses	1	7	0	-	8	2	7	2	-	11	4	0	0	-	4	1	7	1	-	9	32
% Buses	0.4	1.2	0.0	-	1.0	3.0	1.0	0.5	-	0.9	0.9	0.0	-	-	0.4	0.3	1.2	0.4	-	0.8	0.8
Single-Unit Trucks	3	16	0	-	19	1	8	5	-	14	4	16	0	-	20	4	8	5	-	17	70
% Single-Unit Trucks	1.3	2.7	0.0	-	2.3	1.5	1.1	1.2	-	1.2	0.9	2.6	-	-	1.9	1.4	1.3	2.2	-	1.5	1.7
Articulated Trucks	1	3	0	-	4	0	0	11	-	11	3	3	0	-	6	1	0	0	-	1	22
% Articulated Trucks	0.4	0.5	0.0	-	0.5	0.0	0.0	2.7	-	0.9	0.7	0.5	-	-	0.6	0.3	0.0	0.0	-	0.1	0.5
Bicycles on Road	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.2	0.0	-	0.1	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	25.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	13	-	-	-	-	1	-	-	-	-	3	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	75.0	-	-	-	-	100.0	-	-

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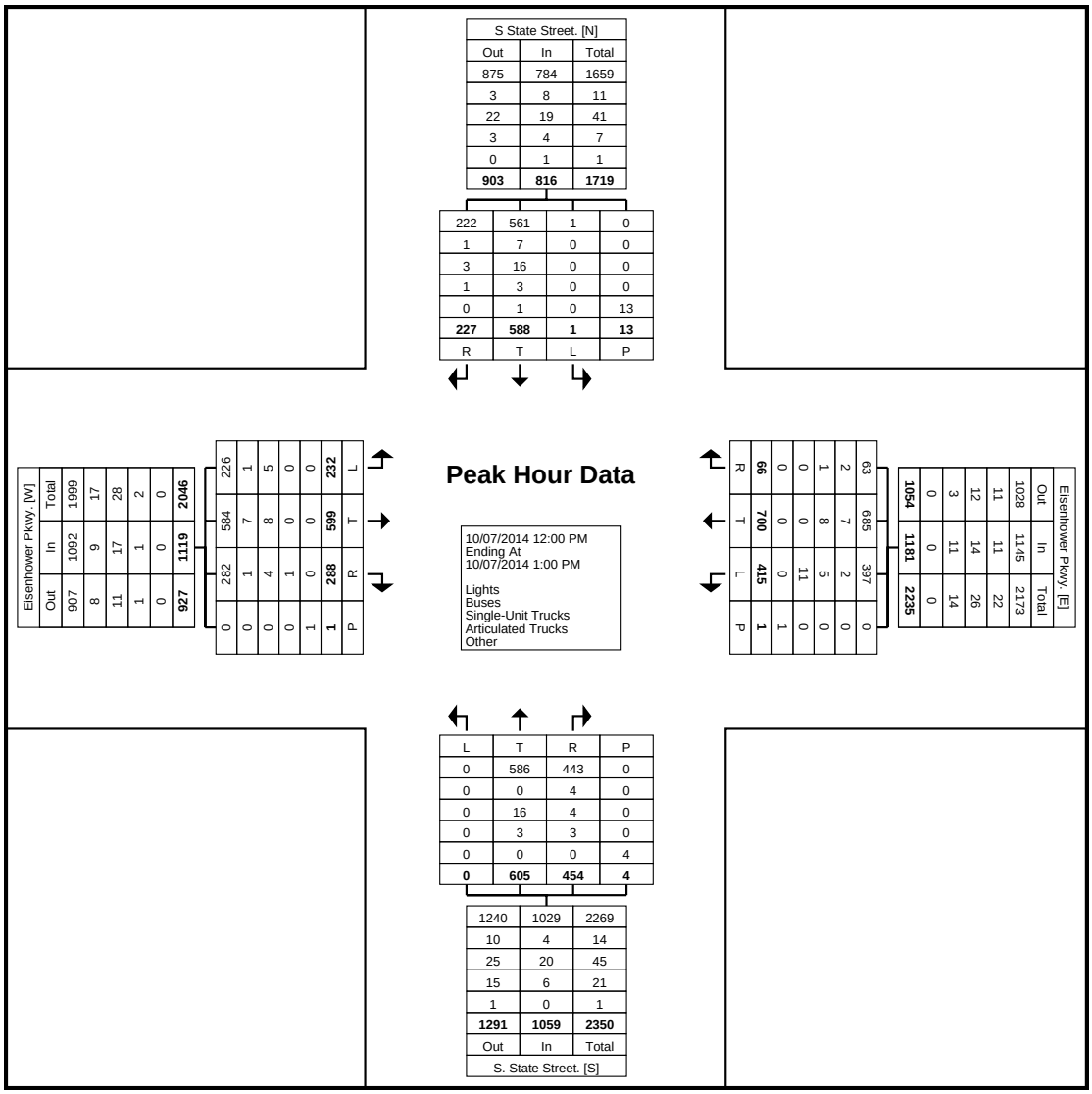
Corridor: S. State Street
Weather: Pt. Cldy 60's Degs.
Video VCU: SCU 1US & 34O

Count Name: StateSt&Eisenhower
Site Code: TMC 2
Start Date: 10/07/2014
Page No: 8



Turning Movement Peak Hour Data Plot (12:00 PM)

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Video VCU: SCU 1US & 34O

Count Name: StateSt&Eisenhower
Site Code: TMC 2
Start Date: 10/07/2014

Turning Movement Peak Hour Data (4:45 PM)

Start Time	S State Street. Southbound					Eisenhower Pkwy. Westbound					S. State Street. Northbound					Eisenhower Pkwy. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
4:45 PM	60	218	0	2	278	7	186	220	0	413	104	135	0	1	239	71	126	41	0	238	1168
5:00 PM	67	197	0	4	264	6	217	204	0	427	87	129	0	4	216	88	144	34	3	266	1173
5:15 PM	58	154	0	1	212	13	227	214	1	454	100	138	0	1	238	69	144	29	0	242	1146
5:30 PM	61	237	0	2	298	15	198	201	2	414	100	137	0	2	237	66	124	28	1	218	1167
Total	246	806	0	9	1052	41	828	839	3	1708	391	539	0	8	930	294	538	132	4	964	4654
Approach %	23.4	76.6	0.0	-	-	2.4	48.5	49.1	-	-	42.0	58.0	0.0	-	-	30.5	55.8	13.7	-	-	-
Total %	5.3	17.3	0.0	-	22.6	0.9	17.8	18.0	-	36.7	8.4	11.6	0.0	-	20.0	6.3	11.6	2.8	-	20.7	-
PHF	0.918	0.850	0.000	-	0.883	0.683	0.912	0.953	-	0.941	0.940	0.976	0.000	-	0.973	0.835	0.934	0.805	-	0.906	0.992
Lights	245	795	0	-	1040	41	821	833	-	1695	386	533	0	-	919	287	525	129	-	941	4595
% Lights	99.6	98.6	-	-	98.9	100.0	99.2	99.3	-	99.2	98.7	98.9	-	-	98.8	97.6	97.6	97.7	-	97.6	98.7
Buses	0	4	0	-	4	0	5	1	-	6	0	0	0	-	0	0	9	0	-	9	19
% Buses	0.0	0.5	-	-	0.4	0.0	0.6	0.1	-	0.4	0.0	0.0	-	-	0.0	0.0	1.7	0.0	-	0.9	0.4
Single-Unit Trucks	1	7	0	-	8	0	2	4	-	6	5	5	0	-	10	7	4	3	-	14	38
% Single-Unit Trucks	0.4	0.9	-	-	0.8	0.0	0.2	0.5	-	0.4	1.3	0.9	-	-	1.1	2.4	0.7	2.3	-	1.5	0.8
Articulated Trucks	0	0	0	-	0	0	0	1	-	1	0	0	0	-	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	0.1	-	0.1	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.2	-	-	0.1	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	4	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	11.1	-	-	-	-	0.0	-	-	-	-	50.0	-	-	-	-	25.0	-	-
Pedestrians	-	-	-	8	-	-	-	-	3	-	-	-	-	4	-	-	-	-	3	-	-
% Pedestrians	-	-	-	88.9	-	-	-	-	100.0	-	-	-	-	50.0	-	-	-	-	75.0	-	-

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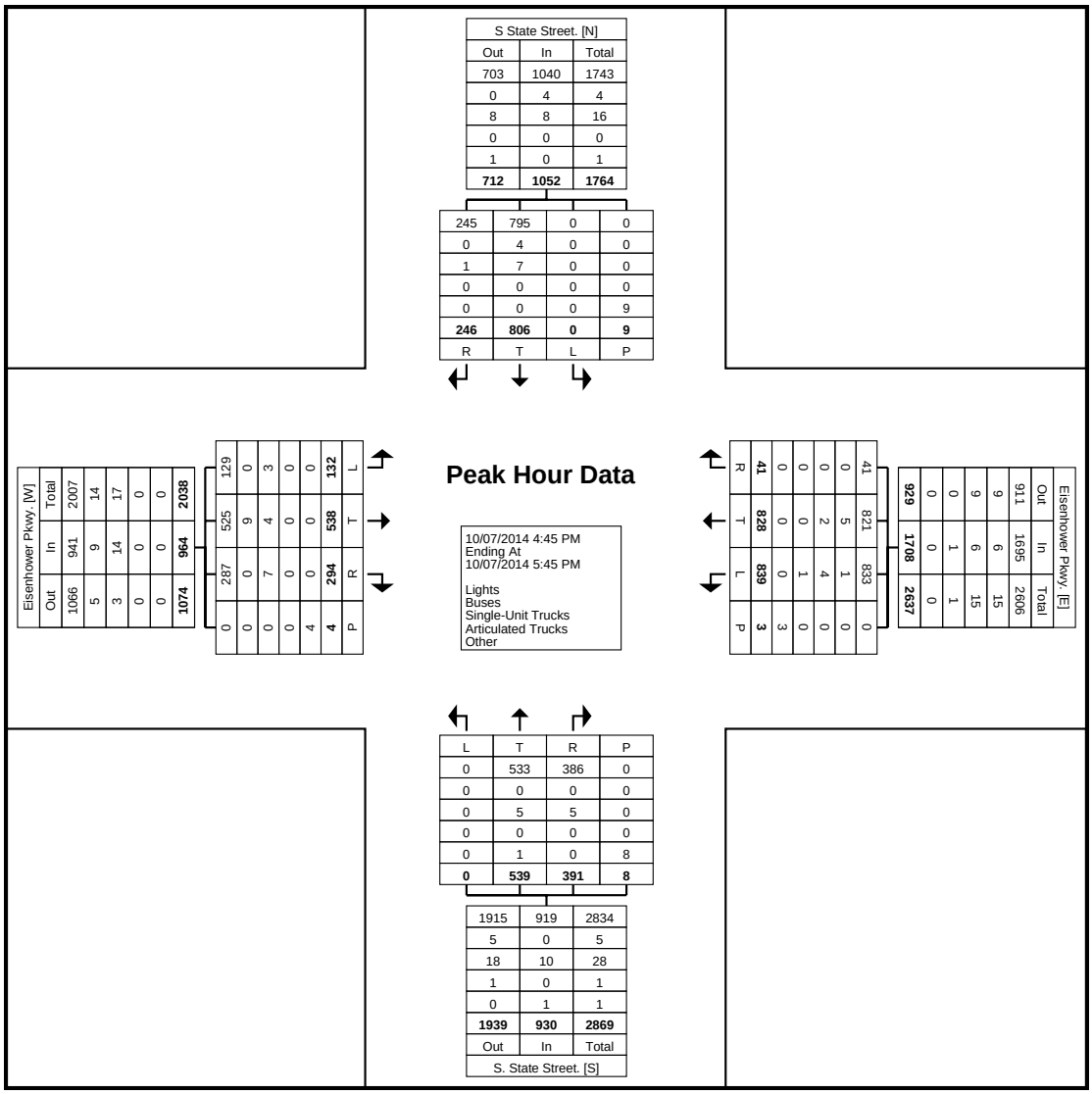
Weather: Pt. Cldy 60's Degs.
Video VCU: SCU 1US & 34O

Count Name: StateSt&Eisenhower
Site Code: TMC 2
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (4:45 PM)

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Signalized intersection with pedestrian signals all quadrants & push buttons for south & north legs. Video VCU cameras were located at NW & SE quadrant. EB had dual left turns. Bike lane exist for S. State Street.
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Clear, 60' Degs.
Video VCU: SCU 3EP

Count Name: StateSt&Mall Dr
Site Code: TMC 3
Start Date: 10/09/2014

Turning Movement Data

Start Time	S. State Street Southbound					S. State Street Northbound			Mall Drive Eastbound					
	Right	Thru	U-Turn	Peds	App. Total	Thru	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Int. Total
7:00 AM	2	135	0	0	137	252	0	252	1	1	0	0	2	391
7:15 AM	3	163	0	0	166	309	0	309	1	0	0	1	1	476
7:30 AM	6	201	0	0	207	406	0	406	0	1	0	0	1	614
7:45 AM	4	273	1	0	278	394	0	394	0	0	0	1	0	672
Hourly Total	15	772	1	0	788	1361	0	1361	2	2	0	2	4	2153
8:00 AM	6	246	0	0	252	369	0	369	0	1	0	1	1	622
8:15 AM	6	258	0	0	264	390	0	390	2	1	0	0	3	657
8:30 AM	5	253	0	2	258	408	3	408	2	0	0	2	2	668
8:45 AM	8	275	0	0	283	375	0	375	1	1	0	0	2	660
Hourly Total	25	1032	0	2	1057	1542	3	1542	5	3	0	3	8	2607
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	5	234	0	0	239	219	0	219	2	1	0	0	3	461
11:15 AM	9	245	0	0	254	203	0	203	1	3	0	0	4	461
11:30 AM	13	278	0	0	291	264	0	264	6	0	0	0	6	561
11:45 AM	10	317	1	0	328	300	0	300	9	1	0	0	10	638
Hourly Total	37	1074	1	0	1112	986	0	986	18	5	0	0	23	2121
12:00 PM	18	314	0	0	332	246	0	246	8	0	0	0	8	586
12:15 PM	19	305	0	0	324	271	0	271	6	2	0	0	8	603
12:30 PM	18	307	0	0	325	268	0	268	8	4	0	0	12	605
12:45 PM	7	328	0	0	335	253	0	253	9	2	0	0	11	599
Hourly Total	62	1254	0	0	1316	1038	0	1038	31	8	0	0	39	2393
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	13	516	0	0	529	198	0	198	11	1	0	1	12	739
4:15 PM	15	476	1	0	492	201	0	201	13	1	0	2	14	707
4:30 PM	20	482	0	0	502	199	0	199	13	1	0	0	14	715
4:45 PM	13	530	0	0	543	239	0	239	10	0	0	0	10	792
Hourly Total	61	2004	1	0	2066	837	0	837	47	3	0	3	50	2953
5:00 PM	21	488	0	0	509	244	0	244	40	2	0	0	42	795
5:15 PM	11	339	1	0	351	244	0	244	18	0	0	1	18	613
5:30 PM	12	445	0	0	457	235	0	235	5	1	0	2	6	698
5:45 PM	11	448	1	0	460	249	0	249	13	3	0	0	16	725
Hourly Total	55	1720	2	0	1777	972	0	972	76	6	0	3	82	2831
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	255	7856	5	2	8116	6736	3	6736	179	27	0	11	206	15058
Approach %	3.1	96.8	0.1	-	-	100.0	-	-	86.9	13.1	0.0	-	-	-
Total %	1.7	52.2	0.0	-	53.9	44.7	-	44.7	1.2	0.2	0.0	-	1.4	-
Lights	252	7627	5	-	7884	6598	-	6598	177	27	0	-	204	14686
% Lights	98.8	97.1	100.0	-	97.1	98.0	-	98.0	98.9	100.0	-	-	99.0	97.5
Buses	0	52	0	-	52	29	-	29	0	0	0	-	0	81
% Buses	0.0	0.7	0.0	-	0.6	0.4	-	0.4	0.0	0.0	-	-	0.0	0.5
Single-Unit Trucks	2	128	0	-	130	93	-	93	2	0	0	-	2	225
% Single-Unit Trucks	0.8	1.6	0.0	-	1.6	1.4	-	1.4	1.1	0.0	-	-	1.0	1.5
Articulated Trucks	1	47	0	-	48	16	-	16	0	0	0	-	0	64
% Articulated Trucks	0.4	0.6	0.0	-	0.6	0.2	-	0.2	0.0	0.0	-	-	0.0	0.4
Bicycles on Road	0	2	0	-	2	0	-	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	0.0	-	-	-	-	9.1	-	-
Pedestrians	-	-	-	2	-	-	3	-	-	-	-	10	-	-
% Pedestrians	-	-	-	100.0	-	-	100.0	-	-	-	-	90.9	-	-

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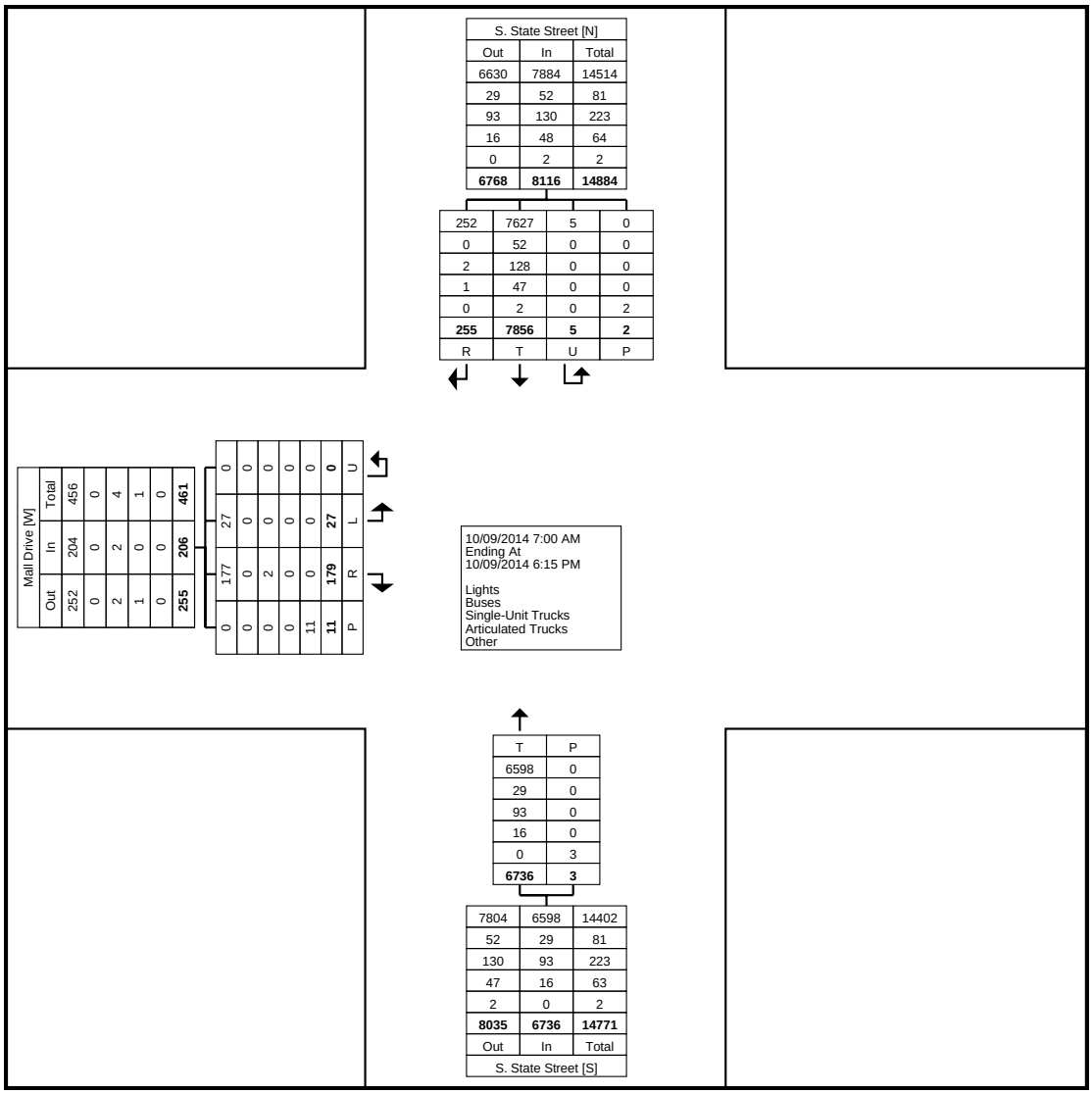

Turning Movement Data Plot

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Video VCU: SCU 3EP

Count Name: StateSt&Mall Dr
Site Code: TMC 3
Start Date: 10/09/2014

Turning Movement Peak Hour Data (7:45 AM)

Start Time	S. State Street Southbound					S. State Street Northbound			Mall Drive Eastbound					
	Right	Thru	U-Turn	Peds	App. Total	Thru	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Int. Total
7:45 AM	4	273	1	0	278	394	0	394	0	0	0	1	0	672
8:00 AM	6	246	0	0	252	369	0	369	0	1	0	1	1	622
8:15 AM	6	258	0	0	264	390	0	390	2	1	0	0	3	657
8:30 AM	5	253	0	2	258	408	3	408	2	0	0	2	2	668
Total	21	1030	1	2	1052	1561	3	1561	4	2	0	4	6	2619
Approach %	2.0	97.9	0.1	-	-	100.0	-	-	66.7	33.3	0.0	-	-	-
Total %	0.8	39.3	0.0	-	40.2	59.6	-	59.6	0.2	0.1	0.0	-	0.2	-
PHF	0.875	0.943	0.250	-	0.946	0.956	-	0.956	0.500	0.500	0.000	-	0.500	0.974
Lights	21	993	1	-	1015	1525	-	1525	4	2	0	-	6	2546
% Lights	100.0	96.4	100.0	-	96.5	97.7	-	97.7	100.0	100.0	-	-	100.0	97.2
Buses	0	10	0	-	10	4	-	4	0	0	0	-	0	14
% Buses	0.0	1.0	0.0	-	1.0	0.3	-	0.3	0.0	0.0	-	-	0.0	0.5
Single-Unit Trucks	0	14	0	-	14	27	-	27	0	0	0	-	0	41
% Single-Unit Trucks	0.0	1.4	0.0	-	1.3	1.7	-	1.7	0.0	0.0	-	-	0.0	1.6
Articulated Trucks	0	13	0	-	13	5	-	5	0	0	0	-	0	18
% Articulated Trucks	0.0	1.3	0.0	-	1.2	0.3	-	0.3	0.0	0.0	-	-	0.0	0.7
Bicycles on Road	0	0	0	-	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	3	-	-	-	-	4	-	-
% Pedestrians	-	-	-	100.0	-	-	100.0	-	-	-	-	100.0	-	-

Traffic Data Collection
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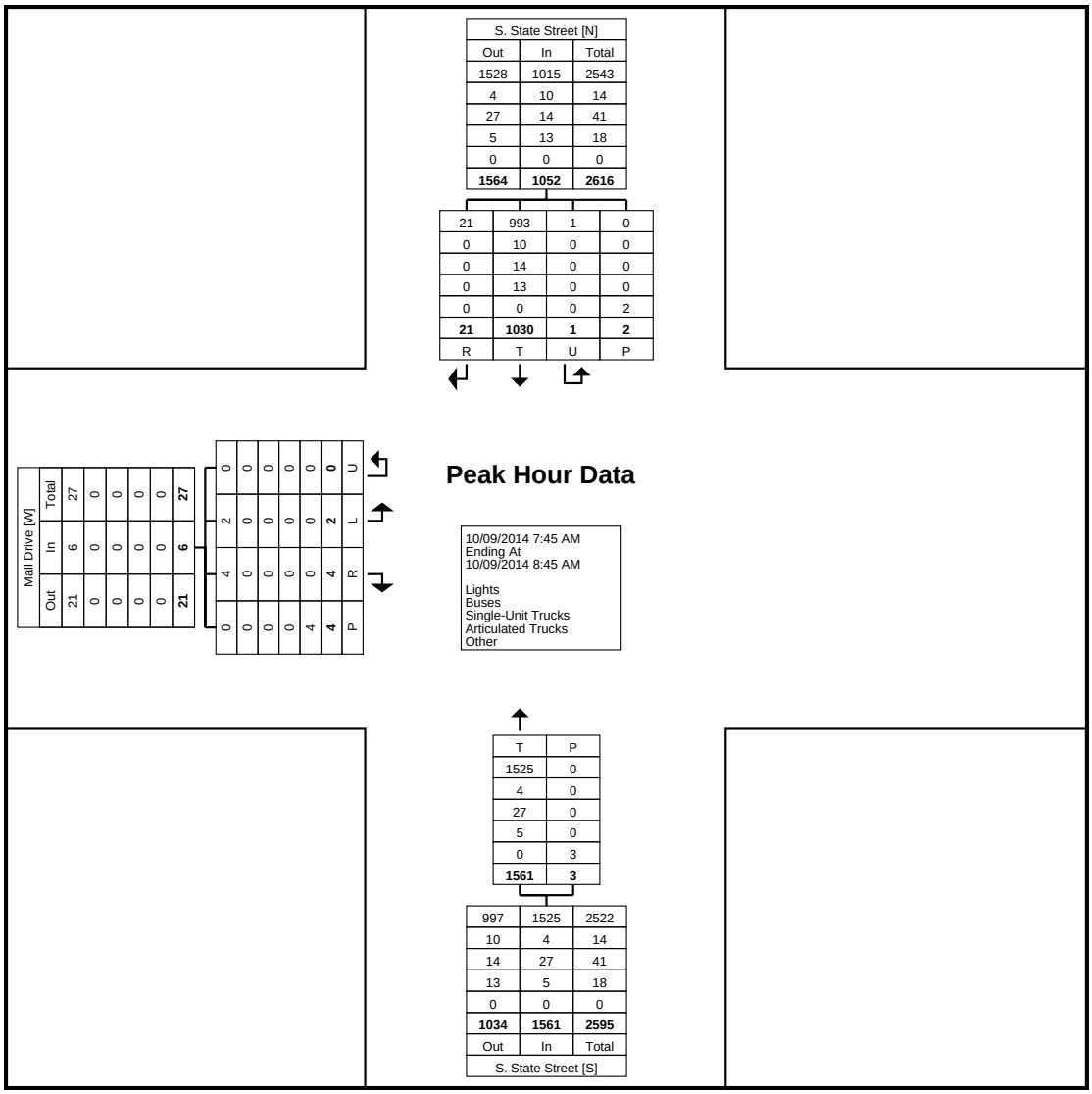
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Clear, 60' Degs.
Video VCU: SCU 3EP

Count Name: StateSt&Mall Dr
Site Code: TMC 3
Start Date: 10/09/2014



Turning Movement Peak Hour Data Plot (7:45 AM)

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Weather: Clear, 60' Degs.
Video VCU: SCU 3EP

Count Name: StateSt&Mall Dr
Site Code: TMC 3
Start Date: 10/09/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	S. State Street Southbound					S. State Street Northbound			Mall Drive Eastbound					
	Right	Thru	U-Turn	Peds	App. Total	Thru	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Int. Total
11:00 AM	5	234	0	0	239	219	0	219	2	1	0	0	3	461
11:15 AM	9	245	0	0	254	203	0	203	1	3	0	0	4	461
11:30 AM	13	278	0	0	291	264	0	264	6	0	0	0	6	561
11:45 AM	10	317	1	0	328	300	0	300	9	1	0	0	10	638
Total	37	1074	1	0	1112	986	0	986	18	5	0	0	23	2121
Approach %	3.3	96.6	0.1	-	-	100.0	-	-	78.3	21.7	0.0	-	-	-
Total %	1.7	50.6	0.0	-	52.4	46.5	-	46.5	0.8	0.2	0.0	-	1.1	-
PHF	0.712	0.847	0.250	-	0.848	0.822	-	0.822	0.500	0.417	0.000	-	0.575	0.831
Lights	37	1024	1	-	1062	959	-	959	18	5	0	-	23	2044
% Lights	100.0	95.3	100.0	-	95.5	97.3	-	97.3	100.0	100.0	-	-	100.0	96.4
Buses	0	10	0	-	10	3	-	3	0	0	0	-	0	13
% Buses	0.0	0.9	0.0	-	0.9	0.3	-	0.3	0.0	0.0	-	-	0.0	0.6
Single-Unit Trucks	0	27	0	-	27	18	-	18	0	0	0	-	0	45
% Single-Unit Trucks	0.0	2.5	0.0	-	2.4	1.8	-	1.8	0.0	0.0	-	-	0.0	2.1
Articulated Trucks	0	12	0	-	12	6	-	6	0	0	0	-	0	18
% Articulated Trucks	0.0	1.1	0.0	-	1.1	0.6	-	0.6	0.0	0.0	-	-	0.0	0.8
Bicycles on Road	0	1	0	-	1	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.1	0.0	-	0.1	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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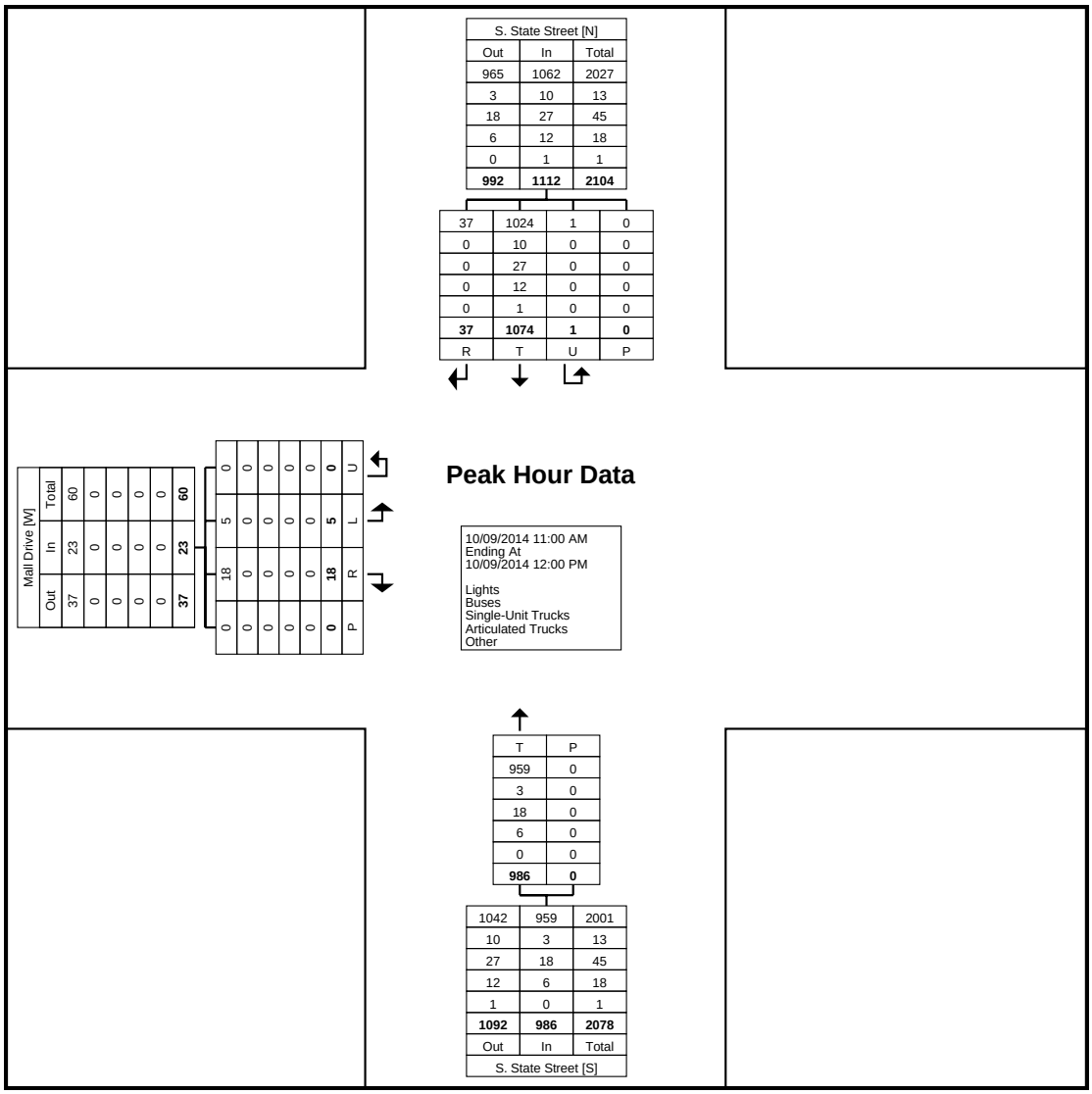
Video VCU: SCU 3EP

Count Name: StateSt&Mall Dr
Site Code: TMC 3
Start Date: 10/09/2014



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Corridor: S. State Street
Weather: Clear, 60' Degs.
Video VCU: SCU 3EP

Count Name: StateSt&Mall Dr
Site Code: TMC 3
Start Date: 10/09/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	S. State Street Southbound					S. State Street Northbound			Mall Drive Eastbound					
	Right	Thru	U-Turn	Peds	App. Total	Thru	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Int. Total
12:00 PM	18	314	0	0	332	246	0	246	8	0	0	0	8	586
12:15 PM	19	305	0	0	324	271	0	271	6	2	0	0	8	603
12:30 PM	18	307	0	0	325	268	0	268	8	4	0	0	12	605
12:45 PM	7	328	0	0	335	253	0	253	9	2	0	0	11	599
Total	62	1254	0	0	1316	1038	0	1038	31	8	0	0	39	2393
Approach %	4.7	95.3	0.0	-	-	100.0	-	-	79.5	20.5	0.0	-	-	-
Total %	2.6	52.4	0.0	-	55.0	43.4	-	43.4	1.3	0.3	0.0	-	1.6	-
PHF	0.816	0.956	0.000	-	0.982	0.958	-	0.958	0.861	0.500	0.000	-	0.813	0.989
Lights	60	1203	0	-	1263	1006	-	1006	29	8	0	-	37	2306
% Lights	96.8	95.9	-	-	96.0	96.9	-	96.9	93.5	100.0	-	-	94.9	96.4
Buses	0	8	0	-	8	4	-	4	0	0	0	-	0	12
% Buses	0.0	0.6	-	-	0.6	0.4	-	0.4	0.0	0.0	-	-	0.0	0.5
Single-Unit Trucks	1	37	0	-	38	26	-	26	2	0	0	-	2	66
% Single-Unit Trucks	1.6	3.0	-	-	2.9	2.5	-	2.5	6.5	0.0	-	-	5.1	2.8
Articulated Trucks	1	6	0	-	7	2	-	2	0	0	0	-	0	9
% Articulated Trucks	1.6	0.5	-	-	0.5	0.2	-	0.2	0.0	0.0	-	-	0.0	0.4
Bicycles on Road	0	0	0	-	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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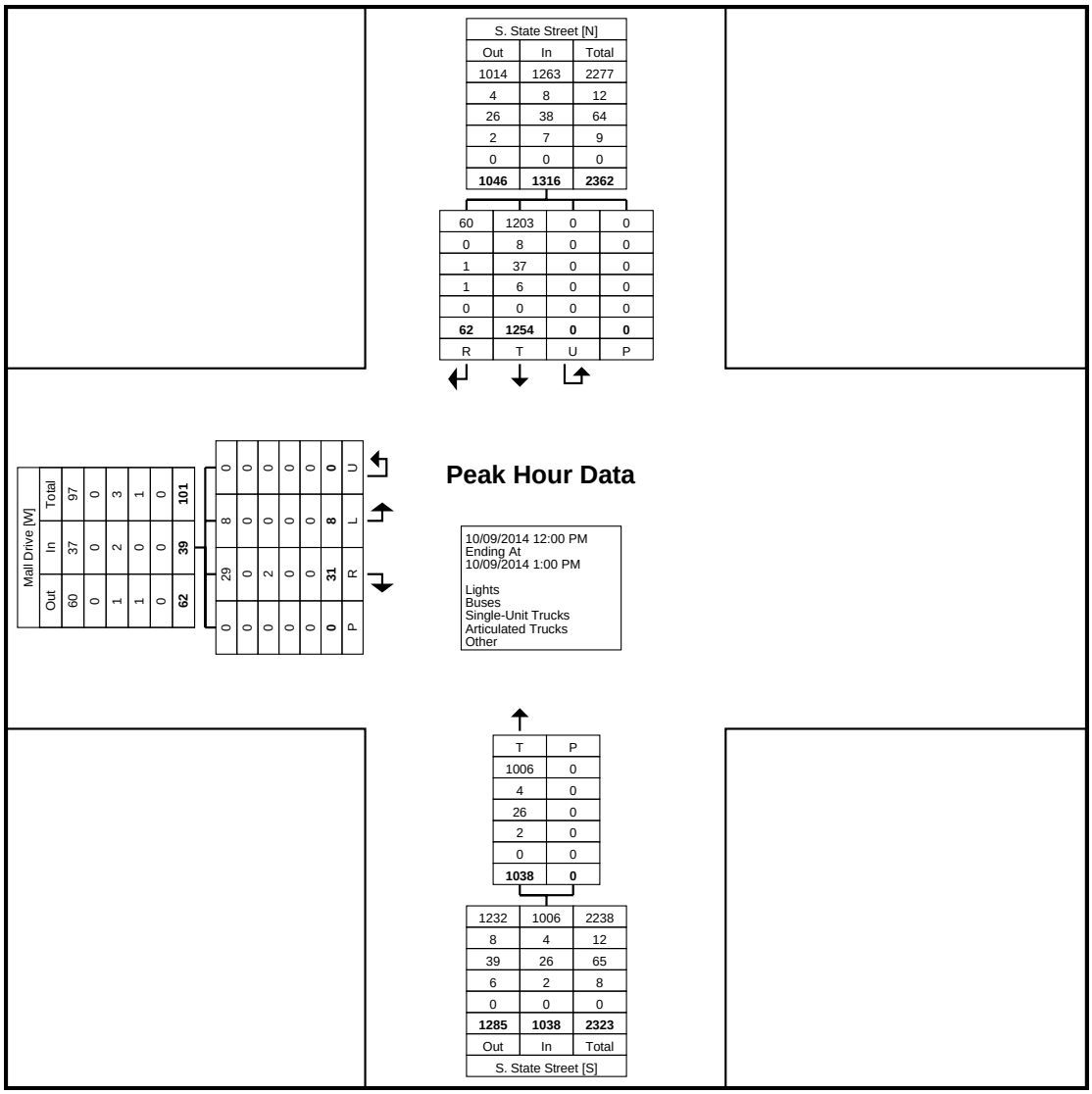
Video VCU: SCU 3EP

Count Name: StateSt&MallDr
Site Code: TMC 3
Start Date: 10/09/2014



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Video VCU: SCU 3EP

Count Name: StateSt&Mall Dr
Site Code: TMC 3
Start Date: 10/09/2014

Turning Movement Peak Hour Data (4:15 PM)

