

# **TRANSPORTATION**

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

The purpose of this Transportation Plan is to provide guidance to the City of Jordan, 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. The primary goal of this Plan is to establish 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 Jordan. To accomplish these objectives, the Transportation Plan provides information about:

- The functional hierarchy of streets and roads related to access and capacity requirements
- Identification of existing and potential deficiencies of the existing arterial-collector street system
- Recommended alternatives to alleviate roadway deficiencies including a future arterial-collector street system capable of accommodating traffic volumes to 2020 and beyond
- Access management policies and intersection controls
- Pedestrian/bicycle trail and sidewalk system along the roadway system

## **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 located are described below and illustrated in Map 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 Jordan area.

Trunk Highway (TH) 169 is the only Principal Arterial in the Jordan area. 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 Mankato and southern Minnesota.

### **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 Jordan area. Minor Arterial roadways are typically spaced approximately 1 – 2 miles apart in developing communities similar to Jordan. The Minor Arterials in the Jordan area are described briefly below.

#### North/South Routes

1. CSAH 59, a B-Minor Arterial, currently has an at grade intersection with TH 169 and is located approximately 1 mile west of Jordan's City limits. The route extends south to Le Sueur County CSAH 11 providing connectivity between TH 169 in Jordan to TH 99 in the City of Le Center.
2. CSAH 9, an A-Minor Arterial-Connector, extends to the northwest out of Jordan, beginning at TH 169 and extending to the Minnesota River where it crosses into Carver County and becomes Carver County CSAH 45. This roadway connects with US Highway 212 west of the City of Chaska and north of the City of Carver by means of Carver County's CSAH 40 to County Road (CR) 147.
3. TH 21 is a B-Minor Arterial from TH 169 south to TH 282 and an A-Minor Arterial-Connector from TH 282 to TH 19. It provides connectivity in Scott County between Jordan and New Prague. South of Scott County, TH 21 extends to the City of Faribault where it terminates at TH 60. Vehicles traveling this route can access Interstate (I) 35 in Faribault.
4. CSAH 15, a B-Minor Arterial, is located east of the City of Jordan's identified urban growth boundary. Between CSAH 10 and TH 282, CSAH 15 is identified as a B-Minor Arterial. The route provides connectivity across central Scott County between New Prague and Shakopee. South of New Prague, the route connects into Le Sueur County to CR 144 and the City of Montgomery.
5. CSAH 7, a B-Minor Arterial, is located approximately 3½ miles southwest of Jordan's City limits. It provides connectivity between CSAH 5 in Belle Plaine and TH 19 in the hamlet of Union Hill located west of New Prague.

#### East/West Routes

1. TH 282, an A-Minor Arterial-Connector, begins at TH 169, and it connects Jordan to Prior Lake at Highway 13.
2. CSAH 8, an A-Minor Arterial-Connector, is located south of the City of Jordan and east of TH 21. This route, together with CR 76, completion of a 3.5 mile missing roadway segment between TH 21 and CSAH 59, and completion of a ¾ mile segment between CR 76 and CSAH 5 in Belle Plaine, will provide connectivity across central Scott County between TH 169 and I-35.

### **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 Jordan, and are typically spaced approximately ½ to 1 mile apart in urbanizing areas.

CSAH 10 and 11 are County roads classified as Major Collector roadways in the Jordan area. Other City streets, such as Sunset Drive to Creek Lane and Hillside Drive, currently function as Major Collector roadways.

### **Minor Collectors**

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). Sunset Drive east of Creek Lane to TH 282 is a good example of an existing street serving as a Minor Collector roadway in Jordan. County Roads 61, 64, 66, and 70 are designated as Minor Collectors.

### **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 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 level of 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 Collector 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 7-1 – Roadway Types and Capacities, identifies various roadway types and the estimated daily capacities that the given roadway can accommodate.

TABLE 7-1 – ROADWAY TYPES AND CAPACITY

| <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 average daily traffic volume (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 the 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 operation 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 the 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 7-2 below.

TABLE 7-2 – HIGHWAY LEVEL OF SERVICE

| Level of Service | Multilane v/c Ratio | Two-Lane Average Travel Speed (mph) |
|------------------|---------------------|-------------------------------------|
| A                | <0.28               | >55                                 |
| B                | >0.28 – 0.45        | >50-55                              |
| C                | >0.45 – 0.65        | >45-50                              |
| D                | >0.65 – 0.86        | >40-45                              |
| E                | >0.86 – 1.00        | ≤40                                 |
| F                | > 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 criterion is established in Table 7-3 below.

TABLE 7-3 – URBAN STREET LEVEL OF SERVICE

| Range of Free-Flow Speed (LOS) | Average Travel Speed (mph) |          |          |          |
|--------------------------------|----------------------------|----------|----------|----------|
|                                | 55 to 45                   | 45 to 35 | 35 to 30 | 35 to 25 |
| A                              | >42                        | >35      | >30      | >25      |
| B                              | >34-42                     | >28-35   | >24-30   | >19-25   |
| C                              | >27-34                     | >22-28   | >18-24   | >13-19   |
| D                              | >21-27                     | >17-22   | >14-18   | >9-13    |
| E                              | >16-21                     | >13-17   | >10-14   | >7-9     |
| F                              | ≤16                        | ≤13      | ≤10      | ≤7       |

