Feasibility Study

Highway 136 Relocation

2nd Street to 8th Street | Beatrice, Nebraska

Prepared for the City of Beatrice

MAY 2014 | OLSSON PROJECT NO. 013-1216

OLSSON® ASSOCIATES

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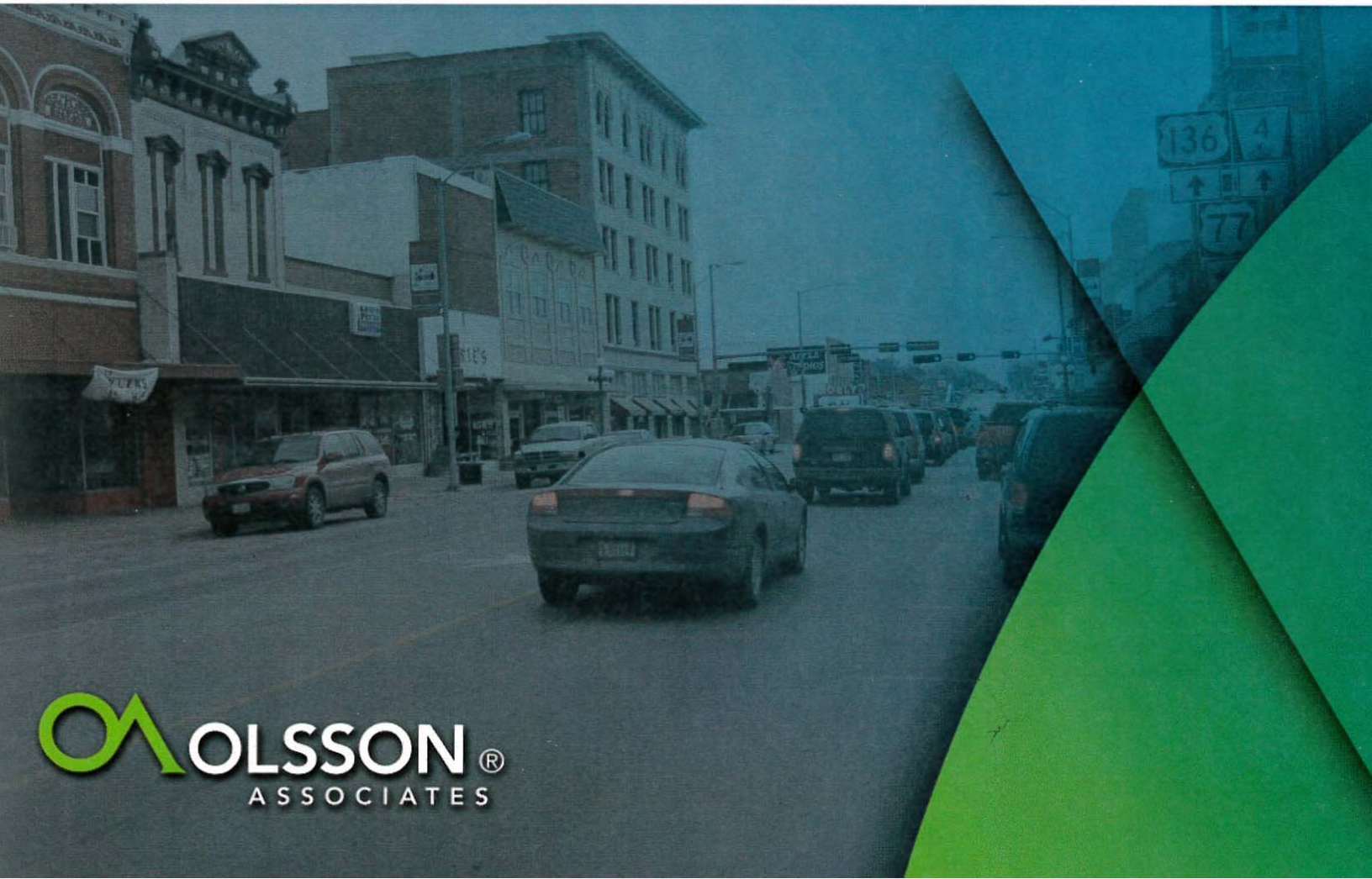

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May 19, 2014

Mr. Tobias Tempelmeyer
City Administrator
City of Beatrice
400 Ella Street
Beatrice, Nebraska 68310

RE: Highway 136 Relocation Feasibility Study – Executive Summary

Dear Mr. Tempelmeyer,

The City of Beatrice intends to relocate a portion of Highway 136 as it passes through the downtown core. The intent of the project would be to eliminate the undesirable amount of heavy trucks that pass through downtown and bring the scale of Court Street down to the pedestrian level. Both of these would help to promote revitalization of the downtown core. The first steps in realizing this plan were to perform a feasibility study to determine potential the geometry of the new alignment and the associated impacts and costs. The study results are documented in four separate technical memorandums addressing four issues specific to the feasibility of the highway relocation. These include the following:

- Environmental Impacts – An assessment of the potential environmental impacts was performed, in the general framework of NEPA provisions, with the intent of identifying any "red flags" that would make the highway relocation unfeasible.
- Traffic Operations – The changes in traffic patterns as a result of reconfiguring the downtown street network needed to be analyzed. Additionally, two alternatives for the relocation were evaluated.
- 6th Street Parking Structure – There is a parking structure on the northwest corner of 6th Street & Market Street that will be an obstacle to performing the relocation while accommodating truck turning. An analysis of the potential solutions to this as a well as potential funding sources were explored.
- Design Considerations – A particular challenge of the highway relocation is to ensure that the geometry of the new roadway, especially the curves that make up the connections from Court Street to Market Street, meet highway design standards. This document outlines the design parameters used and an assessment of the two alternatives considered for the study. It also includes preliminary opinions of cost that include construction and right-of-way acquisition costs.

This letter is intended to provide a summary of each of these documents.

2111 South 67th Street, Suite 200
Omaha, NE 68106

TEL 402.341.1116
FAX 402.341.5895

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Environmental Impacts

A cursory review of the potential environmental impacts was performed to help identify any "red flags" related to the highway relocation. This analysis was performed within the basic framework of the NEPA process. This was done in the event that federal funding would be pursued for this project and a full NEPA evaluation would need to be performed. Twelve subcategories under Human Environmental Resources and Natural Environmental Resources were evaluated. Of these categories, only three areas were identified as having potential impacts. None of the potential impacts are considered "red flags" in that they would be barriers to the completion of the Highway 136 relocation project. The three potential issues to be resolved as the project matures include:

a. Environmental Justice – Some low-income populations will be impacted. There will need to be further analysis to see if this demographic will be disproportionately impacted.
b. Cultural Resources – There are multiple historic properties and the extent of the impacts on these will need to be confirmed with SHPO.
c. Hazardous Materials – Several sites were identified that would need further evaluation.

Traffic Operations

A traffic study was performed to aid in the determination of the optimal roadway configuration and to help identify considerations related to traffic operations for the highway relocation. The study did not identify any existing roadways or intersections that were over capacity or crash patterns that would suggest safety issues within the network.

To generate a representative future scenario, the traffic volumes were grown to a 2035 projection year and the network modified to show the anticipated geometry and shifted travel patterns. The updated geometry also included converting all one-way street to two-way and removing existing traffic signals everywhere except along 6th Street.

Both alternatives were shown to be comparable from a capacity standpoint, however, the roundabout alternative resulted in shorter queues at the Court Street & Market Street intersections. Additionally, the roundabout alternative is anticipated to provide greater safety benefits over conventional intersections.

One of the primary drivers for the highway relocation was the desire to keep heavy trucks out of the downtown core that is intended to be for retail traffic and pedestrians. With the anticipated reconstruction of the highway to make the primary, convenient movement south to Market Street, it is anticipated that this issue will be resolved.

The final issue explored in the traffic analysis was that of access control and intersection spacing. Each alternative will require compromises with respect to access control. The introduction of two additional intersections will require the restriction of certain movements and the elimination of some intersection legs to reduce the conflict points along the highway. Additionally, the Nebraska Department of Roads (NDOR) has indicated that, as part of the highway relocation, controlled access will need to be purchased along the alignment to minimize the number of parcels with direct access to the highway. This will help to improve safety and efficiency of the roadway.

6th Street Parking Structure

The parking structure on the northwest corner of 6th Street & Market Street, especially its cantilevered portion adjacent to the two streets, was shown to provide two significant obstacles to the highway relocation. The first is the accommodation of truck turning for the southbound right-turn movement. Additionally the cantilever is considered to be an encroachment into NDOR right-of-way. Two options were explored as potential solutions to overcome these hurdles: modifying the structure to make truck turning work and remove encroachments or remove the structure completely. Additional issues explored were the structure's condition and the identification of options for funding work on the structure.

It was found that it is possible to leave the garage and accommodate truck turning if the intersection is allowed to shift southwest. Also, constructing the intersection with northbound and southbound left turn lanes would result in very narrow sidewalks at the corners, approximately 4 feet wide. This would result in Market Street being shifted south as well. Completely removing the structure would allow the intersection to remain in place and allow more desirable intersection and sidewalk geometry than if the intersection were to be shifted.

NDOR has indicated that as part of the highway relocation, all right-of-way encroachments would need to be addressed. This includes the parking structure, meaning that even if the garage could be modified to accommodate truck turning, the issue of the remaining portions overhanging into NDOR ROW would need to be resolved. At this time, NDOR is requiring the encroachment be removed.

The parking utilization of the structure was determined to be quite low and the rental bays were found to be completely leased at the time of the study. There were no immediate needs for structural repairs identified, but the first floor especially is showing signs of aging.

The cost of removing the structure is estimated at $900,000. Funding is potentially available in the form of a CDBG through the Nebraska Department of Economic Development. This grant has the potential to contribute $300,000 to the cost of the project, provided it can be tied to economic development.

The conclusion of this assessment was that it is desirable to remove the structure and will likely be necessary to meet the requirements of NDOR.

Design Considerations

Three relevant questions were answered regarding the portion of the highway relocation that would be along the existing Market Street alignment. The design of the highway, between 3rd Street and 8th Street, would be determined by the condition of the current pavement, the impact of the parking structure at 6th Street, and the presence of on-street parking.

Three crucial pieces of information were obtained through correspondence with NDOR. The first is that the pavement condition was in poor condition such that Market Street would need to be reconstructed to handle the future demands of increased volumes, including heavy trucks. The second was that on-street parking would not be permitted along the relocated state highway. Finally, the ROW encroachments along the new highway would need to be removed, namely the cantilever of the parking structure at 6th Street. This would mean that the structure would need to be reconstructed or removed, with the latter being the more likely solution. With this conflict removed, there would be no need to shift the 6th Street intersection and thus Market Street would remain on alignment.

Two alternatives were examined for how to connect the existing Court Street to Market Street via a direct path, referred to in the study as the Court Street Connections. In one alternative conventional unsignalized intersections would be used in combination with a horizontal reverse curve set. The second alternative would include roundabouts at the new intersections and simple horizontal curves to connect down to Market Street.

In both cases, the introduction of two new intersections would result in reduced intersection spacing. This results in the need for movement restrictions to reduce the number of conflict points along the highway and avoid interaction between adjacent intersections. Also in both cases, lanes would need to be widened to accommodate wheel off-tracking for large trucks.

When comparing the two alternatives, the roundabout intersections appeared to be more desirable as it minimized the amount of turning movement restrictions, had the least amount of ROW impacts or building takings, and is expected to provide greater safety benefits over the conventional intersections

Preliminary opinions of cost were prepared for the two alternatives. Both included construction costs, right-of-way costs, design fees, and construction administration fees. The total for the roundabout alternative is anticipated to be $4.7 million dollars and for the conventional intersection option, $5.2 million dollars.

Summary

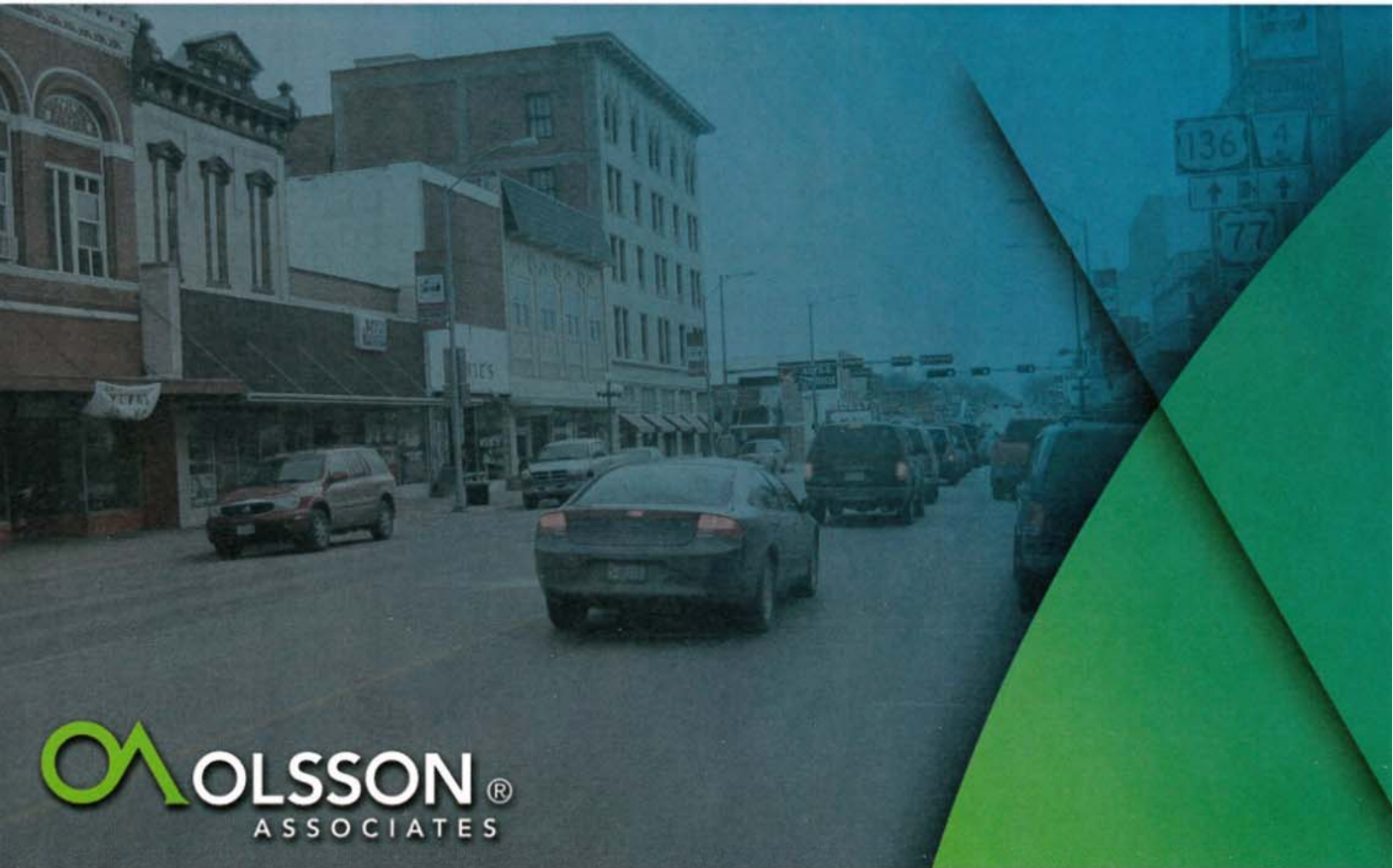
The result of this study is that there will be at least one feasible alternative for the highway relocation. Additionally, the following conclusions were made:

- Three potential environmental impacts were identified that would need resolution, but none were considered "red flags."
- It is considered desirable to find a way to remove the parking structure at 6th Street with the result being an intersection clear of obstructions.
- No parking would be permitted along the relocated highway and controlled access would need to be purchased.
- The whole of Market Street would need to be reconstructed.
- While both alternatives for the Court Street Connections were acceptable from a traffic and design perspective, the roundabout options offered slightly better traffic operations in the way of reduced queues and greater safety. It also will require fewer right-of-way impacts and is anticipated to be a lower construction cost than if conventional intersections were used.

Sincerely,

Christopher M. Rolling, PE, PTOE

2. Planning & Environmental Linkage Review



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TECHNICAL MEMO

TO:	Tobias Tempelmeyer James Burroughs, PE
FROM:	Brian Osborn, CHMM
RE:	Highway 136 Relocation Feasibility Study Planning and Environmental Linkage Review Beatrice, Nebraska
DATE:	May 19, 2014
PROJECT #:	013-1216
CC:	File

INTRODUCTION

The Beatrice Highway 136 Study has been grouped into two categories: Human Environmental Resources and Natural Environmental Resources. Environmental resources discussed below are being analyzed for future red flags if the project receives federal funding by way of the Surface Transportation Program. If federal funding does occur, the project would need to comply with the provisions of the National Environmental Policy Act (NEPA), including additional analyses and agency coordination.

HUMAN ENVIRONMENTAL RESOURCES

Human environmental resources were evaluated within the corridor study area. The study area is located along Highway 136 from 2nd Street to 8th Street. Streets included along the corridor study area are 3rd Street, 4th Street, 5th Street, 6th Street, and 7th Street. Analyzed data include socioeconomic data, environmental justice, general land use and zoning, Section 4(f)/6(f), historic sites, noise, hazardous materials, and utilities.

Socioeconomic Characteristics

Beatrice, Nebraska is located in Gage County. Based on the 2010 U.S. Census Bureau information, Beatrice is the 15th largest city in Nebraska with a population of 12,459, which is a decrease of 0.30 percent from the 2000 population of 12,496 (Census 2012).

The median age in Beatrice increased from 40 years in 2000 to 42.6 in 2010. Between year 2000 and year 2010, the 18 to 64 age group grew by 2.54 percent; the 5 to 17 age group decreased by 9.26 percent, and the 65 years and over age group decreased by 4.25 percent. Of the Beatrice population over 25 years of age, 89.3 percent are high school graduates and 20.1 percent are college graduates. The percent of high school graduates is higher than the national average of 78.2 percent (US Department of Education, 2013). The annual per capita and annual median family income for Beatrice residents is 39,215 respectively, (Census 2007-2011).

2120 South 72nd Street, Suite 1400
Omaha, NE 68124-6316
TEL 402.341.1116
FAX 402.341.5895
www.olssonassociates.com

Environmental Justice

Title VI of the Civil Rights Act ensures that individuals are not excluded from any program receiving Federal aid on the basis of race, color, national origin, age, sex, and disability (42 United States Code [U.S.C.] 2000d et seq.).

An assessment of low-income and minority population impacts was completed using U.S. Census Bureau data (Census 2010). Census Block Group data was analyzed to determine whether or not minority, vulnerable age, or low-income populations exist within the project area. The Census Tracts and Block Groups found within the project area are listed in Table 1. Based on the Census data, no populations in the study area would be considered Environmental Justice Populations.

Table 1: Environmental Justice

Census Tract	Block Group	Minority Population	Hispanic or Latino Population
Tract 9651	Block Group 1	7.5	1.5
Beatrice	N/A	3.9	2.2
Nebraska	N/A	13.9	9.2

The U.S. Census Bureau discontinued the collection of economic data following the decennial census in 2000. Economic data is collected for an area using the American Community Survey (ACS), which provides a representative analysis of economic indicators for areas as small as Census Tracts. Based on the ACS five-year average within the affected Census Tracts, the poverty levels in the last 2 years are 26.4 percent, compared to the poverty level of 14.8 percent for Beatrice and 12 percent for Nebraska. These areas may be considered an area of low income residents, and impacts to these areas may require further analysis if federal funding occurs.

Section 4(f)/6(f)

Section 4(f), of the U.S. Department of Transportation Act of 1966 has protection over publicly owned land of a park, recreation area, or wildlife and waterfowl or land of an historic site that would require use by a federally funded project. Section 6(f) of the 1965 Land and Water Conservation Fund Act (LWCFA) (16 USC 4601-4) provides funding for acquiring property and developing public recreational facilities, and also protects the loss of that property to other uses.

Reviews of zoning and subdivision maps show no parks or 6(f) properties within the study area.

Utilities

The following companies provide utilities to the project area:

- Charter Communications– telecommunications, cable television, internet
- Time Warner – telecommunications, cable television, internet
- City of Beatrice – electric
- City of Beatrice – water
- City of Beatrice – wastewater, sewer, and garbage

Utility plans should be completed and approved before construction begins. Advanced notice should be given to service providers if service disruption is probable.

Noise

Noise regulations have been developed to provide procedures for noise studies and abatement measures for informing the public and local officials for highway projects under Title 23 CFR Part 772.

The direct noise receptors along the project corridor are made up of commercial development. The existing noise environment is characterized by vehicular traffic and noises typical to an urban area. The project impacts on noise levels would come from construction activities and any changes in vehicle mix or speed, or changes in horizontal or vertical alignment of roads. Proposed activities that modify the existing transportation network in a way that may adversely impact noise receptors would require a noise study during the NEPA process to evaluate potential impacts and mitigation measures.

Cultural Resources

Cultural resources (archaeological and historical sites and structures) must be examined according to Section 106 of the National Historic Preservation Act (NHPA) and implementing regulations at 36 CFR 800, Protection of Historic Properties, in addition to review under NEPA.

Native American resources must be evaluated according to the Department of Defense American Indian and Alaska Native Policy, which establishes principles for interacting or working with federally-recognized American Indian and Alaska Native governments.

A review of historic properties listed by the Nebraska State Historic website was completed for the study area. No registered historic places were found within the project study area, however, the Burlington Northern Depot and associated railroad track is adjacent to the west boundaries of the study area. The Beatrice Municipal Auditorium is located 480 feet north of the project area on 4th Street, the Beatrice City Library is located approximately 560 feet north of Highway 136 on 5th Street, and the Paddock Hotel is located approximately 200 feet north of Highway 136 on 6th Street. These areas would require coordination with Nebraska's State Historic office to determine if impacts to the historic sites are possible if the project receives federal funding. A majority of the study area has been previously developed, including excavation and placement of fill for the construction of roads, buildings, and other infrastructure. The potential for unknown archaeological resources to be present within the study area is low.

Hazardous Materials

In accordance with FHWA guidance, the potential for highway projects to impact hazardous material sites must be evaluated, as well as the potential for a hazardous materials site to impact the highway project.

Readily available data sources were searched to identify facilities located within one-quarter mile of the study area.

The following table shows the number of facilities identified within one-quarter mile of the study area. The map attached to this document shows the location of each facility, corresponding to the Map ID Number in **Table 2**.

Table 2: Potential hazardous materials locations.

Agency - Program	Number of Facilities Within ¼ Mile	Facility Map ID Numbers
NDEQ IMS – LUST	20	6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 20, 21, 27, 30, 31, 34, 39, 41, 42
NDEQ IMS - RA	7	11, 16, 19, 24, 29, 34, 35
NDEQ – RCRA	15	3, 5, 6, 8, 13, 14, 16, 25, 28, 32, 33, 34, 35, 36, 37
NDEQ – Superfund	1	7
NDEQ – TL3	14	1, 2, 16, 16, 20, 22, 23, 24, 30, 31, 33, 38, 40, 41
NDEQ – Brownfields	7	4, 6, 7, 14, 16, 26, 31
NDEQ – IWM	4	11, 14, 33, 38
EPA – Superfund (CERCLIS)	1	7
EPA – RCRA	21	6, 13, 14, 16, 25, 28, 32, 33, 34, 35, 36, 37, 43, 44, 45, 48, 49
EPA – BF	6	4, 14, 16, 26, 31, 51
NRC	1	29
UST	22	6, 8, 10, 11, 12, 13, 16, 17, 18, 21, 27, 30, 34, 39, 51, 52, 53, 54, 55, 56, 57, 58

As the project moves forward, a more detailed review of hazardous materials records should be completed. If there is the potential for hazardous materials to occur in the project corridor that could be encountered during construction, then additional work would be completed. If the soil and/or groundwater that will be encountered during construction are suspected to be contaminated, an additional investigation should be completed to characterize and delineate contamination in any areas of concern along the corridor.

NATURAL ENVIRONMENTAL RESOURCES

Wetlands and Floodplains

The USACE has jurisdiction over all waters of the U.S. and is the regulatory authority for decisions regarding the occurrence of wetlands and other waters of the U.S. within the project area. Discharges of dredged or fill materials in waters of the U.S., including wetlands, require prior authorization from the USACE under Section 404 of the Clean Water Act (33 USC 1344).

According to the USFWS National Wetland Inventory (NWI) Map, there are no wetlands within the study area. The nearest wetland is located less than 0.25 mile southwest of the western limits of the study area. The Big Blue River is located adjacent to the west limit of the study area.

Floodplains are identified on Flood Insurance Rate Maps published by the Federal Management Agency (FEMA). Construction must comply with FEMA and county regulations. A 100-year floodplain is located in the western portion of the project area just outside of the project footprint. These zone AE floodplains are associated with Big Blue River. See attached Floodplain Map.

Threatened and Endangered Species

The Endangered Species Act (16 U.S.C. - 1531 to 1544) requires federal agencies to determine the effects of their actions on Federally-listed threatened and endangered species of fish, wildlife, and plants, and their critical habitats. A list of threatened and endangered species in Gage County can be found in Table 1 below.

Table 3: Threatened and Endangered Species for Gage County

Common Name	Scientific Name	Federal Status	State Status	Project Impacts
Plants				
Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Threatened	Not likely
Animals				
Golden Eagle	*Aquila chrysaetos*	Threatened	Threatened	Not likely
Gray Wolf	*Canis lupus*	Endangered	Not Listed	Not likely
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	Threatened	Not likely
Massasauga	*Sistrurus catenatus*	Not Listed	Threatened	Not likely

Migratory Birds

Under the MBTA, construction activities that would result in the taking of migratory birds, eggs, young, and active nests should be avoided. Although the provisions of the MBTA are applicable year-round, most migratory bird nesting activity in Nebraska occurs during 1 April to 15 July. However, some migratory birds are known to nest outside of the aforementioned primary nesting season, including raptors which nest from 1 January to 31 July. If tree or removal occurs during the nesting season, a bird nesting survey would be required.

Water Quality and Water Resources

The NDEQ is responsible for administering Clean Water Act Section 401 Water Quality Certification for any project requiring a Federal permit or license that includes a discharge into a Water of the State. The NDEQ is the responsible agency for issuing NPDES permits in Nebraska. All projects that are greater than 1 acres of soil disturbance must prepare a Storm Water Pollution Prevention Plan (SWPPP).

Farmland

The Federal Farmland Protection Policy Act (FPPA) was enacted to minimize the unnecessary conversion of farmland to nonagricultural uses as a result of Federal actions. The study area is located within an urban portion of Beatrice, and no prime farmland impacts are anticipated.

Conclusions

Based on a review of available resources, no potential "red flags" have been identified within the study area. Red flags are potential issues that may lead to a more complex NEPA evaluation (EA or EIS) if federal funding is obtained in the future. We anticipate this project would likely proceed as a Categorical Exclusion.

Although not considered red flags, several resources were identified that would require additional evaluation if federal funding is utilized for this project. These resources include:

- Environmental Justice – Low-income populations were identified within the study area. Evaluation of whether the project would disproportionately impact these populations would be required. We don't anticipate disproportionate adverse impacts to low-income populations would result; however, additional detail would be required for this analysis.
- Cultural Resources – Multiple historic properties were located near the study area. Coordination with SHPO would be required to determine if the project would adversely impact these properties. Based on the scope of the project and the location of the resources relative to construction activities, the likelihood of adverse to cultural resources is low.
- Hazardous Materials – Several sites were identified within the area that may potentially result in contamination within the study area. Additional evaluation of these sites would be required to determine if any potential hazardous wastes or contamination is present that would have to be evaluated.

2120 South 72nd Street, Suite 1400
Omaha, NE 68124-6316
TEL 402.341.1116
FAX 402.341.5895
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References:

23 CFR 772. Procedures for Abatement of Highway Traffic Noise and Construction Noise.
23 CFR 774. Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites (Section 4(f)).
36 CFR 800. Protection of Historic Properties.
40 CFR 1500-1508. National Environmental Policy Act.
40 CFR 261. Subpart C. Identification and Listing of Hazardous Waste - Characteristics of Hazardous Waste.
43 CFR 10. Native American Graves Protection and Repatriation.
16 U.S.C. 661-667e. Fish and Wildlife Coordination Act.
16 U.S.C. 703-712. Migratory Bird Treaty Act.
16 U.S.C. 1531-1544. Endangered Species Act. .
49 U.S.C. 303[c]. Policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites.
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Executive Order 11988, Floodplain Management, 42 FR 26951. May 24, 1977.
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CC: File

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Omaha, NE 68124-6316
TEL 402.341.1116
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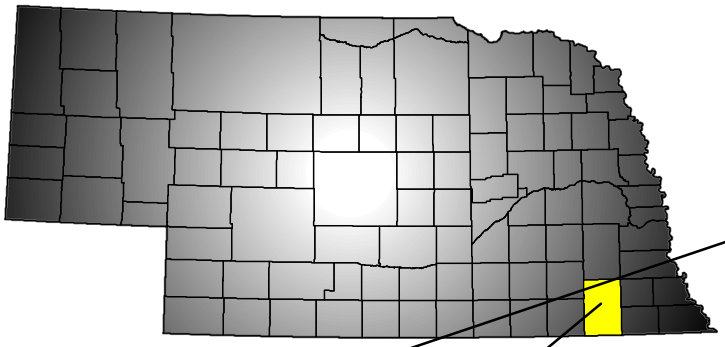
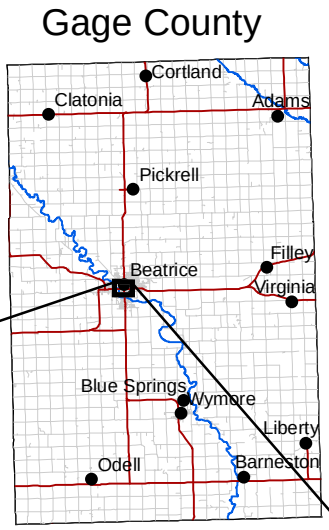
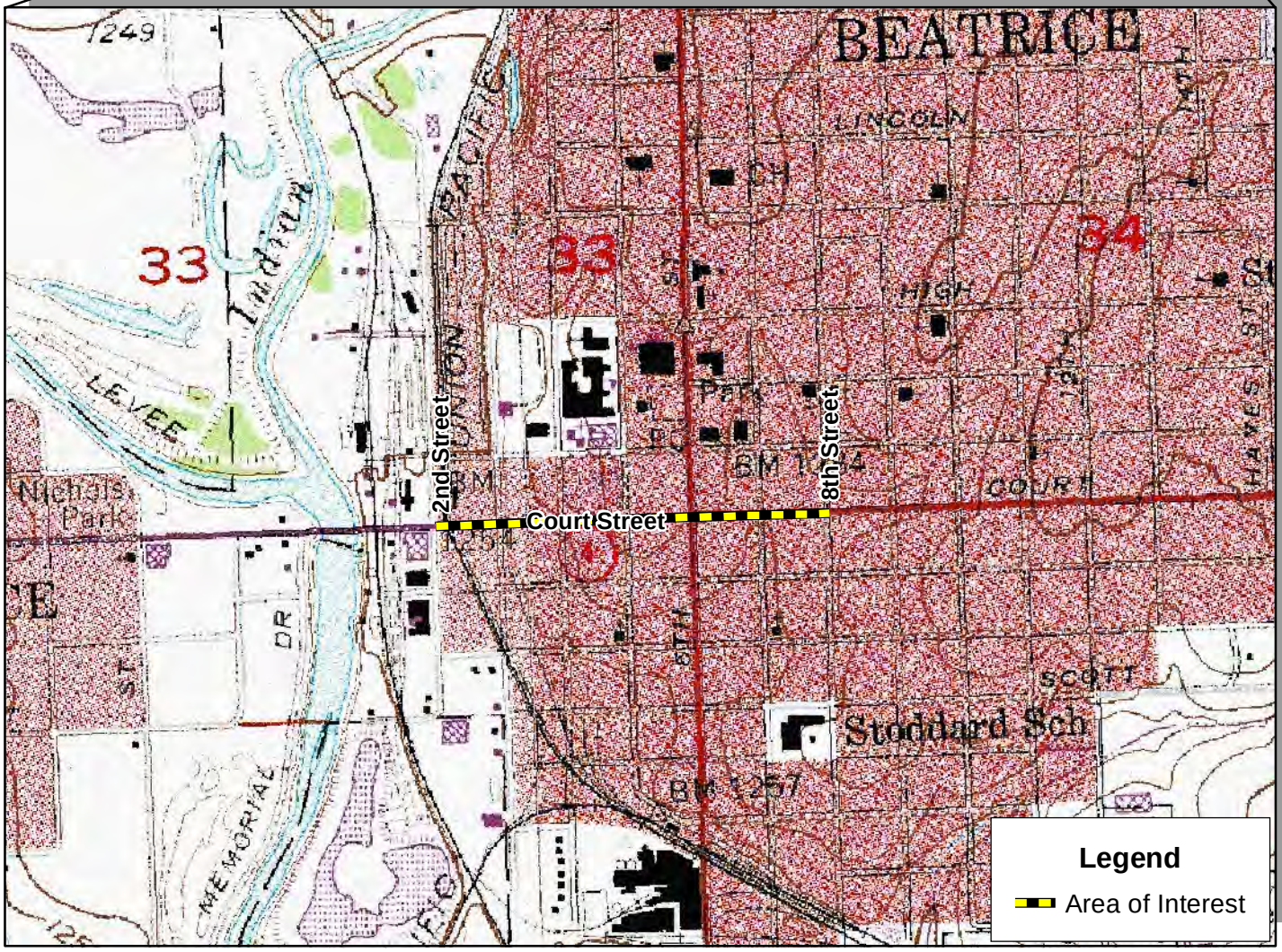
Attachments







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Data Source: USGS 7.5 Minute Topographic Map, Gage County Mosaic

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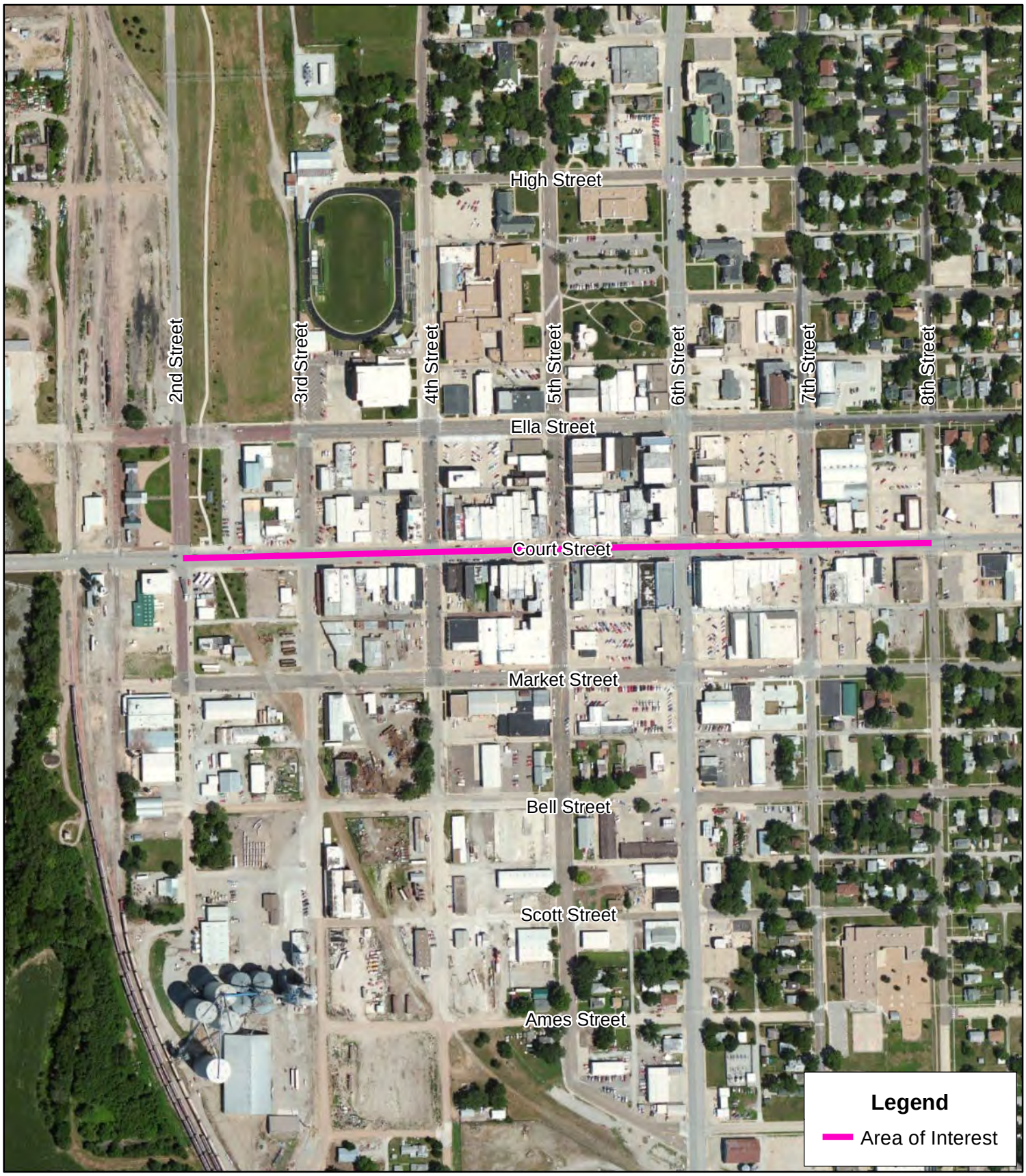
Beatrice PLE
OLSSON Project No. 013-1216
Gage County, Nebraska
Location Map
Figure 1



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Beatrice PLE
OLSSON Project No. 013-1216
Gage County, Nebraska
Site Map
Figure 2

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Beatrice PLE
OLSSON Project No. 013-1216
Gage County, Nebraska
NWI Map
Figure 3

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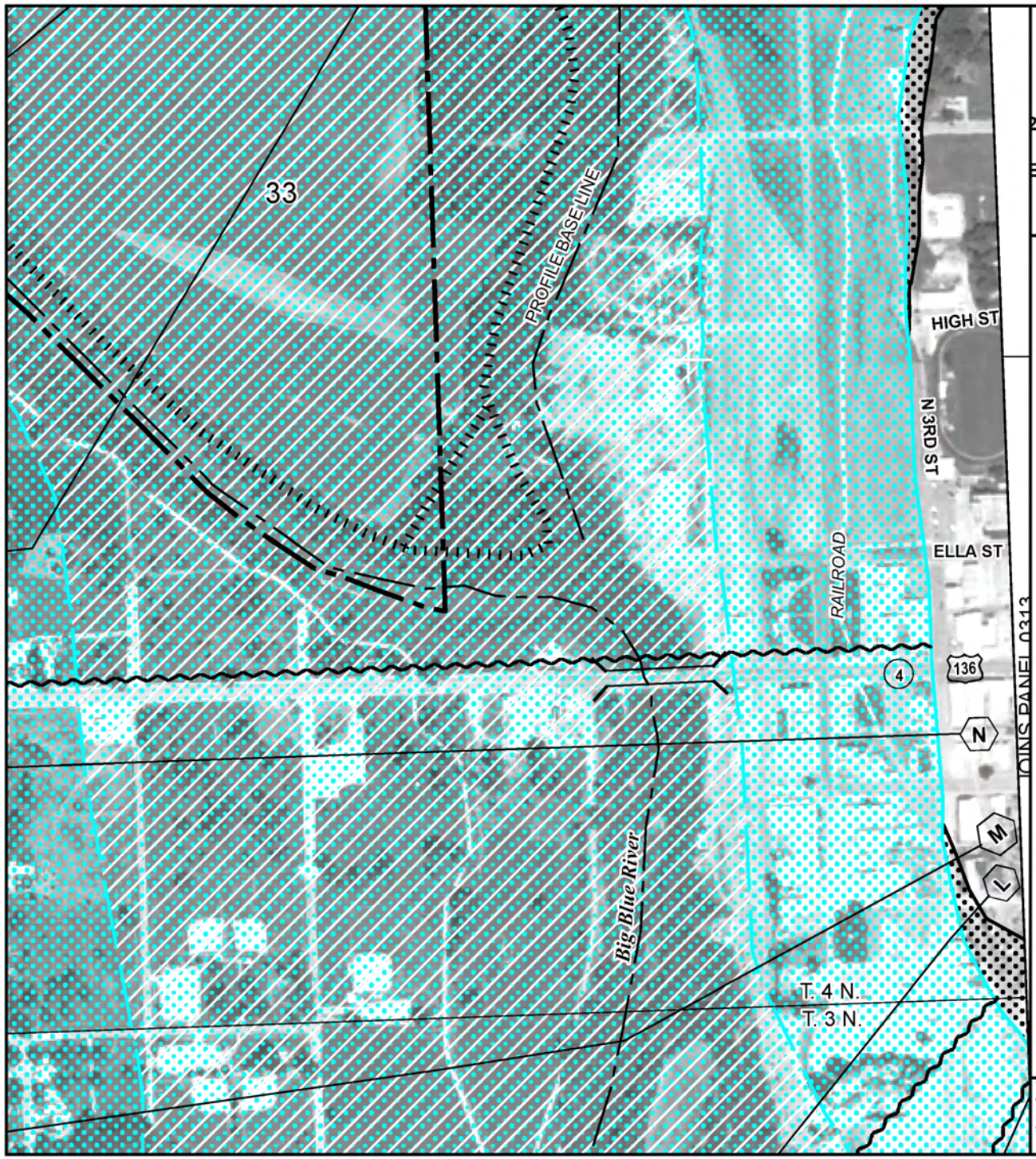
PROJECT: 013-1216	ENVIRONMENTAL FACILITY LOCATION MAP Highway 136 Relocation 2nd Street to 8th Street Beatrice, Nebraska	
DRAWN BY: CH		
DATE: August 01, 2013		



MAP SCALE 1" = 500'

250 0 500 1000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0294C

FIRM

FLOOD INSURANCE RATE MAP

GAGE COUNTY, NEBRASKA AND INCORPORATED AREAS

PANEL 294 OF 625

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEATRICE, CITY OF	310091	0294	C
GAGE COUNTY	310088	0294	C

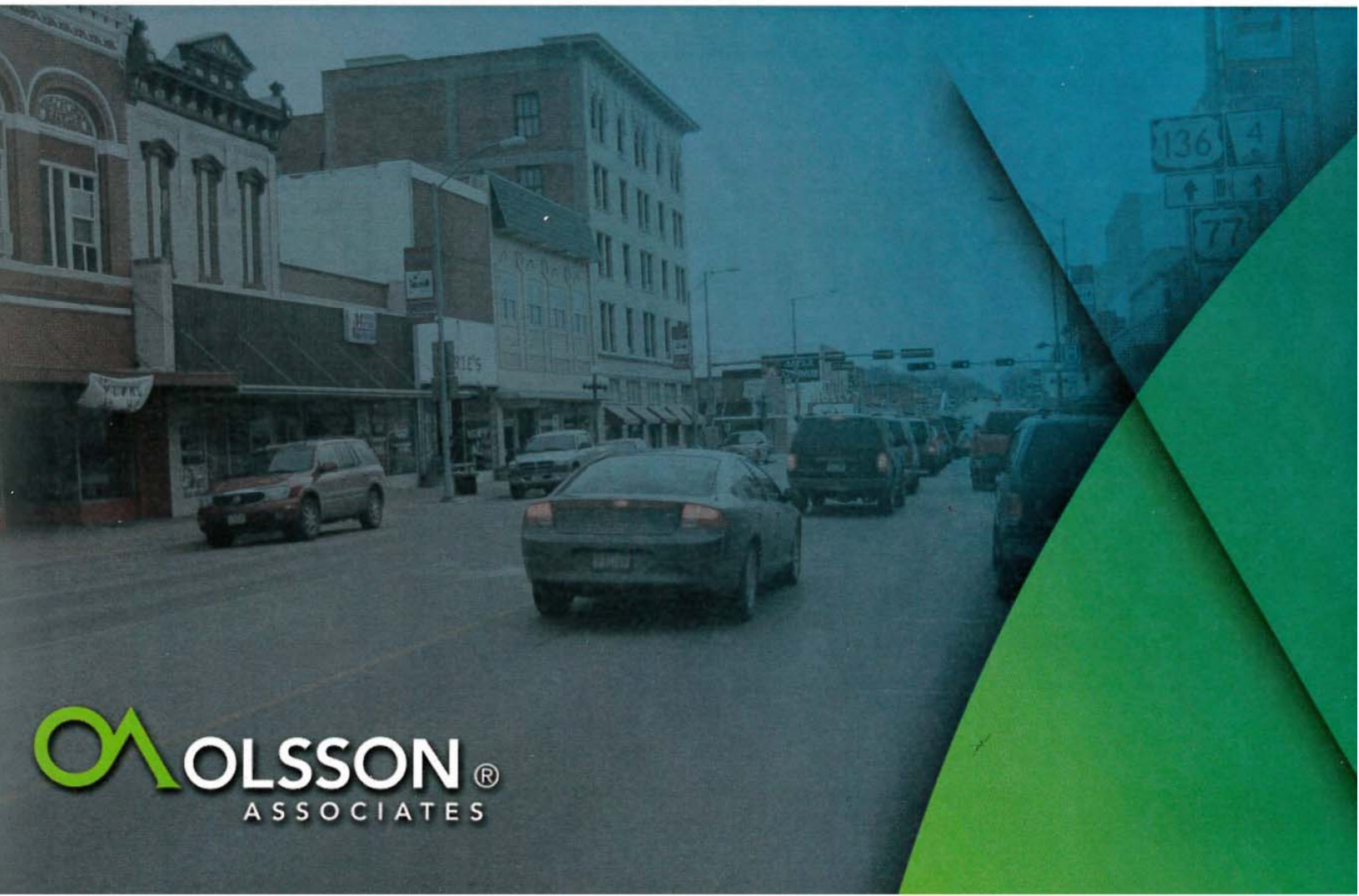
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
31067C0294C

EFFECTIVE DATE
JUNE 18, 2010

Federal Emergency Management Agency

3. Alternatives Analysis



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HIGHWAY 136 RELOCATION
2ND STREET TO 8TH STREET
BEATRICE, NEBRASKA

ALTERNATIVES ANALYSIS

PREPARED FOR

City of Beatrice

MAY 2014

OA PROJECT NO. 013-1216

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1.0 INTRODUCTION AND OBJECTIVE

This report documents the results of an alternatives analysis conducted for the proposed realignment of Highway 136 from the intersection of 2nd Street & Court Street to the intersection of 8th Street & Court Street, in Beatrice, Nebraska. A map showing the general location of the study area is illustrated in **Figure 1**.