Start Time	S. State Street Southbound					S. State Street Northbound			Mall Drive Eastbound					
	Right	Thru	U-Turn	Peds	App. Total	Thru	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Int. Total
4:15 PM	15	476	1	0	492	201	0	201	13	1	0	2	14	707
4:30 PM	20	482	0	0	502	199	0	199	13	1	0	0	14	715
4:45 PM	13	530	0	0	543	239	0	239	10	0	0	0	10	792
5:00 PM	21	488	0	0	509	244	0	244	40	2	0	0	42	795
Total	69	1976	1	0	2046	883	0	883	76	4	0	2	80	3009
Approach %	3.4	96.6	0.0	-	-	100.0	-	-	95.0	5.0	0.0	-	-	-
Total %	2.3	65.7	0.0	-	68.0	29.3	-	29.3	2.5	0.1	0.0	-	2.7	-
PHF	0.821	0.932	0.250	-	0.942	0.905	-	0.905	0.475	0.500	0.000	-	0.476	0.946
Lights	69	1944	1	-	2014	872	-	872	76	4	0	-	80	2966
% Lights	100.0	98.4	100.0	-	98.4	98.8	-	98.8	100.0	100.0	-	-	100.0	98.6
Buses	0	5	0	-	5	9	-	9	0	0	0	-	0	14
% Buses	0.0	0.3	0.0	-	0.2	1.0	-	1.0	0.0	0.0	-	-	0.0	0.5
Single-Unit Trucks	0	18	0	-	18	2	-	2	0	0	0	-	0	20
% Single-Unit Trucks	0.0	0.9	0.0	-	0.9	0.2	-	0.2	0.0	0.0	-	-	0.0	0.7
Articulated Trucks	0	9	0	-	9	0	-	0	0	0	0	-	0	9
% Articulated Trucks	0.0	0.5	0.0	-	0.4	0.0	-	0.0	0.0	0.0	-	-	0.0	0.3
Bicycles on Road	0	0	0	-	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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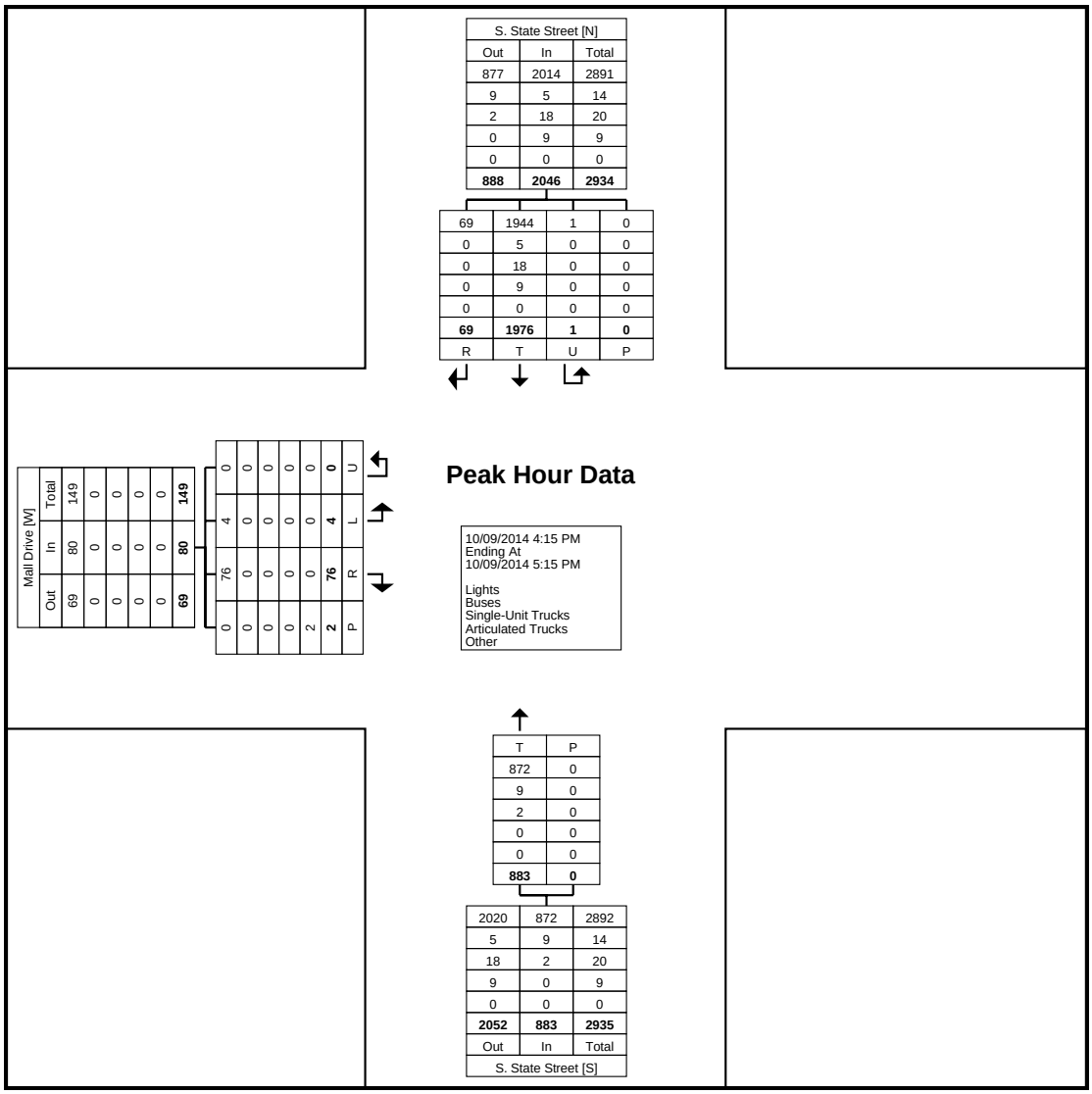
Start Date: 10/09/2014



Turning Movement Peak Hour Data Plot (4:15 PM)

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Corridor: S. State Street
Weather: Clear, 60' Degs.
Video VCU: SCU 3EP

Count Name: StateSt&Mall Dr
Site Code: TMC 3
Start Date: 10/09/2014

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Non-signalized intersection, State Street is a divided roadway. Video VCU camera located at NW quadrant. .
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

Traffic Data Collection

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Project:
Corridor:
Weather:
Video VCU:

Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014

Turning Movement Data

Start Time	Southbound Approach Southbound			Wolverine Tower Westbound				NB S. State Street Northbound					
	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	Int. Total
7:00 AM	135	0	135	0	3	0	3	28	255	0	0	283	421
7:15 AM	202	0	202	2	3	0	5	34	319	0	0	353	560
7:30 AM	204	1	204	0	1	1	1	45	408	1	0	454	659
7:45 AM	238	0	238	0	0	0	0	67	403	1	0	471	709
Hourly Total	779	1	779	2	7	1	9	174	1385	2	0	1561	2349
8:00 AM	252	0	252	2	3	0	5	45	411	0	0	456	713
8:15 AM	232	0	232	1	1	0	2	44	431	1	0	476	710
8:30 AM	236	0	236	1	2	2	3	24	361	0	0	385	624
8:45 AM	244	0	244	2	3	0	5	30	332	2	0	364	613
Hourly Total	964	0	964	6	9	2	15	143	1535	3	0	1681	2660
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	240	0	240	6	5	0	11	20	193	4	0	217	468
11:15 AM	219	0	219	5	11	0	16	21	202	1	0	224	459
11:30 AM	297	0	297	16	13	0	29	23	246	2	0	271	597
11:45 AM	310	0	310	9	23	0	32	25	254	8	0	287	629
Hourly Total	1066	0	1066	36	52	0	88	89	895	15	0	999	2153
12:00 PM	300	0	300	10	26	0	36	18	232	4	0	254	590
12:15 PM	322	0	322	10	10	0	20	23	242	2	0	267	609
12:30 PM	289	0	289	5	15	0	20	26	248	1	0	275	584
12:45 PM	346	0	346	5	15	0	20	30	221	2	0	253	619
Hourly Total	1257	0	1257	30	66	0	96	97	943	9	0	1049	2402
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	469	0	469	7	38	0	45	10	216	2	0	228	742
4:15 PM	464	0	464	9	20	0	29	14	217	4	0	235	728
4:30 PM	483	0	483	11	49	0	60	13	243	6	0	262	805
4:45 PM	435	0	435	13	29	0	42	13	196	0	0	209	686
Hourly Total	1851	0	1851	40	136	0	176	50	872	12	0	934	2961
5:00 PM	313	0	313	12	36	0	48	8	214	5	0	227	588
5:15 PM	324	1	324	5	37	0	42	7	247	1	0	255	621
5:30 PM	460	0	460	5	16	0	21	9	226	3	0	238	719
5:45 PM	420	0	420	7	30	1	37	15	239	1	0	255	712
Hourly Total	1517	1	1517	29	119	1	148	39	926	10	0	975	2640
6:00 PM	0	0	0	0	1	0	1	0	0	0	0	0	1
Grand Total	7434	2	7434	143	390	4	533	592	6556	51	0	7199	15166
Approach %	100.0	-	-	26.8	73.2	-	-	8.2	91.1	0.7	-	-	-
Total %	49.0	-	49.0	0.9	2.6	-	3.5	3.9	43.2	0.3	-	47.5	-
Lights	7243	-	7243	143	389	-	532	561	6423	50	-	7034	14809
% Lights	97.4	-	97.4	100.0	99.7	-	99.8	94.8	98.0	98.0	-	97.7	97.6
Buses	64	-	64	0	0	-	0	29	21	0	-	50	114
% Buses	0.9	-	0.9	0.0	0.0	-	0.0	4.9	0.3	0.0	-	0.7	0.8
Single-Unit Trucks	88	-	88	0	1	-	1	2	87	1	-	90	179
% Single-Unit Trucks	1.2	-	1.2	0.0	0.3	-	0.2	0.3	1.3	2.0	-	1.3	1.2
Articulated Trucks	38	-	38	0	0	-	0	0	22	0	-	22	60
% Articulated Trucks	0.5	-	0.5	0.0	0.0	-	0.0	0.0	0.3	0.0	-	0.3	0.4
Bicycles on Road	1	-	1	0	0	-	0	0	3	0	-	3	4
% Bicycles on Road	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	0	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	0.0	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	2	-	-	-	4	-	-	-	-	0	-	-
% Pedestrians	-	100.0	-	-	-	100.0	-	-	-	-	-	-	-

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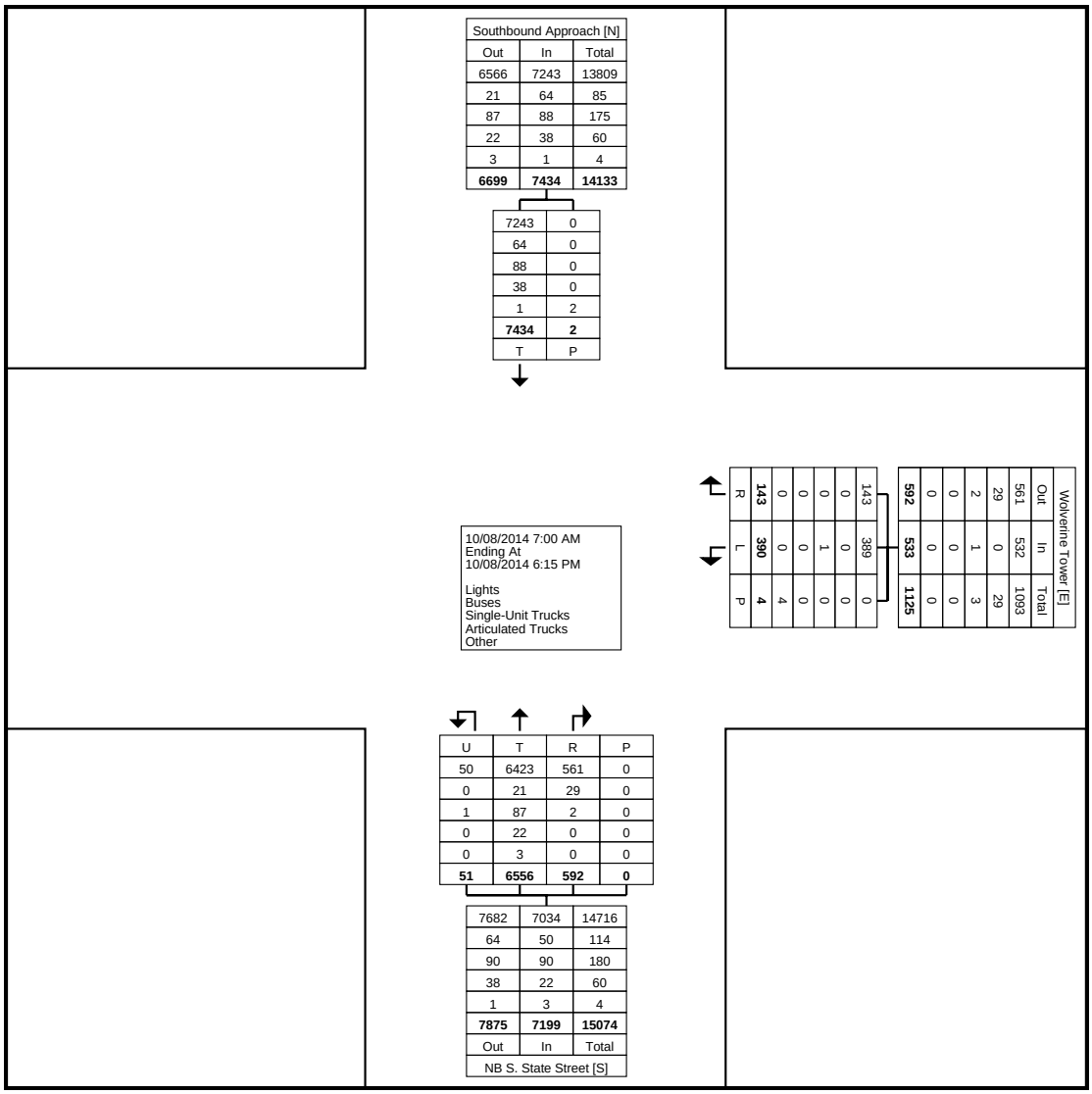
Video VCU:

Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014



Turning Movement Data Plot

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Project:
Corridor:
Weather:
Video VCU:

Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Southbound Approach Southbound			Wolverine Tower Westbound				NB S. State Street Northbound					
	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	Int. Total
7:30 AM	204	1	204	0	1	1	1	45	408	1	0	454	659
7:45 AM	238	0	238	0	0	0	0	67	403	1	0	471	709
8:00 AM	252	0	252	2	3	0	5	45	411	0	0	456	713
8:15 AM	232	0	232	1	1	0	2	44	431	1	0	476	710
Total	926	1	926	3	5	1	8	201	1653	3	0	1857	2791
Approach %	100.0	-	-	37.5	62.5	-	-	10.8	89.0	0.2	-	-	-
Total %	33.2	-	33.2	0.1	0.2	-	0.3	7.2	59.2	0.1	-	66.5	-
PHF	0.919	-	0.919	0.375	0.417	-	0.400	0.750	0.959	0.750	-	0.975	0.979
Lights	894	-	894	3	5	-	8	193	1630	3	-	1826	2728
% Lights	96.5	-	96.5	100.0	100.0	-	100.0	96.0	98.6	100.0	-	98.3	97.7
Buses	13	-	13	0	0	-	0	7	3	0	-	10	23
% Buses	1.4	-	1.4	0.0	0.0	-	0.0	3.5	0.2	0.0	-	0.5	0.8
Single-Unit Trucks	16	-	16	0	0	-	0	1	16	0	-	17	33
% Single-Unit Trucks	1.7	-	1.7	0.0	0.0	-	0.0	0.5	1.0	0.0	-	0.9	1.2
Articulated Trucks	3	-	3	0	0	-	0	0	4	0	-	4	7
% Articulated Trucks	0.3	-	0.3	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.3
Bicycles on Road	0	-	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	0	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	0.0	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	1	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	100.0	-	-	-	100.0	-	-	-	-	-	-	-

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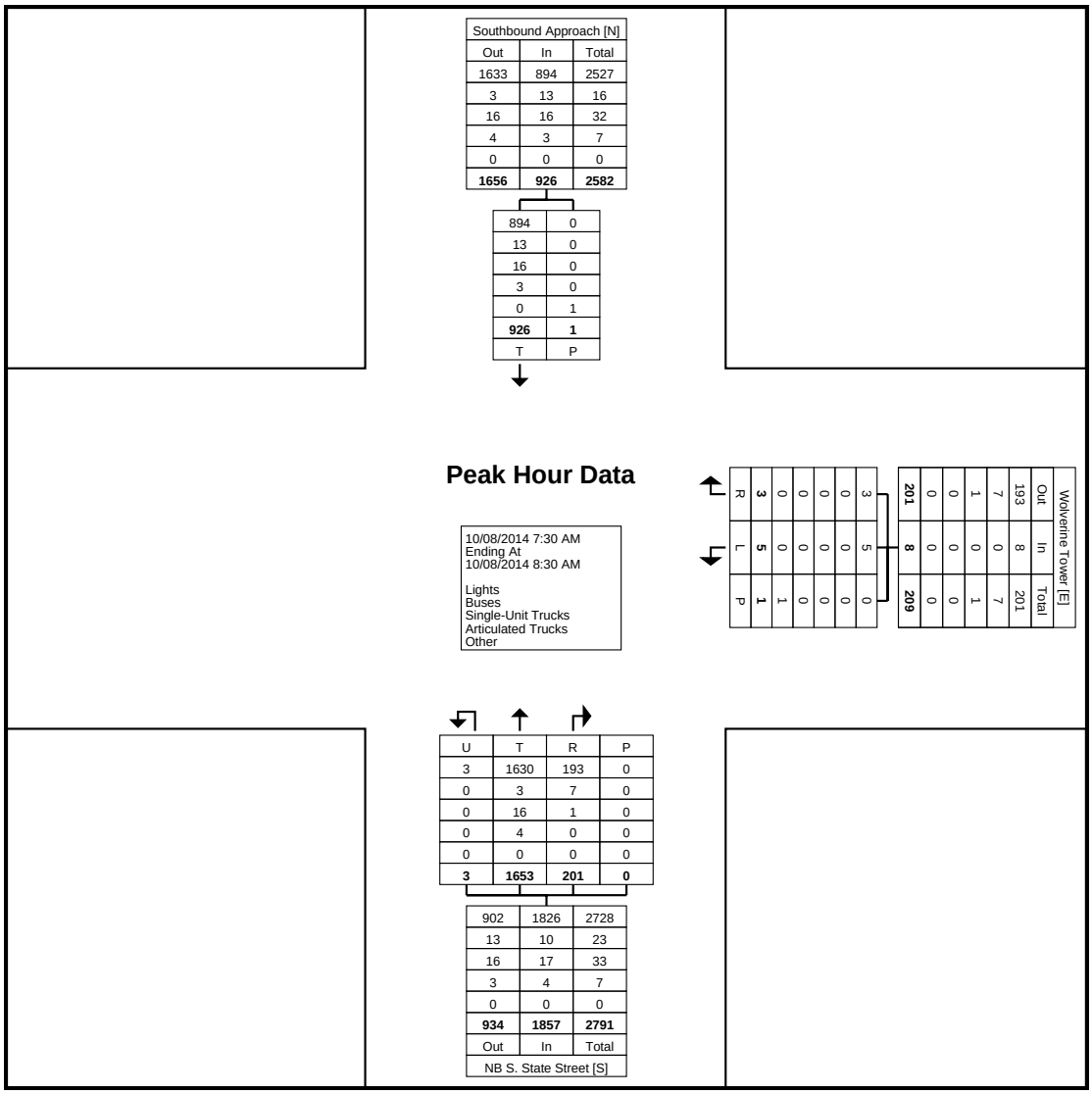
Corridor:
Weather:
Video VCU:

Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014



Turning Movement Peak Hour Data Plot (7:30 AM)

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Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Southbound Approach Southbound			Wolverine Tower Westbound				NB S. State Street Northbound					
	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	Int. Total
11:00 AM	240	0	240	6	5	0	11	20	193	4	0	217	468
11:15 AM	219	0	219	5	11	0	16	21	202	1	0	224	459
11:30 AM	297	0	297	16	13	0	29	23	246	2	0	271	597
11:45 AM	310	0	310	9	23	0	32	25	254	8	0	287	629
Total	1066	0	1066	36	52	0	88	89	895	15	0	999	2153
Approach %	100.0	-	-	40.9	59.1	-	-	8.9	89.6	1.5	-	-	-
Total %	49.5	-	49.5	1.7	2.4	-	4.1	4.1	41.6	0.7	-	46.4	-
PHF	0.860	-	0.860	0.563	0.565	-	0.688	0.890	0.881	0.469	-	0.870	0.856
Lights	1020	-	1020	36	52	-	88	84	862	14	-	960	2068
% Lights	95.7	-	95.7	100.0	100.0	-	100.0	94.4	96.3	93.3	-	96.1	96.1
Buses	14	-	14	0	0	-	0	5	2	0	-	7	21
% Buses	1.3	-	1.3	0.0	0.0	-	0.0	5.6	0.2	0.0	-	0.7	1.0
Single-Unit Trucks	22	-	22	0	0	-	0	0	22	1	-	23	45
% Single-Unit Trucks	2.1	-	2.1	0.0	0.0	-	0.0	0.0	2.5	6.7	-	2.3	2.1
Articulated Trucks	10	-	10	0	0	-	0	0	9	0	-	9	19
% Articulated Trucks	0.9	-	0.9	0.0	0.0	-	0.0	0.0	1.0	0.0	-	0.9	0.9
Bicycles on Road	0	-	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	0	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	0	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

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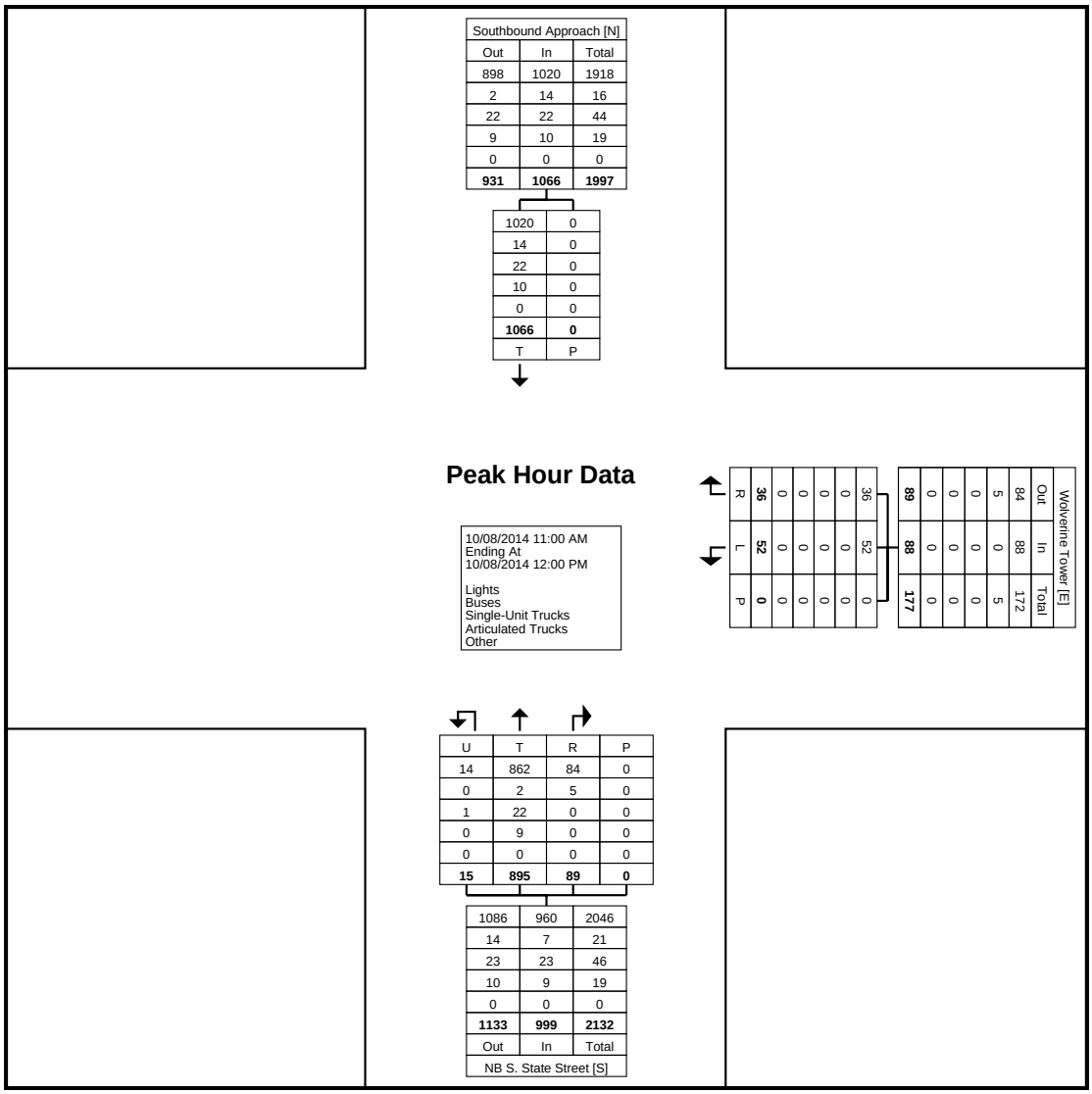
Video VCU:

Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014



Southbound Approach [N]		
Out	In	Total
898	1020	1918
2	14	16
22	22	44
9	10	19
0	0	0
931	**1066**	**1997**

1020	0
14	0
22	0
10	0
0	0
1066	**0**
T	P

R	L	P	Out	In	Total
36	**52**	**0**	84	88	172
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	5	5	10
36	52	0	**89**	**88**	**177**

U	T	R	P
14	862	84	0
0	2	5	0
1	22	0	0
0	9	0	0
0	0	0	0
15	**895**	**89**	**0**

1086	960	2046
14	7	21
23	23	46
10	9	19
0	0	0
1133	**999**	**2132**
Out	In	Total
NB S. State Street [S]		

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Video VCU:

Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Southbound Approach Southbound			Wolverine Tower Westbound				NB S. State Street Northbound					
	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	Int. Total
12:00 PM	300	0	300	10	26	0	36	18	232	4	0	254	590
12:15 PM	322	0	322	10	10	0	20	23	242	2	0	267	609
12:30 PM	289	0	289	5	15	0	20	26	248	1	0	275	584
12:45 PM	346	0	346	5	15	0	20	30	221	2	0	253	619
Total	1257	0	1257	30	66	0	96	97	943	9	0	1049	2402
Approach %	100.0	-	-	31.3	68.8	-	-	9.2	89.9	0.9	-	-	-
Total %	52.3	-	52.3	1.2	2.7	-	4.0	4.0	39.3	0.4	-	43.7	-
PHF	0.908	-	0.908	0.750	0.635	-	0.667	0.808	0.951	0.563	-	0.954	0.970
Lights	1221	-	1221	30	65	-	95	91	924	9	-	1024	2340
% Lights	97.1	-	97.1	100.0	98.5	-	99.0	93.8	98.0	100.0	-	97.6	97.4
Buses	5	-	5	0	0	-	0	5	1	0	-	6	11
% Buses	0.4	-	0.4	0.0	0.0	-	0.0	5.2	0.1	0.0	-	0.6	0.5
Single-Unit Trucks	18	-	18	0	1	-	1	1	13	0	-	14	33
% Single-Unit Trucks	1.4	-	1.4	0.0	1.5	-	1.0	1.0	1.4	0.0	-	1.3	1.4
Articulated Trucks	12	-	12	0	0	-	0	0	5	0	-	5	17
% Articulated Trucks	1.0	-	1.0	0.0	0.0	-	0.0	0.0	0.5	0.0	-	0.5	0.7
Bicycles on Road	1	-	1	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.1	-	0.1	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	0	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	0	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

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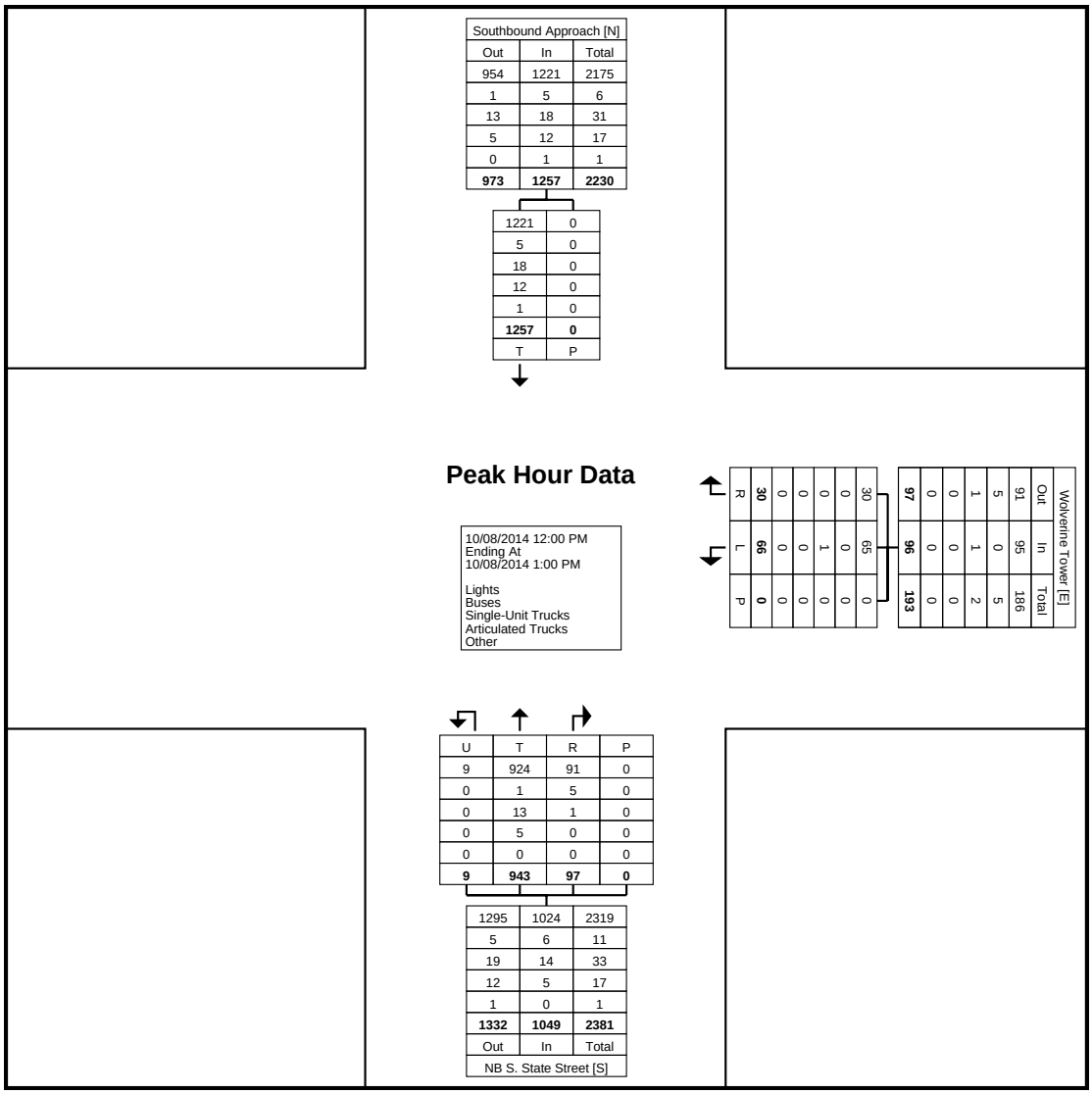
Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014



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Weather:
Video VCU:

Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Southbound Approach Southbound			Wolverine Tower Westbound				NB S. State Street Northbound					
	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	Int. Total
4:00 PM	469	0	469	7	38	0	45	10	216	2	0	228	742
4:15 PM	464	0	464	9	20	0	29	14	217	4	0	235	728
4:30 PM	483	0	483	11	49	0	60	13	243	6	0	262	805
4:45 PM	435	0	435	13	29	0	42	13	196	0	0	209	686
Total	1851	0	1851	40	136	0	176	50	872	12	0	934	2961
Approach %	100.0	-	-	22.7	77.3	-	-	5.4	93.4	1.3	-	-	-
Total %	62.5	-	62.5	1.4	4.6	-	5.9	1.7	29.4	0.4	-	31.5	-
PHF	0.958	-	0.958	0.769	0.694	-	0.733	0.893	0.897	0.500	-	0.891	0.920
Lights	1823	-	1823	40	136	-	176	46	854	12	-	912	2911
% Lights	98.5	-	98.5	100.0	100.0	-	100.0	92.0	97.9	100.0	-	97.6	98.3
Buses	16	-	16	0	0	-	0	4	11	0	-	15	31
% Buses	0.9	-	0.9	0.0	0.0	-	0.0	8.0	1.3	0.0	-	1.6	1.0
Single-Unit Trucks	11	-	11	0	0	-	0	0	4	0	-	4	15
% Single-Unit Trucks	0.6	-	0.6	0.0	0.0	-	0.0	0.0	0.5	0.0	-	0.4	0.5
Articulated Trucks	1	-	1	0	0	-	0	0	2	0	-	2	3
% Articulated Trucks	0.1	-	0.1	0.0	0.0	-	0.0	0.0	0.2	0.0	-	0.2	0.1
Bicycles on Road	0	-	0	0	0	-	0	0	1	0	-	1	1
% Bicycles on Road	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.1	0.0	-	0.1	0.0
Bicycles on Crosswalk	-	0	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	0	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-

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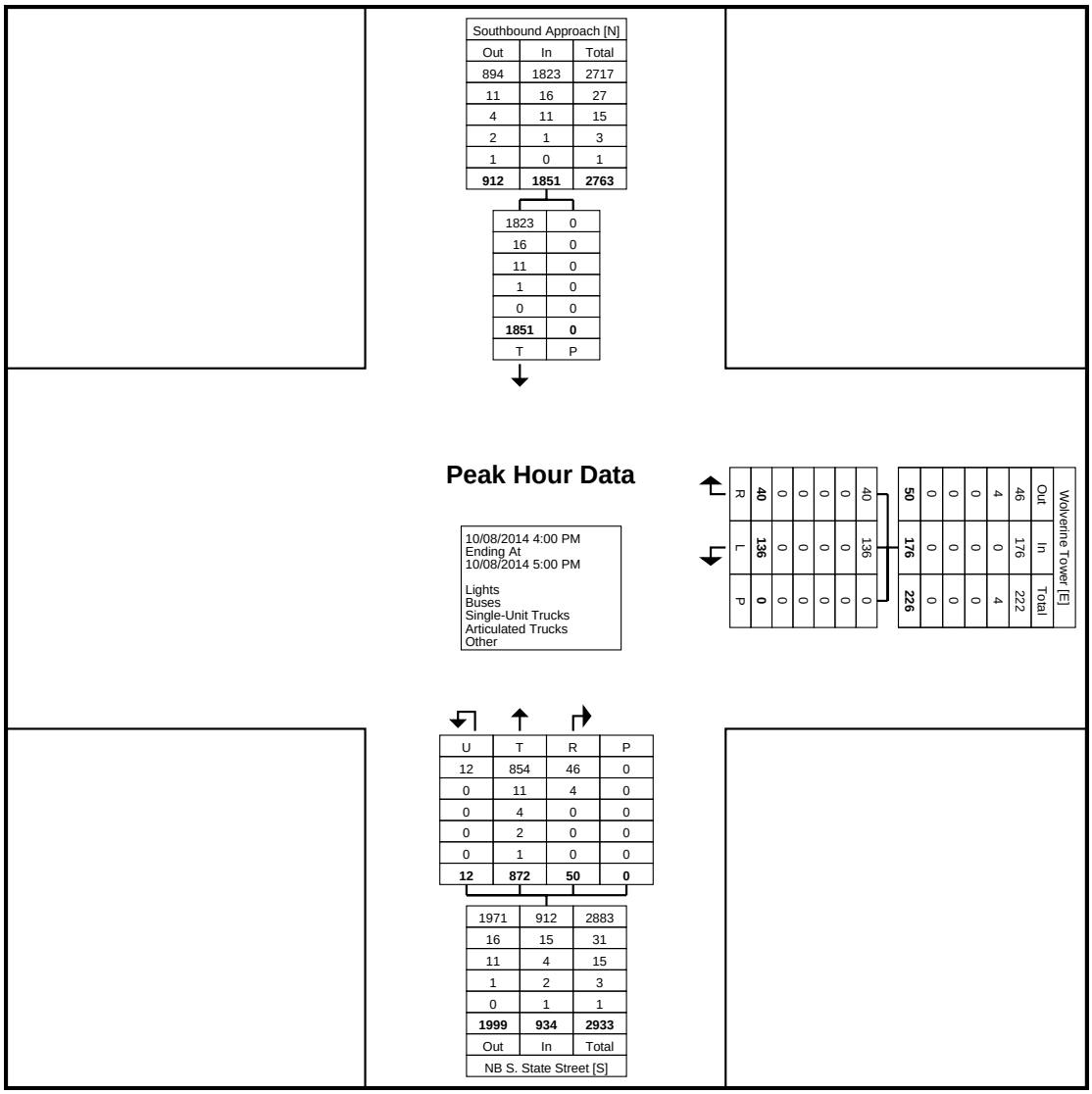
Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014



Turning Movement Peak Hour Data Plot (4:00 PM)

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Project:
Corridor:
Weather:
Video VCU:

Count Name: StateSt&WolverrineTower
Site Code: TMC 4
Start Date: 10/08/2014

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Non-signalized intersection, State Street is a divided roadway with crossover for Wolverine Tower Driveway for SB S. State Street. Video VCU camera located at SE quadrant.
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

Traffic Data Collection

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014

Turning Movement Data

Start Time	Southbound Approach Southbound		Waterworks Plaza Westbound			NB S. State St. Northbound				State St. XO @ Waterworks Eastbound				
	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	0	0	1	0	1	10	282	0	292	0	4	0	4	297
7:15 AM	1	0	2	3	2	10	351	0	361	2	1	0	3	366
7:30 AM	0	0	3	0	3	8	442	0	450	1	6	0	7	460
7:45 AM	0	0	0	0	0	6	466	1	472	4	8	0	12	484
Hourly Total	1	0	6	3	6	34	1541	1	1575	7	19	0	26	1607
8:00 AM	0	0	1	0	1	8	454	0	462	4	2	0	6	469
8:15 AM	0	0	2	0	2	7	472	0	479	5	8	0	13	494
8:30 AM	0	0	1	0	1	5	386	0	391	3	3	0	6	398
8:45 AM	0	0	5	0	5	6	351	0	357	5	5	0	10	372
Hourly Total	0	0	9	0	9	26	1663	0	1689	17	18	0	35	1733
9:00 AM	0	0	0	0	0	0	2	0	2	0	0	0	0	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	2	0	2	0	0	0	0	2
11:00 AM	0	0	2	0	2	1	209	0	210	1	5	0	6	218
11:15 AM	0	0	1	0	1	5	208	0	213	3	11	0	14	228
11:30 AM	0	0	9	0	9	3	256	0	259	7	6	0	13	281
11:45 AM	0	0	12	0	12	5	260	0	265	3	13	0	16	293
Hourly Total	0	0	24	0	24	14	933	0	947	14	35	0	49	1020
12:00 PM	0	0	3	0	3	4	255	0	259	1	6	0	7	269
12:15 PM	0	0	1	2	1	2	263	0	265	3	20	0	23	289
12:30 PM	0	0	2	0	2	13	288	0	301	4	4	0	8	311
12:45 PM	0	0	4	0	4	4	251	0	255	9	10	0	19	278
Hourly Total	0	0	10	2	10	23	1057	0	1080	17	40	0	57	1147
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	3	0	3	4	223	0	227	4	5	0	9	239
4:15 PM	0	0	3	0	3	4	221	0	225	4	9	0	13	241
4:30 PM	0	0	8	0	8	1	241	0	242	2	7	0	9	259
4:45 PM	0	0	1	0	1	2	208	0	210	6	2	0	8	219
Hourly Total	0	0	15	0	15	11	893	0	904	16	23	0	39	958
5:00 PM	0	0	7	0	7	4	222	0	226	0	4	0	4	237
5:15 PM	0	0	3	0	3	5	245	0	250	1	5	0	6	259
5:30 PM	0	0	7	0	7	3	221	0	224	6	5	0	11	242
5:45 PM	0	0	1	1	1	1	248	0	249	3	7	0	10	260
Hourly Total	0	0	18	1	18	13	936	0	949	10	21	0	31	998
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	82	6	82	121	7025	1	7146	81	156	0	237	7465
Approach %	-	-	100.0	-	-	1.7	98.3	-	-	34.2	65.8	-	-	-
Total %	-	0.0	1.1	-	1.1	1.6	94.1	-	95.7	1.1	2.1	-	3.2	-
Lights	-	0	82	-	82	118	6886	-	7004	81	125	-	206	7292
% Lights	-	-	100.0	-	100.0	97.5	98.0	-	98.0	100.0	80.1	-	86.9	97.7
Buses	-	0	0	-	0	0	29	-	29	0	29	-	29	58
% Buses	-	-	0.0	-	0.0	0.0	0.4	-	0.4	0.0	18.6	-	12.2	0.8
Single-Unit Trucks	-	0	0	-	0	3	87	-	90	0	2	-	2	92
% Single-Unit Trucks	-	-	0.0	-	0.0	2.5	1.2	-	1.3	0.0	1.3	-	0.8	1.2
Articulated Trucks	-	0	0	-	0	0	20	-	20	0	0	-	0	20
% Articulated Trucks	-	-	0.0	-	0.0	0.0	0.3	-	0.3	0.0	0.0	-	0.0	0.3
Bicycles on Road	-	0	0	-	0	0	3	-	3	0	0	-	0	3
% Bicycles on Road	-	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	0	-	-	0	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	0.0	-	-	0.0	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	1	-	-	6	-	-	-	1	-	-	-	0	-	-
% Pedestrians	100.0	-	-	100.0	-	-	-	100.0	-	-	-	-	-	-

