

# **TRANSPORTATION**

## **I. Purpose of the Transportation Plan**

The purpose of this Transportation Plan is to provide guidance to the City of Belle Plaine, as well as existing and future landowners in preparing for future growth and development. As such, whether an existing roadway is proposed for upgrading or a land use change is proposed on a property, this Plan provides the framework for decisions regarding the nature of roadway infrastructure improvements necessary to achieve safety, adequate access, mobility, and performance of the existing and future roadway system. This Plan includes established local policies, standards, and guidelines to implement the future roadway network vision that is coordinated with respect to county, regional, and state plans in such a way that the transportation system enhances quality economic and residential development within the City of Belle Plaine.

## **II. Transportation System Principles and Standards**

The transportation system principles and standards included in this Plan create the foundation for developing the transportation system, evaluating its effectiveness, determining future system needs, and implementing strategies to fulfill the goals and objectives identified.

### **A. Functional Classification**

It is recognized that individual roads and streets do not operate independently in any major way. Most travel involves movement through a network of roadways. It becomes necessary to determine how this travel can be channelized within the network in a logical and efficient manner. Functional classification defines the nature of this channelization process by defining the part that any particular road or street should play in serving the flow of trips through a roadway network. Functional classification is the process by which streets and highways are grouped into classes according to the character of service they are intended to provide. Functional classification involves determining what functions each roadway should perform prior to determining its design features, such as street widths, speed, and intersection control.

The functional classification system typically consists of four major classes of roadways: Principal Arterials, Minor Arterials, Major Collectors, and Minor Collectors. The existing roadways are described below and illustrated in Figure 7-1 – Existing Roadway Functional Classification.

#### **Principal Arterials**

Roadways of this classification typically connect large urban areas to other large urban areas or they connect metro centers to regional business concentrations via a continuous roadway without stub connections. They are designed to accommodate the longest trips. Their emphasis is focused on mobility rather than access, and as such private access should not be allowed. They connect only with other Principal Arterials, interstate freeways, and select Minor Arterials and Collector Streets. Principal Arterials are responsible for accommodating thru-trips, as well as trips beginning or ending outside of the Belle Plaine area.

TH 169 is the only principal arterial in Belle Plaine. This corridor, along with others, has been identified by the State of Minnesota as an Interregional Corridor indicating its significance in serving the economic interests of the state. It connects the Twin Cities Metropolitan Area with the Mankato Area.

#### **Minor Arterials**

Roadways of this classification typically link urban areas and rural Principal Arterials to larger towns and other major traffic generators capable of attracting trips over similarly long distances. Minor Arterials service medium length trips, and their emphasis is on mobility as opposed to access in urban areas. They connect with Principal Arterials, other Minor Arterials, and Collector Streets. Connections to Local Streets should be avoided if possible, and private access should not be allowed. Minor Arterials are responsible for accommodating thru-trips, as well as trips beginning or ending outside the Belle Plaine

area. Minor Arterial roadways are typically spaced approximately 1 – 2 miles apart in developing communities similar to Belle Plaine. Within the Belle Plaine Transportation Plan study area TH 25, CSAH 66, CSAH 3, CSAH 6, and CSAH 7 are identified as Minor Arterials.

In the Twin Cities Metropolitan Area, there is a further breakdown of Minor Arterial roadways to establish federal funding priorities, “A–Minor” and “B–Minor.” The A Minor Arterial classifications include Relievers, Expanders, Connectors, and Augmenters. As defined by the Twin Cities Metropolitan Council, Relievers provide ‘open up’ capacity for traffic on Metropolitan Highway Principal Arterials. Augmenters supplement the Principal Arterials within the Beltway. Expanders provide connection between developing areas outside the beltway, and connect Principal Arterials. Connectors provide links between rural town centers in the urban reserve and rural area. Figure 7–1 distinguishes between the types of Minor Arterial corridors.

TH 25, CSAH 3, CSAH 6, CSAH 7, and CR 66/CR 76 are identified as Minor Arterial roadways. TH 25 is a north/south route providing connectivity between TH 10 in Big Lake, I-94 in Monticello, and TH 169 in Belle Plaine. As the TH 25 corridor crosses the Minnesota River into Belle Plaine its alignment follows Walnut Street to Main Street and terminates at a newly constructed interchange with TH 169.

CR 66/CR 76 is an east/west route that upon completion of an approximate 2.5 mile segment will provide connectivity between TH 169 east to I-35 through south–central Scott County via CSAH 8 to Dakota County CSAH 70.

CSAH 3 is also a north-south corridor that begins at TH 25 (intersection of Walnut and Main Streets) and extends south across TH 169 to Le Sueur County State Highway 11 into the City of Le Center. CSAH 5/7 is an east-west route connecting TH 169 within Belle Plaine to New Prague via TH 19. CSAH 6 is an east-west corridor that provides connectivity between the CSAH 1 Minnesota River crossing in the village of Blakeley northeast to TH 25 in Belle Plaine.

### **Major Collectors**

Roadways of this classification typically link neighborhoods together within a city or they link neighborhoods to business concentrations. In highly urban areas, they also provide connectivity between major traffic generators. A trip length of less than 5 miles is most common for Major Collector roadways. A balance between mobility and access is desired. Major Collector street connections are predominately to Minor Arterials, but they can be connected to any of the other four roadway functional classes. Local access to Major Collectors should be provided via public streets and individual property access should be avoided. Major Collector streets are predominantly responsible for providing circulation within a city such as Belle Plaine, and are typically spaced approximately ½ to 1 mile apart in urbanizing areas. According to the Metropolitan Council, no roadways are classified as Major Collectors; however, Commerce Drive West and Laredo Street currently function as Major Collector streets in Belle Plaine.

### **Minor Collector Streets**

Roadways of this classification typically include city streets and rural township roadways, which facilitate the collection of local traffic and convey it to Major Collectors and Minor Arterials. Minor Collector streets serve short trips at relatively low speeds. Their emphasis is focused on access rather than mobility. Minor Collectors are responsible for providing connections between neighborhoods and the Major Collector/Minor Arterial roadways. These roadways should be designed to discourage short-cut trips through the neighborhood by creating jogs in the roadway (i.e. not direct, through routes). CSAH 53, CSAH 5, CSAH 64, Ash Street (between TH 25 and Commerce Drive) are roadways functionally classified as a Minor Collector roadway in the Belle Plaine area. City roadways such as Orchard Street, Ash Street, Lindsey Lane, and Park Street currently function as Minor Collector streets in Belle Plaine.

### **Local Streets**

Roadways of this classification typically include city streets and rural township roadways, which facilitate the collection of local traffic and convey it to collectors and Minor Arterials. Their emphasis is to provide direct property access.

## B. Roadway Capacity

Capacities of roadway systems vary based on the roadway's functional classification. From the Metropolitan Council Local Planning Handbook, roadway capacity per lane for divided arterials is 700 to 1,000 vehicles per hour and 600 to 900 vehicles per hour for undivided arterials. These values tend to be around 10% of the daily physical roadway capacity.

### Principal and Minor Arterials

Based on the capacities noted above, a two lane arterial roadway has a daily capacity of 12,000 to 18,000 vehicles per day, a four-lane divided arterial street has a daily capacity of 28,000 to 40,000 vehicles per day, and a four-lane freeway has a daily capacity of approximately 70,000 vehicles per day. The variability in capacities are directly related to many roadway characteristics including access spacing, traffic control, adjacent land uses, as well as traffic flow characteristics, such as percentage of trucks and number of turning vehicles. Therefore, it is important that the peak hour conditions are reviewed to determine the actual volume-to-capacity on roadway segments with average daily traffic volumes approaching these capacity values.

### Major Collectors and Minor Collector Streets

Major Collector and Minor Collector streets have physical capacities similar to those of a two-lane arterial street, however the acceptable level of traffic on a residential street is typically significantly less than the street's physical capacity. The acceptable level of traffic volumes on Major Collectors and Minor Collector streets vary based on housing densities and setbacks, locations of parks and schools, and overall resident perceptions. Typically, traffic levels on Major Collector streets in residential/educational areas are acceptable when they are at or below 50% of the roadway's physical capacity, resulting in an acceptable capacity of 6,000 to 9,000 vehicles per day. Acceptable traffic levels on Minor Collector streets are considerably less. Typically, a daily traffic volume of 1,000 to 1,500 vehicles per day is acceptable on Minor Collector streets in residential areas.

Table 2.1 – Roadway Types and Capacities, identifies various roadway types and the estimated daily capacities that the given roadway can accommodate.

<b>Roadway Type</b>	<b>Daily Capacities</b>
Gravel Roadway	Up to 500
Minor Collector Street	Up to 1,000
Urban 2-Lane	7,500 – 12,000
Urban 3-Lane or 2-Lane Divided	12,000 – 18,000
Urban 4-Lane Undivided	Up to 20,000
Urban 4-Lane Divided	28,000 to 40,000
4-Lane Freeway	Up to 70,000

The capacity of a gravel road is physically greater than 500 vehicles per day, but based on studies conducted by Minnesota counties, it has been determined that an ADT over 500 justifies paving the roadway. This is justified due to the maintenance costs of keeping a gravel road in working condition when ADT is over 500, and balancing this against the pavement costs, pavement life, and maintenance costs of a paved roadway with the same volumes.