A purpose of the analysis summarized in this report was to determine the changes to traffic patterns as a result of realigning Highway 136 and the Highway 136 truck route through downtown Beatrice. The knowledge of the new traffic patterns will be used to determine the future roadway geometrics of Highway 136, including two transitions on either side of downtown. Two realignment alternatives were analyzed to determine potential impacts to the surrounding roadway infrastructure:

- Realignment Alternative 1 – Reverse Curve Transitions
- Realignment Alternative 2 – Roundabout Transitions

In addition to identifying the potential traffic impacts associated with each alternative, recommendations are made at the end of this report that discuss the feasibility of each alternative. Recommendations include geometric improvements and changes to traffic control that provide acceptable traffic operations.

2.0 DATA COLLECTION

The data collection effort included conducting peak hour turning movement counts, collecting average daily traffic (ADT) volume counts and documentation of current roadway geometrics and traffic control.

2.1 Peak Hour Turning Movement Counts

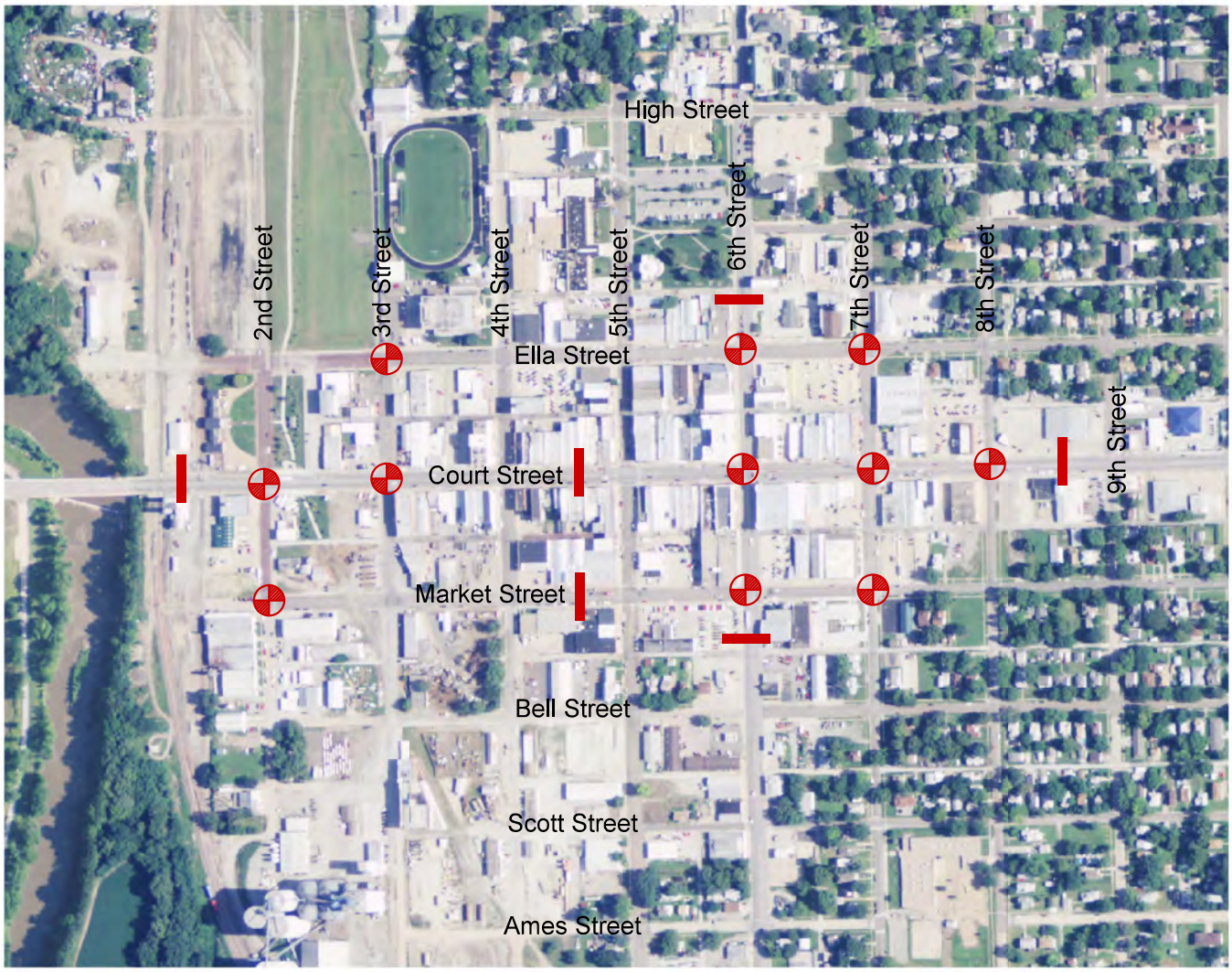
The City of Beatrice Board of Public Works (BPW) collected intersection turning movement counts in May 2013. The counts were conducted during the AM, NOON, and PM peak periods of traffic flow (7:00am – 9:00am, 11:00am – 1:00pm, and 4:00pm – 6:00pm). The peak hour counts included heavy vehicle documentation at all count locations. These volumes were collected for use in capacity analyses and projection of future traffic patterns. Study intersections include the following:

- 2nd Street & Court Street
- 2nd Street & Market Street
- 3rd Street & Ella Street
- 3rd Street & Court Street
- 6th Street & Ella Street
- 6th Street & Court Street
- 6th Street & Market Street
- 7th Street & Ella Street
- 7th Street & Court Street
- 7th Street & Market Street
- 8th Street & Court Street

LEGEND

- Study Intersection
- 24-Hour Count Location
- Site

NTS



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OLSSON ASSOCIATES

Vicinity Map

FIGURE
1

2.2 Average Daily Traffic (ADT) Volumes

Olsson Associates (OA) collected ADT counts at six locations throughout the study area. These traffic volumes were essential in determining the daily utilization of the study corridors and served as a basis for projecting and modeling future conditions. The locations where existing 24-hour counts were performed are shown in **Figure 1**.

2.3 Field Review of Street Geometrics

OA documented cross-section measurements and turn bay storage lengths on each leg of the existing study intersections. The existing pavement markings, lane widths, and general roadway geometrics were documented as well. To aid in the development of recommendations, a photographic inventory and field sketches of the study intersection were included as part of the data collection task.

3.0 EXISTING TRAFFIC CONDITIONS

Existing traffic conditions were evaluated to identify any existing operational deficiencies and to provide a baseline for comparison purposes.

3.1 Network Characteristics

There are eight roadways within the study area; 2nd Street, 3rd Street, 6th Street, 7th Street, 8th Street, Court Street, Ella Street, and Market Street. Current network characteristics are summarized in **Table 1** below. Data in this table was acquired from field observation, aerial photography, and the Nebraska Department of Roads (NDOR) Federal Functional Classification Map.

TABLE 1: EXISTING NETWORK SUMMARY

Roadway	Section	Median Type	Posted Speed	Functional Classification	Travel Direction
Court Street	3-Lane	TWLTL	25 mph	Urban Principal Arterial	Two-way
Ella Street	3-Lane	n/a	25 mph	Urban Collector/ Local	One-way (WB)
Market Street	3-Lane	n/a	25 mph	Urban Collector/ Local	One-way (EB)
2nd Street	2-Lane	n/a	25 mph	Urban Collector	One-way (SB)
3rd Street	2-Lane	n/a	25 mph	Local	Two-way*
6th Street	4-Lane	Undivided	25 mph	Urban Principal Arterial	Two-way
7th Street	3-Lane	n/a	25 mph	Urban Collector	One-way (NB)
8th Street	2-Lane	Undivided	25 mph	Urban Collector	Two-way

*One-way SB North of Court Street

The study network contains two principal arterials that currently pass through the Beatrice central business district; Highway 136 (Court Street) and US Highway 77 (6th Street). US Highway 77 serves interregional trips and freight routes. The highway originates in southern Texas and passes through Beatrice and Lincoln before ending in Sioux City, Iowa. It is the primary north-south corridor through Beatrice carrying approximately 13,000 vehicles per day (vpd) (6% heavy trucks) within the study area. US 77 is on the National Highway System.

US Highway 136 similarly is regional highway, originating in central Nebraska, passing through Beatrice, and ultimately terminating in Indiana. It also serves regional and interregional passenger trips and interregional freight routes. Through the study area, the roadway carries between 8,000 vpd and 13,000 vpd (4% heavy trucks). The highway is on the National Highway System.

There is currently an independent truck route for Highway 136 as it passes through the downtown central business district. The eastbound route diverts from Court Street to Market Street at 2nd Street and rejoins Court Street at 7th Street. The westbound route diverts from Court Street to Ella Street at 7th Street and rejoins Court Street at 3rd Street.

The intersections of 6th Street & Court Street, 6th Street & Ella Street, 6th Street & Market Street, 7th Street & Court Street, 7th Street & Ella, 8th Street & Court Street are currently signalized. All other study area intersections are currently unsignalized. The existing lane configurations and traffic control for the existing study intersections are illustrated in **Figure 2**. Existing peak hour turning-movement and ADT volumes are illustrated in **Figure 3**.

3.2 Existing Conditions Capacity Analysis

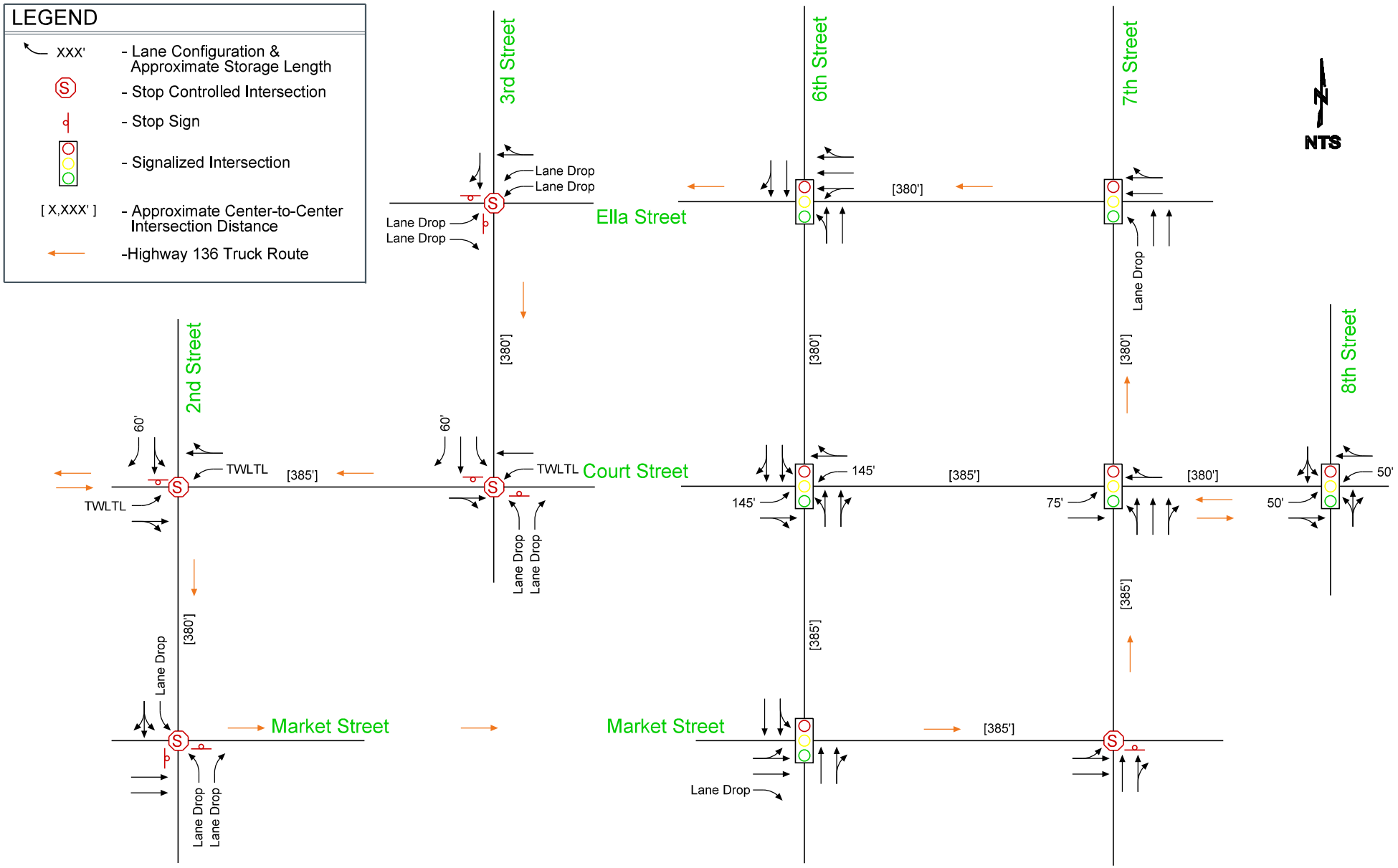
Capacity analyses were performed for all of the study intersections utilizing the existing lane configurations and traffic control. Analyses for stop-controlled intersections in the proposed conditions were conducted using Synchro, Version 8.0 which is based on the Highway Capacity Manual (HCM) delay methodologies. For simplicity, the amount of control delay is equated to a grade or Level of Service (LOS) based on thresholds of driver acceptance. The amount of delay is assigned a letter grade A through F, LOS A representing little or no delay and LOS F representing very high delay. **Table 2** shows the delays associated with each LOS grade for unsignalized and signalized intersections.

TABLE 2: INTERSECTION LOS CRITERIA

Level-of-Service	Average Control Delay	
	Signalized	Unsignalized
A	≤ 10	≤ 10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80
Highway Capacity Manual (HCM 2010)		

Analyses results indicate that all study intersections and all individual movements operate at a LOS C or better and all 95th percentile queue lengths are acceptable during the AM, NOON, and PM peak periods.

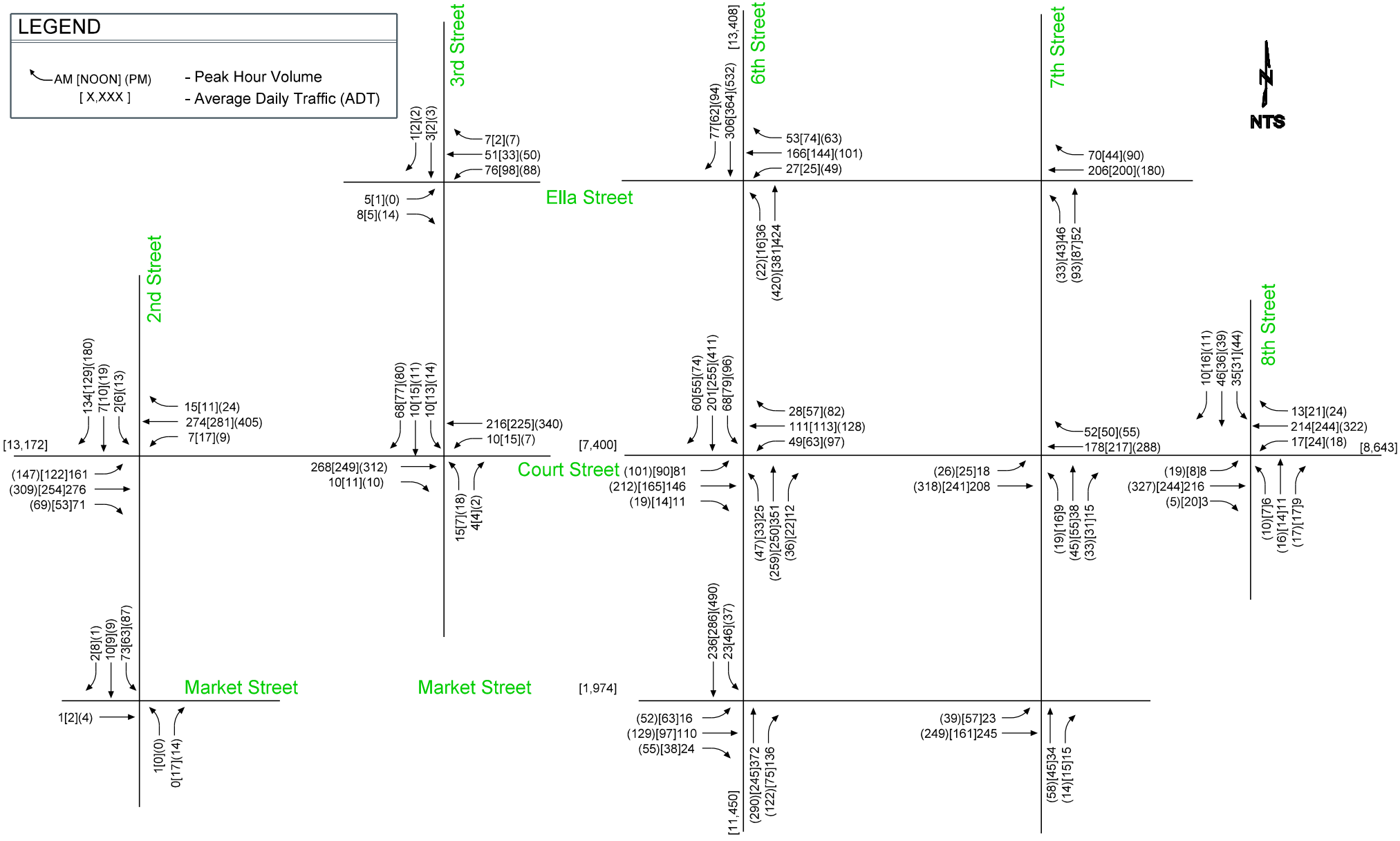
The existing conditions capacity analyses results are illustrated in **Figure 4**. Detailed capacity analyses results are contained in **Appendix A**.



Existing Lane Configurations and Traffic Control

FIGURE 2

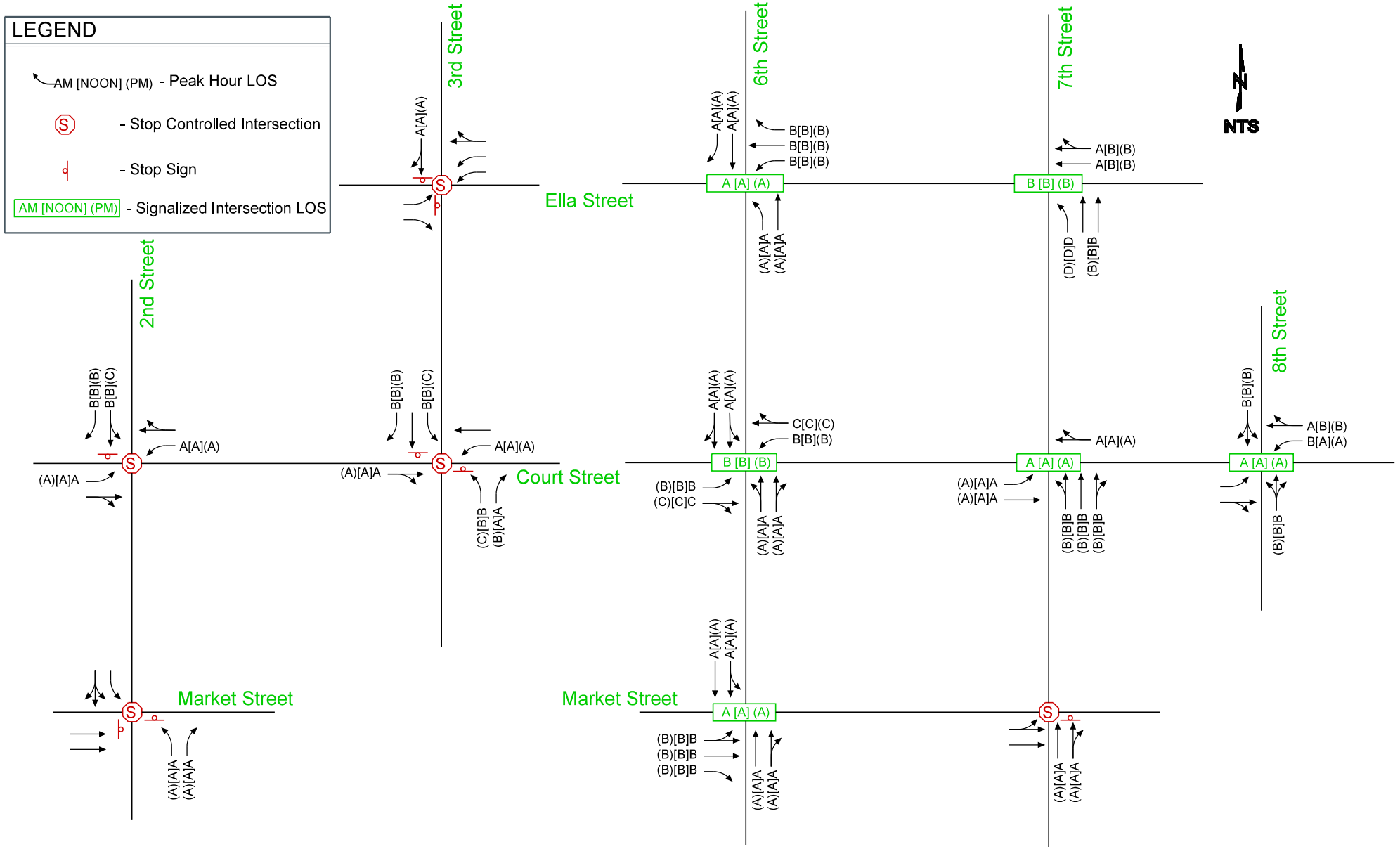
City of Beatrice
Beatrice, NE



OLSSON ASSOCIATES

Existing Peak Hour Volumes

FIGURE
3



OLSSON ASSOCIATES

Existing Capacity Analysis Summary

FIGURE 4

4.0 CRASH ANALYSIS

The Nebraska Department of Roads (NDOR) provided three years of crash data for roadways within the study network. A total of 61 crashes involving multiple vehicles and 16 crashes involving a single vehicle were reported between January 1, 2010 and December 31, 2012. Of these, the most frequent crash type was angle crashes representing approximately 29 percent of the total. Among all crashes, none resulted in fatalities, 17 were injury crashes, 38 resulted in property damage only, and 22 had an unreportable level of damage.

Crash rates for each of the study intersections were calculated using crash history provided by NDOR and traffic volumes counted for this study. The intersection crash rates and breakdown by severity are illustrated in **Table 3.** The types of crashes at the intersections are illustrated in **Table 4**. Crash data was provided for the intersections of Court Street & BNSFRR-E, 4th Street & Court Street, and 5th Street & Court Street. These intersections were not part of the study network; however the crash data was included in the tables to note any possible trends. No crash rates were calculated for these intersections as current traffic volume data was not available.

TABLE 3: CRASH DATA FOR NETWORK INTERSECTIONS

Intersection	2013 ADT	Total Crashes	Crash Rates	INJ	PDO	N-R
2nd & Court Street	14,300	3	0.19	-	2	1
2nd & Market Street	1,400	1	0.65	-	1	-
3rd & Court Street	9,700	2	0.19	-	1	-
3rd & Market Street	2,000	0	0.00	-	-	-
6th & Court Street	19,000	19	0.91	6	9	4
6th & Ella Street	16,200	7	0.39	4	-	3
6th & Market Street	14,300	7	0.45	2	3	2
7th & Court Street	9,900	1	0.09	-	-	1
7th & Ella Street	4,800	2	0.38	1	1	-
7th & Market Street	4,400	4	0.83	-	1	-
8th & Court Street	10,400	3	0.26	1	1	1
Court & BNSFRR-E	n/a	4	n/a	1	3	-
4th & Court	n/a	1	n/a	1	-	-
5th & Court	n/a	3	n/a	-	1	2

There were four crashes at the railroad crossing within the three year period. All crashes were rear-end crashes with only one injury crash (INJ-C).

TABLE 4: TYPES OF CRASHES FOR NETWORK INTERSECTIONS

Intersection	Left Turn Leaving	Angle	Side-Swipe	Rear-End	Parked Motor Vehicle	Bicycle/ Ped.	Other Fixed Object
2nd & Court Street	-	1	1	1	-	-	-
2nd & Market Street	-	-	1	-	-	-	-
3rd & Court Street	-	1	1	-	-	-	-
3rd & Market Street	-	-	-	-	-	-	-
6th & Court Street	6	6	2	2	1	1	1
6th & Ella Street	1	4	1	-	1	-	-
6th & Market Street	1	4	-	2	-	-	-
7th & Court Street	-	-	1	-	-	-	-
7th & Ella Street	-	1	-	-	-	1	-
7th & Market Street	2	1	1	-	-	-	-
8th & Court Street	-	2	-	1	-	-	-
Court & BNSFRR-E	-	-	-	4	-	-	-
4th & Court	-	-	-	-	-	1	-
5th & Court	-	-	1	1	1	-	-

A total of 19 crashes occurred at or near the intersection of 6th Street & Court Street. Of these, 6 were left turn leaving collisions and 6 were angle collisions. These patterns can be related to the lack of NB/SB left-turn lanes. This is likely the result of drivers feeling rushed to turn because they do not have refuge and thus being more apt to take inadequate gaps. Because left-turning vehicles are not lined up head-to-head, there is the potential for a left turning vehicle to not have clear sight distance. While the intersection shows a trend in types of crashes, the intersection crash rate does not indicate an extraordinary number of crashes at the intersection.

Many crashes within the study area occurred at intersections. However, the segment of Court Street between 4th Street and 7th Street did show 11 crashes within the three year period, all of which were PDO. These crashes were mostly side swipes or vehicles hitting roadside objects. This is likely a result of the highway traffic passing through the local downtown area, which involves interacting cars entering or exiting parking spaces and a higher concentration of roadside obstacles within the clear zone.

Crash data provided by NDOR is included in **Appendix B.**

5.0 TRAFFIC FORECASTING

Future year (2035) traffic volume projections were developed and provided by the NDOR and were used to determine background traffic volumes along the study area corridors and at intersections. The study of these future traffic volumes will help identify network deficiencies and facilitate the planning of future roadway improvement needs. The following sections provide a summary of the future traffic projections and analyses.

5.1 Future Roadway Network

Modifications to the roadway network included changing the Highway 136 designation from Court Street to Market Street between 2nd Street to 8th Street, and conversion of all one-way streets to two-way. The truck route would also be eliminated, allowing trucks to use the realigned highway. A cursory review of turning movement volumes indicated that many intersections within the study area were not expected to meet volume-based traffic signal warrants. As such, all intersections within the study area except for those along 6th Street were analyzed as unsignalized intersections.

The construction of the transitions that divert Highway 136 introduces two additional intersections and impacts multiple others within the study network. A more detailed description of access control as it relates to intersection spacing is included in following sections, but it is worth noting that some movements were eliminated at intersections within the study area in an attempt to minimize conflict points along the proposed relocated highway alignment. These modifications vary between the two alternatives, resulting in slightly different traffic volume scenarios.

Realignment Alternative 1 and Realignment Alternative 2 Lane Configurations and Traffic Control are shown in **Figure 5** and **Figure 6**, respectively.

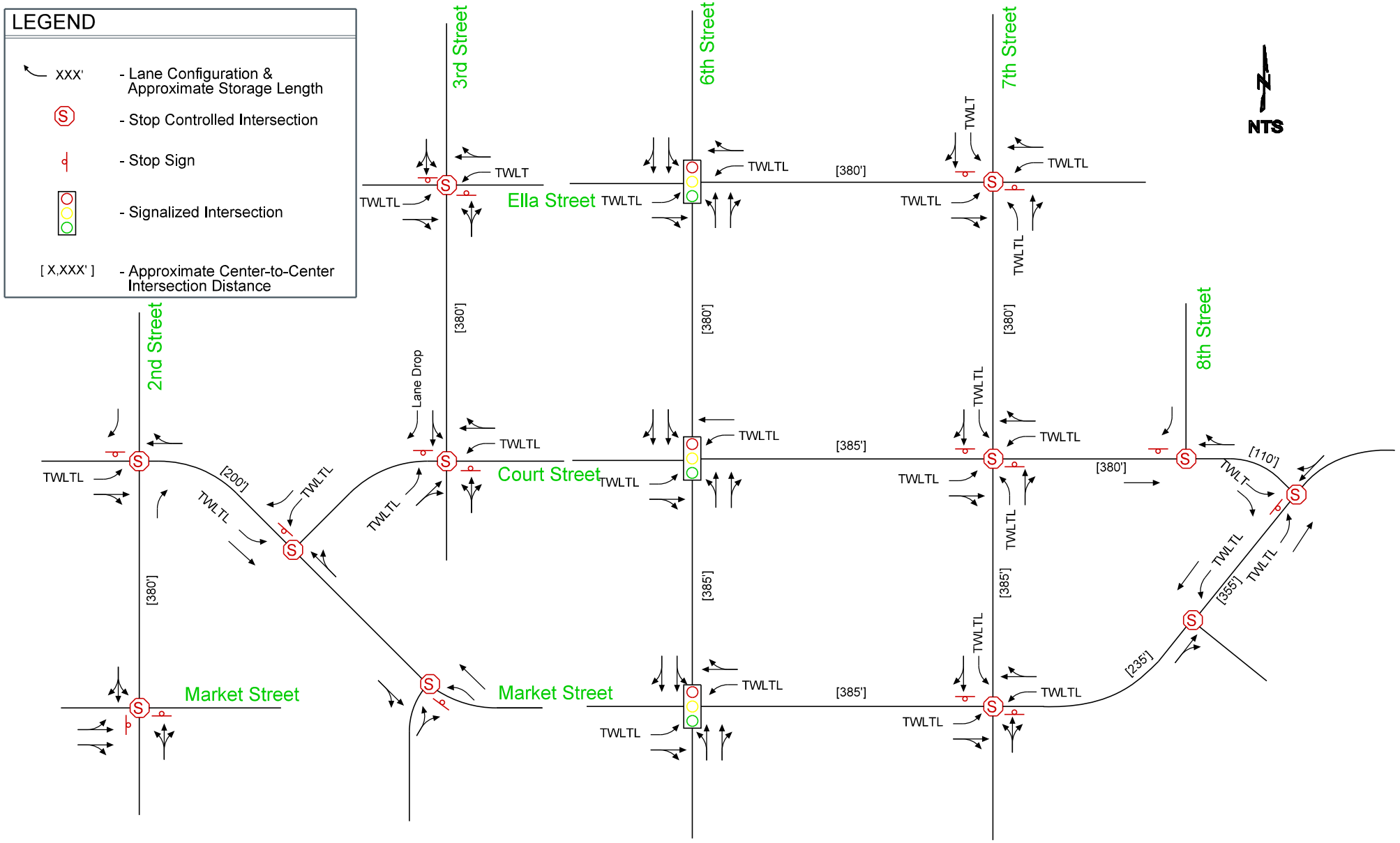
5.2 Traffic Projections

NDOR provided future 2035 traffic volumes for the intersection of 6th Street & Court Street. These volumes showed a half percent annual growth rate along 6th Street and no growth along Court Street. Recent trends in traffic volumes actually show a decrease along Court Street. As such, no growth was assumed for roadways within the study area other than 6th Street. Projected traffic volumes provided by NDOR may be found in **Appendix B**.

With the modified network, it was necessary to reassign volumes within the network. Similar to a screenline procedure, attention was given to maintaining entering and exiting volumes at the study area boundary with the proposed realignment. Consideration was also given of the availability of more direct routes as a result of the two-way conversion. No roadways were expected to approach their respective capacities, so traffic reassignment was performed primarily considering the most direct routes through the network, the relative distribution of existing traffic along corridors, and engineering judgment. In the existing conditions, approximately 60 percent of east-west volume uses Court Street with the remaining traffic is spilt relatively evenly between Ella Street and Market Street.

After reassigning traffic, approximately half of the total east-west traffic volume was assigned to Market Street to account for trucks and trips passing through Beatrice using the more attractive Market Street route. The remaining traffic was split approximately evenly between Ella Street and Market Street. The projected turning movement volumes were then reassigned to the roadway network using the modified network geometry. Side street volumes were distributed using the existing turning volumes as a guide and making adjustments for the two-way conversions. Peak Hour Volumes for each alternative are shown in **Figure 7** and **Figure 8**.