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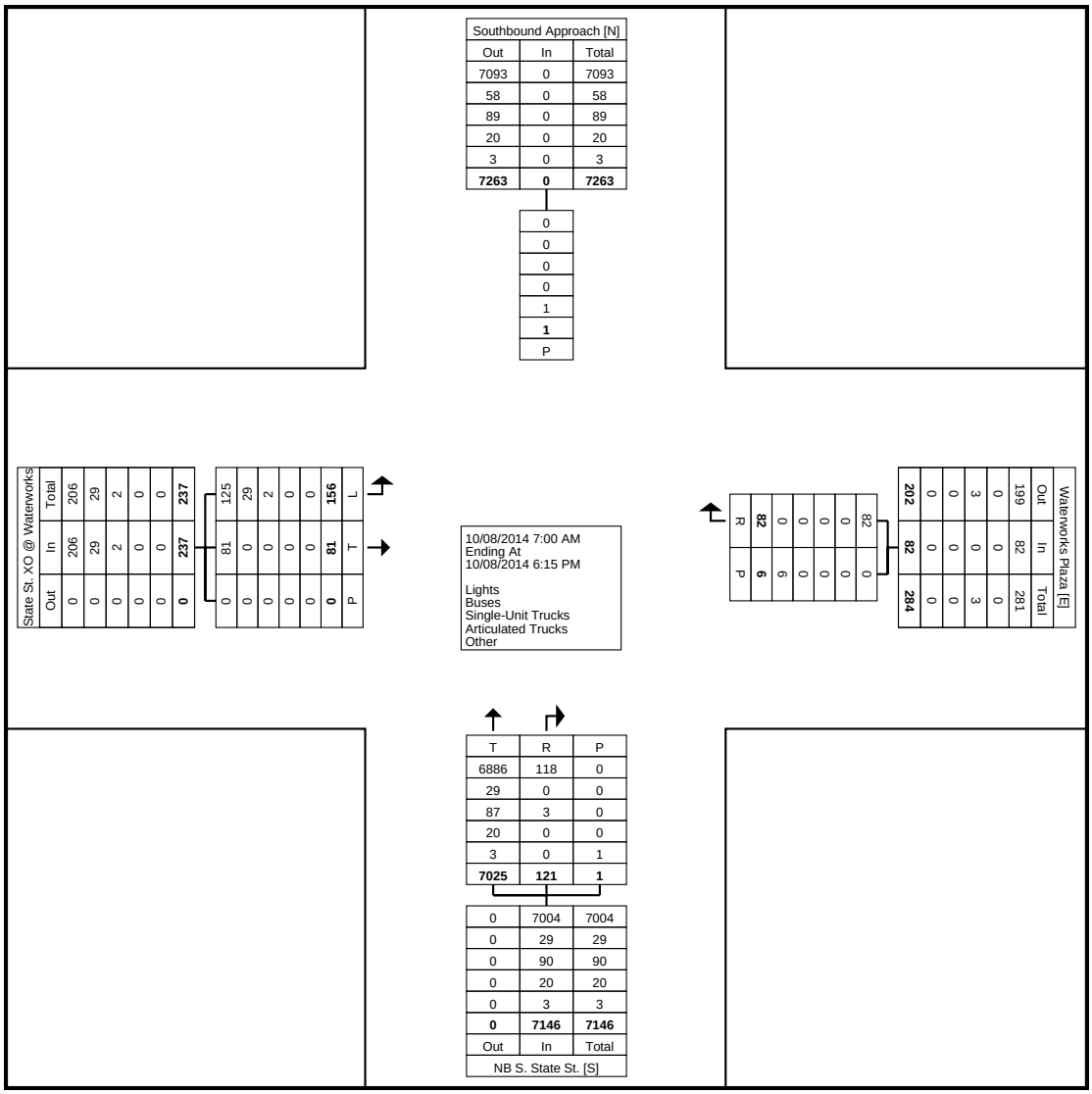
Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014



Turning Movement Data Plot

Traffic Data Collection
7504 Sawgrass Drive
www.tdccounts.com
Washington, Michigan, United States 48094
Ph. (586) 786-5407
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Southbound Approach		Waterworks Plaza			NB S. State St.				State St. XO @ Waterworks				
	Southbound		Westbound			Northbound				Eastbound				
	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
7:30 AM	0	0	3	0	3	8	442	0	450	1	6	0	7	460
7:45 AM	0	0	0	0	0	6	466	1	472	4	8	0	12	484
8:00 AM	0	0	1	0	1	8	454	0	462	4	2	0	6	469
8:15 AM	0	0	2	0	2	7	472	0	479	5	8	0	13	494
Total	0	0	6	0	6	29	1834	1	1863	14	24	0	38	1907
Approach %	-	-	100.0	-	-	1.6	98.4	-	-	36.8	63.2	-	-	-
Total %	-	0.0	0.3	-	0.3	1.5	96.2	-	97.7	0.7	1.3	-	2.0	-
PHF	-	0.000	0.500	-	0.500	0.906	0.971	-	0.972	0.700	0.750	-	0.731	0.965
Lights	-	0	6	-	6	29	1810	-	1839	14	17	-	31	1876
% Lights	-	-	100.0	-	100.0	100.0	98.7	-	98.7	100.0	70.8	-	81.6	98.4
Buses	-	0	0	-	0	0	4	-	4	0	7	-	7	11
% Buses	-	-	0.0	-	0.0	0.0	0.2	-	0.2	0.0	29.2	-	18.4	0.6
Single-Unit Trucks	-	0	0	-	0	0	17	-	17	0	0	-	0	17
% Single-Unit Trucks	-	-	0.0	-	0.0	0.0	0.9	-	0.9	0.0	0.0	-	0.0	0.9
Articulated Trucks	-	0	0	-	0	0	3	-	3	0	0	-	0	3
% Articulated Trucks	-	-	0.0	-	0.0	0.0	0.2	-	0.2	0.0	0.0	-	0.0	0.2
Bicycles on Road	-	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	-	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	0	-	-	0	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	0	-	-	0	-	-	-	1	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-

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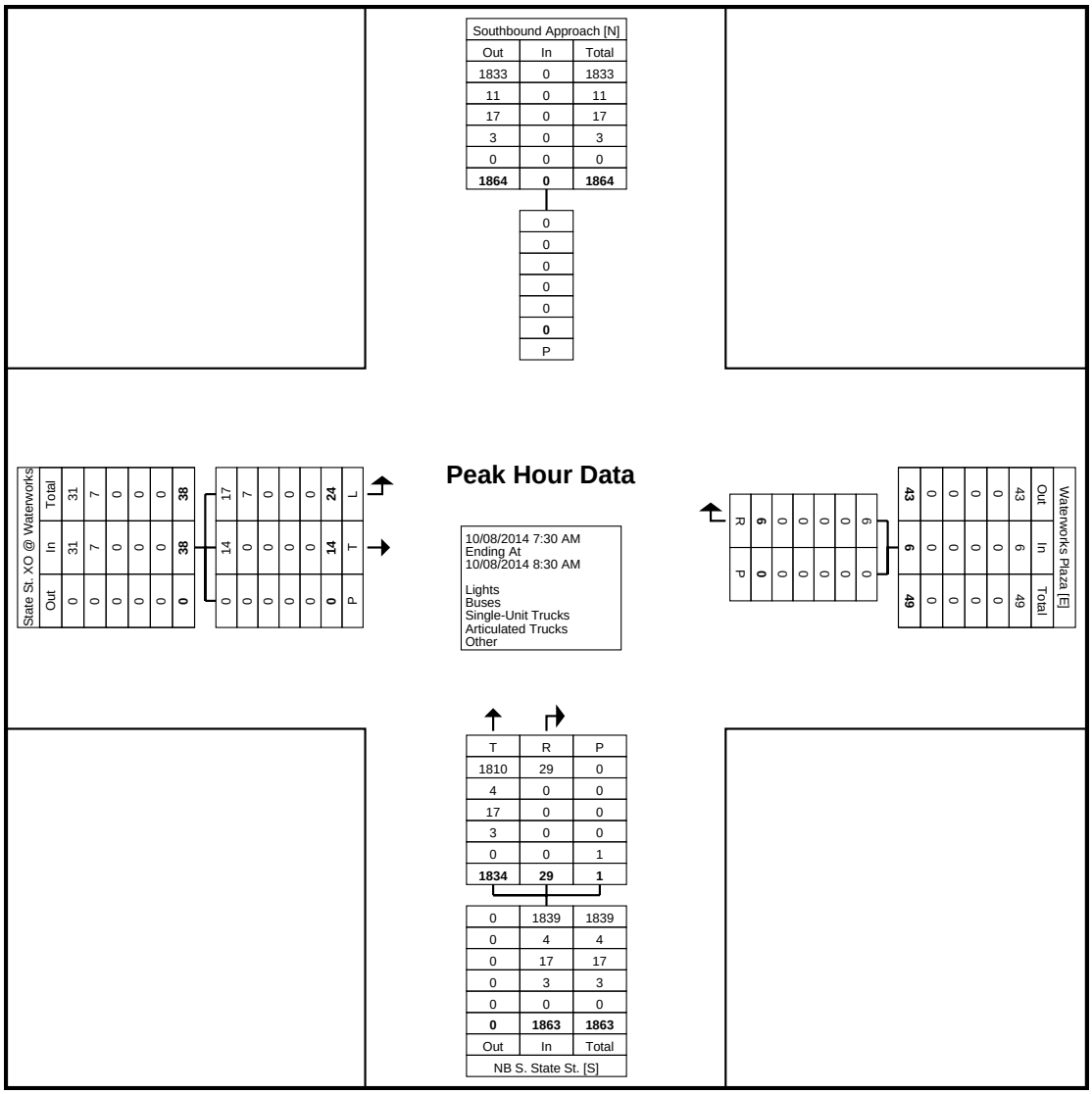
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014



Turning Movement Peak Hour Data Plot (7:30 AM)

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Southbound Approach		Waterworks Plaza			NB S. State St.				State St. XO @ Waterworks				
	Southbound		Westbound			Northbound				Eastbound				
	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	2	0	2	1	209	0	210	1	5	0	6	218
11:15 AM	0	0	1	0	1	5	208	0	213	3	11	0	14	228
11:30 AM	0	0	9	0	9	3	256	0	259	7	6	0	13	281
11:45 AM	0	0	12	0	12	5	260	0	265	3	13	0	16	293
Total	0	0	24	0	24	14	933	0	947	14	35	0	49	1020
Approach %	-	-	100.0	-	-	1.5	98.5	-	-	28.6	71.4	-	-	-
Total %	-	0.0	2.4	-	2.4	1.4	91.5	-	92.8	1.4	3.4	-	4.8	-
PHF	-	0.000	0.500	-	0.500	0.700	0.897	-	0.893	0.500	0.673	-	0.766	0.870
Lights	-	0	24	-	24	14	904	-	918	14	29	-	43	985
% Lights	-	-	100.0	-	100.0	100.0	96.9	-	96.9	100.0	82.9	-	87.8	96.6
Buses	-	0	0	-	0	0	2	-	2	0	5	-	5	7
% Buses	-	-	0.0	-	0.0	0.0	0.2	-	0.2	0.0	14.3	-	10.2	0.7
Single-Unit Trucks	-	0	0	-	0	0	19	-	19	0	1	-	1	20
% Single-Unit Trucks	-	-	0.0	-	0.0	0.0	2.0	-	2.0	0.0	2.9	-	2.0	2.0
Articulated Trucks	-	0	0	-	0	0	8	-	8	0	0	-	0	8
% Articulated Trucks	-	-	0.0	-	0.0	0.0	0.9	-	0.8	0.0	0.0	-	0.0	0.8
Bicycles on Road	-	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	-	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	0	-	-	0	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	0	-	-	0	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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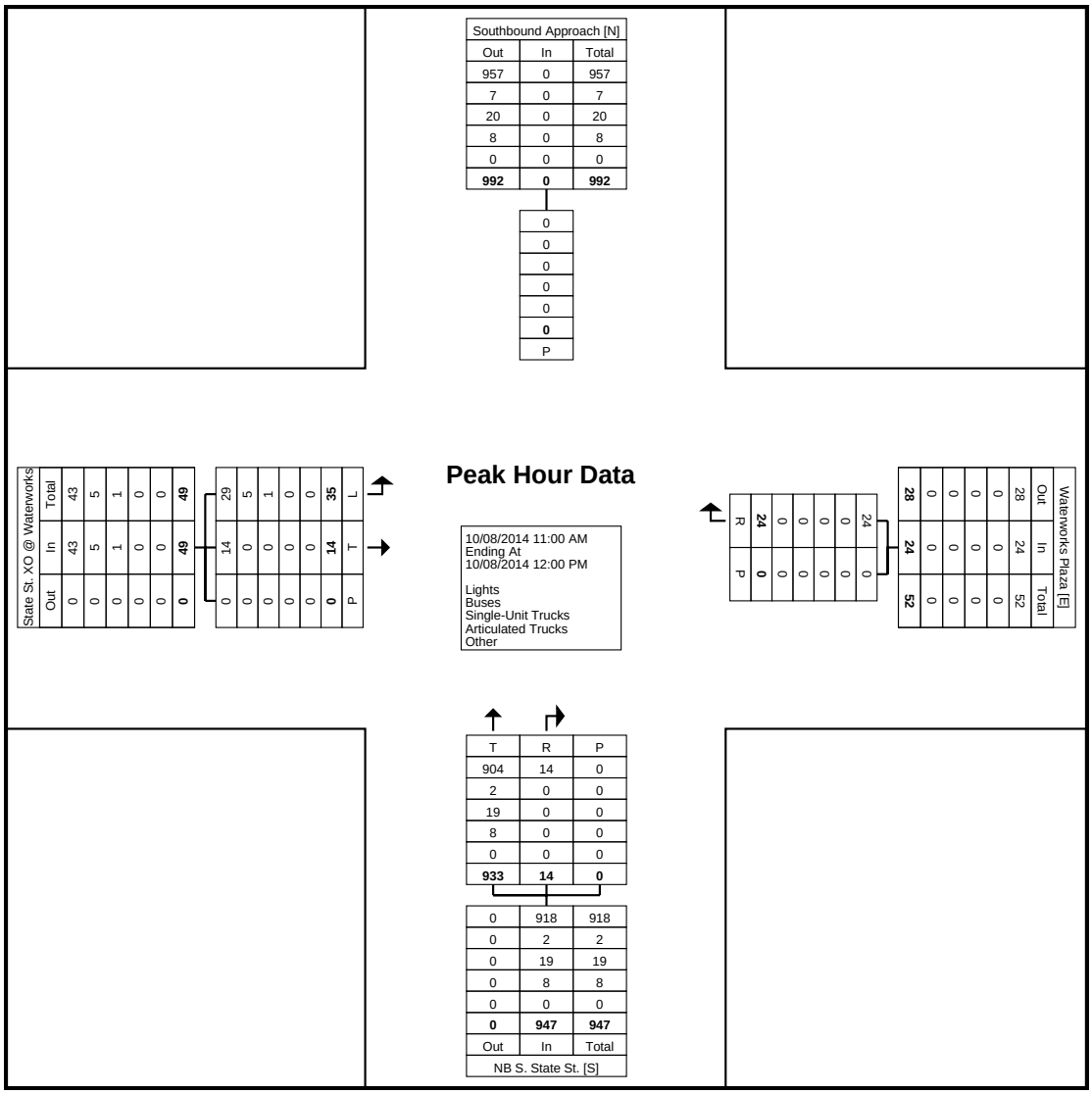
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014



Turning Movement Peak Hour Data Plot (11:00 AM)

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Corridor: S. State Street
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Southbound Approach		Waterworks Plaza			NB S. State St.				State St. XO @ Waterworks				
	Southbound		Westbound			Northbound				Eastbound				
	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
12:00 PM	0	0	3	0	3	4	255	0	259	1	6	0	7	269
12:15 PM	0	0	1	2	1	2	263	0	265	3	20	0	23	289
12:30 PM	0	0	2	0	2	13	288	0	301	4	4	0	8	311
12:45 PM	0	0	4	0	4	4	251	0	255	9	10	0	19	278
Total	0	0	10	2	10	23	1057	0	1080	17	40	0	57	1147
Approach %	-	-	100.0	-	-	2.1	97.9	-	-	29.8	70.2	-	-	-
Total %	-	0.0	0.9	-	0.9	2.0	92.2	-	94.2	1.5	3.5	-	5.0	-
PHF	-	0.000	0.625	-	0.625	0.442	0.918	-	0.897	0.472	0.500	-	0.620	0.922
Lights	-	0	10	-	10	21	1031	-	1052	17	36	-	53	1115
% Lights	-	-	100.0	-	100.0	91.3	97.5	-	97.4	100.0	90.0	-	93.0	97.2
Buses	-	0	0	-	0	0	3	-	3	0	3	-	3	6
% Buses	-	-	0.0	-	0.0	0.0	0.3	-	0.3	0.0	7.5	-	5.3	0.5
Single-Unit Trucks	-	0	0	-	0	2	19	-	21	0	1	-	1	22
% Single-Unit Trucks	-	-	0.0	-	0.0	8.7	1.8	-	1.9	0.0	2.5	-	1.8	1.9
Articulated Trucks	-	0	0	-	0	0	4	-	4	0	0	-	0	4
% Articulated Trucks	-	-	0.0	-	0.0	0.0	0.4	-	0.4	0.0	0.0	-	0.0	0.3
Bicycles on Road	-	0	0	-	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	-	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	0	-	-	0	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-
Pedestrians	0	-	-	2	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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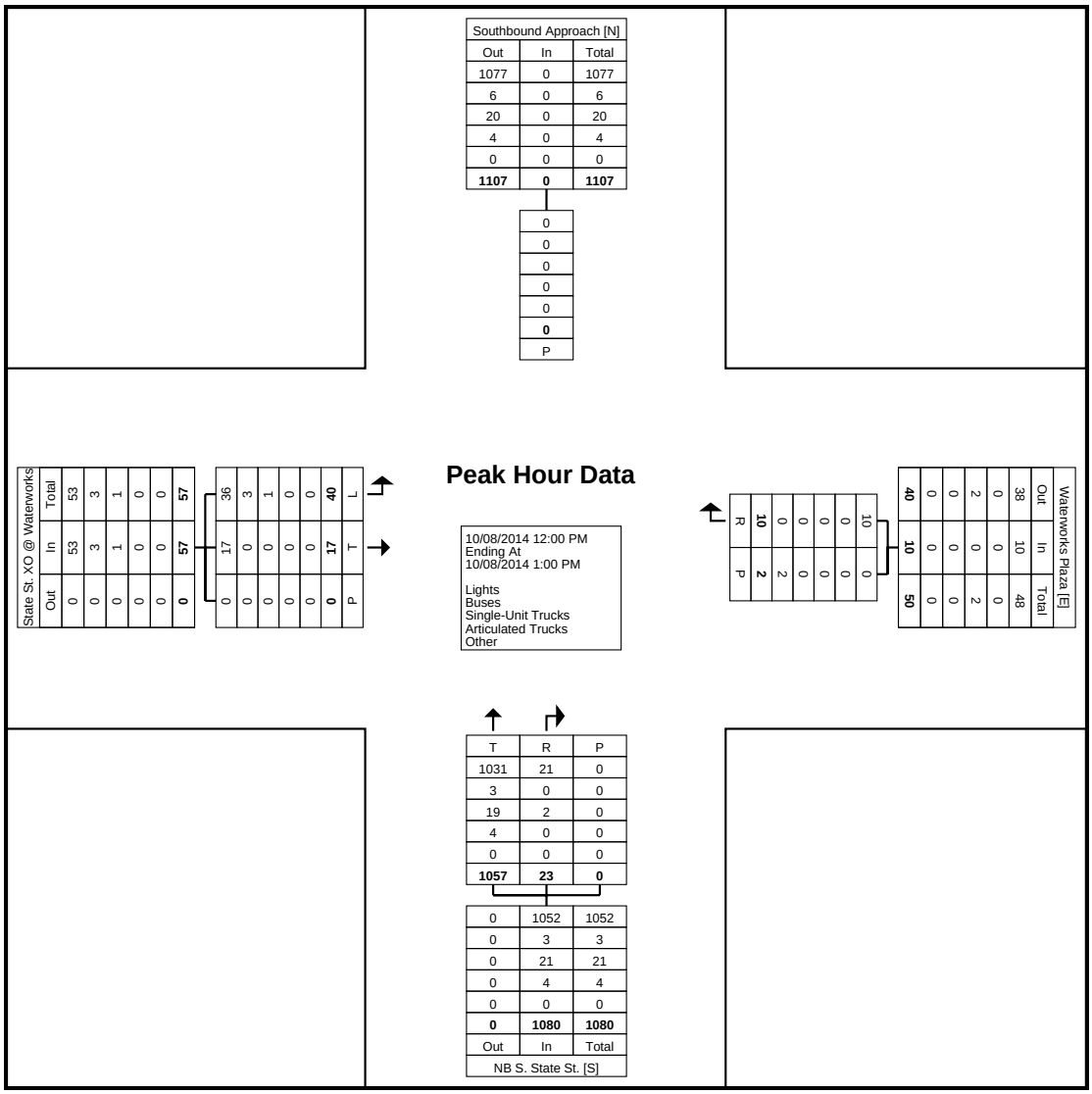
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014



Turning Movement Peak Hour Data Plot (12:00 PM)

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Southbound Approach Southbound		Waterworks Plaza Westbound			NB S. State St. Northbound				State St. XO @ Waterworks Eastbound				
	Peds	App. Total	Right	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
5:00 PM	0	0	7	0	7	4	222	0	226	0	4	0	4	237
5:15 PM	0	0	3	0	3	5	245	0	250	1	5	0	6	259
5:30 PM	0	0	7	0	7	3	221	0	224	6	5	0	11	242
5:45 PM	0	0	1	1	1	1	248	0	249	3	7	0	10	260
Total	0	0	18	1	18	13	936	0	949	10	21	0	31	998
Approach %	-	-	100.0	-	-	1.4	98.6	-	-	32.3	67.7	-	-	-
Total %	-	0.0	1.8	-	1.8	1.3	93.8	-	95.1	1.0	2.1	-	3.1	-
PHF	-	0.000	0.643	-	0.643	0.650	0.944	-	0.949	0.417	0.750	-	0.705	0.960
Lights	-	0	18	-	18	13	926	-	939	10	15	-	25	982
% Lights	-	-	100.0	-	100.0	100.0	98.9	-	98.9	100.0	71.4	-	80.6	98.4
Buses	-	0	0	-	0	0	1	-	1	0	6	-	6	7
% Buses	-	-	0.0	-	0.0	0.0	0.1	-	0.1	0.0	28.6	-	19.4	0.7
Single-Unit Trucks	-	0	0	-	0	0	7	-	7	0	0	-	0	7
% Single-Unit Trucks	-	-	0.0	-	0.0	0.0	0.7	-	0.7	0.0	0.0	-	0.0	0.7
Articulated Trucks	-	0	0	-	0	0	0	-	0	0	0	-	0	0
% Articulated Trucks	-	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	-	0	0	-	0	0	2	-	2	0	0	-	0	2
% Bicycles on Road	-	-	0.0	-	0.0	0.0	0.2	-	0.2	0.0	0.0	-	0.0	0.2
Bicycles on Crosswalk	0	-	-	0	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-
Pedestrians	0	-	-	1	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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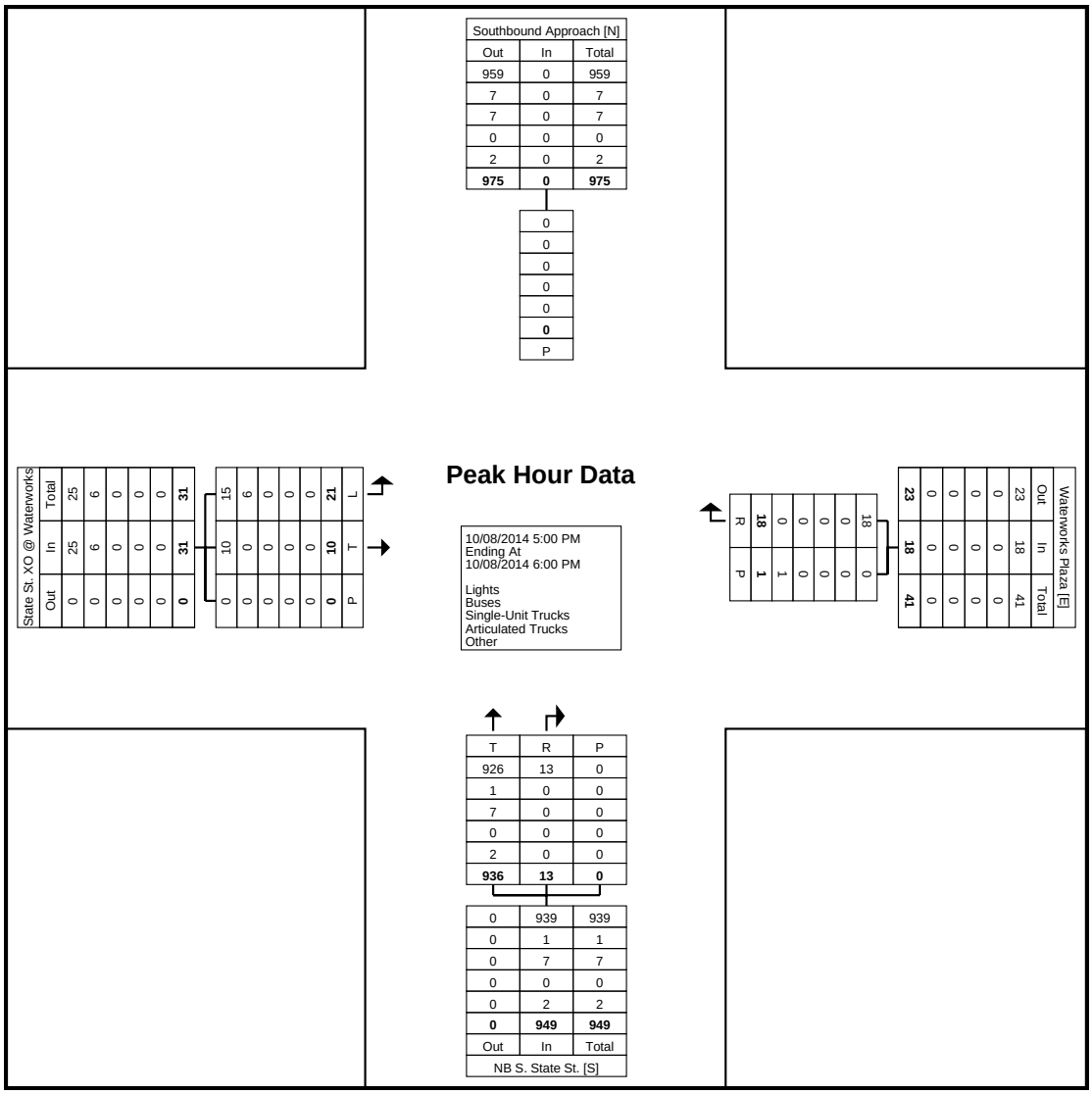
Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014



Turning Movement Peak Hour Data Plot (5:00 PM)

Traffic Data Collection
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Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's
Video VCU: SUV 1TM

Count Name: StateSt&WaterworksPlaza
Site Code: TMC 5
Start Date: 10/08/2014

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Non-signalized intersection, State Street is a divided roadway. Video VCU camera located at SE quadrant.
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

TDC
Traffic Data Collection

Traffic Data Collection
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www.tdccounts.com
Washington, Michigan, United States 48094
Ph. (586) 786-5407
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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs.
Video VCU: SCU 34N

Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014

Turning Movement Data

Start Time	S. State Street Southbound					S. State Street Northbound					Briarwood Circle Eastbound			
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Peds	App. Total	Int. Total
7:00 AM	14	156	2	0	172	268	118	2	0	388	7	0	7	567
7:15 AM	6	174	1	0	181	359	171	0	0	530	7	0	7	718
7:30 AM	8	209	7	0	224	469	103	1	0	573	11	0	11	808
7:45 AM	11	224	6	1	241	455	106	3	0	564	13	0	13	818
Hourly Total	39	763	16	1	818	1551	498	6	0	2055	38	0	38	2911
8:00 AM	5	233	3	0	241	439	99	2	0	540	16	0	16	797
8:15 AM	11	230	5	0	246	425	84	1	0	510	13	0	13	769
8:30 AM	5	286	1	0	292	384	96	3	0	483	86	0	86	861
8:45 AM	14	255	4	0	273	395	104	1	0	500	19	0	19	792
Hourly Total	35	1004	13	0	1052	1643	383	7	0	2033	134	0	134	3219
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	10	206	8	0	224	236	122	0	0	358	51	0	51	633
11:15 AM	16	216	4	0	236	225	126	0	0	351	44	0	44	631
11:30 AM	21	258	14	0	293	231	143	0	0	374	37	0	37	704
11:45 AM	23	305	6	1	334	255	157	0	0	412	41	0	41	787
Hourly Total	70	985	32	1	1087	947	548	0	0	1495	173	0	173	2755
12:00 PM	21	305	8	1	334	255	167	0	0	422	63	0	63	819
12:15 PM	20	273	7	1	300	264	148	0	0	412	61	0	61	773
12:30 PM	26	266	5	0	297	294	166	1	0	461	79	0	79	837
12:45 PM	30	288	14	0	332	291	171	1	0	463	61	0	61	856
Hourly Total	97	1132	34	2	1263	1104	652	2	0	1758	264	0	264	3285
1:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	2	0	0	2	0	0	0	0	0	0	0	0	2
4:00 PM	16	498	6	0	520	184	121	0	1	305	83	1	83	908
4:15 PM	17	402	14	0	433	218	163	1	0	382	75	0	75	890
4:30 PM	11	537	3	0	551	206	121	0	2	327	83	0	83	961
4:45 PM	16	539	3	0	558	236	156	0	1	392	78	0	78	1028
Hourly Total	60	1976	26	0	2062	844	561	1	4	1406	319	1	319	3787
5:00 PM	6	541	6	0	553	213	116	0	0	329	80	0	80	962
5:15 PM	1	481	4	0	486	252	136	0	0	388	68	0	68	942
5:30 PM	15	520	3	0	538	237	130	0	0	367	80	0	80	985
5:45 PM	22	390	5	0	417	249	135	1	0	385	79	0	79	881
Hourly Total	44	1932	18	0	1994	951	517	1	0	1469	307	0	307	3770
6:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	345	7794	139	4	8278	7040	3159	17	4	10216	1236	1	1236	19730
Approach %	4.2	94.2	1.7	-	-	68.9	30.9	0.2	-	-	100.0	-	-	-
Total %	1.7	39.5	0.7	-	42.0	35.7	16.0	0.1	-	51.8	6.3	-	6.3	-
Lights	339	7616	107	-	8062	6898	3122	17	-	10037	1215	-	1215	19314
% Lights	98.3	97.7	77.0	-	97.4	98.0	98.8	100.0	-	98.2	98.3	-	98.3	97.9
Buses	3	41	30	-	74	32	22	0	-	54	14	-	14	142
% Buses	0.9	0.5	21.6	-	0.9	0.5	0.7	0.0	-	0.5	1.1	-	1.1	0.7
Single-Unit Trucks	3	98	2	-	103	85	12	0	-	97	7	-	7	207
% Single-Unit Trucks	0.9	1.3	1.4	-	1.2	1.2	0.4	0.0	-	0.9	0.6	-	0.6	1.0
Articulated Trucks	0	37	0	-	37	24	3	0	-	27	0	-	0	64
% Articulated Trucks	0.0	0.5	0.0	-	0.4	0.3	0.1	0.0	-	0.3	0.0	-	0.0	0.3
Bicycles on Road	0	2	0	-	2	1	0	0	-	1	0	-	0	3
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	0.0	-	-
Pedestrians	-	-	-	4	-	-	-	-	4	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	100.0	-	-

Traffic Data Collection
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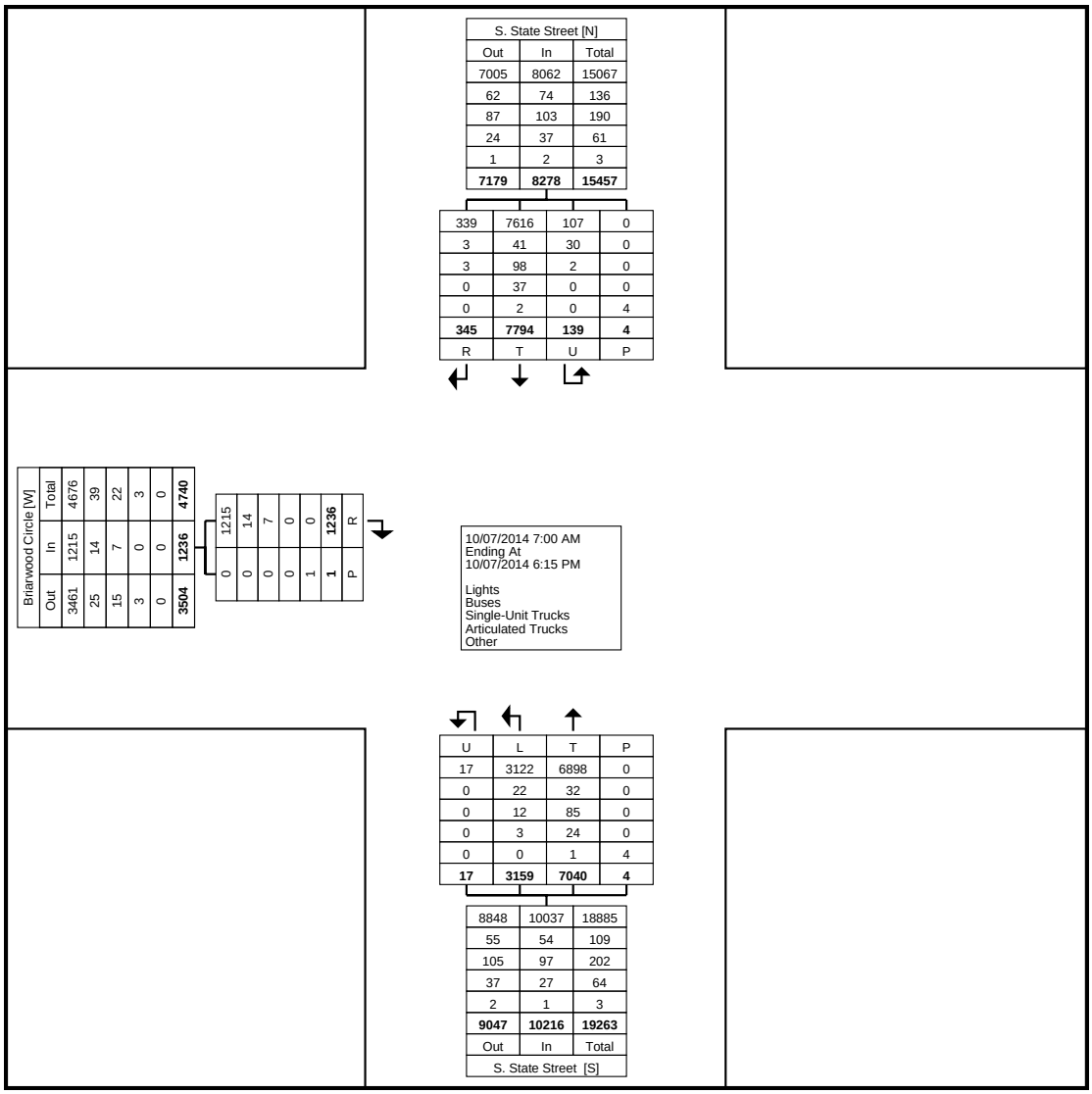
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs.
Video VCU: SCU 34N

Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014
Page No: 2



Turning Movement Data Plot

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Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs.
Video VCU: SCU 34N

Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014

Turning Movement Peak Hour Data (7:45 AM)

Start Time	S. State Street Southbound					S. State Street Northbound					Briarwood Circle Eastbound			
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Peds	App. Total	Int. Total
7:45 AM	11	224	6	1	241	455	106	3	0	564	13	0	13	818
8:00 AM	5	233	3	0	241	439	99	2	0	540	16	0	16	797
8:15 AM	11	230	5	0	246	425	84	1	0	510	13	0	13	769
8:30 AM	5	286	1	0	292	384	96	3	0	483	86	0	86	861
Total	32	973	15	1	1020	1703	385	9	0	2097	128	0	128	3245
Approach %	3.1	95.4	1.5	-	-	81.2	18.4	0.4	-	-	100.0	-	-	-
Total %	1.0	30.0	0.5	-	31.4	52.5	11.9	0.3	-	64.6	3.9	-	3.9	-
PHF	0.727	0.851	0.625	-	0.873	0.936	0.908	0.750	-	0.930	0.372	-	0.372	0.942
Lights	32	955	9	-	996	1676	380	9	-	2065	126	-	126	3187
% Lights	100.0	98.2	60.0	-	97.6	98.4	98.7	100.0	-	98.5	98.4	-	98.4	98.2
Buses	0	4	6	-	10	2	3	0	-	5	2	-	2	17
% Buses	0.0	0.4	40.0	-	1.0	0.1	0.8	0.0	-	0.2	1.6	-	1.6	0.5
Single-Unit Trucks	0	7	0	-	7	19	1	0	-	20	0	-	0	27
% Single-Unit Trucks	0.0	0.7	0.0	-	0.7	1.1	0.3	0.0	-	1.0	0.0	-	0.0	0.8
Articulated Trucks	0	7	0	-	7	6	1	0	-	7	0	-	0	14
% Articulated Trucks	0.0	0.7	0.0	-	0.7	0.4	0.3	0.0	-	0.3	0.0	-	0.0	0.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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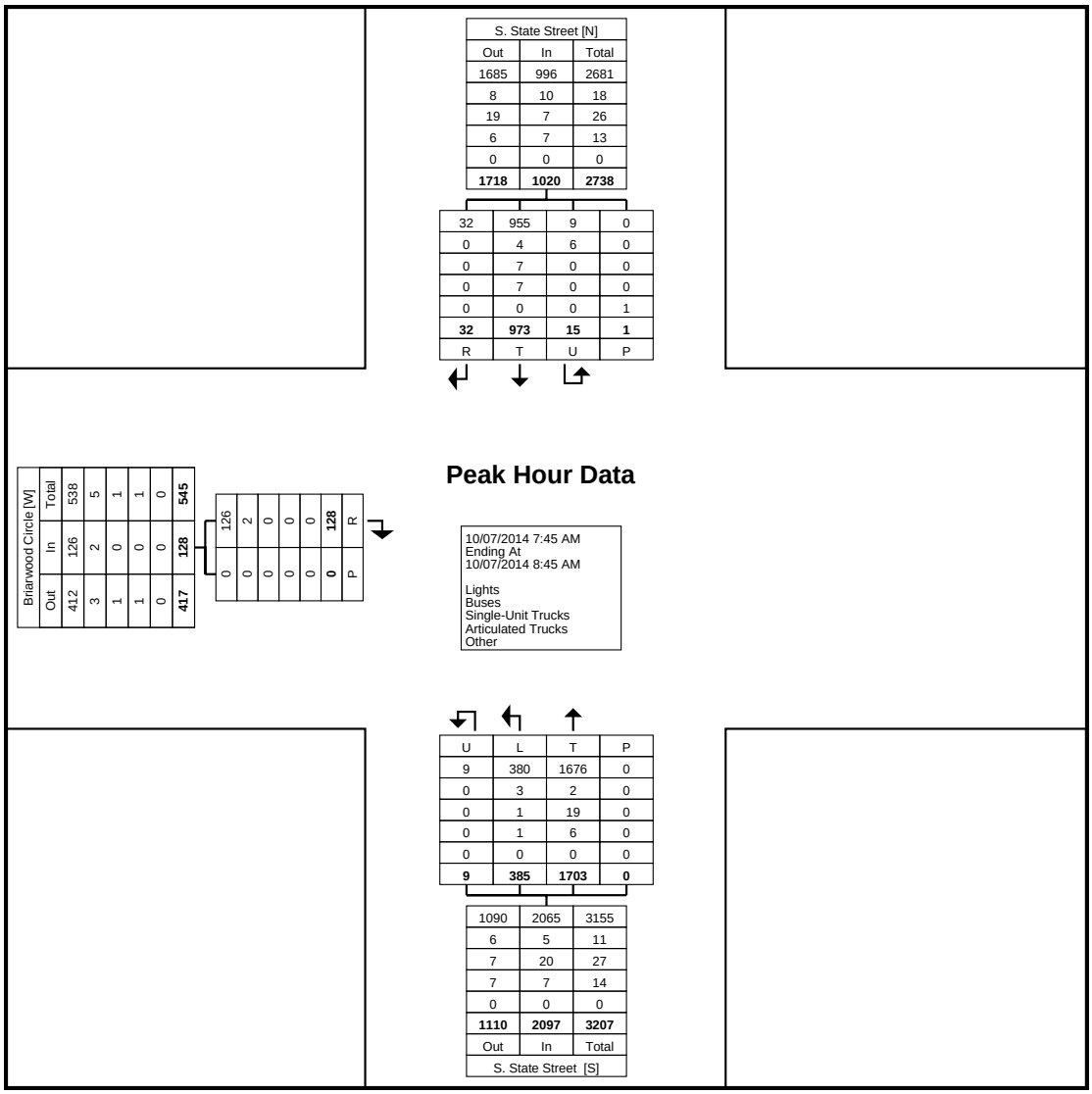
Weather: Pt. Cldy. 60 Degs.
Video VCU: SCU 34N

Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (7:45 AM)

Traffic Data Collection

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Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs.
Video VCU: SCU 34N

Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	S. State Street Southbound					S. State Street Northbound					Briarwood Circle Eastbound			
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Peds	App. Total	Int. Total
11:00 AM	10	206	8	0	224	236	122	0	0	358	51	0	51	633
11:15 AM	16	216	4	0	236	225	126	0	0	351	44	0	44	631
11:30 AM	21	258	14	0	293	231	143	0	0	374	37	0	37	704
11:45 AM	23	305	6	1	334	255	157	0	0	412	41	0	41	787
Total	70	985	32	1	1087	947	548	0	0	1495	173	0	173	2755
Approach %	6.4	90.6	2.9	-	-	63.3	36.7	0.0	-	-	100.0	-	-	-
Total %	2.5	35.8	1.2	-	39.5	34.4	19.9	0.0	-	54.3	6.3	-	6.3	-
PHF	0.761	0.807	0.571	-	0.814	0.928	0.873	0.000	-	0.907	0.848	-	0.848	0.875
Lights	67	948	26	-	1041	907	540	0	-	1447	169	-	169	2657
% Lights	95.7	96.2	81.3	-	95.8	95.8	98.5	-	-	96.8	97.7	-	97.7	96.4
Buses	1	10	5	-	16	4	4	0	-	8	3	-	3	27
% Buses	1.4	1.0	15.6	-	1.5	0.4	0.7	-	-	0.5	1.7	-	1.7	1.0
Single-Unit Trucks	2	23	1	-	26	28	4	0	-	32	1	-	1	59
% Single-Unit Trucks	2.9	2.3	3.1	-	2.4	3.0	0.7	-	-	2.1	0.6	-	0.6	2.1
Articulated Trucks	0	4	0	-	4	8	0	0	-	8	0	-	0	12
% Articulated Trucks	0.0	0.4	0.0	-	0.4	0.8	0.0	-	-	0.5	0.0	-	0.0	0.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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Count Name: State St &Briarwood Circle
Site Code: TMC 6
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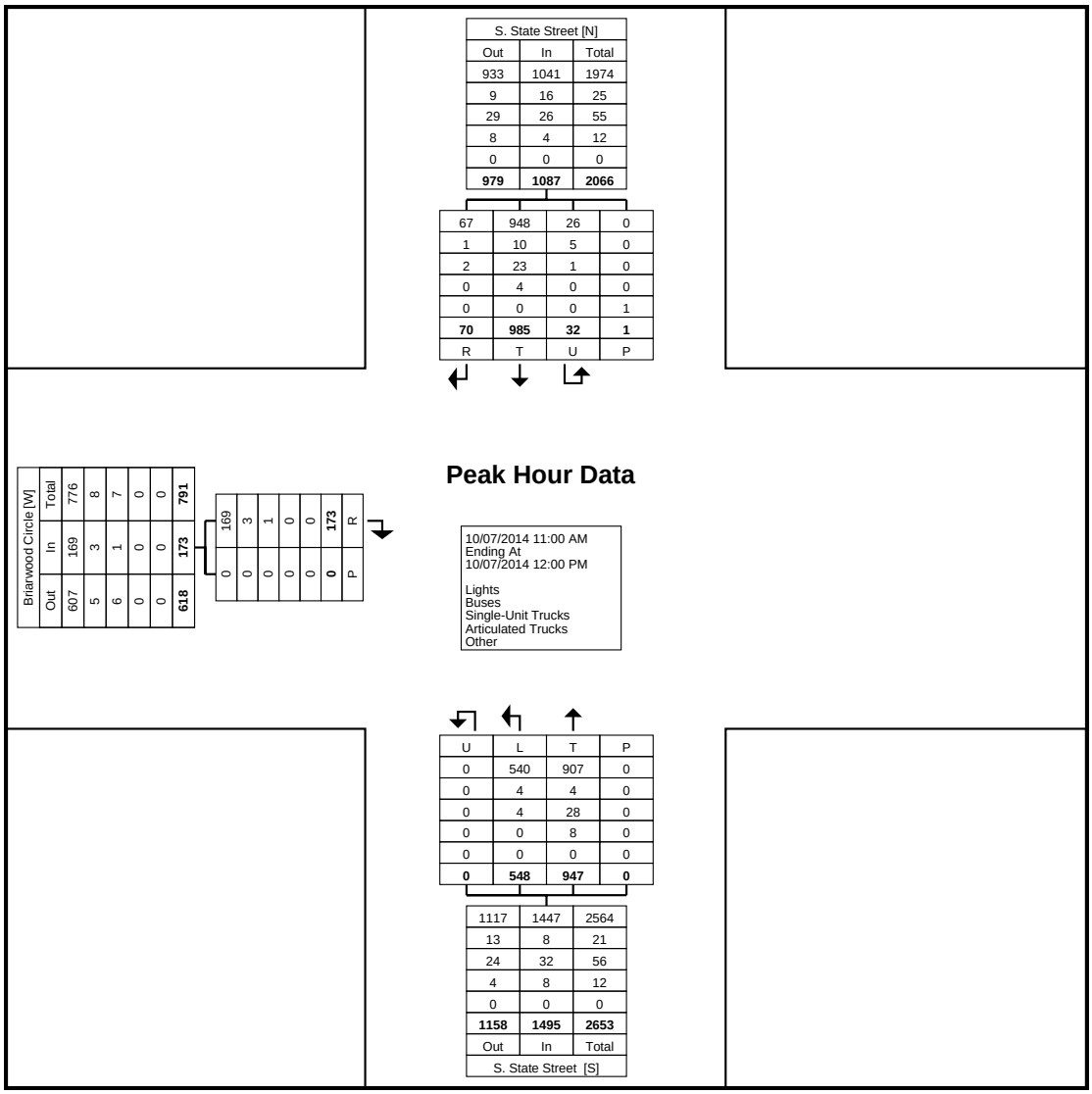

Turning Movement Peak Hour Data Plot (11:00 AM)

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Video VCU: SCU 34N

Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	S. State Street Southbound					S. State Street Northbound					Briarwood Circle Eastbound			
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Peds	App. Total	Int. Total
12:00 PM	21	305	8	1	334	255	167	0	0	422	63	0	63	819
12:15 PM	20	273	7	1	300	264	148	0	0	412	61	0	61	773
12:30 PM	26	266	5	0	297	294	166	1	0	461	79	0	79	837
12:45 PM	30	288	14	0	332	291	171	1	0	463	61	0	61	856
Total	97	1132	34	2	1263	1104	652	2	0	1758	264	0	264	3285
Approach %	7.7	89.6	2.7	-	-	62.8	37.1	0.1	-	-	100.0	-	-	-
Total %	3.0	34.5	1.0	-	38.4	33.6	19.8	0.1	-	53.5	8.0	-	8.0	-
PHF	0.808	0.928	0.607	-	0.945	0.939	0.953	0.500	-	0.949	0.835	-	0.835	0.959
Lights	95	1090	28	-	1213	1076	646	2	-	1724	260	-	260	3197
% Lights	97.9	96.3	82.4	-	96.0	97.5	99.1	100.0	-	98.1	98.5	-	98.5	97.3
Buses	1	3	5	-	9	5	2	0	-	7	2	-	2	18
% Buses	1.0	0.3	14.7	-	0.7	0.5	0.3	0.0	-	0.4	0.8	-	0.8	0.5
Single-Unit Trucks	1	23	1	-	25	17	3	0	-	20	2	-	2	47
% Single-Unit Trucks	1.0	2.0	2.9	-	2.0	1.5	0.5	0.0	-	1.1	0.8	-	0.8	1.4
Articulated Trucks	0	15	0	-	15	6	1	0	-	7	0	-	0	22
% Articulated Trucks	0.0	1.3	0.0	-	1.2	0.5	0.2	0.0	-	0.4	0.0	-	0.0	0.7
Bicycles on Road	0	1	0	-	1	0	0	0	-	0	0	-	0	1
% Bicycles on Road	0.0	0.1	0.0	-	0.1	0.0	0.0	0.0	-	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-

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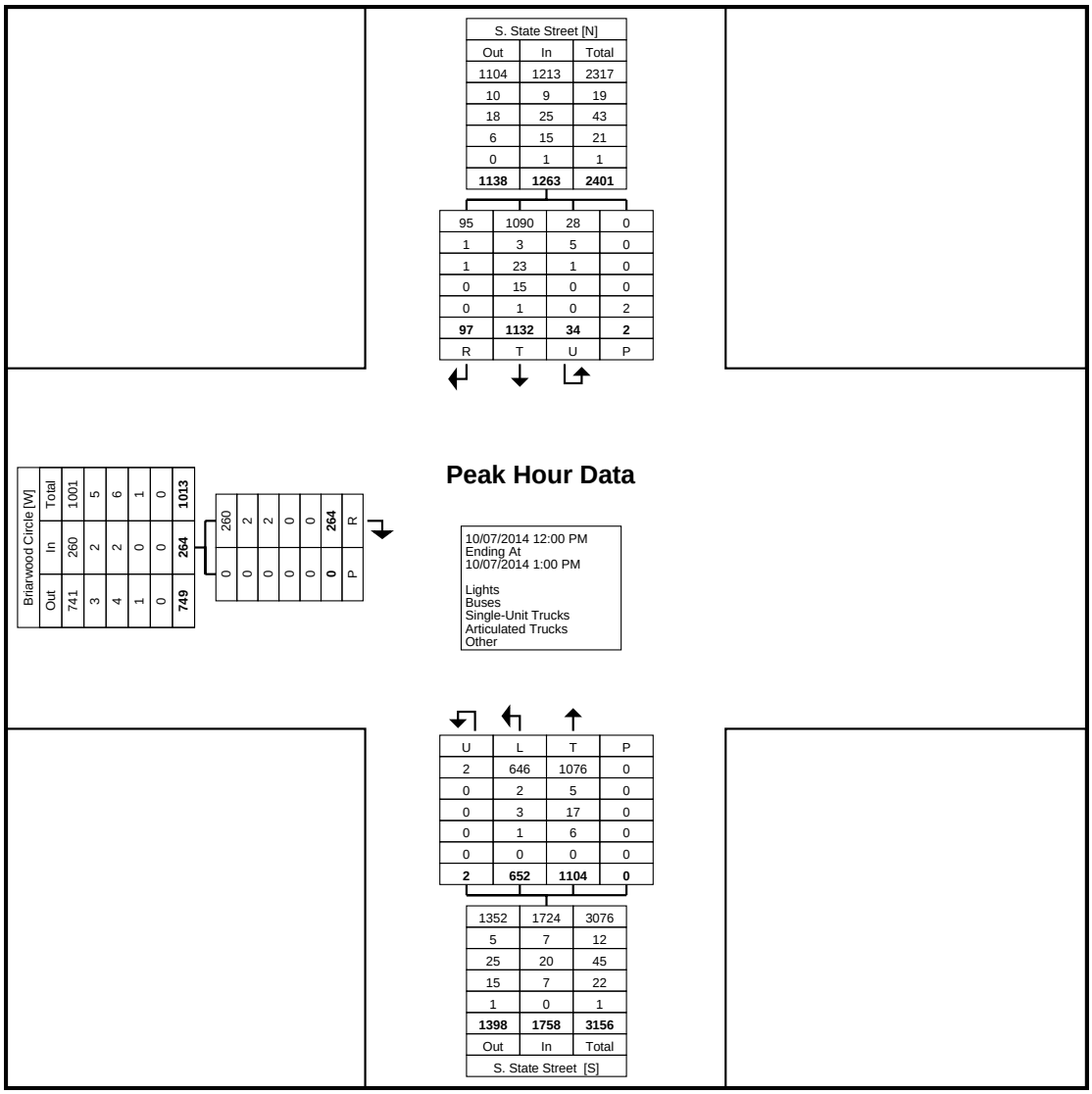
Weather: Pt. Cldy. 60 Degs.
Video VCU: SCU 34N

Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (12:00 PM)

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Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs.
Video VCU: SCU 34N

Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014

Turning Movement Peak Hour Data (4:45 PM)

Start Time	S. State Street Southbound					S. State Street Northbound					Briarwood Circle Eastbound			
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Peds	App. Total	Int. Total
4:45 PM	16	539	3	0	558	236	156	0	1	392	78	0	78	1028
5:00 PM	6	541	6	0	553	213	116	0	0	329	80	0	80	962
5:15 PM	1	481	4	0	486	252	136	0	0	388	68	0	68	942
5:30 PM	15	520	3	0	538	237	130	0	0	367	80	0	80	985
Total	38	2081	16	0	2135	938	538	0	1	1476	306	0	306	3917
Approach %	1.8	97.5	0.7	-	-	63.6	36.4	0.0	-	-	100.0	-	-	-
Total %	1.0	53.1	0.4	-	54.5	23.9	13.7	0.0	-	37.7	7.8	-	7.8	-
PHF	0.594	0.962	0.667	-	0.957	0.931	0.862	0.000	-	0.941	0.956	-	0.956	0.953
Lights	38	2049	12	-	2099	929	529	0	-	1458	301	-	301	3858
% Lights	100.0	98.5	75.0	-	98.3	99.0	98.3	-	-	98.8	98.4	-	98.4	98.5
Buses	0	13	4	-	17	1	8	0	-	9	3	-	3	29
% Buses	0.0	0.6	25.0	-	0.8	0.1	1.5	-	-	0.6	1.0	-	1.0	0.7
Single-Unit Trucks	0	17	0	-	17	5	1	0	-	6	2	-	2	25
% Single-Unit Trucks	0.0	0.8	0.0	-	0.8	0.5	0.2	-	-	0.4	0.7	-	0.7	0.6
Articulated Trucks	0	2	0	-	2	3	0	0	-	3	0	-	0	5
% Articulated Trucks	0.0	0.1	0.0	-	0.1	0.3	0.0	-	-	0.2	0.0	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-

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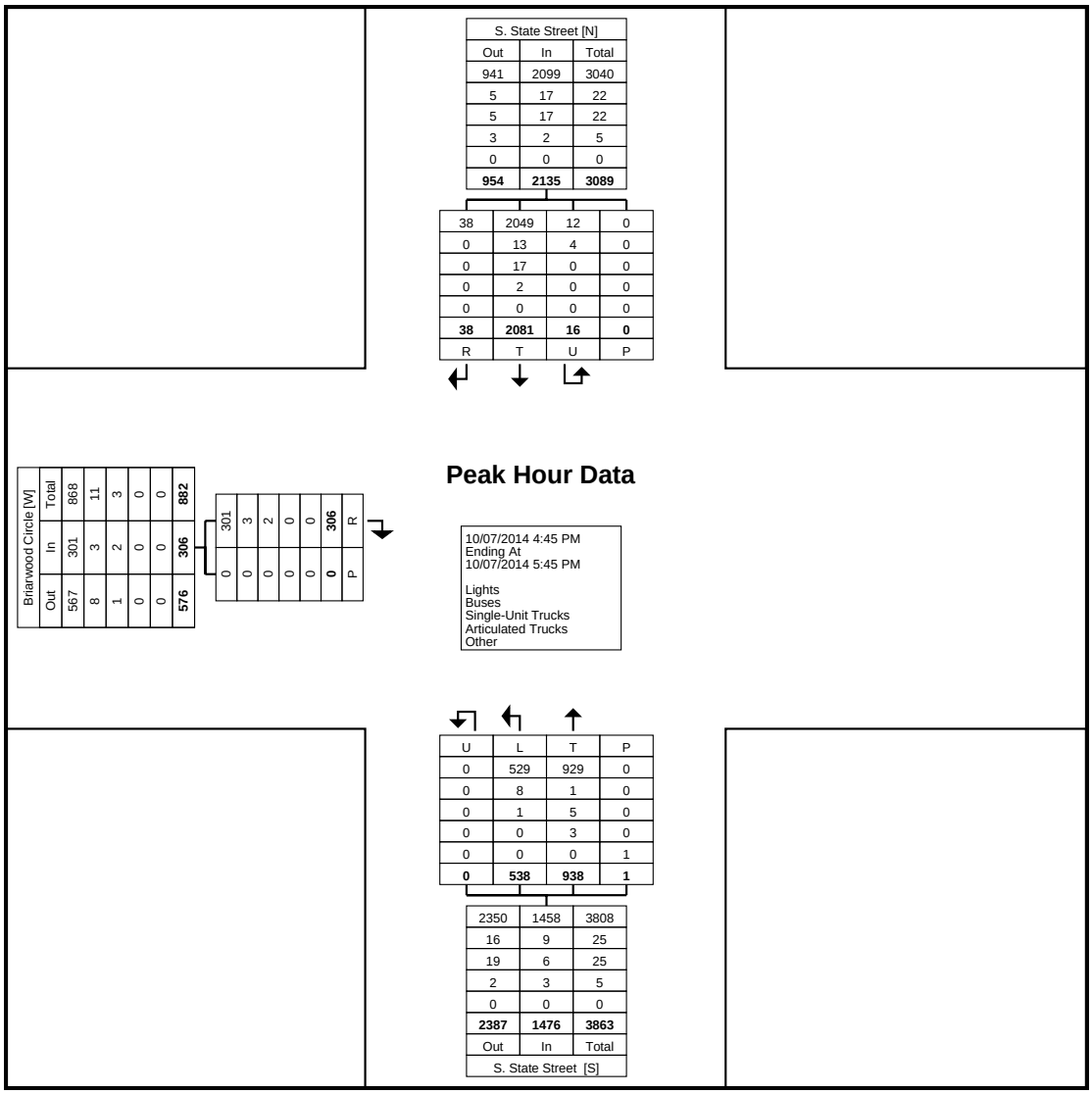
Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (4:45 PM)

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Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs.
Video VCU: SCU 34N

Count Name: State St &Briarwood Circle
Site Code: TMC 6
Start Date: 10/07/2014

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Signalized crossover intersection, S. State Street is a divided roadway. Video VCU camera located at NW quadrant. NB has dual left turns.
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

TDC
Traffic Data Collection

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 1TM & 3CU

Count Name: State&Hilton/Victors Way
Site Code: TMC 7
Start Date: 10/07/2014

Turning Movement Data

Start Time	S. State Street Southbound					Victors Way Westbound				S. State Street Northbound					Hilton Blvd. Eastbound				
	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
7:00 AM	5	155	0	0	160	11	31	0	42	52	402	0	0	454	12	1	0	13	669
7:15 AM	3	179	0	1	182	6	22	0	28	95	527	0	2	622	18	7	1	25	857
7:30 AM	2	216	0	0	218	15	36	0	51	98	555	0	0	653	39	6	0	45	967
7:45 AM	3	239	0	0	242	9	34	0	43	104	564	0	1	668	28	3	0	31	984
Hourly Total	13	789	0	1	802	41	123	0	164	349	2048	0	3	2397	97	17	1	114	3477
8:00 AM	5	226	0	0	231	6	29	0	35	97	550	0	0	647	24	5	0	29	942
8:15 AM	2	219	0	0	221	11	27	0	38	121	502	0	0	623	22	3	0	25	907
8:30 AM	3	347	0	0	350	10	28	0	38	110	493	0	0	603	126	6	0	132	1123
8:45 AM	2	266	0	0	268	7	24	0	31	113	496	0	0	609	32	7	0	39	947
Hourly Total	12	1058	0	0	1070	34	108	0	142	441	2041	0	0	2482	204	21	0	225	3919
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	2	257	4	1	263	8	28	0	36	37	345	0	0	382	37	11	0	48	729
11:15 AM	8	257	0	0	265	8	20	0	28	51	332	0	0	383	48	4	0	52	728
11:30 AM	1	285	0	3	286	12	24	0	36	49	365	0	0	414	62	10	0	72	808
11:45 AM	4	350	0	0	354	13	34	0	47	55	391	0	0	446	49	7	0	56	903
Hourly Total	15	1149	4	4	1168	41	106	0	147	192	1433	0	0	1625	196	32	0	228	3168
12:00 PM	7	365	0	3	372	16	32	0	48	58	390	0	0	448	53	9	0	62	930
12:15 PM	2	333	0	0	335	24	39	2	63	51	376	0	0	427	52	9	0	61	886
12:30 PM	3	341	0	1	344	16	32	0	48	64	428	0	0	492	73	11	0	84	968
12:45 PM	2	345	0	0	347	10	25	0	35	60	445	0	0	505	67	11	0	78	965
Hourly Total	14	1384	0	4	1398	66	128	2	194	233	1639	0	0	1872	245	40	0	285	3749
1:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
4:00 PM	1	574	0	0	575	5	36	0	41	35	299	0	0	334	60	5	2	65	1015
4:15 PM	1	485	1	0	487	10	36	0	46	44	359	0	0	403	59	10	0	69	1005
4:30 PM	3	613	1	0	617	14	68	0	82	50	324	0	0	374	53	10	0	63	1136
4:45 PM	5	615	0	0	620	13	48	0	61	47	372	0	0	419	63	10	0	73	1173
Hourly Total	10	2287	2	0	2299	42	188	0	230	176	1354	0	0	1530	235	35	2	270	4329
5:00 PM	1	613	0	0	614	13	81	0	94	42	307	0	0	349	64	11	0	75	1132
5:15 PM	0	554	0	0	554	10	59	0	69	49	359	0	0	408	76	11	0	87	1118
5:30 PM	1	595	0	0	596	18	65	0	83	45	353	0	0	398	71	13	0	84	1161
5:45 PM	1	462	0	3	463	7	44	1	51	50	369	0	0	419	66	10	0	76	1009
Hourly Total	3	2224	0	3	2227	48	249	1	297	186	1388	0	0	1574	277	45	0	322	4420
6:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Grand Total	67	8891	6	12	8964	272	902	3	1174	1577	9905	0	3	11482	1254	190	3	1444	23064
Approach %	0.7	99.2	0.1	-	-	23.2	76.8	-	-	13.7	86.3	0.0	-	-	86.8	13.2	-	-	-
Total %	0.3	38.5	0.0	-	38.9	1.2	3.9	-	5.1	6.8	42.9	0.0	-	49.8	5.4	0.8	-	6.3	-
Lights	64	8726	6	-	8796	270	895	-	1165	1542	9719	0	-	11261	1235	186	-	1421	22643
% Lights	95.5	98.1	100.0	-	98.1	99.3	99.2	-	99.2	97.8	98.1	-	-	98.1	98.5	97.9	-	98.4	98.2
Buses	2	40	0	-	42	1	0	-	1	21	51	0	-	72	4	3	-	7	122
% Buses	3.0	0.4	0.0	-	0.5	0.4	0.0	-	0.1	1.3	0.5	-	-	0.6	0.3	1.6	-	0.5	0.5
Single-Unit Trucks	1	101	0	-	102	1	6	-	7	9	108	0	-	117	10	1	-	11	237
% Single-Unit Trucks	1.5	1.1	0.0	-	1.1	0.4	0.7	-	0.6	0.6	1.1	-	-	1.0	0.8	0.5	-	0.8	1.0
Articulated Trucks	0	22	0	-	22	0	1	-	1	2	26	0	-	28	4	0	-	4	55
% Articulated Trucks	0.0	0.2	0.0	-	0.2	0.0	0.1	-	0.1	0.1	0.3	-	-	0.2	0.3	0.0	-	0.3	0.2
Bicycles on Road	0	2	0	-	2	0	0	-	0	3	1	0	-	4	1	0	-	1	7
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.2	0.0	-	-	0.0	0.1	0.0	-	0.1	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	0.0	-	-	-	-	0.0	-	-	-	0.0	-	-
Pedestrians	-	-	-	12	-	-	-	3	-	-	-	-	3	-	-	-	3	-	-
% Pedestrians	-	-	-	100.0	-	-	-	100.0	-	-	-	-	100.0	-	-	-	100.0	-	-

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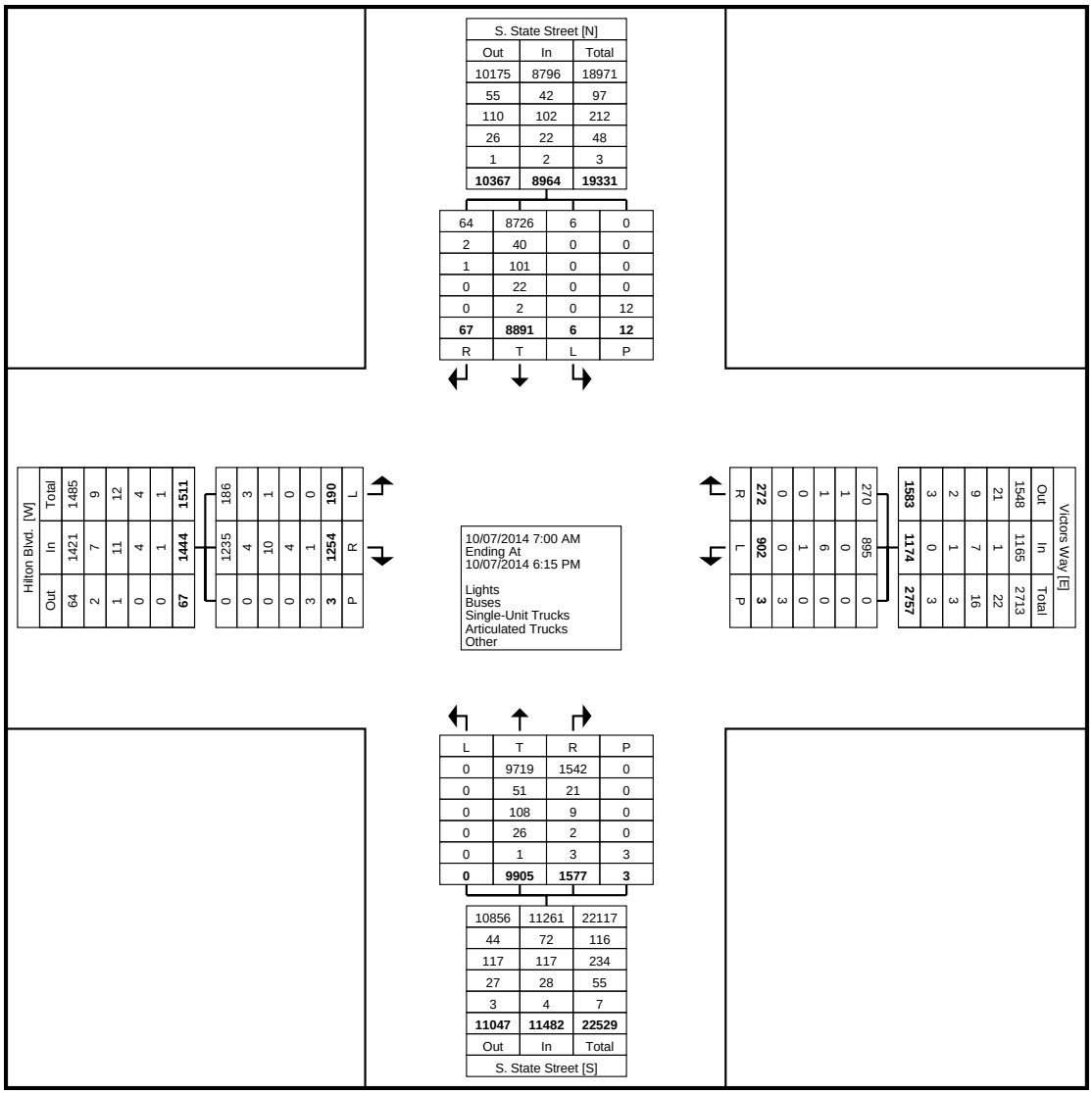
Video VCU: SCU 1TM & 3CU

Count Name: State&Hilton/Victors Way
Site Code: TMC 7
Start Date: 10/07/2014
Page No: 2



Turning Movement Data Plot

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Count Name: State&Hilton/Victors Way
Site Code: TMC 7
Start Date: 10/07/2014

Turning Movement Peak Hour Data (7:45 AM)

Start Time	S. State Street Southbound					Victors Way Westbound				S. State Street Northbound					Hilton Blvd. Eastbound				
	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
7:45 AM	3	239	0	0	242	9	34	0	43	104	564	0	1	668	28	3	0	31	984
8:00 AM	5	226	0	0	231	6	29	0	35	97	550	0	0	647	24	5	0	29	942
8:15 AM	2	219	0	0	221	11	27	0	38	121	502	0	0	623	22	3	0	25	907
8:30 AM	3	347	0	0	350	10	28	0	38	110	493	0	0	603	126	6	0	132	1123
Total	13	1031	0	0	1044	36	118	0	154	432	2109	0	1	2541	200	17	0	217	3956
Approach %	1.2	98.8	0.0	-	-	23.4	76.6	-	-	17.0	83.0	0.0	-	-	92.2	7.8	-	-	-
Total %	0.3	26.1	0.0	-	26.4	0.9	3.0	-	3.9	10.9	53.3	0.0	-	64.2	5.1	0.4	-	5.5	-
PHF	0.650	0.743	0.000	-	0.746	0.818	0.868	-	0.895	0.893	0.935	0.000	-	0.951	0.397	0.708	-	0.411	0.881
Lights	13	1015	0	-	1028	36	117	-	153	429	2072	0	-	2501	198	17	-	215	3897
% Lights	100.0	98.4	-	-	98.5	100.0	99.2	-	99.4	99.3	98.2	-	-	98.4	99.0	100.0	-	99.1	98.5
Buses	0	5	0	-	5	0	0	-	0	1	13	0	-	14	1	0	-	1	20
% Buses	0.0	0.5	-	-	0.5	0.0	0.0	-	0.0	0.2	0.6	-	-	0.6	0.5	0.0	-	0.5	0.5
Single-Unit Trucks	0	11	0	-	11	0	1	-	1	1	18	0	-	19	0	0	-	0	31
% Single-Unit Trucks	0.0	1.1	-	-	1.1	0.0	0.8	-	0.6	0.2	0.9	-	-	0.7	0.0	0.0	-	0.0	0.8
Articulated Trucks	0	0	0	-	0	0	0	-	0	1	6	0	-	7	1	0	-	1	8
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.2	0.3	-	-	0.3	0.5	0.0	-	0.5	0.2
Bicycles on Road	0	0	0	-	0	0	0	-	0	0	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	0	-	-	-	-	1	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-

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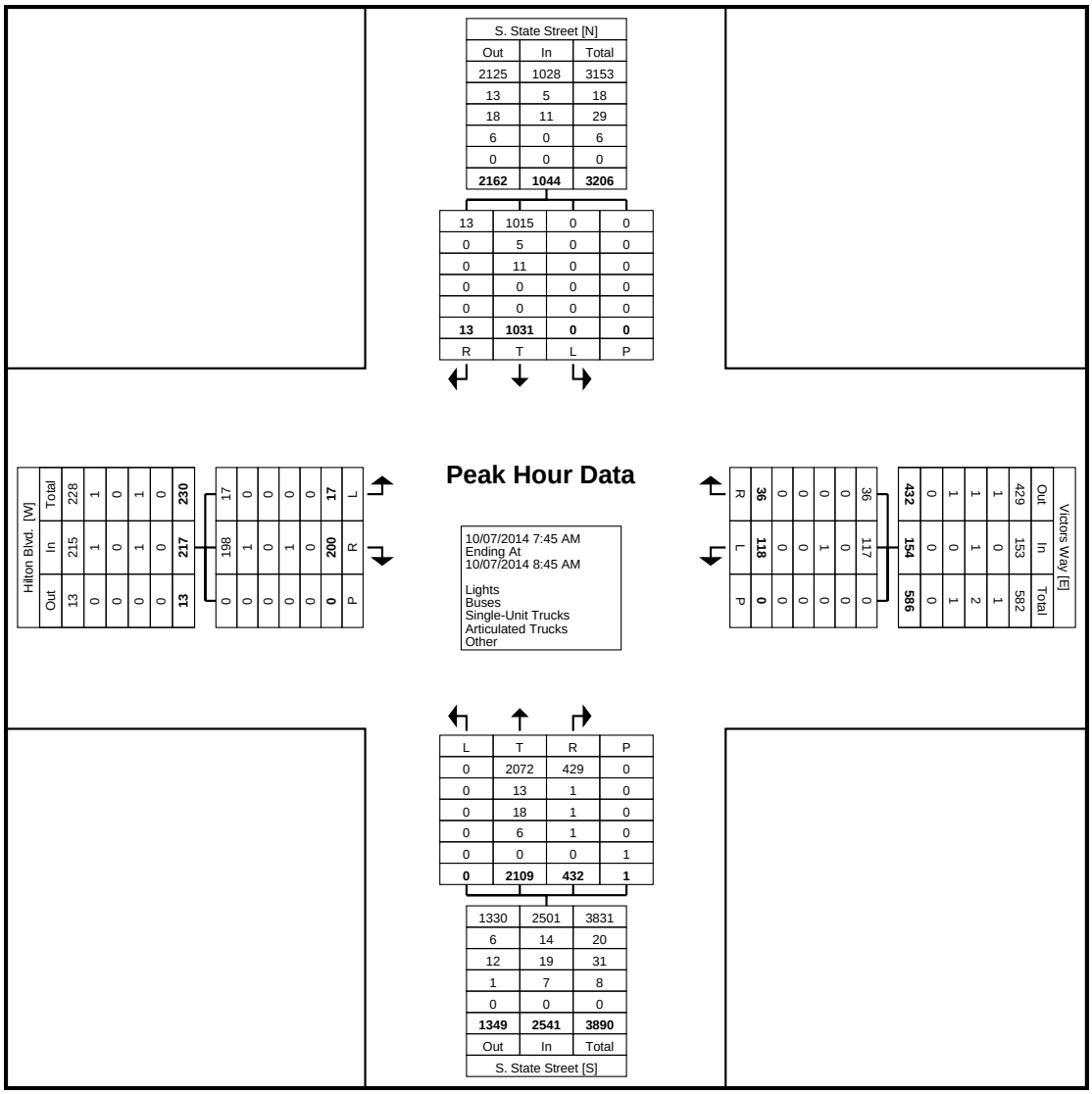

Turning Movement Peak Hour Data Plot (7:45 AM)

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Count Name: State&Hilton/Victors Way
Site Code: TMC 7
Start Date: 10/07/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	S. State Street Southbound					Victors Way Westbound				S. State Street Northbound					Hilton Blvd. Eastbound				
	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
11:00 AM	2	257	4	1	263	8	28	0	36	37	345	0	0	382	37	11	0	48	729
11:15 AM	8	257	0	0	265	8	20	0	28	51	332	0	0	383	48	4	0	52	728
11:30 AM	1	285	0	3	286	12	24	0	36	49	365	0	0	414	62	10	0	72	808
11:45 AM	4	350	0	0	354	13	34	0	47	55	391	0	0	446	49	7	0	56	903
Total	15	1149	4	4	1168	41	106	0	147	192	1433	0	0	1625	196	32	0	228	3168
Approach %	1.3	98.4	0.3	-	-	27.9	72.1	-	-	11.8	88.2	0.0	-	-	86.0	14.0	-	-	-
Total %	0.5	36.3	0.1	-	36.9	1.3	3.3	-	4.6	6.1	45.2	0.0	-	51.3	6.2	1.0	-	7.2	-
PHF	0.469	0.821	0.250	-	0.825	0.788	0.779	-	0.782	0.873	0.916	0.000	-	0.911	0.790	0.727	-	0.792	0.877
Lights	14	1114	4	-	1132	41	104	-	145	189	1389	0	-	1578	189	30	-	219	3074
% Lights	93.3	97.0	100.0	-	96.9	100.0	98.1	-	98.6	98.4	96.9	-	-	97.1	96.4	93.8	-	96.1	97.0
Buses	1	12	0	-	13	0	0	-	0	0	7	0	-	7	1	1	-	2	22
% Buses	6.7	1.0	0.0	-	1.1	0.0	0.0	-	0.0	0.0	0.5	-	-	0.4	0.5	3.1	-	0.9	0.7
Single-Unit Trucks	0	21	0	-	21	0	1	-	1	2	29	0	-	31	4	1	-	5	58
% Single-Unit Trucks	0.0	1.8	0.0	-	1.8	0.0	0.9	-	0.7	1.0	2.0	-	-	1.9	2.0	3.1	-	2.2	1.8
Articulated Trucks	0	2	0	-	2	0	1	-	1	1	8	0	-	9	1	0	-	1	13
% Articulated Trucks	0.0	0.2	0.0	-	0.2	0.0	0.9	-	0.7	0.5	0.6	-	-	0.6	0.5	0.0	-	0.4	0.4
Bicycles on Road	0	0	0	-	0	0	0	-	0	0	0	0	-	0	1	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.5	0.0	-	0.4	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	4	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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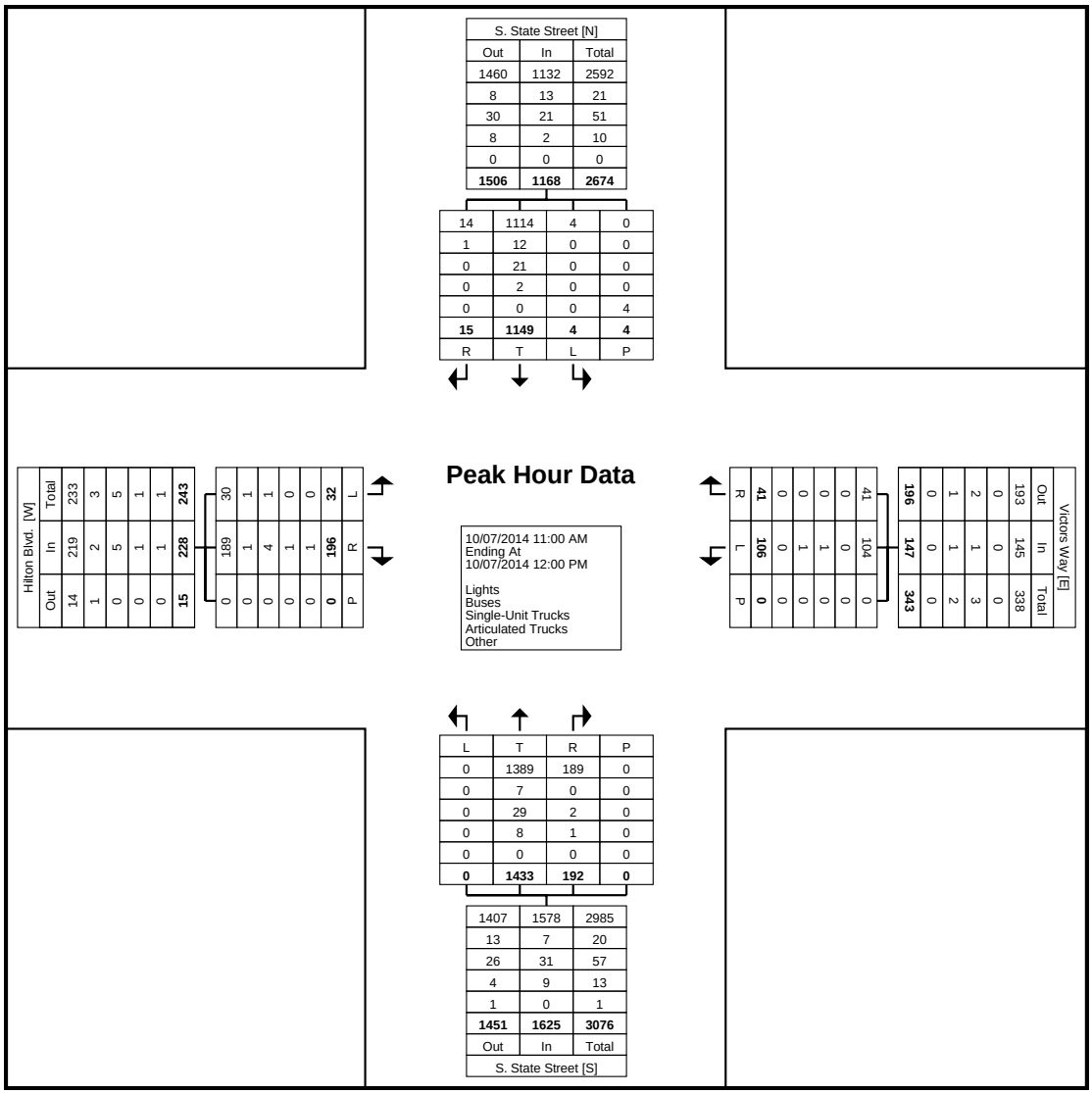

