

ROSEVILLE
REQUEST FOR COUNCIL ACTION

Date: 08/08/11
Item No.: 10 . a

Department Approval



City Manager Approval



Item Description: Public Comment on the County Road C-2 Traffic Study

BACKGROUND

At the March 21, 2011 City Council meeting, a number of property owners from County Road C-2 and Josephine Road spoke regarding County Road C-2. The main point of discussion was the connection of County Road C-2 and potential impacts to Josephine Road and County Road C-2. The Council asked staff to report at a future meeting what the cost of a traffic study to identify impacts to the road system would be.

Staff reported back at the April 25, 2011 meeting and the City Council authorized the completion of the traffic study. The purpose of the study is to quantify the local and regional traffic impacts of connecting County Road C-2 between Hamline Avenue and Lexington Avenue under current traffic volume conditions and future year 2030 conditions.

The findings of the study were presented to the public at an information meeting on Wednesday, July 13, 2011 at 6:00 pm. The City Council received the report at the July 18 Council meeting and set a public comment period for the August 8, 2011 meeting. The Council also requested the neighborhoods submit any questions they have to staff prior to the meeting so appropriate responses to the technical questions can be available from the consultant. The traffic study is attached.

Notices for this meeting were sent to over 300 property owners and it was also advertised via the City's News Fax.

A full list of questions, from residents, and responses, from staff and consultant, are attached and were posted on the study webpage on Wednesday, August 3.

POLICY OBJECTIVE

There is continuous right-of-way for the segment of County Road C-2 between Hamline Avenue and Lexington Avenue, however, there is a 175 foot long segment east of Griggs Street and west of the cul- de- sac off Lexington Avenue that has never been constructed.

FINANCIAL IMPACTS

The cost of the Origin and Destination Study and subsequent public meetings was \$15,000. The study was funded by the street construction fund.

STAFF RECOMMENDATION

Receive public comment on the traffic study and discuss the County Road C-2 traffic study.

REQUESTED COUNCIL ACTION

Provide Staff direction on additional information needs regarding the County Road C-2 traffic study.

Prepared by: Debra Bloom, City Engineer
Attachments: A: Traffic Study
B: Study Questions and Responses



SRF No. 0117477

MEMORANDUM

TO: Debra Bloom, P.E., Assistant Public Works Director/City Engineer
City of Roseville

FROM: Craig Vaughn, P.E., PTOE, Senior Associate
Matthew Pacyna, P.E., Senior Engineer

DATE: July 13, 2011

SUBJECT: COUNTY ROAD C2 SUBAREA ORIGIN-DESTINATION STUDY

INTRODUCTION

As requested, SRF Consulting Group has completed a review of the subarea surrounding County Road C2 between Hamline Avenue and Lexington Avenue in the City of Roseville (see Figure 1: Study Area). The main objective of this study is to evaluate the travel pattern shifts associated with a potential connection of County Road C2 between Hamline Avenue North and Lexington Avenue North. Currently, County Road C2 is disconnected between Griggs Street North and Lexington Avenue North. Current traffic patterns, volumes, and intersection operations were reviewed to determine the effect a potential connection would have on the adjacent roadway network. Furthermore, the roadway design feasibility was reviewed to evaluate the impacts associated with constructing the County Road C2 connection. The following sections summarize the results of this study.

DATA COLLECTION

To determine the potential travel pattern shifts due to a County Road C2 connection, a tiered approach was developed to help identify the potential changes from a local and regional perspective. Based on this approach p.m. peak hour turning movement counts, average daily traffic volumes, and local and regional travel pattern data was collected. Each of the data collection components is summarized below. Figure 2 provides an overview of the various types and locations of data collected.

Turning Movement Counts

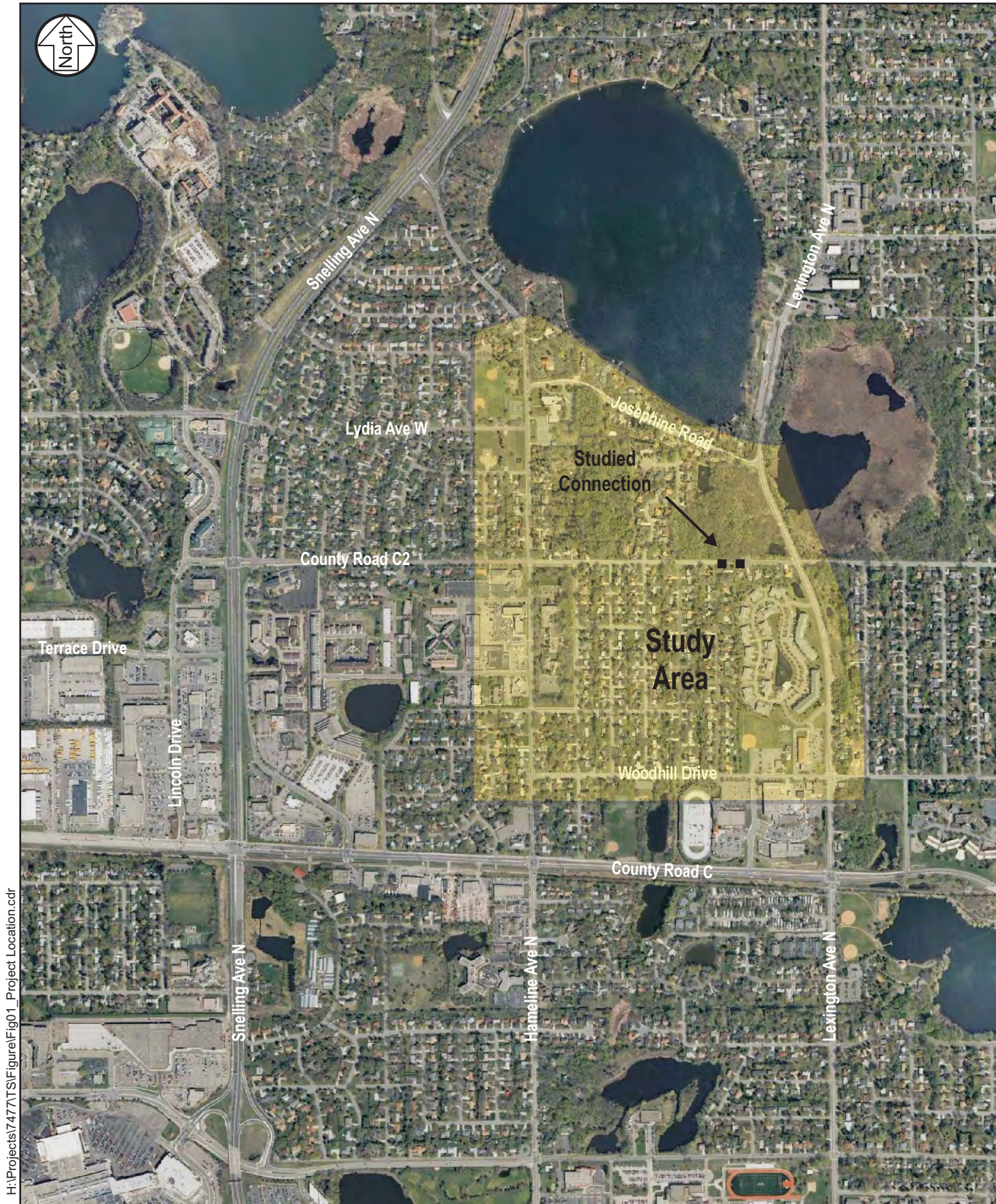
Year 2011 p.m. peak hour turning movements were collected at the following key intersections:

- Lexington Avenue North and County Road C2
- Lexington Avenue North and Josephine Road
- Josephine Road and Fernwood Street

www.srfconsulting.com

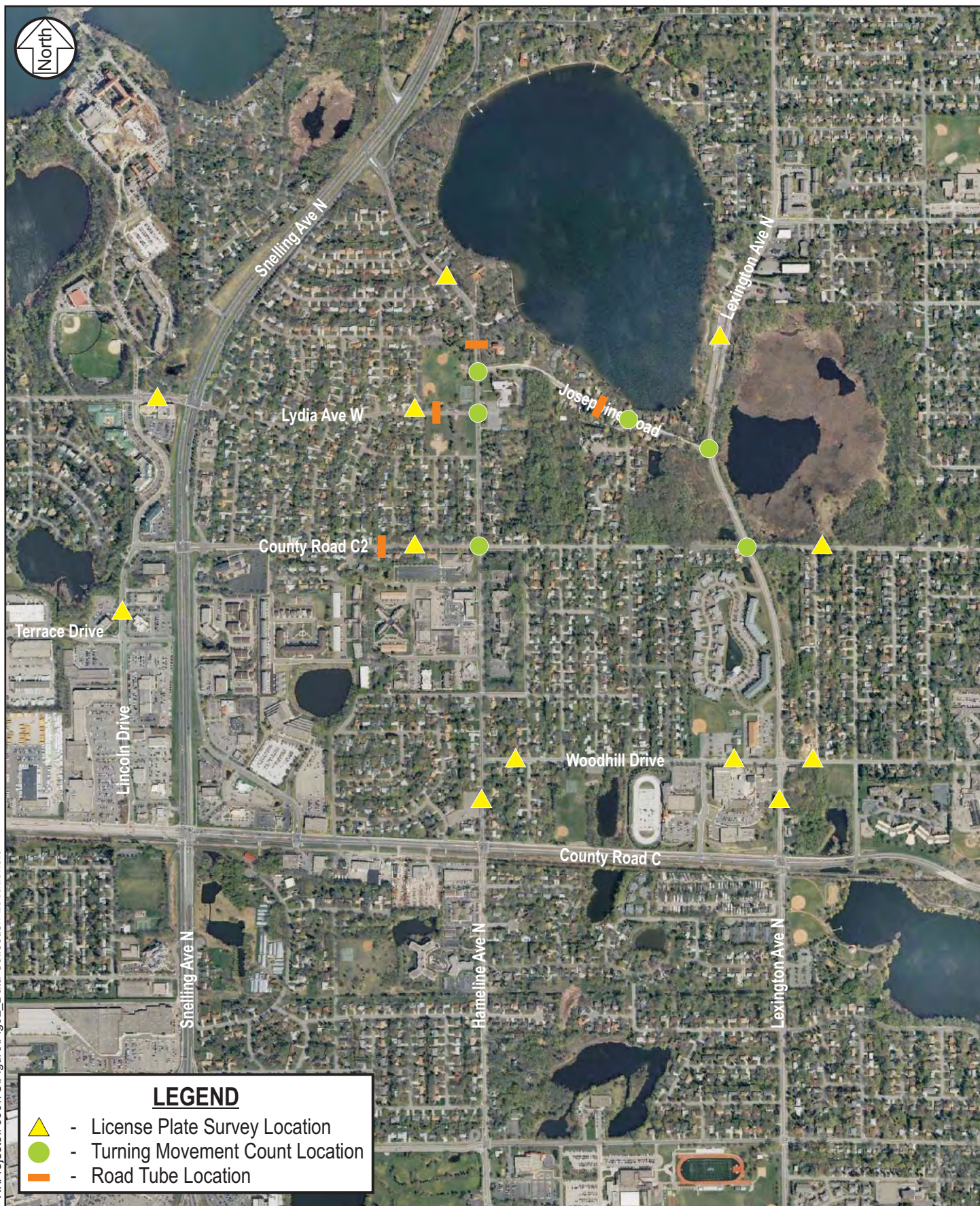
One Carlson Parkway North, Suite 150 | Minneapolis, MN 55447-4443 | 763.475.0010 Fax: 763.475.2429

