

August 2007

# CSAH 28 *(Yankee Doodle Road)* Corridor Study

*Dakota County*

**SRF** CONSULTING GROUP, INC.  
ENGINEERS | PLANNERS | DESIGNERS



**Dakota County CSAH 28  
(Yankee Doodle Road)  
Project Summary Report**

August 20, 2007

Submitted by:

SRF CONSULTING GROUP, INC.

SRF No. 0065772

# TABLE OF CONTENTS

<b>1.0</b>	<b>Introduction and Background .....</b>	<b>1</b>
<b>2.0</b>	<b>Corridor Issues and Needs .....</b>	<b>5</b>
2.1	Land Use .....	5
2.2	Modal Users .....	5
2.3	Access .....	6
2.4	Safety .....	8
2.5	Other Corridor Issues .....	12
2.6	Public Concerns .....	13
<b>3.0</b>	<b>Existing and No-build Traffic Analysis.....</b>	<b>14</b>
3.1	Existing Traffic Volumes .....	14
3.2	Existing Speeds .....	14
3.3	Existing Intersection Operations.....	17
3.4	Forecast Traffic Volumes .....	19
3.5	No Build Conditions .....	23
3.6	Summary .....	25
<b>4.0</b>	<b>Alternatives Analysis .....</b>	<b>26</b>
4.1	West Segment Alternatives.....	27
4.2	Middle Segment Alternatives .....	35
4.3	Public Response to Retained Alternatives .....	45
4.4	Alternatives Evaluation .....	46
4.5	West Segment Evaluation Results .....	47
4.6	Middle Segment Evaluation Results.....	50
4.7	East Segment Evaluation Results .....	52
4.8	Preferred Alternatives (as presented at the third open house) .....	54
4.9	Public Response to Preferred Alternatives .....	55
4.10	Alternative Refinements .....	56
<b>5.0</b>	<b>Study Findings and Recommendations.....</b>	<b>58</b>
5.1	West Segment Recommendation .....	58
5.2	Middle Segment Recommended Alternative.....	61
5.3	East Segment Recommended Alternative .....	63
<b>6.0</b>	<b>Implementation .....</b>	<b>66</b>
<b>7.0</b>	<b>Appendices.....</b>	<b>68</b>

## LIST OF FIGURES

Figure 1 – Study Area .....	2
Figure 2 – Existing Spacing .....	6
Figure 3 – Access versus Mobility .....	7
Figure 4 – Crash Map .....	9
Figure 5 – Daily Traffic Volumes .....	15
Figure 6 – Peak Hour Turning Movement Volumes .....	16
Figure 7 – Future Roadway Assumptions .....	21
Figure 8 – Future Daily Traffic Volumes .....	22
Figure 9 – Forecast Turning Movement Volumes .....	24
Figure 10 – West Segment Alternatives .....	31
Figure 11 – West Segment Turning Movement Comparison .....	34
Figure 12 – Middle Segment Alternatives .....	39
Figure 13 – East Segment Alternatives .....	43
Figure 14 – West Segment Recommendation .....	59
Figure 15 – Middle Segment Recommendation .....	62
Figure 16 – East Segment Recommendation .....	65

## LIST OF TABLES

Table 1 – Crash Table .....	10
Table 2 – Existing P.M. Peak Hour Speeds (mph) .....	14
Table 3 – Daily Traffic Volumes .....	20
Table 4 – West Segment Evaluation Matrix .....	48
Table 5 – Middle Segment Evaluation Matrix .....	51
Table 6 – East Segment Evaluation Matrix .....	53

H:\Projects\5772\Reports\June Final Report\Text\Report\_7-25-2007\_v3.doc

## 1.0 INTRODUCTION AND BACKGROUND

Dakota County State Highway 28 (CSAH 28) extends from Trunk Highway 13 (TH 13) to Trunk Highway 55 (TH 55) in the Cities of Eagan and Inver Grove Heights. Also known as Yankee Doodle Road, CSAH 28 is a major east-west roadway and is classified as a Minor Arterial in both the Dakota County and City of Eagan Transportation Plans. Figure 1 illustrates the location of CSAH 28.

- This study is focused on the portion of CSAH 28 between I-35E and TH 149 (Dodd Road). These limits are also shown in Figure 1.

### 1.1 Plan Purpose

The purpose of this study is to:

- Identify existing safety, mobility, and traffic operations problems.
- Anticipate potential future safety and traffic operations problems.
- Propose geometric, traffic control, and access modifications that will mitigate existing and potential safety and operations issues while striking an appropriate balance between local access and system mobility.

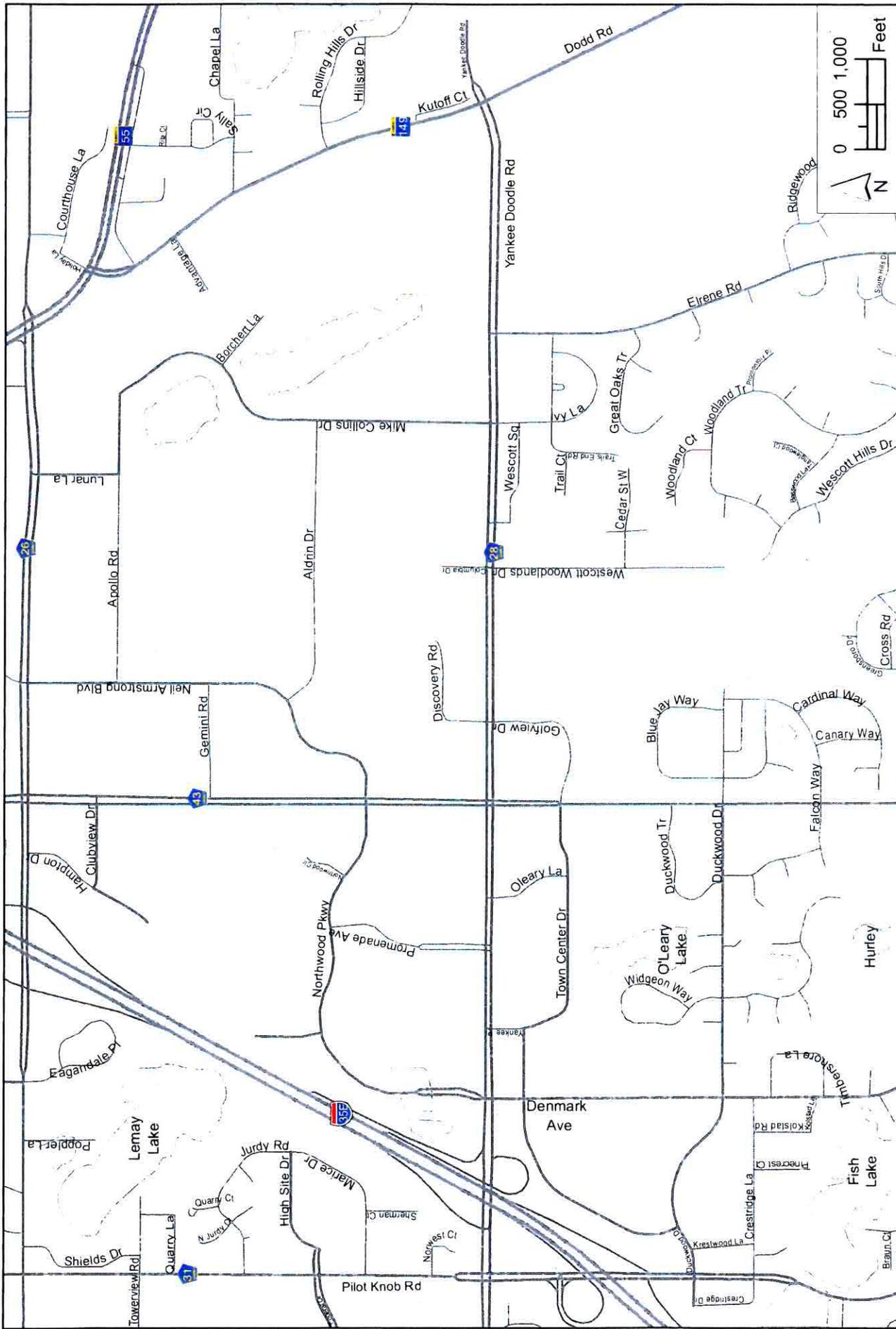
As a minor arterial, CSAH 28 provides important east-west mobility through the City of Eagan. Both Dakota County and the City of Eagan recognize that they must work together to maintain safety and mobility in the CSAH 28 corridor as the Eagan area continues to grow and develop. To accomplish this goal, performance objectives were established for the study against which proposed improvements would be evaluated.

At a minimum, modifications to CSAH 28 must accomplish the following:

- 1) Maintain the ability of roadway users to move efficiently through the area.
- 2) Reduce the number and severity of crashes.
- 3) Continue to provide reasonable access to adjacent properties.

Alternatives will be further evaluated on:

- The extent to which an integrated interconnected roadway network is established.
- How broadly benefits are distributed to the general population and area businesses.



**Study Area**  
 CSAH 28 (Yankee Doodle Road) Corridor Study  
 Dakota County



**Figure 1**

In addition, the preferred alternative will achieve these objectives in the most cost effective manner possible while limiting the negative impact on the surrounding physical environment, local businesses and area residents.

## 1.2 Study Process

The first step in the study process was to identify existing conditions including:

- land use
- traffic volumes
- speeds
- intersection operations
- congestion
- access points
- accident frequency and severity
- truck, transit, and pedestrian traffic

Except for traffic volumes, existing conditions, including concerns raised by the general public, are outlined in Section 2. Existing traffic volumes are outlined in Section 3.

In addition to existing conditions, the study identified and evaluated future conditions. Traffic forecasts were prepared for the year 2030. Based on these forecasts, potential congestion, mobility and intersection operations were assessed. Existing and potential traffic and safety issues are identified in Section 3.

For purposes of alternative evaluation, the corridor was divided into three segments as follows:

- 1) West Segment—From Denmark Avenue to Lexington Avenue
- 2) Middle Segment—From Lexington Avenue to Mike Collins Drive
- 3) East Segment—From Mike Collins Drive to TH 149

With the performance objectives outlined above as a guide, several alternatives in each segment were developed. The most promising of these were studied in more detail and evaluated against criteria that were designed to quantify the performance objectives. This process, which is outlined in Section 4, resulted in a preferred alternative for each segment.

Study findings and recommendations are outlined in Section 5.

An Implementation Plan is outlined in Section 6.

### 1.3 Public Involvement Plan

A public involvement plan was developed for this study and is included in this report as Appendix A. The Public Involvement Plan included several elements:

- Information concerning the study was made available on the Dakota County website and updated as new information became available. When complete, the preliminary plan and study report will also be posted on the website.
- Three public open houses:
  - August 12, 2006 at Eagan City Hall
  - October 12, 2006 at Skyline Displays
  - December 7, 2006 at Skyline Displays
- Three meetings with the Eagan City Council:
  - A Council work session on November 21, 2006 to present the alternatives for each segment
  - A City Council meeting on December 19, 2006 to present the staff recommendation
  - A City Council meeting on March 20, 2007 to present the revised staff recommendation and seek concurrence from the Council
- Three Dakota County Physical Development Committee (PDC) meetings held on December 12, 2006, March 13, 2007 and August 21, 2007.
- A Dakota County Board meeting to adopt the study will occur after the third PDC meeting.
- In addition to the above, several meetings were held with representatives of affected businesses on the corridor to workout solutions to specific issues. A list of these meetings is presented in Appendix B.

The first public open house, held on August 12, 2006 at Eagan City Hall, was designed to solicit public input from citizens and business leaders regarding traffic operations on CSAH 28. The second public open house, held on October 12, 2006 at Skyline Displays, presented alternatives for each segment to solicit public input from citizens and business leaders regarding the range of proposed solutions. The third public open house, held on December 7, 2006, presented a preferred alternative for each segment to solicit public input from citizens and business leaders regarding the staff recommended alternative. Completed summaries of each open house can be found in Appendix C.

## 2.0 CORRIDOR ISSUES AND NEEDS

The project management team collected information about the CSAH 28 corridor in an effort to begin understanding existing and potential issues. Collected data includes both technical information and public input. Sections 2.1 through 2.6 discuss issues identified based on technical data, while Section 2.7 lists the issues identified through the public process.

### 2.1 Land Use

In addition to providing for east-west mobility, CSAH 28 also provides access to commercial, industrial and residential properties, both north and south of the roadway. Between Denmark Avenue and Lexington Avenue, the predominant land use is commercial retail. This includes “Big Box” retailers such as Best Buy, Rainbow and Byerly’s, as well as numerous small retailers, fast-food style restaurants and banks. There are also several non-retail commercial uses including a multi-story office building occupied by Blue Cross Blue Shield and high-density residential development, north of CSAH 28 and west of Lexington Avenue.

Between Lexington Avenue and Dodd Road, the land use north of CSAH 28 is predominantly industrial. Many of these businesses are situated here because of the excellent access to the Metropolitan Highway System. The Faithful Shepherd Catholic School is located on the north side of CSAH 28, west of Columbia Drive. Thresher Fields, a large City Park that includes a number of soccer fields is located between Mike Collins Drive and the Canadian Pacific Railroad.

South of CSAH 28 between Lexington and Elrene, the land use is predominantly residential with a mix of high, medium and low-density neighborhoods. Also on the south side of CSAH 28 is the Carriage Hills Golf Course, which is currently not in operation. Future use of this area is under consideration.

Between Elrene and Dodd Road, south of CSAH 28, is the campus of Thomson (West Publishing) and a proposed office/warehouse development that has been given the name Lo-Nidy.

### 2.2 Modal Users

CSAH 28 serves a variety of modal uses, including trucks, transit (bus), bicycles, and pedestrians.

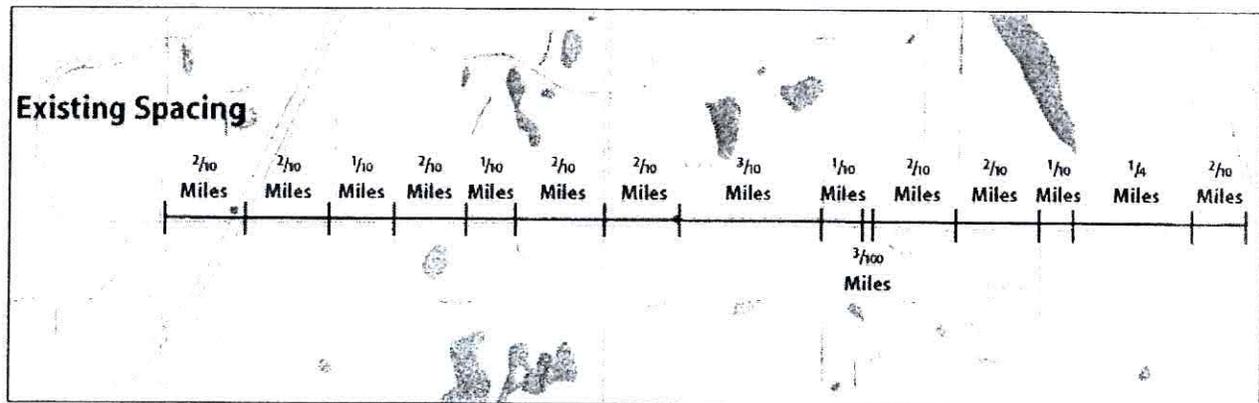
- **Truck Traffic:** CSAH 28 serves truck traffic traveling to and from industrial properties located on the corridor to both I-35E and TH 149 (Dodd Road).
- **Trails:** Multi-use trails for bicyclists and pedestrians are located on both the north and south sides of CSAH 28.

- **Pedestrian:** Safe pedestrian and bicycle access is an important consideration along this retail/commercial and residential corridor. It is also important to provide pedestrian access to bus stops located along the corridor.
- **Transit:** The Minnesota Valley Transit Authority (MVTA) operates several bus routes that travel along the corridor. MVTA also operates a transit center at the CSAH 28/CSAH 31 intersection that includes structured parking, an enclosed passenger waiting area, and several small businesses that cater to the transit commuter market.

### 2.3 Access

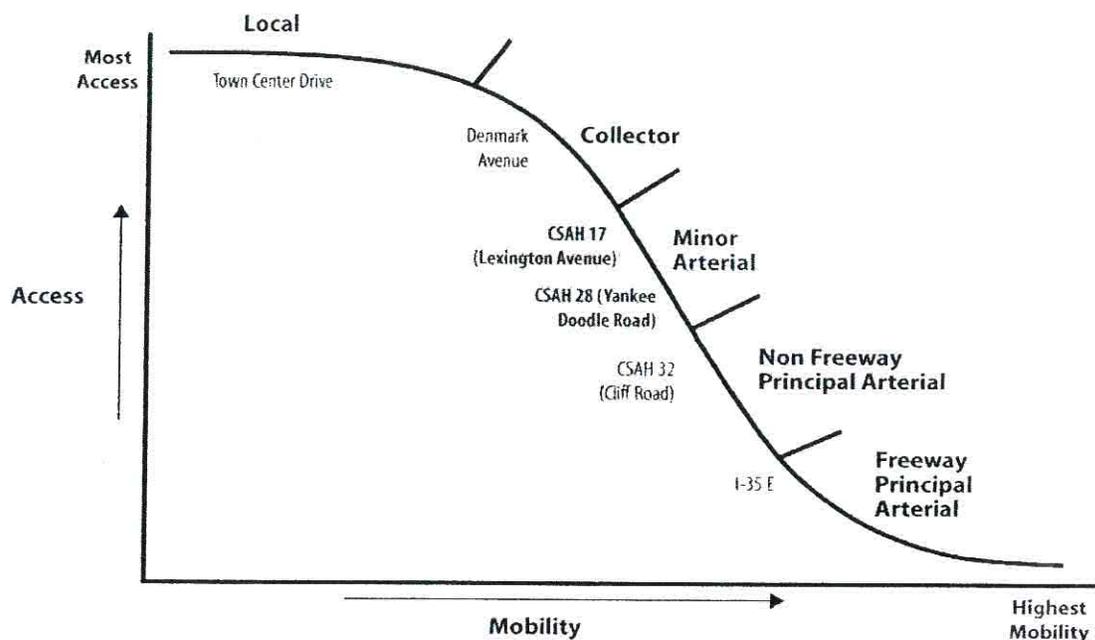
The CSAH 28 corridor presently provides access at 17 points within the 2.5-mile study area. This includes Interstate highway interchange ramps, county roads, local roads and private driveways. The traffic control at these intersections varies from signals to side road stops.

Figure 2 illustrates the location and spacing of existing access.



**Figure 2 – Existing Spacing**

Figure 3 illustrates how the balance between providing mobility and providing land access changes as the functional classification changes from low speed local roads to high-speed Principal Arterials. The Metropolitan Council specifies that as a Minor Arterial, CSAH 28 should provide a high level of mobility with a limited amount of local access.



**Figure 3 – Access versus Mobility**

As traffic volumes continue to grow, the frequency of the existing access will become an increasing problem. Studies show that access frequency is directly related to the number of crashes occurring in corridors. In addition, average speeds will drop, reducing the roadway's effectiveness in providing cross-town mobility.

To support the roadway's purpose, Dakota County has established access spacing guidelines for Dakota County highways. For divided highways that are not Principal Arterials, the access spacing guidelines are based upon the projected 2025 ADT. Roadways with a projected ADT greater than 35,000 have more restrictive guidelines.

For all divided Dakota County Roadways;

- Private residential or commercial access is not desirable.
- Median openings may be removed or modified to address safety and operational issues.

For Dakota County roadways with a projected ADT greater than 35,000, which includes the portion of CSAH 28 from CSAH 31 to Elrene Road;

- Full access intersections to CSAH 28 should be spaced 1/2 mile apart.
- Partial access with median restrictions considered at the 1/4-mile locations.

For Dakota County roadways with a projected ADT between 15,000 and 35,000, which includes the portion of CSAH 28 from Elrene Road to TH 149:

- Full access intersections to CSAH 28 should be spaced 1/4 mile apart.
- Right-in/right-out access may occur at 1/8-mile intervals.

These access spacing guidelines were taken into consideration in the traffic analysis and the development of alternatives. However, these are guidelines and not requirements. In some situations, additional access is proposed to address specific operational issues.

## **2.4 Safety**

Crash data for the study area was collected and analyzed. Figure 4 illustrates the location of crashes in the study area from 2003 to 2005. During this time period, 156 crashes occurred along the CSAH 28 Corridor.

### **Crash Rates**

Detailed crash rates for intersections in the corridor are presented in Table 1.

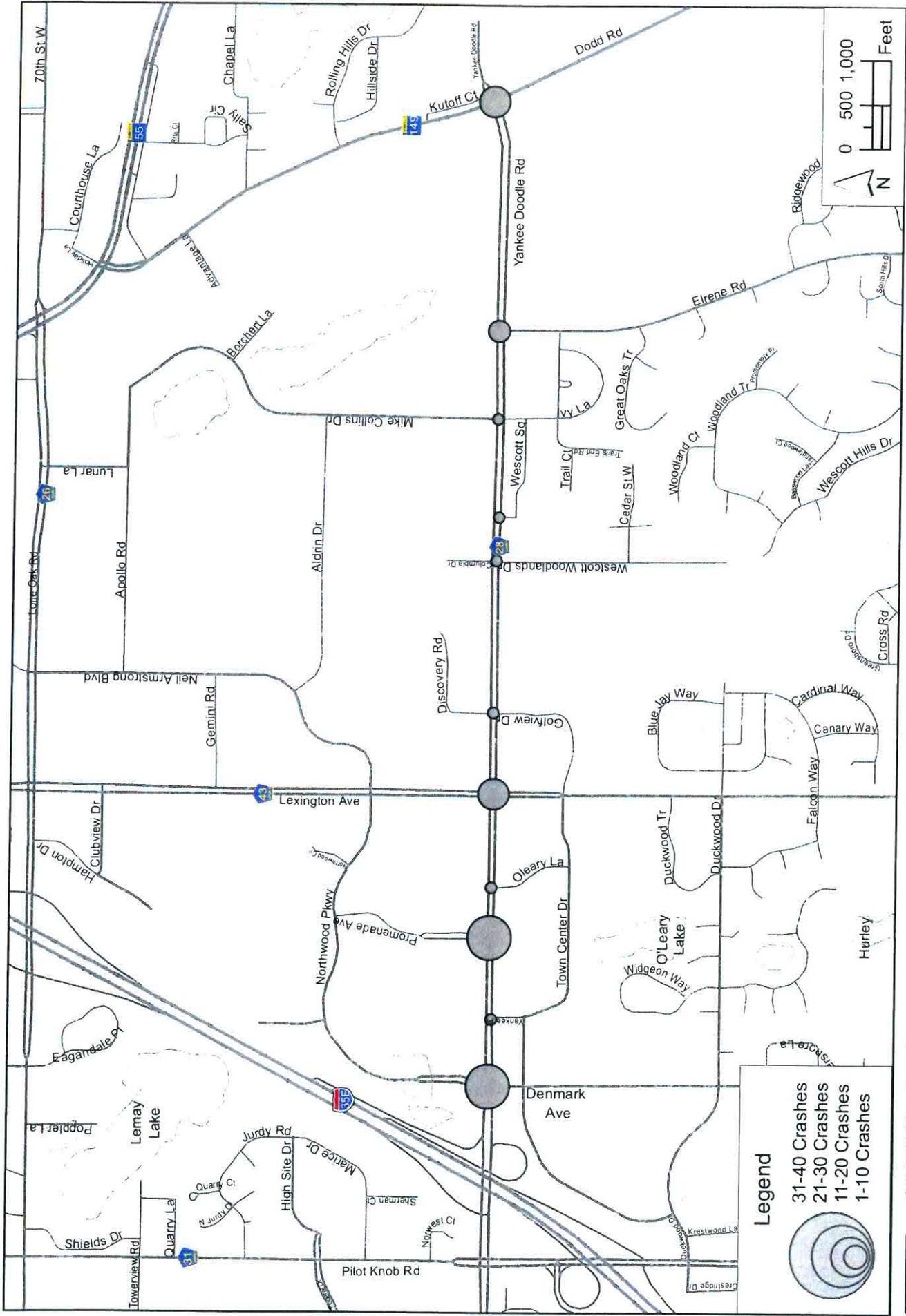
A high crash rate at an unsignalized intersection indicates that traffic volumes on the through street are high enough and random enough to limit the number and duration of gaps in the traffic flow. As wait times increase, motorists entering from the side street are more likely to take chances and enter the through street at the wrong moment. At signalized intersections, high crash rates indicate the development of congestion and declining level of service. As the possibility of waiting through more than one signal cycle increases, following distance decreases and rear end crashes increase.

To better understand and interpret crash data for CSAH 28, average crash rates for both signalized and unsignalized intersections were calculated from Mn/DOT crash data for the two-year period from 2000 to 2002. Based on the Mn/DOT crash data, the average crash rate for a signalized intersection was calculated to be 0.8 crashes per million entering vehicles (MV), while the average crash rate for an unsignalized intersection was calculated at 0.3 per MV.

Analysis of the data and field observations reveal the following specific concerns:

### **General Corridor Safety Issues**

- Many of the cross-street left and through movements at the unsignalized intersections currently operate poorly or will in the near future during the evening peak hour.



**CSAH 28 - Crashes 2003-2005**

CSAH 28 (Yankee Doodle Road) Corridor Study

Dakota County



**Figure 4**

J:\Map95772\mxd\Crashes.mxd

**Table 1 – Crash Table**

Intersection	Total number of Crashes (CSAH 28 and Side Streets)	Severity of Crashes			PD**	Estimated Entering Daily Volume (Year 2006)	Crash Rate <sup>(***)</sup> (per MV)	Severity Rate <sup>(****)</sup> (per MV)
		PI**	K**					
Denmark Ave*	37	28	9	0	47,000	0.719	1.244	
Yankee PI	5	4	1	0	27,700	0.165	0.264	
Promenade Ave	33	23	10	0	30,700	<b>0.982</b>	1.874	
O'Leary Ln	10	5	5	0	26,700	<b>0.342</b>	0.855	
Lexington Ave (CSAH 43)*	30	21	9	0	39,500	0.694	1.318	
Discovery/Golfview Dr	2	1	1	0	21,200	0.086	0.215	
Wescott Hills/Columbia Dr	3	2	1	0	19,000	0.144	0.288	
Wescott Square	1	1	0	0	18,200	0.050	0.050	
Mike Collins Dr	3	3	0	0	18,400	0.149	0.149	
Elrene Rd	11	5	6	0	18,500	<b>0.543</b>	1.432	
TH 149 (Dodd Rd)*	21	16	4	1	29,700	0.646	1.291	
<b>Total</b>	<b>156</b>	<b>109</b>	<b>46</b>	<b>1</b>				
<b>Segment</b>								
Btwn Elrene and TH 149	3	2	1	0	13,200	1.330	2.661	

\*Intersection controlled by traffic signal

\*\*PD = Property Damage, PI = Personal Injury, K = Fatality

\*\*\* Crash rate is crashes per million entering vehicles. Highlighted crash rates indicate crash rate is higher than average calculated from Mn/DOT crash data (2000-2002). The average crash rate for side street stops is 0.3 and 0.8 for traffic signal.

\*\*\*\* Severity rate is calculated using a weighted methodology for severity

CSAH 28 By Segment	Estimated Daily Volume (Year 2006)	Crash Rate <sup>(***)</sup> (per MVM)	Severity Rate <sup>(****)</sup> (per MVM)	Average Segment Crash Rate
Denmark to Lexington	23,000	<b>4.900</b>	9.099	4.5
Lexington to Mike Collins Dr	17,900	1.257	2.576	4.5
Mike Collins Dr to Dodd Rd	14,300	2.241	5.322	4.5

### **West Segment**

- CSAH 28/Promenade Avenue – Motorists turning left from or onto CSAH 28 at Promenade Avenue experience heavy delays. The crash rate for this intersection is 0.98 per MV, which is substantially higher than the average crash rate for an unsignalized intersection.
- Denmark Avenue/Town Centre Drive – The northbound queues from the CSAH 28/Denmark Avenue intersection spill into this intersection, causing the intersection to operate poorly during the evening peak hour.
- CSAH 28/O’Leary Lane – The crash rate at the intersection of O’Leary Lane and CSAH 28 was calculated at 0.34 per MV, slightly higher than the average crash rate for an unsignalized intersection.