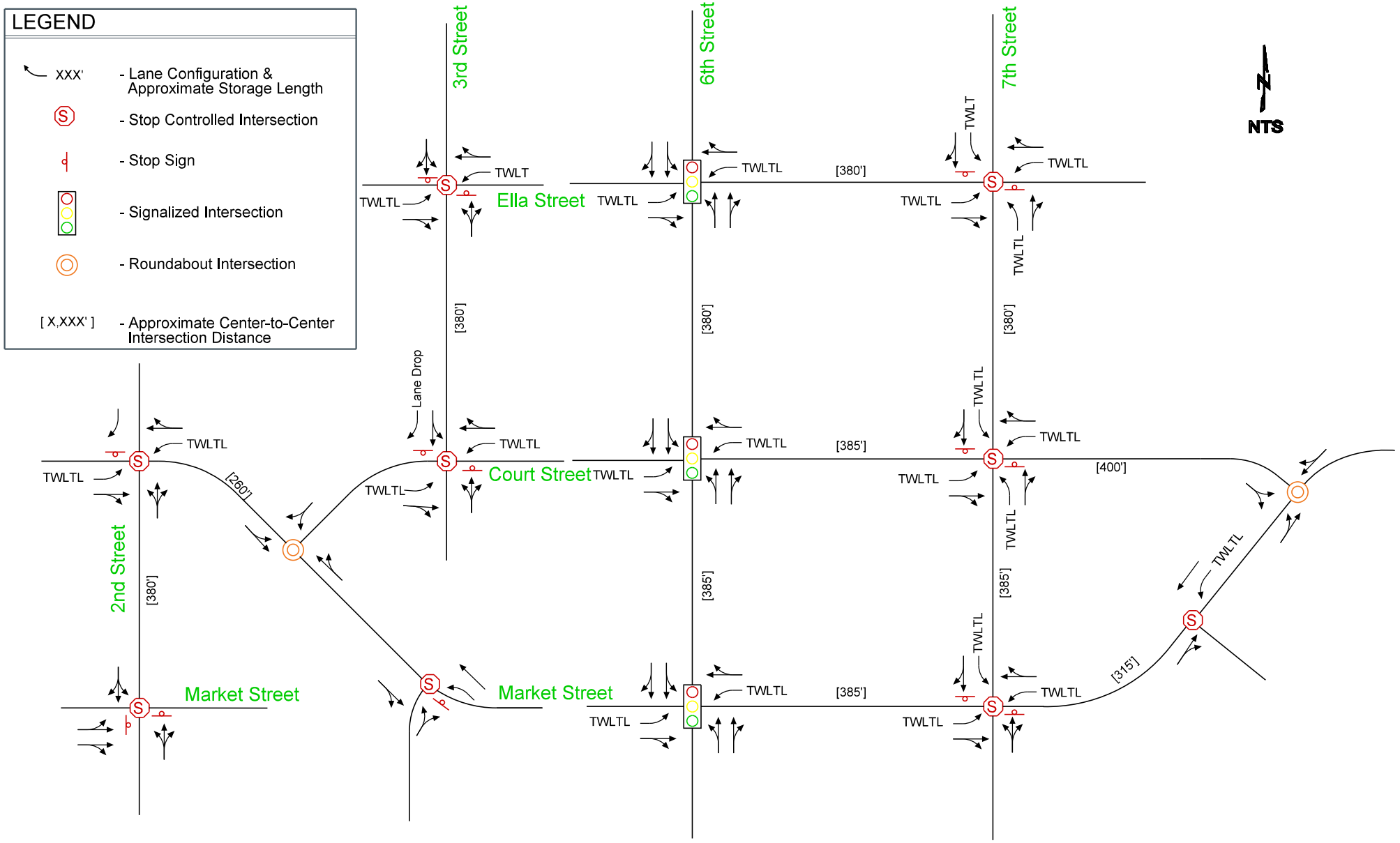
City of Beatrice
Beatrice, NE



OLSSON ASSOCIATES

Realignment Alternative 1 Lane Configuration and Traffic Control

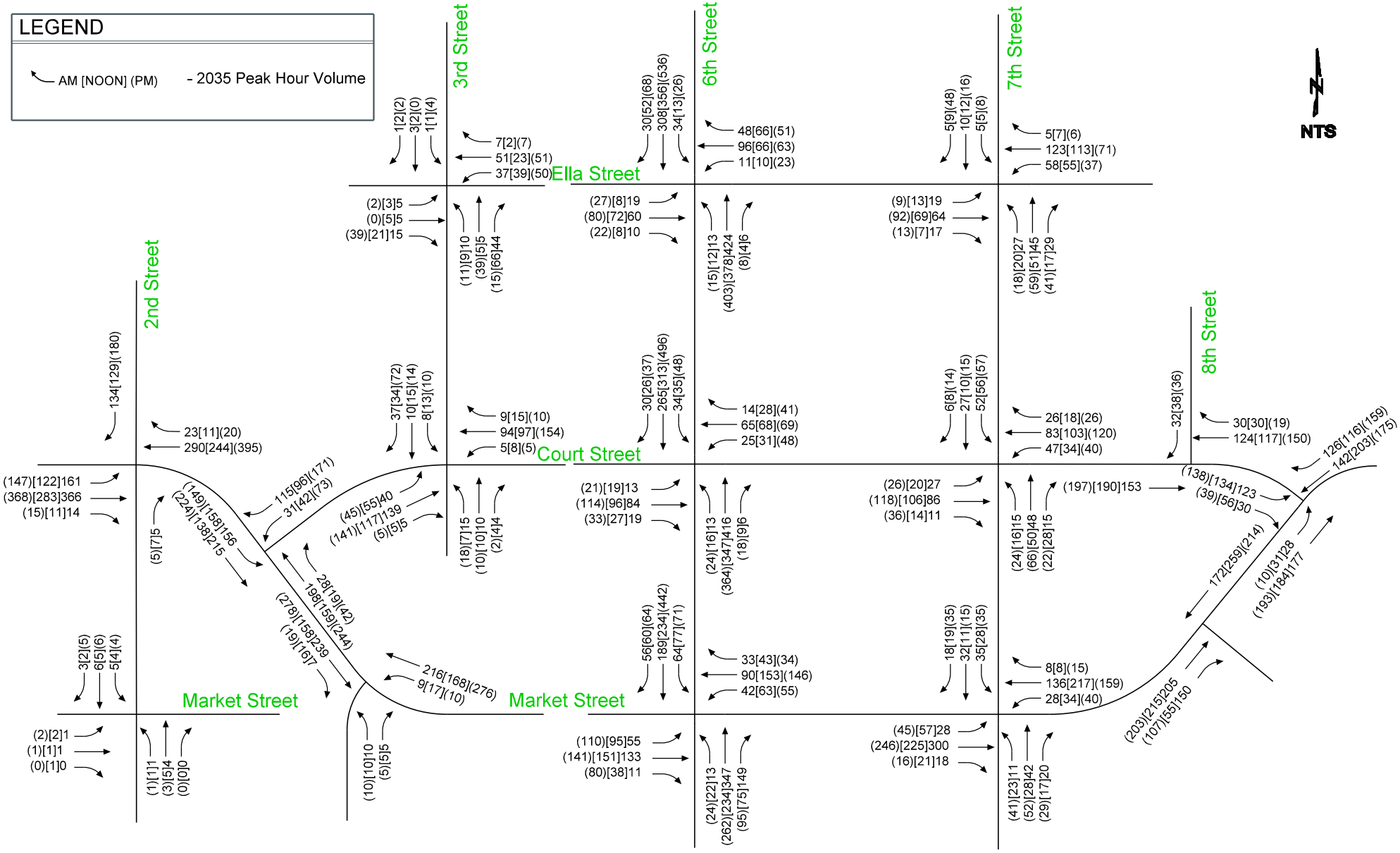
FIGURE 5



OLSSON ASSOCIATES

Realignment Alternative 2 Lane Configuration and Traffic Control

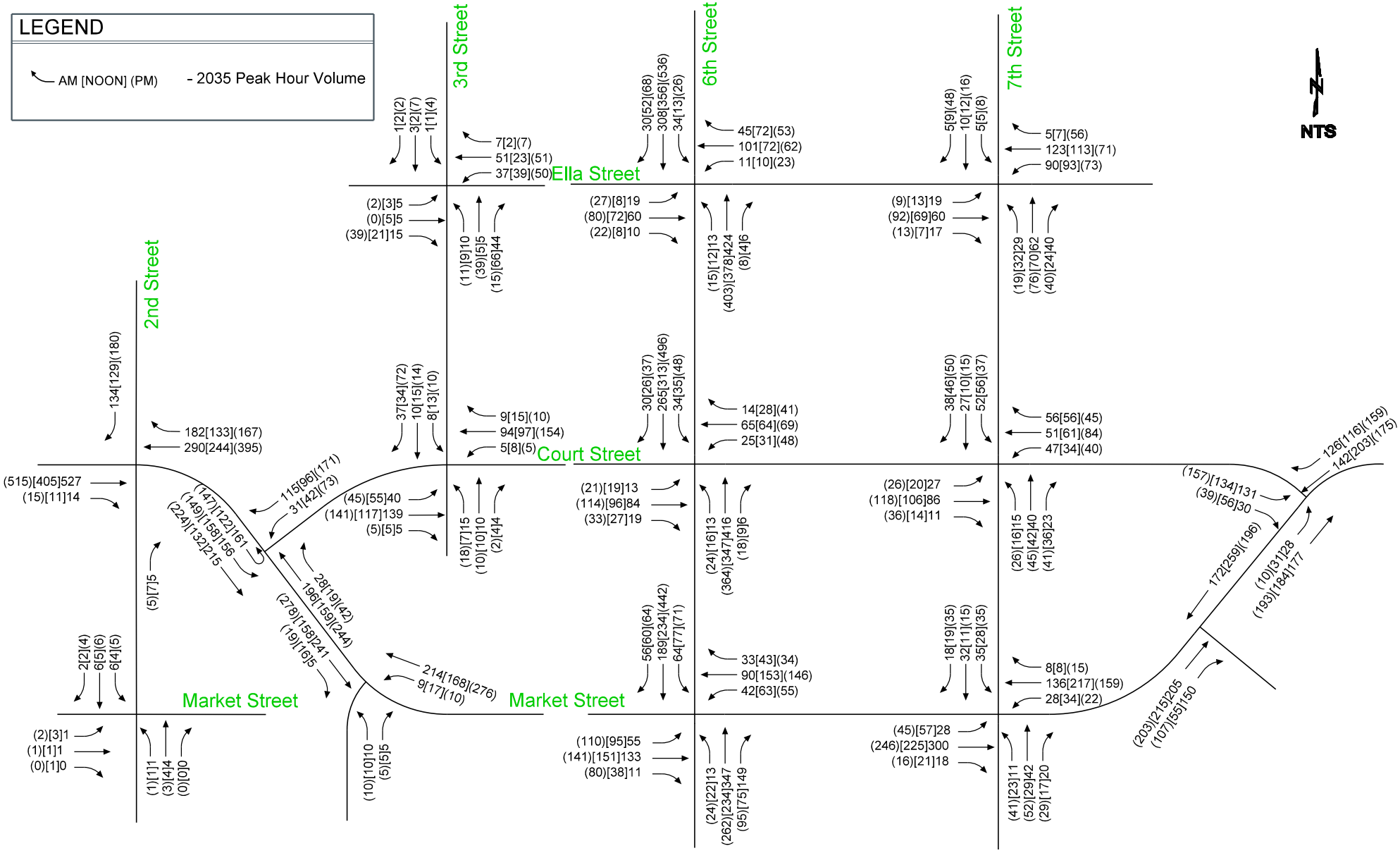
FIGURE 6



OLSSON ASSOCIATES

2035 Peak Hour Volumes - Alternative 1

FIGURE 7



2035 Peak Hour Volumes - Alternative 2

FIGURE 8

6.0 OPERATIONAL ANALYSIS

Using the future year (2035) roadway geometry and traffic volumes, the alternatives were analyzed to determine the expected traffic operations with the highway relocation. The section discusses access control, capacity analysis, and network geometry for each alternative.

6.1 Access Control Considerations

For all the advantages the highway realignment offers, notably the separation of truck traffic from the Court Street pedestrian traffic, there is one primary operational concern. Each connection will introduce another intersection in the already dense central business district which creates less-than-typical intersection spacing. The block spacing in downtown Beatrice is approximately 380 feet. Reduced intersection spacing is not desirable from a traffic operations standpoint because it introduces additional conflict points but there are certain modifications that can be applied to the concepts to help address this issue and others like left-turn overlap. Additionally, NDOR requires a minimum intersection spacing of one-block for full-movement intersections within a downtown area.

The primary solution to resolving the poor intersection spacing is to move or eliminate intersections. Given the dense urban setting, moving intersections is difficult. Eliminating intersections, while effective, was used only where necessary in the interest of maintaining a continuous downtown network. A third solution is to restrict movements at adjacent intersections. This reduces the number of conflict point among the intersections, making the driving task simpler for someone traveling along the corridor. This also eliminates the conflict between left-turning vehicles at adjacent intersections that would be vying for same area within a two-way-left-turn-lane, a condition described as left-turn overlap. In a downtown core like this study area, the short block lengths make finding alternative routes as dictated by restriction of turning movements a relatively simple task.

To limit the number of vehicles entering the traffic stream at mid-block locations, two requirements have been determined to be necessary through evaluation of traffic operations and coordination with NDOR. The first is that no parking will be permitted along the realigned highway. The second is that access control will be purchased in order to limit the number of private access to the realigned highway.

6.1.1 Alternative 1 – Reverse Curve Transitions

At the west connection, there is a unique opportunity to relocate the south leg of the 2nd Street intersection to the new Court Street & Market Street intersection. This potential solution could resolve both the overlapping left-turn storage between westbound lefts at 2nd Street and eastbound lefts at Court Street, improve level of service at 2nd Street, and allow for greater spacing between 2nd Street and Court Street along the relocated Market Street. This option would use the existing mid-block alley right of way.

Upon further examination, however, northeast-bound vehicles using the proposed midblock intersection are expected to have approximately 175 feet of sight distance looking northwest. According to the *Green Book, f*or a 25 mph roadway, 280 feet of intersection sight distance is required for this movement. This may cause potential safety concerns at this intersection. Therefore, without removal of buildings this would not be considered an acceptable option.

Another option would leave the south leg of 2nd Street in its current location and simply restrict certain movements. In this option, the south leg of 2nd Street would become right-in-right-out and the north leg would become three-quarter movement, allowing the eastbound left movement. Note that this and the southbound left-turn movement are high volume, so it would be desirable to maintain them in the interest of minimizing the traffic that is redirected.

This would eliminate the left-turn overlap as well as the poor level of service at the northbound left movement. A disadvantage is that the spacing to Court Street was minimized in order to minimize the skew of the 3rd Street & Court Street intersection.

The west transition curve is anticipated to extend into the 3rd Street & Court Street intersection. This would result in a sharp skew for the west leg of 3rd Street and poor sigh distance for the north leg. It would be desirable to realign the north leg to intersect with the new transition curve at a 90° angle. Existing development north of Market Street does not allow the north leg of 3rd Street to be realigned without impacting existing buildings. Even if the realignment were possible, the location of the north leg within a curve likely have poor intersection sight distance, as a driver would be required to look sharply over his shoulder to see a vehicle approaching from the northwest. For these reasons, a cul-de-sac should be constructed for the north leg of 3rd Street.

The east connection provides comparable intersection spacing for most of the realigned intersections as is provided today with the exception of that between the 8th Street & Court Street and Market Street & Court Street. In the proposed alignment, the intersection spacing is approximately 100 feet. As such, the intersection of 8th Street & Court Street is proposed as a right-in-right-out to avoid conflicts with the eastbound left-turn lane at Market Street.

6.1.2 Alternative 2 – Roundabout Transitions

Similar to Alternative 1, intersection spacing among the roundabout, 2nd Street & Court Street, and 3rd Street & Court Street intersections is not desirable. Generally, intersections should not be within the functional area of the roundabout, which can be defined by the expected 95th percentile queue length, roundabout intersection sight distance, or stopping sight distance of the approach. These are areas where drivers are making decisions about entering or exiting the roundabout and where other distractions, such as vehicles entering or exiting the traffic stream, should be minimized. As such, the 2nd Street & Court Street and 3rd Street & Court Street intersections should be reconstructed to be right-in-right-out. Note that the heavy westbound left-turn movement at 2nd Street would have the opportunity to perform a U-turn at the roundabout.

To maintain full-movement access to the industrial area southwest of the downtown area and one-block intersection spacing, a dead end should be constructed on Market Street east of 2nd Street and the south leg of 3rd Street can be realigned to intersect with the new transition curve. Existing development north of Market Street does not allow the north leg of 3rd Street to be realigned without violating the minimum intersection spacing. Like Alternative 1, this leg of the intersection would likely have poor intersection sight distance to the northwest. For these reasons, a cul-de-sac should be constructed for the north leg of 3rd Street, now making the 3rd Street & Market Street a “T” intersection.

At the proposed east roundabout, 8th Street on the north side will line up with the exiting lane for westbound Court Street traffic. This would be very undesirable, so this leg should be eliminated by constructing a cul-de-sac on 8th Street. It may be possible to bring this leg into the roundabout as the fourth leg with some additional property acquisition. The existing counts showed this as a low volume leg, so realigning 8th Street necessitating the acquisition of more right-of-way is not considered a cost-effective.

The east transition curve would pass northwest of the 8th Street & Market Street intersection, making it possible to construct an intersection for one of these roads. This intersection should be evenly spaced between 7th Street and the proposed roundabout. This would result in an intersection spacing of approximately 300 feet between each intersection, approximately 80 feet short of the typical block spacing. Being adjacent to the roundabout, it would be ideal to limit the traffic entering and exiting the traffic stream. An intersection along this curve should be considered as right-in-right-out.

6.2 Capacity Analysis

Results of the capacity analysis for both alternatives shows that the signalized intersections along 6th Street are expected to operate at LOS B or better in all peak hours. All movements at the intersections are expected to operate at LOS B or better in all peak hours. All movements at unsignalized intersections are expected to operate at LOS C.

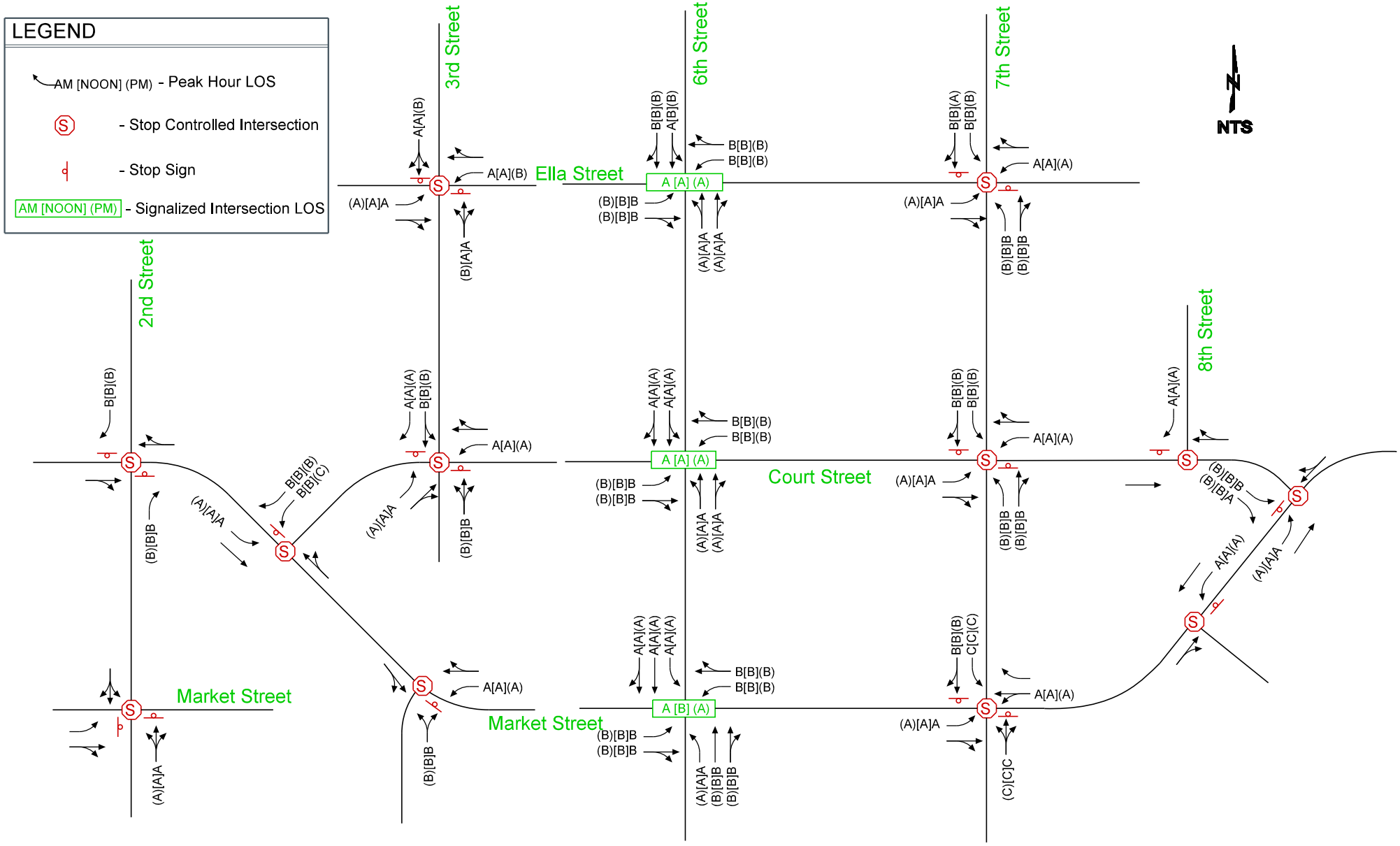
With respect to the two alternate connection configurations that were analyzed, each are expected to operate with acceptable level of service in the horizon year. As stop-controlled intersections, the side street (Court Street) is expected to operate with slightly higher delay than if the same intersection was a roundabout. However, the southeastbound 95th percentile queue at the west connection would be expected to be up to 95 feet in the PM peak hour with the intersection as a roundabout. This would not extend past the 2nd Street intersection.

Peak Hour Capacity Analysis Summaries are shown in **Figure 9** and **Figure 10**, respectively. Detailed results may be found in **Appendix C**.

6.3 Truck Routes

As previously discussed, there is currently an independent truck route for Highway 136 as it passes through the downtown central business district. This route makes use of the one-way downtown grid sending westbound traffic to Ella Street and eastbound traffic to Market Street. This truck route, while used by some trucks, does not see good compliance. This is evident by the existing truck percentages along Court Street that consistently exceed 5%, especially in the AM peak and NOON peak hours. This is likely attributable to the circuitous and inconvenient nature of the truck route that requires four additional turns along tight intersection radii.

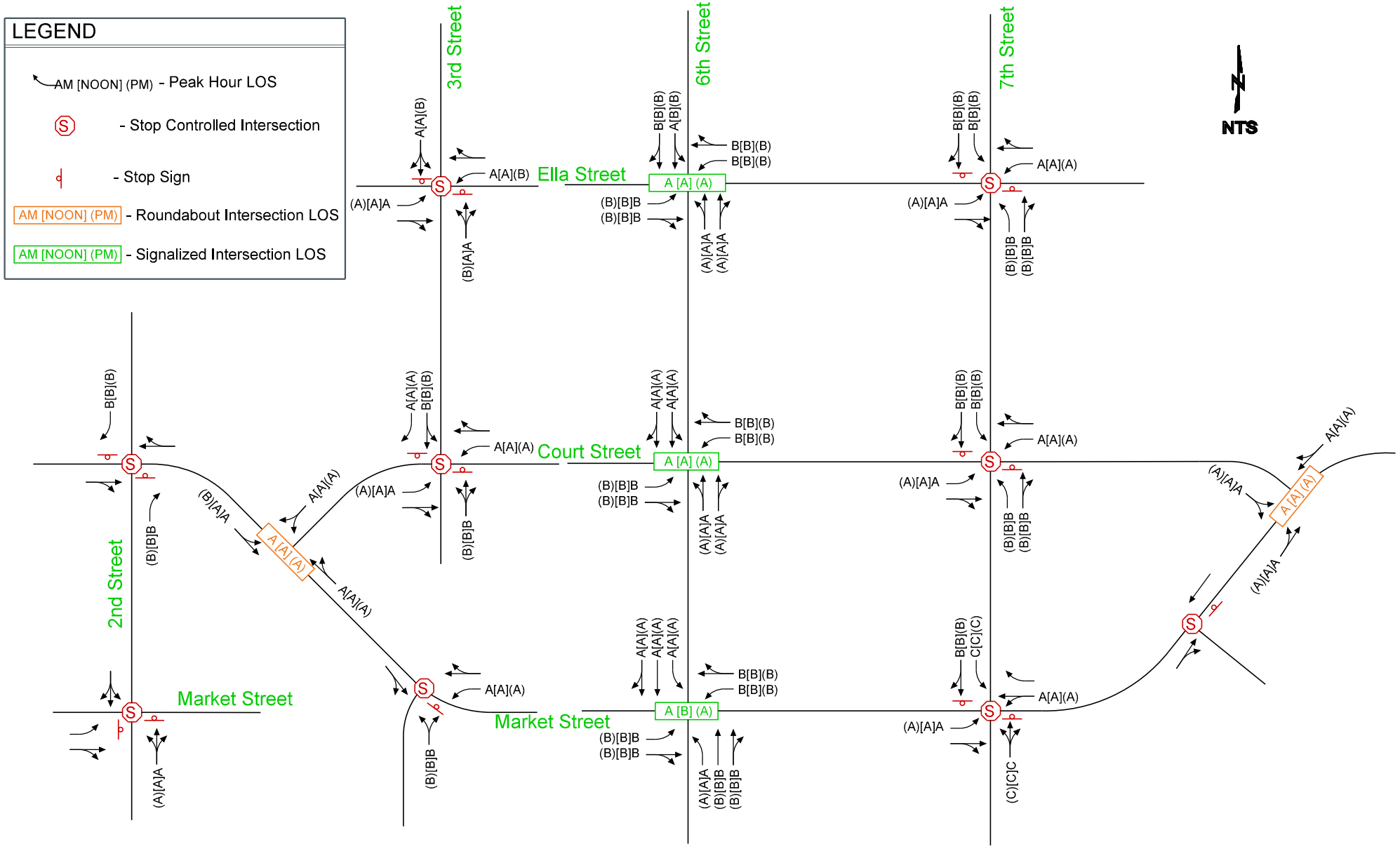
With the realignment of the highway, the truck route will be eliminated, allowing trucks to take the direct route through Beatrice along Market Street. This is anticipated to eliminate the issue of trucks using Court Street as a truck driver would have to make the conscious decision to turn onto Court Street. There is potential for trucks traveling along Highway 77 turning onto Highway 136 to use Court Street; however, directional signage the identify the new Highway 136 route will help to mitigate this problem.



OLSSON ASSOCIATES

2035 Capacity Analysis Summary - Alternative 1

FIGURE 9



OLSSON ASSOCIATES

2035 Capacity Analysis Summary - Alternative 2

FIGURE
10

7.0 CONCLUSIONS & RECOMMENDATIONS

This report documents a review of traffic operations and safety for existing conditions and future traffic volume scenarios, lane configuration, and traffic control after a proposed realignment of Highway 136 to Market Street. The existing conditions analysis did not identify any unacceptable delay or queuing, nor did it identify any high occurrences of crashes. However, left-turning and angle crashes appear to be the prevalent types of crashes at 6th Street & Court Street. No other crash patterns were identified within the study area.

Two alternatives were analyzed for the highway transitions. These included an alternative using conventional intersections to join Court Street to Market street through the reverse curve transitions (Alternative 1) and one using roundabouts at the new Court Street connections and a single curve to tie into Market Street (Alternative 2).

The capacity analysis showed each alternative to have acceptable operations. Alternative 1 features slightly lower 95th percentile queues at the west Court Street intersection and Alternative 2 showed slightly lower average delay. From a delay and queue standpoint, each could be considered acceptable solutions.

From a safety standpoint, however, the roundabout connections would be considered more desirable. Generally, roundabouts have fewer crashes and crashes of lower severity when compared to a stop-controlled intersection. This is expected to be the case for these roundabouts. One operational consideration is that of the accommodation for trucks. The existing counts identified a truck percentage of approximately 4% of the peak hour volumes. With this volume of truck traffic, there would be frequent use of the roundabouts by large trucks and the geometry must accommodate turning for these vehicles.

Access control and proper intersection spacing must be incorporated in the design of the highway realignment. Intersection spacing cannot be less than one city block, 380 feet in the case of downtown Beatrice. At intersections that do not meet this spacing, certain turning movements or the intersections themselves should be eliminated to minimize disruption to the flow of traffic along Market Street. Finally, through coordination efforts with NDOR, it has been determined that controlled access will be purchased through the whole of the highway relocation. This will give NDOR the ability to limit access from individual parcels in the interest of maintaining the integrity of the highway operations on the proposed highway realignment.

7.1 Highway 136

Based on future traffic conditions, capacity analysis results, and expected realignment of Highway 136, recommended geometrics and traffic control have been identified. The recommended geometrics and traffic control are expected to provide acceptable traffic operations for each alternative are described below. These recommendations take into account land-use and future traffic projections as well as roadway geometry and traffic control modifications from the Downtown Revitalization Study, including the two-way conversions and the remove of select traffic signals. Recommendations for the realigned Highway 136 are provided:

- Construct Highway 136 as a three-lane roadway with a two-way-left-turn-lane
- No parking will be permitted along Highway 136
- Controlled access must be purchased and driveways to individual parcels eliminated where possible.

7.2 Alternative 1 – Reverse Curve Transitions

This is considered to be a less desirable alternative from a safety standpoint. However, because this alternative would be considered to provide acceptable operations and is thus considered a viable alternative, recommendations are provided:

- Construct the Court Street & Market Street intersections as "T" intersections. The Court Street approaches should be stop controlled and constructed with dedicated left and right turn lanes.
- The following intersection legs will be eliminated by constructing a cul-de-sac:
  - The north leg of 3rd Street & Market Street
- The following intersection legs will be reconfigured to restrict movements:
  - 8rd Street & Court Street north leg (RIRO)
  - 2nd Street & Court Street north leg (3/4, allow EBL)
  - 2nd Street & Court Street south leg (RIRO)
  - Market Street/8th Street & Court Street east leg (RIRO)

7.3 Alternative 2 – Roundabout Transitions

This is considered to be the more desirable alternative from a traffic operations and safety standpoint. Recommendations are as follows:

- Construct the Court Street & Market Street intersections as roundabouts with single lane approaches for all legs.
- The following intersection legs will be eliminated by constructing a cul-de-sac:
  - The north leg of 3rd Street & Market Street
  - The north leg of 8rd Street & Court Street
- The following intersection legs will be reconfigured to restrict movements:
  - 2nd Street & Court Street north leg (RIRO)
  - 2nd Street & Court Street south leg (RIRO)
  - Market Street/8th Street & Court Street east leg (RIRO)

APPENDIX A

Existing Capacity Analysis Evaluation

Intersection	
Intersection Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	268	10	10	216	0	15	0	4	9	10	68
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	45	-	-	0	-	0	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	3	0	0	7	0	0	0	0	0	10	12
Mvmt Flow	0	291	11	11	235	0	16	0	4	10	11	74

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	240	0	0	307	0	0	569	564	307	564	569	245
Stage 1	-	-	-	-	-	-	302	302	-	262	262	-
Stage 2	-	-	-	-	-	-	267	262	-	302	307	-
Follow-up Headway	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4.09	3.408
Pot Capacity-1 Maneuver	1339	-	-	1265	-	-	436	438	738	439	421	770
Stage 1	-	-	-	-	-	-	712	668	-	747	677	-
Stage 2	-	-	-	-	-	-	743	695	-	712	647	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1335	-	-	1261	-	-	381	432	733	431	415	765
Mov Capacity-2 Maneuver	-	-	-	-	-	-	381	432	-	431	415	-
Stage 1	-	-	-	-	-	-	710	666	-	745	669	-
Stage 2	-	-	-	-	-	-	653	687	-	706	645	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	13.8	11
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	381	733	1335	-	-	1261	-	-	431	415	765
HCM Lane V/C Ratio	0.043	0.006	-	-	-	0.009	-	-	0.023	0.026	0.097
HCM Control Delay (s)	14.9	9.9	0	-	-	7.88	-	-	13.5	13.9	10.2
HCM Lane LOS	B	A	A			A			B	B	B
HCM 95th %tile Q(veh)	0.134	0.018	0	-	-	0.026	-	-	0.07	0.081	0.32

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	0	8	76	51	7	0	0	0	0	3	1
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	13	2	0	0	0	0	0	0	0
Mvmt Flow	5	0	9	83	55	8	0	0	0	0	3	1

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	229	229	64
Stage 1	-	-	-	229	229	-
Stage 2	-	-	-	0	0	-
Follow-up Headway	-	-	-	3.5	4	3.3
Pot Capacity-1 Maneuver	-	-	-	764	674	1006
Stage 1	-	-	-	814	718	-
Stage 2	-	-	-	-	-	-
Time blocked-Platoon, %		-	-			
Mov Capacity-1 Maneuver	-	-	-	759	# 0	1003
Mov Capacity-2 Maneuver	-	-	-	759	# 0	-
Stage 1	-	-	-	812	# 0	-
Stage 2	-	-	-	-	# 0	-

Approach	WB	SB
HCM Control Delay, s	0	8.6
HCM LOS		A

Minor Lane / Major Mvmt	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	1003
HCM Lane V/C Ratio	-	-	-	0.004
HCM Control Delay (s)	-	-	-	8.6
HCM Lane LOS				A
HCM 95th %tile Q(veh)	-	-	-	0.013

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	161	276	71	7	274	15	0	0	0	2	7	134
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	103	-	-	70	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	2	6	0	7	0	0	0	0	0	0	3
Mvmt Flow	175	300	77	8	298	16	0	0	0	2	8	146

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	319	0	0	377	0	0				1015	1053	316
Stage 1	-	-	-	-	-	-				326	326	-
Stage 2	-	-	-	-	-	-				689	727	-
Follow-up Headway	2.209	-	-	2.2	-	-				3.5	4	3.327
Pot Capacity-1 Maneuver	1247	-	-	1193	-	-				266	228	722
Stage 1	-	-	-	-	-	-				736	652	-
Stage 2	-	-	-	-	-	-				502	432	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1243	-	-	1189	-	-				226	# 0	718
Mov Capacity-2 Maneuver	-	-	-	-	-	-				226	# 0	-
Stage 1	-	-	-	-	-	-				729	# 0	-
Stage 2	-	-	-	-	-	-				430	# 0	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0.2	10.9
HCM LOS			B

Minor Lane / Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1243	-	-	1189	-	-	657	718
HCM Lane V/C Ratio	0.141	-	-	0.006	-	-	0.089	0.135
HCM Control Delay (s)	8.37	-	-	8.047	-	-	11	10.8
HCM Lane LOS	A			A			B	B
HCM 95th %tile Q(veh)	0.49	-	-	0.019	-	-	0.291	0.466

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	88	171	53	151	422	357
v/c Ratio	0.27	0.39	0.16	0.35	0.37	0.35
Control Delay	14.0	20.3	12.3	17.7	8.6	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	20.3	12.3	17.7	8.6	7.8
Queue Length 50th (ft)	19	48	11	37	28	22
Queue Length 95th (ft)	44	96	29	81	39	34
Internal Link Dist (ft)		290		308	300	293
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	325	433	335	432	1145	1009
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.39	0.16	0.35	0.37	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	81	146	11	49	111	28	25	351	12	68	201	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus Adj	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	156.9	163.3	171.0	164.4	162.2	171.0	171.0	160.1	171.0	171.0	160.9	171.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	420	351	26	420	293	73	109	1181	39	267	707	214
Arrive On Green	0.08	0.28	0.28	0.08	0.28	0.28	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	1494	1275	96	1566	1066	264	99	2779	93	429	1664	504
Grp Volume(v), veh/h	88	0	171	53	0	151	220	0	202	180	0	177
Grp Sat Flow(s),veh/h/ln	1494	0	1371	1566	0	1331	1530	0	1440	1225	0	1372
Q Serve(g_s), s	0.0	0.0	6.2	0.0	0.0	5.6	0.0	0.0	1.8	0.0	0.0	1.6
Cycle Q Clear(g_c), s	0.0	0.0	6.2	0.0	0.0	5.6	1.7	0.0	1.8	1.3	0.0	1.6
Prop In Lane	1.00		0.07	1.00		0.20	0.12		0.06	0.41		0.37
Lane Grp Cap(c), veh/h	420	0	377	420	0	366	718	0	612	605	0	583
V/C Ratio(X)	0.21	0.00	0.45	0.13	0.00	0.41	0.31	0.00	0.33	0.30	0.00	0.30
Avail Cap(c_a), veh/h	420	0	377	420	0	366	718	0	612	605	0	583
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	18.0	17.9	0.0	17.8	2.7	0.0	2.7	2.7	0.0	2.7
Incr Delay (d2), s/veh	1.1	0.0	3.9	0.6	0.0	3.4	1.1	0.0	1.4	1.3	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.1	0.0	2.4	0.7	0.0	2.1	0.7	0.0	0.7	0.6	0.0	0.6
Lane Grp Delay (d), s/veh	19.2	0.0	21.9	18.5	0.0	21.2	3.8	0.0	4.2	3.9	0.0	4.0
Lane Grp LOS	B		C	B		C	A		A	A		A
Approach Vol, veh/h		259			204			422			357	
Approach Delay, s/veh		21.0			20.5			4.0			4.0	
Approach LOS		C			C			A			A	

Timer												
Assigned Phs	7	4		3	8			2			6	
Phs Duration (G+Y+Rc), s	9.0	21.0		9.0	21.0			30.0			30.0	
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5			4.5			4.5	
Max Green Setting (Gmax), s	4.5	16.5		4.5	16.5			25.5			25.5	
Max Q Clear Time (g_c+I1), s	2.0	8.2		2.0	7.6			3.8			3.6	
Green Ext Time (p_c), s	0.1	0.5		0.1	0.5			2.6			2.2	

Intersection Summary	
HCM 2010 Ctrl Delay	10.2
HCM 2010 LOS	B

Notes

Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	267	500	417
v/c Ratio	0.18	0.34	0.26
Control Delay	8.4	5.4	6.8
Queue Delay	0.0	0.0	0.0
Total Delay	8.4	5.4	6.8
Queue Length 50th (ft)	22	28	31
Queue Length 95th (ft)	39	40	53
Internal Link Dist (ft)	305	293	107
Turn Bay Length (ft)			
Base Capacity (vph)	1473	1483	1575
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.18	0.34	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	27	166	53	36	424	0	0	306	77
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj				0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				171.0	168.8	171.0	171.0	164.9	0.0	0.0	159.5	171.0
Lanes				0	3	0	0	2	0	0	2	0
Cap, veh/h				147	971	301	147	1503	0	0	1295	322
Arrive On Green				0.32	0.32	0.32	1.00	1.00	0.00	0.00	0.52	0.52
Sat Flow, veh/h				453	2987	927	149	2862	0	0	2467	613
Grp Volume(v), veh/h				90	97	79	255	245	0	0	214	203
Grp Sat Flow(s),veh/h/ln				1412	1688	1266	1510	1501	0	0	1595	1485
Q Serve(g_s), s				2.8	2.5	2.7	0.0	0.0	0.0	0.0	4.4	4.5
Cycle Q Clear(g_c), s				2.8	2.5	2.7	0.0	0.0	0.0	0.0	4.4	4.5
Prop In Lane				0.32		0.73	0.15		0.00	0.00		0.41
Lane Grp Cap(c), veh/h				459	549	412	862	788	0	0	837	779
V/C Ratio(X)				0.20	0.18	0.19	0.30	0.31	0.00	0.00	0.26	0.26
Avail Cap(c_a), veh/h				459	549	412	862	788	0	0	837	779
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				14.6	14.5	14.6	0.0	0.0	0.0	0.0	7.8	7.8
Incr Delay (d2), s/veh				1.0	0.7	1.0	0.9	1.0	0.0	0.0	0.7	0.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln				1.0	1.1	0.9	0.2	0.2	0.0	0.0	1.7	1.6
Lane Grp Delay (d), s/veh				15.6	15.2	15.6	0.9	1.0	0.0	0.0	8.5	8.7
Lane Grp LOS				B	B	B	A	A			A	A
Approach Vol, veh/h					267			500			417	
Approach Delay, s/veh					15.5			0.9			8.6	
Approach LOS					B			A			A	

Timer	
Assigned Phs	8 2 6
Phs Duration (G+Y+Rc), s	24.0 36.0 36.0
Change Period (Y+Rc), s	4.5 4.5 4.5
Max Green Setting (Gmax), s	19.5 31.5 31.5
Max Q Clear Time (g_c+I1), s	4.8 2.0 6.5
Green Ext Time (p_c), s	1.3 6.7 6.4

Intersection Summary	
HCM 2010 Ctrl Delay	6.9
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	137	26	552	282
v/c Ratio	0.17	0.08	0.32	0.19
Control Delay	17.2	7.9	5.3	4.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.2	7.9	5.3	4.9
Queue Length 50th (ft)	19	0	33	18
Queue Length 95th (ft)	38	15	56	28
Internal Link Dist (ft)	285		55	300
Turn Bay Length (ft)				
Base Capacity (vph)	829	329	1706	1505
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.08	0.32	0.19

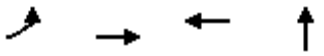
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	110	24	0	0	0	0	372	136	23	236	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99				1.00		1.00	1.00		1.00
Parking Bus Adj	0.85	1.00	0.85				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	171.0	165.4	164.4				0.0	163.0	171.0	171.0	158.9	0.0
Lanes	0	2	1				0	2	0	0	2	0
Cap, veh/h	98	738	325				0	1313	475	167	1533	0
Arrive On Green	0.28	0.28	0.28				0.00	0.57	0.57	1.00	1.00	0.00
Sat Flow, veh/h	357	2685	1181				0	2284	827	168	2666	0
Grp Volume(v), veh/h	66	71	26				0	287	265	144	138	0
Grp Sat Flow(s),veh/h/ln	1388	1654	1181				0	1630	1481	1389	1446	0
Q Serve(g_s), s	2.2	1.9	1.0				0.0	5.4	5.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.2	1.9	1.0				0.0	5.4	5.6	0.0	0.0	0.0
Prop In Lane	0.26		1.00				0.00		0.56	0.17		0.00
Lane Grp Cap(c), veh/h	382	455	325				0	937	852	869	831	0
V/C Ratio(X)	0.17	0.16	0.08				0.00	0.31	0.31	0.17	0.17	0.00
Avail Cap(c_a), veh/h	382	455	325				0	937	852	869	831	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.6	16.5	16.1				0.0	6.6	6.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.7	0.5				0.0	0.8	1.0	0.4	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.8	0.8	0.3				0.0	2.1	1.9	0.1	0.1	0.0
Lane Grp Delay (d), s/veh	17.5	17.2	16.6				0.0	7.4	7.6	0.4	0.4	0.0
Lane Grp LOS	B	B	B					A	A	A	A	
Approach Vol, veh/h		163						552			282	
Approach Delay, s/veh		17.2						7.5			0.4	
Approach LOS		B						A			A	

Timer												
Assigned Phs		4						2			6	
Phs Duration (G+Y+Rc), s		21.0						39.0			39.0	
Change Period (Y+Rc), s		4.5						4.5			4.5	
Max Green Setting (Gmax), s		16.5						34.5			34.5	
Max Q Clear Time (g_c+I1), s		4.2						7.6			2.0	
Green Ext Time (p_c), s		0.6						5.9			6.2	

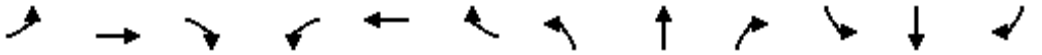
Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

Notes



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	20	226	250	67
v/c Ratio	0.04	0.23	0.27	0.07
Control Delay	5.6	6.7	5.9	14.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.6	6.7	5.9	14.2
Queue Length 50th (ft)	3	35	32	5
Queue Length 95th (ft)	10	64	63	14
Internal Link Dist (ft)		308	300	300
Turn Bay Length (ft)	71			
Base Capacity (vph)	501	971	912	1013
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.04	0.23	0.27	0.07