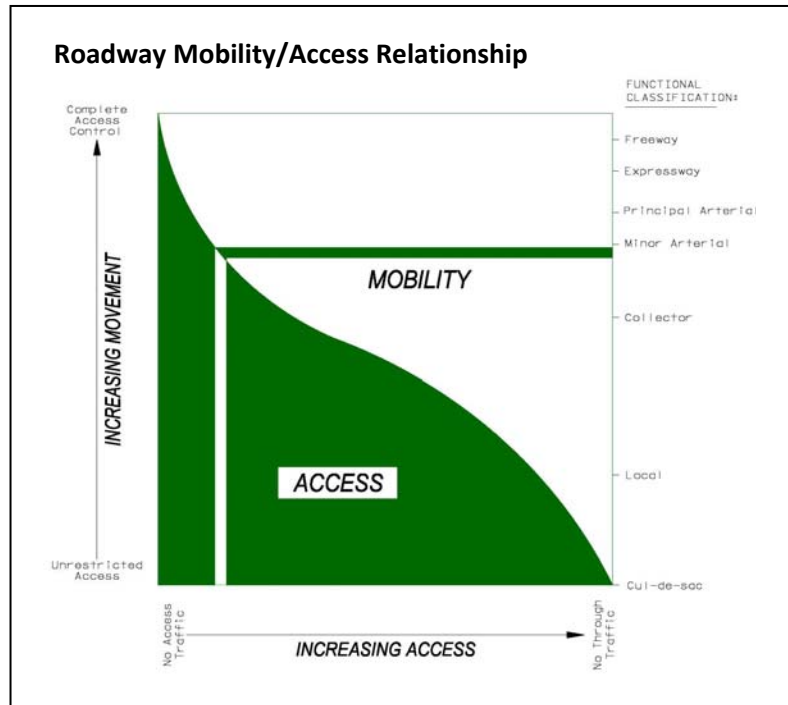
Generally, the City of Jordan should consider capacity improvements on roadways with a LOS D or worse and volume-to-capacity ratios over 0.75 during the peak hours.

**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 Jordan, 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 Jordan, 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 Jordan has access authority for those roadways under their

jurisdiction. Likewise, Scott County and Mn/DOT have access authority for roadways under their jurisdiction. The access spacing guidelines for Jordan are consistent with current practices of other cities, as well as with Scott County and Mn/DOT. The hierarchy of the functional classification system should be maintained when applying the access spacing guidelines to the roadway network (i.e. a collector street should have priority access to a Minor Arterial roadway over a Local street or adjacent property). Tables 7-4 and 7-5 below present the access standards and access spacing for the Jordan roadway network. Please refer to Scott County's minimum access spacing guidelines identified in their current Transportation Plan.

TABLE 7-4 – ROADWAY ACCESS STANDARDS

| <b>Driveway Dimensions</b>                       | <b>Residential</b>         | <b>Commercial<br/>Industrial</b> | <b>or</b> |
|--|----------------------------|----------------------------------|-----------|
| Driveway Access Width                            | 11' – 22'<br>(16' desired) | 16' – 32'<br>(32' desired)       |           |
| Minimum Distance Between Driveways               | 20'                        | 20'                              |           |
| Minimum Corner Clearance from a Collector Street | 60'                        | 80' <sup>(1)</sup>               |           |

<sup>(1)</sup> At the discretion of the City Engineer, 80' minimum

TABLE 7-5 – ACCESS SPACING GUIDELINES FOR COLLECTOR ROADWAYS IN JORDAN <sup>(1)</sup>

| Type of Access by Land Use Type                           | Major Collector              | Minor Collector          |
|---|------------------------------|--------------------------|
| <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 Jordan, 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 Maps 7-2 and 7-3 respectively.

The Geometric Design Standards illustrated in Maps 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 Trunk Highways 21 and 282 within Jordan, 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 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 Jordan 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 and provide connectivity according to the Existing and Future Trail Map.

Along Minor Arterials, a minimum 8' 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' bituminous trail would be more desirable as the 10' width would better accommodate two-way travel safely.

Along Major Collector roadways, 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 these roadways allow for pedestrian travel within the corridor without introducing excessive crossing demand on Major Collectors. A 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.

Along Minor Collector roadways, a 6' concrete sidewalk is recommended on each side of the roadway. With the anticipated vehicular volumes on Minor Collector streets, pedestrians can safely cross the roadway; however, pedestrian travel along the roadway may become uncomfortable.

### **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 7-6 below presents the recommended design speed for the Jordan roadway network.

TABLE 7-6 – ROADWAY DESIGN SPEED GUIDELINES

| Functional Classification | Design Speed <sup>(1)</sup> |
|---------------------------|-----------------------------|
| 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 Maps 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 the approval of 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 Jordan. 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.

**F. Transit**

It is recognized that various methods of travel impact the economic vitality of a city, county, or broader region. The term transit applies to all forms of sharing rides, regardless of whether the service is provided by a public or private operator, organization, or individual vehicle owner, or whether the ridesharing arrangements are formal or informal. Most transit rides, however, are provided by formal transit systems, at least during the morning and afternoon peak travel periods.

Based on the needs of a community, transit systems may be established to accommodate trips that are internal within the city (internal to internal), trips that begin in the city and end somewhere outside of the city (internal to external), and/or trips that begin outside of the city and end within the city (external to internal). An example of an internal to internal trip may be a trip that begins at a home in Jordan and ends at a place of employment such as the Minnesota Valley Electrical Cooperative. An internal to external trip may be a trip that begins at a home in Jordan and ends at the Scott County Government Center in Shakopee. A trip that begins at a home in New Prague and ends at the Jordan High School is an example of an external to internal trip.

Transit studies can evaluate current transit service performance and analyze the market to identify any unmet needs and to look for opportunities to enhance transit service. Generally, communities with dial-a-ride as an initial service explore the feasibility of providing a fixed route schedule to connect residents with businesses, schools, places to shop, and employment centers.

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

The river, 2 railroad lines, TH 169, as well as the bluff/ravine and wetland systems have each bisected the city and impacted how the existing transportation system in Jordan has developed. These factors, access locations to TH 169, and the lack of Major Collector roadways within the City of Jordan has resulted in an over reliance on the Minor Arterial roadways of TH 21 and TH 282 for local circulation and connectivity. The use of Minor Arterial roadways for local traffic creates challenges to maintaining the highways' ability to provide regional mobility. Currently, most traffic desiring to access TH 169 has to funnel its way through the downtown area of Jordan or utilize the Creek Lane extension between TH 282 and Sunset Drive. As population and business attractions grow, increases in traffic volumes have the potential to negatively impact the downtown area by reducing pedestrian mobility, increasing traffic congestion, and increasing parking problems. The City's ability to develop adequate Major Collector roadways is critical to maintain a satisfactory roadway system in the Jordan area and preserve the downtown area of Jordan as a desirable commercial area.