The capacity of a transportation facility reflects its ability to accommodate a moving stream of people or vehicles. It is a measure of a supply side of transportation facilities. Level of Service (LOS) is a measure of the quality of flow. The concept of LOS uses qualitative measures that characterize operational conditions with a traffic stream and their perception by motorists. Six LOS are defined for roadways. They are LOS A, B, C, D, E, and F. LOS A represents the best operating conditions and LOS F represents the worst. The LOS of a multilane roadway can be dictated by its volume-to-capacity (v/c) ratio. The LOS of a two-lane roadway is defined in terms of both percent time-spent-following and average travel speed. LOS F is determined when v/c ratio is over 1.00. The criteria for LOS and general v/c ratio for multilane highways and speed for two-lane highways are provided in Table 2.2 below:

<b>Table 2.2 – Highway Level of Service</b>		
<b>LOS</b>	<b>Multilane v/c Ratio</b>	<b>Two-Lane Avg. Travel Speed (mph)</b>
<b>A</b>	<0.28	>55
<b>B</b>	>0.28 – 0.45	>50-55
<b>C</b>	>0.45 – 0.65	>45-50
<b>D</b>	>0.65 – 0.86	>40-45
<b>E</b>	>0.86 – 1.00	≤40
<b>F</b>	> 1.00	v/c >1.00

For roadways in urban sections, the urban street class and average travel speed determine the LOS. This is generally similar to the LOS for two-lane highways but takes into account the free flow speed of the facility (average speed achieved with no other vehicles present on roadway) and the addition of traffic control. This criteria is established in Table 2.3 below:

<b>Table 2.3 – Urban Street Level of Service</b>				
<b>Range of Free-Flow Speed</b>	<b>55 to 45</b>	<b>45 to 35</b>	<b>35 to 30</b>	<b>35 to 25</b>
<b>LOS</b>	<b>Average Travel Speed (mph)</b>			
<b>A</b>	>42	>35	>30	>25
<b>B</b>	>34-42	>28-35	>24-30	>19-25
<b>C</b>	>27-34	>22-28	>18-24	>13-19
<b>D</b>	>21-27	>17-22	>14-18	>9-13
<b>E</b>	>16-21	>13-17	>10-14	>7-9
<b>F</b>	≤16	≤13	≤10	≤7

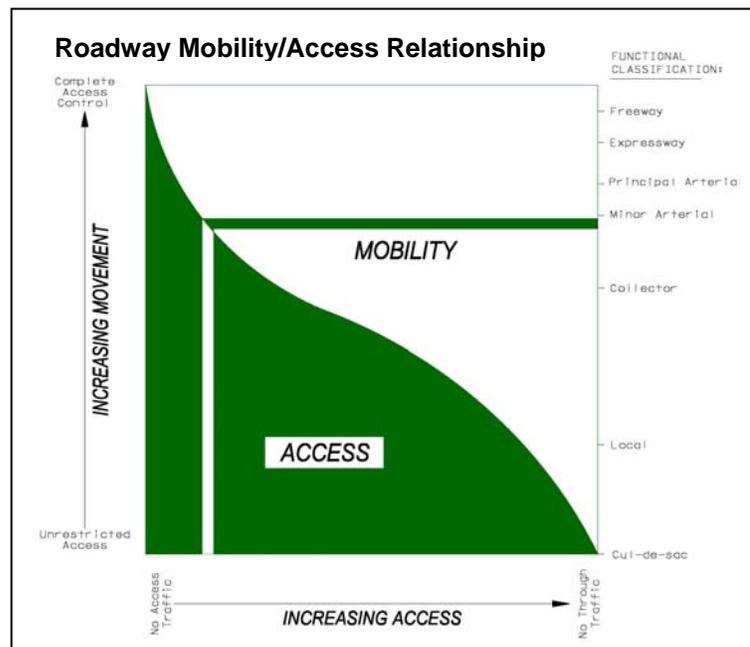
Generally, the City of Belle Plaine should consider capacity improvements on roadways with a LOS D or worse and volume-to-capacity ratios over 0.75 during the peak hours.

### C. Access Management Guidelines

Access management guidelines are developed to maintain traffic flow on the network so each roadway can provide its functional duties, while providing adequate access for private properties to the transportation network. This harmonization of access and mobility is the keystone to effective access management.

*Mobility*, as defined for this Transportation Plan, is the ability to move people, goods, and services via a transportation system component from one place to another. The degree of mobility depends on a number of factors, including the ability of the roadway system to perform its functional duty, the capacity of the roadway, and the operational level of service on the roadway system.

*Access*, as applied to the roadway system in Belle Plaine, is the relationship between local land use and the transportation system. There is an inverse relationship between the amount of access provided and the ability to move through-traffic on a roadway. As higher levels of access are provided, the ability to move traffic is reduced. The graphic below illustrates the relationship between access and mobility.



Each access location (i.e. driveway and/or intersection) creates a potential point of conflict between vehicles moving through an area and vehicles entering and exiting the roadway. These conflicts can result from the slowing effects of merging and weaving that takes place as vehicles accelerate from a stop turning onto the roadway, or deceleration to make a turn to leave the roadway. At signalized intersections, the potential for conflicts between vehicles is increased, because through-vehicles are required to stop at the signals. If the amount of traffic moving through an area on the roadway is high and/or the speed of traffic on the roadway is high, the number and nature of vehicle conflicts are also increased.

Accordingly, the safe speed of a road, the ability to move traffic on that road, and safe access to cross streets and properties adjacent to the roadway all diminish as the number of access points increase along a specific segment of roadway. Because of these effects, there must be a balance between the level of access provided and the desired function of the roadway.

In Belle Plaine, access standards and spacing guidelines are recommended as a strategy to effectively manage existing ingress/egress onto City streets and to provide access controls for new development and redevelopment. The proposed access standards (driveway dimensions) are based on Minnesota Department of Transportation (Mn/DOT) State-Aid design standards. It should be noted that the City of Belle Plaine has access authority for those roadways under their jurisdiction. Likewise, Scott County and Mn/DOT have access authority for roadways under their jurisdiction. To further the relationship of access and mobility throughout the Belle Plaine area, the City supports managing access consistent with the roadway mobility and access relationship figure above and supports the access spacing guidelines of other roadway jurisdictions. Tables 2.4 and 2.5 below present the proposed access standards and access spacing for the Belle Plaine roadway network. Please refer to Scott County's minimum access spacing guidelines identified in their current Transportation Plan.

<b>Table 2.4 – Roadway Access Standards</b>		
<b>Driveway Dimensions</b>	<b>Residential</b>	<b>Commercial or Industrial</b>
<b>Driveway Access Width</b>	11' – 22', 16' desired	16' – 32' 32' desired
<b>Minimum Distance Between Driveways</b>	20'	20'
<b>Minimum Corner Clearance from a Collector Street</b>	60'	80' <sup>(1)</sup>
<sup>(1)</sup> At the discretion of the City Engineer, 80' minimum.		

<b>Table 2.5 – Access Spacing Guidelines for Collector Roadways in Belle Plaine <sup>(1)</sup></b>		
<b>Type of Access by Land Use Type</b>	<b>Major Collector</b>	<b>Minor Collector</b>
<b>Low &amp; Medium Density Residential</b>		
Private Access	Not Permitted <sup>(2)</sup>	As Needed <sup>(3)</sup>
Minimum Corner Clearance from a Collector Street	660'	300'
<b>Commercial, Industrial or High Density Residential</b>		
Private Access	Not Permitted <sup>(2)</sup>	As Needed <sup>(3)</sup>
Minimum Corner Clearance from a Collector Street	660'	660'
<sup>(1)</sup> These guidelines apply to City streets only. Scott County and Mn/DOT have access authority for roadways under their jurisdiction. Please refer to Scott County's minimum access spacing guidelines identified in their current Transportation Plan.		
<sup>(2)</sup> Access to Major Collectors is limited to public street access. Steps should be taken to redirect private accesses on Major Collectors to other local streets. New private access to Major Collectors is not permitted unless deemed necessary.		
<sup>(3)</sup> Private access to Minor Collectors is to be evaluated by other factors. Whenever possible, residential access should be directed to non-continuous streets rather than Minor Collector roadways. Commercial/Industrial properties are encouraged to provide common accesses with adjacent properties when access is located on the Minor Collector system. Cross-traffic between adjacent compatible properties is to be accommodated when feasible. A minimum spacing between accesses of 660' in commercial, industrial, or high density residential areas is encouraged for the development of turn lanes and driver decision reaction areas.		

#### **D. Geometric Design Standards**

Geometric design standards are directly related to a roadway's functional classification and the amount of traffic that the roadway is designed to carry. For the City of Belle Plaine, geometric design standards were developed based on Mn/DOT State-Aid standards. The proposed geometric design standards for Major and Minor Collector roadways are illustrated in Figures 7-2 and 7-3 respectively.

The Geometric Design Standards illustrated in Figures 7-2 and 7-3 were developed to achieve adequate capacity within the roadway network, as well as a level of acceptance by adjacent land uses. Each component identified in the typical sections is essential to a particular roadway's ability to perform its function in the roadway network.

County and State Roadways – In addition to these standards for City Collector roadways, the State and County Arterial and Collector roadways shall include components of the City's transportation system. For each of the County highways and TH 25 within Belle Plaine, a 10' bituminous trail is recommended on both sides of the roadway to accommodate pedestrian, bicycle, and other non-motorized travel.