### **Middle Segment**

- CSAH 28/Discovery Road/Golfview Drive – From field observations, eastbound left-turning vehicles periodically spill out of the turn lane during the a.m. peak hour. Vehicles spilling out of the left-turn lane indicate that a potential safety problem could develop in the future.

### **East Segment**

- CSAH 28/Dodd Road – Heavy delays and queues are currently associated with the southbound through and northbound left-turn movements during the p.m. peak hour. This intersection is currently under design/construction to improve overall operations.
- CSAH 28/Elrene – The crash rate at the intersection of Elrene Road and CSAH 28 was calculated at 0.54 per MV, which is also higher than the average rate for an unsignalized intersection. Currently, there is a large number of left turns from Elrene onto CSAH 28.

### **Crash Severity**

Crash severity was also considered as part of the crash analysis. Of the total crashes along the corridor, only one crash was fatal while 46 crashes resulted in personal injury. A crash severity rate was calculated using a weighted methodology for severity of crash types at different locations. Crash severity rates for intersections along the corridor ranged from a low of 0.05 at the CSAH 28/Wescott Woodlands/Columbia Drive intersection to a high of 1.87 at the CSAH 28/Promenade Avenue intersection, both of which are side road stop intersections.

During the three-year time period, 10 crashes resulting in personal injury and 23 crashes resulting in property damage occurred at Promenade Avenue. High crash severity rates, relative to other intersections along the corridor, also occurred at the signalized intersections of CSAH 28/Denmark Avenue and CSAH 28/Lexington Avenue, and at the unsignalized intersection of CSAH 28/Elrene Road. One fatality occurred at CSAH 28 and Dodd Road.

## 2.5 Other Corridor Issues

In addition to the safety issues identified above, several issues were identified at the beginning of this study. Listed below are some of the problems that the study is intended to address:

- The segment of CSAH 28 from Denmark Avenue to Lexington Avenue has been identified as a candidate for expansion from four-lanes to six-lanes.
- There is currently direct access to private property from CSAH 28 at the Blue Cross Blue Shield building on the south side of CSAH 28 across from the Promenade Avenue intersection.
- There is direct driveway access to private property at the former Super Valu distribution center east of Columbia Drive.
- There are open medians at:
  - Yankee Place
  - Promenade Avenue
  - O'Leary Lane
  - Discovery Road
  - East of Wescott Square, opposite the Super Valu driveway
  - Mike Collins Drive
  - Elrene Road
  - Gopher Resources
- There are several locations on the corridor where turning left on to CSAH 28 from the side street is difficult, particularly during peak periods.

## 2.6 Public Concerns

Concerns raised at the public meeting are listed below:

- Speed limits on CSAH 28 should be enforced.
- The CSAH 28 median should be landscaped.
- There should be more connections for northbound trips.
- It is difficult to make left turns onto CSAH 28 from side streets at unsignalized intersections.
- The corridor should be made more pedestrian friendly/safe.
- Traffic noise is a concern for residential areas.
- Truck traffic is a concern for residential areas.
- Traffic volumes increased after CSAH 28 was extended to TH 149.
- Access to existing businesses and Faithful Shepherd Catholic School is important.
- There should be no additional traffic lights.
- There are too many traffic signals that have left turn only on green arrows (protected left turns).

### 3.0 EXISTING AND NO-BUILD TRAFFIC ANALYSIS

Existing traffic volumes were collected for the corridor in the form of both daily and peak hour turning movement counts. In addition, future traffic volumes for the forecast year 2030 were estimated. Existing volumes were used to analyze existing conditions and future traffic volumes were used to analyze the conditions that would occur if no changes were made, otherwise known as the no-build condition.

#### 3.1 Existing Traffic Volumes

Daily traffic volumes were obtained from data provided by Dakota County. As illustrated in Figure 5, existing daily traffic volumes on CSAH 28 range from 34,646 AADT at the interchange of I-35E to 12,737 near Dodd Road. Traffic count data was collected in July 2006 on CSAH 28 at each intersection from Denmark Avenue to Dodd Road inclusive. This data is presented in Figure 6.

#### 3.2 Existing Speeds

Existing speeds on CSAH 28 were estimated using the traffic count data and the traffic simulation software Synchro (Table 2).

An analysis of travel speeds along the corridor demonstrates that p.m. peak hour travel speeds for the west segment of Yankee Doodle from Denmark Avenue to Lexington Avenue averaged 22 mph for eastbound vehicles and 27 mph for westbound vehicles. These peak hour travel speeds are substantially below the corridor's posted speed of 50 mph.

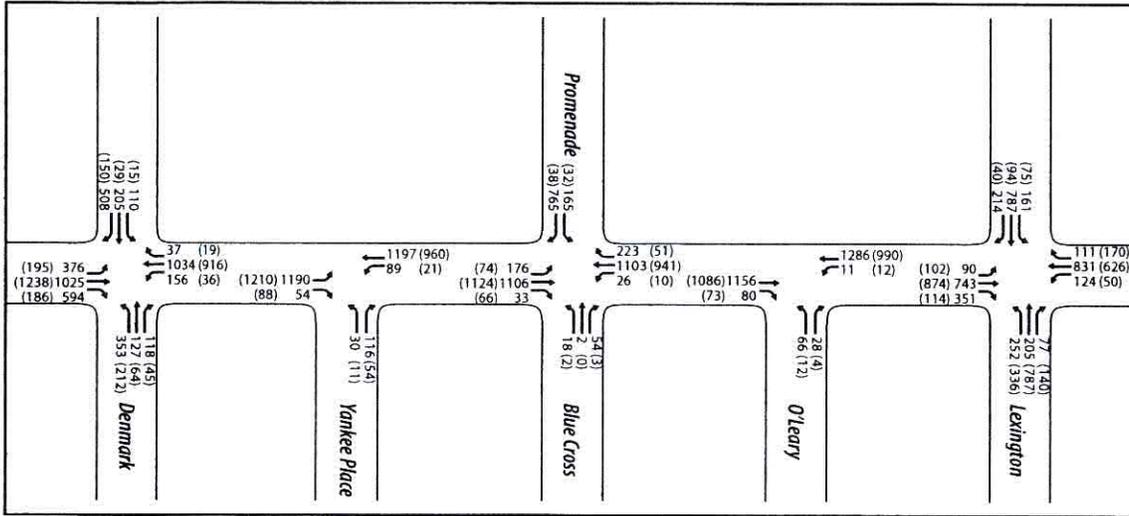
**Table 2 – Existing P.M. Peak Hour Speeds (mph)**

	Eastbound	Westbound
<b>West Segment (Denmark to Lexington)</b>	22 mph	27 mph
<b>Middle Segment (Lexington to Mike Collins)</b>	50 mph	28 mph
<b>East Segment (Mike Collins to Dodd Road)</b>	28 mph	32 mph

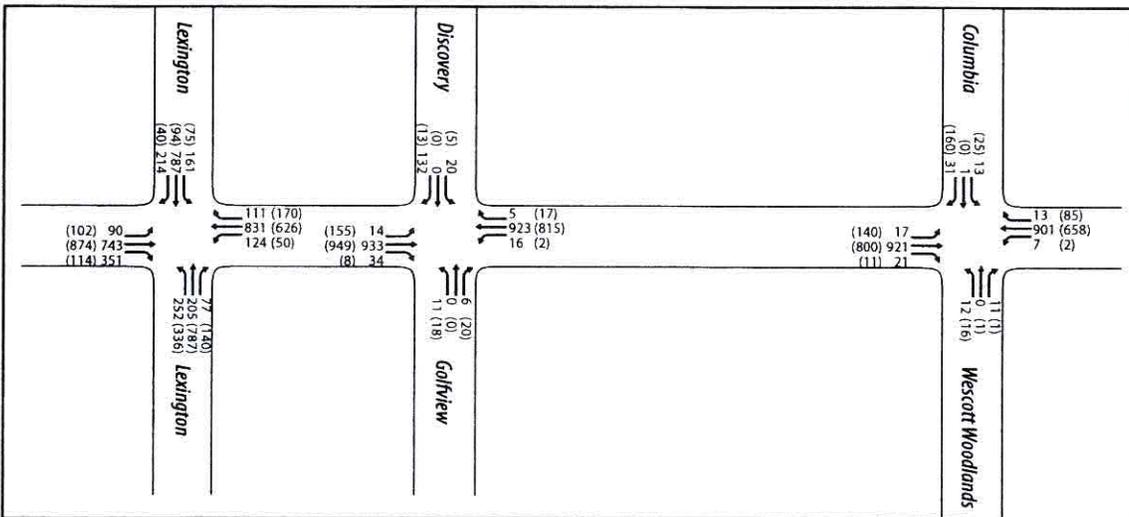
Westbound speeds on CSAH 28 between Lexington Avenue and Mike Collins are significantly lower than eastbound speeds due to the inclusion of Lexington Avenue in westbound speed calculations. Operations at this intersection result in slower speeds for the entire segment. Lexington Avenue is not included in the eastbound speed calculations.



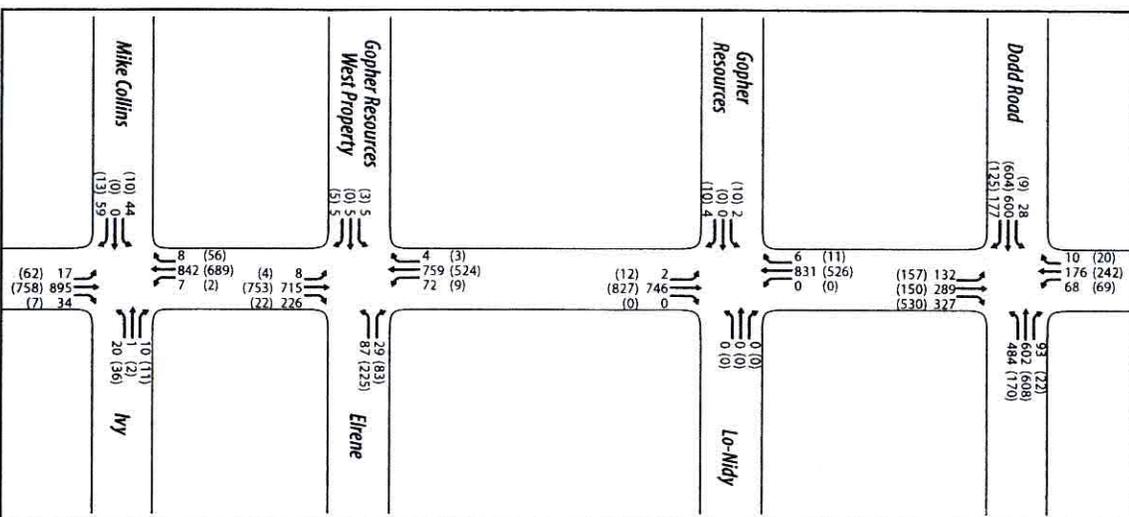
### West Segment



### Middle Segment



### East Segment



### LEGEND

xxx PM Peak  
(xxx) AM Peak



Support\5772\_CSAH 28\Report\Figures\5772\_Report\Figures\VER.qxd



## 2006 PM PEAK HOUR TURNING MOVEMENT VOLUMES

CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County

Figure 6

### 3.3 Existing Intersection Operations

P.M. peak hour and mid-day traffic volume counts were collected in July 2006 on CSAH 28 at each intersection from Denmark Avenue to Dodd Road inclusive. Traffic count data was also collected at the intersection of Denmark Avenue and Town Centre Drive. A traffic operations analysis was completed for each of these intersections for the P.M. peak hour. In addition to the P.M. peak hour analysis, A.M. peak hour data was collected for the Discovery Road and Columbia Drive intersections in order to assess the operations of these intersections when parents drop off students at the Faithful Shepherd School in the morning.

A traffic operations analysis identifies a Level of Service (LOS) that indicates how well an intersection is operating. Intersections are given a ranking from LOS A to LOS F. LOS A indicates the best traffic operation and LOS F indicates an intersection where demand exceeds capacity. Traffic engineers generally consider LOS A through LOS D as acceptable. As part of the traffic operations analysis, an LOS is assigned to the overall intersection and to each movement, (left turn, right turn, through move, etc.). At signalized intersections, the overall LOS is used to evaluate the overall operational efficiency of the intersection. At un-signalized intersections, the operational efficiency of the intersection is judged based on the movement with the worst LOS, otherwise referred to as the critical movement.

From the drivers' viewpoint, an LOS E or LOS F at a signalized intersection means that motorists approaching the intersection from one or more directions consistently have to wait for more than one traffic signal cycle to pass through the intersection during periods of high traffic volumes. At locations with no traffic signal, an LOS E or LOS F assigned to a particular movement means an excessive delay in being able to enter the stream of traffic from a side street or to turn left across traffic.

The operations analysis did reveal existing traffic operations issues along the corridor, including the intersection of CSAH 28 with Denmark Avenue, Promenade Avenue, Discovery Road, Columbia Drive, and Elrene Avenue, as well as the intersection of Denmark Avenue and Town Centre Drive, just south of CSAH 28.

#### **West Segment**

Three intersections along the west segment are currently exhibiting operational problems.

- 1) Denmark/CSAH 28
- 2) Promenade/CSAH 28
- 3) Denmark/Town Centre Drive

The intersection of Denmark Avenue and CSAH 28 is currently operating at LOS D during the p.m. peak hour. However, the volume of traffic making northbound left turns exceeds the capacity of the intersection. The resulting queues back up through the intersection of Denmark Avenue and Town Centre Drive. This is exacerbated by the tendency for traffic to not distribute evenly between the two available left turn lanes. This occurs because:

- Much of the traffic making the northbound to westbound left turn at Denmark/CSAH 28 are going to the on-ramp to northbound I-35E. This makes it more likely that the right most left turn lane will fill before the left most left turn lane.
- Because of the popularity of the right most left turn lane, the traffic queues in the through lanes and the right most left turn lane often block entry in to the left most left turn lane.
- As a result, the left most left turn lane often does not fill before the left turn signal phase appears causing the intersection to handle fewer cars than the intersection is designed for.

Because queues from the Denmark/CSAH 28 intersection extend through the Denmark/Town Centre Drive intersection, this latter intersection is currently operating at LOS E during the p.m. peak hour.

Operational issues are also occurring at the intersection of CSAH 28 and Promenade Avenue. The intersection of CSAH 28 and Promenade Avenue is a side road stop; Promenade Avenue being the side road. Southbound vehicles turning left from Promenade to eastbound CSAH 28 experience long delays of approximately 20 seconds per vehicle. Additionally, adequate gaps are not available for through movements on Promenade Avenue, and left-turn movements from Promenade Avenue to Yankee Doodle Road. This intersection is currently operating at LOS F during the p.m. peak hour.

According to the operations analysis, several intersections in this segment are currently operating at an acceptable level. Overall, the unsignalized intersection of Yankee Place and CSAH 28 is currently operating at an LOS A, with a critical move level of service (define critical move) of LOS D. The unsignalized intersection of O'Leary Lane and CSAH 28 is also currently operating at an overall LOS A and a critical move (define critical move) LOS D. The intersection of Lexington Avenue and CSAH 28, which is signalized, is currently operating at an LOS D.

### **Middle Segment**

Two intersections along the west segment are currently exhibiting operational problems.

- 1) Discovery Road/CSAH 28
- 2) Columbia Drive/CSAH 28

Left turns from either southbound Discovery Road or southbound Columbia Drive onto eastbound CSAH 28 experience long delays during morning and afternoon peak periods, particularly when Faithful Shepherd Catholic School is in session. Traffic primarily makes right turns and then U-turns due to the lack of gaps for the side road to make left turn moves. During the a.m. peak hour, eastbound left turns from CSAH 28 onto Discovery Road or Columbia Drive are also difficult (LOS C), leading to queues on CSAH 28.

Currently the southbound left turn at the unsignalized intersection of Discovery Road and CSAH 28 is operating at LOS E during the p.m. peak hour. The southbound left turn at the unsignalized intersection of Columbia Drive and CSAH 28 is operating at LOS D during the p.m. peak hour. During the a.m. peak hour, the level of service for Discovery Road and Columbia Drive movements is LOS F.

### **East Segment**

Two intersections within the east segment are currently exhibiting operational problems.

- 1) Elrene/CSAH 28
- 2) CSAH 28/Dodd Road

Left turns from northbound Elrene to westbound CSAH 28 also experience long delays during morning and afternoon peak periods. The northbound to westbound movement at this unsignalized intersection is currently operating at LOS E during the p.m. peak hour.

The unsignalized intersection of the Gopher Resources entrance and CSAH 28 is currently operating at an overall LOS A, and a critical move LOS C.

The signalized intersection of CSAH 28 and Dodd Road is currently operating at an LOS F.

## **3.4 Forecast Traffic Volumes**

To identify future traffic operations issues, traffic forecasts were prepared for the year 2030. A complete description of the traffic forecasting methodology used for this study appears in Appendix D. In general, the traffic forecasting model for this study relied on the Metropolitan Council's regional travel demand model. Adjustments were made to reflect the traffic analysis zones (TAZs) and the network in the Dakota County travel demand model. Socio-economic data were based upon the Metropolitan Council's municipal control totals for the years 2030 and distributed to local TAZs with guidance from Dakota County and the City of Eagan.

### Future Land Use Assumptions

In addition to the base socioeconomic assumptions received from the Council, additional development was assumed for the study area as follows:

- Growth in employment from a current level of 6,800 employees to an ultimate level of 17,000 employees was assumed for the Thomson (West) campus.
- Blue Cross Blue Shield is planning an expansion on its property to include 54,000 square feet of office space.
- A development consisting of 14,000 square feet of restaurant and retail space is also planned south of CSAH 28 and west of Blue Cross Blue Shield, adjacent to the Best Buy property.

### Future Roadway Assumptions

For the purpose of this study, it was assumed that the following roadway improvements in or near the study area would be completed by the year 2030:

- Improvements to Dodd Road currently underway would be completed.
- The Northwoods Parkway Bridge over I-35E would be completed (Figure 7), and
- Denmark Avenue will be extended to the north to Lone Oak Road (Figure 7).

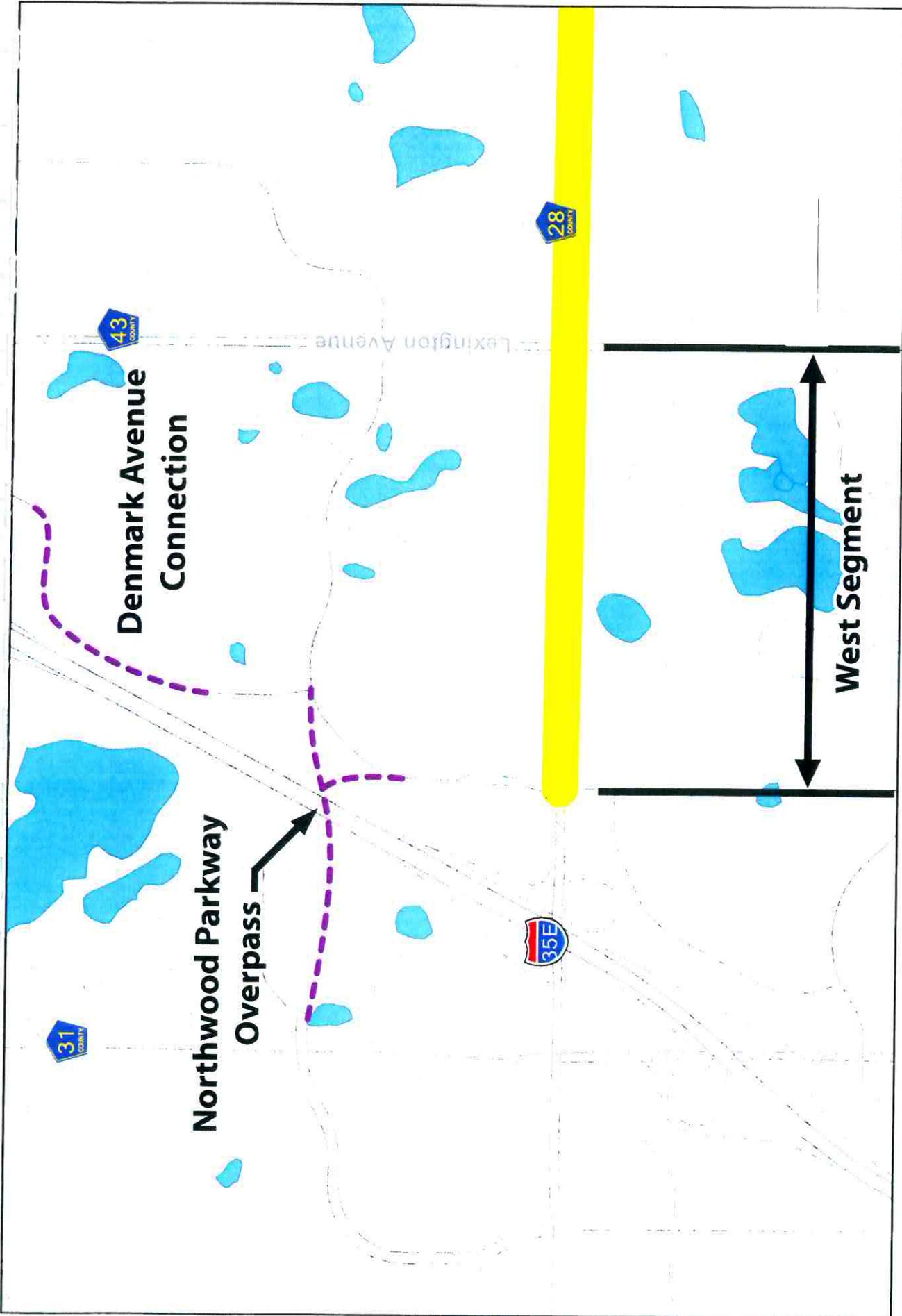
### Future Daily Volumes

Future daily volumes (ADT) are shown in Figure 8. Table 3 shows the comparison of the existing daily traffic volumes counted in year 2005 and the year 2030 forecast volumes for the CSAH 28 corridor. The total growth in traffic along the corridor ranges from 65 to 140 percent from year 2005 to year 2030.

**Table 3 – Daily Traffic Volumes**

Location	Year 2005 (Actual)	Year 2030 (Forecasts)
West of Denmark Avenue	27,000	49,000
West of Lexington Avenue	24,300	40,000
East of Lexington Avenue	19,500	38,000
West of Dodd Road	12,900	31,000
East of Dodd Road	4,100	21,000

In comparison to the Dakota County year 2025 forecast volumes, the year 2030 forecast volumes are higher. The main reason for this difference is that the year 2030 model has a more intense land use allocation east of Lexington Avenue near CSAH 28. The more intense land use is expected to generate approximately 10,000 more daily trips on CSAH 28 east of Lexington Avenue.

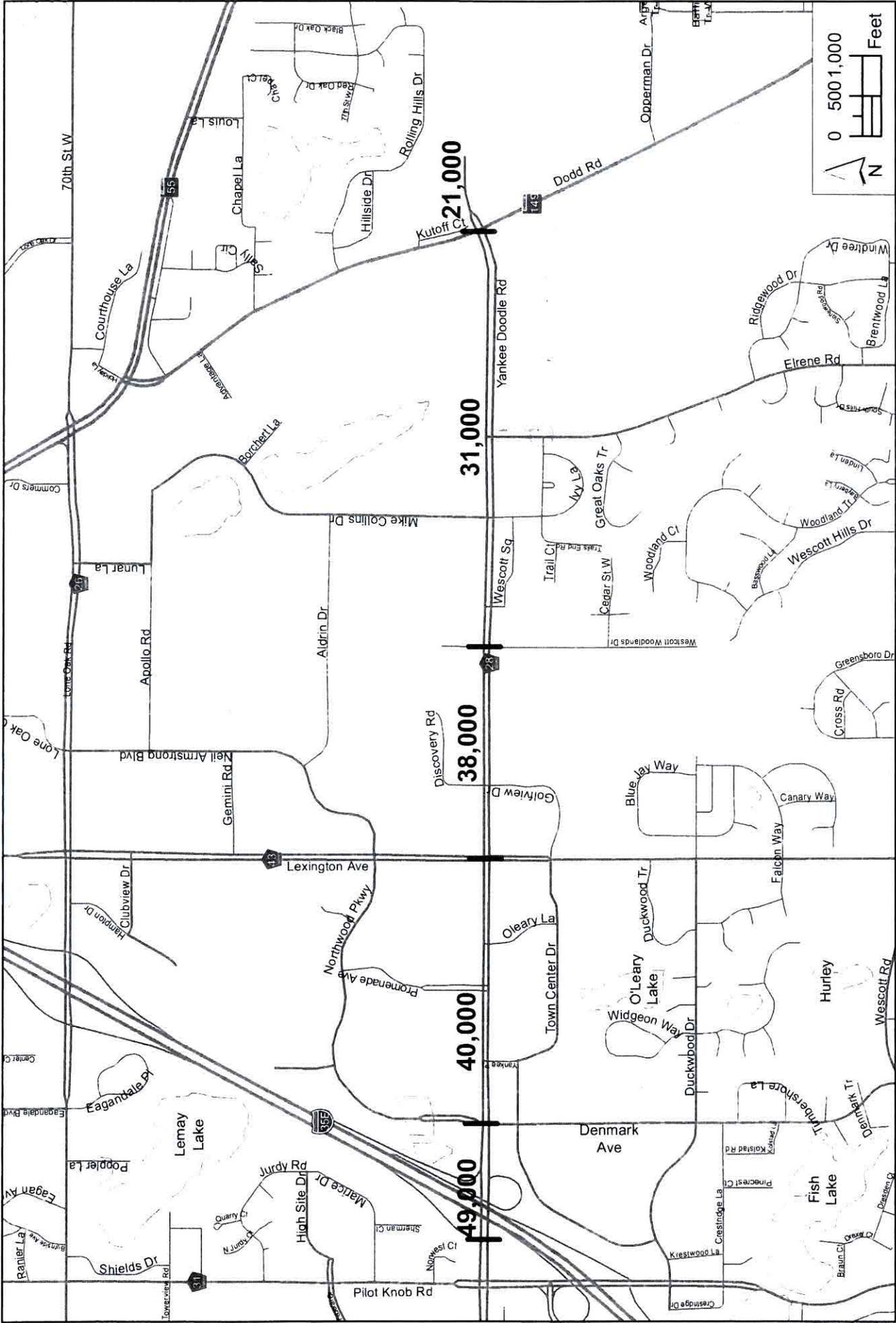


**FUTURE ROADWAY ASSUMPTIONS**

CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County

5772  
041007

**Figure 7**



**CSAH 28 - 2030 Average Annual Daily Traffic (Projected)**

**Figure 8**

CSAH 28 (Yankee Doodle Road) Corridor Study

Dakota County



\\ms051727\proj\2004\44DT.mxd

The proposed Northwoods Parkway Bridge also has an impact on the CSAH 28 forecast volumes, especially on the west segment of the corridor, including the Denmark Avenue intersection. The proposed bridge would carry about 7,500 daily trips by year 2030, approximately 350 eastbound and 420 westbound trips during the p.m. peak hour. Adding these p.m. peak hour trips (or most of them) to the CSAH 28/Denmark Avenue intersection will cause it to operate at unacceptable levels during year 2030 p.m. peak hour conditions.

### **3.5 No Build Conditions**

The year 2030 forecast volumes were analyzed using the existing roadway configuration, except for the improvements currently being constructed for the CSAH 28/Dodd Road intersection. Future turning movement volumes for the no-build scenario were also prepared and are presented in Figure 9. The results of the intersection operations analysis are included in the Traffic Analysis Memo in Appendix E. Detailed traffic forecasting information is presented in Appendix D. The results of the no build analysis for year 2030 are summarized below.

#### **General Corridor Issues**

Most, if not all, cross-street left-turn and through movements at the unsignalized intersections are expected to operate poorly during the evening peak hour. Average travel speeds on the corridor are expected to decrease when compared to existing speeds.

- The east segment of CSAH 28 from Mike Collins Drive to Dodd Road will see the largest decrease in p.m. peak hour average travel speeds with a decrease from 28 mph to 19 mph for eastbound traffic and from 32 mph to 22 mph for westbound vehicles.

