Alexandria Area 2030 Transportation Study

Project Partners:

Minnesota Department of Transportation

Douglas County

Alexandria — Easy To Get To. Hard To Leave.

FINAL REPORT

March 2011

Alexandria Area Transportation Study

Prepared By:

WSB & Associates, Inc.

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Alexandria Area Transportation Plan

Executive Summary

This Transportation Plan was prepared by WSB & Associates, Inc. for the governmental entities, which include the Minnesota Department of Transportation, Douglas County, and the City of Alexandria. The purpose of this plan is to identify, plan, and guide future year transportation decisions and improvements within the greater Alexandria Area.

The geographical boundaries of the Alexandria Area Transportation Plan generally include the City of Alexandria and the adjacent area within 2 to 5 miles beyond the existing City limits. The study area encompasses approximately 110 square miles and is displayed in **Figure 1**.

The Transportation Plan reflects the vision and direction of local officials, relevant agencies, stakeholders, and the general public. From the beginning of the plan development, a proactive public involvement process was undertaken that assured opportunities for the public to be involved in all phases of the planning process. The public provides valuable information needed to develop, maintain, and carry out an effective transportation plan. The public involvement process also provides an opportunity to educate the public about transportation planning and creates an informed community, which in turn leads to better planning.

Transportation Planning

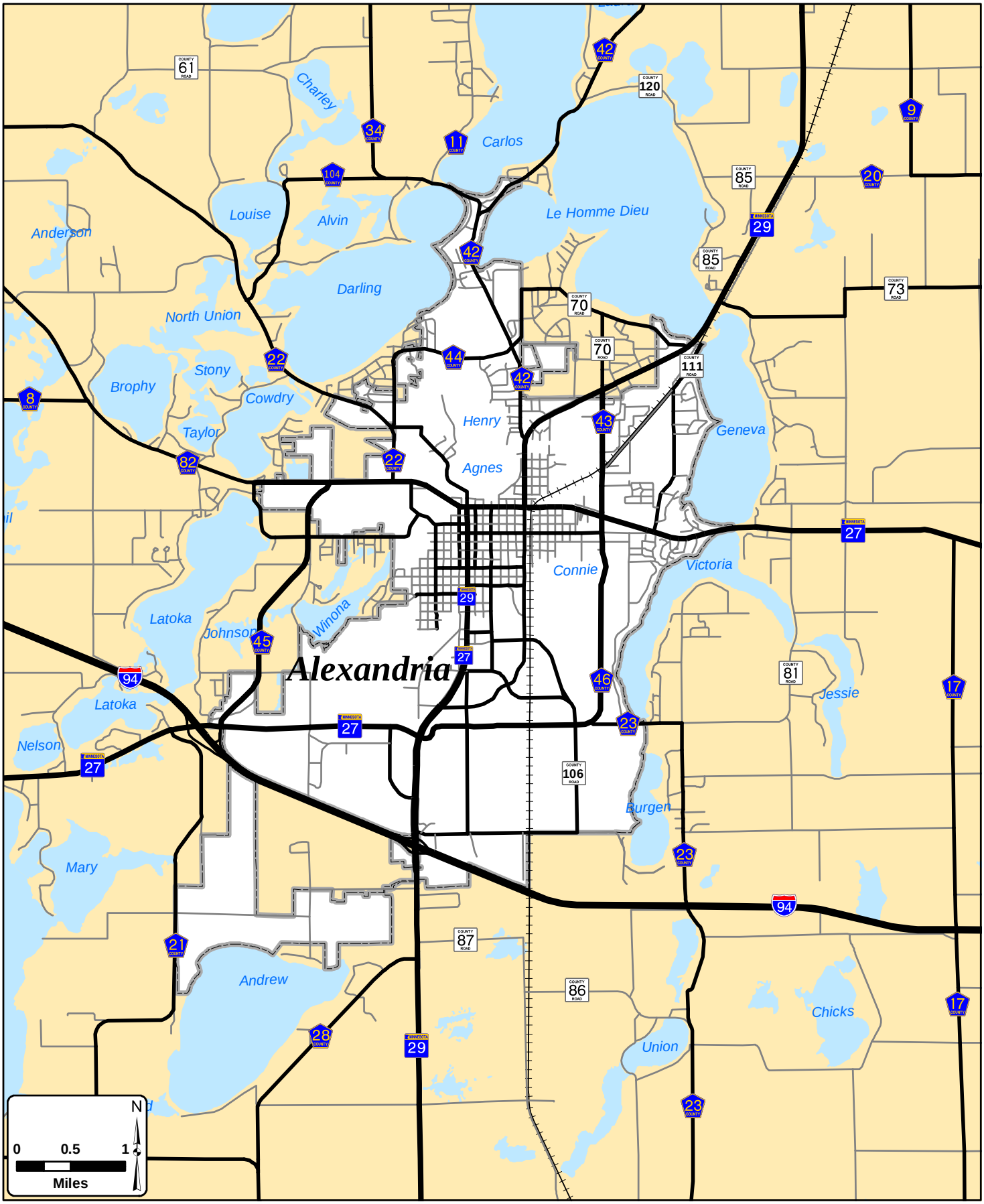
Transportation planning is a process for linking land use, economic development, mobility, and environmental conditions to improve the quality of life for area citizens.

Study Process

The Alexandria Area Transportation Plan is a continuing, comprehensive, and cooperative plan for the future transportation system. The plan provides a blueprint to build upon an ever-evolving process of goal setting, deficiency analysis, and solution identification. The future transportation system will evolve as the area's priorities and conditions change, demographics shift and new technologies develop. These changes will be reflected in future updates of the Plan.

Public Involvement

A proactive public involvement process was undertaken to assure opportunities for the public to be involved in all phases of the planning process. The public provided valuable information needed to develop, maintain, and carry out an effective transportation plan.



Alexandria Area Transportation Study

Figure 1: Study Location Map

A number of activities were used to inform and gather support/comments throughout the study process. The public involvement activities included:

- Stakeholder Interviews (20)
- Public Informational Booth (i.e., Douglas County Fair)
- Project Website (*www.dot.state.mn.us/d4/projects/alexstudy)*
- Public Open Houses
- Property Owner Meetings

Alexandria Area Transportation Plan Newsletters

Vision Statement

The vision statement frames the development of the study for the identification and implementation of the recommended transportation strategies and improvements. The Alexandria Area Transportation Plan vision statement is stated below.

Vision Statement
To promote the development of a balanced, multi-modal transportation system that enhances mobility, economic vitality, and facilitates the safe and efficient movement of people and goods within the greater Alexandria area by analyzing the existing system, collecting data and making system/budgetary recommendations

Transportation Conditions

This section of the Executive Summary provides an overview of the existing transportation conditions within the Alexandria Area. The analysis includes an evaluation of individual transportation modes, which include roadways, transit, pedestrian and bicycle facilities, and aviation/airport.

Roadways

The Alexandria Area consists of primarily a grid street pattern that is altered by the lakes in the region. Although not prevalent, there are some residential developments within the area, typically near the lakes, that use curvilinear street patterns to limit pass-through traffic and increase developable land. The Alexandria Area is connected to the surrounding rural areas by a system of Federal, State and County highways.

Functional Classification

The various functional classifications define a roadway's general role in performing the two primary functions:

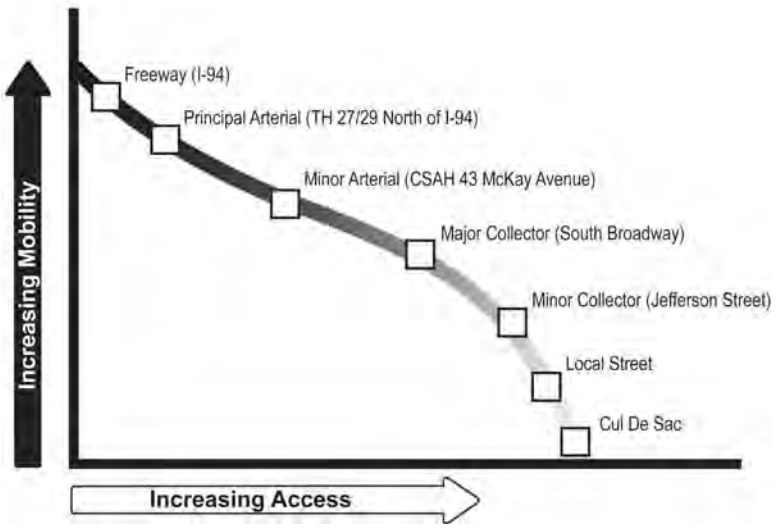
- Providing access to adjacent properties
- Providing travel mobility from one part of the region to another

Each of the roadways within the Alexandria area, as well as all roads in the State of Minnesota, may be described by their function. The differentiation between functional classifications is based on through-traffic movement and access to adjacent land. The system is broken down into four primary categories – principal arterials, minor arterials, major and minor collectors, and local roadways. Developing a working functional classification provides a method for channeling traffic in a logical and

efficient manner. Roadways are classified by the function they serve and not by the amount of traffic they carry; however, higher traffic volumes are usually found on roadways of higher functional classification. The density of access points on local roads is intended to be higher in comparison to higher functional classes, which are intended to move large volumes of traffic and provide limited access to adjacent property. Roadways of a higher functional class, such as arterials (i.e., I-94, TH 29, etc.), are designed to maximize mobility and through-traffic flow, with each subsequent lower level of functional classification placing more emphasis on access rather than mobility.

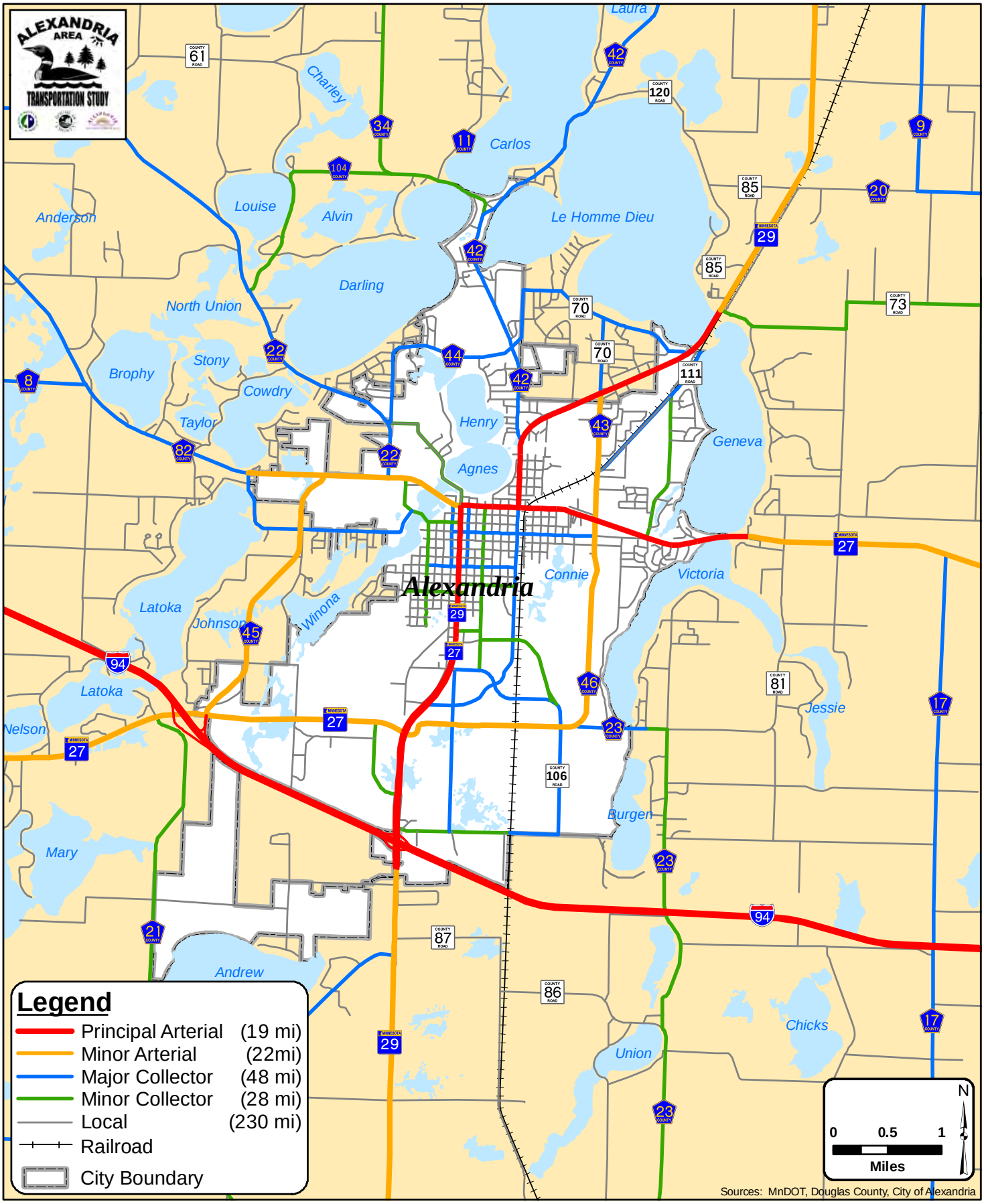
Figure 2 displays the relative level of mobility and access performed by the various facility types in the study area.

Figure 2. Functional Emphasis on Mobility and Access by Facility Type



The functional classifications of the study area's roadways provide insight into the level of traffic they were designed for and expected to carry. **Figure 3** displays the functional classification of the roadways within the Alexandria area.

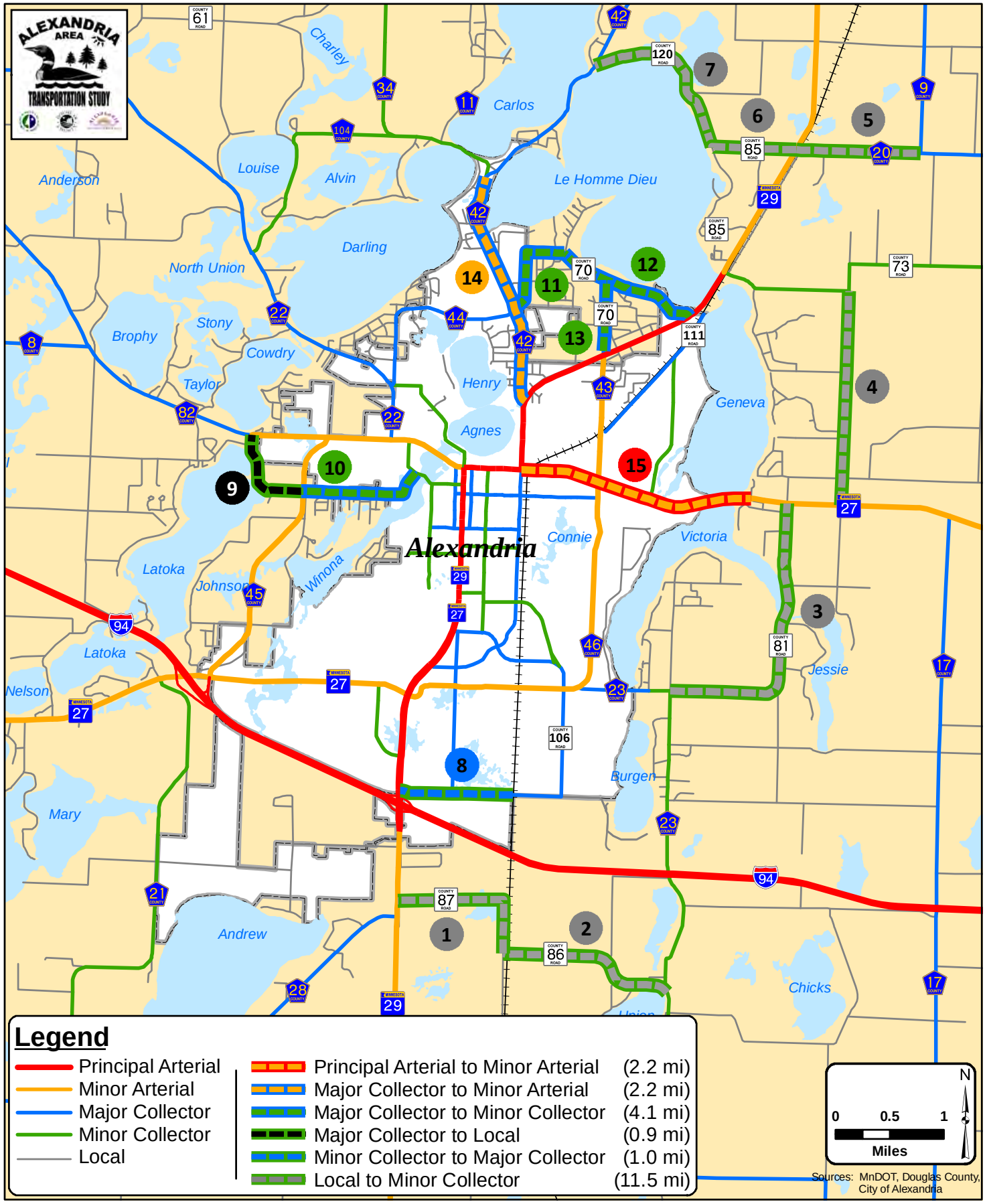
Proposed functional classification changes were suggested based on the projected operation of the roadways; these are shown in **Figure 4**.



Alexandria Area Transportation Study

Figure 3: Existing (2010) Functional Classification

WSB & Associates, Inc.



Alexandria Area Transportation Study

Figure 4: Proposed Functional Classification Changes

WSB & Associates, Inc.

Jurisdictional Classification

In addition to functional classification, a roadway is also classified according to the level of government that has jurisdiction over the road. Three levels of government have roadway jurisdiction in the Study Area: Mn/DOT, Douglas County, and the City of Alexandria. Mn/DOT owns/maintains the Interstate (I) and Trunk Highway (TH) systems. Douglas County owns/maintains the County State Aid Highway (CSAH) and County Road (CR) system. The City owns/maintains the local streets, including Municipal State Aid (MSA) streets. Cities in Minnesota receive federal funding through the state MSA program to improve and maintain MSA streets designated by each city. Typically these facilities are collector or arterial roadways. MSA design and maintenance requirements are established by Mn/DOT.

In general, the functional and jurisdictional classifications are directly related. Roadways of the highest functional classification are typically under the jurisdiction of the highest level of government (e.g., the state), and conversely, roadways of the lowest functional classification are owned and maintained by the lower level of government (i.e., the cities and townships).

Figure 5 displays the jurisdictional classification of the roadways within the Alexandria area. Displayed on **Figure 6** are the roadway segments identified for potential transfer, as determined by the project partners.

Capacity

In general, the street and highway system in the Alexandria performs well. In recent years, congestion has been building on TH 29 north of I-94 as the Alexandria area continues to grow. This growth, coupled with the development of the TH 29 corridor as a retail and commercial center, has led to congested conditions on TH 29. This is experienced at its interchange with I-94, immediately to the north of the interchange.

Average annual daily traffic (AADT) counts for the Alexandria area were obtained from Mn/DOT for the most recent year available, which was 2006. The highest observed traffic volumes were along the section of TH 27/29 through Alexandria (principal arterial at 18,700 vehicles per day [vpd]). In contrast, I-94 within the study area carries between 16,200 vpd west of the TH 29 interchange and 17,200 vpd east of TH 29 interchange.

The roadway system has a finite vehicle - carrying capacity. The maximum number of vehicles that a roadway segment or intersection can accommodate is defined as Roadway Capacity. As traffic volumes increase and approach the capacity of a segment or intersection, travel delays increase. When traffic volumes are at the roadway's capacity threshold, delays are excessive and traffic flow breaks down. This is also referred to as a Capacity Deficiency.

Traffic Terminology
Roadway Capacity is the maximum number of vehicles a street segment / intersection can accommodate. As traffic volumes approach roadway capacity, travel delays increase.
Capacity Deficiency is the condition where traffic volumes reach a level that causes undesirable travel delays. In the Alexandria area, this is defined as a level of service D or worse.

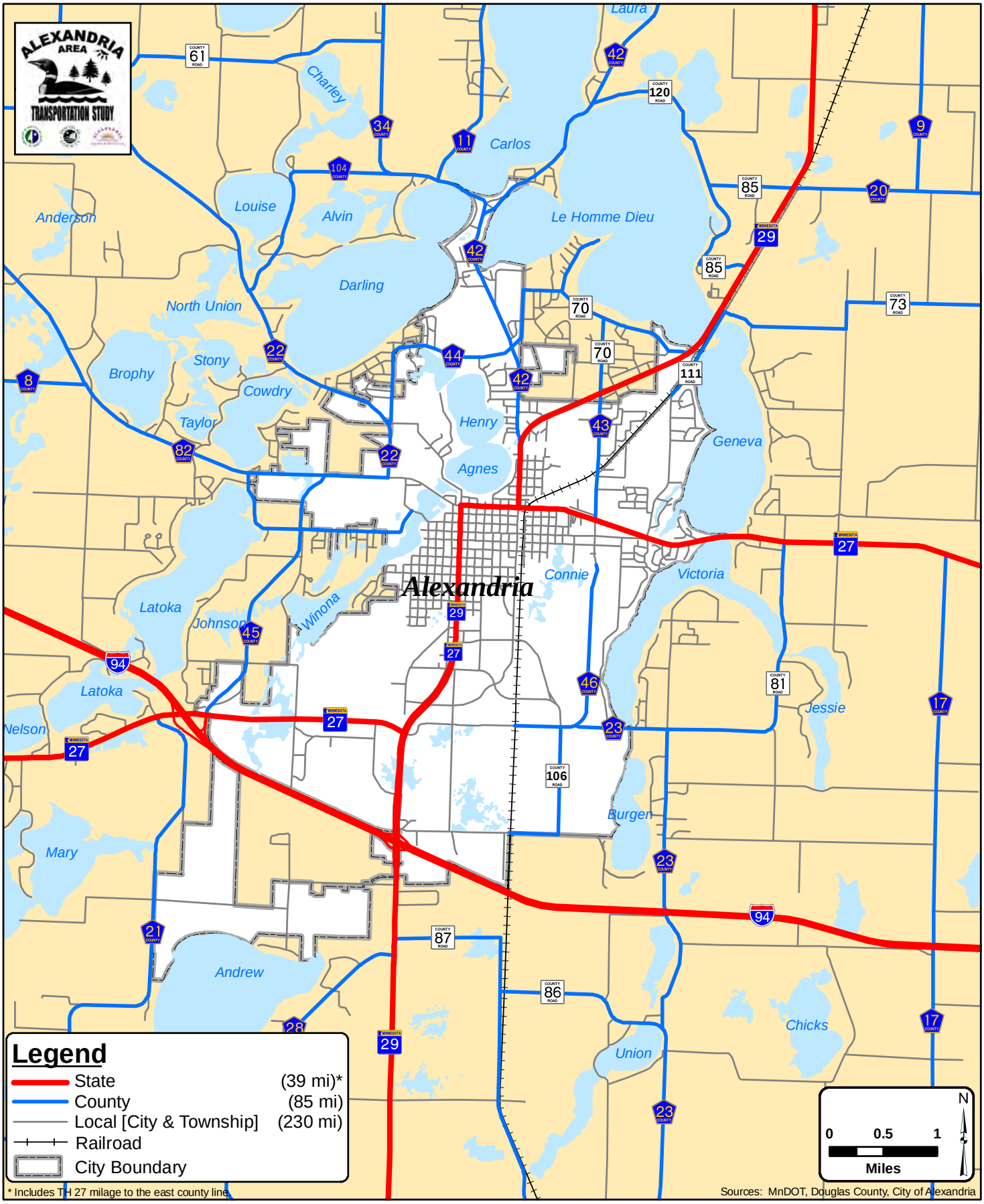


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Figure 5: Existing (2010) Jurisdictional Classification

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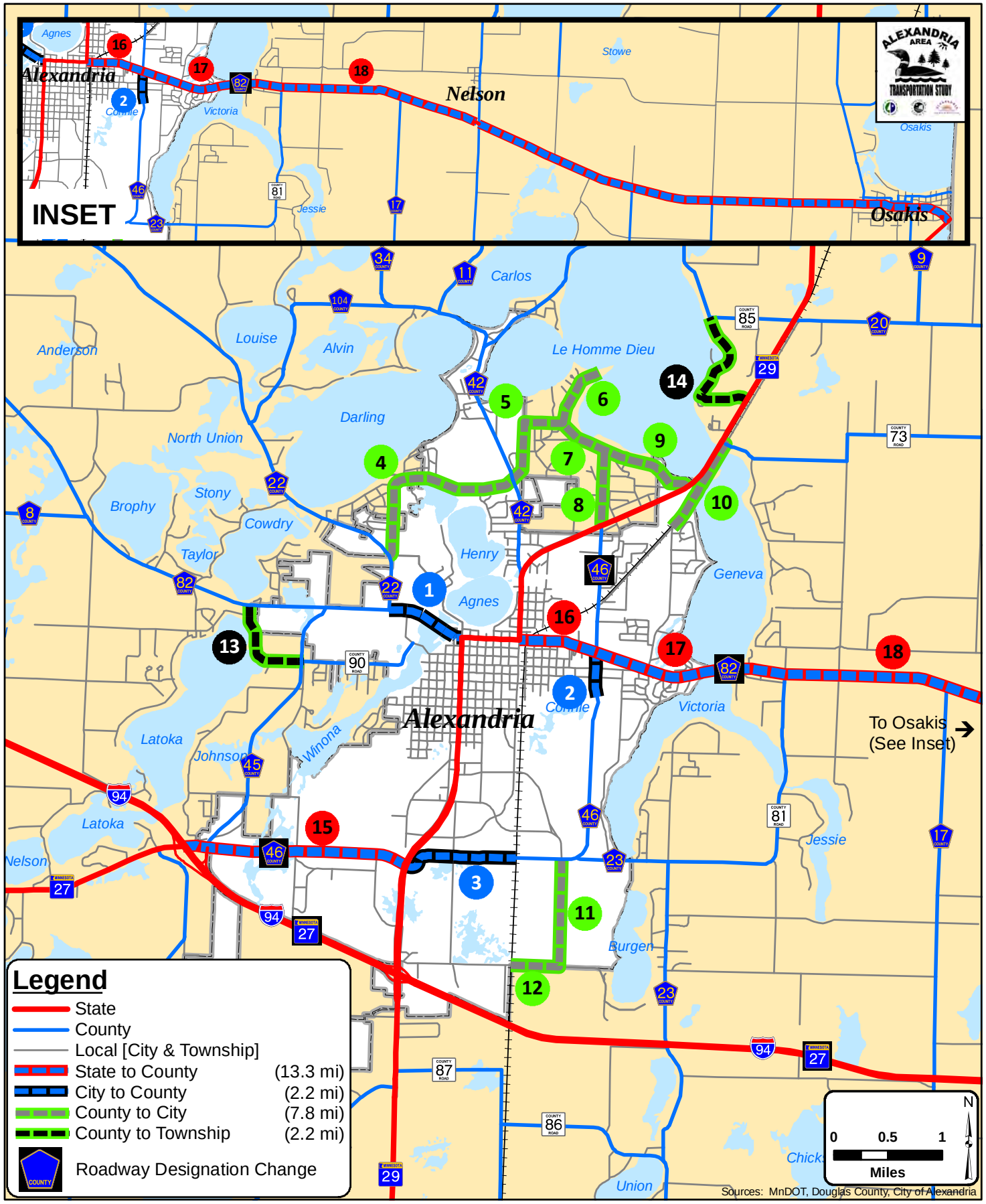

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Figure 6: Proposed Jurisdictional Classification Transfers

The capacity analysis of the roadways in the Alexandria Area shows that approximately 9.2 miles of roadways were approaching-capacity, at-capacity, or over-capacity (see **Table 1**). Of this total, 8.4 miles (91.3%) were identified as approaching-capacity and may not require immediate attention. Instead, roadway segments identified as approaching-capacity should be closely monitored to ensure that these facilities do not worsen and become classified as at-capacity or over-capacity. In total, less than one percent of the roadways were identified as either at-capacity or over-capacity.

Table 1. Capacity Levels within the Alexandria Area (2006)

	Capacity Level			
	Approaching Capacity	At Capacity	Over Capacity	Total
Miles	9.2	0.8	-	10.0
Percentage	92.0%	8.0%		100%
Percentage of Total Modeled Roadway Miles[1]	4.8%	0.4%	0.0%	5.3%

1) Modeled roadways generally include those classified as Collectors and higher.

SOURCE: WSB & Associates, Inc.

K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Congestion Summary Table

Safety Analysis

High accident locations were identified for roadway segments and spot locations within the Alexandria Area. The crash data used to identify locations of interest for this study was obtained from Mn/DOT and represents a three-year period of (2005 to 2007). The following summarizes the findings of the safety analyses for the Alexandria area.

Roadway segments were analyzed between 2005 and 2007. **Table 2** displays the segment crash locations ranked in order of total number of crashes.

Table 2. Segment Crash Data (2005 – 2007)

		Approximate Location		
	Roadway	From	To	Crash Rate[1]
1	3rd Avenue	Broadway	Nokomis Street	**5.4**
2	TH 29	CSAH 46	3rd Avenue	**3.4 - 5.4**
3	CSAH 43 (McKay)	TH 27	TH 29	**2.3**
4	TH 29	I-94	34th Avenue	**3.4**
5	3rd Avenue	Broadway	CSAH 22	**2.2**
6	CSAH 46	TH 29	TH 27	**2.3**
7	CSAH 42	TH 29	CSAH 34	**2.2**
8	TH 27	CSAH 45	TH 29	**2.3**
9	Nokomis Street	3rd Avenue	CSAH 42	**2.2**
10	TH 27	Nokomis Street	CR 81	**2.3**

[1] Crash Rate per Million Vehicle Miles Traveled

SOURCE: Mn/DOT District 4

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Access Management

Access management is the proper planning and design of access to the public roadway system that helps ensure better traffic mobility with fewer crashes. Fewer direct access points, greater separation of driveways, and better driveway design and location are the basic elements of access management. When these techniques are implemented uniformly and comprehensively, there is less occasion for

through traffic to brake and change lanes in order to avoid turning traffic. As a result, the flow of traffic will be smoother and average travel times lower resulting in less potential accidents.

Table 3 shows how crash rates generally increase as the number of access points per mile increase along a roadway corridor. According to the Federal Highway Administration (FHWA), before and after analyses show those routes with well managed access can experience 50% fewer accidents than comparable facilities with no access controls.

Table 3. Comparison of Accident Rate Indices for Access Spacing

	NCHRP 420 Literature Synthesis	NCHRP 420 Safety Analysis	Minnesota Study				Indiana Study	Square Root Rule [1]
Access Points per Mile	All Roads	Urban-Suburban Roads	Urban-Suburban Roads				Urban-Suburban Roads	All Roads
			UC 2 NLT (a)	UC 4 NLT (b)	UC 4 LT (c)	Average		
10	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
20	1.3	1.4	1.3	1.4	1.4	1.4	1.2	1.4
30	1.7	1.8	1.9	1.7	1.6	1.7	1.5	1.7
40	2.1	2.1	2.5	2.0	1.8	2.1	1.8	2.0
50	2.8	2.3	2.7	2.5	2.3	2.5	2.1	2.2
60	4.1	2.5	2.9	2.8	2.9	2.9	2.5	2.7
70	N/A	2.9	3.1	3.1	3.2	3.1	3.0	2.7

SOURCE: Access Management Manual, Transportation Research Board, 2003, Page 16.

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[1] Square Root Rule is a statistical calculation used to provide a weighted average for all roads.

(a) Urban Conventional (UC), Two-lane urban arterial, no left-turn lanes.

(b) Urban Conventional (UC), Four-lane urban arterial, no left-turn lanes.

(c) Urban Conventional (UC), Four-lane urban arterial with left-turn lanes.

Access Management Assessment

For the Alexandria Area Transportation Study, a review of congested roadway segments was compared to the high accident segment and spot locations. The purpose of this analysis was to identify locations where existing roadway access might be a contributing factor in traffic congestion and/or a safety concern.

The primary corridor identified through this analysis was along TH 29 from CSAH 4 to CSAH 13/42 near Carlos, representing a distance of approximately 14 miles. Sections of this corridor, particularly south of I-94, have a significant amount of open space that over the next twenty years it may be a primary corridor for the commercial development. Adopting and implementing access management policies and techniques now will help ensure that this corridor can handle increasing traffic volumes associated with future year development.

The TH 29 corridor was sub-divided into 14 geographical segments. Each of these segments carries an Access Category as determined by Mn/DOT, which is used to establish spacing guidelines. These categories and the guidelines for spacing between intersections are provided in **Table 4**.

Table 4. Mn/DOT Access Categories and Spacing Guidelines

Access Category	Land-Use or Facility Type	Typical Functional Classification	Typical Posted Speed	Public Street Spacing	
				Primary Full-Movement Intersection	Secondary Intersection
5A	Rural	Minor Arterials	45 - 55 mph	1/2 mile	1/4 mile
5B	Urban/Urbanizing	Minor Arterials	40 - 45 mph	1/4 mile	1/8 mile
5C	Urban Core	Minor Arterials	30 - 40 mph	300-660 feet, dependent on block length	

As displayed in **Table 5** below, the access management assessment of this corridor revealed 107 access points that did not conform to Mn/DOT's guidelines. This accounted for approximately 45% of all accesses. The average accesses per mile ranged from 4 in rural area to 80 in urban areas. Referring to *Table 3 – Comparison of Accident Rate Indices for Access Spacing*, an average of 70 or more access points per mile results in nearly three times as many accidents as roadways with fewer access points.

Table 5. Access Assessment Results

TH 29 Segment		Access Category	Length (miles)	Non-Conforming Accesses	Total Number of Accesses	Access Points Per Mile
From	To					
CSAH 4	Hiebel Rd	5A	1.0	0	7	7.0
Hiebel Rd	CSAH 28	5B	1.3	1	12	9.2
CSAH 28	I-94 EB Ramps	5B	1.0	7	10	10.0
I-94 EB Ramps	TH 27	5B	1.1	2	6	5.5
TH 27	17th Avenue	5B	1.2	1	5	4.2
17th Avenue	10th Avenue	5C	0.5	29	40	80.0
10th Avenue	3rd Avenue	5C	0.6	13	20	33.3
Broadway	Nokomis Street	5C	0.5	13	20	40.0
3rd Avenue	Carlos Avenue	5C	0.5	24	34	68.0
Carlos Avenue	Birch Avenue	5B	1.9	3	18	9.5
Birch Avenue	CSAH 20	5B	1.8	0	13	7.2
CSAH 20	Pike Rd	5A	1.0	2	11	11.0
Pike Rd	Prairie Rd	5A	1.0	1	16	16.0
Prairie Rd	CSAH 42/CSAH 13	5A	1.0	2	6	6.0
Total TH 29 Corridor		**5A,5B,5C**	**14.4**	**98**	**218**	**15.1**

Source: WSB and Associates

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Figure 7 displays examples of potential areas for access management within the Alexandria Area Transportation Study.

Figure 7. Examples of Potential Access Management Locations

TH 29 / 50th Avenue

CONCERNS

50th Avenue, near the I-94 interchange, contains a number of retail and service businesses with multiple access points. Given the high travel volumes and numerous access points make this area a prime location for potential access management.

3rd Avenue / Nokomis Street

CONCERNS

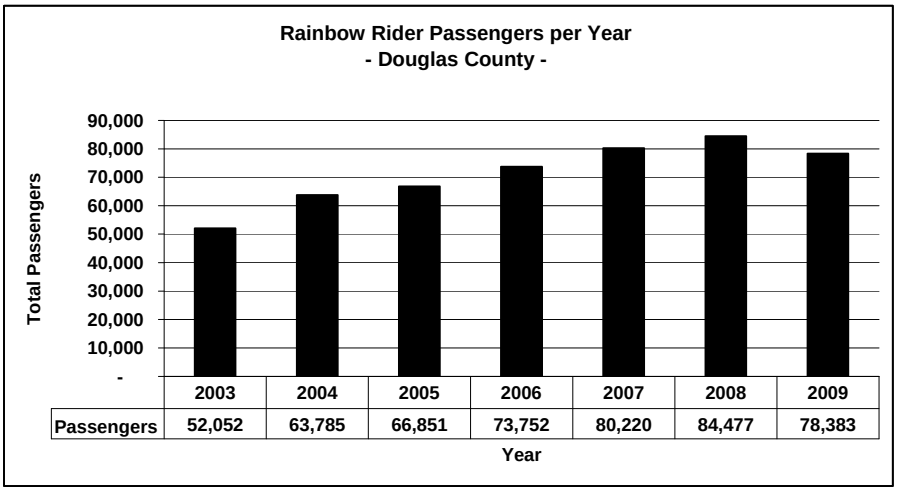
Nokomis Street, just north of 3rd Avenue, experiences a lot of through traffic as well as business traffic. The high travel volumes combined with numerous access points close to a high volume intersection make this location a possible area for access management.

Transit Operations

Rainbow Rider, which started operating in 1995, has approximately 37 employees and operates 32 wheelchair accessible buses. Rainbow Rider offers door-to-door service and is governed by the Rainbow Rider Transit Board and supported by passenger fares, service contracts, state and federal taxes, sales of advertising space, local county appropriations, and donations.

In 2009, Rainbow Rider provided approximately 142,000 rides in its four county service area, with approximately 80,000, or 56 percent of those for people in Douglas County, with the majority of these trips being in the City of Alexandria. **Figure 8** displays the ridership totals for the time period 2003 to 2009.

Figure 8. Douglas County - Rainbow Rider Passengers (2003-2009)



SOURCE: Rainbow Rider

In addition to the Rainbow Rider, transportation between the Alexandria area and other cities is served by Peoples Express, Greyhound, and Jefferson Lines. Transportation to and from the Minneapolis – St. Paul International Airport is provided by private operators, such as Executive Express, which operates up to nine trips per day from Alexandria. From the public outreach effort of this study, it was determined that the public was pleased with these transit options, particularly with the Rainbow Rider.

Pedestrian and Bicycle Facilities

Bicycle facilities and trail systems are valuable community assets and are an important transportation mode for recreational and other trip purposes. Within the Alexandria Area Transportation Plan area, there is a network of sidewalks and trails. **Table 6** displays the current mileage by pedestrian/bicycle facility. Photographs taken along the Central Lakes Trail are displayed in **Figure 9**.

Table 6. Existing Pedestrian / Bicycle Facility Characteristics

Type of Facitlity	Description	Length (miles)
Sidewalk	Within City of Alexandria	21
City Bike Route	On-street (not striped)	31
County Bike Route	On-street (not striped)	9
Central Lakes Trail	State Trail from Fergus Falls to Osakis	55
Esplanade Trail	City Trail along Lake Agnes	1

SOURCE: WSB & Associates, Inc.
K:\01874-00\Admin\Docs\FINAL REPORT\[Alex 2 Tables.xls]Trails

Figure 9. Central Lakes Multi-use Trail

Aviation / Airport

The Alexandria Municipal Airport (Chandler Field) is owned and operated by the City of Alexandria. The Airport encompasses an area of approximately 2,200 acres and includes over 5,000,000 square feet of pavement surfaces for aircraft operations (runways, taxiways, and parking aprons) and 360,000 square feet of roads and vehicle parking areas.

Primary users of the airport are general aviation, airfreight, and the military. Alexandria Aviation, Inc., a full fixed base operator, provides charter services, flight instruction, fuel maintenance, and sales. Chandler Airport averages over 25,000 aircraft operations per year, or an average of approximately 70 per day, of which 90 percent are general aviation, 9 percent air taxi, and 1 percent military.[1]

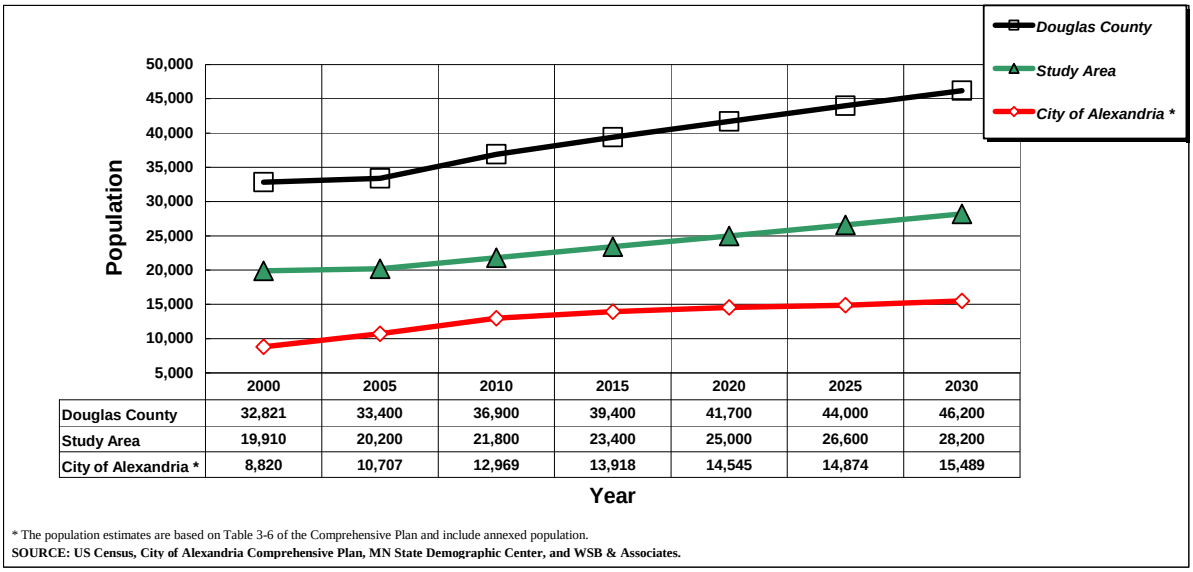
[1] Mn/DOT, US Federal Aviation Administration (FAA)

In recent years, there has been discussion on whether the Alexandria Municipal Airport should be relocated outside of the downtown area, to allow the airport to expand more easily to meet future needs. However, in recent years, discussion on the potential relocation of the airport has subsided due to a host of factors including a downturn in the economy. As it currently stands, the airport will remain at its present location and its current configuration. There are no scheduled improvements for runway extensions that would impact the adjacent roadway network (i.e. TH 27).

Future Year Population and Employment Projections

In analyzing the future year population, the analysis shows that the population of the area will see continued growth through 2030, with the County population increasing from 32,821 in 2000 to over 46,000. This growth is reflected in the total for both the City of Alexandria as well as the study area for the analysis. The population projections are displayed in **Figure 10**.

Figure 10. Population Projections



	2000	2005	2010	2015	2020	2025	2030
Douglas County	32,821	33,400	36,900	39,400	41,700	44,000	46,200
Study Area	19,910	20,200	21,800	23,400	25,000	26,600	28,200
City of Alexandria *	8,820	10,707	12,969	13,918	14,545	14,874	15,489

* The population estimates are based on Table 3-6 of the Comprehensive Plan and include annexed population.
SOURCE: US Census, City of Alexandria Comprehensive Plan, MN State Demographic Center, and WSB & Associates.

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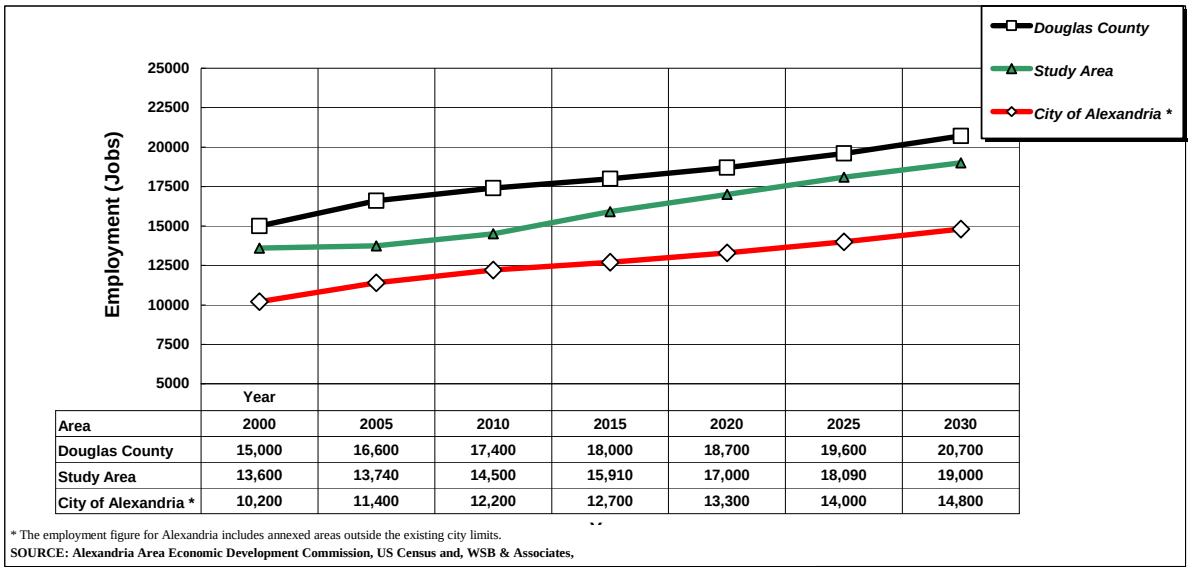
The Alexandria Area Transportation Plan study area has a strong employment base and is a net importer of workers. In the year 2030, it is projected that Douglas County would have an employment total of approximately 20,700. Of this total, approximately 19,000 of these jobs would be located within the study area and 14,800 would be located within the Alexandria city limits.

Figure 11 displays the employment projections for Douglas County, the study area, and the City of Alexandria.

Figure 11. Employment (Job) Projections



Area	2000	2005	2010	2015	2020	2025	2030
Douglas County	15,000	16,600	17,400	18,000	18,700	19,600	20,700
Study Area	13,600	13,740	14,500	15,910	17,000	18,090	19,000
City of Alexandria *	10,200	11,400	12,200	12,700	13,300	14,000	14,800

* The employment figure for Alexandria includes annexed areas outside the existing city limits.
SOURCE: Alexandria Area Economic Development Commission, US Census and, WSB & Associates,

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Future Transportation Analysis

This chapter summarizes the analysis of the years 2020 and 2030 conditions and identifies future year issues within the Alexandria Area Transportation Plan study area. The analysis ideates potential deficiencies or weaknesses within the overall transportation system.

Travel Demand Forecasting

Based on US Census data, nearly 20 percent of the jobs located in the study area are held by individuals living outside of Douglas County. Because of the Alexandria's unique role as a net-importer of labor, it is important to have a dynamic method of forecasting travel patterns. This is accomplished using a computer model that inputs population and employment (number and location) information as well as physical transportation network attributes (roads, intersections, speeds, etc.) to forecast future year traffic volumes and travel patterns. To supplement this information, an origin-destination travel survey was conducted for identifying travel patterns from and between locations on highways on the periphery of the study/model area. Nearly 4,000 license plates were recorded and entered into a spreadsheet for analysis to identify the level of trip interaction between each of the locations.

A travel demand forecasting model incorporates a series of mathematical equations that are used to represent how choices are made when people travel. This information is then used to assign trips to the transportation network based on the land use and the transportation system. Because future trips or traffic is based on both land use and the transportation system, it is a dynamic process, rather than the other methods such as the application of a historic traffic growth factor to develop future traffic projections, which do not always take into consideration future land use and transportation system characteristics.

Roadways

Year 2020 and 2030 traffic volume forecasts, developed using the travel demand model, were compared to roadway capacities standards to determine the future roadway congestion levels. For these forecasts, programmed and planned transportation improvement projects were assumed. *Programmed* projects have committed funding sources and will likely to be constructed by 2015. *Planned* projects are transportation improvements that have been discussed and there is a desire to construct them between years 2015 and 2020.

The programmed and planned transportation improvement projects are summarized in **Table 7**. **Figure 12** displays the mileage comparison of existing and future congestion levels for approaching, at, and over-capacity roadway segments.

Table 7. Programmed and Planned Roadway Improvement Projects

Map ID #	Project	Location		Improvement	Capacity	
		From	To		Before	After
1. Programmed Projects (completed prior to 2015)						
Pr1	TH 29	3rd Avenue	just north of CSAH 42	Construct / Restripe Additional NB Lane	At	Under
Pr2	18th Avenue	Broadway	Nokomis Street	New Roadway (2-Lane)	NA	NA
Pr3	18th Avenue	Nokomis Street	CSAH 46	New Roadway (2-Lane)	NA	NA
Pr4	50th Avenue	Broadway	Railroad	Upgrade from 2-Ln to 5-Ln Roadway	Approaching	Under
Pr5	Nokomis Street	3rd Avenue	6th Avenue	Construct / Restripe Additional NB Lane	Approaching	Under
Pr6	CR 106	CSAH 46	50th Avenue	Add Turn Lanes	NA	NA
2. Planned Projects (completed between 2015 and 2020)						
Pl1	TH 29	I-94	CSAH 28	Upgrade from 2-Ln to 4-Ln Divided Roadway[1]	Approaching	Under
Pl2	TH 29	NA	NA	Replace interchange at TH 29 and I-94[2]	NA	NA

[1]Project is expected to be included in the 2012 - 2015 State Transportation Improvement Program (STIP).

[2]Alternative interchange concepts were developed for the Subarea 1 Analysis (See Section 6.1 of the Report). These concepts range in cost from $4 million (bridge replacement) to $25 million (full reconstruction). Of the concepts, the tight urban diamond interchange represents the lowest cost alternative that meets the mobility objectives. Only the replacement of the existing bridges is expected to be included in the 2012 - 2015 STIP.

GENERAL NOTE:

Programmed and Planned projects were used to categorize projects into different improvement scenarios. The terminology does not guarantee that any of these projects will be constructed nor does it guarantee that a specific project will be constructed during the identified time frame.

SOURCE: Mn/DOT, Douglas County, City of Alexandria, and WSB & Associates

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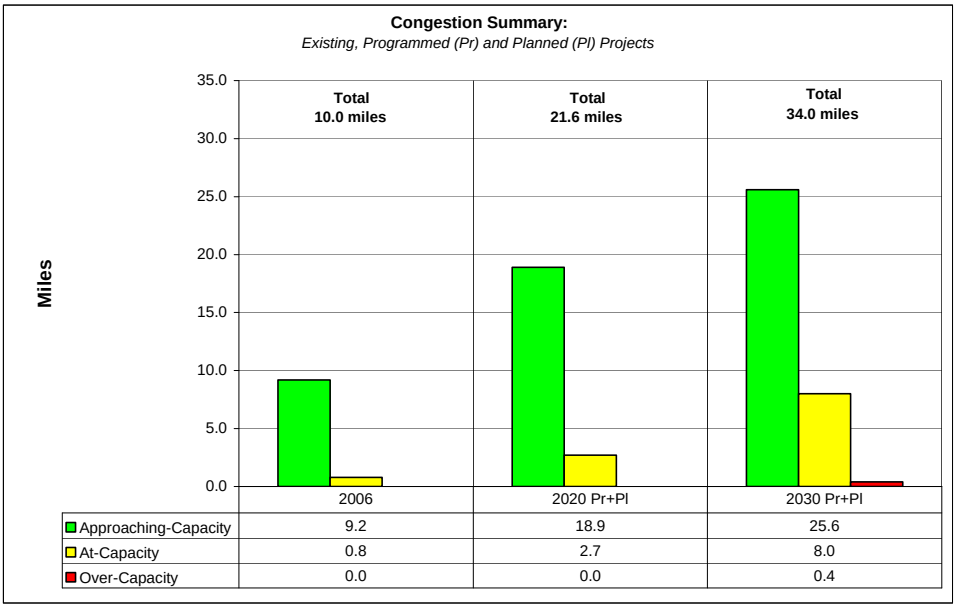
Figure 12. Existing and Future Congestion Levels with Programmed and Planned Projects



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Potential transportation improvement projects attempt to address the remaining transportation deficiencies identified after the programmed and planned projects are constructed. Potential projects are assumed to be constructed by year 2020 or by year 2030. The potential projects are summarized in **Table 8**.

Table 8. Potential Roadway Improvement Projects

Map ID #	Project	Location		Improvement	Capacity	
		From	To		Before	After
3. Potential Projects (completed prior to 2020)						
Po1	Nokomis Street	18th Avenue	6th Avenue	Upgrade from 2-Ln to 3-Ln Roadway	At	Approaching
Po2	CSAH 22	CSAH 82	CSAH 44	Upgrade from 2-Ln to 3-Ln Roadway	At	Approaching
Po3	CSAH 42	TH 29	Bethesda Street	Upgrade from 3-Ln to 4-Ln Divided Roadway	At	Under
Po4	CSAH 42	CSAH 44	Browns Point Road	Upgrade from 2-Ln to 3-Ln Roadway	At	Under
Po5	CSAH 46	CR 106	CSAH 23	Add Eastbound Auxiliary Lane[1]	Approaching	Under
Po6	50th Avenue	TH 29	42nd Avenue	New Roadway (2-Lane)[2]	NA	NA
Po7	New Connection	Park Street/1st Avenue	TH 27	New Roadway (2-Lane)[3]	NA	NA
4. Potential Projects (completed prior to 2030)						
Po8	TH 29	CSAH 28	CSAH 4	Upgrade from 2-Ln to 4-Ln Divided Roadway	Approaching	Under
Po9	TH 27	CSAH 21	Nevada Street	Upgrade from 2-Ln to 4-Ln Divided Roadway	At	Under
Po10	CSAH 23	CSAH 46	CR 81	Upgrade from 2-Ln to 3-Ln Roadway	At	Under
Po11	TH 29	CSAH 42	CR 73	Upgrade from 2-Ln to 4-Ln Divided Roadway	At	Under
Po12	CSAH 42	Bethesda Street	CSAH 44	Upgrade from 3-Ln to 4-Ln Divided Roadway	At	Under
Po13	CSAH 42	Browns Point Road	CSAH 11	Upgrade from 2-Ln to 3-Ln Roadway	At	Under
Po14	Nevada Street	NA	NA	Construct I-94 Overpass and Roadway	NA	NA
Po15	CR 106	NA	NA	Construct I-94 Interchange and Roadway	NA	NA
Po16	TH 29	3rd Avenue	just north of CSAH 42	Construct Additional SB Lane (5-Lane Roadway)	Under[4]	Under

[1]This segment of CSAH 46 performs like a 3-lane section due to left and right turn lanes being present at the intersections. Therefore, the capacity is assumed to be the same as a 3-lane section. To address delay and congestion at the intersection of CR 106 and CSAH 46, an eastbound auxiliary lane is recommended.

[2]This improvement includes extending 50th Avenue west to 42nd Avenue, realigning the southern portion of the West Frontage Road, modifying access at the 50th Avenue / Twin Blvd intersection (3/4 access), and constructing a new roadway segment from Twin Blvd to 50th Avenue ending in a new traffic signal.

[3]This improvement provides residents of the neighborhood east of TH 29 another option to connecting to the regional roadway network at TH 27. This improvement may offer a safer route into and out of the neighborhood during peak traffic periods on TH 29.

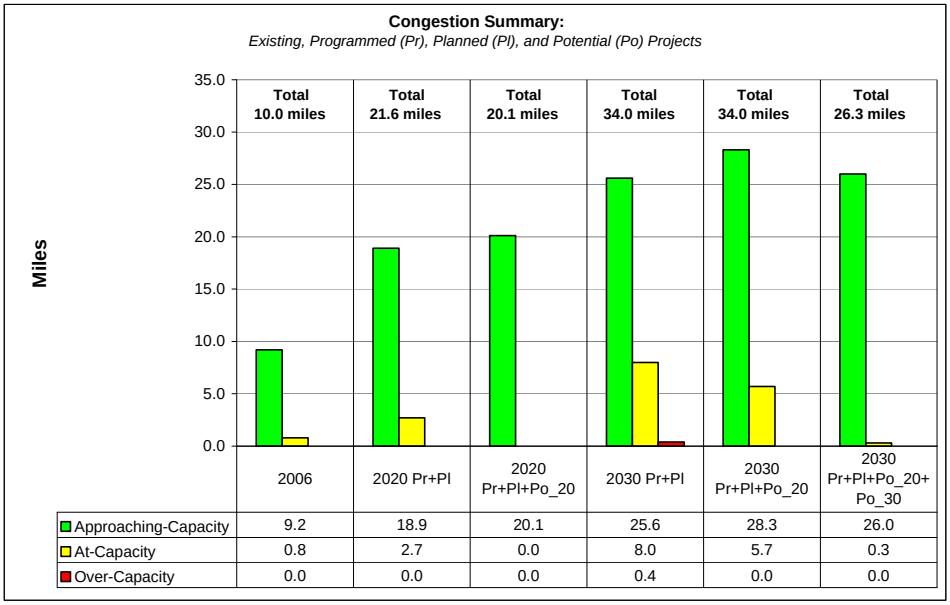
[4]Although this segment is projected to operate under capacity, this improvement is being reccommended so as to achieve lane balance between northbound and southbound lanes due to the near-term improvement of constructing an additional northbound lane.

SOURCE: Mn/DOT, Douglas County, City of Alexandria, and WSB & Associates

K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Roadway Projects Congestion

Figure 13 displays the mileage comparison of existing and future congestion levels for approaching-, at-, and over-capacity roadway segments. *Figures 3-7 and 5-6 through 5-10* within the final report display the locations of these segments. **Figure 14** displays the locations of the programmed, planned, and potential projects. The map ID numbers in Table 7 and Table 8 correspond to the improvements identified on the Figure 14.

Figure 13. Existing and Future Congestion Levels with Programmed, Planned, and Potential Projects



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Potential Locations for New I-94 Interchange

An evaluation was conducted to determine the effect of adding an additional interchange on I-94. A specific consideration was the impact a new interchange would have on reducing traffic on the existing interchange at TH 29, which is projected to see a large increase in traffic. For the analysis, two potential interchange locations east of TH 29 were evaluated. These locations include:

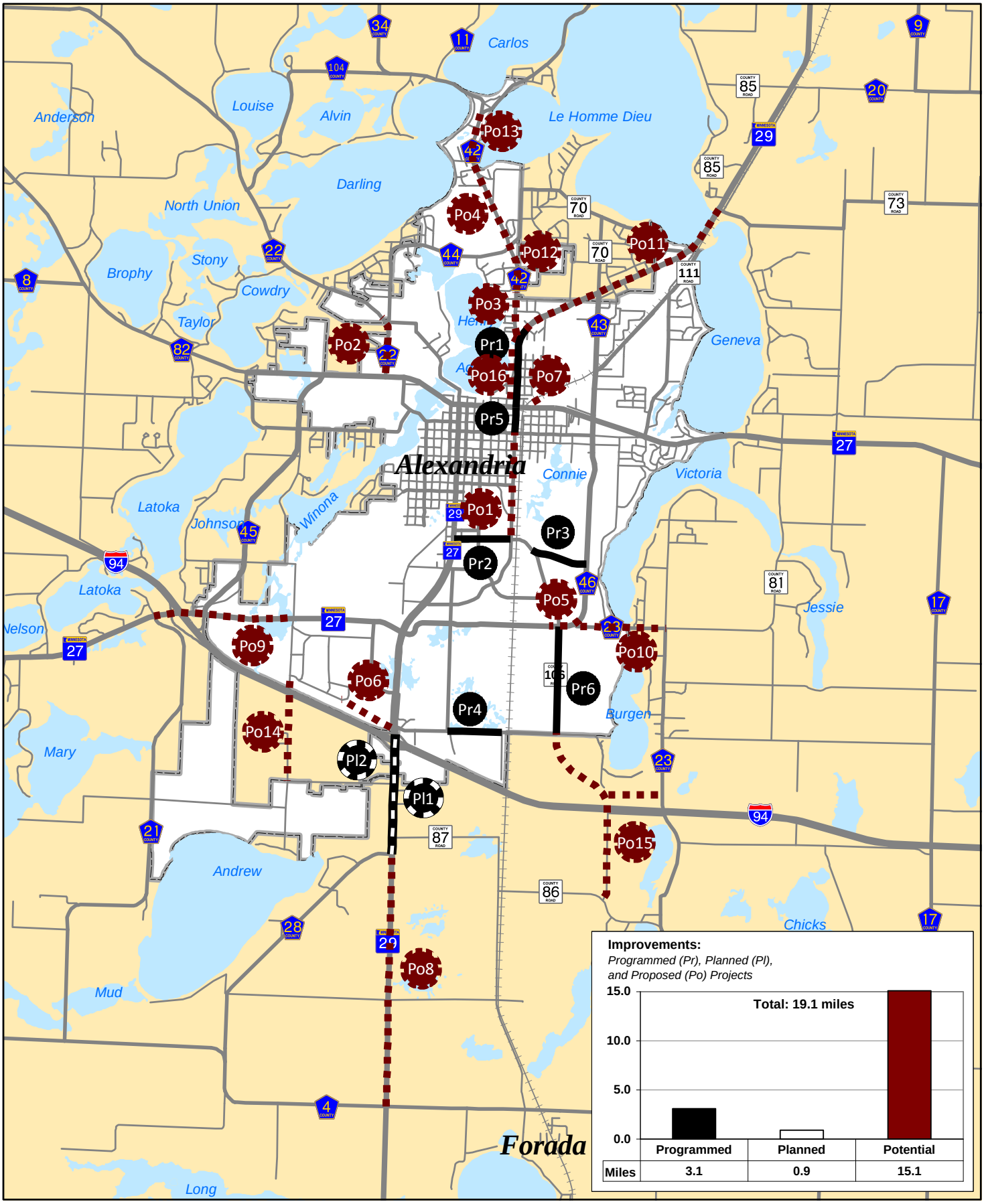
- CSAH 17 (approximately 5 miles east of TH 29)
- CR 106 (approximately 2 miles east of TH 29)

CSAH 17 (approximately 5 miles east of TH 29)

The analysis of the CSAH 17 interchange determined that it would have a negligible impact on serving local and regional travel. CSAH 17 north of I-94 would attract only 2,100 additional trips per day. It was concluded that CSAH 17, which is over 4 miles from the TH 29 interchange and east of the lakes (Geneva, Victoria, Jessie, and Burgen), was too isolated from major trip generators and travel routes. While an interchange at CSAH 17 might not be needed for 2030 forecasted traffic levels, it may be needed beyond 2030 as travel demand continues to increase. Therefore, this interchange location should be revisited in future studies.

CR 106 (approximately 2 miles east of TH 29)

The analysis of the CR 106 interchange determined that it will relieve traffic on TH 29 and its interchange with I-94. In general, the interchange allows for more direct and efficient travel between major trip generators. Routes that are anticipated to experience increased traffic volumes include CR 106, CR 81, CSAH 46/43, and CSAH 23. The travel pattern changes will be more pronounced near the interchange (increases and decreases greater than 1,000). By the time traffic reaches the area north of 22nd Avenue, changes will be less noticeable as travel disperses onto local routes. South of I-94, there will be little change in daily traffic volumes.



Alexandria Area Transportation Study

Figure 14: Programmed, Planned, & Potential Improvements

WSB & Associates, Inc.

Nevada Street Overpass at I-94

An evaluation was conducted to determine the effectiveness of constructing an overpass of I-94 that would connect the north and south sides via an extension of Nevada Street. In the future, it is projected that the area south of I-94, specifically near Lake Andrew will see a substantial increase in population. Likewise, the area north of I-94 within or near the Alexandria Industrial Park is expected to see a large increase in employment. With these increases, it can be expected that there will be an increase in travel between these two areas. Currently, travelers must use either TH 27 or TH 29 to cross I-94.

The analysis of the Nevada overpass determined that it will attract approximately 3,500 vehicles per day. The addition of this overpass provides relief to TH 29, which realizes a reduction of 2,000 vehicles near the I-94 interchange. As TH 29 becomes increasingly congested, an overpass at this location will relieve use on TH 29 for these types of local, short trips.

Non-motorized Transportation

The Alexandria Area has a good bicycle and sidewalk network, particularly in or near the downtown area. Among these is the Central Lakes Trail, which is a major east-west multi-use trail through Douglas County. While bicycles are prohibited on downtown sidewalks, there has been discussion with Mn/DOT to incorporate streetscape elements, including an off-street bike trail on Broadway through downtown Alexandria.