Roadway Width – Roadway and travel lane widths are directly associated with a roadway's ability to carry vehicular traffic. On Major Collector roadways and Minor Collector streets, a 12' lane is required for each direction of travel. The 24' total travel width is needed to accommodate anticipated two-way traffic volumes without delay. In addition to the travel width, minimum shoulder/parking lane widths are also required to accommodate parked or stalled vehicles. Roadway widths not meeting the Geometric Design Standards will result in decreased performance of the particular roadway and additional travel demand on the adjacent roadway network components. For example, a sub-standard Major Collector roadway may result in additional travel demand on an adjacent Minor Collector street resulting in an overburden for adjacent landowners. Similarly, additional local circulation may result on an adjacent Minor Arterial resulting in reduced mobility for regional trips.

Sidewalk/Trail – Sidewalks and/or trails are recommended to be adjacent to all Minor Collector, Major Collector, and Minor Arterial roadways within Belle Plaine to accommodate pedestrian, bicycle, and other non-motorized travel in a safe and comfortable manner. These roadways are expected to carry a significant amount of vehicular traffic and separation of travel modes is necessary. At the discretion of the City, in commercial and industrial areas, the requirements for trails and sidewalks may vary to accommodate additional pedestrian and bicycle traffic to provide connectivity according to the Master Trail Plan.

Along Minor Arterials, a 10' bituminous trail is recommended on both sides of the roadway. Similar to the type of travel on the adjacent roadway, the trail will accommodate higher volume and longer pedestrian and bicycle trips. A 10' width would better accommodate two-way travel safely.

Along Major Collectors and Minor Collectors, an 8' bituminous trail and 6' concrete walk is recommended on either side of the roadway to accommodate local pedestrian and bicycle travel. The pedestrian facilities on both sides of the roadway allow for pedestrian travel within the corridor without introducing excessive crossing demand on Major Collectors. With the anticipated vehicular volumes of Minor Collector streets, pedestrians can safely cross the roadway; however, pedestrian travel along the roadway may become uncomfortable. The 6' concrete walk and 8' bituminous trail will accommodate pedestrian travel along the corridor as well as provide a safe, comfortable link between lower volume residential streets and the other pedestrian facilities within the community.

**Medians** – Medians are recommended on several Major Collector roadways under the jurisdiction of the City. Medians on Major Collector roadways assist in accommodating significant vehicular volumes at acceptable travel speeds for adjacent land uses. While maintaining the travel lane widths required for traffic, the total pavement width is reduced, creating a more appealing and acceptable travel corridor. Trees and other landscaping can be included within medians on City Major Collector roadways, provided they do not compromise minimum clear zone requirements and do not interfere with traffic control devices. Medians also allow for more comfortable pedestrian crossings of Major Collector roadways by providing a safe haven for pedestrians to assess crossing opportunities one direction of vehicular travel at a time.

**Design Speed** – The design speed of a roadway is directly related to the roadway’s function in the roadway system. The focus of Minor Arterial roadways is mobility; therefore these roadways should be designed to accommodate higher travel speeds. Likewise, Minor Collector roadways are more focused on accessibility and should be designed to accommodate lower travel speeds. The function of Major Collectors is balanced between mobility and accessibility; therefore these roadways should be designed accordingly. Table 2.6 below presents the recommended design speed for the Belle Plaine roadway network:

<b>Table 2.6 – Roadway Design Speed Guidelines</b>	
<b>Functional Classification</b>	<b>Design Speed <sup>(1)</sup></b>
Minor Collector Street	30 mph
Major Collector Roadway	35 – 40 mph
Minor Arterial Roadway	45 – 55 mph
<sup>(1)</sup> At the discretion of the City Engineer for City roadways, with approval by the City Council.	

**Right-of-Way Width** – Right-of-way width is directly related to the roadway’s width and its ability to carry vehicular and pedestrian traffic in a safe and efficient manner. The roadway right-of-way widths identified in Figures 7–2 and 7–3 are the minimum required for Major and Minor Collector streets, respectively. For Minor Collector streets in residential areas, a minimum right-of-way width of 80’ is necessary for the added roadway width, as well as to provide added setback distance between the roadway and homes along the roadway. Right-of-way widths greater than 100’ will be required on Major Collector roadways within commercial areas to accommodate the potential for higher traffic volumes and the need for additional lanes. All right-of-way requirements may be increased at the discretion of the City Engineer, with approval by the City Council. Please refer to Scott County’s right-of-way requirements for county roads in their current Transportation Plan. The City should obtain identified local, county, and state right-of-way through the platting process to accommodate long-term roadway and sidewalk/trail needs.

**E. Roadway Jurisdiction**

Roadway jurisdiction directly relates to functional classification of roadways. Generally, roadways with higher mobility functions (such as arterials) should fall under the jurisdiction of a regional level of government. In recognizing these roadways serve greater areas resulting in longer trips and higher volumes, jurisdiction of Principal Arterial and Minor Arterial roadways should fall under the jurisdiction of the state and county, respectively. Similarly, roadways with more emphasis on local circulation and access (such as collectors) should fall under the jurisdiction of the local government unit. These roadways serve more localized areas and result in shorter trip lengths and lower volumes. Major Collector and Minor Collector roadways should fall under the jurisdiction of the City of Belle Plaine. As roadway segments are considered for turn-back to the City, efforts will be taken to evaluate the roadway features for conformance to current standards, structural integrity, and safety. This effort will help the City develop short and long-range programs to assume the responsibilities of jurisdictional authority.

### **III. Existing Transportation System Evaluation**

The existing transportation system within the City of Belle Plaine currently provides sufficient transportation service to the City. While several transportation improvements currently underway or completed since the 2003 Transportation Plan have provided improved safety and mobility within the City of Belle Plaine, the intersection of TH 169 and CSAH 3 is still an area of concern.

#### **A. Safety and Continuity**

Improvements to Commerce Drive East created a parallel route to TH 169 providing for local traffic circulation on the northwest side of the City. This project also included closure of several skewed intersections with TH 169, improving safety, and increasing the mobility of TH 169.

With the completion of the TH 25/TH 169 interchange, the mobility and safety of this intersection has been improved. A taskforce had been organized in 2007 to explore opportunities and fund a solution related to the CSAH 3/TH 169 intersection needs. The goal was to increase the long-term safety of the intersection and the mobility of Meridian Street between the downtown area of Belle Plaine and developing areas south of TH 169 in a manner consistent with the TH 169 Corridor Management Plan. The County and City partnered together to seek federal funding for an overpass; however the project was not selected.

Incremental improvements to Hickory Boulevard (future CSAH 5 as explained in Section III–D) have improved north/south mobility between new residential and commercial growth areas on the southeast side of TH 169 and the TH 25/TH 169 interchange. As new development continues, additional east-west Major and Minor Collector roadways will be necessary.

#### **B. Traffic Volumes**

The existing traffic volumes within the area were collected from Mn/DOT, including recent counts by the City of Belle Plaine and Scott County, and are represented in Figure 7–4 – 2000 and 2005 Average Daily Traffic Volumes. Roadway analysis indicates that the system operates well for most roadways within Belle Plaine. There are currently no roadways providing a Level of Service C or less.

#### **C. Jurisdictional Issues**

Consistent with the CSAH 5 Memorandum of Understanding outlined in Section III–D, upon completion of roadway improvements associated the new alignment of CSAH 5 south of CR 64 the current alignment of CSAH 5 between TH 169 and its intersection with the future Hickory Boulevard will be turned back to the City of Belle Plaine and/or Belle Plaine Township. No other jurisdictional issues have been identified in the Belle Plaine area in either the Scott County 2020 Transportation Plan or the Mn/DOT Metro District Long Range Plan.

#### **D. Relevant Area Transportation Studies**

Several studies have been completed in recent years to provide direction relative to the development of the City of Belle Plaine's roadway system.

TH 169 Corridor Management Plan<sup>1</sup> – In May of 2002, Mn/DOT issued the State Highway 169 Corridor Management Plan (CMP). This report covered a 73-mile stretch of TH 169 from I-494 to Mankato. The purpose of the CMP is to create a better understanding of the issues and concerns along the corridor, as well as to develop consensus with corridor partners for a long-term vision and action plan that can be implemented over time.

The CMP recommended transitioning TH 169 to a freeway facility (limited access, no at-grade intersections) from Interstate 494 to Belle Plaine. Recommendations relative to the City of Belle Plaine and the surrounding area from the CMP are outlined below.

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<sup>1</sup>SRF, State Highway 169 Corridor Management Plan, p. 5–7, I-35 – I-38, Mn/DOT, May 2002, <http://www.dot.state.mn.us/movingminnesota/169corridorplan.html>.

CR 66 - Three different concepts were developed for the CR 66 intersection. One of the concepts provides an overpass at CR 66, the other two concepts show a full diamond interchange and a folded diamond interchange. The CMP recommends that an overpass be developed for this area, unless Scott County decides to pursue an east-west arterial alignment in this location. If an east-west arterial alignment is pursued, the TH 169 CMP supports an interchange. As outlined below, the CSAH 8 Corridor Preservation Study identifies this location for a future interchange.

CSAH 6/64 (now known as CR 64) – The CMP reflects a proposed interchange that was developed as part of a sub–area study. This interchange was completed in 2007.