An Equal Opportunity Employer



H:\Projects\7477\TISI\Figure\Fig01 Project Location.cdr

H:\Projects\7366\TSIFigure\Fig02_Data Collection Locations.cdr



Data Collection Overview

County Road C2 Subarea Origin-Destination Traffic Study
City of Roseville

Figure 2

- Josephine Road and Hamline Avenue North
- Hamline Avenue North and County Road C2
- Hamline Avenue North and Lydia Avenue

It should be noted that the p.m. peak hour turning movement counts at all key intersections, except the Hamline Avenue North and Lydia Avenue intersection, were collected for the *Pulte Homes Traffic Study*, dated February 22, 2011. The p.m. peak hour turning movement count at the Hamline Avenue North and Lydia Avenue intersection was completed on May 18, 2011.

The key intersections within the study area are currently unsignalized, with side-street stop control. Lexington Avenue North is a three-lane roadway (two-lane roadway with a center two-way left-turn lane (TWLTL)) with a posted speed limit of 40 miles per hour (mph). Hamline Avenue North is a two-lane roadway with a posted speed limit of 35 mph; the other roadways within the study area are two-lane roadways with posted speed limits of 30 mph. Full-access is provided at each key intersection. Year 2011 geometrics, traffic controls, and p.m. peak hour volumes for the key intersections are shown in Figure 3.

Average Daily Traffic Volumes

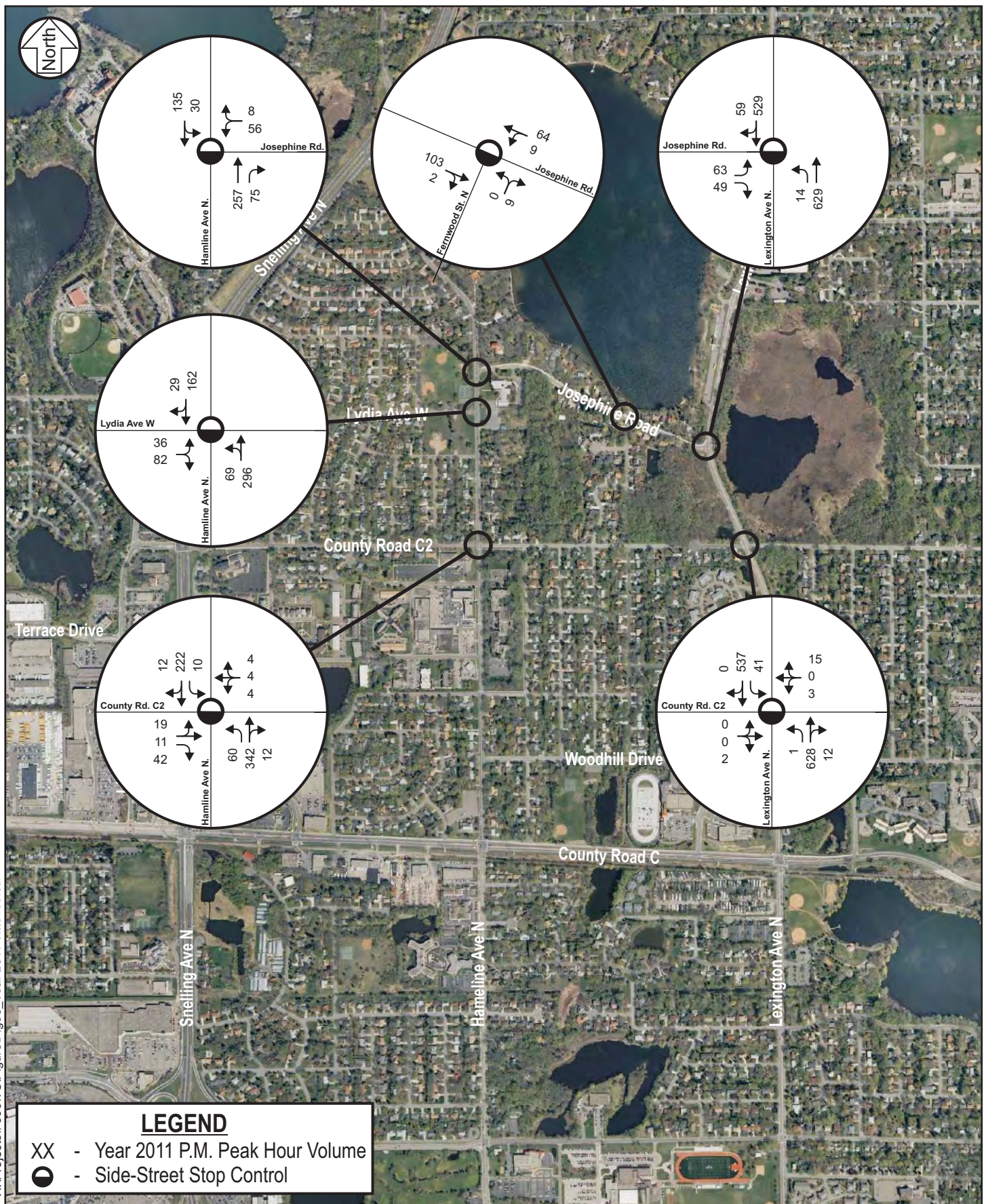
To determine the travel pattern shifts a potential County Road C2 connection will have on area roadways, existing average daily traffic volumes were collected. The volumes included a combination of historical and newly collected average daily traffic volumes. Updated average daily traffic volumes were collected the week of May 16, 2011 at the following locations:

- Hamline Avenue North (North of Josephine Road)
- Lydia Avenue (between Snelling Avenue and Hamline Avenue North)
- County Road C2 (between Snelling Avenue and Hamline Avenue North)
- Josephine Road (between Hamline Avenue North and Lexington Avenue North)

The updated average daily traffic volumes were used to determine the percent capture for the license plate origin-destination study discussed later in this memorandum. It should be noted that the average daily traffic volumes from the 2009 Minnesota Department of Transportation flow maps were used as the base average daily traffic volumes.

Current Travel Patterns

To determine the current travel patterns, an origin-destination (O-D) study was conducted. The goal of the O-D study was to identify the potential travel pattern changes if the County Road C2 connection were constructed. To perform the O-D study, a cordon area was developed around the potential County Road C2 connection area. The O-D study was conducted by recording the location, time, direction, and license plate information for all vehicles that passed each survey location. The license plate O-D surveys were conducted during the p.m. peak hour (4:30 p.m. to 5:30 p.m.) on Tuesday May 24, 2011.



As previously mentioned, average daily traffic volumes were collected to help determine the percent capture of license plates. The percent capture is used to gauge the statistical reliability of the data collected. Based on the comparison between the p.m. peak hour data collected from the average daily traffic counts and the license plate O-D study, the average percent capture was approximately 90 percent, which represents a reliable data set.

The license plate data was reviewed and matches identified to develop an understanding of the current travel patterns within the study area. Based on the current travel pattern information, the amount of traffic that may potentially shift to County Road C2 can be determined if the connection were constructed. It should be noted that the peak hour data collected as part of the O-D data collection effort was extrapolated to daily values using the tube count data to identify the percent peak hour proportion. A summary of the current travel patterns and daily traffic volumes using the specific traveled routes are shown in Figures 5 through 8. Please note that this set of figures also presents the amount of traffic that can be expected to shift to County Road C2 if it were connected through. How this was determined is discussed in the following section.

TRAVEL PATTERN SHIFTS

Local Travel Pattern Shifts

The license plate O-D data and subsequent travel time comparisons were reviewed in order to estimate how much traffic can be expected to shift to County Road C2 if it were connected. Please note, never will 100 percent of drivers change their travel pattern if the connection were constructed; the current routes may have some travel time benefit or operational benefit that make them attractive. The new route must be significantly quicker in order to get a large amount of people to change their current pattern. Travel times for the routes that could have drivers shift to County Road C2 were developed.

The travel times were calculated using a combination of the length of the route, the average speed, and specific intersection delays. The travel times were categorized into groups based on the general travel pattern (i.e. southwest to/from northeast) and include an estimated travel time for the potential route using a County Road C2 connection. A route diversion curve was used to determine the amount of vehicles that can be expected to change their travel pattern.