The existing transportation system within the City of Jordan currently provides sufficient transportation service to the City. Generally, the transportation system operates effectively, however several safety concerns and system continuity deficiencies exist.

#### **A. Traffic Volumes**

The existing traffic volumes within the area were collected from Mn/DOT and Scott County and are represented in Map 7-4 – Existing Average Daily Traffic Volumes. Roadway analysis indicates that the system operates well for most roadways within Jordan. As identified in Appendix A-1, roadway segments in Jordan currently operating at near congested levels include TH 169 north of TH 21, TH 282 between Creek Lake and TH 21, and Creek Lane/Sunset Boulevard from TH 282 to Hillside Drive. Roadway segments operating at a periodically congested level include TH 169 between TH 21 and TH 282 and TH 21 between the TH 169 northbound entrance ramp and CR 66.

#### **B. Continuity Deficiencies**

The completion of Creek Lane between Sunset Drive and 2nd Street (TH 282) has assisted in accommodating north/south travel in the City. Sunset Drive cannot be extended further to the south due to the location of the Jordan High School.

County Road 66 terminates at TH 21. Extension of this roadway east to CSAH 10 would provide an alternative to TH 282 for regional traffic to travel east/west. Similarly, CSAH 8 terminates at TH 21. The westerly extension of this roadway to CR 76/CR 66 would offer a continuous route for regional traffic to travel between TH 169 and I-35.

CSAH 15 is located approximately one mile east of the City of Jordan's identified urban growth boundary. This roadway is currently not a continuous route between New Prague and Shakopee. Continuity in this system may redirect some traffic currently using TH 21/TH 169 to the improved roadway.

### **C. Safety Issues**

A planning-level analysis of the existing transportation system in Jordan was completed and included evaluating crash records for the types of accidents most commonly occurring and to determine where crash trends may exist. In the five year time period from January 1, 2002 through December 31, 2006 there were 201 crashes on the roadways within the City of Jordan. Locations with the highest crash frequency are illustrated on Map 7-4 and include the intersections of TH 169 at TH 282, TH 282 at TH 21, TH 282 at Triangle Lane, and TH 282 at Creek Lane. Of the 201 crashes, 24 included injuries, 32 had possible injuries, and 145 involved property damage only. Rear end crashes represented 28% of the crashes, and 19% were right angle crashes.

As noted above, TH 169 at TH 282 has a high crash rate. Mn/DOT has analyzed this location for a future interchange. Removing this at-grade intersection would reduce the number the crashes and eliminate the conflict points associated with TH 169 traffic, as well as improve mobility.

Pedestrian safety across TH 169 is a concern. Numerous safety options available include the use of physical barriers, such as fences, to prevent entrance across TH 169 and divert pedestrians to crossings or overpasses with the use of trails and sidewalks.

County Road 66 has been identified as an area of safety concern due to the varying speed limits, which range from 40 to 50 miles per hour, and the lack of a sidewalk or trail to separate pedestrian and vehicular traffic. The City is working with Scott County to construct a segment of this trail in 2009, and seeking funding sources to construct the balance of the trail in the future.

### **D. Jurisdictional Issues**

TH 21 and TH 282 have been identified as potential turn back candidates from the state to Scott County; however, no plans are in place to complete the transfers.

173rd Street West is a local township road. While this roadway is outside of the growth boundary, it has been identified in the TH 169 Corridor Management Plan as a future interchange location. A corridor in this location is also identified for an east/west study by Scott County for a future county roadway. Upon completion of the interchange, this roadway may be under Scott County's jurisdiction.

### **E. Relevant Area Transportation Studies**

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

#### **TH 169 Corridor Management Plan**

In May of 2002, the State Highway 169 Corridor Management Plan (CMP) was issued by Mn/DOT. 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 Jordan and the surrounding area from the CMP are outlined below.

- 173<sup>rd</sup> Street (listed as County Road 65 in CMP) – 2 concepts were developed for this intersection. Concept 1 shows an overpass and Concept 2 shows a folded diamond interchange. Accommodating an interchange in this area is particularly difficult due to the proximity to the spur line, bluff area, and floodplain. Sand Creek Township indicated that it would prefer to have an interchange rather than an overpass at this location, given the spacing between CSAH 14 and TH 21. Scott County also indicated that CR 65 has

potential to serve as an arterial route to the east, if it does, the County would prefer an interchange at this location.<sup>1</sup>

- TH 282 – this area was identified for analysis in a separate sub-area study and is described below.
- CSAH 59 - One concept was developed for the CSAH 59 intersection. The City of Jordan sees this interchange as serving the southern access to the City. The concept for this location shows a folded diamond interchange with limited frontage roads. Additional local roads would be incorporated as development occurs. St. Lawrence Township and Mn/DOT agreed that the concept was feasible, and met the transportation needs of the area.<sup>2</sup>
- 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.<sup>3</sup>

#### **TH 169 Frontage Road & Interchange Study – TH 41 to CSAH 14, CSAH 59**

To further the goals of the TH 169 CMP of transitioning TH 169 to a freeway facility, in June of 2003 Mn/DOT undertook this study to assist local agencies in further defining an interchange location at CSAH 59 and frontage/backage road connections along both sides of TH 169 between TH 41 and CSAH 14.

This study identified 3 interchange concepts for the purpose of preserving right-of-way for a future interchange at CSAH 59. The study recommends an option for a folded diamond interchange to reduce right-of-way impacts and the preservation of the associated footprint.<sup>4</sup>

#### **TH 169/TH 282 Interchange Alternatives Study**

Mn/DOT and the City of Jordan have worked together to develop two interchange alternatives for the TH 169/TH 282 area. Both alternatives bridge TH 282 over TH 169 and bridge TH 169 over Creek Lane.

#### **CSAH 8 Corridor Preservation Study**

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 TH 169/TH 25-CSAH 5 interchange at 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 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 corridor that continues north into Jordan.

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<sup>1</sup> Minnesota Department of Transportation, State Highway 169 Corridor Management Plan, May 2002, p. I-28 – I-30.