In the Alexandria area, there are a host of potential non-motorized transportation projects in various stages of planning. Through the Douglas County Safe Communities and Active Living groups, several potential bicycle and pedestrian travel projects have been identified. Currently there is discussion for additional protected crosswalks in downtown Alexandria. One such location is on 3rd Avenue (TH 27/29) at Jefferson Street.

Subareas Analyses

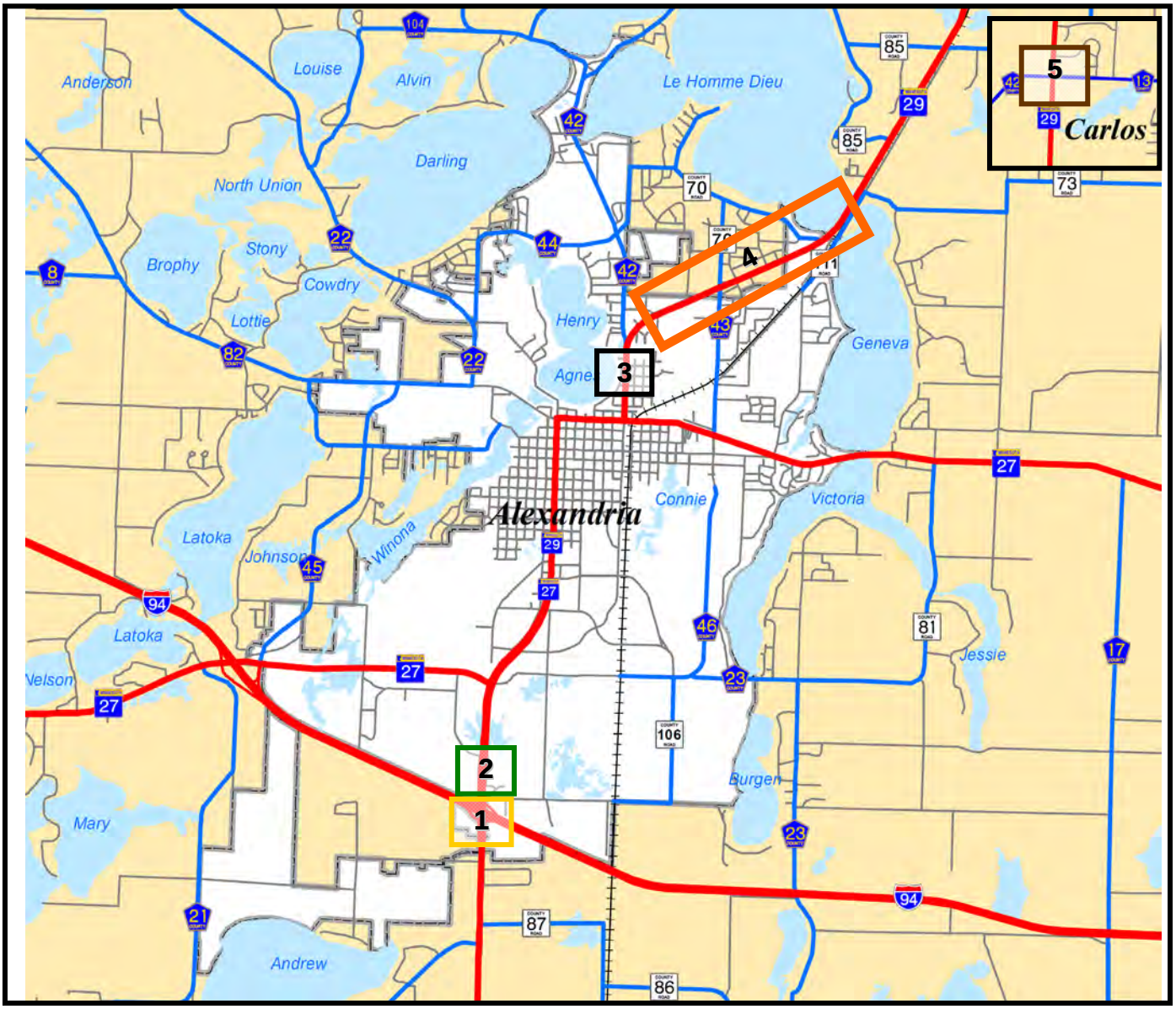
As part of the Alexandria Area Transportation Plan, five geographic subareas experiencing specific issues were identified to receive a more focused analysis than the region as a whole. These subareas are displayed on **Figure 15**. Provided below is a summary of the analysis for each of these areas.

Subarea 1 – TH 29 South and I-94 Interchange

Subarea 1 includes Trunk Highway (TH) 29 south of Interstate (I)-94 and its interchange with I-94. Currently the junction of I-94 and TH 29 is a standard diamond interchange with separate two-lane northbound and southbound bridges spanning over I-94. The intersection of the I-94 eastbound ramps at TH 29 is signalized, while the westbound ramps at TH 29 are stop controlled with TH 29 having the right-of-way. The spacing between the ramp intersections is 720 feet. Approximately 300 feet north of the westbound ramps intersection is the TH 29/50th Avenue intersection.

Three alternatives were developed to assess improvements to the interchange. These alternatives include:

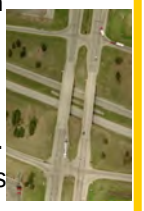
- Alternative 1 – Existing/No-Build Interchange
- Alternative 2 – Tight Diamond Interchange
- Alternative 3 – Single Point Interchange
- Alternative 4 – Diverging Diamond Interchange



1. I-94/TH 29 Interchange and TH 29 South

Issues:

1) Existing and future operation of interchange which is characterized by inadequate spacing between intersections.
2) Future operation of TH 29 south of I-94 as area continues to grow.



2. 50th Avenue Extension

Issues:

1) Intersection and access spacing.
2) Access to the industrial park.

3. TH 29, north of 3rd Avenue

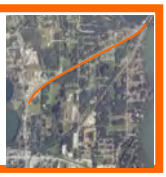
Issues:

1) Lane drop on TH 29 north of 3rd Avenue.
2) Difficult access to TH 29 from neighborhood located to the east.

4. TH 29, east of CSAH 42

Issues:

1) Access management.
2) Speed limit transitions.



5. Intersection of TH 29 with CSAH 42/13 near Carlos

Issues:

1) Safety and access management.

- **Other modes of Transportation: Airport, Transit, Bicycle, Pedestrians**

Alexandria Area Transportation Study

Figure 15: Subareas Location Map

Alternatives 1 and 4 would not resolve the intersection spacing issue that exists between the interchange and 50th Avenue. Only Alternatives 2 (tight-diamond interchange) and 3 (single-point interchange) resolve this intersection spacing issue. However, given the difference in estimated construction costs, **Alternative 2 is the recommended design** for the reconstruction of the TH 29 at I-94 interchange.

South of the I-94 eastbound ramps intersection, TH 29 is a four-lane divided roadway for approximately 900 feet and then tapers to a 2-lane roadway. By year 2020, the two-lane section of roadway from just south of I-94 to CSAH 28 (0.8 mile) will be at-capacity. The two-lane section of roadway from CSAH 28 to CSAH 4 (2.4 miles) will be approaching-capacity.

Based on traffic volume forecasts, **it is recommended that the section of TH 29 extending from just south of I-94 to CSAH 28 be expanded to a four lane divided roadway by 2020**.

Subarea 2 – 50th Avenue Extension and Access Improvements

The purpose of the Subarea 2 analysis is to document existing conditions and proposed improvement alternatives specifically addressing intersection spacing issues and access to the industrial park west of TH 29 and north of I-94.

Several issues were identified in Subarea 2 including:

- Intersection spacing along TH 29
- Access between the freeway and the industrial park via TH 29
- Intersection spacing along 50th Avenue
- East Access Road connection to 50th Avenue
- West Access Road intersection with TH 29

The three concept alternatives that were developed to mitigate the above mentioned issues include:

- Alternative 1 – 50th Avenue Extension
- Alternative 2 – 49th Avenue Extension
- Alternative 3 – 48th Avenue Extension

As was previously discussed in the Subarea 1 analysis, a tight diamond interchange at the junction of I-94 and TH 29 would provide adequate spacing between the interchange ramps and 50th Avenue. Therefore, **Alternative 1 (50th Avenue Extension) is the recommended improvement** as it would be the most economical and feasible option with the fewest impacts to right-of-way. Moving the west access road intersection further west along the new 50th Avenue extension alignment would provide for adequate spacing between intersections and allow vehicles to queue without blocking access points. Also, access to the industrial park from 50th Avenue would provide quick and easy access to and from I-94.

Subarea 3 – Neighborhood Access to TH 29

The Subarea 3 analysis had two objectives. The first objective was to identify potential measures to improve access between TH 29 and the adjacent neighborhood to the east. The second objective was to address the abrupt lane drop on TH 29 (Nokomis Street) northbound, just north of 3rd Avenue. The following discusses improvements being considered to resolve these issues.

Objective 1: Improve Neighborhood Access

- Alternative 1 – Traffic Control Modification at Lakeview Avenue
- Alternative 2 – CSAH 42 Connection to Neighborhood (Park Street or Quincy Street)
- Alternative 3 – TH 27 Connection to Neighborhood (Park Street/1st Avenue)

It is recommended that Alternative 3 be considered for implementation. Currently, drivers waiting on the minor streets intersecting TH 29 are at a relatively high risk of a right angle collision as there is pressure to accept shorter gaps in the TH 29 traffic stream. A new roadway connecting the southern part of the neighborhood to TH 27 would provide residents with another option for accessing the regional roadway network. As the majority of trips from this neighborhood are destined to areas located to the south, this connection would improve safety by reducing the number of vehicles currently making left-turns onto TH 29.

Objective 2: Address the TH 29 Northbound Lane Drop

- TH 29 Roadway Improvements

This improvement will provide northbound TH 29 with two continuous travel lanes from 3rd Avenue to just north of CSAH 42. This upgrade will improve mobility throughout this segment of roadway**. It is recommended that this improvement be implemented.**

Subarea 4 – TH 29 Access Management and Speed Limit Transition

The purpose of the Subarea 4 analysis is to examine access issues and speed limit transitions on TH 29 for a two mile segment centered on the intersection of TH 29 and County Road 70 (McKay Avenue).

From the review of existing access locations, **it is recommended to close or limit access to TH 29 from Lisa Avenue (approximately 750 feet northeast of the TH 29/McKay Avenue intersection).** Closing this access point or reducing it to right-in/out access will improve the safety along TH 29 by reducing turning conflicts along this segment. Left-turning vehicles will enter and exit the TH 29 corridor at the signalized intersection of TH 29 and McKay Avenue.

The speed transition on TH 29 is an issue as the posted speed limit abruptly transitions from 55 miles per hour (mph) to 30 mph just north of CSAH 42. This abrupt change in speed can lead to high deceleration rates among drivers and increases the chance of rear-end collisions. **It is recommended that a speed study be conducted to determine if an intermediate speed limit between 30 mph and 55 mph could be implemented to better transition vehicle speeds along this segment of TH 29**.

Subarea 5 – Carlos Corners Intersection Control and Access Management

The purpose of the Subarea 5 analysis is to document past issues, recent improvements, and proposed access management associated with the intersection of TH 29 and CSAH 42/13 (commonly referred to as Carlos Corners) just west of the city of Carlos, MN.

Recently, all-way stop control has been implemented at this intersection. New "Stop Ahead" and "Stop" signs along TH 29 were installed and enhanced with solar-powered LED lights around their perimeter in an attempt to further inform drivers of the new traffic control. The implementation of the all-way stop condition at this intersection was well received by the traveling public and is producing satisfactory results.

The closure of two existing access points is recommended in order to maintain safety near the intersection while providing storage for vehicles to queue without blocking access to nearby business driveways. One access closure is located in the northwest quadrant and the second in the southeast quadrant of the intersection. An alternative TH 29 access point for the northwest quadrant (fuel station) is for vehicles to use the existing access point on CSAH 42. These closures will ensure that vehicles turning into and out of parcels adjacent to the intersection will be uninhibited by queuing vehicles waiting at the all-way stop signs. If at some point in the future a traffic signal or roundabout is warranted at this location, consideration should be given to the closure of additional access points near the intersection. These closures will help maintain safety as through-speeds will likely increase warranting increased sight distance for vehicles turning into and out of nearby access points. Likewise, queue lengths during the peak periods may block additional access points located near the intersection.

Funding Sources and Implementation Plan

For each project identified in the 20-year improvement needs map (see Figure 14), a specific project description, cost estimate, and responsible agency was identified. Projects primarily address projected capacity deficiency needs, system connectivity, and roadway expansion. A key factor in implementation of these projects is funding.

Funding strategies for implementation are primarily comprised of programs offered by the Federal, State, and Local agencies. Under each of these agencies, particularly Federal and State, there are a variety of funding opportunities that the area may qualify for to supplement local funding. Chapter 7 of the Final Report provides more detail on potential funding sources for the identified improvements for implementation.

Projects were scheduled based on the information generated by the Alexandria Area Travel Demand Model, the Project Team, the Steering Committee, public input, and from technical analysis. Identified in Table 7 and Table 8 were the transportation improvements. **Table 9** lists only the potential improvements in a prioritized list based on need and anticipated funding availability. More detail about each of the potential improvement projects, as well as the programmed and planned improvements, is available in Chapter 7 of the Final Report.[2]

[2] The programmed and planned improvements have a project cost of $20.4 million (2010$). Therefore the total estimated cost of all improvements is $65.4 million (2010$).

Table 9. Potential Priority List of Improvements

No.	Improvement	Estimated Cost (2010 $)
1.	**50th Avenue Extension** *(Potential Improvement 6)*	$2,100,000
2.	**TH 27 Connection to Neighborhood (Park Street/1st Avenue)** *(Potential Improvement 7)*	$200,000
3.	**CSAH 42: Upgrade from 3-Lane to 4-Lane Divided (TH 29 to Bethesda Street)** *(Potential Improvement 3)*	$1,600,000
4.	**Nokomis Street: Upgrade from 2-Lane to 3-Lane (18th Avenue to 6th Avenue)** *(Potential Improvement 1)*	$1,500,000
5.	**CSAH 46: Auxiliary Lane (CR 106 to CSAH 23)** *(Potential Improvement 5)*	$100,000
6.	**CSAH 42: Upgrade from 2-Lane to 3-Lane (CSAH 44 to Browns Point Road)** *(Potential Improvement 4)*	$1,200,000
7.	**CSAH 22: Upgrade from 2-Lane to 3-Lane (CSAH 82 to CSAH 44)** *(Potential Improvement 2)*	$800,000
8.	**TH 29: Upgrade from 2-Lane to 4-Lane Divided (CSAH 42 to CR 73)** *(Potential Improvement 11)*	$8,600,000
9.	**Interchange at I-94 and CR 106** **(***Potential Improvement 15)*	$10,200,000
10.	**CSAH 42: Upgrade from 3-Lane to 4-Lane Divided (Bethesda Street to CSAH 44)** *(Potential Improvement 12)*	$2,000,000
11.	**CSAH 42: Upgrade from 2-Lane to 3-Lane (Browns Point Road to CSAH 11)** *(Potential Improvement 13)*	$800,000
12.	**TH 29: Upgrade from 2-Lane to 4-Lane Divided (CSAH 28 to CSAH 4)** *(Potential Improvement 8)*	$7,200,000
13.	**CSAH 23: Upgrade from 2-Lane to 3-Lane (CSAH 46 to CR 81)** *(Potential Improvement 10)*	$1,200,000
14.	**TH 27: Upgrade from 2-Lane to 4-Lane Divided (CSAH 21 to Nevada Street)** *(Potential Improvement 9)*	$3,900,000
15.	**Nevada Street Overpass** *(Potential Improvement 14)*	$2,900,000
16.	**TH 29: Additional Southbound Lane (CSAH 42 to 3rd Avenue)** *(Potential Improvement 16)*	$700,000
	TOTAL (Potential Projects Only)	**$45,000,000**

NOTE: Cost estimates are for construction only.

SOURCES: WSB & Associates, Mn/DOT, Douglas County, City of Alexandria

Right-of-way Planning

Most of the potential projects require widening of the existing roadway, which would result in expanding the roadway cross-section within the existing right-of-way or the purchase of additional right-of-way. In anticipation of these identified roadway expansions, the responsible agencies should preserve existing right-of-way and/or take action to procure the additional right-of-way. Specific examples of this would be for Mn/DOT to protect the right-of-way necessary to accommodate the widening of TH 29. Advance planning for protecting and/or procuring the necessary right-of-way minimizes both the expense as well as inconvenience to affected or adjacent property owners.

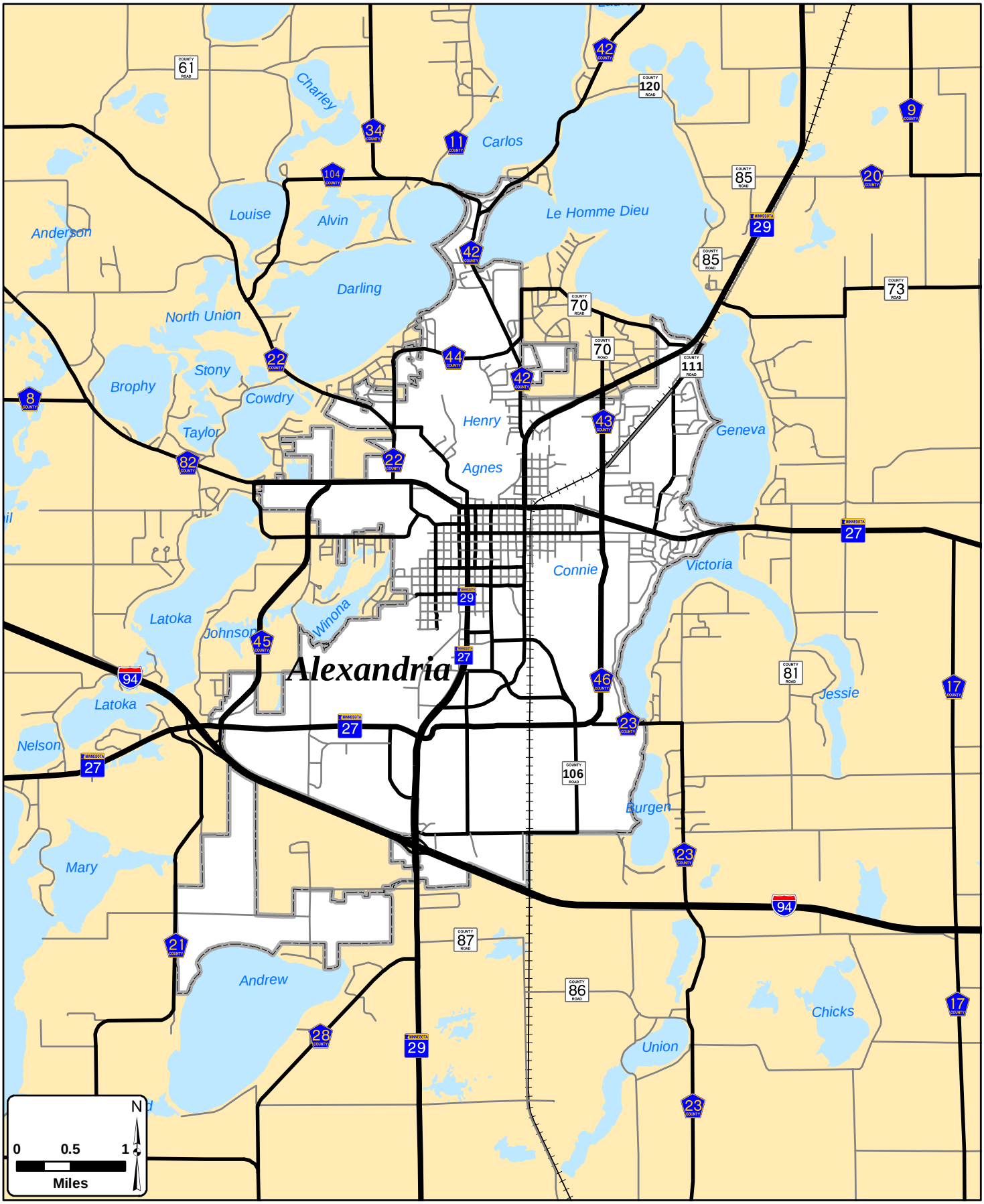
Chapter 1

Introduction

This Transportation Plan was prepared by WSB & Associates, Inc. for the governmental entities, which include the Minnesota Department of Transportation (Mn/DOT), Douglas County, and the City of Alexandria. The purpose of this plan is to identify, plan, and guide future year transportation decisions and improvements within the greater Alexandria Area.

The Transportation Plan reflects the vision and direction of local officials, relevant agencies, stakeholders, and the general public. From the beginning of the plan development, a proactive public involvement process was undertaken that assured opportunities for the public to be involved in all phases of the planning process. The public provides valuable information needed to develop, maintain, and carry out an effective transportation plan. The public involvement process also provides an opportunity to educate the public about transportation planning and creates an informed community, which in turn leads to better planning.

The geographical boundaries of the Alexandria Area Transportation Plan generally include the City of Alexandria and the adjacent area within 2 to 5 miles beyond the existing City limits. The study area encompasses approximately 110 square miles and is displayed in **Figure 1-1**.



Alexandria Area Transportation Study

Figure 1-1: Study Location Map

WSB & Associates, Inc.

1.1 Study Process

The Alexandria Area Transportation Plan is a continuing, comprehensive, and cooperative plan for the future transportation system. The plan provides a blueprint to build upon an ever-evolving process of goal setting, deficiency analysis, and solution identification. The future transportation system will evolve as the area's priorities and conditions change, demographics shift and new technologies develop. These changes will be reflected in future updates of the Plan.

1.1.1 Public Involvement

A proactive public involvement process was undertaken to assure opportunities for the public to be involved in all phases of the planning process. The public provides valuable information needed to develop, maintain, and carry out an effective transportation plan.

A number of activities were used to inform and gather support/comments throughout the study process. The public involvement activities included:

- **Stakeholder Interviews –** Twenty stakeholder interviews were conducted as part of the Plan development. Stakeholders are individuals or entities that could be significantly affected by the transportation plan recommendations or could significantly influence implementation. Stakeholders included the Alexandria Area Economic Development Commission, the Alexandria Public School District (209), emergency response providers, and major employers in the Alexandria area.

- **Public Open House #1 –** The first public open house was held in the fall of 2009 to inform the public regarding the findings of existing transportation system conditions and initial findings of the year 2030 conditions. The public was encouraged to comment on the findings and provide additional feedback concerning the Alexandria Area transportation system.

- **Public Open House #2 –** A second public open house was held in the summer of 2010 to inform the public regarding the findings of the travel pattern study and possible solutions to specific subarea issues. All of the property owners directly affected by the potential transportation improvements for each of the subarea studies received a mailed invitation to the open house to try to maximize their participation. The format for the meeting allowed for an informal setting in which specific questions by the public could be answered by the project team.

- **Public Open House #3 –** The third and final public open house was held in the fall of 2010 to present the study recommendations. The recommendations focused on future improvements, functional and jurisdictional roadway changes, access management, costs, and funding sources.

- **Alexandria Area Transportation Study Newsletter** – A project newsletter was created to provide continuing updates on the development of the 2030 Plan. Over the course of the project three newsletters were distributed to provide information regarding current planning activities, to provide information on upcoming events, and to encourage public feedback as part of the study process.

- **Website –** A website was set-up and advertised as part of the planning process to encourage citizens and businesses to complete an online survey as well as to contact the

project team with questions and comments concerning the study. The website address, which was active through the completion of the study, was: *www.dot.state.mn.us/d4/projects/alexstudy*.

The following is a summarized list of comments received during the study duration.

- **Stakeholder Comments**

  - TH 29/I-94 Interchange and 50th Avenue – too congested
  - Confusing and difficult access to "big box" retail areas off of TH 29 and 50th Avenue
  - Difficult access to/from the industrial park
  - Lane drop on TH 29 north of 3rd Avenue
  - Too many uncontrolled intersections
  - Need more right-turn lanes
  - Need to more clearly mark the bypass routes

- **Comments received at the Douglas County Fair**

  - TH 29/50th Avenue intersection needs improvement
  - More turn-lanes on TH 29
  - TH 29 needs 4 lanes from Alexandria to Glenwood
  - Interconnect/time signals through Alexandria
  - New traffic signal on TH 27/I-94 WB ramps/CR 45 is a mess – sign overload
  - Dual left turn lanes at 3rd Avenue/Broadway and 3rd Avenue/TH 29 are confusing
  - Many positive comments about Carlos Corners improvements (All-way Stop)
  - All-way stop needed at CR 14 / TH 29 intersection (Miltona)

- **Project Website Survey Comments**

  - **Most frustrating thing about driving in Alexandria?**
    - Poor pavement quality
    - Need more left-turns lanes
    - Accessing Alexandria from the southeast
    - Intersection at 6th Avenue and Nokomis Street
    - Intersection at 3rd Avenue and Nokomis Street
    - Delay at signalized intersections – need better signal timing
    - Too many All-way stop controlled intersections
    - Too many uncontrolled intersections
    - McKay Avenue does not operate as a true bypass

  - **Roads that should be widened?**
    - McKay Avenue may need to be widened with all the new development
    - Nokomis Street north of 3rd Avenue to accommodate the dual-lefts on TH 29
    - Jefferson Street near the high school – eliminate the on-street parking
    - TH 29 south of I-94
    - CSAH 82 - west of Alexandria

  - **Unsafe intersections?**
    - CSAH 11/34 (between the lakes)
    - CSAH 46/CSAH 23
    - 3rd Avenue / Nokomis Street
    - TH 29 / 50th Avenue
    - 50th Avenue / Twin Boulevard
    - McKay Avenue near Woodland Elementary

- **Other modes of transportation and airport concerns?**
    - The airport is landlocked – should look for new location
    - Airport is operating fine in its current location
    - More bicycle/walking paths – particularly to new school sites
    - Add a bike lane on Broadway
    - Pedestrian / bike crossing over TH 27/29 near Mall and the Target area
    - Rainbow Rider is providing a good service to the community

- **Most important transportation improvements?**
    - More traffic signals – less All-way stops
    - Another bypass further west (longer-term)
    - Another I-94 interchange east of TH 29 – CSAH 23, CSAH 17? (longer-term)
    - TH 29 north and south of Alexandria should be 4-lanes

1.2 Alexandria Area Transportation Plan Report Organization

Chapter 1 provided background on the Plan development process and information on the regional setting and transportation system. Chapter 2 outlines the vision statement, goals, and objectives for the Plan. Chapter 3 summarizes the existing transportation conditions, identifies transportation deficiencies within the study area, and assesses access spacing along the Trunk Highway 29 corridor. Chapter 4 identifies year 2030 conditions including population and employment projections. Chapter 5 analyzes year 2020 and 2030 conditions and identifies issues and potential transportation improvements. Chapter 6 contains analysis for each of the five geographic subareas, in which the review and analysis was more detailed than the larger Alexandria area. Chapter 7 contains cost estimates, funding information, and an implementation plan including a prioritized list of identified improvements.

Throughout the study, a series of technical memoranda were prepared containing information regarding various aspects of the planning process. The technical memoranda are included as part of the appendices (included on a CD attached to the end of the Report) and provide additional detail into the development of the Plan.

Chapter 2

Goals and Objectives

This chapter defines the vision statement, goals, and objectives used in the formulation of the Alexandria Area Transportation Plan. A primary component of this Plan is that the recommended improvements reflect the values of the area citizens, businesses, industries, and the traveling public. The goals and objectives provide a general guidance in the planning process and define the means by which transportation improvements are evaluated. The Alexandria Area Transportation Plan vision statement, goals, and objectives are identified in the following sections.

2.1 Vision Statement

The vision statement is a brief description of a desired future condition that is dependent on specific transportation policies and decisions. The vision statement defines the general direction of the transportation system if policies and strategies are implemented to address the goals and objectives. The vision statement frames the development of the study goals and objectives that in turn drive the identification and implementation of the recommended transportation strategies and improvements. The Alexandria Area Transportation Plan vision statement is stated below.

Vision Statement

To promote the development of a balanced, multi-modal transportation system that enhances mobility, economic vitality, and facilitates the safe and efficient movement of people and goods within the greater Alexandria area by analyzing the existing system, collecting data, and making system/budgetary recommendations.

2.2 Goals and Objectives

Goals and objectives are an important part of the Plan as they set forth a direction to follow for incorporating the community's vision. Goals and objectives are the result of public involvement and the translation of this involvement into specific guidelines and recommendations to the agencies that construct, operate, and maintain the transportation facilities.

Goals are very general. They pertain to area-wide or systemic issues. For example, "to improve the safety and efficiency of travel" can be a goal. The statement provides no further information on how the goal may be achieved. Further, often a specific goal will overlap with other goals and impacts on the system as a whole must be considered. Decision-makers by definition assign priority to the various goals when making implementation decisions.

Goals developed for the Alexandria Area Transportation Plan are a continuing and collaborative effort between the Project Team, Steering Committee, and the public. They reflect the current collective vision that defines the important transportation issues for the Alexandria area. The goals provide the framework for the Plan.

Objectives expand upon the goal by identifying types of actions that may alleviate the problem. For example, one measure of travel efficiency is travel time. An objective could be "to maintain or improve existing travel times on arterial corridors". There are generally several objectives associated with a particular goal. The Plan's goals and objectives are provided in **Table 2-1** through **Table 2-6**.

Table 2-1. Goal and Objectives – #1

Goal	Objectives
1. **Develop a safe, secure multi-modal transportation system that provides for the efficient movement of people and goods.**	• Preserve and maintain the existing transportation system to maximize the performance of transportation facilities. • Identify appropriate mitigation techniques to minimize the number and severity of accidents within the study area. • Identify future year transportation improvements that are fiscally constrained and support the creation of a comprehensive, multi-modal transportation system. • Select and program transportation projects that are consistent with community values and goals.

Table 2-2. Goal and Objectives – #2

Goal	Objectives
2. **Identify and support transportation improvements to ensure a high level of mobility and accessibility throughout the greater Alexandria area.**	• Provide sufficient roadway capacity to maintain an acceptable level of service throughout the study area. • Evaluate alternatives to minimize traffic delays associated with signalized intersections, stop-controlled intersections, and at-grade rail crossings. • Identify priority corridors where access management techniques can be implemented to improve traffic flow and produce positive safety benefits. • Maintain truck routes that provide direct connections to I-94 while minimizing negative impacts on residential areas.

Table 2-3. Goal and Objectives – #3

Goal	Objectives
3. Develop a transportation system that promotes the use of alternative modes of transportation including walking, transit, and the regional bicycle network.	• Support transportation improvements that enhance existing linkages and create new linkages between transportation modes. • Ensure a high level of transit service to persons with special needs and at-risk groups. • Promote a regional bicycle network that serves recreational and utilitarian trips by connecting major trip attractions such as Jefferson High School, Alexandria Technical College, library, parks, and other important trip destinations. • Identify and preserve right-of-way, including abandoned rail lines, for future bicycle and multi-use trails.

Table 2-4. Goal and Objectives – #4

Goal	Objectives
4. Support transportation enhancements and projects that promote existing and future economic development.	• Evaluate the economic impacts and benefits of potential transportation projects and support those projects that maintain or enhance the economic vitality of the region. • Ensure adequate accessibility to major highways and interstates to promote the efficient movement and transfer of goods within and beyond the study area. • Support transit improvements and programs that provide increased access to local and regional employment centers. • Support projects that encourage the planned growth of airport facilities and operations including projects that provide improved accessibility to the airport (Chandler Field or a future new facility)

Table 2-5. Goal and Objectives – #5

Goal	Objectives
5. Balance transportation improvements with potential impacts to the surrounding physical and social environment.	• Encourage a proactive planning process that recognizes the land use/transportation connection and provides for coordinated management with existing and planned transportation facilities and future land use plans. • Preserve adequate right-of-way for future transportation infrastructure to minimize the negative impacts on area residents and businesses, including potential displacement. • Mitigate the negative effects of traffic, such as cut-through traffic and excessive noise, on residential neighborhoods. • Apply appropriate, context sensitive solutions when planning and designing transportation improvements. • Maintain an open transportation planning process that encourages involvement and input from all communities, businesses, individuals, and stakeholders.

Table 2-6. Goal and Objectives – #6

Goal	Objectives
6. Promote cooperation and coordination among jurisdictions in maintaining and developing the transportation infrastructure.	• Identify opportunities for coordinating on transportation improvement projects to maximize federal funding opportunities. • Identify potential jurisdictional transfers, including the rationale for these potential transfers, as well as issues and policies associated with these transfers. • Maintain productive relationships among respective jurisdictional agencies for the improvement of the transportation system.

Chapter 3

Existing Transportation Conditions

This chapter summarizes the existing transportation conditions within the Alexandria Area. The analysis includes an evaluation of individual transportation modes, which include roadways, transit, pedestrian and bicycle facilities, and aviation/airport.

3.1 Roadways

The Alexandria Area consists of primarily a grid street pattern that is altered by the lakes in the region. Although not prevalent, there are some residential developments within the area, typically near the lakes, that use curvilinear street patterns to limit pass-through traffic and increase developable land.

The Alexandria Area is connected to the surrounding rural areas by a system of Federal, State, and County highways, including:

- Interstate (I) 94, located south of Alexandria, provides an east-west connection to the national interstate highway system. Traffic volumes on I-94 range from 17,000 to 19,000 vehicles per day with truck traffic accounting for 14 – 18 percent of the total.

- Trunk Highway (TH) 29, which has an interchange with I-94, runs north-south linking Alexandria with other regional trade centers. Within Alexandria, the shared alignment of TH 29 and TH 27 form the main commercial thoroughfare for the region. Traffic on the duplexed section of TH 27/29 ranges from 17,000 to 19,000 vehicles per day, while dropping to under 10,000 outside of Alexandria.

- TH 27, which also has an interchange with I-94 southwest of Alexandria, runs east-west through Douglas County and links Alexandria with other regional trade centers. Traffic on TH 27 (outside of the duplexed sections with TH 29) ranges from approximately 5,000 to 8,000 vehicles per day.

In general, the street and highway system in the Alexandria performs well. In recent years, congestion has been building on TH 29 north of I-94 as the Alexandria area continues to grow. This growth, coupled with the development of the TH 29 corridor as a retail and commercial center, has led to congested conditions on TH 29. This is experienced at its interchange with I-94, immediately to the north of the interchange. TH 29 runs through downtown Alexandria and carries a lot of through-traffic navigating its way to and from I-94. In recent years there has been discussion on whether a

new interchange is needed to serve the eastern area of Alexandria. Provided later in this report (Chapter 5), is an evaluation of alternative locations for a new interchange.

Provided in the remainder of this section of the report is information on key existing characteristics of the roadway system, including functional classification, jurisdictional classification, congestion, and safety.

3.1.1 Functional Classification

The various functional classifications define a roadway's general role in performing the two primary functions:

- Providing access to adjacent properties
- Providing travel mobility from one part of the region to another.

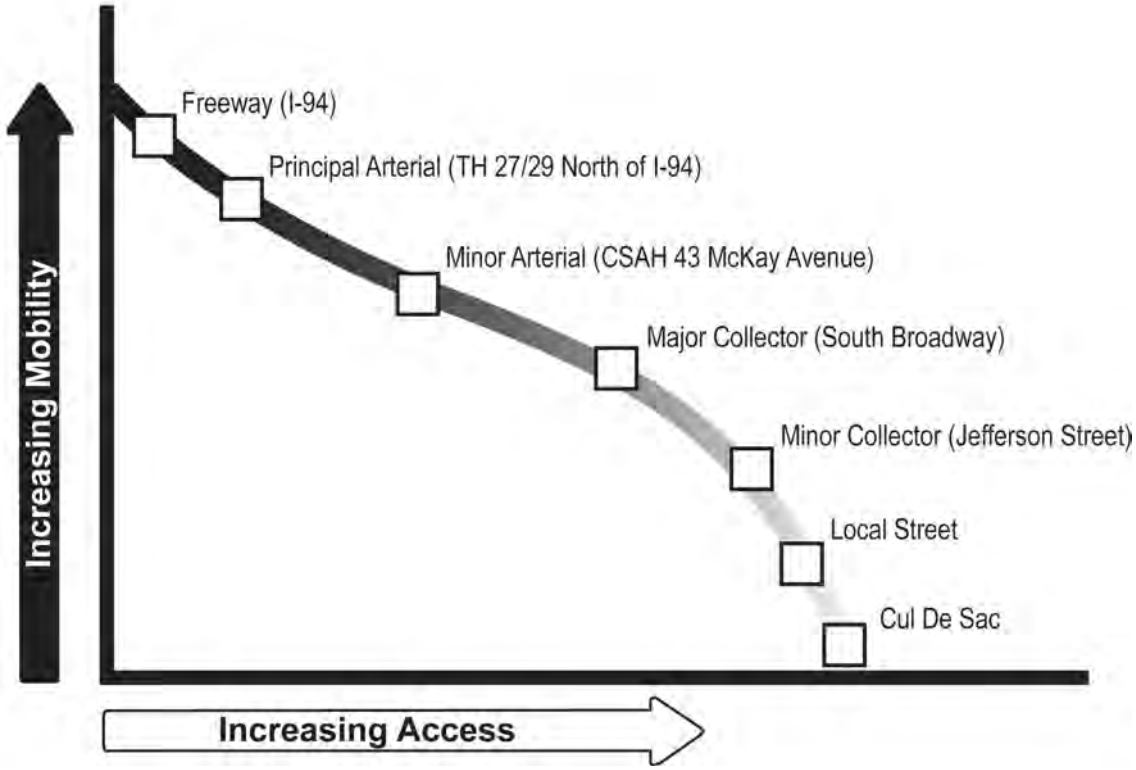
Each of the roadways within the Alexandria area, as well as all roads in the State of Minnesota, may be described by their function. The differentiation between functional classifications is based on through-traffic movement and access to adjacent land.

The functional classification system is broken down into four primary categories – principal arterials, minor arterials, major and minor collectors, and local roadways. Principal arterial roadways generally serve statewide and interstate travel. They connect large activity centers and attract relatively long trips. Minor arterial roadways connect cities and larger towns and are eligible to compete for federal funding. They are regionally important highways with an emphasis on mobility as opposed to access. Collector roadways mainly serve intra-county travel and connect local roadways to the arterial network. They provide connections between neighborhoods and from neighborhoods to minor business concentrations. Collector roadways are further classified into major and minor collectors based on the type of service they provide. Local roadways provide direct access to individual land-uses and connect them to collector roadways.

Individual roadways do not serve their purposes independently; rather, most trips involve travel through a network and system of roadways. Developing a working functional classification provides a method for channeling traffic in a logical and efficient manner. Roadways are classified by the function they serve and not by the amount of traffic they carry; however, higher traffic volumes are usually found on roadways of higher functional classification. The density of access points on local roads is intended to be higher in comparison to higher functional classes, which are intended to move large volumes of traffic and provide limited access to adjacent property. Roadways of a higher functional class, such as arterials (i.e., I-94, TH 29, etc.), are designed to maximize mobility and through-traffic flow, with each subsequent lower level of functional classification placing more emphasis on access rather than mobility.

Figure 3-1 displays the relative level of mobility and access performed by the various facility types in the study area. More specific definitions of each of the classifications, including roadway examples for each found within the Alexandria area, is provided following Figure 3-1.

Figure 3-1. Functional Emphasis on Mobility and Access by Facility Type



These categories are listed as follows:

Principal Arterials (e.g., I-94, TH-27/29 north of I-94)

- Connect major activity centers
- Have significant continuity at a state level
- Serve long, through-type trips
- Typically high-speed with limited access
- Serve very large travelsheds (regions)

Minor Arterials (e.g., TH-29 south of I-94, TH-27 east of Alexandria, CSAH 43 and CSAH 46 (McKay Avenue), CSAH 45 (West Bypass))

- Connect key activity centers
- Have significant continuity on county/multi-county area
- Serve longer to medium-length trips
- Typically high-speed with limits on access
- Serve large areas

Collectors

- Connect local activity centers and/or connect to higher-order routes
- Have continuity on local level
- Serve medium- to short-length trips
- Can serve a variety of uses and can therefore have a variety of speeds

- Places equal emphasis on access and mobility
- Route spacing allows service to smaller or localized areas

Major Collectors

Examples: CSAH 42 (North Nokomis) north of TH-29, CSAH 82 west of Alexandria, CR 90 (Lakota Drive), Nokomis Street (south of 3rd Avenue), South Broadway, and CSAH 28

Minor Collectors

Examples: Fairgrounds Road, Cedar Street, Jefferson Street, CR 123 (Pioneer Road), CSAH 23 (south of Hazel Hill Road), 50th Avenue, Dakota Street, and CSAH 21 (south of TH-27).

Local Roads (e.g., Ash Street, 9th Avenue, Henry Avenue, and Township Roads)

- Connect local neighborhoods, farms, small developments, and higher-order streets/routes
- Have a low degree of continuity
- Have closely spaced access
- Provide direct access (no access control) to property
- Serve limited travelsheds (very few through trips)

The functional classifications of the study area's roadways provide insight into the level of traffic they were designed for and expected to carry. **Table 3-1** displays the miles of roadway by functional classification. **Figure 3-2** displays the functional classification of the roadways within the Alexandria area.

Table 3-1. Miles of Roadway by Functional Classification

Functional Classification	Miles	Percentage of Total Miles
Interstate	10	3%
Other Principal Arterial	9	3%
Minor Arterial	22	6%
Major Collector	48	14%
Minor Collector	28	8%
Local Road or Street	230	66%
TOTAL	**347.0**	**100%**

SOURCE: WSB & Associates, Inc.

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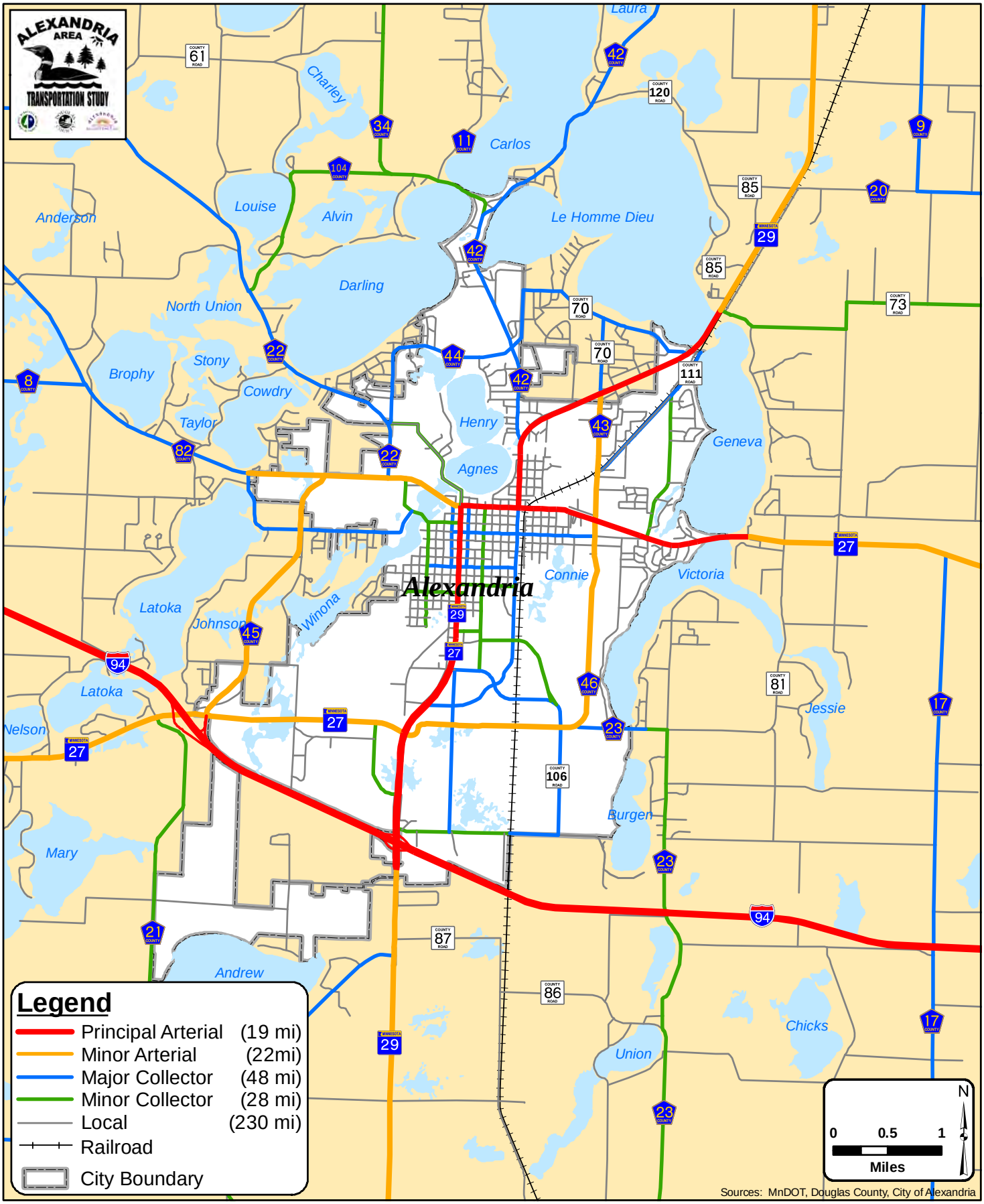

Alexandria Area Transportation Study

Figure 3-2: Existing (2010) Functional Classification

WSB & Associates, Inc.

3.1.2 Jurisdictional Classification

In addition to functional classification, a roadway is also classified according to the level of government that has jurisdiction over the road. Three levels of government have roadway jurisdiction in the Study Area: Mn/DOT, Douglas County, and the City of Alexandria. Mn/DOT owns/maintains the Interstate (I) and Trunk Highway (TH) systems. Douglas County owns/maintains the County State Aid Highway (CSAH) and County Road (CR) system. The City owns/maintains the local streets, including Municipal State Aid (MSA) streets. Cities in Minnesota receive federal funding through the state MSA program to improve and maintain MSA streets designated by each city. Typically these facilities are collector or arterial roadways. MSA design and maintenance requirements are established by Mn/DOT.

In general, the functional and jurisdictional classifications are directly related. Roadways of the highest functional classification are typically under the jurisdiction of the highest level of government (e.g., the state), and conversely, roadways of the lowest functional classification are owned and maintained by the lower level of government (i.e., the cities and townships).

Within the Study Area, 66 percent of the roadway miles are either under city or township jurisdiction. This is higher than Douglas County as a whole, due to the presence of the largest city within the county. In looking at the jurisdictional classification allocation at a county level, a comparison was made to a sampling of adjacent counties and counties with similar geographic characteristics. Douglas County has a slightly higher percentage of county roadways under their jurisdiction than Nobles, Otter Tail, and Pope Counties. However, Douglas County's jurisdictional allocation of roadways is comparable to the averages from these counties. **Figure 3-3** displays the jurisdictional classification of the roadways within the Alexandria area and **Table 3-2** displays the roadway mileage for each classification.

Table 3-2. Miles of Roadway by Jurisdictional Classification

Study Area			Allocation of Miles by Jurisdiction				
Jurisdiction Classification	Miles	Study Area	Douglas County	Nobles County	Otter Tail County	Pope County	*Average*
Federal / State	10.0	9%	10%	10%	10%	10%	10%
State of Minnesota	22.0						
County	85.0	25%	35%	28%	27%	30%	30%
City/Township	230.0	66%	55%	62%	63%	60%	60%
TOTAL	**347.0**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

SOURCE: WSB & Associates, Inc.

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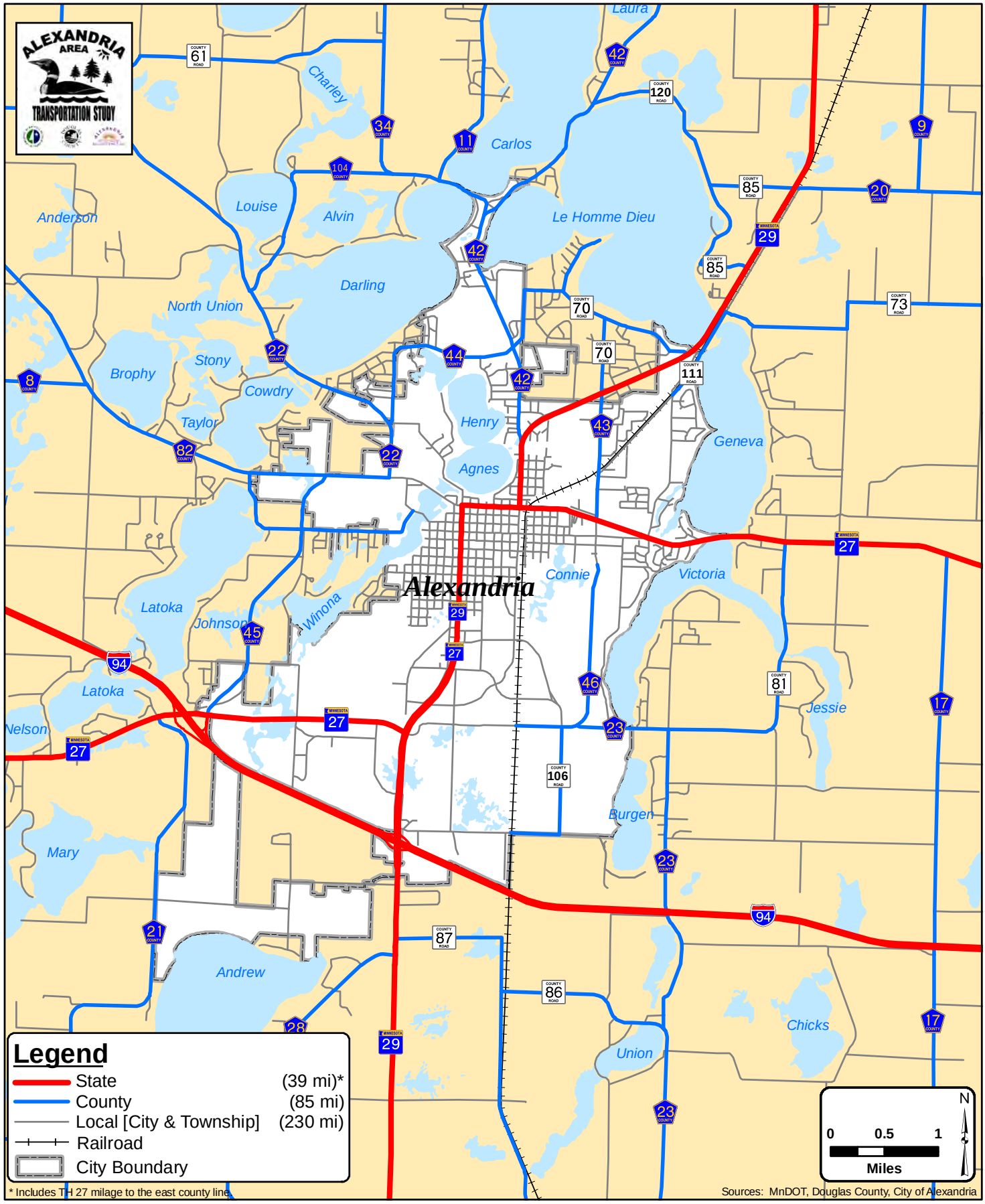

Alexandria Area Transportation Study

Figure 3-3: Existing (2010) Jurisdictional Classification

WSB & Associates, Inc.

3.1.3 Existing Traffic Counts

Average annual daily traffic (AADT) counts for the Alexandria area were obtained from Mn/DOT for the most recent year available, which was 2006. The highest observed traffic volumes were along the section of TH 27/29 through Alexandria (principal arterial at 18,700 vehicles per day (vpd)). In contrast, I-94 within the study area carries between 16,200 vpd (west of the TH 29 interchange) and 17,200 vpd (east of TH 29 interchange).

AADT volumes for the study area are displayed in **Figure 3-4**, while **Table 3-3** displays the ten highest traffic count segments in the area. The number of lanes on roadways is presented on **Figure 3-5**.

Table 3-3. Top Ten Highest Traffic Volume Locations

	Roadway	Approximate Location	Functional Classification	Number of Lanes	2006 Traffic (vpd)
1	TH 29	North of 34th Avenue	Primary Arterial	4	18,700
2	TH 29	North of 3rd Avenue	Primary Arterial	3	18,400
3	I-94	East of TH 29	Primary Arterial	4	17,200
4	TH 29	North of I-94	Primary Arterial	4	16,400
5	I-94	West of TH 29	Primary Arterial	4	16,200
6	3rd Avenue	East of Broadway	Primary Arterial	5	16,200
7	3rd Avenue	East of CSAH 22	Minor Arterial	3	14,900
8	CSAH 42	North of TH 29	Major Collector	3	12,000
9	CSAH 82	West of CSAH 22	Minor Arterial	3	10,600
10	Nokomis Street	South of 6th Avenue	Major Collector	2	10,200

SOURCE: Mn/DOT and WSB & Associates, Inc.

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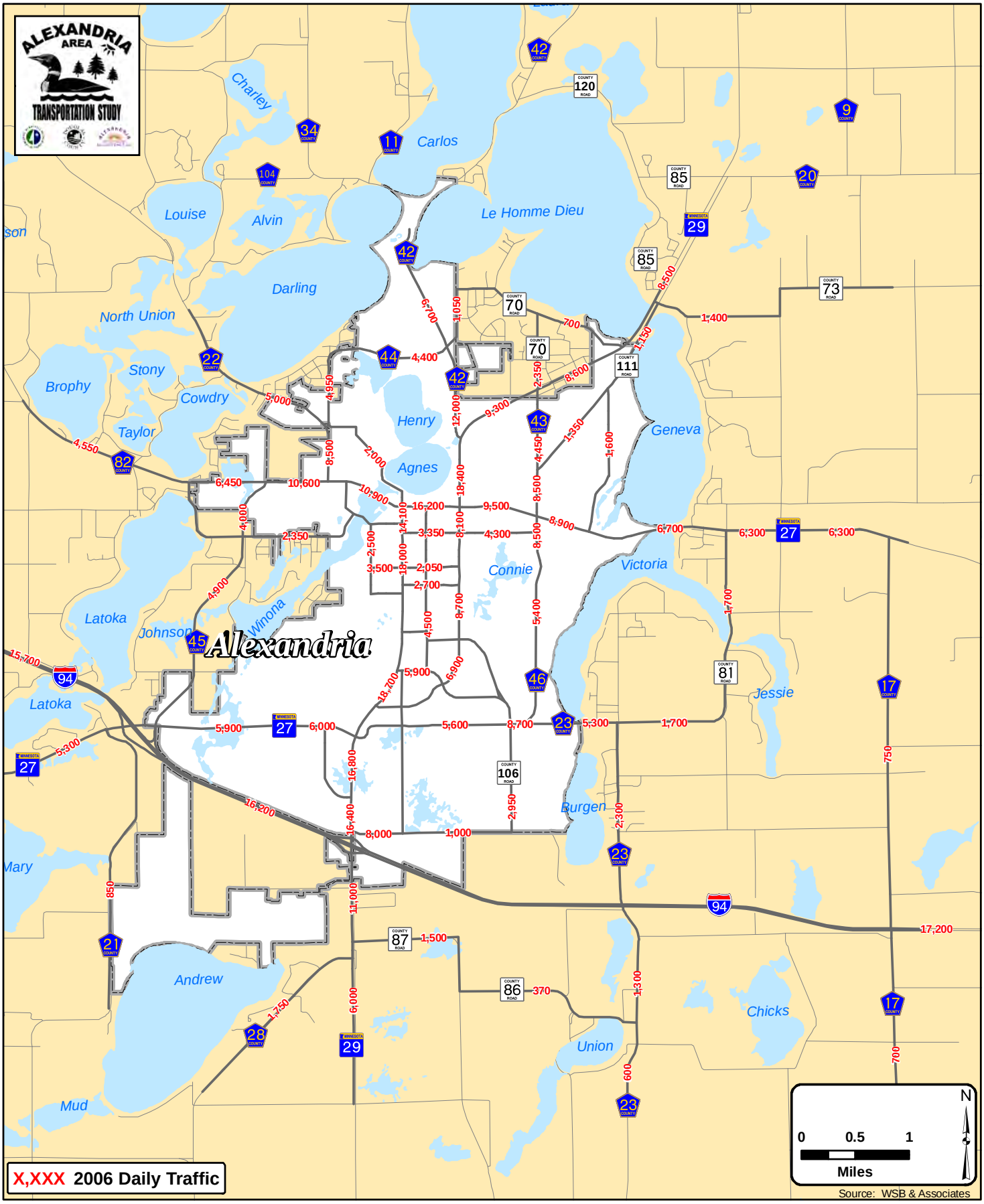

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Figure 3-4: Existing (2006) Average Daily Traffic

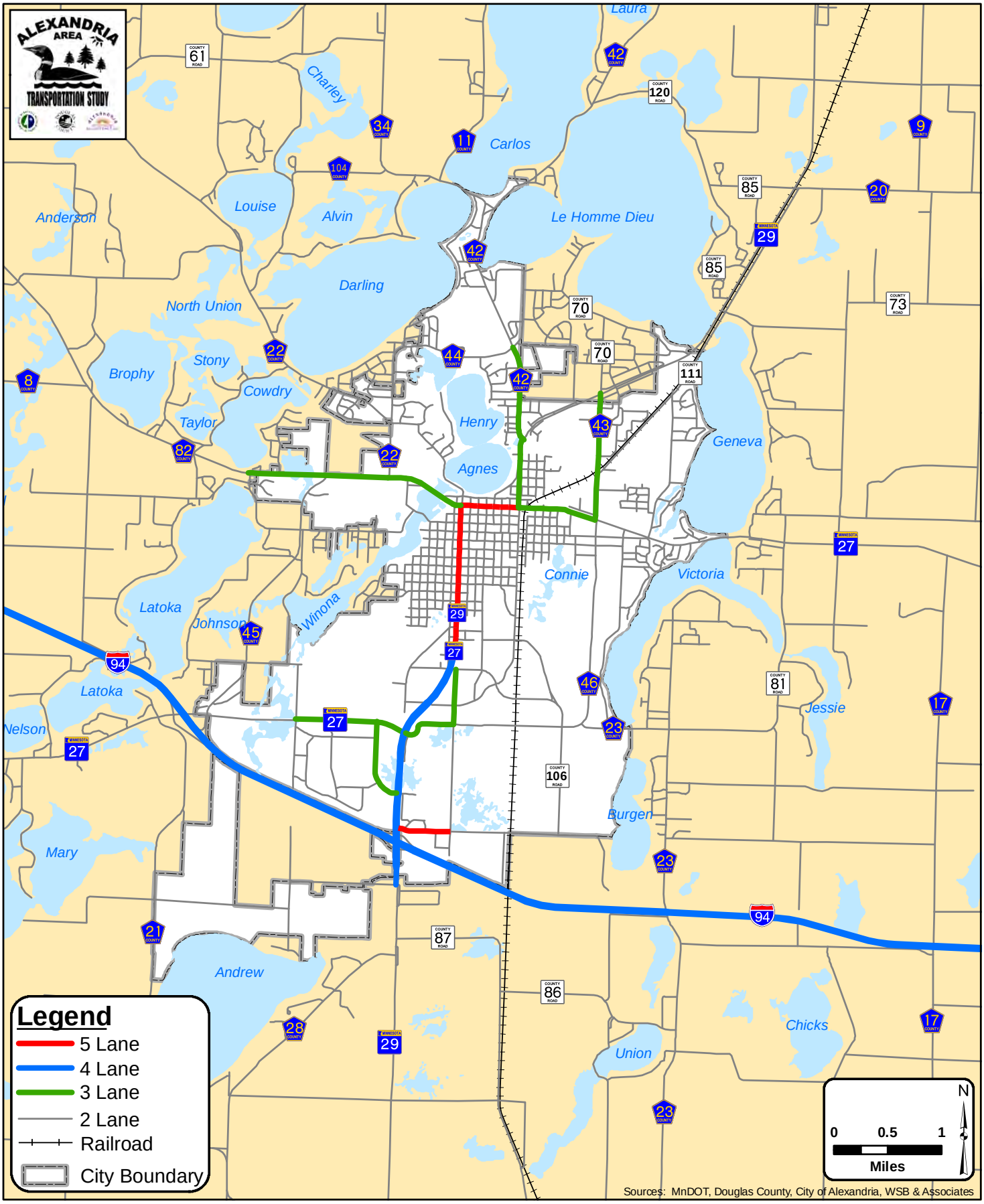

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Figure 3-5: Existing (2010) Roadway Lanes

3.1.4 Capacity Analysis

The roadway system has a finite vehicle - carrying capacity. The maximum number of vehicles that a roadway segment or intersection can accommodate is defined as Roadway Capacity. As traffic volumes increase and approach the capacity of a segment or intersection, travel delays increase. When traffic volumes are at the roadway's capacity threshold, delays are excessive and traffic flow breaks down. This is also referred to as a Capacity Deficiency.

Traffic Terminology
Roadway Capacity is the maximum number of vehicles a street segment / intersection can accommodate. As traffic volumes approach roadway capacity, travel delays increase.
Capacity Deficiency is the condition where traffic volumes reach a level that causes undesirable travel delays. In the Alexandria area, this is defined as a level of service D or worse.

The capacities used in this evaluation are presented in terms of daily traffic volumes, but have been developed to reflect the approximate daily traffic levels at which a roadway will experience peak period congestion. Thus, roadways that have daily traffic volumes that are approaching or exceeding the daily capacities, likely only experience relatively short periods of travel delays (often an hour or two) over the course of the day.

Roadway Segment Capacity Analysis

The approach to the capacity analysis is derived from the established methodologies documented in the Highway Capacity Manual (HCM), 2000. The HCM contains a series of analysis techniques that are used to evaluate the operation of transportation facilities under specified conditions.

The results of the traffic operations analysis are typically presented in the form of a letter grade (A-F) that provides a qualitative indication of the operational efficiency or effectiveness. The letter grade assigned to traffic operations analysis results is referred to as level of service (LOS). By definition, LOS A conditions represent high-quality operations (i.e., motorists experience very little delay or interference) and LOS F conditions represent very poor operations (i.e., extreme delay or severe congestion). Level of service refers to the quality of traffic operations in the transportation system along segments of roadway and through intersections. For this study, both the segment and intersection levels of service were evaluated.

Segment Level of Service

In general, the capacity of a roadway is a measure of its ability to accommodate a certain volume of moving vehicles. The segment level of service in this context refers to a quantitative comparison between the existing volume on a roadway and the maximum volume of traffic the roadway can be expected to accommodate in its present configuration. Based on the ratio between existing traffic volumes and roadway capacity, a level of service from A-F is assigned. For the Alexandria Area, the LOS C/D boundary is the desired threshold for traffic operations.

Table 3-4 contains a summary of generalized traffic thresholds for specific roadway types, levels of service, and number of traffic lanes. The volumes shown are the *maximum* daily traffic volumes for each level of service category.