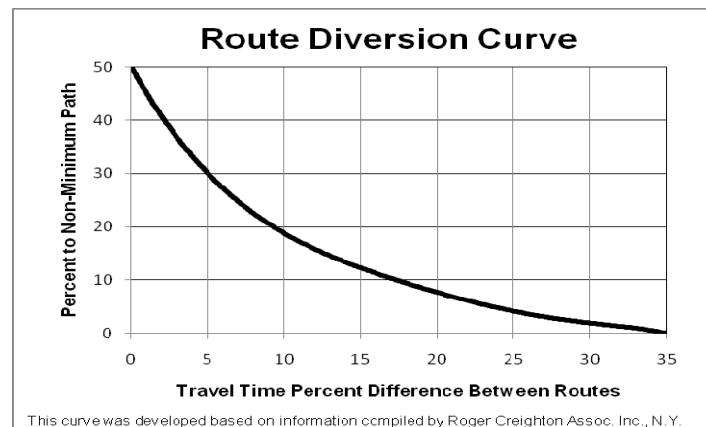
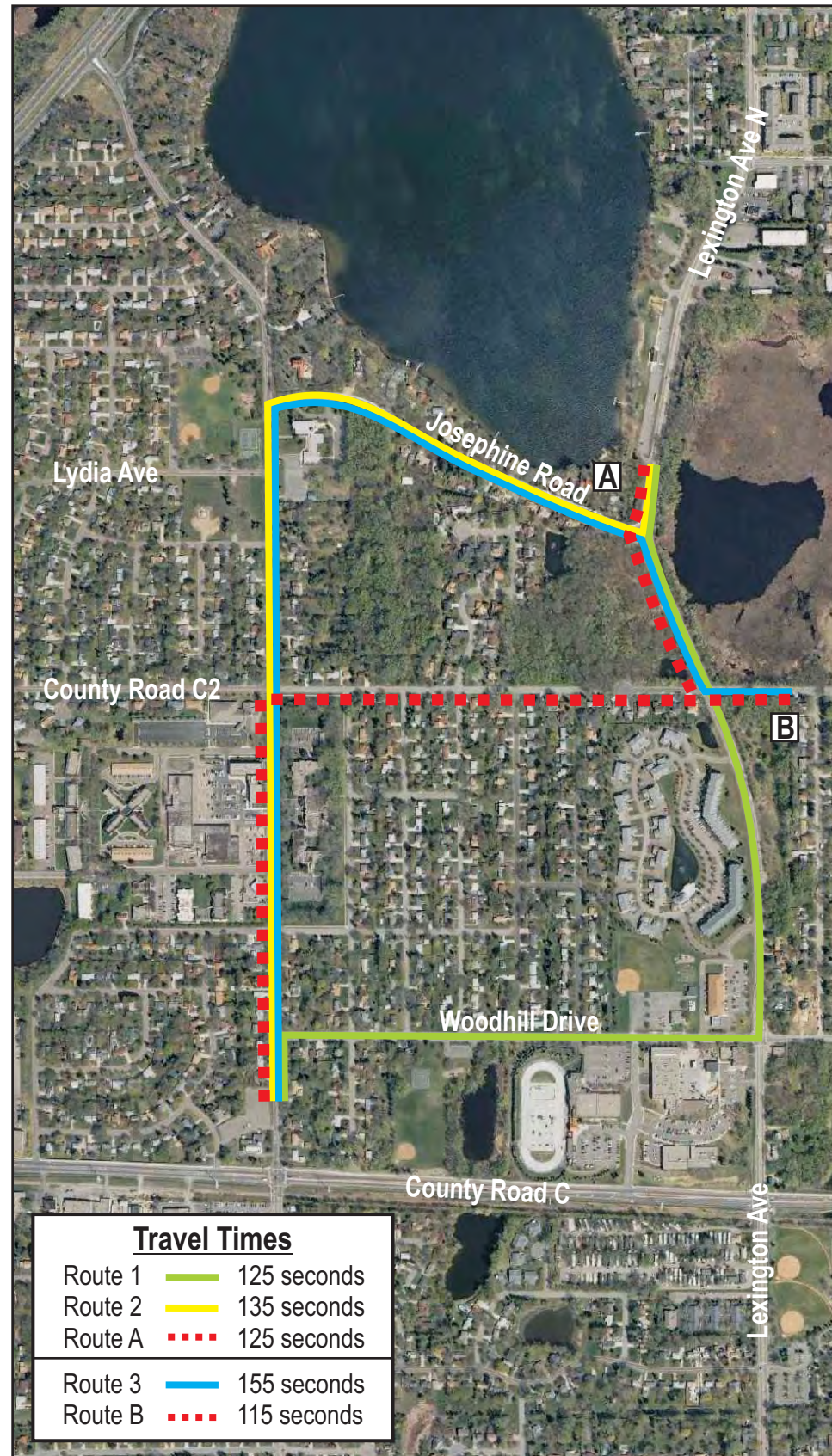
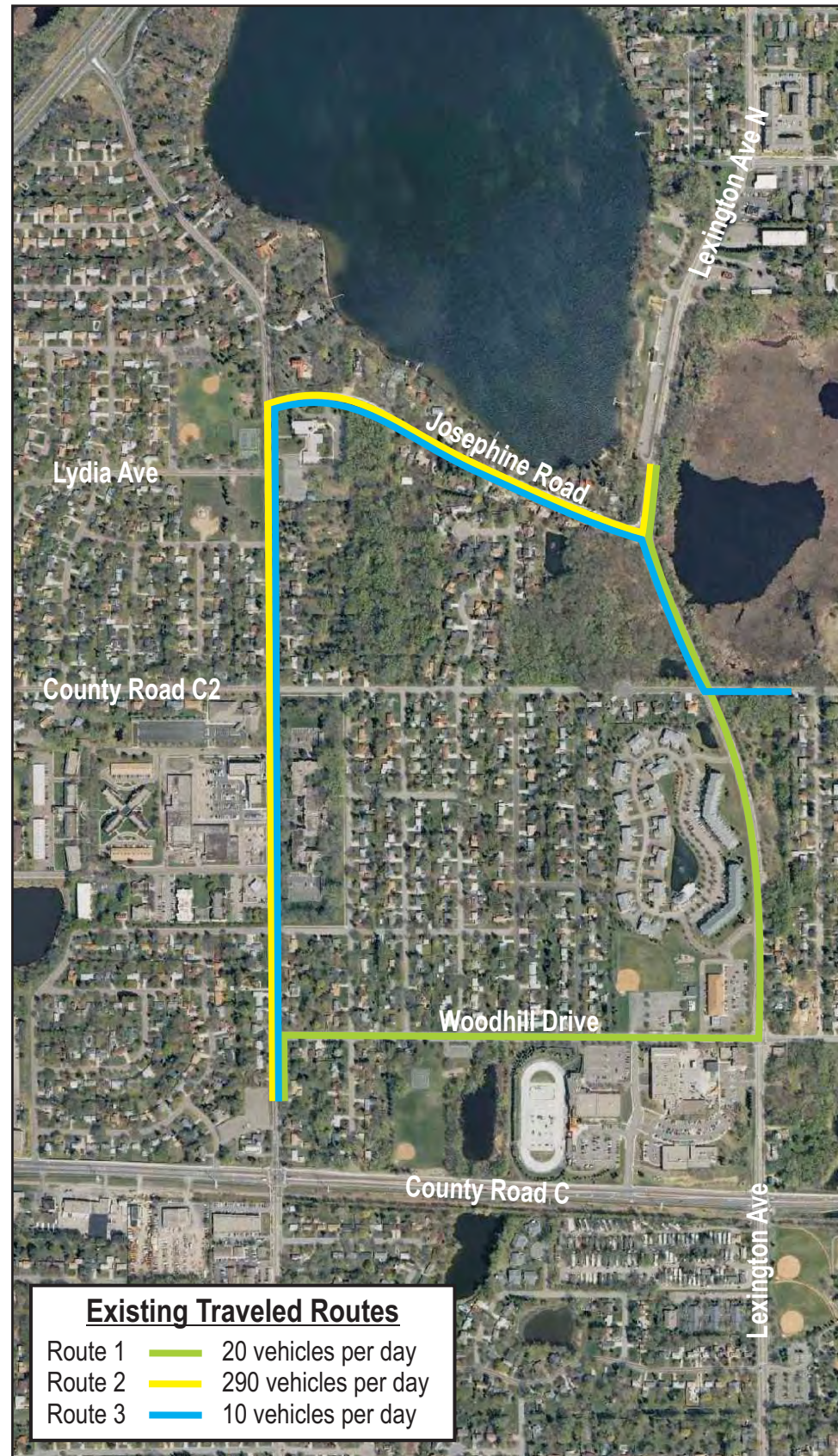
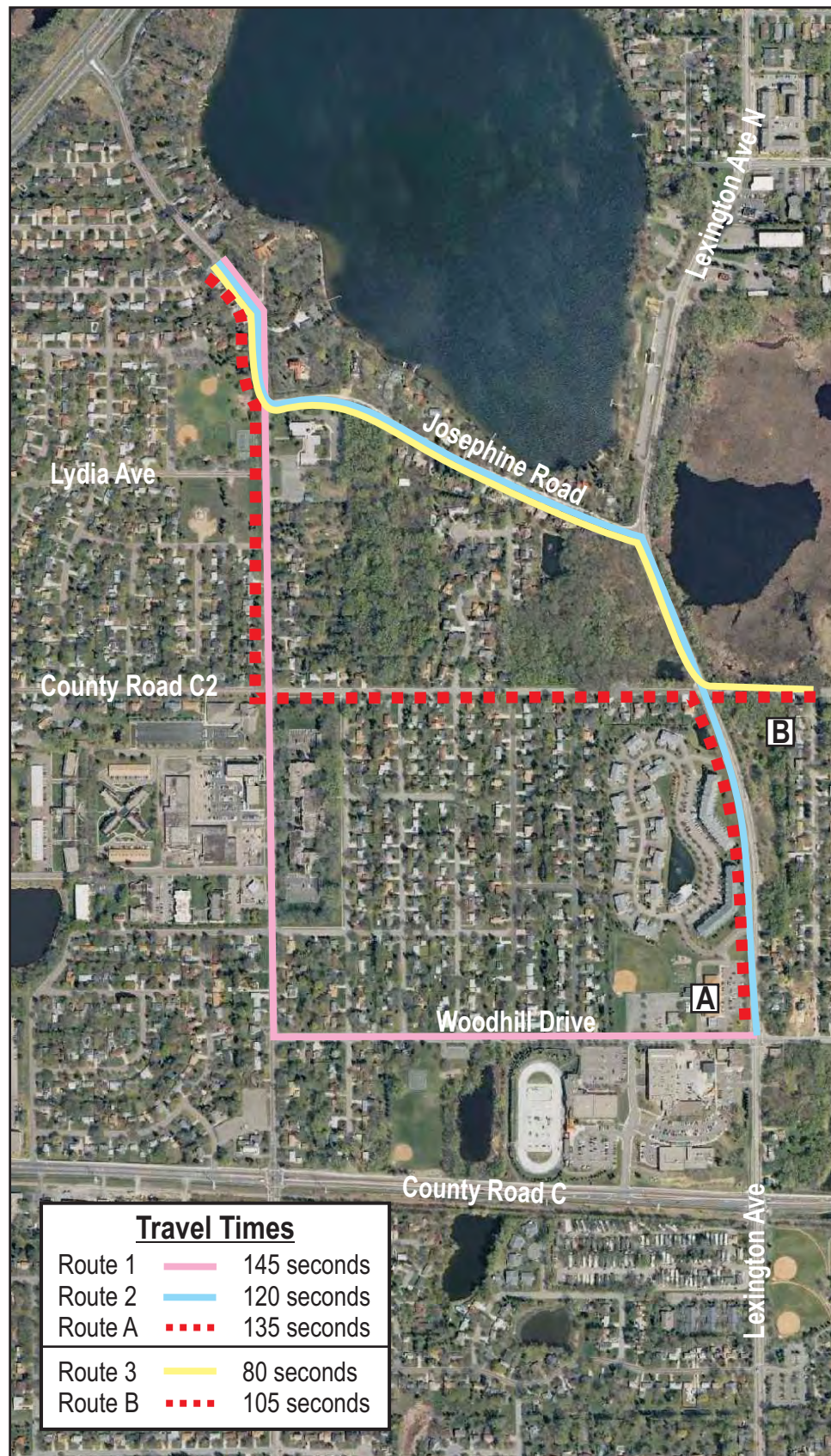
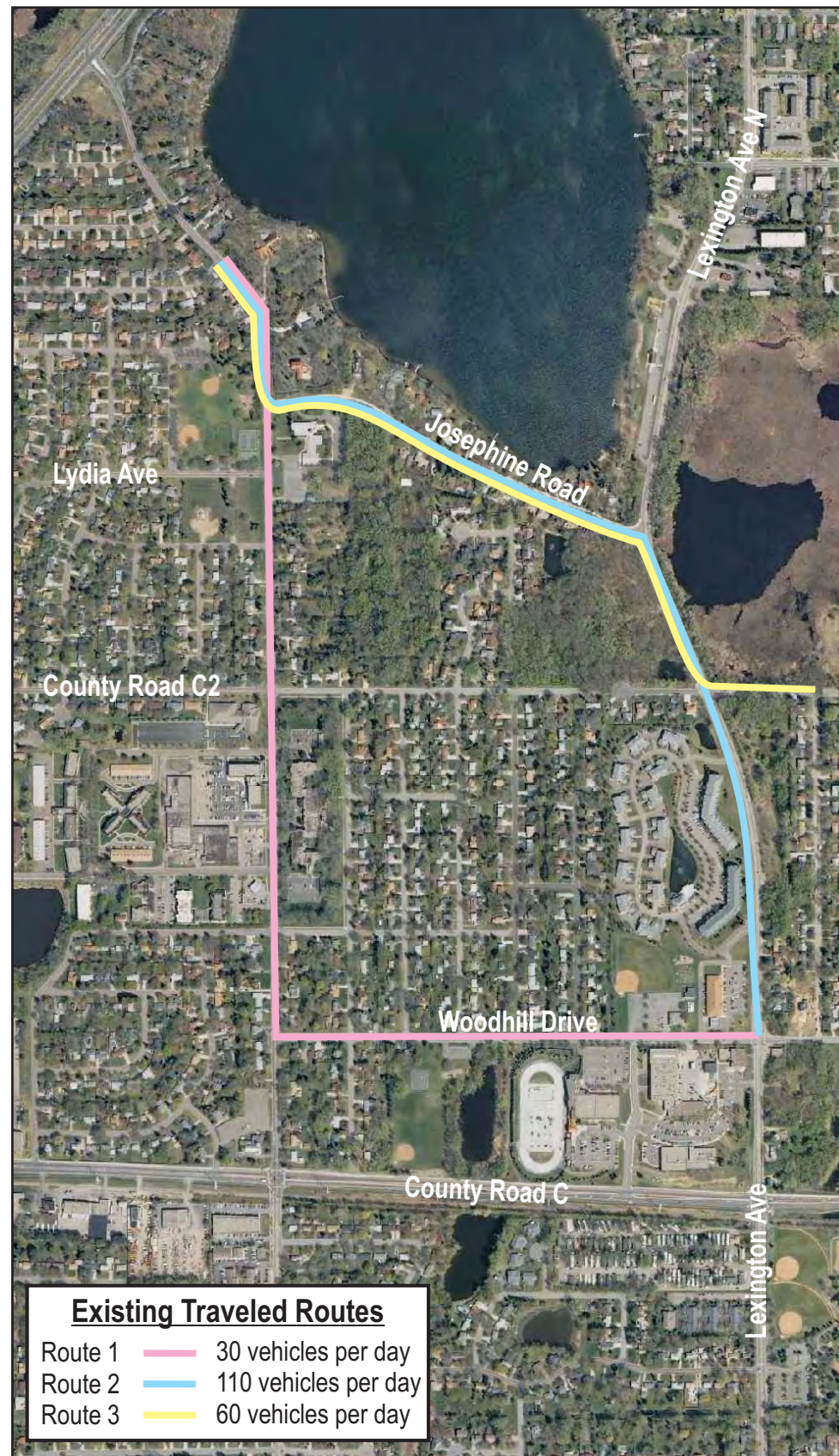