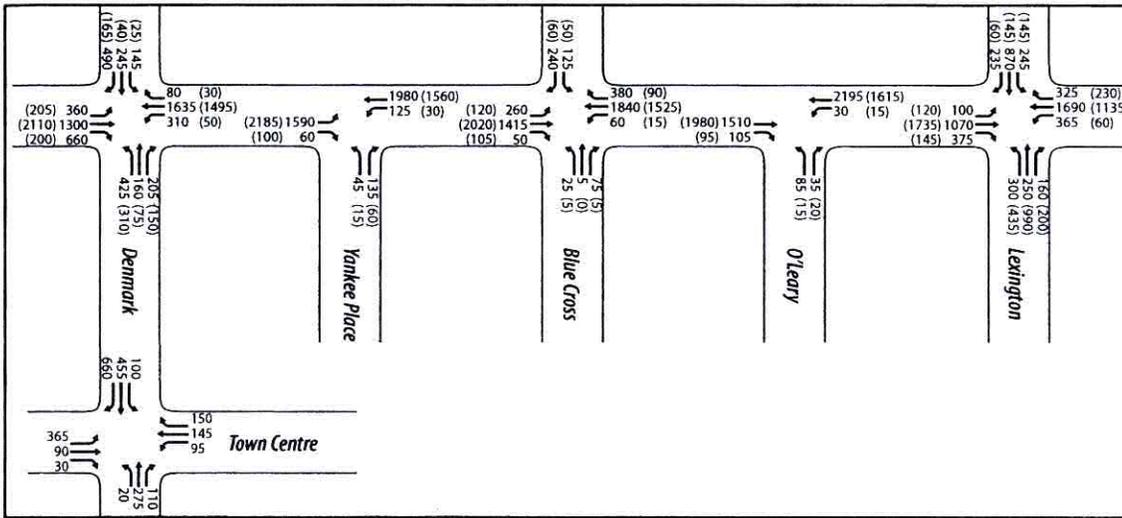
#### **West Segment**

CSAH 28/Denmark Avenue – This intersection will have operational problems with the inefficiencies of split-phasing for Denmark Avenue. The northbound left-turn lanes are not long enough to provide the necessary capacity, impacting the overall operations of this intersection. In addition, the northbound queues extend to the south, impacting the intersection of Denmark Avenue/Town Centre Drive.

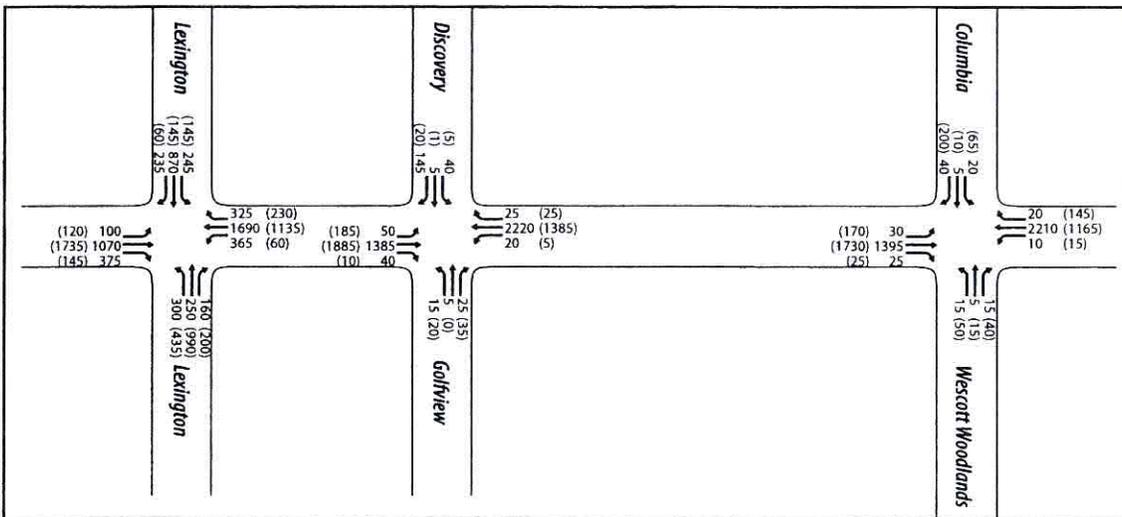
CSAH 28/Promenade Drive – The eastbound left-turning vehicles will spill out of the left-turn lane, creating safety concerns. The number of acceptable gaps in the westbound traffic will not accommodate the number of eastbound left-turn motorists, causing heavy delays of over 80 seconds per vehicle, long queues and aggressive driving.

CSAH 28/Lexington Avenue – The through traffic volumes on westbound CSAH 28 and southbound Lexington Avenue are too high to be accommodated by the existing intersection geometrics. A six-lane CSAH 28 should be extended east of the Lexington intersection.

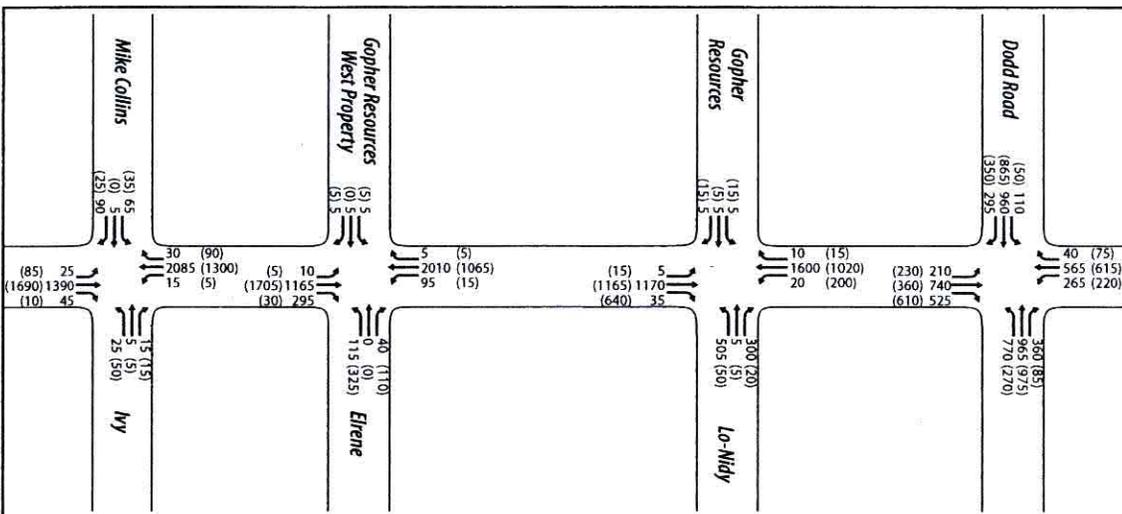
### West Segment



### Middle Segment



### East Segment



### LEGEND

- xxx PM Peak
- (xxx) AM Peak



Support/5772\_CSAH 28/Report/Figures/5772\_Report/Figures/VER.qxd



## 2030 FORECAST PM PEAK HOUR TURNING MOVEMENT VOLUMES

CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County

Figure 9

Denmark Avenue/Town Centre Drive – The northbound queues from the CSAH 28/Denmark Avenue intersection spill into this intersection, causing the intersection to operate poorly.

### **Middle Segment**

CSAH 28/Discovery Road/Golfview Drive – Increased concerns with the eastbound left-turning vehicles spilling out of the turn lane during the a.m. peak hour. Motorists making a northbound or southbound left-turn/through movement will not be able to make these movements safely, as traffic volumes on CSAH 28 increase.

### **East Segment**

CSAH 28/Gopher Entrance and CSAH 28/Dodd Road – Future proposed development south of CSAH 28 will generate additional traffic at the current full-access unsignalized intersection at Gopher Resources, causing it to operate poorly. This unacceptable level of operations causes the CSAH 28/Dodd Road intersection to operate poorly. In addition, trucks entering the Gopher Resources site sometimes create a queue in the WB right-turn lane because there is insufficient storage on-site.

## **3.6 Summary**

The analysis of existing traffic volumes and forecast traffic volumes for the year 2030 under no-build conditions raises additional issues beyond those identified in Section 2.

- In addition to reduced mobility on CSAH 28, all signalized intersections along the corridor will be failing or near failing during the p.m. peak hour.
- The intersection of Denmark Avenue and Town Centre Drive will operate at LOS E during the p.m. peak hour, while the intersections of Lexington Avenue and Dodd Road will operate at LOS F.
- Additionally, the intersection of Town Centre Drive and Denmark Avenue, which is located just south of CSAH 28 and provides additional access to the commercial district south of CSAH 28 and east of Denmark, will also be operating at a LOS F during the p.m. peak hour.
- The Critical Move Level of Service for all unsignalized intersections along the corridor will be LOS F.

## 4.0 ALTERNATIVES ANALYSIS

For the purposes of this study, the corridor was divided into three (3) distinct sections. This allowed for easier evaluation of the alternatives considered.

- **West Segment:** Denmark Avenue to Lexington Avenue.
- **Middle Segment:** Lexington Avenue to Mike Collins Drive
- **East Segment:** Mike Collins Drive to Dodd Road

Based upon an analysis of existing conditions, anticipated conditions and public comment, the study team identified several issues within each segment that required that specific actions be taken to correct or prevent safety and/or operational issues. Possible actions that could address these issues were identified in each segment and grouped into alternatives for detailed evaluation. Identification of possible actions is based upon the following general principles:

- Reducing the number of locations where two automobiles cross each other's path will reduce the likelihood and incidence of crashes. In practical terms, this means closing medians to turning and crossing traffic, eliminating driveways, and closing side streets.
- Existing and additional traffic signals need to be constructed and timed to be as efficient as possible in moving traffic.
- Additional traffic signals need to be kept to a minimum for the following reasons:
  - Additional signals would contribute to a reduction in the average speed on CSAH 28.
  - The installation of a traffic signal has the overall effect of reducing speeds on the primary roadway without a concomitant improvement in overall safety. While the presence of a traffic signal will reduce certain types of crashes involving traffic entering from the side road, other types of crashes associated with the traffic now stopping at the traffic signal will be increased.
- The installation of traffic signals at selected locations may be necessary to provide accessibility to neighboring properties.
- Whenever a traffic signal is installed on a County Road, the side streets should be public streets that provide good connectivity to the City street system. The final decision to install a signal will be based on overall need and justification in consideration to the area as a whole.

The following points need to be emphasized related to the actions described above.

- Closing the median on a County road does not constitute a reduction in access.
- The County is not obligated to provide driveway access to a parcel if the parcel has direct access to another public roadway.
- The installation of a traffic signal, even if recommended in this report, will still need to be individually evaluated by a professional traffic engineer following established procedures.

For each segment several possible actions were identified that would address the safety, mobility and accessibility issues in that segment. Some of the actions considered within each segment were not retained for evaluation as they did not adequately respond to project area issues and needs or were not consistent with the above principles. The remainder was grouped into a discrete number of alternatives that represented realistic comprehensive approaches to addressing the safety, mobility and accessibility objectives of the study.

## **4.1 West Segment Alternatives**

The West Segment extends from Denmark Avenue to Lexington Avenue.

### **Safety and Operational Issues**

There are several safety and operational issues that need to be addressed in the west segment of the study area, as follows:

- The forecast for peak hour and daily volumes for this segment exceeds the current mainline capacity of the four-lane section of CSAH 28.
- The calculated crash rate at the CSAH 28/Promenade intersection is greater than the State average for this type of intersection and is perceived as a problem by the City and by the general public.
- The existing level of service at the Promenade intersection is 'A' for the overall intersection, but is 'F' for the SB to EB left turn.
- The existing level of service is 'A' overall for both the CSAH 28/Yankee Place and the CSAH 28/O'Leary Lane intersections. However, the critical move at each intersection, the left turn from the side street to CSAH 28, currently operates at LOS D and is expected to drop to a LOS F in the forecast year 2030.

- As traffic volumes continue to increase, the level of service at the signalized intersection of CSAH 28 and Denmark will gradually deteriorate with average delay exceeding acceptable standards. Even with the construction of the Northwood Parkway Bridge, which will provide an alternate route for some trips, the Denmark intersection is projected to operate at Level of Service E or worse during the P.M. Peak hour in the year 2030 with its current configuration.
- By 2030, the intersection of CSAH 28 and Lexington Avenue will operate at an overall LOS F. The through traffic volumes on westbound CSAH 28 and southbound Lexington Avenue are too large to be accommodated by the existing intersection geometrics, which include two through lanes on all four approaches
- Under current conditions, the NB queue at the Denmark intersection extends back through the Denmark Avenue/Town Centre Drive intersection during periods of high traffic flow, including the mid-day lunch hour and P.M. peak hour.

If by 2030, no changes are implemented, the following conditions will also be present in this segment of CSAH 28.

- Each intersection on CSAH 28 in this segment is expected to have operational problems.
  - The Denmark intersection will barely be adequate even if the Northwood Parkway Bridge is built. If the bridge is not built, the Denmark intersection will be severely congested.
  - The Lexington intersection will be severely congested.
- Crash rates will increase.
  - The existing side street stop intersection at Promenade will continue to have a high crash rate and it is reasonable to expect that the other two side street stop intersections will also exhibit high crash rates as volumes on CSAH 28 increase.
  - It will become increasingly difficult for Eagan residents to access businesses in the commercial areas adjacent to CSAH 28 in this area because of the congestion at the intersections and the difficulty in getting back out onto CSAH 28 from the side streets.
- Average speed on CSAH 28 will drop from 22 mph to 21 mph for eastbound traffic and 27 mph to 26 mph for westbound traffic.

For these reasons, several actions will need to be taken to maintain mobility, maintain access to neighboring properties and improve safety along this stretch of CSAH 28.

## **Other Issues**

In addition to the safety and operational issues, the southbound leg of the CSAH 28/Promenade intersection is a private driveway serving the Blue Cross/Blue Shield building. The County would be willing to allow a right-in/right-out access here because the parcel is not adjacent to another public street. (The access to the south is over an adjacent parcel without benefit of formal easement.) But the County is not obligated to provide traffic signal access.

## **Actions Required for All West Segment Alternatives**

All of the alternatives prepared for this study assume the following:

- 1) Construction of the Northwood Parkway Bridge.
- 2) Modification of the Denmark Avenue/CSAH 28 intersection.
- 3) Construction of an additional through lane in each direction from its current terminus near Yankee Place to east of Lexington Avenue. (Assessment of additional lane needs is covered in the Traffic Analysis technical memorandum – see Appendix E.)

### ***Northwood Parkway Bridge***

The base 2030 turning movement forecasts were calculated with the assumption that the Northwood Parkway Bridge would be in place by 2030 and that Denmark Avenue would be extended to the north. Once this bridge is in place, some traffic that now uses the Denmark intersection to go west will be able to use an alternate route to cross I-35E. A sensitivity analysis was performed as described in the previous chapter to determine what the impact on the Denmark Avenue intersection would be if the bridge were not in place in 2030. This analysis concluded that if the Northwood Parkway Bridge were not in place by 2030, the Denmark Avenue/CSAH 28 intersection would be operating at LOS F, meaning that it would be severely congested. This would occur even if all the other recommendations for the West Segment were to be carried out.

### ***Denmark Avenue Intersections***

The Denmark Avenue/CSAH 28 intersection is a key intersection for the West Segment of the study area. This intersection and the Denmark/Town Centre Drive intersection are both congested during the P.M. peak period and the mid-day lunch period.

The problems of congestion that occur at the intersections of Denmark and Town Centre Drive and Denmark and CSAH 28 are primarily a result of the unique land use pattern in the area. Typically, an intersection near the ramps to an interchange would only be serving a small area because the adjacent freeway normally is parallel to the adjacent city streets. The fact that I-35E in this area is crossing the City in a diagonal manner creates a pocket of developed land that is much larger than would

occur under normal circumstances. This area is forced to rely on the Denmark Avenue intersections for all access to CSAH 28 and I-35E. That the development in this area is commercial, with high trip generation rates and high peaking contributes further to the pressure on the Denmark intersections.

Adding to the congestion problem is the current signal timing. The traffic signal at the existing intersection operates with split phase timing for the side streets. The timing sequence that only allows one side street to receive a green indication at a time was implemented because there was a high incidence of crashes involving opposing left turns. However, this increases the overall cycle time and reduces the efficiency of the intersection.

Three specific actions are proposed that would relieve some of the congestion at these intersections in the near term.

- 1) Under all of the following scenarios, the Denmark Avenue/CSAH 28 intersection would be modified to allow the elimination of the split phasing currently controlling the side street movements. This would be accomplished through the alteration of the median barriers and the provision of 'cat-track' striping to allow left turning vehicles more room to make the maneuver and therefore leave more space between opposing left turning vehicles. These actions will improve the efficiency of the intersection in moving vehicles and improve speeds on CSAH 28.
- 2) The northbound left turn lanes would be extended all the way to the Town Centre Drive intersection. This would allow traffic to more efficiently utilize both left turn lanes and allow more traffic to move through the intersection when this movement has a green indication.
- 3) The southbound left turn lane at the Denmark/Town Centre Drive intersection would be eliminated to allow the extension of the left turn lanes as described above. The SB to EB left turn would be prohibited at this intersection.

#### ***Additional Through Lane***

As reviewed in Section 4.1, future traffic volumes are expected to exceed the capacity of the existing roadway. Therefore each of the following alternatives assumes that CSAH 28 would be widened to six-lanes from Denmark Avenue to the east side of Lexington Avenue.

#### **Alternatives Advanced for Evaluation**

Three alternatives for the West Segment of CSAH 28 were developed and retained for further evaluation. Each of these alternatives is designed to address the safety and operational issues identified above. Each alternative is shown in Figure 10.

### Alternative 1-W



### Alternative 2-W



### Alternative 3-W



### Legend

-  = Full Access
-  = No Southbound Left Turns
-  = Left-turns Restricted
-  = Private Connection
-  = Public Connection
-  = Right-in/Right-out
-  = Closed Intersection/Driveway



Support/5772\_CSAH 28/Report/Figures/5772\_ReportFiguresVER.qxd



## WEST SEGMENT ALTERNATIVES

CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County

Figure 10

### *Alternative 1-W*

The characteristics of the first alternative are as follows:

- Full access signalized intersections at Denmark Avenue and Lexington Avenue remain.
- The median openings at both Yankee Place and O'Leary Lane are closed. At both locations, an eastbound right-in right-out is assumed.
- At Promenade Avenue, the existing full access intersection would be reconstructed as a three-quarter intersection. As a result, left turns from CSAH 28 to the side streets would be allowed, but left turns from the side streets and through moves from side street to side street would not be allowed. A two-phase traffic signal could be constructed at this location to provide protection for EB to NB left turns in the future if issues arise. Westbound to Southbound left turns would be prohibited.

This alternative eliminates as many conflicts as is feasible. The only non-signalized left turn move that would remain would be the EB to NB left turn at Promenade Avenue. This configuration would maintain the highest level of mobility and would raise the level of safety by reducing the number of conflict points.

### *Alternative 2-W*

The second alternative includes the characteristics of the first with the following changes:

- Southbound left turns at the intersection of Denmark and Town Centre Drive would be prohibited in order to lengthen the northbound left-turn lane at the intersection of Denmark Avenue and CSAH 28.
- At Yankee Place, the median is reconfigured to restrict left turns from the side street to CSAH 28 and prohibit through movements by modifying the intersection geometrics. Left turns from CSAH 28 and right-in right-out turns would still be allowed.

As described in Section 3.3, the NB left turn lanes at the Denmark/CSAH 28 intersection do not function efficiently because of the extended queues. Extending both left turn lanes all the way to the Denmark/Town Centre Drive intersection would make it possible for both lanes to operate more efficiently and increase the overall capacity of both intersections.

Because of the limited width in this area, in order to extend the northbound left turn lanes, the required space would have to be taken from the southbound left turn lane of the Denmark/Town Centre Drive intersection. This would in turn require prohibiting the southbound left turn.

Modifying the median at Yankee Place to allow the WB to SB left turn would compensate for prohibiting the SB left at Town Centre Drive by making it possible for WB traffic to access the businesses in the vicinity by turning left at Yankee Place. This left-turn movement is not expected to spill out the turn-lane, nor impact any major intersection. Additionally, this movement will be accommodated by gaps in eastbound traffic during the westbound left-turn phase at the Yankee Doodle Road/Denmark Avenue intersection.

### *Alternative 3-W*

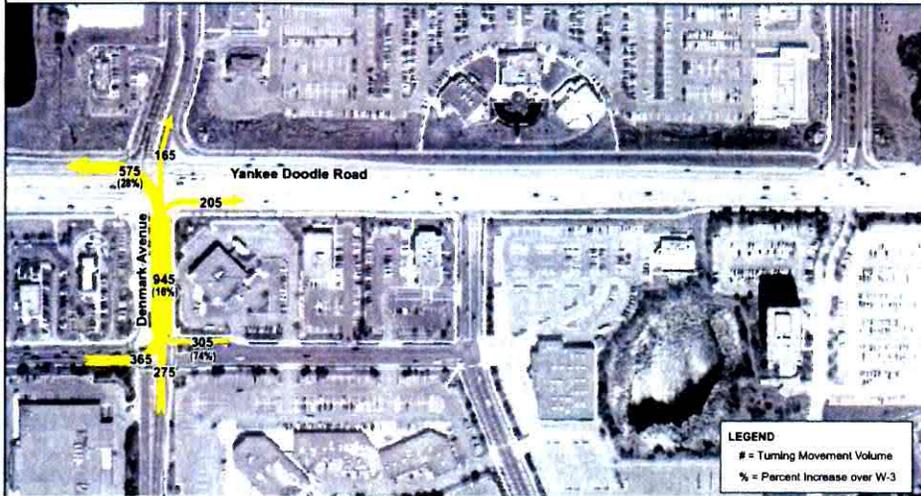
The third alternative includes the characteristics of the second alternative with the following exceptions:

- At Promenade Avenue, the existing full access intersection would be reconstructed as a full access intersection. A new public roadway would be constructed to connect the Promenade intersection to Town Centre Drive to the south. This intersection would be signalized, assuming that an engineering study determines that a signal is justified; preliminary review indicates this is the proper traffic control for the traffic volumes expected at this newly configured intersection.

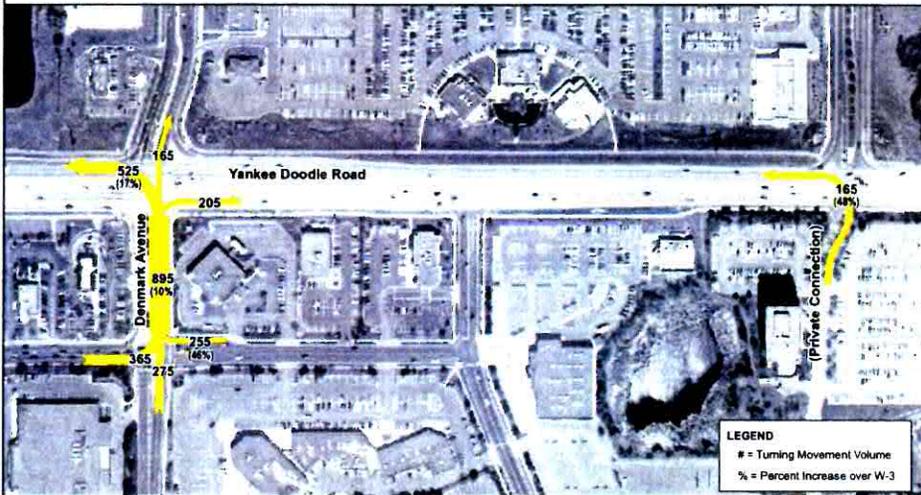
As Figure 10 demonstrates, this alternative incorporates the same treatments as Alternative 2-W, with the exception of its treatment of Promenade Avenue. Alternative 3-W includes a full access intersection at Promenade Avenue with a traffic signal. Given that a full signal is proposed at this location, the south leg of the intersection, which is currently a private driveway, would be upgraded to a public street to provide a connection from Town Centre Drive to CSAH 28.

Congestion at the intersections of Denmark and Town Centre Drive, caused by unique land use patterns in the area, make it necessary to provide as many alternate routes as possible to allow traffic to bypass the Denmark Avenue intersections. The proposal to prohibit the southbound left turn and substitute the access provided by this movement with access at Yankee Place is one way to reduce traffic flowing through the intersection without materially affecting either mobility on CSAH 28 or access to the commercial properties south of CSAH 28 and east of Denmark. The provision of a full access intersection at Promenade with a connection to Town Centre Drive will also provide relief for the Denmark intersection. As shown in Figure 11, the provision of a full access signalized intersection and public connection at Promenade Avenue reduces the peak hour northbound volumes on Denmark Avenue from 945 for W-2 to 815 for W-3. Volumes on Denmark Avenue would also be significantly higher (895) with a full access signalized intersection and only a private connection at Promenade Avenue. There will be some impact on mobility because of the extra traffic signal, but the opportunity to remove traffic from the Denmark intersections will benefit mobility by reducing the likelihood that the CSAH 28/Denmark intersection will fail at some point in the future.

**W-2 (LEFT TURNS ONTO YANKEE DOODLE ROAD RESTRICTED AT PROMENADE AVENUE/BCBS)**



**W-3 FULL ACCESS INTERSECTION AT PROMENADE AVENUE WITH NO PUBLIC SOUTH CONNECTION**



**W-3 FULL ACCESS INTERSECTION AT PROMENADE AVENUE WITH PUBLIC SOUTH CONNECTION**



Support/5772\_CSAH 28/Report/Figures/5772\_ReportFiguresVER.qxd



**WEST SEGMENT TURNING MOVEMENT COMPARISON**

CSAH 28 (Yankee Doodle Road) Corridor Study  
 Dakota County

**Figure 11**

### **Actions Not Considered**

For the west segment, some actions were reviewed and dismissed as impractical or not likely to contribute to the achievement of project objectives. The following are some actions that were not considered for inclusion in the alternatives that were evaluated:

- Closing the Promenade Avenue intersection was not considered feasible because the diversion of traffic would increase the congestion and operational problems at the Denmark Avenue intersection.
- Installing a full access intersection with a traffic signal at Promenade Avenue without the development of a public street to the south was not considered. Although there is an existing private driveway, the intersection would not provide access to the businesses on the south side of CSAH 28 unless members of the public could use the private roadway without restriction. The overall mobility would decrease on CSAH 28 without the ability to distribute traffic to reduce congestion at the near capacity intersections along CSAH 28 at Denmark and Lexington.

## **4.2 Middle Segment Alternatives**

The Middle Segment extends from Lexington Avenue to Mike Collins Drive.

### **Safety and Operational Issues**

There are several safety and operational issues that need to be addressed in the middle segment of the study area, as follows:

- By 2030, the intersection of CSAH 28 and Lexington Avenue will operate at LOS F.

Although neither the Discovery Road/Golfview nor the Columbia Drive/Westcott intersections have calculated crash rates that are above average, members of the general public that participated in the public review perceive both intersections as potentially hazardous, particularly to vehicles turning left from the side street. The existing level of service at the Discovery Road/Golfview intersection is 'A' for the overall intersection, but is 'E' for the SB to EB left turn. In addition, the EB left turn lane can't accommodate the queue. With no changes, the critical move LOS will drop to 'F' in 2030.

- The existing level of service at the Columbia Drive/Westcott intersection is 'A' for the overall intersection, but is 'D' for the SB to EB left turn. With no changes, the critical move LOS will drop to 'F' in 2030.

Basically, in the forecast year of 2030, if no changes are made:

- Every intersection on CSAH 28 in this segment is expected to have operational problems.

- The Lexington intersection will be severely congested, as capacity will not be adequate to accommodate future volumes for through or left turning traffic.
- It will become more and more difficult for Eagan residents to access businesses in the commercial areas adjacent to CSAH 28 in this area because of intersection congestion and the difficulty in getting back out onto CSAH 28.
- Average speeds on CSAH 28 will drop from 28 mph to 21 mph for westbound traffic. Eastbound speeds will not change. It is important to note that Lexington Avenue was included in westbound mobility calculations but not for eastbound mobility calculations.

For these reasons, several actions will need to be taken to maintain mobility, maintain access to neighboring properties and improve safety along this stretch of CSAH 28.