Table 3-4. Planning Level Capacity Thresholds

Level of Service Threshold (upper capacity limits)						
Facility Type	**LOS A**	**LOS B**	**LOS C**	**LOS D**	**LOS E**	**LOS F**
Freeway (6-lane)	< 32,400	< 51,600	< 77,300	< 98,900	< 120,000	> 120,000
Freeway (4-lane)	< 15,800	< 33,600	< 50,400	< 64,400	< 78,100	> 78,100
Divided Arterial (6-lane)	< 18,000	< 28,800	< 46,100	< 51,600	< 57,500	> 57,500
Divided Arterial (4-lane)	< 11,900	< 19,100	< 30,500	< 34,400	< 38,100	> 38,100
Primary/Principal Arterial (5-lane)	< 11,400	< 18,200	< 29,100	< 32,600	< 36,300	> 36,300
Primary/Principal Arterial (4-lane)	< 7,600	< 12,100	< 19,400	< 23,300	< 27,600	> 27,600
Primary/Principal Arterial (3-lane)	< 4,900	< 7,900	< 12,700	< 17,000	< 21,100	> 21,100
Primary/Principal Arterial (2-lane)	< 3,100	< 5,000	< 8,000	< 12,000	< 15,900	> 15,900
Secondary/Minor Arterial (5-lane)	< 10,400	< 16,600	< 26,500	< 30,000	< 33,100	> 33,100
Secondary/Minor Arterial (4-lane)	< 6,600	< 10,600	< 17,000	< 20,500	< 24,200	> 24,200
Secondary/Minor Arterial (3-lane)	< 4,300	< 6,900	< 11,100	< 14,800	< 18,500	> 18,500
Secondary/Minor Arterial (2-lane)	< 2,700	< 4,300	< 6,900	< 10,300	< 13,700	> 13,700
Collector (4-lane)	< 6,100	< 9,800	< 15,700	< 19,100	< 22,500	> 22,500
Collector (3-lane)	< 3,700	< 5,900	< 9,400	< 12,500	< 15,700	> 15,700
Collector (2-lane)	< 2,200	< 3,600	< 5,800	< 8,800	< 11,700	> 11,700
Ramp (1-lane)	< 3,400	< 5,400	< 8,600	< 9,400	< 10,600	> 10,600
Ramp (2-lane)	< 6,300	< 10,100	< 16,100	< 17,700	< 19,900	> 19,900

This table presents LOS threshold values developed to denote operational characteristics of a roadway and their perception by motorists and passengers. The values shown in this table (based on K100 factors, not peak-to-daily ratios) for levels of service and are based on the 2000 Highway Capacity Manual.

SOURCE: Mn/DOT and WSB & Associates

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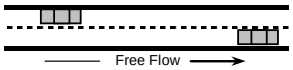
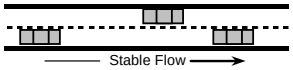
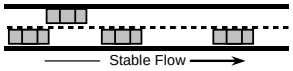
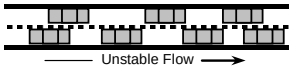
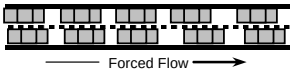
Figure 3-6 displays the capacity categories and a general description of the traffic operations. The category "Approaching Capacity" corresponds to LOS C for the Alexandria Area Transportation Plan.

Figure 3-6. Roadway Capacity Levels

Capacity	Traffic Flow	Description
Under		**FREE FLOW** Low volumes and no delays.
		**STABLE FLOW** Low volumes and speeds dictated by travel conditions.
		**STABLE FLOW** Speeds and maneuverability closely controlled due to higher volumes.
Approaching		**RESTRICTED FLOW** Higher density traffic restricts maneuverability and volumes approaching capacity.
At		**UNSTABLE FLOW** Low speeds, considerable delays, and volumes at or slightly over capacity.
Over		**FORCED FLOW** Very low speeds, volumes exceed capacity, and long delays with stop-and-go traffic.

SOURCE: Highway Capacity Manual and WSB & Associates, Inc.

K:\01874-00\Graphics\[Tables.xls]Capacity Graphic

The capacity analysis of the roadways in the Alexandria Area shows that approximately 9.2 miles of roadways were approaching-capacity, at-capacity, or over-capacity (see **Table 3-5**). Of this total, 8.4 miles (91.3%) were identified as approaching-capacity and may not require immediate attention. Instead, roadway segments identified as approaching-capacity should be closely monitored to ensure that these facilities do not worsen and become classified as at-capacity or over-capacity. In total, less than one percent of the roadways were identified as either at-capacity or over-capacity. **Figure 3-7** displays the results of the capacity analysis completed for the existing conditions within the Alexandria Area.

Table 3-5. Capacity Levels within the Alexandria Area (2006)

	Capacity Level			
	Approaching Capacity	At Capacity	Over Capacity	Total
Miles	9.2	0.8	-	10.0
Percentage	92.0%	8.0%		100%
Percentage of Total Modeled Roadway Miles[1]	4.8%	0.4%	0.0%	5.3%

1) Modeled roadways generally include those classified as Collectors and higher.

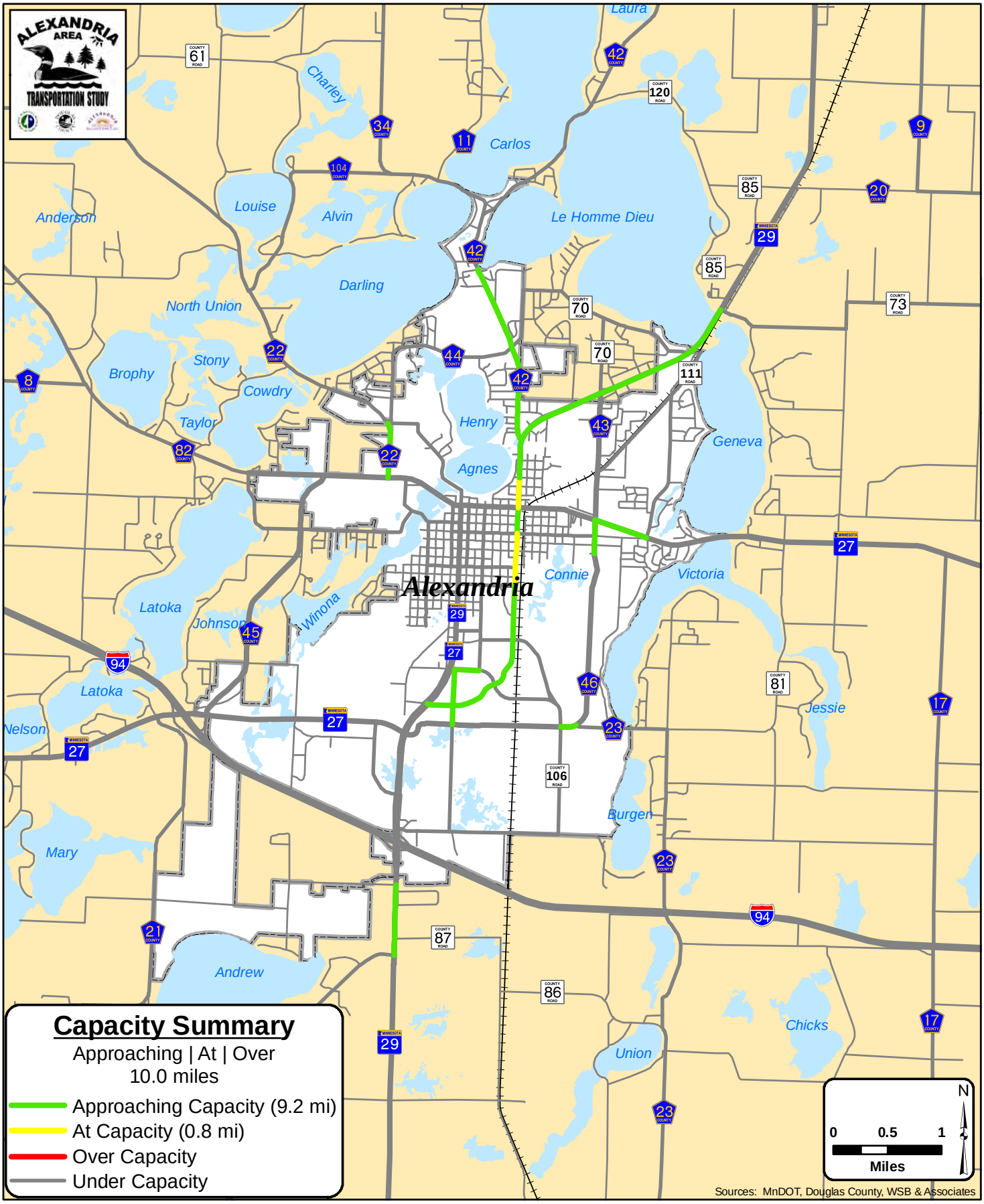
SOURCE: WSB & Associates, Inc.

K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Congestion Summary Table

Intersection Capacity Analysis

Intersection LOS typically focuses on operations during the periods of the day with the highest traffic volumes whereas the segment level of service is based on traffic volumes over an average 24-hour period. Thus, the intersection LOS analysis gives a "worst-case" result for each intersection and more clearly identifies operational problems at the intersections. **Figure 3-8** presents the intersection LOS boundaries, in terms of seconds of vehicle delay, as defined in the 2000 *Highway Capacity Manual*.

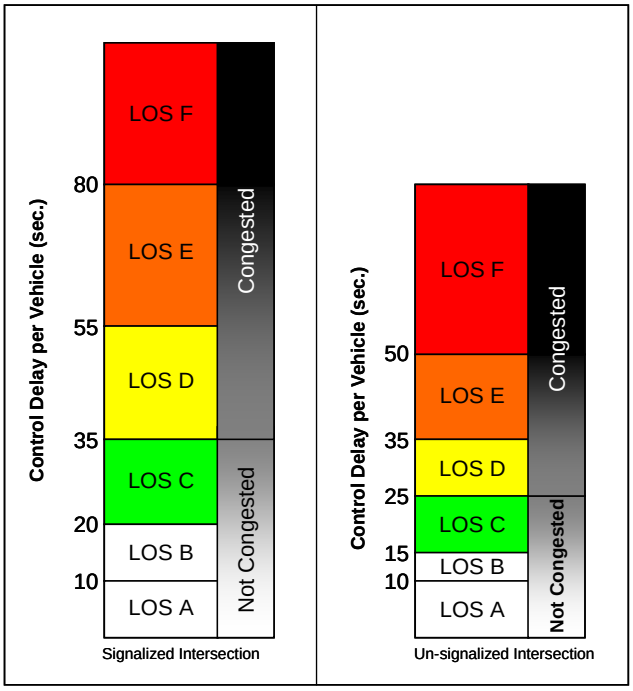
The intersection operational analysis process includes determining the level of service for each of the key intersections under the existing peak traffic conditions. In accordance with the Alexandria Area Transportation Plan, the LOS C/D boundary is the indicator of acceptable traffic operations and congestion. LOS C indicates that the intersection is operating at the minimum acceptable standard during peak hours and it should be monitored to ensure that acceptable operations are maintained.



Alexandria Area Transportation Study

Figure 3-7: 2006 Roadway Congestion Levels

Figure 3-8. Intersection Level of Service Boundaries



SOURCE: Level of Service thresholds from the Highway Capacity Manual, 2000.
Congestion thresholds are consistent with the Alexandria Area.
K:\Traffic\Level of Service (LOS)\LOS Delay Graphic.ppt

In observing various intersections throughout the Alexandria Area, we have identified many intersections that experience unacceptable delay during the peak hours of travel. Some of these intersections include:

- 50th Avenue and TH 29
- CSAH 23 and CSAH 46
- 3rd Avenue and Nokomis Street, and
- Nokomis Street and 6th Avenue

3.1.5 Truck Traffic

The primary roadway used for truck traffic in the area is I-94. In Minnesota, the section of I-94 between St. Cloud and Moorhead is one of the busiest freight routes, averaging between 20 and 40 millions of tonnage per year.[1] This route links Alexandria to St. Cloud, the Twin Cities, and other markets to the east and west; it provides a link to the Fargo-Moorhead area as well as the western United States. On the State system, the section of TH 27/29 between 22nd Avenue and 10th Avenue averages nearly 700 trucks per day. Within downtown, TH 27/29 (3rd Avenue) averages nearly 450 truck movements per day.

In addition to the federal- and state-designated routes, local system roadways play an important role in freight movement. City and county routes that receive state aid funding generally connect freight generating/receiving facilities to the state and federal systems. These roadways are often referred to

[1] Minnesota Statewide Freight Plan, 2005. Mn/DOT

as the “last mile” of the system. Mn/DOT is assisting county efforts in developing a 10-ton network of roads that are capable of withstanding heavy trucks.

On the County system, the majority of roadways are rated as 10-ton routes and are thereby able to accommodate most travel trailers. Two county roadways that receive a lot of truck traffic include CSAH 45 (West Bypass), which was constructed in the mid 1990’s primarily to relieve congestion and truck traffic on TH 27/29, and CSAH 46 (Southeast Bypass), also constructed in the late 1990’s to provide a travel option for vehicles and truck traffic with originations or destinations east of downtown Alexandria. These along with other preferred truck routes are shown on **Figure 3-9**. Mn/DOT is working with the City and County to establish appropriate signage to better identify these routes for trucking.

In addition to trucks, recreational trailers (travel trailer campers, boat trailers, etc.) can cause increased congestion in downtown. Overall, traffic in downtown areas is a concern given the large size of the vehicles and the negative impacts such as interrupting traffic flow, excessive fumes, and noise. These concerns can lead to significant travel delays and can have negative impacts on pedestrian and bicycle travel in the downtown area. Because of these impacts, it is important in analyzing any potential transportation improvement that the impact of truck traffic be considered against other transportation modes. The year 2006 daily truck volumes and percentage of total daily traffic are shown in **Table 3-6**. The values shown in **Table 3-6** are daily truck volumes averaged over the calendar year.

Table 3-6. Ten Highest Truck Traffic Roadways

	Location	From	To	AADT	Heavy Commercial Vehicles [1]	
					Volume	%
1	I-94	TH 29	CSAH 3 (Osakis)	17,800	**2,850**	16.0%
2	I-94	TH 27	TH 29	18,800	**2,750**	14.6%
3	I-94	TH 114	TH 27	15,500	**2,800**	18.1%
4	TH-27/29	22nd Avenue	10th Avenue	19,000	**670**	3.5%
5	TH 27	Nokomis Avenue	CSAH 43 (McKay Ave)	9,900	**520**	5.3%
6	TH 27	CSAH 42	CSAH 43/70 (McKay Ave)	15,900	**495**	3.1%
7	TH 27	CR 4	CSAH 28	6,200	**490**	7.9%
8	TH 29	Dakota Street	34th Avenue	16,800	**455**	2.7%
9	TH 27/29 (3rd Avenue)	Broadway	Nokomis	16,500	**445**	2.7%
10	TH-27/29	I-94	Dakota Street	16,400	**435**	2.7%

SOURCE:Mn/DOT

NOTES:

1. Heavy Commercial Vehicles represents total truck traffic and includes Multi-unit trucks and Single-unit trucks.
2. Percentages shown represent the percentage of AADT for each location.

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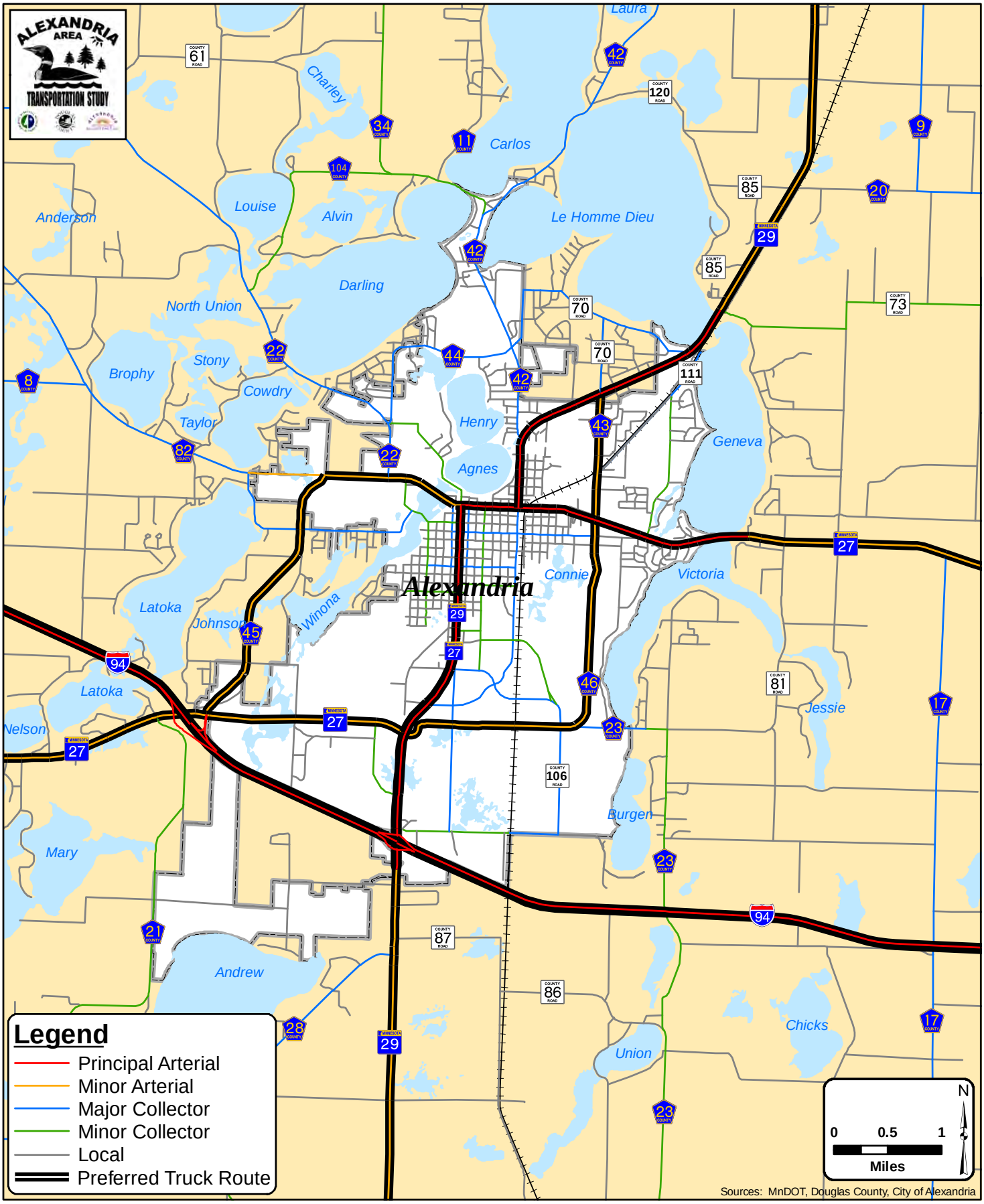
3.1.6 Recreational Traffic

I-94 is a gateway to many of the resort communities in west-central Minnesota. TH 29 serves these resort communities north and south of Alexandria and attracts thousands of additional travelers during peak recreational periods. Recreational peak periods occur particularly on Fridays and Sundays during the summer months and can result in traffic volumes nearly doubling, resulting in noticeable congestion.



Alexandria Area Transportation Study

Figure 3-9: Preferred Truck Routes

WSB & Associates, Inc.

The primary reason for this congestion is the significant difference in the directional distribution as compared to the typical weekday directional distribution. A typical weekday peak directional distribution split of 60/40 can increase to a split of 75/25 (75 percent traveling in the peak direction) during the recreational peak periods. The 75/25 directional distribution creates an overload of traffic traveling in one direction, ultimately resulting in traffic congestion. Although not always to this degree, the directional characteristics and concentrated peak of traffic would be typical for a Friday and a Sunday along the TH 29 Corridor during the peak recreational season.

Considering that the recreational peak period occurs primarily on weekends and during summer months, extensive upgrades, just to serve the recreational peak, are often not very cost-effective since this facility would operate well below capacity for the majority of the year.

3.2 Existing Travel Patterns

One of the most important criteria to the success of any transportation network is to understand the users of the network. Understanding the user's needs and travel patterns are essential to planning and implementing successful measures to improve mobility. One way to obtain travel patterns is by conducting a travel pattern survey to determine origins and destinations of trips. For the Alexandria Area Transportation Plan, a travel origin-destination survey was used to determine the proportion and number of trips through the area.

3.2.1 Travel Pattern Survey Purpose

The purpose of the travel pattern survey was to determine travel patterns on key roadways serving the Alexandria area; specifically, the amount of through and local trips made on these roadways. A through trip is defined as a longer distance trip that begins outside of the urban area and passes through it on their way to a destination outside of the urban area. In many cases they are recreational or personal business trips or trucks engaged in the intercity movement of goods. Local trips are those trips that either start or end within the urban area.

This information obtained from the travel pattern survey is useful in the validation of the origin-destination distribution used in the travel demand model for the Alexandria Area Transportation Plan. Information derived from this study is used to forecast future traffic volumes to assist in the development of potential transportation improvements to address identified needs.

3.2.2 Travel Pattern Survey Methodology

An origin-destination travel survey was conducted in the afternoon on April 1, 2010 with approximately 20 field staff recording the first five characters of the license plate passing each of the eight survey locations. During this time, nearly 4,000 license plates were recorded. The license plate data for each of the survey sites was entered into a spreadsheet for analysis to identify the level of trip interaction between each of the locations.

Locations 1 through 7 are external survey points while Location 8 is considered an internal survey location. These locations are defined below and displayed on **Figure 3-10**.

- External Location 1: TH 29, north of I-94
- External Location 2: TH 27, east of CSAH 45
- External Location 3: CSAH 82, east of CSAH 22

- External Location 4: CSAH 42, south of CR 70
- External Location 5: TH 29, north of McKay Avenue
- External Location 6: TH 27, east of McKay Avenue
- External Location 7: 34th Avenue, east of Broadway
- Internal Location 8: Broadway, between 4th and 5th Avenues (Downtown)

3.2.3 Travel Pattern Survey Results

The travel survey results showed Alexandria as a key destination in the greater region. Given Alexandria's strength and a regional employment center, it was revealed that the vast majority of trips entering into the area are "local" rather than through-trips, or in other words, the destination is within Alexandria. An example of a through trip would be a vehicle recorded at Location 1 (TH 29 just north of I-94) and again at Location 5 on the other side of Alexandria (TH 29, north of McKay Avenue). A specific example of this through trip might be someone exiting I-94 at TH 29 and traveling to a destination in Carlos. An example of a local trip would be a vehicle recorded at Location 5, but not at any of the other external locations. A specific example of such a trip might be someone that exits I-94 at TH 29 and ends their trip at the Alexandria Technical College.

Figure 3-11 and **Figure 3-12** show the percentage of vehicles interacting between the survey location and the other external locations. The percentage is based on the number of vehicles recorded at the specific survey location being evaluated. For example, five percent of the vehicles recorded at Location 1 were also recorded at Location 4. The sum of the trips from Location 1 to the six other external locations is 23 percent. Therefore, 23 percent of the trips recorded at Location 1 are "through" trips, and the 77 percent are "local" trips.

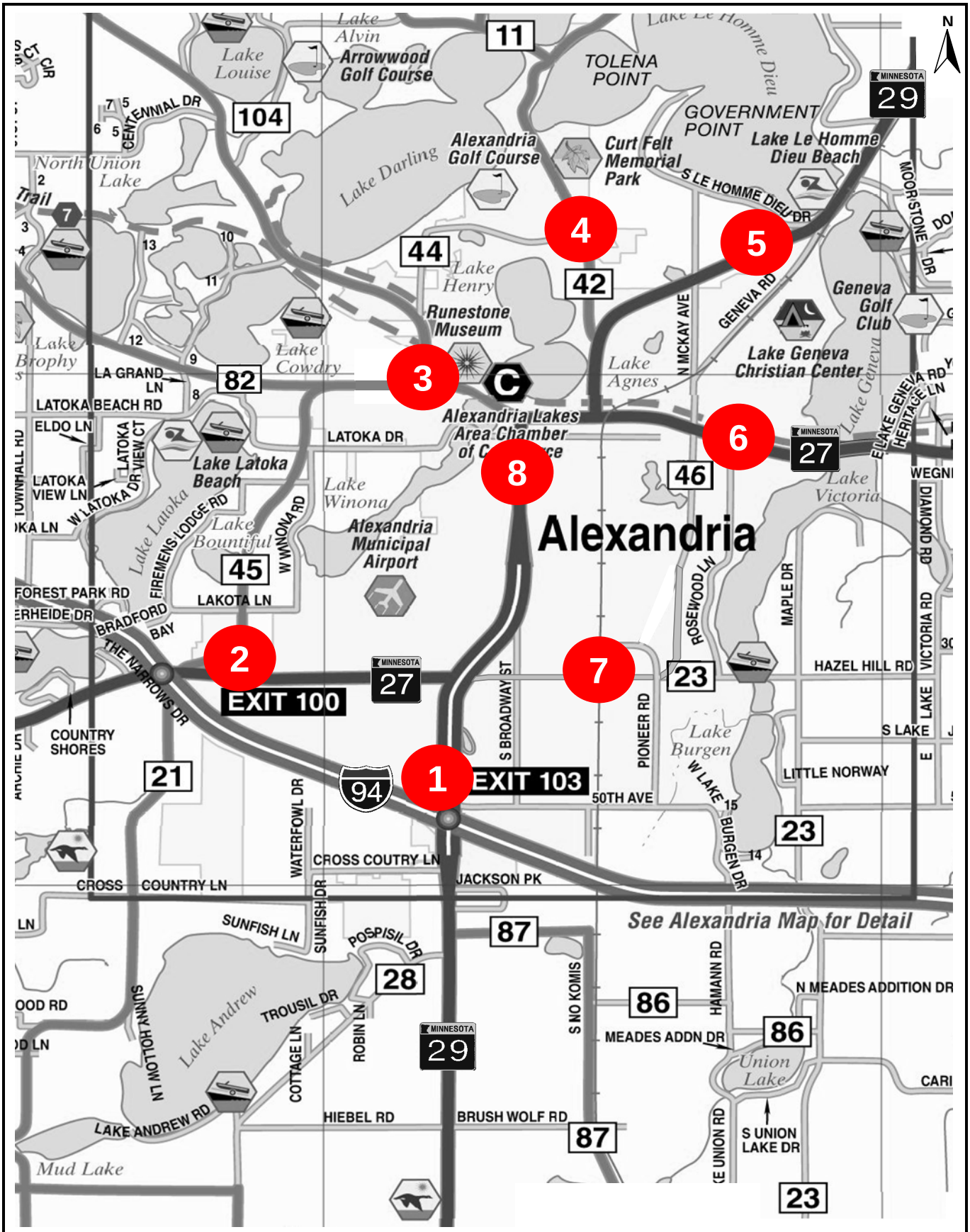


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Figure 3-10: Vehicle Recording Locations

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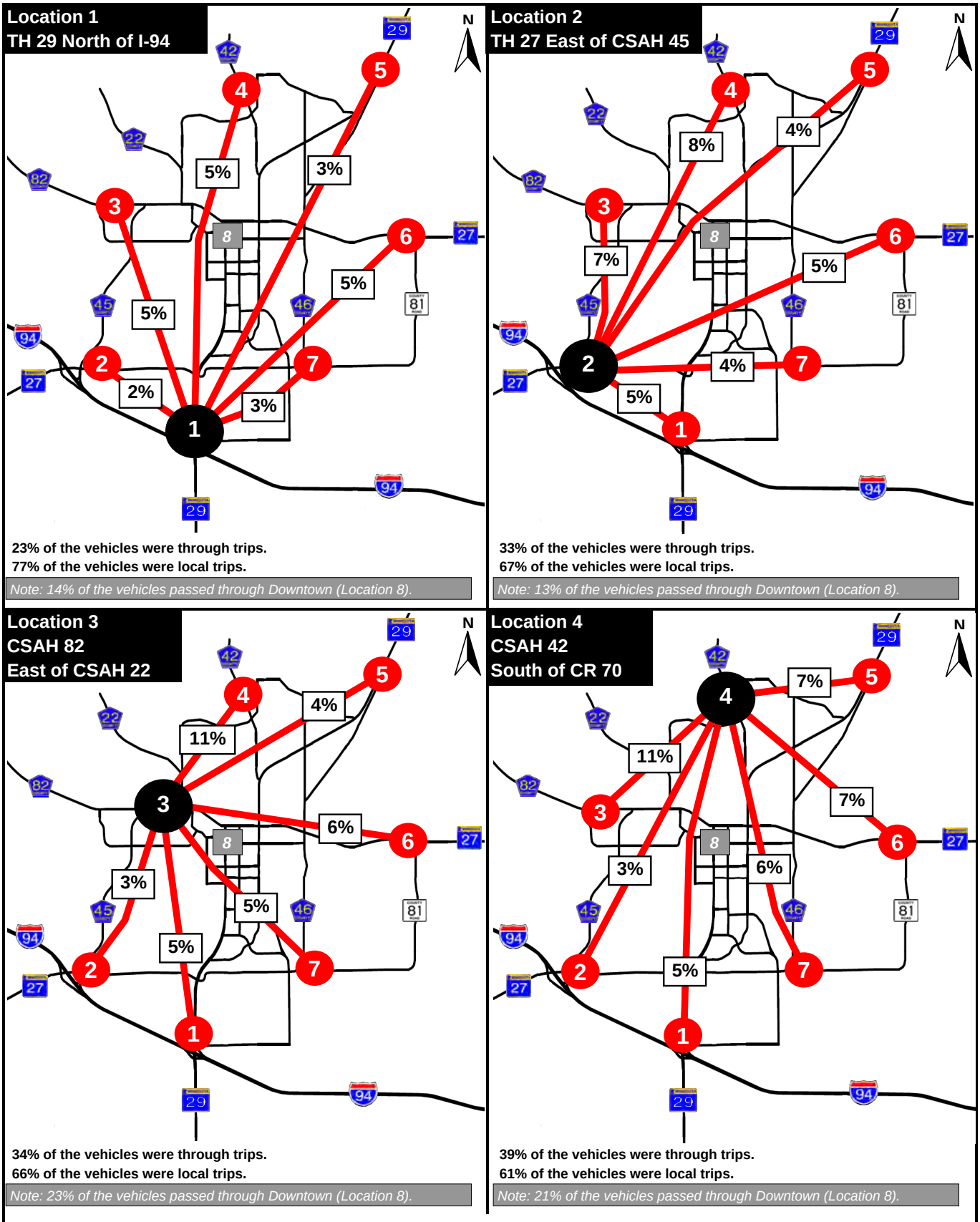

Data represents travel patterns observed on a weekday (April 1, 2010).

Alexandria Area Transportation Study

Figure 3-11: Existing Travel Patterns (Locations 1 through 4)

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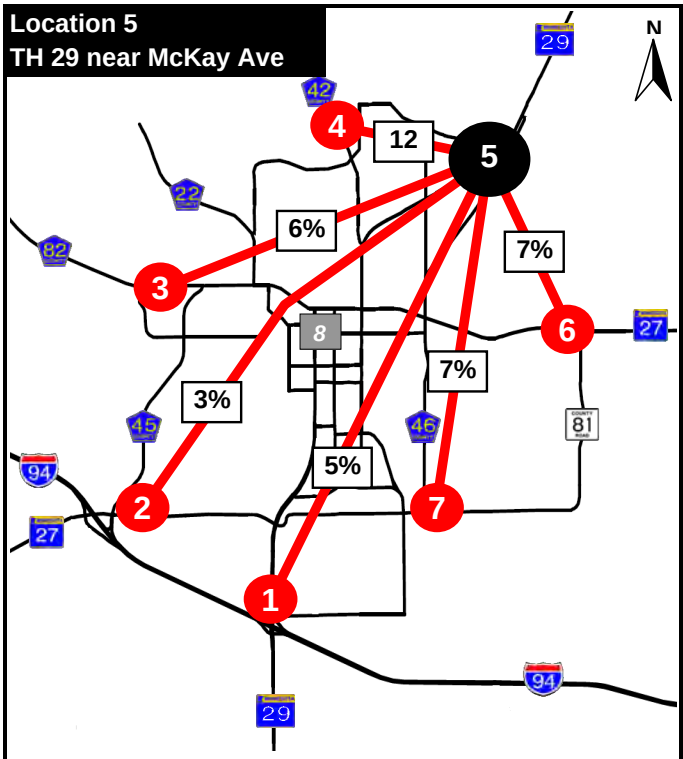
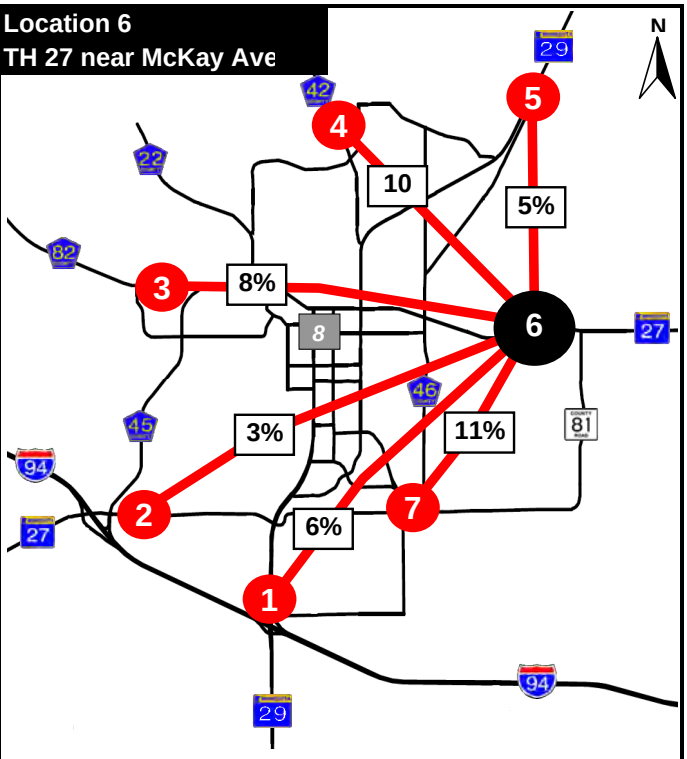
Location 5
TH 29 near McKay Ave



40% of the vehicles were through trips.
60% of the vehicles were local trips.

Note: 20% of the vehicles passed through Downtown (Location 8).

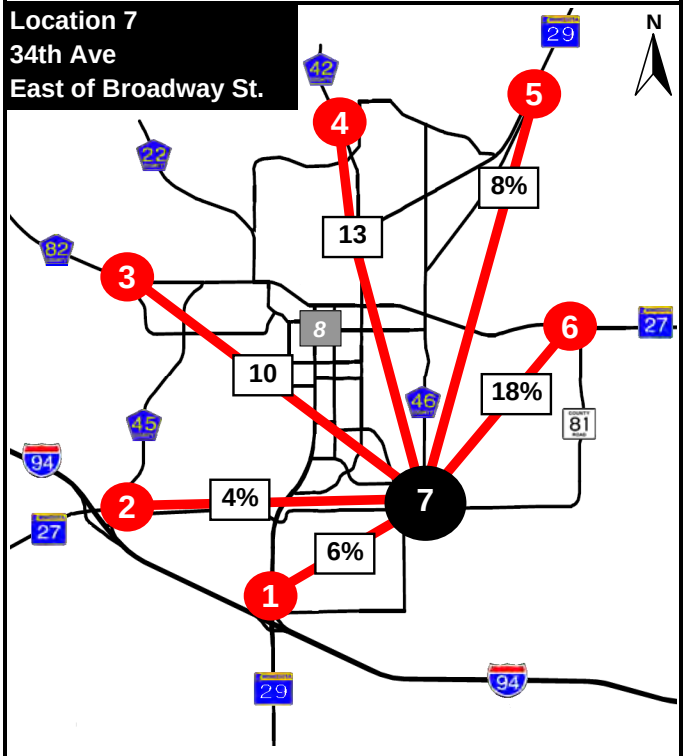
Location 6
TH 27 near McKay Ave



43% of the vehicles were through trips.
57% of the vehicles were local trips.

Note: 18% of the vehicles passed through Downtown (Location 8).

Location 7
34th Ave
East of Broadway St.



59% of the vehicles were through trips.
41% of the vehicles were local trips.

Note: 14% of the vehicles passed through Downtown (Location 8).

Data represents travel patterns observed on a weekday (April 1, 2010).

Alexandria Area Transportation Study

Figure 3-12: Existing Travel Patterns (Locations 5 through 7)

WSB & Associates, Inc.

3.3 Safety Analysis

High accident locations were identified for roadway segments and spot locations within the Alexandria Area. The crash data used to identify locations of interest for this study was obtained from Mn/DOT and represents a three-year period of (2005 to 2007). The following summarizes the findings of the safety analyses for the Alexandria area.

3.3.1 Segment Analysis

Roadway segments were analyzed between 2005 and 2007. **Figure 3-13** displays segment crash data between 2005 and 2007 to identify corridor segments with a high occurrence of accidents/crashes. **Table 3-7** displays the segment crash locations ranked in order of total number of crashes.

Table 3-7. Segment Crash Data (2005 – 2007)

	Roadway	Approximate Location From	To	Crash Rate[1]
1	3rd Avenue	Broadway	Nokomis Street	**5.4**
2	TH 29	CSAH 46	3rd Avenue	**3.4 - 5.4**
3	CSAH 43 (McKay)	TH 27	TH 29	**2.3**
4	TH 29	I-94	34th Avenue	**3.4**
5	3rd Avenue	Broadway	CSAH 22	**2.2**
6	CSAH 46	TH 29	TH 27	**2.3**
7	CSAH 42	TH 29	CSAH 34	**2.2**
8	TH 27	CSAH 45	TH 29	**2.3**
9	Nokomis Street	3rd Avenue	CSAH 42	**2.2**
10	TH 27	Nokomis Street	CR 81	**2.3**

[1] Crash Rate per Million Vehicle Miles Traveled

SOURCE: Mn/DOT District 4

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3.3.2 Intersection / Spot Location Analysis

Intersections were analyzed using 2005 to 2007 data from Mn/DOT. **Table 3-8** displays the intersection / spot crash locations ranked in order of total number of crashes. **Figure 3-14** displays the location of spot crashes within the Alexandria Area.

Table 3-8. Spot Crash Data (2005 – 2007)

	Primary Roadway	Intersecting Roadway	Traffic Control	Crashes (2005 - 2007) Number
1	TH 29	50th Avenue	Signal	**34**
2	TH 29	30th Avenue	Signal	**34**
3	TH 29	15th Avenue	Signal	**33**
4	TH 29	10th Avenue	Signal	**30**
5	TH 29	6th Avenue	Signal	**30**
6	TH 29	22nd Avenue	Signal	**25**
7	3rd Avenue	Broadway	Signal	**22**
8	TH 29	CSAH 46	Signal	**20**
9	TH 27	CSAH 43	Signal	**19**
10	3rd Avenue	Nokomis Street	Signal	**17**

SOURCE: MnCMAT Database

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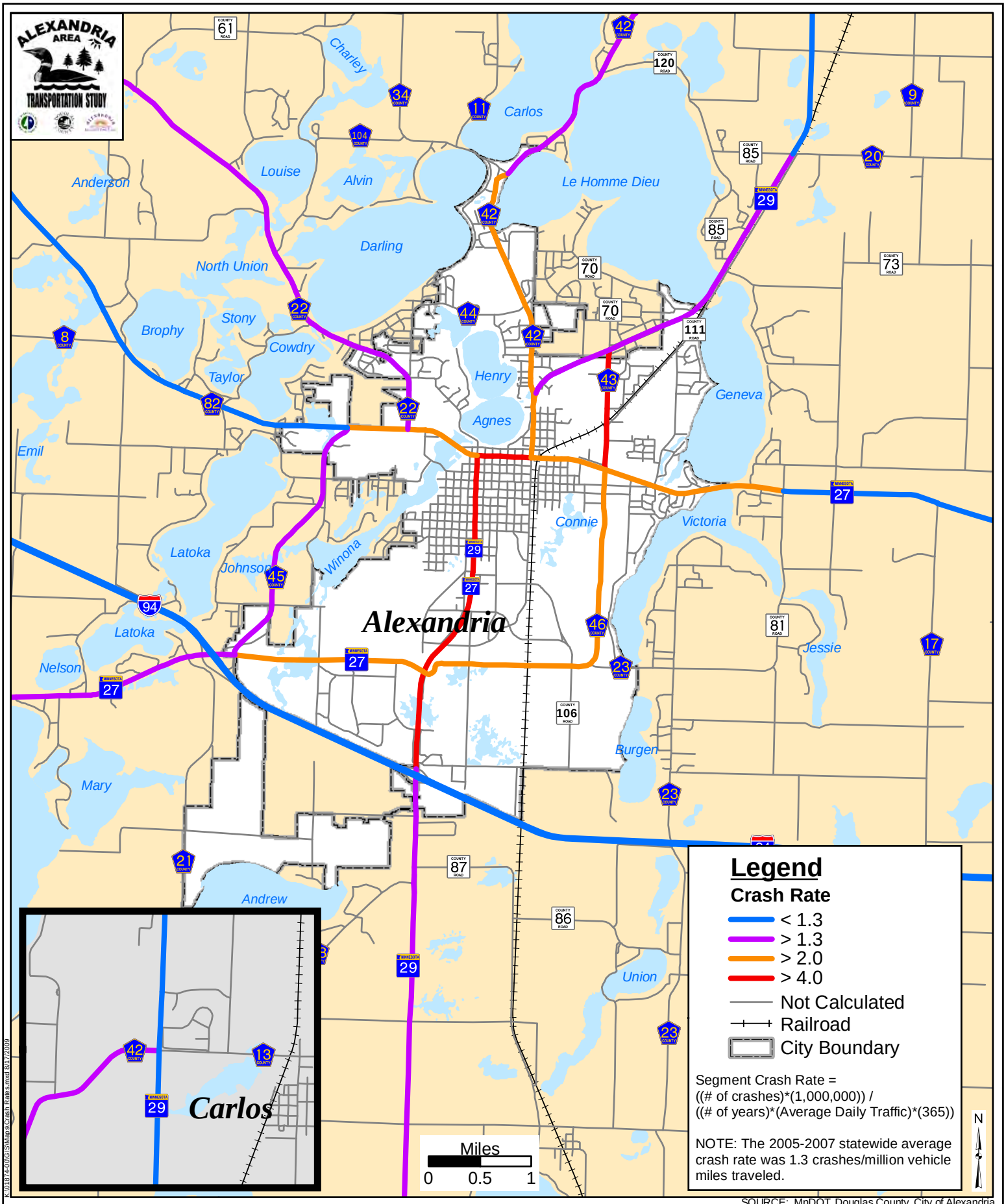

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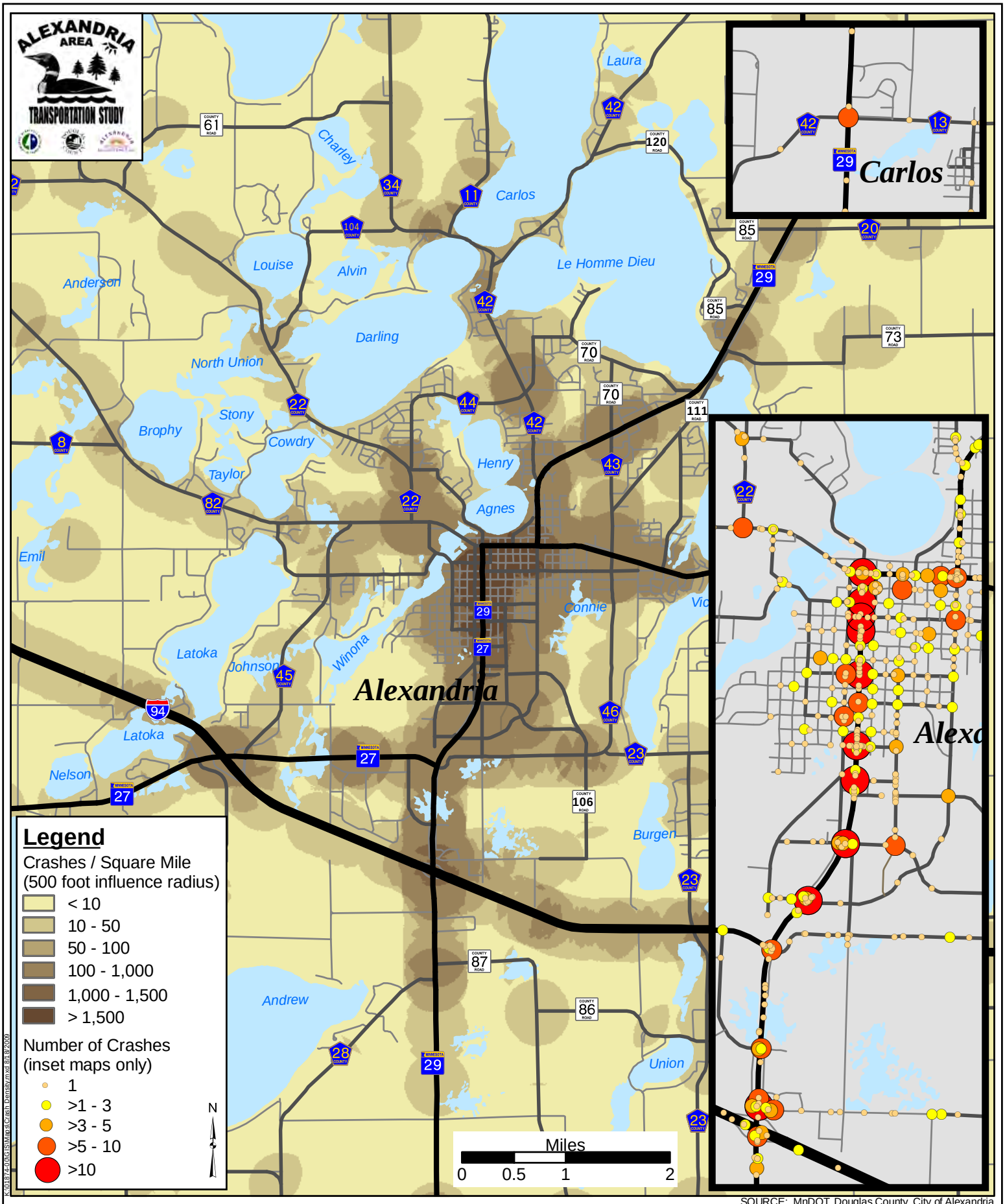
Alexandria Area Transportation Study

Figure 3-13: Roadway Segment Crash Rate (2005-2007)



SOURCE: MnDOT, Douglas County, City of Alexandria

Alexandria Area Transportation Study

Figure 3-14: Crash Density (2005-2007)

WSB & Associates, Inc.

3.3.3 Access Management

Access management is the proper planning and design of access to the public roadway system that helps ensure better traffic mobility with fewer crashes. Fewer direct access points, greater separation of driveways, and better driveway design and location are the basic elements of access management. When these techniques are implemented uniformly and comprehensively, there is less occasion for through traffic to brake and change lanes in order to avoid turning traffic. As a result, the flow of traffic will be smoother and average travel times lower resulting in less potential accidents.

Table 3-9 shows how crash rates generally increase as the number of access points per mile increase along a roadway corridor. According to the Federal Highway Administration (FHWA), before and after analyses show those routes with well managed access can experience 50% fewer accidents than comparable facilities with no access controls.

Table 3-9. Comparison of Accident Rate Indices for Access Spacing

	NCHRP 420 Literature Synthesis	NCHRP 420 Safety Analysis	Minnesota Study				Indiana Study	Square Root Rule [1]
			Urban-Suburban Roads					
Access Points per Mile	All Roads	Urban-Suburban Roads	UC 2 NLT (a)	UC 4 NLT (b)	UC 4 LT (c)	Average	Urban-Suburban Roads	All Roads
10	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
20	1.3	1.4	1.3	1.4	1.4	1.4	1.2	1.4
30	1.7	1.8	1.9	1.7	1.6	1.7	1.5	1.7
40	2.1	2.1	2.5	2.0	1.8	2.1	1.8	2.0
50	2.8	2.3	2.7	2.5	2.3	2.5	2.1	2.2
60	4.1	2.5	2.9	2.8	2.9	2.9	2.5	2.7
70	N/A	2.9	3.1	3.1	3.2	3.1	3.0	2.7

SOURCE: Access Management Manual, Transportation Research Board, 2003, Page 16.

C:\Documents and Settings\jmeye\My Documents\Danville LRTP\Tech Memos\[tables.xls]Access Managment Table

[1] Square Root Rule is a statistical calculation used to provide a weighted average for all roads.

(a) Urban Conventional (UC), Two-lane urban arterial, no left-turn lanes.

(b) Urban Conventional (UC), Four-lane urban arterial, no left-turn lanes.

(c) Urban Conventional (UC), Four-lane urban arterial with left-turn lanes.

Potential Access Management Corridors

For the Alexandria Area Transportation Study, a review of congested roadway segments was compared to the high accident segment and spot locations. The purpose of this analysis was to identify locations where existing roadway access might be a contributing factor in traffic congestion and/or a safety concern. Corridors with high levels of traffic congestion and/or high crash rates could be candidates for access management techniques to improve mobility and to minimize potential crashes.

The analysis for the study area showed there are one primary and three secondary corridors that could benefit from access management. A primary corridor is one that has a history of higher than normal crash rates and includes congested roadway segments. Access management techniques may have significant benefits if implemented within these areas. A secondary corridor is one that has isolated high crash locations and/or traffic congestion. Secondary corridors may not immediately require access management but these corridors could benefit in future years as corridor development and increasing traffic volumes result in increased demand for access. Secondary corridors are also ideal locations to begin identifying potential access management strategies to be proactive in preserving a high level of mobility and safety within these corridors.

The primary corridor identified was TH 29/TH 27 from 34th Avenue to Nokomis Street. This corridor includes roadway segments intersecting the trunk highway identified as approaching-capacity and at-capacity in addition to several high accident spot and segment locations.

Another area for access management is located along the CSAH 43 corridor from just south of the rail line extending to the intersection of CSAH 43 and TH 27. This corridor currently has a high accident spot location and a high accident segment, identified. The intersection of CSAH 43 and TH 27 also has at-capacity segments entering from the east and south. Implementing access management policies and techniques could be beneficial to traffic operations along this corridor.

Another corridor for potential access management is 50th Avenue just east of TH 29. This corridor consists of service and retail businesses each accessing 50th Avenue. This corridor consists of mostly developed sites with some open space. This corridor currently has a high accident spot location at the intersection of 50th Avenue and TH 29. Access near the intersection and observed traffic queuing may be leading to driver frustration and confusion. Access management policies and techniques may help to reduce crashes along this corridor.

Another corridor for potential access management is TH 29 south of I-94. This corridor consists of a significant amount of open space that over the next twenty years would be prime development sites for commercial and retail centers. Adopting and implementing access management policies and techniques now will help ensure that this corridor can handle increasing traffic volumes associated with future year development.

Figure 3-15 displays examples of potential areas for access management within the Alexandria Area Transportation Study. **Figure 3-16** displays the areas of congestion along with high accident spot and segment locations within the Alexandria Area Transportation Study. The potential corridors where access management might be implemented are also identified.

Figure 3-15. Example Locations to Apply Access Management Techniques

TH 29 / 50th Avenue

CONCERNS

50th Avenue, near the I-94 interchange, contains a number of retail and service businesses with multiple access points. Given the high travel volumes and numerous access points make this area a prime location for potential access management.

3rd Avenue / Nokomis Street

CONCERNS

Nokomis Street, just north of 3rd Avenue, experiences a lot of through traffic as well as business traffic. The high travel volumes combined with numerous access points close to a high volume intersection make this location a possible area for access management.

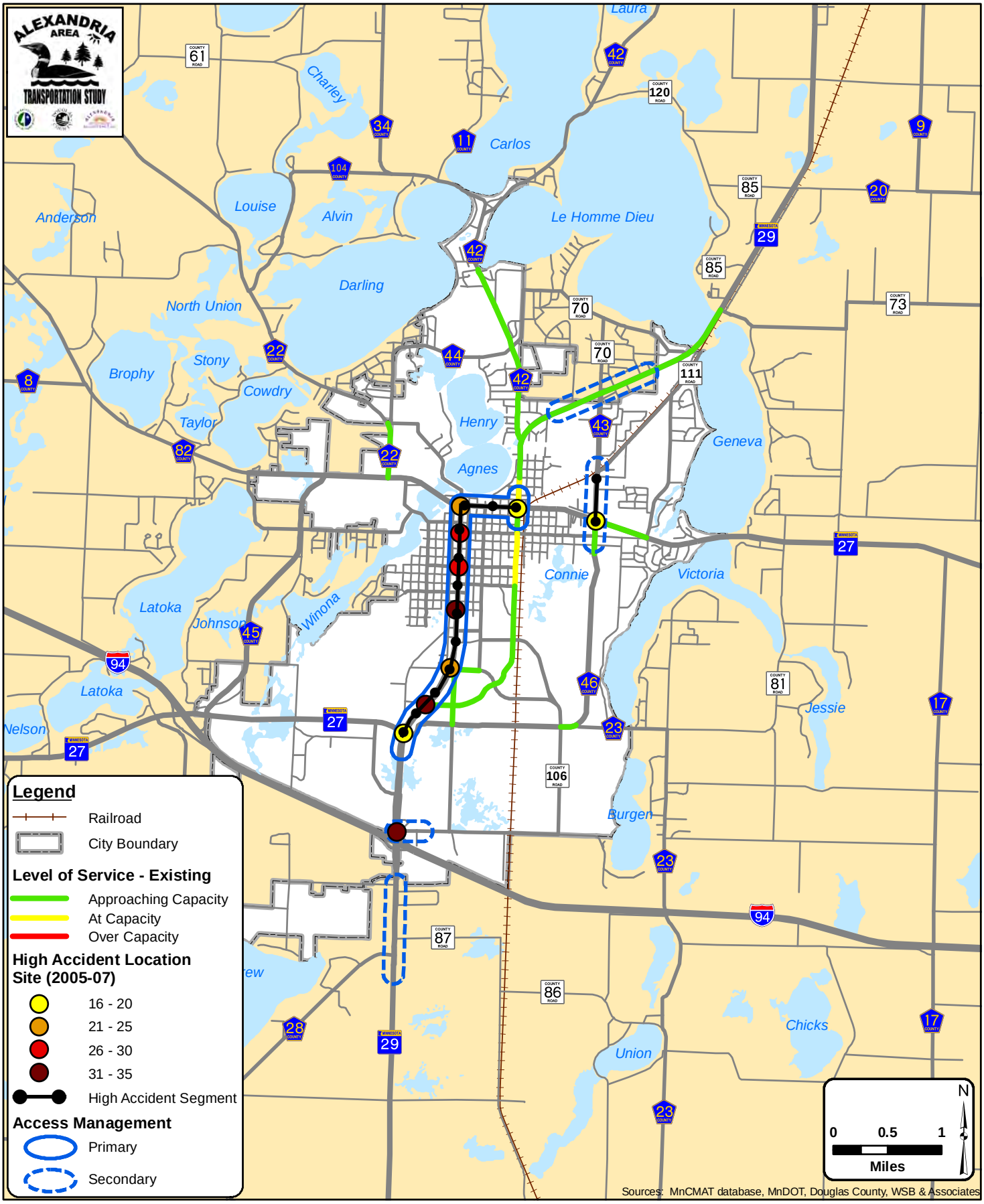


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Figure 3-16: Potential Access Management Locations

Access Management Guidelines

Within the Alexandria Area Transportation Plan study area, each of the three governmental jurisdictions maintains some degree of access management control measures. Provided below are summaries of their respective access management policies.

Mn/DOT

Working with city and county representatives, Mn/DOT has developed guidelines for managing access to the state highway system. Every highway segment has been assigned to a primary access category based on the roadway's functional and strategic importance within the statewide network. In addition to the primary category, every highway segment also had been assigned a subcategory based on the existing and planned land use for the surrounding area. The recommended spacing and allowance for public street intersections and private driveways varies with the highway's primary access category and subcategory. The following facility type categories used by Mn/DOT, include:

1. High Priority Interregional Corridor
2. Medium Priority Interregional Corridor
3. High Priority Regional Corridor
4. Principal Arterial (Metro Area and Primary Trade Centers)
5. Minor Arterial
6. Collector
7. Specific Plan

Within the Alexandria area, I-94 is categorized as a High Priority Regional Corridor (1), with the remaining Trunk Highways identified under Category 5 – Minor Arterial.

Within each primary access category are Urban Core, Urbanizing, and Rural subcategories, which are based on the existing and planned land use of the surrounding area. The recommended spacing and allowance for public street intersections and private access varies with the highway's primary category and subcategory.

Urban Core areas are fully developed with a tightly woven network of public streets. Public street spacing is based on block length, usually between 300-660 feet. The spacing for direct property access typically should be at least 200 feet to provide adequate stopping sight distance.

Urbanizing areas are developing areas beyond the urban core. Local governments should develop a complete network of supporting local streets to serve these areas. Public intersections should be spaced at 1/8, 1/4, or 1/2 mile increments, depending on the highway's primary category assignment. Access to homes and businesses should be provided from the local supporting street network, not from the state highway.

In **Rural** areas where agriculture, forestry, or very low density residential uses predominate, the local network of supporting roads is usually quite limited. In these areas, public street intersections should be spaced at 1/4, 1/2, or 1 mile increments, depending on the highway's primary category assignment. Direct access to homes and farms should be provided by local roads when possible. When that is not possible, limited direct property access may be permitted.

Mn/DOT applies the access management guidelines when reviewing plats, subdivisions, environmental

documents, and development plans and when conducting access permit review. In the Alexandria area, the majority of the State Highway roadways (TH 27 and TH 29) are located in urbanizing areas where until recently the traffic volumes have been relatively low, with few issues involving access management. However, as the area has grown, so has traffic and issues related to access management. For each access category (i.e., urbanizing, rural, urban core), there are guidelines that have been established for the provision of appropriate access spacing.

Figure 3-17 displays the access management categories for the State Highway system in the Alexandria area.

Figure 3-17. Mn/DOT District 4 Access Management Categories for Alexandria Area

Source: Mn/DOT Office of Investment Management, 2004
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TH 29 Access Management Assessment

For the Alexandria Area Transportation Study, a review of congested roadway segments was compared to the high accident segment and spot locations. The purpose of this analysis was to identify locations where existing roadway access might be a contributing factor in traffic congestion and/or a safety concern.

The primary corridor identified through this analysis was along TH 29 from CSAH 4 (south of I-94) to CSAH 13/42 near Carlos, representing a distance of approximately 14 miles. The TH 29 corridor was sub-divided into 14 geographical segments identified in part by adjacent land-use and roadway characteristics. Sections of this corridor, particularly south of I-94, have a significant amount of open space that over the next twenty years may be a primary corridor for commercial development. Adopting and implementing access management policies and techniques now will help ensure that this corridor can handle increasing traffic volumes associated with future year development.

Each of the 14 segments carries an Access Category as determined by Mn/DOT, which is used to establish spacing guidelines. These categories and the guidelines for spacing between intersections are provided in **Table 3-10**.

Table 3-10. Mn/DOT Access Categories and Spacing Guidelines

Access Category	Land-Use or Facility Type	Typical Functional Classification	Typical Posted Speed	Public Street Spacing	
				Primary Full-Movement Intersection	Secondary Intersection
5A	Rural	Minor Arterials	45 - 55 mph	1/2 mile	1/4 mile
5B	Urban/Urbanizing	Minor Arterials	40 - 45 mph	1/4 mile	1/8 mile
5C	Urban Core	Minor Arterials	30 - 40 mph	300-660 feet, dependent on block length	

Access type and spacing guidelines per Mn/DOT's Access Management Manual (2008) are identified in **Table 3-11** and **Table 3-12**.

Table 3-11. Mn/DOT Access Types and Descriptions

Access Type	Access Description
ACCESS TYPE 1 Single Family or Field Access	Includes driveways that serve up to three single-family homes or provide field access. (Does NOT include agri-business driveways.)
ACCESS TYPE 2 Low-Volume Driveway <100 Trips/Day	Includes driveways that serve small commercial, industrial, public, and institutional developments; small residential complexes and subdivisions; or small agri-business operations. • May be designated as a private street serving ten or fewer lots; • Generates fewer than 100 trips per day.
ACCESS TYPE 3 High-Volume Driveway >100 Trips/Day	Includes driveways that serve large commercial, industrial, public and institutional developments; shopping centers; industrial and office parks; colleges; large residential complexes and subdivisions, or large agricultural operations. • May be designated as a private street serving more than ten lots; • Generates 100 trips per day or more.
ACCESS TYPE 4 Public Street	All public street or roadway intersections. • Should be part of an integrated network that serves multiple properties.

Source: Mn/DOT

K:\01874-00\Access Management Assessment\[TH-29 Access.xls]Access Type

Table 3-12. Mn/DOT Spacing Guidelines for Adjacent Driveways

Posted Speed (mph)	Type 1 & 2	Type 3
40	--	305
45	50	360
50	75	425
55	100	495
60	100	570
65	--	645

Source: Mn/DOT Access Management Manual, 2008
K:\01874-00\Access Management Assessment\[TH-29 Access.xls]Spacing

Using the access and spacing guidelines developed by Mn/DOT, an assessment was conducted for the3 TH 29 corridor to determine conformance. The access management assessment of this corridor revealed 98 access points that did not conform to Mn/DOT's guidelines. This accounted for approximately 45% of all accesses. The average accesses per mile ranged from 4 in rural areas to 80 in urban areas. Referring to Table 3-9 *Comparison of Accident Rate Indices for Access Spacing*, an average of 70 or more access points per mile results in nearly three times as many accidents as roadways with fewer access points. **Table 3-13** provides a summary of access conformance for each of the fourteen segments. Contained in **Appendix A** (TH 29 Access Assessment Layouts) are **Figures A1** through **A13** displaying these segments, with locations of access points, access categories, and potential consolidation and/or mitigation measures to improve access spacing and/or conformance.

As Mn/DOT is planning to reconstruct TH 29 from a two-lane to a four-lane divided roadway from just south of I-94 to CSAH 28, a preliminary layout was developed to identify access improvement measures to implement as part of the reconstruction. **Figure 3-18** displays a layout for this improvement which Mn/DOT is planning to construct in the 2011 – 2015 timeframe. Two options are shown for realigning CR 87 to intersect with TH 29. Option A realigns CR 87 approximately 800 feet to the south to intersect with CSAH 28. Option B realigns CR 87 approximately 950 feet to the north to intersect with a public access frontage road. Either of these measures will result in eliminating a type 4 (Public Street) non-conforming access point. Option A is preferred as it would result in the consolidation of two T-intersections into one full access intersection at CSAH 28. Option A would also provide for improved east-west route connectivity. **Figure 3-19** provides a conceptual before and after rendering of TH 29 south of I-94. More information on the planned improvement on TH 29 is provided in Chapter 5 – Future Transportation Analysis.