Figure 4: Route Diversion Curve

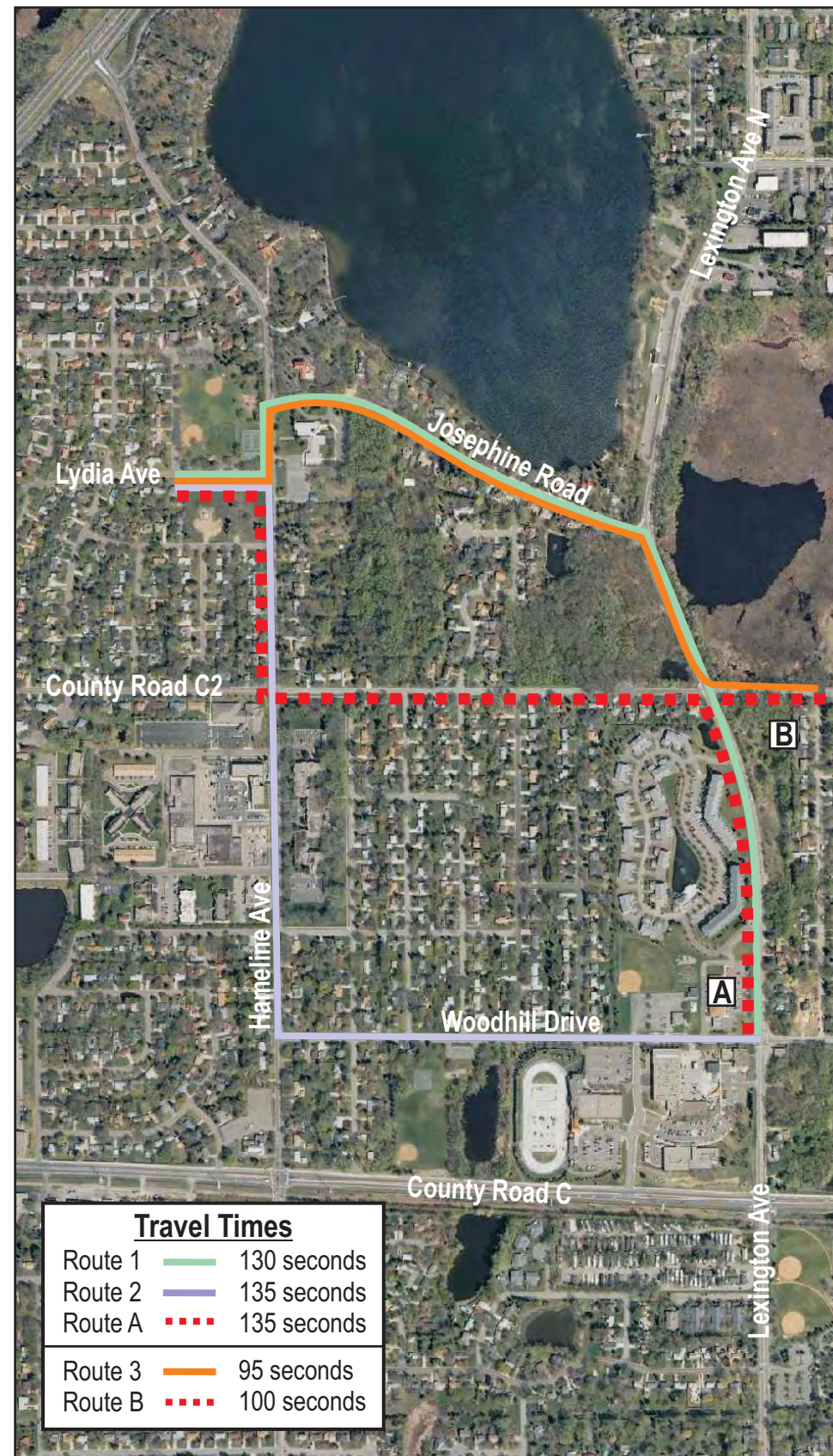
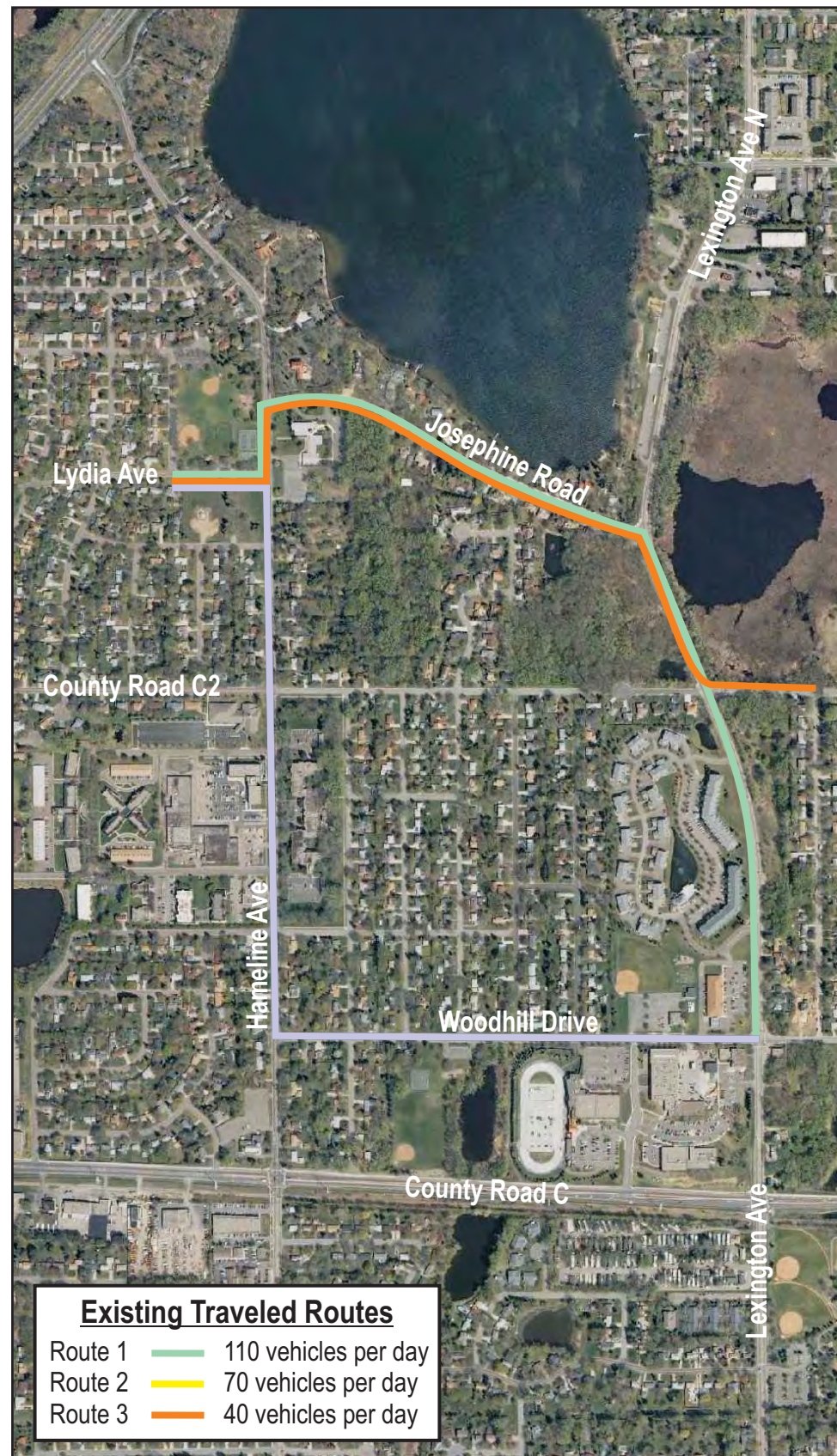
H:\Projects\7366\ITS\Figure\Fig05_OD Routes_SW to NE.cdr