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	208	0	0	178	52	9	38	15	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.85	0.85	1.00	0.85			
Adj Sat Flow veh/h/ln	171.0	169.3	0.0	0.0	161.6	171.0	171.0	153.7	171.0			
Lanes	1	1	0	0	1	0	0	3	0			
Cap, veh/h	631	1005	0	0	605	179	148	648	234			
Arrive On Green	0.59	0.59	0.00	0.00	0.59	0.59	0.26	0.26	0.26			
Sat Flow, veh/h	1031	1693	0	0	1019	301	567	2489	898			
Grp Volume(v), veh/h	20	226	0	0	0	250	23	24	20			
Grp Sat Flow(s),veh/h/ln	1031	1693	0	0	0	1320	1278	1537	1138			
Q Serve(g_s), s	0.6	3.9	0.0	0.0	0.0	5.8	0.8	0.7	0.8			
Cycle Q Clear(g_c), s	6.5	3.9	0.0	0.0	0.0	5.8	0.8	0.7	0.8			
Prop In Lane	1.00		0.00	0.00		0.23	0.44		0.79			
Lane Grp Cap(c), veh/h	631	1005	0	0	0	783	333	400	296			
V/C Ratio(X)	0.03	0.22	0.00	0.00	0.00	0.32	0.07	0.06	0.07			
Avail Cap(c_a), veh/h	631	1005	0	0	0	783	333	400	296			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	7.9	5.9	0.0	0.0	0.0	6.3	17.1	17.1	17.1			
Incr Delay (d2), s/veh	0.1	0.5	0.0	0.0	0.0	1.1	0.4	0.3	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (50%), veh/ln	0.1	1.4	0.0	0.0	0.0	1.8	0.3	0.3	0.3			
Lane Grp Delay (d), s/veh	8.0	6.4	0.0	0.0	0.0	7.3	17.5	17.4	17.6			
Lane Grp LOS	A	A				A	B	B	B			
Approach Vol, veh/h		246			250			67				
Approach Delay, s/veh		6.5			7.3			17.5				
Approach LOS		A			A			B				

Timer												
Assigned Phs		4			8			2				
Phs Duration (G+Y+Rc), s		41.0			41.0			20.5				
Change Period (Y+Rc), s		4.5			4.5			4.5				
Max Green Setting (Gmax), s		36.5			36.5			16.0				
Max Q Clear Time (g_c+I1), s		8.5			7.8			2.8				
Green Ext Time (p_c), s		3.3			3.3			0.2				

Intersection Summary												
HCM 2010 Ctrl Delay			8.2									
HCM 2010 LOS			A									

Notes

Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	300	50	57
v/c Ratio	0.23	0.09	0.04
Control Delay	8.6	4.1	10.3
Queue Delay	0.0	0.0	0.0
Total Delay	8.6	4.1	10.3
Queue Length 50th (ft)	25	0	6
Queue Length 95th (ft)	47	16	15
Internal Link Dist (ft)	109		296
Turn Bay Length (ft)			
Base Capacity (vph)	1309	574	1334
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.09	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	206	70	46	52	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus Adj				1.00	1.00	0.88	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	169.3	171.0	159.8	171.0	0.0			
Lanes				0	2	0	1	2	0			
Cap, veh/h				0	972	319	0	1454	0			
Arrive On Green				0.00	0.43	0.43	0.43	0.43	0.00			
Sat Flow, veh/h				0	2288	751	0	3420	0			
Grp Volume(v), veh/h				0	164	136	0	57	0			
Grp Sat Flow(s),veh/h/ln				0	1693	1346	0	1710	0			
Q Serve(g_s), s				0.0	3.7	3.9	0.0	0.6	0.0			
Cycle Q Clear(g_c), s				0.0	3.7	3.9	0.0	0.6	0.0			
Prop In Lane				0.00		0.56	0.00		0.00			
Lane Grp Cap(c), veh/h				0	720	572	0	1454	0			
V/C Ratio(X)				0.00	0.23	0.24	0.00	0.04	0.00			
Avail Cap(c_a), veh/h				0	720	572	0	1454	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	0.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	11.0	11.0	0.0	10.1	0.0			
Incr Delay (d2), s/veh				0.0	0.7	1.0	0.0	0.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (50%), veh/ln				0.0	1.5	1.3	0.0	0.2	0.0			
Lane Grp Delay (d), s/veh				0.0	11.7	12.0	0.0	10.1	0.0			
Lane Grp LOS					B	B		B				
Approach Vol, veh/h					300			57				
Approach Delay, s/veh					11.9			10.1				
Approach LOS					B			B				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	30.0	30.0
Change Period (Y+Rc), s	4.5	4.5
Max Green Setting (Gmax), s	25.5	25.5
Max Q Clear Time (g_c+I1), s	5.9	2.6
Green Ext Time (p_c), s	1.7	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.6
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	0

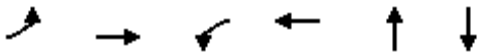
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	23	245	0	0	0	0	0	34	15	0	0	0
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	26	2	0	0	0	0	0	6	0	0	0	6
Mvmt Flow	25	266	0	0	0	0	0	37	16	0	0	0

Major/Minor	Major1						Minor1					
Conflicting Flow All	0	0	0				321	321	137			
Stage 1	-	-	-				321	321	-			
Stage 2	-	-	-				0	0	-			
Follow-up Headway	-	-	-				3.5	4.06	3.3			
Pot Capacity-1 Maneuver	-	-	-				613	586	893			
Stage 1	-	-	-				671	640	-			
Stage 2	-	-	-				-	-	-			
Time blocked-Platoon, %		-	-									
Mov Capacity-1 Maneuver	-	-	-				609	# 0	890			
Mov Capacity-2 Maneuver	-	-	-				609	# 0	-			
Stage 1	-	-	-				669	# 0	-			
Stage 2	-	-	-				-	# 0	-			

Approach	EB	NB
HCM Control Delay, s	0	+
HCM LOS		-

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR
Capacity (veh/h)	0	890	-	-	-
HCM Lane V/C Ratio	+	0.039	-	-	-
HCM Control Delay (s)	+	9.2	-	-	-
HCM Lane LOS	+	A			
HCM 95th %tile Q(veh)	+	0.122	-	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	9	238	18	247	29	99
v/c Ratio	0.02	0.28	0.04	0.30	0.06	0.22
Control Delay	6.6	8.5	6.8	8.5	11.9	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	8.5	6.8	8.5	11.9	15.6
Queue Length 50th (ft)	1	42	3	42	5	23
Queue Length 95th (ft)	7	78	11	79	20	55
Internal Link Dist (ft)		300		114	110	109
Turn Bay Length (ft)	50					
Base Capacity (vph)	466	844	470	834	462	446
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.28	0.04	0.30	0.06	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	216	3	17	214	13	6	11	9	35	46	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	0.99		0.99
Parking Bus Adj	1.00	1.00	0.87	1.00	1.00	0.87	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow veh/h/ln	171.0	161.4	171.0	171.0	160.4	171.0	171.0	171.0	171.0	171.0	167.2	171.0
Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Cap, veh/h	576	745	10	586	702	42	150	231	161	207	230	44
Arrive On Green	0.54	0.54	0.54	0.54	0.54	0.54	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1033	1376	18	1041	1296	78	244	748	522	402	747	144
Grp Volume(v), veh/h	9	0	238	18	0	247	29	0	0	99	0	0
Grp Sat Flow(s),veh/h/ln	1033	0	1393	1041	0	1373	1514	0	0	1293	0	0
Q Serve(g_s), s	0.3	0.0	5.7	0.6	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.3	0.0	5.7	6.2	0.0	6.0	0.8	0.0	0.0	3.1	0.0	0.0
Prop In Lane	1.00		0.01	1.00		0.06	0.24		0.34	0.38		0.11
Lane Grp Cap(c), veh/h	576	0	755	586	0	744	541	0	0	482	0	0
V/C Ratio(X)	0.02	0.00	0.32	0.03	0.00	0.33	0.05	0.00	0.00	0.21	0.00	0.00
Avail Cap(c_a), veh/h	576	0	755	586	0	744	541	0	0	482	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.5	0.0	7.6	9.3	0.0	7.7	14.6	0.0	0.0	15.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.1	0.1	0.0	1.2	0.2	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.1	0.0	1.9	0.2	0.0	2.0	0.3	0.0	0.0	1.1	0.0	0.0
Lane Grp Delay (d), s/veh	9.5	0.0	8.7	9.4	0.0	8.9	14.8	0.0	0.0	16.4	0.0	0.0
Lane Grp LOS	A		A	A		A	B			B		
Approach Vol, veh/h		247			265			29			99	
Approach Delay, s/veh		8.7			8.9			14.8			16.4	
Approach LOS		A			A			B			B	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		37.0			37.0			23.0			23.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		32.5			32.5			18.5			18.5	
Max Q Clear Time (g_c+I1), s		8.3			8.2			2.8			5.1	
Green Ext Time (p_c), s		3.2			3.2			0.6			0.5	

Intersection Summary												
HCM 2010 Ctrl Delay			10.3									
HCM 2010 LOS			B									

Notes

Intersection	
Intersection Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	1	0	0	0	0	1	0	0	73	10	2
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	7	0	0
Mvmt Flow	0	1	0	0	0	0	1	0	0	79	11	2

Major/Minor	Minor2			Major2		
Conflicting Flow All	176	176	17	0	0	0
Stage 1	176	176	-	-	-	-
Stage 2	0	0	-	-	-	-
Follow-up Headway	3.5	4	3.3	-	-	-
Pot Capacity-1 Maneuver	818	721	1068	-	-	-
Stage 1	859	757	-	-	-	-
Stage 2	-	-	-	-	-	-
Time blocked-Platoon, %					-	-
Mov Capacity-1 Maneuver	813	0	1065	-	-	-
Mov Capacity-2 Maneuver	813	0	-	-	-	-
Stage 1	856	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	NB	SB
HCM Control Delay, s	9.4	0
HCM LOS	A	

Minor Lane / Major Mvmt	NBLn1	NBLn2	SBL	SBT	SBR
Capacity (veh/h)	813	0	-	-	-
HCM Lane V/C Ratio	0.001	+	-	-	-
HCM Control Delay (s)	9.4	0	-	-	-
HCM Lane LOS	A	A			
HCM 95th %tile Q(veh)	0.004	+	-	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	249	11	15	225	0	7	0	4	13	15	77
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	45	-	-	0	-	0	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	7	0	13	6	0	0	0	0	0	7	21
Mvmt Flow	0	271	12	16	245	0	8	0	4	14	16	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	245	0	0	283	0	0	562	554	277	554	560	245
Stage 1	-	-	-	-	-	-	277	277	-	277	277	-
Stage 2	-	-	-	-	-	-	285	277	-	277	283	-
Follow-up Headway	2.2	-	-	2.317	-	-	3.5	4	3.3	3.5	4.063	3.489
Pot Capacity-1 Maneuver	1333	-	-	1219	-	-	441	443	767	446	430	749
Stage 1	-	-	-	-	-	-	734	685	-	734	672	-
Stage 2	-	-	-	-	-	-	727	685	-	734	668	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1333	-	-	1219	-	-	376	437	767	439	424	749
Mov Capacity-2 Maneuver	-	-	-	-	-	-	376	437	-	439	424	-
Stage 1	-	-	-	-	-	-	734	685	-	734	663	-
Stage 2	-	-	-	-	-	-	622	676	-	730	668	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	12.9	11.3
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	376	767	1333	-	-	1219	-	-	439	424	749
HCM Lane V/C Ratio	0.02	0.006	-	-	-	0.013	-	-	0.032	0.038	0.112
HCM Control Delay (s)	14.8	9.7	0	-	-	7.993	-	-	13.5	13.8	10.4
HCM Lane LOS	B	A	A			A			B	B	B
HCM 95th %tile Q(veh)	0.062	0.017	0	-	-	0.041	-	-	0.1	0.12	0.376

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	1	0	5	98	33	2	0	0	0	0	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	20	11	9	0	0	0	0	0	0	0
Mvmt Flow	1	0	5	107	36	2	0	0	0	0	2	2

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	250	250	37
Stage 1	-	-	-	250	250	-
Stage 2	-	-	-	0	0	-
Follow-up Headway	-	-	-	3.5	4	3.3
Pot Capacity-1 Maneuver	-	-	-	743	656	1041
Stage 1	-	-	-	796	704	-
Stage 2	-	-	-	-	-	-
Time blocked-Platoon, %		-	-			
Mov Capacity-1 Maneuver	-	-	-	743	# 0	1041
Mov Capacity-2 Maneuver	-	-	-	743	# 0	-
Stage 1	-	-	-	796	# 0	-
Stage 2	-	-	-	-	# 0	-

Approach	WB	SB
HCM Control Delay, s	0	8.5
HCM LOS		A

Minor Lane / Major Mvmt	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	1041
HCM Lane V/C Ratio	-	-	-	0.004
HCM Control Delay (s)	-	-	-	8.5
HCM Lane LOS				A
HCM 95th %tile Q(veh)	-	-	-	0.013

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	122	254	53	17	281	11	0	0	0	6	10	129
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	103	-	-	70	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	4	15	0	6	0	0	0	0	0	0	0
Mvmt Flow	133	276	58	18	305	12	0	0	0	7	11	140

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	317	0	0	334	0	0				918	947	311
Stage 1	-	-	-	-	-	-				348	348	-
Stage 2	-	-	-	-	-	-				570	599	-
Follow-up Headway	2.209	-	-	2.2	-	-				3.5	4	3.3
Pot Capacity-1 Maneuver	1249	-	-	1237	-	-				304	263	734
Stage 1	-	-	-	-	-	-				719	638	-
Stage 2	-	-	-	-	-	-				570	494	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1249	-	-	1237	-	-				268	# 0	734
Mov Capacity-2 Maneuver	-	-	-	-	-	-				268	# 0	-
Stage 1	-	-	-	-	-	-				709	# 0	-
Stage 2	-	-	-	-	-	-				509	# 0	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0.4	11
HCM LOS			B

Minor Lane / Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1249	-	-	1237	-	-	605	734
HCM Lane V/C Ratio	0.106	-	-	0.015	-	-	0.106	0.127
HCM Control Delay (s)	8.224	-	-	7.954	-	-	11.7	10.6
HCM Lane LOS	A			A			B	B
HCM 95th %tile Q(veh)	0.355	-	-	0.045	-	-	0.354	0.435

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	98	194	68	185	332	423
v/c Ratio	0.30	0.44	0.20	0.41	0.30	0.40
Control Delay	14.1	21.1	7.6	8.3	8.9	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	21.1	7.6	8.3	8.9	6.2
Queue Length 50th (ft)	21	55	7	5	27	16
Queue Length 95th (ft)	47	107	15	10	41	25
Internal Link Dist (ft)		287		308	300	293
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	330	441	334	453	1114	1065
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.44	0.20	0.41	0.30	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	90	165	14	63	113	57	33	250	22	79	255	55
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	166.0	166.3	171.0	171.0	167.7	171.0	171.0	156.3	171.0	171.0	161.1	171.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	400	354	30	414	246	124	158	1011	88	272	783	170
Arrive On Green	0.08	0.28	0.28	0.05	0.18	0.18	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	1581	1286	108	1629	895	451	202	2380	208	442	1842	401
Grp Volume(v), veh/h	98	0	194	68	0	185	172	0	160	214	0	209
Grp Sat Flow(s),veh/h/ln	1581	0	1394	1629	0	1346	1403	0	1386	1290	0	1395
Q Serve(g_s), s	2.6	0.0	7.0	1.7	0.0	7.4	0.0	0.0	1.4	0.0	0.0	1.9
Cycle Q Clear(g_c), s	2.6	0.0	7.0	1.7	0.0	7.4	1.3	0.0	1.4	1.6	0.0	1.9
Prop In Lane	1.00		0.08	1.00		0.34	0.21		0.15	0.40		0.29
Lane Grp Cap(c), veh/h	400	0	383	414	0	370	669	0	589	632	0	593
V/C Ratio(X)	0.25	0.00	0.51	0.16	0.00	0.50	0.26	0.00	0.27	0.34	0.00	0.35
Avail Cap(c_a), veh/h	400	0	383	414	0	370	669	0	589	632	0	593
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	0.0	18.3	14.0	0.0	20.8	2.7	0.0	2.7	2.7	0.0	2.7
Incr Delay (d2), s/veh	1.5	0.0	4.7	0.9	0.0	4.8	0.9	0.0	1.1	1.5	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.1	0.0	2.8	0.7	0.0	3.0	0.5	0.0	0.5	0.7	0.0	0.7
Lane Grp Delay (d), s/veh	15.5	0.0	23.0	14.9	0.0	25.5	3.6	0.0	3.8	4.2	0.0	4.4
Lane Grp LOS	B		C	B		C	A		A	A		A
Approach Vol, veh/h		292			253			332			423	
Approach Delay, s/veh		20.5			22.7			3.7			4.3	
Approach LOS		C			C			A			A	

Timer												
Assigned Phs	7	4		3	8			2			6	
Phs Duration (G+Y+Rc), s	9.0	21.0		9.0	21.0			30.0			30.0	
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5			4.5			4.5	
Max Green Setting (Gmax), s	4.5	16.5		4.5	16.5			25.5			25.5	
Max Q Clear Time (g_c+I1), s	4.6	9.0		3.7	9.4			3.4			3.9	
Green Ext Time (p_c), s	0.0	1.4		0.0	1.3			2.0			2.7	

Intersection Summary		
HCM 2010 Ctrl Delay		11.4
HCM 2010 LOS		B

Notes

Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	264	431	463
v/c Ratio	0.17	0.30	0.30
Control Delay	3.4	5.9	8.3
Queue Delay	0.0	0.0	0.0
Total Delay	3.4	5.9	8.3
Queue Length 50th (ft)	3	30	41
Queue Length 95th (ft)	7	41	66
Internal Link Dist (ft)	305	293	40
Turn Bay Length (ft)			
Base Capacity (vph)	1541	1418	1535
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.17	0.30	0.30

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	25	144	74	16	381	0	0	364	62
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj				0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				171.0	167.9	171.0	171.0	157.4	0.0	0.0	160.2	171.0
Lanes				0	3	0	0	2	0	0	2	0
Cap, veh/h				146	908	415	89	1478	0	0	1360	228
Arrive On Green				0.34	0.34	0.34	1.00	1.00	0.00	0.00	0.51	0.51
Sat Flow, veh/h				428	2657	1213	49	2908	0	0	2676	449
Grp Volume(v), veh/h				89	95	80	224	207	0	0	236	227
Grp Sat Flow(s),veh/h/ln				1406	1679	1213	1524	1432	0	0	1602	1523
Q Serve(g_s), s				2.7	2.4	2.8	0.0	0.0	0.0	0.0	5.1	5.2
Cycle Q Clear(g_c), s				2.7	2.4	2.8	0.0	0.0	0.0	0.0	5.1	5.2
Prop In Lane				0.30		1.00	0.08		0.00	0.00		0.29
Lane Grp Cap(c), veh/h				480	574	415	839	728	0	0	814	774
V/C Ratio(X)				0.18	0.17	0.19	0.27	0.28	0.00	0.00	0.29	0.29
Avail Cap(c_a), veh/h				480	574	415	839	728	0	0	814	774
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				13.9	13.8	13.9	0.0	0.0	0.0	0.0	8.5	8.5
Incr Delay (d2), s/veh				0.8	0.6	1.0	0.8	1.0	0.0	0.0	0.9	1.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln				1.0	1.0	0.9	0.2	0.2	0.0	0.0	1.9	1.9
Lane Grp Delay (d), s/veh				14.7	14.4	15.0	0.8	1.0	0.0	0.0	9.4	9.5
Lane Grp LOS				B	B	B	A	A			A	A
Approach Vol, veh/h					264			431			463	
Approach Delay, s/veh					14.7			0.9			9.4	
Approach LOS					B			A			A	

Timer	
Assigned Phs	8 2 6
Phs Duration (G+Y+Rc), s	25.0 35.0 35.0
Change Period (Y+Rc), s	4.5 4.5 4.5
Max Green Setting (Gmax), s	20.5 30.5 30.5
Max Q Clear Time (g_c+I1), s	4.8 2.0 7.2
Green Ext Time (p_c), s	1.4 6.4 6.1

Intersection Summary	
HCM 2010 Ctrl Delay	7.4
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	173	41	345	361
v/c Ratio	0.18	0.11	0.24	0.28
Control Delay	13.8	5.7	7.1	5.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.8	5.7	7.1	5.7
Queue Length 50th (ft)	22	0	25	23
Queue Length 95th (ft)	41	17	46	30
Internal Link Dist (ft)	285		55	300
Turn Bay Length (ft)				
Base Capacity (vph)	985	386	1463	1299
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.18	0.11	0.24	0.28

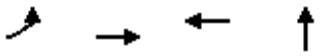
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	63	97	38	0	0	0	0	242	75	46	286	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus Adj	0.85	1.00	0.85				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	171.0	158.1	143.7				0.0	157.8	171.0	171.0	159.6	0.0
Lanes	0	2	1				0	2	0	0	2	0
Cap, veh/h	380	650	372				0	1142	348	221	1237	0
Arrive On Green	0.36	0.36	0.36				0.00	0.49	0.49	0.98	0.98	0.00
Sat Flow, veh/h	1059	1813	1038				0	2324	708	294	2517	0
Grp Volume(v), veh/h	83	90	41				0	177	168	182	179	0
Grp Sat Flow(s),veh/h/ln	1291	1581	1038				0	1578	1453	1359	1452	0
Q Serve(g_s), s	2.6	2.3	1.6				0.0	3.8	4.0	0.0	0.2	0.0
Cycle Q Clear(g_c), s	2.6	2.3	1.6				0.0	3.8	4.0	0.1	0.2	0.0
Prop In Lane	0.82		1.00				0.00		0.49	0.27		0.00
Lane Grp Cap(c), veh/h	463	567	372				0	776	715	744	714	0
V/C Ratio(X)	0.18	0.16	0.11				0.00	0.23	0.24	0.25	0.25	0.00
Avail Cap(c_a), veh/h	463	567	372				0	776	715	744	714	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.2	13.1	12.9				0.0	8.7	8.8	0.3	0.3	0.0
Incr Delay (d2), s/veh	0.8	0.6	0.6				0.0	0.7	0.8	0.8	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.9	0.9	0.4				0.0	1.5	1.4	0.2	0.2	0.0
Lane Grp Delay (d), s/veh	14.0	13.7	13.5				0.0	9.4	9.5	1.0	1.1	0.0
Lane Grp LOS	B	B	B					A	A	A	A	
Approach Vol, veh/h		214						345			361	
Approach Delay, s/veh		13.8						9.5			1.1	
Approach LOS		B						A			A	

Timer												
Assigned Phs		4						2			6	
Phs Duration (G+Y+Rc), s		26.0						34.0			34.0	
Change Period (Y+Rc), s		4.5						4.5			4.5	
Max Green Setting (Gmax), s		21.5						29.5			29.5	
Max Q Clear Time (g_c+I1), s		4.6						6.0			2.2	
Green Ext Time (p_c), s		1.0						4.7			4.8	

Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

Notes



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	27	262	290	111
v/c Ratio	0.06	0.30	0.35	0.09
Control Delay	7.2	8.0	2.1	10.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	7.2	8.0	2.1	10.9
Queue Length 50th (ft)	4	42	5	7
Queue Length 95th (ft)	m13	96	11	20
Internal Link Dist (ft)		308	300	300
Turn Bay Length (ft)	71			
Base Capacity (vph)	432	878	832	1275
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.06	0.30	0.35	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	241	0	0	217	50	16	55	31	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.85	0.85	1.00	0.85			
Adj Sat Flow veh/h/ln	171.0	167.6	0.0	0.0	160.5	171.0	171.0	162.5	171.0			
Lanes	1	1	0	0	1	0	0	3	0			
Cap, veh/h	659	908	0	0	582	133	191	727	362			
Arrive On Green	1.00	1.00	0.00	0.00	1.00	1.00	0.31	0.31	0.31			
Sat Flow, veh/h	996	1676	0	0	1075	246	618	2358	1174			
Grp Volume(v), veh/h	27	262	0	0	0	290	37	40	34			
Grp Sat Flow(s),veh/h/ln	996	1676	0	0	0	1321	1351	1625	1174			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.0	1.2			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.0	1.2			
Prop In Lane	1.00		0.00	0.00		0.19	0.46		1.00			
Lane Grp Cap(c), veh/h	659	908	0	0	0	715	416	501	362			
V/C Ratio(X)	0.04	0.29	0.00	0.00	0.00	0.41	0.09	0.08	0.09			
Avail Cap(c_a), veh/h	659	908	0	0	0	715	416	501	362			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	14.8	14.7	14.8			
Incr Delay (d2), s/veh	0.1	0.8	0.0	0.0	0.0	1.7	0.4	0.3	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (50%), veh/ln	0.0	0.2	0.0	0.0	0.0	0.3	0.4	0.4	0.4			
Lane Grp Delay (d), s/veh	0.1	0.8	0.0	0.0	0.0	1.7	15.2	15.0	15.3			
Lane Grp LOS	A	A				A	B	B	B			
Approach Vol, veh/h		289			290			111				
Approach Delay, s/veh		0.7			1.7			15.2				
Approach LOS		A			A			B				

Timer												
Assigned Phs		4			8			2				
Phs Duration (G+Y+Rc), s		37.0			37.0			23.0				
Change Period (Y+Rc), s		4.5			4.5			4.5				
Max Green Setting (Gmax), s		32.5			32.5			18.5				
Max Q Clear Time (g_c+I1), s		2.0			2.0			3.2				
Green Ext Time (p_c), s		3.9			3.9			0.4				

Intersection Summary												
HCM 2010 Ctrl Delay			3.5									
HCM 2010 LOS			A									

Notes												

Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	265	47	95
v/c Ratio	0.19	0.08	0.07
Control Delay	9.2	2.5	6.7
Queue Delay	0.0	0.0	0.0
Total Delay	9.2	2.5	6.7
Queue Length 50th (ft)	24	1	9
Queue Length 95th (ft)	44	11	16
Internal Link Dist (ft)	109		296
Turn Bay Length (ft)			
Base Capacity (vph)	1371	557	1321
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.19	0.08	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	200	44	43	87	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus Adj				1.00	1.00	0.88	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	171.0	171.0	155.5	169.3	0.0			
Lanes				0	2	0	1	2	0			
Cap, veh/h				0	1086	235	0	1439	0			
Arrive On Green				0.00	0.43	0.43	0.43	0.43	0.00			
Sat Flow, veh/h				0	2556	552	0	3386	0			
Grp Volume(v), veh/h				0	143	122	0	95	0			
Grp Sat Flow(s),veh/h/ln				0	1710	1399	0	1693	0			
Q Serve(g_s), s				0.0	3.2	3.3	0.0	1.0	0.0			
Cycle Q Clear(g_c), s				0.0	3.2	3.3	0.0	1.0	0.0			
Prop In Lane				0.00		0.39	0.00		0.00			
Lane Grp Cap(c), veh/h				0	727	594	0	1439	0			
V/C Ratio(X)				0.00	0.20	0.20	0.00	0.07	0.00			
Avail Cap(c_a), veh/h				0	727	594	0	1439	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	0.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	10.8	10.9	0.0	10.2	0.0			
Incr Delay (d2), s/veh				0.0	0.6	0.8	0.0	0.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (50%), veh/ln				0.0	1.3	1.1	0.0	0.4	0.0			
Lane Grp Delay (d), s/veh				0.0	11.4	11.6	0.0	10.3	0.0			
Lane Grp LOS					B	B		B				
Approach Vol, veh/h					265			95				
Approach Delay, s/veh					11.5			10.3				
Approach LOS					B			B				

Timer	
Assigned Phs	8 2
Phs Duration (G+Y+Rc), s	30.0 30.0
Change Period (Y+Rc), s	4.5 4.5
Max Green Setting (Gmax), s	25.5 25.5
Max Q Clear Time (g_c+I1), s	5.3 3.0
Green Ext Time (p_c), s	1.5 0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.2
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	57	161	0	0	0	0	0	45	15	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	4	0	0	0	0	0	3	6	0	0	0
Mvmt Flow	62	175	0	0	0	0	0	49	16	0	0	0

Major/Minor	Major1						Minor1					
Conflicting Flow All	0	0	0				299	299	87			
Stage 1	-	-	-				299	299	-			
Stage 2	-	-	-				0	0	-			
Follow-up Headway	-	-	-				3.5	4.03	3.36			
Pot Capacity-1 Maneuver	-	-	-				636	610	941			
Stage 1	-	-	-				691	662	-			
Stage 2	-	-	-				-	-	-			
Time blocked-Platoon, %		-	-									
Mov Capacity-1 Maneuver	-	-	-				636	# 0	941			
Mov Capacity-2 Maneuver	-	-	-				636	# 0	-			
Stage 1	-	-	-				691	# 0	-			
Stage 2	-	-	-				-	# 0	-			

Approach	EB	NB
HCM Control Delay, s	0	9.1
HCM LOS		A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR
Capacity (veh/h)	941	941	-	-	-
HCM Lane V/C Ratio	0.058	0.012	-	-	-
HCM Control Delay (s)	9.1	8.9	-	-	-
HCM Lane LOS	A	A			
HCM 95th %tile Q(veh)	0.184	0.035	-	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	9	287	26	288	41	90
v/c Ratio	0.02	0.39	0.07	0.39	0.07	0.16
Control Delay	6.5	9.7	9.2	11.8	8.8	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	9.7	9.2	11.8	8.8	11.4
Queue Length 50th (ft)	2	64	5	60	5	17
Queue Length 95th (ft)	m5	83	16	111	22	43
Internal Link Dist (ft)		300		114	110	109
Turn Bay Length (ft)	50					
Base Capacity (vph)	375	737	376	733	577	577
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.39	0.07	0.39	0.07	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	244	20	24	244	21	7	14	17	31	36	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.87	1.00	1.00	0.87	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow veh/h/ln	171.0	161.4	171.0	171.0	160.7	171.0	171.0	166.7	171.0	171.0	171.0	171.0
Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Cap, veh/h	455	604	50	576	599	52	142	241	244	238	242	92
Arrive On Green	0.95	0.95	0.95	0.47	0.47	0.47	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	998	1272	106	999	1261	109	188	642	650	413	645	246
Grp Volume(v), veh/h	9	0	287	26	0	288	41	0	0	90	0	0
Grp Sat Flow(s),veh/h/ln	998	0	1378	999	0	1370	1480	0	0	1304	0	0
Q Serve(g_s), s	0.2	0.0	1.1	0.9	0.0	8.4	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	8.6	0.0	1.1	1.9	0.0	8.4	1.0	0.0	0.0	2.5	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.08	0.20		0.44	0.38		0.19
Lane Grp Cap(c), veh/h	455	0	654	576	0	651	627	0	0	572	0	0
V/C Ratio(X)	0.02	0.00	0.44	0.05	0.00	0.44	0.07	0.00	0.00	0.16	0.00	0.00
Avail Cap(c_a), veh/h	455	0	654	576	0	651	627	0	0	572	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.4	0.0	0.8	9.1	0.0	10.5	12.0	0.0	0.0	12.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	2.1	0.1	0.0	2.2	0.2	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	0.6	0.2	0.0	2.9	0.4	0.0	0.0	0.9	0.0	0.0
Lane Grp Delay (d), s/veh	2.5	0.0	2.9	9.2	0.0	12.6	12.2	0.0	0.0	13.1	0.0	0.0
Lane Grp LOS	A		A	A		B	B			B		
Approach Vol, veh/h		296			314			41			90	
Approach Delay, s/veh		2.9			12.4			12.2			13.1	
Approach LOS		A			B			B			B	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		33.0			33.0			27.0			27.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		28.5			28.5			22.5			22.5	
Max Q Clear Time (g_c+I1), s		10.6			10.4			3.0			4.5	
Green Ext Time (p_c), s		3.6			3.6			0.6			0.6	

Intersection Summary												
HCM 2010 Ctrl Delay			8.7									
HCM 2010 LOS			A									

Notes

Intersection	
Intersection Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	2	0	0	0	0	0	0	17	63	9	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	9	0	0
Mvmt Flow	0	2	0	0	0	0	0	0	18	68	10	9

Major/Minor	Minor2			Major2		
Conflicting Flow All	151	151	14	0	0	0
Stage 1	151	151	-	-	-	-
Stage 2	0	0	-	-	-	-
Follow-up Headway	3.5	4	3.3	-	-	-
Pot Capacity-1 Maneuver	846	744	1072	-	-	-
Stage 1	882	776	-	-	-	-
Stage 2	-	-	-	-	-	-
Time blocked-Platoon, %					-	-
Mov Capacity-1 Maneuver	846	0	1072	-	-	-
Mov Capacity-2 Maneuver	846	0	-	-	-	-
Stage 1	882	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	NB	SB
HCM Control Delay, s	8.4	0
HCM LOS	A	

Minor Lane / Major Mvmt	NBLn1	NBLn2	SBL	SBT	SBR
Capacity (veh/h)	0	1072	-	-	-
HCM Lane V/C Ratio	+	0.017	-	-	-
HCM Control Delay (s)	0	8.4	-	-	-
HCM Lane LOS	A	A			
HCM 95th %tile Q(veh)	+	0.053	-	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	312	10	7	340	0	18	0	2	14	11	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	45	-	-	0	-	0	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	3	0	11	0	0	0	18	8
Mvmt Flow	0	339	11	8	370	0	20	0	2	15	12	87

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	370	0	0	350	0	0	736	730	345	730	735	370
Stage 1	-	-	-	-	-	-	345	345	-	385	385	-
Stage 2	-	-	-	-	-	-	391	385	-	345	350	-
Follow-up Headway	2.2	-	-	2.2	-	-	3.599	4	3.3	3.5	4.162	3.372
Pot Capacity-1 Maneuver	1200	-	-	1220	-	-	324	352	702	340	328	663
Stage 1	-	-	-	-	-	-	652	640	-	642	584	-
Stage 2	-	-	-	-	-	-	616	614	-	675	605	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1200	-	-	1220	-	-	272	350	702	337	326	663
Mov Capacity-2 Maneuver	-	-	-	-	-	-	272	350	-	337	326	-
Stage 1	-	-	-	-	-	-	652	640	-	642	580	-
Stage 2	-	-	-	-	-	-	521	610	-	673	605	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	18.4	12.4
HCM LOS			C	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	272	702	1200	-	-	1220	-	-	337	326	663
HCM Lane V/C Ratio	0.072	0.003	-	-	-	0.006	-	-	0.045	0.037	0.131
HCM Control Delay (s)	19.3	10.1	0	-	-	7.969	-	-	16.2	16.5	11.2
HCM Lane LOS	C	B	A			A			C	C	B
HCM 95th %tile Q(veh)	0.231	0.009	0	-	-	0.019	-	-	0.141	0.114	0.45

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	14	88	50	7	0	0	0	0	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	7	2	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	15	96	54	8	0	0	0	0	3	2

Major/Minor	Major2			Minor2		
Conflicting Flow All	0	0	0	249	249	58
Stage 1	-	-	-	249	249	-
Stage 2	-	-	-	0	0	-
Follow-up Headway	-	-	-	3.5	4	3.3
Pot Capacity-1 Maneuver	-	-	-	744	657	1014
Stage 1	-	-	-	797	704	-
Stage 2	-	-	-	-	-	-
Time blocked-Platoon, %		-	-			
Mov Capacity-1 Maneuver	-	-	-	744	# 0	1014
Mov Capacity-2 Maneuver	-	-	-	744	# 0	-
Stage 1	-	-	-	797	# 0	-
Stage 2	-	-	-	-	# 0	-

Approach	WB	SB
HCM Control Delay, s	0	8.6
HCM LOS		A

Minor Lane / Major Mvmt	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	1014
HCM Lane V/C Ratio	-	-	-	0.005
HCM Control Delay (s)	-	-	-	8.6
HCM Lane LOS				A
HCM 95th %tile Q(veh)	-	-	-	0.016

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.7

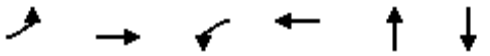
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	147	309	69	9	405	24	0	0	0	13	19	180
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	103	-	-	70	-	-	-	-	-	-	-	70
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	3	0	3	4	0	0	0	0	5	0
Mvmt Flow	160	336	75	10	440	26	0	0	0	14	21	196

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	466	0	0	411	0	0				1166	1203	453
Stage 1	-	-	-	-	-	-				473	473	-
Stage 2	-	-	-	-	-	-				693	730	-
Follow-up Headway	2.209	-	-	2.2	-	-				3.5	4.045	3.3
Pot Capacity-1 Maneuver	1101	-	-	1159	-	-				216	182	611
Stage 1	-	-	-	-	-	-				631	553	-
Stage 2	-	-	-	-	-	-				500	423	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1101	-	-	1159	-	-				183	# 0	611
Mov Capacity-2 Maneuver	-	-	-	-	-	-				183	# 0	-
Stage 1	-	-	-	-	-	-				626	# 0	-
Stage 2	-	-	-	-	-	-				427	# 0	-

Approach	EB	WB	SB
HCM Control Delay, s	2.5	0.2	14
HCM LOS			B

Minor Lane / Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1101	-	-	1159	-	-	431	611
HCM Lane V/C Ratio	0.145	-	-	0.008	-	-	0.232	0.213
HCM Control Delay (s)	8.824	-	-	8.133	-	-	15.9	12.5
HCM Lane LOS	A			A			C	B
HCM 95th %tile Q(veh)	0.507	-	-	0.026	-	-	0.887	0.804

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	110	251	105	228	372	631
v/c Ratio	0.36	0.56	0.36	0.50	0.34	0.57
Control Delay	15.2	23.6	10.6	10.0	9.2	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	23.6	10.6	10.0	9.2	8.8
Queue Length 50th (ft)	24	75	12	10	31	34
Queue Length 95th (ft)	52	139	26	25	46	48
Internal Link Dist (ft)		269		308	300	293
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	309	450	288	458	1098	1104
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.56	0.36	0.50	0.34	0.57

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	101	212	19	97	128	82	47	259	36	96	411	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	169.3	169.4	171.0	166.0	167.9	171.0	171.0	165.1	171.0	171.0	167.2	171.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	393	358	33	358	224	143	192	940	130	236	895	158
Arrive On Green	0.08	0.28	0.28	0.13	0.46	0.46	0.85	0.85	0.85	0.85	0.85	0.85
Sat Flow, veh/h	1612	1301	119	1581	814	521	273	2211	306	368	2106	371
Grp Volume(v), veh/h	110	0	251	105	0	228	187	0	185	317	0	314
Grp Sat Flow(s),veh/h/ln	1612	0	1419	1581	0	1335	1341	0	1448	1390	0	1456
Q Serve(g_s), s	2.9	0.0	9.3	2.8	0.0	7.7	0.0	0.0	1.5	0.0	0.0	3.4
Cycle Q Clear(g_c), s	2.9	0.0	9.3	2.8	0.0	7.7	1.3	0.0	1.5	2.8	0.0	3.4
Prop In Lane	1.00		0.08	1.00		0.39	0.27		0.21	0.33		0.25
Lane Grp Cap(c), veh/h	393	0	390	358	0	367	646	0	616	670	0	619
V/C Ratio(X)	0.28	0.00	0.64	0.29	0.00	0.62	0.29	0.00	0.30	0.47	0.00	0.51
Avail Cap(c_a), veh/h	393	0	390	358	0	367	646	0	616	670	0	619
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.2	0.0	19.2	13.6	0.0	13.9	2.7	0.0	2.7	2.8	0.0	2.8
Incr Delay (d2), s/veh	1.8	0.0	7.9	2.1	0.0	7.7	1.1	0.0	1.2	2.4	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.2	0.0	3.9	1.1	0.0	2.8	0.6	0.0	0.6	1.1	0.0	1.2
Lane Grp Delay (d), s/veh	15.9	0.0	27.1	15.7	0.0	21.5	3.8	0.0	4.0	5.2	0.0	5.8
Lane Grp LOS	B		C	B		C	A		A	A		A
Approach Vol, veh/h		361			333			372			631	
Approach Delay, s/veh		23.7			19.7			3.9			5.5	
Approach LOS		C			B			A			A	

Timer												
Assigned Phs	7	4		3	8			2			6	
Phs Duration (G+Y+Rc), s	9.0	21.0		9.0	21.0			30.0			30.0	
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5			4.5			4.5	
Max Green Setting (Gmax), s	4.5	16.5		4.5	16.5			25.5			25.5	
Max Q Clear Time (g_c+I1), s	4.9	11.3		4.8	9.7			3.5			5.4	
Green Ext Time (p_c), s	0.0	1.4		0.0	1.7			2.3			4.1	

Intersection Summary		
HCM 2010 Ctrl Delay		11.8
HCM 2010 LOS		B

Notes

Lane Group	WBT	NBT	SBT
Lane Group Flow (vph)	231	481	680
v/c Ratio	0.16	0.32	0.41
Control Delay	5.0	6.0	8.8
Queue Delay	0.0	0.0	0.0
Total Delay	5.0	6.0	8.8
Queue Length 50th (ft)	6	36	65
Queue Length 95th (ft)	11	51	98
Internal Link Dist (ft)	305	293	40
Turn Bay Length (ft)			
Base Capacity (vph)	1473	1510	1657
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.16	0.32	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	49	101	63	22	420	0	0	532	94
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj				0.85	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				171.0	170.2	171.0	171.0	166.3	0.0	0.0	167.6	171.0
Lanes				0	3	0	0	2	0	0	2	0
Cap, veh/h				308	701	398	105	1570	0	0	1458	257
Arrive On Green				0.32	0.32	0.32	1.00	1.00	0.00	0.00	0.52	0.52
Sat Flow, veh/h				949	2158	1225	75	2991	0	0	2778	489
Grp Volume(v), veh/h				78	85	68	247	234	0	0	348	332
Grp Sat Flow(s),veh/h/ln				1399	1702	1231	1553	1513	0	0	1676	1590
Q Serve(g_s), s				2.4	2.1	2.4	0.0	0.0	0.0	0.0	7.5	7.5
Cycle Q Clear(g_c), s				2.4	2.1	2.4	0.0	0.0	0.0	0.0	7.5	7.5
Prop In Lane				0.68		1.00	0.10		0.00	0.00		0.31
Lane Grp Cap(c), veh/h				455	553	400	881	794	0	0	880	835
V/C Ratio(X)				0.17	0.15	0.17	0.28	0.30	0.00	0.00	0.40	0.40
Avail Cap(c_a), veh/h				455	553	400	881	794	0	0	880	835
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				14.5	14.4	14.5	0.0	0.0	0.0	0.0	8.5	8.6
Incr Delay (d2), s/veh				0.8	0.6	0.9	0.8	0.9	0.0	0.0	1.3	1.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln				0.9	0.9	0.8	0.2	0.2	0.0	0.0	2.9	2.8
Lane Grp Delay (d), s/veh				15.3	15.0	15.4	0.8	0.9	0.0	0.0	9.9	10.0
Lane Grp LOS				B	B	B	A	A			A	A
Approach Vol, veh/h					231			481			680	
Approach Delay, s/veh					15.2			0.9			9.9	
Approach LOS					B			A			A	