Land Use and Access Management Strategies – Section 5.2.C of the CMP recommends the following policies and strategies be adopted into local ordinances and regulations:

- Direct property access to TH 169 should be prohibited, making these uses legal non-conforming. Existing access may continue as long as alternative access is not feasible; however, the existing use may not expand or reestablish.
- Left-turn lanes should be provided at all high-speed areas or access should be restricted to right-in/right-out to enhance safety and mobility.
- Right-turn lanes should be provided at commercial and public street access points.
- As conditional use permits are issued or modified, access to the sites will be reviewed for conformance with the plan.
- Rezoning of properties should not precede the availability of the local road network.
- Temporary access may be granted to TH 169 if no other feasible alternative is available; these accesses will be removed/shifted to the local street network as it becomes available or they may be limited to right-in/right-out.
- Access in freeway transition areas will be converted to frontage/backage roads over time.
- Local units of government are encouraged to develop and adopt interchange access circulation plans.
- New development should be limited to identified growth areas.
- New development should have its access from local street networks (no direct access off of TH 169) with connections to identified full-access intersections/interchanges.

TH 169 Corridor Belle Plaine Area Plan<sup>2</sup> – The City of Belle Plaine, Mn/DOT, Scott County, as well as Belle Plaine, St. Lawrence, and Blakeley Townships partnered to develop a local corridor vision consistent with the TH 169 CMP. Based upon the roadway functional classification system, specific design options were developed for the major access facilities along the TH 169 corridor within the area. In summary, the recommended vision includes focusing commercial and industrial land uses at interchange locations and the following roadway features and status:

- An interchange at TH 169 and CSAH 6/CR 64 (now known as CR 64 or Main Street). Improvements have been completed.
- An interchange at TH 169 and TH 25/CSAH 3 (now known as CSAH 3 or Meridian Street). Right-of-way has been officially mapped and partially acquired.
- A potential overpass or interchange at CSAH 66. The CSAH 8 Corridor Preservation Study further refines this vision.
- Closure of the South Street, Walnut Street, Ash Street, Laredo Street, and Maple Street intersections with TH 169. Improvements have been completed, with the exception of South Street access to northbound TH 169.
- A north frontage road between CSAH 6 (now known as Main Street) and TH 25 (now known as CSAH 3 or Meridian Street). Improvements have been completed.

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<sup>2</sup> Bolton & Menk, Inc. & Resource Strategies Corporation, TH 169 Corridor Belle Plaine Area Plan, City of Belle Plaine, 2003, [http://www.dot.state.mn.us/metro/pdf%27s/th169corridor\\_belleplaine\\_areaplan.pdf](http://www.dot.state.mn.us/metro/pdf%27s/th169corridor_belleplaine_areaplan.pdf).

- A south frontage road between CSAH 3 (Meridian Street) and South Street. Improvements have been partially completed.
- A Hanlon Drive extension to CR 64 (now known as Enterprise Drive). Improvements have been partially completed.

CSAH 5 Realignment Memorandum of Understanding (MOU) – This MOU between the City of Belle Plaine and Scott County identified the recommended future alignment for CSAH 5 between 250<sup>th</sup> Street and CR 64 and an implementation framework that included right-of-way identification, preservation and acquisition, roadway design criteria and construction, access management, and jurisdictional modifications. Approximately 1.5 miles of the 2.5 miles of improvements have been completed.

CSAH 8 Corridor Preservation Study<sup>3</sup> – Scott County completed a corridor preservation study for the extension of CSAH 8 west of TH 21 to TH 169. This study identified a future alignment for CSAH 8 that generally follows the township border between St. Lawrence and Helena Townships. The study also determined a short term connection to the currently funded TH 169 interchange at CR 64 by means of a frontage road to be located parallel to the highway. If, or when, development in the area requires an additional interchange to TH 169, besides the currently funded interchange at CR 64, the study recommends to continue the alignment of CSAH 8 along the township/section line west, past CR 66, to a future interchange location with TH 169. This alignment could eventually be connected to a frontage road system on the west side of TH 169, or the existing Park Boulevard that continues north into Jordan. The study also indicated the need for upgrading CR 64 to a Minor Arterial designation in the future based on its east–west continuity. Preservation along the corridor has begun outside Belle Plaine city limits.

CR 66/64 Corridor Preservation Study – The City of Belle Plaine and Scott County, together with St. Lawrence and Belle Plaine Townships, have begun a corridor preservation study. The study takes a closer look at the CSAH 8 Corridor Preservation Study to refine the corridor alignment between CR 64 and CR 66. It will also identify interim and long-term connections between the corridor and CR 64. This study will aid agencies in working with developers to assure that the needs of the roadway system will be met in the future.

## **E. Multimodal Transportation Opportunities<sup>4</sup>**

### Railroad System

A rail line is located in the northerly section of the community. This rail line is situated in the Minnesota River Valley area. The train's rail system does not intersect with any city streets; therefore, train and vehicular safety are not a concern.

### Transit Service

The Scott County Transit currently provides transit bus service within the City of Belle Plaine via a dial-a-ride service. According to the Scott County Transit, “Dial-A-Ride” service is a reservation-only, shared ride transit service. Door-to-door assistance is available and buses are all wheelchair lift-equipped. Scott County Transit integrates with the Dial-A-Ride services of the surrounding communities to travel anywhere in the seven county metro area. Rides are reserved on a first-call, first-served basis up to 3 days in advance.” The City currently does not have a regular-scheduled public transit alternative at this time. There are a number of privately organized van and car pools.

### Aviation

The A.R.S. Sport Strip is located north of Belle Plaine northeast of Highway 25. The airstrip was originally developed in 1966. The 2,530-foot runway is attended 40 hours per week. The average number of operations per day varies depending on the season with a minimum of zero operations up to 100 operations per day on a weekend in the summer.

<sup>3</sup> Scott County, CSAH 8 Corridor Preservation Study, March 2005, [http://www.co.scott.mn.us/wps/PA\\_1\\_0\\_FL/SimpleGetPDFFileServlet?dDocName=011529&RevisionSelectionMethod=Latest&inline=true](http://www.co.scott.mn.us/wps/PA_1_0_FL/SimpleGetPDFFileServlet?dDocName=011529&RevisionSelectionMethod=Latest&inline=true).

<sup>4</sup> Municipal Development Group

In 1998 the City adopted an Ordinance which requires an applicant who proposes the construction of any structure with a height equal to or greater than 200 feet above ground level; or the alteration of any structure to a height which is equal to or greater than 200 feet above ground level to notify the MN Department of Transportation and Federal Aviation Administration of the proposal at least 30 days prior to the City's Council's consideration of the request.

Belle Plaine is outside of the "Airport Influence Area," with Flying Cloud Airport in Eden Prairie, the closest Metropolitan Airport identified in the Metropolitan Council's Transportation Policy Plan.

#### Sidewalks and Trails

As a part of the community survey, respondents were asked for input on where sidewalks and/or trails should be required. 90% of those responding indicated sidewalks leading to educational facilities should be required, 70% of those responding indicated sidewalks should be installed leading to Main Street businesses, 80% of those responding indicated sidewalks should be required in locations leading to or connecting parks, 50% of those responding indicated sidewalks or trails should be located within all subdivisions, 60% of those responding indicated sidewalks or trails should be installed within all recreation areas or parks and 10% of those responding indicated sidewalks should not be required anywhere.

There are a number of sidewalks within the older sections of Belle Plaine. New subdivisions, developed after 2000, also include segments of trail. A local trail plan is included as Map 8-4. The City's Subdivision Ordinance requires that, "...in locations deemed appropriate by the City Council and as designed by the Comprehensive Plan, sidewalks of not less than five feet in width shall be provided. Where a proposed plat abuts or includes an arterial street, sidewalks of not less than five feet in width shall be provided on both sides of the paved surface, unless a trail is included as designated by the Comprehensive Plan. Where the proposed plat abuts or includes a collector street, sidewalks of not less than five feet in width shall be required on one side of the street. In all cases where sidewalks are provided, provisions shall be made for handicapped access."

Section II-D also recommends for each of the county highways within Belle Plaine a 10' bituminous trail is recommended on both sides of the roadway to accommodate pedestrian, bicycle, and other non-motorized travel. To the extent possible within the downtown and early-settled areas of Belle Plaine, a 10' bituminous trail is recommended on both sides of TH 25.

On a regional basis, the Metropolitan Council has identified a potential trail along the Minnesota River, connecting a possible new regional park in the Blakeley area to the City of Belle Plaine and extending north to Jordan to connect with a larger Scott County trail system. Scott County is also in the process of planning future trails including a "Southern Scott Regional Trail" which is proposed to be approximately 25 miles in length to connect the future Blakeley Regional Park Reserve through Belle Plaine to the City of Jordan, extend south and east to the proposed Cedar Lake Regional Park and Doyle-Kennefick Regional Park, proceed north to Cleary Lake Regional Park and terminate with a final connection to the Scott Regional Trail near the Murphy-Hanrehan Regional Park Reserve.

#### **IV. Future Transportation System**

The transportation system in the Belle Plaine area is in a rural to urban transition in response to the rapid growth experienced in the past 5 years and the anticipated growth for this area. As growth continues to occur, it will be important for the City to develop a roadway system that is efficient and consistent with the transportation system principles and standards outlined in Section II.