<sup>2</sup> See also State Highway 169 Corridor Management Plan, p. I-33 – I-34.

<sup>3</sup> See also State Highway 169 Corridor Management Plan, p. I-35 – I-38.

<sup>4</sup> Minnesota Department of Transportation, Scott County TH 169 Frontage Road and Interchange Study – TH 41 to CSAH 14, CSAH 59, June 2003, p. 13 – 21.

### **TH 212 Design-Build Project**

The construction of the TH 212 freeway between eastern Chanhassen to an interchange at CR 147 is underway. This project is significant to the City of Jordan, because CSAH 9 extends to the Minnesota River where it crosses into Carver County and becomes Carver County CSAH 45. This roadway will eventually be a direct connection with TH 212 west of the City of Chaska by means of Carver County CSAH 45 to CSAH 40 to CR 147. As the river crossings further north of Jordan become increasingly congested, and TH 212 is completed to bypass downtown Chaska, CSAH 9 will experience increased travel demands.

### **F. Multimodal Transportation Opportunities**

It is recognized that various methods of travel impact the economic vitality of a city, county, or broader region.

#### **Transit Service**

The City of Jordan is currently outside of the transit taxing district. Scott County Transit currently provides dial-a-ride service throughout the county. According to 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. The closest regular route transit services are at the Southbridge Transit Station in Shakopee located near TH 169 and CSAH 18. The Blue Express is an express commuter bus service providing connectivity between Shakopee and Minneapolis from 8 AM to 8 PM. This service is a collaborative operation between Shakopee Transit and Prior Lake Laker Lines.

A park and ride facility also exists at the Lion's Park. In 2003 there were 15 parking spaces with a 25-33% occupancy rate.<sup>5</sup>

#### **Railroads**

Union Pacific operates two railroad corridors in the Jordan area. The railroad adjacent to Sand Creek runs 2 trains per day. The railroad paralleling TH 169 on the northwest side operates 7 trains per day.

#### **Aviation Plans/Facilities**

There is no public airport within the Study Area. A rarely used private airstrip named Stocker Landing Field is located just north of the current City limits east of CSAH 9. The City is outside of the "Airport Influence Area," with Flying Cloud Airport in Eden Prairie being the closest Metropolitan Airport identified in the Metropolitan Council's Transportation Policy Plan. However, the City is required to include standards for airspace protection in its Comprehensive Plan and local controls.

#### **Sidewalks and Trails**

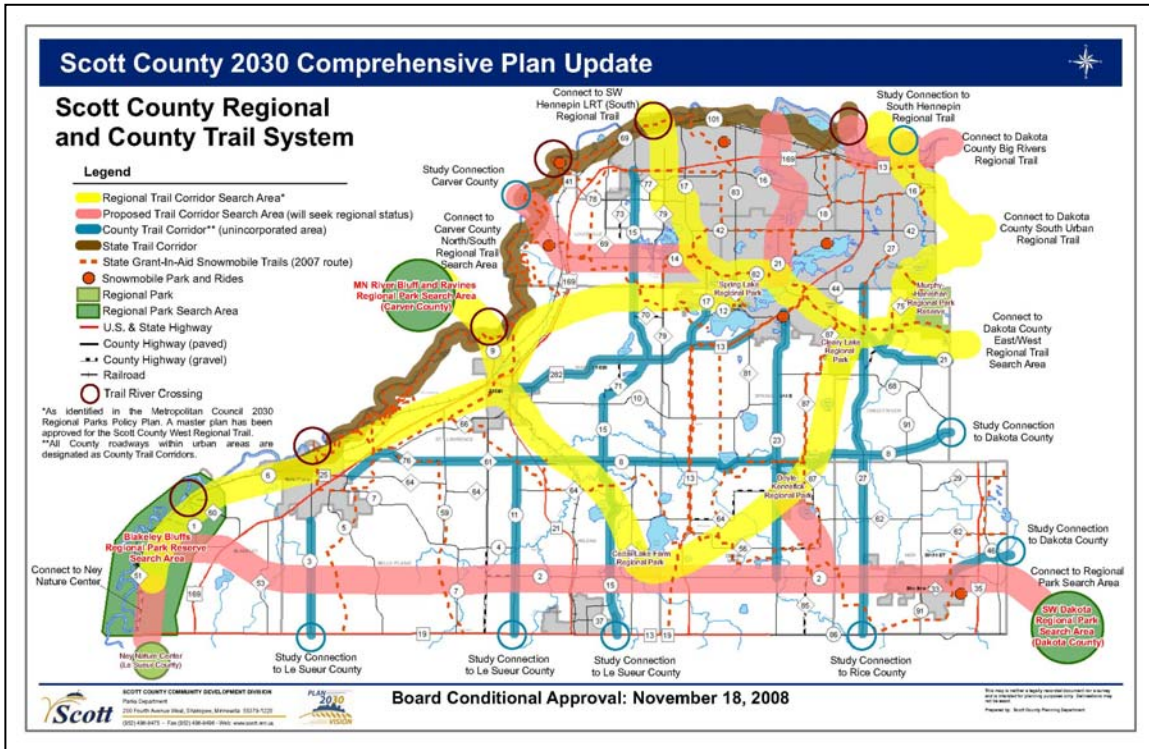
Bicycle and pedestrian circulation is an important component of the transportation system that needs to continue to be developed. Map 8-4 of the Comprehensive Plan illustrates existing trail locations. As the City and employment opportunities within the City grow, the system will develop providing alternatives for residents to travel about without utilizing an automobile. It is the desire of the City to develop alternative modes of transportation to reduce traffic demand.

The Metropolitan Council identifies a regional park search area northwest of Jordan in Carver County along the Minnesota River and associated bluff and ravine system. Scott County's draft 2030 Comprehensive Plan Update includes a Regional and County Trail System illustrated

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<sup>5</sup> Scott County Housing and Redevelopment Authority, Scott County Transit Demand Analysis, July 2003, p. 6.

below. Consistent with the Metropolitan Council's 2030 Regional Parks Policy Plan, a regional trail corridor is envisioned from the future regional park in Carver County to the Cedar Lake Farm Regional Park and from a future Blakely Bluffs Regional Park southwest of Belle Plaine to Spring Lake Regional Park in Prior Lake.