Timer	
Assigned Phs	8 2 6
Phs Duration (G+Y+Rc), s	24.0 36.0 36.0
Change Period (Y+Rc), s	4.5 4.5 4.5
Max Green Setting (Gmax), s	19.5 31.5 31.5
Max Q Clear Time (g_c+I1), s	4.4 2.0 9.5
Green Ext Time (p_c), s	1.1 8.9 8.0

Intersection Summary	
HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

Notes

Lane Group	EBT	EBR	NBT	SBT
Lane Group Flow (vph)	197	60	448	573
v/c Ratio	0.21	0.15	0.27	0.38
Control Delay	15.4	5.8	5.9	4.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	15.4	5.8	5.9	4.5
Queue Length 50th (ft)	26	0	28	28
Queue Length 95th (ft)	47	22	51	35
Internal Link Dist (ft)	276		55	300
Turn Bay Length (ft)				
Base Capacity (vph)	952	396	1653	1497
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.15	0.27	0.38

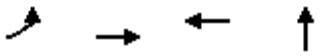
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	129	55	0	0	0	0	290	122	37	490	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus Adj	0.85	1.00	0.85				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	171.0	167.6	156.9				0.0	167.0	171.0	171.0	166.0	0.0
Lanes	0	2	1				0	2	0	0	2	0
Cap, veh/h	271	723	368				0	1180	488	135	1531	0
Arrive On Green	0.32	0.32	0.32				0.00	0.52	0.52	1.00	1.00	0.00
Sat Flow, veh/h	835	2225	1133				0	2247	929	128	2917	0
Grp Volume(v), veh/h	94	103	60				0	232	216	292	281	0
Grp Sat Flow(s),veh/h/ln	1383	1676	1133				0	1670	1506	1534	1511	0
Q Serve(g_s), s	3.0	2.6	2.3				0.0	4.6	4.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.0	2.6	2.3				0.0	4.6	4.8	0.0	0.0	0.0
Prop In Lane	0.60		1.00				0.00		0.62	0.14		0.00
Lane Grp Cap(c), veh/h	450	545	368				0	877	791	874	793	0
V/C Ratio(X)	0.21	0.19	0.16				0.00	0.27	0.27	0.33	0.35	0.00
Avail Cap(c_a), veh/h	450	545	368				0	877	791	874	793	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.7	14.6	14.4				0.0	7.9	7.9	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.8	0.9				0.0	0.7	0.9	1.0	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.1	1.1	0.7				0.0	1.8	1.7	0.3	0.3	0.0
Lane Grp Delay (d), s/veh	15.7	15.3	15.4				0.0	8.6	8.8	1.0	1.2	0.0
Lane Grp LOS	B	B	B					A	A	A	A	
Approach Vol, veh/h		257						448			573	
Approach Delay, s/veh		15.5						8.7			1.1	
Approach LOS		B						A			A	

Timer												
Assigned Phs		4						2			6	
Phs Duration (G+Y+Rc), s		24.0						36.0			36.0	
Change Period (Y+Rc), s		4.5						4.5			4.5	
Max Green Setting (Gmax), s		19.5						31.5			31.5	
Max Q Clear Time (g_c+I1), s		5.0						6.8			2.0	
Green Ext Time (p_c), s		1.1						7.2			7.6	

Intersection Summary												
HCM 2010 Ctrl Delay			6.7									
HCM 2010 LOS			A									

Notes



Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	28	346	373	106
v/c Ratio	0.07	0.39	0.42	0.09
Control Delay	6.8	8.1	2.1	10.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.8	8.1	2.1	10.0
Queue Length 50th (ft)	4	56	5	6
Queue Length 95th (ft)	m9	114	10	17
Internal Link Dist (ft)		308	300	300
Turn Bay Length (ft)	71			
Base Capacity (vph)	376	886	884	1244
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.07	0.39	0.42	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	318	0	0	288	55	19	45	33	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.85	0.85	1.00	0.85			
Adj Sat Flow veh/h/ln	171.0	169.3	0.0	0.0	170.5	171.0	171.0	159.6	171.0			
Lanes	1	1	0	0	1	0	0	3	0			
Cap, veh/h	620	917	0	0	640	123	253	645	356			
Arrive On Green	1.00	1.00	0.00	0.00	1.00	1.00	0.31	0.31	0.31			
Sat Flow, veh/h	923	1693	0	0	1182	227	819	2093	1153			
Grp Volume(v), veh/h	28	346	0	0	0	373	34	36	36			
Grp Sat Flow(s),veh/h/ln	923	1693	0	0	0	1409	1316	1596	1153			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.0	1.3			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.0	1.3			
Prop In Lane	1.00		0.00	0.00		0.16	0.62		1.00			
Lane Grp Cap(c), veh/h	620	917	0	0	0	763	406	492	356			
V/C Ratio(X)	0.05	0.38	0.00	0.00	0.00	0.49	0.08	0.07	0.10			
Avail Cap(c_a), veh/h	620	917	0	0	0	763	406	492	356			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	14.7	14.7	14.8			
Incr Delay (d2), s/veh	0.1	1.2	0.0	0.0	0.0	2.2	0.4	0.3	0.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (50%), veh/ln	0.0	0.3	0.0	0.0	0.0	0.5	0.4	0.4	0.4			
Lane Grp Delay (d), s/veh	0.1	1.2	0.0	0.0	0.0	2.2	15.1	15.0	15.4			
Lane Grp LOS	A	A				A	B	B	B			
Approach Vol, veh/h		374			373			106				
Approach Delay, s/veh		1.1			2.2			15.2				
Approach LOS		A			A			B				

Timer												
Assigned Phs		4			8			2				
Phs Duration (G+Y+Rc), s		37.0			37.0			23.0				
Change Period (Y+Rc), s		4.5			4.5			4.5				
Max Green Setting (Gmax), s		32.5			32.5			18.5				
Max Q Clear Time (g_c+I1), s		2.0			2.0			3.3				
Green Ext Time (p_c), s		5.4			5.4			0.4				

Intersection Summary												
HCM 2010 Ctrl Delay			3.3									
HCM 2010 LOS			A									

Notes

Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	294	36	101
v/c Ratio	0.22	0.07	0.08
Control Delay	7.6	2.7	6.6
Queue Delay	0.0	0.0	0.0
Total Delay	7.6	2.7	6.6
Queue Length 50th (ft)	22	1	10
Queue Length 95th (ft)	43	m9	17
Internal Link Dist (ft)	109		296
Turn Bay Length (ft)			
Base Capacity (vph)	1355	542	1321
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.07	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	180	90	33	93	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00			
Parking Bus Adj				1.00	1.00	0.88	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	169.3	171.0	152.7	169.3	0.0			
Lanes				0	2	0	1	2	0			
Cap, veh/h				0	864	412	0	1439	0			
Arrive On Green				0.00	0.43	0.43	0.43	0.43	0.00			
Sat Flow, veh/h				0	2034	969	0	3386	0			
Grp Volume(v), veh/h				0	162	132	0	101	0			
Grp Sat Flow(s),veh/h/ln				0	1693	1310	0	1693	0			
Q Serve(g_s), s				0.0	3.6	3.9	0.0	1.1	0.0			
Cycle Q Clear(g_c), s				0.0	3.6	3.9	0.0	1.1	0.0			
Prop In Lane				0.00		0.74	0.00		0.00			
Lane Grp Cap(c), veh/h				0	720	557	0	1439	0			
V/C Ratio(X)				0.00	0.22	0.24	0.00	0.07	0.00			
Avail Cap(c_a), veh/h				0	720	557	0	1439	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	0.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	11.0	11.0	0.0	10.2	0.0			
Incr Delay (d2), s/veh				0.0	0.7	1.0	0.0	0.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (50%), veh/ln				0.0	1.5	1.3	0.0	0.4	0.0			
Lane Grp Delay (d), s/veh				0.0	11.7	12.0	0.0	10.3	0.0			
Lane Grp LOS					B	B		B				
Approach Vol, veh/h					294			101				
Approach Delay, s/veh					11.8			10.3				
Approach LOS					B			B				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	30.0	30.0
Change Period (Y+Rc), s	4.5	4.5
Max Green Setting (Gmax), s	25.5	25.5
Max Q Clear Time (g_c+I1), s	5.9	3.1
Green Ext Time (p_c), s	1.7	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	11.5
HCM 2010 LOS	B

Notes

Intersection	
Intersection Delay, s/veh	1.9

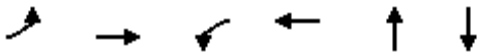
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	39	249	0	0	0	0	0	58	14	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	3	0	0	0	0	0	3	7	0	0	0
Mvmt Flow	42	271	0	0	0	0	0	63	15	0	0	0

Major/Minor	Major1						Minor1					
Conflicting Flow All	0	0	0				355	355	134			
Stage 1	-	-	-				355	355	-			
Stage 2	-	-	-				0	0	-			
Follow-up Headway	-	-	-				3.5	4.03	3.37			
Pot Capacity-1 Maneuver	-	-	-				581	567	875			
Stage 1	-	-	-				641	626	-			
Stage 2	-	-	-				-	-	-			
Time blocked-Platoon, %		-	-									
Mov Capacity-1 Maneuver	-	-	-				581	# 0	875			
Mov Capacity-2 Maneuver	-	-	-				581	# 0	-			
Stage 1	-	-	-				641	# 0	-			
Stage 2	-	-	-				-	# 0	-			

Approach	EB	NB
HCM Control Delay, s	0	9.5
HCM LOS		A

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR
Capacity (veh/h)	875	875	-	-	-
HCM Lane V/C Ratio	0.078	0.012	-	-	-
HCM Control Delay (s)	9.5	9.2	-	-	-
HCM Lane LOS	A	A			
HCM 95th %tile Q(veh)	0.253	0.035	-	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	21	360	20	376	46	102
v/c Ratio	0.06	0.45	0.06	0.47	0.08	0.19
Control Delay	8.2	11.6	8.7	12.3	9.5	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	11.6	8.7	12.3	9.5	13.1
Queue Length 50th (ft)	5	85	4	81	6	22
Queue Length 95th (ft)	m10	114	13	144	25	51
Internal Link Dist (ft)		300		114	110	109
Turn Bay Length (ft)	50					
Base Capacity (vph)	332	796	343	794	561	534
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.45	0.06	0.47	0.08	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	327	5	18	322	24	10	16	17	44	39	11
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.87	1.00	1.00	0.87	1.00	1.00	1.00	1.00	1.00	0.88
Adj Sat Flow veh/h/ln	171.0	167.7	171.0	171.0	167.9	171.0	171.0	171.0	171.0	171.0	171.0	171.0
Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Cap, veh/h	406	702	10	571	657	49	165	238	211	278	214	54
Arrive On Green	0.98	0.98	0.98	0.49	0.49	0.49	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	920	1427	20	934	1335	99	253	665	590	529	598	150
Grp Volume(v), veh/h	21	0	360	20	0	376	46	0	0	102	0	0
Grp Sat Flow(s),veh/h/ln	920	0	1447	934	0	1435	1508	0	0	1278	0	0
Q Serve(g_s), s	0.5	0.0	0.5	0.7	0.0	10.8	0.0	0.0	0.0	0.7	0.0	0.0
Cycle Q Clear(g_c), s	11.4	0.0	0.5	1.2	0.0	10.8	1.1	0.0	0.0	3.0	0.0	0.0
Prop In Lane	1.00		0.01	1.00		0.07	0.24		0.39	0.47		0.12
Lane Grp Cap(c), veh/h	406	0	711	571	0	705	615	0	0	546	0	0
V/C Ratio(X)	0.05	0.00	0.51	0.03	0.00	0.53	0.07	0.00	0.00	0.19	0.00	0.00
Avail Cap(c_a), veh/h	406	0	711	571	0	705	615	0	0	546	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.5	0.0	0.3	8.2	0.0	10.5	12.7	0.0	0.0	13.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	2.6	0.1	0.0	2.9	0.2	0.0	0.0	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.1	0.0	0.6	0.2	0.0	3.9	0.4	0.0	0.0	1.1	0.0	0.0
Lane Grp Delay (d), s/veh	2.7	0.0	2.8	8.3	0.0	13.4	13.0	0.0	0.0	14.0	0.0	0.0
Lane Grp LOS	A		A	A		B	B			B		
Approach Vol, veh/h		381			396			46			102	
Approach Delay, s/veh		2.8			13.1			13.0			14.0	
Approach LOS		A			B			B			B	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		34.0			34.0			26.0			26.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		29.5			29.5			21.5			21.5	
Max Q Clear Time (g_c+I1), s		13.4			12.8			3.1			5.0	
Green Ext Time (p_c), s		4.5			4.6			0.7			0.7	

Intersection Summary												
HCM 2010 Ctrl Delay			9.0									
HCM 2010 LOS			A									

Notes

Intersection	
Intersection Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	4	0	0	0	0	0	0	14	87	9	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	7	0	0
Mvmt Flow	0	4	0	0	0	0	0	0	15	95	10	1

Major/Minor	Minor2			Major2		
Conflicting Flow All	199	199	10	0	0	0
Stage 1	199	199	-	-	-	-
Stage 2	0	0	-	-	-	-
Follow-up Headway	3.5	4	3.3	-	-	-
Pot Capacity-1 Maneuver	794	700	1077	-	-	-
Stage 1	839	740	-	-	-	-
Stage 2	-	-	-	-	-	-
Time blocked-Platoon, %					-	-
Mov Capacity-1 Maneuver	794	0	1077	-	-	-
Mov Capacity-2 Maneuver	794	0	-	-	-	-
Stage 1	839	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	NB	SB
HCM Control Delay, s	8.4	0
HCM LOS	A	

Minor Lane / Major Mvmt	NBLn1	NBLn2	SBL	SBT	SBR
Capacity (veh/h)	0	1077	-	-	-
HCM Lane V/C Ratio	+	0.014	-	-	-
HCM Control Delay (s)	0	8.4	-	-	-
HCM Lane LOS	A	A			
HCM 95th %tile Q(veh)	+	0.043	-	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

APPENDIX B

Crash Data

ACCIDENT QUERY LIST
District 1
Gage County - Beatrice
Ella St., 3rd St. to 7th St.
Non-fatal Accidents: 1-1-2010 thru 12-31-2012
Fatal Accidents: 1-1-2010 thru 12-31-2012

ACCIDENTS LISTED WEST TO EAST

NDOR Accident Key	Accident Date	Week day	Mil. Time	Ref. Post Num	Accident Location Description	Acc Sev	Num. Injured	Num. Fatal	Weather	Light Cond	Multi Vehicle Accident Type	First Harmful Event	Road Surf Cond	Alco Rel?
Ella St., 3rd St. to 7th St.														
210025928	3/10/2010	WED	0808		4TH ST & ELLA ST	PDO	0	0	Not	Light	Angle	MV transprt	Dry	N
212024790	4/13/2012	FRI	2499		5TH ST & ELLA ST	N-R	0	0	Not	N/S	Angle	MV transprt	N/S	N
210047206	8/31/2010	TUE	1515		7TH ST & ELLA ST	INJ-C	1	0	Cloudy	Light	N/A	Bicycle	Dry	N
212004408	11/22/2011	TUE	1150		7TH ST & ELLA ST	PDO	0	0	Cloudy	Light	Angle	MV transprt	Dry	N
211035258	6/18/2011	SAT	2499		ELLA ST W OF 6TH ST(US77)	N-R	0	0	Unknown	Dark	N/A	Parked MV	Unk	N
=====							===	===						
5							1	0						

FILE: F:\Projects\013-1216_TRFC\data\Crash Data from NDOR\22.10 to 22.45 & 177.27 to 177.83-06-2013-QM Ella St.xlsx

ACCIDENT QUERY LIST
District 1
Gage County - Beatrice
Market St., 2nd St. to 7th St.
Non-fatal Accidents: 1-1-2010 thru 12-31-2012
Fatal Accidents: 1-1-2010 thru 12-31-2012

ACCIDENTS LISTED WEST TO EAST

NDOR Accident Key	Accident Date	Week day	Mil. Time	Ref. Post Num	Accident Location Description	Acc Sev	Num. Injured	Num. Fatal	Weather	Light Cond	Multi Vehicle Accident Type	First Harmful Event	Road Surf Cond	Alco Rel?
Market St., 2nd St. to 7th St.														
212024636	3/29/2012	THU	0807		2ND ST & MARKET ST	PDO	0	0	Cloudy	Light	SS (same)	MV transprt	Dry	N
211006759	12/9/2010	THU	1214		4TH ST & MARKET ST	PDO	0	0	Clear	Light	Angle	MV transprt	Dry	N
211016038	2/10/2011	THU	1426		4TH ST & MARKET ST	PDO	0	0	Cloudy	Light	LT Leavng	MV transprt	Dry	N
211009853	2/9/2011	WED	0908		4TH ST AT MARKET ST	PDO	0	0	Clear	Light	Backing	MV transprt	Wet	N
210027510	3/27/2010	SAT	0852		7TH ST & MARKET ST	PDO	0	0	Rain	Light	Angle	MV transprt	Wet	N
210045476	8/10/2010	TUE	1545		7TH ST & MARKET ST	PDO	0	0	Clear	Light	LT Leavng	MV transprt	Dry	N
211019825	3/15/2011	TUE	1907		7TH ST & MARKET ST	PDO	0	0	Clear	Light	LT Leavng	MV transprt	Dry	N
211038614	8/8/2011	MON	1613		7TH ST & MARKET ST	PDO	0	0	Clear	Light	SS (same)	MV transprt	Dry	N
=====							===	===						
8							0	0						

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FILE: F:\Projects\013-1216_TRFC\data\Crash Data from NDOR\22.10 to 22.45 & 177.27 to 177.83-06-2013-QM Market St.xlsx

ACCIDENT QUERY LIST
District 1
Gage County - Beatrice
US-77, RP 22+10 to RP 22+45
Non-fatal Accidents: 1-1-2010 thru 12-31-2012
Fatal Accidents: 1-1-2010 thru 12-31-2012
ACCIDENTS LISTED IN REFERENCE POST ORDER

NDOR Accident Key	Accident Date	Week day	Mil. Time	Ref. Post Num	Accident Location Description	Acc Sev	Num. Injured	Num. Fatal	Weather	Light Cond	Multi Vehicle Accident Type	First Harmful Event	Road Surf Cond	Alco Rel?
US-77, RP 22+10 (Begin Study - 0.02 mi. S. of Bell St.) to RP 22+27 (Jct. w/ US-136)														
211014225	1/28/2011	FRI	1630	022.12	6TH ST(US77) AT BELL ST	PDO	0	0	Clear	Light	Rear-end	MV transprt	Wet	N
210048801	9/1/2010	WED	0758	022.20	6TH ST(US77) & MARKET ST	N-R	0	0	Cloudy	Light	LT Leavng	MV transprt	Dry	N
211023843	4/11/2011	MON	1628	022.20	6TH ST(US77) & MARKET ST	PDO	0	0	Clear	Light	Angle	MV transprt	Dry	N
211025267	5/3/2011	TUE	1620	022.20	6TH ST(US77) AT MARKET ST	PDO	0	0	Clear	Light	Rear-end	MV transprt	Dry	N
211032922	6/27/2011	MON	1025	022.20	6TH ST(US77) AT MARKET ST	INJ-C	1	0	Clear	Light	Rear-end	MV transprt	Dry	N
212021726	5/23/2012	WED	1135	022.20	6TH ST(US77) & MARKET ST	INJ-B	2	0	Clear	Light	Angle	MV transprt	Dry	N
212045617	9/28/2012	FRI	1108	022.20	6TH ST(US77) & MARKET ST	N-R	0	0	Clear	Light	Angle	MV transprt	Dry	N
212053209	11/26/2012	MON	1712	022.20	6TH ST(US77) & MARKET ST	PDO	0	0	Clear	Dusk	Angle	MV transprt	Dry	N
=====							===	===						
8							3	0						
Jct. of US-77 (RP 22+10) and US-136 (RP 177+64)														
210014790	1/2/2010	SAT	1214	022.27	6TH ST(US77) & COURT ST(US136)	PDO	0	0	Clear	Light	SS (same)	MV transprt	Ice	N
210025907	3/7/2010	SUN	1842	022.27	6TH ST(US77) & COURT ST(US136)	INJ-C	2	0	Clear	Dusk	LT Leavng	MV transprt	Dry	N
210050009	9/12/2010	SUN	2104	022.27	6TH ST(US77) & COURT ST(US136)	N-R	0	0	Clear	Dark	Angle	MV transprt	Dry	N
210055034	10/14/2010	THU	1640	022.27	6TH ST(US77) & COURT ST(US136)	PDO	0	0	Clear	Light	LT Leavng	MV transprt	Dry	N
211014160	1/24/2011	MON	0647	022.27	6TH ST(US77) & COURT ST(US136)	INJ-A	1	0	Clear	Dark	N/A	Pedestrian	Sno	N
211018552	2/28/2011	MON	1512	022.27	6TH ST(US77) & COURT ST(US136)	PDO	0	0	Clear	Light	LT Leavng	MV transprt	Dry	Y
211032397	6/17/2011	FRI	1122	022.27	6TH ST(US77) & COURT ST(US136)	INJ-C	1	0	Clear	Light	LT Leavng	MV transprt	Dry	N
211033386	6/17/2011	FRI	1301	022.27	6TH ST(US77) AT COURT ST(US136)	PDO	0	0	Clear	Light	SS (same)	MV transprt	Dry	N
211038494	8/12/2011	FRI	1939	022.27	6TH ST(US77) & COURT ST(US136)	PDO	0	0	Clear	Dusk	Angle	MV transprt	Dry	N
211046221	9/25/2011	SUN	1630	177.64	COURT ST(US136) AT 6TH ST(US77)	INJ-C	1	0	Clear	Light	Rear-end	MV transprt	Dry	N
211046446	9/29/2011	THU	1140	022.27	6TH ST(US77) & COURT ST(US136)	INJ-C	1	0	Clear	Light	N/A	Parked MV	Dry	N
212004646	10/21/2011	FRI	1253	022.27	6TH ST(US77) & COURT ST(US136)	N-R	0	0	Clear	Light	LT Leavng	MV transprt	Dry	N
212014967	2/3/2012	FRI	1430	022.27	6TH ST(US77) & COURT ST(US136)	PDO	0	0	Unknown	Light	Angle	MV transprt	Dry	N
212025792	3/14/2012	WED	1500	022.27	6TH ST(US77) & COURT ST(US136)	PDO	0	0	Clear	Light	Angle	MV transprt	Dry	N
212018981	4/22/2012	SUN	1356	022.27	6TH ST(US77) & COURT ST(US136)	PDO	0	0	Clear	Light	LT Leavng	MV transprt	Dry	N
212022152	4/23/2012	MON	1726	022.27	6TH ST(US77) & COURT ST(US136)	N-R	0	0	Clear	Light	Angle	MV transprt	Dry	N
212023990	5/31/2012	THU	2140	022.27	6TH ST(US77) & COURT ST(US136)	N-R	0	0	Clear	Dusk	N/A	Oth fix obj	Dry	N
212032465	7/9/2012	MON	1223	022.27	6TH ST(US77) AT COURT ST(US136)	PDO	0	0	Clear	Light	Rear-end	MV transprt	Dry	N
212033498	7/20/2012	FRI	1305	022.27	6TH ST(US77) & COURT ST(US136)	INJ-C	1	0	Clear	Light	Angle	MV transprt	Dry	N
=====							===	===						
19							7	0						

US-77, RP 22+27 to RP 22+45 (End Study - 0.02 mi. N. of Elk St.)

FILE: F:\Projects\013-1216_TRFC\data\Crash Data from NDOR\22.10 to 22.45 & 177.27 to 177.83-06-2013-QM US-77.xlsx

ACCIDENT QUERY LIST
District 1
Gage County - Beatrice
US-77, RP 22+10 to RP 22+45
Non-fatal Accidents: 1-1-2010 thru 12-31-2012
Fatal Accidents: 1-1-2010 thru 12-31-2012
ACCIDENTS LISTED IN REFERENCE POST ORDER

NDOR Accident Key	Accident Date	Week day	Mil. Time	Ref. Post Num	Accident Location Description	Acc Sev	Num. Injured	Num. Fatal	Weather	Light Cond	Multi Vehicle Accident Type	First Harmful Event	Road Surf Cond	Alco Rel?
212045369	9/20/2012	THU	1115	022.35	6TH ST(US77) S OF ELLA ST	N-R	0	0	Clear	Light	SS (same)	MV transprt	Dry	N
210043177	7/21/2010	WED	1547	022.36	6TH ST(US77) & ELLA ST	INJ-B	2	0	Not stated	Light	Angle	MV transprt	Dry	N
211026725	5/11/2011	WED	1745	022.36	6TH ST(US77) & ELLA ST	INJ-C	4	0	Cloudy	Light	Angle	MV transprt	Dry	N
211026744	5/12/2011	THU	1256	022.36	6TH ST(US77) & ELLA ST	INJ-B	2	0	Clear	Light	Angle	MV transprt	Dry	N
211031358	6/14/2011	TUE	0810	022.36	6TH ST(US77) & ELLA ST	N-R	0	0	Clear	Light	LT Leavng	MV transprt	Dry	N
212035761	7/31/2012	TUE	1611	022.36	6TH ST(US77) & ELLA ST	N-R	0	0	Clear	Light	SS (same)	MV transprt	Dry	N
212045708	10/10/2012	WED	0736	022.36	6TH ST(US77) & ELLA ST	INJ-C	1	0	Clear	Light	Angle	MV transprt	Dry	N
212058916	12/31/2012	MON	1325	022.36	6TH ST(US77) & ELLA ST	N-R	0	0	Snow	Light	N/A	Parked MV	Sno	N
212045719	8/24/2012	FRI	1210	022.38	6TH ST(US77) N OF ELLA ST-US BANK ENT	INJ-C	1	0	Clear	Light	Angle	MV transprt	Wet	N
211038504	8/12/2011	FRI	1040	022.39	6TH ST(US77) N OF ELLA ST-ALLEY	N-R	0	0	Cloudy	Light	Rear-end	MV transprt	Wet	N
211011559	1/4/2011	TUE	1440	022.43	6TH ST(US77) & ELK ST	PDO	0	0	Clear	Light	Angle	MV transprt	Dry	N
211021338	3/22/2011	TUE	0802	022.44	6TH ST(US77) N OF ELK ST-ENT	PDO	0	0	Cloudy	Light	Rear-end	MV transprt	Dry	N
=====							===	===						
12							10	0						

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ACCIDENT QUERY LIST
District 1
Gage County - Beatrice
US-136, RP 177+27 to RP 177+83
Non-fatal Accidents: 1-1-2010 thru 12-31-2011
Fatal Accidents: 1-1-2010 thru 12-31-2011
ACCIDENTS LISTED IN REFERENCE POST ORDER

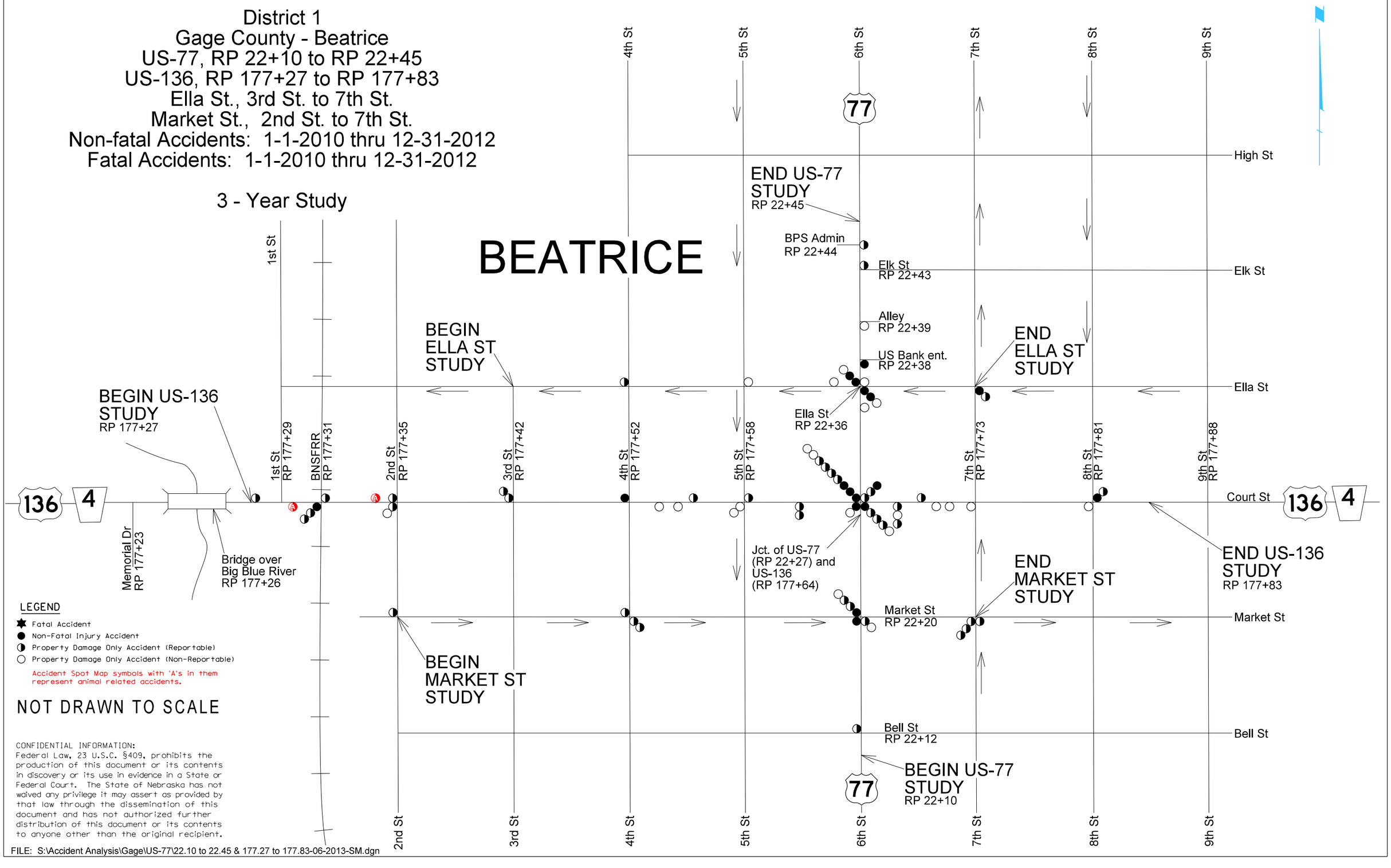
NDOR Accident Key	Accident Date	Week day	Mil. Time	Ref. Post Num	Accident Location Description	Acc Sev	Num. Injured	Num. Fatal	Weather	Light Cond	Multi Vehicle Accident Type	First Harmful Event	Road Surf Cond	Alco Rel?
US-136, RP 177+27 (Begin Study - 0.02 mi. W. of 1st St.) to RP 177+83 (End Study - 0.02 mi. E. of 8th St.) - excluding Jct. w/ US-77														
212022004	4/23/2012	MON	1648	177.270	COURT ST(US136) W OF 1ST ST	PDO	0	0	Clear	Light	Rear-end	MV transprt	Dry	N
211021048	3/16/2011	WED	2027	177.300	COURT ST(US136) E OF 1ST ST	PDO	0	0	Clear	Dark	N/A	Animal	Dry	N
211011789	1/11/2011	TUE	1300	177.310	COURT ST(US136) AT BNSFRR-E OF 1ST ST	INJ-C	2	0	Clear	Light	Rear-end	MV transprt	Sls	N
211019915	3/4/2011	FRI	0844	177.310	COURT ST(US136) & BNSFRR-E OF 1ST ST	PDO	0	0	Cloudy	Light	Rear-end	MV transprt	Dry	N
211029594	5/28/2011	SAT	2011	177.310	COURT ST(US136) AT BNSFRR-E OF 1ST ST	PDO	0	0	Clear	Light	Rear-end	MV transprt	Dry	N
212022014	3/31/2012	SAT	0609	177.310	COURT ST(US136) AT BNSFRR-E OF 1ST ST	PDO	0	0	Clear	Dawn	Rear-end	MV transprt	Dry	N
211017833	2/16/2011	WED	2307	177.340	COURT ST(US136) W OF 2ND ST	PDO	0	0	Clear	Dark	N/A	Animal	Wet	N
210015593	1/6/2010	WED	1420	177.350	COURT ST(US136) AT 2ND ST	PDO	0	0	Cloudy	Light	Rear-end	MV transprt	Sno	N
210034801	5/20/2010	THU	0911	177.350	COURT ST(US136) AT 2ND ST	N-R	0	0	Clear	Light	SS (same)	MV transprt	Wet	N
212049401	11/6/2012	TUE	0810	177.350	COURT ST(US136) & 2ND ST	PDO	0	0	Clear	Light	Angle	MV transprt	Dry	N
210012321	1/19/2010	TUE	1335	177.420	COURT ST(US136) & 3RD ST	PDO	0	0	Cloudy	Light	SS (same)	MV transprt	Wet	N
211035607	7/20/2011	WED	1751	177.420	COURT ST(US136) & 3RD ST	PDO	0	0	Clear	Light	Angle	MV transprt	Dry	N
212035507	7/24/2012	TUE	1136	177.520	COURT ST(US136) & 4TH ST	INJ-B	1	0	Clear	Light	N/A	Pedestrian	Dry	Y
210017635	1/15/2010	FRI	0622	177.540	COURT ST(US136) E OF 4TH ST	N-R	0	0	Fog,	Light	N/A	Pedestrian	Dry	N
210021918	2/5/2010	FRI	1355	177.550	COURT ST(US136) W OF 5TH ST	N-R	0	0	Cloudy	Light	N/A	Parked MV	Wet	N
211021050	3/16/2011	WED	1000	177.560	COURT ST(US136) W OF 5TH ST	PDO	0	0	Clear	Light	SS (same)	MV transprt	Dry	N
211017649	2/18/2011	FRI	1351	177.580	COURT ST(US136) & 5TH ST	N-R	0	0	Clear	Light	Rear-end	MV transprt	Dry	N
211024957	4/28/2011	THU	1253	177.580	COURT ST(US136) AT 5TH ST	PDO	0	0	Clear	Light	SS (same)	MV transprt	Dry	N
212033713	7/19/2012	THU	1530	177.580	COURT ST(US136) & 5TH ST	N-R	0	0	Clear	Light	N/A	Parked MV	Dry	N
210045474	8/10/2010	TUE	1845	177.620	COURT ST(US136) W OF 6TH ST(US77)	PDO	0	0	Clear	Light	N/A	Parked MV	Dry	N
211014128	1/24/2011	MON	1105	177.620	COURT ST(US136) W OF 6TH ST(US77)	PDO	0	0	Clear	Light	SS (same)	MV transprt	Wet	N
210024155	2/23/2010	TUE	1728	177.650	COURT ST(US136) E OF 6TH ST(US77)	PDO	0	0	Clear	Light	SS (same)	MV transprt	Dry	N
210028732	4/2/2010	FRI	0910	177.650	COURT ST(US136) E OF 6TH ST(US77)	N-R	0	0	Clear	Light	N/A	Lite supprt	Dry	N
212053026	11/6/2012	TUE	1648	177.650	COURT ST(US136) E OF 6TH ST(US77)	PDO	0	0	Clear	Light	Backing	MV transprt	Dry	N
212022173	3/6/2012	TUE	1157	177.690	COURT ST(US136) E OF 6TH ST(US77)	PDO	0	0	Clear	Light	SS (same)	MV transprt	Dry	N
210022012	2/9/2010	TUE	1312	177.700	COURT ST(US136) W OF 7TH ST	N-R	0	0	Cloudy	N/S	N/A	Parked MV	Dry	N
210043749	8/27/2010	FRI	1222	177.720	COURT ST(US136) W OF 7TH ST	N-R	0	0	Clear	Light	N/A	Lite supprt	Dry	N
212022163	5/2/2012	WED	1416	177.730	COURT ST(US136) & 7TH ST	N-R	0	0	Clear	Light	SS (same)	MV transprt	Dry	N
210039566	6/19/2010	SAT	1308	177.810	COURT ST(US136) & 8TH ST	INJ-C	1	0	Not stated	Light	Angle	MV transprt	Dry	N
211042912	9/1/2011	THU	1030	177.810	COURT ST(US136) & 8TH ST	PDO	0	0	Clear	Light	Angle	MV transprt	Dry	N
212008873	12/17/2011	SAT	1132	177.810	COURT ST(US136) AT 8TH ST	N-R	0	0	Clear	Light	Rear-end	MV transprt	Dry	N
=====							===	===						
31							4	0						

FILE: F:\Projects\013-1216_TRFC\data\Crash Data from NDOR\22.10 to 22.45 & 177.27 to 177.83-06-2013-QM US-136.xlsx

SPOT MAP

District 1
Gage County - Beatrice
US-77, RP 22+10 to RP 22+45
US-136, RP 177+27 to RP 177+83
Ella St., 3rd St. to 7th St.
Market St., 2nd St. to 7th St.
Non-fatal Accidents: 1-1-2010 thru 12-31-2012
Fatal Accidents: 1-1-2010 thru 12-31-2012

3 - Year Study



LEGEND

- Fatal Accident
- Non-Fatal Injury Accident
- Property Damage Only Accident (Reportable)
- Property Damage Only Accident (Non-Reportable)

Accident Spot Map symbols with 'A's in them represent animal related accidents.

NOT DRAWN TO SCALE

FILE: S:\Accident Analysis\Gage\US-77\22.10 to 22.45 & 177.27 to 177.83-06-2013-SM.dgn

APPENDIX C

Traffic Volume Projections

Nebraska
Department of Roads

Memorandum

Planning and Project Development Division **Traffic Analysis Unit**

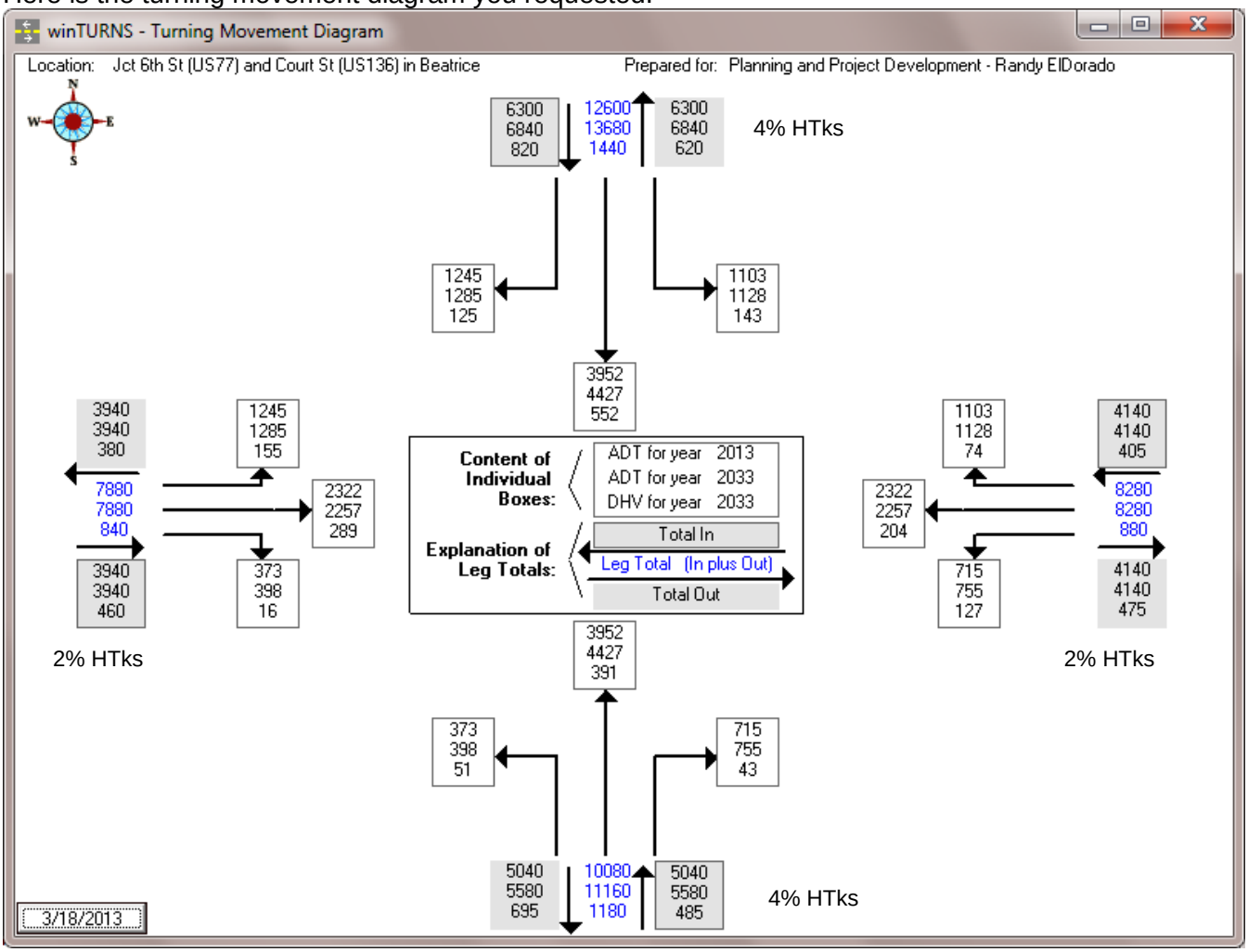
Date: March 18, 2013

To: Randy ElDorado, Planning and Project Development Division

From: Rick Ernstmeyer, Traffic Analysis Supervisor

Subject: Turning Movement Diagrams at Jct of US77 and US136 in Beatrice

Here is the turning movement diagram you requested.