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Count Name: State&Hilton/Victors Way
Site Code: TMC 7
Start Date: 10/07/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	S. State Street Southbound					Victors Way Westbound				S. State Street Northbound					Hilton Blvd. Eastbound				
	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
12:00 PM	7	365	0	3	372	16	32	0	48	58	390	0	0	448	53	9	0	62	930
12:15 PM	2	333	0	0	335	24	39	2	63	51	376	0	0	427	52	9	0	61	886
12:30 PM	3	341	0	1	344	16	32	0	48	64	428	0	0	492	73	11	0	84	968
12:45 PM	2	345	0	0	347	10	25	0	35	60	445	0	0	505	67	11	0	78	965
Total	14	1384	0	4	1398	66	128	2	194	233	1639	0	0	1872	245	40	0	285	3749
Approach %	1.0	99.0	0.0	-	-	34.0	66.0	-	-	12.4	87.6	0.0	-	-	86.0	14.0	-	-	-
Total %	0.4	36.9	0.0	-	37.3	1.8	3.4	-	5.2	6.2	43.7	0.0	-	49.9	6.5	1.1	-	7.6	-
PHF	0.500	0.948	0.000	-	0.940	0.688	0.821	-	0.770	0.910	0.921	0.000	-	0.927	0.839	0.909	-	0.848	0.968
Lights	13	1342	0	-	1355	65	126	-	191	229	1603	0	-	1832	240	40	-	280	3658
% Lights	92.9	97.0	-	-	96.9	98.5	98.4	-	98.5	98.3	97.8	-	-	97.9	98.0	100.0	-	98.2	97.6
Buses	0	5	0	-	5	0	0	-	0	2	7	0	-	9	1	0	-	1	15
% Buses	0.0	0.4	-	-	0.4	0.0	0.0	-	0.0	0.9	0.4	-	-	0.5	0.4	0.0	-	0.4	0.4
Single-Unit Trucks	1	25	0	-	26	1	2	-	3	2	22	0	-	24	3	0	-	3	56
% Single-Unit Trucks	7.1	1.8	-	-	1.9	1.5	1.6	-	1.5	0.9	1.3	-	-	1.3	1.2	0.0	-	1.1	1.5
Articulated Trucks	0	11	0	-	11	0	0	-	0	0	7	0	-	7	1	0	-	1	19
% Articulated Trucks	0.0	0.8	-	-	0.8	0.0	0.0	-	0.0	0.0	0.4	-	-	0.4	0.4	0.0	-	0.4	0.5
Bicycles on Road	0	1	0	-	1	0	0	-	0	0	0	0	-	0	0	0	-	0	1
% Bicycles on Road	0.0	0.1	-	-	0.1	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	4	-	-	-	2	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

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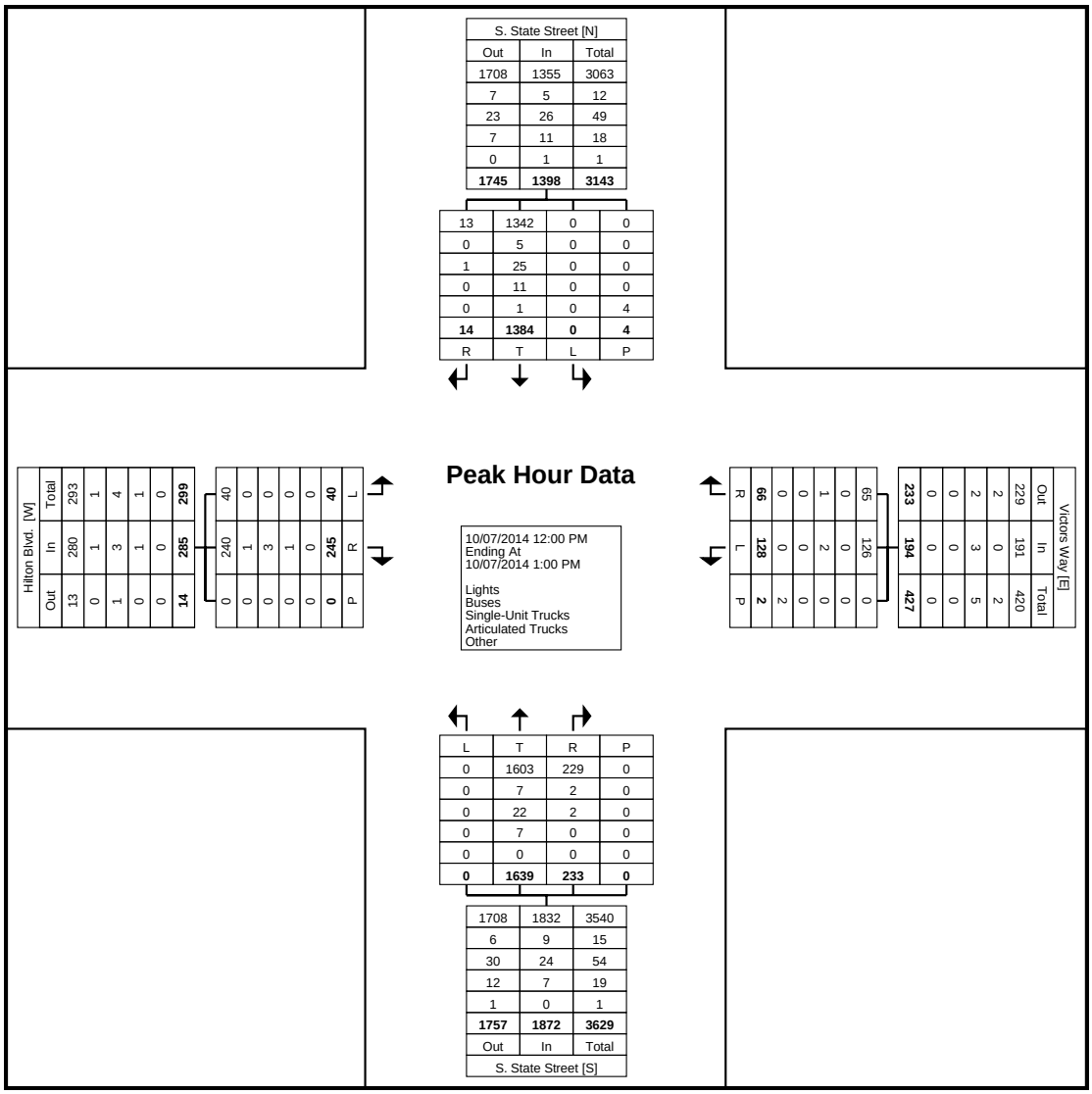

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Count Name: State&Hilton/Victors Way
Site Code: TMC 7
Start Date: 10/07/2014

Turning Movement Peak Hour Data (4:45 PM)

Start Time	S. State Street Southbound					Victors Way Westbound				S. State Street Northbound					Hilton Blvd. Eastbound				
	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
4:45 PM	5	615	0	0	620	13	48	0	61	47	372	0	0	419	63	10	0	73	1173
5:00 PM	1	613	0	0	614	13	81	0	94	42	307	0	0	349	64	11	0	75	1132
5:15 PM	0	554	0	0	554	10	59	0	69	49	359	0	0	408	76	11	0	87	1118
5:30 PM	1	595	0	0	596	18	65	0	83	45	353	0	0	398	71	13	0	84	1161
Total	7	2377	0	0	2384	54	253	0	307	183	1391	0	0	1574	274	45	0	319	4584
Approach %	0.3	99.7	0.0	-	-	17.6	82.4	-	-	11.6	88.4	0.0	-	-	85.9	14.1	-	-	-
Total %	0.2	51.9	0.0	-	52.0	1.2	5.5	-	6.7	4.0	30.3	0.0	-	34.3	6.0	1.0	-	7.0	-
PHF	0.350	0.966	0.000	-	0.961	0.750	0.781	-	0.816	0.934	0.935	0.000	-	0.939	0.901	0.865	-	0.917	0.977
Lights	7	2349	0	-	2356	54	253	-	307	181	1377	0	-	1558	269	45	-	314	4535
% Lights	100.0	98.8	-	-	98.8	100.0	100.0	-	100.0	98.9	99.0	-	-	99.0	98.2	100.0	-	98.4	98.9
Buses	0	4	0	-	4	0	0	-	0	1	2	0	-	3	1	0	-	1	8
% Buses	0.0	0.2	-	-	0.2	0.0	0.0	-	0.0	0.5	0.1	-	-	0.2	0.4	0.0	-	0.3	0.2
Single-Unit Trucks	0	21	0	-	21	0	0	-	0	1	9	0	-	10	3	0	-	3	34
% Single-Unit Trucks	0.0	0.9	-	-	0.9	0.0	0.0	-	0.0	0.5	0.6	-	-	0.6	1.1	0.0	-	0.9	0.7
Articulated Trucks	0	2	0	-	2	0	0	-	0	0	3	0	-	3	1	0	-	1	6
% Articulated Trucks	0.0	0.1	-	-	0.1	0.0	0.0	-	0.0	0.0	0.2	-	-	0.2	0.4	0.0	-	0.3	0.1
Bicycles on Road	0	1	0	-	1	0	0	-	0	0	0	0	-	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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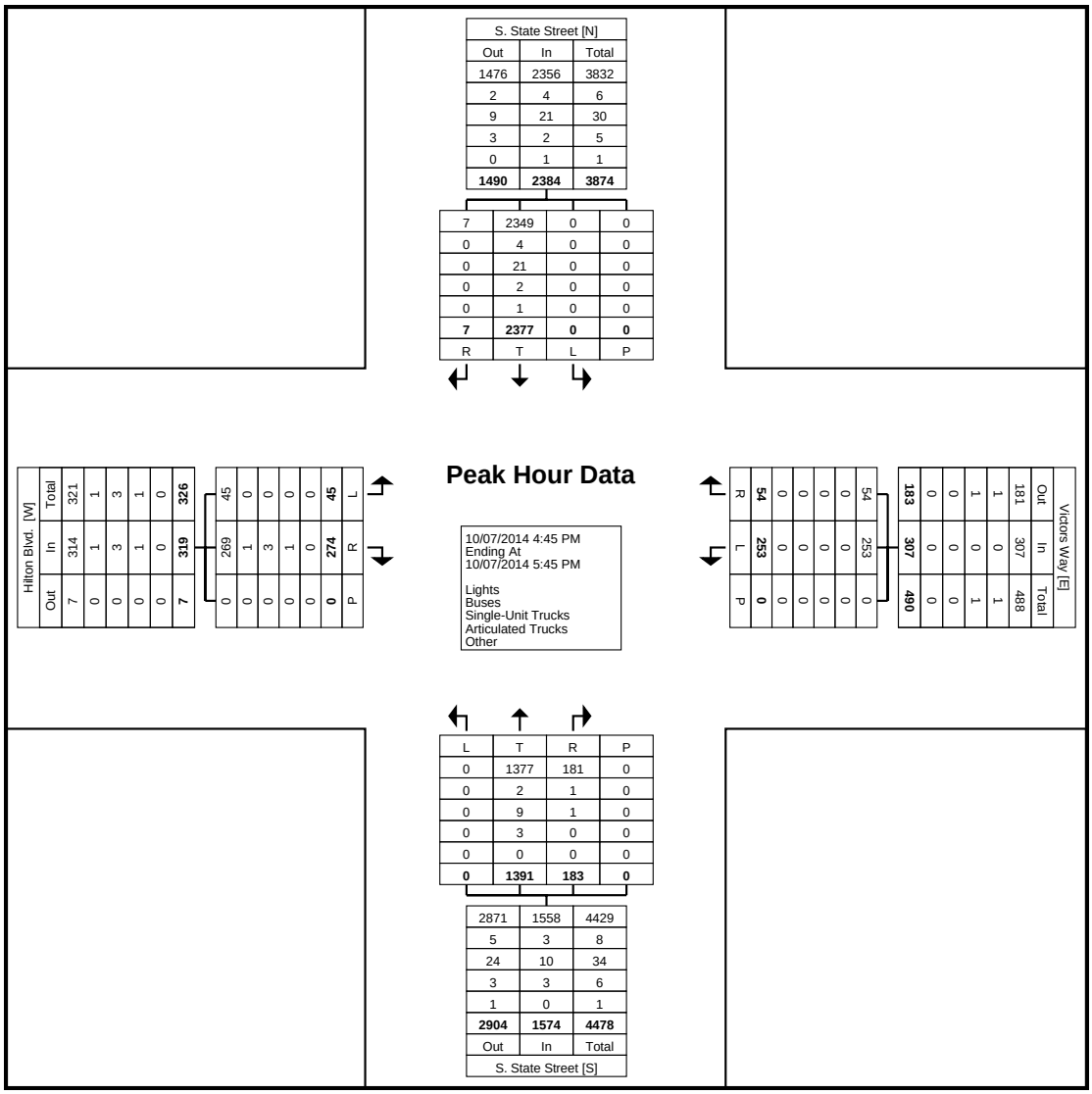
Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 1TM & 3CU

Count Name: State&Hilton/Victors Way
Site Code: TMC 7
Start Date: 10/07/2014
Page No: 10



Turning Movement Peak Hour Data Plot (4:45 PM)

Traffic Data Collection

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Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 1TM & 3CU

Count Name: State&Hilton/Victors Way
Site Code: TMC 7
Start Date: 10/07/2014

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Non-signalized intersection, S. State Street is a divided roadway. Video VCU cameras were located at NW & SE quadrant. NB & SB left turns are prohibited.
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 4BT

Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014

Turning Movement Data

Start Time	S. State Street Southbound				I-94 WB Off-Ramp Westbound				S. State Street Northbound			I-94 WB On-Ramp Eastbound		
	Right	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Thru	Peds	App. Total	Peds	App. Total	Int. Total
7:00 AM	38	152	0	190	228	159	0	387	228	0	228	0	0	805
7:15 AM	42	181	0	223	318	177	0	495	310	0	310	0	0	1028
7:30 AM	57	228	0	285	289	157	0	446	358	0	358	0	0	1089
7:45 AM	45	256	0	301	296	170	0	466	381	0	381	0	0	1148
Hourly Total	182	817	0	999	1131	663	0	1794	1277	0	1277	0	0	4070
8:00 AM	35	272	0	307	319	164	0	483	322	0	322	0	0	1112
8:15 AM	44	244	0	288	265	145	0	410	349	0	349	0	0	1047
8:30 AM	136	390	0	526	291	140	0	431	310	0	310	0	0	1267
8:45 AM	39	292	0	331	310	157	0	467	300	0	300	0	0	1098
Hourly Total	254	1198	0	1452	1185	606	0	1791	1281	0	1281	0	0	4524
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	46	272	0	318	155	68	0	223	223	0	223	0	0	764
11:15 AM	51	277	0	328	162	65	0	227	231	0	231	0	0	786
11:30 AM	47	322	0	369	168	80	0	248	240	0	240	0	0	857
11:45 AM	61	374	0	435	163	92	0	255	296	0	296	0	0	986
Hourly Total	205	1245	0	1450	648	305	0	953	990	0	990	0	0	3393
12:00 PM	61	389	0	450	155	79	0	234	270	0	270	0	0	954
12:15 PM	46	379	0	425	146	80	0	226	260	0	260	0	0	911
12:30 PM	53	394	0	447	172	72	0	244	290	0	290	0	0	981
12:45 PM	48	389	0	437	187	83	0	270	306	0	306	0	0	1013
Hourly Total	208	1551	0	1759	660	314	0	974	1126	0	1126	0	0	3859
1:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	1	0	0	1	0	0	0	0	0	1
4:00 PM	114	557	0	671	145	79	0	224	191	0	191	0	0	1086
4:15 PM	103	480	0	583	185	102	0	287	220	0	220	1	0	1090
4:30 PM	129	592	0	721	167	112	0	279	204	0	204	0	0	1204
4:45 PM	118	618	0	736	179	126	0	305	247	0	247	0	0	1288
Hourly Total	464	2247	0	2711	676	419	0	1095	862	0	862	1	0	4668
5:00 PM	121	619	0	740	146	122	0	268	208	0	208	0	0	1216
5:15 PM	116	591	0	707	171	106	0	277	235	0	235	0	0	1219
5:30 PM	115	626	0	741	165	121	0	286	224	0	224	0	0	1251
5:45 PM	105	478	0	583	172	115	0	287	247	0	247	0	0	1117
Hourly Total	457	2314	0	2771	654	464	0	1118	914	0	914	0	0	4803
6:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	1
Grand Total	1770	9373	0	11143	4955	2771	0	7726	6450	0	6450	1	0	25319
Approach %	15.9	84.1	-	-	64.1	35.9	-	-	100.0	-	-	-	-	-
Total %	7.0	37.0	-	44.0	19.6	10.9	-	30.5	25.5	-	25.5	-	0.0	-
Lights	1735	9215	-	10950	4883	2675	-	7558	6305	-	6305	-	0	24813
% Lights	98.0	98.3	-	98.3	98.5	96.5	-	97.8	97.8	-	97.8	-	-	98.0
Buses	7	35	-	42	21	0	-	21	43	-	43	-	0	106
% Buses	0.4	0.4	-	0.4	0.4	0.0	-	0.3	0.7	-	0.7	-	-	0.4
Single-Unit Trucks	20	86	-	106	34	69	-	103	83	-	83	-	0	292
% Single-Unit Trucks	1.1	0.9	-	1.0	0.7	2.5	-	1.3	1.3	-	1.3	-	-	1.2
Articulated Trucks	8	36	-	44	17	27	-	44	14	-	14	-	0	102
% Articulated Trucks	0.5	0.4	-	0.4	0.3	1.0	-	0.6	0.2	-	0.2	-	-	0.4
Bicycles on Road	0	1	-	1	0	0	-	0	5	-	5	-	0	6
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.1	-	0.1	-	-	0.0
Bicycles on Crosswalk	-	-	0	-	-	-	0	-	-	0	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	0	-	-	-	0	-	-	0	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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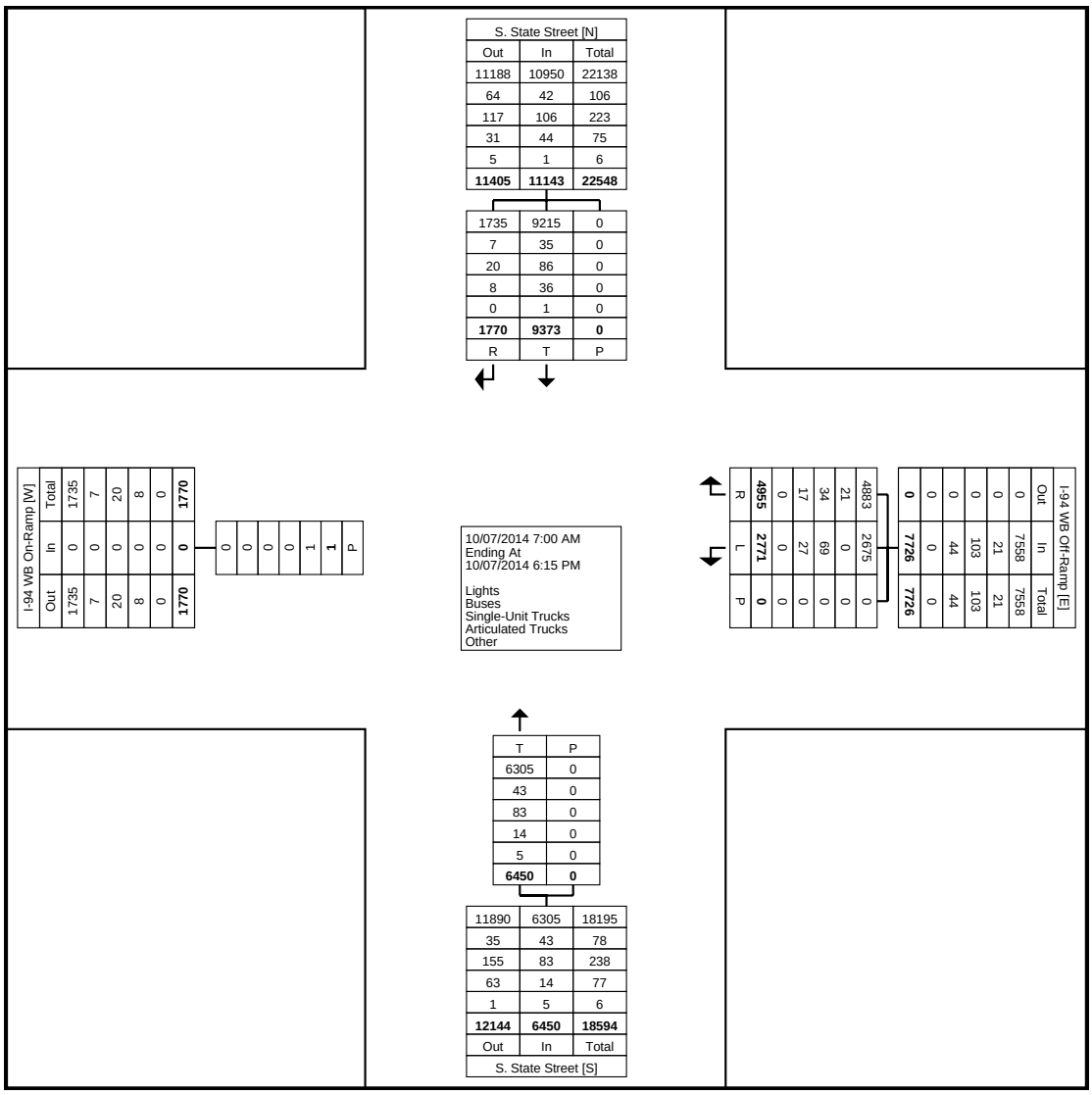
Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 4BT

Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014



Turning Movement Data Plot

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Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 4BT

Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014

Turning Movement Peak Hour Data (7:45 AM)

Start Time	S. State Street Southbound				I-94 WB Off-Ramp Westbound				S. State Street Northbound			I-94 WB On-Ramp Eastbound		
	Right	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Thru	Peds	App. Total	Peds	App. Total	Int. Total
7:45 AM	45	256	0	301	296	170	0	466	381	0	381	0	0	1148
8:00 AM	35	272	0	307	319	164	0	483	322	0	322	0	0	1112
8:15 AM	44	244	0	288	265	145	0	410	349	0	349	0	0	1047
8:30 AM	136	390	0	526	291	140	0	431	310	0	310	0	0	1267
Total	260	1162	0	1422	1171	619	0	1790	1362	0	1362	0	0	4574
Approach %	18.3	81.7	-	-	65.4	34.6	-	-	100.0	-	-	-	-	-
Total %	5.7	25.4	-	31.1	25.6	13.5	-	39.1	29.8	-	29.8	-	0.0	-
PHF	0.478	0.745	-	0.676	0.918	0.910	-	0.927	0.894	-	0.894	-	0.000	0.903
Lights	257	1142	-	1399	1158	610	-	1768	1335	-	1335	-	0	4502
% Lights	98.8	98.3	-	98.4	98.9	98.5	-	98.8	98.0	-	98.0	-	-	98.4
Buses	0	7	-	7	2	0	-	2	4	-	4	-	0	13
% Buses	0.0	0.6	-	0.5	0.2	0.0	-	0.1	0.3	-	0.3	-	-	0.3
Single-Unit Trucks	0	7	-	7	6	4	-	10	20	-	20	-	0	37
% Single-Unit Trucks	0.0	0.6	-	0.5	0.5	0.6	-	0.6	1.5	-	1.5	-	-	0.8
Articulated Trucks	3	6	-	9	5	5	-	10	3	-	3	-	0	22
% Articulated Trucks	1.2	0.5	-	0.6	0.4	0.8	-	0.6	0.2	-	0.2	-	-	0.5
Bicycles on Road	0	0	-	0	0	0	-	0	0	-	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	-	0.0
Bicycles on Crosswalk	-	-	0	-	-	-	0	-	-	0	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	0	-	-	-	0	-	-	0	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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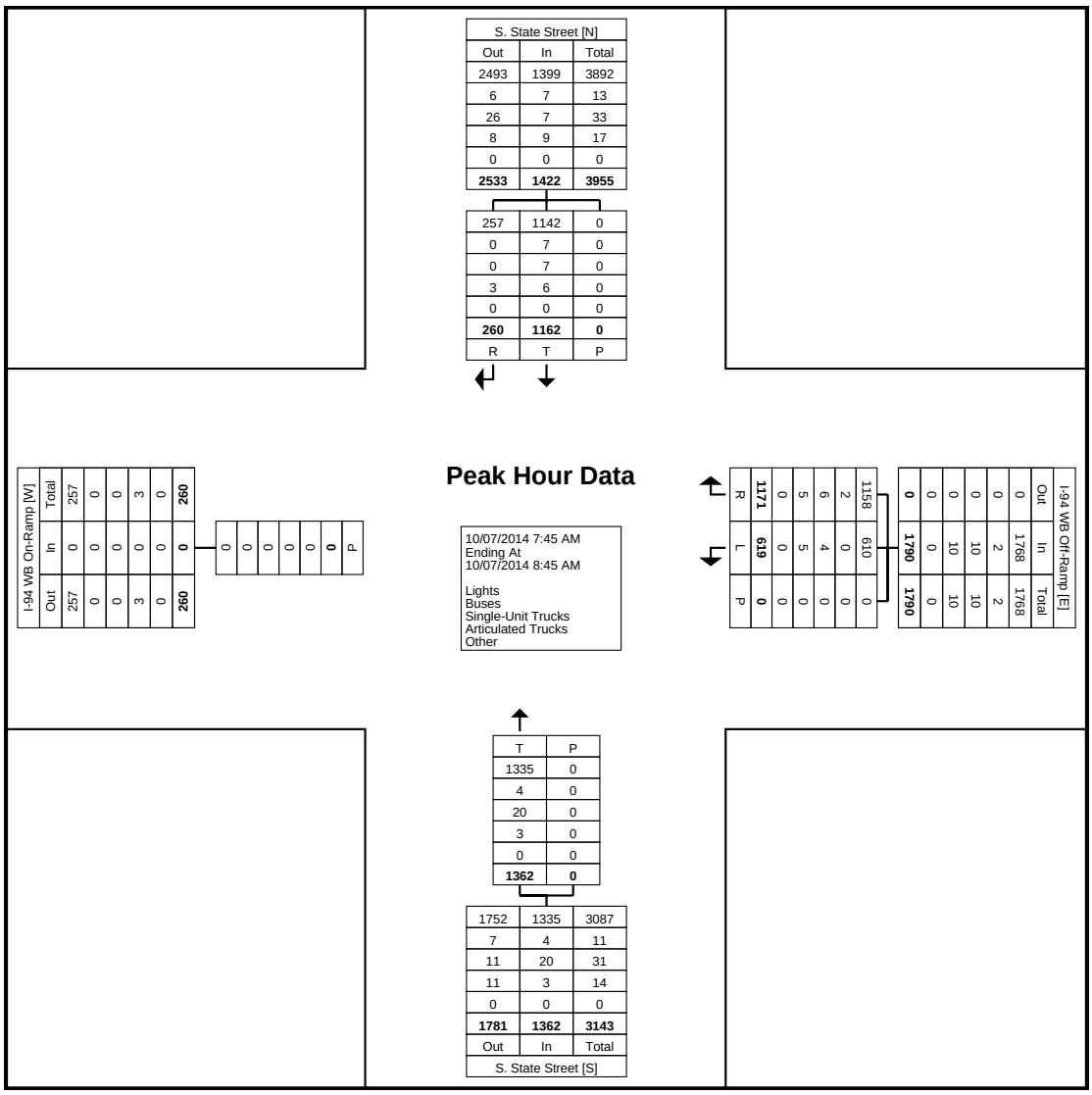
Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 4BT

Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (7:45 AM)

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 4BT

Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	S. State Street Southbound				I-94 WB Off-Ramp Westbound				S. State Street Northbound			I-94 WB On-Ramp Eastbound		
	Right	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Thru	Peds	App. Total	Peds	App. Total	Int. Total
11:00 AM	46	272	0	318	155	68	0	223	223	0	223	0	0	764
11:15 AM	51	277	0	328	162	65	0	227	231	0	231	0	0	786
11:30 AM	47	322	0	369	168	80	0	248	240	0	240	0	0	857
11:45 AM	61	374	0	435	163	92	0	255	296	0	296	0	0	986
Total	205	1245	0	1450	648	305	0	953	990	0	990	0	0	3393
Approach %	14.1	85.9	-	-	68.0	32.0	-	-	100.0	-	-	-	-	-
Total %	6.0	36.7	-	42.7	19.1	9.0	-	28.1	29.2	-	29.2	-	0.0	-
PHF	0.840	0.832	-	0.833	0.964	0.829	-	0.934	0.836	-	0.836	-	0.000	0.860
Lights	196	1208	-	1404	629	281	-	910	958	-	958	-	0	3272
% Lights	95.6	97.0	-	96.8	97.1	92.1	-	95.5	96.8	-	96.8	-	-	96.4
Buses	3	10	-	13	0	0	-	0	6	-	6	-	0	19
% Buses	1.5	0.8	-	0.9	0.0	0.0	-	0.0	0.6	-	0.6	-	-	0.6
Single-Unit Trucks	5	21	-	26	15	22	-	37	20	-	20	-	0	83
% Single-Unit Trucks	2.4	1.7	-	1.8	2.3	7.2	-	3.9	2.0	-	2.0	-	-	2.4
Articulated Trucks	1	5	-	6	4	2	-	6	6	-	6	-	0	18
% Articulated Trucks	0.5	0.4	-	0.4	0.6	0.7	-	0.6	0.6	-	0.6	-	-	0.5
Bicycles on Road	0	1	-	1	0	0	-	0	0	-	0	-	0	1
% Bicycles on Road	0.0	0.1	-	0.1	0.0	0.0	-	0.0	0.0	-	0.0	-	-	0.0
Bicycles on Crosswalk	-	-	0	-	-	-	0	-	-	0	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	0	-	-	-	0	-	-	0	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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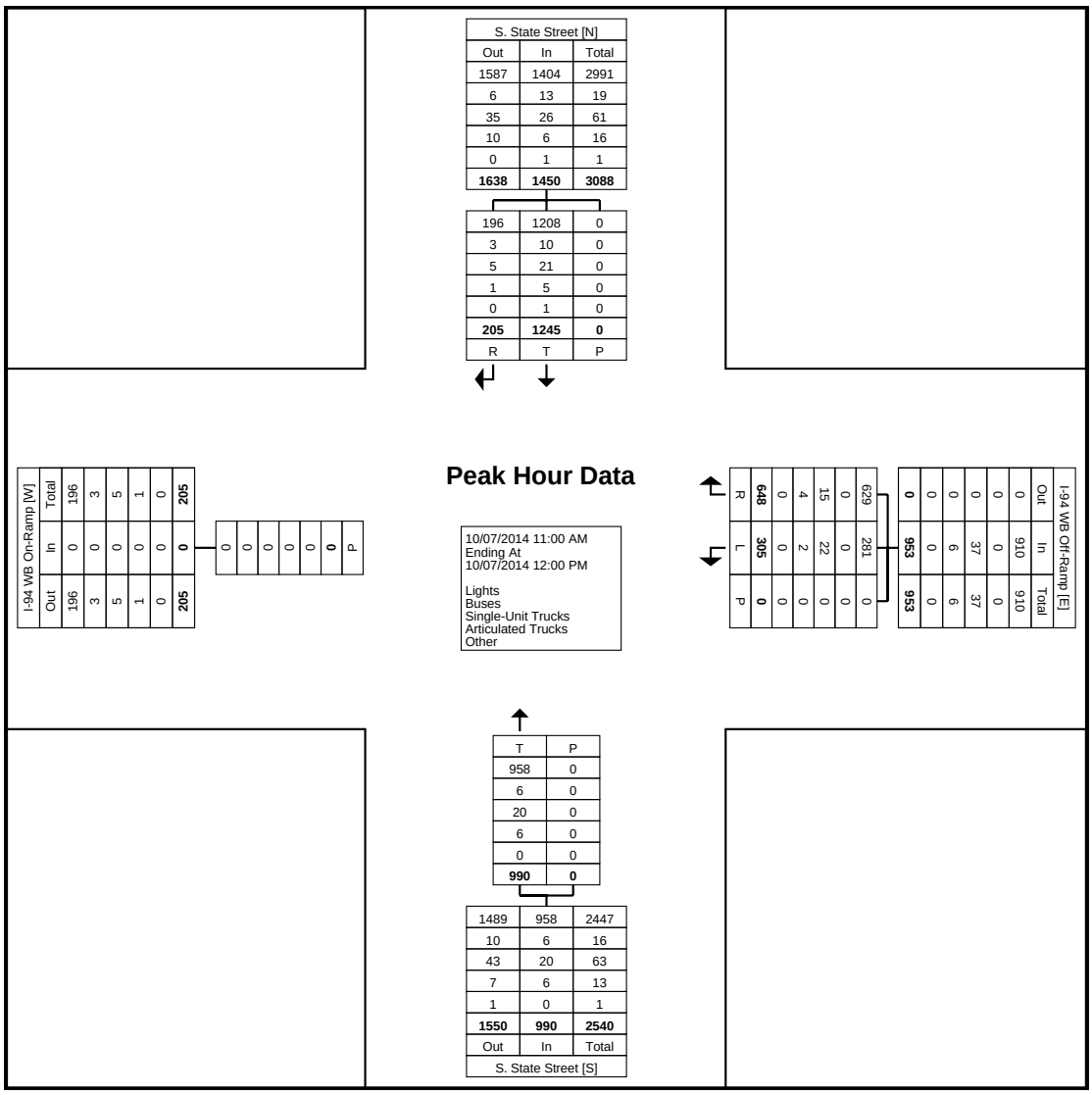
Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (11:00 AM)

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Video VCU: SCU 4BT

Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	S. State Street Southbound				I-94 WB Off-Ramp Westbound				S. State Street Northbound			I-94 WB On-Ramp Eastbound		
	Right	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Thru	Peds	App. Total	Peds	App. Total	Int. Total
12:00 PM	61	389	0	450	155	79	0	234	270	0	270	0	0	954
12:15 PM	46	379	0	425	146	80	0	226	260	0	260	0	0	911
12:30 PM	53	394	0	447	172	72	0	244	290	0	290	0	0	981
12:45 PM	48	389	0	437	187	83	0	270	306	0	306	0	0	1013
Total	208	1551	0	1759	660	314	0	974	1126	0	1126	0	0	3859
Approach %	11.8	88.2	-	-	67.8	32.2	-	-	100.0	-	-	-	-	-
Total %	5.4	40.2	-	45.6	17.1	8.1	-	25.2	29.2	-	29.2	-	0.0	-
PHF	0.852	0.984	-	0.977	0.882	0.946	-	0.902	0.920	-	0.920	-	0.000	0.952
Lights	199	1510	-	1709	649	292	-	941	1100	-	1100	-	0	3750
% Lights	95.7	97.4	-	97.2	98.3	93.0	-	96.6	97.7	-	97.7	-	-	97.2
Buses	0	6	-	6	3	0	-	3	6	-	6	-	0	15
% Buses	0.0	0.4	-	0.3	0.5	0.0	-	0.3	0.5	-	0.5	-	-	0.4
Single-Unit Trucks	6	21	-	27	4	16	-	20	17	-	17	-	0	64
% Single-Unit Trucks	2.9	1.4	-	1.5	0.6	5.1	-	2.1	1.5	-	1.5	-	-	1.7
Articulated Trucks	3	14	-	17	4	6	-	10	3	-	3	-	0	30
% Articulated Trucks	1.4	0.9	-	1.0	0.6	1.9	-	1.0	0.3	-	0.3	-	-	0.8
Bicycles on Road	0	0	-	0	0	0	-	0	0	-	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	-	0.0	-	-	0.0
Bicycles on Crosswalk	-	-	0	-	-	-	0	-	-	0	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	0	-	-	-	0	-	-	0	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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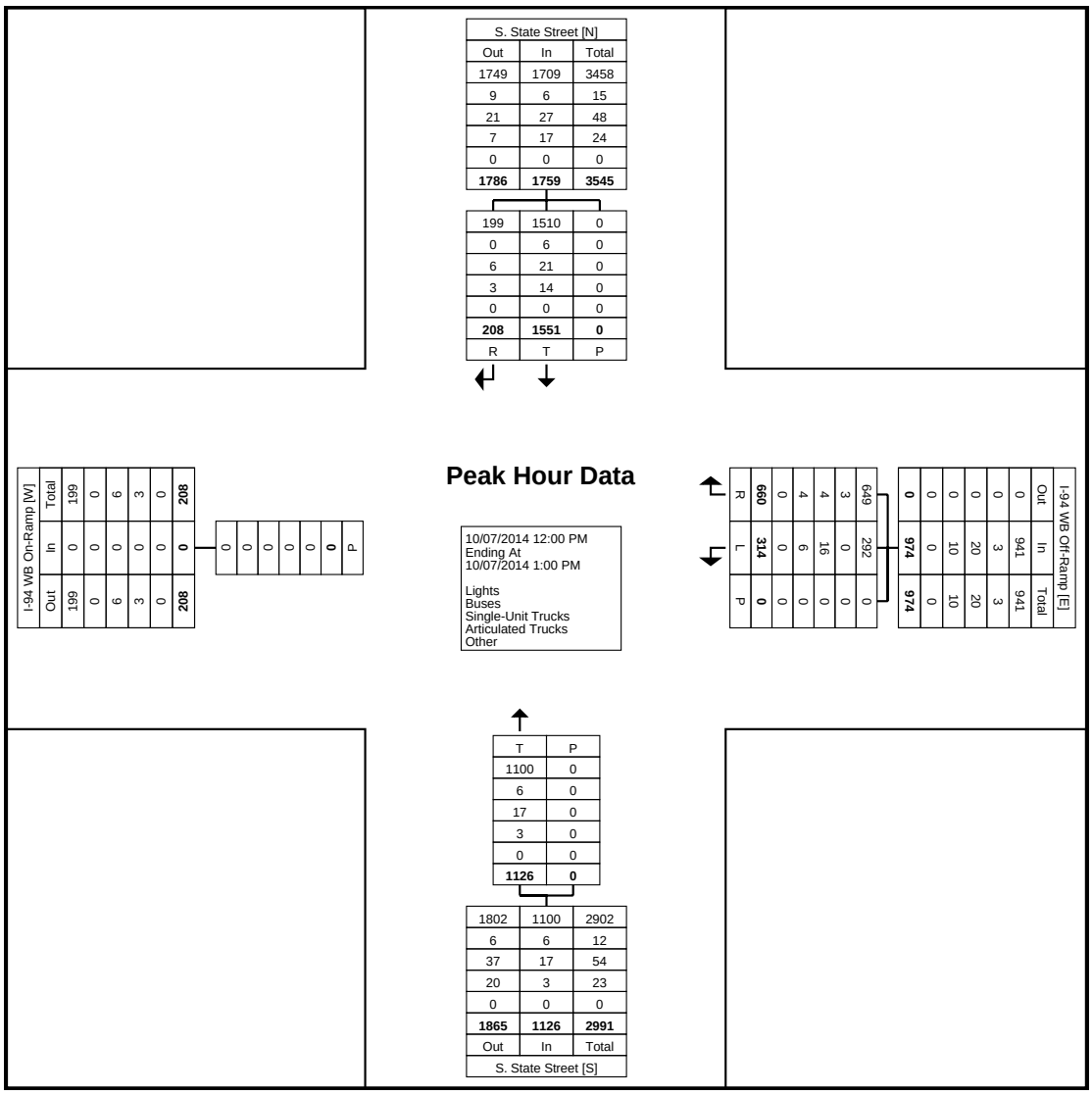
Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (12:00 PM)

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Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 4BT

Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014

Turning Movement Peak Hour Data (4:45 PM)