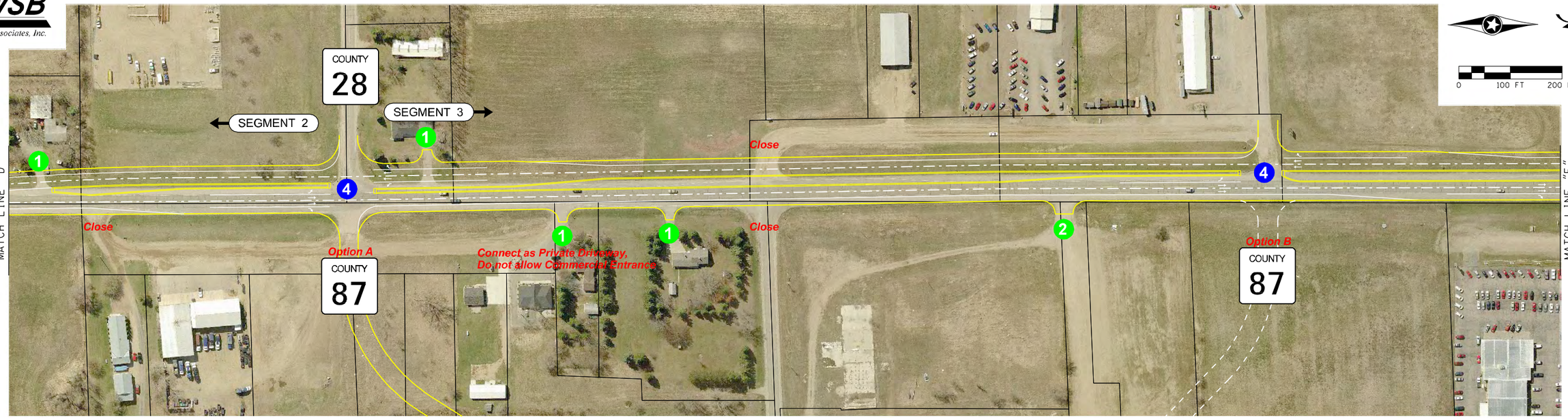
Table 3-13. Access Management Assessment Results

TH 29 Segment		Access Category	Length (miles)	Non-Conforming Accesses	Total Number of Accesses	Access Points Per Mile
From	To					
CSAH 4	Hiebel Rd	5A	1.0	0	7	7.0
Hiebel Rd	CSAH 28	5B	1.3	1	12	9.2
CSAH 28	I-94 EB Ramps	5B	1.0	7	10	10.0
I-94 EB Ramps	TH 27	5B	1.1	2	6	5.5
TH 27	17th Avenue	5B	1.2	1	5	4.2
17th Avenue	10th Avenue	5C	0.5	29	40	80.0
10th Avenue	3rd Avenue	5C	0.6	13	20	33.3
Broadway	Nokomis Street	5C	0.5	13	20	40.0
3rd Avenue	Carlos Avenue	5C	0.5	24	34	68.0
Carlos Avenue	Birch Avenue	5B	1.9	3	18	9.5
Birch Avenue	CSAH 20	5B	1.8	0	13	7.2
CSAH 20	Pike Rd	5A	1.0	2	11	11.0
Pike Rd	Prairie Rd	5A	1.0	1	16	16.0
Prairie Rd	CSAH 42/CSAH 13	5A	1.0	2	6	6.0
Total TH 29 Corridor		**5A,5B,5C**	**14.4**	**98**	**218**	**15.1**

Source: WSB and Associates

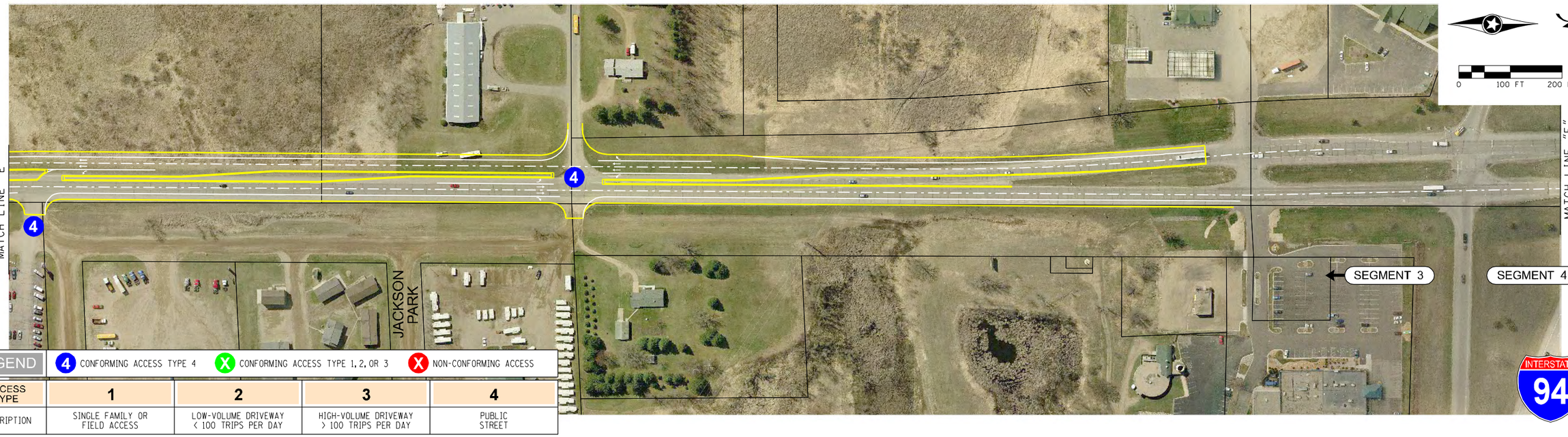
K:\01874-00\Access Management Assessment\[TH-29 Access.xls]Existing

Trunk Highway 29



See Figure A2 in Appendix A

Trunk Highway 29



See Figure A4 in Appendix A

LEGEND: 4 CONFORMING ACCESS TYPE 4 | X CONFORMING ACCESS TYPE 1, 2, OR 3 | X NON-CONFORMING ACCESS

ACCESS TYPE	1	2	3	4
DESCRIPTION	SINGLE FAMILY OR FIELD ACCESS	LOW-VOLUME DRIVEWAY < 100 TRIPS PER DAY	HIGH-VOLUME DRIVEWAY > 100 TRIPS PER DAY	PUBLIC STREET

Alexandria Area Transportation Study

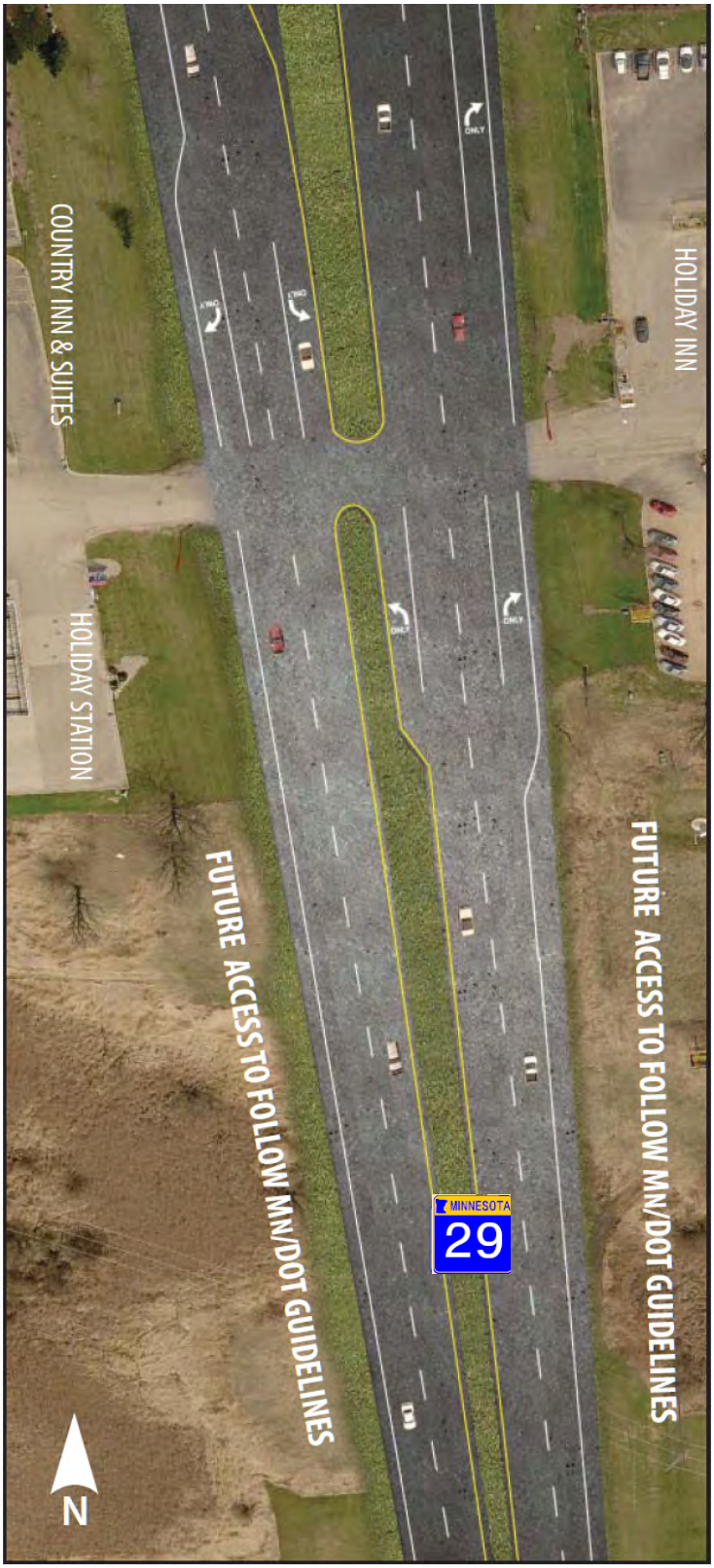
Douglas County, Minnesota

Figure 3-18
Proposed 4-Lane Section

PLOTTED/REVISED: 11/5/2010

PATH & FILENAME: K:\0\874-00\Cad\Plan\ProposedLayout 4-Lndgn

BEFORE IMPROVEMENT



AFTER IMPROVEMENT

Douglas County and the City of Alexandria

As with Mn/DOT facilities, access management on Douglas County or City of Alexandria roadways is determined by the governing entity. Currently, Douglas County and the City of Alexandria generally follow guidelines established by Mn/DOT. These guidelines are provided in **Table 3-14**.

Table 3-14. Mn/DOT Recommended Access Spacing

Functional Class	Median Treatment	Existing and Proposed Land Use	Typical Posted Speed (MPH)	Full Median Opening Spacing	Minimum Signal Spacing	Spacing Between Connections*
Principal Arterial	Divided	Rural	65	1 mile	1 mile	1320 feet
		Urban	≥ 45	1/2 mile	1/2 mile	1320 feet
		Urban Core	< 45	1/4 mile	1/4 mile	440 feet
	Undivided	Rural	55	NA	1 mile	860 feet
		Urban	≥ 45	NA	1/2 mile	860 feet
		Urban Core	< 45	NA	1/4 mile	440 feet
Minor Arterial	Divided	Rural	55	1/2 mile	1/2 mile	820 feet
		Urban	≥ 40	1/2 mile	1/2 mile	490 feet
		Urban Core	< 40	1/4 mile	1/4 mile	275 feet
	Undivided	Rural	55	NA	1/2 mile	820 feet
		Urban	≥ 40	NA	1/2 mile	490 feet
		Urban Core	< 40	NA	1/4 mile	350 feet
Collectors	Divided	Urban	≥ 40	1/4 mile	1/4 mile	435 feet
		Urban Core	< 40	1/8 mile	1/8 mile	275 feet
	Undivided	Rural	55	NA	1/2 mile	585 feet
		Urban	≥ 40	NA	1/4 mile	435 feet
		Urban Core	< 40	NA	1/8 mile	310 feet

*Distances are based upon spacing between connections (major roads, local public streets and private driveways. Distances are minimum and greater spacing is beneficial.

Source: MnDOT, City of Alexandria Comprehensive Plan, 2007.

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3.4 Transit Operations

Rainbow Rider currently provides public transit for Douglas, Pope, Stevens, and Traverse Counties with wheelchair accessible buses and a volunteer driver program. The service is governed by the Rainbow Rider Transit Board and supported by passenger fares, service contracts, state and federal taxes, sales of advertising space, local county appropriations, and donations.

The following provides more information on the Rainbow Rider transit service.

3.4.1 System Overview

Rainbow Rider, which started operating in 1995, has approximately 37 employees and operates 32 wheelchair accessible buses. Rainbow Rider offers door-to-door service with extra care given to children and senior citizens. Door-to-door service means drivers assist passengers with a steadying arm between the bus and the exterior door of their pick-up and drop-off locations and carry up to three small packages (up to 25 pounds or what can be carried in one trip). Service throughout Douglas County is provided weekdays from 6:30 a.m. to 7:45 p.m., with additional service provided within Alexandria on Saturdays from 8:00 a.m. until 4:00 p.m.

In addition to paratransit service, Rainbow Rider recently initiated a fixed/deviated route service that stops at various locations within Alexandria at scheduled times. In between the scheduled stops, the

bus will pick up individuals requesting service. This service operates during weekdays from 11:00 a.m. until 3:00 p.m., with fares set at $1.00 for unlimited trips. The complete roundtrip on the route takes one hour with scheduled stops located at:

- Wal-Mart at 11 a.m.,
- Target at 11:04 a.m.,
- Alexandria Clinic at 11:09 a.m.,
- Viking Plaza at 11:12 a.m.,
- Kmart at 11:17 a.m.,
- Pete's County Market at 11:20 a.m.,
- Alexandria Technical College at 11:23 a.m.,
- Broadway Clinic at 11:26 a.m.,
- Stop-n-Go at 11:29 a.m.,
- Bethel I at 11:31 a.m. and,
- Viking Towers at 11:34 a.m.

Figure 3-20 displays the transportation service within the Alexandria Area.

Figure 3-20. Douglas County – Rainbow Rider Vehicle

Facilities

The Rainbow Rider Administrative Office Building and Maintenance Garage is located approximately 15 miles south of Alexandria in Lowry, Minnesota. They do have plans to begin housing some buses in Alexandria.

Fare Structure

The current fare structure for Rainbow Rider is based on distance traveled with the cost per adult rider being $2.00 for trips up to five miles, $4.00 for trips up to ten miles, and $5.00 plus two additional dollars for trips over twenty miles in length. Children under three years of age travel free when accompanied by an adult, as do aids traveling with passengers needing assistance. **Table 3-15** lists the 2010 fare structure for Rainbow Rider.

Table 3-15. Douglas County - Rainbow Rider Fare Structure

TYPE OF FARE	DISTANCE TRAVELED 0 to 5 miles	5.1 to 10 miles	10.1 to 20 miles	Over 20 miles
Adult Fare	$ 2.00	$ 4.00	$ 5.00	$5 + $2.00 additional for every 10 miles
Children 3-11, traveling with Adult	$ 1.00	$ 2.00	$ 2.50	$2.50 + $1.00 additional for every 10 miles
Children 3-11 (traveling alone)	$ 2.00	$ 4.00	$ 5.00	$5 + $2.00 additional for every 10 miles

SOURCE: Rainbow Rider (2010)

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Ridership

In 2009, Rainbow Rider provided approximately 142,000 rides in its four-county area, with approximately 80,000 or 56 percent of those for people in Douglas County, with the majority of these trips being in the City of Alexandria.

Table 3-16 displays historical ridership by fare category for Douglas County users of Rainbow Rider. **Figure 3-21** displays the ridership totals for the time period 2003 to 2009.

Table 3-16. Douglas County - Rainbow Rider Passengers by Rider Category

Rider Category	Total Passengers by Year - Douglas County 2003	2004	2005	2006	2007	2008	2009
Students	21,159	29,180	27,082	29,391	33,506	34,361	31,090
Adults	14,061	18,279	19,782	23,595	24,279	28,393	25,990
Elderly	9,587	8,993	9,828	9,737	11,381	11,857	10,541
Disabled	5,044	5,667	6,822	8,266	7,866	6,204	8,326
Children	2,201	1,666	3,337	2,763	3,188	3,662	2,436
TOTAL	**52,052**	**63,785**	**66,851**	**73,752**	**80,220**	**84,477**	**78,383**

SOURCE: Rainbow Rider

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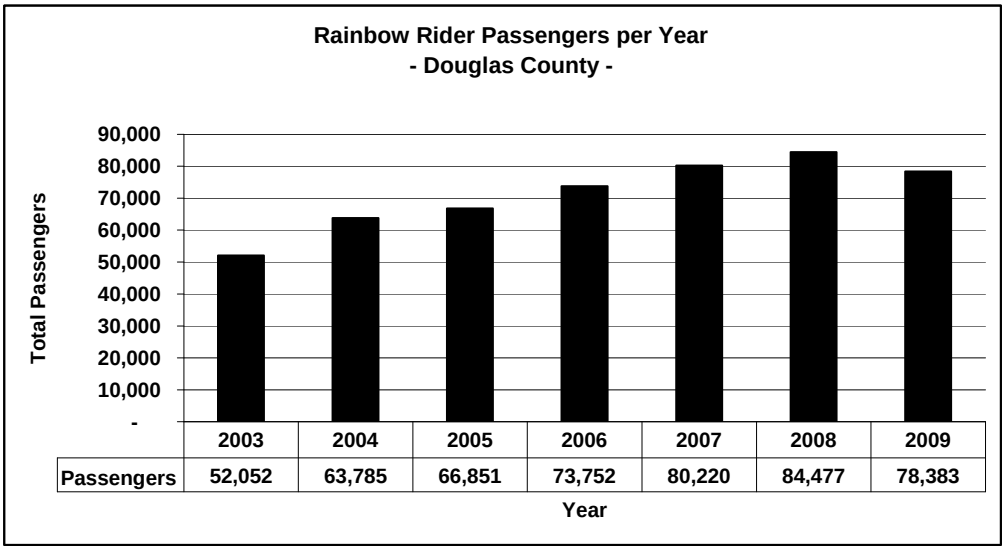
Figure 3-21. Douglas County – Rainbow Rider Passengers (2003-2009)



SOURCE: Rainbow Rider

In addition to the Rainbow Rider, transportation between the Alexandria area and other cities is served by Peoples Express, Greyhound, and Jefferson Lines. Transportation to and from the Minneapolis – St. Paul International Airport is provided by private operators, such as Executive Express, which operates up to nine trips per day from Alexandria. From the public outreach effort of this study, it was determined that the public was pleased with these transit options, particularly with the Rainbow Rider.

3.5 Pedestrian and Bicycle Facilities

Bicycle facilities and trail systems are valuable community assets and are an important transportation mode for recreational and other trip purposes. Within the Alexandria area, there is a network of sidewalks and trails. **Table 3-17** displays the current mileage by pedestrian /bicycle facility.

Table 3-17. Existing Pedestrian / Bicycle Facility Characteristics

Type of Facitlity	Description	Length (miles)
Sidewalk	Within City of Alexandria	21
City Bike Route	On-street (not striped)	31
County Bike Route	On-street (not striped)	9
Central Lakes Trail	State Trail from Fergus Falls to Osakis	55
Esplanade Trail	City Trail along Lake Agnes	1

SOURCE: WSB & Associates, Inc.

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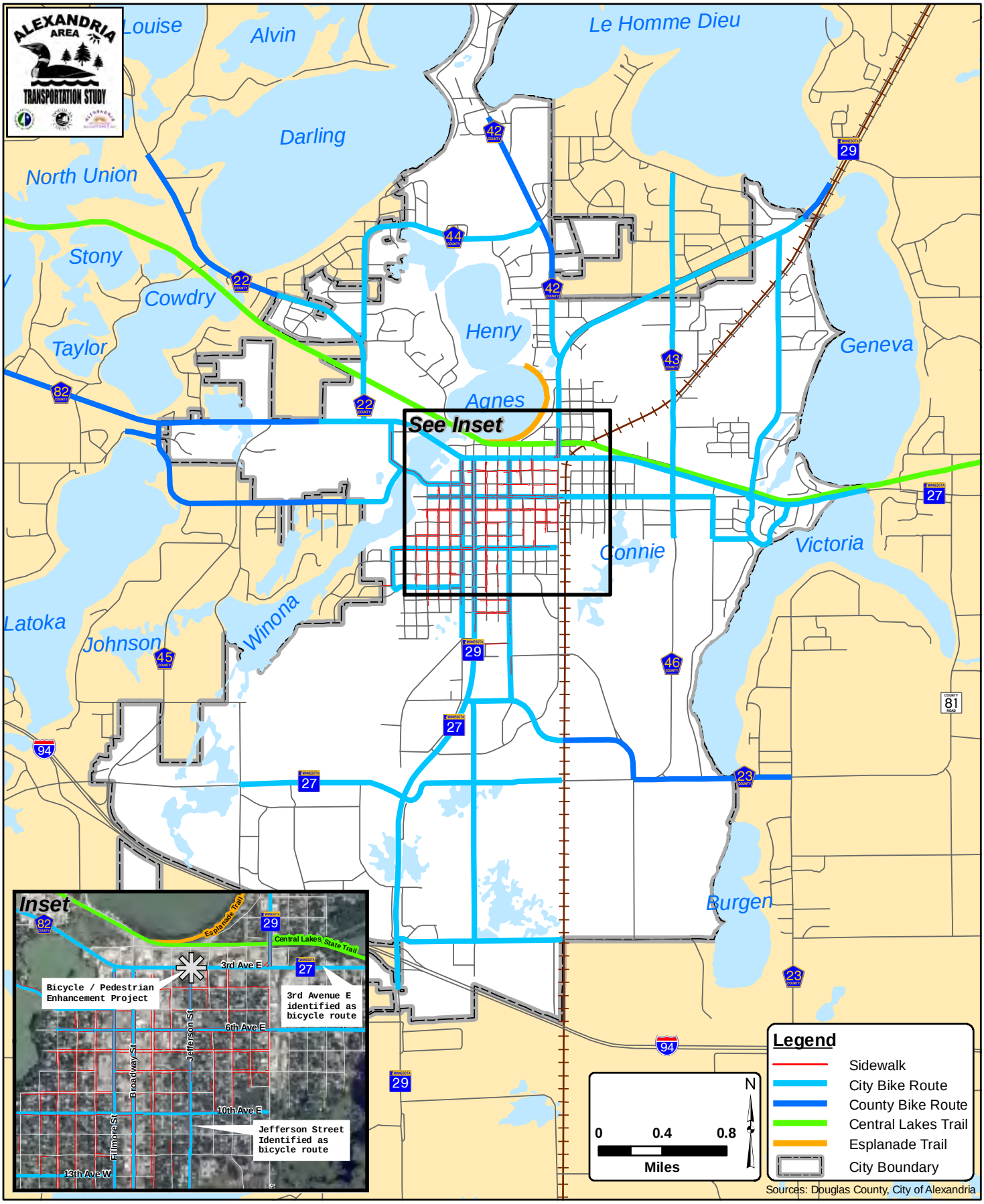
Existing bicycle facilities were evaluated within the Alexandria area. The following section summarizes the findings.

3.5.1 System Overview

The Alexandria area currently has few designated bicycle facilities, with the primary trails being the Central Lakes Trail and the Esplanade Trail. The remaining bicycle trips within the area are generally made on the existing street network.

Figure 3-22 displays the existing pedestrian and bicycle facilities within the Alexandria area.



Alexandria Area Transportation Study

Figure 3-22: Pedestrian and Bicycle Facilities

3.5.2 Multi-use Trails/Paths

Well-planned and designed multi-use trails/paths can provide good pedestrian and bicycle mobility. The trails/paths can serve both commuter and recreational cyclists. The following points are critical to developing successful trails/paths[2]:

- Continuous separation from traffic, by locating paths along a river or a greenbelt such as a rail-to-trail conversion, with few street or driveway crossings (paths directly adjacent to roadways are not recommended, as they tend to have many conflict points);
- Scenic qualities, offering an aesthetic experience that attracts cyclists and pedestrians;
- Connection to land-uses, such as shopping malls, downtown, schools, and other community destinations;
- Well-designed street crossings, with measures such as bike and pedestrian activated signals, median refuges, and warning signs for both motor vehicles and path users;
- Shorter trip lengths than the road network, with connections between dead-end streets, cul-de-sacs, or short-cuts through open spaces;
- Visibility: proximity to housing and businesses increases safety. Despite fears of some property owners, paths have not attracted crime into adjacent neighborhoods;
- Good design by providing adequate width and sight distance and avoiding problems such as poor drainage, blind corners, and steep slopes; and
- Proper maintenance with regular sweeping and repairs. The separation from motor vehicle traffic can reduce some maintenance requirements, such as sweeping the debris that accumulates on roads.

The primary trail within the Alexandria Area is the Central Lakes Trail, which runs from Osakis to Fergus Falls and has been dedicated as Minnesota's 23rd State Trail. This scenic recreational trail covers 55 miles through the communities of Osakis, Nelson, Alexandria, Garfield, Brandon, Evansville, Melby, Ashby, and beyond to Fergus Falls. The Central Lakes Trail is an all season recreational trail that provides a 14 foot wide bituminous surface for safe, off road, non-motorized travel by biking, walking, or rollerblading in the spring, summer, and fall. It also provides safe permanent routes for snowmobiling in the winter (December-April). The Central Lakes Trail offers a variety of scenery and an opportunity for families to participate in outdoor activities and events. The trail also connects to the Lake Wobegon Trail which covers 60 miles from Osakis to St. Joseph, Minnesota. The Central lakes trail will also connect to a planned multi-use trail on Broadway through downtown (currently in the planning stages).

Photographs taken along the Central Lakes Trail are displayed in **Figure 3-23**.

[2] Oregon Department of Transportation study.

Figure 3-23. Central Lakes Multi-use Trail

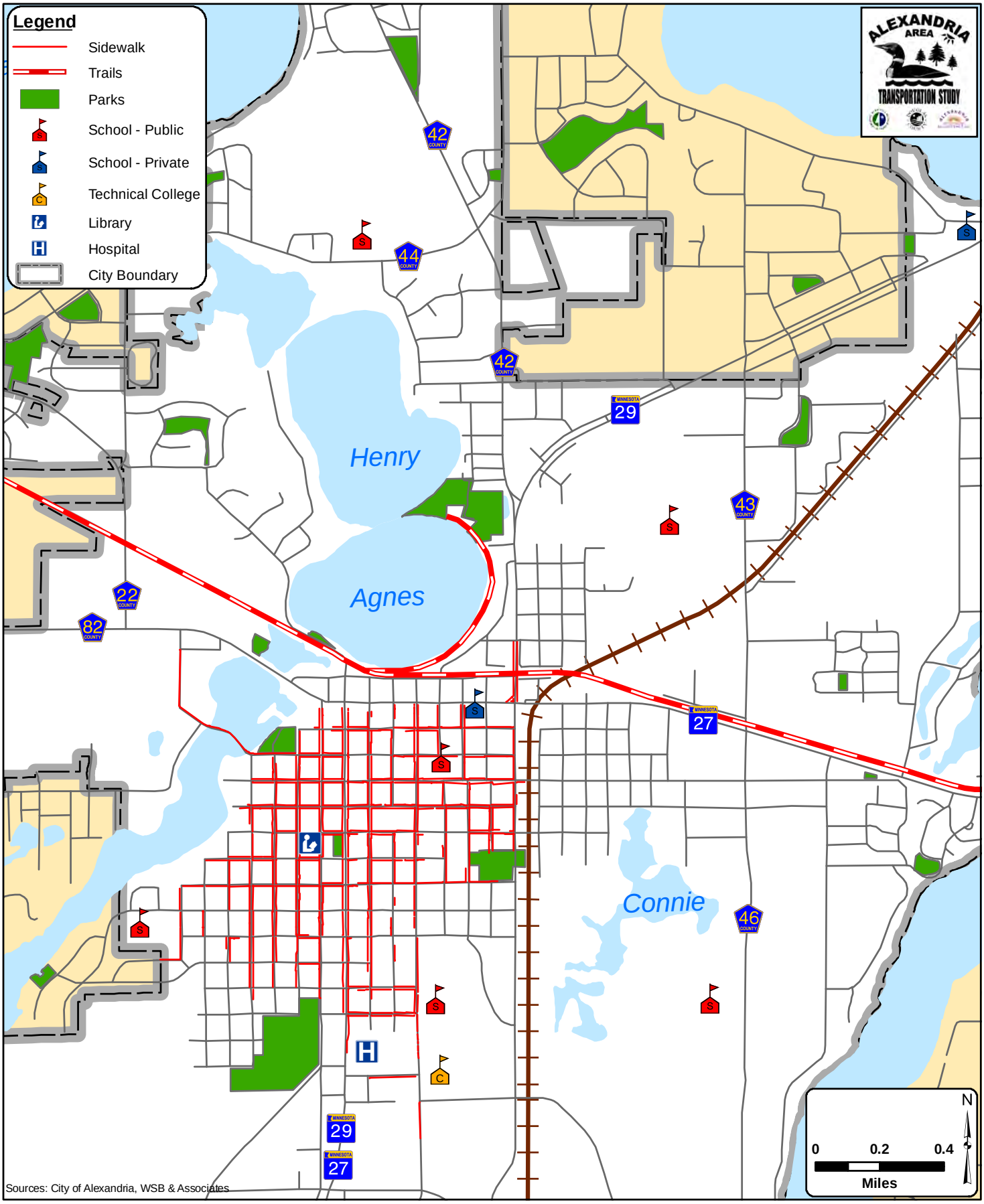
A secondary trail is the Esplanade Trail which runs along the south and east sides of Lake Agnes in Alexandria. Beyond these trails, there are few designated walkways or bikeways within the City. Pedestrians may use sidewalks when available; however, a systematic pedestrian network is not available.

3.5.3 On-street Facilities

The majority of bicycle travel within the Alexandria area takes place along roadways. Bicycle travel along a roadway can be accommodated by designating bicycle routes or providing on-street facilities such as striped bicycle lanes. Currently, there are no striped bicycle lanes within the City of Alexandria.

3.5.4 Accessibility to Community Resources

Accessibility to community resources such as schools, colleges, libraries, and parks is an important aspect of any pedestrian and bicycle network. These community resources were overlaid with the existing Alexandria area sidewalk and trail system to determine areas that may lack accessibility. Potential pedestrian and bicycle improvements will be identified to maximize connections to these community resources. **Figure 3-24** identifies the existing sidewalk and trail system in relationship to various community resources.



Alexandria Area Transportation Study

Figure 3-24: Community Resources

WSB & Associates, Inc.

3.6 Aviation / Airport

The following provides an overview of existing facilities and operations at the Alexandria Municipal Airport. The airport is located approximately two miles south of downtown and west of TH 29/27.

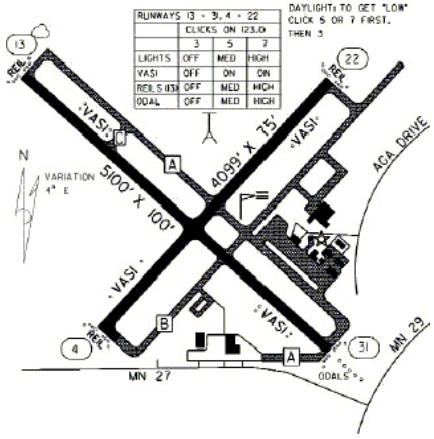
3.6.1 System Overview

The Alexandria Municipal Airport (Chandler Field) is owned and operated by the City of Alexandria. The Airport encompasses an area of approximately 2,200 acres and includes over 5,000,000 square feet of pavement surfaces for aircraft operations (runways, taxiways, parking aprons) and 360,000 square feet of roads and vehicle parking areas.

The airport maintains two runways as shown in **Figure 3-25**. Runway 4/22, is 4,099 by 75 feet, while Runway 13/31 is 5,100 by 100. Each of the runways are paved and weight rated for 35,000 lbs (single wheel craft), and 60,000 lbs (double wheel craft). Both runways are served by a full taxiway system and while there is not a control tower, there is an attendant on duty daily. Over 50 aircraft are based at Chandler Field, with the majority of them being single engine planes.

Figure 3-25. Alexandria Municipal Airport (Chandler Field)

Alexandria – Chandler Airport, 2604 Aga Drive



Chandler Airport Runway Configuration

3.6.2 Operational Characteristics

Primary users of the airport are general aviation, airfreight, and the military. Alexandria Aviation, Inc., a full fixed base operator, provides charter services, flight instruction, fuel maintenance, and sales. Chandler Airport averages over 25,000 aircraft operations per year, or an average of approximately 70 per day, of which 90 percent are general aviation, 9 percent air taxi, and 1 percent military.[3]

3.6.3 Future Airport Needs

The Alexandria Municipal Airport's existing runway length of 5,100 feet is capable of serving the majority of the aircraft operations currently using the airport. However, to meet the 20-year aviation needs[4], a runway length of 5,510 feet to 8,140 feet would be needed depending on the critical aircraft group's percentage of fleet, useful load factor, and runway length adjustments. This extension can not be accommodated at the airport's current location.

[3] Mn/DOT, US Federal Aviation Administration (FAA)

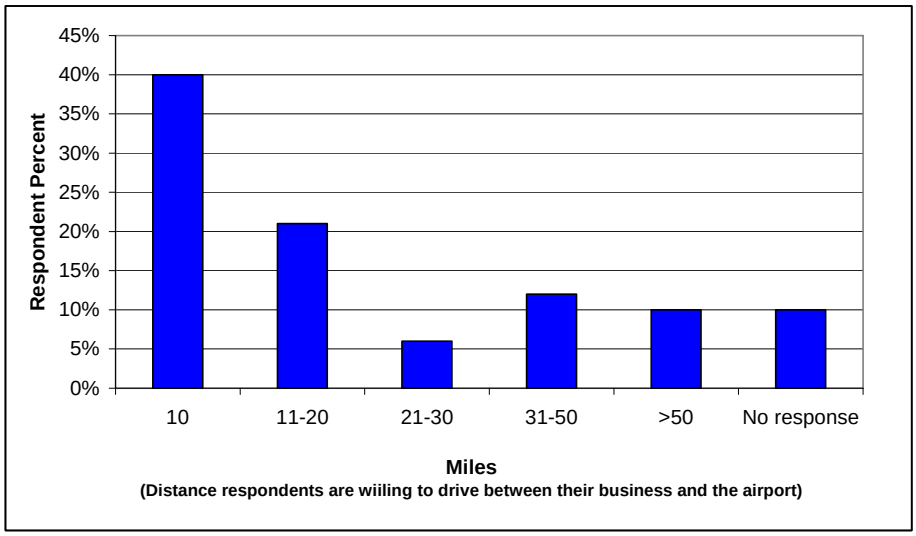
[4] Regional Airport Operations Analysis Document, 2007

Potential Relocation of Airport

In recent years, there has been discussion on whether the Alexandria Municipal Airport should be relocated. Proposing an airport relocation, outside of the downtown area, would allow the airport to expand more easily to meet future needs. Also, the land currently used for the airport could be redeveloped into a higher and better use given it's proximity to downtown. Relocating the airport may add additional travel time between current businesses and the airport. Access to downtown is currently convenient due to the airport's centralized location near many local businesses.

In a survey conducted in 2006 (Qualitative Research Regarding A Regional Airport), research regarding a new regional airport was conducted to gauge public interest[5]. Data from surveying local business and community leaders was gathered to determine their attitudes toward a Regional Airport. The distances that business executives would be willing to drive from their business location to the airport are shown in **Figure 3-26**. From this data and the assumption that most of the businesses are located near downtown Alexandria, an airport within ten miles of downtown would satisfy nearly all of the respondents. This would likely place the location within Douglas County, with specific discussion being east of TH 29 and south of I-94. However, in recent years, discussion on the potential relocation of the airport has subsided due to a host of factors including a downturn in the economy. Furthermore, public opinion as determined throughout this study process has indicated that there is a strong degree of support for leaving the airport in its current location. Therefore, in the absence of further study, the airport will remain at its present location and in its current configuration. There are no scheduled improvements for runway extensions that would impact the adjacent roadway network (i.e. TH 27).

Figure 3-26. Distance Willing to Travel between Business and Airport



Source: Qualitative Research Regarding A Regional Airport, dated November 2006

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Access to Commercial Airline Service

While the airport in Alexandria does not provide scheduled commercial airline service, a shuttle service (Executive Express) does provide up to nine trips per day to Minneapolis – St. Paul International Airport.

[5] Qualitative Research Regarding A Regional Airport, (CJ Olson Market Research, dated November 2006). A total of 112 interviews were completed with business people in Pope and Douglas Counties.

Chapter 4

Future Year Conditions

This chapter presents the year 2030 socioeconomic data and the methodology used for the development of future travel conditions within the Alexandria area.

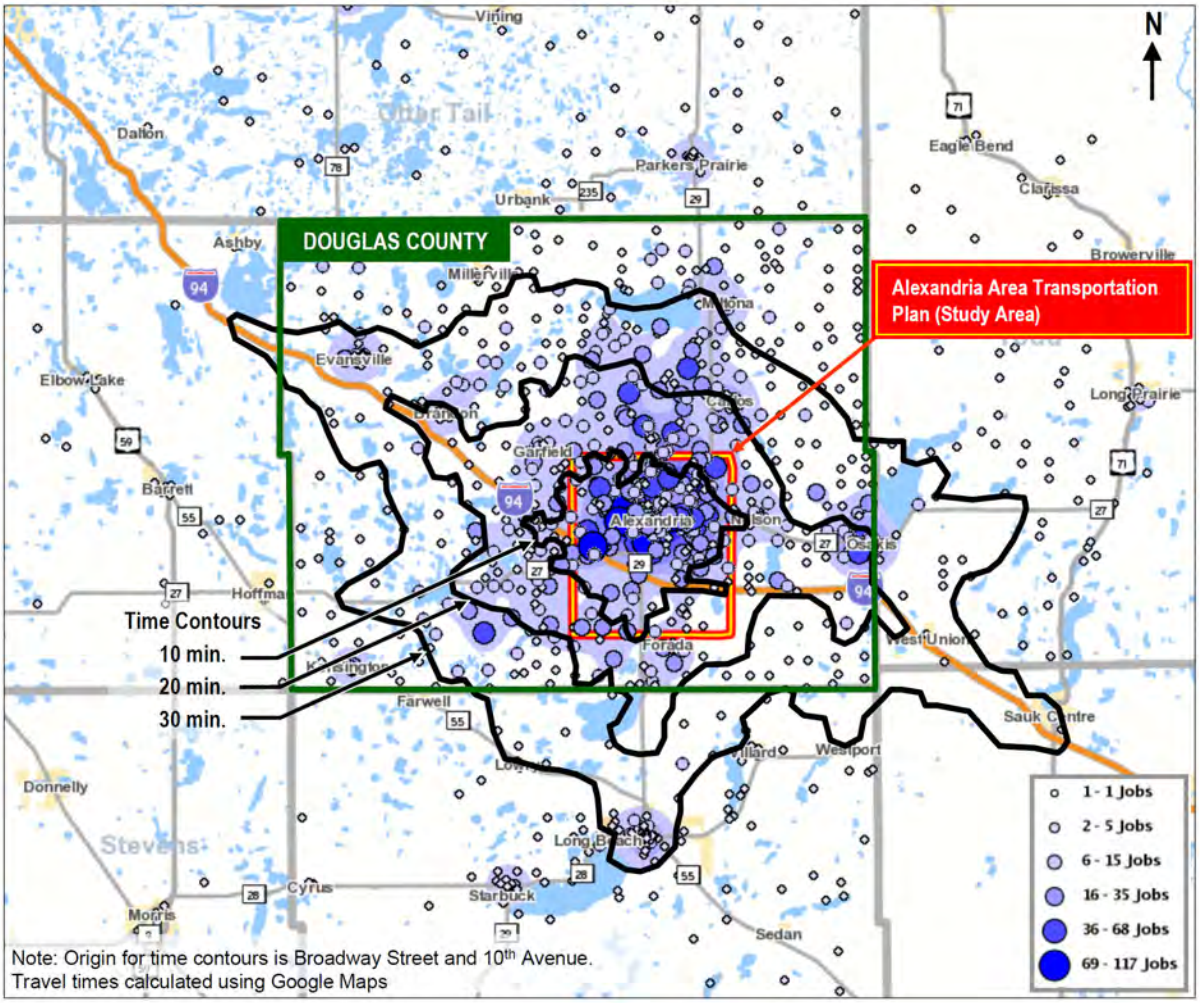
4.1 Travel Demand Forecasting

Future year travel conditions were developed using a travel demand forecasting model. The model converts population and employment data into traffic levels to project future year travel patterns. Specifically, a travel demand forecasting model incorporates a series of mathematical equations that are used to represent how choices are made when people travel. Travel demand occurs as a result of thousands of individual travelers making individual decisions on how, where and when to travel. These decisions are affected by many factors such as family situations, characteristics of the person making the trip, and the choices (destination, route and mode) available for the trip. Mathematical relationships are used to represent (model) human behavior in making these choices. Models require a series of assumptions in order to work and are limited by the data available to make forecasts. The coefficients and parameters in the model are set (calibrated) to match existing data. Normally, these relationships are assumed to be valid and to remain constant in the future.

From review of existing travel patterns (origin – destination survey), it can be seen that the Alexandria area is a primary destination for trips from the surrounding area. **Figure 4-1** displays information obtained from the US Census that shows over 18 percent of the jobs located in the study area are held by individuals living outside of Douglas County. Because of the Alexandria's unique role as a net-importer of labor, it is important to have a dynamic method of forecasting travel patterns. A dynamic method of traffic forecasting uses a computer model that inputs population and employment (number and location) information as well as physical transportation network attributes (roads, intersections, speeds, etc.) to determine trip routes and roadway traffic volumes.

The model developed for the Alexandria Area provides the basis to identify future year transportation needs and gives the analyst the ability to test potential improvements. The travel demand forecasting results are analyzed and used as a tool to help prioritize future year transportation improvements. As such, the model should be maintained or updated periodically to ensure its effectiveness.

Figure 4-1. Residence Location for Study Area Workers



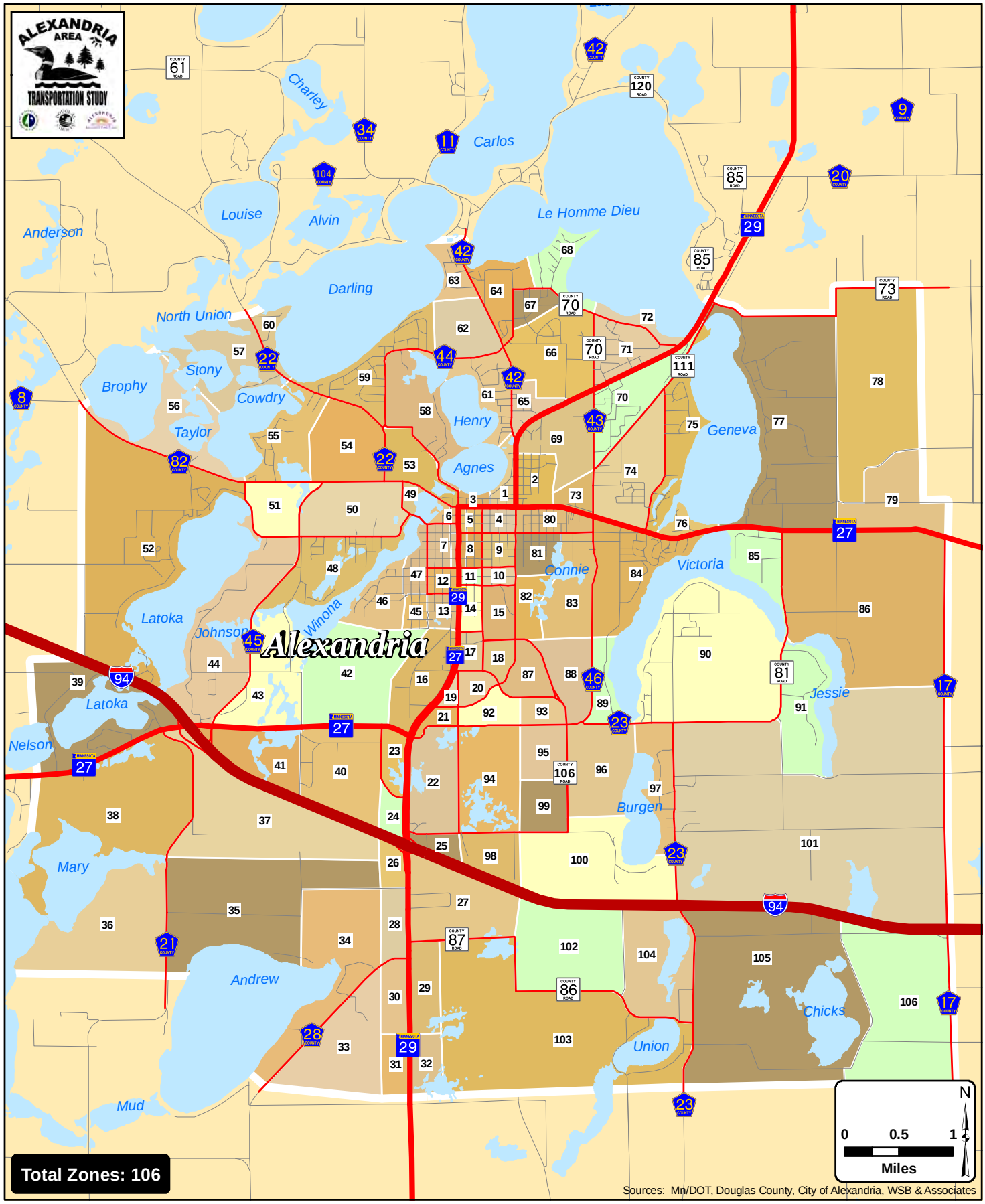
This graphic displays the location of residence of people holding the approximately 13,800 jobs located in the Alexandria Area Transportation Plan study area in 2006. While the majority of the employees (82 percent) live in Douglas County, over 18 percent of the jobs are held by persons living in areas adjacent to or near Douglas County. This illustrates the position of the Alexandria Area Transportation Plan study area as a net-importer of workers.

SOURCE: US Census Bureau, LED OnTheMap Origin-Destination Database

4.1.1 Modeling Process

A core concept of travel demand forecasting is the use of Transportation Analysis Zones (TAZs). The Alexandria Area Transportation Plan study area is divided into 106 TAZs as shown in **Figure 4-2**. Each TAZ has land-use data which dictates trip generation and trip attraction including population and employment data.

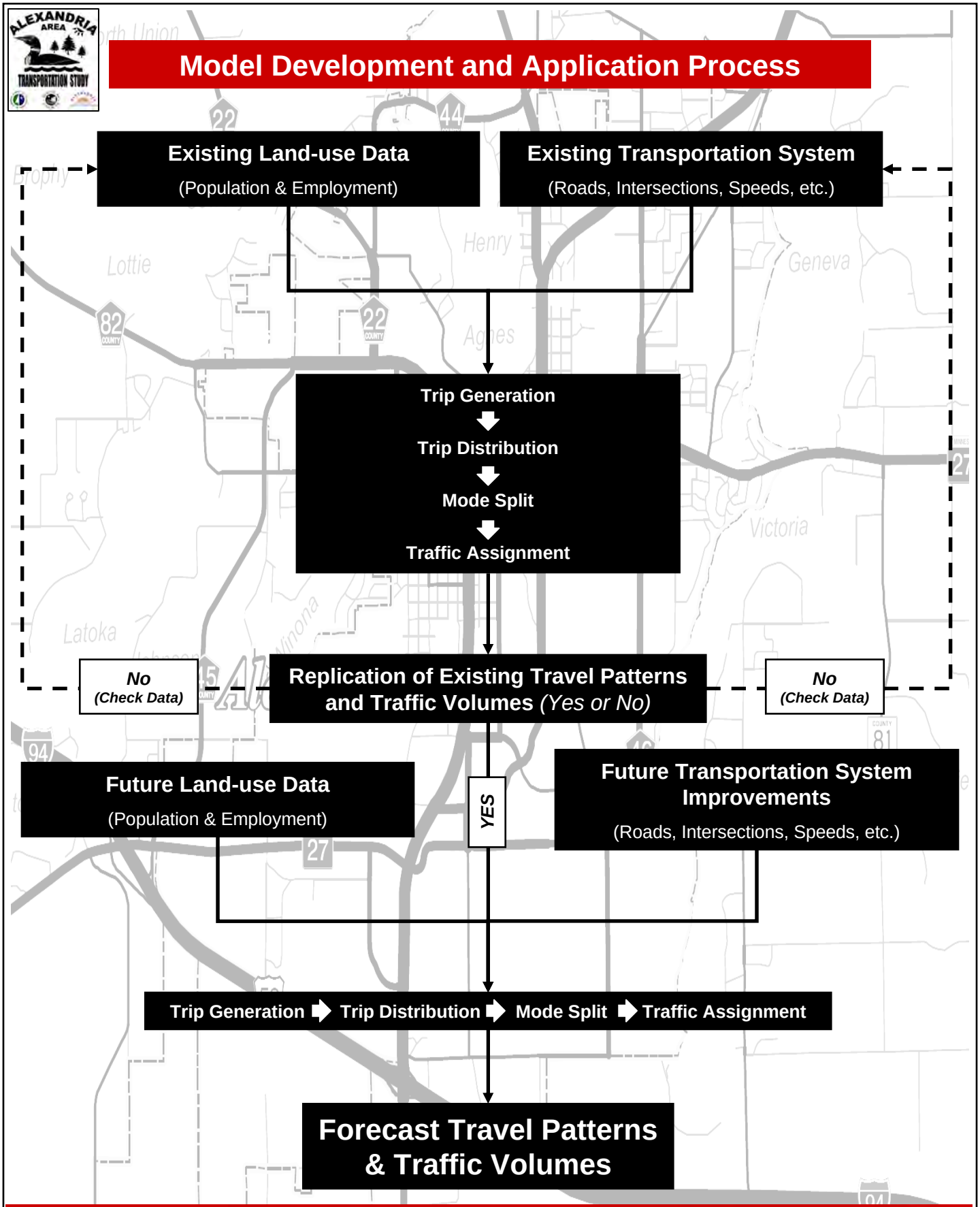
The model follows what is referred to as the four-step model process. The sequence of analysis starting with TAZ information is summarized as follows and displayed in **Figure 4-3**.



Alexandria Area Transportation Study

Figure 4-2: Transportation Analysis Zones (TAZ's)

Model Development and Application Process



Alexandria Area Transportation Study

Figure 4-3: Travel Demand Forecasting Model Process

1. **Trip Generation.** The first step in forecasting travel is trip generation. Information about land-use as well as population and economic forecasts are used to estimate how many person-trips will be made to and from each TAZ. Trip generation is estimated by applying trip generation equations to zoned land-use information. Trip production zones are based on household characteristics such as the number of people in the household and the number of vehicles available. Trip attractions are based on the level of employment in a zone.

2. **Trip Distribution.** The second step, trip distribution, estimates the number of trips that begin and end at particular TAZs. These linked trip ends form an origin-destination trip matrix through the process of trip distribution. Trip distribution is based on the idea that the number of trips between two points is dependent upon their attractiveness for a given trip purpose and the separation (distance or travel time) between the points.

3. **Mode Choice.** The third step, mode choice, is the step where trips between a given origin and destination are separated into different modes of travel including public transit and personal vehicles. The attractiveness of travel by different modes based on various characteristics is estimated to determine their relative usage. In smaller urban areas, such as Alexandria where transit usage is minimal, the mode choice step is accommodated by adjusting the number of vehicle trips to represent the observed mode choice as indicated by US Census information.

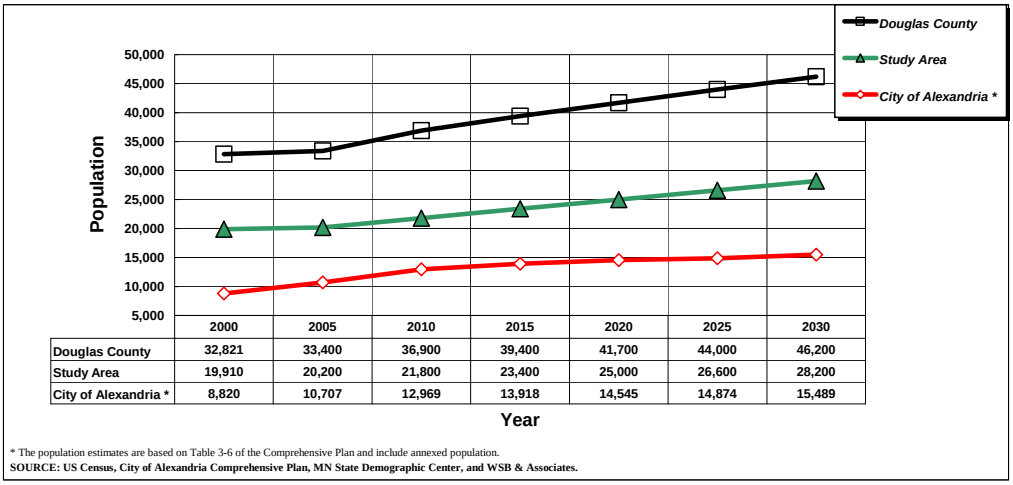
4. **Traffic Assignment.** The fourth step, traffic assignment, assigns trips to specific paths. The particular routes used to travel from each origin to each destination are first determined based on the shortest travel times. The assigned trip volumes are then compared to the capacity of each link to see which, if any, links are congested. If a roadway is congested, the travel speed will be less, resulting in longer travel time on that roadway. As a result, trips in the model are shifted to less congested links until there is a balance between travel demand and travel supply on the network.

4.1.2 Population and Employment Projections

Population and employment projections were developed for the City of Alexandria, the Alexandria Study Area, and Douglas County.

In analyzing the future year population, the analysis shows that the population of the area will see continued growth through 2030, with the County population increasing from 32,821 in 2000 to over 46,000. This growth is reflected in the total for both the City of Alexandria as well as the study area for the analysis. One thing to point out is that the projections represent annexed lands as identified in the City's Comprehensive Plan. Between now and 2030 it is expected that the City will continue to expand their boundaries through orderly annexation agreements that they have with the surrounding townships. For study purposes, the more important number is that represented for the study area for the Transportation Plan, which is projected to increase by over 40 percent, going from 19,910 in 2000 to nearly 28,200 in 2030. The population projections are displayed in **Figure 4-4**.

Figure 4-4. Population Projections



	2000	2005	2010	2015	2020	2025	2030
Douglas County	32,821	33,400	36,900	39,400	41,700	44,000	46,200
Study Area	19,910	20,200	21,800	23,400	25,000	26,600	28,200
City of Alexandria *	8,820	10,707	12,969	13,918	14,545	14,874	15,489

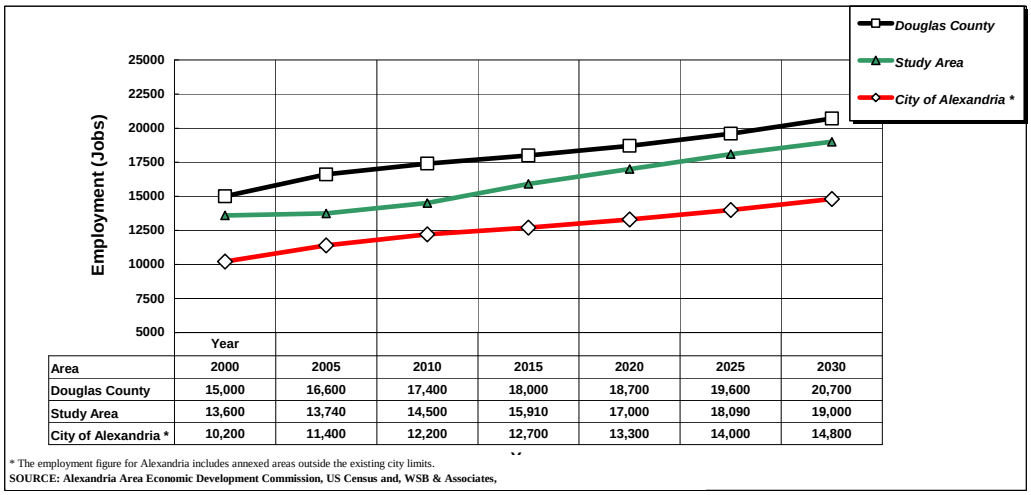
* The population estimates are based on Table 3-6 of the Comprehensive Plan and include annexed population.
SOURCE: US Census, City of Alexandria Comprehensive Plan, MN State Demographic Center, and WSB & Associates.

K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Pop and Emp_Comp Plan

The Alexandria Area Transportation Plan study area has a strong employment base and is a net importer of workers. A study conducted in 2007 by the Minnesota Department of Employment and Economic Development (MN DEED) revealed that of the 17,236 jobs located in Douglas County, 2,802 (16.3 percent) of them were held by workers living in other counties. This trend was also observed in the origin-destination travel survey described in Chapter 3. The County with the most workers commuting to work in Douglas County is Pope County located directly to the south, in which TH 29 is the major travel route. Unlike population data, it can be very difficult to find reliable and accurate employment data/projections. Therefore, the employment projections were based on the actual and projected population data using existing data as well as considering employment-to-population ratios. In the year 2030, it is estimated that Douglas County would have an employment total of approximately 20,700. Of this total, approximately 19,000 of these jobs would be located within the study area and 14,800 would be located within the City of Alexandria.

Figure 4-5 displays the employment projections for Douglas County, the study area, and the City of Alexandria.

Figure 4-5. Employment (Jobs) Projections



Area	2000	2005	2010	2015	2020	2025	2030
Douglas County	15,000	16,600	17,400	18,000	18,700	19,600	20,700
Study Area	13,600	13,740	14,500	15,910	17,000	18,090	19,000
City of Alexandria *	10,200	11,400	12,200	12,700	13,300	14,000	14,800

* The employment figure for Alexandria includes annexed areas outside the existing city limits.
SOURCE: Alexandria Area Economic Development Commission, US Census and, WSB & Associates,

K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Pop and Emp_Comp Plan

4.1.3 Land-use Assumptions (Socioeconomic Data)

Existing and future land-use requires the allocation of socioeconomic data (i.e., population and employment) into individual TAZs. Existing and future population and employment values were assigned to the Alexandria area's 106 TAZs as displayed in Table 4-1 and on **Figure 4-6** through **Figure 4-9**. Future socioeconomic data was based on land-use plans and known development proposals.

Table 4-1. Existing and Future Socioeconomic Data per TAZ

	Population			Total Employment			Retail Employment			Non-Retail Employment		
TAZ	2006	2030	*Change*	2006	2030	*Change*	2006	2030	*Change*	2006	2030	*Change*
1	169	189	20	159	179	20	150	162	12	9	17	8
2	354	396	42	95	195	100	78	138	60	17	57	40
3	36	36	0	80	180	100	30	90	60	50	90	40
4	341	348	7	331	351	20	110	120	10	221	231	10
5	269	274	5	551	571	20	365	375	10	186	196	10
6	108	108	0	220	240	20	20	28	8	200	212	12
7	801	817	16	980	1,000	20	229	241	12	751	759	8
8	264	269	5	240	260	20	140	150	10	100	110	10
9	538	549	11	37	37	0	10	10	0	27	27	0
10	247	252	5	10	10	0	10	10	0	0	0	0
11	175	179	4	70	90	20	50	60	10	20	30	10
12	376	384	8	117	137	20	58	68	10	59	69	10
13	207	211	4	200	220	20	150	160	10	50	60	10
14	346	353	7	838	858	20	164	174	10	674	684	10
15	358	365	7	632	632	0	0	0	0	632	632	0
16	534	545	11	362	462	100	162	212	50	200	250	50
17	1	1	0	370	370	0	20	20	0	350	350	0
18	1	1	0	300	800	500	0	100	100	300	700	400
19	0	0	0	512	512	0	486	486	0	26	26	0
20	3	3	0	250	250	0	0	0	0	250	250	0
21	0	0	0	350	350	0	350	350	0	0	0	0
22	7	7	0	600	700	100	600	700	100	0	0	0
23	10	10	0	430	480	50	100	112	12	330	368	38
24	3	3	0	239	289	50	239	289	50	0	0	0
25	0	0	0	150	170	20	100	113	13	50	57	7
26	4	4	0	45	65	20	45	65	20	0	0	0
27	17	17	0	150	650	500	50	217	167	100	433	333
28	22	22	0	18	68	50	0	0	0	18	68	50
29	4	4	0	3	33	30	0	0	0	3	33	30
30	6	6	0	0	20	20	0	0	0	0	20	20
31	5	5	0	0	15	15	0	0	0	0	15	15
32	3	3	0	0	15	15	0	0	0	0	15	15
33	28	35	7	0	0	0	0	0	0	0	0	0
34	143	229	86	0	0	0	0	0	0	0	0	0
35	74	1,674	1,600	0	0	0	0	0	0	0	0	0
36	43	108	65	0	0	0	0	0	0	0	0	0
37	24	30	6	0	0	0	0	0	0	0	0	0
38	56	125	69	4	4	0	0	0	0	4	4	0
39	280	375	95	0	0	0	0	0	0	0	0	0
40	12	12	0	1,161	1,661	500	0	0	0	1,161	1,661	500
41	2	2	0	0	500	500	0	100	100	0	400	400
42	108	121	13	116	316	200	0	0	0	116	316	200
43	26	33	7	45	345	300	0	30	30	45	315	270
44	350	519	169	70	70	0	15	15	0	55	55	0
45	252	282	30	2	2	0	0	0	0	2	2	0
46	509	570	61	131	131	0	0	0	0	131	131	0
47	661	740	79	100	100	0	0	0	0	100	100	0
48	464	580	116	2	2	0	0	0	0	2	2	0
49	79	88	9	104	104	0	30	30	0	74	74	0
50	288	360	72	700	1,200	500	0	100	100	700	1,100	400
51	39	52	13	1	1	0	0	0	0	1	1	0
52	591	992	401	21	21	0	0	0	0	21	21	0
53	46	52	6	625	625	0	20	20	0	605	605	0
54	145	181	36	130	530	400	0	80	80	130	450	320

SOURCES: Mn/DOT, Douglas County, City of Alexandria, WSB & Associates, Inc.

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Table 4-1 (continued). Existing and Future Socioeconomic Data per TAZ

	Population			Total Employment			Retail Employment			Non-Retail Employment		
TAZ	2006	2030	*Change*	2006	2030	*Change*	2006	2030	*Change*	2006	2030	*Change*
55	178	239	61	0	0	0	0	0	0	0	0	0
56	214	287	73	7	7	0	0	0	0	7	7	0
57	223	299	76	7	7	0	0	0	0	7	7	0
58	369	413	44	40	40	0	20	20	0	20	20	0
59	814	1,018	204	30	30	0	0	0	0	30	30	0
60	25	34	9	0	0	0	0	0	0	0	0	0
61	440	493	53	80	80	0	60	60	0	20	20	0
62	153	241	88	150	150	0	50	50	0	100	100	0
63	176	220	44	100	100	0	50	50	0	50	50	0
64	223	279	56	24	24	0	7	7	0	17	17	0
65	62	69	7	104	504	400	80	280	200	24	224	200
66	460	515	55	6	6	0	0	0	0	6	6	0
67	290	325	35	35	35	0	0	0	0	35	35	0
68	154	172	18	0	0	0	0	0	0	0	0	0
69	134	150	16	250	350	100	52	73	21	198	277	79
70	606	758	152	44	44	0	0	0	0	44	44	0
71	436	488	52	10	10	0	0	0	0	10	10	0
72	55	62	7	5	5	0	0	0	0	5	5	0
73	24	27	3	449	449	0	0	0	0	449	449	0
74	473	591	118	42	42	0	0	0	0	42	42	0
75	570	713	143	7	7	0	7	7	0	0	0	0
76	88	110	22	0	0	0	0	0	0	0	0	0
77	495	963	468	53	53	0	28	28	0	25	25	0
78	22	522	500	1	1	0	0	0	0	1	1	0
79	29	89	60	25	25	0	25	25	0	0	0	0
80	598	670	72	192	192	0	45	45	0	147	147	0
81	297	333	36	81	81	0	20	20	0	61	61	0
82	134	150	16	0	0	0	0	0	0	0	0	0
83	256	287	31	16	16	0	0	0	0	16	16	0
84	852	1,065	213	94	94	0	10	10	0	84	84	0
85	80	207	127	6	6	0	4	4	0	2	2	0
86	93	225	132	15	15	0	0	0	0	15	15	0
87	7	7	0	24	24	0	0	0	0	24	24	0
88	5	68	63	0	0	0	0	0	0	0	0	0
89	73	91	18	0	0	0	0	0	0	0	0	0
90	400	836	436	10	10	0	0	0	0	10	10	0
91	167	274	107	6	6	0	0	0	0	6	6	0
92	302	338	36	30	30	0	0	0	0	30	30	0
93	8	8	0	0	0	0	0	0	0	0	0	0
94	120	134	14	82	182	100	0	0	0	82	182	100
95	3	3	0	0	0	0	0	0	0	0	0	0
96	25	625	600	0	100	100	0	0	0	0	100	100
97	115	144	29	0	0	0	0	0	0	0	0	0
98	0	0	0	0	100	100	0	30	30	0	70	70
99	3	3	0	0	300	300	0	60	60	0	240	240
100	131	331	200	6	36	30	0	0	0	6	36	30
101	215	488	273	18	18	0	0	0	0	18	18	0
102	7	7	0	0	0	0	0	0	0	0	0	0
103	107	134	27	0	0	0	0	0	0	0	0	0
104	32	40	8	0	0	0	0	0	0	0	0	0
105	64	80	16	0	0	0	0	0	0	0	0	0
106	4	4	0	0	0	0	0	0	0	0	0	0
TOTAL	**22,246**	**30,180**	**7,910**	**15,606**	**21,030**	**5,400**	**6,245**	**7,624**	**1,355**	**11,367**	**15,436**	**4,045**

SOURCES: Mn/DOT, Douglas County, City of Alexandria, WSB & Associates, Inc.