##### **A. Future Roadway Corridors**

Map 6–2 illustrates the projected future land uses within an urban growth boundary. A supporting future road network has been developed in consideration of long-term growth in the area and is illustrated in Figure 7–5 – Recommended Future Roadway Functional Classification. This network has been developed in consideration of the proposed land uses, the Scott County 2020 Transportation Plan, and the various studies outlined in Section III–D.

A suitable arterial-collector system to accommodate future development and traffic patterns is necessary in the growing community of Belle Plaine. The existing county and state highways have historically provided much of the local circulation and connectivity; however these roadways will not be capable of meeting both the future local and regional travel demands. A city collector system consisting of Major Collector roadways and Minor Collector streets is needed to provide acceptable local circulation and access to developing areas, as well as to enable the Principal Arterial and Minor Arterial roadways to serve longer, regional travel. It is not anticipated that all of the proposed collector streets will be constructed by 2030, rather, collector streets should be constructed as development occurs. As the urban growth boundary is amended over time, additional studies will be necessary to determine specific roadway alignments and intersection spacing. An example of an area needing further study by the City of Belle Plaine, Scott County, and other adjacent jurisdictions is the intersection/potential interchange at CR 66 and TH 169.

The roadway corridors identified are conceptual, based on network needs, and should be used as a guide for development of the City's roadway system. In most cases, the actual roadway alignments are flexible to meet the needs of future development, at the discretion of the City Engineer. New or re-designated roadways necessary to support the land uses identified in Map 6–2 of the Land Use Plan and future traffic growth are mentioned below. The following describes the long-term roadway network vision recommended for new Major Collector roadway corridors within the urban growth boundary:

##### New Major Collector Roadways Within the Urban Growth Boundary

The northerly extension of Hickory Boulevard, in an alignment parallel to TH 169, to CR 66 will provide access to commercial land uses and higher density residential areas. It will also distribute traffic to the future interchange and east/west CSAH 8 corridor providing connectivity to I–35. Iago Boulevard's northerly extension to CR 66 will provide similar benefits.

On the south side of the urban growth boundary, a future east/west Major Collector corridor in approximately the 245<sup>th</sup> Street alignment will collect traffic from residential areas and distribute it to CSAH 3, Laredo Street, and CSAH 5/Hickory Boulevard and ultimately provide access to TH 169 or other destinations on the northwest side of TH 169. As the City's urban growth boundary trends further to the south, this corridor will connect to CR 53, which has an at-grade intersection with TH 169. This may eventually require an evaluation of an overpass or underpass of TH 169 between CR 53 and Stoppelman Boulevard.

Century Street west of CSAH 3 will provide residential areas access to commercial destinations located parallel to TH 169 along the corridor.

### Minor Collectors

Astute land use planning and subdivision plat review are key to ensuring an adequate local roadway network is developed and future local street traffic issues are avoided. Minor Collector streets are designed to carry traffic to higher-level roadways. They typically do not carry trips through an area; rather they connect non-continuous local streets and provide individual property access.

One of the primary issues facing developing communities around the Twin Cities Metropolitan area is a perception of excess traffic on “local” streets. The physical ability of these streets to carry traffic typically far exceeds the acceptable traffic levels for those property owners along the street. Minor Collector streets in residential areas must be identified during the preliminary platting process and design measures taken to provide acceptable conditions for the future owners of the adjacent lots. As a rule of thumb, one Minor Collector street connection to a Major Collector roadway is needed for each 100 housing units. For example, a developing area with a capacity of 400 homes should have at least four Minor Collector connections to the Major Collector network. If evenly distributed, these connections will ensure the Minor Collector streets will not be required to carry an unacceptable level of traffic. These Minor Collector streets should be continuous through multiple developments, but not necessarily continuous between Major Collectors. Direct, continuous Minor Collectors that connect between Major Collectors should be discouraged, as they are often used as short cuts for travelers and tend to result in traffic volume levels unacceptable to the affected neighborhoods.

### **B. Forecasted Traffic Volumes**

Traffic volumes were developed for two land use scenarios, build-out of the City’s identified growth boundary and 2030 planned growth consistent with Chapter 3 – Demographic Trends and Assumptions. Both scenarios are based on the future land use vision identified in Chapter 6 – Land Use and Map 6-2. Existing traffic volumes were obtained from Mn/DOT, and assumed traffic growth rates were also factored.

Figure 7-6 – 2030 Growth Boundary Forecasted Average Daily Traffic Volumes identifies the average annual daily traffic volumes forecasted for Minor and Major Collector, Minor Arterial, and Principal Arterial roadways. Due to the uncertainty of where development will actually occur, this information will serve as the basis for the City of Belle Plaine to make decisions on roadway design features to accommodate long-term planned growth.

Figure 7-7 – 2030 Land Use Plan Forecasted Average Daily Traffic Volumes was developed for arterial roadways only to provide the Metropolitan Council with an understanding of the anticipated traffic impacts associated with growth consistent with the City’s planned 2030 dwelling units (7,480), population (19,425), and employees (4,000) per net acre identified in Chapter 3 – Demographic Trends and Assumptions.

### **C. Roadway Safety & Capacity Needs**

The forecasted average annual daily travel demands approach or exceed daily capacities on several corridors, as well as some gravel roads located on the periphery of the urban growth boundary. Generally, the recommended Geometric Design Standards and associated right-of-way width requirements illustrated in Section II–D (Geometric Design Standards) will provide sufficient capacity to accommodate the forecasted traffic volumes on the City’s roadways; however, in certain locations a 4–lane corridor will be necessary. Table 2.1 – Roadway Types and Capacities identifies various roadway types and the daily capacities that the given roadway can accommodate.

Roadway characteristics and forecasted peak hour traffic volumes were reviewed to anticipate the level of traffic congestion anticipated on various roadway segments in 2030. Figure 7-8 – 2030 Growth Boundary Maximum Peak Hour Volume to Capacity Ratios displays the existing roadway segments where capacity improvements will be needed to accommodate the future traffic volumes identified in Figure 7-6. Figure 7-9 – 2030 Land Use Plan Maximum Peak Hour Volume to Capacity Ratios includes an analysis of arterial roads only. It varies only slightly from Figure 7-8. Table 6.2 – Traffic Volumes and Capacity Analysis further describes historical and 2030 traffic volumes and capacities.

Capacity improvements are recommended on any roadway with a future level of service of D, E, or F, as defined in Section II–B. Roadways identified on Figure 7-8 as near congested (having a volume to capacity ratio between 0.75 and 1) or congested (having a volume to capacity ratio greater than 1) are recommended to be monitored and programmed for capacity improvements when necessary. Roadways that are periodically congested (having a volume to capacity ratio between 0.5 and 0.75) are generally identified as providing an acceptable level of service. The development of the future roadway network illustrated in Figure 7-5 is necessary to provide alternatives to the routes recommended for capacity improvements. Corridors and associated strategies recommended for capacity improvements are summarized for each roadway identified below with a volume to capacity ratio over 0.5:

#### State Roadways:

TH 25 north of CSAH 6 is forecasted to be congested, with traffic more than doubling 2005 volumes to approximately 16,700 vehicles per day. This high volume is anticipated due to the congestion levels at other Minnesota River crossings further to the north at CSAH 9, TH 41, CSAH 101, and TH 169. It is also due to the connection TH 25 provides to the TH 212 freeway by means of Carver County CSAH 40 and CR 147. The congestion at the TH 25 bridge would be relieved through expansion of the bridge (which was reconstructed in 2007), or through the expansion of TH 169 and other river crossings to the north. A future new TH 41 river crossing is being studied in a Draft Environmental Impact Statement, however funding for the new crossing is not in place.

Based on current travel trends, congestion on TH 169 is anticipated to increase. The corridor is anticipated to be able to accommodate the growth planned by the City of Belle Plaine. By approximately 2030, TH 169 is anticipated to be congested north of the City of Belle Plaine based on its current design. However, based on Mn/DOT's initiative to convert this portion of TH 169 from a 4-lane expressway to a 4-lane freeway, sufficient capacity is expected.

The TH 169 Corridor Belle Plaine Area Plan includes an overpass on CSAH 3. The City has begun to acquire property based on the Official Map prepared. Based on the City's anticipated development, the intersection of TH 169/CSAH 3 is anticipated to be congested within approximately 15 years. The high traffic volumes on CSAH 3 illustrate the need for an overpass of TH 169 as an interim measure prior to the interchange to accommodate local traffic movements across TH 169. As noted in Section III–A, a taskforce had been established to explore opportunities to fund a solution that will increase the safety of the intersection and mobility of TH 169. The City should continue discussions with Mn/DOT and Scott County to fund and stage improvements.

#### County Roadways:

Traffic volumes on CSAH 3 north of Commerce Drive are expected to nearly triple 2005 volumes to approximately 12,100 vehicles per day. South of TH 169 between Haralson Drive and Evergreen Street volumes are expected to increase significantly from 3,200 in 2005 to 17,200 in 2030. This is due to local traffic's need to access destinations on both sides of TH 169 and the concentration of trips is limited at the TH 169 intersections. During the peak travel hours, CSAH 3 will likely be

- Periodically Congested
  - Between Main Street and Park Street
  - Between Century Street and the future Major Collector located at an alignment of approximately 245<sup>th</sup> Street.
- Near Congested
  - Between Park Street and Commerce Drive
  - Between Evergreen Street and Century Street
- Congested between Commerce Drive and Evergreen Street

A 4-lane roadway with appropriate turn lanes will likely be necessary between Commerce Drive and Evergreen Street. Advanced intersection control will likely be necessary at Park Street, Commerce Drive, Haralson Drive, Evergreen Street, and Century Street. The City will work with Scott County to implement the TH 169/CSAH 3 study conclusions, review and monitor traffic volumes and intersection operations, obtain additional right-of-way, as well as stage improvement strategies that will become necessary as development occurs.