No growth expected on US136. Forecast volumes are based upon trend analysis of nearby portable count locations. Distribution of ADTs and DHVs are based upon the May 16, 2007 manual count by Traffic Engineering Division. Truck percentages shown are based upon that same count.

APPENDIX D

Capacity Analysis Evaluation

Intersection	
Intersection Delay, s/veh	3.8

Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	156	217	205	28	24	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	170	236	223	30	26	125

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	253	0	-	0	813	238
Stage 1	-	-	-	-	238	-
Stage 2	-	-	-	-	575	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1312	-	-	-	348	801
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	563	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1312	-	-	-	303	801
Mov Capacity-2 Maneuver	-	-	-	-	401	-
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	490	-

Approach	SE	NW	SW
HCM Control Delay, s	3.4	0	11
HCM LOS			B

Minor Lane / Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1312	-	401	801
HCM Lane V/C Ratio	-	-	0.129	-	0.065	0.156
HCM Control Delay (s)	-	-	8.151	-	14.6	10.3
HCM Lane LOS			A		B	B
HCM 95th %tile Q(veh)	-	-	0.444	-	0.208	0.551

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	40	139	5	5	94	9	15	10	4	8	10	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	151	5	5	102	10	16	11	4	9	11	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	112	0	0	157	0	0	364	364	154	366	361	107
Stage 1	-	-	-	-	-	-	241	241	-	118	118	-
Stage 2	-	-	-	-	-	-	123	123	-	248	243	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1478	-	-	1423	-	-	592	564	892	590	566	947
Stage 1	-	-	-	-	-	-	762	706	-	887	798	-
Stage 2	-	-	-	-	-	-	881	794	-	756	705	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1478	-	-	1423	-	-	549	546	892	564	548	947
Mov Capacity-2 Maneuver	-	-	-	-	-	-	549	546	-	564	548	-
Stage 1	-	-	-	-	-	-	740	685	-	861	795	-
Stage 2	-	-	-	-	-	-	836	791	-	719	684	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.3	11.6	10
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	579	1478	-	-	1423	-	-	651	947
HCM Lane V/C Ratio	0.054	0.029	-	-	0.004	-	-	0.047	0.023
HCM Control Delay (s)	11.6	7.51	-	-	7.54	-	-	10.8	8.9
HCM Lane LOS	B	A			A			B	A
HCM 95th %tile Q(veh)	0.172	0.091	-	-	0.012	-	-	0.147	0.07

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	161	366	14	9	290	21	10	2	5	2	5	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	175	398	15	10	315	23	11	2	5	2	5	146

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	338	0	0	413	0	0	1177	1113	405	1105	1109	327
Stage 1	-	-	-	-	-	-	755	755	-	346	346	-
Stage 2	-	-	-	-	-	-	422	358	-	759	763	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1221	-	-	1146	-	-	168	208	646	188	210	714
Stage 1	-	-	-	-	-	-	401	417	-	670	635	-
Stage 2	-	-	-	-	-	-	609	628	-	399	413	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1221	-	-	1146	-	-	116	177	646	163	178	714
Mov Capacity-2 Maneuver	-	-	-	-	-	-	116	177	-	163	178	-
Stage 1	-	-	-	-	-	-	344	357	-	574	629	-
Stage 2	-	-	-	-	-	-	476	623	-	337	354	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	0.2	30.1	12.7
HCM LOS			D	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	162	1221	-	-	1146	-	-	618
HCM Lane V/C Ratio	0.114	0.143	-	-	0.009	-	-	0.248
HCM Control Delay (s)	30.1	8.441	-	-	8.168	-	-	12.7
HCM Lane LOS	D	A			A			B
HCM 95th %tile Q(veh)	0.378	0.5	-	-	0.026	-	-	0.973

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	153	124	30	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	166	135	33	0	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	167	0	-	0	317	151
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	166	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1411	-	-	-	676	895
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	863	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1411	-	-	-	676	895
Mov Capacity-2 Maneuver	-	-	-	-	705	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	863	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1411	-	-	-	895
HCM Lane V/C Ratio	-	-	-	-	0.039
HCM Control Delay (s)	0	-	-	-	9.2
HCM Lane LOS	A				A
HCM 95th %tile Q(veh)	0	-	-	-	0.121

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.3

Movement	SEL	SER	NEL	NET	SWT	SWR
Vol, veh/h	123	30	28	177	142	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	134	33	30	192	154	137

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	476	223	291	0	-	0
Stage 1	223	-	-	-	-	-
Stage 2	253	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	548	817	1271	-	-	-
Stage 1	814	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	535	817	1271	-	-	-
Mov Capacity-2 Maneuver	605	-	-	-	-	-
Stage 1	814	-	-	-	-	-
Stage 2	770	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	12	1.1	0
HCM LOS	B		

Minor Lane / Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	1271	-	605	817	-	-
HCM Lane V/C Ratio	0.024	-	0.221	0.04	-	-
HCM Control Delay (s)	7.902	-	12.6	9.6	-	-
HCM Lane LOS	A		B	A		
HCM 95th %tile Q(veh)	0.074	-	0.839	0.125	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	60	157	46	134	553	336
v/c Ratio	0.14	0.22	0.10	0.19	0.36	0.27
Control Delay	13.0	12.5	12.3	9.8	8.5	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	12.5	12.3	9.8	8.5	3.9
Queue Length 50th (ft)	14	34	10	22	46	8
Queue Length 95th (ft)	35	69	28	53	76	19
Internal Link Dist (ft)		305		305	138	301
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	415	726	479	722	1539	1267
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.22	0.10	0.19	0.36	0.27

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	55	133	11	42	90	33	13	347	149	64	189	56
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	548	565	47	516	509	187	76	1081	449	285	792	242
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.46	0.46	0.46	0.92	0.92	0.92
Sat Flow, veh/h	1250	1443	119	1225	1301	478	29	2359	979	430	1728	528
Grp Volume(v), veh/h	60	0	157	46	0	134	301	0	252	151	0	185
Grp Sat Flow(s),veh/h/ln	1250	0	1562	1225	0	1778	1843	0	1522	1084	0	1602
Q Serve(g_s), s	2.0	0.0	4.1	1.6	0.0	3.0	0.0	0.0	6.4	1.4	0.0	0.8
Cycle Q Clear(g_c), s	5.0	0.0	4.1	5.7	0.0	3.0	6.3	0.0	6.4	7.8	0.0	0.8
Prop In Lane	1.00		0.08	1.00		0.27	0.05		0.64	0.46		0.33
Lane Grp Cap(c), veh/h	548	0	612	516	0	697	908	0	698	584	0	734
V/C Ratio(X)	0.11	0.00	0.26	0.09	0.00	0.19	0.33	0.00	0.36	0.26	0.00	0.25
Avail Cap(c_a), veh/h	548	0	612	516	0	697	908	0	698	584	0	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.6	0.0	12.3	14.3	0.0	12.0	10.5	0.0	10.5	1.8	0.0	1.4
Incr Delay (d2), s/veh	0.4	0.0	1.0	0.3	0.0	0.6	1.0	0.0	1.5	1.1	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.6	0.0	1.6	0.5	0.0	1.3	2.8	0.0	2.5	0.3	0.0	0.4
Lane Grp Delay (d), s/veh	14.0	0.0	13.4	14.6	0.0	12.6	11.5	0.0	12.0	2.8	0.0	2.2
Lane Grp LOS	B		B	B		B	B		B	A		A
Approach Vol, veh/h		217			180			553			336	
Approach Delay, s/veh		13.5			13.1			11.7			2.5	
Approach LOS		B			B			B			A	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		28.0			28.0			32.0			32.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		23.5			23.5			27.5			27.5	
Max Q Clear Time (g_c+I1), s		7.0			7.7			8.4			9.8	
Green Ext Time (p_c), s		1.9			1.8			5.7			5.5	

Intersection Summary												
HCM 2010 Ctrl Delay			9.8									
HCM 2010 LOS			A									

Notes

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	14	112	27	86	473	358
v/c Ratio	0.04	0.17	0.07	0.13	0.29	0.23
Control Delay	12.9	11.8	13.5	11.9	7.7	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	11.8	13.5	11.9	7.7	7.0
Queue Length 50th (ft)	3	22	6	17	42	25
Queue Length 95th (ft)	13	51	m20	42	61	39
Internal Link Dist (ft)		305		301	301	305
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	397	662	388	659	1637	1529
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.17	0.07	0.13	0.29	0.23

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	13	84	19	25	65	14	13	416	6	34	265	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	538	446	103	513	454	96	81	1688	26	186	1341	152
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.49	0.49	0.49	0.98	0.98	0.98
Sat Flow, veh/h	1306	1245	287	1276	1268	268	35	3434	52	232	2728	310
Grp Volume(v), veh/h	14	0	112	27	0	86	247	0	226	183	0	175
Grp Sat Flow(s),veh/h/ln	1306	0	1533	1276	0	1536	1836	0	1686	1630	0	1640
Q Serve(g_s), s	0.4	0.0	3.0	0.9	0.0	2.3	0.0	0.0	4.7	0.0	0.0	0.1
Cycle Q Clear(g_c), s	2.7	0.0	3.0	3.9	0.0	2.3	4.7	0.0	4.7	0.1	0.0	0.1
Prop In Lane	1.00		0.19	1.00		0.17	0.06		0.03	0.20		0.19
Lane Grp Cap(c), veh/h	538	0	549	513	0	550	966	0	829	873	0	807
V/C Ratio(X)	0.03	0.00	0.20	0.05	0.00	0.16	0.26	0.00	0.27	0.21	0.00	0.22
Avail Cap(c_a), veh/h	538	0	549	513	0	550	966	0	829	873	0	807
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.0	0.0	13.3	14.7	0.0	13.1	8.9	0.0	9.0	0.3	0.0	0.3
Incr Delay (d2), s/veh	0.1	0.0	0.8	0.2	0.0	0.6	0.6	0.0	0.8	0.5	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.1	0.0	1.2	0.3	0.0	0.9	2.0	0.0	1.9	0.2	0.0	0.2
Lane Grp Delay (d), s/veh	14.1	0.0	14.2	14.9	0.0	13.7	9.6	0.0	9.8	0.8	0.0	0.9
Lane Grp LOS	B		B	B		B	A		A	A		A
Approach Vol, veh/h		126			113			473			358	
Approach Delay, s/veh		14.2			14.0			9.7			0.8	
Approach LOS		B			B			A			A	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		26.0			26.0			34.0			34.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		21.5			21.5			29.5			29.5	
Max Q Clear Time (g_c+I1), s		5.0			5.9			6.7			2.1	
Green Ext Time (p_c), s		1.1			1.1			3.0			2.3	

Intersection Summary												
HCM 2010 Ctrl Delay			7.7									
HCM 2010 LOS			A									

Notes

Intersection	
Intersection Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	28	300	18	11	136	8	11	42	20	35	32	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	326	20	12	148	9	12	46	22	38	35	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	157	0	0	346	0	0	600	577	336	606	583	152
Stage 1	-	-	-	-	-	-	397	397	-	176	176	-
Stage 2	-	-	-	-	-	-	203	180	-	430	407	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1423	-	-	1213	-	-	413	427	706	409	424	894
Stage 1	-	-	-	-	-	-	629	603	-	826	753	-
Stage 2	-	-	-	-	-	-	799	750	-	603	597	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1423	-	-	1213	-	-	369	414	706	355	411	894
Mov Capacity-2 Maneuver	-	-	-	-	-	-	369	414	-	355	411	-
Stage 1	-	-	-	-	-	-	616	590	-	809	746	-
Stage 2	-	-	-	-	-	-	738	743	-	528	584	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.6	14.5	14.4
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	457	1423	-	-	1213	-	-	355	471
HCM Lane V/C Ratio	0.174	0.021	-	-	0.01	-	-	0.071	0.142
HCM Control Delay (s)	14.5	7.585	-	-	7.997	-	-	15.9	13.9
HCM Lane LOS	B	A			A			C	B
HCM 95th %tile Q(veh)	0.622	0.066	-	-	0.03	-	-	0.23	0.493

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	5.8

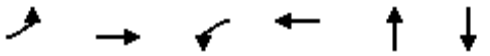
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	27	86	11	47	83	26	15	48	15	52	27	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	93	12	51	90	28	16	52	16	57	29	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	118	0	0	105	0	0	382	379	99	399	371	104
Stage 1	-	-	-	-	-	-	158	158	-	207	207	-
Stage 2	-	-	-	-	-	-	224	221	-	192	164	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1470	-	-	1486	-	-	576	553	957	561	559	951
Stage 1	-	-	-	-	-	-	844	767	-	795	731	-
Stage 2	-	-	-	-	-	-	779	720	-	810	762	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1470	-	-	1486	-	-	525	522	957	488	528	951
Mov Capacity-2 Maneuver	-	-	-	-	-	-	525	522	-	488	528	-
Stage 1	-	-	-	-	-	-	827	752	-	779	704	-
Stage 2	-	-	-	-	-	-	714	693	-	726	747	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	2.3	12.1	12.6
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	525	580	1470	-	-	1486	-	-	488	541
HCM Lane V/C Ratio	0.021	0.127	0.02	-	-	0.034	-	-	0.077	0.101
HCM Control Delay (s)	12	12.1	7.499	-	-	7.509	0	-	13	12.4
HCM Lane LOS	B	B	A			A	A		B	B
HCM 95th %tile Q(veh)	0.063	0.435	0.061	-	-	0.107	-	-	0.25	0.336

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	21	76	12	156	482	405
v/c Ratio	0.05	0.11	0.03	0.23	0.31	0.27
Control Delay	12.4	11.4	12.2	10.0	2.7	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	11.4	12.2	10.0	2.7	9.6
Queue Length 50th (ft)	5	15	3	25	8	40
Queue Length 95th (ft)	16	38	11	60	17	65
Internal Link Dist (ft)		295		305	305	169
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	459	690	420	693	1580	1487
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.11	0.03	0.23	0.31	0.27

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	60	10	11	96	48	13	424	6	34	308	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	490	583	99	578	374	187	79	1632	24	164	1348	131
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.95	0.95	0.95	0.47	0.47	0.47
Sat Flow, veh/h	1226	1553	263	1318	997	498	33	3436	51	195	2839	275
Grp Volume(v), veh/h	21	0	76	12	0	156	252	0	230	208	0	197
Grp Sat Flow(s),veh/h/ln	1226	0	1816	1318	0	1495	1835	0	1686	1663	0	1647
Q Serve(g_s), s	0.7	0.0	1.6	0.4	0.0	4.4	0.0	0.0	0.6	0.0	0.0	4.3
Cycle Q Clear(g_c), s	5.1	0.0	1.6	2.0	0.0	4.4	0.6	0.0	0.6	4.0	0.0	4.3
Prop In Lane	1.00		0.14	1.00		0.33	0.06		0.03	0.18		0.17
Lane Grp Cap(c), veh/h	490	0	681	578	0	561	935	0	801	861	0	782
V/C Ratio(X)	0.04	0.00	0.11	0.02	0.00	0.28	0.27	0.00	0.29	0.24	0.00	0.25
Avail Cap(c_a), veh/h	490	0	681	578	0	561	935	0	801	861	0	782
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.9	0.0	12.2	12.9	0.0	13.1	0.8	0.0	0.8	9.3	0.0	9.4
Incr Delay (d2), s/veh	0.2	0.0	0.3	0.1	0.0	1.2	0.7	0.0	0.9	0.7	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.2	0.0	0.7	0.1	0.0	1.7	0.4	0.0	0.4	1.8	0.0	1.7
Lane Grp Delay (d), s/veh	15.0	0.0	12.6	12.9	0.0	14.3	1.5	0.0	1.7	10.0	0.0	10.2
Lane Grp LOS	B		B	B		B	A		A	A		B
Approach Vol, veh/h		97			168			482			405	
Approach Delay, s/veh		13.1			14.2			1.6			10.1	
Approach LOS		B			B			A			B	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		27.0			27.0			33.0			33.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		22.5			22.5			28.5			28.5	
Max Q Clear Time (g_c+I1), s		7.1			6.4			2.6			6.3	
Green Ext Time (p_c), s		1.3			1.3			6.1			5.9	

Intersection Summary		
HCM 2010 Ctrl Delay	7.4	
HCM 2010 LOS	A	

Notes

Intersection	
Intersection Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	19	64	17	58	123	5	27	45	29	5	10	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	50	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	70	18	63	134	5	29	49	32	5	11	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	139	0	0	88	0	0	391	385	79	423	392	136
Stage 1	-	-	-	-	-	-	120	120	-	263	263	-
Stage 2	-	-	-	-	-	-	271	265	-	160	129	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1445	-	-	1508	-	-	568	549	981	541	544	913
Stage 1	-	-	-	-	-	-	884	796	-	742	691	-
Stage 2	-	-	-	-	-	-	735	689	-	842	789	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1445	-	-	1508	-	-	532	518	981	465	514	913
Mov Capacity-2 Maneuver	-	-	-	-	-	-	532	518	-	465	514	-
Stage 1	-	-	-	-	-	-	871	784	-	731	662	-
Stage 2	-	-	-	-	-	-	689	660	-	753	778	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	2.3	11.8	11.6
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	532	622	1445	-	-	1508	-	-	465	584
HCM Lane V/C Ratio	0.037	0.145	0.014	-	-	0.042	-	-	0.008	0.031
HCM Control Delay (s)	12	11.8	7.527	-	-	7.491	-	-	12.8	11.4
HCM Lane LOS	B	B	A			A			B	B
HCM 95th %tile Q(veh)	0.114	0.505	0.043	-	-	0.131	-	-	0.024	0.096

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	5	8	37	51	7	10	5	44	1	3	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	9	40	55	8	11	5	48	1	3	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	14	0	0	163	164	10	187	165	59
Stage 1	-	-	-	-	-	-	21	21	-	140	140	-
Stage 2	-	-	-	-	-	-	142	143	-	47	25	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1540	-	-	1604	-	-	802	729	1071	774	728	1007
Stage 1	-	-	-	-	-	-	998	878	-	863	781	-
Stage 2	-	-	-	-	-	-	861	779	-	967	874	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1540	-	-	1604	-	-	781	709	1071	719	708	1007
Mov Capacity-2 Maneuver	-	-	-	-	-	-	781	709	-	719	708	-
Stage 1	-	-	-	-	-	-	995	875	-	860	762	-
Stage 2	-	-	-	-	-	-	835	760	-	915	871	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	2.8	9	9.8
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	968	1540	-	-	1604	-	-	755
HCM Lane V/C Ratio	0.066	0.004	-	-	0.025	-	-	0.007
HCM Control Delay (s)	9	7.346	-	-	7.302	-	-	9.8
HCM Lane LOS	A	A			A			A
HCM 95th %tile Q(veh)	0.212	0.011	-	-	0.077	-	-	0.022

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	1	0	0	0	0	1	10	0	12	12	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	1	0	0	0	0	1	11	0	13	13	4

Major/Minor	Minor2			Major2		
Conflicting Flow All	41	41	15	0	0	0
Stage 1	41	41	-	-	-	-
Stage 2	0	0	-	-	-	-
Follow-up Headway	3.518	4.018	3.318	-	-	-
Pot Capacity-1 Maneuver	970	851	1065	-	-	-
Stage 1	981	861	-	-	-	-
Stage 2	-	-	-	-	-	-
Time blocked-Platoon, %					-	-
Mov Capacity-1 Maneuver	970	# 0	1065	-	-	-
Mov Capacity-2 Maneuver	970	# 0	-	-	-	-
Stage 1	981	# 0	-	-	-	-
Stage 2	-	# 0	-	-	-	-

Approach	NB	SB
HCM Control Delay, s	8.8	0
HCM LOS	A	

Minor Lane / Major Mvmt	NBLn1	SBL	SBT	SBR
Capacity (veh/h)	970	-	-	-
HCM Lane V/C Ratio	0.012	-	-	-
HCM Control Delay (s)	8.8	-	-	-
HCM Lane LOS	A			
HCM 95th %tile Q(veh)	0.037	-	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.3

Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	158	138	176	19	26	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	172	150	191	21	28	104

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	212	0	-	0	695	202
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	493	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1358	-	-	-	408	839
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	614	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1358	-	-	-	356	839
Mov Capacity-2 Maneuver	-	-	-	-	444	-
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	536	-

Approach	SE	NW	SW
HCM Control Delay, s	4.3	0	11.3
HCM LOS			B

Minor Lane / Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1358	-	705
HCM Lane V/C Ratio	-	-	0.126	-	0.188
HCM Control Delay (s)	-	-	8.034	-	11.3
HCM Lane LOS			A		B
HCM 95th %tile Q(veh)	-	-	0.433	-	0.688

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	55	117	5	8	97	15	7	10	4	13	15	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	60	127	5	9	105	16	8	11	4	14	16	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	122	0	0	133	0	0	388	388	130	388	383	114
Stage 1	-	-	-	-	-	-	249	249	-	131	131	-
Stage 2	-	-	-	-	-	-	139	139	-	257	252	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1465	-	-	1452	-	-	571	547	920	571	550	939
Stage 1	-	-	-	-	-	-	755	701	-	873	788	-
Stage 2	-	-	-	-	-	-	864	782	-	748	698	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1465	-	-	1452	-	-	526	521	920	539	524	939
Mov Capacity-2 Maneuver	-	-	-	-	-	-	526	521	-	539	524	-
Stage 1	-	-	-	-	-	-	724	672	-	837	783	-
Stage 2	-	-	-	-	-	-	823	777	-	702	669	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.5	11.6	11
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	570	1465	-	-	1452	-	-	575	939
HCM Lane V/C Ratio	0.04	0.041	-	-	0.006	-	-	0.064	0.014
HCM Control Delay (s)	11.6	7.562	-	-	7.494	-	-	11.7	8.9
HCM Lane LOS	B	A			A			B	A
HCM 95th %tile Q(veh)	0.125	0.128	-	-	0.018	-	-	0.205	0.042

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	122	283	11	17	244	11	9	3	7	6	10	129
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	133	308	12	18	265	12	10	3	8	7	11	140

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	277	0	0	320	0	0	963	893	314	892	893	271
Stage 1	-	-	-	-	-	-	579	579	-	308	308	-
Stage 2	-	-	-	-	-	-	384	314	-	584	585	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1286	-	-	1240	-	-	235	281	726	263	281	768
Stage 1	-	-	-	-	-	-	501	501	-	702	660	-
Stage 2	-	-	-	-	-	-	639	656	-	498	498	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1286	-	-	1240	-	-	169	248	726	235	248	768
Mov Capacity-2 Maneuver	-	-	-	-	-	-	169	248	-	235	248	-
Stage 1	-	-	-	-	-	-	449	449	-	629	650	-
Stage 2	-	-	-	-	-	-	506	646	-	439	446	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0.5	20.5	12.8
HCM LOS			C	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	253	1286	-	-	1240	-	-	620
HCM Lane V/C Ratio	0.082	0.103	-	-	0.015	-	-	0.254
HCM Control Delay (s)	20.5	8.121	-	-	7.947	-	-	12.8
HCM Lane LOS	C	A			A			B
HCM 95th %tile Q(veh)	0.264	0.344	-	-	0.045	-	-	1.005

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	8	1	1	0	0	0	1	11	0	18	14	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	1	1	0	0	0	1	12	0	20	15	7

Major/Minor	Minor2			Major2		
Conflicting Flow All	58	58	18	0	0	0
Stage 1	58	58	-	-	-	-
Stage 2	0	0	-	-	-	-
Follow-up Headway	3.518	4.018	3.318	-	-	-
Pot Capacity-1 Maneuver	949	833	1061	-	-	-
Stage 1	965	847	-	-	-	-
Stage 2	-	-	-	-	-	-
Time blocked-Platoon, %					-	-
Mov Capacity-1 Maneuver	949	# 0	1061	-	-	-
Mov Capacity-2 Maneuver	949	# 0	-	-	-	-
Stage 1	965	# 0	-	-	-	-
Stage 2	-	# 0	-	-	-	-

Approach	NB	SB
HCM Control Delay, s	8.8	0
HCM LOS	A	

Minor Lane / Major Mvmt	NBLn1	SBL	SBT	SBR
Capacity (veh/h)	949	-	-	-
HCM Lane V/C Ratio	0.014	-	-	-
HCM Control Delay (s)	8.8	-	-	-
HCM Lane LOS	A			
HCM 95th %tile Q(veh)	0.042	-	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	190	117	30	0	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	207	127	33	0	41

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	160	0	-	0	350	143
Stage 1	-	-	-	-	143	-
Stage 2	-	-	-	-	207	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1419	-	-	-	647	905
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	828	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1419	-	-	-	647	905
Mov Capacity-2 Maneuver	-	-	-	-	684	-
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	828	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	905
HCM Lane V/C Ratio	-	-	-	-	0.046
HCM Control Delay (s)	0	-	-	-	9.2
HCM Lane LOS	A				A
HCM 95th %tile Q(veh)	0	-	-	-	0.143

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.7

Movement	SEL	SER	NEL	NET	SWT	SWR
Vol, veh/h	134	56	31	184	203	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	146	61	34	200	221	126

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	551	284	347	0	-	0
Stage 1	284	-	-	-	-	-
Stage 2	267	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	495	755	1212	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	481	755	1212	-	-	-
Mov Capacity-2 Maneuver	566	-	-	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	756	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	12.6	1.2	0
HCM LOS	B		

Minor Lane / Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	1212	-	566	755	-	-
HCM Lane V/C Ratio	0.028	-	0.257	0.081	-	-
HCM Control Delay (s)	8.055	-	13.6	10.2	-	-
HCM Lane LOS	A		B	B		
HCM 95th %tile Q(veh)	0.086	-	1.02	0.262	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	103	205	68	213	360	403
v/c Ratio	0.27	0.28	0.15	0.30	0.24	0.31
Control Delay	14.9	12.2	13.0	12.2	8.0	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	12.2	13.0	12.2	8.0	4.8
Queue Length 50th (ft)	24	42	15	44	29	12
Queue Length 95th (ft)	56	83	38	86	52	26
Internal Link Dist (ft)		305		305	138	301
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	380	722	455	722	1483	1313
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.28	0.15	0.30	0.24	0.31

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	95	151	38	63	153	43	22	234	75	77	234	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	480	479	120	469	547	155	124	1123	347	318	901	233
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.46	0.46	0.46	0.92	0.92	0.92
Sat Flow, veh/h	1164	1223	306	1172	1397	396	122	2450	758	508	1966	507
Grp Volume(v), veh/h	103	0	205	68	0	213	191	0	169	197	0	206
Grp Sat Flow(s),veh/h/ln	1164	0	1529	1172	0	1793	1769	0	1561	1376	0	1606
Q Serve(g_s), s	4.0	0.0	5.6	2.6	0.0	4.9	0.0	0.0	3.9	0.5	0.0	0.9
Cycle Q Clear(g_c), s	8.9	0.0	5.6	8.2	0.0	4.9	3.7	0.0	3.9	4.4	0.0	0.9
Prop In Lane	1.00		0.20	1.00		0.22	0.13		0.49	0.43		0.32
Lane Grp Cap(c), veh/h	480	0	599	469	0	702	878	0	716	716	0	736
V/C Ratio(X)	0.21	0.00	0.34	0.15	0.00	0.30	0.22	0.00	0.24	0.28	0.00	0.28
Avail Cap(c_a), veh/h	480	0	599	469	0	702	878	0	716	716	0	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	12.8	15.7	0.0	12.6	9.8	0.0	9.9	1.4	0.0	1.4
Incr Delay (d2), s/veh	1.0	0.0	1.6	0.7	0.0	1.1	0.6	0.0	0.8	1.0	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.2	0.0	2.2	0.8	0.0	2.2	1.6	0.0	1.5	0.4	0.0	0.4
Lane Grp Delay (d), s/veh	16.7	0.0	14.4	16.4	0.0	13.7	10.4	0.0	10.6	2.4	0.0	2.3
Lane Grp LOS	B		B	B		B	B		B	A		A
Approach Vol, veh/h		308			281			360			403	
Approach Delay, s/veh		15.2			14.4			10.5			2.4	
Approach LOS		B			B			B			A	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		28.0			28.0			32.0			32.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		23.5			23.5			27.5			27.5	
Max Q Clear Time (g_c+I1), s		10.9			10.2			5.9			6.4	
Green Ext Time (p_c), s		2.6			2.6			5.0			4.9	

Intersection Summary												
HCM 2010 Ctrl Delay			9.9									
HCM 2010 LOS			A									

Notes

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	21	133	34	104	404	406
v/c Ratio	0.05	0.20	0.09	0.16	0.25	0.26
Control Delay	13.2	11.8	13.6	10.6	7.0	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	11.8	13.6	10.6	7.0	7.3
Queue Length 50th (ft)	5	26	8	17	41	29
Queue Length 95th (ft)	17	58	24	45	49	44
Internal Link Dist (ft)		305		301	301	305
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	391	662	381	658	1621	1551
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.20	0.09	0.16	0.25	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	96	27	31	68	28	16	347	9	35	313	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	519	427	119	492	384	156	96	1641	43	173	1422	115
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.49	0.49	0.49	0.98	0.98	0.98
Sat Flow, veh/h	1285	1192	332	1252	1072	435	63	3339	87	208	2891	235
Grp Volume(v), veh/h	21	0	133	34	0	104	211	0	193	209	0	197
Grp Sat Flow(s),veh/h/ln	1285	0	1525	1252	0	1507	1809	0	1680	1680	0	1654
Q Serve(g_s), s	0.7	0.0	3.7	1.2	0.0	2.9	0.0	0.0	4.0	0.0	0.0	0.2
Cycle Q Clear(g_c), s	3.5	0.0	3.7	4.9	0.0	2.9	3.9	0.0	4.0	0.1	0.0	0.2
Prop In Lane	1.00		0.22	1.00		0.29	0.08		0.05	0.18		0.14
Lane Grp Cap(c), veh/h	519	0	546	492	0	540	954	0	826	897	0	813
V/C Ratio(X)	0.04	0.00	0.24	0.07	0.00	0.19	0.22	0.00	0.23	0.23	0.00	0.24
Avail Cap(c_a), veh/h	519	0	546	492	0	540	954	0	826	897	0	813
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.5	0.0	13.5	15.2	0.0	13.3	8.7	0.0	8.8	0.3	0.0	0.3
Incr Delay (d2), s/veh	0.1	0.0	1.1	0.3	0.0	0.8	0.5	0.0	0.7	0.6	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.2	0.0	1.5	0.4	0.0	1.1	1.7	0.0	1.6	0.2	0.0	0.2
Lane Grp Delay (d), s/veh	14.6	0.0	14.6	15.5	0.0	14.1	9.3	0.0	9.4	0.9	0.0	1.0
Lane Grp LOS	B		B	B		B	A		A	A		A
Approach Vol, veh/h		154			138			404			406	
Approach Delay, s/veh		14.6			14.4			9.3			0.9	
Approach LOS		B			B			A			A	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		26.0			26.0			34.0			34.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		21.5			21.5			29.5			29.5	
Max Q Clear Time (g_c+I1), s		5.7			6.9			6.0			2.2	
Green Ext Time (p_c), s		1.4			1.3			2.5			2.6	

Intersection Summary												
HCM 2010 Ctrl Delay			7.6									
HCM 2010 LOS			A									

Notes

Intersection	
Intersection Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	57	225	21	10	217	8	23	29	17	28	11	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	62	245	23	11	236	9	25	32	18	30	12	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	245	0	0	267	0	0	658	646	256	667	653	240
Stage 1	-	-	-	-	-	-	380	380	-	262	262	-
Stage 2	-	-	-	-	-	-	278	266	-	405	391	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1321	-	-	1297	-	-	378	390	783	372	387	799
Stage 1	-	-	-	-	-	-	642	614	-	743	691	-
Stage 2	-	-	-	-	-	-	728	689	-	622	607	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1321	-	-	1297	-	-	344	369	783	325	366	799
Mov Capacity-2 Maneuver	-	-	-	-	-	-	344	369	-	325	366	-
Stage 1	-	-	-	-	-	-	612	585	-	708	685	-
Stage 2	-	-	-	-	-	-	691	683	-	548	579	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0.3	15.6	14.4
HCM LOS			C	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	413	1321	-	-	1297	-	-	325	476
HCM Lane V/C Ratio	0.182	0.047	-	-	0.008	-	-	0.062	0.09
HCM Control Delay (s)	15.6	7.859	-	-	7.799	-	-	16.8	13.3
HCM Lane LOS	C	A			A			C	B
HCM 95th %tile Q(veh)	0.656	0.147	-	-	0.025	-	-	0.199	0.294

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	20	106	14	34	103	18	16	50	28	56	10	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	115	15	37	112	20	17	54	30	61	11	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	132	0	0	130	0	0	371	371	123	405	370	122
Stage 1	-	-	-	-	-	-	166	166	-	196	196	-
Stage 2	-	-	-	-	-	-	205	205	-	209	174	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1453	-	-	1455	-	-	586	559	928	556	560	929
Stage 1	-	-	-	-	-	-	836	761	-	806	739	-
Stage 2	-	-	-	-	-	-	797	732	-	793	755	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1453	-	-	1455	-	-	553	536	928	480	537	929
Mov Capacity-2 Maneuver	-	-	-	-	-	-	553	536	-	480	537	-
Stage 1	-	-	-	-	-	-	823	749	-	794	719	-
Stage 2	-	-	-	-	-	-	757	712	-	701	744	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	1.7	11.7	12.6
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	553	626	1453	-	-	1455	-	-	480	555
HCM Lane V/C Ratio	0.021	0.145	0.015	-	-	0.025	-	-	0.085	0.072
HCM Control Delay (s)	11.6	11.7	7.515	-	-	7.539	0	-	13.2	12
HCM Lane LOS	B	B	A			A	A		B	B
HCM 95th %tile Q(veh)	0.064	0.504	0.046	-	-	0.078	-	-	0.276	0.231

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	9	87	11	144	428	458
v/c Ratio	0.02	0.13	0.03	0.21	0.27	0.29
Control Delay	12.1	11.9	12.2	7.9	3.3	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	11.9	12.2	7.9	3.3	9.4
Queue Length 50th (ft)	2	18	2	16	11	45
Queue Length 95th (ft)	10	43	11	48	17	72
Internal Link Dist (ft)		295		305	305	169
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	464	693	416	691	1579	1568
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.13	0.03	0.21	0.27	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	72	8	10	66	66	12	378	4	13	356	52
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	500	615	71	569	273	273	80	1638	16	80	1418	204
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.95	0.95	0.95	0.47	0.47	0.47
Sat Flow, veh/h	1239	1640	189	1305	727	727	36	3448	33	35	2986	428
Grp Volume(v), veh/h	9	0	87	11	0	144	223	0	205	243	0	215
Grp Sat Flow(s),veh/h/ln	1239	0	1829	1305	0	1455	1828	0	1689	1830	0	1619
Q Serve(g_s), s	0.3	0.0	1.9	0.3	0.0	4.1	0.0	0.0	0.5	0.0	0.0	4.8
Cycle Q Clear(g_c), s	4.4	0.0	1.9	2.2	0.0	4.1	0.5	0.0	0.5	4.7	0.0	4.8
Prop In Lane	1.00		0.10	1.00		0.50	0.06		0.02	0.06		0.26
Lane Grp Cap(c), veh/h	500	0	686	569	0	546	932	0	802	933	0	769
V/C Ratio(X)	0.02	0.00	0.13	0.02	0.00	0.26	0.24	0.00	0.26	0.26	0.00	0.28
Avail Cap(c_a), veh/h	500	0	686	569	0	546	932	0	802	933	0	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.5	0.0	12.3	13.0	0.0	13.0	0.8	0.0	0.8	9.5	0.0	9.5
Incr Delay (d2), s/veh	0.1	0.0	0.4	0.1	0.0	1.2	0.6	0.0	0.8	0.7	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.1	0.0	0.8	0.1	0.0	1.5	0.3	0.0	0.3	2.1	0.0	1.9
Lane Grp Delay (d), s/veh	14.6	0.0	12.7	13.1	0.0	14.2	1.4	0.0	1.6	10.2	0.0	10.4
Lane Grp LOS	B		B	B		B	A		A	B		B
Approach Vol, veh/h		96			155			428			458	
Approach Delay, s/veh		12.9			14.1			1.5			10.3	
Approach LOS		B			B			A			B	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		27.0			27.0			33.0			33.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		22.5			22.5			28.5			28.5	
Max Q Clear Time (g_c+I1), s		6.4			6.1			2.5			6.8	
Green Ext Time (p_c), s		1.2			1.3			6.1			5.8	

Intersection Summary												
HCM 2010 Ctrl Delay			7.7									
HCM 2010 LOS			A									

Notes

Intersection	
Intersection Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	13	69	7	55	113	7	20	51	17	5	12	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	50	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	75	8	60	123	8	22	55	18	5	13	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	130	0	0	83	0	0	365	357	79	390	357	127
Stage 1	-	-	-	-	-	-	107	107	-	246	246	-
Stage 2	-	-	-	-	-	-	258	250	-	144	111	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1455	-	-	1514	-	-	591	569	981	569	569	923
Stage 1	-	-	-	-	-	-	898	807	-	758	703	-
Stage 2	-	-	-	-	-	-	747	700	-	859	804	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1455	-	-	1514	-	-	553	541	981	496	541	923
Mov Capacity-2 Maneuver	-	-	-	-	-	-	553	541	-	496	541	-
Stage 1	-	-	-	-	-	-	889	799	-	751	675	-
Stage 2	-	-	-	-	-	-	696	672	-	777	796	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	2.3	11.9	11
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	553	604	1455	-	-	1514	-	-	496	642
HCM Lane V/C Ratio	0.026	0.134	0.01	-	-	0.039	-	-	0.007	0.038
HCM Control Delay (s)	11.7	11.9	7.498	-	-	7.476	-	-	12.3	10.8
HCM Lane LOS	B	B	A			A			B	B
HCM 95th %tile Q(veh)	0.081	0.462	0.029	-	-	0.123	-	-	0.022	0.12

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	5	5	39	23	2	9	5	66	1	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	5	5	42	25	2	10	5	72	1	2	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	27	0	0	11	0	0	128	127	8	164	128	26
Stage 1	-	-	-	-	-	-	15	15	-	111	111	-
Stage 2	-	-	-	-	-	-	113	112	-	53	17	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1587	-	-	1608	-	-	845	764	1074	801	763	1050
Stage 1	-	-	-	-	-	-	1005	883	-	894	804	-
Stage 2	-	-	-	-	-	-	892	803	-	960	881	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1587	-	-	1608	-	-	823	743	1074	727	742	1050
Mov Capacity-2 Maneuver	-	-	-	-	-	-	823	743	-	727	742	-
Stage 1	-	-	-	-	-	-	1003	881	-	892	783	-
Stage 2	-	-	-	-	-	-	864	782	-	889	879	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	4.4	8.9	9.3
HCM LOS			A	A

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1011	1587	-	-	1608	-	-	837
HCM Lane V/C Ratio	0.086	0.002	-	-	0.026	-	-	0.006
HCM Control Delay (s)	8.9	7.273	-	-	7.299	-	-	9.3
HCM Lane LOS	A	A			A			A
HCM 95th %tile Q(veh)	0.282	0.006	-	-	0.081	-	-	0.02

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.3

Movement	SEL	SET	NWT	NWR	SWL	SWR
Vol, veh/h	149	237	254	42	41	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	162	258	276	46	45	186

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	322	0	-	0	881	299
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	582	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1238	-	-	-	317	741
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	559	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1238	-	-	-	276	741
Mov Capacity-2 Maneuver	-	-	-	-	385	-
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	486	-

Approach	SE	NW	SW
HCM Control Delay, s	3.2	0	12.3
HCM LOS			B

Minor Lane / Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	1238	-	385	741
HCM Lane V/C Ratio	-	-	0.131	-	0.116	0.251
HCM Control Delay (s)	-	-	8.345	-	15.6	11.5
HCM Lane LOS			A		C	B
HCM 95th %tile Q(veh)	-	-	0.45	-	0.389	0.99