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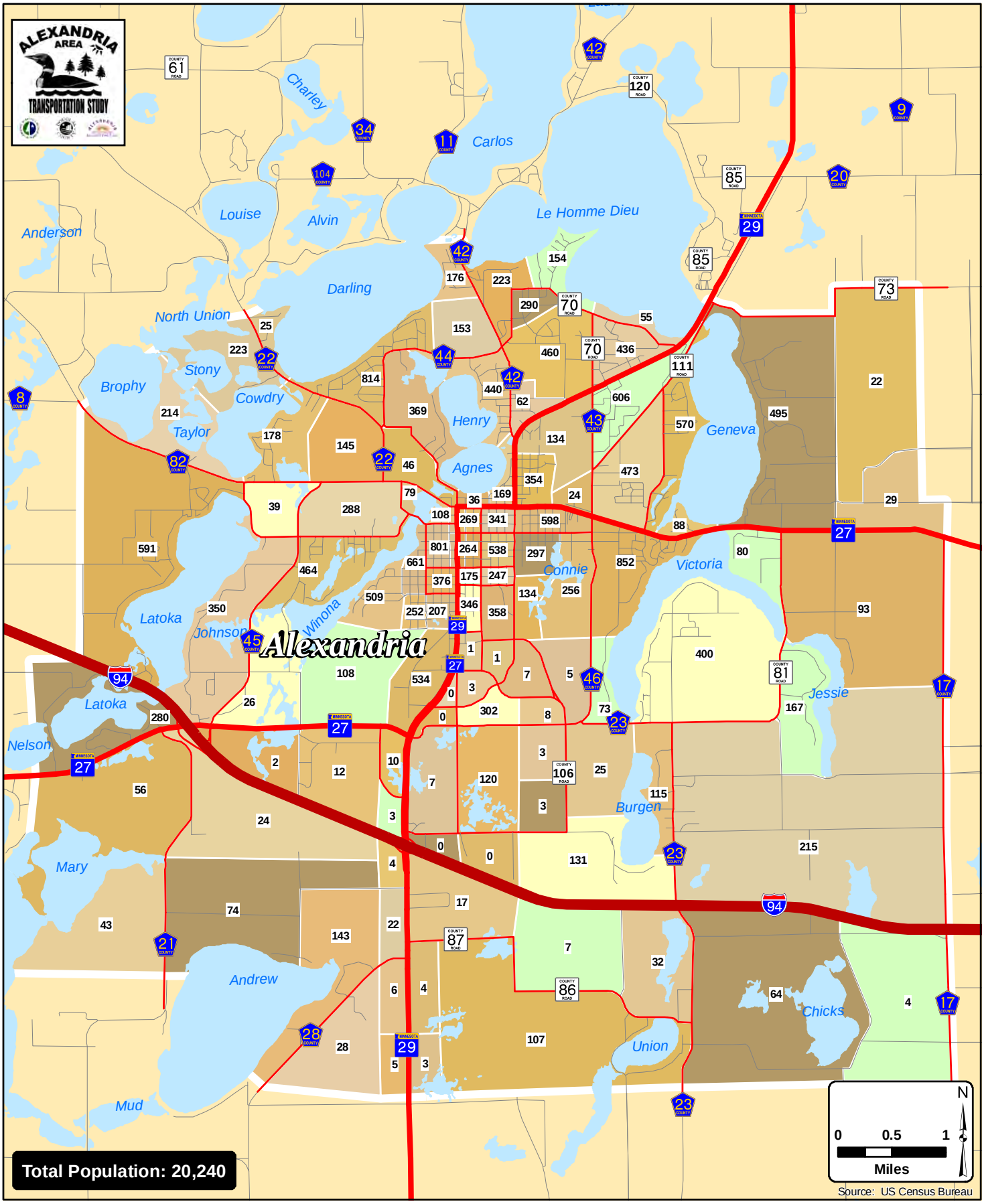

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Figure 4-6: Existing (2006) Population by TAZ

WSB & Associates, Inc.

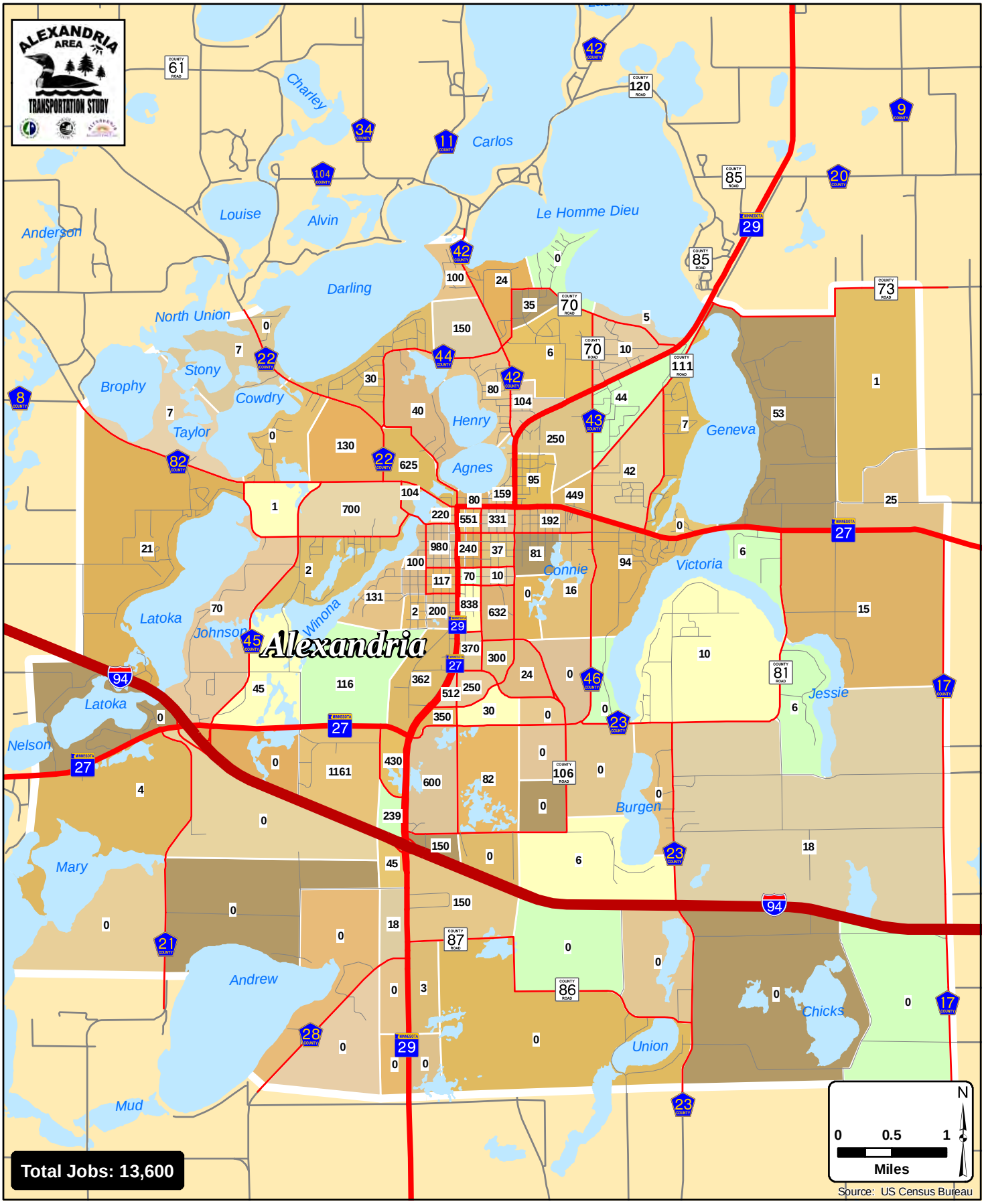

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Figure 4-7: Existing (2006) Jobs by TAZ

WSB & Associates, Inc.

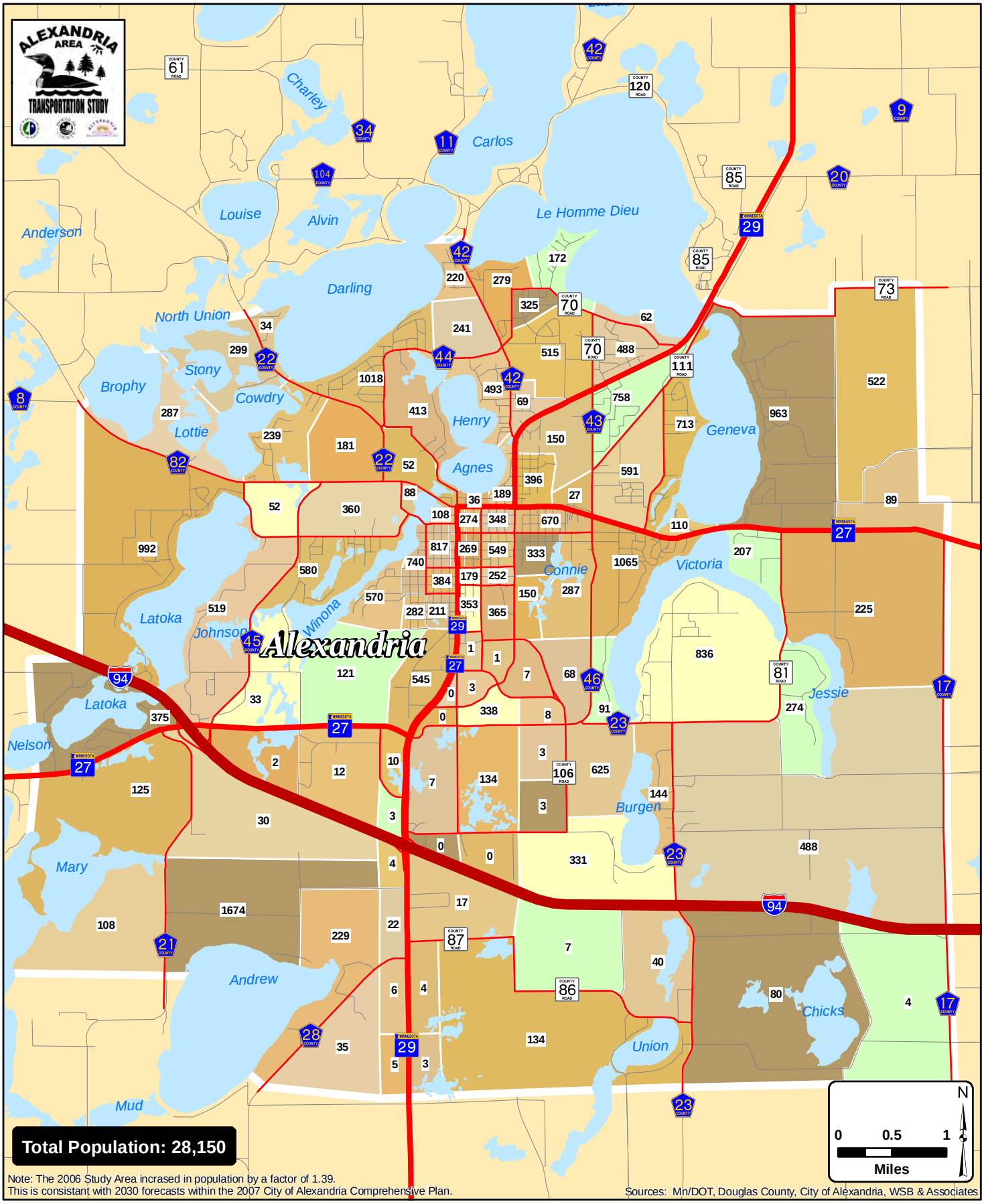

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Figure 4-8: Projected 2030 Population by TAZ

WSB & Associates, Inc.

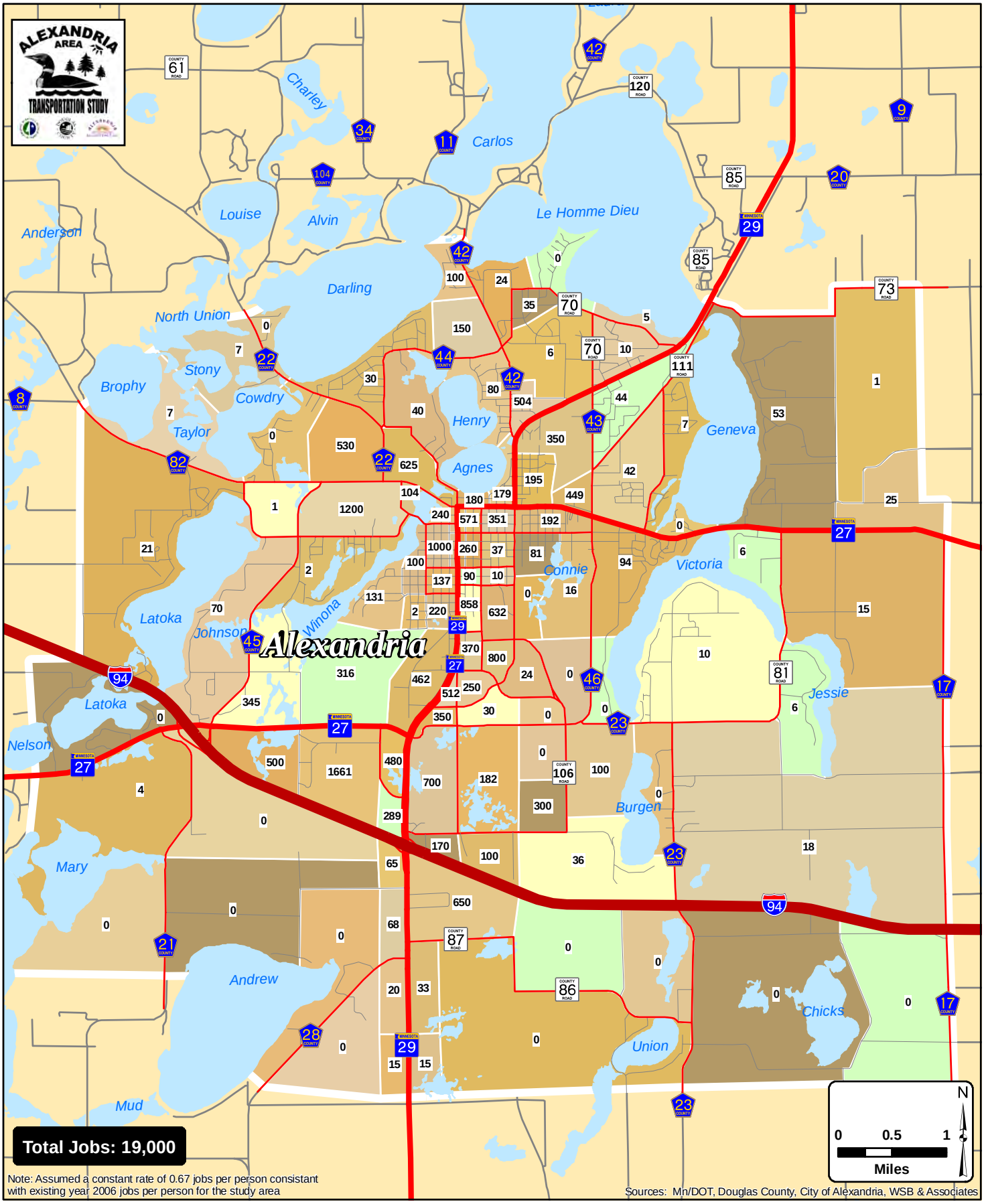

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Figure 4-9: Projected 2030 Jobs by TAZ

WSB & Associates, Inc.

Chapter 5

Future Transportation Analysis

This chapter summarizes the analysis of the years 2020 and 2030 conditions and identifies future year issues within the Alexandria Area Transportation Study area. The analysis addresses vehicle, transit, and non-motorized transportation modes to identify potential deficiencies or weaknesses within the overall transportation system. Future year issues/concerns are identified and potential transportation improvements are considered for application within the Alexandria area.

5.1 Forecast 2020 and 2030 Daily Traffic

The year 2030 population and employment projections for the Alexandria area are the two critical variables used to project future year traffic levels for identifying capacity and other transportation related deficiencies. As expected, the growth in population and employment translated into increased traffic levels on the transportation network. In addition to projecting 2030 traffic levels, 2020 projections were developed to assist in determining the timing of necessary improvements. The 2020 traffic levels were developed using a linear regression formula to develop a growth factor that was applied to existing traffic levels.

Using the Alexandria Area Transportation Plan Travel Demand Model, 2020 and 2030 traffic projections were developed as presented on **Figure 5-1** and **Figure 5-2**.

5.2 Transportation Improvements

The year 2030 daily traffic projections for the Alexandria area are necessary to evaluate future year transportation conditions and potential transportation improvements. Potential transportation improvements were identified and evaluated to determine how effective the potential improvements are in addressing the transportation deficiencies. In general, only projects that would increase traffic capacity were identified in the plan. Project such as resurfacing or reconstruction of facilities to their original function (capacity) were not included as these generally will not result in changed travel patterns or travel conditions.

Programmed improvements are those that have been approved for implementation with identified funding sources. For the City of Alexandria and Douglas County these projects are included within their Capital Improvements Program (CIP). For Mn/DOT, they are identified within the State Transportation Improvement Program (STIP) which lists all state and local transportation projects with federal highway and/or federal transit funding along with 100% state funded transportation projects. The STIP is developed/updated on an annual basis. The following sections summarize the transportation improvements being considered over the next twenty years within the Alexandria area.

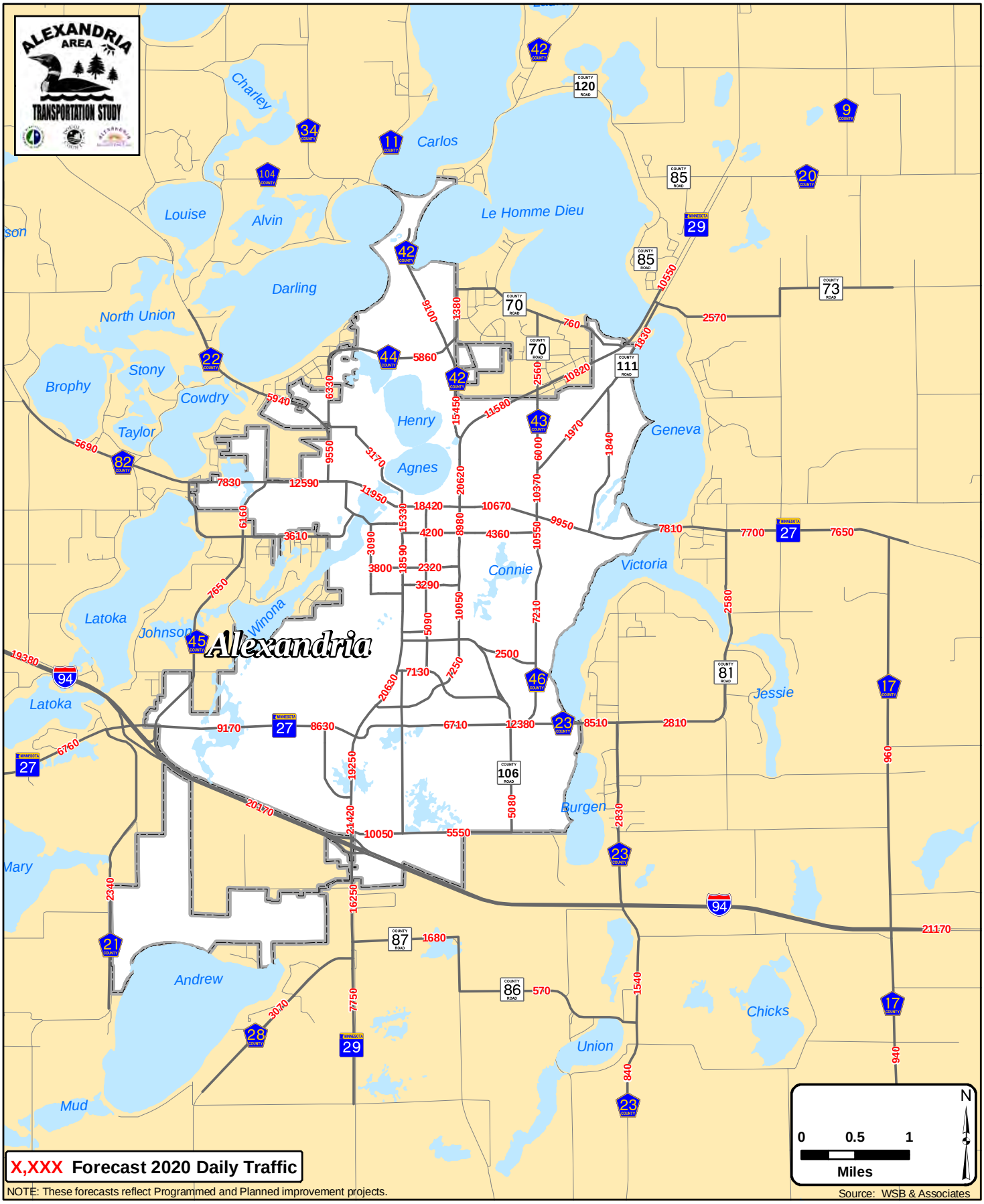

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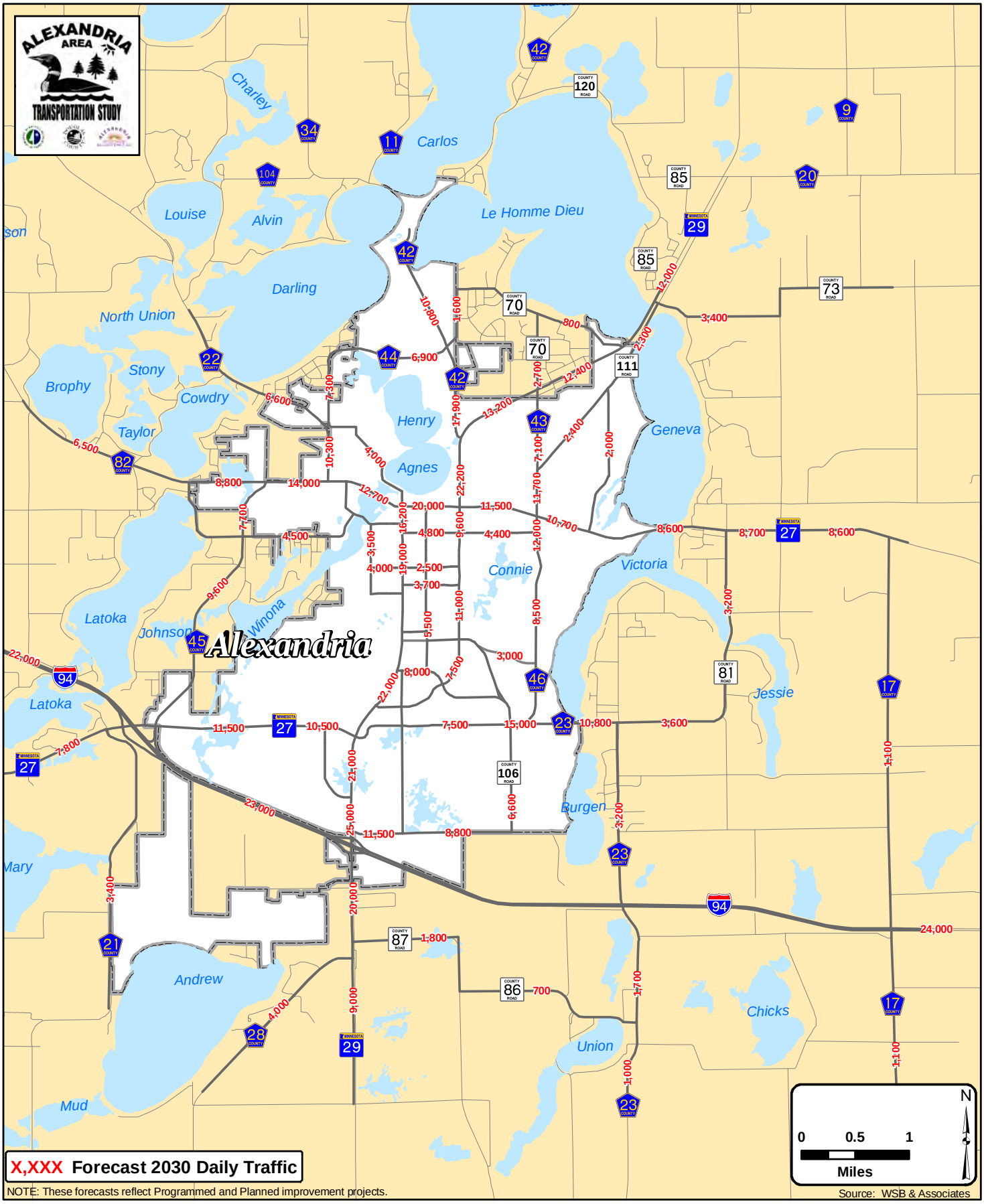
Figure 5-1: Forecast 2020 Average Daily Traffic



Alexandria Area Transportation Study

Figure 5-2: Forecast 2030 Average Daily Traffic

5.2.1 Roadway Improvement Projects

Three transportation improvement scenarios (programmed, planned, and potential projects) were identified for analysis as part of the Alexandria Area Transportation Plan. The improvement scenarios attempt to address future year transportation deficiencies. The roadway improvement scenarios were defined as follows:

- **Programmed Projects**[6] – Programmed projects are transportation improvements that have funding and are likely to be constructed by 2015.
- **Planned Projects** – Planned projects are transportation improvements that are either planned or desired to be in place between the years 2015 and 2020.
- **Potential Projects** – Potential projects are defined as transportation improvements that are being recommended for construction by either year 2020 or 2030.

Figure 5-3 displays the Programmed, Planned, and Potential projects described in the following sections.

Programmed and Planned Roadway Improvements

The programmed and planned transportation improvement projects have been discussed at the State, County, or City level and currently have funding or are in the process of acquiring funding. These projects have been previously identified as improving the access and mobility of the area and are scheduled to be completed in the near future. **Table 5-1** summarizes these projects and the effect that each project will have on the capacity of the roadway.

Table 5-1. Programmed and Planned Roadway Improvement Projects

Map ID #	Project	Location		Improvement	Capacity	
		From	To		Before	After
1. Programmed Projects (completed prior to 2015)						
Pr1	TH 29	3rd Avenue	just north of CSAH 42	Construct / Restripe Additional NB Lane	At	Under
Pr2	18th Avenue	Broadway	Nokomis Street	New Roadway (2-Lane)	NA	NA
Pr3	18th Avenue	Nokomis Street	CSAH 46	New Roadway (2-Lane)	NA	NA
Pr4	50th Avenue	Broadway	Railroad	Upgrade from 2-Ln to 5-Ln Roadway	Approaching	Under
Pr5	Nokomis Street	3rd Avenue	6th Avenue	Construct / Restripe Additional NB Lane	Approaching	Under
Pr6	CR 106	CSAH 46	50th Avenue	Add Turn Lanes	NA	NA
2. Planned Projects (completed between 2015 and 2020)						
Pl1	TH 29	I-94	CSAH 28	Upgrade from 2-Ln to 4-Ln Divided Roadway[1]	Approaching	Under
Pl2	TH 29	NA	NA	Replace interchange at TH 29 and I-94[2]	NA	NA

[1]Project is expected to be included in the 2012 - 2015 State Transportation Improvement Program (STIP).

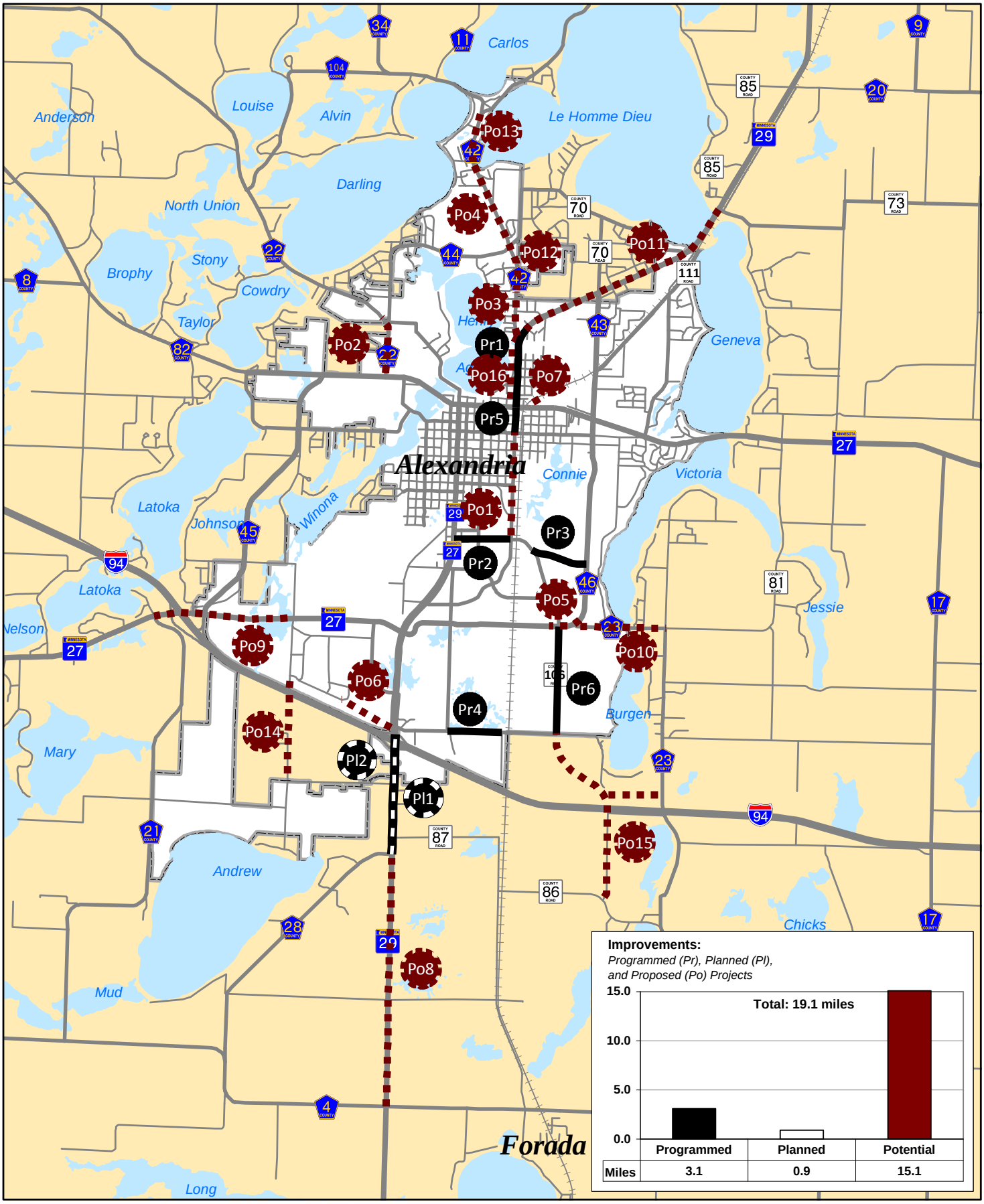
[2]Alternative interchange concepts were developed for the Subarea 1 Analysis (See Section 6.1 of the Report). These concepts range in cost from $4 million (bridge replacement) to $25 million (full reconstruction). Of the concepts, the tight urban diamond interchange represents the lowest cost alternative that meets the mobility objectives. Only the replacement of the existing bridges is expected to be included in the 2012 - 2015 STIP.

GENERAL NOTE:
Programmed and Planned projects were used to categorize projects into different improvement scenarios. The terminology does not guarantee that any of these projects will be constructed nor does it guarantee that a specific project will be constructed during the identified time frame.

SOURCE: Mn/DOT, Douglas County, City of Alexandria, and WSB & Associates
K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Roadway Projects Congestion

The 2020 and 2030 roadway networks assume that the programmed and planned projects have been constructed. Year 2020 and 2030 congestion levels were determined using the 2020 and 2030 projected traffic volumes. These volumes were compared to roadway capacities standards to determine future roadway congestion. **Figure 5-4** displays the mileage comparison of existing and future (2020 and 2030) congestion levels for approaching, at, and over-capacity roadway segments.

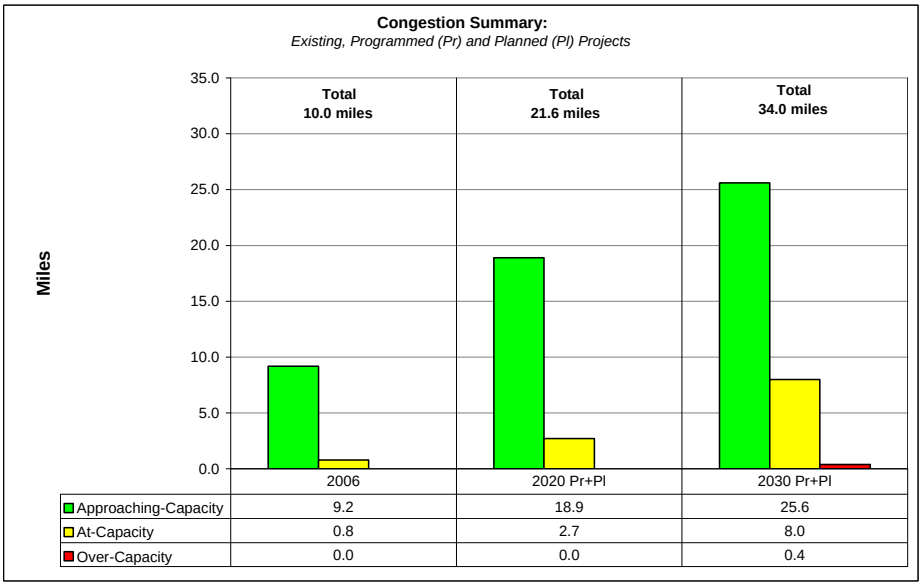
[6] The term "Programmed Projects" does not guarantee that these projects will be constructed.



Alexandria Area Transportation Study

Figure 5-3: Programmed, Planned, & Potential Improvements

Figure 5-4. Existing and Future Congestion Levels with Programmed and Planned Projects



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Potential Roadway Improvements

Potential transportation improvement projects are those that address the remaining transportation deficiencies identified after the programmed and planned projects are constructed. Potential projects are assumed to be constructed by year 2020 or year 2030. The determination on when to implement potential improvement projects is dependent upon the projected congestion level by time period. For example, some roadway segments will reach congestion levels sooner than others and therefore require mitigation earlier. The potential projects by year 2020 and 2030 are summarized in **Table 5-2**.

Table 5-2. Potential Roadway Improvement Projects

Map ID #	Project	Location		Improvement	Capacity	
		From	To		Before	After
3. Potential Projects (completed prior to 2020)						
Po1	Nokomis Street	18th Avenue	6th Avenue	Upgrade from 2-Ln to 3-Ln Roadway	At	Approaching
Po2	CSAH 22	CSAH 82	CSAH 44	Upgrade from 2-Ln to 3-Ln Roadway	At	Approaching
Po3	CSAH 42	TH 29	Bethesda Street	Upgrade from 3-Ln to 4-Ln Divided Roadway	At	Under
Po4	CSAH 42	CSAH 44	Browns Point Road	Upgrade from 2-Ln to 3-Ln Roadway	At	Under
Po5	CSAH 46	CR 106	CSAH 23	Add Eastbound Auxiliary Lane[1]	Approaching	Under
Po6	50th Avenue	TH 29	42nd Avenue	New Roadway (2-Lane)[2]	NA	NA
Po7	New Connection	Park Street/1st Avenue	TH 27	New Roadway (2-Lane)[3]	NA	NA
4. Potential Projects (completed prior to 2030)						
Po8	TH 29	CSAH 28	CSAH 4	Upgrade from 2-Ln to 4-Ln Divided Roadway	Approaching	Under
Po9	TH 27	CSAH 21	Nevada Street	Upgrade from 2-Ln to 4-Ln Divided Roadway	At	Under
Po10	CSAH 23	CSAH 46	CR 81	Upgrade from 2-Ln to 3-Ln Roadway	At	Under
Po11	TH 29	CSAH 42	CR 73	Upgrade from 2-Ln to 4-Ln Divided Roadway	At	Under
Po12	CSAH 42	Bethesda Street	CSAH 44	Upgrade from 3-Ln to 4-Ln Divided Roadway	At	Under
Po13	CSAH 42	Browns Point Road	CSAH 11	Upgrade from 2-Ln to 3-Ln Roadway	At	Under
Po14	Nevada Street	NA	NA	Construct I-94 Overpass and Roadway	NA	NA
Po15	CR 106	NA	NA	Construct I-94 Interchange and Roadway	NA	NA
Po16	TH 29	3rd Avenue	just north of CSAH 42	Construct Additional SB Lane (5-Lane Roadway)	Under[4]	Under

[1]This segment of CSAH 46 performs like a 3-lane section due to left and right turn lanes being present at the intersections. Therefore, the capacity is assumed to be the same as a 3-lane section. To address delay and congestion at the intersection of CR 106 and CSAH 46, an eastbound auxiliary lane is recommended.

[2]This improvement includes extending 50th Avenue west to 42nd Avenue, realigning the southern portion of the West Frontage Road, modifying access at the 50th Avenue / Twin Blvd intersection (3/4 access), and constructing a new roadway segment from Twin Blvd to 50th Avenue ending in a new traffic signal.

[3]This improvement provides residents of the neighborhood east of TH 29 another option to connecting to the regional roadway network at TH 27. This improvement may offer a safer route into and out of the neighborhood during peak traffic periods on TH 29.

[4]Although this segment is projected to operate under capacity, this improvement is being reccommended so as to achieve lane balance between northbound and southbound lanes due to the near-term improvement of constructing an additional northbound lane.

SOURCE: Mn/DOT, Douglas County, City of Alexandria, and WSB & Associates

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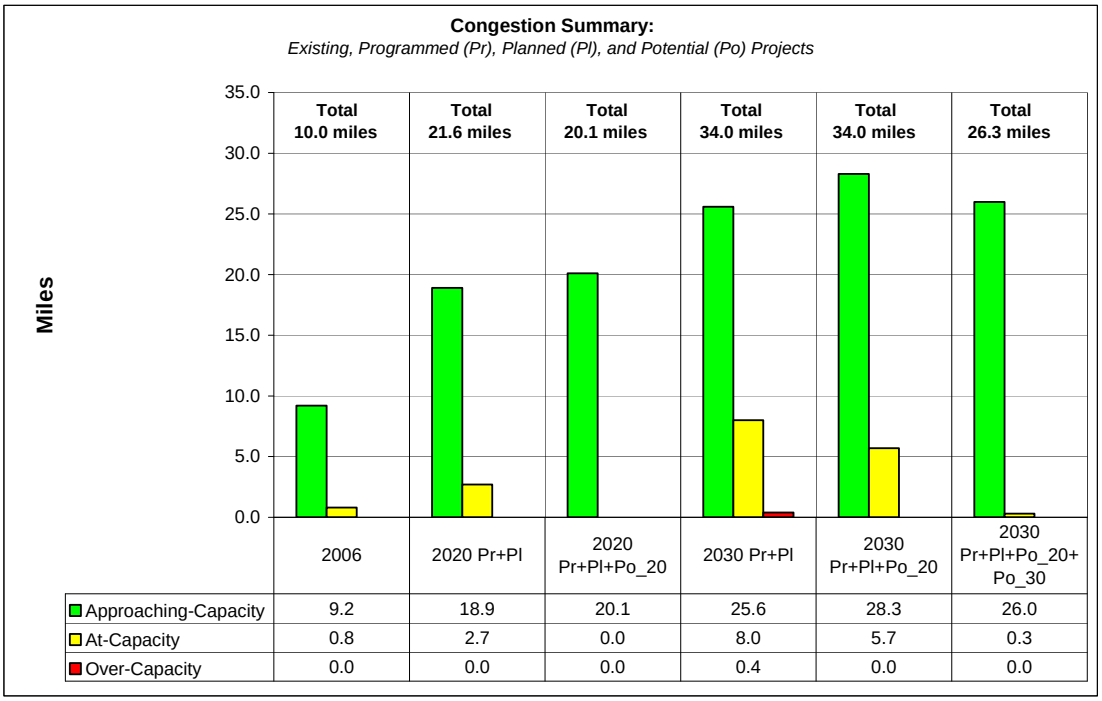
A cause and effect comparison was made to show changes in congestion on the transportation system due to constructing potential projects 1 through 7 by year 2020 and projects 8 through 16 by year 2030. **Figure 5-5** displays this comparison in miles of existing and future congestion for approaching, at, and over-capacity roadway segments.

Figure 5-5. Existing and Future Congestion Levels with Programmed, Planned, and Potential Projects



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With all the potential improvements in-place by year 2030, it is anticipated that no miles will be operating over-capacity with only 0.3 miles operating at-capacity. Provided in **Figure 5-6** through **Figure 5-10** are the actual roadway segments experiencing congestion in 2020 and 2030 within the study area. The following provides a description of the improvement scenarios:

- 2020 Programmed plus Planned Improvements (2020 Pr+Pl)
  Programmed and planned projects completed by year 2020

- 2020 Programmed plus Planned plus 2020 Potential Improvements (2020 Pr+Pl+Po_20)
  Programmed, planned, and 2020 potential projects completed by year 2020

- 2030 Programmed plus Planned Improvements (2030 Pr+Pl)
  2030 traffic levels with programmed and planned projects completed by year 2030

- 2030 Programmed plus Planned plus 2020 Potential Improvements (2030 Pr+Pl+Po_20)
  2030 traffic levels with programmed, planned, and 2020 potential projects completed by year 2030

- 2030 Programmed plus Planned plus 2020 and 2030 Potential Improvements (2030 Pr+Pl+Po_20+Po_30)

  2030 traffic levels with programmed, planned, 2020 and 2030 potential projects completed by year 2030

General Improvement Recommendations

Through the course of this study, there has a theme of transportation improvements that have been requested by the public, stakeholders, and project committee members. These comments can be grouped into three general improvement categories:

- **Signal timing and traffic progression**

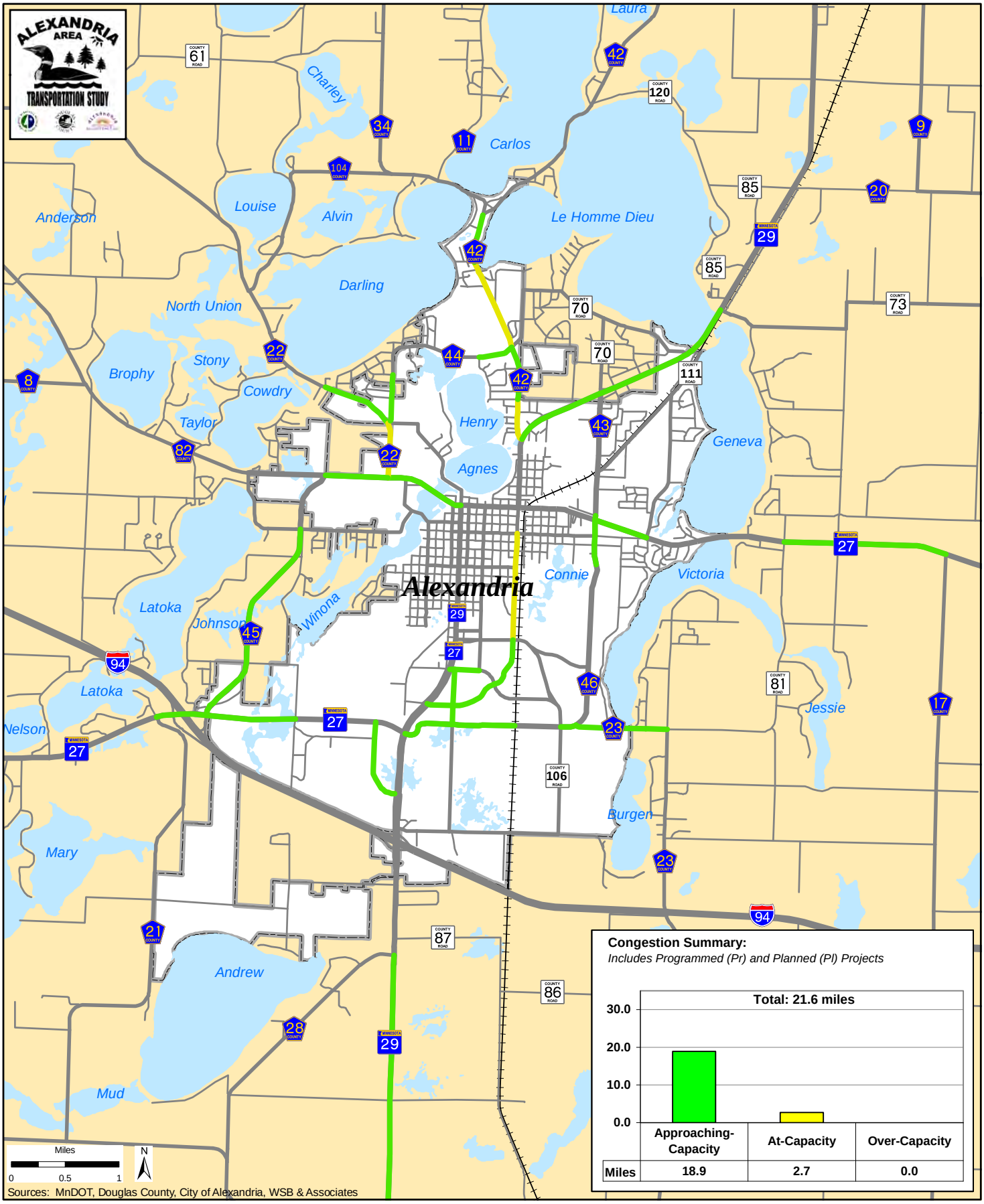
  Traffic progression can be improved through signal timing and network coordination. An area that has received many comments is the TH 29 corridor from I-94 through downtown. To facilitate travel mobility through this corridor, efforts should be made to coordinate the signals For instance, a system that has coordinated timing for each of the peak periods of travel (a.m. and p.m.) should be incorporated into the entire signal network as opportunity arises such as intersection reconstruction or signal upgrades, etc. In addition to the TH 29 corridor, there may be other corridors in the area that could benefit from these types of signal progression improvements.

- **Pedestrian and bicycle crossings**

  Throughout the study area there are opportunities to improve pedestrian and bicycle travel movements. Provided in the appendix is the Pedestrian / Bicycle Crossing Enhancements Study – 3rd Avenue Focus, 2010, which was completed by WSB for Douglas County Active Living and Safe Communities. In this report, a design was completed for an enhanced pedestrian crossing of 3rd Avenue between Broadway and Nokomis Street. This design incorporates low cost improvement measures such as a pedestrian refuge island, enhanced signing, and a more visible crosswalk. In the report, a design was developed for the 3rd Avenue crossing at Jefferson Street. This design, which includes the pedestrian crossing on the west approach of the intersection is estimated to cost under 10,000 dollars (2010) to construct. A similar effort, also sponsored by Douglas County Active Living and Safe Communities, was completed by HKGi with WSB for the section of Broadway in downtown Alexandria. In this effort, a redesigned streetscape was developed that incorporates enhanced pedestrian and bicycle travel amenities. A rendering of the potential design (not funded) is provided in the appendix.

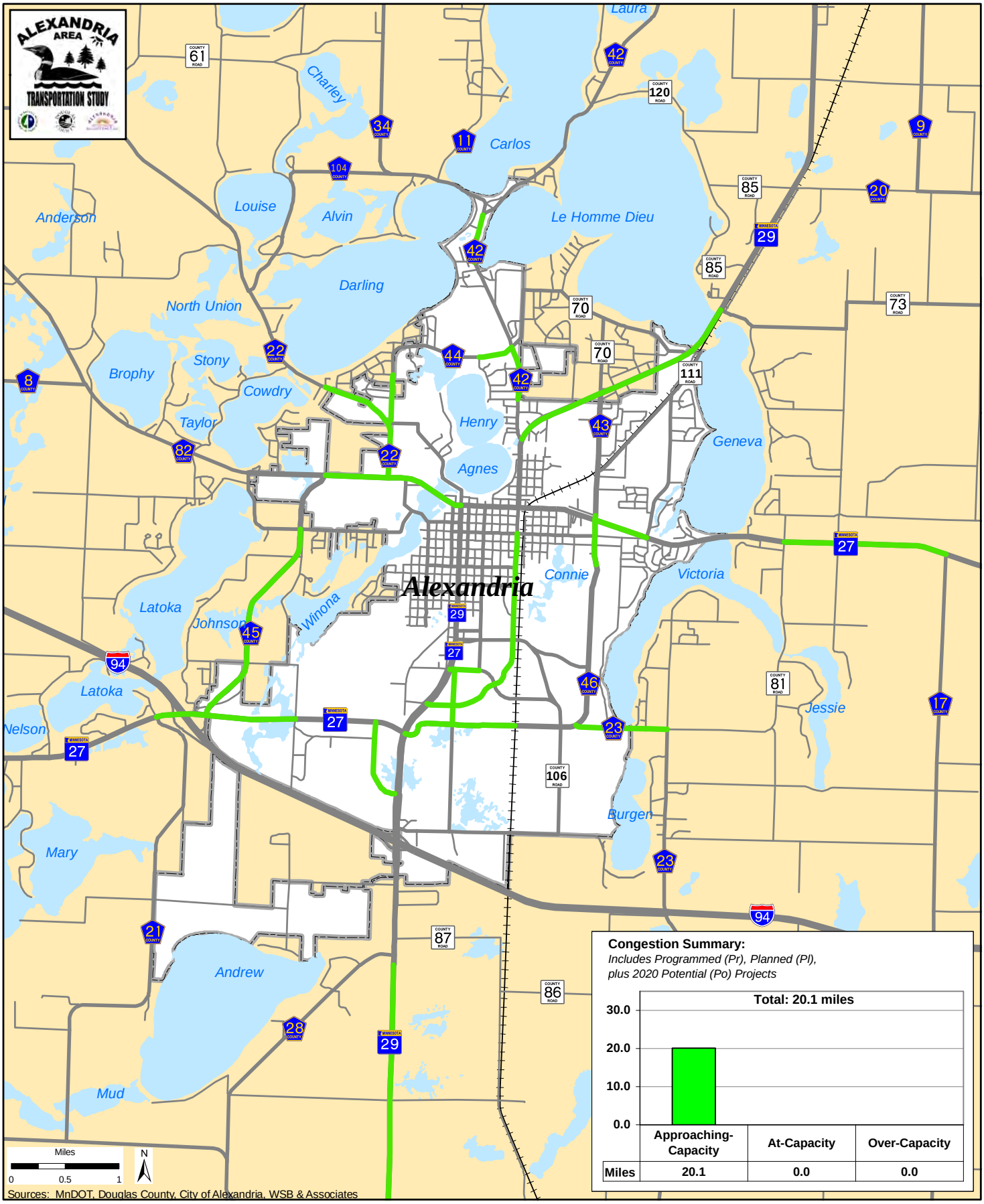
- **Travel turn lanes and/or bypass lanes**

  TH 29, particularly on the outer edges of the study area, is a higher speed roadway where in some locations there are turn-lanes and/or bypass lanes. This has been very successful in maintaining traffic flow around stopped or slowing left-turning vehicles. This is a measure that could be expanded to additional locations. One such location that has been cited by the public is southbound TH 29 at CR 73 in the northeastern portion of the study area.



Alexandria Area Transportation Study

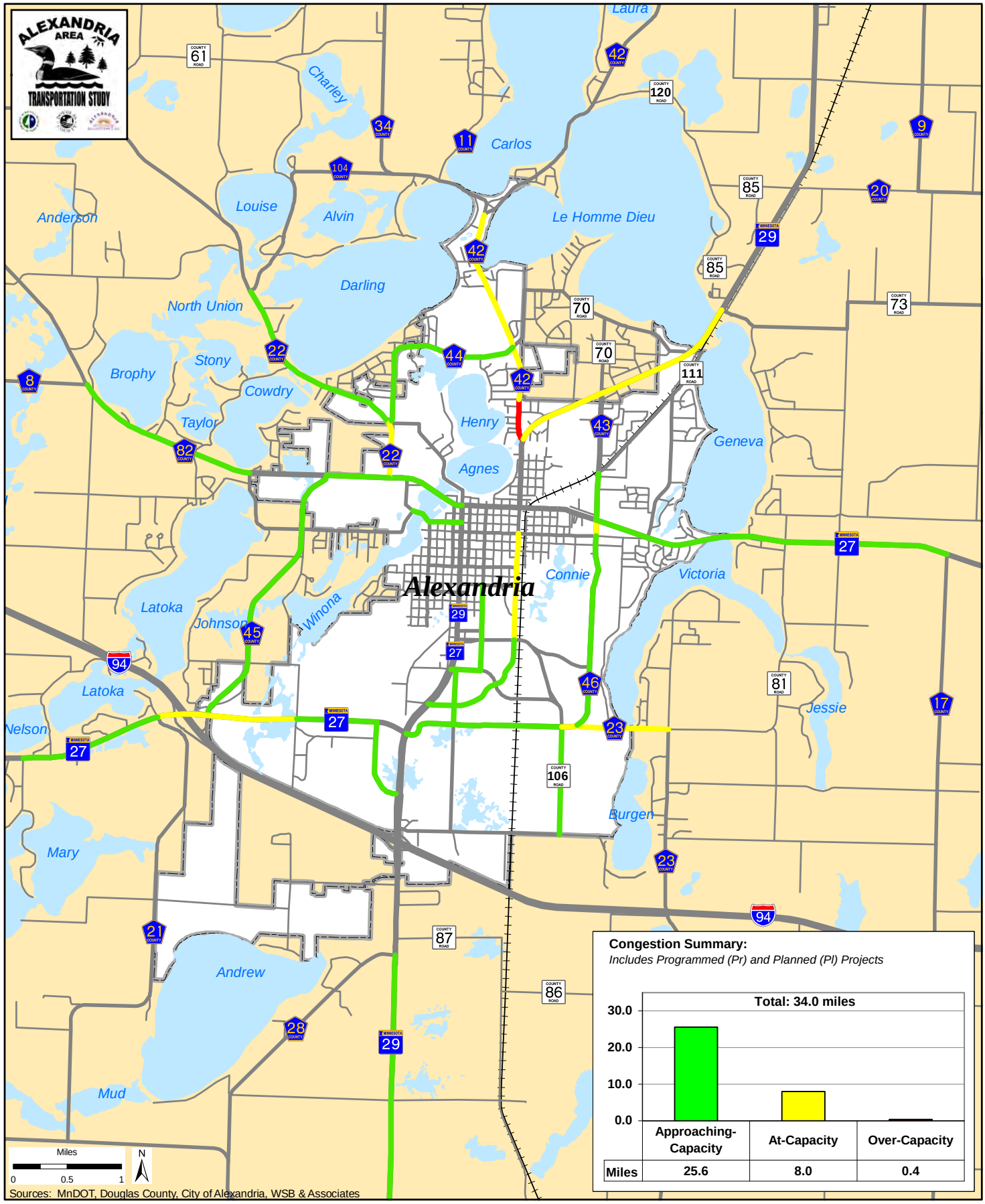
Figure 5-6: 2020 Roadway Congestion Levels (Pr+Pl)



Alexandria Area Transportation Study

Figure 5-7: 2020 Roadway Congestion Levels (Pr+Pl+Po_20)

WSB & Associates, Inc.



Alexandria Area Transportation Study

Figure 5-8: 2030 Roadway Congestion Levels (Pr+Pl)

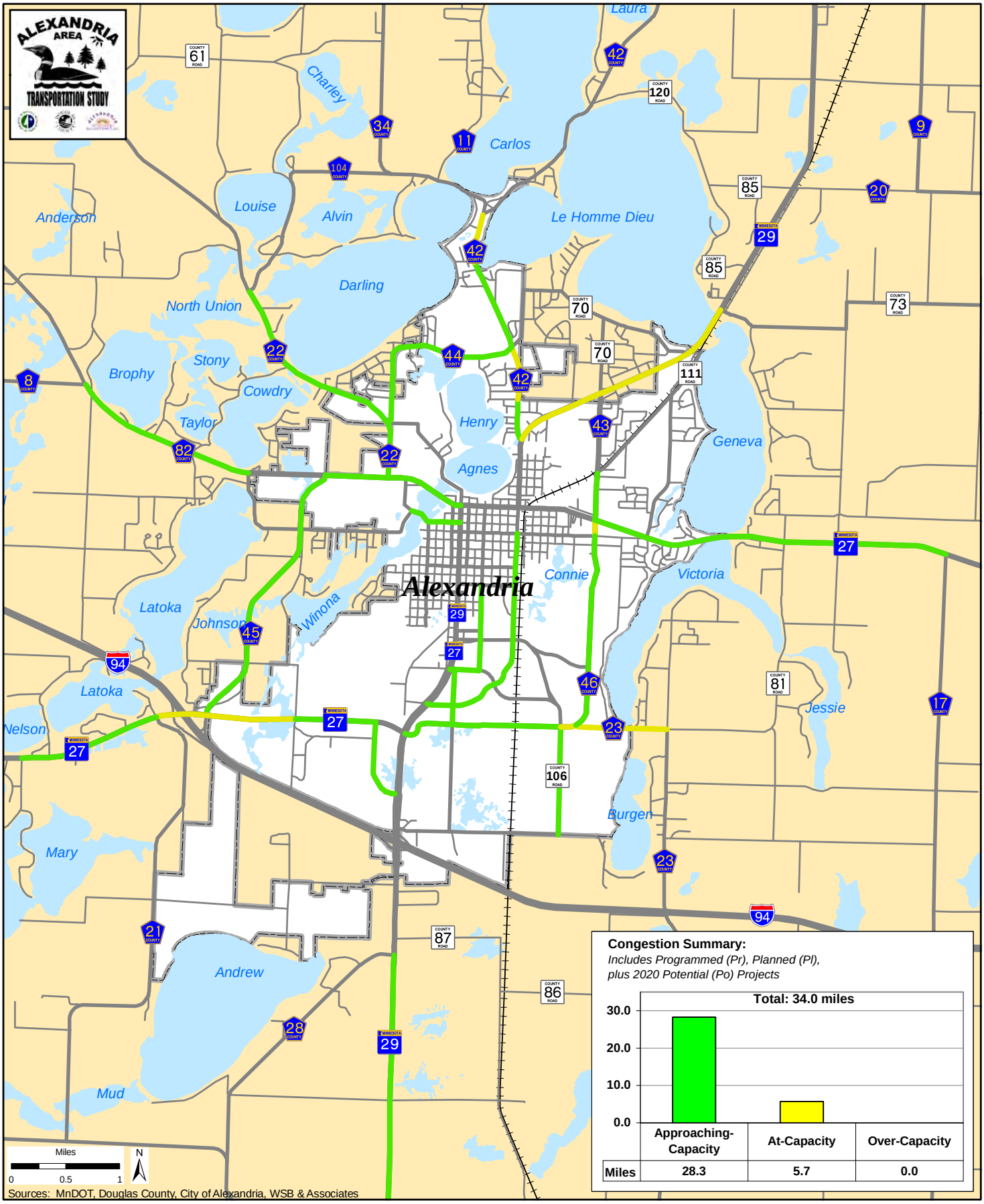


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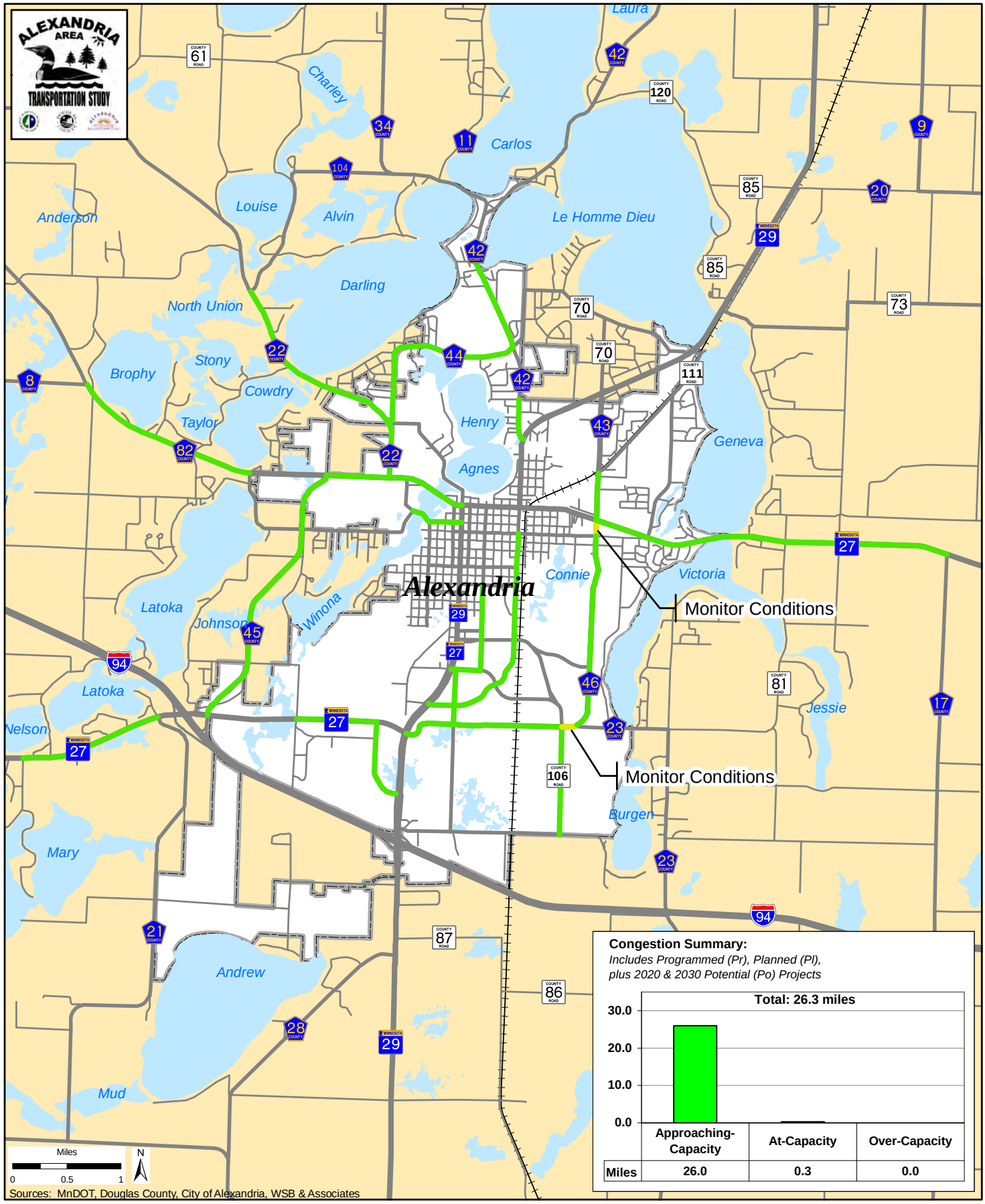
Figure 5-9: 2030 Roadway Congestion Levels (Pr+Pl+Po_20)



Alexandria Area Transportation Study

Figure 5-10: 2030 Roadway Congestion Levels (Pr+Pl+Po_20+Po_30)

5.3 Potential Locations for New Interchange

An evaluation was conducted to determine whether adding an additional interchange on I-94 would reduce traffic on TH 29 through Alexandria. Two potential interchange locations east of TH 29 were evaluated. These locations include:

- CSAH 17 (approximately 5 miles east of TH 29)
- CR 106 (approximately 2 miles east of TH 29)

The locations of the existing and potential interchanges are displayed in **Figure 5-11**.