#### IV. Future Transportation System

The transportation system in the Jordan area is in a rural to urban transition in response to the rapid growth experienced in the past 10 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 of the Comprehensive Plan illustrates the planned future land uses within the identified 2030 urban growth area. A supporting future road network has been developed in consideration of long-term growth in the area and is illustrated in Map 7-5 – Recommended Future Roadway Functional Classification. This network was developed in consideration of the long-term land use vision for the area, the draft Scott County 2030 Comprehensive Plan Update, and the various plans outlined in Section III–D.

A suitable arterial-collector system to accommodate future development and traffic patterns is necessary in the growing community of Jordan. The existing county and state highways have historically provided much of the local circulation and connectivity; however these roadways will be less capable of meeting both the future local and regional travel demands. A City collector system consisting of Major and Minor Collector roadways is recommended to provide acceptable local traffic 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.

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. If not already completed, additional studies will be necessary to determine specific roadway alignments and intersection spacing. New or re-designated roadways necessary to support the land uses identified in Figure 6-2 and future traffic growth are mentioned below. Corridor study areas A-C are depicted as such, because specific conceptual corridor alignments are unknown at this time. The following describes the long-term roadway network vision recommended for new roadway corridors within and around the Jordan area and corridor locations are labeled on Map 7-6 – Recommended Future Corridor Study Areas.

### **Minor Arterial Corridors**

*Corridor A: CSAH 15 Realignment.* As identified in Section II-A, Scott County has identified the need to complete a study to provide a continuous north-south corridor from Shakopee to New Prague along the CSAH 15 alignment.

*Corridor B: New Minor Arterial East of TH 21.* This future study would evaluate the potential for a new north-south Minor Arterial corridor between CSAH 8 and 173<sup>rd</sup> Street. This future corridor would provide an alternative route to TH 21 through downtown Jordan with improved mobility.

*Corridor C: 185th Street Overpass.* The intent of this corridor is to provide connectivity between CSAH 9 and TH 282, and is proposed to include an overpass of TH 169. This route would improve mobility between Jordan and western Scott County to the CSAH 9 river crossing into Carver County and TH 212. This route would accommodate through traffic and residences north and east of downtown Jordan desiring to access commercial and industrial land uses north of TH 169 or the river crossing, while avoiding congestion on TH 282 and TH 169.

*Corridor 6: CR 64 Realignment:* Upon the completion of two missing segments totaling approximately 1 ¼ miles, this corridor will provide east-west continuity between TH 169 and CSAH 15.

*Corridor 7: CR 66 Realignment.* Upon completion of a missing segment between CSAH 10 and TH 21, this roadway will provide connectivity between residential areas on the east side of Jordan to commercially guided land at the future CSAH 59/TH 169 interchange. A significant portion of Jordan's future residential growth will occur in the vicinity of this roadway, and CR 66 will play a critical role in keeping local traffic off TH 169. This roadway will also provide an alternative to TH 282 through downtown Jordan.

### **East-West Major Collector Roadways**

*Corridor 1: 173rd Street Extension.* As outlined in Sections III-D, this roadway's at-grade access with TH 169 is planned to be improved to an interchange some time in the future. The extension is planned to connect to 170th Street to the east, over to CR 70, and eventually to CSAH 12 in Prior Lake.

*Corridor 2: Delaware Avenue Extension to 185<sup>th</sup> Street.* This roadway is proposed to provide connectivity between CSAH 9 west and south to the future interchange at TH 169 and Delaware Avenue/CSAH 59. This roadway will provide travel originating north of the Minnesota River on Carver County CSAH 45/Scott County CSAH 9 to access the commercial area at the TH 169/CSAH 59 interchange.

*Corridors 3, 4, and 5: Hillside Drive Extension (4), 210th Street Extension from TH 21 to Bessie Drive (5), and Golfview Drive Extension to CR 61/218th Street Intersection (6).* These segments are proposed to provide local circulation and connectivity without reliance on CR 66 and CSAH 8.



*Corridors 8, 9, and 10: 195 Street Alignment East of Naylor Avenue (8), 205th Street Corridor East of Sawmill Road (9), and 210th Street Corridor East of Naylor Avenue (10).* Upon future urban development outside of the growth boundary, these roadways will play an important role in conveying local traffic to business concentrations on the western side of the City by means of CR 66 and CSAH 8. These connections will also help facilitate local traffic to CSAH 15.

#### **North-South Major Collector Roadways**

*Corridor 11: Corridor between CSAH 59 and CR 61 with Future Overpass of TH 169.* This roadway will establish local connectivity between future residential and commercial areas on both sides of TH 169 by means of an overpass, without reliance on the Minor Arterial roadways of CSAH 9 and CSAH 59. This Plan illustrates a potential overpass across TH 169 that would be located approximately ½ mile northeast of CSAH 59 avoiding the large wetland complex south of TH 169.

*Corridors 12 and 13: Beaumont Avenue Extension South between 190th and 195th Streets (12) and North/South Roadway between 190th and 195th Streets along Aberdeen Avenue Alignment (13).* These roadways will provide local connectivity to the commercial and industrial land uses in the area.

*Corridor 14: Creek Lane Underpass.* This segment provides continuity between 190<sup>th</sup> Street and TH 282 and will serve as the primary local access to commercial and industrial areas located at TH 169/TH 282/CSAH 9. This route will provide efficient travel for traffic desiring to get to downtown Jordan or the Junior and Senior High Schools by means of Creek Lane and Sunset Drive.

*Corridors 15, 16 and 17: Naylor Avenue Extension North to TH 282 (15), Continuous Forest Avenue between 195th and 205th Street (16), and Continuous Xanadu Avenue between Akers Lane and CSAH 10 (17).* Upon future urban development outside of the growth boundary, these roadways will play an important role in conveying local traffic between residential neighborhoods on the east side of the City and to the Minor Arterial roadways of TH 282 and CSAH 8, as well as other Major Collector roadways.