### **Other Issues**

Between Lexington Avenue and Mike Collins Drive, there are two city streets intersecting CSAH 28 from the north. Both of these, Discovery Road and Columbia drive, are dead-end streets. In addition, Wescott Woodlands, which intersects CSAH 28 opposite Columbia Drive, is also a dead-end street. Restricting access to either of these intersections directly affects the businesses and the school located on these streets because there is no alternative access. Development and evaluation of alternatives on CSAH 28 need to take into consideration this situation.

The construction of a six-lane roadway west of Lexington Avenue requires the extension of the six-lane section east of Lexington Avenue for 1,200 feet for westbound lanes and 1,200 to 1,300 feet for eastbound lanes. This distance is necessary to allow the CSAH 28/Lexington Avenue to operate safely and efficiently.

Because of the volumes and speed of CSAH 28, this transition section would be 300 to 400 feet longer but the location of the full access intersection at Columbia/Wescott Woodlands, 2500 feet east of Lexington, needs to be considered. The recommended distances maximize the length of the transition section without affecting operations at Columbia/Wescott.

In order to accommodate 2030 forecast volumes, the WB to SB left turn lanes at the Lexington intersection need to be a minimum of 500 feet. This and the length of the transition section require that the median at Discovery Road/Golfview Drive be closed. There is not enough distance to create a left turn lane for EB to NB traffic at Discovery. Based on the 2030 forecast volumes, back to back left turn lanes between Lexington and Discovery Road would not have sufficient storage to accommodate peak hour volumes. In addition, traffic turning left at Discovery Road would need to cross three through lanes of traffic in an unsignalized environment. A signalized intersection at this location would not be feasible because it is too close to the Lexington intersection.

### **Actions Required for All Alternatives**

All of the alternatives prepared for this study assume the following:

- Extension of a six-lane divided roadway from East of Denmark Avenue to Lexington Avenue to accommodate increased daily volumes west of Lexington and to address the anticipated congestion issues at the Lexington intersection will require extension of the six-lane section of CSAH 28 east of the Lexington intersection.
- The length of the WB left turn lanes at the Lexington intersection and the difficulty in establishing a corresponding EB left turn lane at the Discovery Road/Golfview intersection will require the complete closure of the median at Discovery Road and Golfview.
- The intersection at CSAH 28 and Westcott Square would remain a right-in right-out.
- The median opening and driveway to the former Super Value warehouse would be closed. Access to this property would be from a new private driveway connecting to Columbia Drive.

### **Alternatives Advanced for Evaluation**

For this segment, there are three primary alternatives that define access to CSAH 28. Each alternative is shown in Figure 12. All of the primary alternatives assume the following:

- The intersection of Lexington Avenue and CSAH 28 would remain as full access and signalized.
- Expansion of CSAH 28 from four to six lanes through the intersection of Lexington Avenue with the transition area extending at least 1,000 feet east of Lexington Avenue. The six-lane need extends through Lexington Avenue because through traffic volumes on westbound Yankee Doodle Road and southbound Lexington Avenue are too large to be accommodated by the existing intersection geometrics. Currently, a 2030 six-lane need beyond this point (i.e., to Elrene Road) is not warranted, as volumes on this segment of the roadway are not constricted by a major intersection, which reduces roadway capacity. Forecasts demonstrate that a four-lane roadway will be adequate to accommodate future traffic volumes for this segment.
- No access changes at the intersection of Westcott Square and CSAH 28, which is currently a right-in right-out access.
- Right-in right-out access in each direction on CSAH 28 at the Discovery/Golfview Drive intersection.
- The private driveway serving the currently vacant industrial building north of CSAH 28 would be replaced with a connection to Columbia Drive.

### ***Alternative 1-M***

In addition to the changes described above for all middle segment alternatives, the following changes are also proposed for Alternative 1-M:

- A full access intersection at Columbia Drive/Westcott Woodlands would remain and be reconstructed to accommodate a traffic signal. The timing of the installation would be determined by a separate engineering study. With the current usage, traffic volume does not show need for signal.

Alternative 1-M has two sub-alternatives: Developed as a result of stakeholder concerns in November.

- Sub-alternative 'a' would involve the construction of a new city street connecting Discovery Road and Lexington Avenue and passing south of the Skyline Displays building.
- Sub-alternative 'b' would involve the construction of new city street connecting Discovery Road and Neil Armstrong and passing north of the Skyline Displays building.

### ***Alternative 2-M***

Alternative 2-M is shown in Figure 12.

In addition to the changes described above for all middle segment alternatives, the following changes are also proposed for Alternative 2-M:

- A full access intersection at Columbia Drive/Westcott Woodlands would remain and be reconstructed to accommodate a traffic signal. The timing of the installation would be determined by a separate engineering study. Bringing all Discovery Road to this connection would suggest a greater signal need here.
- To provide accessibility with the median closed at Discovery, A new city street would be constructed to connect the cul-de-sac on Discovery Road to the cul-de-sac on Columbia Drive. The exact alignment would need to be determined through additional engineering design.

### ***Alternative 3-M***

Alternative 3-M is shown in Figure 12.

In addition to the changes described above for all middle segment alternatives, the following changes are also proposed for Alternative 3-M:

- A new full access intersection is proposed south and west of the Faithful Shepherd Catholic School. The need for a traffic signal would be determined by a separate engineering study.

### Alternative 1-M



### Alternative 2-M



### Alternative 3-M



### Legend

-  = Full Access
-  = No Southbound Left Turns
-  = Left-turns Restricted
-  = Private Connection
-  = Public Connection
-  = Right-in/Right-out
-  = Closed Intersection/Driveway



Support/5772\_CSAH\_28/Report/Figures/5772\_ReportFiguresVER.qxd



## MIDDLE SEGMENT ALTERNATIVES

CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County

Figure 12

- A new roadway would be constructed connecting Discovery Road to CSAH 28 at the new intersection.
- Wescott Woodlands would be realigned to form the south leg of the new intersection.
- Turning movements at the existing intersection of Columbia Drive and CSAH 28 will be restricted to right-in right-out, due to its proximity to the new intersection.

### **Actions Not Considered**

For the middle segment, some actions were reviewed and dismissed as impractical or not likely to contribute to the achievement of project objectives. The following are some actions that were not considered for inclusion in the alternatives that were evaluated:

- Efforts to extend Wescott Woodlands to the south have been vigorously opposed by neighborhood interests and therefore this option was not considered as part of this study.
- Extending Columbia Drive to the north involves significant wetland impacts and encroachment on two businesses and the Faithful Shepherd Catholic School. A preliminary traffic analysis indicated that this extension would have little traffic benefit.
- Another option reviewed and dropped from consideration was the construction of a frontage road on the north side of CSAH 28 between Columbia Drive and Mike Collins Drive. Such a roadway would encroach into the south lot of the former Super Value warehouse, a currently vacant industrial building. This building has most recently been used as a food distribution center. A frontage road would eliminate the availability of loading docks on the south side of the building, significantly reducing the utility of the building for the use that it is currently configured.
- Placing a traffic signal at the Discovery Road/CSAH 28 intersection would improve accessibility to both the north and south, but a traffic signal at this location would negatively affect the operation of the Lexington Avenue intersection and speeds on CSAH 28 due to its proximity to Lexington Avenue. The Discovery Road intersection is simply too close to Lexington Avenue to consider placing a traffic signal there.

- **East Segment Alternatives**

The East Segment extends from Mike Collins Drive to Dodd Road.

## Safety and Operational Issues

There are several safety and operational issues that need to be addressed in the east segment of the study area, as follows:

- The calculated crash rate at the CSAH 28/Elrene intersection is greater than the State average for this type of intersection and is perceived as a problem by the City and by the general public.
- The existing level of service at the CSAH 28/Mike Collins/Ivy intersection is 'A' for the overall intersection, but is 'E' for the SB to EB left turn. In 2030, the critical move will deteriorate to LOS 'F'.
- The existing level of service at the CSAH 28/Elrene intersection is 'A' for the overall intersection, but is 'E' for the NB to WB left turn. In 2030, the critical move will deteriorate to LOS 'F'.
- The existing level of service at the CSAH 28/Gopher Resources/Lo-Nidy intersection is 'A' for the overall intersection, but in 2030, the critical move will deteriorate to LOS 'F'.
- The intersection of CSAH 28 and Dodd Road currently operates at LOS F. This intersection is negatively affected by queuing on CSAH 28 at the Thomson West entrance.

Basically, in the forecast year of 2030, if no changes are made,

- Every intersection on CSAH 28 in this segment is expected to have operational problems.
- The Dodd intersection will be severely congested.
- The existing side street stop intersection at Elrene will continue to have a high crash rate and it is reasonable to expect that the other two side street stop intersections will also exhibit high crash rates as volumes on CSAH 28 increase.
- Average speed on CSAH 28 will drop from 28 mph to 19 mph for eastbound traffic and from 32 mph to 22 mph for westbound traffic.

For these reasons, several actions will need to be taken to maintain mobility, maintain access to neighboring properties and improve safety along this stretch of CSAH 28.

## **Other Issues**

For the east segment, one of the major problems is the proximity of the Gopher Resources/Lo-Nidy intersection to Dodd Road. From a spacing standpoint, a new intersection one-quarter mile west of Dodd Road could serve both Gopher Resources and Lo-Nidy. But at this quarter-mile location, there is a significant increase in elevation on the south side of CSAH 28 and a significant decrease on the north. For such an intersection, both the north and south approaches would be difficult to construct. The elevation issue and the presence of a water tower also eliminate the possibility of a south frontage road.

## **Actions Required for All Alternatives**

All of the alternatives prepared for this study assume the following:

- The existing intersection at TH 149 and CSAH 28 would not be modified beyond improvements already programmed by Mn/DOT.

## **Actions Not Considered**

For the west segment, some actions were reviewed and dismissed as impractical or not likely to contribute to the achievement of project objectives. The following are some actions that were not considered for inclusion in the alternatives that were evaluated:

- Leaving the median open at the Gopher Resources/Lo-Nidy intersection was not considered as viable in the long term. While the median could stay open for a period of time without a safety issue, the distance to the TH 149 intersection and poor sight distance means that the County needs to reserve the right to close the median when safety conditions warrant.
- A new full access intersection at the ¼ mile point between Elrene Avenue and Dodd Road was not considered due to the challenging topography in this area.

## **Alternatives Advanced for Evaluation**

For this segment, there are three primary alternatives that define access to CSAH 28. Each alternative is show in Figure 13. All of the primary alternatives assume the following:

- CSAH 28 will remain a four-lane divided roadway between Mike Collins and TH 149.

### Alternative 1-E



### Alternative 2-E



### Alternative 3-E



### Legend

-  = Full Access
-  = No Southbound Left Turns
-  = Left-turns Restricted
-  = Private Connection
-  = Public Connection
-  = Right-in/Right-out
-  = Closed Intersection/Driveway



Support/5772\_CSAH 28/Report/Figures/5772\_ReportFiguresVER.qxd



## EAST SEGMENT ALTERNATIVES

CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County

Figure 13

### *Alternative 1-E*

In addition to the modifications described above for all east segment alternatives, the following changes are proposed for Alternative 1-E:

- This alternative proposes a three-quarter intersection restricting left turns onto Yankee Doodle from Mike Collins and Ivy Lane. Currently this is a full access intersection with stop signs at Mike Collins and Ivy Lane.
- A new traffic signal is proposed at Elrene Road, which is currently not signalized. A new private roadway will connect the Thomson (West) campus to Elrene Avenue.
- The full access intersection at the Gopher Resource/Lo-Nidy site would be restricted to right-in/ right-out.

### *Alternative 2-E*

In addition to the modifications described above for all east segment alternatives, the following changes are proposed for Alternative 2-E:

- This alternative proposes a realignment of Mike Collins to connect to the existing intersection of Elrene Road and CSAH 28. A new traffic signal is proposed at this intersection.
- Given its proximity to the new signalized intersection, access from Ivy Lane to CSAH 28 would be restricted to right in right-out.
- A private drive south of CSAH 28 would connect Thomson (West) to Elrene Road.
- The Lo-Nidy access to CSAH 28 would be closed, and a connection made to Elrene Road.

### *Alternative 3-E*

In addition to the modifications described above for all east segment alternatives, the following changes are proposed for Alternative 3-E:

- This alternative proposes full access controlled by a signal at the Mike Collins/Ivy Lane intersection with CSAH 28. Elrene Road would be realigned to connect to CSAH 28 at new intersection east of the existing Elrene Road alignment.
- As a result, the existing Elrene Road intersection would be closed.
- A private roadway would connect Thomson (West) to the realigned Elrene Road, and the Lo-Nidy entrance would be closed.
- Additionally, a north frontage road would be constructed to connect the Gopher Resources site with the Elrene Road.

### 4.3 Public Response to Retained Alternatives

A second Open House was held on October 12 to present the retained alternatives to the public, and to obtain feedback on these alternatives. Approximately 30 people attended the Open House. Comments on the alternatives received at this open house are summarized below:

#### **West Segment:**

- There is public support for alternatives that do not add signals to CSAH 28.
- Blue Cross Blue Shield prefers full access to CSAH 28 from their property with a traffic signal at Promenade Avenue.

#### **Middle Segment:**

- Wescott Square needs an EB left-turn lane.
- There is support for a traffic signal at Wescott Woodlands/Columbia Drive for improved safety and to create gaps in traffic flow for Discovery Road.
- There is mixed support for closing the median at Discovery Road.
- There is support for restricting left turns from Discovery Road and/or Columbia Drive.
- The extension of Discovery Road to Lexington has some public support, but is opposed by Skyline Exhibits.

#### **East Segment:**

- All alternatives are acceptable.
- There is public support for a traffic signal at Elrene Avenue.

In addition to the October 12 public open house, the project management team also met with representatives from several stakeholders on the corridor, including Blue Cross Blue Shield, Thomson (West), Skyline Exhibits, Don Stevens Inc., Gopher Resources, and the Faithful Shepherd Catholic School to discuss the corridor alternatives.

## 4.4 Alternatives Evaluation

Each of the retained alternatives was evaluated in the process to select a preferred alternative. Results of the evaluation process for each segment are discussed in Section 4.6 through 4.8.

### Evaluation Criteria

Several criteria were used to evaluate the segment alternatives in order to select a preferred alternative. These criteria are presented below:

- **Safety:** Safety is a critical issue on the corridor, with above average crash rates at several intersections. To evaluate safety along the corridor, the project management team used existing crash data from the corridor, as well as crash statistics for both signalized and unsignalized intersections, to identify whether safety along the corridor would be improved, would be similar to existing conditions, or would be reduced.
- **Mobility:** Given its functional classification as a minor arterial, mobility on CSAH 28 is important. For purposes of this evaluation, mobility was evaluated by estimating average travel speed on CSAH 28 for both eastbound and westbound vehicles. The overall segment level of service was also used to evaluate mobility.
- **Access:** Accessibility is a key issue for commercial businesses and employers located along the corridor, as customers and employees must be able to safely and efficiently access these businesses. For each alternative, the project management team determined whether a reasonable path to and from CSAH 28 was available for vehicles traveling to and from properties located north and south of CSAH 28.
- **Intersection Operations:** A key issue identified on this corridor during the study process was that long delays occur at several intersections along the corridor, particularly during peak hours. Peak hour turning movement volumes were prepared, and are presented in Appendix F. Peak hour volumes were used to calculate an overall level of service for the p.m. peak hour for all signalized intersections. A critical move level of service was calculated for all unsignalized intersections, which is presented in the Traffic Analysis Memo in Appendix E.
- **Wetland Impacts:** Wetlands can provide important ecological benefits. Additionally, wetlands can make construction very difficult and expensive. To evaluate wetland impacts of the alternatives, the project management team assessed the likelihood of negatively affecting wetlands in the project area.
- **Right-of-Way Impacts:** The amount of right-of-way required for an alternative has important implications for implementation and will affect an alternative's cost. Potential right-of-way impacts for the alternatives were determined by estimating the square footage of private property required to construct an alternative.

- **Capital Cost:** As with right-of-way impacts, costs should be considered during the alternative evaluation process, as costs will affect the feasibility of implementing an alternative. Capital costs were estimated for each alternative.
- **Pedestrian Impacts:** Pedestrian impacts of each alternative will also be considered, as the preferred alternative should allow for safe pedestrian movement along the corridor.
- **Trail Impacts:** Trails serve an important role in a region's transportation system by providing a safe and efficient travel alternative for pedestrians and bicyclists. Each alternative will be evaluated based on its impact to trails located adjacent to CSAH 28.
- **Transit Impacts:** Transit also serves an important role in a region's transportation system. Impacts to transit mobility will be considered for each alternative.

Each alternative was evaluated with the above criteria. Results of the evaluation process are summarized below. Additionally, a completed evaluation matrix for each segment is presented in this section.

## 4.5 West Segment Evaluation Results

A detailed evaluation matrix for the west segment is presented in Table 4. Results of the evaluation process are summarized below:

- **Safety:** Both Alternative 1-W and Alternative 2-W improve safety conditions by reducing conflicting turning movements along the corridor. Although conflicts are also reduced for Alternative 3-W, this alternative proposes an additional signal at Promenade Avenue. Given that signalized intersections have an average crash rate only slightly lower than the existing crash rate at this intersection, safety for 3-W would be similar to existing safety conditions.
- **Mobility:** Eastbound and westbound mobility is improved for both 1-W and 2-W. Mobility decreases for alternative 3-W, because speeds decrease from 22 mph to 20 mph for eastbound vehicles, and from 27 mph to 25 mph for westbound vehicles. The segment LOS also demonstrates decreased mobility for alternative 3-W, with an LOS of E compared LOS D for 1-W and 2-W for eastbound traffic.
- **Access:** All three alternatives provide a reasonable path to and from CSAH 28 for motorists traveling to and from properties north and south of CSAH 28. Alternative 3-W enhances access to Town Centre Drive south of CSAH 28.

# 2006

**Table 4 - West Segment Evaluation Matrix**

Impact Area	Existing Conditions	2030				Recommended Alternative (Fig 14)
		No-Build	1-W Fig 10	2-W Fig 10	3-W Fig 10	
<b>Safety</b> <sup>(1)</sup>	--	Feasible	Improved	Improved	Similar	Similar
<b>Mobility</b> <sup>(2)</sup>	Eastbound	21 mph LOS D	24 mph LOS D	24 mph LOS D	29 mph LOS E	29 mph LOS E
	Westbound	26 mph LOS D	30 mph LOS C	27 mph LOS D	25 mph LOS D	25 mph LOS D
<b>Access</b> <sup>(3)</sup>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Intersection Operations</b>	Unacceptable	Unacceptable	Unacceptable	Unacceptable	Unacceptable	Acceptable
<b>Wetland Impacts</b> <sup>(4)</sup>	--	--	--	--	--	Possible
<b>Right-of-Way Impacts</b> <sup>(5)</sup>	--	--	48,000	48,000	118,400	118,400
<b>Capital Cost</b>	--	--	\$2.3 Million	\$2.8 Million	\$4.2 Million	\$2.3 Million
• Cost increase over 1-W	--	--	--	\$0.4 Million	\$0.2 Million	\$0.2 Million
<b>Pedestrian Environment</b>	--	Similar	Similar	Similar	Improved <sup>(7)</sup>	Improved <sup>(7)</sup>
<b>Trails</b>	Both sides of YDR	No Change	No Change	No Change	No Change	No Change
<b>Transit Environment</b> <sup>(8)</sup>	--	Similar	Improved Travel Time	Improved Travel Time	Similar	Similar

<sup>(1)</sup> When compared to existing safety conditions.

<sup>(2)</sup> Estimated average speed for an automobile traveling between Lexington Avenue and Denmark Avenue.

<sup>(3)</sup> Reasonable path to/from CSAH 28 available for motorists traveling to/from properties north and south of CSAH 28.

<sup>(4)</sup> Likelihood of negatively affecting wetlands.

<sup>(5)</sup> Estimated square feet of private property required to construct elements of this alternative.

<sup>(6)</sup> Depends upon alignment selected (Cost estimate based on "middle" alternative).

<sup>(7)</sup> Additional protected crossing across CSAH 28 provided for pedestrians.

<sup>(8)</sup> Bus travel time on CSAH 28.

- **Intersection Operations:** All intersections operate at an acceptable level of service during the p.m. peak period for both alternatives 1-W and 2-W. Alternative 3-W does provide additional relief to the Denmark Avenue intersection, by providing an additional connection to retail and commercial areas, reducing volumes at the intersection of Denmark Avenue and CSAH 28. The provision of a full access signalized intersection and public connection at Promenade Avenue reduces the peak hour northbound volumes on Denmark Avenue from 945 for 2-W to 815 for 3-W.
- **Wetland Impacts:** Alternatives 1-W and 2-W do not affect wetlands. Alternative 3-W does have the potential for wetland impacts.
- **Right-of-Way Impacts:** Right-of-way impacts for both 1-W and 2-W were estimated at approximately 48,000 square feet. Right-of-way impacts were larger for 3-W due to the public roadway south of CSAH 28 at the Promenade Avenue intersection. The amount of private right-of-way required for 3-W is estimated to be 118,400 square feet.
- **Capital Cost:** Alternative 1-W had the lowest estimated capital cost of \$2.3 million. Cost for Alternative 2-W were slightly higher due to additional costs related to the two-phase signal at Promenade Avenue. As with right-of-way impacts, 3-W had the highest capital costs due to the construction of the public roadway south of the Promenade Avenue intersection.
- **Pedestrian Impacts:** Alternatives 2-W and 3-W provide the most benefit to pedestrians, because the signal at Promenade Avenue and CSAH 28 provides for an additional protected pedestrian crossing of CSAH 28. Alternative 1-W does not negatively affect pedestrians, but does not improve conditions for pedestrians.
- **Trail Impacts:** Widening of CSAH 28 through this segment for all alternatives will affect the existing trail on both the north and south sides of CSAH 28. Each alternative will involve reconstruction of the trails; therefore none of the alternatives will significantly affect the trail system.
- **Transit Impacts:** Eastbound and westbound mobility is improved for both 1-W and 2-W, therefore both reliability and travel speeds for buses would also be improved. Mobility decreases for alternative 3-W, which would negatively affect transit service by decreasing travel speeds for buses.

## 4.6 Middle Segment Evaluation Results

A detailed evaluation matrix for the middle segment alternatives is presented in Table 5. Results of the evaluation process are summarized below:

- **Safety:** Alternative 1-M improves safety on the corridor by reducing the number of access points and conflicting turn movements. Safety conditions are expected to be similar to existing conditions for 2-M and 3-M.
- **Mobility:** The existing average speed for eastbound vehicles on this segment of CSAH 28 is 50 mph with a segment LOS A; therefore eastbound mobility is not a major issue for this segment. This average speed of 50 mph and LOS A for eastbound traffic is maintained for Alternative 1-M; however eastbound average speeds decrease slightly to 46 mph for both 2-M and 3-M. Westbound mobility is an issue on this segment, with an existing average speed of 28 mph and forecasted average speed of 21 mph and segment LOS D. Westbound mobility on this segment is improved for all three alternatives, with increased speeds and an LOS C. However, 1-M showed the most significant increase to 33 mph. Westbound average speeds increased to 30 mph for 2-M and 3-M.
- **Access:** Both 1-M and 2-M provide a reasonable path to and from CSAH 28 for vehicles traveling to and from properties north and south of CSAH 28. However, 3-M does not provide access from the west or existing left turns for some properties north of CSAH 28 and east of Columbia Drive, such as Stock Lumber.
- **Intersection Operations:** Intersection operations are acceptable for each alternative.
- **Wetland Impacts:** Both 2-M and 3-M have wetland impacts because there are wetlands located near the Faithful Shepherd Catholic School that would be affected by the new roadways proposed in this area. Depending on the alignment selected for the proposed connection from Lexington Avenue to Discovery Road, wetland impacts for 1-M are also possible.
- **Right-of-Way Impacts:** Alternative 1-M had the greatest right-of-way impacts, which were estimated at 120,000 square feet because the proposed roadway for this alternative is a new alignment on private property, while roadways proposed for other alignments involve partially realigning existing public roadways. Alternative 3-M had the lowest right-of-way impacts at 77,000 square feet. Right-of-way impacts for 2M were estimated at 91,000 square feet.
- **Capital Cost:** Alternative 1-M was the highest cost alternative at \$4.9 million, which was expected due to the large amount of right-of-way required for this alternative. Similarly, 3-M was the lowest cost alternative (\$3.0 million). Capital costs for 2-M were estimated at \$3.6 million.

# 2006

## Table 5 - Middle Segment Evaluation Matrix

Impact Area	Existing Conditions
Safety <sup>(1)</sup>	--
Mobility <sup>(2)</sup>	50 mph LOSA
	28 mph LOSC
Access <sup>(3)</sup>	Yes
Intersection Operations	Some problems
Wetland Impacts <sup>(4)</sup>	--
Right-of-Way Impacts <sup>(5)</sup>	--
Capital Cost	--
• Cost increase over 1-M	--
Pedestrian Environment	--
Trails	Both sides of YDR
Transit Environment <sup>(7)</sup>	--

	2030				Recommended Alternative (Fig 15)
	No-Build	1-M Fig 12	2-M Fig 12	3-M Fig 12	
Safety <sup>(1)</sup>	Redesign	Improved	Similar	Similar	Similar
Mobility <sup>(2)</sup>	50 mph LOSA	50 mph LOSA	46 mph LOSA	46 mph LOSA	46 mph LOSA
	28 mph LOSC	33 mph LOSC	30 mph LOSC	30 mph LOSC	30 mph LOSC
Access <sup>(3)</sup>	Yes	Yes	Yes	Yes	Yes
Intersection Operations	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable
Wetland Impacts <sup>(4)</sup>	--	No	No	No	No
Right-of-Way Impacts <sup>(5)</sup>	--	--	--	--	91,000
Capital Cost	--	\$1.6 Million	\$1.8 Million	\$2.0 Million	\$1.8 Million
• Cost increase over 1-M	--	--	\$0.2 Million	\$0.3 Million	\$0.3 Million
Pedestrian Environment	Similar	Similar	Improved <sup>(6)</sup>	Improved <sup>(6)</sup>	Improved <sup>(6)</sup>
Trails	No change	No change	No change	No change	No change
Transit Environment <sup>(7)</sup>	Improved travel times	Improved travel times	Similar	Similar	Similar

<sup>(1)</sup> When compared to existing safety conditions.

<sup>(2)</sup> Estimated average speed for an automobile traveling between Lexington Avenue and Mike Collins.

<sup>(3)</sup> Reasonable path to/from CSAH 28 available for motorists traveling to/from properties north and south of CSAH 28.

<sup>(4)</sup> Likelihood of negatively affecting wetlands.

<sup>(5)</sup> Estimated square feet of private property required to construct elements of this alternative.

<sup>(6)</sup> Additional protected crossing across CSAH 28 provided for pedestrians.

<sup>(7)</sup> Bus travel time on CSAH 28.

- ***Pedestrian Impacts:*** The first two alternatives improve conditions for pedestrians by providing an additional signal on CSAH 28 at Columbia/Wescott Woodlands. This provides an additional protected crossing of CSAH 28 for pedestrians, including pedestrians accessing the transit facility at Dakota Woodlands. Alternative 3-M, which includes a signal at the realigned intersection in front of the Faithful Shepherd School, provides for improved pedestrian access to the school.
- ***Trail Impacts:*** The widening of CSAH 28 through Lexington Avenue for all alternatives will affect the existing trail on both the north and south sides of CSAH 28. Each alternative will involve reconstruction of the trails; therefore none of the alternatives will significantly affect the trail system.
- ***Transit Impacts:*** Alternative 1-M showed the most significant increase in mobility along the corridor. Therefore this alternative would provide transit benefits by increasing the reliability and travel speeds for buses.