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	45	141	5	5	154	10	18	10	2	10	14	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	153	5	5	167	11	20	11	2	11	15	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	178	0	0	159	0	0	445	443	156	444	441	173
Stage 1	-	-	-	-	-	-	254	254	-	184	184	-
Stage 2	-	-	-	-	-	-	191	189	-	260	257	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1398	-	-	1420	-	-	523	509	890	524	510	871
Stage 1	-	-	-	-	-	-	750	697	-	818	747	-
Stage 2	-	-	-	-	-	-	811	744	-	745	695	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1398	-	-	1420	-	-	471	489	890	499	490	871
Mov Capacity-2 Maneuver	-	-	-	-	-	-	471	489	-	499	490	-
Stage 1	-	-	-	-	-	-	724	673	-	789	744	-
Stage 2	-	-	-	-	-	-	752	741	-	706	671	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	0.2	12.8	10.6
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	493	1398	-	-	1420	-	-	584	871
HCM Lane V/C Ratio	0.066	0.035	-	-	0.004	-	-	0.069	0.033
HCM Control Delay (s)	12.8	7.668	-	-	7.545	-	-	11.6	9.3
HCM Lane LOS	B	A			A			B	A
HCM 95th %tile Q(veh)	0.212	0.109	-	-	0.012	-	-	0.223	0.103

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	147	368	15	10	395	20	10	2	5	13	19	180
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	160	400	16	11	429	22	11	2	5	14	21	196

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	451	0	0	416	0	0	1298	1201	408	1194	1198	440
Stage 1	-	-	-	-	-	-	728	728	-	462	462	-
Stage 2	-	-	-	-	-	-	570	473	-	732	736	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1109	-	-	1143	-	-	139	185	643	163	186	617
Stage 1	-	-	-	-	-	-	415	429	-	580	565	-
Stage 2	-	-	-	-	-	-	506	558	-	413	425	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1109	-	-	1143	-	-	76	157	643	141	158	617
Mov Capacity-2 Maneuver	-	-	-	-	-	-	76	157	-	141	158	-
Stage 1	-	-	-	-	-	-	355	367	-	496	560	-
Stage 2	-	-	-	-	-	-	330	553	-	348	364	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0.2	43.4	23.5
HCM LOS			E	C

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	112	1109	-	-	1143	-	-	420
HCM Lane V/C Ratio	0.165	0.144	-	-	0.01	-	-	0.549
HCM Control Delay (s)	43.4	8.792	-	-	8.18	-	-	23.5
HCM Lane LOS	E	A			A			C
HCM 95th %tile Q(veh)	0.565	0.503	-	-	0.029	-	-	3.212

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	1	0	0	0	0	1	10	0	18	19	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	1	0	0	0	0	1	11	0	20	21	8

Major/Minor	Minor2			Major2		
Conflicting Flow All	64	64	24	0	0	0
Stage 1	64	64	-	-	-	-
Stage 2	0	0	-	-	-	-
Follow-up Headway	3.518	4.018	3.318	-	-	-
Pot Capacity-1 Maneuver	942	827	1052	-	-	-
Stage 1	959	842	-	-	-	-
Stage 2	-	-	-	-	-	-
Time blocked-Platoon, %					-	-
Mov Capacity-1 Maneuver	942	# 0	1052	-	-	-
Mov Capacity-2 Maneuver	942	# 0	-	-	-	-
Stage 1	959	# 0	-	-	-	-
Stage 2	-	# 0	-	-	-	-

Approach	NB	SB
HCM Control Delay, s	8.9	0
HCM LOS	A	

Minor Lane / Major Mvmt	NBLn1	SBL	SBT	SBR
Capacity (veh/h)	942	-	-	-
HCM Lane V/C Ratio	0.013	-	-	-
HCM Control Delay (s)	8.9	-	-	-
HCM Lane LOS	A			
HCM 95th %tile Q(veh)	0.039	-	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	177	150	19	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	192	163	21	0	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	184	0	-	0	365	173
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	192	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1391	-	-	-	635	871
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	841	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1391	-	-	-	635	871
Mov Capacity-2 Maneuver	-	-	-	-	677	-
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	841	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1391	-	-	-	871
HCM Lane V/C Ratio	-	-	-	-	0.045
HCM Control Delay (s)	0	-	-	-	9.3
HCM Lane LOS	A				A
HCM 95th %tile Q(veh)	0	-	-	-	0.141

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.2

Movement	SEL	SER	NEL	NET	SWT	SWR
Vol, veh/h	138	39	10	193	175	159
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	150	42	11	210	190	173

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	509	277	363	0	-	0
Stage 1	277	-	-	-	-	-
Stage 2	232	-	-	-	-	-
Follow-up Headway	3.518	3.318	2.218	-	-	-
Pot Capacity-1 Maneuver	524	762	1196	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	519	762	1196	-	-	-
Mov Capacity-2 Maneuver	595	-	-	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	800	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	12.4	0.4	0
HCM LOS	B		

Minor Lane / Major Mvmt	NEL	NET	SELn1	SELn2	SWT	SWR
Capacity (veh/h)	1196	-	595	762	-	-
HCM Lane V/C Ratio	0.009	-	0.252	0.056	-	-
HCM Control Delay (s)	8.038	-	13.1	10	-	-
HCM Lane LOS	A		B	B		
HCM 95th %tile Q(veh)	0.028	-	0.993	0.176	-	-

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	120	240	60	196	414	627
v/c Ratio	0.31	0.33	0.14	0.27	0.28	0.46
Control Delay	15.3	11.2	12.9	12.2	8.2	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	11.2	12.9	12.2	8.2	7.5
Queue Length 50th (ft)	29	44	14	41	34	30
Queue Length 95th (ft)	65	89	35	81	58	43
Internal Link Dist (ft)		305		305	138	301
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	393	724	423	723	1464	1373
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.33	0.14	0.27	0.28	0.46

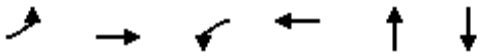
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	110	141	80	55	146	34	24	262	95	71	442	64
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	495	372	211	432	573	133	116	1081	375	208	1182	169
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.46	0.46	0.46	0.92	0.92	0.92
Sat Flow, veh/h	1182	949	539	1135	1462	340	108	2360	819	290	2580	368
Grp Volume(v), veh/h	120	0	240	60	0	196	219	0	195	317	0	310
Grp Sat Flow(s),veh/h/ln	1182	0	1488	1135	0	1803	1736	0	1551	1608	0	1630
Q Serve(g_s), s	4.6	0.0	7.0	2.4	0.0	4.5	0.0	0.0	4.7	0.0	0.0	1.5
Cycle Q Clear(g_c), s	9.1	0.0	7.0	9.4	0.0	4.5	4.3	0.0	4.7	1.3	0.0	1.5
Prop In Lane	1.00		0.36	1.00		0.19	0.12		0.53	0.24		0.23
Lane Grp Cap(c), veh/h	495	0	583	432	0	706	863	0	711	811	0	747
V/C Ratio(X)	0.24	0.00	0.41	0.14	0.00	0.28	0.25	0.00	0.27	0.39	0.00	0.41
Avail Cap(c_a), veh/h	495	0	583	432	0	706	863	0	711	811	0	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	13.2	16.7	0.0	12.5	10.0	0.0	10.1	1.4	0.0	1.4
Incr Delay (d2), s/veh	1.2	0.0	2.1	0.7	0.0	1.0	0.7	0.0	1.0	1.4	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	1.4	0.0	2.7	0.7	0.0	2.0	1.9	0.0	1.8	0.7	0.0	0.7
Lane Grp Delay (d), s/veh	16.7	0.0	15.4	17.3	0.0	13.4	10.7	0.0	11.0	2.8	0.0	3.1
Lane Grp LOS	B		B	B		B	B		B	A		A
Approach Vol, veh/h		360			256			414			627	
Approach Delay, s/veh		15.8			14.3			10.8			3.0	
Approach LOS		B			B			B			A	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		28.0			28.0			32.0			32.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		23.5			23.5			27.5			27.5	
Max Q Clear Time (g_c+I1), s		11.1			11.4			6.7			3.5	
Green Ext Time (p_c), s		2.7			2.7			7.0			7.4	

Intersection Summary												
HCM 2010 Ctrl Delay			9.5									
HCM 2010 LOS			A									

Notes



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	160	52	120	442	631
v/c Ratio	0.06	0.24	0.14	0.18	0.28	0.41
Control Delay	13.3	12.4	14.3	9.6	7.0	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	12.4	14.3	9.6	7.0	9.6
Queue Length 50th (ft)	5	32	12	17	44	47
Queue Length 95th (ft)	18	69	33	47	53	92
Internal Link Dist (ft)		305		301	301	305
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	385	661	372	658	1571	1539
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.24	0.14	0.18	0.28	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	114	33	48	69	41	24	364	18	48	496	37
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	502	423	123	466	333	200	118	1544	77	156	1458	106
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.49	0.49	0.49	0.98	0.98	0.98
Sat Flow, veh/h	1266	1180	343	1221	928	557	105	3140	156	176	2966	215
Grp Volume(v), veh/h	23	0	160	52	0	120	228	0	214	323	0	308
Grp Sat Flow(s),veh/h/ln	1266	0	1523	1221	0	1485	1733	0	1668	1700	0	1657
Q Serve(g_s), s	0.8	0.0	4.5	1.9	0.0	3.4	0.0	0.0	4.5	0.0	0.0	0.3
Cycle Q Clear(g_c), s	4.2	0.0	4.5	6.4	0.0	3.4	4.3	0.0	4.5	0.3	0.0	0.3
Prop In Lane	1.00		0.22	1.00		0.38	0.11		0.09	0.16		0.13
Lane Grp Cap(c), veh/h	502	0	546	466	0	532	919	0	820	905	0	815
V/C Ratio(X)	0.05	0.00	0.29	0.11	0.00	0.23	0.25	0.00	0.26	0.36	0.00	0.38
Avail Cap(c_a), veh/h	502	0	546	466	0	532	919	0	820	905	0	815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.9	0.0	13.8	16.1	0.0	13.4	8.8	0.0	8.9	0.3	0.0	0.3
Incr Delay (d2), s/veh	0.2	0.0	1.4	0.5	0.0	1.0	0.6	0.0	0.8	1.1	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.2	0.0	1.8	0.6	0.0	1.3	1.9	0.0	1.8	0.3	0.0	0.4
Lane Grp Delay (d), s/veh	15.1	0.0	15.2	16.6	0.0	14.4	9.5	0.0	9.7	1.4	0.0	1.6
Lane Grp LOS	B		B	B		B	A		A	A		A
Approach Vol, veh/h		183			172			442			631	
Approach Delay, s/veh		15.2			15.1			9.6			1.5	
Approach LOS		B			B			A			A	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		26.0			26.0			34.0			34.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		21.5			21.5			29.5			29.5	
Max Q Clear Time (g_c+I1), s		6.5			8.4			6.5			2.3	
Green Ext Time (p_c), s		1.7			1.6			2.8			4.4	

Intersection Summary												
HCM 2010 Ctrl Delay			7.4									
HCM 2010 LOS			A									

Notes

Intersection	
Intersection Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	45	246	16	22	159	15	41	52	29	35	15	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	267	17	24	173	16	45	57	32	38	16	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	189	0	0	285	0	0	630	611	276	647	612	181
Stage 1	-	-	-	-	-	-	374	374	-	229	229	-
Stage 2	-	-	-	-	-	-	256	237	-	418	383	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1385	-	-	1277	-	-	394	409	763	384	408	862
Stage 1	-	-	-	-	-	-	647	618	-	774	715	-
Stage 2	-	-	-	-	-	-	749	709	-	612	612	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1385	-	-	1277	-	-	350	387	763	314	386	862
Mov Capacity-2 Maneuver	-	-	-	-	-	-	350	387	-	314	386	-
Stage 1	-	-	-	-	-	-	624	596	-	747	702	-
Stage 2	-	-	-	-	-	-	686	696	-	512	590	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.9	17.4	14.1
HCM LOS			C	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	421	1385	-	-	1277	-	-	314	529
HCM Lane V/C Ratio	0.315	0.035	-	-	0.019	-	-	0.081	0.127
HCM Control Delay (s)	17.4	7.694	-	-	7.873	-	-	17.5	12.8
HCM Lane LOS	C	A			A			C	B
HCM 95th %tile Q(veh)	1.33	0.11	-	-	0.057	-	-	0.262	0.432

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	5.2

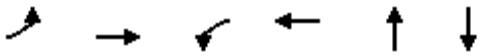
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	26	118	36	40	120	26	24	66	22	37	15	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	28	128	39	43	130	28	26	72	24	40	16	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	159	0	0	167	0	0	451	450	148	484	456	145
Stage 1	-	-	-	-	-	-	204	204	-	232	232	-
Stage 2	-	-	-	-	-	-	247	246	-	252	224	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1420	-	-	1411	-	-	519	504	899	493	501	902
Stage 1	-	-	-	-	-	-	798	733	-	771	713	-
Stage 2	-	-	-	-	-	-	757	703	-	752	718	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1420	-	-	1411	-	-	477	477	899	408	474	902
Mov Capacity-2 Maneuver	-	-	-	-	-	-	477	477	-	408	474	-
Stage 1	-	-	-	-	-	-	782	719	-	756	689	-
Stage 2	-	-	-	-	-	-	702	679	-	646	704	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	1.6	13.3	13.1
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	477	534	1420	-	-	1411	-	-	408	534
HCM Lane V/C Ratio	0.036	0.195	0.02	-	-	0.031	-	-	0.066	0.084
HCM Control Delay (s)	12.8	13.4	7.587	-	-	7.632	0	-	14.4	12.4
HCM Lane LOS	B	B	A			A	A		B	B
HCM 95th %tile Q(veh)	0.113	0.719	0.061	-	-	0.095	-	-	0.21	0.274

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	29	111	25	123	463	685
v/c Ratio	0.06	0.16	0.06	0.18	0.30	0.44
Control Delay	12.6	10.9	12.6	8.5	4.0	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	10.9	12.6	8.5	4.0	11.1
Queue Length 50th (ft)	7	20	6	16	14	76
Queue Length 95th (ft)	21	48	19	45	22	114
Internal Link Dist (ft)		295		305	305	169
Turn Bay Length (ft)	50		50			
Base Capacity (vph)	473	691	406	686	1557	1547
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.16	0.06	0.18	0.30	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	27	80	22	23	63	51	15	403	8	26	536	68
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	190.0	186.3	190.0	190.0	186.3	190.0
Lanes	1	1	0	1	1	0	0	2	0	0	2	0
Cap, veh/h	521	527	145	546	304	246	85	1602	32	95	1423	177
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.95	0.95	0.95	0.47	0.47	0.47
Sat Flow, veh/h	1263	1406	388	1277	811	656	44	3373	68	63	2995	372
Grp Volume(v), veh/h	29	0	111	25	0	123	241	0	222	360	0	325
Grp Sat Flow(s),veh/h/ln	1263	0	1794	1277	0	1468	1801	0	1683	1801	0	1630
Q Serve(g_s), s	1.0	0.0	2.5	0.8	0.0	3.4	0.0	0.0	0.5	0.0	0.0	7.8
Cycle Q Clear(g_c), s	4.4	0.0	2.5	3.3	0.0	3.4	0.5	0.0	0.5	7.6	0.0	7.8
Prop In Lane	1.00		0.22	1.00		0.45	0.07		0.04	0.08		0.23
Lane Grp Cap(c), veh/h	521	0	673	546	0	550	920	0	799	920	0	774
V/C Ratio(X)	0.06	0.00	0.16	0.05	0.00	0.22	0.26	0.00	0.28	0.39	0.00	0.42
Avail Cap(c_a), veh/h	521	0	673	546	0	550	920	0	799	920	0	774
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.3	0.0	12.5	13.6	0.0	12.8	0.8	0.0	0.8	10.3	0.0	10.3
Incr Delay (d2), s/veh	0.2	0.0	0.5	0.2	0.0	0.9	0.7	0.0	0.9	1.3	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.3	0.0	1.1	0.3	0.0	1.3	0.3	0.0	0.3	3.3	0.0	3.2
Lane Grp Delay (d), s/veh	14.5	0.0	13.0	13.7	0.0	13.7	1.5	0.0	1.7	11.5	0.0	12.0
Lane Grp LOS	B		B	B		B	A		A	B		B
Approach Vol, veh/h		140			148			463			685	
Approach Delay, s/veh		13.3			13.7			1.6			11.7	
Approach LOS		B			B			A			B	

Timer												
Assigned Phs		4			8			2			6	
Phs Duration (G+Y+Rc), s		27.0			27.0			33.0			33.0	
Change Period (Y+Rc), s		4.5			4.5			4.5			4.5	
Max Green Setting (Gmax), s		22.5			22.5			28.5			28.5	
Max Q Clear Time (g_c+I1), s		6.4			5.4			2.5			9.8	
Green Ext Time (p_c), s		1.4			1.4			8.4			7.4	

Intersection Summary												
HCM 2010 Ctrl Delay			8.8									
HCM 2010 LOS			A									

Notes

Intersection	
Intersection Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	92	13	37	71	6	18	59	41	8	16	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	50	-	-	50	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	100	14	40	77	7	20	64	45	9	17	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	84	0	0	114	0	0	323	291	107	342	295	80
Stage 1	-	-	-	-	-	-	127	127	-	161	161	-
Stage 2	-	-	-	-	-	-	196	164	-	181	134	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1513	-	-	1475	-	-	630	619	947	612	616	980
Stage 1	-	-	-	-	-	-	877	791	-	841	765	-
Stage 2	-	-	-	-	-	-	806	762	-	821	785	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1513	-	-	1475	-	-	568	598	947	522	595	980
Mov Capacity-2 Maneuver	-	-	-	-	-	-	568	598	-	522	595	-
Stage 1	-	-	-	-	-	-	871	786	-	835	744	-
Stage 2	-	-	-	-	-	-	725	741	-	714	780	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	2.4	11.2	10
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	568	695	1513	-	-	1475	-	-	522	823
HCM Lane V/C Ratio	0.023	0.166	0.006	-	-	0.027	-	-	0.011	0.088
HCM Control Delay (s)	11.5	11.2	7.395	-	-	7.509	-	-	12	9.8
HCM Lane LOS	B	B	A			A			B	A
HCM 95th %tile Q(veh)	0.07	0.591	0.02	-	-	0.084	-	-	0.034	0.289

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	0	7	50	51	7	11	39	15	4	7	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	8	54	55	8	12	42	16	4	8	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	8	0	0	181	180	4	206	180	59
Stage 1	-	-	-	-	-	-	8	8	-	168	168	-
Stage 2	-	-	-	-	-	-	173	172	-	38	12	-
Follow-up Headway	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Capacity-1 Maneuver	1540	-	-	1612	-	-	781	714	1080	752	714	1007
Stage 1	-	-	-	-	-	-	1013	889	-	834	759	-
Stage 2	-	-	-	-	-	-	829	756	-	977	886	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1540	-	-	1612	-	-	752	689	1080	687	689	1007
Mov Capacity-2 Maneuver	-	-	-	-	-	-	752	689	-	687	689	-
Stage 1	-	-	-	-	-	-	1012	888	-	833	734	-
Stage 2	-	-	-	-	-	-	791	731	-	915	885	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	3.4	10.2	10.1
HCM LOS			B	B

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	764	1540	-	-	1612	-	-	724
HCM Lane V/C Ratio	0.092	0.001	-	-	0.034	-	-	0.02
HCM Control Delay (s)	10.2	7.341	-	-	7.311	-	-	10.1
HCM Lane LOS	B	A			A			B
HCM 95th %tile Q(veh)	0.305	0.004	-	-	0.105	-	-	0.06

Notes
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

MOVEMENT SUMMARY

Site: Existing AM

East AM
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
North East: Court											
6X	T	154	2.0	0.274	6.0	LOS A	1.2	30.9	0.16	0.44	29.8
16X	R	137	2.0	0.274	6.0	LOS A	1.2	30.9	0.16	0.55	29.1
Approach		291	2.0	0.274	6.0	LOS A	1.2	30.9	0.16	0.49	29.5
North West: Court											
7X	L	142	2.0	0.185	5.6	LOS A	0.7	18.2	0.30	0.72	26.8
14X	R	33	2.0	0.185	5.6	LOS A	0.7	18.2	0.30	0.55	29.1
Approach		175	2.0	0.185	5.6	LOS A	0.7	18.2	0.30	0.69	27.2
South West: Market											
5X	L	30	2.0	0.233	6.1	LOS A	0.9	24.1	0.31	0.86	26.9
2X	T	192	2.0	0.233	6.1	LOS A	0.9	24.1	0.31	0.51	29.8
Approach		223	2.0	0.233	6.1	LOS A	0.9	24.1	0.31	0.56	29.3
All Vehicles		689	2.0	0.274	5.9	LOS A	1.2	30.9	0.24	0.56	28.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing AM

West AM
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South East: Market											
8X	T	223	2.0	0.325	8.4	LOS A	1.3	34.2	0.50	0.69	28.3
18X	R	30	2.0	0.325	8.4	LOS A	1.3	34.2	0.50	0.76	27.9
Approach		253	2.0	0.325	8.4	LOS A	1.3	34.2	0.50	0.70	28.2
North East: Court											
1X	L	26	2.0	0.205	7.1	LOS A	0.8	19.2	0.48	0.87	26.3
16X	R	125	2.0	0.205	7.1	LOS A	0.8	19.2	0.48	0.72	28.3
Approach		151	2.0	0.205	7.1	LOS A	0.8	19.2	0.48	0.75	27.9
North West: Court											
7X	L	345	2.0	0.538	9.8	LOS A	3.6	92.7	0.19	0.77	24.6
4X	T	236	2.0	0.538	9.8	LOS A	3.6	92.7	0.19	0.41	27.4
Approach		580	2.0	0.538	9.8	LOS A	3.6	92.7	0.19	0.62	25.6
All Vehicles		985	2.0	0.538	9.1	LOS A	3.6	92.7	0.32	0.66	26.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing MID

East MID
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
North East: Court											
6X	T	221	2.0	0.327	6.7	LOS A	1.6	39.5	0.18	0.45	29.4
16X	R	126	2.0	0.327	6.7	LOS A	1.6	39.5	0.18	0.56	28.7
Approach		347	2.0	0.327	6.7	LOS A	1.6	39.5	0.18	0.49	29.1
North West: Court											
7X	L	154	2.0	0.243	6.6	LOS A	1.0	24.8	0.38	0.76	26.4
14X	R	61	2.0	0.243	6.6	LOS A	1.0	24.8	0.38	0.61	28.5
Approach		215	2.0	0.243	6.6	LOS A	1.0	24.8	0.38	0.72	26.9
South West: Market											
5X	L	34	2.0	0.247	6.3	LOS A	1.0	25.9	0.32	0.86	26.8
2X	T	200	2.0	0.247	6.3	LOS A	1.0	25.9	0.32	0.52	29.6
Approach		234	2.0	0.247	6.3	LOS A	1.0	25.9	0.32	0.57	29.1
All Vehicles		796	2.0	0.327	6.5	LOS A	1.6	39.5	0.28	0.57	28.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing MID

West MID
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South East: Market											
8X	T	191	2.0	0.261	7.3	LOS A	1.0	26.4	0.45	0.64	29.0
18X	R	21	2.0	0.261	7.3	LOS A	1.0	26.4	0.45	0.72	28.5
Approach		212	2.0	0.261	7.3	LOS A	1.0	26.4	0.45	0.65	29.0
North East: Court											
1X	L	28	2.0	0.167	6.3	LOS A	0.6	15.5	0.43	0.83	26.7
16X	R	104	2.0	0.167	6.3	LOS A	0.6	15.5	0.43	0.67	28.8
Approach		133	2.0	0.167	6.3	LOS A	0.6	15.5	0.43	0.70	28.3
North West: Court											
7X	L	304	2.0	0.422	7.9	LOS A	2.3	59.1	0.16	0.76	25.5
4X	T	150	2.0	0.422	7.9	LOS A	2.3	59.1	0.16	0.41	28.5
Approach		454	2.0	0.422	7.9	LOS A	2.3	59.1	0.16	0.64	26.4
All Vehicles		799	2.0	0.422	7.5	LOS A	2.3	59.1	0.28	0.65	27.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing PM

East PM
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
North East: Court											
6X	T	190	2.0	0.338	6.8	LOS A	1.6	41.8	0.15	0.44	29.3
16X	R	173	2.0	0.338	6.8	LOS A	1.6	41.8	0.15	0.55	28.6
Approach		363	2.0	0.338	6.8	LOS A	1.6	41.8	0.15	0.49	29.0
North West: Court											
7X	L	171	2.0	0.233	6.3	LOS A	0.9	23.8	0.35	0.74	26.4
14X	R	42	2.0	0.233	6.3	LOS A	0.9	23.8	0.35	0.58	28.7
Approach		213	2.0	0.233	6.3	LOS A	0.9	23.8	0.35	0.71	26.8
South West: Market											
5X	L	11	2.0	0.237	6.2	LOS A	1.0	24.4	0.34	0.89	26.9
2X	T	210	2.0	0.237	6.2	LOS A	1.0	24.4	0.34	0.54	29.7
Approach		221	2.0	0.237	6.2	LOS A	1.0	24.4	0.34	0.56	29.5
All Vehicles		797	2.0	0.338	6.5	LOS A	1.6	41.8	0.26	0.57	28.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing PM

West PM
Roundabout

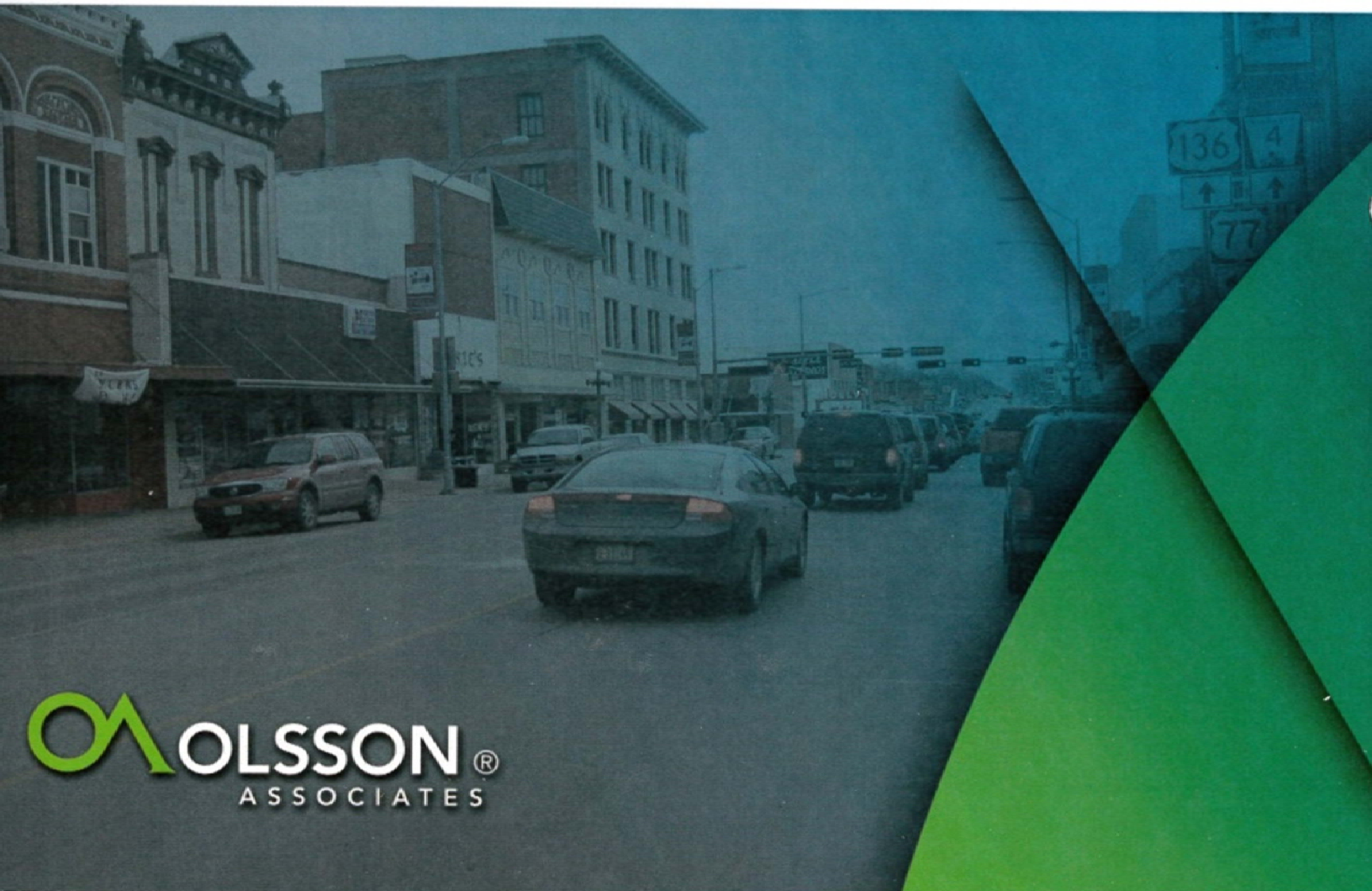
Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South East: Market											
8X	T	276	2.0	0.403	9.5	LOS A	1.8	46.2	0.53	0.70	27.7
18X	R	46	2.0	0.403	9.5	LOS A	1.8	46.2	0.53	0.76	27.3
Approach		322	2.0	0.403	9.5	LOS A	1.8	46.2	0.53	0.71	27.6
North East: Court											
1X	L	45	2.0	0.324	9.1	LOS A	1.3	33.0	0.55	0.92	25.4
16X	R	186	2.0	0.324	9.1	LOS A	1.3	33.0	0.55	0.79	27.2
Approach		230	2.0	0.324	9.1	LOS A	1.3	33.0	0.55	0.81	26.8
North West: Court											
7X	L	322	2.0	0.547	10.2	LOS B	3.7	94.0	0.26	0.76	24.5
4X	T	258	2.0	0.547	10.2	LOS B	3.7	94.0	0.26	0.43	27.2
Approach		579	2.0	0.547	10.2	LOS B	3.7	94.0	0.26	0.61	25.6
All Vehicles		1132	2.0	0.547	9.8	LOS A	3.7	94.0	0.39	0.68	26.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

4. Garage Impacts



OLSSON®
ASSOCIATES

Technical Memorandum

Date: May 19, 2014

To: Tobias Templemeyer
James Burroughs, PE

From: Christopher M. Rolling, PE, PTOE

RE: Highway 136 Relocation Feasibility Study
Beatrice, Nebraska
Garage Impacts

Project #: 013-1216

cc: File

INTRODUCTION & OBJECTIVE

The feasibility study for the Highway 136 relocation plan included a detailed review of the intersection of 6th Street & Market Street which would also be the intersection of Highway 77 & Highway 136. With the highway designation moving to Market Street and the intersection at 6th Street being another state highway designation, it is considered necessary to accommodate turning for a larger design vehicle than what the intersection currently allows.

Furthermore, the parking structure on the northwest corner of the intersection in question poses a challenge in that a portion of the garage is a low overhang into NDOR right-of-way that would not allow a large truck to pass under it. The garage support is also at the edge of right-of-way resulting it little room for expansion of the intersection. This memorandum details an assessment of the garage from the following criteria:

- General condition of the structure
- Accommodation of truck turning
- Cost of modification or removal
- Availability of funding or cost sharing

This memorandum summarizes the findings of the assessment and provides recommendations for on how to proceed with the garage with respect to the Highway 136 relocation plan.

TRUCK TURNING ACCOMMODATION

The primary reason for exploring the state of the structure is the speculation that the current location and architecture of the structure does not allow for truck turning, specifically for a southbound right-turning vehicle. To verify this, a truck turning analysis was performed using both the current geometry and a modified geometry after the proposed highway relocation. This was performed using AutoTURN, version 8.1. This software is based on established performance characteristics of various standard design vehicles published in the AASHTO *Policy on the Geometric Design of Highways, 6th Edition.* For the purposes of this analysis a WB-62 design vehicle was used. The analysis revealed that a WB-62 truck cannot make the southbound right turn without impacting the structure or its cantilever.

The geometry of the intersection was modified concurrent with what may be done as part of the highway relocation. This included shifting the intersection southeast and modifying curb return geometry for wider radii and entrance curves. With this modified geometry, the design vehicle would be able to perform the right turn without impacting the structure's columns, but would encroach on the cantilever. It should be noted that the removal of only a portion of the structure, that is the southeast cantilever, would result in the loss of approximately fifteen to twenty parking stalls and is not expected to impact the drive aisle so as to negatively affect the functionality of the remainder of the garage.

CONDTION OF STRUCTURE

Olsson Associates (OA) performed a site visit on the afternoon of Wednesday, July 24, 2013 to perform a visual inspection of the structure with the intention of determining the potential options for impacting the structure to accommodate truck turning. The site visit included assessing the condition from a structural standpoint and the implications of modifying structure.

From an engineering perspective, there are two primary observations. The first is that the garage has does not meet current Americans with Disabilities Act (ADA) requirements. The structure lacks of elevators for disabled individuals to reach the upper floors. Because this in an existing structure, there it is not required to alter to structure to meet ADA regulations, but these deficiencies are certainly liabilities for the owner. It should be noted that there is an option to reconstruct a portion of the structure discussed below. This work may necessitate the upgrading of the structures pedestrian features to current ADA standards.

Additionally, the railings surrounding the edge of the structure appear to have gaps sufficiently large so that a person could fall through. It should be noted that there is chain link fence in place to help mitigate this issue, but this is not considered a typical or sufficient solution to resolve the issue.

The garage is not necessarily structurally deficient, but there are some instances of exposed rebar on some of the lower levels. This is likely due to higher utilization of the lower floors as compared to the upper floors, coupled with the age and exposure of the structure. While this is not believed to be an imminently dangerous condition, it appears to be something that would need to be addressed in the future.

The second observation is related to the utilization of the structure itself. It is also worth noting that the utilization of the structure has come into question not only during the process of developing the downtown revitalization plan and through discussions with the City of Beatrice. During the brief site visit fewer than twenty vehicles were counted and the top level of the garage was barricaded to disallow vehicles from using it at all. There are also four rental bays on the ground level of the structure. At the time of the site visit, all bays were occupied.

FEASIBILITY REVIEW

Initial concepts included removing the structure altogether, however, this analysis shows the physical possibility also to remove only the portion of the cantilever that encroaches on truck turning. Conversations between OA and a local contractor familiar with this work revealed a potential cost range between $700,000 and $1,000,000. A current project with similar scope being performed by a contractor is approximately $900,000. While the complexity and uniqueness of modifying this structure makes it difficult to predict the cost without generating additional structural design and performing a detailed cost analysis, initial estimates would be approximately half of the cost of complete removal, around $400,000. Additionally, if the structure is modified, it will be required that the structure be updated to meet current ADA regulations, including the installation of an elevator. This would be an expected additional cost of approximately $250,000, based on the expected cost of the equipment and to retrofit the elevator.

The costs discussed above would represent a large portion of the total project cost. To aid in the financing of this work, OA performed additional research and analysis with the intent of determining how the City may finance the removal or reconstruction of the structure.

Initial correspondence with the Southeast Nebraska Development District (SENDD) resulted in a determination that there would a potential source for financial support in the form of Community Development Block Grant (CDBG), U.S. Department of Housing and Urban Development (HUD) funding, administered by the Nebraska Department of Economic Development. Beatrice qualifies for funding consideration through the Downtown Revitalization grant program for approximately $300,000. There are two phases of funding for this grant program, the first of which involves planning funding (up to $30,000 and requiring a 25% match) and a second phase for implementation (up to $300,000). Beatrice could choose to pursue CDBG funding through the Nebraska Department of Economic Development via SENDD or through the City of Beatrice.

To successfully compete for CDBG Downtown Revitalization funding, the community should be aware of two primary stipulations. The first is that the removal or modification of the garage must be tied to the revitalization of downtown Beatrice. The Downtown Revitalization Plan has determined that resolution of this conflict is critical to the Highway 136 relocation which is, in turn, critical to the resurgence of commercial potency along Court Street. The second stipulation is that a municipality is allowed only a single grant annually, so this pursuit should be done within the context of other downtown improvements that may benefit from economic support. Beatrice has received both Phase I and Phase II Downtown Revitalization funding awards in the past (more than 12 months prior), however, this should neither help nor hinder a new application. The main questions Beatrice will need to have answered is whether or not the community will have to undergo an application for planning funding (Phase I) prior to accessing implementation funds (Phase II) since planning for this project is already in process.

CONCLUSIONS AND RECOMMENDATIONS

The primary obstacle to the relocation of Highway 136 to Market Street is the parking structure on the northwest corner of 6th Street & Market Street. Here, where two state highways will intersect necessitating the accommodation of turning for large trucks, there is a portion of the structure that encroaches into NDOR ROW and support columns are directly adjacent to ROW. This assessment concluded that the structure may either be removed or reconstructed to allow for truck turning.

Reconstruction

- Requires shifting of the 6th Street intersection
- Eliminates approximately fifteen to twenty parking stalls and minor impacts to drive aisle
- Leaves ROW encroachments (must be approved by NDOR)
- Estimated cost: $650,000

Removal

- Allows for 6th Street intersection to remain in place
- Eliminates ROW encroachments
- Positions key parcel for redevelopment to the highest and best use
- Estimated cost: $700,000 to $1,000,000

It is apparent that the complete removal of the structure would be the greater expense, however, from an engineering standpoint this would be a more desirable alternative. It would not only provide a clear area to construct the 6th Street intersection as needed, but it would eliminate NDOR ROW encroachments. Discussions with NDOR have revealed that this encroachment would need to be resolved if the highway relocation were to move forward.

Alternatively, the reconstruction could be considered acceptable although not preferred. Moving forward with this alternative, however, would result in shifting of the 6th Street & Market Street intersection, necessitate removal of the portions of the structure encroaching on truck turning, and would potentially trigger the need to upgrade pedestrian facilities within the structure to current ADA standards. Additionally, NDOR would approve an encroachment remaining within ROW, something that has preliminarily been met with resistance from the Department. The viability of this alternative is based the cursory assessment of the structure. A more detailed structural analysis would need to be completed to further this alternative if it is determined to be the preferred alternative.

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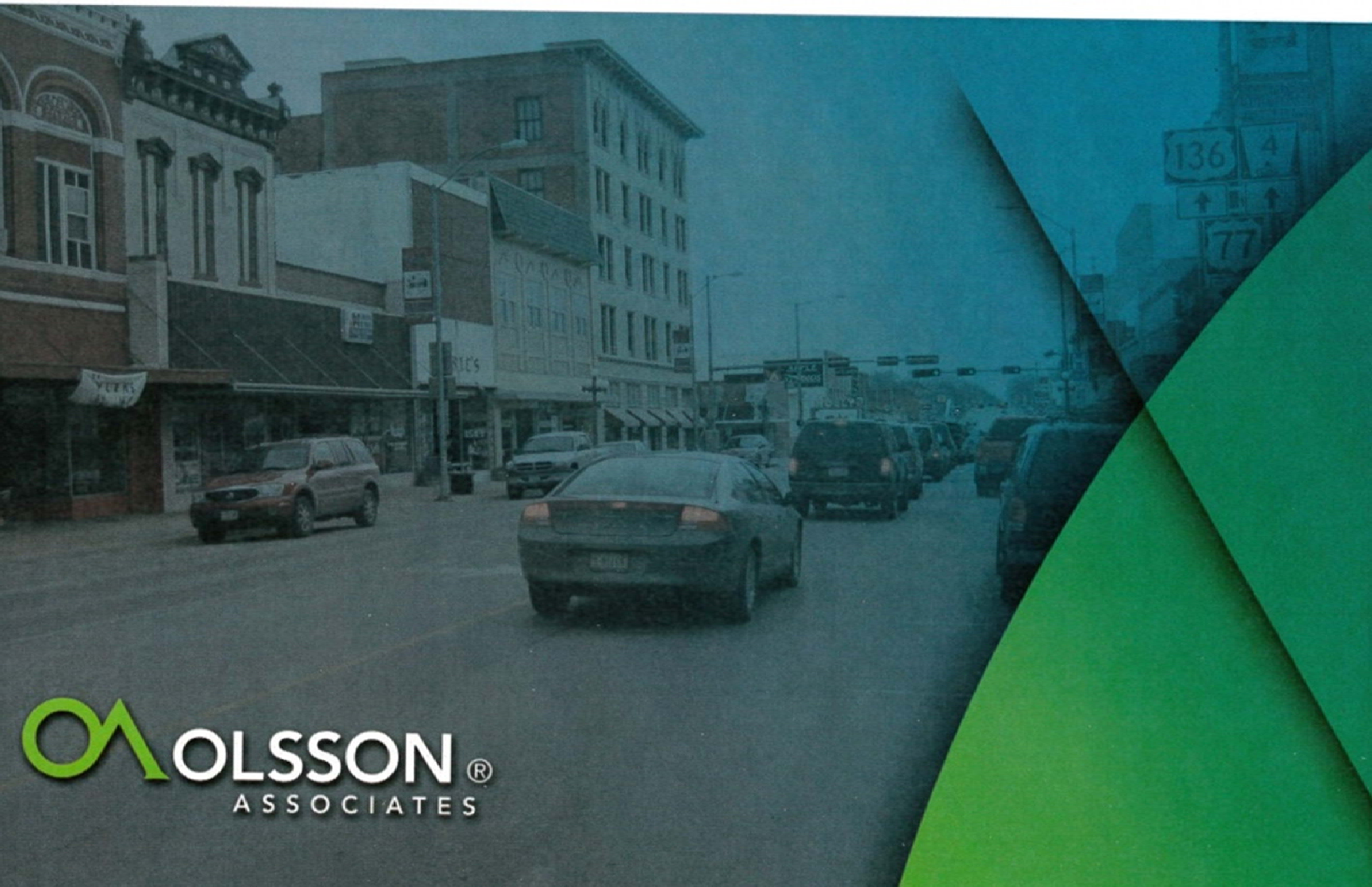
5. Design Memorandum



OLSSON ®
ASSOCIATES

Technical Memorandum

Date: May 19, 2014

To: Tobias Templemeyer
James Burroughs, PE

From: Christopher M. Rolling, PE, PTOE

RE: U.S. Highway 136 Relocation Feasibility Study
Beatrice, Nebraska
Design Memorandum

Project #: 013-1216

cc: File

INTRODUCTION & OBJECTIVE

The City of Beatrice is exploring the possibility of relocating the U.S. Highway 136 designation through downtown from its current alignment on Court Street south one block to Market Street. The intention is to redirect heavy truck traffic and through passenger traffic out of the downtown core and revitalize Court Street into a pedestrian-scale corridor suitable for commercial redevelopment. As part of this plan, it is necessary to evaluate the implications of the relocation with respect to the roadway infrastructure, traffic operations, and impacts to surrounding stakeholders.