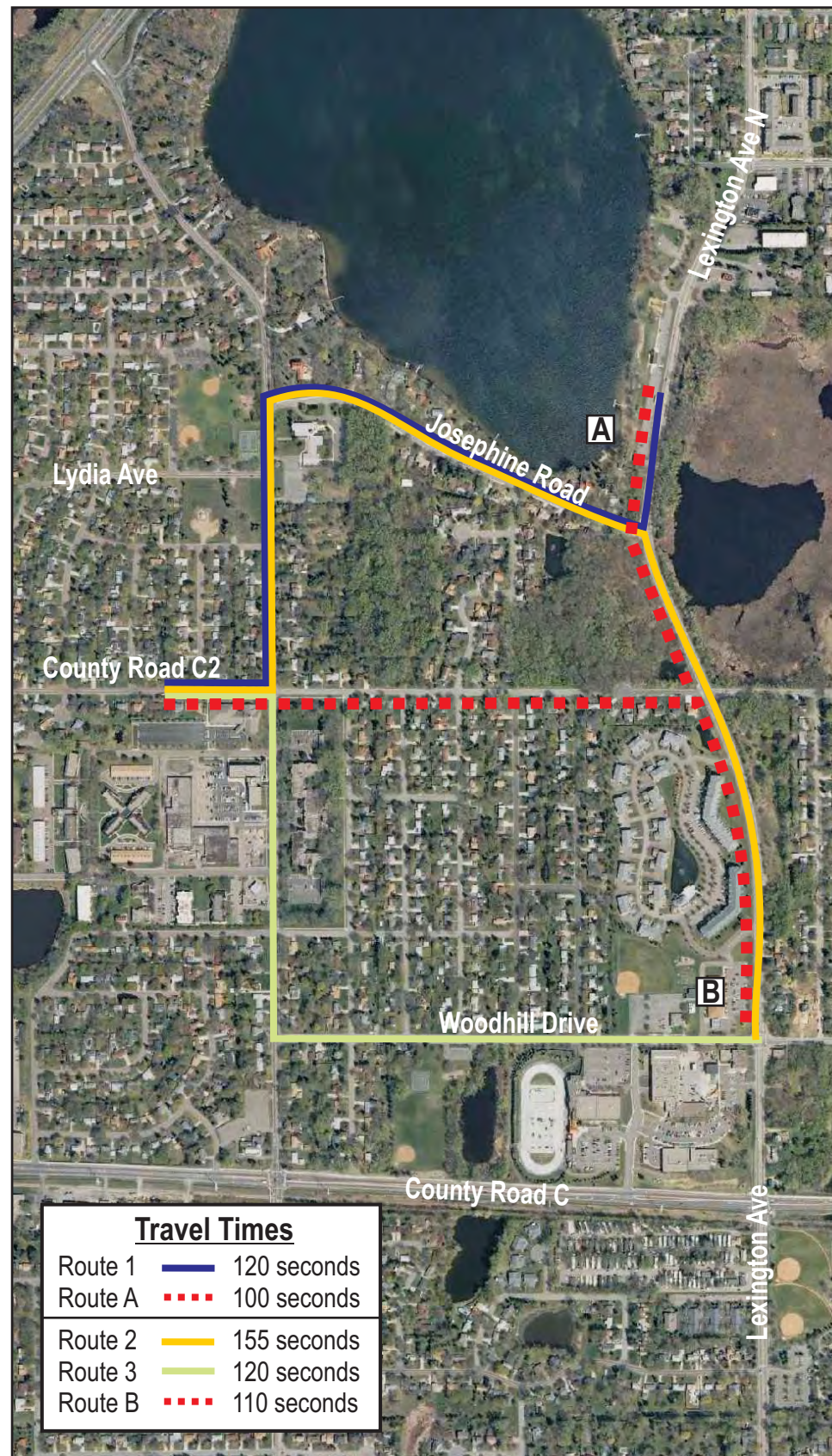
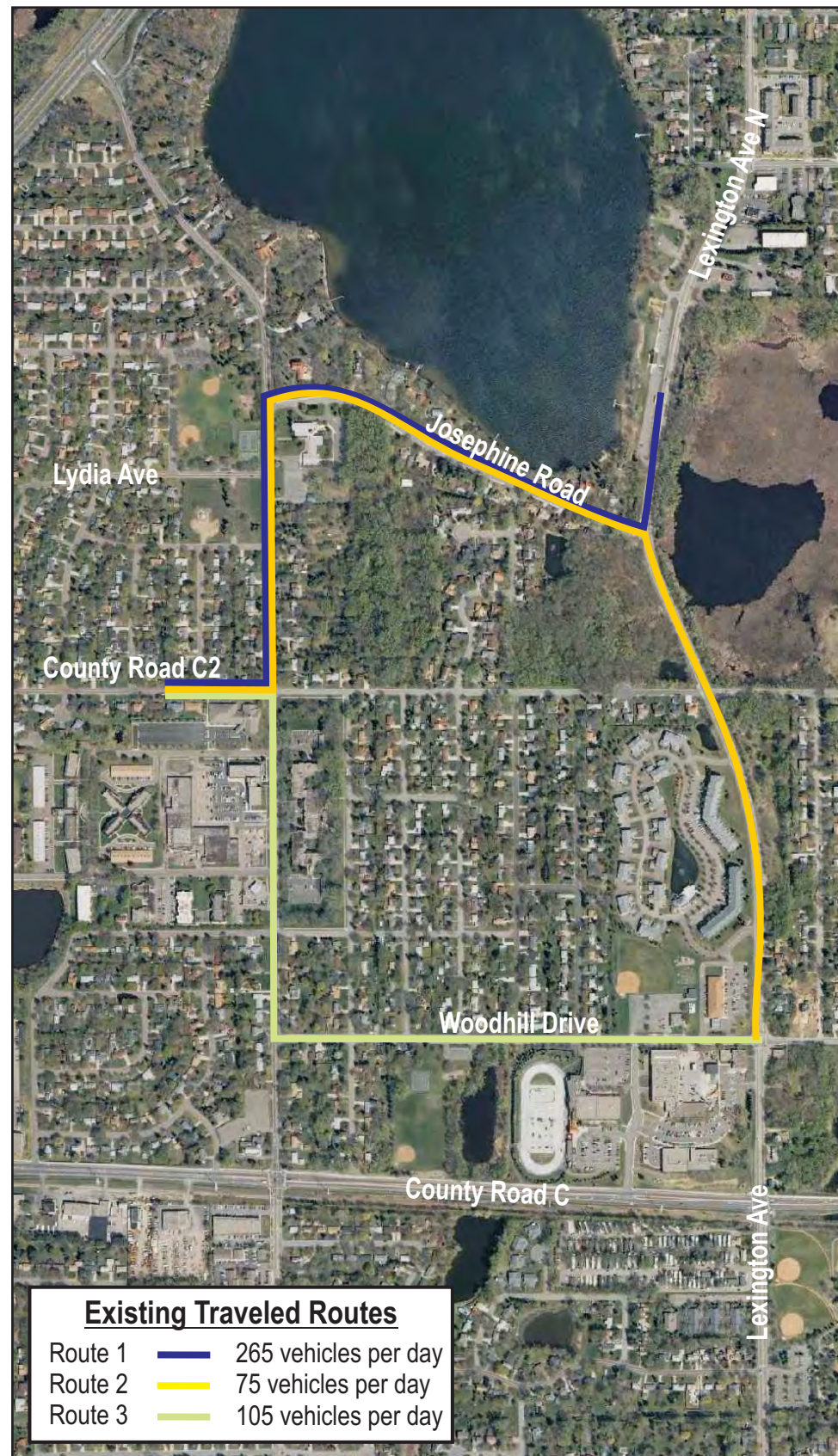
H:\Projects\7366\ITS\Figure\Fig06_OD Routes_NW to SE.cdr