#### 4.7 East Segment Evaluation Results

A detailed evaluation matrix for the east segment alternatives is presented in Table 6. Results of the evaluation process are summarized below:

- ***Safety:*** Safety conditions for 1-E are similar to existing safety conditions along the corridor. Safety is improved by restricting left turns from Mike Collins/Ivy Lane onto CSAH 28; however the installation of an additional traffic signal at Elrene Road has safety implications given the higher crash rates at signalized intersections. Safety conditions are improved for 2-E by restricting access to right-in right out at Ivy Lane, and closing the south entrance to Gopher Resources. Safety conditions are reduced for Alternative 3-E because this alternative places two additional signals on the corridor at Mike Collins/Ivy Lane and the realigned Elrene Road.
- ***Mobility:*** Mobility is reduced in comparison to existing conditions for all three alternatives, which can be attributed to the need for additional traffic control and development pressure along the corridor. Alternative 1-E has the greatest reduction in travel speeds for both eastbound and westbound traffic, with a decrease in average speed of approximately 10 mph for both directions. The eastbound level of service for 1-E is LOS E. This is comparable to average travel speeds and level of service for the no-build conditions for this segment. Average travel speeds and segment level of service for alternatives 2-E and 3-E are improved relative to the no-build conditions.
- ***Access:*** All three alternatives provide a reasonable path to and from CSAH 28 for motorists traveling to and from properties north and south of CSAH 28. Facilities located along Mike Collins Drive may be accessed by Lone Oak Road connections.

# 2006

**Table 6 - East Segment Evaluation Matrix**

Impact Area	Existing Conditions
Safety <sup>(1)</sup>	--
Mobility <sup>(2)</sup>	Eastbound 28 mph LOS C
	Westbound 32 mph LOS C
Access <sup>(3)</sup>	Yes
Intersection Operations	Acceptable
Wetland Impacts <sup>(4)</sup>	--
Right-of-Way Impacts <sup>(5)</sup>	--
Capital Cost	--
• Cost increase over 1-E	--
Pedestrian Environment <sup>(6)</sup>	--
Trails	On both sides of YDR
Transit Environment <sup>(7)</sup>	--

2030					2030
No-Build	1-E Fig 13	2-E Fig 13	3-E Fig 13	Recommended Alternative (Fig 16)	
Similar	Similar	Improved	Improved	Improved	
24 mph LOS E	24 mph LOS E	24 mph LOS D	22 mph LOS D	24 mph LOS D	
25 mph LOS D	25 mph LOS E	25 mph LOS D	23 mph LOS D	25 mph LOS D	
Yes	Yes	Yes	Yes	Yes	
Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
No	No	No	No	No	
--	--	108,000	--	64,200	
--	\$0.5 Million	--	\$2.7 Million	\$2.3 Million	
--	--	\$2.2 Million	\$2.2 Million	\$1.8 Million	
Similar	Improved	Improved	Improved	Improved	
No change	No change	No change	No change	No change	
Similar	Similar	Similar	Similar	Similar	

(1) When compared to existing safety conditions.  
 (2) Estimated average speed for an automobile traveling between Mike Collins and Dodd Road.  
 (3) Reasonable path to/from CSAH 28 available for motorists traveling to/from properties north and south of CSAH 28.  
 (4) Likelihood of negatively affecting wetlands.  
 (5) Estimated square feet of private property required to construct elements of this alternative.  
 (6) Additional protected crossing across CSAH 28 provided for pedestrians.  
 (7) Bus travel time on CSAH 28.

- **Intersection Operations:** Both the Dodd Road/CSAH 28 and the Gopher Resource entrance/CSAH 28 intersections operate at an LOS F during the p.m. peak period in Alternative 1-E. All intersections operate at an acceptable level of service during the p.m. peak period for both alternatives 2-E and 3-E.
- **Wetland Impacts:** None of the alternatives were likely to negatively affect wetlands.
- **Right-of-Way Impacts:** Alternative 1-E did not have significant right-of-way impacts to private property, as no new roadways are proposed for this alternative. Alternative 3-E required the largest amount of right-of-way due to the realignment of Elrene Road. This alternative required 186,000 square feet of private property. Alternative 2-E required 108,000 square feet of right-of-way.
- **Capital Cost:** Given that Alternative 1-E did not require construction of a new roadway alignment; this alternative was the lowest cost alternative at \$0.5 million. At \$3.2 million, Alternative 2-E was the highest cost alternative due to the need for additional traffic control at the intersection of Elrene Road and the private roadway to Thomson (West). Capital costs for 3-E were estimated at \$2.7 million.
- **Pedestrian Impacts:** Alternative 3-E provides the most significant benefits to pedestrians because the signals at Mike Collins/Ivy Lane and realigned Elrene Avenue provide for two protected crossings of CSAH 28 for pedestrians. However, both 1-E and 2-E provide one additional protected crossing for pedestrians with the signal at Elrene Avenue and CSAH 28.
- **Trail Impacts:** None of the alternatives will have a significant negative impact on existing trails along CSAH 28.
- **Transit Impacts:** Mobility is reduced in comparison to existing conditions for all three alternatives, which can be attributed to the need for additional traffic control and development pressure along the corridor. Alternative 1-E has the greatest reduction in travel speeds for both eastbound and westbound traffic, which would negatively affect travel speeds for buses on the corridor.

#### 4.8 Preferred Alternatives (as presented at the third open house)

Based on the alternative development and evaluation process described above, a 'preferred alternative' was developed for each segment:

- West Segment – Alternative 2-W: two-phase signal at Promenade, closure of the median at O'Leary, modifications to the Denmark intersection and construction of a partial access intersection at Yankee Place.
- Middle Segment – Alternative 2-M: the closure of the median at Discovery Road, and full access at Columbia Drive (assumes the construction of a City street connecting Discovery Road and Columbia Drive).

- East Segment – Alternative 2-E: installation of a traffic signal at Elrene, construction of a partial access intersection at Mike Collins, construction of a city street connecting Borchert Lane to Dodd Road and closure of the median at the entrance to Gopher Resources and the Lo-Nidy site.

Although described as ‘preferred’, these alternatives were not designated as final alternatives to be constructed, but became the basis for continued discussions with the public, the Egan City Council and affected businesses, property owners, including the Faithful Shepherd School, BCBS, Gopher (see stakeholder meeting list Appendix B).

## 4.9 Public Response to Preferred Alternatives

A third Open House was held on December 7 to present the preferred alternatives to the public, and to obtain feedback on these alternatives. Approximately 40 people attended the Open House. Comments on the preferred alternative received at this open house are summarized below:

- There is support for the preferred alternative because it addresses recent growth.
- Concern was raised about the speeds on CSAH 28. The suggestion was made that CSAH 28 should have a 45 mph speed limit for its entire length.
- Some residents are concerned that the preferred alternative will require residents of the townhouses on CSAH 28 west of Ivy Lane to weave through the neighborhood. Examine need for traffic control, such as an all-way stop, on Ivy Lane to Trails End.
- A noise study should be completed to determine the additional traffic noise resulting from traffic increases on CSAH 28. Traffic noise affects property values for condominiums located on CSAH 28. Consider a noise wall, window replacement, or compensation for these residents.
- The Borchert Lane connection does not need to cross the railroad tracks and connect to Dodd Road. Most truck traffic travels to I-35E via CSAH 28 or north to Lone Oak Road and on to I-494. This option is unnecessary because Lone Oak is lightly traveled and is a right turn for those who need this option.

In general, the public reacted favorably to the preferred alternatives because of the improvements to safety and the limited impact on mobility. However, specific concerns were raised by several businesses and the Faithful Shepherd School that required additional attention. The specific concerns are as follows:

### West Segment

- In the West segment, Blue Cross Blue Shield had concerns regarding the partial access intersection at Promenade with reduced movements to the Blue Cross Blue Shield property.

### **Middle Segment**

- Skyline Displays expressed concern regarding the closure of the median at Discovery Road because of a perceived reduction in movements to their front entrance for visitors to the facility.
- Faithful Shepherd Catholic School expressed significant concern over the impacts on their facility of the proposed frontage road connecting Discovery Road and Columbia Drive.
- Don Stevens also expressed concern over how the proposed frontage road would affect their business.

### **East Segment**

- In the East segment, Gopher Resources, which also owns the site being developed under the name Lo-Nidy, expressed concern over the proposed closure of the median at the Gopher Resources/Lo-Nidy entrances.

## **4.10 Alternative Refinements**

As a follow up to the public open house and the November 21 City Council meeting, members of the study team met with representatives of each of the above referenced businesses as well as the Faithful Shepherd Catholic School to discuss these issues and to devise alternative solutions that would reduce the perceived impact on the businesses and the school. A complete list of all of the meetings is attached in Appendix B. As a result of these discussions, continued development/refinement of roadway alternatives and additional evaluation took place, which resulted in the following modifications to the preferred alternatives:

- In the West segment, Blue Cross Blue Shield (BCBS) generally consented to the concept of a public road as the south leg of a signalized intersection at CSAH 28 and Promenade. While no detailed design has yet been developed, the concept for this new roadway would be to shift the existing intersection slightly to the east and bring the new road over to the eastern property boundary of the BCBS property. The new roadway would connect to Town Centre Drive and could also provide access to the businesses on the east side of the road that currently have access to O'Leary Lane.
- In the Middle segment, no consensus could be achieved on the location of a new city street connection in the Discovery Road area. Therefore the proposed city street connecting Discovery Road and Columbia Drive was dropped from consideration.

The necessity of closing the median at Discovery Road and the construction of the U-turn is based upon the forecast volumes for 2030. In consultation with the business owners in the area, a long-term solution has been devised. In addition, recognizing that the long-term solution is not required in the near term, an immediate solution has been devised that addresses the EB left-turn queuing issue while deferring the need to close the median entirely.

#### Long-Term Solution

As a long term solution, a U-turn is proposed approximately 1,400 feet east of Lexington Avenue. This U-turn would be designed to accommodate westbound trucks and would be coordinated with the initiation of the westbound through lane.

This location was selected because it is far enough east of the Lexington intersection to allow an eastbound left turn lane, has good sight distance and could benefit from gaps in the westbound traffic flow created if Columbia Drive were to be signalized in the future. The location of this U-turn would also allow the construction of a one-way roadway between the Don Stevens facility and the Eagandale Crossing building if the landowners in the vicinity come to a consensus on this approach to improving access.

#### Near-term Solution

As a near term solution, certain traffic management strategies can be employed to defer the complete closing of the median and the implementation of the U-turn. In order to reduce the impact of the morning school traffic, in particular the extended queues in the EB left turn lane, the County can work with the school to better distribute traffic between Discovery Road and Columbia Drive. A temporary intersection may be provided that only allows the EB left turn to maintain access to businesses in the Discovery Road area.

Predicting exactly when traffic volumes will rise to levels that require the complete closure of the median is difficult because it is predicated upon continued commercial development in the corridor. However, the County and City should be prepared to implement the long term strategy in this area when the increase in WB volume and decrease in gaps necessitates a change.

- In the East segment, Gopher Resources has agreed to the relocation of their access to 300 feet to the west. This new intersection will be constructed as a three-quarter style allowing left turns from CSAH 28. The south leg of this new intersection will provide access to the Lo-Nidy site.

Based upon the changes described above, final alternatives and recommendations were reached which are described in the following section.

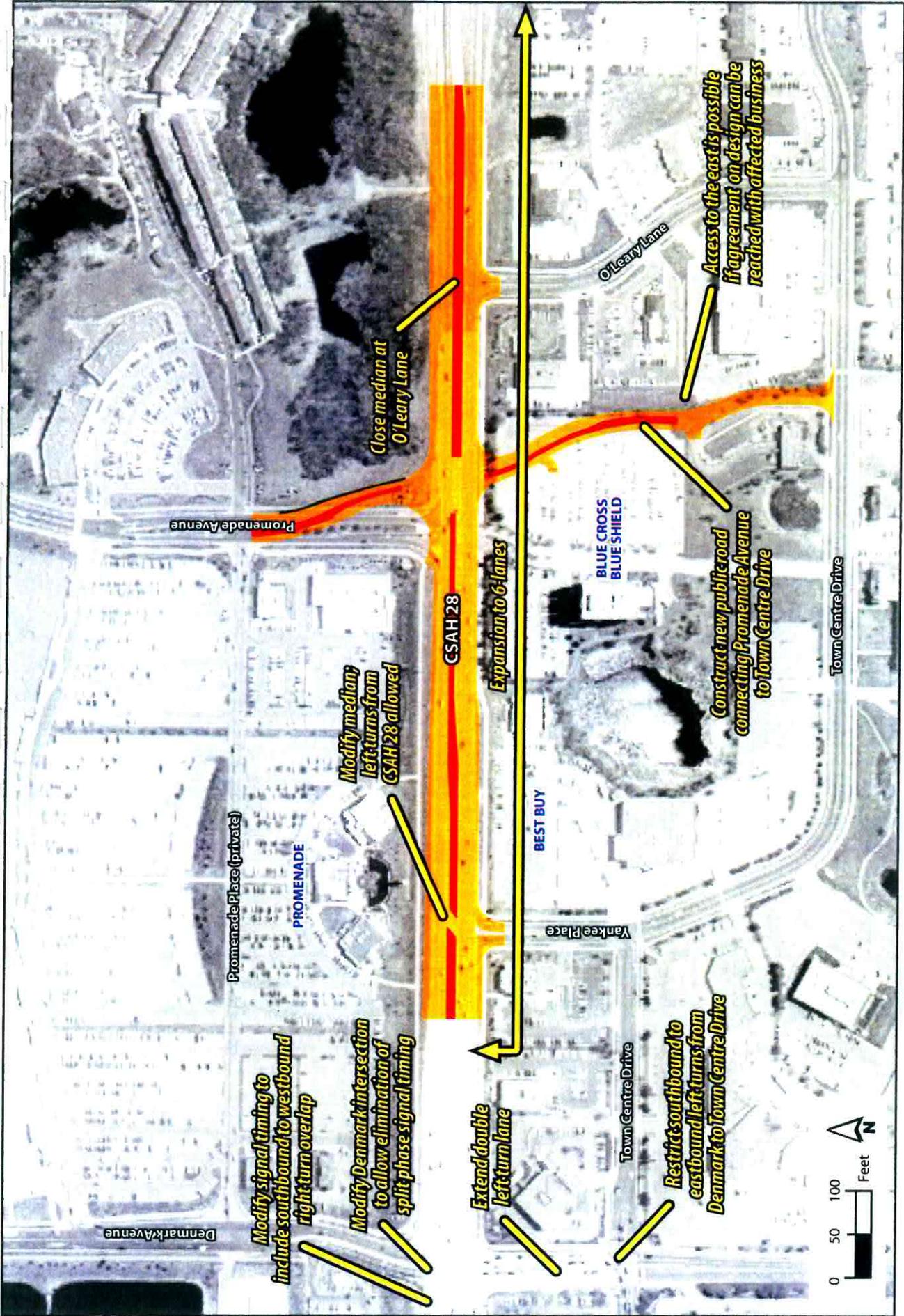
## 5.0 STUDY FINDINGS AND RECOMMENDATIONS

Based on the alternative development and evaluation process described in Section 4, follow up public involvement and direct communication with affected stakeholders, a 'final recommendation' was developed for each segment.

### 5.1 West Segment Recommendation

The recommendation for the West Segment includes the following improvements and/or modifications (Figure 14):

- Construct a third through lane on CSAH 28.
  - In the eastbound direction, the new third through lane will extend from the existing third lane that now ends east of Denmark to 1200-1300 feet east of the Lexington Avenue intersection.
  - In the westbound direction, the new third through lane will begin 1,200 feet east of the Lexington Avenue intersection and extend to the existing third through lane that now begins east of Denmark Avenue. (Note: If the closure of the median at Discovery Drive is deferred, as described below in the Middle Segment Recommendation, the third westbound through lane would begin at Discovery Drive until the long-term recommendation is implemented.)
- Modify the geometrics at the Denmark Avenue intersection to allow the traffic signal to operate with concurrent side street movements. This primarily involves modifications to the medians on the north and east legs of the intersection. This traffic signal should also allow a SB right-turn overlap concurrent with the mainline EB/WB left-turn phase.
- Reconstruct the Denmark Avenue/Town Centre Drive intersection to eliminate the southbound left turn lane and increase the length/capacity of the northbound dual left turn lanes at the Denmark Avenue/CSAH 28 intersection. This will make it easier for motorists to get onto westbound CSAH 28 from the Town Centre Drive commercial area.
- Reconstruct the Yankee Place intersection to prohibit left turns out of Yankee Place on to westbound CSAH 28. Left turns from CSAH 28 to Yankee Place will still be allowed. Right turns in and right turns out of Yankee Place would also be allowed. Traffic control would be limited to a stop sign on Yankee Place to control the NB to EB right turn.
- Reconstruct the Promenade Avenue intersection to accommodate a traffic signal and a new public roadway to the south that would connect to Town Centre Drive. The timing of the installation of the traffic signal will be determined by means of an engineering study.



Support/5772\_CSAH 28/Report/Figures/5772\_ReportFiguresHOR.qxd

**WEST SEGMENT RECOMMENDATION**  
 CSAH 28 (Yankee Doodle Road) Corridor Study  
 Dakota County

**Figure 14**

- Close the median at O'Leary Lane. Right turns in to and right turns out of O'Leary Lane would still be allowed. Traffic control would be limited to a stop sign on O'Leary Lane to control the NB to EB right turn.
- Reconfigure the Lexington Avenue intersection to accommodate the additional through lanes on CSAH 28.

Implementation of these improvements will have the following effects:

- Average speed for through traffic on CSAH 28 will be maintained at a high level.
- Safety is improved because the hazardous conditions at all current full access side roads are addressed and operation at Denmark Avenue is improved.
- Access to the commercial properties, north and south of CSAH 28, is not reduced and in many cases improved because CSAH 28 and the remaining intersections operate more efficiently.
- The overall cost of improvements is kept to a minimum.

The above recommendations assume the construction of a new city street connecting the CSAH 28/Promenade Avenue intersection to Town Centre Drive. If the provision of this street is not likely to occur before completion of the CSAH 28 improvements, the CSAH 28/Promenade Avenue intersection should be constructed according to the following specifications:

- The new intersection will be constructed at the location of the existing intersection.
- The following movements will be prohibited:
  - Westbound to southbound left turns.
  - Northbound to westbound left turns.
  - Southbound to eastbound left turns.
- Crossing traffic will also be prohibited.
- The eastbound to northbound left and westbound through traffic will be signal controlled. The eastbound through move will not be signal controlled.
- Right-in/right-out access will be allowed at Promenade Avenue and at the Blue Cross/Blue Shield driveway.

## 5.2 Middle Segment Recommended Alternative

The recommendation for the Middle Segment includes the following improvements and/or modifications (Figure 15):

- Construct a third through lane in each direction of the Lexington Avenue intersection to 1,200 feet east of Lexington Avenue for westbound lanes and 1,200-1300 feet for eastbound lanes. The result will be three through lanes in each direction on CSAH 28 transitioning to two east of Discovery/Golfview Drive. (Note: If the closure of the median at Discovery Drive is deferred, as described below, the third westbound through lane would begin at Discovery Drive until the long-term recommendation is implemented.)
- Close the median at the Discovery Road/Golfview Drive intersection. This is necessary because the six-lane to four-lane transition section extends through the intersection. It is also necessary because the westbound to southbound left turn lane at the Lexington Avenue intersection needs to be lengthened to accommodate turning traffic. Right turns into and right turns out of both Discovery Road and Golfview Drive would still be possible. The timing of this modification should be determined by monitoring EB traffic on CSAH 28, both in terms of volume and in the availability of gaps. This modification may also be necessary as a response to development proposals that would be expected to significantly increase traffic in this area.
  - To address existing problems but defer the necessity of closing the median, the Discovery Road/Golfview Drive intersection may be reconfigured to restrict left turns from the side streets and from westbound CSAH 28 but continue to allow the EB to NB left turn to Discovery Road. This action will require working with the Faithful Shepherd Catholic School to redirect some of the traffic bound for the school in the morning to better balance the left turning traffic between the Discovery Road intersection and the Columbia Drive intersection. This design should also allow the County to close the median and lengthen the WB to SB left turn lanes at Lexington Avenue without modifying other roadway elements.
- Construct a U-turn 1,440 feet east of Lexington Avenue. This U-turn will be designed to accommodate westbound truck traffic. It will also be coordinated with the initiation of the third westbound through lane. This improvement will be necessary when the median at Discovery Road is closed.

When implemented, the U-turn location will be far enough east of the Lexington intersection to allow an eastbound left turn lane, will have good sight distance and will benefit from gaps in the westbound traffic flow created by the Columbia Drive traffic signal. The location of this U-turn would also allow the construction of a one-way roadway between the Don Stevens facility and the Eagandale Crossing building if the landowners in the vicinity come to a consensus on this approach to improving access.

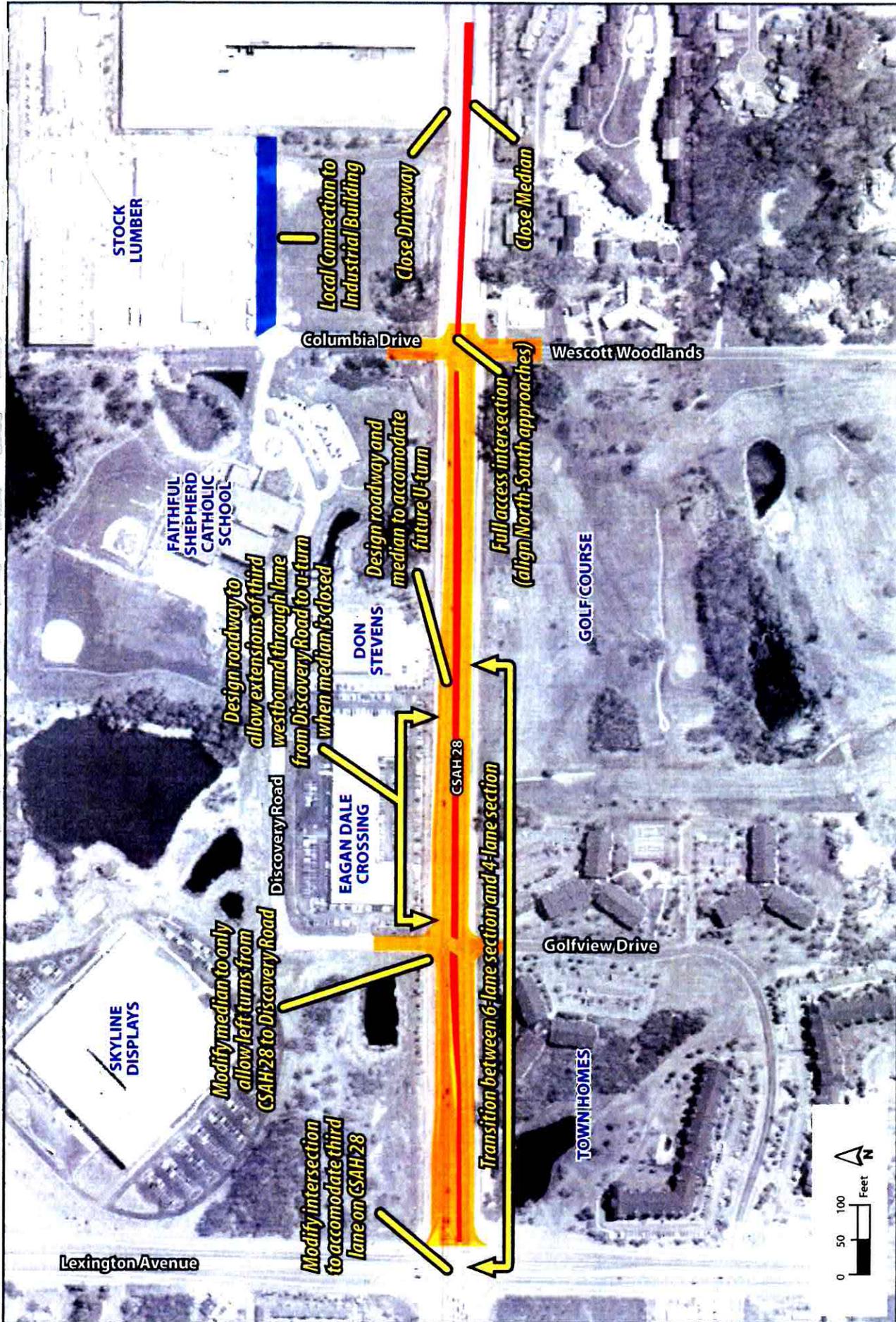


Figure 15

**MIDDLE SEGMENT RECOMMENDATION**

CSAH 28 (Yankee Doodle Road) Corridor Study

Dakota County



5772  
041007

- Close the driveway to the former Super-Valu facility and provide a connection to Columbia Drive.
- Reconstruct the CSAH 28/Columbia Drive/Wescott Woodlands intersection to accommodate a traffic signal. The timing of the installation of the signal would be determined by means of an engineering study.

Implementation of these improvements will have the following effects:

- Average speed for through traffic on CSAH 28 will be maintained at a high level.
- Safety on the corridor will be improved because the number of access points and conflicting turn movements will be reduced.
- Access to the residential properties to the south will be maintained.
- Although there will be some increase in travel time for some movements, the businesses and school on the north side of CSAH 28 will still have reasonable access to the public roadway system.
- The overall cost of improvements will be kept to a minimum.

### **5.3 East Segment Recommended Alternative**

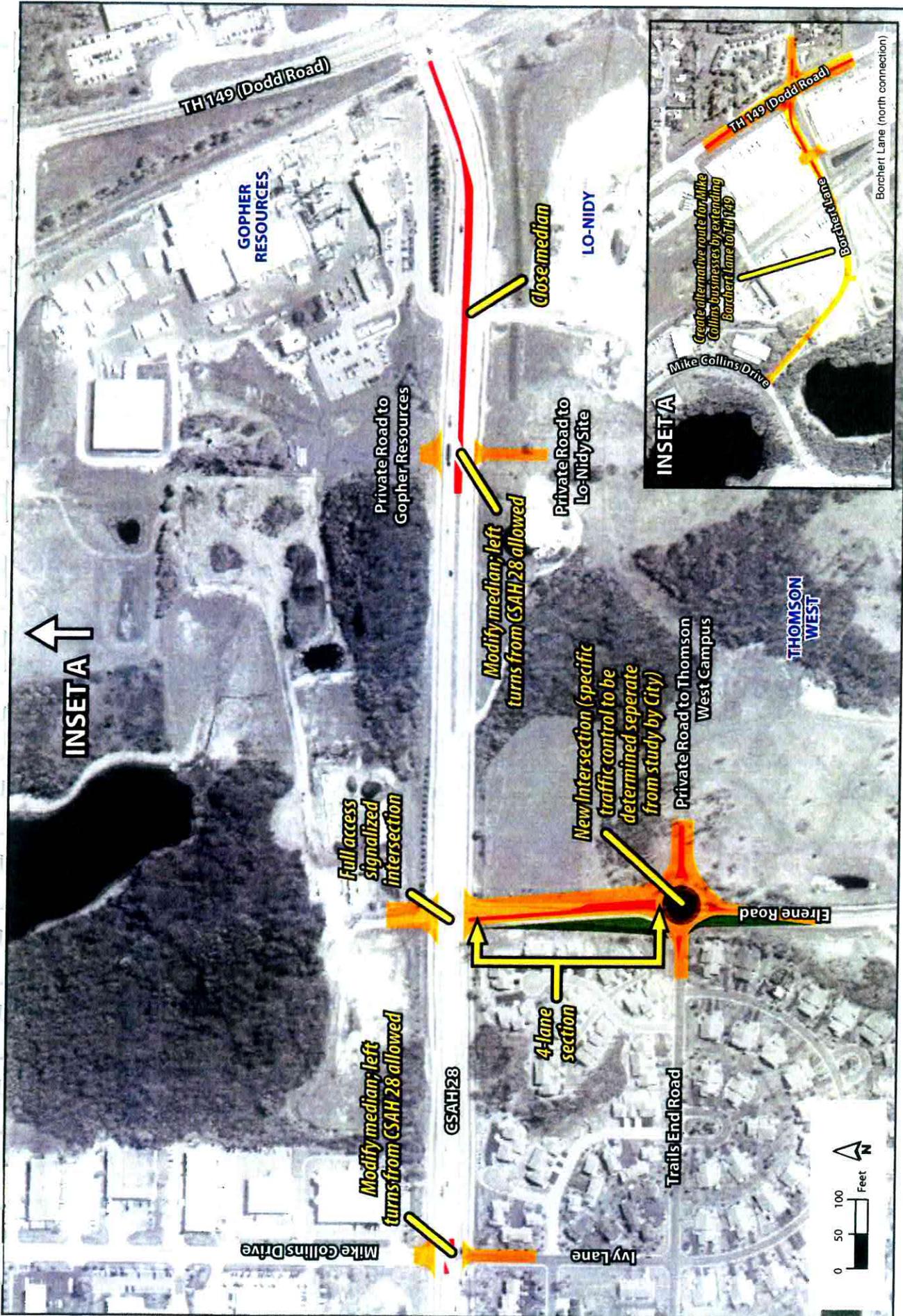
The recommendation for the East Segment includes the following improvements and/or modifications (Figure 16):

- Reconstruct the Mike Collins/Ivy Lane intersection to prohibit left turns from either Mike Collins Drive or Ivy Lane on to CSAH 28. Crossing traffic would also be prohibited. Right turns into and right turns out of both Mike Collins Drive and Ivy Lane would still be allowed.
- Reconstruct the CSAH 28/Elrene intersection to accommodate a traffic signal. The timing of the installation of the signal would be determined by means of an engineering study. If not necessary under existing conditions, the traffic signal should be installed in coordination with the Thomson West expansion plans.
- Upgrade Elrene Road to four lanes between CSAH 28 and Trails End Road in coordination with the Thomson (West) expansion plans. This includes reconstruction of the Elrene Road and Trails End Road intersection to allow the construction of a private roadway to serve the Thomson West campus. (Note: If the Thomson West expansion plans do not occur, this improvement will not be necessary.)