As part of this evaluation, a series of alternatives for the realignment were considered. This technical memorandum is intended to provide a summary of each alternative and provide a recommendation for the ultimate configuration of Highway 136 through downtown Beatrice. Drawings of each concept design can be found in **Attachment A** at the end of this document.

MARKET STREET

A portion of Market Street is to remain within existing right-of-way after the highway relocation is completed. This is between 3rd Street and 7th Street. It was first necessary to determine the nature of work along this section of roadway. This includes the extent of repair or reconstruction and the need for shifts as related to the 6th Street intersection.

To aid in the determination of repair or reconstruction, the Nebraska Department of Roads (NDOR) Pavement Design Division performed an analysis of the existing Market Street cross section. This included fourteen borings along the existing alignment. Examination of these borings revealed an inconsistent pavement section along Market Street, including areas of a brick base. The asphalt overlay itself is in poor condition and much of the bonds to the pavement or brick base are not present. The results of this analysis indicate that the existing pavement would not be suitable for future demands if the highway is relocated and would need to be completely replaced as part of this project. Additional details of the pavement determination are included in **Attachment B.**

A separate document prepared as part of this feasibility study concluded it would be desirable to remove the parking structure on the northwest corner of 6th Street & Market Street to allow for Market Street to remain on alignment through the intersection. Similarly, this would be most desirable with respect to the remaining portions of Market Street as it would allow the roadway to be centered within ROW throughout the reconstructed section, minimizing the chance for impacts to the adjacent private property. Removing the structure will also eliminate NDOR ROW encroachments, as NDOR has been expressed to be necessary.

In the event that the 6th Street & Market Street intersection is shifted, a corresponding shift along Market Street would be necessary. Geometrically, it is possible to have a portion of Market Street on-alignment and a portion shifted only in the area of 6th Street. However, this would require a shift using minimum design values. With the expected prevalence of truck traffic along the roadway, this would not be desirable when considering truck wheel tracking through reverse curves. For this reason and the conflicts at the 6th Street intersection, an alternative that includes Market Street shifted was not considered feasible and not carried forward.

COURT STREET CONNECTIONS

Reverse Curves

The first alternative for the Court Street connections is a pair of reverse curves, one starting west of 2nd Street and ending east of 3rd Street and the second approximately one block on either side of 8th Street. Each curve is designed using a 30 mph design speed. Because this is a low speed urban condition, the curves were drawn with horizontal curve radii of 350' and no superelevation. To accommodate for wheel off-tracking, travel lanes were widened to 16 feet through the curves.

The first of the curves would start approximately 150 feet west of 2nd Street resulting in a slight skew through this intersection. The angle of the 2nd Street intersection after realignment of the east and west legs would be approximately 80 degrees which is considered acceptable. Although realignment of the north leg of this intersection is possible for an ideal approach angle of 90 degrees, it could be avoided in the interest of minimizing impacts.

Capacity analyses performed as part of this feasibility study identified the northbound left-turn movement as having unacceptable delay. Additionally, the Court Street intersection to the east constructed as part of the realignment will intersect the realigned highway between 200 feet and 230 feet (center-to-center distance). Existing block lengths are approximately 380 feet. This close intersection spacing between 2nd Street & Court Street and the relocated highway intersection would result in left-turn overlap.

A potential solution to resolve both the overlapping left-turn storage between westbound lefts at 2nd Street and eastbound lefts at Court Street and the poor level of service at 2nd Street was identified. This would be to utilize the existing alley right-of-way to realign the south leg of this intersection to the new intersection along the aforementioned reverse curve section. However, existing buildings on the south side of present-day Court Street would restrict intersection sight distance, subsequently making the removal of these buildings and this alternative less attractive.

To resolve these issues, another alternative would include restricting movements at 2nd Street & Court Street. Note that there is a heavy paired movement (eastbound left and southbound right) that, ideally, would be permitted. Therefore, a configuration wherein the north leg would be a three-quarter movement (allowing the eastbound left) and the south leg right-in-right-out is shown in the concept. Again, this eliminates the left-turn overlap and the movement with unacceptable delay.

Due to anticipated poor intersection sight distance for the southbound movements, the north leg of the 3rd Street & Market Street intersection was eliminated. However, to maintain access to the grain elevators to the south of the study area, the south leg is shown to remain. This intersection is to remain in its current location, so there are no intersection spacing issues.

The east reverse curve would begin near 7th Street & Market Street and end near 8th Street & Court Street. In the proposed alignment, the intersection spacing among 7th Street & Market Street, 8th Street & Market, and the new midblock intersection would be less than one block. In order to maintain acceptable traffic operations and avoid left-turn overlap, the 8th Street & Market Street intersection is shown as right-in-right-out.

The spacing 8th Street & Court Street and the new midblock intersection is approximately 100 feet. The intersection of 8th Street & Court Street is proposed as a right-in right-out intersection. This is due to the storage length for eastbound left-turning vehicles at the new midblock intersection extending to the 8th Street & Court Street intersection.

Roundabouts

A second alternative was considered that shows the two intersections of Court Street and the realigned highway as roundabouts. These were located such that they would have similar footprints as the reverse curves, or similar right-of-way takings. They were also designed to accommodate a WB-62 design vehicle. Finally, the use of the roundabouts would still necessitate the use of a single horizontal curve to bring the highway alignment up from Market Street. This curve was designed with the same parameters as those for the reverse curve alternative.

Intersection spacing among the proposed roundabouts, 2nd Street & Court Street, and 3rd Street & Court Street is still closer than desirable. However, with the roundabouts, the adjacent intersections could be right-in-right-out, converting most crossing and left-turn movements to right-turn movements using the roundabout to turn around and continue on their destination. Furthermore, the roundabouts show further decreased delay over the reverse curve alternative at these intersections. With the restriction of turning movements at the 2nd Street intersection, a way to facilitate movements to and from the south leg would be to bring a leg of existing Market Street from the west into the curve. This would create a three-leg intersection located approximately 200 feet south of the roundabout.

The intersection spacing between the proposed roundabout intersection and 8th Street & Court Street is limited at approximately 75 feet as measured from the exit of the roundabout and the center of 8th Street & Court Street. Because of this limited spacing, 8th Street & Court Street is proposed to be right-in right-out.

OPINIONS OF COST

Opinions of cost were developed using the alternatives described above, NDOR average unit prices, and information from parcel research performed by Midwest Right-of-Way services. These are summarized below in **Table 1**. Additional information on the valuation of the affected properties as well as detailed construction estimates is included in **Attachment C**.

Table 1: OPINIONS OF COST

Alternative	Construction Cost	Right-of-Way		Total
		Taking (sf)	Cost	
Court Street Connections				
Roundabout	$1,143,200	55,936	$976,550	*$2,119,750*
Reverse Curves	$1,371,100	65,320	$1,193,910	*$2,564,910*
Market Street				
On-Alignment	$1,148,850	1,790	$921,425	*$2,070,275*

There are multiple whole-parcel acquisitions that are expected to occur as a result of a significant portion being required for the relocation. This will result in tracts that are ultimately of little use to the City of Beatrice, but can be returned to adjacent land owners as a form of compensation for acquisition of their property. Although not included in the estimates, there is a potential for both alternatives to include approximately $100,000 worth of land that could be used as compensation for other right-of-way acquisitions. This would help to reduce the right-of-way acquisition costs for the relocation project.

CONCLUSIONS AND RECOMMENDATIONS

There are three primary considerations with respect to the design of the U.S. Highway 136 relocation. These include the geometry of the connections, the configuration of 6th Street & Market Street, and the alignment of Market Street between the connections. A separate document determined that the desirable configuration of the 6th Street & Market Street intersection was in the current location concurrent to the removal of the parking structure on its northwest corner. If this alternative moves forward, it follows that Market Street should remain on alignment. This helps to ensure that all improvements stay within public right-of-way.

In the event the parking structure remains and the 6th Street & Market Street intersection is shifted, it would be desirable to shift the entirety of the reconstructed portion of Market Street south to line up with the 6th Street intersection. It is expected that this would still remain within current right-of-way and would avoid shifts along the new highway, especially when considering truck traffic. This option of leaving the parking structure in place will require further coordination with NDOR to resolve the issue of right-of-way encroachments. It could be that the structure would be required to be modified such that there are no encroachments at all, as is indicated by correspondence with NDOR up to this point.

Finally, the roundabout option appears to be the more desirable alternative for the Court Street Connections with respect to both a design and traffic operations standpoint. The roundabouts would minimize impacts to adjacent buildings and minimize construction costs, while still accommodating large truck turning. Each roundabout is expected to operate with less delay than its stop-controlled counterparts, albeit only slightly. Finally, with the reduced speed in the areas of the roundabouts, there is an anticipated safety benefit for both motorists and pedestrians in the downtown area.

With this combination of improvements the expected cost of the project is $4.7 million. This includes construction, right-of-way, engineering, and construction administration costs. For comparison, an alternative that includes the reverse curve connections with Market Street on alignment is $5.2 million. A summary of the design alternatives is included in **Table 2** below.

Table 2: ALTERNATIVES COST SUMMARY

	Alternative 1		Alternative 2	
	Roundabouts	**Market Street**	**Reverse Curves**	**Market Street**
Construction	$1,143,200	$1,148,900	$1,371,100	$1,148,900
Mobilization	$183,400.00		$201,600.00	
Construction Cost	*$2,475,500.00*		*$2,721,600.00*	
Engineering	$198,040.00		$217,728.00	
Const. Admin.	$297,060.00		$326,592.00	
ROW Costs	$852,587	$921,425	$1,042,059	$921,425
Total Project Cost	**$4,744,612**		**$5,229,404**	
Advantages	• Minimizes impacts to adjacent intersections at tie-ins • Eliminates poor intersection spacing at tie-ins • Minimizes ROW taking at tie-ins and along Market • Eliminates ROW encroachments at 6th & Market		• Eliminates ROW encroachments at 6th & Market	
Disadvantages	• Initial learning curve and public outreach for roundabouts		• Impacts to adjacent intersections at tie-ins • Close intersection spacing at west curve • Higher ROW taking • Higher cost	
Recommendation	**X**			

F:\Projects\013-1216\Documents\Reports\Design Memorandum\Design_Memo.docx

ATTACHMENT A

Concept Design Layouts

PROJECT NO.	SHEET NO.
·	21

C.N. ·

2ND STREET

3RD STREET

COURT STREET

4TH STREET

5TH STREET

MARKET STREET

N

LEGEND

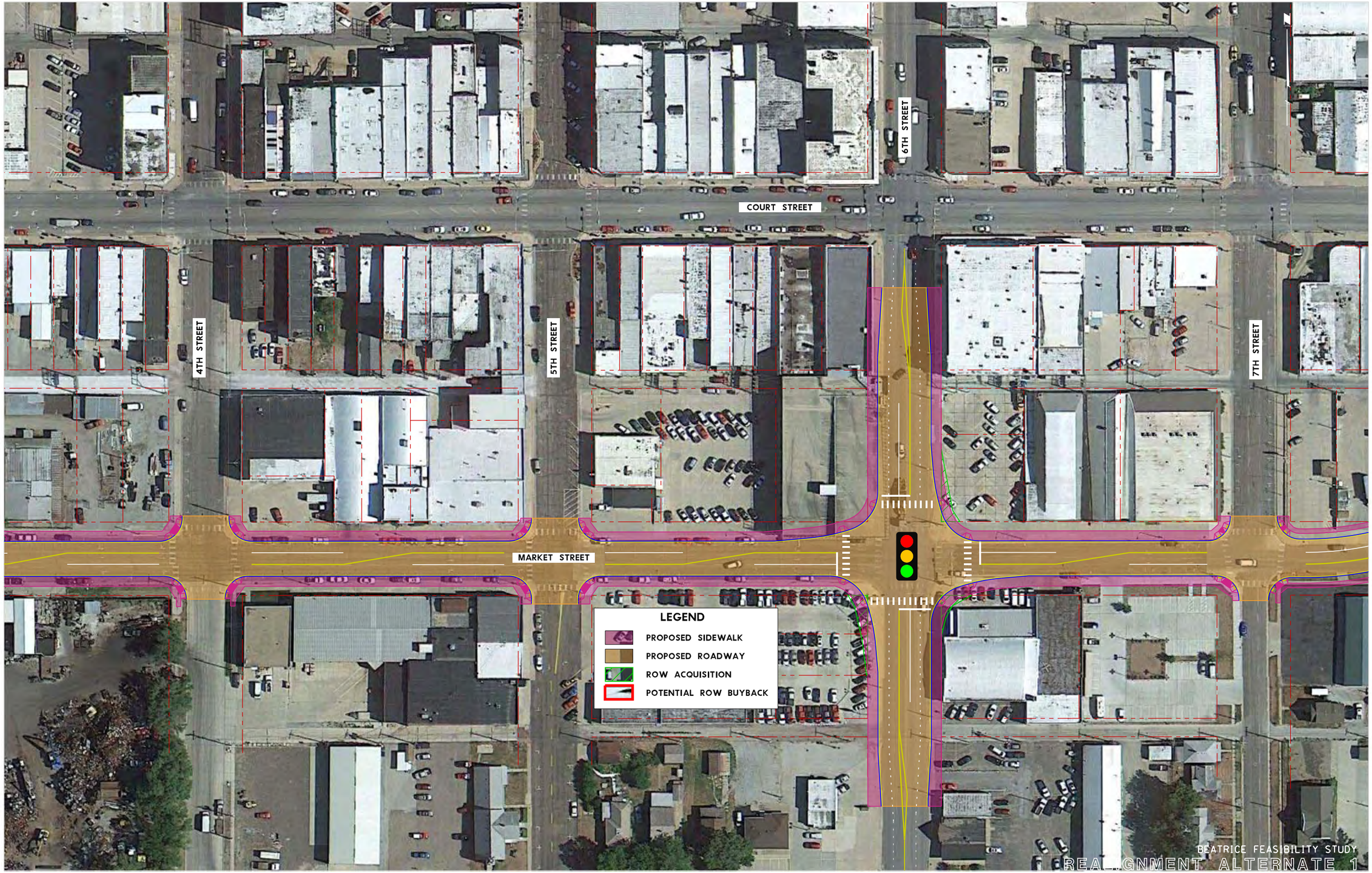
- PROPOSED SIDEWALK
- PROPOSED ROADWAY
- ROW ACQUISITION
- POTENTIAL ROW BUYBACK

BEATRICE FEASIBILITY STUDY

REALIGNMENT - ALTERNATE 1

PROJECT NO.	SHEET NO.
·	2/2

C.N. ·



PROJECT NO.	SHEET NO.
.	2:3

C.N. .

6TH STREET

7TH STREET

8TH STREET

9TH STREET

COURT STREET

MARKET STREET

LEGEND

- PROPOSED SIDEWALK
- PROPOSED ROADWAY
- ROW ACQUISITION
- POTENTIAL ROW BUYBACK

BEATRICE FEASIBILITY STUDY

REALIGNMENT ALTERNATE 1

PROJECT NO.	SHEET NO.
·	4

C.N. ·

2ND STREET

3RD STREET

COURT STREET

4TH STREET

5TH STREET

MARKET STREET

LEGEND

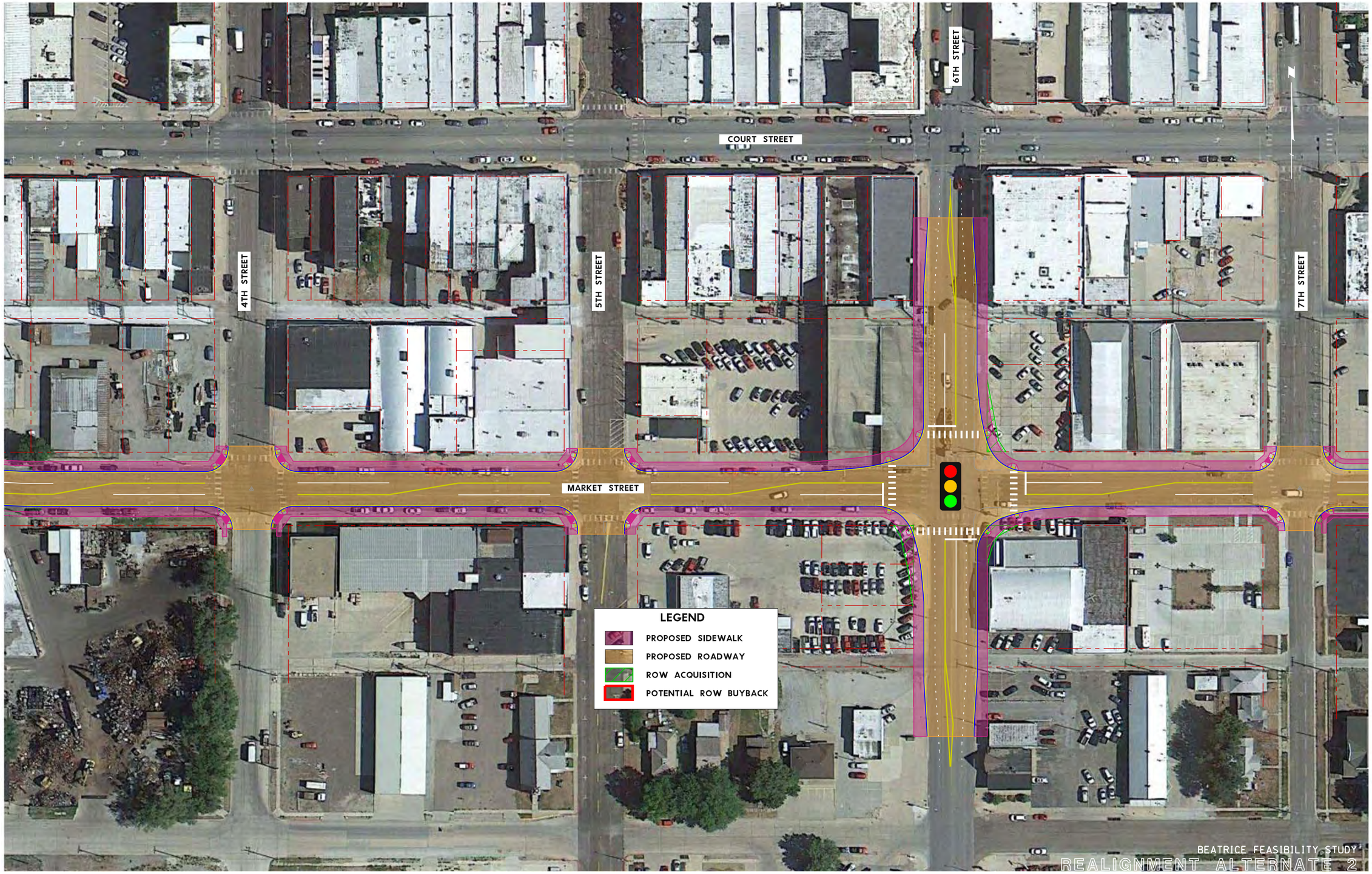
- PROPOSED SIDEWALK
- PROPOSED ROADWAY
- ROW ACQUISITION
- POTENTIAL ROW BUYBACK

BEATRICE FEASIBILITY STUDY

REALIGNMENT ALTERNATE 2

PROJECT NO.	SHEET NO.
·	1.2

C.N. ·



BEATRICE FEASIBILITY STUDY

REALIGNMENT ALTERNATE 2

PROJECT NO.	SHEET NO.
.	1.3

C.N. .

6TH STREET

7TH STREET

8TH STREET

9TH STREET

COURT STREET

MARKET STREET

LEGEND

- PROPOSED SIDEWALK
- PROPOSED ROADWAY
- ROW ACQUISITION
- POTENTIAL ROW BUYBACK

BEATRICE FEASIBILITY STUDY

REALIGNMENT ALTERNATE 2

ATTACHMENT B

Pavement Determination

Chris Rolling

From: Rex Behrends <rbehrends@beatrice.ne.gov>
Sent: Thursday, May 09, 2013 1:50 PM
To: Chris Rolling
Subject: Fwd: FW: Hwy 136 Relocation Project
Attachments: IMG_6690.jpg; IMG_6693.jpg; IMG_6681.jpg; IMG_6683.jpg; Concept Master Plan Layout with Labels.pdf

---------- Forwarded message ----------
From: **ElDorado, Randy** <randy.eldorado@nebraska.gov>
Date: Thu, May 9, 2013 at 11:47 AM
Subject: FW: Hwy 136 Relocation Project
To: "Behrends, Rex" <rbehrends@beatrice.ne.gov>

Rex – Our pavement analysis team has completed their work on Market Street and has provided the results below. Their work indicates that Market street will require full reconstruction should US Highway 136 be relocated on this street. Please forward this information to your consultant working on the feasibility study.

Randy

Randall J. ElDorado, P.E.

Planning & Location Studies Engineer

NDOR
Nebraska
Department of Roads

Office: (402) 479-4417

Fax: (402) 479-3884

Email: randy.eldorado@nebraska.gov

From: Varilek, Brandon
Sent: Wednesday, May 08, 2013 11:00 AM
To: ElDorado, Randy

Cc: Syslo, Mick; Owen, Mike; Goodbarn, Thomas; Barrett, Bruce
Subject: FW: Hwy 136 Relocation Project

Randy

We have completed our analysis. We took 14 cores from the driving lanes and parking areas of Market Street (See example photos). We also performed Falling Weight Deflectometer testing of the driving lanes. Cores show an inconsistent cross-section. Driving lanes consist of 3-4" of HMA on two layers of brick separated by a sand blanket. Parking areas consist of 3-3 ½" of HMA on PCC. The HMA overlay is in poor condition with stripping present throughout the segment. Most HMA cores show the bond with underlying brick or concrete has been lost. The underlying brick and concrete are broken in some cores. FWD testing indicated WEAK (150,000-250,000 psi) to VERY WEAK (<150,000 psi) pavement moduli (strength).

Given the structure, condition, and anticipated truck volume (appr. 500 ADTT) that would be present, Market Street cannot be used for Hwy 136 traffic in its present condition. Market Street would require reconstruction to support HWY 136 traffic. Please let me know if you have any questions. Thanks.

Brandon

From: ElDorado, Randy
Sent: Wednesday, April 17, 2013 9:44 AM
To: Varilek, Brandon
Cc: Syslo, Mick; Owen, Mike
Subject: FW: Hwy 136 Relocation Project

Brandon / Mick – I mentioned to Rex, during consultant interviews last month, that I would check with you guys to see if you would be willing to evaluate the pavements' structural qualities to determine if Market Street is suitable for US Hwy 136 traffic loads. As the attached map indicates, this proposed concept will utilize the existing pavement on Market Street between 3rd St and 7th St.

I would like to be able to provide Rex and answer for our willingness to do this analysis, and if willing, to provide him an answer to the pavements' condition by early May.

Let me know if you can assist on this issue.


#5
Market
MADE IN U.S.A.
1
2
3
4
5
6
7
8
9
10
WESTCOTT
RULER


#13
Market
MADE IN U.S.A.
WESTCOTT


#6
Market
MADE IN U.S.A.
WESTCOTT


#10
Market
MADE IN U.S.A.
1
2
3
4
5
6
7
8
WESTCOTT

Chris Rolling

From: Mike Piernicky
Sent: Monday, June 10, 2013 8:08 AM
To: Chris Rolling
Subject: FW: Hwy 136 Relocation Project

Michael C. Piernicky, PE, PTOE | Vice President
Olsson Associates | 2111 South 67th Street, Suite 200 | Omaha, Nebraska 68106
TEL 402.341.1116 | DIR 402.938.2434 | CELL 402.960.0237
mpiernicky@olssonassociates.com

From: ElDorado, Randy [mailto:randy.eldorado@nebraska.gov]
Sent: Friday, June 07, 2013 9:09 AM
To: Mike Piernicky; Behrends, Rex
Cc: Goodbarn, Thomas
Subject: FW: Hwy 136 Relocation Project

Rex / Mike – Below is NDOR's pavement determination for Market St. should Hwy 136 traffic be relocated.

Randy

Randall J. ElDorado, P.E.
Planning & Location Studies Engineer

Office: (402) 479-4417
Cell: (402) 310-8695
Email: randy.eldorado@nebraska.gov

From: Varilek, Brandon
Sent: Thursday, June 06, 2013 4:27 PM
To: ElDorado, Randy
Cc: Syslo, Mick; Owen, Mike; Goodbarn, Thomas; Barrett, Bruce
Subject: RE: Hwy 136 Relocation Project

Randy – We received traffic information. If Hwy 136 were relocated, we would require 9" doweled PCC on 4" foundation course on a prepared subgrade. The foundation course would require a perforated pipe underdrain system emptying to storm sewer. Thanks.

ATTACHMENT C

Detailed Cost Estimates

OPINION OF PROBABLE COST
CITY OF BEATRICE
HIGHWAY 136 RELOCATION FEASIBILITY STUDY
COST ESTIMATES FOR DOWNTOWN REVITALIZATION
Court Street Connections - Reverse Curves

ITEM No.	DESCRIPTION	UNIT	QNTY	UNIT COST	TOTAL COST
1	General Clearing & Grubbing	LS	1	$15,000.00	$15,000.00
1	Remove Pavement	SY	13742	$5.25	$72,145.50
2	Remove Traffic Signal	EA	1	$8,000.00	$8,000.00
3	Remove Storm Pipe	LF	500	$12.00	$6,000.00
4	Remove Sewer Structures	EA	10	$450.00	$4,500.00
5	Earthwork	CY	2272	$7.00	$15,903.07
6	9" Doweled Concrete Pavement	SY	15146	$37.00	$560,393.78
7	Foundation Course	SY	15146	$3.50	$53,010.22
8	Subgrade Preparation	STA	15	$1.70	$25.50
9	4" Perforated Pipe Underdrain	LF	3080	$5.15	$15,862.00
10	4" Concrete Sidewalk	SY	4245	$34.00	$144,345.11
11	Storm Sewer Pipe	LF	1771	$48.00	$85,008.00
12	Storm Sewer Structures	EA	20	$2,500.00	$50,000.00
13	Pavement Markings (Linear)	LF	6160	$4.50	$27,720.00
14	Pavement Markings (Symbols)	EA	10	$375.00	$3,750.00
15	Type "A" Signs & Posts	EA	25.00	$225.00	$5,625.00
16	Traffic Signal Construction	EA	1	$125,000.00	$125,000.00
				Subtotal Construction =	**$1,192,288.18**
				Construction Contingencies (15%) =	**$ 178,843.23**
65320	Area of Additional ROW Needed			**Total Estimated Construction Cost =**	**$ 1,371,131.40**
				Total Opinion of Cost =	**$ 1,371,131.40**

OPINION OF PROBABLE COST
CITY OF BEATRICE
HIGHWAY 136 RELOCATION FEASIBILITY STUDY
COST ESTIMATES FOR DOWNTOWN REVITALIZATION
Court Street Connections - Roundabouts

ITEM No.	DESCRIPTION	UNIT	QNTY	UNIT COST	TOTAL COST
1	General Clearing & Grubbing	LS	1	$15,000.00	$15,000.00
1	Remove Pavement	SY	11760	$5.25	$61,740.00
2	Remove Traffic Signal	EA	1	$8,000.00	$8,000.00
3	Remove Storm Pipe	LF	500	$12.00	$6,000.00
4	Remove Sewer Stuructures	EA	10	$450.00	$4,500.00
5	Earthwork	CY	2093	$7.00	$14,650.65
6	9" Doweled Concrete Pavement	SY	13953	$37.00	$516,261.00
7	Foundation Course	SY	13953	$3.50	$48,835.50
8	Subgrade Preparation	STA	14	$1.70	$23.80
9	4" Perforated Pipe Underdrain	LF	3388	$5.15	$17,448.20
10	4" Concrete Sidewalk	SY	3239	$34.00	$110,114.67
11	Storm Sewer Pipe	LF	1848	$48.00	$88,704.00
12	Storm Sewer Structures	EA	30	$2,500.00	$75,000.00
13	Pavement Markings (Linear)	LF	3850	$4.50	$17,325.00
14	Pavement Markings (Symbols)	EA	10	$375.00	$3,750.00
15	Type "A" Signs & Posts	EA	30.00	$225.00	$6,750.00
16	Traffic Signal Construction	EA	0	$125,000.00	$0.00
				Subtotal Construction =	**$994,102.82**
				Construction Contingencies (15%) =	**$ 149,115.42**
55936	Area of Additional ROW Needed			**Total Estimated Construction Cost =**	**$ 1,143,218.24**
				Total Opinion of Cost =	**$ 1,143,218.24**

OPINION OF PROBABLE COST
CITY OF BEATRICE
HIGHWAY 136 RELOCATION FEASIBILITY STUDY
COST ESTIMATES FOR DOWNTOWN REVITALIZATION
Market Street - 3rd Street to 7th Street

ITEM No.	DESCRIPTION	UNIT	QNTY	UNIT COST	TOTAL COST
1	Remove Pavement	SY	11550	$5.25	$60,638.08
2	Remove Traffic Signal	EA	1	$8,000.00	$8,000.00
3	Remove Storm Pipe	LF	1500	$12.00	$18,000.00
4	Remove Sewer Stuructures	EA	23	$450.00	$10,350.00
5	Earthwork	CY	1614	$7.00	$11,300.92
6	9" Doweled Concrete Pavement	SY	10763	$37.00	$398,222.78
7	Foundation Course	SY	10763	$3.50	$37,669.72
8	Subgrade Preparation	STA	14	$1.70	$23.80
9	4" Perforated Pipe Underdrain	LF	2850	$5.15	$14,677.50
10	4" Concrete Sidewalk	SY	4177	$34.00	$142,010.44
11	Storm Sewer Pipe	LF	1639	$48.00	$78,660.00
12	Storm Sewer Structures	EA	20	$2,500.00	$50,000.00
13	Pavement Markings (Linear)	LF	4988	$4.50	$22,443.75
14	Pavement Markings (Symbols)	EA	20	$375.00	$7,500.00
15	Type "A" Signs & Posts	EA	20.00	$225.00	$4,500.00
16	Traffic Signal Construction	EA	1	$135,000.00	$135,000.00
				Subtotal Construction =	**$998,996.99**
				Construction Contingencies (15%) =	**$ 149,849.55**
1790	Area of Additional ROW Needed			**Total Estimated Construction Cost =**	**$ 1,148,846.54**
				Total Opinion of Cost =	**$ 1,148,846.54**

Beatrice Feasibility Study - Roundabouts

.	Name	ROW (sf)	Unit Price	ROW Compensation	Temporary Easement (sf)	Unit Price	Temporary Easement Compensation	Relocation Costs	Additional Compensation	*Total Compensation*	NOTES
1	Katigan Schottler Mfg	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	
2	Nebraskaland Glass - Schuster, Timother	1916.00	$ 5.00	$ 9,580.00	0.00	$ 0.50	$ -		$ -	*$ 9,580.00*	
3	BNSF Depot	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	
4	RR ROW - O & R.V. RR Co	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	
5	Beatrice Scrap Processing	13050.00	$ 3.00	$ 39,150.00	0.00	$ 0.30	$ -	$ 3,000.00	$ -	*$ 42,150.00*	Semi-trailers/flatbeds $100 each x 15 x 2 rows = max
6	Beatrice Iron & Metal	150.00	$ 5.00	$ 750.00	0.00	$ 0.50	$ -		$ -	*$ 750.00*	
7	Darrick D. Fletcher	1275.00	$ 5.00	$ 6,375.00	0.00	$ 0.50	$ -		$ -	*$ 6,375.00*	
8	UPRR	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	
9	The Rail/Robert Mason	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	
10	Donald & Linda Catlin, Trustee	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	
11	Beatrice Iron & Metal	0.00	$ 3.00	$ -	0.00	$ 0.30	$ -		$ -	*$ -*	
12	Carriage Chevrolet	1165.00	$ 5.00	$ 5,825.00	0.00	$ 0.50	$ -		$ 1,165.00	*$ 6,990.00*	Paving $1/SF
13	Pinnacle Bank & parking garage	0.00	$ -	$ -	0.00	$ -	$ -		$ 900,000.00	*$ 900,000.00*	to demolish
14	First National parking lot	625.00	$ 5.00	$ 3,125.00	0.00	$ 0.50	$ -		$ 625.00	*$ 3,750.00*	Paving $1/SF

.	Name	ROW (sf)	Unit Price	ROW Compensation	Temporary Easement (sf)	Unit Price	Temporary Easement Compensation	Relocation Costs	Additional Compensation	*Total Compensation*	NOTES
15	Marvin Vollertsen/Parking lot	430.00	$ 2.50	$ 1,075.00	0.00	$ 0.25	$ -		$ 430.00	*$ 1,505.00*	Paving $1/SF
16	House & C.B. Garage - Wrightsman	7255.00	$ 3.50	$ 25,392.50	0.00	$ 0.35	$ -	$ 50,000.00	$ -	*$ 75,392.50*	1 story - 1 car garage, 2bd, 1bth; tax=$3,000 perm. Siding 1915 Int?=$3,000 move= $1,500/closing $3,500/r&p=$35,000
17	Johnsen Enterprise	14560.00	$ 3.50	$ 50,960.00	0.00	$ 0.35	$ -		$ 20,000.00	*$ 70,960.00*	Pavement
18	Aunt Mary's Center parking (Johnsen Enterprise)	6130.00	$ 3.50	$ 21,455.00	0.00	$ 0.35	$ -		$ 6,100.00	*$ 27,555.00*	Paving $1/SF
19	Dennis Bodtke	10120.00	$ 20.00	$ 202,400.00	0.00	$ 2.00	$ -	$ 300,000.00	$ -	*$ 502,400.00*	1 owner - $30,000 4 possible tenants repst=$25,000,Search $2,500 Msc move $40,000
20	Calver Dean Prebyl, Jr.	0.00	$ 15.00	$ -	0.00	$ 1.50	$ -		$ -	*$ -*	
21	Traci & Stephanie Quick	870.00	$ 3.50	$ 3,045.00	0.00	$ 0.35	$ -		$ -	*$ 3,045.00*	
22	Beulah F Jurgens	180.00	$ 3.50	$ 630.00	0.00	$ 0.35	$ -		$ -	*$ 630.00*	
23	Potnetial Land Swaps	24792.00	$ (4.00)	$ (99,168.00)	0.00	$ (0.40)	$ -		$ -	*$ (99,168.00)*	Potential land swaps for property the City buys as a result of the total lot aquistition, but doesn't have a long term use for. Can be joined with remaining adjacent lots to offset aquistion of a portion of the adjacent lot.
24		0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	
25		0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	
		0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	

Property #	Tract #	Negotiation		Connections	Market Street	Total
			Total Estimated Compensation =	$ 738,837.50	$ 10,740.00	$ 749,577.50
13	58	19500	25% Contingencies (eminent domain and misc) =	$ 184,709.38	$ 2,685.00	$ 187,394.38
19	59	19500	Right of Way Negotiations (estimate $2,000 per tract+11,500 tract 60 + 19,500 tracts 58 & 59)) =	$ 53,000.00	$ 8,000.00	$ 61,000.00
16	60	11500	**Total Right of Way Costs =**	**$ 976,546.88**	**$ 921,425.00**	$ 1,897,971.88

Market	1790.00
Connections	55936.00

Beatrice Feasibility Study - Reverse Curves

.	Name	ROW (sf)	Unit Price	ROW Compensation	Temporary Easement (sf)	Unit Price	Temporary Easement Compensation	Relocation Costs	Additional Compensation	*Total Compensation*	NOTES
1	Katigan Schottler Mfg	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	0
2	Nebraskaland Glass - Schuster, Timother	1920.00	$ 5.00	$ 9,600.00	0.00	$ 0.50	$ -		$ -	*$ 9,600.00*	0
3	BNSF Depot	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	0
4	RR ROW - O & R.V. RR Co	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	0
5	Beatrice Scrap Processing	13050.00	$ 3.00	$ 39,150.00	0.00	$ 0.30	$ -	$ 3,000.00	$ -	*$ 42,150.00*	Semi-trailers/flatbeds $100 each x 15 x 2 rows = max
6	Beatrice Iron & Metal	400.00	$ 5.00	$ 2,000.00	0.00	$ 0.50	$ -		$ -	*$ 2,000.00*	0
7	Darrick D. Fletcher	380.00	$ 5.00	$ 1,900.00	0.00	$ 0.50	$ -		$ -	*$ 1,900.00*	0
8	UPRR	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	0
9	The Rail/Robert Mason	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	0
10	Donald & Linda Catlin, Trustee	0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	0
11	Beatrice Iron & Metal	0.00	$ 3.00	$ -	0.00	$ 0.30	$ -		$ -	*$ -*	0
12	Carriage Chevrolet	1165.00	$ 5.00	$ 5,825.00	0.00	$ 0.50	$ -		$ 1,165.00	*$ 6,990.00*	Paving $1/SF
13	Pinnacle Bank & parking garage	0.00	$ -	$ -	0.00	$ -	$ -		$ 900,000.00	*$ 900,000.00*	to demolish
14	First National parking lot	625.00	$ 5.00	$ 3,125.00	0.00	$ 0.50	$ -		$ 625.00	*$ 3,750.00*	Paving $1/SF
15	Marvin Vollertsen/Parking lot	770.00	$ 2.50	$ 1,925.00	0.00	$ 0.25	$ -		$ 770.00	*$ 2,695.00*	Paving $1/SF

.	Name	ROW (sf)	Unit Price	ROW Compensation	Temporary Easement (sf)	Unit Price	Temporary Easement Compensation	Relocation Costs	Additional Compensation	*Total Compensation*	NOTES
16	House & C.B. Garage - Wrightsman	7255.00	$ 3.50	$ 25,392.50	0.00	$ 0.35	$ -	$ 50,000.00	$ -	*$ 75,392.50*	1 story - 1 car garage, 2bd, 1bth; tax=$3,000 perm. Siding 1915 Int?=$3,000 move= $1,500/closing $3,500/r&p=$35,000
17	Johnsen Enterprise	14560.00	$ 3.50	$ 50,960.00	0.00	$ 0.35	$ -		$ 20,000.00	*$ 70,960.00*	Pavement
18	Aunt Mary's Center parking (Johnsen Enterprise)	13490.00	$ 3.50	$ 47,215.00	0.00	$ 0.35	$ -		$ 13,490.00	*$ 60,705.00*	Paving $1/SF
19	Dennis Bodtke	10120.00	$ 20.00	$ 202,400.00	0.00	$ 2.00	$ -	$ 300,000.00	$ -	*$ 502,400.00*	1 owner - $30,000 4 possible tenants repst=$25,000,Search $2,500 Msc move $40,000
20	Calver Dean Prebyl, Jr.	3375.00	$ 15.00	$ 50,625.00	0.00	$ 1.50	$ -	$ 97,500.00	$ -	*$ 148,125.00*	1 owner - $30,000 1 possible tenant repst=$25,000,Search $2,500 Msc move $40,000
21	Traci & Stephanie Quick	0.00	$ 3.50	$ -	0.00	$ 0.35	$ -		$ -	*$ -*	0
22	Beulah F Jurgens	0.00	$ 3.50	$ -	0.00	$ 0.35	$ -		$ -	*$ -*	0
23	Potnetial Land Swaps	30370.00	$ (4.00)	$ (121,480.00)	0.00	$ (0.40)	$ -		$ -	*$ (121,480.00)*	Potential land swaps for property the City buys as a result of the total lot aquistition, but doesn't have a long term use for. Can be joined with remaining adjacent lots to offset aquistion of a portion of the adjacent lot.
24		0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	0
25		0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	0
		0.00	$ -	$ -	0.00	$ -	$ -		$ -	*$ -*	

			Connections	Market Street	Total
Market	1790.00	Total Estimated Compensation =	$ 915,927.50	$ 10,740.00	$ 926,667.50
Connections	65320.00	25% Contingencies (eminent domain and misc) =	$ 228,981.88	$ 2,685.00	$ 231,666.88
		Right of Way Negotiations (estimate $2,000 per tract+11,500 tract 60 + 19,500 tracts 58 & 59)) =	$ 49,000.00	$ 8,000.00	$ 57,000.00
		Total Right of Way Costs =	**$ 1,193,909.38**	**$ 921,425.00**	$ 2,115,334.38