Due to anticipated development on the west side of the City, CSAH 6 is anticipated to be congested between TH 25 and Meridian Street, with volumes increasing from 860 to 7,500. West of Meridian Street, CSAH 6 is anticipated to be near congested with traffic volumes increasing from 1,700 in 2005 to 5,100 in 2030. The existing driveway access along this corridor will reduce the roadway's ability to meet increasing traffic demands, resulting in a congested segment.

#### Local Roadways:

Old Highway 169 is anticipated to be near congested between Main Street and 1<sup>st</sup> Street NE, and periodically congested north to the intersection of TH 169 and CR 66. This is due to planned residential and commercial growth, and desire to access various locations such as downtown Belle Plaine, the TH 25/TH 169 interchange, and the TH 25 Minnesota River Crossing.

Commerce Drive between Oakcrest Trail and the future ramps at TH 169 and CSAH 3 is anticipated to be periodically congested. Between the ramps and CSAH 3 the corridor will likely be near congested. This is due to the desire for traffic to access TH 169, as well as the high school and future commercial destinations.

Portions of Century Street and future 245<sup>th</sup> Street west of CSAH 3 are also anticipated to be periodically congested. This is due to traffic desiring to access TH 169 and other destinations in the community located to the east, and because there isn't a corridor within the urban growth boundary planned to the west. As outlined in Section IV-A, as growth extends to the southwest, the City of Belle Plaine and Scott County should study the merits of a grade separated crossing to align CR 53 and Stoppelmann Boulevard. An overpass or underpass would be consistent with the TH 169 CMP and reduce challenges associated with the bluff/ravine complex and Robert Creek terrain.

Several gravel roadway corridors located outside of the City's urban growth boundary are projected to have high traffic volumes. Although the roads could handle the traffic, consistent maintenance would be required to keep them in working condition. Studies indicate that as volumes exceed 500 ADT, it becomes cost effective to pave the roadway. Since these corridors are not anticipated to be within the City's jurisdiction, it is recommended that during annexation discussions or prior to preliminary plat approval that the City work with the township and developer to upgrade and improve the corridor through a joint agreement with the developer, township, and City. The horizontal and vertical alignments of each corridor should be reviewed prior to paving, as motorists drive paved roadways more aggressively than gravel roadways, and higher travel speeds should be accounted for in the design. Tight, horizontal curves and limited sight distance over hills, which may have not been a problem with a gravel surface, can often result in immediate crash problems when the roadway is paved. Roadways identified for potential surfacing include 250<sup>th</sup> Street (between CSAH 3 and Laredo Street), Century Street (currently Kittson Boulevard between Farmers Ridge Trail and Homestead Avenue), Homestead Avenue (between CSAH 7 and Kittson Boulevard/Century Street), and Galena Avenue (between CSAH 7 and CR 64).

#### Intersections:

Existing and proposed intersection locations may have inadequate sight distances. Sight lines at these locations may be obstructed due to horizontal and/or vertical curvature of the roadways, as well as other roadside obstructions. As future intersections are established or new land use developments route additional traffic to existing intersections, an engineering study will be required to determine the appropriate measures needed to achieve adequate intersection sight distances. These may include reconstruction of a portion of the existing through roadway, relocating the intersection, or other means to remove the sight obstruction. To accommodate necessary turn lanes, additional right-of-way may be required at the intersection.

Figure 7-8 identifies several potential locations that may require an intersection control evaluation. The intersection control evaluation will identify the traffic control option (e.g. all way stop, roundabout, possible signalization) and capacity improvements (e.g. turn lanes) necessary to accommodate the traffic volumes in a safe and efficient manner. Intersections along Commerce Drive, Old Highway 169, Century Street, and future 245<sup>th</sup> Street should be designed to properly handle the anticipated traffic through the use of turn lanes and/or alternate traffic control (e.g. all way stop, roundabout, possible signalization) at all intersections and limiting Minor Collector access along the roadway as consistent with the standards in Section II. Direct driveway access should not be allowed. Access management, as outlined in Section II-C, will be an important tool in maintaining mobility on these roadways. Right-of-way should be acquired as properties in the area develop or redevelop.

#### **D. Multimodal<sup>5</sup>**

Scott County's Unified Transit Management Plan, dated May 2005, states that "steady rapid growth in this region suggests that close monitoring of densities, population and travel patterns of residents of these communities (Jordan, Belle Plaine, Elko, New Market and New Prague) should be conducted."

The City should consider a park-and-ride location close to Highway 169 to help foster new car/van pools. The Metropolitan Council has proposed an additional park-and-ride facility, with an initial 200-car capacity, near the Highway 169 and CR 83 interchange in Shakopee. This is the closest regional park-and-ride facility planned. The City should continue to work with Scott County Transit to determine long term needs for additional service.

In addition to these recommendations, it is important for the community to plan for the ability to accommodate multimodal activities (i.e. transit, pedestrian, and bicycle) on all non-Local roadways to provide other opportunities to move about the city and beyond. The typical sections for Minor and Major Collectors listed in Section II-D – Geometric Design Standards and Figures 7-2 and 7-3 include construction requirements for these off-street opportunities.

The City should consider reviewing pedestrian facilities and school routings to determine their adequacy as traffic conditions change. Sidewalks and trails, providing pedestrians a route to future controlled intersections, should be incorporated into road projects and land developments to safely accommodate pedestrian and traffic growth in the City.

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<sup>5</sup> Municipal Development Group

## **V. Goals & Implementation**

The following goals and strategies outline the City of Belle Plaine's plan for ensuring adequate infrastructure is available to support the growth anticipated within the urban growth boundary, as well as potential funding sources for completing necessary improvements.

### **A. Goals**

The transportation goals and implementation strategies identified have been developed to meet the needs of the land uses associated with the build-out of the urban growth boundary.

1. Comprehensive Transportation Planning – Approach transportation in a comprehensive manner by giving attention to all modes and related facilities through linking transit and land use and by combining or concentrating various land use activities to reduce the need for transportation facilities.
2. Transportation System – Create/provide a safe, cost effective, and efficient transportation system that is adequate for vehicular, pedestrian, bicycle, and truck transportation for the movement of people and goods and services in the community.
3. Local Streets – Local streets should be laid out to permit efficient plat layout while being compatible with the area's topography, adjacent roadways, municipal utility plans and environmental constraints.
4. Collector Streets – The location of collector streets promotes orderly development. As development plans are presented to the City, future collector streets should be designed to provide continuity and prudent access to other collector streets and arterials and adhere to the recommended access management guidelines and locations identified in Figure 7–5 – Recommended Future Roadway Functional Classification.
5. TH 169 Safety – To protect the safety of residents, businesses and visitors to and through the community, the City should continue to work with Mn/DOT and Scott County to address the CSAH 3/TH 169 intersection and for the agreed solution.
6. Transportation Improvement & Expansion – Improve and expand the existing transportation system as necessary to meet current and future transportation needs.
7. Maintain Existing Infrastructure – Preserve and maintain the existing transportation infrastructure to protect the significant investment, to increase its efficiency, and delay the need for improvement or expansion by use of a Capital Improvement Plan.
8. Municipal Services – As the street system continues to expand, street maintenance such as snowplowing, grading rural roadways, dust coating, routine maintenance, etc. will become increasingly important issues. Additional street construction will either increase contracted labor expenses or necessitate an expansion of the City's services provided by the municipal public works department. Prior to approving proposed subdivisions, consideration should be given to the City's ability to provide municipal services, facilities and equipment for snowplowing, street grading, minor street repair, dust-coating, etc. on either a contracted or staff basis.
9. Transit/Alternative Modes of Transportation – To diminish/prevent congestion, the City should encourage alternate and/or integrated transportation methods that are less dependent on motor vehicles. The City could promote and encourage walking and biking as alternate transportation methods. The City should strive to provide park and ride facilities near Highway 169 as a means of encouraging car-pooling and ride sharing. As the population ages and diversifies, bus service will become an important amenity in the community and should be further studied with Scott County Transit. Special attention should be given to improving pedestrian access, movement and crossings to provide both convenience and safety.