H:\Projects\7366\TS\Figure\Fig07_OD Routes_West to East via Lydia.cdr



H:\Projects\7366\TS\Figure\Fig08_OD Routes_West to East via CR C2.cdr



Results of the travel time route comparison and the resultant percent diversion to County Road C2 is summarized in Table 1. The most affected routes from a volume perspective will be Josephine Road and Woodhill Drive between Hamline Avenue and Lexington Avenue. Josephine Road and Woodhill Drive are expected to see a reduction of approximately 650 and 450 vehicles per day, respectively. It is estimated that approximately 300 vehicles per day of the 450 vpd along Woodhill Drive originate or are destined for the neighborhood between Hamline Avenue and Lexington Avenue, and will utilize the potential County Road C2 connection if constructed. This summarizes the potential County Road C2 connection local changes (approximately 1,100 vehicles per day). Again, Figures 5 through 8 present the current and potential (with the County Road C2 connection) travel time routes for those affected.

Table 1
Travel Time Comparison

General Travel Pattern	Average Travel Time (Seconds) *	Percent Diversion to County Road C2
Southwest to/from Northeast (Figure 5)		
Route 1	125 seconds	50 percent
Route 2	135 seconds	80 percent
- Route A - via CR C2	125 seconds	---
Route 3	155 seconds	100 percent
- Route B - via CR C2	125 seconds	---
Northwest to/from Southeast (Figure 6)		
Route 1	145 seconds	70 percent
Route 2	120 seconds	15 percent
- Route A - via CR C2	135 seconds	---
Route 3	80 seconds	No Diversion
- Route B - via CR C2	105 seconds	---
West to/from East (via Lydia) (Figure 7)		
Route 1	130 seconds	70 percent
Route 2	135 seconds	50 percent
- Route A - via CR C2	135 seconds	---
Route 3	95 seconds	30 percent
- Route B - via CR C2	100 seconds	---
West to/From East (via CR C2) (Figure 8)		
Route 1	120 seconds	90 percent
Route 2	155 seconds	100 percent
- Route A - via CR C2	100 seconds	---
Route 3	120 seconds	80 percent
- Route B - via CR C2	110 seconds	---

* Travel times for each route include intersections delays.

Regional Travel Pattern Shifts

The license plate O-D study provides an understanding of travel patterns at the local level under current conditions. In order to understand the expanded attraction this connection may have on the transportation system, if any, the Metropolitan Council Regional Travel Demand Model was used to identify potential pattern shifts from outside of the immediate study area. The regional model takes into account current and planned households, employment figures, and transportation network changes (under future conditions) to project traffic volumes and travel patterns. The future construction of Twin Lakes Parkway was considered under future conditions to understand if this connection would provide an efficient route for trips to this area. It was determined that fewer than five percent of the proposed Twin Lakes Redevelopment Area travel shed will use either Josephine Road or County Road C2. Therefore, the County Road C2 connection does not serve a significant amount of traffic destined for the Twin Lakes redevelopment area.

Based on the Regional Travel Demand Model, approximately 450 vehicles per day will divert from County Road C to use County Road C2. Other regional system travel pattern shifts include a reduction of approximately 350 vehicles per day from other regional routes in the area (i.e., Snelling Avenue, County Road B2, TH 36, County Road E, etc.). Therefore, the potential County Road C2 connection regional travel pattern shift would be approximately 800 vehicles per day under year 2011 conditions.

Overall Travel Pattern Shifts

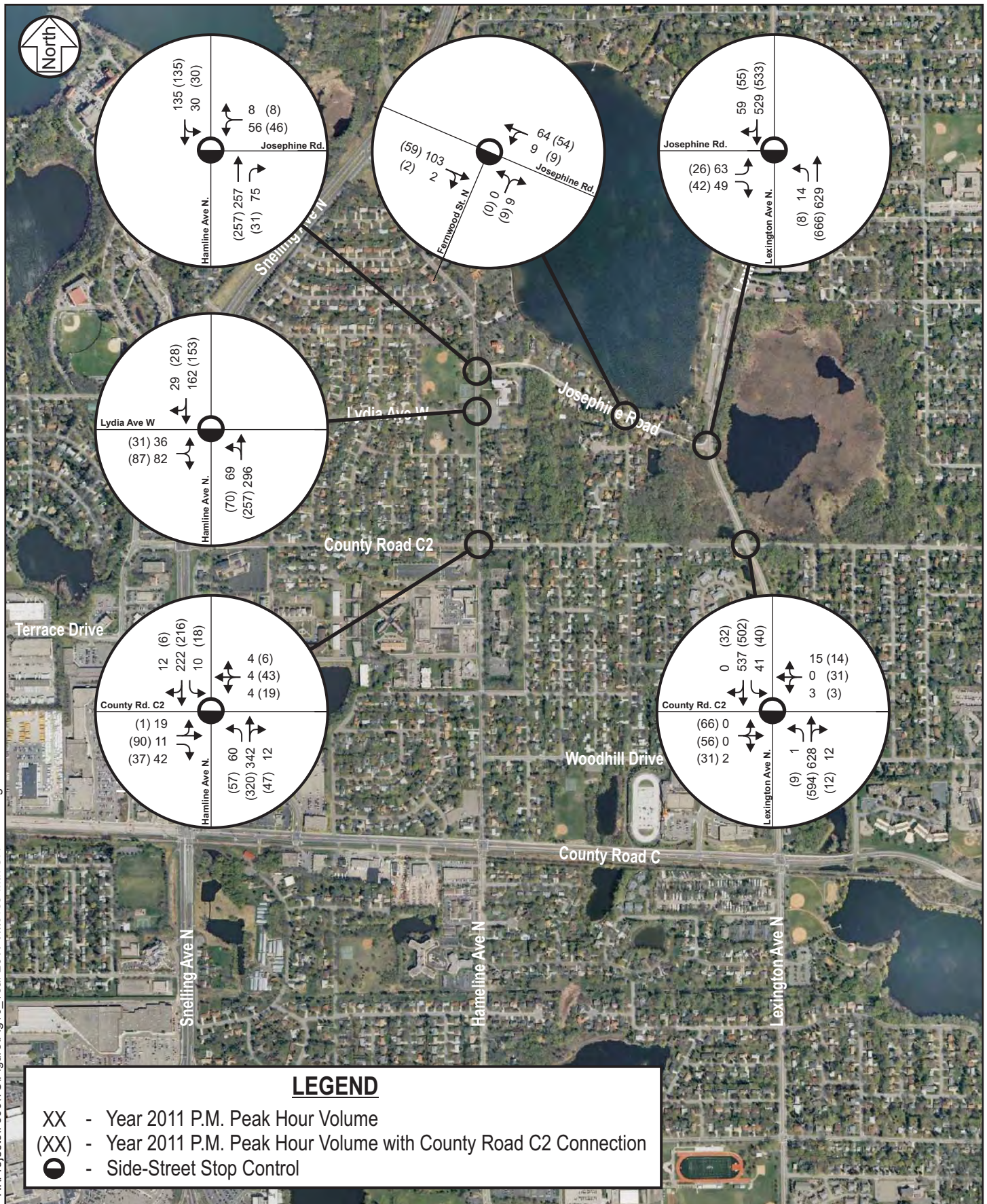
The local and regional travel pattern shifts combined together result in a year 2011 diversion of approximately 1,900 vehicles per day using County Road C2 if the connection were constructed. This results in a year 2011 County Road C2 average daily traffic volume of approximately 2,510 between Hamline Avenue and Lexington Avenue. Figure 9 shows the net change for the key east/west roadways within the study area and the expected year 2011 average daily traffic volumes if the County Road C2 connection were constructed.

TRAFFIC OPERATION ANALYSIS

Year 2011 Peak Hour Intersection Operations

To establish a baseline for the area intersection operations, a p.m. peak hour intersection capacity analysis was completed. This analysis was used to compare the operational impacts with and without the potential County Road C2 connection. The operations analysis was conducted using a combination of the Highway Capacity Manual (HCM) and Synchro/SimTraffic software (version 7). The current p.m. peak hour volumes collected and the modified p.m. peak hour volumes based on the potential County Road C2 connection that were used for the operations analysis are shown in Figure 10. It should be noted that only the p.m. peak hour was reviewed due to it representing a worst-case scenario for the adjacent roadway network. This has been validated with the daily data that has been collected.