#### **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 through trips; 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.

The only Minor Collector roadways illustrated on Map 7-5 generally run parallel to TH 21 south of downtown. These roadways are illustrative only and should follow the guidelines outlined above. Additional future Minor Collector roadway locations should be identified at the concept stage of each development proposal.

### **Intersection Sight Distance Analysis**

Existing and proposed intersections on existing Major Collector and Minor Arterial roadways were field reviewed to assess the sight distance present along the existing roadway. Intersection sight distance was reviewed based on methodologies outlined in Chapter 5 of the Mn/DOT Road Design Manual. Map 7-7 – Intersection Sight Distance Evaluation Areas summarizes the findings of these field evaluations.

Several existing and proposed intersection locations appear to have inadequate intersection sight distances. Sight lines at these locations are 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.

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

Traffic volumes were developed for two land use scenarios. One is consistent with the households, population, and employment identified in the City's Metropolitan System Statement. The second scenario envisions limited additional growth by 2030 as outlined in 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 Scott County, and assumed traffic growth rates were also factored.

Map 7-8 – 2030 Land Use Plan Forecasted Average Daily Traffic Volumes identifies the average annual daily traffic volumes forecasted for Minor and Major Collector, Minor Arterial, and Principal Arterial roadways. This information will serve as the basis for the City of Jordan to make decisions on roadway design features to accommodate long-term planned growth. Map 7-9 – 2030 System Statement 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 System Statement. 2030 average daily traffic conditions differ minimally between the scenarios, typically less than 300 trips a day on any roadway. Socioeconomic information by transportation analysis zone for each scenario is displayed in Appendix B.

### **Roadway Safety and Capacity Needs**

The forecasted average annual daily travel demands illustrated on Map 7-8 – 2030 Land Use Plan Average Daily Traffic Volumes 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

The TH 169 Corridor Management Plan recommends transitioning TH 169 to a freeway facility from I-494 to Belle Plaine, including through the City of Jordan. The City supports this corridor vision and will continue to work with Mn/DOT to achieve the vision. A 4-lane freeway facility would provide adequate capacity to accommodate the forecasted volumes. Without the highway being converted to a freeway, TH 169 is anticipated to be congested north of TH 282. It should be noted that recommendations of the Interregional Corridor Studies were not adopted by the Metropolitan Council or incorporated into the 2004 Transportation Policy Plan. There is no major expansion project planned for TH 169 before 2030.

TH 21 is forecasted to be congested between TH 282 and CR 66, and near congested between TH 169 and TH 282 and between CR 66 and CSAH 11. TH 282 is forecasted to be congested between Creek Lane and TH 21, and near congested between TH 21 and CSAH 10 and east of Xanadu Avenue. Between CSAH 10 and Xanadu Avenue, TH 282 is forecasted to be periodically congested.

One of the transportation issues that the City of Jordan will be required to address is increasing volumes on TH 21 and TH 282 as traffic passes through the heart of the downtown area. Current traffic volumes on TH 21 present difficulties for pedestrians crossing this street. Based on land uses and population projections identified in the Comprehensive Plan, forecasted volumes will approach or exceed capacity on segments of these highways.

Forecasted volumes in the downtown area are in a range that may be able to be supported by an urban 3-lane or a 2-lane divided roadway. Expanding TH 21 and TH 282 to 4-lane facilities are not acceptable to the City, due to the loss of on-street parking. This also increases concerns regarding pedestrian safety and accessibility to existing businesses. While it may be more challenging to develop an acceptable solution to capacity problems in the downtown area, TH 21 and TH 282 will also need capacity improvements out of the downtown area.

The development of the future roadway network illustrated in Map 7-5 will provide alternatives to these routes. The City should conduct a parking study to develop a strategy to support downtown activities while allowing for the movement of traffic. As properties in the area are proposed for development or redevelopment the City should acquire additional right-of-way. The City should initiate discussions and partner with Mn/DOT and Scott County to study and implement the appropriate capacity improvements on TH 21 and TH 282. In addition, the City, County, and State should study the merits of a new Minor Arterial corridor east of TH 21 (Corridor B) between CSAH 8 and 173<sup>rd</sup> Street and an overpass at approximately 185<sup>th</sup> Street between CSAH 9 and TH 282 (Corridor C) to provide alternatives to these routes for traffic.

#### County Roadways

Given the City's planned land use, congestion on TH 169, and limitations of the river crossings north of Jordan (e.g. TH 41 west of Shakopee, CSAH 101 in downtown Shakopee, and TH 169 in Shakopee), it is reasonable to anticipate that the traveling public will seek alternative routes to reach their designations. As a result, CSAH 9 is anticipated to carry high volumes of traffic and be congested north of 9<sup>th</sup> Street. South of 9<sup>th</sup> Street the corridor is forecasted to be periodically congested.

CR 66 and CSAH 10 are expected to carry more regional traffic as volumes rise on the arterial roadways, and expansion of these roadways may become necessary. CR 66 is forecasted to be periodically congested through the growth boundary, except between CR 61 and TH 21 where it is forecasted to be near congested. CSAH 10 between TH 282 and Xanadu Avenue and CR 61 between Beaumont Boulevard and the future Major Collector south of CR 66 are forecasted to be periodically congested. The City will work with Scott County to obtain additional right-of-way, as well as evaluate improvement strategies that will become necessary as development occurs.

#### Local Roadways

Congestion will also be experienced on some of Jordan's City streets. Following are the roadway segments forecasted to be near or periodically congested

##### Near Congested

- 190<sup>th</sup> Street from the future Major Collector on the Aberdeen Avenue alignment to CSAH 9
- Valley View Drive from 190<sup>th</sup> Street to Circle Drive
- Creek Lane/Sunset Drive from TH 169 to Hillside Drive
- Hillside Drive from Aberdeen Avenue to Sunset Drive

#### Periodically Congested

- 185th Street from Beaumont Avenue to CSAH 9
- 190th Street from Beaumont Avenue to the future Major Collector on the Aberdeen Avenue alignment
- Creek Lane from Valley View Drive to TH 169
- Hillside Drive from Sunset Drive to CR 66
- Xanadu Avenue from 173rd Street to Akers Lane

Creek Lane/Sunset Drive from TH 169 to Hillside Drive may need to be upgraded to a 3-lane roadway (Typical Section of Major Collector as illustrated on Map 7-2 – Geometric Design Standards for Major Collector Roadways). Hillside Drive from CR 61 east to Sunset Drive may also need to be upgraded to a 3-lane facility.