5.3.1 Interchange at CSAH 17

This location, which is approximately 5 miles east of the TH 29, would link I-94 and CSAH 17, which is a north-south travel route. This would be a direct connection between the interstate and the County roadway system. Furthermore, it was assumed that a new east bypass route would be completed to connect I-94 to TH 29 near Carlos, via CSAH 17, TH 27, Liberty Road, and an extension of Liberty Road to CSAH 20, which would then connect to TH 29.

The travel demand model developed for the Alexandria Area was used to compare differences in year 2030 traffic assignments between the roadway network with and without the additional interchange. Using the travel demand model, traffic forecasts were developed that reflected the change in travel patterns. A comparison was then made to determine the impact of the new interchange on the existing interchanges and the associated roadway network.

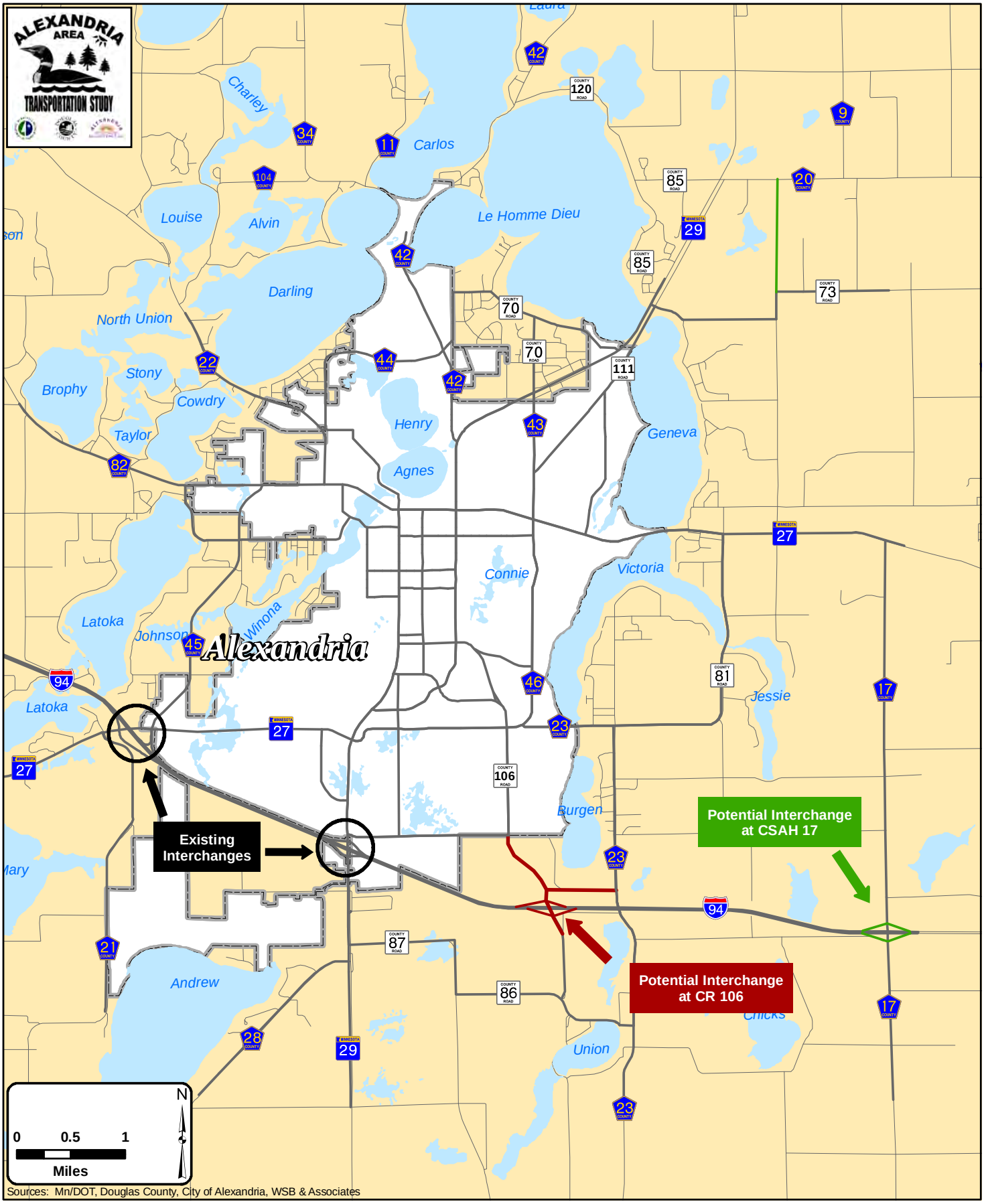
The results of the analysis, which compared the base 2030 roadway network (no new interchange) with the revised roadway network (CSAH 17 interchange), revealed a minimal impact on serving local and regional travel. CSAH 17 north of I-94 would attract only 2,100 additional trips per day. It was concluded that CSAH 17, which is east of the lakes area (Geneva, Victoria, Jessie, and Burgen), is too isolated from major trip generators and travel routes to relieve traffic on the TH 29 corridor. **Figure 5-12** displays projected 2030 daily traffic volumes for the CSAH 17 interchange option.

5.3.2 Interchange at CR 106 (Pioneer Road)

The location, which is approximately 2 miles east of the TH 29 interchange, would link I-94 with CR 106. In addition to the interchange, a supporting roadway system would be constructed to link into the existing County roadway system. Immediately north of I-94, a new east-west frontage road would connect to CSAH 23. South of I-94, the interchange would connect to CR 86 via Hamann Road.

The travel demand model compared differences in year 2030 traffic assignments between the roadway network with and without the additional interchange. Using the model, traffic forecasts were developed and evaluated to determine the impact of the new interchange on the existing interchanges and the associated roadway network. Currently there is a rest area with truck parking located on the north side of I-94 at this location. Adverse and/or favorable impacts associated with closing or relocating this rest area were not considered in this evaluation.

The results of the analysis, which compared the base 2030 roadway network (no new interchange) with the revised roadway network (CR 106 interchange), revealed that TH 29 will experience a reduction in daily traffic. The greatest reduction will be on the 1.75 mile segment extending from I-94



Sources: Mn/DOT, Douglas County, City of Alexandria, WSB & Associates

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Figure 5-11: Existing and Potential Interchange Locations

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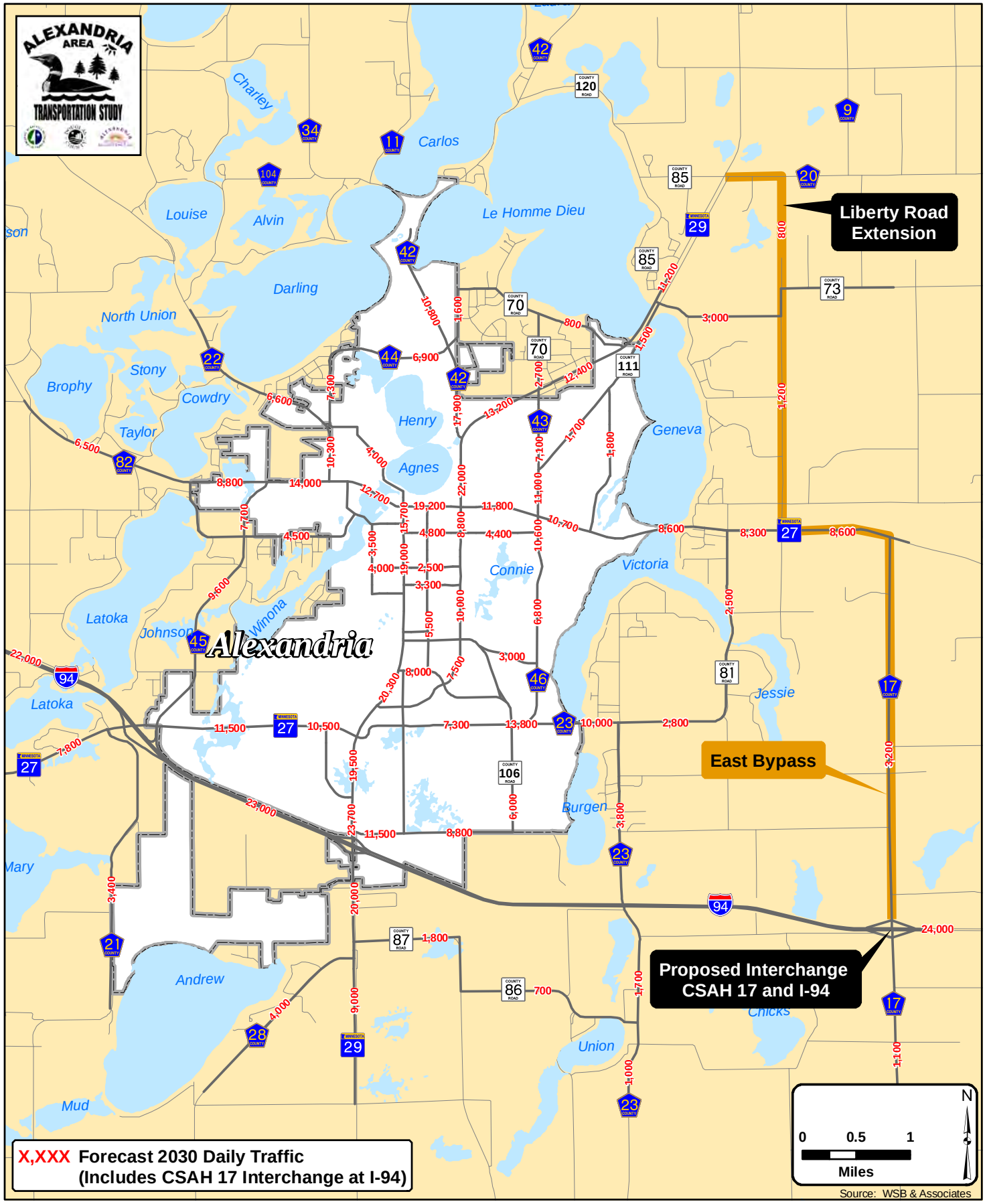

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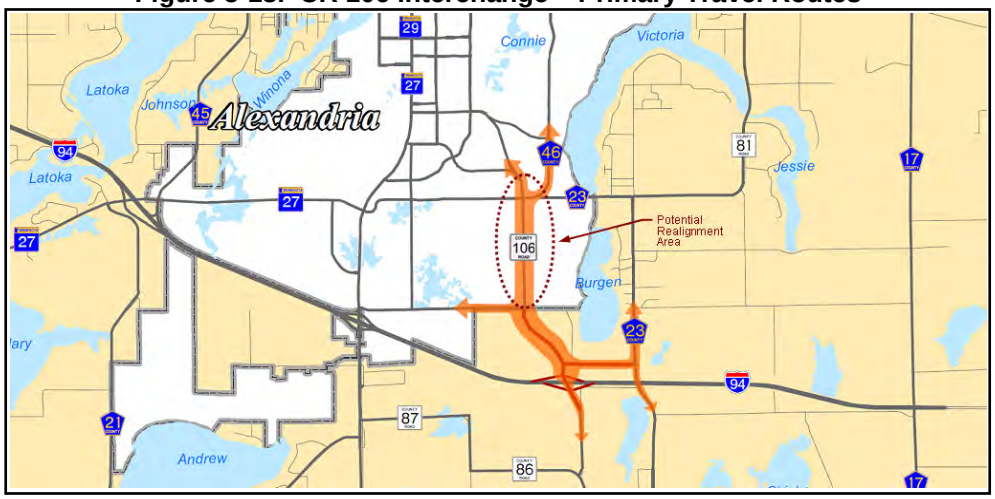
Figure 5-12: Forecast 2030 Average Daily Traffic (CSAH 17 Interchange)

to 22nd Avenue, where traffic volumes will decrease by up to 7,000 vehicles compared to the scenario with no new interchange. Immediately north of I-94 the daily traffic volume will decrease from 25,000 to 18,000. It can be assumed that these vehicles will use the new interchange at CR 106 as the daily traffic volume on CR 106 north of I-94 is also 7,000. The CSAH 23/46 and CR 106 alignment should be adjusted at the time of the improvement to accommodate increased traffic levels. Along with this, the affected agencies should consider undertaking Official Mapping within the corridor to preserve alignment right-of-way.

From a review of travel patterns of vehicles using this interchange, this location provides an alternative route to access the 50th Avenue corridor, the Alexandria Technical College/3-M/Hospital/High School area, downtown Alexandria, eastern Alexandria (CSAH 23, CR 81), and northern Alexandria (TH 29) via CSAH 46/43 (McKay Avenue). **Figure 5-13** displays the primary travel routes utilized by drivers using the new interchange. **Figure 5-14** displays the forecast 2030 daily traffic volumes with the additional interchange. Roadway segments are color coded to represent increases or decreases as compared to forecasts without the additional interchange.

Figure 5-13. CR 106 Interchange – Primary Travel Routes

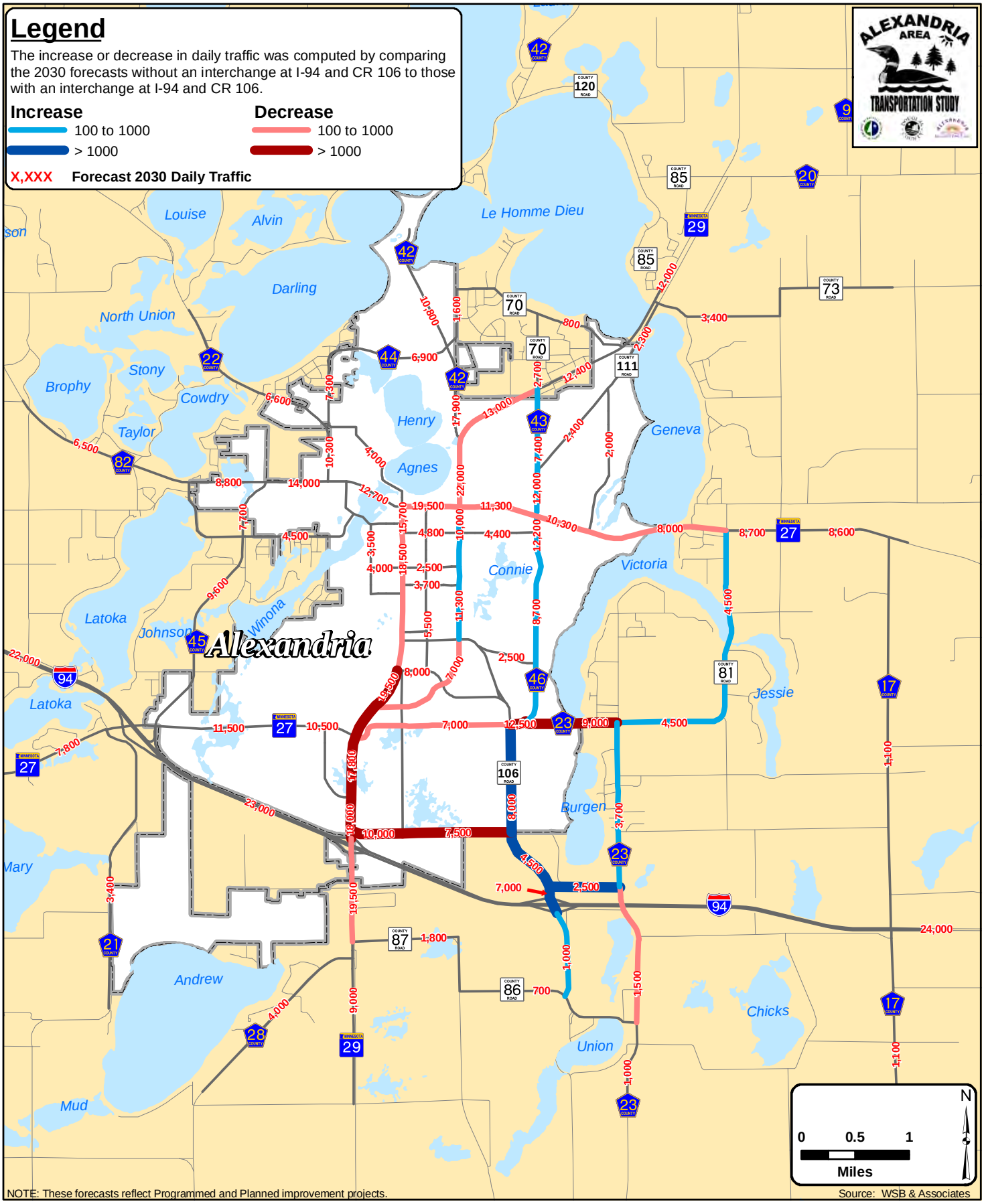


5.3.3 Summary

The analysis of the CSAH 17 interchange determined that it would have a negligible impact on serving local and regional travel. CSAH 17 north of I-94 would attract only 2,100 additional trips per day. It was concluded that CSAH 17, which is over 5 miles from the TH 29 interchange and east of the lakes (Geneva, Victoria, Jessie, and Burgen), was too isolated from major trip generators and travel routes.

The analysis of the CR 106 interchange determined that it will relieve traffic on TH 29 and its interchange with I-94. In general, the interchange allows for more direct and efficient travel between major trip generators. Routes that are anticipated to experience increased traffic volumes include CR 106, CR 81, CSAH 46/43, and CSAH 23. In general, the travel pattern changes will be more pronounced near the interchange (increases and decreases greater than 1,000). By the time traffic reaches the area north of 22nd Avenue, changes will be less noticeable as travel disperses onto local routes. South of I-94, there will be little change in daily traffic volumes.

In summary, it is recommended that the next interchange for the Alexandria area should be located at CR 106. However, it is also recognized that the CSAH 17 has merit, particularly as the Alexandria area



Alexandria Area Transportation Study

Figure 5-14: Forecast 2030 Average Daily Traffic (CR 106 Interchange)

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continues to grow. Therefore, it is recommended that CSAH 17 be the next interchange location upon construction of the CR 106 interchange. As the need for this interchange (CSAH 17) is based on travel demand, it is recommended that each subsequent transportation plan revisit this future improvement to determine a timeline for construction.

5.4 Nevada Street Overpass at I-94

An evaluation was conducted to determine the effectiveness of constructing an overpass of I-94 that would connect the north and south sides via an extension of Nevada Street. In the future, it is projected that the area south of I-94, specifically near Lake Andrew will see a substantial increase in population. Likewise, the area north of I-94 within or near the Alexandria Industrial Park is expected to see a large increase in employment. With these increases, it can be expected that there will be an increase in travel between these two areas. Currently, travelers must use either CSAH 21 or TH 29 to cross I-94. As TH 29, is becoming increasingly congested, another option for crossing I-94 may relieve the need to use TH 29 for these types of local or short trips.

The analysis of the Nevada overpass determined that it will attract approximately 3,500 vehicles per day. The addition of this overpass provides relief to TH 29, which realizes a reduction of 2,000 vehicles near the I-94 interchange. **Figure 5-15** displays projected 2030 daily traffic volumes with the Nevada Street overpass at I-94**.** As TH 29 becomes increasingly congested, an overpass at this location will relieve use on TH 29 for these types of local, short trips.

5.5 Functional Classification Changes

An important element of this Transportation Plan involved reviewing and suggesting modifications to the functional classification plan. The functional classification process considered the following roadway and system characteristics:

- The trip length as indicated by length of route, type and size of traffic generators served, and route continuity.
- The ability of the route to serve regional population centers, activity centers, and major traffic generators.
- The spacing of the route to serve different functions (need to provide access and mobility functions for entire area).
- The ability of the route to provide continuity through and between travelsheds.
- The role of the route in providing mobility or land access (number of accesses, access spacing, speed, parking and traffic control).
- The relationship of the route to adjacent land uses (growth, industrial, and neighborhood areas).

5.5.1 Proposed Roadway Changes

The function of given roadways or roadway segments can change over time as surrounding land-use evolves and/or as new roadways are constructed. As development increases and/or intensifies, additional local street mileage will be added and proposed functional classification changes can be completed to maintain appropriate distribution between local, collector, and arterial routes.

Mn/DOT and Douglas County determine functional classification for arterial roadways. Local authorities may request changes (either from arterial to collector or from collector to arterial), but must provide sound justification for the request.

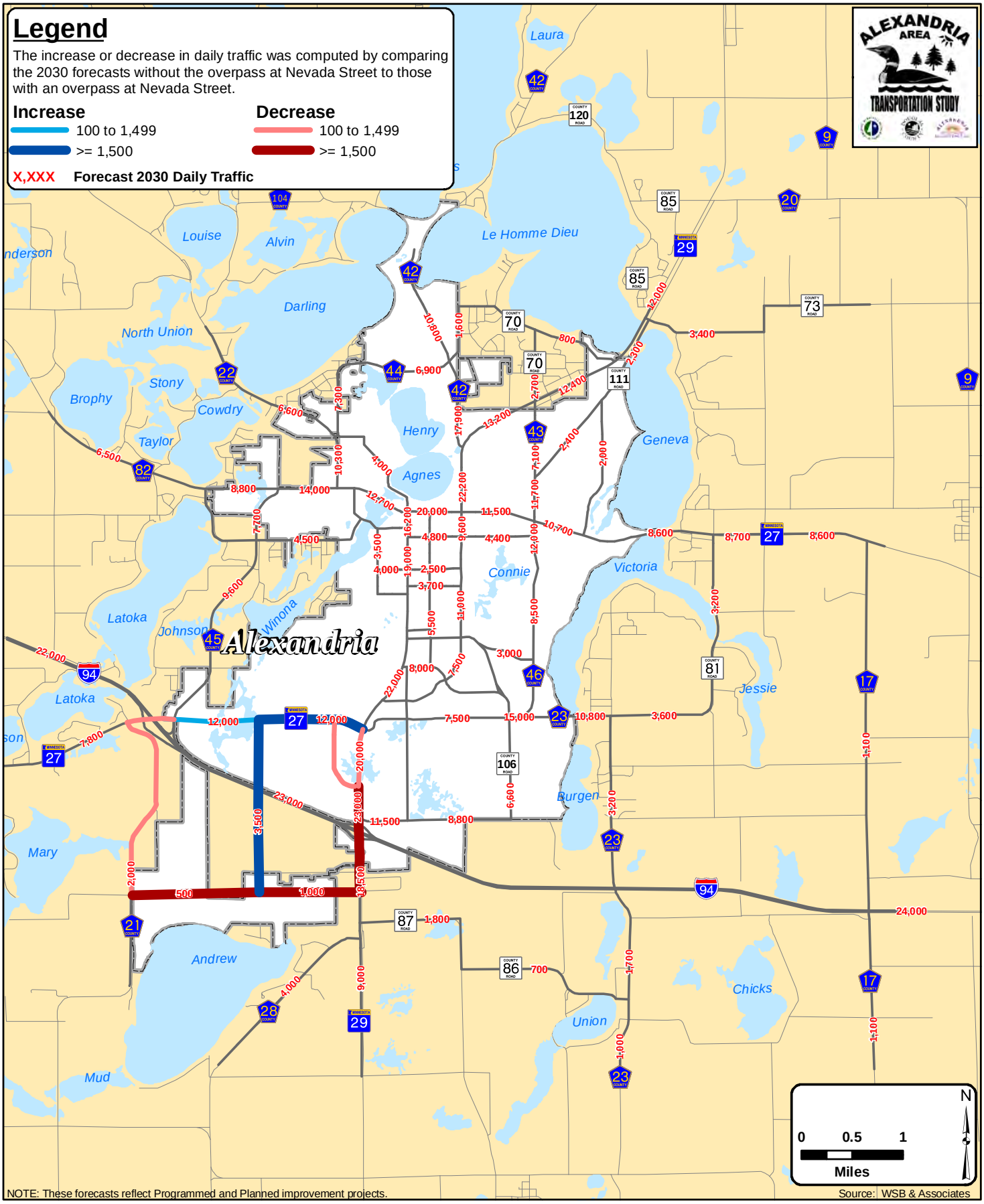

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Figure 5-15: Forecast 2030 Average Daily Traffic (Nevada Street Overpass)

For revisions in functional classification not involving arterial roadways, the unit of government that has jurisdiction over the facility has the authority to determine the functional classification. Thus, Alexandria has the authority to designate a municipal street as a collector or to change from collector to local street classification. Proposed functional classification changes were developed using the guidelines described previously and are listed in **Table 5-3** and shown in **Figure 5-16**.

5.6 Jurisdictional Classification Transfers

The following are guidelines to provide a basis to review the routes in the Alexandria Area for potential jurisdictional transfers. These guidelines define an approach for arriving at logical jurisdictional designations. Once there is agreement on how the jurisdictional designations should be established, an ongoing jurisdictional transfer process will need to be developed to address the issues that are present. Issues which must be considered include: historical practices, type of trips served, traffic volumes, access controls, functional classification, legal requirements, and funding/maintenance. Not all of these guidelines need to be met to warrant a jurisdictional transfer. However, a roadway meeting the majority of the criteria is a stronger jurisdictional transfer candidate.

Since the last transportation plan was completed for the area, several roadways appear to be candidates for jurisdictional transfers. Refer to Figure 3-3 for the existing jurisdictional classification of roadways in the Alexandria area.

Considerations for Jurisdictional Designation

Factors that should be considered when determining potential roadway jurisdictional transfers include:

- The type of trips served (purpose and length) on the roadway
- The traffic volumes on the roadway
- The degree of access control on the roadway
- The functional classification of the roadway
- Legal requirements that may effect roadway jurisdiction decisions
- Funding and maintenance issues, and
- Historical practices of agency involvement in roadways and their impact on jurisdiction

Upon agreement on how the jurisdictional designations should be established, an ongoing jurisdictional transfer process will need to be developed to address issues including the following:

- financial implications for construction and maintenance of the facility
- operational implications (perceived level of service (LOS), and ability to maintain LOS)
- perceived fairness in the distribution of route responsibilities, and
- timing of transfer

Provided in the following sections are descriptions of the typical characteristics of roadways for State, County, Municipal (City), and Township jurisdiction. This information provides a basis to review the roadways in the Alexandria Area for potential jurisdictional transfer.

Table 5-3. Proposed Functional Classification Changes

Map ID	Route	From	To	Current Functional Classification	Proposed Functional Classification	Approximate Length (miles)	Rationale for Change
1	CR 87	TH 29	CR 86	Local	Minor Collector	1.5	Provides east-west connection linking TH 29 with CSAH 23
2	CR 86	CR 87	CSAH 23	Local	Minor Collector	1.7	Provides east-west connection linking TH 29 with CSAH 23
3	CR 81	CSAH 23	TH 27	Local	Minor Collector	2.7	North-south connection between CSAH 23 and TH 27
4	Liberty Rd	TH 27	CR 73	Local	Minor Collector	2.0	North-south connection between TH 27 and CR 73
5	CSAH 20	TH 29	CSAH 9	Local	Minor Collector	1.1	Provides east-west connection linking TH 29 with CSAH 9
6	CR 85	CR 120	TH 29	Local	Minor Collector	0.8	Key collector route west of TH 29
7	CR 120	CR 85	CSAH 42	Local	Minor Collector	1.7	Key connection route linking CR 85 with CSAH 42
8	50th Avenue	TH 29	Railroad Crossing	Minor Collector	Major Collector	1.0	Key east-west connection between TH 29 and CR 106
9	CR 90 (Latoka Road)	CSAH 82	CSAH 45	Major Collector	Local	0.9	Lower volume roadway providing access to Fairgrounds area
10	CR 90 (Latoka Road)	CSAH 45	Fairgrounds Road / Willow Drive	Major Collector	Minor Collector	1.2	Lower volume roadway providing access to Fairgrounds area
11	CR 70	CSAH 42 (N. Nokomis St)	CR 70 (Govt Point Road)	Major Collector	Minor Collector	0.9	Relatively short segment providing residential property access
12	CR 70 (S. Le Homme Dieu Drive)	CR 70 (Govt Point Road)	TH 29	Major Collector	Minor Collector	1.3	Relatively short segment providing residential property access
13	CR 70 (McKay Ave)	CR 70 (S. Le Homme Dieu Drive)	TH 29	Major Collector	Minor Collector	0.7	Relatively short segment providing residential property access
14	CSAH 42 (N. Nokomis St)	TH 29	CSAH 11	Major Collector	Minor Arterial	2.2	Major roadway connecting Alexandria with areas to the north
15	TH 27 (3rd Avenue)	TH 29 (Nokomis Street)	CR 81 (East Victoria Road)	Principal Arterial	Minor Arterial	2.2	Functions as a east-west reliever roadway for I-94 (Principal Arterial)

SOURCE: WSB & Associates

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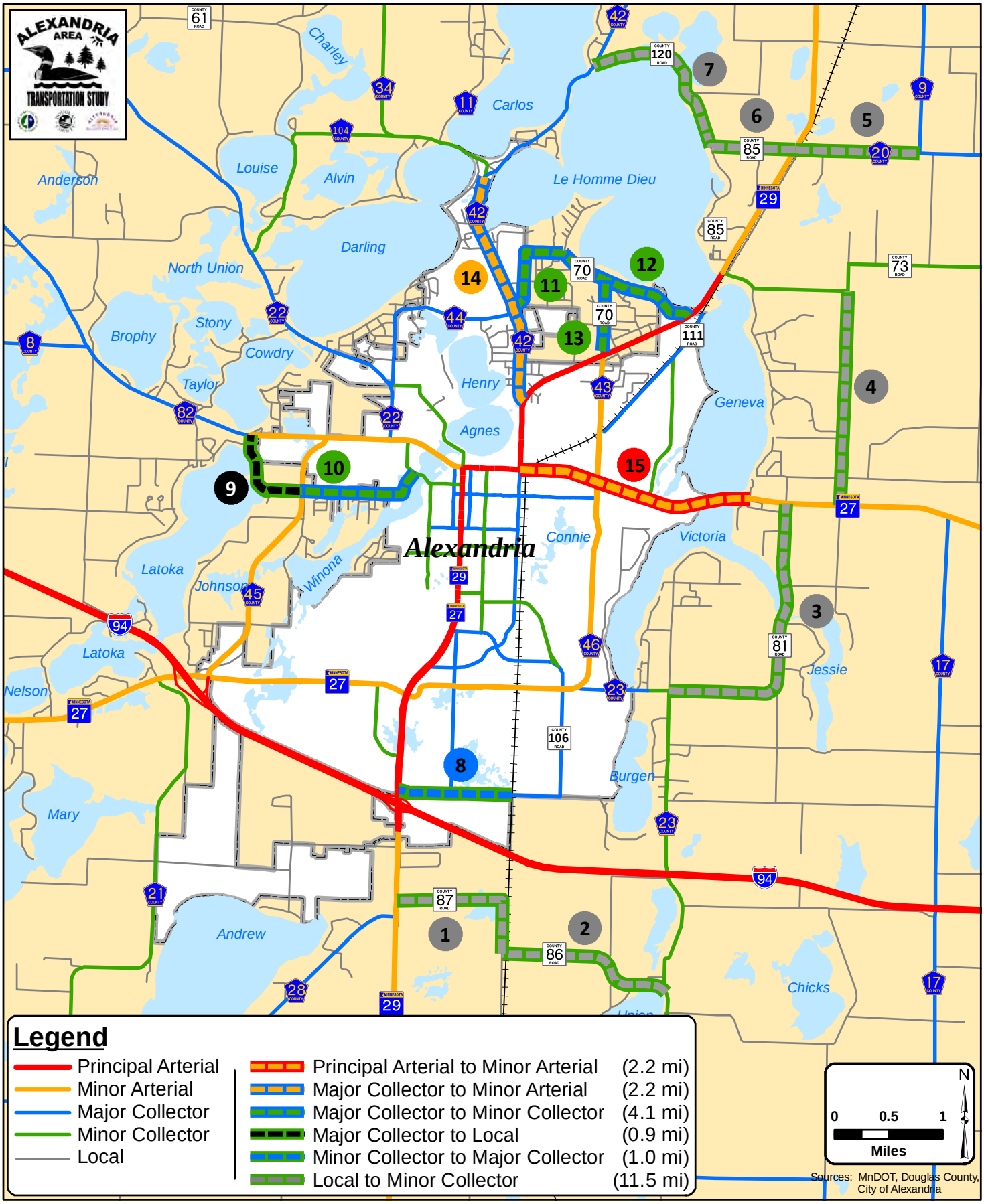

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Figure 5-16: Proposed Functional Classification Changes

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State Jurisdiction

Normally, state jurisdiction (U.S Highway, Trunk Highway) is focused on routes that can be characterized as follows:

- They are classified as a principal arterial or minor arterial
- They are longer routes that provide for statewide and interstate travel, serving longer regional trips that connect larger population and business centers
- They are spaced at intervals that are consistent with population density, such that all developed areas of the state are within reasonable distance of an arterial (As a guide, arterial routes are considered to "serve" a community if it is within 10 miles or 20 minutes travel time).
- They have higher design features (such as properly spaced access points), which are intended to promote higher travel speeds. They also accommodate more truck movements.
- They carry the major portion of trips entering and leaving urban areas as well as the majority of trips bypassing central cities.

County Jurisdiction

In general, county jurisdiction is broken into whether the roadway is within a rural area, or within an urban area. Provided below are typical characteristics for County roadways within these two types of environments:

Rural Areas

- They are classified as a minor arterial, major collector, or minor collector
- They provide essential connections and links not served by the principal and other minor arterial routes
- They serve adjacent larger towns that are not directly served by principal and minor arterial routes
- They provide service to major traffic generators that have intra-county importance
- They are spaced at intervals that are consistent with population density so as to provide reasonable access to arterial or collector routes in developed areas, and
- They provide links between local traffic generators and outlying rural areas

Urban Areas/Boundaries

- They are classified as a principal arterial or minor arterial
- They have higher traffic volumes or they provide access to major regional traffic generators (shopping centers, education centers, major industrial complexes)
- They provide connections and continuity to major rural collector routes accessing the urban area and they provide continuity within the urban area, but do not divide homogeneous neighborhoods, and
- They provide higher mobility features than other local minor arterial routes (i.e., some form of access management or access control)

Municipal Jurisdiction

Arterial routes, within the urban area, should be considered for municipal or city jurisdiction if they can be characterized as follows:

- They are shorter length segments (less than 3 miles) with a moderate Average Daily Traffic (ADT) of 3,000 to 8,000

- They provide higher local land access needs and close intersection spacing (promotion of local land access over mobility)
- They have close spacing with other arterial routes and shorter trip lengths such as found in Central Business District (CBD) areas
- They provide very limited continuity to outlying rural areas. Urban arterials tend to have shorter trip lengths than rural arterials or collectors
- They serve small geographic travelsheds, and
- They provide on-street parking or other amenities that discourage the use of the route as a regional route (promotion of local access and adjacent land use activities at the street edge)

Collectors and local streets that provide property access and local traffic circulation are normally under city jurisdiction. These streets typically constitute 65 to 80 percent of the entire urban system mileage and can generally be characterized as follows:

- They are short segments, (less than 1.5 miles) and carry low to medium volumes of traffic (500 to 3,000 ADT)
- They have higher local land access needs and close intersection spacing (promotion of local land access over mobility
- They may divide homogeneous residential neighborhoods to distribute trips to arterial street system or their final trip destination

Township Jurisdiction

Generally, township jurisdiction is focused on rural routes that can be characterized with the following attributes:

- They have low traffic volumes (less than 500 ADT)
- They are classified as local roadways on the functional classification system
- They have minimal design features and most often are gravel surfaced
- Their primary purpose is to provide access to adjacent property
- They link outlying rural areas to County Roads (CR) or County State Aid Highways (CSAH) and route length is usually less than five miles between CR or CSAHs
- They primarily serve farmsteads, small rural subdivisions, rural churches/cemeteries, and agricultural facilities
- They have irregular access spacing, but most often provide access to farms, field entrances, and they sometimes “T” with other roadways or dead-end.

5.6.1 Potential Roadway Transfers

Using the information on the typical characteristics and function of roadways, a framework for determining jurisdictional transfers was developed. In addition to the function of the roadway, the framework considers the funding implications and potential funding categories (i.e., County State-aid Highways (CSAH), County Road (CR), Municipal State-aid (MSA), etc.)

Following these guidelines, the project partners worked to develop a list of roadway segments for potential transfer. These are presented in **Table 5-4** and displayed on **Figure 5-17.**

Table 5-4. Proposed Jurisdictional Classification Transfers

Map ID	Route	From	To	Current Jurisdictional Classification	Proposed Jurisdictional Classification	Approximate Length (miles)	Rationale for Change
1	3rd Avenue	CSAH 22	TH 27/29 (Broadway)	City	County	0.7	Serves longer trip purpose
2	McKay Avenue	TH 27	0.40 miles south of TH 27 *(9th Ave)*	City	County	0.4	Serves longer trip purpose
3	34th Avenue	TH 27/29	CP RR Tracks	City	County	1.1	Serves longer trip purpose
4	CSAH 44	CSAH 22	CSAH 42 (N. Nokomis)	County	City	1.8	Serves shorter trip purposes
5*	CR 70	CSAH 42 (N. Nokomis St)	CR 70 (Good Point Road)	County	City	0.9	Serves shorter trip purposes
6*	CR 70 (Govt Point Road)	CR 70 (S. Le Homme Dieu Drive)	Northeast end of Van Avenue	County	City	0.6	Serves shorter trip purposes
7*	CR 70 (S. Le Homme Dieu Drive)	CR 70 (Govt Point Road)	CR 70 (McKay Avenue)	County	City	0.5	Serves shorter trip purposes
8*	CR 70 (McKay Avenue)	CR 70 (S. Le Homme Dieu Drive)	TH 29	County	City	0.7	Serves shorter trip purposes
9*	CR 70 (S. Le Homme Dieu Drive)	CR 70 (McKay Avenue)	TH 29	County	City	0.9	Serves shorter trip purposes
10*	CR 111 (Geneva Road)	Birch Avenue	CR 73	County	City	0.9	Serves shorter trip purposes
11**	CR 106 (Pioneer Road)	CSAH 46 (34th Avenue)	CR 106 (50th Avenue)	County	City	1.0	Serves shorter trip purposes
12	CR 106 (50th Avenue)	CP RR Tracks	CR 106 (Pioneer Road)	County	City	0.5	Serves shorter trip purposes
13	CR 90 (Latoka Road)	CSAH 82	CSAH 45 (west bypass)	County	Township	0.9	Serves shorter trip purposes
14	CR 85	CR 120	TH 29	County	Township	1.3	Serves shorter trip purposes
15	TH 27	I-94	TH 27/29	State	County	2.1	Serves shorter trip purposes
16	TH 27 (3rd Avenue)	TH 29 (Nokomis Street)	CSAH 46 (McKay Avenue)	State	County	0.7	Serves shorter trip purposes
17	TH 27	CSAH 46 (McKay Avenue)	CR 81 (East Victoria Road)	State	County	1.8	Serves shorter trip purposes
18	TH 27	CR 81 (East Victoria Road)	East Douglas County line	State	County	8.7	Serves shorter trip purposes

* Will be annexed into the City limits in January 2012.

** If an interchange at CR 106 is funded, this segment should remain under the County's jurisdiction. Also, in advance of the improvement, the jurisdictional classification of area roadways should be reviewed.

SOURCE: Mn/DOT, Douglas County, City of Alexandria, and WSB & Associates

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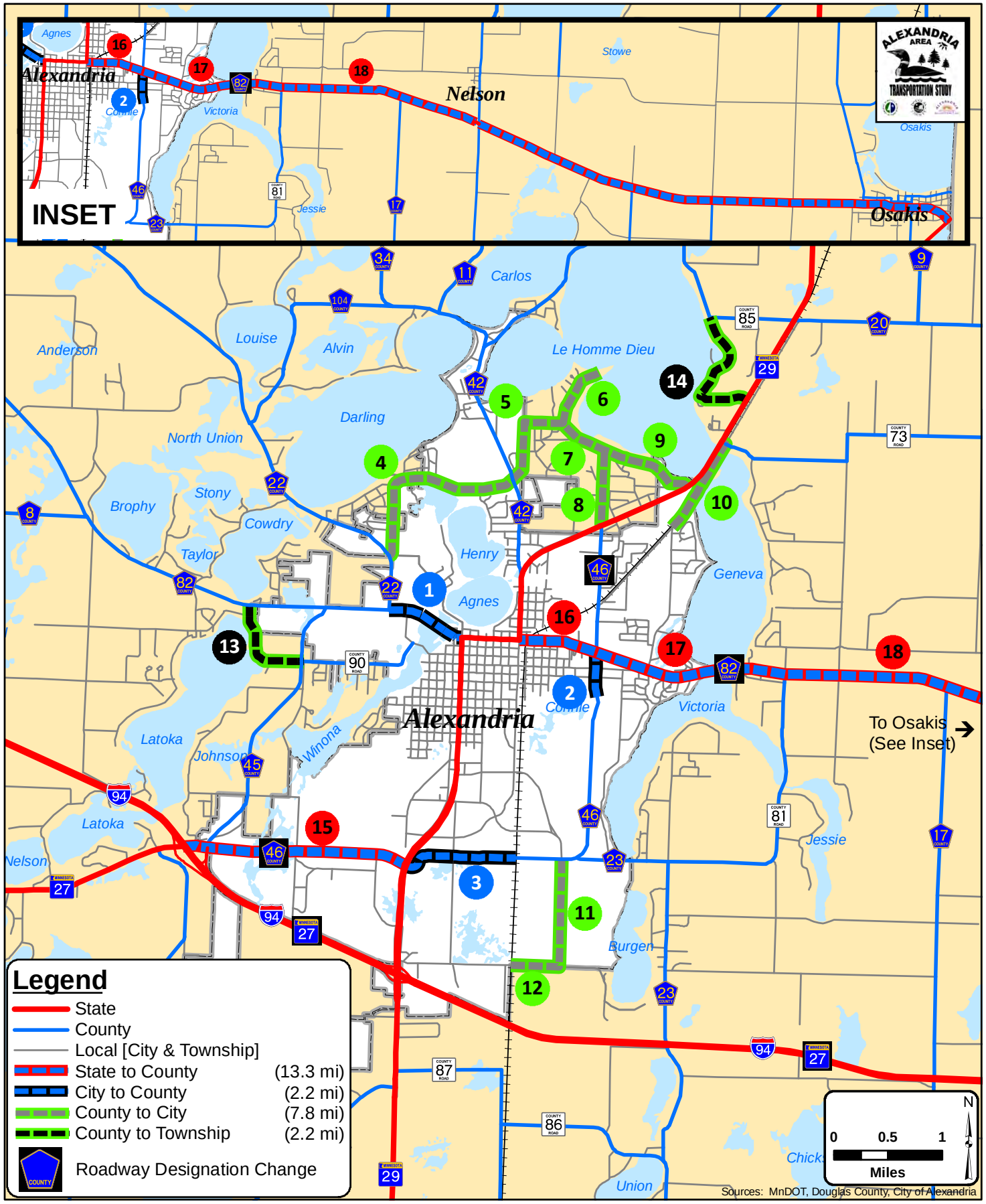

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Figure 5-17: Proposed Jurisdictional Classification Transfers

5.7 Truck Routing

The primary truck route through the Alexandria area is TH 29, traveling through downtown Alexandria. As TH 29 provides north-south connectivity through the region linking southern Minnesota with Wadena, which is approximately 50 miles north of Alexandria. As such, TH 29 is an important travel route for freight. Within Alexandria, however, TH 29 also functions as the main street of downtown (Broadway). There are options provided within Alexandria to fulfill TH 29's function as a travel route that could remove heavy truck movements through downtown. Two such routes are CSAH 45 (west bypass) and CSAH 46 (southeast bypass). While both of these routes are used by trucks with local destinations (industry located near CSAH 45 and 46), most through-trips use TH 29. Through stakeholder interviews and discussion with the public and project partners, it was found there is a lack of knowledge about alternative routes. At the State level, Mn/DOT could provide routing information to the freight operators directing them onto alternative routes (CSAH 45 and 46), which could shorten their trip as well as reduce trucking impacts through downtown. *Figure 3-9 (in Section 3.1.5)*, displays a system of preferred truck routes used in the movement of freight in and through Alexandria. The project partners should work together to provide appropriate identification of these routes to the trucking industry, particularly for drivers not familiar with the Alexandria roadway system.

5.8 Transit

Rainbow Rider is the provider of transit service in the Alexandria area. In recent years they have expanded their service to provide deviated route service, with scheduled stops at several major trips attractor locations (i.e., Wal-Mart, Alexandria Technical College, Viking Towers, etc.). Over the next several years, Rainbow Rider will be acquiring new transit vehicles (8 new buses between 2011 and 2013) and expanding their service in the Alexandria area as demand warrants.

5.9 Non-motorized Transportation

Several projects are in the planning phase for non-motorized transportation in the Alexandria Area. Through the Douglas County Safe Communities and Active Living groups, several potential bicycle and pedestrian travel projects have been identified. Currently there is a plan for additional protected crosswalks in downtown Alexandria on 3rd Avenue and on TH 29 (Broadway), where there is a plan to provide a bike trail on the west side of the roadway. Other planned or recently studied bicycle improvements include the provision of striped bike lanes on Fillmore and Hawthorne Streets from 3rd to 8th Avenues in the downtown area. These three bicycle projects would be linked into the Central Lakes Trail through an improved connection on Agnes Street north of 3rd Avenue. **Figure 5-18** provides a conceptual before and after rendering of a pedestrian crossing on 3rd Avenue which includes a pedestrian refuge island, enhanced crosswalk, and appropriate signage. While this rendering is for 3rd Avenue at Jefferson Street, similar improvements could be implemented at locations throughout the Alexandria area.

Projects that are being considered in the Alexandria Area Transportation Plan study area are summarized in **Table 5-5**.

Table 5-5. Planned Non-motorized Improvements

ID #	Project	Description
1	3rd Avenue / Jefferson Street Intersection	Pedestrian/Bicycle Crossing improvements
2	TH 29 - Broadway Streetscape (3rd to 8th Avenues)	Bike trail on west side of Broadway
3	Agnes Street (3rd to Central Lakes Trail)	Bike trail
4	Fillmore Street (3rd to 8th Avenues)	Striped bike route
5	Hawthorne Street (3rd to 8th Avenues)	Striped bike route

SOURCE: Mn/DOT, Douglas County, City of Alexandria, and WSB & Associates

K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]NonMotorized Projects

In general, new developments in the Alexandria area should be encouraged to address bicycle and pedestrian accessibility. Also, efforts should be taken to connect residential developments with existing and planned bicycle facilities such as the Central Lakes Trail and Geneva Road Bike Path. In commercial areas such as downtown or developing corridors such as TH 29, the provision of bicycle parking facilities should be encouraged to accommodate bicycle travel.

Figure 5-18. Rendering of Enhanced Pedestrian Crossing

Chapter 6

Subareas Analyses

This chapter addresses special issues related to five geographic subareas within the Alexandria study area. **Figure 6-1** shows the locations of the five subareas. Each Subarea's issues and mitigation recommendations are described in the following sections.

6.1 Subarea 1 – TH 29 South and I-94 Interchange

6.1.1 Overview

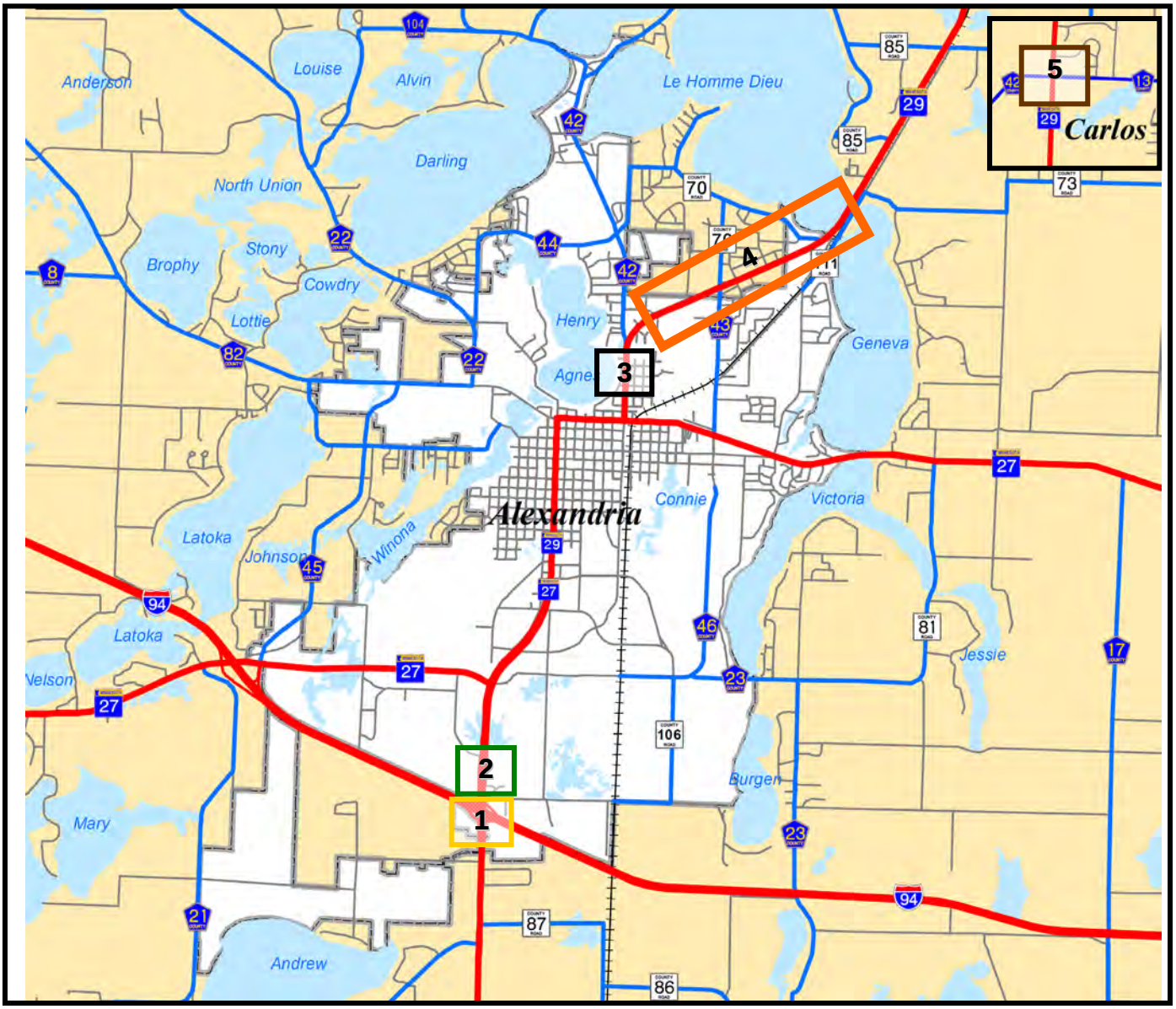
Subarea 1 includes Trunk Highway (TH) 29 south of Interstate (I)-94 and its interchange with I-94. **Figure 6-2** shows the location of Subarea 2 as well as its existing lane configuration for TH 29 and its intersections. Figure 6-3 displays the most recent existing daily traffic volumes, which were obtained from Mn/DOT traffic maps. **Figure 6-4** displays the existing pm peak hour turning movements at the ramp intersections.

6.1.2 Existing Conditions

Currently the junction of I-94 and TH 29 is a standard diamond interchange with separate two-lane northbound and southbound bridges spanning over I-94. The intersection of the I-94 eastbound ramps at TH 29 is signalized, while the westbound ramps at TH 29 are stop controlled with TH 29 having the right-of-way. The spacing between the ramp intersections is 720 feet. Approximately 300 feet north of the westbound ramps intersection is the TH 29/50th Avenue intersection. The 50th Avenue intersection will be discussed in the forthcoming section of this memorandum – Subarea 2 Analysis.

6.1.3 Future Conditions

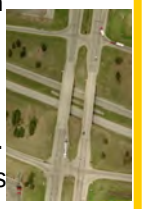
Forecast daily traffic volumes were generated using the travel demand model that WSB developed for the Alexandria Area Transportation Study. Future peak hour turning movements at the ramp intersections were then developed by increasing existing counts by the percent growth in daily traffic between the existing traffic volumes and 2030 forecasted traffic volumes. **Figure 6-5** displays the forecasted daily traffic volumes approaching the ramp intersections from each direction. **Figure 6-6** displays the forecasted pm peak hour turning movements at the ramp intersections.



1. I-94/TH 29 Interchange and TH 29 South

Issues:

1) Existing and future operation of interchange which is characterized by inadequate spacing between intersections.
2) Future operation of TH 29 south of I-94 as area continues to grow.



2. 50th Avenue Extension

Issues:

1) Intersection and access spacing.
2) Access to the industrial park.

3. TH 29, north of 3rd Avenue

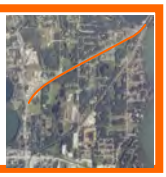
Issues:

1) Lane drop on TH 29 north of 3rd Avenue.
2) Difficult access to TH 29 from neighborhood located to the east.

4. TH 29, east of CSAH 42

Issues:

1) Access management.
2) Speed limit transitions.



5. Intersection of TH 29 with CSAH 42/13 near Carlos

Issues:

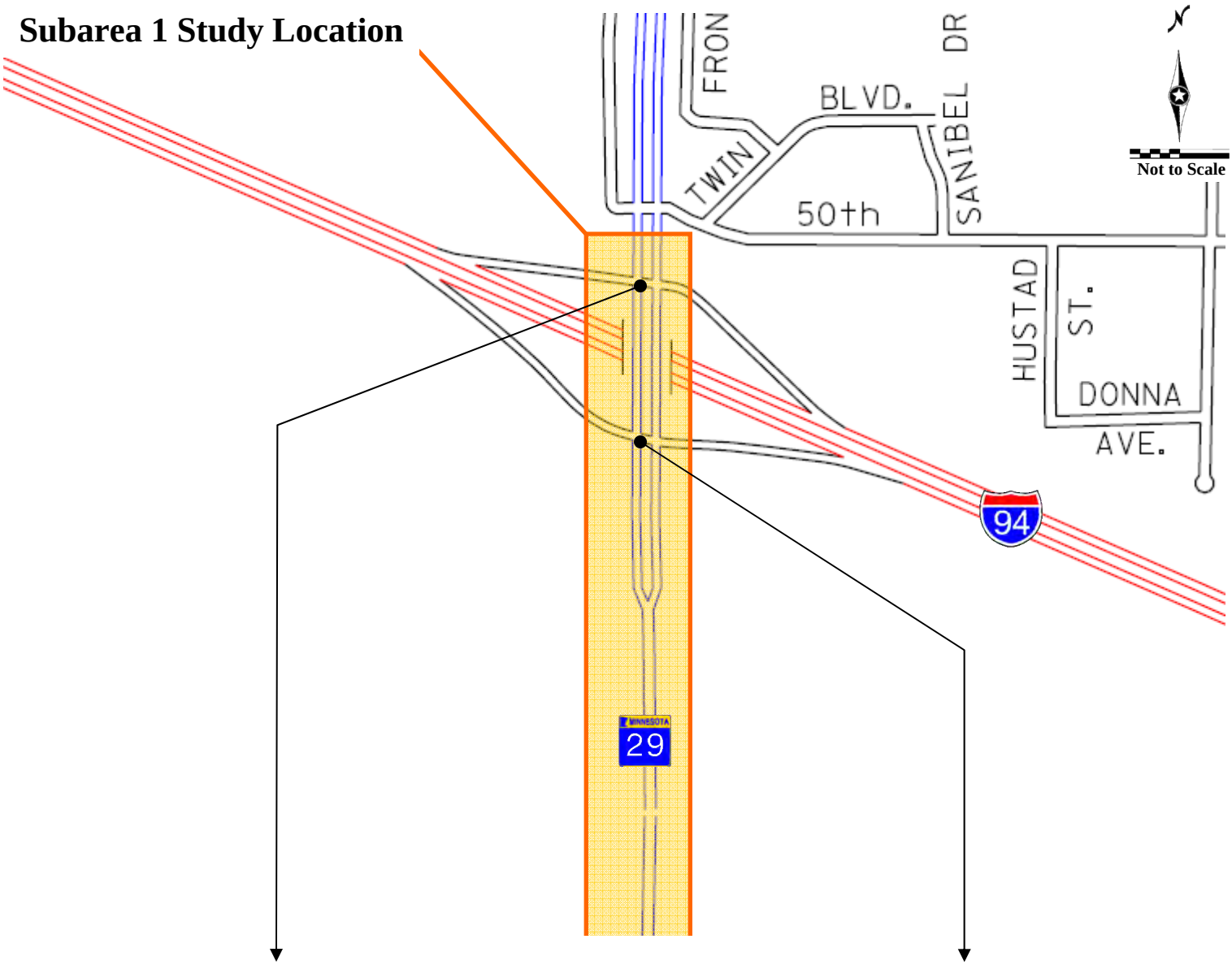
1) Safety and access management.