Capacity analysis results identify a Level of Service (LOS), which indicates how well an intersection is operating. The LOS results are based on average delay per vehicle. Intersections are given a ranking from LOS A through LOS F. LOS A indicates the best traffic operation and LOS F indicates an intersection where demand exceeds capacity. In the Twin Cities metropolitan area, LOS A through D is generally considered acceptable by drivers. For side-street stop controlled intersections, special emphasis is given to providing an estimate for the level of service of the minor approach. Traffic operations at unsignalized intersections with side-street stop control can be described in two ways. First, consideration is given to the overall intersection level of service. This takes into account the total number of vehicles entering the intersection and the capability of the intersection to support those volumes. Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, the majority of delay is attributed to the side-street approaches in most cases. Table 2 presents the level of service criteria for signalized and unsignalized intersections.

Table 2
Level of Service Criteria for Signalized and Unsignalized Intersections

Level of Service	Average Delay per Vehicle [seconds]	
	Signalized Intersections	Unsignalized Intersections
A	< 10	< 10
B	10 – 20	10 – 15
C	20 – 35	15 – 25
D	35 – 55	25 – 35
E	55 – 80	35 – 50
F	> 80	> 50

⁽¹⁾ Stop-controlled intersection LOS criteria are the same for side-street and all-way stop controlled intersections.

Results of the year 2011 operations analysis shown in Table 3 indicate that all key intersections currently operate at an acceptable overall LOS A during the p.m. peak hour with existing traffic control and geometric layout. All side-street delays are considered acceptable and do not require mitigation. With year 2011 traffic volume levels and the County Road C2 connection, all key intersections will continue to operate at an acceptable overall LOS A during the p.m. peak hour with existing traffic control and geometric layout. Side-street delays will increase at the County Road C2 intersections with Lexington Avenue North and Hamline Avenue North. However, the increase in side-street delays is considered acceptable and does not require mitigation. Therefore, from an operations perspective, the potential County Road C2 connection does not significantly impact area intersection operations.

Table 3
Year 2011 Peak Hour Capacity Analysis Comparison
Level of Service Results

Intersection	P.M. Peak Hour Level of Service	
	Without C2 Connection	With C2 Connection
Lexington Avenue North and County Road C2 *	A/B	A/D
Lexington Avenue North and Josephine Road *	A/C	A/B
Josephine Road and Fernwood Street *	A/A	A/A
Josephine Road and Hamline Avenue North *	A/B	A/B
Hamline Avenue North and County Road C2 *	A/B	A/C
Hamline Avenue North and Lydia Avenue *	A/B	A/B

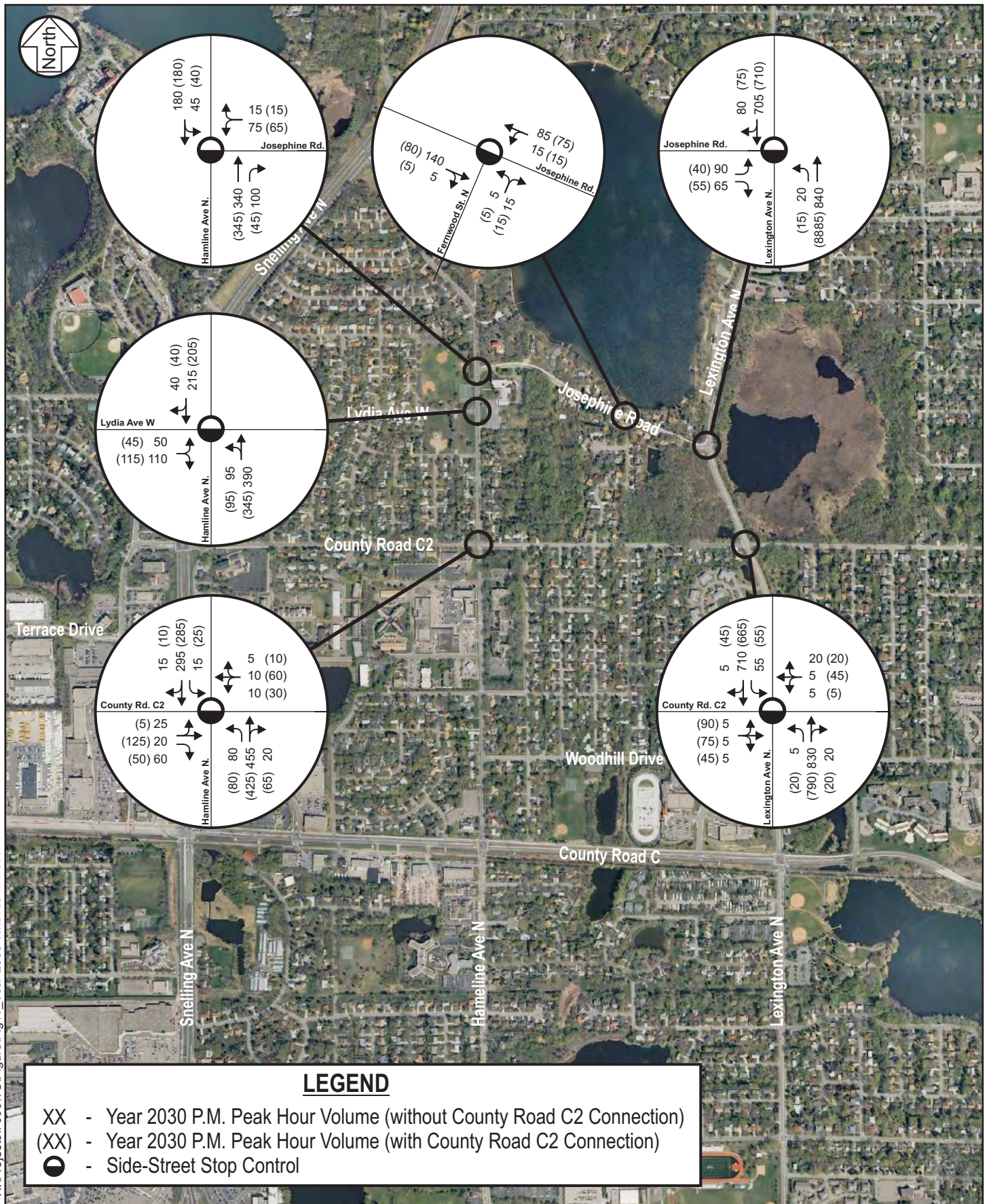
* Indicates an unsignalized intersection with side-street stop control. The overall LOS is shown followed by the worst approach LOS.

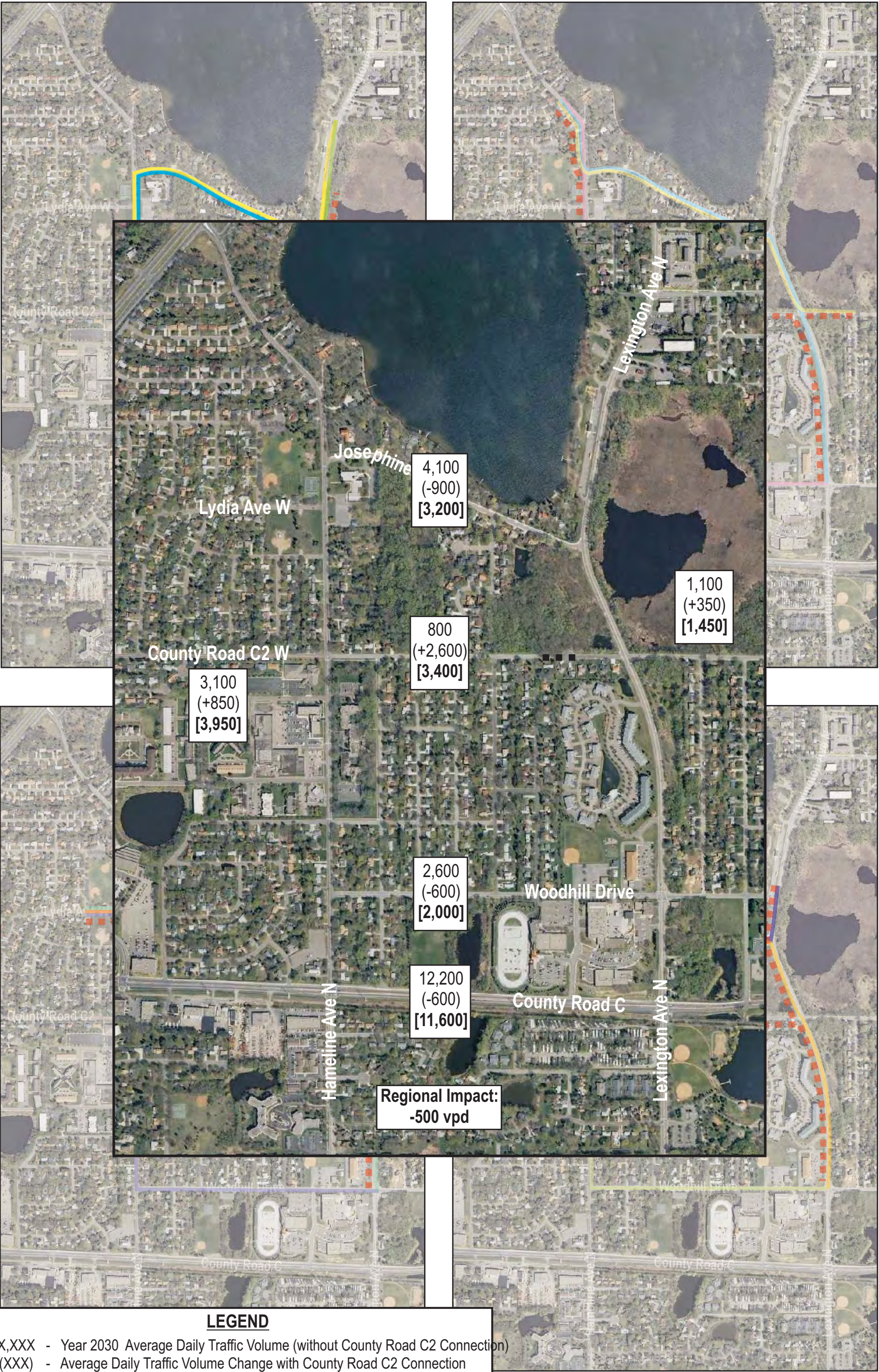
Year 2030 Traffic Forecasts

To determine how the existing and potential (with the County Road C2 connection) roadway network will operate under year 2030 conditions, p.m. peak hour and daily traffic forecasts were developed. The traffic forecasts were developed using a combination of historical area growth, the Regional Travel Demand Model and traffic volumes from the City of Roseville Transportation Plan. Based on this information, an annual growth rate of one and one-half percent was applied to the year 2011 peak hour volumes (with and without the County Road C2 connection) to develop year 2030 traffic forecasts. It should be noted that the Josephine Woods residential development is accounted for as part of this year 2030 forecast.