Start Time	S. State Street Southbound				I-94 WB Off-Ramp Westbound				S. State Street Northbound			I-94 WB On-Ramp Eastbound		
	Right	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Thru	Peds	App. Total	Peds	App. Total	Int. Total
4:45 PM	118	618	0	736	179	126	0	305	247	0	247	0	0	1288
5:00 PM	121	619	0	740	146	122	0	268	208	0	208	0	0	1216
5:15 PM	116	591	0	707	171	106	0	277	235	0	235	0	0	1219
5:30 PM	115	626	0	741	165	121	0	286	224	0	224	0	0	1251
Total	470	2454	0	2924	661	475	0	1136	914	0	914	0	0	4974
Approach %	16.1	83.9	-	-	58.2	41.8	-	-	100.0	-	-	-	-	-
Total %	9.4	49.3	-	58.8	13.3	9.5	-	22.8	18.4	-	18.4	-	0.0	-
PHF	0.971	0.980	-	0.987	0.923	0.942	-	0.931	0.925	-	0.925	-	0.000	0.965
Lights	466	2434	-	2900	656	467	-	1123	901	-	901	-	0	4924
% Lights	99.1	99.2	-	99.2	99.2	98.3	-	98.9	98.6	-	98.6	-	-	99.0
Buses	0	4	-	4	1	0	-	1	3	-	3	-	0	8
% Buses	0.0	0.2	-	0.1	0.2	0.0	-	0.1	0.3	-	0.3	-	-	0.2
Single-Unit Trucks	4	14	-	18	3	4	-	7	8	-	8	-	0	33
% Single-Unit Trucks	0.9	0.6	-	0.6	0.5	0.8	-	0.6	0.9	-	0.9	-	-	0.7
Articulated Trucks	0	2	-	2	1	4	-	5	1	-	1	-	0	8
% Articulated Trucks	0.0	0.1	-	0.1	0.2	0.8	-	0.4	0.1	-	0.1	-	-	0.2
Bicycles on Road	0	0	-	0	0	0	-	0	1	-	1	-	0	1
% Bicycles on Road	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.1	-	0.1	-	-	0.0
Bicycles on Crosswalk	-	-	0	-	-	-	0	-	-	0	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	0	-	-	-	0	-	-	0	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Project: City of Ann Arbor
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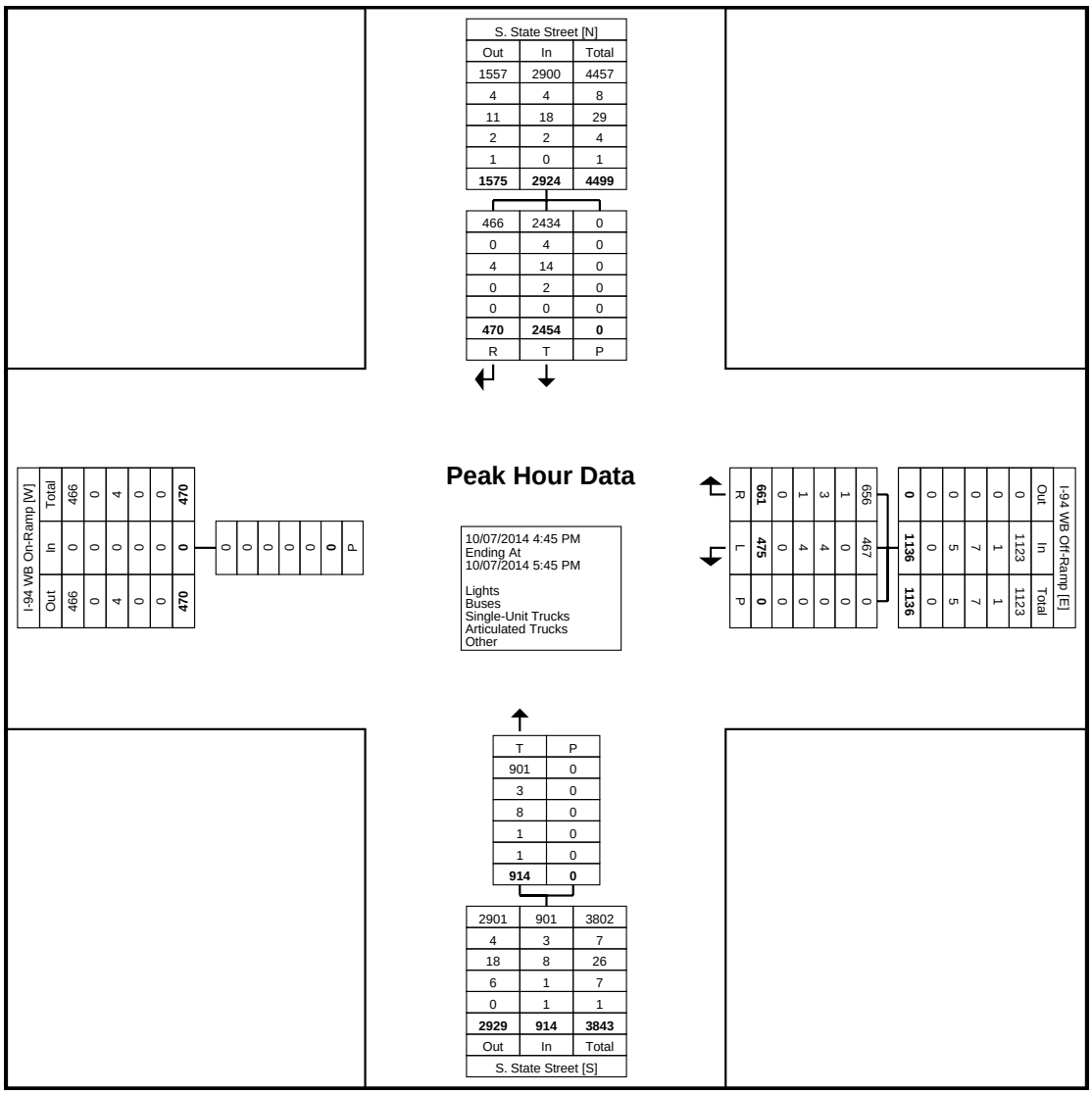
Weather: Pt. Cldy. 60 Degs
Video VCU: SCU 4BT

Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (4:45 PM)

Traffic Data Collection

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Count Name: StateSt&WBI94Ramps
Site Code: TMC 8
Start Date: 10/07/2014

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Signalized intersection with no pedestrian signals/push button pedestrian. Video VCU camera located at SE quadrant.
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

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Corridor: S. State Street
Weather: Pt. Cldy. 60' Degs
Video VCU: SCU 34G

Count Name: StateSt&EBI94Ramps
Site Code: TMC 9
Start Date: 10/07/2014

Turning Movement Data

Start Time	S.State Street Southbound					S. State Street Northbound			I-94 EB Off Ramp Eastbound				
	Right	Thru	Left	Peds	App. Total	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
7:00 AM	85	224	0	0	309	313	0	313	92	77	0	169	791
7:15 AM	87	275	0	0	362	376	0	376	109	107	0	216	954
7:30 AM	94	295	0	0	389	410	0	410	132	110	0	242	1041
7:45 AM	89	325	0	0	414	450	0	450	161	125	0	286	1150
Hourly Total	355	1119	0	0	1474	1549	0	1549	494	419	0	913	3936
8:00 AM	99	345	0	0	444	336	0	336	127	97	0	224	1004
8:15 AM	90	302	0	0	392	401	0	401	139	119	1	258	1051
8:30 AM	109	409	0	0	518	335	0	335	122	103	0	225	1078
8:45 AM	106	347	0	0	453	329	0	329	107	106	1	213	995
Hourly Total	404	1403	0	0	1807	1401	0	1401	495	425	2	920	4128
9:00 AM	1	1	0	0	2	1	0	1	0	0	0	0	3
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	1	1	0	0	2	1	0	1	0	0	0	0	3
11:00 AM	104	234	0	0	338	305	0	305	50	39	0	89	732
11:15 AM	113	235	0	0	348	310	0	310	57	40	0	97	755
11:30 AM	115	278	0	0	393	327	0	327	51	57	1	108	828
11:45 AM	117	347	0	0	464	387	0	387	48	47	0	95	946
Hourly Total	449	1094	0	0	1543	1329	0	1329	206	183	1	389	3261
12:00 PM	143	322	0	0	465	374	0	374	55	49	0	104	943
12:15 PM	130	339	0	0	469	357	0	357	62	50	0	112	938
12:30 PM	132	327	0	0	459	409	0	409	54	53	1	107	975
12:45 PM	136	331	0	0	467	407	0	407	62	54	0	116	990
Hourly Total	541	1319	0	0	1860	1547	0	1547	233	206	1	439	3846
1:00 PM	3	0	0	0	3	0	0	0	0	0	0	0	3
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	3	0	0	0	3	0	0	0	0	0	0	0	3
4:00 PM	318	308	1	0	627	546	0	546	71	43	0	114	1287
4:15 PM	252	344	1	0	597	506	0	506	81	48	2	129	1232
4:30 PM	337	358	0	0	695	568	0	568	47	34	0	81	1344
4:45 PM	348	427	0	0	775	563	0	563	46	59	1	105	1443
Hourly Total	1255	1437	2	0	2694	2183	0	2183	245	184	3	429	5306
5:00 PM	298	412	0	0	710	581	0	581	67	39	1	106	1397
5:15 PM	237	427	0	0	664	545	0	545	52	57	1	109	1318
5:30 PM	261	461	0	0	722	512	0	512	85	71	0	156	1390
5:45 PM	247	410	0	0	657	517	0	517	62	40	1	102	1276
Hourly Total	1043	1710	0	0	2753	2155	0	2155	266	207	3	473	5381
6:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	1
Grand Total	4051	8084	2	0	12137	10165	0	10165	1939	1624	10	3563	25865
Approach %	33.4	66.6	0.0	-	-	100.0	-	-	54.4	45.6	-	-	-
Total %	15.7	31.3	0.0	-	46.9	39.3	-	39.3	7.5	6.3	-	13.8	-
Lights	3985	7888	2	-	11875	9923	-	9923	1855	1578	-	3433	25231
% Lights	98.4	97.6	100.0	-	97.8	97.6	-	97.6	95.7	97.2	-	96.4	97.5
Buses	12	26	0	-	38	27	-	27	4	16	-	20	85
% Buses	0.3	0.3	0.0	-	0.3	0.3	-	0.3	0.2	1.0	-	0.6	0.3
Single-Unit Trucks	29	120	0	-	149	154	-	154	52	21	-	73	376
% Single-Unit Trucks	0.7	1.5	0.0	-	1.2	1.5	-	1.5	2.7	1.3	-	2.0	1.5
Articulated Trucks	21	47	0	-	68	58	-	58	28	9	-	37	163
% Articulated Trucks	0.5	0.6	0.0	-	0.6	0.6	-	0.6	1.4	0.6	-	1.0	0.6
Bicycles on Road	4	3	0	-	7	3	-	3	0	0	-	0	10
% Bicycles on Road	0.1	0.0	0.0	-	0.1	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	10.0	-	-
Pedestrians	-	-	-	0	-	-	0	-	-	-	9	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	90.0	-	-

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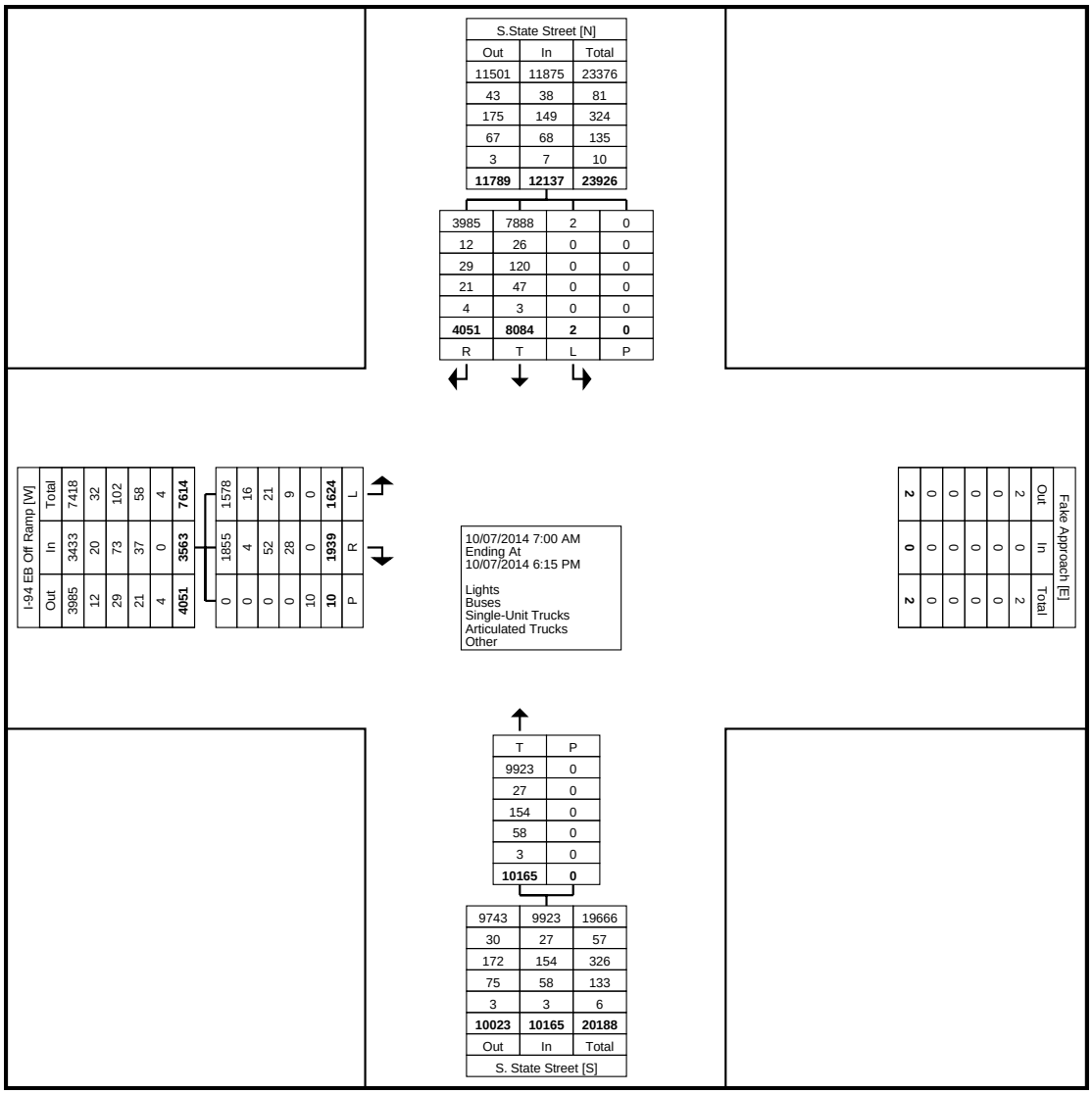
Weather: Pt. Cldy. 60' Degs
Video VCU: SCU 34G

Count Name: StateSt&EBI94Ramps
Site Code: TMC 9
Start Date: 10/07/2014



Turning Movement Data Plot

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Count Name: StateSt&EBI94Ramps
Site Code: TMC 9
Start Date: 10/07/2014

Turning Movement Peak Hour Data (7:45 AM)

Start Time	S.State Street Southbound					S. State Street Northbound			I-94 EB Off Ramp Eastbound				
	Right	Thru	Left	Peds	App. Total	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
7:45 AM	89	325	0	0	414	450	0	450	161	125	0	286	1150
8:00 AM	99	345	0	0	444	336	0	336	127	97	0	224	1004
8:15 AM	90	302	0	0	392	401	0	401	139	119	1	258	1051
8:30 AM	109	409	0	0	518	335	0	335	122	103	0	225	1078
Total	387	1381	0	0	1768	1522	0	1522	549	444	1	993	4283
Approach %	21.9	78.1	0.0	-	-	100.0	-	-	55.3	44.7	-	-	-
Total %	9.0	32.2	0.0	-	41.3	35.5	-	35.5	12.8	10.4	-	23.2	-
PHF	0.888	0.844	0.000	-	0.853	0.846	-	0.846	0.852	0.888	-	0.868	0.931
Lights	377	1357	0	-	1734	1475	-	1475	525	434	-	959	4168
% Lights	97.4	98.3	-	-	98.1	96.9	-	96.9	95.6	97.7	-	96.6	97.3
Buses	1	7	0	-	8	4	-	4	2	0	-	2	14
% Buses	0.3	0.5	-	-	0.5	0.3	-	0.3	0.4	0.0	-	0.2	0.3
Single-Unit Trucks	5	10	0	-	15	35	-	35	13	7	-	20	70
% Single-Unit Trucks	1.3	0.7	-	-	0.8	2.3	-	2.3	2.4	1.6	-	2.0	1.6
Articulated Trucks	4	7	0	-	11	8	-	8	9	3	-	12	31
% Articulated Trucks	1.0	0.5	-	-	0.6	0.5	-	0.5	1.6	0.7	-	1.2	0.7
Bicycles on Road	0	0	0	-	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	0	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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Count Name: StateSt&EBI94Ramps
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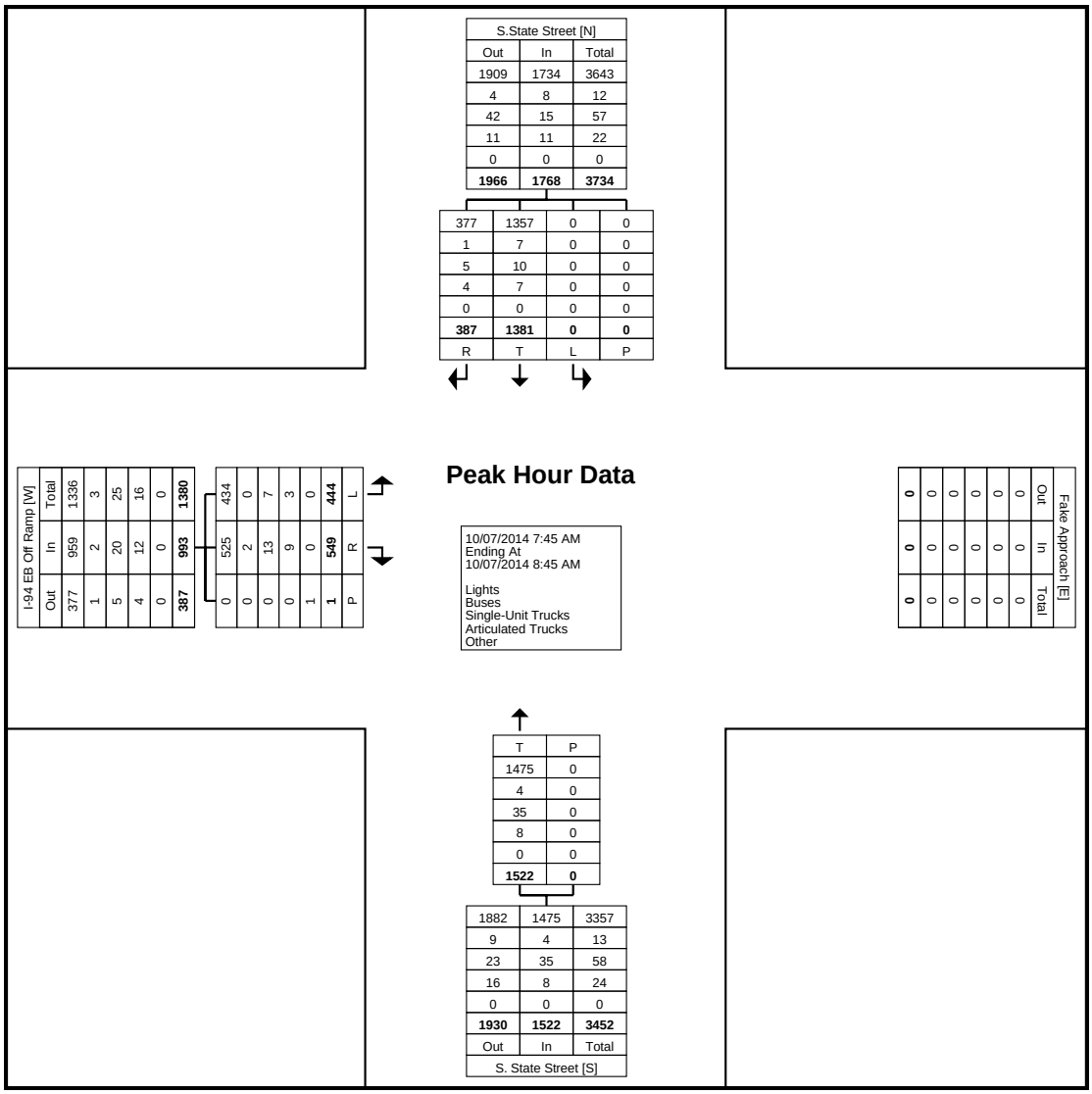
Start Date: 10/07/2014



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Video VCU: SCU 34G

Count Name: StateSt&EBI94Ramps
Site Code: TMC 9
Start Date: 10/07/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	S.State Street Southbound					S. State Street Northbound			I-94 EB Off Ramp Eastbound				
	Right	Thru	Left	Peds	App. Total	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
11:00 AM	104	234	0	0	338	305	0	305	50	39	0	89	732
11:15 AM	113	235	0	0	348	310	0	310	57	40	0	97	755
11:30 AM	115	278	0	0	393	327	0	327	51	57	1	108	828
11:45 AM	117	347	0	0	464	387	0	387	48	47	0	95	946
Total	449	1094	0	0	1543	1329	0	1329	206	183	1	389	3261
Approach %	29.1	70.9	0.0	-	-	100.0	-	-	53.0	47.0	-	-	-
Total %	13.8	33.5	0.0	-	47.3	40.8	-	40.8	6.3	5.6	-	11.9	-
PHF	0.959	0.788	0.000	-	0.831	0.859	-	0.859	0.904	0.803	-	0.900	0.862
Lights	435	1045	0	-	1480	1274	-	1274	188	175	-	363	3117
% Lights	96.9	95.5	-	-	95.9	95.9	-	95.9	91.3	95.6	-	93.3	95.6
Buses	4	7	0	-	11	5	-	5	0	1	-	1	17
% Buses	0.9	0.6	-	-	0.7	0.4	-	0.4	0.0	0.5	-	0.3	0.5
Single-Unit Trucks	7	34	0	-	41	35	-	35	12	5	-	17	93
% Single-Unit Trucks	1.6	3.1	-	-	2.7	2.6	-	2.6	5.8	2.7	-	4.4	2.9
Articulated Trucks	3	7	0	-	10	15	-	15	6	2	-	8	33
% Articulated Trucks	0.7	0.6	-	-	0.6	1.1	-	1.1	2.9	1.1	-	2.1	1.0
Bicycles on Road	0	1	0	-	1	0	-	0	0	0	-	0	1
% Bicycles on Road	0.0	0.1	-	-	0.1	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	0	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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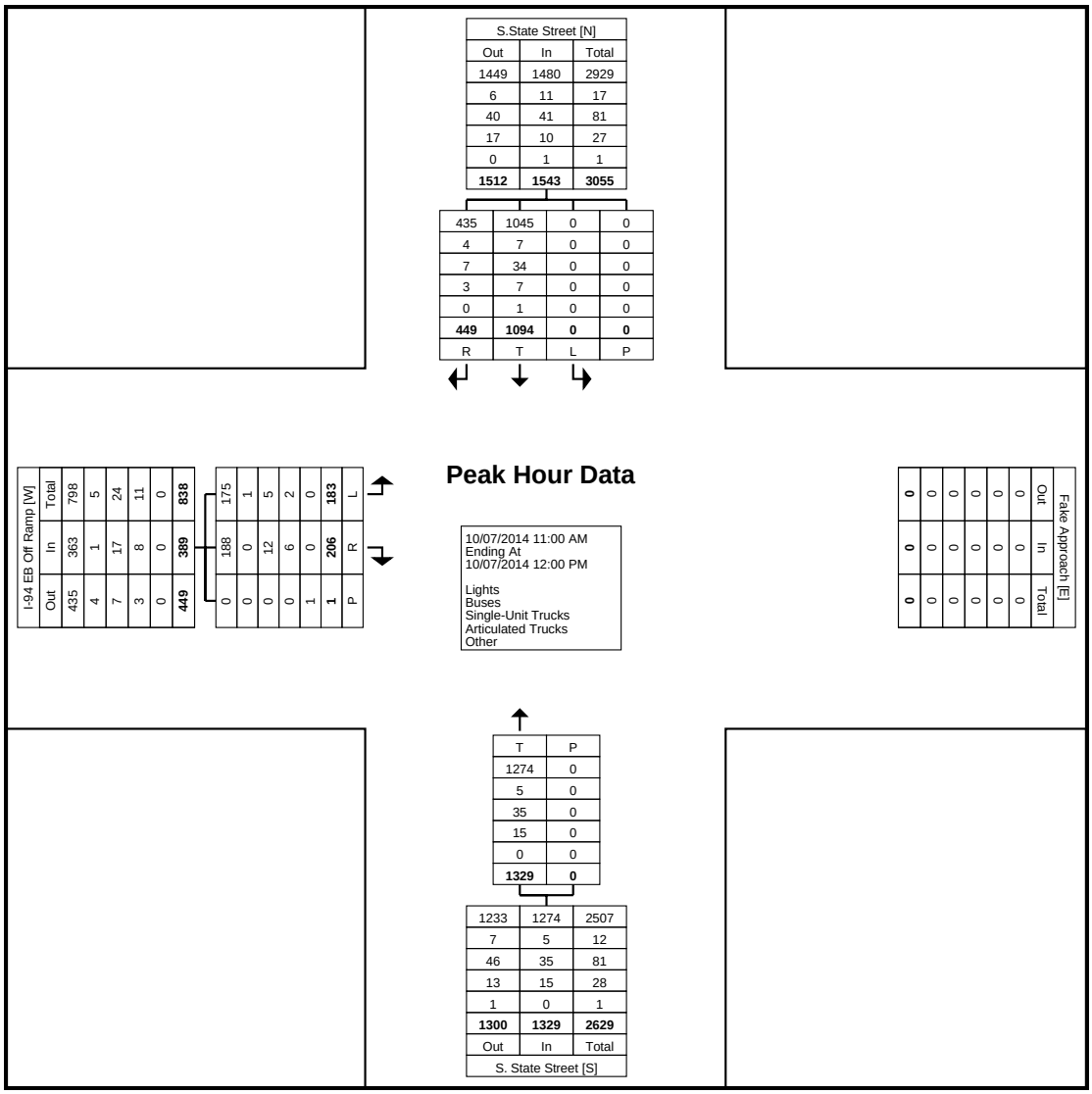

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Video VCU: SCU 34G

Count Name: StateSt&EBI94Ramps
Site Code: TMC 9
Start Date: 10/07/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	S.State Street Southbound					S. State Street Northbound			I-94 EB Off Ramp Eastbound				
	Right	Thru	Left	Peds	App. Total	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
12:00 PM	143	322	0	0	465	374	0	374	55	49	0	104	943
12:15 PM	130	339	0	0	469	357	0	357	62	50	0	112	938
12:30 PM	132	327	0	0	459	409	0	409	54	53	1	107	975
12:45 PM	136	331	0	0	467	407	0	407	62	54	0	116	990
Total	541	1319	0	0	1860	1547	0	1547	233	206	1	439	3846
Approach %	29.1	70.9	0.0	-	-	100.0	-	-	53.1	46.9	-	-	-
Total %	14.1	34.3	0.0	-	48.4	40.2	-	40.2	6.1	5.4	-	11.4	-
PHF	0.946	0.973	0.000	-	0.991	0.946	-	0.946	0.940	0.954	-	0.946	0.971
Lights	525	1275	0	-	1800	1492	-	1492	221	202	-	423	3715
% Lights	97.0	96.7	-	-	96.8	96.4	-	96.4	94.8	98.1	-	96.4	96.6
Buses	3	3	0	-	6	5	-	5	0	1	-	1	12
% Buses	0.6	0.2	-	-	0.3	0.3	-	0.3	0.0	0.5	-	0.2	0.3
Single-Unit Trucks	3	30	0	-	33	40	-	40	7	1	-	8	81
% Single-Unit Trucks	0.6	2.3	-	-	1.8	2.6	-	2.6	3.0	0.5	-	1.8	2.1
Articulated Trucks	10	11	0	-	21	10	-	10	5	2	-	7	38
% Articulated Trucks	1.8	0.8	-	-	1.1	0.6	-	0.6	2.1	1.0	-	1.6	1.0
Bicycles on Road	0	0	0	-	0	0	-	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	0	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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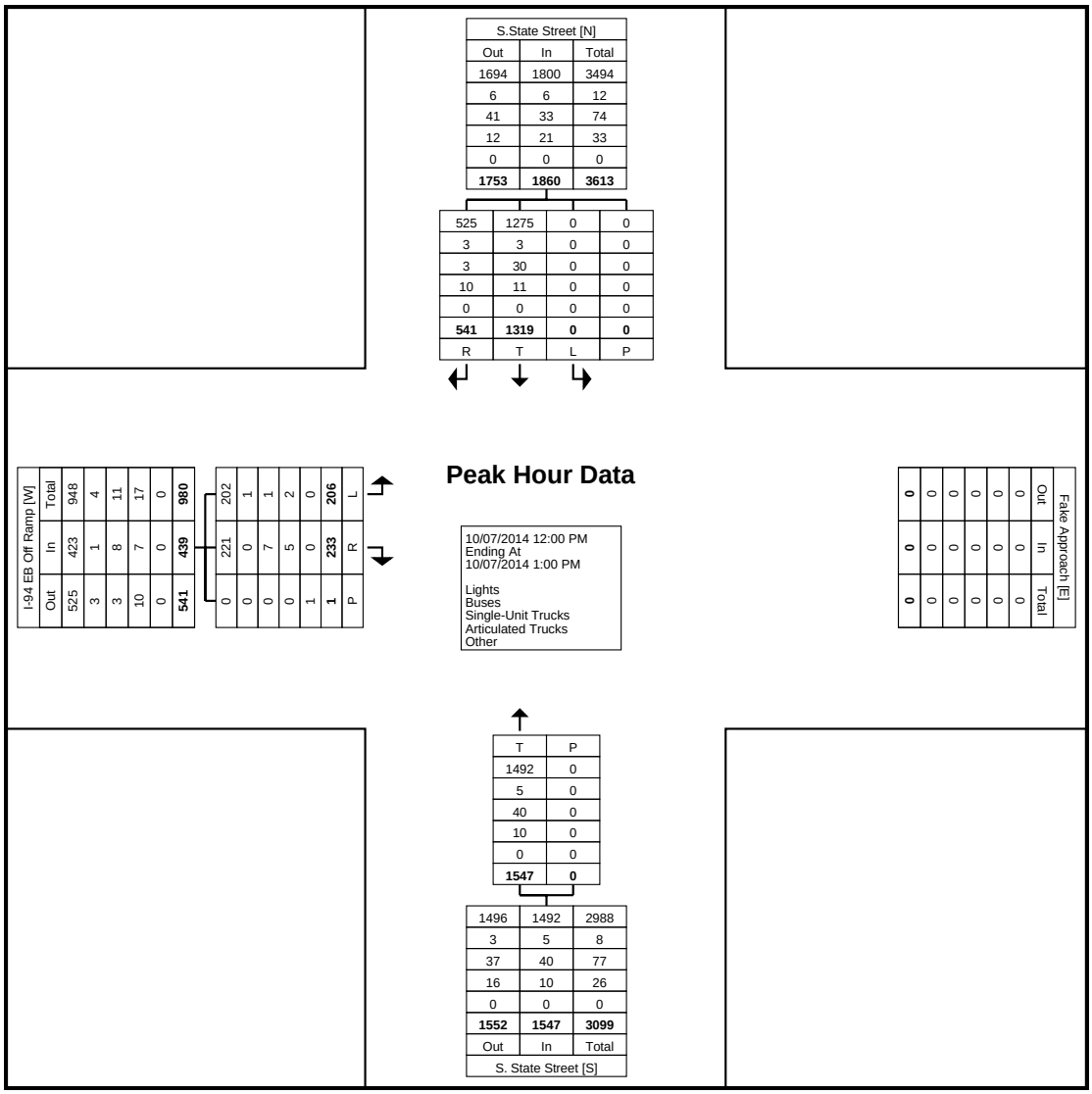

Turning Movement Peak Hour Data Plot (12:00 PM)

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Video VCU: SCU 34G

Count Name: StateSt&EBI94Ramps
Site Code: TMC 9
Start Date: 10/07/2014

Turning Movement Peak Hour Data (4:45 PM)

Start Time	S.State Street Southbound					S. State Street Northbound			I-94 EB Off Ramp Eastbound				
	Right	Thru	Left	Peds	App. Total	Thru	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
4:45 PM	348	427	0	0	775	563	0	563	46	59	1	105	1443
5:00 PM	298	412	0	0	710	581	0	581	67	39	1	106	1397
5:15 PM	237	427	0	0	664	545	0	545	52	57	1	109	1318
5:30 PM	261	461	0	0	722	512	0	512	85	71	0	156	1390
Total	1144	1727	0	0	2871	2201	0	2201	250	226	3	476	5548
Approach %	39.8	60.2	0.0	-	-	100.0	-	-	52.5	47.5	-	-	-
Total %	20.6	31.1	0.0	-	51.7	39.7	-	39.7	4.5	4.1	-	8.6	-
PHF	0.822	0.937	0.000	-	0.926	0.947	-	0.947	0.735	0.796	-	0.763	0.961
Lights	1136	1707	0	-	2843	2187	-	2187	246	220	-	466	5496
% Lights	99.3	98.8	-	-	99.0	99.4	-	99.4	98.4	97.3	-	97.9	99.1
Buses	1	3	0	-	4	1	-	1	0	1	-	1	6
% Buses	0.1	0.2	-	-	0.1	0.0	-	0.0	0.0	0.4	-	0.2	0.1
Single-Unit Trucks	6	12	0	-	18	8	-	8	2	3	-	5	31
% Single-Unit Trucks	0.5	0.7	-	-	0.6	0.4	-	0.4	0.8	1.3	-	1.1	0.6
Articulated Trucks	0	4	0	-	4	4	-	4	2	2	-	4	12
% Articulated Trucks	0.0	0.2	-	-	0.1	0.2	-	0.2	0.8	0.9	-	0.8	0.2
Bicycles on Road	1	1	0	-	2	1	-	1	0	0	-	0	3
% Bicycles on Road	0.1	0.1	-	-	0.1	0.0	-	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	0	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	33.3	-	-
Pedestrians	-	-	-	0	-	-	0	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	66.7	-	-

Traffic Data Collection
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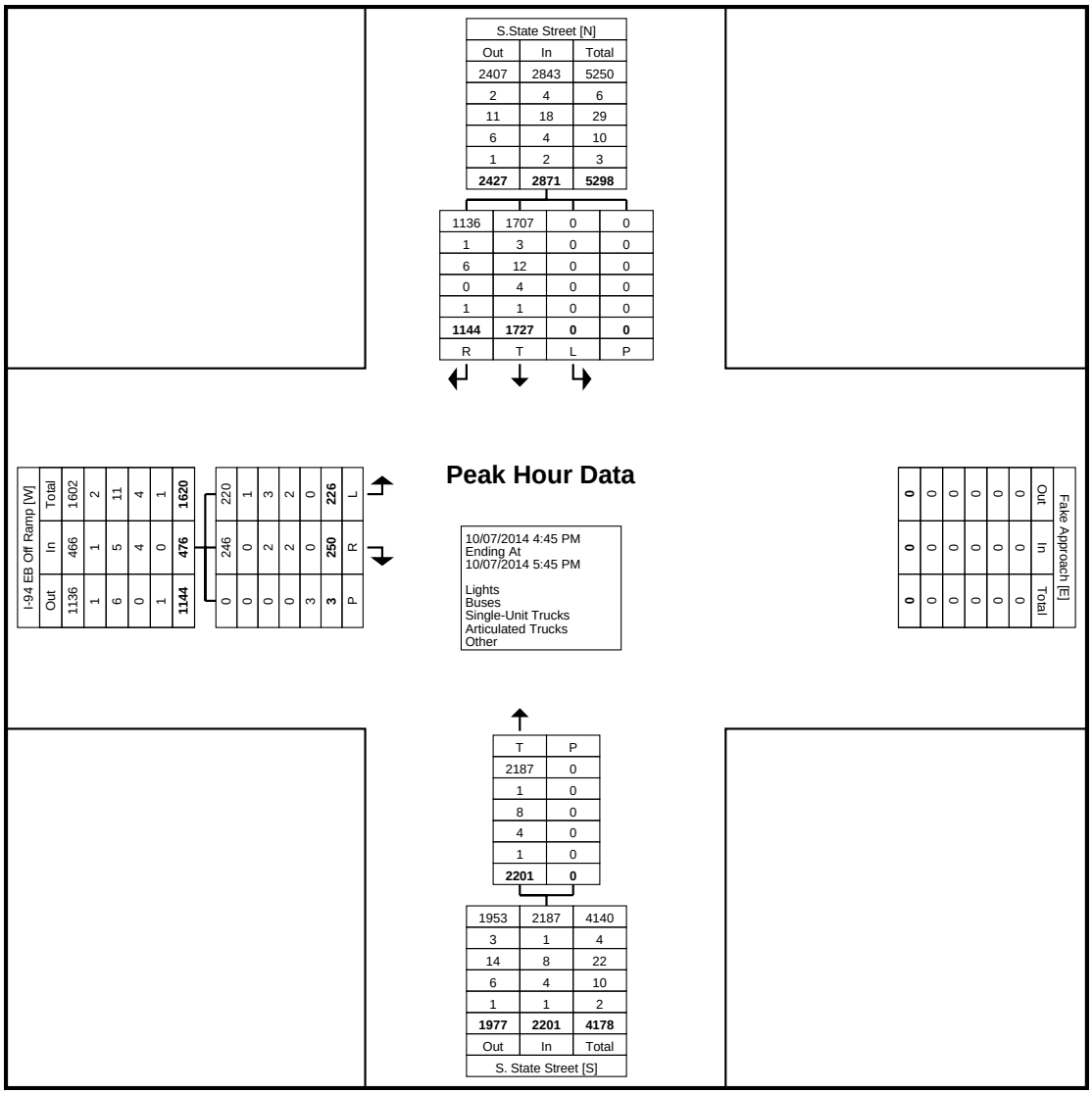
Ph. (586) 786-5407
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60' Degs
Video VCU: SCU 34G

Count Name: StateSt&EBI94Ramps
Site Code: TMC 9
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (4:45 PM)

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Video VCU: SCU 34G

Count Name: StateSt&EBI94Ramps
Site Code: TMC 9
Start Date: 10/07/2014

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Signalized intersection with no pedestrian signals/push button pedestrian. Video VCU camera located at SE quadrant.
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

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Weather: Pt. Cldy. 60's Degs
Video VCU: SCU 2Z4 & 3HT

Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014

Turning Movement Data

Start Time	S. State Street Southbound					Research Park Dr. Westbound					S. State Street Northbound					Airport Blvd. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	29	241	0	0	270	28	1	2	0	31	15	286	0	0	301	6	41	0	0	47	649
7:15 AM	47	284	0	0	331	23	2	0	0	25	11	357	0	0	368	11	37	0	0	48	772
7:30 AM	62	317	0	0	379	33	6	0	0	39	16	376	0	0	392	14	45	0	0	59	869
7:45 AM	74	372	0	1	446	54	5	0	0	59	18	403	0	0	421	10	67	0	1	77	1003
Hourly Total	212	1214	0	1	1426	138	14	2	0	154	60	1422	0	0	1482	41	190	0	1	231	3293
8:00 AM	75	329	0	0	404	48	8	0	0	56	45	288	0	0	333	12	50	1	0	63	856
8:15 AM	80	337	0	0	417	74	6	0	0	80	34	334	0	0	368	9	60	1	0	70	935
8:30 AM	66	435	0	0	501	49	7	0	0	56	11	292	0	0	303	17	46	0	0	63	923
8:45 AM	80	351	0	0	431	36	2	0	0	38	17	291	0	0	308	18	39	0	1	57	834
Hourly Total	301	1452	0	0	1753	207	23	0	0	230	107	1205	0	0	1312	56	195	2	1	253	3548
9:00 AM	0	1	0	0	1	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	3
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	1	0	0	1	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	3
11:00 AM	77	190	0	0	267	59	8	0	0	67	14	228	0	0	242	21	52	0	2	73	649
11:15 AM	96	190	2	0	288	66	11	0	0	77	10	237	0	0	247	16	50	0	0	66	678
11:30 AM	97	224	1	0	322	78	19	0	0	97	13	258	0	0	271	19	52	0	0	71	761
11:45 AM	100	265	1	0	366	92	25	0	0	117	10	297	0	0	307	26	74	0	0	100	890
Hourly Total	370	869	4	0	1243	295	63	0	0	358	47	1020	0	0	1067	82	228	0	2	310	2978
12:00 PM	121	230	0	0	351	93	22	0	0	115	11	292	0	0	303	21	77	0	0	98	867
12:15 PM	130	273	0	0	403	82	15	0	0	97	10	277	0	0	287	22	81	0	0	103	890
12:30 PM	107	266	0	0	373	93	20	0	0	113	16	310	0	0	326	31	80	0	0	111	923
12:45 PM	100	290	0	0	390	87	4	0	0	91	21	318	0	0	339	28	86	0	0	114	934
Hourly Total	458	1059	0	0	1517	355	61	0	0	416	58	1197	0	0	1255	102	324	0	0	426	3614
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	111	259	0	1	370	126	24	0	0	150	4	386	0	0	390	33	77	0	1	110	1020
4:15 PM	126	305	0	0	431	82	19	0	0	101	3	397	0	0	400	29	58	0	0	87	1019
4:30 PM	104	280	0	0	384	131	22	0	0	153	6	372	0	0	378	26	70	0	0	96	1011
4:45 PM	154	282	1	0	437	102	17	0	1	119	7	451	0	0	458	30	61	0	1	91	1105
Hourly Total	495	1126	1	1	1622	441	82	0	1	523	20	1606	0	0	1626	118	266	0	2	384	4155
5:00 PM	141	315	0	0	456	163	34	0	0	197	1	400	0	0	401	35	101	0	0	136	1190
5:15 PM	118	351	1	0	470	108	21	0	0	129	7	398	0	0	405	24	65	1	2	90	1094
5:30 PM	135	377	0	0	512	88	19	0	0	107	5	383	0	0	388	33	66	1	0	100	1107
5:45 PM	152	329	0	0	481	92	16	0	0	108	6	403	0	0	409	18	69	1	0	88	1086
Hourly Total	546	1372	1	0	1919	451	90	0	0	541	19	1584	0	0	1603	110	301	3	2	414	4477
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	2382	7093	6	2	9481	1888	333	2	1	2223	312	8034	0	0	8346	509	1504	5	8	2018	22068
Approach %	25.1	74.8	0.1	-	-	84.9	15.0	0.1	-	-	3.7	96.3	0.0	-	-	25.2	74.5	0.2	-	-	-
Total %	10.8	32.1	0.0	-	43.0	8.6	1.5	0.0	-	10.1	1.4	36.4	0.0	-	37.8	2.3	6.8	0.0	-	9.1	-
Lights	2353	6857	5	-	9215	1846	324	2	-	2172	307	7823	0	-	8130	505	1480	5	-	1990	21507
% Lights	98.8	96.7	83.3	-	97.2	97.8	97.3	100.0	-	97.7	98.4	97.4	-	-	97.4	99.2	98.4	100.0	-	98.6	97.5
Buses	0	30	0	-	30	17	0	0	-	17	0	13	0	-	13	0	0	0	-	0	60
% Buses	0.0	0.4	0.0	-	0.3	0.9	0.0	0.0	-	0.8	0.0	0.2	-	-	0.2	0.0	0.0	0.0	-	0.0	0.3
Single-Unit Trucks	21	141	1	-	163	19	4	0	-	23	5	152	0	-	157	0	14	0	-	14	357
% Single-Unit Trucks	0.9	2.0	16.7	-	1.7	1.0	1.2	0.0	-	1.0	1.6	1.9	-	-	1.9	0.0	0.9	0.0	-	0.7	1.6
Articulated Trucks	7	64	0	-	71	6	3	0	-	9	0	45	0	-	45	4	7	0	-	11	136
% Articulated Trucks	0.3	0.9	0.0	-	0.7	0.3	0.9	0.0	-	0.4	0.0	0.6	-	-	0.5	0.8	0.5	0.0	-	0.5	0.6
Bicycles on Road	1	1	0	-	2	0	2	0	-	2	0	1	0	-	1	0	3	0	-	3	8
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.6	0.0	-	0.1	0.0	0.0	-	-	0.0	0.0	0.2	0.0	-	0.1	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	1	-	-	-	-	0	-	-	-	-	8	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

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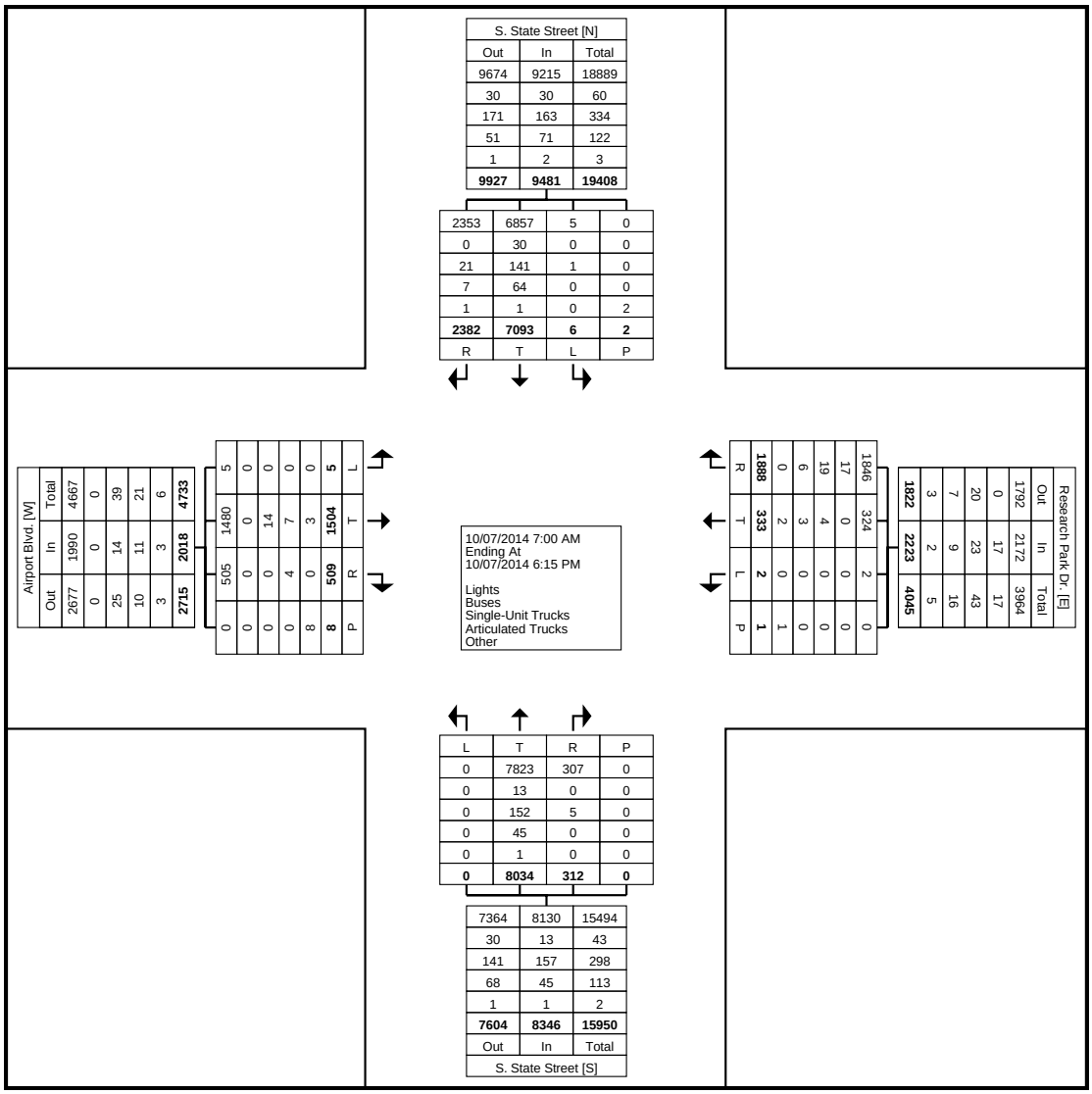
Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014



Turning Movement Data Plot

Traffic Data Collection

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Video VCU: SCU 2Z4 & 3HT

Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014

Turning Movement Peak Hour Data (7:45 AM)

Start Time	S. State Street Southbound					Research Park Dr. Westbound					S. State Street Northbound					Airport Blvd. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:45 AM	74	372	0	1	446	54	5	0	0	59	18	403	0	0	421	10	67	0	1	77	1003
8:00 AM	75	329	0	0	404	48	8	0	0	56	45	288	0	0	333	12	50	1	0	63	856
8:15 AM	80	337	0	0	417	74	6	0	0	80	34	334	0	0	368	9	60	1	0	70	935
8:30 AM	66	435	0	0	501	49	7	0	0	56	11	292	0	0	303	17	46	0	0	63	923
Total	295	1473	0	1	1768	225	26	0	0	251	108	1317	0	0	1425	48	223	2	1	273	3717
Approach %	16.7	83.3	0.0	-	-	89.6	10.4	0.0	-	-	7.6	92.4	0.0	-	-	17.6	81.7	0.7	-	-	-
Total %	7.9	39.6	0.0	-	47.6	6.1	0.7	0.0	-	6.8	2.9	35.4	0.0	-	38.3	1.3	6.0	0.1	-	7.3	-
PHF	0.922	0.847	0.000	-	0.882	0.760	0.813	0.000	-	0.784	0.600	0.817	0.000	-	0.846	0.706	0.832	0.500	-	0.886	0.926
Lights	292	1439	0	-	1731	221	25	0	-	246	108	1270	0	-	1378	47	220	2	-	269	3624
% Lights	99.0	97.7	-	-	97.9	98.2	96.2	-	-	98.0	100.0	96.4	-	-	96.7	97.9	98.7	100.0	-	98.5	97.5
Buses	0	7	0	-	7	2	0	0	-	2	0	3	0	-	3	0	0	0	-	0	12
% Buses	0.0	0.5	-	-	0.4	0.9	0.0	-	-	0.8	0.0	0.2	-	-	0.2	0.0	0.0	0.0	-	0.0	0.3
Single-Unit Trucks	2	11	0	-	13	1	1	0	-	2	0	39	0	-	39	0	2	0	-	2	56
% Single-Unit Trucks	0.7	0.7	-	-	0.7	0.4	3.8	-	-	0.8	0.0	3.0	-	-	2.7	0.0	0.9	0.0	-	0.7	1.5
Articulated Trucks	1	16	0	-	17	1	0	0	-	1	0	5	0	-	5	1	1	0	-	2	25
% Articulated Trucks	0.3	1.1	-	-	1.0	0.4	0.0	-	-	0.4	0.0	0.4	-	-	0.4	2.1	0.4	0.0	-	0.7	0.7
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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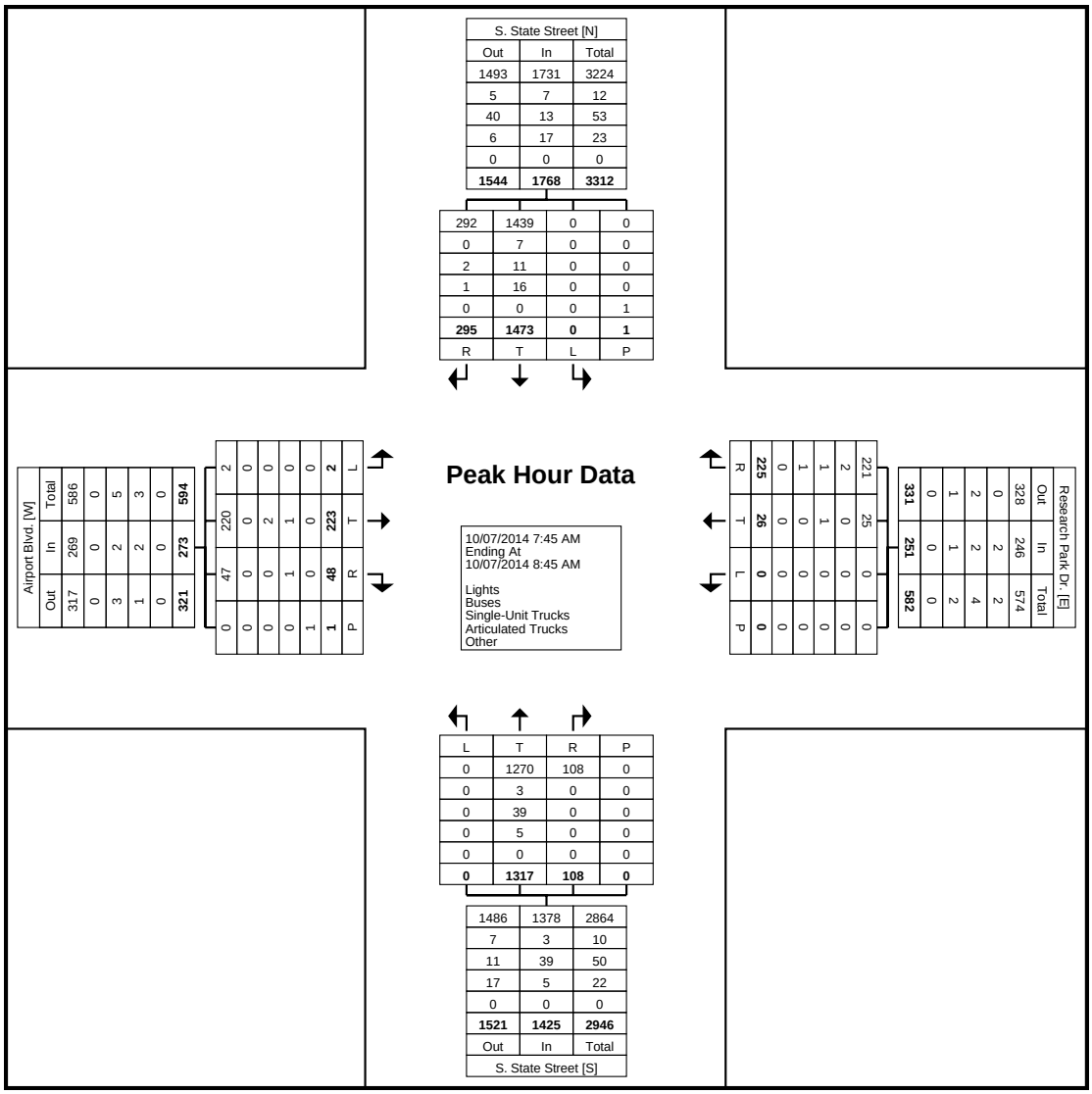

Turning Movement Peak Hour Data Plot (7:45 AM)

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Video VCU: SCU 2Z4 & 3HT

Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	S. State Street Southbound					Research Park Dr. Westbound					S. State Street Northbound					Airport Blvd. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	77	190	0	0	267	59	8	0	0	67	14	228	0	0	242	21	52	0	2	73	649
11:15 AM	96	190	2	0	288	66	11	0	0	77	10	237	0	0	247	16	50	0	0	66	678
11:30 AM	97	224	1	0	322	78	19	0	0	97	13	258	0	0	271	19	52	0	0	71	761
11:45 AM	100	265	1	0	366	92	25	0	0	117	10	297	0	0	307	26	74	0	0	100	890
Total	370	869	4	0	1243	295	63	0	0	358	47	1020	0	0	1067	82	228	0	2	310	2978
Approach %	29.8	69.9	0.3	-	-	82.4	17.6	0.0	-	-	4.4	95.6	0.0	-	-	26.5	73.5	0.0	-	-	-
Total %	12.4	29.2	0.1	-	41.7	9.9	2.1	0.0	-	12.0	1.6	34.3	0.0	-	35.8	2.8	7.7	0.0	-	10.4	-
PHF	0.925	0.820	0.500	-	0.849	0.802	0.630	0.000	-	0.765	0.839	0.859	0.000	-	0.869	0.788	0.770	0.000	-	0.775	0.837
Lights	365	808	3	-	1176	285	61	0	-	346	45	978	0	-	1023	82	224	0	-	306	2851
% Lights	98.6	93.0	75.0	-	94.6	96.6	96.8	-	-	96.6	95.7	95.9	-	-	95.9	100.0	98.2	-	-	98.7	95.7
Buses	0	6	0	-	6	3	0	0	-	3	0	1	0	-	1	0	0	0	-	0	10
% Buses	0.0	0.7	0.0	-	0.5	1.0	0.0	-	-	0.8	0.0	0.1	-	-	0.1	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	5	45	1	-	51	6	1	0	-	7	2	30	0	-	32	0	3	0	-	3	93
% Single-Unit Trucks	1.4	5.2	25.0	-	4.1	2.0	1.6	-	-	2.0	4.3	2.9	-	-	3.0	0.0	1.3	-	-	1.0	3.1
Articulated Trucks	0	10	0	-	10	1	1	0	-	2	0	11	0	-	11	0	1	0	-	1	24
% Articulated Trucks	0.0	1.2	0.0	-	0.8	0.3	1.6	-	-	0.6	0.0	1.1	-	-	1.0	0.0	0.4	-	-	0.3	0.8
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Traffic Data Collection
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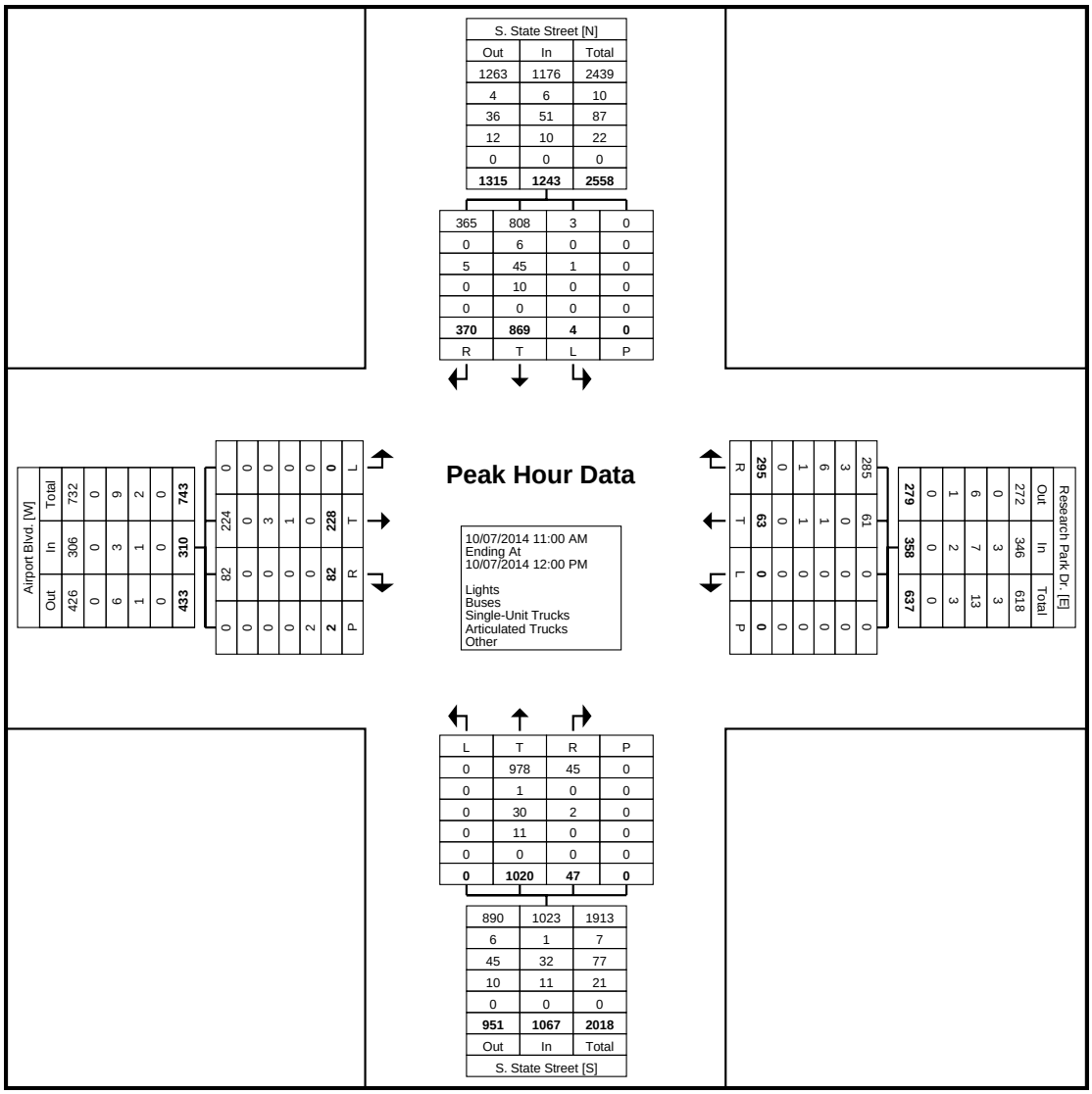
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's Degs
Video VCU: SCU 2Z4 & 3HT

Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (11:00 AM)

Traffic Data Collection

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Ph. (586) 786-5407
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's Degs
Video VCU: SCU 2Z4 & 3HT

Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	S. State Street Southbound					Research Park Dr. Westbound					S. State Street Northbound					Airport Blvd. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
12:00 PM	121	230	0	0	351	93	22	0	0	115	11	292	0	0	303	21	77	0	0	98	867
12:15 PM	130	273	0	0	403	82	15	0	0	97	10	277	0	0	287	22	81	0	0	103	890
12:30 PM	107	266	0	0	373	93	20	0	0	113	16	310	0	0	326	31	80	0	0	111	923
12:45 PM	100	290	0	0	390	87	4	0	0	91	21	318	0	0	339	28	86	0	0	114	934
Total	458	1059	0	0	1517	355	61	0	0	416	58	1197	0	0	1255	102	324	0	0	426	3614
Approach %	30.2	69.8	0.0	-	-	85.3	14.7	0.0	-	-	4.6	95.4	0.0	-	-	23.9	76.1	0.0	-	-	-
Total %	12.7	29.3	0.0	-	42.0	9.8	1.7	0.0	-	11.5	1.6	33.1	0.0	-	34.7	2.8	9.0	0.0	-	11.8	-
PHF	0.881	0.913	0.000	-	0.941	0.954	0.693	0.000	-	0.904	0.690	0.941	0.000	-	0.926	0.823	0.942	0.000	-	0.934	0.967
Lights	450	1018	0	-	1468	343	57	0	-	400	57	1149	0	-	1206	102	316	0	-	418	3492
% Lights	98.3	96.1	-	-	96.8	96.6	93.4	-	-	96.2	98.3	96.0	-	-	96.1	100.0	97.5	-	-	98.1	96.6
Buses	0	3	0	-	3	5	0	0	-	5	0	0	0	-	0	0	0	0	-	0	8
% Buses	0.0	0.3	-	-	0.2	1.4	0.0	-	-	1.2	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.2
Single-Unit Trucks	5	26	0	-	31	7	1	0	-	8	1	39	0	-	40	0	7	0	-	7	86
% Single-Unit Trucks	1.1	2.5	-	-	2.0	2.0	1.6	-	-	1.9	1.7	3.3	-	-	3.2	0.0	2.2	-	-	1.6	2.4
Articulated Trucks	2	12	0	-	14	0	1	0	-	1	0	9	0	-	9	0	0	0	-	0	24
% Articulated Trucks	0.4	1.1	-	-	0.9	0.0	1.6	-	-	0.2	0.0	0.8	-	-	0.7	0.0	0.0	-	-	0.0	0.7
Bicycles on Road	1	0	0	-	1	0	2	0	-	2	0	0	0	-	0	0	1	0	-	1	4
% Bicycles on Road	0.2	0.0	-	-	0.1	0.0	3.3	-	-	0.5	0.0	0.0	-	-	0.0	0.0	0.3	-	-	0.2	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Data Collection
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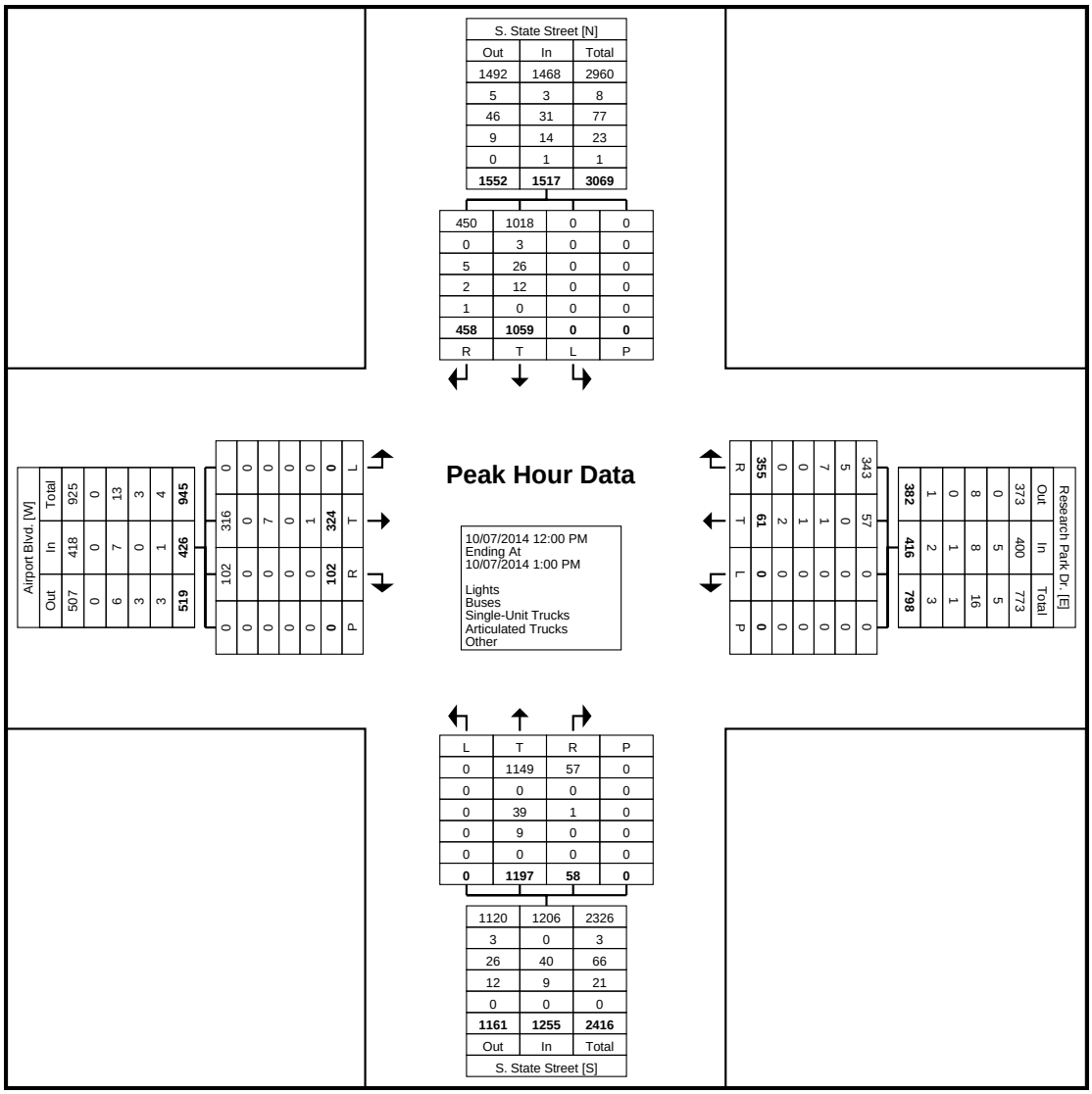
Corridor: S. State Street
Weather: Pt. Cldy. 60's Degs
Video VCU: SCU 2Z4 & 3HT

Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014



Turning Movement Peak Hour Data Plot (12:00 PM)

TDC
Traffic Data Collection

Traffic Data Collection
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Ph. (586) 786-5407
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's Degs
Video VCU: SCU 2Z4 & 3HT

Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014

Turning Movement Peak Hour Data (4:45 PM)

Start Time	S. State Street Southbound					Research Park Dr. Westbound					S. State Street Northbound					Airport Blvd. Eastbound					
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
4:45 PM	154	282	1	0	437	102	17	0	1	119	7	451	0	0	458	30	61	0	1	91	1105
5:00 PM	141	315	0	0	456	163	34	0	0	197	1	400	0	0	401	35	101	0	0	136	1190
5:15 PM	118	351	1	0	470	108	21	0	0	129	7	398	0	0	405	24	65	1	2	90	1094
5:30 PM	135	377	0	0	512	88	19	0	0	107	5	383	0	0	388	33	66	1	0	100	1107
Total	548	1325	2	0	1875	461	91	0	1	552	20	1632	0	0	1652	122	293	2	3	417	4496
Approach %	29.2	70.7	0.1	-	-	83.5	16.5	0.0	-	-	1.2	98.8	0.0	-	-	29.3	70.3	0.5	-	-	-
Total %	12.2	29.5	0.0	-	41.7	10.3	2.0	0.0	-	12.3	0.4	36.3	0.0	-	36.7	2.7	6.5	0.0	-	9.3	-
PHF	0.890	0.879	0.500	-	0.916	0.707	0.669	0.000	-	0.701	0.714	0.905	0.000	-	0.902	0.871	0.725	0.500	-	0.767	0.945
Lights	548	1301	2	-	1851	459	90	0	-	549	20	1614	0	-	1634	122	293	2	-	417	4451
% Lights	100.0	98.2	100.0	-	98.7	99.6	98.9	-	-	99.5	100.0	98.9	-	-	98.9	100.0	100.0	100.0	-	100.0	99.0
Buses	0	5	0	-	5	2	0	0	-	2	0	0	0	-	0	0	0	0	-	0	7
% Buses	0.0	0.4	0.0	-	0.3	0.4	0.0	-	-	0.4	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.2
Single-Unit Trucks	0	14	0	-	14	0	0	0	-	0	0	12	0	-	12	0	0	0	-	0	26
% Single-Unit Trucks	0.0	1.1	0.0	-	0.7	0.0	0.0	-	-	0.0	0.0	0.7	-	-	0.7	0.0	0.0	0.0	-	0.0	0.6
Articulated Trucks	0	5	0	-	5	0	1	0	-	1	0	6	0	-	6	0	0	0	-	0	12
% Articulated Trucks	0.0	0.4	0.0	-	0.3	0.0	1.1	-	-	0.2	0.0	0.4	-	-	0.4	0.0	0.0	0.0	-	0.0	0.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Traffic Data Collection
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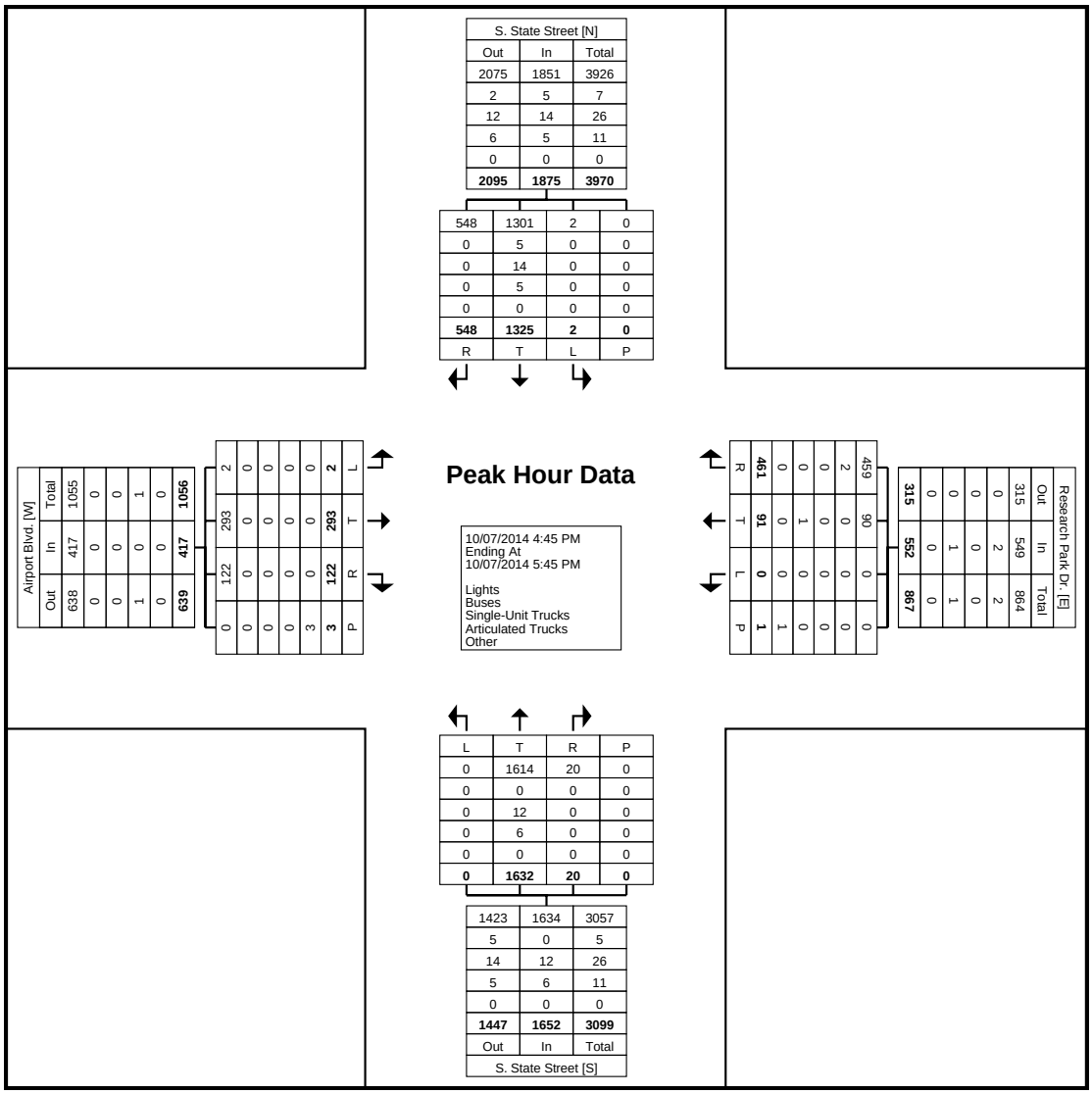
Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's Degs
Video VCU: SCU 2Z4 & 3HT

Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014
Page No: 10



Turning Movement Peak Hour Data Plot (4:45 PM)

Traffic Data Collection

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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy. 60's Degs
Video VCU: SCU 2Z4 & 3HT

Count Name: StateSt & Research
Site Code: TMC 10
Start Date: 10/07/2014

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Signalized intersection with pedestrian signals/push button pedestrian for west & south legs. Video VCU cameras were located at NW & SE quadrant. Left turn prohibited for approaches.
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

IIDC
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Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy, 60' Degs.
Video VCU: SCU
3EP,24L&3DDQ

Count Name: StateSt&Ellsworth_ Roundabout
Site Code: TMC 11
Start Date: 10/08/2014

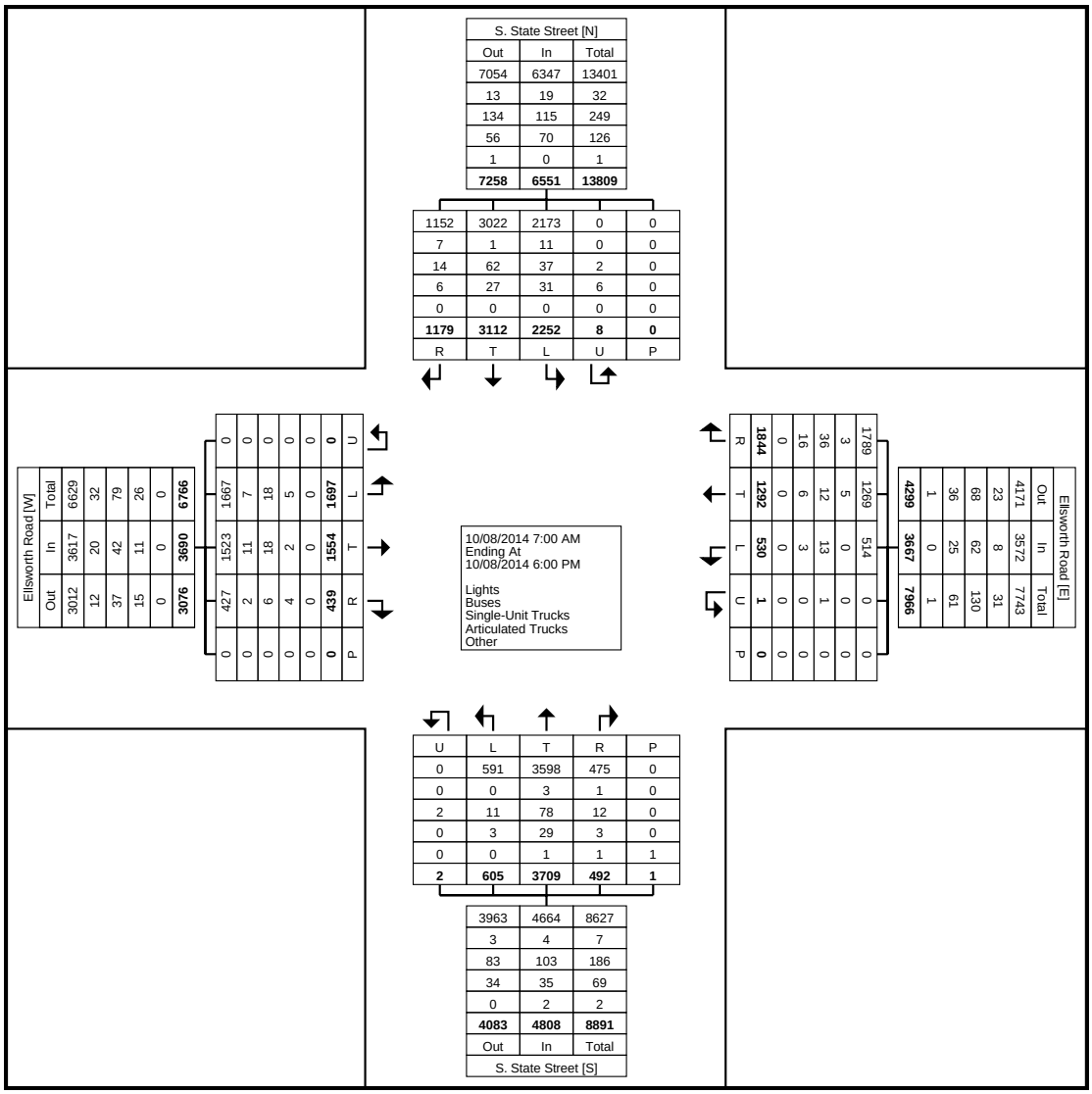
Turning Movement Data

Start Time	S. State Street Southbound						Ellsworth Road Westbound						S. State Street Northbound						Ellsworth Road Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
7:00 AM	25	117	77	1	0	220	35	15	13	1	0	64	14	118	11	0	0	143	9	31	99	0	0	139	566
7:15 AM	26	137	67	0	0	230	47	24	33	0	0	104	19	136	21	0	0	176	11	53	105	0	0	169	679
7:30 AM	38	155	100	0	0	293	89	30	25	0	0	144	25	163	9	0	0	197	20	50	115	0	0	185	819
7:45 AM	40	173	112	0	0	325	65	48	27	0	0	140	25	189	17	0	0	231	20	64	106	0	0	190	886
Hourly Total	129	582	356	1	0	1068	236	117	98	1	0	452	83	606	58	0	0	747	60	198	425	0	0	683	2950
8:00 AM	47	184	96	0	0	327	67	46	27	0	0	140	17	162	14	0	0	193	14	69	94	0	0	177	837
8:15 AM	36	189	103	0	0	328	81	57	28	0	0	166	24	148	14	0	0	186	26	64	99	0	0	189	869
8:30 AM	63	137	100	2	0	302	63	57	20	0	0	140	38	164	20	0	0	222	26	74	71	0	0	171	835
8:45 AM	59	145	98	0	0	302	63	55	13	0	0	131	31	103	14	0	0	148	24	70	88	0	0	182	763
Hourly Total	205	655	397	2	0	1259	274	215	88	0	0	577	110	577	62	0	0	749	90	277	352	0	0	719	3304
9:00 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
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	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
11:00 AM	26	81	55	0	0	162	55	50	16	0	0	121	26	119	22	1	1	168	12	47	34	0	0	93	544
11:15 AM	39	84	57	0	0	180	72	44	15	0	0	131	17	95	19	1	0	132	11	46	33	0	0	90	533
11:30 AM	45	82	78	0	0	205	77	50	13	0	0	140	21	130	31	0	0	182	21	59	39	0	0	119	646
11:45 AM	37	109	69	1	0	216	63	56	15	0	0	134	22	129	37	0	0	188	24	57	54	0	0	135	673
Hourly Total	147	356	259	1	0	763	267	200	59	0	0	526	86	473	109	2	1	670	68	209	160	0	0	437	2396
12:00 PM	37	97	67	2	0	203	88	59	22	0	0	169	29	149	38	0	0	216	11	64	44	0	0	119	707
12:15 PM	49	94	90	0	0	233	84	61	24	0	0	169	22	126	30	0	0	178	13	54	53	0	0	120	700
12:30 PM	42	119	92	0	0	253	88	56	23	0	0	167	15	124	31	0	0	170	25	58	59	0	0	142	732
12:45 PM	42	157	87	0	0	286	60	53	22	0	0	135	15	98	28	0	0	141	35	58	52	0	0	145	707
Hourly Total	170	467	336	2	0	975	320	229	91	0	0	640	81	497	127	0	0	705	84	234	208	0	0	526	2846
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	62	109	74	0	0	245	102	74	21	0	0	197	13	204	29	0	0	246	28	69	50	0	0	147	835
4:15 PM	58	125	135	0	0	318	90	52	28	0	0	170	18	194	20	0	0	232	13	73	65	0	0	151	871
4:30 PM	69	141	132	1	0	343	104	57	34	0	0	195	10	213	28	0	0	251	13	75	68	0	0	156	945
4:45 PM	58	148	129	1	0	336	94	90	16	0	0	200	23	204	16	0	0	243	17	72	67	0	0	156	935
Hourly Total	247	523	470	2	0	1242	390	273	99	0	0	762	64	815	93	0	0	972	71	289	250	0	0	610	3586
5:00 PM	52	110	103	0	0	265	104	57	20	0	0	181	16	180	44	0	0	240	13	89	83	0	0	185	871
5:15 PM	66	152	100	0	0	318	101	64	31	0	0	196	13	184	43	0	0	240	12	82	73	0	0	167	921
5:30 PM	78	145	117	0	0	340	71	63	25	0	0	159	27	179	39	0	0	245	21	94	69	0	0	184	928
5:45 PM	85	122	114	0	0	321	81	74	19	0	0	174	12	198	30	0	0	240	20	82	77	0	0	179	914
Hourly Total	281	529	434	0	0	1244	357	258	95	0	0	710	68	741	156	0	0	965	66	347	302	0	0	715	3634
Grand Total	1179	3112	2252	8	0	6551	1844	1292	530	1	0	3667	492	3709	605	2	1	4808	439	1554	1697	0	0	3690	18716
Approach %	18.0	47.5	34.4	0.1	-	-	50.3	35.2	14.5	0.0	-	-	10.2	77.1	12.6	0.0	-	-	11.9	42.1	46.0	0.0	-	-	-
Total %	6.3	16.6	12.0	0.0	-	35.0	9.9	6.9	2.8	0.0	-	19.6	2.6	19.8	3.2	0.0	-	25.7	2.3	8.3	9.1	0.0	-	19.7	-
Lights	1152	3022	2173	0	-	6347	1789	1269	514	0	-	3572	475	3598	591	0	-	4664	427	1523	1667	0	-	3617	18200
% Lights	97.7	97.1	96.5	0.0	-	96.9	97.0	98.2	97.0	0.0	-	97.4	96.5	97.0	97.7	0.0	-	97.0	97.3	98.0	98.2	-	-	98.0	97.2
Buses	7	1	11	0	-	19	3	5	0	0	-	8	1	3	0	0	-	4	2	11	7	0	-	20	51
% Buses	0.6	0.0	0.5	0.0	-	0.3	0.2	0.4	0.0	0.0	-	0.2	0.2	0.1	0.0	0.0	-	0.1	0.5	0.7	0.4	-	-	0.5	0.3
Single-Unit Trucks	14	62	37	2	-	115	36	12	13	1	-	62	12	78	11	2	-	103	6	18	18	0	-	42	322
% Single-Unit Trucks	1.2	2.0	1.6	25.0	-	1.8	2.0	0.9	2.5	100.0	-	1.7	2.4	2.1	1.8	100.0	-	2.1	1.4	1.2	1.1	-	-	1.1	1.7
Articulated Trucks	6	27	31	6	-	70	16	6	3	0	-	25	3	29	3	0	-	35	4	2	5	0	-	11	141
% Articulated Trucks	0.5	0.9	1.4	75.0	-	1.1	0.9	0.5	0.6	0.0	-	0.7	0.6	0.8	0.5	0.0	-	0.7	0.9	0.1	0.3	-	-	0.3	0.8
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	1	1	0	0	-	2	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Traffic Data Collection
7504 Sawgrass Drive
www.tdccounts.com
Washington, Michigan, United States 48094
Ph. (586) 786-5407
Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy, 60' Degs.
Video VCU: SCU
3EP,24L&3DDQ