- Close the existing median at the Gopher Resources and Lo-Nidy site. Provide a median opening at a new location about 300 feet to the west of the existing location. This new intersection should be constructed as a three-quarters style intersection wherein left turns from CSAH 28 to the north and south will be allowed but left turns and through movements from the side streets will be restricted. Right turns in and right turns out of both sites would still be allowed. The timing of this modification will be determined by an engineering study based on safety conditions and the timing of improvements to be made on the Gopher Resources and Lo-Nidy sites. Gopher Resources will cooperate with the City and the County to determine when this modification will be made.
- A new connection from Borchert Lane to Dodd Road could be constructed to provide additional access to Dodd Road to/from the commercial area along Mike Collins Lane. Although the existing SB to EB left turning volume is low at the CSAH 28/Mike Collins Lane intersection, this new connection would provide an alternative path to traffic seeking to go southbound on Dodd Road. Traffic to northbound Dodd Road or TH 55 already uses other routes.

Implementation of these improvements will have the following effects:

- Average speed for through traffic on CSAH 28 is maintained at the highest feasible level because the number of traffic signals on CSAH 28 is kept to a minimum.
- Safety is maintained because uncontrolled conflicting turn traffic is reduced and the number of additional traffic signals is kept to a minimum.
- Access to the commercial and residential properties, north and south of CSAH 28, is maintained and in some cases improved because CSAH 28 and the remaining intersections operate more efficiently.
- The overall cost of improvements is kept to a minimum.



Support/5772\_CSAH 28/Report/Figures/5772\_ReportFiguresHOR.qxd

**EAST SEGMENT RECOMMENDATION**

CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County



5772  
041007

**Figure 16**

## 6.0 IMPLEMENTATION

The corridor study has identified improvements for the entire length of CSAH 28 from I-35E to TH 149. However, not all of the improvements are required immediately. The following are recommendations for staging the improvements.

- A single project extending from the CSAH 28/Denmark Avenue intersection to one-quarter mile east of Lexington needs to be designed and constructed in the near term.
  - The safety issue at Promenade Avenue needs to be addressed.
  - The congestion issue at Denmark Avenue/Town Centre Drive needs to be addressed.
  - The third through lane from east of Denmark Avenue to east of Discovery Road needs to be added to stay ahead of growing traffic.
- The construction of a new city street from CSAH 28 to Town Centre Drive needs to be pursued and constructed in coordination with the reconstruction of the CSAH 28/Promenade Avenue intersection.
- An intersection control evaluation should be conducted at the CSAH 28/Elrene Avenue intersection to determine if a traffic signal is required under existing traffic conditions.
- The County should continue to monitor all other full access intersections to determine when an upgrade in intersection control may be necessary. Any change in traffic control should be made as a result of an engineering study.
- Expansion of the Thomson West campus and construction of the connecting roadway to Elrene needs to be coordinated with the installation of a traffic signal at the CSAH 28/Elrene intersection (if not installed prior to development based on existing traffic conditions), the expansion of Elrene Avenue to four lanes from CSAH 28 to the new intersection, the reconstruction of the CSAH 28/Mike Collins intersection and the reconstruction of the CSAH 28/Columbia Drive intersection (if not already in place). The expansion of the Thomson West campus may also require the closing of the median at Discovery Road/Golfview if it is still open.
- The median opening at the Gopher Resources driveway should be closed and a new intersection developed about 300 feet to the west in coordination with improvements to be made at both the Gopher Resources and Lo-Nidy sites. This would require that Gopher Resources follow through with the County's permitting process.

- The Borchert Lane connection could be implemented in the near term to create alternate routes for businesses in the area.
- Projects to address safety/management concerns could be done along the corridor as need, funding or development occurs.

## **7.0 APPENDICES**

**Appendix A – Public Involvement Plan**

**Appendix B – List of Meetings with Stakeholders on the Corridor**

**Appendix C – Public Open House Summaries**

**Appendix D – Traffic Forecasting Methodology**

**Appendix E – Traffic Analysis Memo**

**Appendix F –Turning Movement Volumes for Alternatives**

**Appendix A**  
**Public Involvement Plan**

**Public Involvement Plan**  
for  
**County State Aid Highway 28 in Eagan**  
**From Denmark Avenue to TH 149**  
**Corridor Study**

Prepared for:  
Dakota County  
City of Eagan

August 2006

## Table of Contents

<b>Introduction .....</b>	<b>1</b>
<b>Goals and Objectives of Public Involvement Plan .....</b>	<b>1</b>
<b>Public Involvement Plan – Key Elements .....</b>	<b>2</b>
Element 1 – Project Management Team (PMT)	
Element 2 – Project Web Page	
Element 3 – Press Releases	
Element 4 – Newsletters	
Element 5 – Public Information Meetings	
Element 6 – Small Group Meetings	
Element 7 – Official Board/Council Meetings	
Element 8 – Incorporate Public and Agency Input into the Design	

## Appendices

- Appendix A – Project Management Team (PMT)
- Appendix B – News Media List
- Appendix C – Key Stakeholders

## **INTRODUCTION**

Dakota County and the City of Eagan are studying CSAH 28 (Yankee Doodle Road) from Denmark Avenue to TH 149 to determine what improvements should be made to ensure that the roadway continues to provide good mobility for Dakota County residents while allowing sufficient access to adjacent properties.

The current roadway configuration has several intersections that do not meet the County's intersection spacing guidelines, provide direct access to private property and/or are not in alignment with other access locations. With continued traffic growth and development in the corridor, these deficiencies will lead to increasing concern for the roadway's safety and functionality. Dakota County and the City of Eagan are seeking, through this study, to develop a roadway design that not only provides sufficient capacity for the foreseeable future but will also identify access locations and a potential frontage/backage road system that will give direction for existing and future development.

The public involvement approach with this project will include working closely with stakeholders to balance transportation needs (e.g., safety and mobility for CSAH 28 users) with the needs of the community (e.g., good traffic circulation to businesses, space for safe pedestrian crossings, and attractive aesthetic treatments). Stakeholders, including the public, businesses, and agencies, will be given the opportunity for input in developing and evaluating project alternatives.

This Public Involvement Plan summarizes key aspects of our approach to encouraging business, council and board participation by members of the public, the business community and elected officials.

## **GOALS AND OBJECTIVES OF PUBLIC INVOLVEMENT PLAN**

Public involvement provides the public and agencies with continuing opportunities to be involved. Input from affected agencies and the public also lends credibility to key decisions made during the project development process. Making timely, accurate, and useful information available to both key decision-makers and the general public will help to achieve the following goals and objectives of public involvement:

- 1. Inform, obtain input and gain support.**
- 2. Achieve informed agreement.**

These objectives will remain consistent over the course of the public involvement effort. The intended outcome is an informed agreement among decision makers and the public on the preferred design concept layout for this segment of the corridor.

The Public Involvement Plan for Dakota County CSAH 28 in the City of Eagan contains the following key elements:

### **Element 1 – Project Management Team**

**Purpose:** The Project Management Team (PMT) will provide input to Dakota County, the City of Eagan, and the Consultant Team on technical issues and concerns, design treatment elements and options.

**Description:** The Project Management Team will include representatives from the County, City and the consultant team. The members will be expected to share their perspective with the Project Management Team, as well as take information back to the groups they represent.

The PMT's role is to provide input and advice on technical issues, design and alternative evaluation and selection.

The consultant team will lead the preparation and facilitation of the Project Management Team meetings and distribute meeting notices and summaries for Project Management Team meetings to be held in the Dakota County Government Center.

**Schedule:** The Project Management Team meetings will be held on a monthly basis.

### **Element 2 – Project Web Page**

**Purpose:** To provide user friendly, easy Internet access to information about the project.

**Description:** Dakota County will be the lead agency in coordinating the web page. The web page will list project contact persons, notices for public meetings, news releases and provide links to .pdf versions of graphic materials such as maps, drawings and layouts of alternatives.

**Schedule:** The project web page should become available by July 2006.

### **Element 3 – Press Releases**

**Purpose:** To provide written information about the project to the media as a way of conveying general information to the public and generating interest in scheduled public meetings.

**Description:** News releases will usually contain announcements of upcoming open houses and other public involvement opportunities as well as the current status of the project development, and list the web site and contact person information. The consultant team will be responsible for drafting and, if necessary, printing press releases. The County will be responsible for distribution.

**Schedule:** Prior to public information meetings throughout the project development.

## **Element 4 – Newsletters**

**Purpose:** To communicate project information to potentially affected interests (PAI's) in advance of public meetings.

**Description:** Newsletter describing the project, the project purpose and the progress of the study will be prepared in advance of each public open house. The newsletter will list dates and times of upcoming meetings and the next steps in the study process.

The consultant team will prepare and print newsletters, PMT member agencies will identify and provide contact information for the parties to receive the newsletter and then distribute the newsletter.

**Schedule:** There will be three mailings timed to reach recipients approximately two weeks prior to the public meetings.

## **Element 5 – Public Information Meetings**

**Purpose:** To gather input and inform the community and other stakeholders of the study's progress.

**Description:** Three public information meetings will be held to gather input and inform the community and other stakeholders of the study's progress. These meetings will be open house style, but may also include a short presentation. There will be numerous displays with information at these meetings including layouts of the project options to inform the public and also to gather input on the options. The consultant team will have primary responsibility for planning and conducting these meetings.

**Schedule:** The first public information meeting will be held in July, the second in early October, and the third in December 2006.

- At the first meeting, the reasons for the corridor study and the particular challenges of the project will be explained to the community.
  - Individuals attending the public meeting will be asked to identify specific issues that they feel should be addressed in the study.
  - The focus will be on identifying problems and discussing possible approaches to solving the problem.
- The second meeting will be used to present roadway improvement alternatives and receive feedback. A summary of comments from the first public meeting will also be available.
  - Individuals attending the public meeting will be asked to provide feedback on the various alternatives presented.
  - The focus will be on listening to concerns that members of the public have with any of the alternatives presented and identifying which alternatives received the most favorable comment.

- The preferred alternative will be presented at the third meeting. A summary of comments from the first and second public meetings will also be provided along with a tentative timeline for follow-up actions.
  - Individuals attending the meeting will be asked to provide feedback on the preferred alternative.
  - The focus of the meeting will be listening to any concerns that the public has on the preferred alternative.

## **Element 6 – Small Group Meetings**

**Purpose:** To solicit input from key businesses or neighborhoods situated along the corridor.

**Description:** These will be one-on-one or small group discussions with businesses or residents to listen and understand the issues, generate alternative solutions, and to articulate and clarify the key issues affecting properties along the corridor.

**Schedule:** To be determined by the PMT (up to two meetings).

## **Element 7 – Official Board/Council Meetings**

**Purpose:** Assist Council/Board in project understanding and decision making.

**Description:** Through the course of the study, the consultant team will prepare and give presentations to the Eagan City Council and to the Dakota County Physical Development Committee. These presentations will describe the project, project purpose and progress of the study. Members of each body will be given the chance to provide input on the alternatives being studied as well as the overall project.

**Schedule:** Two presentations to the Eagan City Council and one presentation to the Dakota County Physical Development Committee. Dates will be determined by the PMT.

## **Element 8 – Incorporate Public and Agency Input into the Design**

**Purpose:** The purpose of conducting public involvement is to involve people and to incorporate their input into project decisions.

**Description:** Dakota County, the City of Eagan and the Consultant Team will maintain up to date documentation on feedback and input that is obtained during public involvement activities. As alternatives are developed and recommended, it is important they are endorsed by key stakeholders.

**Schedule:** Complete preliminary highway and landscape design by late December 2006.

## APPENDIX A

### Project Management Team (PMT)

This committee will provide technical expertise and advice to Dakota County, the City of Eagan and the consultant team.

<u>Representing</u>	<u>Name</u>	<u>Phone</u>	<u>Email</u>
<b>Dakota County</b>	Kristi Sebastian	952-891-7178	kristi.sebastian@co.dakota.mn.us
	Brian Sorenson	952-891-7122	brian.sorenson@co.dakota.mn.us
<b>City of Eagan</b>	Tom Colbert	651-675-5635	tcolbert@cityofeagan.com
	Russ Matthys	651-675-5637	rmatthys@cityofeagan.com
	Tim Plath	651-675-5643	tplath@cityofeagan.com
<b>SRF Consulting</b>	Jim Dvorak	763-475-0010	jdvorak@srfconsulting.com
	Frank Loetterle	763-475-0010	floetterle@srfconsulting.com
	Denny Eyer	763-475-0010	deyer@srfconsulting.com
	Pat Corkle	763-475-0010	pcorkle@srfconsulting.com

**APPENDIX B**  
**News Media List**

**Newspapers**

*Eagan This Week* –  
Erin Johnson (952) 846-2030 ..... [eagan.thisweek@ecm-inc.com](mailto:eagan.thisweek@ecm-inc.com)

*Eagan Sun Current* –  
Josh Nicols (952) 882-2462 ..... [jnichols@mnsunpub.com](mailto:jnichols@mnsunpub.com)

*Pioneer Press* –  
Meggen Lindsay (651) 228-5260 ..... [mlindsay@pioneerpress.com](mailto:mlindsay@pioneerpress.com)

*Star Tribune South* –  
Sarah Lemagie (612) 673-7557 .....

**Television Station**

*Burnsville-Eagan Community Television* –  
Dan Callahan (651) 882-8213 (before September 1, 2006)  
(952) 641-1355 (after September 1, 2006)

## **APPENDIX C**

### **Potential Affected Interests**

- Commuters (automobiles, motorcycles and trucks)
- Pedestrian and bicyclists
- Transit Providers (MVTA, School Districts)
- Businesses
  - Blue Cross
  - West Publishing
- Landowners and Residents/Tenants
- Community Services
  
- Government Staff
  - Dakota County
  - City of Eagan
- Legislators
  - State
  - Federal
- Media
- Resource Agencies

## **Appendix B**

### **List of Meetings with Stakeholders on the Corridor**

## **CSAH 28 Corridor Study Stakeholder Meetings**

**November 3, 2006**

**Blue Cross Blue Shield of Minnesota**

**Meeting held at BCBS; 1200 Yankee Doodle Road**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan  
Tim Plath, Transportation Engineer, City of Eagan  
Denny Eyler, Principal, SRF Consulting  
Frank Loetterle, Senior Associate, SRF Consulting

Blue Cross Blue Shield:

Roger Kleppe, Senior Vice President, Human Resources and Facilities Services  
Frank Fidler, Director, Real Estate and Facility Services  
Jim Paulet, Facilities Operations Manager  
Steve Merwin,

**November 6, 2006**

**Discovery Drive Businesses & School**

**Meeting held at Skyline Displays; 3355 Discovery Road**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan  
Tim Plath, Transportation Engineer, City of Eagan  
Denny Eyler, Principal, SRF Consulting  
Frank Loetterle, Senior Associate, SRF Consulting

Discovery Drive Businesses and School

Jim Zechmann, President, Don Stevens, Inc.  
David Meyer, Assistant Principal, Faithful Shepherd Catholic School  
Al Meinke, Facilities Manager, Skyline Displays

**November 15, 2006**

**Thomson Legal and Regulatory**

**Meeting held at Thomson, 610 Opperman Drive**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan  
Tim Plath, Transportation Engineer, City of Eagan  
Denny Eyler, Principal, SRF Consulting  
Frank Loetterle, Senior Associate, SRF Consulting

Thomson Legal and Regulatory

Thomas Walrath, Senior Director, Facility Management  
Jon Durand, Director, Facility Operations

**November 21, 2006**

**Gopher Resource Corporation**

**Meeting held at Gopher, 3385 South Highway 149**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan  
Tim Plath, Transportation Engineer, City of Eagan  
Denny Eyler, Principal, SRF Consulting  
Frank Loetterle, Senior Associate, SRF Consulting

Gopher Resources Corporation

David Kutoff, Lo Nidy/Gopher Resources  
John Tapper, Chief Operating Officer  
Kevin Murphy, Chief Financial Officer

**January 9, 2007**

**Blue Cross Blue Shield of Minnesota**

**Meeting held at BCBS; 1200 Yankee Doodle Road**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Tom Colbert, Director of Public Works, City of Eagan  
Russ Matthys, City Engineer, City of Eagan  
Tim Plath, Transportation Engineer, City of Eagan

Blue Cross Blue Shield:

**January 12, 2007**

**Faithful Shepherd Catholic School**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan

Faithful Shepherd Catholic School:

David Meyer, Assistant Principal, Faithful Shepherd Catholic School  
Brian Howard, Board Member, Faithful Shepherd Catholic School  
Peter Coyle, Larkin Hoffman-Faithful Shepherd Catholic School

**January 29, 2007**

**Blue Cross Blue Shield of Minnesota**

**Meeting held at BCBS; 1200 Yankee Doodle Road**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Tom Colbert, Director of Public Works, City of Eagan  
Russ Matthys, City Engineer, City of Eagan  
Tim Plath, Transportation Engineer, City of Eagan

Blue Cross Blue Shield:

**January 29, 2007**

**Faithful Shepherd Catholic School**

**Meeting held at Faithful Shepherd Catholic School**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Pat Corkle, Associate, SRF Consulting Group

Faithful Shepherd Catholic School:

David Meyer, Assistant Principal, Faithful Shepherd Catholic School  
Brian Howard, Board Member, Faithful Shepherd Catholic School  
Mike Spack, TDI

**January 29, 2007**  
**Don Stevens Enterprises**  
**Meeting held at Don Steven Enterprises**

Agency:  
Kristi Sebastian, Dakota County Traffic Engineer  
Tim Plath, Transportation Engineer, City of Eagan

Faithful Shepherd Catholic School:  
Dave Sutter  
Jim Zechman, TDI

**February 2, 2007**  
**Gopher Resource Corporation**  
**Meeting held at Gopher Resource Corporation**

Agency:  
Russ Matthys, City Engineer, City of Eagan

Gopher Resource Corporation:  
Kevin Murphy, Chief Financial Officer

**February 27, 2007**  
**Discovery Drive Property Owners**  
**Meeting held at Don Stevens Enterprises**

Agency:  
Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan  
Tim Plath, Transportation Engineer, City of Eagan

Discovery Drive Businesses and School  
David Meyer, Assistant Principal, FSCS  
Jim Benshoof, Wenck Associates  
Greg Korstad, Larkin Hoffman/Skyline Displays  
Al Meinke, Facilities Manager, Skyline Displays  
Dave DeSutter, Don Stevens, Inc.  
Brian Howard, FSCS  
Mike Spack, TDI  
Darlene Personius, First Industrial Realty

**March 12, 2007**  
**Discovery Drive Property Owners**  
**Meeting held at Don Stevens Enterprises**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Tim Plath, Transportation Engineer, City of Eagan

Discovery Drive Businesses and School  
Jim Benshoof, Wenck Associates  
Jim Zechman, TDI-Faithful Shepherd Catholic School  
Dave DeSutter, Don Stevens Inc.

**March 24, 2007**  
**Gopher Resource Corporation**  
**Meeting held at Gopher Resource Corporation**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan

Gopher Resource Corporation:

Kevin Murphy, Chief Financial Officer  
John Tapper, Chief Operating Officer  
Kevin Leach

**March 27, 2007**  
**Don Stevens Enterprises**  
**Meeting held at Don Stevens**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Pat Corkle, Associate, SRF Consulting Group

Don Stevens Corp.:

**March 27, 2007**  
**Blue Cross Blue Shield of Minnesota**  
**Conference Call**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan

Blue Cross Blue Shield:

Roger Kleppe, Senior Vice President, Human Resources and Facilities Services  
Frank Fidler, Director, Real Estate and Facility Services

**March 29, 2007**

**Gopher Resource Corporation**  
**Meeting held at Gopher Resource Corporation**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan

Gopher Resource Corporation:

Kevin Murphy, Chief Financial Officer  
Mark Kutoff  
Dan Leach

Louck Associates

Jeff Shopek  
Bill Sharbrau

**June 21, 2007**

**Gopher Resource Corporation**

**Meeting held at Gopher Resource Corporation**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan

Gopher Resource Corporation:

Kevin Murphy, Chief Financial Officer  
Mark Kutoff  
Dan Leach

Louck Associates

Jeff Shopek  
Bill Sharbrau

**July 19, 2007**

**Blue Cross Blue Shield of Minnesota**

**Meeting held at BCBS; 1200 Yankee Doodle Road**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan

Blue Cross Blue Shield:

Roger Kleppe, Senior Vice President, Human Resources and Facilities Services  
Jim Paulet, Facilities Operations Manager  
Steve Merwin,

**July 25, 2007**

**Faithful Shepherd Catholic School**

**Meeting held at Faithful Shepherd Catholic School**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan

Faithful Shepherd Catholic School:

David Meyer, Assistant Principal, Faithful Shepherd Catholic School  
Brian Howard, Board Member, Faithful Shepherd Catholic School

**July 25, 2007**

**O'Leary Lane Businesses**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Brian Sorenson, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan

Area Businesses:

Carol Elstad, Elder Doyle, Eagan Counseling Clinic  
Steve Karban, VIOC  
Bruce Miller, MFL Properties  
Jon Phillips, Valvoline  
Cal Christensen, Minnwest Bank  
Todd McVay, Minnwest Bank  
Clint Racine, Culver's in Eagan  
Will Merritt, CSK Auto "Checker"  
Steven Scheller, Triple S Investments  
Jeff Berg, Durand Associates

**July 26, 2007**

**Gopher Resource Corporation**

**Meeting held at Gopher Resource Corporation**

Agency:

Kristi Sebastian, Dakota County Traffic Engineer  
Russ Matthys, City Engineer, City of Eagan

Gopher Resource Corporation:

Kevin Murphy, Chief Financial Officer  
Mark Kutoff  
Dan Leach

Louck Associates

Jeff Shopek  
Bill Sharbrau

**Appendix C**  
**Public Open House Summaries**

## CSAH 28 CORRIDOR STUDY: AUGUST 2 OPEN HOUSE

### SUMMARY OF COMMENTS

- Put stoplight at Ivy Lane and CSAH 28, difficulties turning left onto CSAH 28 (2)
- Put stoplight at Elrene Road and CSAH 28, difficulties turning left on CSAH 28 (3)
- Enforce speed limits on CSAH 28 (3)
- Put more retail on CSAH 28 (no big boxes)
- People going east on CSAH 28 stop at FSCS to go to school
- Fewer gaps in traffic with CSAH 28 extension to Inver Grove Heights
- Roundabouts work well in other areas
- Make more connections for northbound trips
- Difficult getting on CSAH 28 at O'Leary Lane
- Left on CSAH 28 from Promenade is not feasible
- Need pedestrian crossing controls at Lexington and TH 149, make corridor more pedestrian friendly/safe
- Question need for study
- Possible 6-lane need from Lexington to at least Pilot Knob Road or Highway 13 (2)
- Noise concern, especially with trucks using roadway (3)
- Re-route trucks through non-residential areas
- NB left at CSAH 28 and O'Leary Lane is OK (2)
- SB Right from Dodd Road onto YDR needs advance warning of a train crossing at CSAH 28
- Elevator maintenance facility on Town Center Drive south of CSAH 28 generates two semi-trailer trips per week for deliveries and has six field employees
- Difficult to cross and make U-turns at CSAH 28 and Wescott Square (4)
- An expensive warehouse is located at Columbia Drive and CSAH 28
- Possible lead contamination north of YDR and approximately 800 feet west of TH 149, very steep grade at this site as well
- Put signal at Promenade and CSAH 28 (3)
- Rear driveway for BCBS is very important
- Congestion on CSAH 28 occurs at noon hour
- Volumes increased after CSAH 28 extended to TH 149 (2)
- NB left at Golfview is difficult in the mornings

- EB left in at Skyline is important queue back ups
- Concern about drive through traffic and traffic internal to Skyline
- Bank access at O'Leary Lane and CSAH 28 is important
- Potential for roundabout or frontage at O'Leary Lane and CSAH 28
- Not a problem getting onto CSAH 28 at Elrene/Wescott, but sometimes have to wait for a break in traffic
- There is an elementary school along CSAH 228
- Support for having more stoplights to slow down traffic, even though no one wants another CSAH 42
- Happy with extension of CSAH 28 to TH 55
- No more traffic lights
- Currently, too many left turn on green arrows only, wait with no oncoming cars
- Prohibit left turns at Yankee Doodle and Promenade

**CSAH 28 CORRIDOR STUDY: OCTOBER 12 OPEN HOUSE**  
**SUMMARY OF COMMENTS**

- Support for alternatives that do not add any additional stoplights along YDR. When accessing Promenade business one can use backage roads or cut across on Denmark to avoid all the lights and congestion on YDR.
- Preference for 1M and 2E. 1M will not help unless 2E is added.
- Do not extend Wescott Woodlands to the south.
- Wescott Square needs EB right turn lane and the opening just east of Wescott Square should be removed to reduce weaving movements.
- Support for signal at Elrene Avenue
- Suggest buying Don Steven Building to demolish for new public street. Move Don Stevens into adjacent building to west (who has available space).
- Support for all east alternatives
- Look at cost-benefit of improvements to business/school on Discovery Road. Significant impacts to truck traffic (Don Stevens). A traffic signal at Wescott Woodlands to provide gaps for turns at Discovery Road. Open to 3/4 intersection at Discovery Road (left in). No interest in public street on Skyline Displays.
- BCBS wants full access to YDR at south side of Promenade with signal. Does not want public street on property. BCBS has development interests on south property adjacent to Town Centre Drive. Will hold development hostage, if don't get signal and full access.
- Middle Segment: Alternative 1 is the best option and Alternative 3 is the least desirable.
- Thank you for having these meetings
- Great exhibits. Wonderful to have people presenting
- Very well organized
- Meet and greet table was very helpful; gave good direction and welcoming
- Presented all the options
- City staff and consultants know what they are doing; Eagan is ahead of the curve with streets and highways
- PowerPoint presentation with a Q and A session would have been nice
- Keep up the good work
- Need signal at Elrene. People from Elrene use Ivy Lane to avoid delays getting onto YDR.
- Speeding along CSAH 28 is huge issues; traffic speeds exceed 70 mph
- YDR is gateway to Eagan, but is unattractive. Put trees in boulevard like Woodbury has done

- Rear-end crashes occur for vehicles leaving Columbus Drive to turn right onto YDR.
- 50 mph is not too fast for the road; people are not being courteous or cautious drivers
- Suggest restricting left turns onto YDR from Columbia and Discovery during busy hours or putting in a stop light
- Lack of respect for business owners on Discovery Road; entryways are blocked by FSCS queues
- Need to do something before someone is killed; similar to problems off of TH 149 and Wescott

## CSAH 28 CORRIDOR STUDY: DECEMBER 7 OPEN HOUSE

### SUMMARY OF COMMENTS

- The Borchert Lane connection does not need to cross the railroad tracks and connect to Dodd Road. Most truck traffic travel to I-35E via Yankee Doodle Road or not to Lone Oak Road and on to I-494. This option is unnecessary as Lone Oak is lightly traveled and is a right turn for those who need this option.
- The preferred alternative will require residents of the townhouses on CSAH 28, west of Ivy Lane, to weave through the neighborhood. Examine the need for traffic control, such as an all-way stop on Ivy Lane to Trails end.
- Conduct a noise study to determine the additional traffic noise resulting from traffic increases on Yankee Doodle Road. Traffic noise affects property values for condos located on Yankee Doodle Road. Consider a noise wall, window replacement or compensation for these residents.
- Consider a 45 mph speed limit the length of Yankee Doodle Road
- Do not support a roundabout on Elrene Road, would prefer a 4-way stop
- Support preferred alternative, as it is overdue and fits well with recent growth.