10. Trunk Highway Crossings – The City should promote safe pedestrian crossings of Highway 169 and TH 25.
11. Transportation & Economic Development – Create or encourage a transportation system that contributes to the economic vitality of the community by connecting people to work, shopping, and other activity generators/attractions and supports growth of commercial and industrial uses.
12. Regional Transportation Planning – Cooperate on a regional level in planning and development of a transportation system, including coordination among multiple jurisdictions, public and private transit providers and agencies at all government levels, while serving the functional needs of all.
13. Regional Traffic Management – Work on a local, state, and regional level to reduce traffic congestion and safety concerns on transportation corridors.
14. County Capital Improvement Plan – The City should continue to work with the County elected and appointed officials to include County Road reconstruction projects on the County’s Capital Improvement Plan to address needed reconstruction and potential trails along the roadways when improved.
15. Regional Transportation Funding – Pursue a balanced approach to financing transportation and other community needs at the local level based on current availability of services and facilities and maintenance of existing infrastructure.
16. Roadway Project Coordination – Continue to coordinate future road construction and reconstruction projects with all utility service providers and Scott County to ensure efficient repair/replacement and avoid duplicate costs.
17. Capital Improvement Plan – Develop a Capital Improvement Plan that contains elements for new construction and reconstruction of the roadway system, with scheduled maintenance included in annual budgets. Street maintenance should include routine patching, crack filling, and storm sewer cleaning. Implement a schedule for roadway maintenance and reconstruction (e.g. seal coating every 4 to 5 years, complete reconstruction or mill/overlay every 15 to 20 years), street widening/realignment, etc.
18. Zoning and Subdivision Ordinance Update – Update the Zoning and Subdivision Ordinances consistent with the Transportation Plan.
19. Right-of-Way Dedication – Require right-of-way dedication along state, county, and local roads to meet future capacity needs.
20. Minor Collector Review – review concept plans for plat and development proposals to evaluate the distribution of Minor Collector roadways so as to not overburden local streets.
21. Development Driven Improvements – Work with developers to construct needed improvements prior to development.
22. Non-Development Driven Improvements – Non-development driven improvements should be prioritized and programmed in the Capital Improvement Program.
23. Assessment Policy – Develop an assessment policy for Major Collector and Minor Arterial roadways to establish expectations and ensure consistent application.
24. Developer Agreements – Utilize developer agreements as a tool to ensure improvements are constructed as agreed upon in the platting or development process.

25. Traffic Impact Study Policy – Establish a policy outlining when a traffic impact study should be conducted, including acceptable information to be contained within the study.
26. Gravel Roadway Improvements – When traffic from a proposed urban development may exceed 500 ADT will work with the developer and township to identify a strategy to upgrade and improve the gravel corridor through a joint agreement with the developer, township, and City.

## **B. Strategies**

Various strategies can be utilized to ensure proper transportation improvements are made to provide and protect the infrastructure investment. Astute land use planning and subdivision plat review are key to ensuring the long-term roadway network vision is developed and future traffic issues are avoided. To accomplish this, each development proposal (e.g. redevelopment of a single parcel, plat review, change of use, expansion of a business or operation, etc.) should be evaluated for consistency with the following policies/standards:

1. Work with property owners / developers to remove / relocate existing driveway and field approaches off non-local roads.
2. Provide road and trail connectivity between adjacent parcels.
3. Review/require access spacing that is consistent with the transportation plan.
4. Connect residential and non-residential areas.
5. Require turn and bypass lanes on non-local roads impacted by new development, including those that are not immediately adjacent.
6. Require off-site improvements, including those in other jurisdictions, where the existing transportation network will be directly impacted by new development, including where the development is not immediately adjacent. This could include but is not limited to paving roads, repairing surfaces, fixing sub-standard drainage, improving sight distances, etc.
7. Require the dedication of rights-of-way for all required future transportation improvements identified in the transportation plan including trails, roads, bridges, transit facilities, drainage, utilities, and any other related improvement requiring use of a corridor/location.
8. Require the equitable participation in the construction of collector and arterial roads.
9. Review probable neighborhood traffic patterns, areas where excessive speed is possible, and the potential for pedestrian conflicts.
10. Require all local roads to be constructed to property lines, or the corresponding amounts of money be escrowed, where stub streets are proposed to adjacent properties, but are not immediately warranted.
11. Require fees, construction participation, and/or cost participation proportionately to future required infrastructure such as overpasses, interchanges, and other Local/County responsibilities as afforded by law and justifiable.
12. Require traffic impact studies, including the analysis of intersections to determine the need for and contribution to intersection improvements.
13. Incorporate into local ordinances land use and access strategies of the TH 169 CMP identified in Section III.D. – Relevant Area Transportation Studies.

14. Support Minnesota River bridge expansion initiatives at CSAH 9, TH 41, CSAH 101, and TH 169 to preserve TH 169 access to destinations to the north and TH 25 roadway capacity within the City of Belle Plaine.

In addition to the review of specific development driven improvements, short-term and mid to long-term improvements have been identified for capital improvement planning (CIP) purposes as follows:

Short-Term Improvements (2008 – 2013 years):

As required by state law, update the City zoning and subdivision ordinances to comply with and implement the transportation chapter of the 2008 Comprehensive Plan. A planning level cost estimate in 2008 dollars for a study is estimated at \$2,500 to \$7,500.

It is recommended that the City of Belle Plaine, together with Mn/DOT and Scott County, continue to work together to fund and implement potential solutions that improve the safety of the TH 169/CSAH 3 intersection and mobility of CSAH 3. The cost of further studies and identified improvements should be incorporated into the City's CIP accordingly.

As traffic volumes increase to levels forecasted, it is recommended that the City of Belle Plaine and Scott County initiate capacity and intersection control needs studies for the intersections identified in Figure 7-8 to determine safety, capacity, and traffic control needs. A planning level cost estimate in 2008 dollars for a phase one study is estimated at \$5,000 to \$15,000 per intersection.

The City, together with Blakeley Township and Mn/DOT, are recommended to initiate a study to evaluate alternatives to discourage the urbanizing area of Belle Plaine's use of Oakcrest Trail/Stopplemann Boulevard. A planning level cost estimate in 2008 dollars for this portion of the study is estimated at \$5,000 to \$10,000.

Mid to Long-Term Improvements (2014 – 2030):

It is recommended that the City of Belle Plaine and Scott County work together to initiate a corridor preservation study to determine an alignment option for further planning, preservation, and environmental analysis for the extension of CSAH 7 to CR 64 between Hickory Boulevard and Iago Boulevard. A planning level cost estimate in 2008 dollars for a study of this magnitude may cost in the range of \$30,000 to \$50,000, with potential funding partnerships between the developers, city and county.

As development approaches gravel roadways adjacent to the urban growth boundary, the City of Belle Plaine should work with the adjacent townships to measure traffic volumes and develop a strategy for the upgrading of the roadway when necessary. A planning level cost estimate in 2008 dollars for collecting and reviewing the traffic counts on each corridor is estimated at \$500 annually.

Intersections not evaluated in 2008–2013 should be programmed for capacity and intersection control needs studies to determine safety, capacity, and traffic control needs as traffic volumes increase to levels forecasted. A planning level cost estimate in 2008 dollars for a phase one study is estimated at \$5,000 to \$15,000 per intersection.

**C. Potential Transportation Funding Sources<sup>6</sup>**

There are a number of various funding mechanisms available to support transportation projects these include the following:

1. Federal Funding. Belle Plaine may apply for federal funds for highways through the Surface Transportation Program of the Federal Highway Trust Fund, through MnDOT's Areas Transportation Partnership (ATP). Solicitation occurs approximately every two years, with federal funding covering 80% of a project's cost. Types of projects funded include highway reconstruction, safety projects, trails which are part of projects, transit and park-and-ride projects.

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<sup>6</sup> Municipal Development Group

2. MSAS System. The State of Minnesota, through the gas tax and license fees, collects funds to be used to construct and maintain the State's transportation system. Most of the funds collected are distributed for use on the State's Trunk Highway (TH) system, the County State Aid Highway (CSAH) system and the Municipal State Aid Street (MSAS) system. Of the funds available they are distributed 62% TH, 29% CSAH and 9% MSAS. Cities with a population above 5,000 are eligible to receive a portion of the MSAS funding. Belle Plaine has received state aid funding since 2004.
3. Mn/DOT Cooperative Funds. The State of Minnesota has funds available to assist with cooperative projects that increase safety and mobility. Solicitations are due in October each year for construction the following year.
4. Minnesota Railroad-Highway Grade Crossing Safety Improvement Program. This program is available to increase the safety at at-grade railroad crossings. Funds may be used for the installation of warning devices, signal installation and upgrades, signs and pavement markings, crossing closures, roadway relocations, lighting, crossing alignments and grade improvements and grade separations.
5. MN Department of Natural Resources Grants. Various federal and state grants are available for the development or reconstruction of trails. Typically grants require a 50% match and illustration that the trail is not only of local importance but also of regional significance. Grant programs through the DNR for trail projects include the Federal Recreational Trail Grant Program, Regional Trail Grant Program, Outdoor Recreation Grant Program, and Local Trail Connections Program.
6. Collector and Local Streets. Developers may be required to fund the entire cost of Minor and Major Collector Roadways, as well as local streets as a part of their development fees.

## VI. Traffic Forecast Modeling

The following describes the general approach to traffic forecasting efforts and resulting outputs for this Transportation Plan.

Developers will use the traffic volume forecast data to include in the individual development traffic study. The TAZ projections on smaller zones let a Developer know if their plan conflicts or is consistent with the City Plan Development projections and lets them get a better handle on what traffic improvements are needed with their Development.

### Model Used:

- Twin Cities Regional Model
  - Existing Model: Year 2000
  - Future Model: Year 2030
- Consistent with Current Regional Transportation Policy Plan Adopted by the Metropolitan Council
  - Demographics
  - Metropolitan Highway System
  - Metropolitan Transit System

### Models:

Existing Model provides the basis of the roadway connections and existing capacity, speed, and functional class.

Future Model uses the existing model parameters to set-up a no-build scenario. New roadways are added to provide additional connections throughout the city. Planned improvements are also included for existing roadways. These improvements and new roadways provide for the anticipated future roadway network to handle the citywide growth.