Valley View Drive from Creek Lane north to Circle Drive should be upgraded as shown on Map 7-2 to a 2-lane roadway with a center median. 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.

Increased traffic and levels of congestion are anticipated near the existing schools along Hillside Drive and Sunset Drive. As traffic volumes increase, it will be necessary to evaluate the Hillside Drive/Aberdeen Avenue and Hillside Drive/Sunset Drive intersections, as well as the school entrances, to maintain appropriate levels of mobility and accommodate safe pedestrian movements.

Several gravel roadway corridors located outside of the City's urban growth boundary are projected to have high traffic volumes. Due to future development's desire to access CSAH 8 in the southeast part of the City, it is anticipated that a portion of Saw Mill Road and Xanadu Avenue will exceed 500 vehicles per day. 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.

It is also anticipated that Valley View Drive and the corridor between TH 169 and CSAH 15 that includes Bluff Drive, 165th Street West, Harlow Avenue, 170th Street West will exceed 500 vehicles per day in 2030. These volume levels are anticipated as a result of traffic occurring outside of the City of Jordan trying to seek alternative routes to reach TH 169 or the CSAH 9 river crossing.

#### **Intersection Study Needs**

Forecasted average annual daily traffic volumes were reviewed to determine where future intersection studies would be needed to determine the appropriate traffic control and lane configurations. Map 7-10 – 2030 Levels of Congestion also illustrates those intersections where the through-stop condition will likely not function under the forecasted volumes. As development occurs or reconstruction is proposed, these intersections need to be evaluated for potential additional needs, such as right-of-way dedication, turn lane construction, and driveway spacing. Appropriate traffic control, such as an all-way stop, a round-about, or a traffic signal also needs to be determined. Traffic control will be considered on a site-by-site basis and will be placed consistent with the warrants identified in the MN MUTCD when funding is available. These warrants include specific thresholds relating to traffic volumes and considerations of safety and pedestrian activity. Stop signs will also be considered to manage speed and other perceived traffic safety problems. The City Engineer will evaluate each request using State Uniform Traffic Warrant Criteria.

### **C. Multimodal**

Scott County's Unified Transit Management Plan, updated in 2008, 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." As a Transit Market Area IV, service options are anticipated to include dial-a-ride, volunteer driver programs, and ride sharing. 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 Major and Minor Collectors listed in Section II-D – Geometric Design Standards and Maps 7-2 and 7-3 includes construction requirements for these off-street opportunities. Additionally, the 2008 update broadened the membership body to include representation from the City of Jordan and other communities in the County, including the Shakopee Mdewakanton Sioux Community, as well as recommendations to evaluate the need for additional park and ride facilities along TH 169.

The forecasted traffic volumes on TH 282 and TH 21 have raised concerns regarding pedestrian safety within Jordan. 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.

The City should also pursue a grade-separated pedestrian crossing of TH 169 at Sand Creek. The existing TH 169 overpass of Sand Creek does not provide adequate vertical clearance for pedestrian passing. The future interchange project at TH 169 and TH 282 or the Creek Lane underpass may present an opportunity to provide this crossing.

Traffic volumes and levels are congestion are going to result in decreased mobility through and near the City, especially on TH 169. To assist in managing travel demand on the corridor, the City should consider a park-and-ride location with more capacity close to TH 169 to help foster new car/van pools. The City should continue to work with Scott County Transit to determine long term needs for additional service and opportunities to integrate with services provided in other cities.

As noted in the discussion of the existing transportation system, the City of Jordan is required to include standards for airspace protection in its Comprehensive Plan and local controls. Federal Regulation Title 14, Part 77 establishes standards and notification requirements for objects affecting navigable airspace. This notification serves as the basis for evaluating the effect of the construction or alteration on operating procedures, determining the potential hazardous effect of the proposed construction on air navigation, identifying mitigation measures to enhance safe air navigation, and charting of new objects. Notification allows the Federal Aviation Administration (FAA) to identify potential aeronautical hazards in advance, thus preventing or minimizing the adverse impacts to the safe and efficient use of navigable airspace.

Title 14, Part 77.13 requires any person/organization who intends to sponsor any of the following construction or alterations to notify the Administrator of the FAA when:

- Any construction or alteration exceeding 200 feet above ground level;
- Any construction or alteration:
  - Within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 feet
  - Within 10,000 feet of a public use or military airport which exceeds 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
  - Within 5,000 feet of a public use heliport which exceeds a 25:1 surface;
- Any highway, railroad or other traverse way whose prescribed adjusted height would exceed that above noted standards;

- When requested by FAA; and,
- Any construction or alteration located on a public use airport or heliport regardless of height or location.

Persons/organizations intending to sponsor construction/alterations which require notification to the FAA under Title 14, Part 77.13 shall notify the FAA using FAA form 7460–1 as may be amended.

The City's Zoning Ordinance should be amended to require persons/organizations intending to sponsor construction/alterations which require notification to the FAA under Title 14, Part 77.13 to notify the FAA using FAA form 7460–1 as may be amended.

The City of Jordan's Zoning Ordinance was updated in April of 2009 to include aviation requirements. The new language 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/DOT Aeronautics and Federal Aviation Administration of the proposal at least 30 days prior to the City's Council's consideration of the request.

## **V. Goals & Implementation**

The following goals and strategies outline the City of Jordan'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 planned 2030 growth.