**Appendix D**  
**Traffic Forecasting Methodology**

# CSAH 28 (Yankee Doodle Road) Corridor Study August 22, 2006

## FORECASTING ASSUMPTIONS AND METHODOLOGY

### OVERVIEW

SRF developed a travel demand forecasting model for this project by combining the highway network and TAZ detail of the Dakota County Transportation Model and the Metropolitan Council Travel Demand Model. The trips from the Dakota County TAZs in the Regional Model were distributed to the smaller TAZs in the combined model according to the mode choice outputs of the Dakota County Model. This process was used to develop forecasts that benefit from the large scale of the regional model and the detailed roadway network information for the project area. Existing and design year forecasts were compared to recent turning movement counts in the corridor to ensure consistency and reliability.

### ADDITIONAL TRIPS ADDED TO FORECAST

Some additional land use changes not considered in the travel demand models or the recent turning movement counts were added to the forecast link volumes after the baseline forecasts were developed. Trip generation rates used are from the *ITE Trip Generation Manual, 7th Edition*.

#### Elementary School

Located on Columbia Dr. north of CSAH 28.

- Total number of students is 600.
- "Elementary School" land use type #520.

#### Vacant Building

Located between Columbia Dr and Mike Collins Dr north of CSAH 28.

- Total square footage 200,000.
- Average of rates for "General Light Industrial" #110, "Manufacturing." #140, and "Warehousing" #150.

#### Thomson West

New access west of Dodd Rd on south side of CSAH 28.

- Turning movements into and out of this access were taken from the *Thomson Access Study* prepared by SEH, Inc. September 23, 2005.
- Regional model used to determine direction of approach proportions for trips accessing other roadways along the CSAH 28 corridor.

#### Carriage Hills Golf Course

No changes in land use assumed.

**Appendix E**  
**Traffic Analysis Memo**

## MEMORANDUM

TO: Kristi Sebastian, PE, Traffic Engineer  
DAKOTA COUNTY

FROM: Patrick Corkle, PE, PTOE, Senior Associate

DATE: March 21, 2007

SUBJECT: CSAH 28 (YANKEE DOODLE ROAD) TRAFFIC ANALYSIS

### INTRODUCTION

As part of the CSAH 28 (Yankee Doodle Road) Corridor Study, we were requested to complete a traffic analysis of the proposed roadway alternatives between Denmark Avenue and Dodd Road. The study includes an operations analysis of the intersections and arterial for existing and future conditions, a crash analysis of the existing roadway and a safety review of the proposed alternatives.

The study corridor under review was broken into the following three segments:

- West segment (Denmark Avenue to Lexington Avenue)
- Middle segment (Lexington Avenue to west of Mike Collins Drive)
- East segment (Mike Collins Drive to Dodd Road)

### EXISTING CONDITIONS

The existing conditions analysis was based on turning movement counts collected for the a.m. and p.m. peak hours in June 2006. Crash data provided by Mn/DOT for the years 2000 to 2002 was also reviewed. The intersection operations analysis (worst-case operations for the p.m. peak hour) and crash analysis results for existing conditions are included as an attachment. The results of our existing conditions analysis are summarized below.

#### General Corridor Issues

- Many of the cross-street left and through movements at the unsignalized intersections currently operate poorly or will in the near future during the evening peak hour.

## West Segment

- CSAH 28/Promenade Avenue – Motorists turning left from or onto CSAH 28 at Promenade Avenue experience heavy delays. The crash rate for this intersection is much higher than the average crash rate for an unsignalized intersection, indicating a current safety problem.
- Denmark Avenue/Town Centre Drive – The northbound queues from the CSAH 28/Denmark Avenue intersection spill into this intersection, causing the intersection to operate poorly during the evening peak hour.

## Middle Segment

- CSAH 28/Discovery Drive/Golfview Drive – From field observations, eastbound left-turning vehicles periodically spill out of the turn lane during the a.m. peak hour. Vehicles spilling out of the left-turn lane indicate that a potential safety problem could develop in the future.

## East Segment

- CSAH 28/Dodd Road – Heavy delays and queues are currently associated with the southbound through and northbound left-turn movements during the p.m. peak hour. This intersection is currently under design/construction to improve overall operations.

## FORECAST TRAFFIC VOLUMES

Forecast traffic volumes were developed to evaluate the existing roadway configuration and potential alternatives. The traffic volumes for year 2030 were consistent with other future roadway projects and land use changes. Future roadway projects include the Northwoods Parkway overpass, the extension of Denmark Avenue north to Lone Oak Road, the extension of CSAH 28 to the east, and the future north-south corridor. Proposed land use changes not initially included in the Regional Forecast Model were added. Table 1 shows the comparison of the existing daily traffic volumes counted in year 2005 and the year 2030 forecast volumes for the CSAH 28 corridor. The total growth in traffic along the corridor ranges from 65 to 140 percent from year 2005 to year 2030.

**Table 1**  
**Daily Traffic Volumes**

Location	Year 2005 (Actual)	Year 2030 (Forecasts)
West of Denmark Avenue	27,000	49,000
West of Lexington Avenue	24,300	40,000
East of Lexington Avenue	19,500	38,000
West of Dodd Road	12,900	31,000
East of Dodd Road	4,100	21,000

In comparison to the Dakota County year 2025 forecast volumes, the year 2030 forecast volumes are higher. The main reason for this difference is that the year 2030 model has a more intense land use allocation east of Lexington Avenue near CSAH 28. The more intense land use is expected to generate approximately 10,000 more daily trips on CSAH 28 east of Lexington Avenue.

The proposed Northwoods Parkway bridge also has an impact on the CSAH 28 forecast volumes, especially on the west segment of the corridor, including the Denmark Avenue intersection. The proposed bridge would carry about 7,500 daily trips by year 2030, approximately 350 eastbound and 420 westbound trips during the p.m. peak hour. Adding these p.m. peak hour trips (or most of them) to the CSAH 28/Denmark Avenue intersection will cause it to operate at unacceptable levels during year 2030 p.m. peak hour conditions.

## **NO BUILD CONDITIONS**

The year 2030 forecast volumes were analyzed using the existing roadway configuration, except for the improvements currently being constructed for the CSAH 28/Dodd Road intersection. The results of the intersection operations analysis are included as an attachment. The results of our no build analysis for year 2030 are summarized below.

### **General Corridor Issues**

- Most, if not all, cross-street left-turn and through movements at the unsignalized intersections are expected to operate poorly during the evening peak hour.

### **West Segment**

- CSAH 28/Denmark Avenue – This intersection will have operational problems with the inefficiencies of split-phasing for Denmark Avenue. The northbound left-turn lanes are not long enough to provide the necessary capacity, impacting the overall operations of this intersection. In addition, the northbound queues extend to the south, impacting the intersection of Denmark Avenue/Town Centre Drive.
- CSAH 28/Promenade Drive – The eastbound left-turning vehicles will spill out of the left-turn lane, creating safety concerns. The number of acceptable gaps in the westbound traffic will not accommodate the number of eastbound left-turn motorists, causing heavy delays, long queues and aggressive driving.
- CSAH 28/Lexington Avenue – The through traffic volumes on westbound CSAH 28 and southbound Lexington Avenue are too high to be accommodated by the existing intersection geometrics. A six-lane CSAH 28 should be extended east of the Lexington intersection.

- Six-Lane to Four-Lane Transition – The location of the transition from six-lane to four-lane is critical. In the eastbound direction, the third through lane must extend far enough to encourage full utilization of the lane at the intersection. In the westbound direction, the third through lane must be long enough to allow traffic sufficient time to redistribute among all three through lanes before reaching the intersection.
- Demark Avenue/Town Centre Drive – The northbound queues from the CSAH 28/Denmark Avenue intersection spill into this intersection, causing the intersection to operate poorly.

### **Middle Segment**

- CSAH 28/Discovery Drive/Golfview Drive – Increased concerns with the eastbound left-turning vehicles spilling out of the turn lane during the a.m. peak hour. Motorists making a northbound or southbound left-turn/through movement will not be able to make these movements safely, as traffic volumes on CSAH 28 increase.

### **East Segment**

- CSAH 28/Gopher Entrance and CSAH 28/Dodd Road – Future proposed development south of CSAH 28 will generate additional traffic at the current full-access unsignalized intersection at Gopher Resources, causing it to operate poorly. This unacceptable level of operations causes the CSAH 28/Dodd Road intersection to operate poorly.
- CSAH 28/Elrene – As with other unsignalized intersections, the northbound to westbound left turn is expected to operate poorly during the pm peak hour. This is especially important at this location because of Elrene Road's designation as a major collector.

## **BUILD CONDITIONS – WEST SEGMENT ALTERNATIVES**

As a result of the operations analysis for future no build conditions, roadway alternatives for the west segment were developed to address future operational problems and safety concerns. The results of the intersection operations analysis for the west segment alternatives are included as an attachment.

### **General Corridor Improvements**

The west segment alternatives were analyzed under year 2030 future conditions. The main concerns along this segment are the significant traffic impacts on the Denmark Avenue and Lexington Avenue intersections, due to the existing roadway network and the intense level of development in the area. The following intersection improvements are included under all west segment alternatives:

### CSAH 28/Denmark Avenue

This intersection will operate poorly under its existing signal phasing and operations. The intersection should be modified as follows:

- The northbound and southbound split phasing should be replaced by standard protected left-turn phasing.
- The medians on the north and east approaches should be modified to promote easier left-turn movements.
- Additionally, “cat-track” striping should be installed for the northbound and southbound left-turn movements to guide them through the intersection.
- A southbound right-turn overlap arrow should be installed to run concurrent with the eastbound left-turn phase.

### CSAH 28/Lexington Avenue

This intersection does not have enough capacity to accommodate traffic volumes for year 2030. The intersection should be modified as follows:

- The six-lane CSAH 28 should be extended east of Lexington Avenue. The extension should be at least 1,200 to 1,300 feet east of Lexington Avenue where the transition to two lanes could begin. The exact transition location will depend on other intersection locations and traffic controls.

### **Alternative W-1**

In addition to the improvements previously mentioned, this alternative includes the modification of Yankee Place and O’Leary Lane to right-in/right-out only intersections. In addition, Promenade Avenue will be restricted to a three-quarter intersection, removing the cross-street left and through movements. This alternative will meet the County’s access spacing guidelines. The results of our analysis for Alternative W-1 are summarized below.

### CSAH 28/Promenade Avenue

- This alternative does not eliminate eastbound left-turning vehicles from spilling out of the left-turn lane.

### Demark Avenue/Town Centre Drive

- This alternative does not eliminate northbound queues from CSAH 28/Denmark Avenue from spilling into this intersection.

## **Alternative W-2**

To improve the operations at the intersection of CSAH 28/Promenade Avenue and Denmark Avenue/Town Centre Drive, Alternative W-2 was developed. This alternative is not expected to experience any operational or safety concerns under year 2030 forecast volumes. The proposed improvements and results of our analysis for Alternative W-2 are summarized below.

### CSAH 28/Promenade Avenue

In order to improve the operations and safety at this intersection, the eastbound left-turn movements need to be eliminated from CSAH 28 or a signal needs to be installed for this movement. While the safest improvement would be to remove the left-turn movements, this would displace most of the eastbound left-turns to the Denmark Avenue intersection. The Denmark Avenue intersection is already on the edge of operating poorly even with the proposed improvements and the eastbound left-turn movements should not be relocated to this intersection. The Denmark Avenue intersection is also impacted by the closure of the westbound left-turn movement to Yankee Place. The recommendation is to signalize the eastbound left-turn movement at Promenade Avenue.

### Denmark Avenue/Town Centre Drive

The northbound left-turn lanes at the intersection of CSAH 28/Denmark Avenue need to be extended. This is difficult with the intersection so close to Denmark Avenue/Town Centre Drive. One option would be to widen the roadway, which would likely require reconstruction of both roadway segments south and north of CSAH 28. In addition, both traffic signals would need reconstruction. The other option would be to remove the southbound left-turn lane at the Denmark Avenue/Town Centre Drive intersection and use the space for additional storage for the northbound left-turn lanes at the CSAH 28/Denmark Avenue intersection.

Removing the southbound left-turn lane, restricting the movement and providing a westbound left-turn turn lane on CSAH 28 at Yankee Place is recommended. Allowing the left-turn movement on CSAH 28 without a designated turn lane would be a safety concern. Since removal of the southbound left-turn movement at the intersection of Denmark Avenue/Town Centre Drive is rather drastic, we offer the following additional rationale.

- The first item to review is the change in travel patterns. Vehicles coming from the west would turn right at Yankee Place and turn-right at Town Centre Drive, in place of a right turn at Denmark Avenue and a left turn at Town Centre Drive. The reverse trip would not be affected. Vehicles coming from the east would have no opportunity to access the site without making a U-turn at Denmark Avenue or some other undesirable movement. It also seems unreasonable to require these drivers to make a left turn at Lexington Avenue and a right turn onto Town Centre Drive. Therefore, we recommend the westbound left-turn movement remain on CSAH 28 at Yankee Place. This left-turn movement is not expected to extend beyond the turn lane, nor impact any major intersection. There will be available gaps in eastbound traffic during the westbound left-turn phase at the CSAH 28/Denmark Avenue intersection.

- The existing northbound left-turn lanes at the CSAH 28/Denmark Avenue intersection provide storage for about 19 vehicles. The interior left-turn lane is 120 feet (six vehicles) and the exterior left-turn lane is 270 feet (13 vehicles). By using the additional space, the proposed configuration would have space for 26 vehicles. The extension of the interior left-turn lane to 270 feet (might be slightly less depending on how it is "developed"), would add about seven left-turning vehicles. This would equate to seven more vehicles per signal cycle. With 30 cycles per p.m. peak hour, there is the potential of accommodating an additional 210 left-turn vehicles stored at the correct intersection, with queues not extending into the Denmark Avenue/Town Centre Drive intersection.
- The current problem is that only 120 feet of storage is provided for the dual left-turn lanes, or the first 15 seconds of the green phase. After the two lanes of storage are served, only a single lane of traffic can be served. With approximately 260 feet of dual left-turn lanes, the first 29 seconds of the green phase could use both lanes. Basically, the proposed improvement would allow two left-turn lanes during the green phase instead of 1.5 left-turn lanes.

### **Alternative W-3 (Recommended)**

An additional alternative was developed to provide a full-access signalized intersection at CSAH 28/Promenade Avenue. While this location does not meet the County's guidelines for full-access spacing, the intensity of retail/commercial land use and the understanding that the two adjacent intersections at Denmark Avenue and Lexington Avenue are congested in the future, the need to evaluate this alternative seemed appropriate. Alternative W-3 is considered a viable option from a traffic operations and safety aspect. The proposed improvements and results of our analysis for Alternative W-3 are summarized below.

#### CSAH 28/Promenade Avenue

This intersection will be signalized, allowing all movements. Additionally, the south approach would be extended from CSAH 28 to Town Centre Drive. Currently the roadway only serves the Blue Cross/Blue Shield office building. By providing the extension, adjacent users will be able to use the connection, providing some relief to the CSAH 28/Denmark Avenue intersection.

The proposed full-access signalized intersection will have negative impacts to the mainline operations of CSAH 28. The additional traffic signal along the corridor will reduce the arterial speeds (increase travel time) and reduce safety with the likely increase in rear-end crashes. While these are important concerns, the benefits of providing a new connection to Town Centre Drive and better distribution of traffic within the study roadways outweighs the concerns.

## **General West Segment Alternative Comments**

As described below, the intersections of CSAH 28/O'Leary Lane and Lexington Avenue/Town Centre Drive are two other intersections impacted by proposed Alternatives W-2 and W-3.

### CSAH 28/O'Leary Lane

For all alternatives, this current full movement intersection is proposed to become a right-in/right-out only. The following are concerns with allowing the westbound left-turn movement at this intersection.

- If adequate gaps are not available and westbound queues develop, this will have a negative impact on the intersection of CSAH 28/Lexington Avenue.
- A motorist making a southbound right turn from Lexington Avenue, followed by a left turn at O'Leary Lane will require many lane changes in a relatively short distance. Therefore, safety concerns related to weaving will develop.
- Currently, O'Leary Lane is approximately 475 to 500 feet from Promenade Avenue. Although a minimum standard left-turn lane requires approximately 420 to 440 feet, there is the concern with the close spacing between the two intersections. If Alternative W-3 is selected, Promenade Avenue will likely be shifted to the east, further reducing the spacing between the intersections.
- Alternative access to businesses on O'Leary Lane could be provided by using Lexington Avenue/Town Centre Drive or, if Alternative W-3 is selected, the proposed Promenade Avenue extension.

### Lexington Avenue/Town Centre Drive

With proposed Alternative W-2, we reviewed the impacts to this intersection to determine if the intersection traffic control should be changed. Turning movement counts were not collected at this intersection. As summarized below, estimated turning movement counts were developed using data from the CSAH 28/Lexington Avenue intersection, the daily volume on Town Centre Drive west of Lexington Avenue and the expected diversion of traffic related to Alternative W-2.

- Lexington Avenue south of CSAH 28 (1,262 southbound vehicles and 535 northbound vehicles).
- Town Centre Drive west of Lexington Avenue carries 3,450 ADT (175 vehicles in each direction for the p.m. peak hour).
- Diversion created by Alternative W-2 could add approximately 90 eastbound left-turns and 90 southbound right-turns at the intersection.

A review of the Peak Hour traffic signal warrant using the estimated traffic volumes was completed and is summarized below.

- Existing volumes (with right-turn volume) - Met
- Existing volumes (without right-turn volume) - Not Met
- Alternative W-2 with rerouted existing volumes (with right-turn volume) - Met
- Alternative W-2 with rerouted existing volumes (without right-turn volume) - Met

A review of the Eight Hour traffic signal warrant (assuming the eighth highest hour volume is fifty percent of the p.m. peak hour) was completed and is summarized below.

- Existing volumes (with right-turn volume) - Not Met
- Existing volumes (without right-turn volume) - Not Met
- Alternative W-2 with rerouted existing volumes (with right-turn volume) - Not Met
- Alternative W-2 with re-routed existing volumes (without right-turn volume) - Close to being Met

An operations analysis of the intersection with these estimated traffic volumes was completed. The volume estimate includes about 50 existing eastbound left-turn vehicles from Town Centre Drive onto Lexington Avenue in the p.m. peak hour. As a quick analysis, 50 left-turn vehicles is the capacity of this movement (according to HCS). If all of the existing O'Leary Lane northbound left-turn vehicles relocate to eastbound Town Centre Drive, that would increase the eastbound movement by 85 vehicles. It is unlikely that all of these vehicles could be accommodated under the current traffic control. Some of the vehicles will likely use Denmark Avenue, where improvements are proposed. Alternative W-2 will likely divert the Blue Cross/Blue Shield and Yankee Place northbound left-turn vehicles to Denmark Avenue.

Based on these assumptions and Alternative W-2, the signalization of Lexington Avenue/Town Centre Drive would be appropriate to accommodate the additional volume, especially the additional left-turn movements, assuming the 900-foot signal spacing is acceptable. Ultimately, since this analysis is mainly based on assumptions, a warrant analysis using 48 hour tube counts would be necessary. If Alternative W-3 were selected, more of these diverted northbound left-turns would likely use Promenade Avenue. However, the Lexington Avenue/Town Centre Drive intersection should be reviewed after the preferred alternative is constructed.

## **BUILD CONDITIONS – MIDDLE SEGMENT ALTERNATIVES**

As a result of the operations analysis for future no build conditions, roadway alternatives for the middle segment were developed to address future operational problems and safety concerns. The results of the intersection operations analysis for the middle segment alternative are included as an attachment.

## General Corridor Improvements

The middle segment alternatives were analyzed under year 2030 future conditions. The main concerns along this segment are the operations and safety of the Discovery Drive/Goldenvue Drive intersection, access to the properties north of CSAH 28 and the location of full-access intersections. From a corridor perspective, the alternatives are very similar. The main difference is the local roadway changes on the north side of CSAH 28. The following intersection improvements are included under all west segment alternatives:

### CSAH 28/Discovery Drive/Golfview Drive

This intersection will be modified from a full-access intersection to a right-in/right-out only access. In order to understand our reasoning for this access modification, we offer the following:

- Turning movements collected at this intersection by SRF in June 15, 2006 resulted in 165 eastbound left-turns from CSAH 28 to Discovery Drive during the morning peak hour (7:30-8:30 a.m.). While the typical operations analysis does not show a significant problem in the future, there are concerns that the number of eastbound left-turn vehicles crossing the proposed three lanes, higher speeds and higher traffic volumes by year 2030 will create an operational and safety problem. If the eastbound left-turn queues exceed the left-turn lane storage, it will impact the CSAH 28/Lexington Avenue intersection. Dakota County observations of this intersection during the a.m. peak hour identified heavier delays and queuing under current morning conditions.
- The eastbound left-turn movement will become more difficult in the future due to fewer gaps caused by the expected increase in traffic. Daily traffic volumes are expected to increase from approximately 20,000 vehicles today to 38,000 vehicles in year 2030. An additional third through lane is needed on CSAH 28 at the Lexington Avenue intersection to provide acceptable intersection operations.
- Another safety concern is the maneuver of the northbound right-turn vehicle from Lexington Avenue onto CSAH 28, which then turns left at Discovery Drive. This weaving movement (with less than 800 feet) will become more difficult and unsafe with higher speeds, larger conflicting volumes and number of lanes in the future.
- Extending the westbound left-turn lanes for CSAH 28 at Lexington Avenue is being recommended. The longer westbound lanes would reduce the eastbound left-turn lane at Discovery Drive to a length, which would not be acceptable. The following is the methodology in determining the length of the westbound left-turn lanes and the resulting space for the eastbound left-turn lane.
  - The space on CSAH 28 between Lexington Avenue and Discover Drive is approximately 810 feet. This is the available space for the left-turn lanes (westbound at Lexington Avenue and eastbound at Discovery Drive) and taper.

- The length of left-turn lanes needed for westbound CSAH 28 at Lexington Avenue should be determined by using the longest turn-bay based on the following three conditions:
  - A) left-turn 95th% queue length
  - B) The 50th% queue for the adjacent through lane (blocks left-turn bays)
  - C) Adequate deceleration length (based on Mn/DOT Table 5-3.01A; Design Speed 50 MPH to a stop condition) and storage for the 50th% average left-turn queue
- From the modeling and analysis, the values for each condition were calculated and shown in the following:
  - A) The 95th% queue for the left-turn – approximately 350 Feet
  - B) The 50th% queue for the through lane – approximately 475 Feet
  - C) The 50th% queue of the left-turn and deceleration length – approximately 200 feet plus 440 feet. The result is 640 feet.
- The taper for the westbound dual left-turn lanes (24 feet) would be 10:1 (same as existing). The result is a 240-foot taper.
- The remaining length available for an eastbound left-turn lane for CSAH 28 to Discovery Drive would be:
  - A) 810 feet – 350 feet (turn bays) – 240 feet (taper) = 220 feet
  - B) 810 feet – 475 feet (turn bays) – 240 feet (taper) = 95 feet
  - C) 810 feet – 640 feet (turn bay and taper) = 170 feet
- The eastbound left-turn lane should also be tested against the three criteria to determine the length of the left-turn lane.
  - A) The 95th% queue for the left-turn - approximately 65 feet
  - B) The 50th% queue for the through lane - 0 feet
  - C) The 50th% queue of the left-turn and deceleration length – approximately 30 feet plus 440 feet. The result is 470 feet.
- If a taper of 10:1 is used, Condition C would require a 350-foot left-turn lane, but only 95 feet would be available based on Condition B above. In general, most agencies would use a minimum 300-foot left-turn lane for this type and speed of roadway.
- Without having the necessary deceleration length (Condition C) for an eastbound left-turn movement, vehicles will need to decelerate in the through lane, which is not acceptable based on the future volumes, speed and proximity to Lexington Avenue.

- In order to provide the safest roadway and reduce conflicts near major intersections, we recommend 500 foot westbound left and right-turn lanes for CSAH 28 at Lexington Avenue. In addition, the access at Discovery Drive should become a right-in/right out only intersection. To accommodate the left-turns onto Discovery Drive, an eastbound U-turn will be allowed approximately 700 feet east of Discovery Drive. At this location, a long enough U-turn lane and taper will be provided. This location is at a high-point in the roadway profile , which would provide adequate sight distance.

#### CSAH 28/Wescott Square

This intersection access will be modified from a full-access intersection to a right-in/right-out only access. Currently, those drivers using this access have a “right-in/right-out” access, but can use a left-turn lane into a commercial property to make a U-turn to travel to the west. As described below, this left-turn lane would be removed. These residents wishing to go west will either make a u-turn at Mike Collins Lane/Ivy Lane or use the future traffic signal at Arlene Road depending on the East alternative selected.

#### CSAH 28/North Commercial Property

This intersection access will be modified from a full access to a right-in/right-out only access. A proposed roadway connection to Columbia Drive will likely provide full access to CSAH 28, depending on the alternative selected.

#### **Alternative M-1**

In addition to the improvements previously mentioned, this alternative will provide a new roadway connection between Lexington Avenue and Discovery Drive. This will provide additional access to the northern properties along CSAH 28. This access will likely provide enough relief to the intersection of Columbia Drive/Wescott Woodlands where it may not need to be signalized by year 2030. However, making left-turn or through movements from the cross streets will be difficult in the future. This alternative is not expected to experience any operational or safety problems on CSAH 28 in the future, with the exception of Columbia Drive/Wescott Woodlands left-turn movements. The difficulty with Alternative M-1 is that the proposed roadway may significantly impact the Skyline property and require substantial right-of-way.

## **Alternative M-2**

To reduce impacts to existing properties, Alternative M-2 was developed. This alternative is not expected to experience any operational or safety problems on CSAH 28. The proposed improvements and results of our analysis for Alternative M-2 are summarized below.

This alternative includes a new roadway connection between Columbia Drive and Discovery Drive, providing additional access to the northern properties along CSAH 28. The full access at CSAH 28 and Columbia Drive/Wescott Woodlands will need to be signalized. Additionally, the intersection will need to be realigned to “square” the intersection, since it is slightly offset today.

The difficulty with Alternative M-2 is that the proposed roadway may significantly impact the existing school property and require significant right-of-way acquisition. It will combine school traffic with office/commercial traffic. Another concern is adding all of the eastbound left-turning traffic at one location. We analyzed this condition and offer the following:

- Eastbound left-turn movements were estimated at Columbia Drive to be 415 vehicles for year 2030 during the a.m. peak hour. A signalized intersection with a single eastbound left-turn is expected to operate at LOS D during the school’s peak 15-minute period, and LOS C/D over the entire a.m. peak hour. The single eastbound left-turn lane will need to be approximately 550 to 600 feet long. The eastbound left-turn phase will need to provide 40 percent of the green time during the peak 15-minute period (about equal to the green time for the westbound through movement). The southbound right-turn movement should be over-lapped with the eastbound left-turn to provide better operations for southbound traffic. The main concern is managing the traffic at the next intersection to the north.

## **Alternative M-3**

To reduce property impacts and create a new intersection along CSAH 28 instead of realigning the existing Columbia Drive/Wescott Woodlands roadways, Alternative M-3 was developed. This alternative is not expected to experience any operational or safety problems on CSAH 28. The proposed improvements and results of our analysis for Alternative M-2 are summarized below.

For this alternative, the existing east-west Discovery Drive roadway would be extended to the south to intersect CSAH 28 at a new intersection. Similar to Alternative M-2, this alternative will provide additional access to the northern properties along CSAH 28. The new full-access at CSAH 28 will need to be signalized. From a corridor perspective, this is not much different from the previous alternative, with the objective to minimize impacts to adjacent properties. The difficulty with Alternative M-3 continues to be impacts to existing properties.