- **Other modes of Transportation: Airport, Transit, Bicycle, Pedestrians**

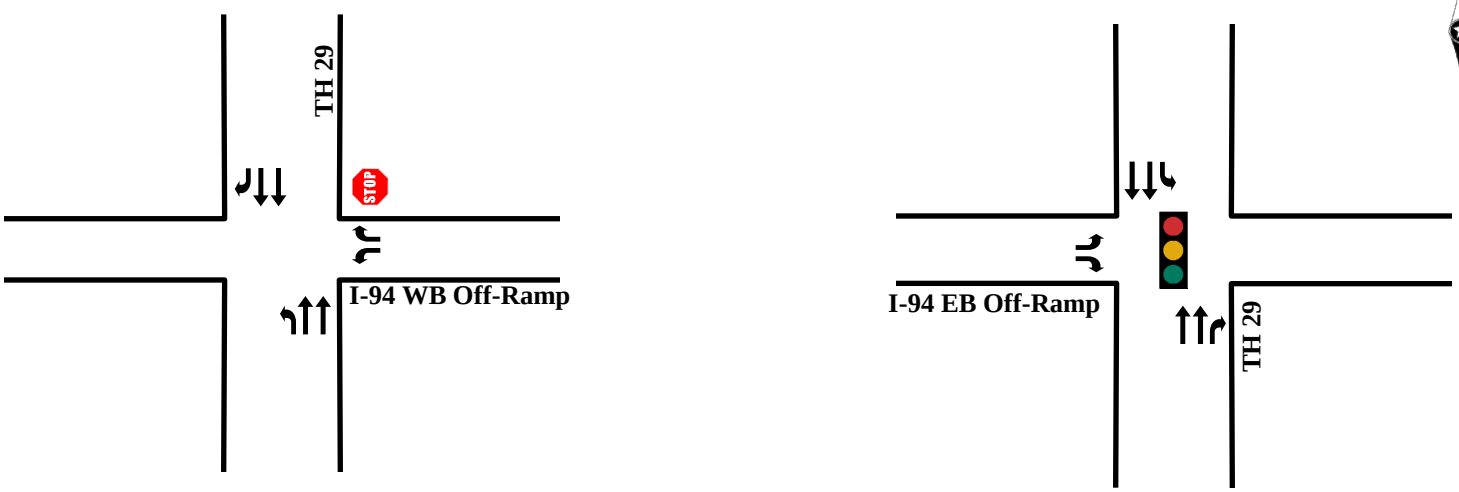
Alexandria Area Transportation Study

Figure 6-1: Subareas Location Map

Subarea 1 Study Location

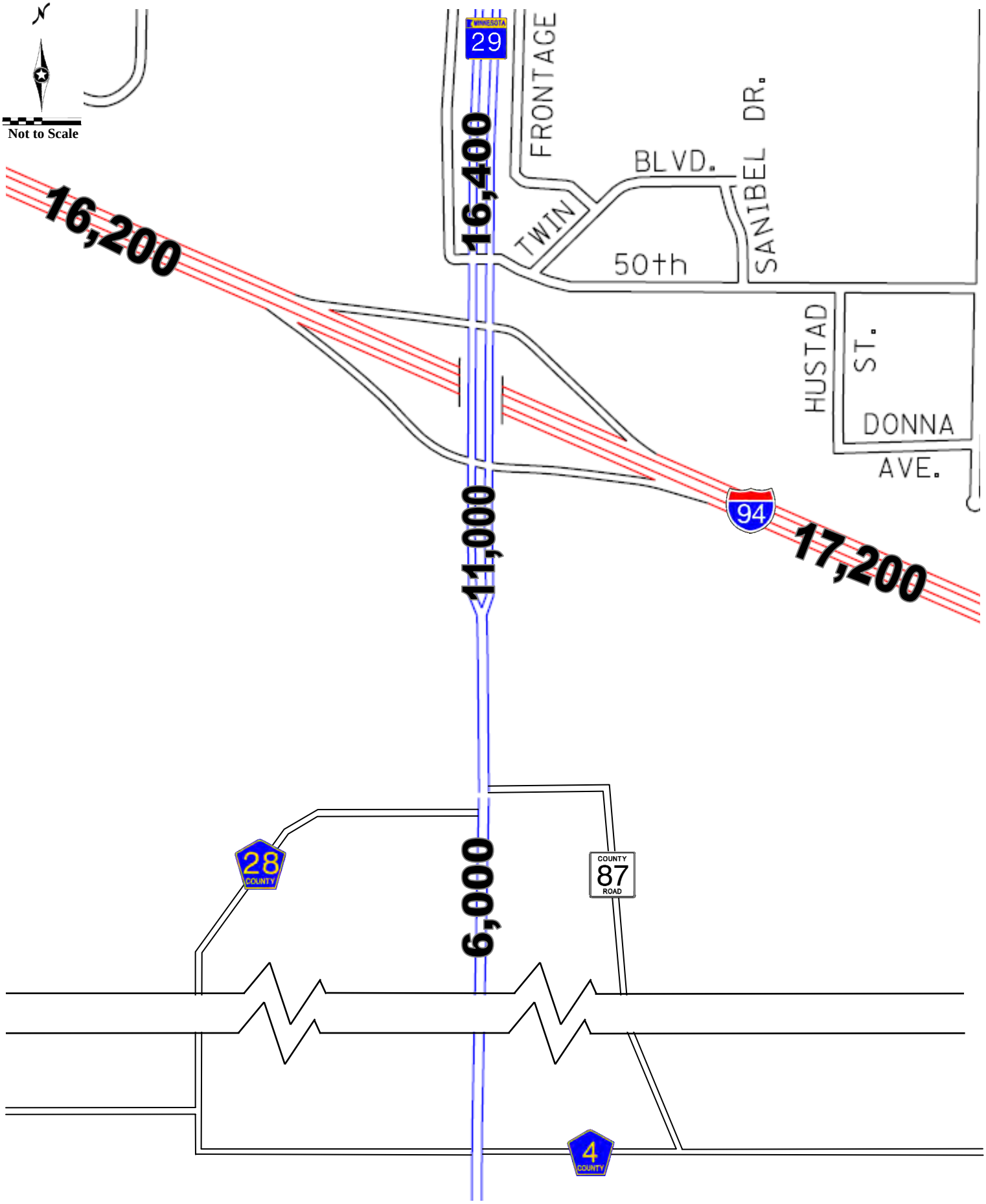


Existing Ramp Lane Configurations



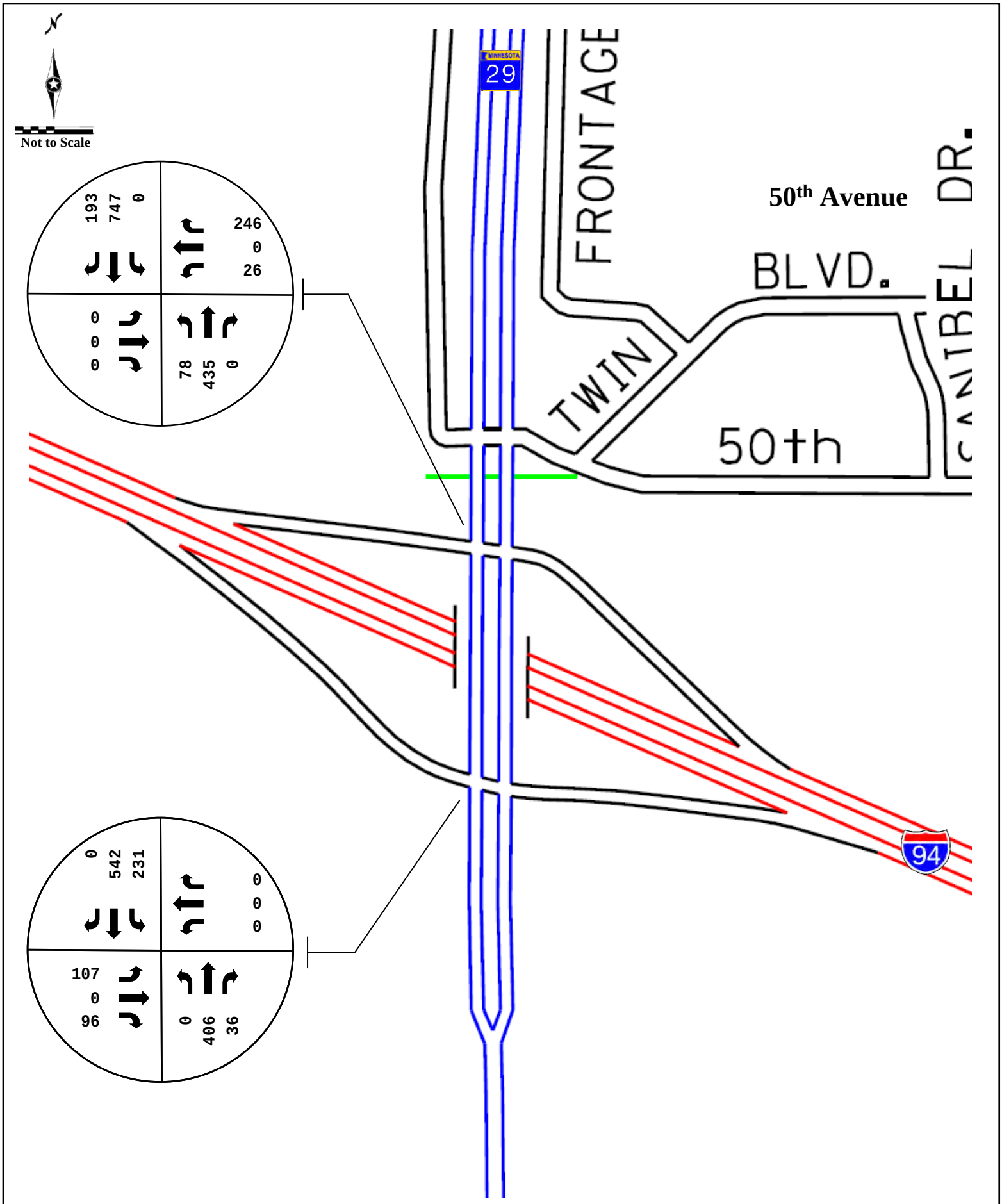
Subarea 1
TH 29 South & Interchange

Figure 6-2
Subarea Location and Lane Configurations



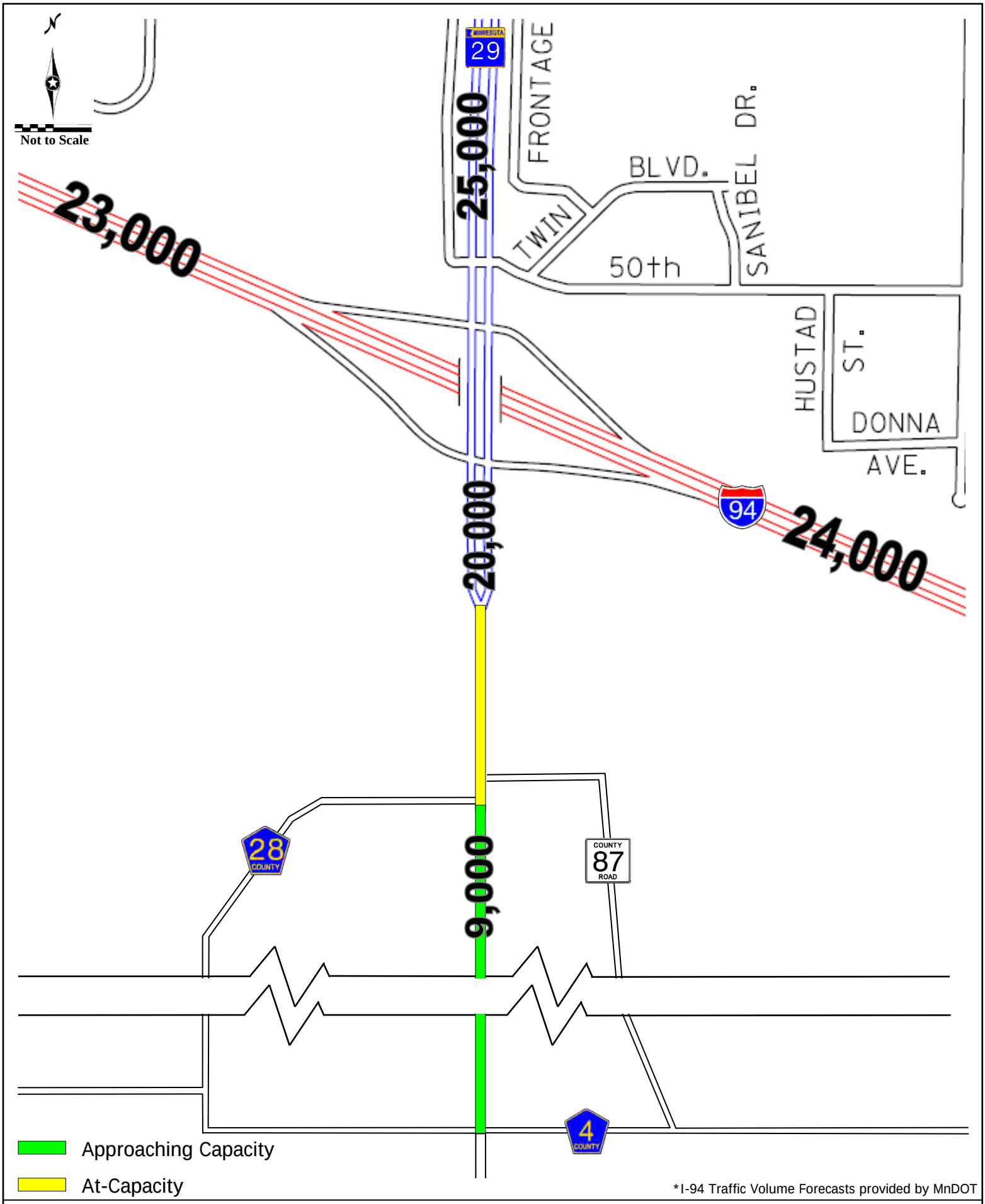
Subarea 1
TH 29 South & Interchange

Figure 6-3
Existing 2006 Daily Traffic Volumes



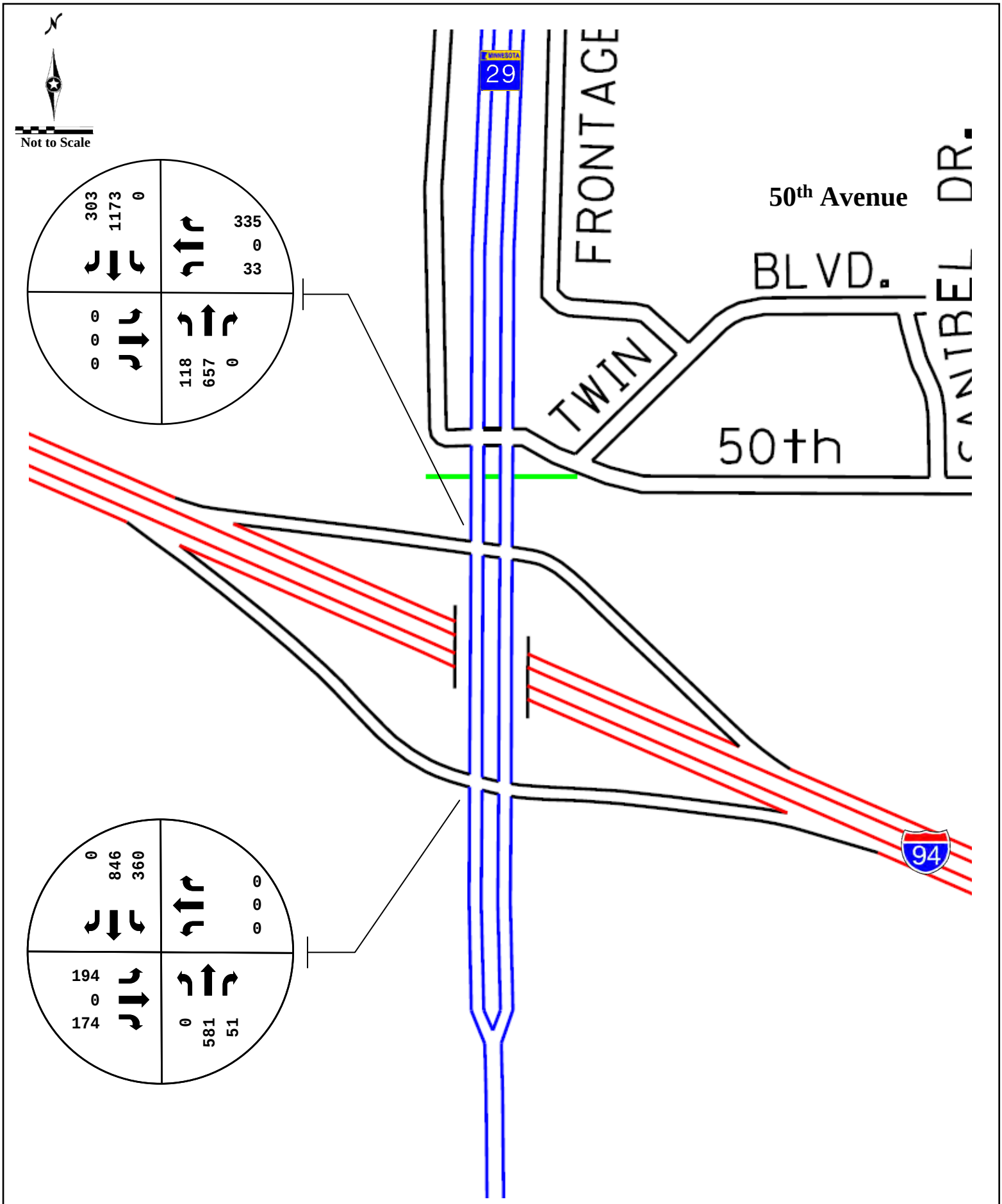
Subarea 1
TH 29 South & Interchange

Figure 6-4
Existing 2009
PM Peak Hour Turning Movements



Subarea 1
TH 29 South & Interchange

Figure 6-5
2030 Daily Traffic Volumes



Subarea 1
TH 29 South & Interchange

Figure 6-6
2030 Peak Hour Turning Movements

6.1.4 Proposed Improvement Alternatives

The improvement alternatives for this subarea can be broken into two sub-categories; interchange and mainline.

Interchange Improvement Alternatives

Three alternatives were developed to assess improvements to the interchange. These alternatives include:

- Alternative 1 – Existing/No-Build Interchange
- Alternative 2 – Tight Diamond Interchange
- Alternative 3 – Single Point Interchange
- Alternative 4 – Diverging Diamond Interchange

TH 29 Mainline Improvement

South of the I-94 eastbound ramps intersection, TH 29 is a four-lane divided roadway for approximately 900 feet and then tapers to a 2-lane roadway. As can be seen in Figure 6-5 displayed earlier, 2030 daily traffic volumes indicate that the two-lane section of TH 29 just south of I-94 to CSAH 28 is at-capacity. Additionally, TH 29 from CSAH 28 to CSAH 4 is approaching capacity. To address this projected deficiency, TH 29 would be widened from just south of I-94 to either CSAH 28 (0.8 miles), or to CSAH 4 (3.2 miles). As only the section extending to CSAH 28 is projected to operate at-capacity, the capacity improvement would only extend to this point.

The alternatives that were developed to assess improvements to the TH 29 mainline include:

- Alternative 5 – TH 29 Widening from I-94 to CSAH 28 (0.8 miles)
- Alternative 6 – TH 29 Widening from I-94 to CSAH 4 (3.2 miles)

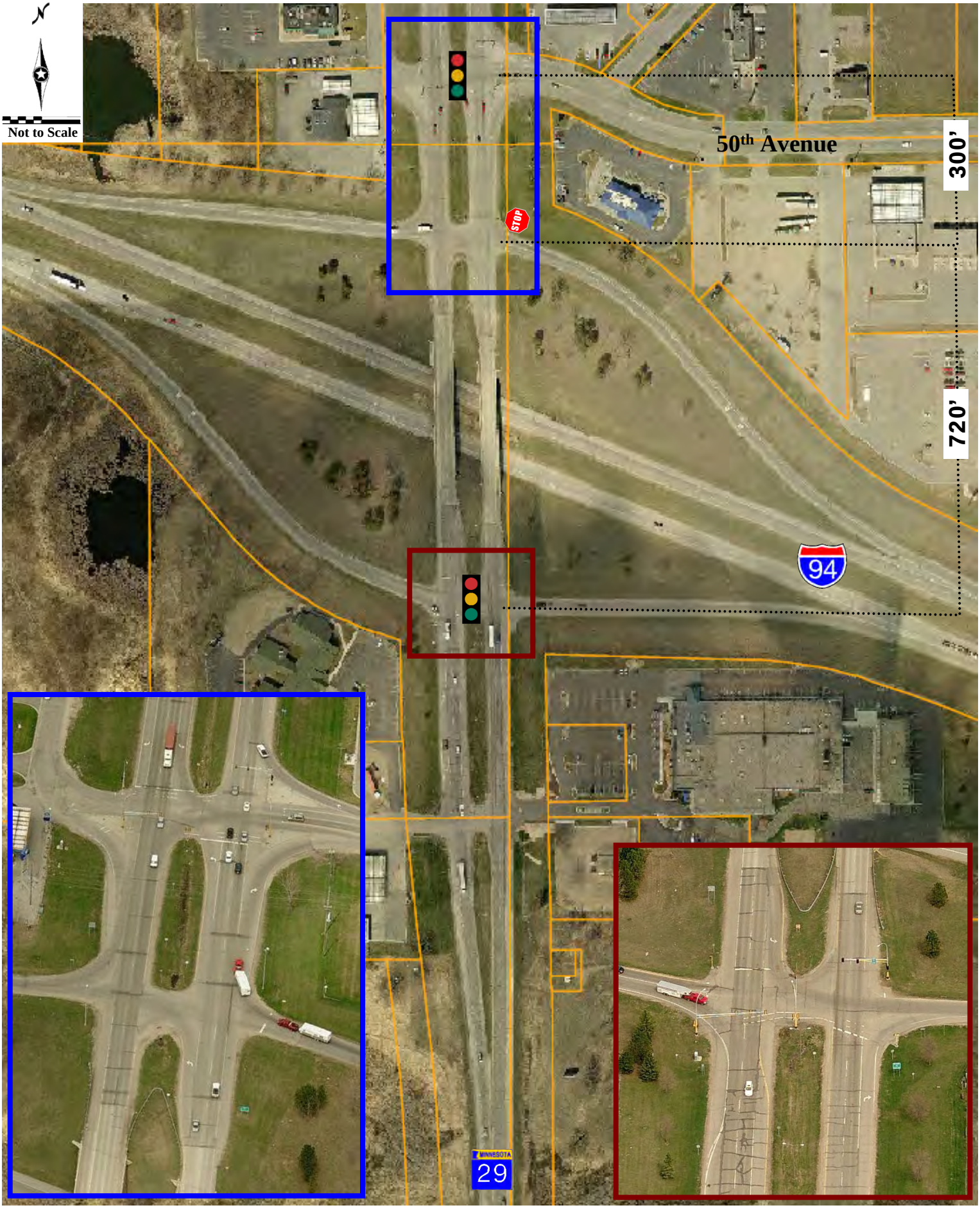
6.1.5 Description of Alternatives

Provided in the following section are more detailed descriptions of interchange and mainline alternatives:

Alternative 1 – Existing/No-Build Interchange

The existing interchange was constructed as a standard diamond interchange with ramp intersections on each side of I-94. The intersection with the I-94 westbound ramps is stop controlled while the intersection with the eastbound ramps is controlled by a traffic signal. There is approximately 720 feet between the intersections providing adequate intersection spacing. However, there is only approximately 300 feet along TH 29 between the intersection with the westbound ramps and the 50th Avenue intersection. These intersections are shown on **Figure 6-7.**

The insufficient spacing along TH 29 between the intersection at 50th Avenue and the intersection with the I-94 westbound ramps creates safety and mobility issues for vehicles traveling in this area. The vehicle queue at the 50th Avenue signal and traffic weaving across lanes to turn or go through this signal conflict with vehicles entering northbound TH 29 from the westbound I-94 ramp. One solution to mitigate the intersection spacing issue is to redesign the interchange and shift the intersection for the westbound I-94 ramps further to the south. Redesigning the interchange will be discussed further in Alternatives 2, 3, and 4. Another solution to the intersection spacing issue would be to modify or move the 50th Avenue intersection further to the north. These types of improvements at 50th Avenue will be discussed further in the analysis of Subarea 2.



Subarea 1
TH 29 South & Interchange

Figure 6-7
Alternative 1 – Existing/No-Build
Standard Diamond Interchange

Alternative 2 – Tight Diamond Interchange

Alternative 2 was developed to consider the reconstruction of the TH 29/I-94 interchange utilizing a tight diamond interchange design as shown on **Figure 6-8**. This intersection design would move the ramp intersections closer together, thus creating more spacing between the intersections at 50th Avenue and the I-94 West Ramps. A tight diamond interchange would require that both ramp intersections be signalized and coordinated to minimize the traffic queue between the two signals. The additional spacing between 50th Avenue and the west ramps intersection would greatly help traffic from the westbound ramp enter the northbound TH 29 traffic stream. Proper coordination of signals along TH 29 would reduce the risk of traffic queues at 50th Avenue impacting the signalized intersection located at the I-94 westbound ramps.

Alternative 3 – Single Point Interchange

Alternative 3 was developed to consider the reconstruction of the TH 29/I-94 interchange using the single point interchange design as shown on **Figure 6-9**. This interchange design would create additional spacing between the intersections at 50th Avenue and the I-94 ramps. A single point interchange combines all the ramp approaches and exits into a single intersection centered over the freeway. This type of interchange minimizes delays by best allocating green time between approaches. The bridge structure required to span the freeway is much larger, thus this alternative would be significantly more expensive to construct.

Alternative 4 – Diverging Diamond Interchange

Alternative 4 was developed to consider the reconstruction of the TH 29/I-94 interchange using the diverging diamond interchange design as shown on **Figure 6-10**.

A diverging diamond interchange is characterized by having the two directions of traffic cross to the opposite sides of the bridge, traverse the bridge, then cross back to their original sides. This is different from traditional interchange designs in that it requires traffic on the freeway overpass to briefly drive on the opposite side of the road from what they are accustomed.

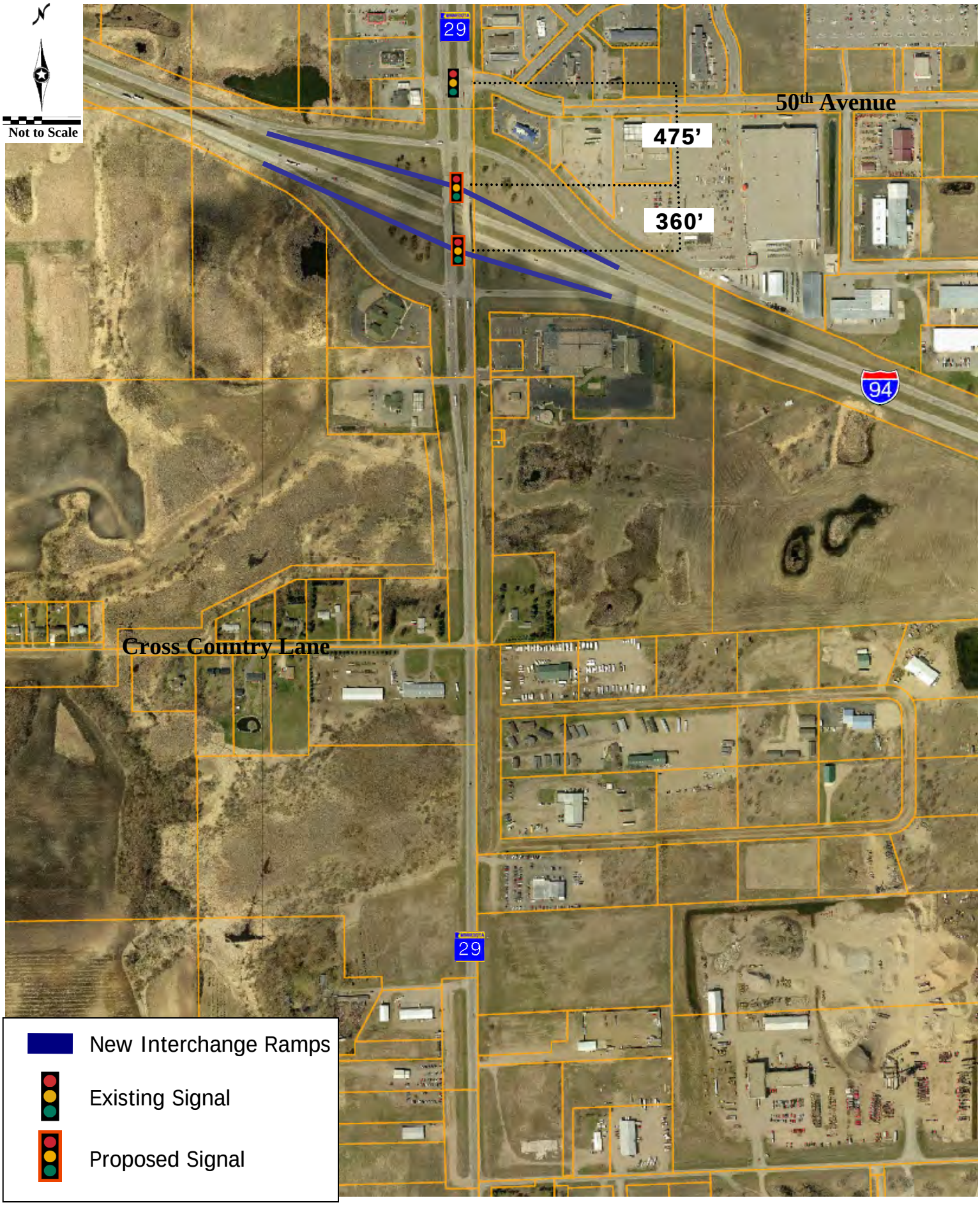
The diverging diamond interchange allows for two-phase operation at all signalized intersections within the interchange. This offers a significant improvement in safety, since no left turns must clear opposing traffic and all movements are discrete, with most controlled by traffic signals. Additionally, the design can improve the efficiency of an interchange, as the lost time for various phases in the cycle can be redistributed as green time; there are only two clearance intervals (the time for traffic signals to change from green to yellow to red) instead of the six or more found in other interchange designs.

Alternative 5 – TH 29 Widening to CSAH 28

Alternative 5 involves adding capacity to TH 29 south of the I-94 interchange, by extending the four-lane divided section to CSAH 28 (0.8 miles). This improvement measure is displayed on **Figure 6-11**.

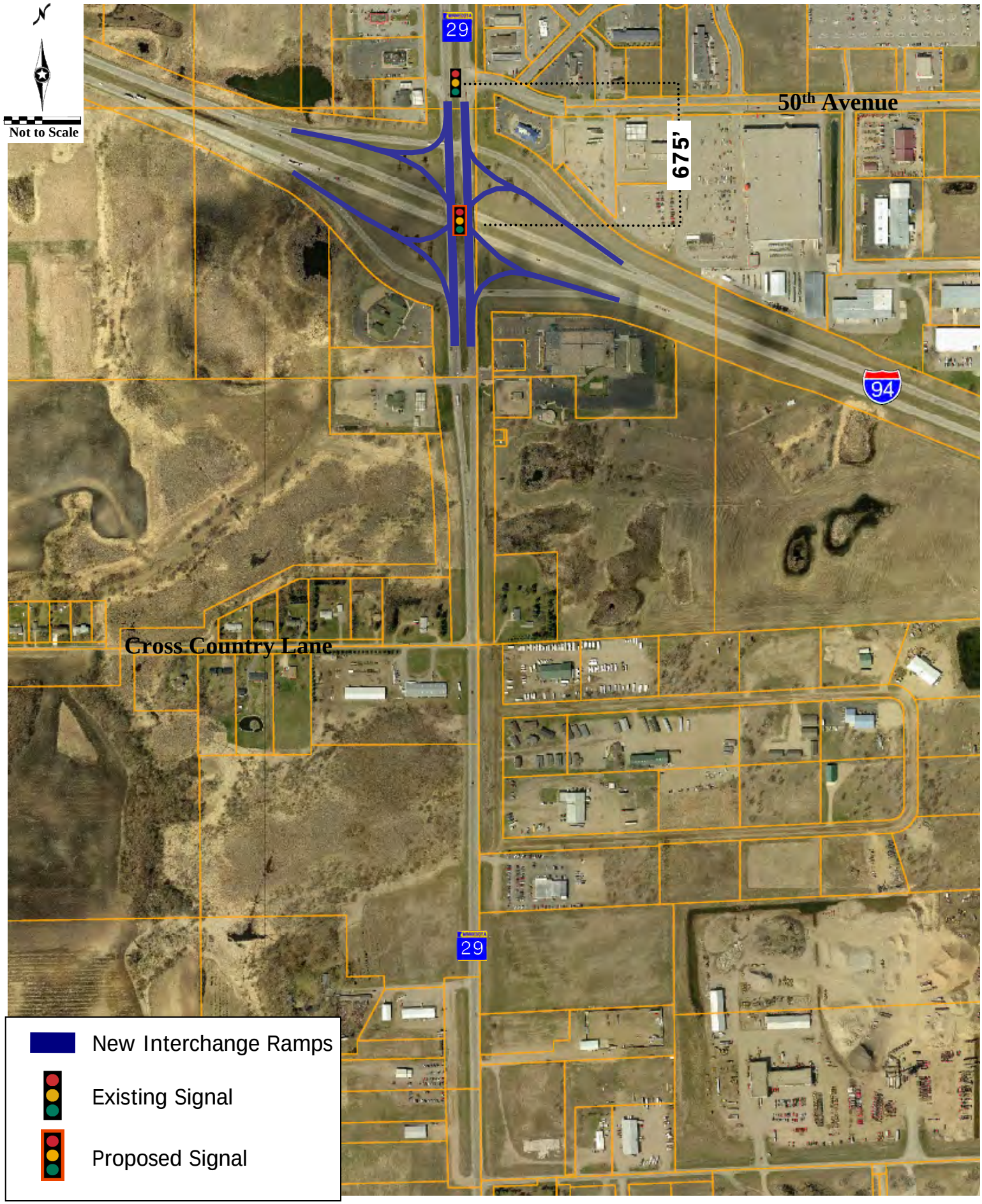
Alternative 6 – TH 29 Widening to CSAH 4

Alternative 6 involves adding capacity to TH 29 south of the I-94 interchange, by extending the four-lane divided section to CSAH 4 (3.2 miles). This improvement measure is also displayed on **Figure 6-11**.



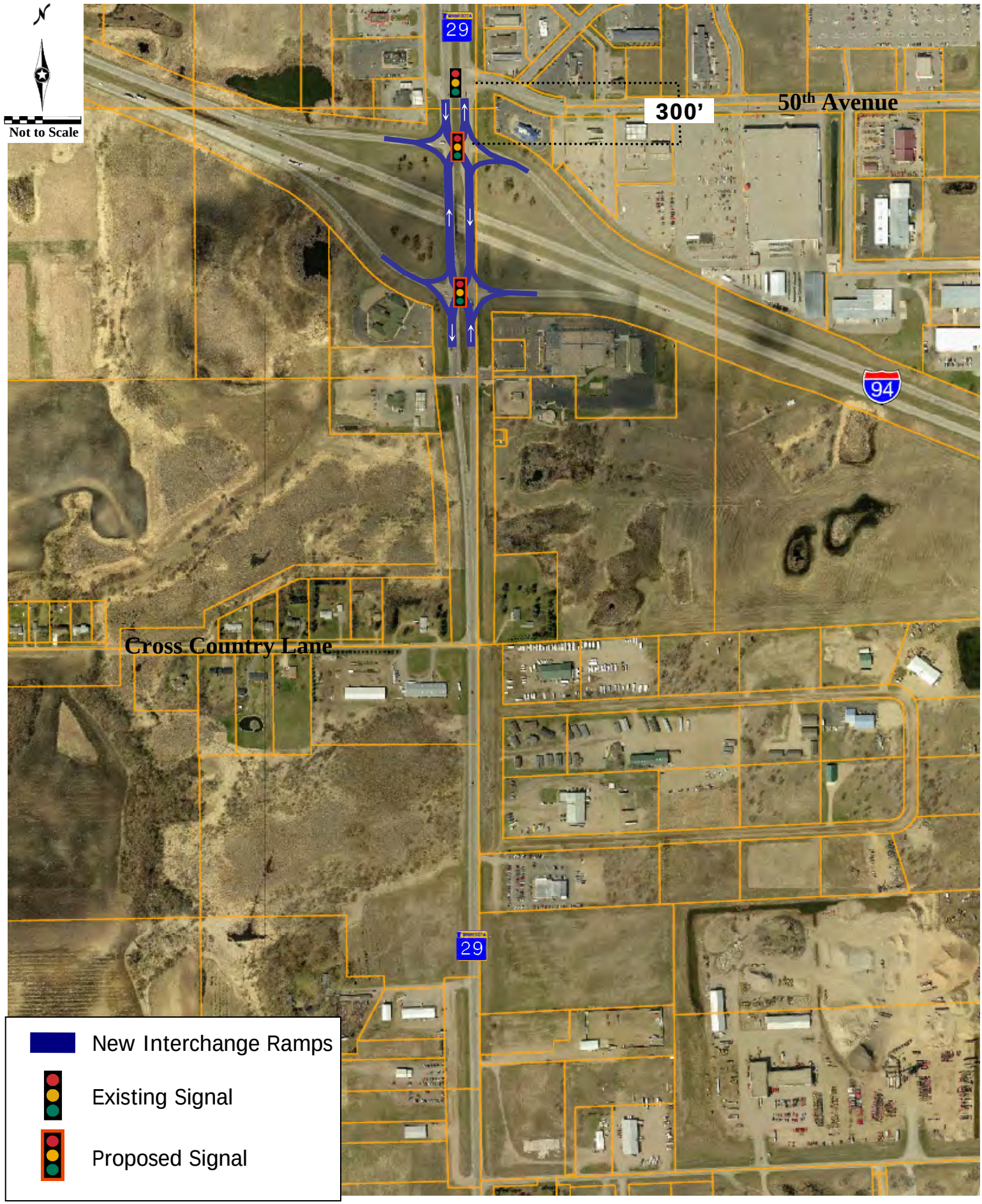
Subarea 1
TH 29 South & Interchange

Figure 6-8
Alternative 2 - Tight Diamond Interchange



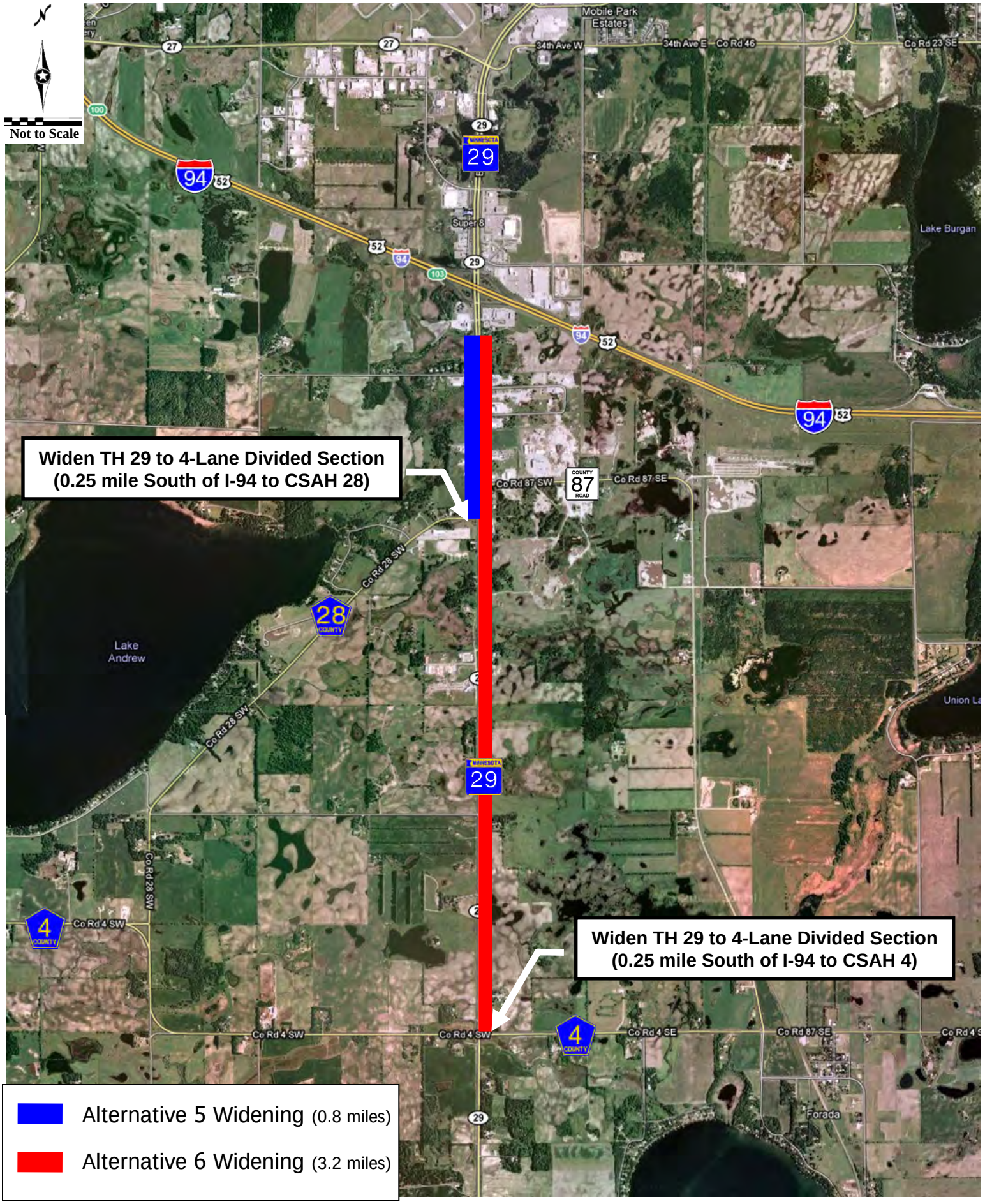
Subarea 1
TH 29 South & Interchange

Figure 6-9
Alternative 3 - Single-point Urban Interchange



Subarea 1
TH 29 South & Interchange

Figure 6-10
Alternative 4 – Diverging Diamond Interchange



Subarea 1
TH 29 South & Interchange

Figure 6-11
Alternatives 5 & 6 - TH 29 Widening

6.1.6 Interchange Improvement Costs

According to the Mn/DOT District 4 – 20-year Highway Investment Plan, dated August 2009, the two bridges on TH 29 over I-94 are scheduled to be replaced by the year 2018.

A general construction cost estimate, in 2010 dollars, to replace the TH 29 bridges spanning I-94 would range from four million to six million dollars. This cost does not include possible right-of-way acquisition, engineering, and administrative costs. Replacing the bridges would require upgrading them from four spans to two spans resulting in a thicker bridge section slightly raising the bridge deck. This improvement would increase the safety of vehicles traveling on I-94 by removing the piers next to the roadway shoulder currently protected by a guardrail. The additional bridge height would slightly alter the roadway grade approaching the bridge prompting the need for 200 to 300 feet of roadway construction on each end of each bridge to match back into the original profile.

A tight diamond interchange at this location would involve realigning the exit and entrance ramps closer to the interstate thus prompting the need for retaining walls. The bridge spanning over I-94 would be relatively the same size as the bridge replacement improvement mentioned previously. The additional cost would be in realigning the ramps. The estimated construction cost to construct a tight diamond interchange at this location would range from 12 million to 15 million dollars.

A single point interchange at this location would also involve realigning the exit and entrance ramps and significantly increasing the size of the bridge spanning over I-94. The additional cost would be in realigning the ramps and the larger bridge structure. The estimated construction cost to construct a single point interchange at this location would range from 20 million to 25 million dollars.

A diverging diamond interchange at this location would involve realigning the exit and entrance ramps. The bridge spanning over I-94 would be relatively the same size as the bridge replacement improvement mentioned previously. The additional cost would be in realigning the ramps. The estimated construction cost to construct a diverging diamond interchange at this location would range from 8 million to 12 million dollars. Provided below, in **Table 6-1**, are the cost comparisons for the interchange improvement alternatives.

Table 6-1. Estimated Interchange Construction Cost (2010 dollars)

Alternative	Estimated Construction Cost ($1M)	Cost Beyond Bridge Replacement ($1M)
Replace Bridges	5 - 7	---
Tight Diamond Interchange	12 - 15	7 - 8
Single Point Interchange	20 - 25	15 - 18
Diverging Diamond Interchange	8 - 12	3 - 5

Source: WSB & Associates, Inc.

6.1.7 Mainline Improvement Costs

It is anticipated that TH 29, south of I-94 will be widened by the year 2018. For purposes of comparison, three million dollars per mile was used to calculate preliminary construction costs as shown below in **Table 6-2**. These costs assume that the existing roadway will be used for northbound traffic while a new two-lane roadway will be constructed for southbound traffic.

Table 6-2. Estimated Mainline Construction Cost (2010 dollars)

Alternative	Length	Cost ($1M)
South of I-94 to CSAH 28	0.8 miles	2.4
South of I-94 to CSAH 4	3.2 miles	9.6

Source: WSB & Associates, Inc.

6.1.8 Summary/Conclusion

Alternatives 1 and 4 would not resolve the intersection spacing issue that exists between the interchange and 50th Avenue. Only Alternatives 2 (tight-diamond interchange) and 3 (single-point interchange) resolve this intersection spacing issue. However, given the difference in estimated construction costs, **Alternative 2 is the recommended design** for the reconstruction of the TH 29 at I-94 interchange.

South of the I-94 eastbound ramps intersection, TH 29 is a four-lane divided roadway for approximately 900 feet and then tapers to a 2-lane roadway. By year 2020, the two-lane section of roadway from just south of I-94 to CSAH 28 (0.8 mile) will be at-capacity. The two-lane section of roadway from CSAH 28 to CSAH 4 (2.4 miles) will be approaching-capacity.

Based on traffic volume forecasts, **it is recommended that the section of TH 29 extending from just south of I-94 to CSAH 28 be expanded to a four-lane divided roadway by 2020**.

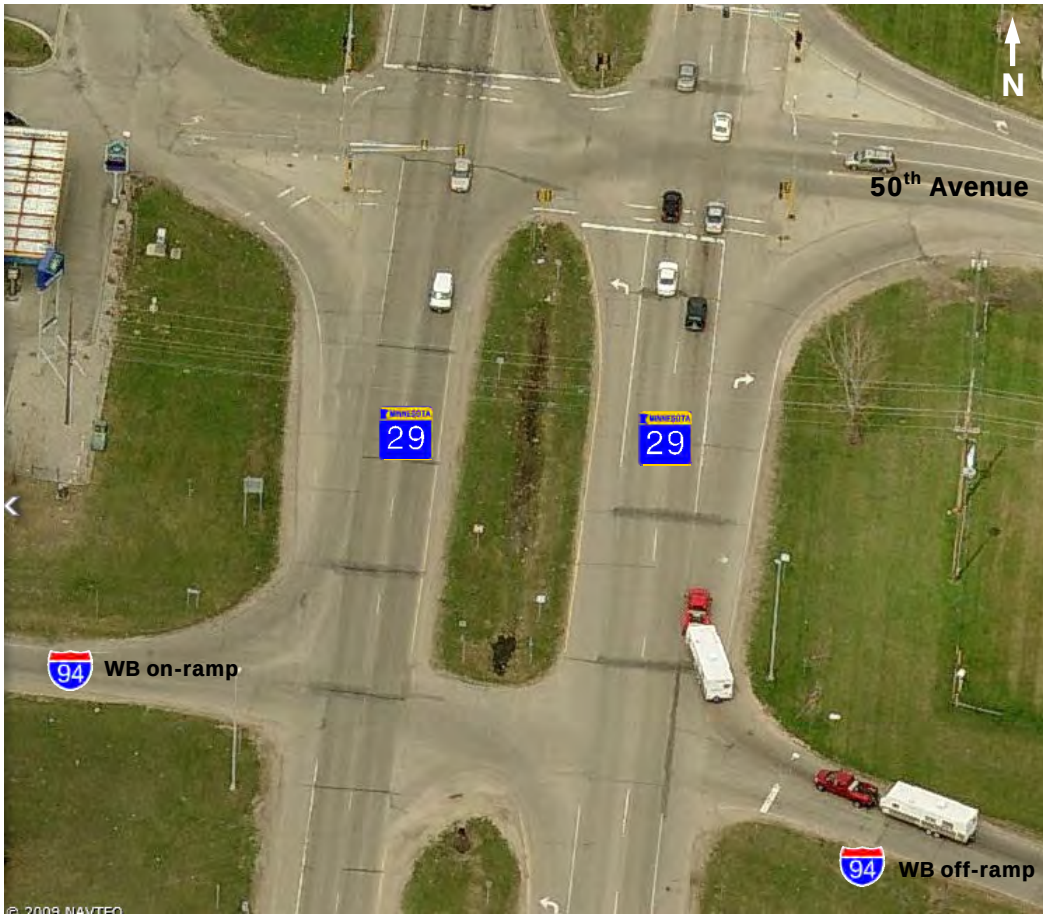
6.2 Subarea 2 – 50th Avenue Extension and Access Improvements

6.2.1 Overview

The purpose of the Subarea 2 analysis is to document existing conditions and proposed improvement alternatives specifically addressing intersection spacing issues and access to the industrial park west of TH 29 and north of I-94.

6.2.2 Existing Conditions

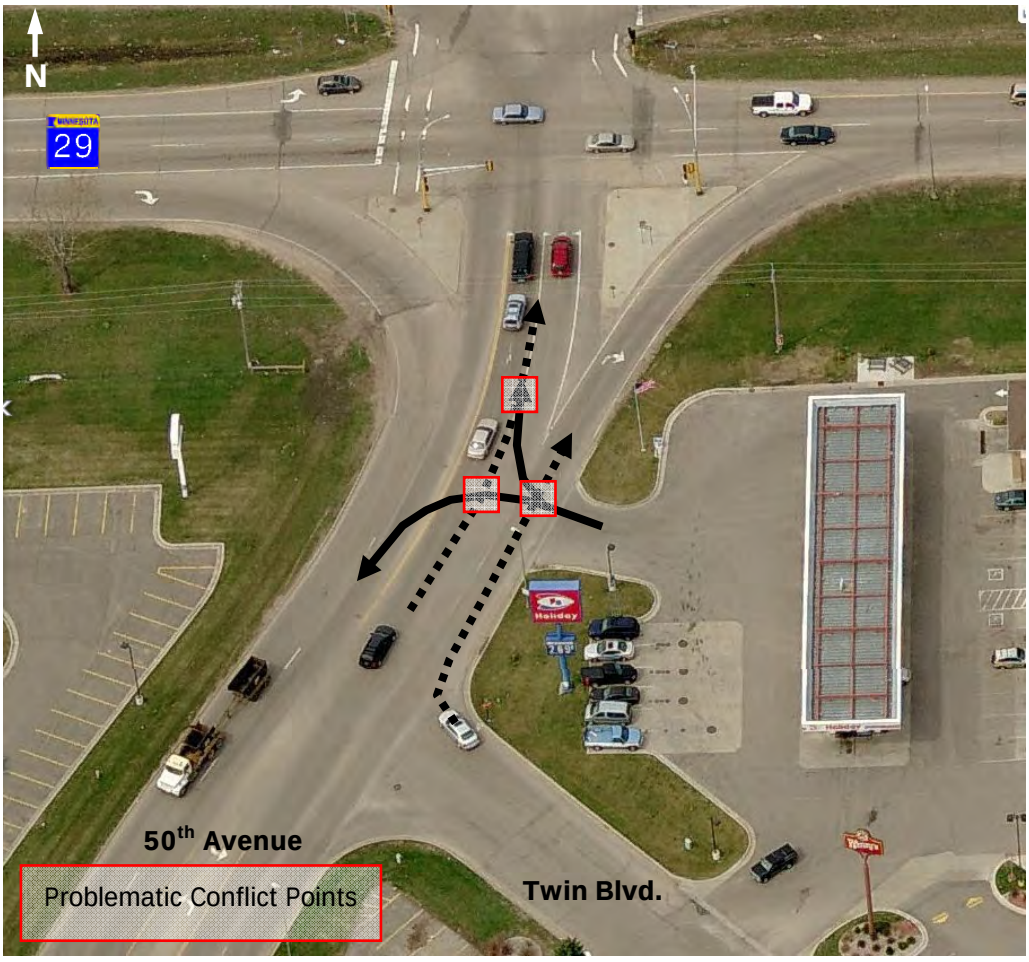
Currently the intersection of 50th Avenue and TH 29 is signalized and is located only 300 feet north of the intersection of TH 29 and the I-94 westbound ramps. With this short spacing, vehicle queues and weaving create mobility and safety concerns. Vehicles turning right onto TH 29 from the westbound I-94 exit ramp enter a right turn-only lane that terminates at 50th Avenue. For vehicles continuing north past 50th Avenue, they must merge into the adjacent lane. This leads to undesirable weaving conditions for TH 29 traffic. When the traffic signal is red, this becomes even more difficult as vehicles in the TH 29 northbound lanes quickly form significant queues shortening distance available for merging traffic.



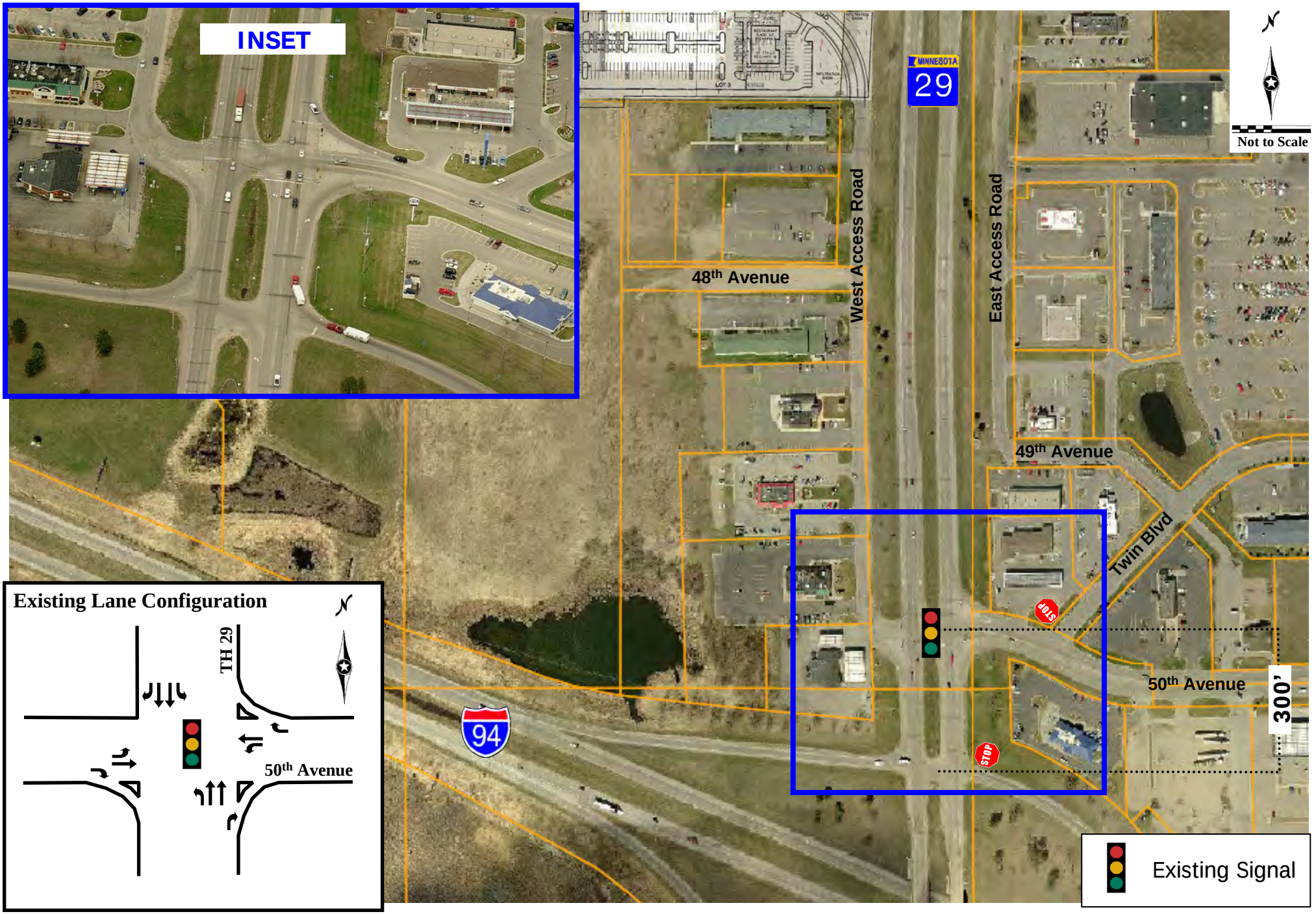
Vehicles turning right onto TH 29 from the westbound I-94 exit ramp enter a right turn-only lane that terminates at 50th Avenue. For vehicles continuing north past 50th Avenue, they must merge into the adjacent lane.

There are also queuing and blocking issues along 50th Avenue. Currently the traffic signal has permitted left turns on green with no protected turn phases for vehicles on 50th Avenue. Left turning vehicles on westbound 50th Avenue queue in one lane as far back as 300 feet blocking access to a gas station and Twin Boulevard which connect to 50th Avenue in this area. On the west side of TH 29, a north-south frontage road also connects to this intersection, but 50th Avenue does not continue to the west. Extending 50th Avenue would be desirable as it would provide access to a nearby industrial park and greatly improve connectivity and mobility in this area. Vehicle queues from the traffic signal also back up blocking access to a gas station and other businesses along the access road.

Figure 6-12 displays the Subarea 2 location and existing lane configurations at the intersection of 50th Avenue and TH 29. From 2003-07 several crashes occurred on 50th Avenue east of TH 29. A contributing factor to this may be the close spacing of access points, which increases turning movement conflicts.



The gas station driveway is one example of how close spacing increases vehicle turning movement conflicts. The proximity of the gas station access point to TH 29 and Twin Boulevard makes it difficult for vehicles crossing multiple lanes to reach 50th Avenue or TH 29.



Subarea 2
50th Avenue Extension & Access Improvements

Figure 6-12
Location and Lane Configuration

6.2.3 Proposed Improvement Alternatives

Several issues were identified in Subarea 2 including:

- Intersection spacing along TH 29
- Access between the freeway and the industrial park via TH 29
- Intersection spacing along 50th Avenue
- East Access Road connection to 50th Avenue
- West Access Road intersection with TH 29

The three concept alternatives that were developed to mitigate the above mentioned issues include:

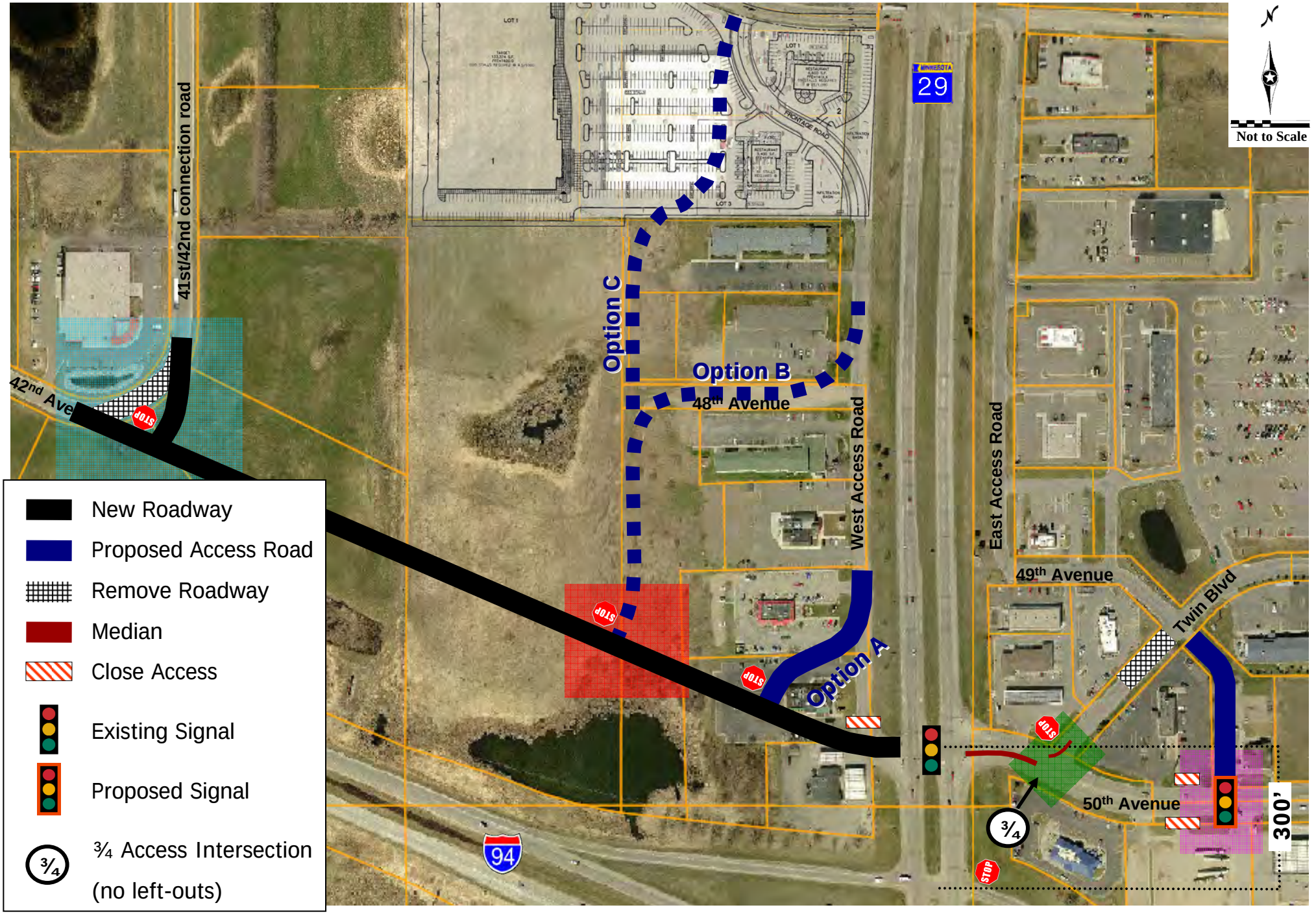
- Alternative 1 – 50th Avenue Extension
- Alternative 2 – 49th Avenue Extension
- Alternative 3 – 48th Avenue Extension

Alternative 1 – 50th Avenue Extension

Alternative 1 proposes to extend 50th Avenue to the west, which would provide access to a nearby industrial park (see **Figure 6-13**). With this alternative, a ¾ access intersection is proposed at 50th Avenue and Twin Boulevard. This intersection improvement will still allow vehicles to access adjacent businesses but will prohibit vehicles on Twin Boulevard from accessing 50th Avenue eastbound. This would reduce vehicular conflicts as well as driver confusion due to the close spacing of intersections in this area. Continuity of the East Access Road is proposed by creating a segment that runs southward between Hardees and Subway to 50th Avenue. The intersection of the East Access Road and 50th Avenue will be controlled by a traffic signal.

The proposed realignment of the West Access Road has three possible options. Option A moves the intersection of the West Access Road and 50th Avenue approximately 300 feet west of TH 29. The access road alignment would bend and reconnect to the west frontage road 350 feet north of 50th Avenue. Options B and C move the intersection of the West Access Road and 50th Avenue approximately 650 feet west of TH 29. The access road alignment in Option B would provide back access to businesses between 48th Avenue and 50th Avenue. The existing 48th Avenue alignment would then be utilized to connect the new alignment to the existing west frontage road. Option C continues to provide back access from 48th Avenue to the proposed Target redevelopment site. The West Access Road would then connect directly into Dakota Street approximately 400 feet west of TH 29.

By moving the West Access Road/50th Avenue intersection further west, storage will be created for the eastbound vehicle queue at the TH 29/50th Avenue intersection thus preventing vehicles queuing from extending back through adjacent intersections. Although this alternative would improve access to the industrial park as well as businesses adjacent to existing west access road, it would not resolve the intersection spacing concerns along TH 29 between 50th Avenue and I-94.



Subarea 2
50th Avenue Extension & Access Improvements

Figure 6-13
Alternative 1 - 50th Avenue Extension

Alternative 2 – 49th Avenue Extension

Alternative 2 proposes to move the signalized intersection from 50th Avenue to 49th Avenue, as seen in **Figure 6-14.** 50th Avenue is to be a right-in/out intersection at its junction with TH 29. The Twin Boulevard/50th Avenue intersection will be reconstructed as a ¾ access intersection in the same manner as described in Alternative 1. West of TH 29, 49th Avenue will extend and connect to 42nd Avenue in the industrial park. The north-south segment of 42nd Avenue will intersect 49th Avenue in a T-intersection. The proposed realignment for the West Access Road will utilize 48th Avenue (Option A) or continue up to Dakota Street as described in Alternative 1.

On the east side of TH 29, there are two alignments for 49th Avenue to provide access to local businesses in this area while still facilitating safe and efficient movement through the TH 29/49th Avenue intersection.

Eastern Alignment 1

49th Avenue transitions into 50th Avenue by creating a new southeast-northwest segment to that runs between Motel USA and Subway. **Figure 6-14** graphically displays this alignment along with proposed closures.

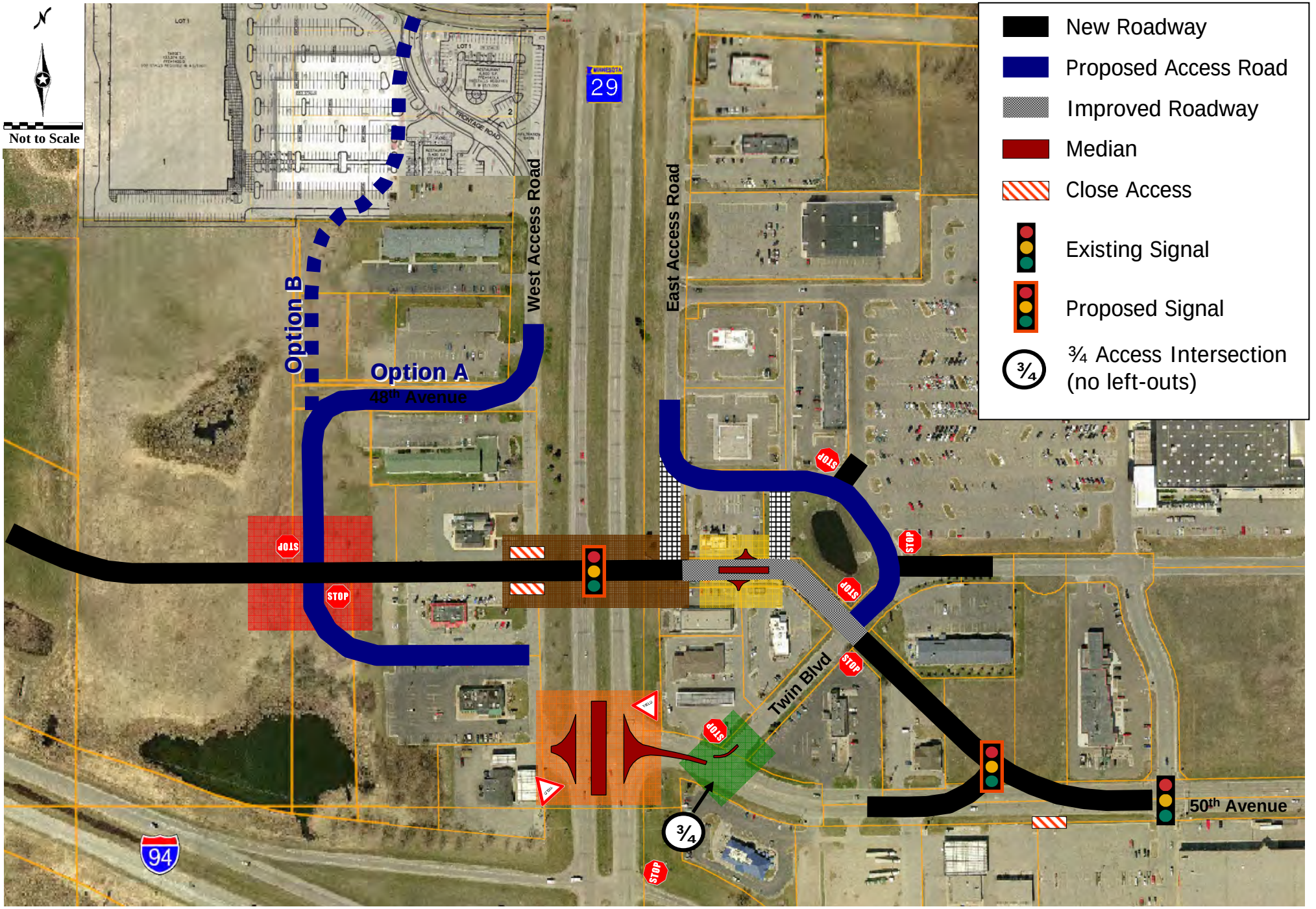
Eastern Alignment 2

49th Avenue first transitions into Twin Boulevard running between Motel USA and Wal-Mart then shifts to a southeast-northwest alignment as it transitions into 50th Avenue south of Menards. **Figure 6-15** graphically displays this alignment along with proposed closures.