### Model Methodology:

The general approach to forecasting the traffic volumes consisted of the following:

- Utilize the Twin Cities regional travel demand model and model parameters, maintained by Metropolitan Council, as the primary instrument for forecasting the volumes.
- Collect year 2000 and current year traffic count data and basic roadway attribute information in the study area for the purpose of validating the regional model, run for the base year (2000).
- Collect year 2000 census data from the U.S. Census Bureau.
- Determine Traffic Analysis Zones based on roadways, land use data, and land features.
- Split regional model Traffic Analysis Zones into smaller zones for basis of projections.
- Add additional county and other major local roadways to the roadway network in the regional model.
- Apply the regional model for the base year and validate its projections against the observed traffic count information; make appropriate adjustments as necessary to reach an acceptable validation.
- Apply the regional model for the forecast year (2030), taking into account the adjustments made to the 2000 model run, to generate the projected volumes.
- Analyze traffic patterns that ultimately comprise the elements themselves, through a series of special selected link analyses; use this information as a basis for adjusting the forecasted volumes if determined to be necessary.
- Prepare the final set of forecast volumes.

### Details:

Additional details concerning the methodology follow:

*Regional Model* – The regional model provides a systematic procedure for forecasting volumes, taking into account the projected changes in regional land use/socioeconomic data and the regional transportation network. The regional model was obtained from Metropolitan Council for 2000 and 2030 conditions.

*Historical and Current Year Traffic Count Data* – Traffic count data in the study area was collected from the Minnesota Department of Transportation (Mn/DOT) and recent traffic studies in the area. This included A.M. and P.M. peak hour, as well as average daily traffic volumes.

*Current Roadway Attribute Information* – The regional model highway network was reviewed in detail for conformity to current conditions. A thorough check of roadway functional classification, speed, number of through lanes, and roadway capacity was completed. Several roadways were added to the network to assist in the future network analysis. These roadways were populated with the appropriate attributes based on regional model documentation, so as to be consistent with the regional model parameters.

*Census Data* – Year 2000 census data was collected from the U.S. Census Bureau. This data includes population and households by census block.

*Employment Data* – Employment figures were obtained from the City of Belle Plaine to identify trip attractions within the City.

*Traffic Analysis Zones (TAZs)* – Based on the census blocks, land use, roadway network, and land features (including railroads, waterways, and bluffs), zones were identified for traffic to enter and exit from the roadway network. These zones include both traffic productions and attractions. These zones were split from the regional model traffic analysis zones, which cover a much larger area and were broken apart to allow for additional roadway traffic volume projections, which would not have been available in the base regional model. These zones and their relevant information were added to the regional model.

*Socioeconomic Data* – Land Use data for year 2030 was received from the land use consultant. The projected population, households, and employment data was aggregated into the TAZs.

*Base Model Validation* – The 2000 model was validated using many resources, including: 2000 traffic count data, Scott County Transportation Plan, aerial photos, and field observations. The assigned volumes from the 2000 regional model were then compared to the 2000 traffic counts. Adjustments were made to centroid locations and additional centroid connectors were added to help smooth volumes along individual roadways and more closely match ground counts. Additionally, because of the “regional” nature of the regional model, roadways are categorized into a select number of functional classifications. Thus, roadways that have minor differences may have the same functional classification. Some roadways in the study area were refined to reflect these minor differences. Specifically, local gravel roadways were defined as minor collectors but were adjusted with a lower capacity and speed than a typical paved minor collector.

*Future Model Forecasts* – The 2030 model was updated to include the existing roadways and the additional TAZ's as used in the 2000 model. Future roadways within the urban growth boundary were added and centroid connectors were adjusted as required to connect with the newly proposed roadways. Additionally, functional classifications, speed, and capacities were adjusted based on the expected future roadway attributes.

*Review of Forecasts* – The traffic forecasts were reviewed for reasonableness. As with any travel demand model, it would be inappropriate to rely solely on direct model output for design volumes. The modeled volumes were reviewed and adjusted based on existing and historic travel patterns and also through some additional selected link analysis of model output. A series of selected link assignments were performed and the model estimated volumes were adjusted to more accurately reflect future traffic patterns within the study area. The checks for reasonableness of the projected volumes follow the procedures as outlined in the Mn/DOT Metro: Model Output Checks for Reasonableness and Post Processing Adjustments (Revised 5 January, 2006). These include:

- **Peak Hour Percentage of Daily Traffic:** The peak hour percentages of daily traffic produced by the model for the forecast year were compared to existing/observed peak hour percentages within the project limits and on other routes nearby with the same functional classification.
- **Directional Split of Peak Hour Traffic:** The directional splits of peak hour traffic forecasts produced by the model for the forecast year were compared to existing/observed directional splits within the project limits and on other routes nearby with the same functional classification.
- **Capacity of Road Segments Beyond Limits of Project:** Peak hour traffic forecast volumes assigned to road segments beyond the limits of the study area were studied to determine if the projected growth from the area affects the capacities of those road segments. On roadways outside of the study area with volume to capacity ratios over 1.00, the model results were compared to the regional model results from Met Council and Mn/DOT. The capacities of feeder roadways were not exceeded near the study area, except on TH 25, north of Main Street. TH 25 provides an important connection north to the new TH 212 freeway by use of CSAH 40 and CR 147. This congestion is recognized and seems to be typical of the bridge crossings over the Minnesota River. If this bridge and roadway is not expanded, there is expected to be a capacity issue on the TH 25 Bridge, and also on TH 169, north of CSAH 59. This would extend the current 2030 congestion seen in the forecasts by Met Council, which shows a volume to capacity ratio over 1.00, north on TH 169 north of the City of Jordan. The 2030 land use projections for Belle Plaine would consequently extend congestion on TH 169 approximately two (2) miles to the south. The congestion at the TH 25 Bridge would be relieved through expansion of the Bridge (which was reconstructed in 2007) or through the expansion of TH 169 and other river crossings to the north, such as the proposed new TH 41 River Crossing. The congestion on TH 169 is likely to be partially relieved by the future CSAH 8 extension to the east from Belle Plaine to Lakeville and I-35 in the short term and by the reconstruction of TH 169 to a freeway type facility from I-494 to Belle Plaine in the long term.
- **Daily Traffic Growth Factors:** The daily traffic forecasts from the model on the state roadways were compared with the last 20 years record of daily volumes and with the regional model results from Met Council and Mn/DOT. The projections are consistent with the general expectation that the model should yield forecast values which are lower than those based on an extrapolation of the last 20 years of increases in daily traffic. Daily growth is higher on some roadways than existing traffic based on the realignment of certain county roadways including CSAH 5 and CSAH 7.

*Post Processing* – The post-processing of the projected volumes follow some of the procedures as outlined in the Mn/DOT Metro: Model Output Checks for Reasonableness and Post Processing Adjustments (Revised 5 January, 2006). The post processing includes:

- Traffic forecast volumes were rounded to the closest 10 if less than 1,000 or to the nearest 100 if more than 1,000.
- All products depicting the forecast numbers (maps, tables, layouts, etc.) contain a very visible caution that the forecast numbers depicted have a likely confidence range of plus or minus 15 percent.

Traffic smoothing and corridor diversion adjustments were accomplished using the procedures described in Chapter 9 of NCHRP Report 365, "Travel Estimation Techniques for Urban Planning".

## **VII. Community Perceptions<sup>7</sup>**

Following are comments received related to transportation that were obtained during the comprehensive planning process. A cross section of community leaders were interviewed and asked to rank the overall physical condition of roadways within the community, results from 14 respondents follow:

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<u>Condition</u>	<u>Percent</u>
Excellent	0%
Good	36%
Fair	57%
Poor	7%

Survey participants were also asked to identify specific priorities for the improvement of roadways within the community. Participants identified a need to improve the following:

- South Street design and capacity concerns.
- CR 3 crossing and need to retain this when the interchange at CR 64 and Highway 169 is complete. The need to address this crossing and construct an interchange to coincide with new school construction in the area.
- Highway 169 and the need to further address this corridor and crossings.
- Trail systems – need to expand the system.

Participants were also asked if they felt transportation needs will be met with the proposed interchange at CR 64/Highway 169 and the proposed frontage road. Of the 11 responding, 27% noted they felt needs will be addressed, 73% felt they would not. Those noting transportation needs should be further addressed suggested the following:

- The EDA could assist with relocating businesses along Hwy 169.
- Plan for an overpass on Laredo Avenue as access points are very limited.
- Leave a couple Right On – Right offs and work with Mn/DOT to try to lobby these back in.
- Look at the Meridian Street /Hwy 25 interchange and the crossing by Petro Pete's as soon as possible. Do everything possible to move it up the schedule for CR 3 crossing.
- A diamond shaped interchange would be preferred, similar to Shakopee. It provides for more development and is easier for public to determine where they are going. The proposed design is more confusing and takes up more space. Consider a diamond interchange, especially at County Road 3.
- Sidewalks are needed on East Main Street coming into town from CR 64 to the downtown.

The community leader survey indicated over one-third of respondents (38%) were uncertain whether or not public transportation access and services are being adequately met for all age groups in Belle Plaine. Only 15% believe public transportation is being adequately met for all age groups and 46% believe public transportation does not adequately serve all age groups within the community.