## **Alternative M-1 Modified (Recommended)**

This alternative does not require the construction of any new local roadways north of CSAH 28. Therefore, the changes to Alternative M-1 include no new local roadways, a U-turn 700 feet east of Discovery Drive and no traffic signal at the intersection of Columbia Drive/Wescott Woodlands until sufficient warrants for signalization are met. This alternative is not expected to experience any operational or safety problems on CSAH 28.

## **BUILD CONDITIONS – EAST SEGMENT ALTERNATIVES**

As a result of the operations analysis for future no build conditions, roadway alternatives for the east segment were developed to address future operational problems and safety concerns. The results of the intersection operations analysis for the east segment alternative are included as an attachment.

### **General Corridor Issues**

The east segment alternatives were analyzed under year 2030 future conditions. The main concern for this segment is to identify the necessary improvements to support future growth along the segment. This segment of CSAH 28 has many different options. The no build analysis for this segment identified that all intersections are expected to operate poorly under the existing roadway configuration.

### **Alternative E-1**

Alternative E-1 was developed to improve roadway operations and safety by restricting the Mike Collins Drive/Ivy Lane intersection to a right-in/right-out/left-in only access. In addition, Elrene Road will be signalized and the Gopher property/Lo-Nidy property access to the immediate south will be limited to a right-in/right-out only access. The results of our analysis for Alternative E-1 are summarized below.

#### CSAH 28 /Gopher Entrance and CSAH 28/Dodd Road

- With future development in the southwest quadrant of CSAH 28 and Dodd Road, the additional volume at the right-in/right-out access to the properties will operate very poorly. In addition, the expected U-turns cause significant problems at the CSAH 28/Dodd Road intersection. This alternative is expected to cause operational and safety problems in the future.

## **Alternative E-2**

To address the unacceptable operations and safety concerns, Alternative E-2 was developed. This alternative was also developed to review the possibility of providing a full-access intersection for Mike Collins Drive. In this alternative, Mike Collins Drive was realigned to intersect CSAH 28 across from Elrene Road. This modified intersection will be signalized. In addition, the Lo-Nidy and Thomson-West properties will be served by a new roadway connection to Elrene Road. Right-in/right-out access will still be provided at the existing Ivy Lane and Gopher Resources access intersections. This alternative is not expected to experience any operational or safety problems on CSAH 28 in the future. The difficulty with Alternative E-2 is the realignment of Mike Collins Drive to Elrene Road. This would require the construction of a new roadway and right-of-way acquisition, including a business.

## **Alternative E-3**

In order to continue to provide full access to Mike Collins Drive and the Gopher Resources property, Alternative E-3 was developed. Initially, a signal was not proposed at the Mike Collins Drive/Ivy Lane intersection due to its close spacing to Elrene Road. In this alternative Mike Collins Drive/Ivy Lane will be a signalized full-access intersection. However, Elrene Road will need to be realigned 250 to 400 feet to the east, in order to provide a signal with adequate spacing to Mike Collins Drive/Ivy Lane. A new roadway connection from the Gopher Resources property to Elrene Road will need be constructed. In addition, the Lo-Nidy and Thomson-West properties will be served by a new roadway connection to Elrene Road. This alternative is not expected to experience any operational or safety problems on CSAH 28 in the future.

The difficulty with Alternative E-3 is the realignment of Elrene Road and the new roadway connection from Gopher Resources. Both of these roadways would require new construction and right-of-way acquisition. Additionally, the schedule of the proposed Lo-Nidy and Thomson-West projects, as well as the roadway alignment, could cause the building of the proposed southern roadway difficult. An additional traffic signal will increase the travel time (reducing arterial speed) on CSAH 28.

## **Alternative E-2 Modified (Recommended)**

While identified as Alternative E-2 Modified, it is a combination of the above alternatives and additional roadway connections. Mike Collins Drive would become a right-in/right-out/left-in intersection as described in Alternative E1, but would also provide an additional connection from Mike Collins Drive to Dodd Road via a new roadway called Borchert Lane. Elrene Road will be a signalized full-access roadway, with a potential private roadway from Thomson-West that will extend to Elrene Road to create an intersection with Trails End Road. A roundabout or traffic signal could control the new intersection (further discussed below) and Elrene Road will be upgraded to a four-lane facility from this location to CSAH 28. The access for Gopher Resources and Lo-Nidy will be right-in/right-out only. This alternative is not expected to experience any operational or safety problems on CSAH 28 in the future.

Alternative E-2 Modified is considered a viable option from a traffic operations and safety aspect. A few of the recommendations need further explanation, which are summarized below.

#### CSAH 28/Mike Collins Drive/Ivy Lane

This intersection is recommended as a right-in/right-out/left-in access, while many of the unsignalized intersections are proposed to be right-in/right-out only. One of the main reasons this is being proposed is that CSAH 28 is a four-lane section (not a six-lane) within this segment. In addition, the mainline volumes are not as high, and if operational or safety problems develop, the left-in movement from CSAH 28 could be closed. An additional concern is that a majority of the motorists traveling from the east into the residential area southwest of CSAH 28/Elrene Road may use Trails End Road, which might be adding too much traffic for the local street system.

#### CSAH 28/Gopher Resources/Lo-Nidy

This access intersection is too close to Dodd Road to signalize. Left-turn movements from the cross-street will be nearly impossible to make during the p.m. peak hours. The westbound left-turn movement from CSAH 28 will not have enough gaps in the eastbound traffic and queues. This will likely cause operational and safety problems at the Dodd Road intersection, which is significant.

#### Elrene Road/Trails End Road/Potential Thomson-West

This potential intersection was analyzed with a roundabout in place. Based on projected volumes, a single-lane roundabout will not have enough capacity. Using a multi-lane roundabout with year 2030 p.m. peak hour volumes, approximately 60 percent of the capacity will be used. During the a.m. peak period for year 2030 (with only one northbound lane), approximately 80 percent of the capacity will be used.

Although this intersection should operate acceptably with a roundabout, it should be analyzed in more detail, if considered, to make sure queuing does not impact adjacent intersections.

*H:\Projects\5772\Reports\June Final Report\Text\Report\_7-25-2007\_v3.doc*

## **ATTACHMENTS**

**Intersection Level of Service (LOS)  
PM Peak Hour**

INTERSECTION	Existing	2030 No Build	2030 Alt. 1	2030 Alt.2	2030 Alt.3
<u>West Segment</u>					
CSAH 28/Denmark	D	E	D	D	D
CSAH 28/Yankee Doodle Place	(A/D)	(A/F)	(A/A)	(A/C)	(A/C)
CSAH 28/Promenade	(A/F)	(A/F)	(A/F)	A	C
CSAH 28/O'Leary	(A/D)	(A/F)	(A/B)	(A/A)	(A/A)
CSAH 28/Lexington	C/D	F	D	D	D
Denmark/Town Center	E	F	F	D	D
<u>Middle Segment</u>					
CSAH 28/Discovery/Golfview	(A/E)	(A/F)	(A/C)	(A/C)	(A/C)
CSAH 28/Columbia/Westcott	(A/D)	(A/F)	(A/F)	B/C	-
CSAH 28/New Columbia	-	-	-	-	B/C
<u>East Segment</u>					
CSAH 28/Mike Collins/Ivy	(A/E)	(A/F)	(A/C)	(A/B)	B
CSAH 28/Elrene	(A/E)	(A/F)	B	C/D	-
CSAH 28/New Elrene/New Gopher	-	-	-	-	C
CSAH 28/Gopher Entrance	(A/C)	(F/F)	(F/F)	(A/C)	-
CSAH 28/Dodd	F	F	F	D	D

X – LOS at Signalized Intersections

(X/X) – Overall LOS/Critical Movement LOS for Unsignalized Intersections

**Arterial Speeds**

**PM Peak Hour**

Segment	"Free Flow"		Existing	
	EB	WB	EB	WB
West	45 mph	45 mph	22 mph	27 mph
Middle	50 mph	50 mph	50 mph	28 mph
East	50 mph	50 mph	28 mph	32 mph

Segment	No Build		Alt.1		Alt.2		Alt.3	
	EB	WB	EB	WB	WB	WB	EB	WB
West	21 mph	26 mph	24 mph	30 mph	30 mph	30 mph	20 mph	25 mph
Middle	50 mph	21 mph	50 mph	33 mph	33 mph	33 mph	46 mph	30 mph
East	19 mph	22 mph	19 mph	21mph	21mph	21mph	22 mph	23 mph

## **Appendix F**

### **2030 Forecast Turning Movement Volumes for Alternatives**

SRF No. 0065527

**MEMORANDUM**

TO: Al Orsen, City Manager  
City of Wayzata

FROM: Denny Eyer, PE, PTOE, Principal  
Carla Stueve, PE, PTOE, Associate

DATE: August 20, 2007

SUBJECT: SUPERIOR BOULEVARD/LAKE STREET INTERSECTION REVIEW

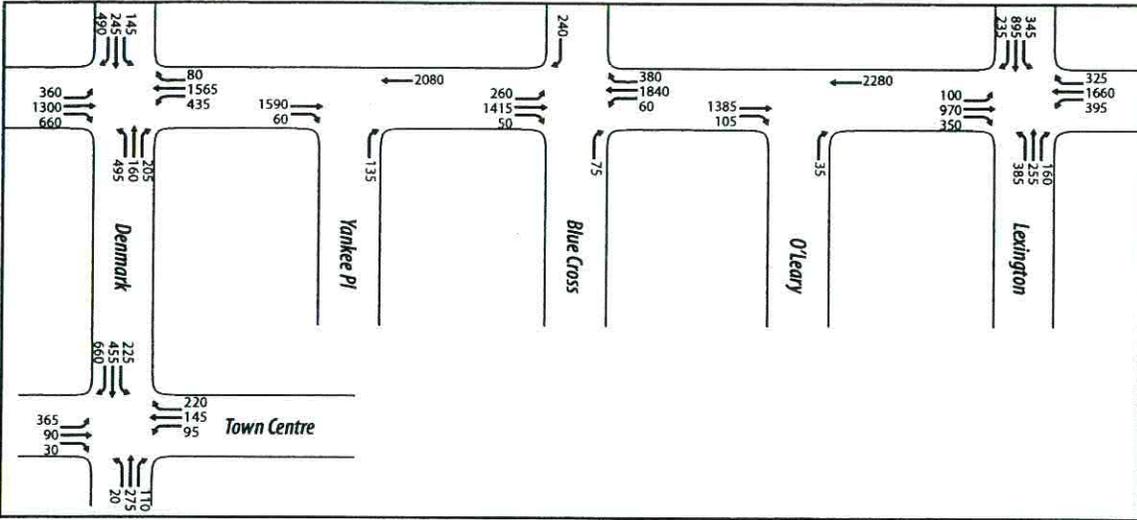
**Introduction**

The City of Wayzata has requested that SRF Consulting Group review the current alignment of Superior Boulevard and Lake Street, along with potential alternate intersection alignments. The purpose of this review is to develop an intersection alignment that would provide the optimal location based on existing utilities, future driveway locations, future land use and intersection design objectives that would provide a balance between vehicle operations and pedestrian safety (i.e. installation of a traffic signal, center medians with landscaping).

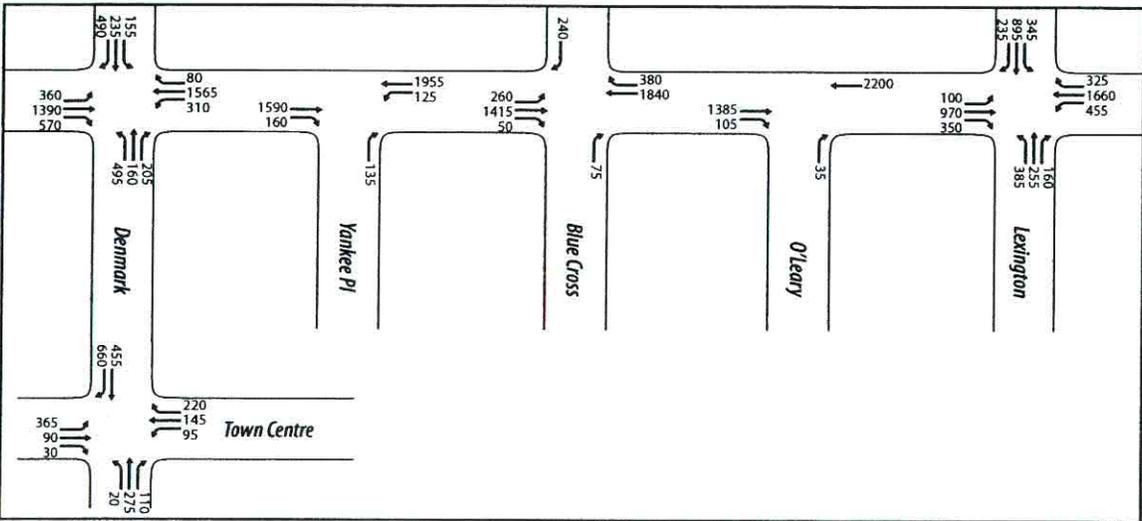
The current location was analyzed to determine if it would meet the identified intersection objectives. The Superior Boulevard/Lake Street intersection currently encroaches on private right-of-way on the east side of Superior Boulevard, which may require a partial taking of the gas station property. This is an issue worth noting. A drawing of the intersection realigned slightly to stay within the existing curb lines as much as possible is shown in Figure 1. However, this current intersection location/alignment may be too constrained to provide optimal intersection geometry, to allow for installation of traffic signals, and to incorporate features such as landscaped center medians.

In addition to the current alignment of the Superior Boulevard/Lake Street intersection, SRF completed a preliminary review of the proposed Roadway Layout Concept (dated June 12, 2007) and surrounding roadways/access driveways for the Wayzata Bay Center Redevelopment, which is shifted to the east of the current location as shown in Figure 2. This proposed intersection alignment intersects Superior Boulevard with Lake Street at an obtuse angle, which is not ideal for the current and future traffic patterns. In addition, the proposed alignment will require major changes to property accesses south of Lake Street.

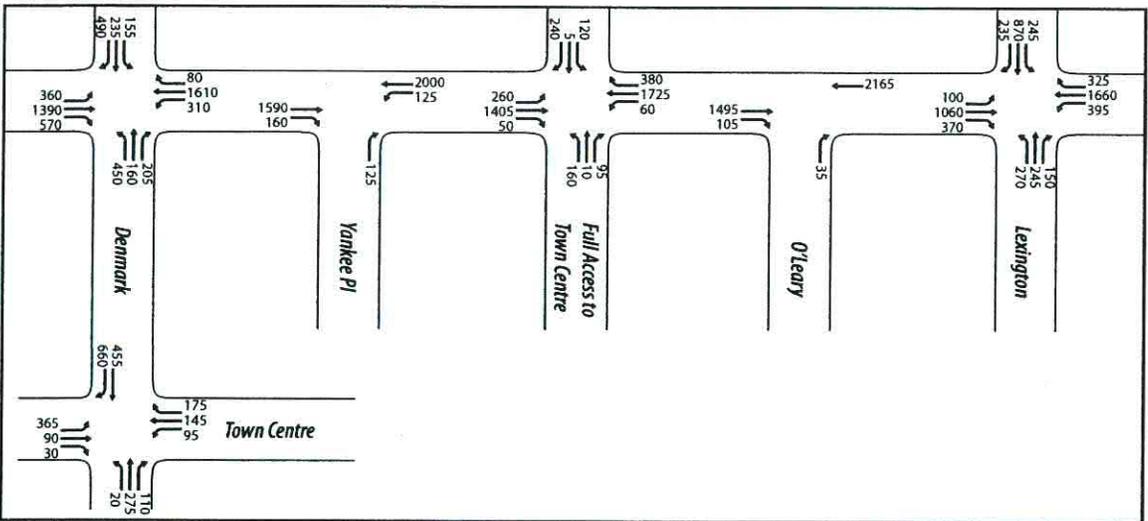
### Alternative 1-W



### Alternative 2-W



### Alternative 3-W



Support/5772\_CSAH 28/Report/Figures/5772\_Report/Appendix/VER.qxd

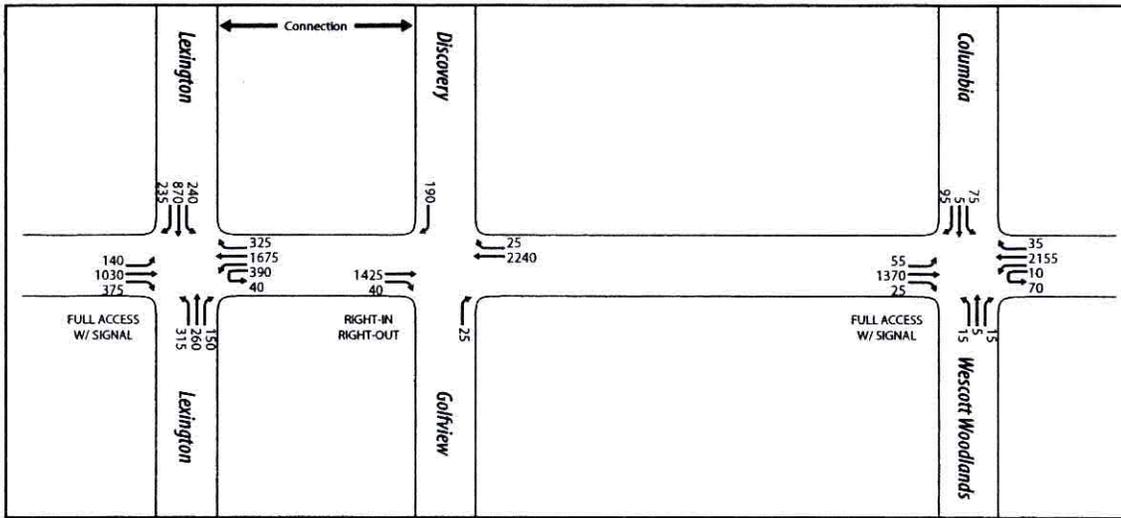


## WEST SEGMENT - 2030 FORECAST PM PEAK HOUR TURNING MOVEMENTS

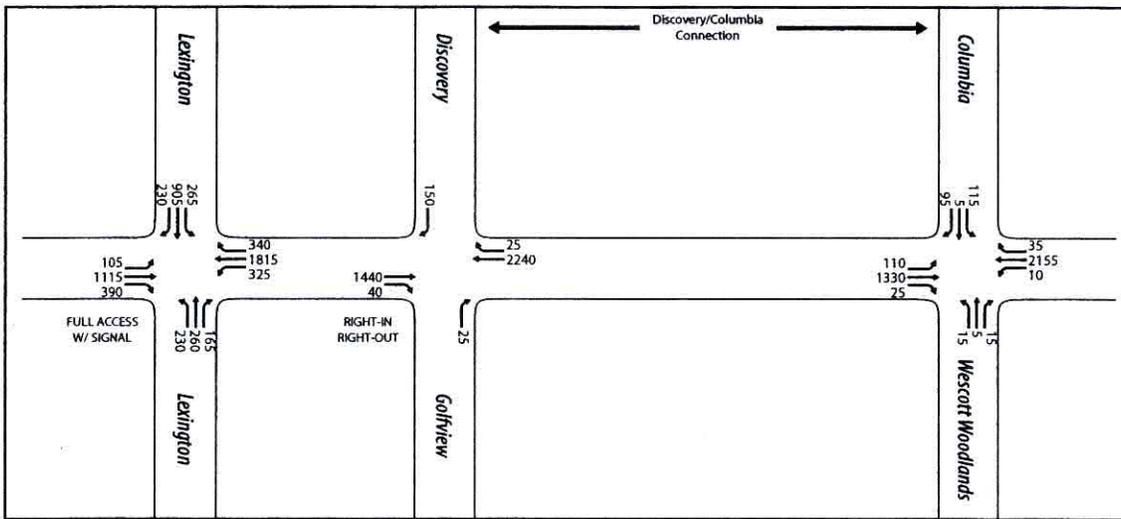
CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County

Figure F-1

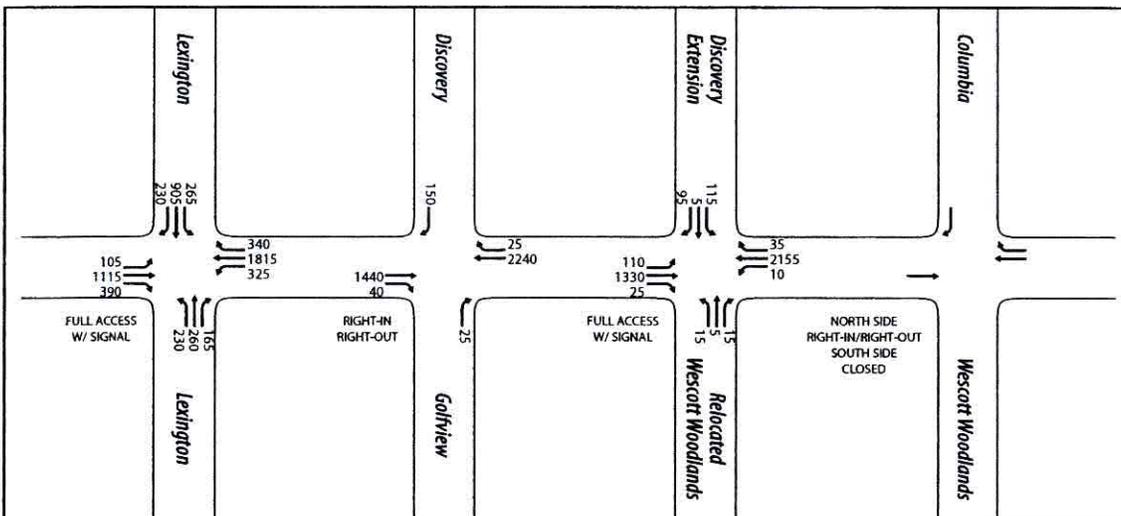
### Alternative 1-M



### Alternative 2-M



### Alternative 3-M



Support/5772\_CSAH 28/Report/Figures/5772\_Report/Appendix/VER.qxd



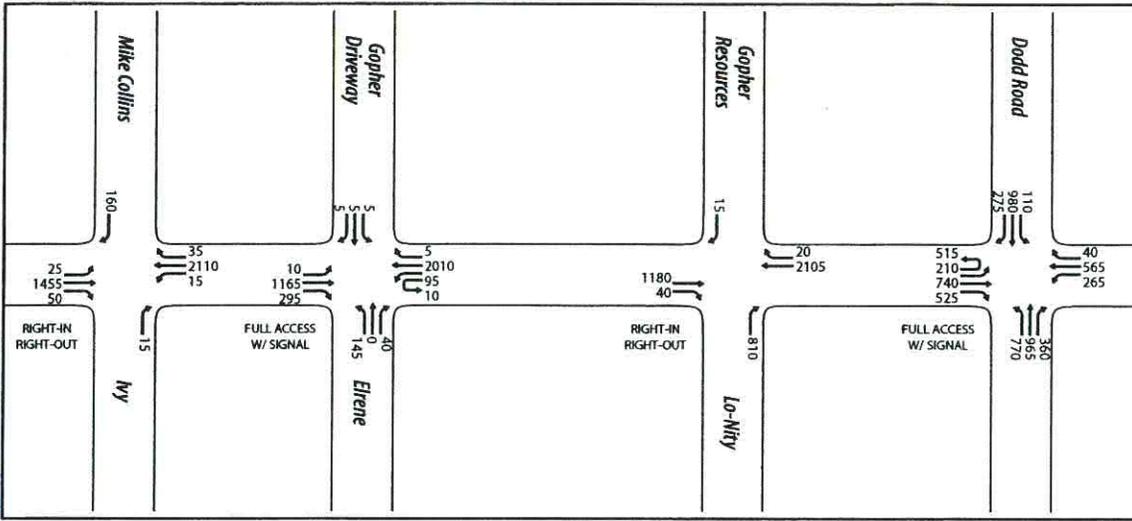
## MIDDLE SEGMENT – 2030 FORECAST PM PEAK HOUR TURNING MOVEMENTS

CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County

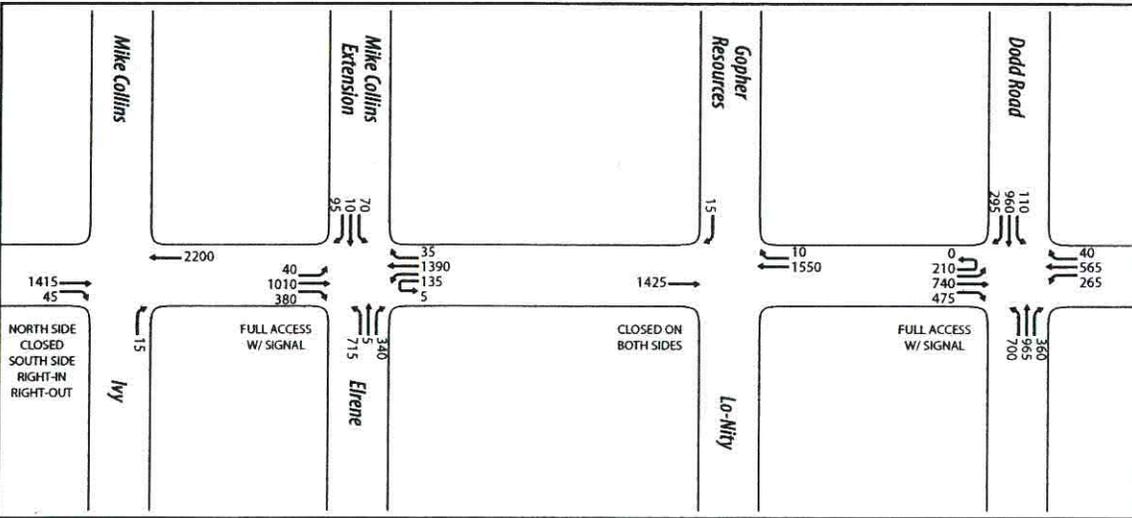
Figure F-2

Support/5772\_CSAH 28/Report/Figures/5772\_ReportAppendixVER.qxd

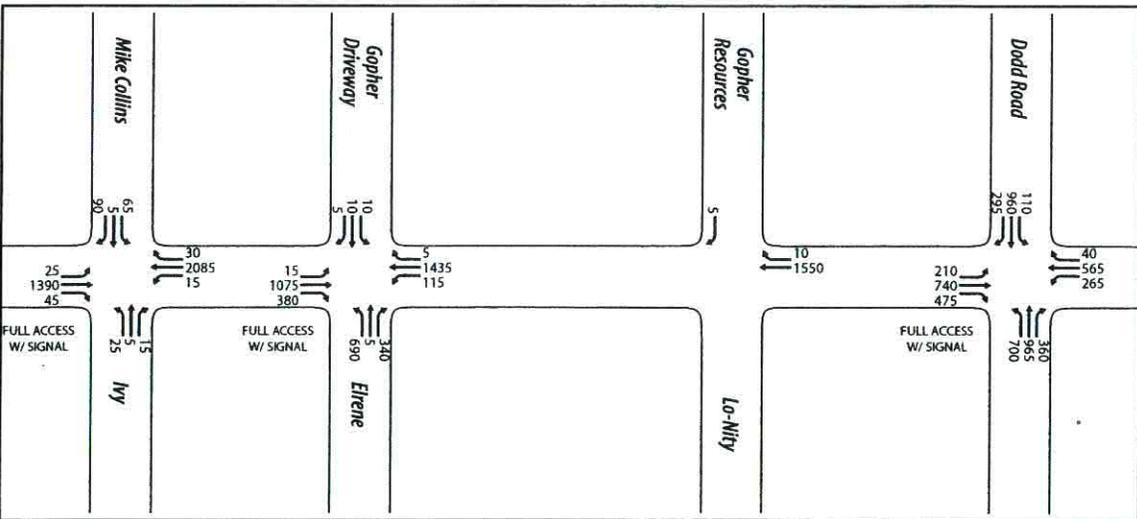
### Alternative 1-E



### Alternative 2-E



### Alternative 3-E



## EAST SEGMENT - 2030 FORECAST PM PEAK HOUR TURNING MOVEMENTS

CSAH 28 (Yankee Doodle Road) Corridor Study  
Dakota County

Figure F-3