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. 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.
4. 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.
5. Regional Traffic Management – Work on a local, state, and regional level to reduce traffic congestion and safety concerns on transportation corridors.
6. TH 169 – Improve connections to TH 169 by working with Mn/DOT, Scott County, and other agencies to plan for and construct interchanges at TH 282/CSAH 9 and CSAH 59/Delaware Avenue in the future. Also work together to evaluate possible alternatives to improve transportation issues on TH 169 for the benefit of area residents and businesses, including

participation in a future study to assess supportive transportation facilities (frontage/backage roads), future commercial/industrial uses, and uniform design guidelines.

7. Regional (South Metro) Transit – Recognizing the warrants may occur in the future, encourage the continued operation and future expansion of the regional bus systems as a method of transportation between regional rural communities and to connect with the metro core.
8. 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 4.1 – Recommended Future Roadway Functional Classification.
9. 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.
10. 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.
11. Transportation Improvement & Expansion – Improve and expand the existing transportation system as necessary to meet current and future transportation needs.
12. 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.
13. 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 TH 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. The City will work with the Metropolitan Council, or an opt out provider, to determine future transit services consistent with the City’s transit market area and its associated service standards and strategies.
14. 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.
15. TH 21 & TH 282 Future Studies – Partner with Mn/DOT and Scott County to study alternatives to TH 21 and TH 282 to address anticipated capacity issues and pedestrian safety.
16. Arterial Roadway Crossings – The City should promote safe pedestrian crossings of arterial roadways.

17. CSAH 15 Completion – Encourage Scott County to construct a continuous CSAH 15 route, which will provide an alternate route to TH 21 for traffic traveling north/south through Scott County.
18. 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.
19. 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.
20. Downtown Parking Study – Conduct a parking study to develop a strategy to support downtown activities while allowing for the movement of traffic.
21. Zoning and Subdivision Ordinance Update – Update the Zoning and Subdivision Ordinances consistent with the Transportation Plan.
22. Right-of-Way Dedication – Require right-of-way dedication along state, county, and local roads to meet future capacity needs.
23. Development Driven Improvements – Work with developers to construct needed improvements prior to development.
24. Non-Development Driven Improvements – Non-development driven improvements should be prioritized and programmed in the Capital Improvement Program.
25. 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.
26. Assessment Policy – Develop an assessment policy for Major Collector and Minor Arterial roadways to establish expectations and ensure consistent application.
27. Developer Agreements – Utilize developer agreements as a tool to ensure improvements are constructed as agreed upon in the platting or development process.
28. 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.
29. 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.
30. Trail System along County Roadways – Support the County’s trail system policies of developing a system to serve countywide healthy/active living needs (i.e., access to County parks, activity centers, schools), and transportation needs that provide connections between municipalities and to adjacent counties by
  - Including trails as part of the Transportation Improvement Program
  - Coordinating development of trails with counties, cities, townships, and Three Rivers Park District when opportunities arise



- Including paved shoulders or separated trails as a regular component of highway improvements on both sides of the highway where possible in the urban area
- Including separated trail facility phasing considerations (additional right-of-way, grading) on County identified future separated trail corridors where current needs do not warrant a full facility with a project on the trail corridor
- Supporting the provision of pedestrian and bicycle facilities that are consistent with the safe and convenient circulation/recreational needs of pedestrians and bicyclists
- When rail corridors become available through abandonment, pursue options of alternate uses including trails and other forms of transit or recreation uses

## **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 and developers to remove and/or relocate existing driveways 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. Review developments for the accommodation of transit opportunities as part of the development review process.
6. Require turn and bypass lanes on non-local roads impacted by new development, including those that are not immediately adjacent.
7. 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.
8. 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.
9. Require the equitable participation in the construction of collector and arterial roads.
10. Review probable neighborhood traffic patterns, areas where excessive speed is possible, and the potential for pedestrian conflicts.
11. 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.

12. 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.
13. Require traffic impact studies, including the analysis of intersections to determine the need for and contribution to intersection improvements.

### **C. Improvements**

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, it is necessary to 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 Jordan 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 10 to TH 21 at Sawmill Road. It has been agreed that Scott County will fund \$25,000 and the City will fund \$25,000.

It is recommended that the City of Jordan, together with Mn/DOT and Scott County, continue to work together to fund an interchange at the TH 169/TH 282 intersection. 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 Jordan initiate capacity and intersection control needs studies for the intersections of Hillside Drive/Aberdeen Avenue, Hillside Drive/Sunset Drive, and Hillside Drive/CR 66 as identified in Figure 7-10. These studies would 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.

#### **Mid to Long-Term Improvements (2014 – 2030)**

As traffic volumes approach 12,000 vehicles a day on TH 282 and TH 21, it is recommended that the City of Jordan and Mn/DOT study roadway capacity improvement options for the corridors. A planning level cost estimate in 2008 dollars is estimated at \$50,000 per corridor, depending on the limits and magnitude of the studies. Funding for the study is anticipated to be provided by the City and State.

It is recommended that the City of Jordan, together with Scott County and Mn/DOT work together to initiate corridor preservation studies to determine alternative alignment options for further planning, preservation, and environmental analysis for TH 282 and TH 21. A planning level cost estimate in 2008 dollars for a study of this magnitude may cost in the range of \$100,000 to \$125,000 per study, with potential funding partnerships between developers, City and County.

As development approaches gravel roadways adjacent to the urban growth boundary, the City of Jordan should work with the adjacent townships to measure traffic volumes and develop a strategy for upgrading 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.

#### **D. Potential Transportation Funding Sources**

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

##### **Federal Funding**

Jordan may apply for federal funds for highways through the Surface Transportation Program of the Federal Highway Trust Fund, through Mn/DOT's Area 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.

##### **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. Jordan has received state aid funding since 2006.

##### **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.

##### **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.

##### **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 Jordan 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 exceeded near the study area on TH 169, TH 21, TH 282, and CSAH 9. CSAH 9 provides an important connection north to the new TH 212 freeway. 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 CSAH 9 Bridge, and also on TH 169, north of TH 282. This would be consistent with the current 2030 congestion seen in the forecasts by Met Council, which shows a volume to capacity ratio over 1.00 on TH 169 north of the City of Jordan. The congestion at the CSAH 9 Bridge would be relieved through expansion of the Bridge 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 to 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”.