Alternative 3 – 48th Avenue Extension

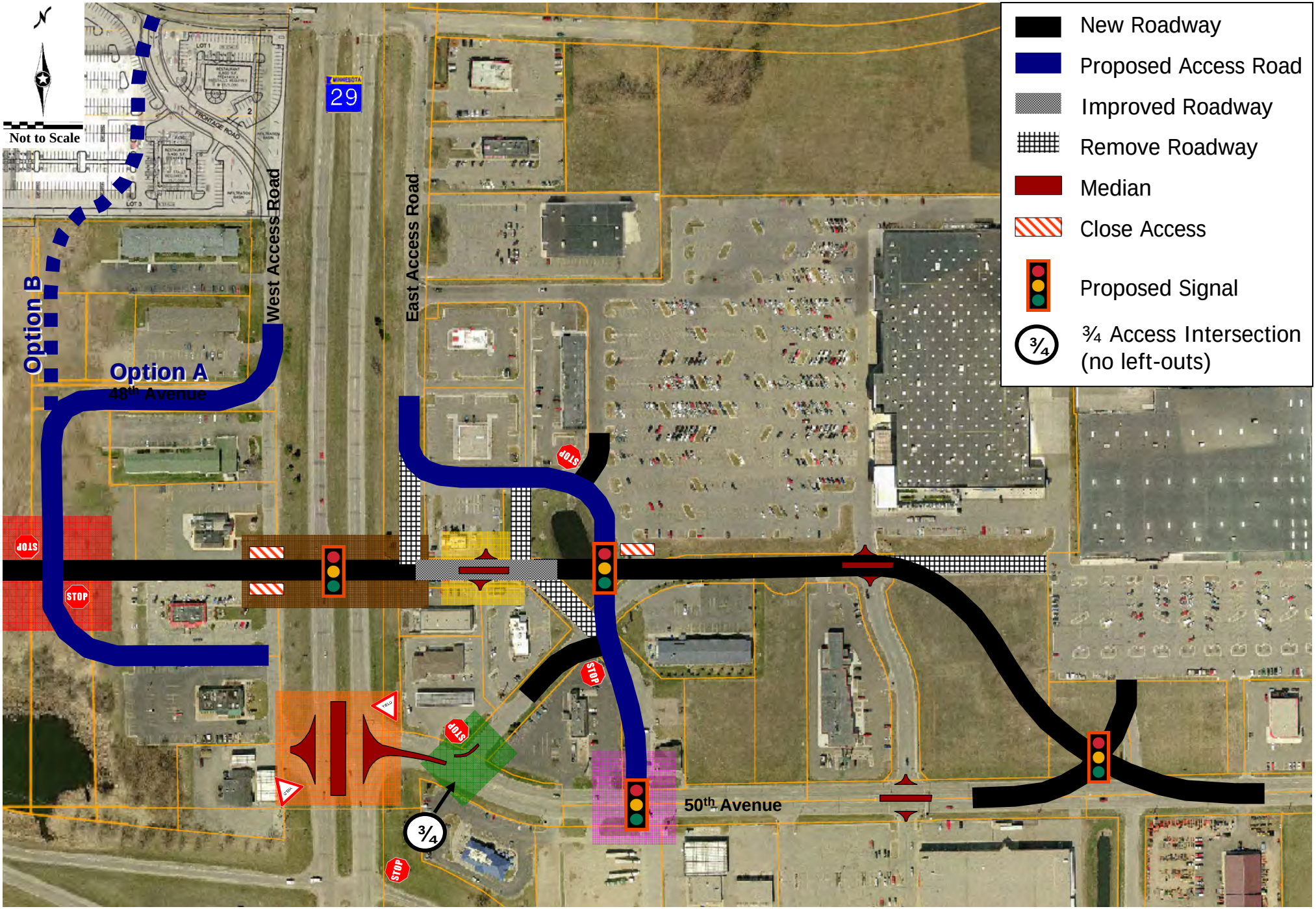
Alternative 3 proposes to move the signalized intersection from 50th Avenue to 48th Avenue, as seen in **Figure 6-16**. 50th Avenue would be reconstructed as a right-in/out intersection at its junction with TH 29. The Twin Boulevard/50th Avenue intersection will be reconstructed as a ¾ access intersection in the same manner as described in Alternative 1. West of TH 29, 48th Avenue will extend and connect to 42nd Avenue in the industrial park with a T-intersection in the same manner as Alternative 2. The proposed alignment for the West Access Road will provide back access to businesses near 48th Avenue and reconnect to the existing West Frontage Road south of 48th Avenue. North of 48th Avenue, the West Access Road will continue up to Dakota Street as described in Alternative 1. The connection of the West Access Road to the proposed 48th Avenue extension will provide adequate storage for queuing vehicles at the new TH 29/49th Avenue intersection.

On the east side of TH 29, the 48th Avenue alignment transitions into 50th Avenue near Menards by creating a new southeast-northwest segment that runs through part of the existing Wal-Mart parking lot. **Figure 6-17** provides additional information on common characteristics related to areas within **Figure 6-13** through **Figure 6-16**.



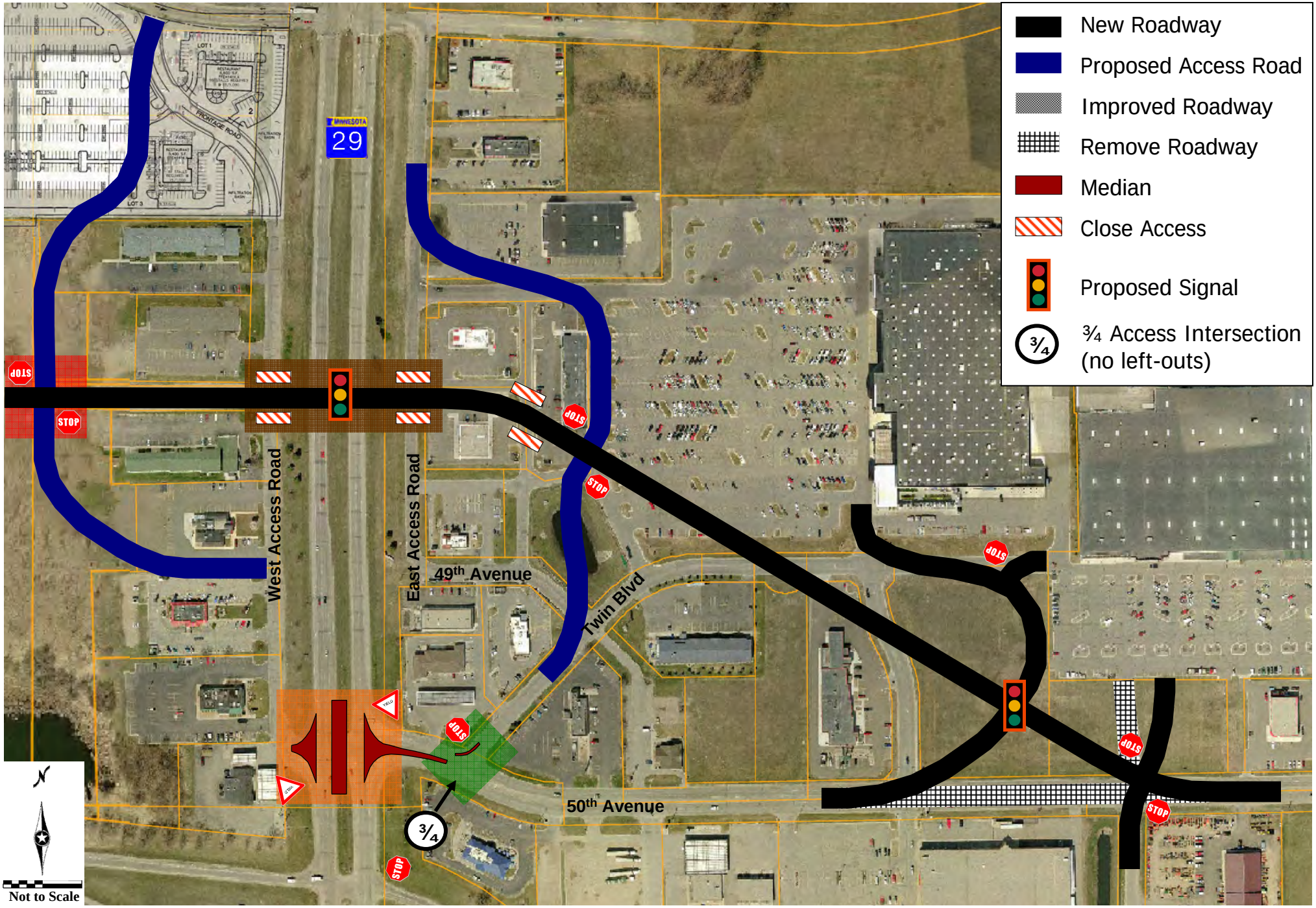
Subarea 2
50th Avenue Extension & Access Improvements

Figure 6-14
Alternative 2 - 49th Avenue Extension
(Eastern Alignment 1)



Subarea 2
50th Avenue Extension & Access Improvements

Figure 6-15
Alternative 2 - 49th Avenue Extension
(Eastern Alignment 2)



Subarea 2
50th Avenue Extension & Access Improvements

Figure 6-16
Alternative 3 - 48th Avenue Extension

Area 1 – Industrial Park area intersection improvements (42nd Avenue)

Improvement Measure 1: Extension of 42nd Avenue.
Rationale: Provide better access to industrial park from TH 29.

Improvement Measure 2: Realign southern section of 41st/42nd connection road to intersect 42nd Avenue extension at a right angle (T-intersection).
Rationale: Without realignment, it would be a skewed intersection, resulting in safety concerns.

Improvement Measure 3: Install stop sign on southbound 41st/42nd connection road. Traffic on 42nd Avenue extension would be uncontrolled (major travel movement).
Rationale: Travel safety. 41st/42nd connection road is the minor travel movement and should be stop sign controlled.

Area 2 – West Access Road intersection relocation

Improvement Measure: New West Access Road intersection.
Rationale: Move access road intersection further west to provide storage for vehicles at the new TH 29 intersection.

Area 3 – ¾ access at 50th Avenue and Twin Boulevard

Improvement Measure: Prohibit left turns from Twin Boulevard to 50th Avenue through signing and a raised median.
Rationale: Safety. Reduce vehicle turning movement conflicts.

Area 4 – East Access Road and 50th Avenue intersection

Improvement Measure: The East Access Road will extend south to 50th Avenue running between Hardees and Subway. A new traffic signal will be installed on 50th Avenue.
Rationale: Provide safer access to businesses north of 50th Avenue by increasing the intersection spacing between full access intersections thereby reducing turning movement conflicts.

Area 5 – Revised access at the 50th Avenue and TH 29 intersection

Improvement Measure: Conversion of full access intersections to right-in/out access only (installation of raised medians).
Rationale: Improve intersection spacing along TH 29, thereby reducing turning movement conflicts.

Area 6 – 48th or 49th Ave and TH 29 intersection *(depending on scenario)*

Improvement Measure: New at-grade, full-access intersection along TH 29.
Rationale: Improve travel flow along TH 29 by providing improved spacing between full-access intersections.

Area 7 – Revised access on 48th Avenue east of TH 29

Improvement Measure: Conversion of full access intersections to right-in/out access only (installation of raised medians)
Rationale: Maintain direct access with improvement measures while providing adequate spacing between full-access intersections.

Proposed Access Road

Summary/Conclusion

As was previously discussed in the Subarea 1 analysis, a tight diamond interchange at the junction of I-94 and TH 29 would provide adequate spacing between the interchange ramps and 50th Avenue. Therefore, Alternative 1 (50th Avenue Extension) would be the most feasible option with the fewest impacts to right-of-way and being the most economical. Moving the west access road intersection further west along the new 50th Avenue extension alignment would provide for adequate spacing between intersections and allow vehicles to queue without blocking access points. Access to the industrial park from 50th Avenue would also provide quick and easy access to and from I-94. Therefore, if a tight diamond interchange is constructed at the I-94/TH 29 junction, the 50th Avenue extension would provide a new connection to the industrial park and move the West Access Road intersection further west, thus improving operations at the TH 29/50th Avenue intersection.

6.3 Subarea 3 – Neighborhood Access to TH 29

6.3.1 Overview

The Subarea 3 analysis has two objectives. The first objective is to identify potential measures to improve access between TH 29 and the adjacent neighborhood. The second objective is to address the abrupt lane drop on TH 29 (Nokomis Street) north of 3rd Avenue.

Alternative 1 – Traffic Control Modification at Lakeview Avenue

Alternative 1 proposes the installation of a new traffic signal or roundabout at the intersection of Lakeview Avenue and TH 29 (see **Figure 6-18**). New traffic control at this intersection will provide residents of the neighborhood and local business customers the ability to safely cross or merge onto the TH 29 traffic stream. As part of this alternative, an option would be to eliminate full access (closure or right-in/out access) from Agnes and Darling Avenues to TH 29, which would improve mobility and safety on TH 29. It is expected that the left-turning traffic that used these access points would reroute to the controlled intersection at Lakeview Avenue and TH 29.

Alternative 2 – CSAH 42 Connection to Neighborhood (Park Street or Quincy Street)

Alternative 2 proposes the installation of a new traffic signal or roundabout at the intersection of CSAH 42 and TH 29 (see **Figure 6-19**). Two possible alignments (Options A and B) were proposed to connect the neighborhood to TH 29 and CSAH 42. New traffic control at this intersection will provide residents the ability to safely enter or cross the TH 29 traffic stream. Since the new signal or roundabout would be located north of the neighborhood, it is anticipated that some residents traveling to the south would still use the uncontrolled intersections to access TH 29 due to the inconvenience of having to travel further to use the controlled intersection.

Alternative 3 – TH 27 Connection to Neighborhood (Park Street/1st Avenue)

Alternative 3 proposes a new roadway connection between TH 27 and the neighborhood (see **Figure 6-20**). This connection would go under the railroad bridge, crossing the Central Lakes Trail at-grade. This improvement provides residents of the neighborhood east of TH 29 another option to connect to the regional roadway network via TH 27. Since the new connection would be located south of the neighborhood, it is anticipated that residents traveling southbound on TH 29 would still use the uncontrolled intersections to access the neighborhood. To reduce the potential for northbound cut-through traffic as well as project cost, this improvement could be built as a southbound one-way roadway and still effectively serve the neighborhood. As the majority of trips from this neighborhood are destined to areas located to the south, this connection would improve safety by reducing the number of vehicles currently making left-turns onto TH 29.

Subarea 3

Neighborhood Access to TH 29 (North of 3rd Avenue)

Figure 6-18
Alternative 1 – Lakeview Avenue
Traffic Control Modification

Subarea 3

Neighborhood Access to TH 29 (North of 3rd Avenue)

Figure 6-19

Alternative 2 – CSAH 42 Connection to Neighborhood (Park Street or Quincy Street)

Subarea 3

Neighborhood Access to TH 29 (North of 3rd Avenue)

Figure 6-20

Alternative 3 – TH 27 Connection to Neighborhood (Park Street/1st Avenue)

TH 29 Roadway Improvements

This improvement proposes to expand TH 29 northbound to two lanes from 2nd Avenue to just north of CSAH 42. The proposed TH 29 roadway cross-section would consist of a single southbound lane, a two-way left turn lane, and two northbound lanes. This will resolve the lane drop, merge condition and encourage a better distribution of traffic in the preceding eastbound dual left-turn lanes on 3rd Avenue. It is projected that this improvement will be constructed in 2011. A typical roadway cross-section of the proposed design is shown in **Figure 6-21**.

This improvement will accommodate current and shorter term traffic needs, however, it is expected that the long term solution is to widen TH 29 (Nokomis Street) to a five-lane section from 3rd Avenue to CSAH 42.

6.3.2 Summary/Conclusion

There are two objectives within Subarea 3, the first is to improve neighborhood access.

Objective 1: Improve Neighborhood Access

- Alternative 1 – Traffic Control Modification at Lakeview Avenue
- Alternative 2 – CSAH 42 Connection to Neighborhood (Park Street or Quincy Street)
- Alternative 3 – TH 27 Connection to Neighborhood (Park Street/1st Avenue)

Currently, drivers waiting on the minor streets intersecting TH 29 are at a relatively high risk of a right angle collision as there is pressure to accept shorter gaps in the TH 29 traffic stream. A new roadway connecting the southern part of the neighborhood to TH 27 would provide residents with another option for accessing the regional roadway network. As the majority of trips from this neighborhood are destined to areas located to the south, this connection would improve safety by reducing the number of vehicles currently making left-turns onto TH 29. **It is recommended that Alternative 3 be considered for implementation**.

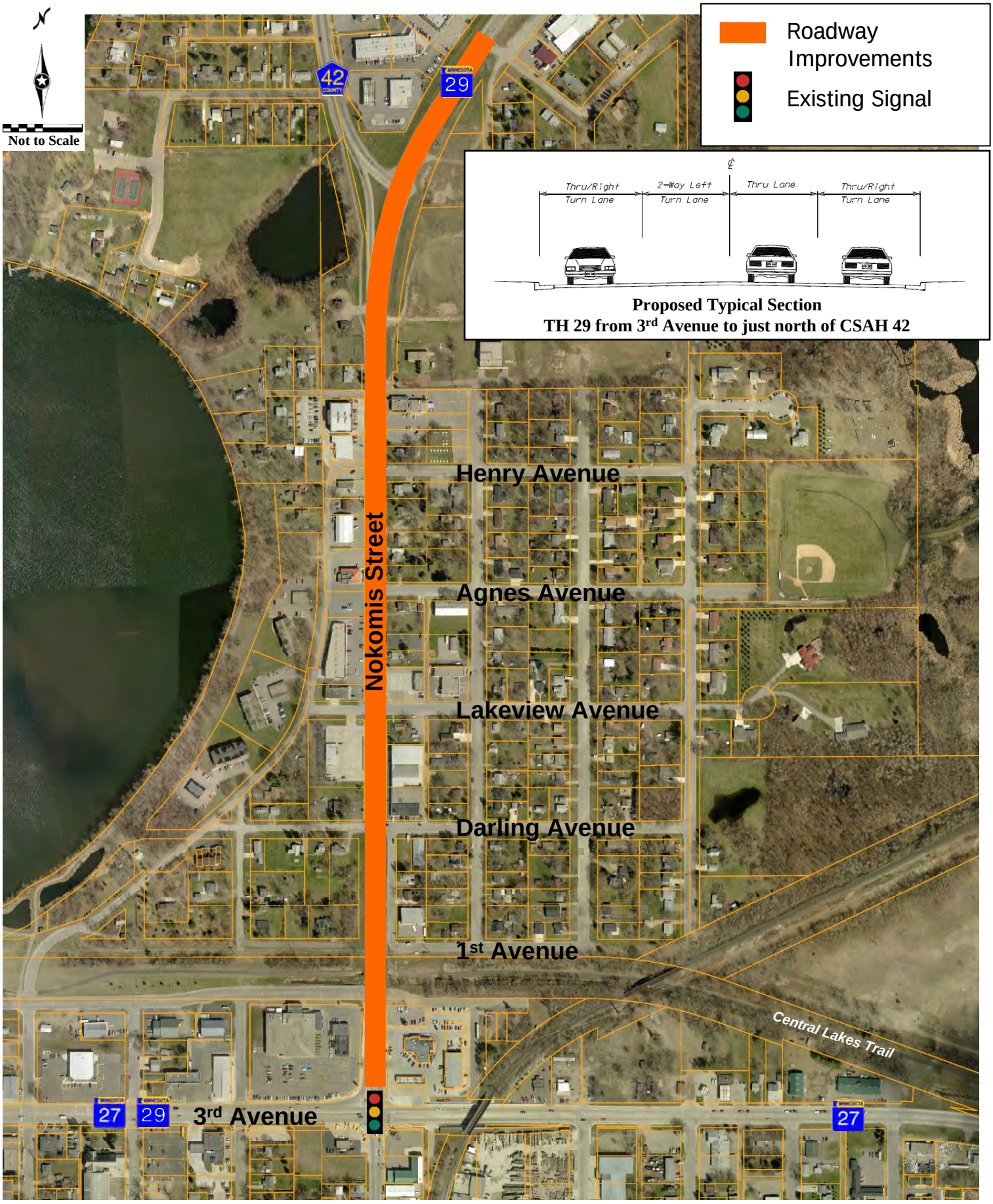
The second objective is to address the northbound lane drop on TH 29.

Objective 2: Address the TH 29 Northbound Lane Drop

- TH 29 Roadway Improvements

Improving the roadway cross-section along TH 29 will resolve the lane drop issue between 2nd Avenue and Darling Avenue. This new cross-section will provide northbound TH 29 with two continuous travel lanes from 3rd Avenue to just north of CSAH 42. At CSAH 42, the two-way left-turn lane will become a left-turn only lane to CSAH 42 northbound. This upgrade will improve mobility throughout this segment of roadway**. It is recommended that this improvement be implemented.**

Each of the recommended improvements addresses a different objective; therefore, each improvement may be considered separately or together.



Subarea 3

Neighborhood Access to TH 29 (North of 3rd Avenue)

Figure 6-21
Recommended TH 29 Improvements

6.4 Subarea 4 – TH 29 Speed Limit Transition and Access Management

6.4.1 Overview

The purpose of the Subarea 4 analysis is to examine speed limit transitions and access to TH 29 from approximately one mile east to one mile west of the intersection of TH 29 and County Road 70 (McKay Avenue).

6.4.2 Existing Condition

Currently, while traveling southbound on TH 29 through Subarea 4, the speed limit abruptly transitions from 55 miles per hour (mph) to 30 mph just north of CSAH 42 (see **Figure 6-22**). This abrupt change in speed can lead to high deceleration rates among drivers and increases the chance of rear end collisions when inattentive drivers are present. Access to TH 29 along this segment of roadway has been managed relatively well. The only signalized intersection along this segment of roadway is located at the junction of TH 29 and McKay Avenue.

6.4.3 Proposed Improvement

One solution to the abrupt speed limit change would be to transition the limit from 55 mph to 30 mph by adding an intermediate speed limit sign so drivers are accelerating and decelerating at more acceptable rates.

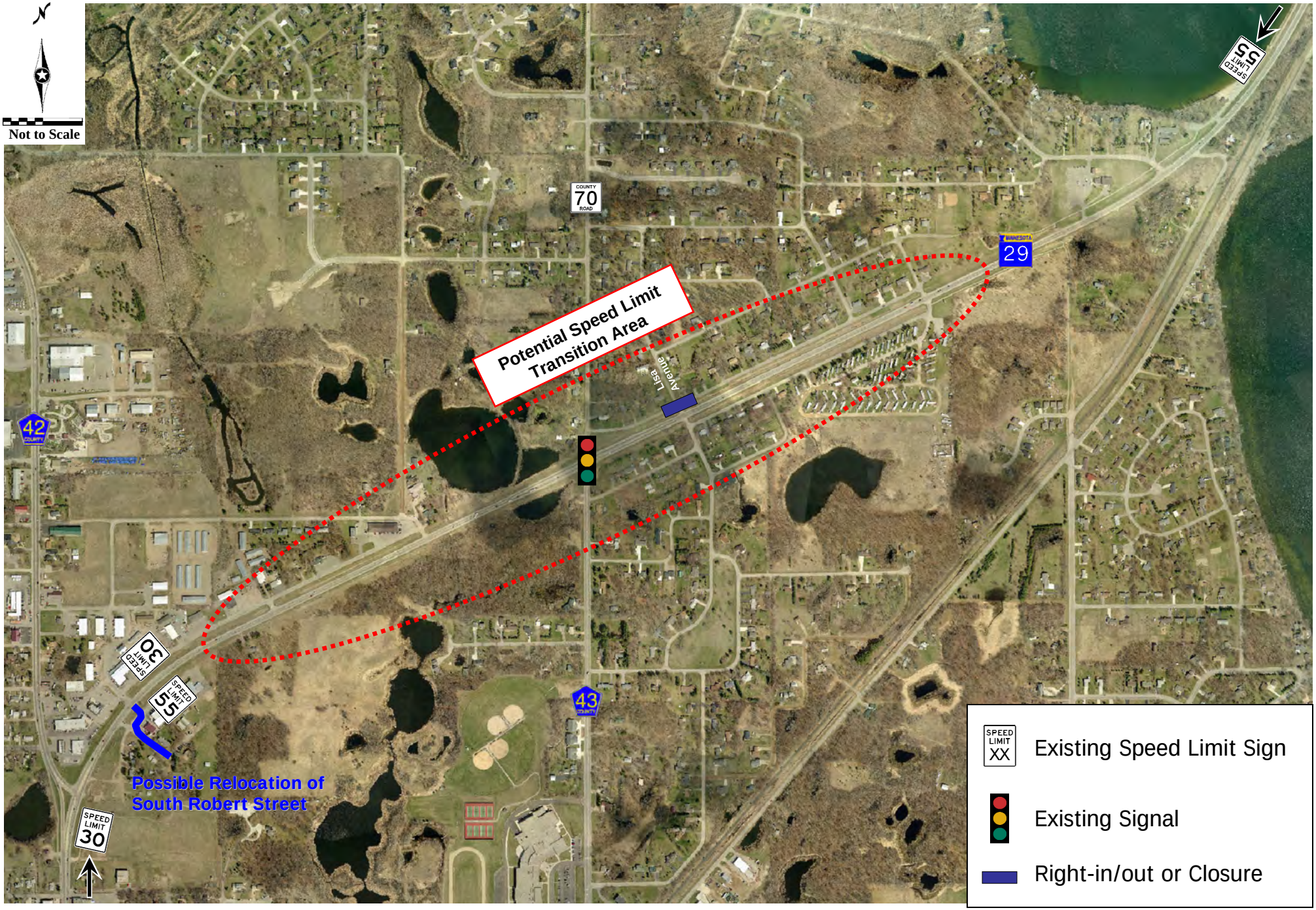
Another mobility and safety improvement would be the reduction in access to TH 29. One such location is Lisa Avenue which intersects TH 29 approximately 750 feet northeast of the TH 29/McKay Avenue intersection. It is proposed that this access point be considered for closure or right-in/out access only. Access to the neighborhood would still be provided via McKay Avenue.

Another potential improvement is to realign the south leg of Robert Street so that it aligns with Robert Street to the north of TH 29. **Figure 6-22** also displays this potential realignment.

6.4.4 Summary/Conclusion

From the review of existing access locations, **it is recommended to close or limit access to TH 29 from Lisa Avenue (approximately 750 feet northeast of the TH 29/McKay Avenue intersection).** Closing this access point or reducing it to right-in/out access will improve the safety along TH 29 by reducing turning conflicts along this segment. Left-turning vehicles will enter and exit the TH 29 corridor at the signalized intersection of TH 29 and McKay Avenue.

The speed transition on TH 29 is an issue as the posted speed limit abruptly transitions from 55 miles per hour (mph) to 30 mph just north of CSAH 42. This abrupt change in speed can lead to high deceleration rates among drivers and increases the chance of rear-end collisions. **It is recommended that a speed study be conducted to determine if an intermediate speed limit between 30 mph and 55 mph could be implemented to better transition vehicle speeds along this segment of TH 29**.



Subarea 4

TH 29 Speed Limit Transition & Access Management

Figure 6-22

Potential Speed Limit Transition Area

6.5 Subarea 5 – Carlos Corners Intersection Control

6.5.1 Overview

The purpose of the Subarea 5 analysis is to document past issues, recent improvements, and proposed access management associated with the intersection of TH 29 and CSAH 42/13 (commonly referred to as Carlos Corners) just west of the city of Carlos, MN.

6.5.2 Past Conditions

Previously the Carlos Corners intersection was minor street stop-controlled with TH 29 free flowing. TH 29 has a posted speed of 55 mph in this area. Located approximately one mile to the east of this intersection is the city of Carlos. Many residents use the Carlos Corners intersection as a means of accessing the TH 29 corridor. The northwest quadrant of the intersection also has a gas station which produces many inbound and outbound trips per day. The intersection had a high reported crash rate due to the high speeds and drivers underestimating the time gap needed to safely navigate the intersection.

6.5.3 Recent Improvements

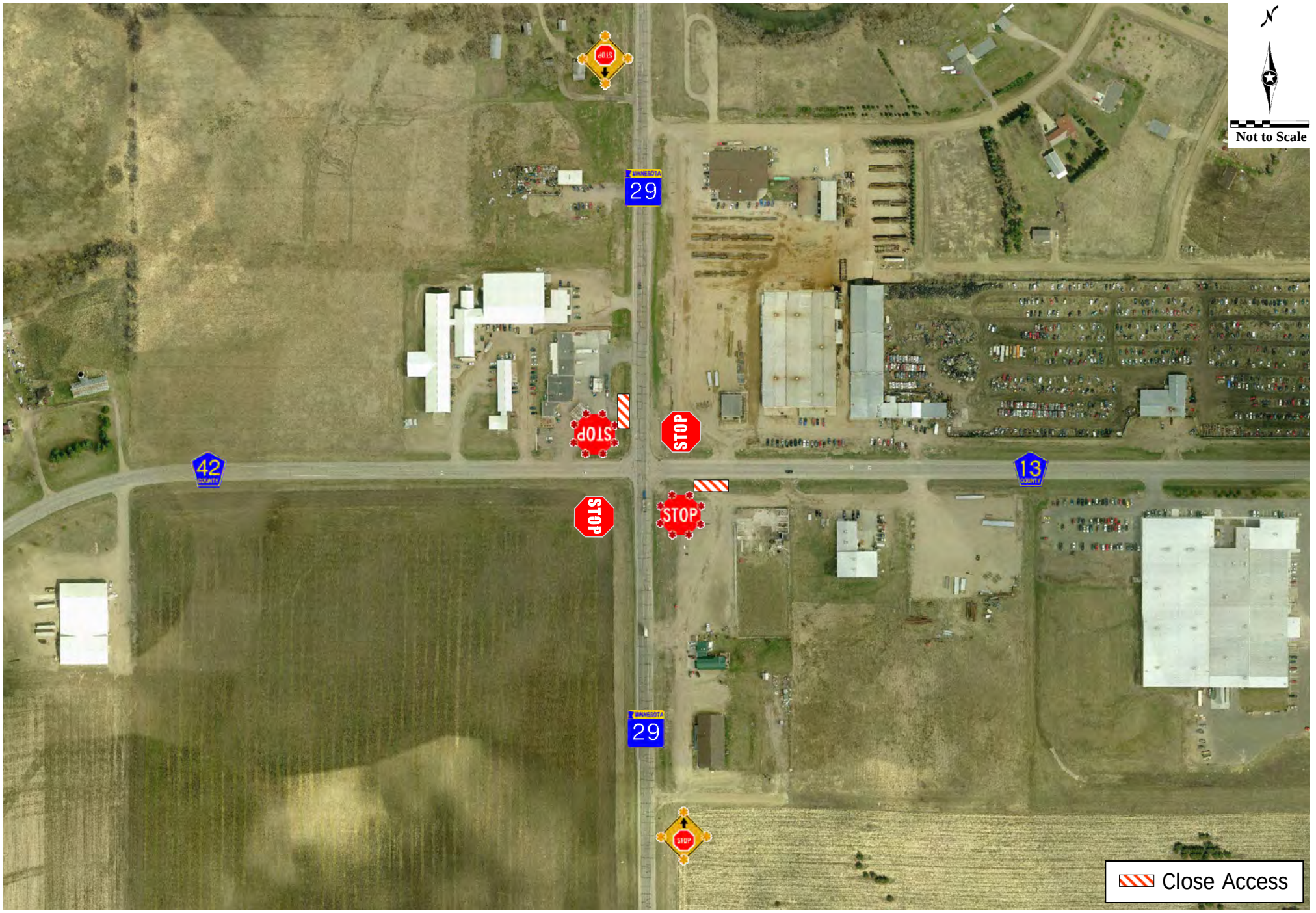
Recently, all-way stop control has been implemented at this intersection (see **Figure 6-23**). This included installing "Stop Ahead" signs along TH 29 to alert drivers of the new traffic control at the intersection. The new “Stop Ahead” and “Stop” signs were enhanced with solar-powered LED lights around their perimeter in an attempt to further inform drivers of the new traffic control.

6.5.4 Proposed Improvement

The closure of two existing access points is proposed in order to maintain safety near the intersection while providing storage for vehicles to queue without blocking access to nearby business driveways. One access closure is located in the northwest quadrant and the second in the southeast quadrant of the intersection as can be seen in **Figure 6-23.** These closures will ensure that vehicles turning into and out of parcels adjacent to the intersection will be uninhibited by queuing vehicles waiting at the all-way stop signs.

6.5.5 Summary/Conclusion

Due to the recent improvements at the Carlos Corners intersection, there has been a decrease in reported crashes. The implementation of the all-way stop condition at this intersection was well received by the traveling public and is producing satisfactory results. To further improve the safety of the intersection, it is recommended that the access closures mentioned previously be implemented. If at some point in the future a traffic signal or roundabout is warranted at this location, consideration should be given to the closure of additional access points near the intersection. These closures will help maintain safety as through-speeds will likely increase warranting increased sight distance for vehicles turning into and out of nearby access points. Likewise, queue lengths during the peak periods may block additional access points located near the intersection.



Subarea 5
Carlos Corners Intersection Control

Figure 6-23
All-way Stop Control

Chapter 7

Funding Sources and Implementation Plan

This chapter summarizes the financial analysis of potential transportation investments. Estimated revenue from existing and proposed funding sources is compared with estimated project costs of constructing the (programmed, planned, and planned) transportation improvements to the year 2030.

7.1 Cost Estimates

General planning level roadway improvement costs were developed for each improvement. It is important to consider the following when reviewing the project cost estimates. First, because it is difficult to identify a specific year that each project might be constructed, all estimated costs are presented in 2010 dollars. Second, since specific details regarding design, engineering, and construction are often not available, the estimated costs represent a very general planning level cost estimate. As projects proceed to the detailed planning and engineering phases, resulting in more accurate estimates, the project cost estimates contained in this transportation plan should be updated.

For the purpose of transportation plan, projects were grouped into one of four categories: programmed (completed prior to year 2015), planned (completed prior to year 2020), potential by year 2020, and potential by year 2030. The terminology (programmed, planned, and potential projects) was used for analyzing the various transportation improvements and does not guarantee that a specific roadway improvement will be constructed. Furthermore, there is no guarantee that a specific improvement will be constructed during the time frame identified. The design, engineering, and construction of the specific roadway improvements identified in this transportation plan depend heavily on the availability of transportation funds.

Based on the identified projects and estimated costs, it is projected that the roadway improvement projects would total approximately $65.4 million in year 2010 dollars. A proposed tight diamond interchange at I-94 and TH 29, a proposed new interchange at I-94 and CR 106, and an I-94 overpass on Nevada Street total $25.6 million all together. The potential roadway improvement costs, in year 2010 dollars, are displayed in **Table 7-1**.

Table 7-1. Roadway Improvement Costs

Map ID #	Project	Location		Improvement	Current Jurisdiction	Length (miles)	Construction Cost[1] (2010 $)
		From	To				
1. Programmed Projects (completed prior to 2015)							
Pr1	TH 29	3rd Avenue	just north of CSAH 42	Construct / Restripe Additional NB Lane	Mn/DOT	0.7	$900,000
Pr2	18th Avenue	Broadway	Nokomis Street	New Roadway (2-Lane)	City of Alexandria	0.5	$500,000
Pr3	18th Avenue	Nokomis Street	CSAH 46	New Roadway (2-Lane)	City of Alexandria	0.7	$700,000
Pr4	50th Avenue	Broadway	Railroad	Upgrade from 2-Ln to 5-Ln Roadway	City of Alexandria	0.6	$1,500,000
Pr5	Nokomis Street	3rd Avenue	6th Avenue	Construct / Restripe Additional NB Lane	City of Alexandria	0.3	$200,000
Pr6	CR 106	CSAH 46	50th Avenue	Add Turn Lanes	Douglas Co	0.3	$200,000
SUBTOTAL						***3.1***	***$4,000,000***
2. Planned Projects (completed between 2015 and 2020)							
Pl1	TH 29	I-94	CSAH 28	Upgrade from 2-Ln to 4-Ln Divided Roadway[2]	Mn/DOT	0.8	$2,400,000
Pl2	TH 29	NA	NA	Replace interchange at TH 29 and I-94[3]	Mn/DOT	0.1	$14,000,000
SUBTOTAL						***0.9***	***$16,400,000***
3. Potential Projects (completed prior to 2020)							
Po1	Nokomis Street	18th Avenue	6th Avenue	Upgrade from 2-Ln to 3-Ln Roadway	City of Alexandria	1.0	$1,500,000
Po2	CSAH 22	CSAH 82	CSAH 44	Upgrade from 2-Ln to 3-Ln Roadway	Douglas Co	0.5	$800,000
Po3	CSAH 42	TH 29	Bethesda Street	Upgrade from 3-Ln to 4-Ln Divided Roadway	Douglas Co	0.4	$1,600,000
Po4	CSAH 42	CSAH 44	Browns Point Road	Upgrade from 2-Ln to 3-Ln Roadway	Douglas Co	0.8	$1,200,000
Po5	CSAH 46	CR 106	CSAH 23	Add Eastbound Auxiliary Lane[4]	Douglas Co	0.2	$100,000
Po6	50th Avenue	TH 29	42nd Avenue	New Roadway (2-Lane)[5]	City of Alexandria	0.7	$2,100,000
Po7	New Connection	Park Street/1st Avenue	TH 27	New Roadway (2-Lane)	City of Alexandria	0.1	$200,000
SUBTOTAL						***3.7***	***$7,500,000***
4. Potential Projects (completed prior to 2030)							
Po8	TH 29	CSAH 28	CSAH 4	Upgrade from 2-Ln to 4-Ln Divided Roadway	Mn/DOT	2.4	$7,200,000
Po9	TH 27	CSAH 21	Nevada Street	Upgrade from 2-Ln to 4-Ln Divided Roadway	Mn/DOT	1.3	$3,900,000
Po10	CSAH 23	CSAH 46	CR 81	Upgrade from 2-Ln to 3-Ln Roadway	Douglas Co	0.8	$1,200,000
Po11	TH 29	CSAH 42	CR 73	Upgrade from 2-Ln to 4-Ln Divided Roadway	Mn/DOT	2.2	$8,600,000
Po12	CSAH 42	Bethesda Street	CSAH 44	Upgrade from 3-Ln to 4-Ln Divided Roadway	Douglas Co	0.5	$2,000,000
Po13	CSAH 42	Browns Point Road	CSAH 11	Upgrade from 2-Ln to 3-Ln Roadway	Douglas Co	0.5	$800,000
Po14	Nevada Street	NA	NA	Construct I-94 Overpass and Roadway	City of Alexandria	0.9	$2,900,000
Po15	CR 106	NA	NA	Construct I-94 Interchange and Roadway	Douglas Co	2.2	$10,200,000
Po16	TH 29	3rd Avenue	just north of CSAH 42	Construct Additional SB Lane (5-Lane Roadway)	Mn/DOT	0.7	$700,000
SUBTOTAL						***11.5***	***$37,500,000***
TOTAL						**19.2**	**$65,400,000**

[1]Costs do not include right-of-way and engineering.

[2]Project is expected to be included in the 2012 - 2015 State Transportation Improvement Program (STIP).

[3]Alternative interchange concepts were developed for the Subarea 1 Analysis (See Section 6.1 of the Report). These concepts range in cost from $4 million (bridge replacement) to $25 million (full reconstruction). Of the concepts, the tight urban diamond interchange represents the lowest cost alternative that meets the mobility objectives. Only the replacement of the existing bridges is expected to be included in the 2012 - 2015 STIP.

[4]This segment of CSAH 46 performs like a 3-lane section due to left and right turn lanes being present at the intersections. Therefore, the capacity is assumed to be the same as a 3-lane section. To address delay and congestion at the intersection of CR 106 and CSAH 46, an eastbound auxiliary lane is recommended.

[5]This improvement includes extending 50th Avenue west to 42nd Avenue, realigning the southern portion of the West Frontage Road, modifying access at the 50th Avenue / Twin Blvd intersection (3/4 access), constructing a new roadway segment from Twin Blvd to 50th Avenue ending in a new traffic signal.

GENERAL NOTE:

Programmed and Planned projects were used to categorize projects into different improvement scenarios. The terminology does not guarantee that any of these projects will be constructed nor does it guarantee that a specific project will be constructed during the identified time frame.

SOURCE: Mn/DOT, Douglas County, City of Alexandria, and WSB & Associates

K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Roadway Projects Costs

The planning level cost estimates of new and reconstructed roadways were developed based on the length being improved. The cost assumptions, displayed in **Table 7-2**, were used as the basis for developing each alternative's construction cost.

Table 7-2. Planning Level Cost Estimate Assumptions

ROADWAY COST ASSUMPTIONS		
Roadway Cross Section		Cost per mile
From	To	Year 2010[1]
-NA-	New 2-lane w/shoulders	$ 1,000,000
2-lane	Reconstruct 3-lane	$ 1,500,000
2-lane	5-lane	$ 2,500,000
2-lane	Reconstruct/Replace 4-lane Divided[2]	$ 3,000,000
3-lane	Reconstruct/Replace 4-lane Divided[3]	$ 4,000,000
-NA-	Adding Auxiliary Lane	$ 500,000

[1] The estimated costs are conceptual costs for construction only and do not include costs for right-of-way acquisition, engineering, design, or other pre-construction costs.

[2] Assumes the use of the existing set of lanes for one direction of travel. (Cost assumes two new lanes of roadway, shoulders, and median)

[3] Assumes the complete reconstruction of the roadway as a 4-lane divided.

SOURCE: WSB & Associates

K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Improv Costs per mile

7.2 Funding

The financial analysis looks at estimated revenues from existing and proposed funding sources that can reasonably be expected to be available for transportation uses and the estimated costs of constructing the (existing plus planned) transportation system.

The estimated revenues by existing revenue sources (Local, County, and State) available for transportation projects shall be determined and any shortfalls identified. Existing and proposed revenues should cover all forecasted capital costs. All cost and revenue projections are based on the existing and historical trends.

The identification of funding sources is difficult to project for unprogrammed projects. The intent of the following section is to provide an abbreviated listing of potential funding sources for various transportation improvement projects. This information is to be used only for planning purposes.

Funding for the transportation improvement projects comes from a variety of Federal, State, and local sources. Federal funds come from federally assessed user fees, and fuel taxes. They are apportioned back to the states on a formula basis. The primary source of revenue at the Federal and State levels includes motor fuel taxes, vehicle registration fees, special motor carrier fees, and parking fees. Finance at the county and municipal levels are primarily based on property taxes, sales taxes, and special assessments.

Table 7-3 displays the estimated roadway revenues for the years 2010 through 2030 for the Alexandria Area. The future year revenues are based on recent funding levels. While it is likely that these funding levels will continue to increase beyond 2010, for the purpose of the financial analysis all projected funding levels beyond the year 2010 are kept at current levels. Keeping these funding levels constant through the year 2030 allows the projected revenues to be compared to the roadway improvements costs that are presented in year 2010 dollars.

With these assumptions, it is estimated that approximately **$67.6 million** would be available for the Alexandria area roadway improvements to the year 2030. Of this total, a significant percentage will be dedicated to the maintenance of the existing transportation infrastructure including bridges, pavement, traffic signals, traffic signs, and other improvements. The percentage of each funding source available for new construction was estimated and the remaining percentage was assumed to be used for the on-going maintenance and preservation of the existing roadway system. In total, it is estimated that approximately **$38 million** would be available between 2010 and 2030 for new roadway construction.

Table 7-3. Potential Revenues (2010 through 2030)

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PROJECTED REVENUES (2010 to 2030)							
	Year	Mn/DOT[1]	Douglas County State Aid[2,3]	Douglas County[2,4]	City of Alexandria State Aid[2,5]	City of Alexandria[2,6]	Total
2010 - 2015	2011		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2012		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2013		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2014		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2015		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	Subtotal	**$ 200,000**	**$ 6,250,000**	**$ 625,000**	**$ 2,500,000**	**$ 500,000**	**$ 10,075,000**
2015 - 2020	2016		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2017		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2018		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2019		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2020		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	Subtotal	**$ 15,600,000**	**$ 6,250,000**	**$ 625,000**	**$ 2,500,000**	**$ 500,000**	**$ 25,475,000**
2020 - 2030	2021		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2022		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2023		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2024		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2025		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2026		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2027		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2028		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2029		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	2030		$ 1,250,000	$ 125,000	$ 500,000	$ 100,000	$ 1,975,000
	Subtotal	**$ 12,300,000**	**$ 12,500,000**	**$ 1,250,000**	**$ 5,000,000**	**$ 1,000,000**	**$ 32,050,000**
	Total	**$ 28,100,000**	**$ 25,000,000**	**$ 2,500,000**	**$ 10,000,000**	**$ 2,000,000**	**$ 67,600,000**
	Percent Available[7]	**100%**	**25%**	**25%**	**25%**	**25%**	
	Total	**$ 28,100,000**	**$ 6,250,000**	**$ 625,000**	**$ 2,500,000**	**$ 500,000**	**$ 37,975,000**

[1] The Mn/DOT District 4 20-year Highway Investment Plan (2009-2028) identifies the replacement of the TH 29 bridges over I-94 as having a cost exceeding $5.0 million. District 4 is committed to funding these bridges by 2018. This study assumed that along with replacing the bridges, Mn/DOT would fund a new interchange and expand TH 29 to 4-lanes from I-94 to just south of CSAH 28 by 2018.

[2] Douglas County and City of Alexandria funding levels were held constant at 2010 levels.

[3] The annual Douglas County State Aid construction allotment is $2,081,000 per year. As the population of the Alexandria area accounts for approximately 60% of the entire county, 60% of these funds ($1,250,000) were assumed to be used in the Alexandria area.

[4] The annual Douglas County construction fund is currently $200,000 per year. As the population of the Alexandria area accounts for approximately 60% of the entire county, 60% of these funds ($125,000) were assumed to be used in the Alexandria area.

[5] The annual State Aid Construction fund for the City of Alexandria is expected to average approximately $500,000 per year from 2010 to 2015.

[6] The annual Capital Improvement Fund for the City of Alexandria was estimated at $100,000 per year.

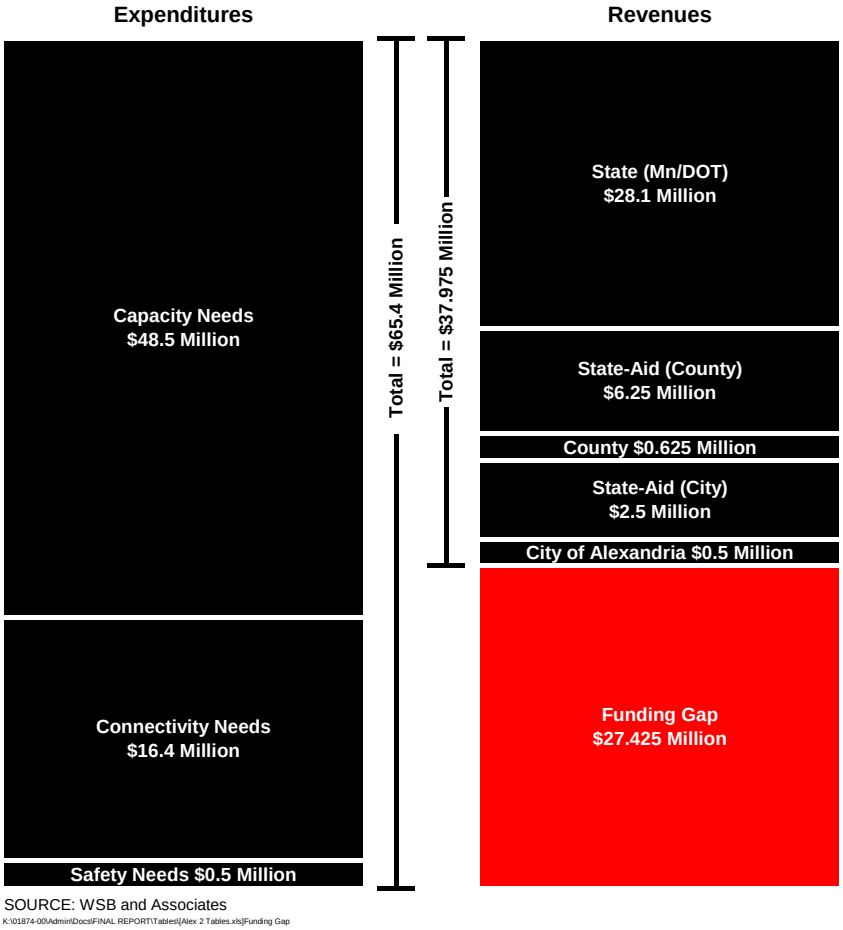
[7] Represents the assumed percentage of funding available for new construction

SOURCE: WSB and Associates

K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Projected Revenues

The improvements total an estimated **$65.4 million** in year 2010 dollars. Previously, the funding analysis shows that approximately **$38 million**, in year 2010 dollars, would be available for the identified roadway improvements. As shown in **Figure 7-1**, this would leave approximately **$27.4 million** of unfunded roadway improvements. While this shortfall represents a significant amount of investment, if new or expanded financing methods are implemented, the amount of local resources needed to close this gap could be reduced. Therefore, to assist decision makers in addressing the future funding gap, both general and specific funding strategies are provided.

Figure 7-1. Potential Revenues and Expenditures (2010 through 2030)



SOURCE: WSB and Associates
K:\01874-00\Admin\Docs\FINAL REPORT\Tables\[Alex 2 Tables.xls]Funding Gap

7.2.1 General Funding Strategies

State, County, and City staff are well versed in state and federal funding programs and are actively seeking a variety of funding sources to supplement local funding sources. The funding strategies should consider present constraints and opportunities while planning for the transportation infrastructure needed to meet expected growth.

In general, this means:

- State-aid transportation needs should be adjusted/updated to increase annual funding allotments.
- Agencies may need to partner, pool resources, and jointly lobby for outside funding assistance.
- Support legislation that will generate additional transportation funding assistance
- Aggressively seek new and innovative forms of nonlocal assistance.
- Public-private partnerships should be considered.
- Non-traditional funding methods for major projects (i.e., bonding, congressional appropriations, fees, third party, and cooperative agreements).

7.2.2 Specific Funding Programs

It is recommended that State, County, and City leaders actively investigate and possibly pursue the following specific funding programs/strategies to address future transportation investment needs:

- **Federal Transportation Funds** – The guidelines for direct federal funding for transportation projects are established under the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU).
- **Congressional High Priority Project (HPP) Funding** for county road projects that have a significant impact to communities and the county's transportation system.
- **State Roads of Regional Significance Funds** (from biennial bonding bills) for construction or reconstruction of county roads that address major system deficiencies, contribute to economic development, or redevelopment efforts.
- **Trunk Highway Corridor Account Loan Program (revolving loan fund)** to assist the county in paying for the local costs related to trunk highway improvement projects.
- **Mn/DNR Recreation Grant Programs** as noted below for trails and county and township road needs:
  - – Outdoor Recreation Grant Program
  - – Regional Park Grant Program
  - – State Park Road Program
  - – Local Trail Connections Program
  - – Regional Trail Grant Program
  - – Federal Recreation Trail Program
- **Mn/DOT's Rural Safety Audit (RSA) Grant** to identify safety solutions and **Comprehensive Highway Safety Plan (CHSP) Central Fund** for grants to implement safety projects (e.g., cost-effective lane departures or intersection improvements).
- **Mn/DOT Safe-Route-To-School Grant Program** (infrastructure or non-infrastructure projects) for city-county trail projects within two miles of schools.
- **Mn/DOT Hazard Elimination (HES) Funds** to remedy high crash locations.
- **Mn/DOT Turnback Account Funding** to upgrade future Trunk Highways if transferred to the county.
- **Mn/DOT Access Management Program Funding** to help county/cities close/consolidate or otherwise develop access alternatives that maximize the capacity of TH's.
- **Municipal State Aid** – Highway User Tax Distribution Fund (funded with the state gas tax and vehicle taxes, as well as federal transportation funds through Mn/DOT). These funds are allocated to a network of Municipal State Aid (MSA) streets.
- **Transportation Economic Development (TED) Pilot Program** – The purpose of this program is to provide state funding for a share of the costs for projects that will improve the

statewide transportation network while promoting economic growth through expansion of an existing business or development of new business.

- **General Obligation Bonds**

- **General Ad Valorem (Property) Taxes** – Transportation projects can be funded with the general pool of municipal revenues raised through property taxes.

- **Cooperative Agreements** – Different levels of government can cooperate on planning, implementing, and financing transportation projects which provide benefits to all the concerned agencies. The financial terms and obligations are generally established at the front end of the projects.

- **Tax Increment Financing (TIF)** – This is a method of funding improvements that are needed immediately by using the additional tax revenue anticipated to be generated because of the given project's benefits in future years. The difference between current tax revenues from the targeted district and the increased future tax revenues resulting from the improvements is dedicated to retiring the municipal bonds used to finance the initial improvement(s).

- **Property Tax Abatement** - a city may grant an abatement of some or all of the taxes or the increase in taxes it imposes on a parcel of property if the city excepts the benefits of the proposed abatement agreement to at least equal the costs of the proposed agreement. The City must also determine that the agreement is in the public interest because it will increase or preserve tax base, provide employment opportunities, provide or help acquire or construct public facilities, help redevelop or renew blighted areas, or help provide access to services for residents of the city.

- **Developer Contributions/Impact Fees** – Under this approach, the impact of the additional traffic from a proposed development on the local roadway system is projected, using standard traffic engineering procedures. Costs associated with improving the roadway system to handle the additional traffic at an acceptable level of service are assessed to the developer. This approach generally involves some level of negotiation between the local government and the developer to work out a cost-sharing agreement that allows the development to move forward.

- **Assessments** – Properties that benefit from a roadway scheduled for improvement may be assessed for the cost of construction. In order to assess the owner, it must be demonstrated that the value of their property will increase by at least the amount of the assessment.

- **Grants** – Many grant programs exist that generally can provide for partial or full payment for specific project components. For example, Mn/DOT has operated a Safe Routes to School grant program.

7.3 Implementation – Priority of Improvements

Several potential roadway improvements were identified for evaluation as part of the 2030 Alexandria Area Transportation Plan. The majority of the roadway improvement projects were evaluated using the Alexandria area travel demand forecasting model to determine the future year impacts on the regional transportation system.

Based on the evaluation and analysis of the various projects, specific roadway related improvements were identified as having the most benefit to traffic operations within the Alexandria area. The priority of these projects is identified in **Table 7-4** and shown in **Figure 7-2**. The priority of the projects is based on the improvement providing the greatest benefit to the Alexandria area transportation system. This transportation plan is intended to serve as a working document that can constantly be updated to reflect the changing needs and priorities of the Alexandria area. Over the next twenty years many things will change which could result in the addition, deletion, or modification of the priority improvements.

Table 7-4. Potential Priority List of Improvements

	Improvement	Estimated Cost (2010 $)	Project Description
1.	**50th Avenue Extension** *(Potential Improvement 6)*	$2,100,000	• Construct a roadway connecting TH 29 to the industrial park. This would be a two-lane roadway extending 50th Avenue westward to connect with 42nd Avenue in the industrial park. The West Frontage Road along TH 29 would intersect this new segment approximately 300 feet west of TH 29. • Reconstruct the 50th Avenue/Twin Boulevard intersection to a ¾ access intersection to reduce vehicular conflicts and driver confusion. • Provide continuity of the East Access Road by creating a segment that runs north-south between Hardees and Subway with a traffic signal at the new East Access Road/50th Avenue intersection.
2.	**TH 27 Connection to Neighborhood (Park Street/1st Avenue)** *(Potential Improvement 7)*	$200,000	A new roadway connecting the southern part of the neighborhood to TH 27 would provide residents with another option for accessing the regional roadway network. Since Alexandria and I-94 attract the majority of the trips, this improvement could greatly increase safety and reduce driver frustration during the peak hours.
3.	**CSAH 42: Upgrade from 3-Lane to 4-Lane Divided** *(Potential Improvement 3)*	$1,600,000	Upgrade CSAH 42 from a 3-lane to a 4-lane divided section from TH 29 to Bethesda Street. This project will help alleviate projected traffic congestion on CSAH 42 and will provide increased accessibility.
4.	**Nokomis Street: Upgrade from 2-Lane to 3-Lane** *(Potential Improvement 1)*	$1,500,000	Upgrade Nokomis Street from a 2-lane to a 3-lane section from 18th Avenue to 6th Avenue. This project will help alleviate projected traffic congestion on Nokomis Street by providing a separate travel lane for left turning vehicles.
5.	**CSAH 46: Auxiliary Lane** *(Potential Improvement 5)*	$100,000	Construct an eastbound auxiliary lane on CSAH 46 from CR 106 to CSAH 23. This improvement will attempt to improve safety, delay, and congestion at the CR 106/CSAH 46 intersection.
6.	**CSAH 42: Upgrade from 2-Lane to 3-Lane** *(Potential Improvement 4)*	$1,200,000	Upgrade CSAH 42 from a 2-lane to a 3-lane section from CSAH 44 to Browns Point Road. This project will help alleviate projected traffic congestion on CSAH 42 by providing a separate travel lane for left turning vehicles.
7.	**CSAH 22: Upgrade from 2-Lane to 3-Lane** *(Potential Improvement 2)*	$800,000	Upgrade CSAH 22 from a 2-lane to a 3-lane section from CSAH 82 to CSAH 44. This project will help alleviate projected traffic congestion on CSAH 22 by providing a separate travel lane for left turning vehicles.

8.	**TH 29: Upgrade from 2-Lane to 4-Lane Divided** *(Potential Improvement 11)*	$8,600,000	Upgrade TH 29 from a 2-lane to 4-lane divided section from CSAH 42 to CR 73. This project will help alleviate projected traffic congestion along TH 29.
9.	**Interchange at I-94 and CR 106** **(***Potential Improvement 15)*	$10,200,000	• Construct a new interchange on I-94 approximately 2 miles east of the TH 29 interchange. This project would link I-94 with CR 106, thus improving the accessibility to jobs and resources in Alexandria. • A new east-west frontage road would connect to CSAH 23. South of I-94, the interchange would connect to CR 86 via Hamann Road. The traffic analysis indicates that this project could help alleviate projected traffic congestion on TH 29 near its interchange with I-94.
10.	**CSAH 42: Upgrade from 3-Lane to 4-Lane Divided** *(Potential Improvement 12)*	$2,000,000	Upgrade CSAH 42 from a 3-lane to 4-lane divided section from Bethesda Street to CSAH 44. This project will help alleviate projected traffic congestion along CSAH 42.
11.	**CSAH 42: Upgrade from 2-Lane to 3-Lane** *(Potential Improvement 13)*	$800,000	Upgrade CSAH 42 from a 2-lane to 3-lane section from Browns Point Road to CSAH 11. This project will help alleviate projected traffic congestion on CSAH 42 by providing a separate travel lane for left turning vehicles.
12.	**TH 29: Upgrade from 2-Lane to 4-Lane Divided** *(Potential Improvement 8)*	$7,200,000	Upgrade TH 29 from a 2-lane to 4-lane divided section from just south of CSAH 28 to CSAH 4. This project will help alleviate projected traffic congestion along TH 29, will provide increased accessibility, and will open up economic development opportunities.
13.	**CSAH 23: Upgrade from 2-Lane to 3-Lane** *(Potential Improvement 10)*	$1,200,000	Upgrade CSAH 23 from a 2-lane to 3-lane section from CSAH 46 to CR 81. This project will help alleviate projected traffic congestion on CSAH 23 by providing a separate travel lane for left turning vehicles.
14.	**TH 27: Upgrade from 2-Lane to 4-Lane Divided** *(Potential Improvement 9)*	$3,900,000	Upgrade TH 27 from a 2-lane to 4-lane divided section from CSAH 21 to Nevada Street. This project will help alleviate projected traffic congestion along TH 27, will provide increased accessibility, and will open up economic development opportunities.
15.	**Nevada Street Overpass** *(Potential Improvement 14)*	$2,900,000	Construct an overpass bridge crossing I-94 to connect the Industrial Park to planned residential developments on the south side of I-94. The traffic analysis indicates that this project could help alleviate projected traffic congestion on TH 29 near its interchange with I-94.
16.	**TH 29: Additional Southbound Lane** *(Potential Improvement 16)*	$700,000	Construct an additional southbound lane along TH 29 (Nokomis Street) from CSAH 42 to 3rd Avenue. This will add additional southbound capacity, thus creating a 5-lane section.
	TOTAL (Potential Projects Only)	**$45,000,000**	

NOTE: Cost estimates are for construction only.

SOURCES: WSB & Associates, Mn/DOT, Douglas County, City of Alexandria

7.3.1 Right-of-way Planning

Most of the potential projects require widening of the existing roadway, which would result in expanding the roadway cross-section within the existing right-of-way or the purchase of additional right-of-way. In anticipation of these identified roadway expansions, the responsible agencies should preserve existing right-of-way and/or take action to procure the additional right-of-way. Specific examples of this would be for Mn/DOT to protect the right-of-way necessary to accommodate the widening of TH 29 from two-lanes to four-lanes at:

- TH 29 from just south of I-94 to CSAH 4 (3.2 miles)
- TH 29 from CSAH 42 to CR 73 (2.2 miles)

Advance planning for protecting and/or procuring the necessary right-of-way minimizes both the expense as well as inconvenience to affected or adjacent property owners.

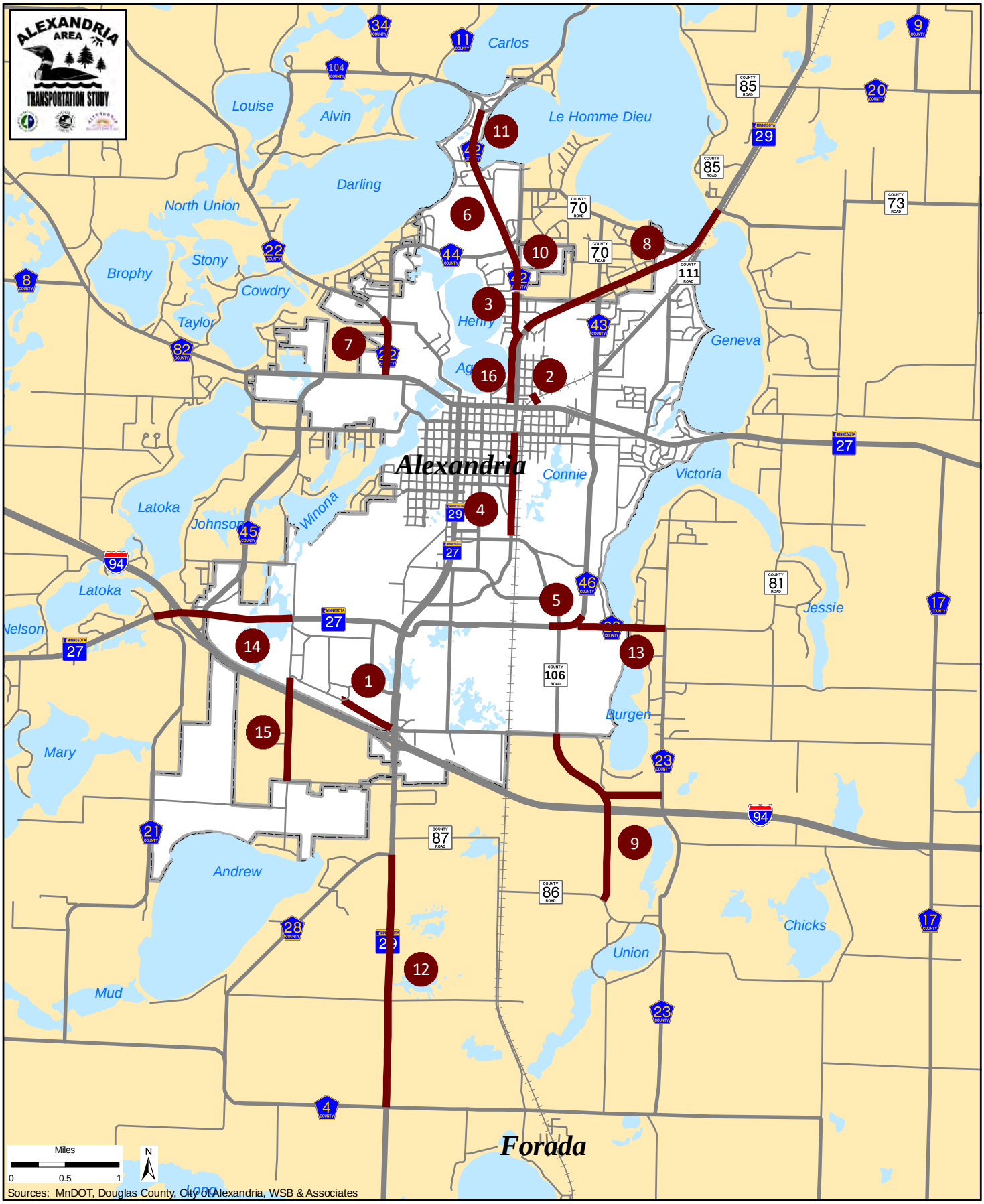


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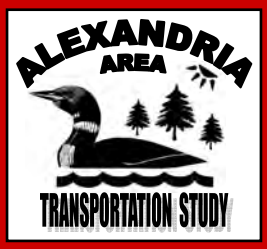
Figure 7-2: Priority of Improvements



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March 2011