Count Name: StateSt&Ellsworth_ Roundabout
Site Code: TMC 11
Start Date: 10/08/2014



Turning Movement Data Plot

Traffic Data Collection

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Project: City of Ann Arbor
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Count Name: StateSt&Ellsworth_ Roundabout
Site Code: TMC 11
Start Date: 10/08/2014

Approach Data

Start Time	Southbound Street Southbound						Westbound Street Westbound						Northbound Street Northbound						Eastbound Street Eastbound					
	Peds CCW	Peds CW	Circulating	Out	In	Next	Peds CCW	Peds CW	Circulating	Out	In	Next	Peds CCW	Peds CW	Circulating	Out	In	Next	Peds CCW	Peds CW	Circulating	Out	In	Next
7:00 AM	0	0	37	253	223	25	0	0	235	118	62	35	0	0	202	134	148	14	0	0	209	50	143	9
7:15 AM	0	0	71	299	243	26	0	0	275	139	101	47	0	0	214	184	179	19	0	0	246	70	165	11
7:30 AM	0	0	53	372	307	38	0	0	303	172	139	89	0	0	252	200	202	25	0	0	287	74	184	20
7:45 AM	0	0	89	365	339	40	0	0	320	196	136	65	0	0	267	225	237	25	0	0	325	102	186	20
Hourly Total	0	0	250	1289	1112	129	0	0	1133	625	438	236	0	0	935	743	766	83	0	0	1067	296	678	60
8:00 AM	0	0	81	326	338	47	0	0	270	186	137	67	0	0	263	229	190	17	0	0	314	105	174	14
8:15 AM	0	0	99	329	340	36	0	0	262	190	165	81	0	0	252	247	187	24	0	0	335	104	185	26
8:30 AM	0	0	94	299	312	63	0	0	251	212	140	63	0	0	245	187	220	38	0	0	268	138	165	26
8:45 AM	0	0	87	248	311	59	0	0	195	203	137	63	0	0	244	190	144	31	0	0	273	126	173	24
Hourly Total	0	0	361	1202	1301	205	0	0	978	791	579	274	0	0	1004	853	741	110	0	0	1190	473	697	90
9:00 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
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	84	217	165	26	0	0	179	127	119	55	0	1	136	112	171	26	0	0	155	94	92	12
11:15 AM	0	0	73	199	186	39	0	0	149	119	128	72	0	0	133	111	133	17	0	0	159	98	86	11
11:30 AM	0	0	85	252	210	45	0	0	203	158	134	77	0	0	179	115	181	21	0	0	177	121	120	21
11:45 AM	0	0	101	255	221	37	0	0	225	143	131	63	0	0	175	148	191	22	0	0	197	124	134	24
Hourly Total	0	0	343	923	782	147	0	0	756	547	512	267	0	1	623	486	676	86	0	0	688	437	432	68
12:00 PM	0	0	109	295	207	37	0	0	242	157	166	88	0	0	175	131	221	29	0	0	189	129	118	11
12:15 PM	0	0	111	266	237	49	0	0	206	166	165	84	0	0	194	136	177	22	0	0	215	135	115	13
12:30 PM	0	0	105	275	258	42	0	0	217	164	164	88	0	0	204	175	171	15	0	0	240	124	139	25
12:45 PM	0	0	100	207	291	42	0	0	174	162	139	60	0	0	197	220	139	15	0	0	275	117	140	35
Hourly Total	0	0	425	1043	993	170	0	0	839	649	634	320	0	0	770	662	708	81	0	0	919	505	512	84
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	0	114	374	250	62	0	0	291	152	193	102	0	0	195	158	249	13	0	0	203	160	148	28
4:15 PM	0	0	94	350	328	58	0	0	280	226	168	90	0	0	269	171	231	18	0	0	294	127	145	13
4:30 PM	0	0	109	389	354	69	0	0	317	212	192	104	0	0	276	192	256	10	0	0	310	152	152	13
4:45 PM	0	0	117	372	347	58	0	0	291	223	194	94	0	0	263	188	243	23	0	0	303	161	149	17
Hourly Total	0	0	434	1485	1279	247	0	0	1179	813	747	390	0	0	1003	709	979	64	0	0	1110	600	594	71
5:00 PM	0	0	112	356	277	52	0	0	325	197	191	104	0	0	259	139	249	16	0	0	238	150	187	13
5:15 PM	0	0	123	358	329	66	0	0	316	192	196	101	0	0	252	190	252	13	0	0	283	169	171	12
5:30 PM	0	0	115	318	351	78	0	0	302	234	159	71	0	0	273	188	249	27	0	0	289	177	189	21
5:45 PM	0	0	111	359	332	85	0	0	323	205	169	81	0	0	265	158	245	12	0	0	259	187	187	20
Hourly Total	0	0	461	1391	1289	281	0	0	1266	828	715	357	0	0	1049	675	995	68	0	0	1069	683	734	66
Grand Total	0	0	2274	7333	6756	1179	0	0	6151	4253	3625	1844	0	1	5384	4128	4865	492	0	0	6043	2994	3647	439
Approach %	-	-	13.0	41.8	38.5	6.7	-	-	38.8	26.8	22.8	11.6	-	-	36.2	27.8	32.7	3.3	-	-	46.0	22.8	27.8	3.3
Total %	-	-	3.7	11.9	11.0	1.9	-	-	10.0	6.9	5.9	3.0	-	-	8.8	6.7	7.9	0.8	-	-	9.8	4.9	5.9	0.7
Lights	-	-	2227	7138	6540	1152	-	-	5998	4121	3533	1789	-	-	5230	4008	4723	475	-	-	5841	2934	3578	427
% Lights	-	-	97.9	97.3	96.8	97.7	-	-	97.5	96.9	97.5	97.0	-	-	97.1	97.1	97.1	96.5	-	-	96.7	98.0	98.1	97.3
Buses	-	-	5	10	22	7	-	-	9	25	8	3	-	-	35	2	4	1	-	-	15	11	20	2
% Buses	-	-	0.2	0.1	0.3	0.6	-	-	0.1	0.6	0.2	0.2	-	-	0.7	0.0	0.1	0.2	-	-	0.2	0.4	0.5	0.5
Single-Unit Trucks	-	-	34	134	117	14	-	-	109	68	60	36	-	-	70	84	101	12	-	-	113	38	35	6
% Single-Unit Trucks	-	-	1.5	1.8	1.7	1.2	-	-	1.8	1.6	1.7	2.0	-	-	1.3	2.0	2.1	2.4	-	-	1.9	1.3	1.0	1.4
Articulated Trucks	-	-	8	51	75	6	-	-	34	37	24	16	-	-	48	34	35	3	-	-	72	11	13	4
% Articulated Trucks	-	-	0.4	0.7	1.1	0.5	-	-	0.6	0.9	0.7	0.9	-	-	0.9	0.8	0.7	0.6	-	-	1.2	0.4	0.4	0.9
Bicycles on Road	-	-	0	0	2	0	-	-	1	2	0	0	-	-	1	0	2	1	-	-	2	0	1	0
% Bicycles on Road	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.2	-	-	0.0	0.0	0.0	0.0
Bicycles on Crosswalk	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-
Pedestrians	0	0	-	-	-	-	0	0	-	-	-	-	0	1	-	-	-	-	0	0	-	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-

Traffic Data Collection

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Reliable Traffic Data

Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy, 60' Degs.
Video VCU: SCU
3EP,24L&3DDQ

Count Name: StateSt&Ellsworth_ Roundabout
Site Code: TMC 11
Start Date: 10/08/2014

Turning Movement Peak Hour Data (7:45 AM)

Start Time	S. State Street Southbound						Ellsworth Road Westbound						S. State Street Northbound						Ellsworth Road Eastbound						
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Int. Total
7:45 AM	40	173	112	0	0	325	65	48	27	0	0	140	25	189	17	0	0	231	20	64	106	0	0	190	886
8:00 AM	47	184	96	0	0	327	67	46	27	0	0	140	17	162	14	0	0	193	14	69	94	0	0	177	837
8:15 AM	36	189	103	0	0	328	81	57	28	0	0	166	24	148	14	0	0	186	26	64	99	0	0	189	869
8:30 AM	63	137	100	2	0	302	63	57	20	0	0	140	38	164	20	0	0	222	26	74	71	0	0	171	835
Total	186	683	411	2	0	1282	276	208	102	0	0	586	104	663	65	0	0	832	86	271	370	0	0	727	3427
Approach %	14.5	53.3	32.1	0.2	-	-	47.1	35.5	17.4	0.0	-	-	12.5	79.7	7.8	0.0	-	-	11.8	37.3	50.9	0.0	-	-	-
Total %	5.4	19.9	12.0	0.1	-	37.4	8.1	6.1	3.0	0.0	-	17.1	3.0	19.3	1.9	0.0	-	24.3	2.5	7.9	10.8	0.0	-	21.2	-
PHF	0.738	0.903	0.917	0.250	-	0.977	0.852	0.912	0.911	0.000	-	0.883	0.684	0.877	0.813	0.000	-	0.900	0.827	0.916	0.873	0.000	-	0.957	0.967
Lights	179	666	395	0	-	1240	261	201	100	0	-	562	97	619	61	0	-	777	86	261	368	0	-	715	3294
% Lights	96.2	97.5	96.1	0.0	-	96.7	94.6	96.6	98.0	-	-	95.9	93.3	93.4	93.8	-	-	93.4	100.0	96.3	99.5	-	-	98.3	96.1
Buses	5	0	1	0	-	6	0	0	0	0	-	0	0	0	0	0	-	0	0	6	0	0	-	6	12
% Buses	2.7	0.0	0.2	0.0	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	2.2	0.0	-	-	0.8	0.4
Single-Unit Trucks	2	14	10	0	-	26	13	5	2	0	-	20	7	37	3	0	-	47	0	3	1	0	-	4	97
% Single-Unit Trucks	1.1	2.0	2.4	0.0	-	2.0	4.7	2.4	2.0	-	-	3.4	6.7	5.6	4.6	-	-	5.6	0.0	1.1	0.3	-	-	0.6	2.8
Articulated Trucks	0	3	5	2	-	10	2	2	0	0	-	4	0	7	1	0	-	8	0	1	1	0	-	2	24
% Articulated Trucks	0.0	0.4	1.2	100.0	-	0.8	0.7	1.0	0.0	-	-	0.7	0.0	1.1	1.5	-	-	1.0	0.0	0.4	0.3	-	-	0.3	0.7
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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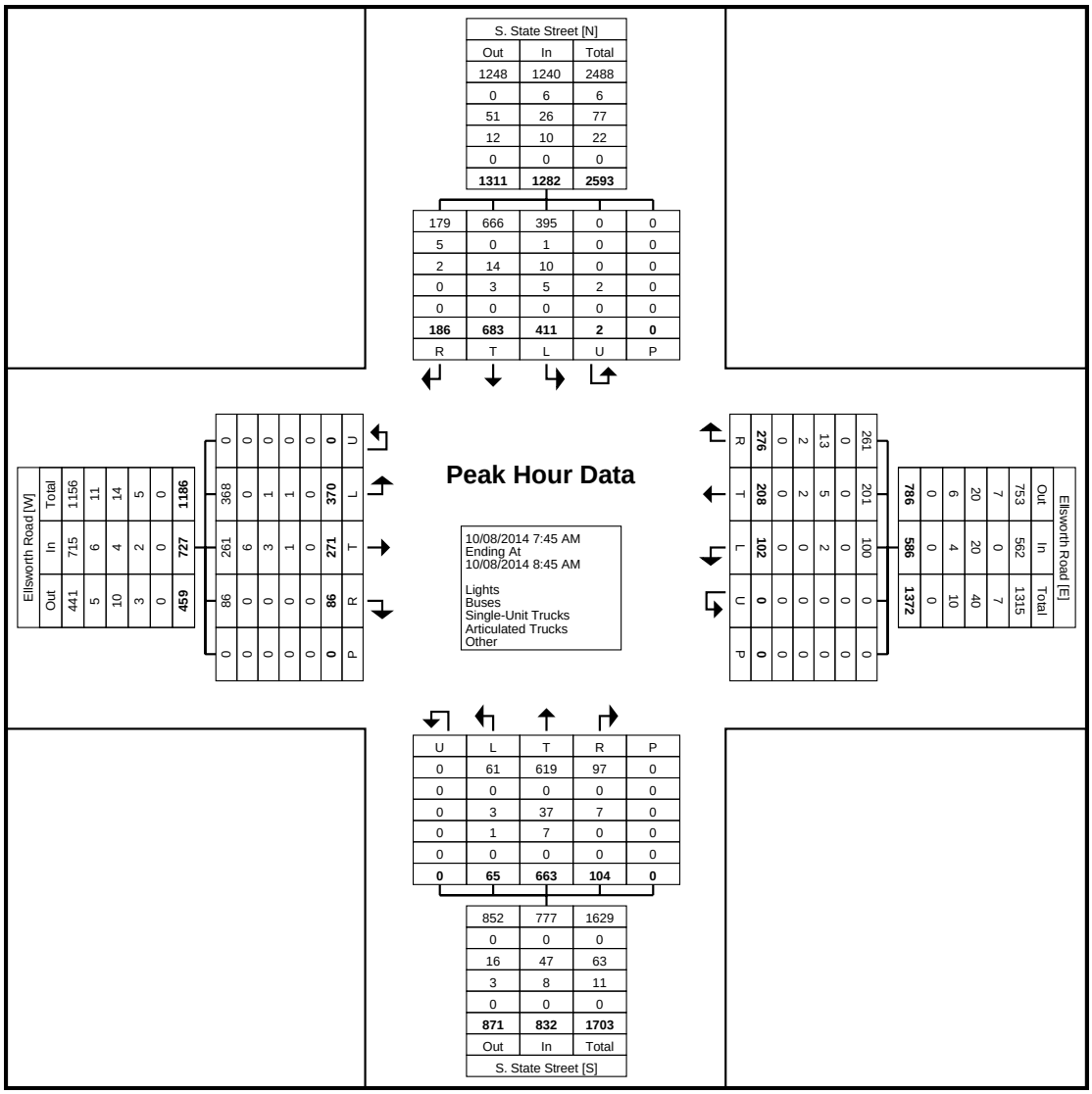

Turning Movement Peak Hour Data Plot (7:45 AM)

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3EP,24L&3DDQ

Count Name: StateSt&Ellsworth_ Roundabout
Site Code: TMC 11
Start Date: 10/08/2014

Turning Movement Peak Hour Data (11:00 AM)

Start Time	S. State Street Southbound						Ellsworth Road Westbound						S. State Street Northbound						Ellsworth Road Eastbound						
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Int. Total
11:00 AM	26	81	55	0	0	162	55	50	16	0	0	121	26	119	22	1	1	168	12	47	34	0	0	93	544
11:15 AM	39	84	57	0	0	180	72	44	15	0	0	131	17	95	19	1	0	132	11	46	33	0	0	90	533
11:30 AM	45	82	78	0	0	205	77	50	13	0	0	140	21	130	31	0	0	182	21	59	39	0	0	119	646
11:45 AM	37	109	69	1	0	216	63	56	15	0	0	134	22	129	37	0	0	188	24	57	54	0	0	135	673
Total	147	356	259	1	0	763	267	200	59	0	0	526	86	473	109	2	1	670	68	209	160	0	0	437	2396
Approach %	19.3	46.7	33.9	0.1	-	-	50.8	38.0	11.2	0.0	-	-	12.8	70.6	16.3	0.3	-	-	15.6	47.8	36.6	0.0	-	-	-
Total %	6.1	14.9	10.8	0.0	-	31.8	11.1	8.3	2.5	0.0	-	22.0	3.6	19.7	4.5	0.1	-	28.0	2.8	8.7	6.7	0.0	-	18.2	-
PHF	0.817	0.817	0.830	0.250	-	0.883	0.867	0.893	0.922	0.000	-	0.939	0.827	0.910	0.736	0.500	-	0.891	0.708	0.886	0.741	0.000	-	0.809	0.890
Lights	139	338	245	0	-	722	258	198	54	0	-	510	84	463	107	0	-	654	65	204	153	0	-	422	2308
% Lights	94.6	94.9	94.6	0.0	-	94.6	96.6	99.0	91.5	-	-	97.0	97.7	97.9	98.2	0.0	-	97.6	95.6	97.6	95.6	-	-	96.6	96.3
Buses	1	1	1	0	-	3	0	0	0	0	-	0	0	1	0	0	-	1	0	0	1	0	-	1	5
% Buses	0.7	0.3	0.4	0.0	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.2	0.0	0.0	-	0.1	0.0	0.0	0.6	-	-	0.2	0.2
Single-Unit Trucks	4	10	3	0	-	17	6	1	3	0	-	10	0	6	2	2	-	10	1	5	5	0	-	11	48
% Single-Unit Trucks	2.7	2.8	1.2	0.0	-	2.2	2.2	0.5	5.1	-	-	1.9	0.0	1.3	1.8	100.0	-	1.5	1.5	2.4	3.1	-	-	2.5	2.0
Articulated Trucks	3	7	10	1	-	21	3	1	2	0	-	6	2	3	0	0	-	5	2	0	1	0	-	3	35
% Articulated Trucks	2.0	2.0	3.9	100.0	-	2.8	1.1	0.5	3.4	-	-	1.1	2.3	0.6	0.0	0.0	-	0.7	2.9	0.0	0.6	-	-	0.7	1.5
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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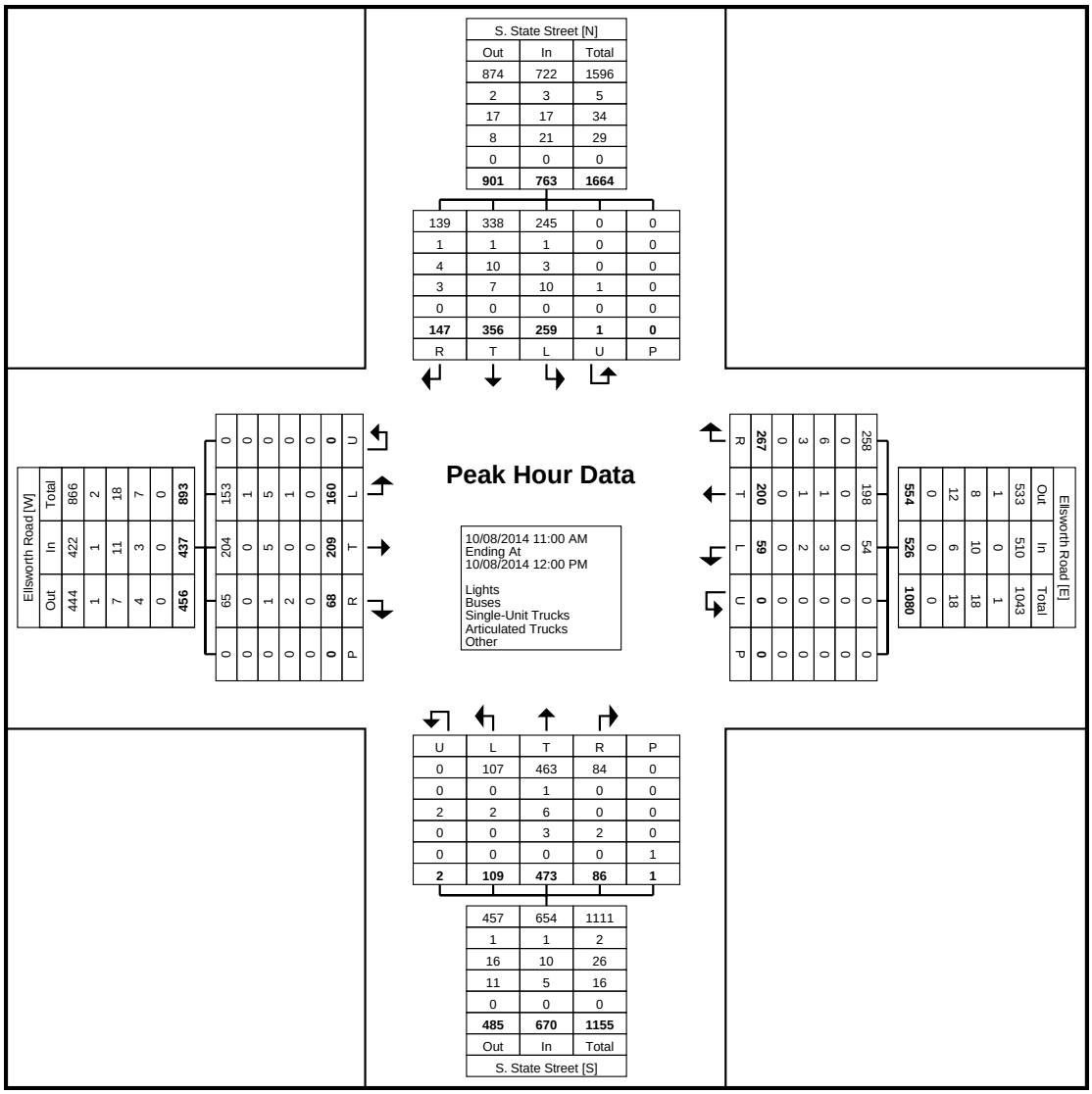

Turning Movement Peak Hour Data Plot (11:00 AM)

Traffic Data Collection

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Count Name: StateSt&Ellsworth_ Roundabout
Site Code: TMC 11
Start Date: 10/08/2014

Turning Movement Peak Hour Data (12:00 PM)

Start Time	S. State Street Southbound						Ellsworth Road Westbound						S. State Street Northbound						Ellsworth Road Eastbound						
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Int. Total
12:00 PM	37	97	67	2	0	203	88	59	22	0	0	169	29	149	38	0	0	216	11	64	44	0	0	119	707
12:15 PM	49	94	90	0	0	233	84	61	24	0	0	169	22	126	30	0	0	178	13	54	53	0	0	120	700
12:30 PM	42	119	92	0	0	253	88	56	23	0	0	167	15	124	31	0	0	170	25	58	59	0	0	142	732
12:45 PM	42	157	87	0	0	286	60	53	22	0	0	135	15	98	28	0	0	141	35	58	52	0	0	145	707
Total	170	467	336	2	0	975	320	229	91	0	0	640	81	497	127	0	0	705	84	234	208	0	0	526	2846
Approach %	17.4	47.9	34.5	0.2	-	-	50.0	35.8	14.2	0.0	-	-	11.5	70.5	18.0	0.0	-	-	16.0	44.5	39.5	0.0	-	-	-
Total %	6.0	16.4	11.8	0.1	-	34.3	11.2	8.0	3.2	0.0	-	22.5	2.8	17.5	4.5	0.0	-	24.8	3.0	8.2	7.3	0.0	-	18.5	-
PHF	0.867	0.744	0.913	0.250	-	0.852	0.909	0.939	0.948	0.000	-	0.947	0.698	0.834	0.836	0.000	-	0.816	0.600	0.914	0.881	0.000	-	0.907	0.972
Lights	164	456	316	0	-	936	308	221	91	0	-	620	77	481	126	0	-	684	81	231	203	0	-	515	2755
% Lights	96.5	97.6	94.0	0.0	-	96.0	96.3	96.5	100.0	-	-	96.9	95.1	96.8	99.2	-	-	97.0	96.4	98.7	97.6	-	-	97.9	96.8
Buses	0	0	2	0	-	2	1	2	0	0	-	3	0	1	0	0	-	1	0	1	0	0	-	1	7
% Buses	0.0	0.0	0.6	0.0	-	0.2	0.3	0.9	0.0	-	-	0.5	0.0	0.2	0.0	-	-	0.1	0.0	0.4	0.0	-	-	0.2	0.2
Single-Unit Trucks	5	8	12	2	-	27	7	4	0	0	-	11	2	10	0	0	-	12	2	1	4	0	-	7	57
% Single-Unit Trucks	2.9	1.7	3.6	100.0	-	2.8	2.2	1.7	0.0	-	-	1.7	2.5	2.0	0.0	-	-	1.7	2.4	0.4	1.9	-	-	1.3	2.0
Articulated Trucks	1	3	6	0	-	10	4	2	0	0	-	6	1	5	1	0	-	7	1	1	1	0	-	3	26
% Articulated Trucks	0.6	0.6	1.8	0.0	-	1.0	1.3	0.9	0.0	-	-	0.9	1.2	1.0	0.8	-	-	1.0	1.2	0.4	0.5	-	-	0.6	0.9
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	1.2	0.0	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Traffic Data Collection
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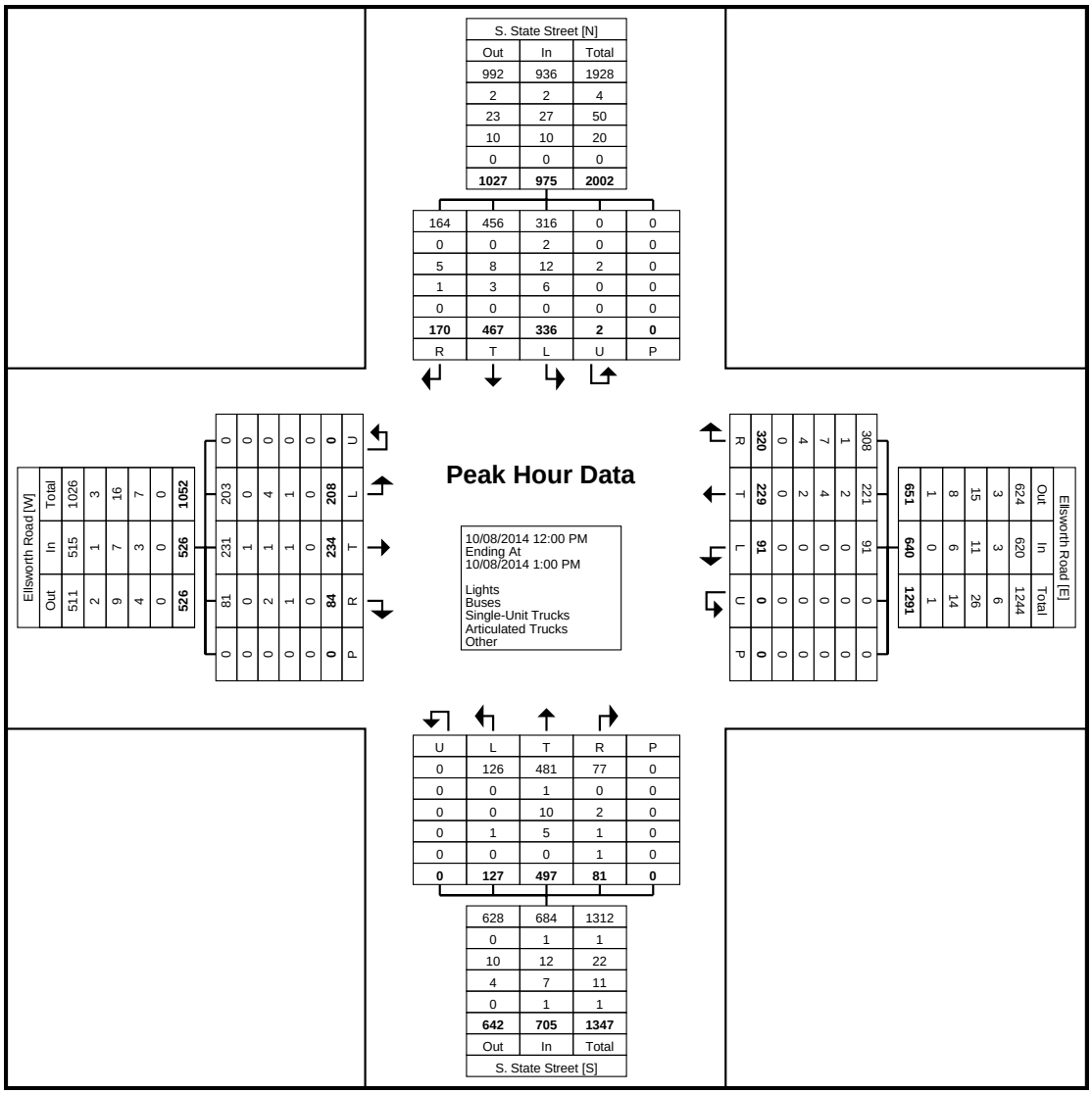
Project: City of Ann Arbor
Corridor: S. State Street
Weather: Pt. Cldy, 60' Degs.
Video VCU: SCU
3EP,24L&3DDQ

Count Name: StateSt&Ellsworth_ Roundabout
Site Code: TMC 11
Start Date: 10/08/2014



Turning Movement Peak Hour Data Plot (12:00 PM)

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Video VCU: SCU
3EP,24L&3DDQ

Count Name: StateSt&Ellsworth_ Roundabout
Site Code: TMC 11
Start Date: 10/08/2014

Turning Movement Peak Hour Data (4:30 PM)

Start Time	S. State Street Southbound						Ellsworth Road Westbound						S. State Street Northbound						Ellsworth Road Eastbound						
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Int. Total
4:30 PM	69	141	132	1	0	343	104	57	34	0	0	195	10	213	28	0	0	251	13	75	68	0	0	156	945
4:45 PM	58	148	129	1	0	336	94	90	16	0	0	200	23	204	16	0	0	243	17	72	67	0	0	156	935
5:00 PM	52	110	103	0	0	265	104	57	20	0	0	181	16	180	44	0	0	240	13	89	83	0	0	185	871
5:15 PM	66	152	100	0	0	318	101	64	31	0	0	196	13	184	43	0	0	240	12	82	73	0	0	167	921
Total	245	551	464	2	0	1262	403	268	101	0	0	772	62	781	131	0	0	974	55	318	291	0	0	664	3672
Approach %	19.4	43.7	36.8	0.2	-	-	52.2	34.7	13.1	0.0	-	-	6.4	80.2	13.4	0.0	-	-	8.3	47.9	43.8	0.0	-	-	-
Total %	6.7	15.0	12.6	0.1	-	34.4	11.0	7.3	2.8	0.0	-	21.0	1.7	21.3	3.6	0.0	-	26.5	1.5	8.7	7.9	0.0	-	18.1	-
PHF	0.888	0.906	0.879	0.500	-	0.920	0.969	0.744	0.743	0.000	-	0.965	0.674	0.917	0.744	0.000	-	0.970	0.809	0.893	0.877	0.000	-	0.897	0.971
Lights	244	540	456	0	-	1240	396	267	98	0	-	761	59	774	127	0	-	960	53	314	287	0	-	654	3615
% Lights	99.6	98.0	98.3	0.0	-	98.3	98.3	99.6	97.0	-	-	98.6	95.2	99.1	96.9	-	-	98.6	96.4	98.7	98.6	-	-	98.5	98.4
Buses	0	0	0	0	-	0	1	0	0	0	-	1	1	0	0	0	-	1	1	1	2	0	-	4	6
% Buses	0.0	0.0	0.0	0.0	-	0.0	0.2	0.0	0.0	-	-	0.1	1.6	0.0	0.0	-	-	0.1	1.8	0.3	0.7	-	-	0.6	0.2
Single-Unit Trucks	0	5	4	0	-	9	3	1	2	0	-	6	2	5	3	0	-	10	0	3	0	0	-	3	28
% Single-Unit Trucks	0.0	0.9	0.9	0.0	-	0.7	0.7	0.4	2.0	-	-	0.8	3.2	0.6	2.3	-	-	1.0	0.0	0.9	0.0	-	-	0.5	0.8
Articulated Trucks	1	6	4	2	-	13	3	0	1	0	-	4	0	2	1	0	-	3	1	0	2	0	-	3	23
% Articulated Trucks	0.4	1.1	0.9	100.0	-	1.0	0.7	0.0	1.0	-	-	0.5	0.0	0.3	0.8	-	-	0.3	1.8	0.0	0.7	-	-	0.5	0.6
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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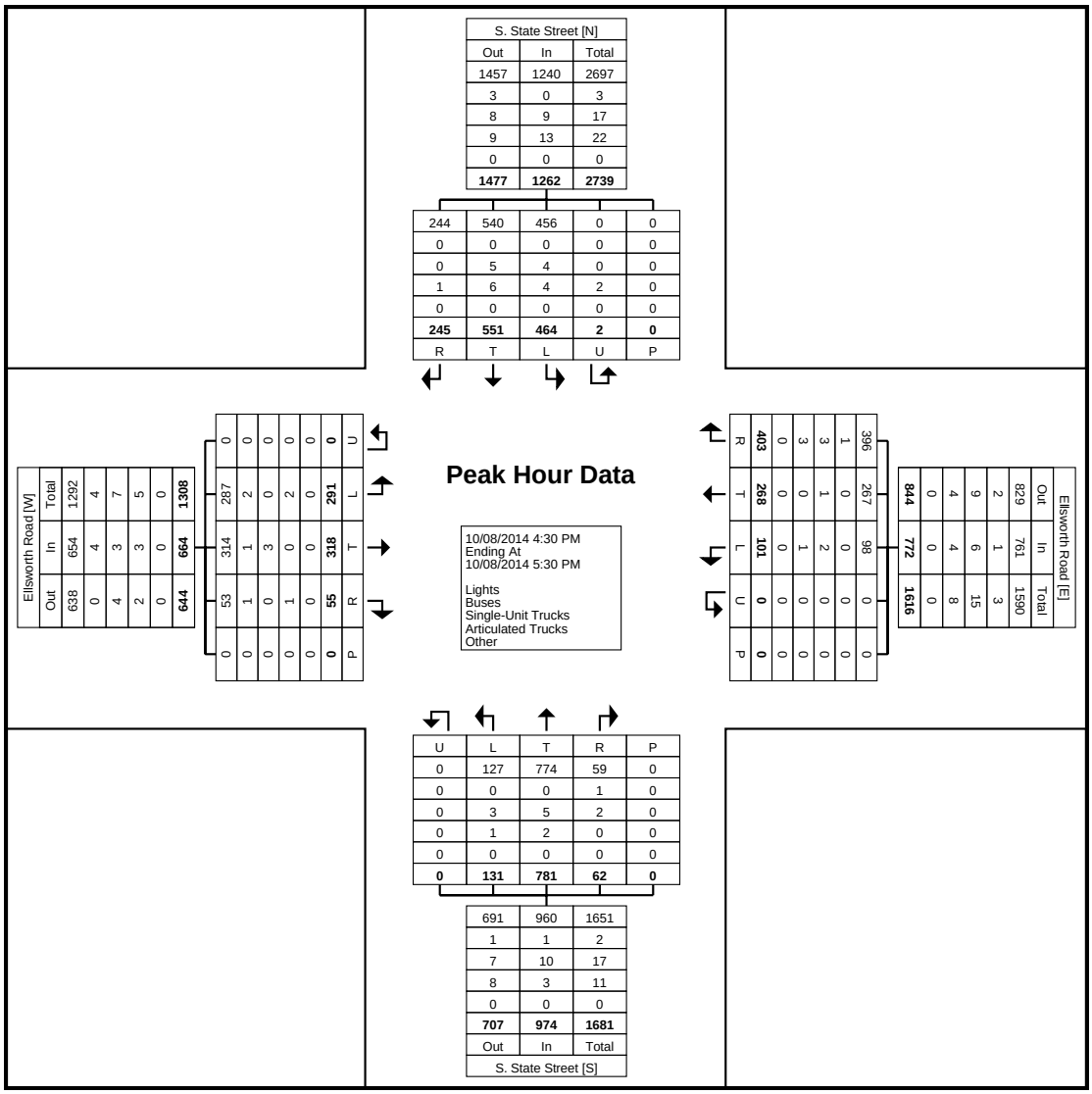

Turning Movement Peak Hour Data Plot (4:30 PM)

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Start Date: 10/08/2014

Comments: 6 hour intersection turning movement count conducted during typical weekday (Tuesday-Thursday) 7:00-9:00 AM morning, 11:00 AM – 1:00 PM mid-day & 4:00-6:00 PM afternoon peak hours while school was in session. TMC was performed with Miovision video VCU recording cameras for City of Ann Arbor S. State Street Corridor Transportation Study (Oakbrook Drive to Ellsworth Road) 1.13 Miles. Traffic study performed for Parson Brinkerhoff Inc.
Roundabout non-signalized intersection, SB S. State Street has right turn slip lane. Video VCU cameras were located at NW, NE & SE quadrants.
Classification Summary Details & Percentages: Seven (7) Groupings:
1)Lights Includes: FHWA Classes 1-3 (Motorcycles, Cars, Light Goods Vehicles)
2)Buses Includes: FHWA Class 4 (School Buses & Regional Transportation Metro Buses)
3)Single-Unit Trucks Includes: FHWA Classes 5-7 (2-4 Axle SU Medium Trucks)
4)Articulated Trucks Includes: FHWA Classes 8-12 (Heavy Trucks W/Single & Multi Unit Trailers)
5)Bicycles On Road Includes: All bicycles on the roadway
6)Bicycles On Crosswalk Includes: All bicycles using sidewalk
7)Pedestrians Includes: All pedestrians using crosswalk

301 E. Huron St.
Ann Arbor, MI 48104