During the year 2030 forecast development and comparison with historical information a relatively significant difference was identified with respect to the traffic forecast on Josephine Road. The Regional Travel Demand Model evaluated as part of this current study forecast the average daily traffic on Josephine Road to be approximately 4,100 vehicles per day. This is different than the value of 6,500 presented in the Year 2030 Comprehensive Plan. The difference was reconciled understanding that the Year 2030 Comprehensive Plan values were developed using an earlier data set for the base assumptions. The Regional Travel Demand Model evaluated as part of this current study used a base network of year 2010, whereas the previous Year 2030 Comprehensive Plan Regional Travel Demand Model evaluation would have used a base network of year 2005.

Figure 11 shows the p.m. peak hour turning movement volumes under year 2030 conditions with and without the potential County Road C2 connection. Figure 12 shows the year 2030 average daily traffic volumes with and without the potential County Road C2 connection.





Year 2030 Peak Hour Intersection Operations

To determine how the existing and potential (with the County Road C2 connection) roadway network will operate under year 2030 conditions, a p.m. peak hour intersection capacity analysis was completed. This analysis was used to compare the operational impacts with or without the potential County Road C2 connection.

The year 2030 operations analysis results shown in Table 4 indicate that all key intersections will operate at an acceptable overall LOS A during the p.m. peak hour with existing traffic control and geometric layout. All side-street delays are considered acceptable and do not require mitigation. Under year 2030 conditions with the County Road C2 connection, all key intersections will operate at an acceptable overall LOS C or better during the p.m. peak hour with existing traffic control and geometric layout. The side-street at the Lexington Avenue North and County Road C2 intersection will operate at LOS F with an eastbound side-street delay of approximately two minutes. Side-street delays of this magnitude are generally considered unacceptable to motorists and warrant mitigation.

Table 4
Year 2030 Peak Hour Capacity Analysis Comparison
Level of Service Results

Intersection	P.M. Peak Hour Level of Service	
	No C2 Connection	With C2 Connection
Lexington Avenue North and County Road C2 *	A/C	C/F (B/F)
Lexington Avenue North and Josephine Road *	A/C	A/C
Josephine Road and Fernwood Street *	A/A	A/A
Josephine Road and Hamline Avenue North *	A/C	A/C
Hamline Avenue North and County Road C2 *	A/C	A/B
Hamline Avenue North and Lydia Avenue *	A/B	A/B

* Indicates an unsignalized intersection with side-street stop control. The overall LOS is shown followed by the worst approach LOS.

() Parentheses indicate the intersection operations with the recommended improvements.

To improve the side-street delays at the Lexington Avenue North and County Road C2 intersection under year 2030 conditions (with the County Road C2 connection), an eastbound right-turn lane should be constructed. With the recommended right-turn lane, the Lexington Avenue North and County Road C2 intersection will operate at LOS B/F (shown in parentheses in Table 4). Side-street delays along County Road C2 will be approximately 90 seconds. While this may be perceived unacceptable, it will only occur during the peak hour, which represents a small proportion of the overall daily operation. However, if the side-street delays are considered unacceptable by the City, installation of a traffic signal would mitigate this condition. Based on a preliminary review of the p.m. peak hour traffic volumes, the Lexington Avenue North and County Road C2 intersection will likely meet the peak hour traffic signal warrant.

ROADWAY DESIGN REVIEW

The following section presents a conceptual roadway design for the potential County Road C2 connection. This layout is presented for conceptual purposes only and is not intended to represent a detailed construction drawing. Furthermore, other alternatives are possible to complete this connection and the one shown in Figure 13 would require further review, comment, data collection and development.

Existing Conditions – Alignment

The existing alignment of County Road C2 between Merrill Street and Griggs Street as well as the segment from the cul-de-sac to Lexington Avenue are straight and in line, and as such present no significant impacts to adjacent properties due to alignment connections. Design speed on a roadway without horizontal curves is not a factor in this case. The posted speed limit is 30 mph.

Existing Conditions – Profile

The existing roadway profiles of both segments referenced above were evaluated to determine adequacy of the grades and vertical curves with the 30 mph posted / design speed. In accordance with MnDOT Road Design Manual Table 2-5.06A, the design speed for a low speed collector should be 30 – 40 mph. The existing maximum grade in this segment is eight percent (8%), which by itself does not pose an issue with design compliance as the length is less than 500 feet and is less than the 11.0% maximum grade suggested by MnDOT Road Design Manual Table 3-4.02A. However, the combination of the rolling terrain and short vertical curves, cause deficiency in the design such that the existing configuration does not meet the design standards for 30 mph in several areas. The existing vertical curves and existing design speed standards that are met are shown in Figure 13. Within both segments there are areas with very short vertical curves (50 feet or less) or in some cases no curves at all. These areas typically have very small algebraic differences of grades and as such should not present issues with traffic at the design speed. However, the MnDOT State Aid Manual would recommend that the minimum vertical curve length be 3-times the design speed, which in this case is 90 feet. If the roadway is improved, it is recommended that the vertical curve lengths be constructed to meet current standards.

Potential Roadway Conditions – Profile

In an effort to determine the approximate impacts of a proposed connection, a conceptual profile was developed that meets a 30 mph design speed (see Figure 13). The following issues and impacts that should be resolved as part of further study or design, if the County Road C2 roadway connection is to proceed, are listed as follows:

- In an effort to balance impacts across the different properties adjacent to County Road C2, the high point of the proposed vertical curve near Merrill Street is represented further west of its current location; this was done in order to limit the amount of fill in the low area of CR C2 near Fernwood Street. As a result, there are impacts to Merrill Street and driveways in the area.



- The proposed profile in the vicinity of the existing retaining wall may drop by approximately 1.6 feet. The slope between the curb and retaining wall will need to be steepened to keep proper cover over the bottom of the retaining wall. The wall should be studied further to determine if the wall bottom would be disturbed during construction, which may require complete wall replacement.
- The correction of the vertical curvature to meet 30 mph design speed causes as much as 3.2 feet of additional fill to be placed in the low area near Fernwood Street. This causes the need to reconstruct approximately 175' of Fernwood Street to accommodate the additional fill and create an acceptable profile on the cross street.
- Driveways in the area should be carefully studied to ensure that acceptable grades and drainage patterns can be met.
- Existing storm sewer systems will require reconstruction to accommodate the revised drainage patterns.
- The existing sanitary sewer manholes will require reconstruction to meet the proposed grade of the new roadway.
- The existing watermain will need to be evaluated as well to determine potential impacts due to change in roadway profile.

SUMMARY AND CONCLUSIONS

Based on the analysis, the following conclusions and recommendations are offered for your consideration:

- To determine the current travel patterns, an origin-destination (O-D) study was conducted. The license plate O-D surveys were conducted during the p.m. peak hour (4:30 p.m. to 5:30 p.m.) on Tuesday May 24, 2011.
- Based on the O-D survey data the most affected routes from a volume perspective will be Josephine Road and Woodhill Drive between Hamline Avenue and Lexington Avenue. Josephine Road and Woodhill Drive are expected to see a reduction of approximately 650 and 450 vehicles per day, respectively. This summarizes the potential County Road C2 connection local changes (approximately 1,100 vehicles per day).
- In order to understand the expanded attraction this connection may have on the transportation system, if any, the Metropolitan Council Regional Travel Demand Model was used to identify potential pattern shifts from outside of the immediate study area. Based on the Regional Travel Demand Model, approximately 450 vehicles per day will divert from County Road C to use County Road C2. Other regional system travel pattern shifts include a reduction of approximately 350 vehicles per day from other regional routes in the area (i.e., Snelling Avenue, County Road B2, TH 36, County Road E, etc.). Therefore, the potential County Road C2 connection regional travel pattern shift would be approximately 800 vehicles per day under year 2011 conditions.

- The local and regional travel pattern shifts combined together result in a potential diversion of approximately 1,900 vehicles per day under year 2011 conditions if County Road C2 were connected. This results in an existing County Road C2 average daily traffic volume of approximately 2,510 between Hamline Avenue and Lexington Avenue.
 - o Josephine Road would have an ADT of approximately 1,940
 - o Woodhill Drive would have an ADT of approximately 1,460
 - o County Road C would have an ADT of approximately 8,450
- Year 2030 traffic forecasts were developed using a combination of historical area growth, the Regional Travel Demand Model and traffic volumes from the City of Roseville Transportation Plan. Based on this information, an annual growth rate of one and one-half percent was applied to the year 2011 peak hour volumes (with and without the County Road C2 connection) to develop year 2030 traffic forecasts.
- The local and regional travel pattern shifts combined under year 2030 conditions result in a diversion of approximately 2,600 vehicles per day to County Road C2 for a total projected average daily traffic volume of 3,400.
 - o Josephine Road would have an ADT of approximately 3,200
 - o Woodhill Drive would have an ADT of approximately 2,000
 - o County Road C would have an ADT of approximately 11,600
- All key intersections currently operate at an acceptable overall LOS A during the p.m. peak hour without the County Road C2 connection, and with existing traffic control and geometric layout. All side-street delays are considered acceptable and do not require mitigation. Under year 2011 conditions with the County Road C2 connection, all key intersections will continue to operate at an acceptable overall LOS A during the p.m. peak hour with existing traffic control and geometric layout. Side-street delays will increase at the County Road C2 intersections with Lexington Avenue North and Hamline Avenue North. However, the increase in side-street delays is considered acceptable and does not require mitigation considering year 2011 traffic volumes.
- Under year 2030 conditions all key intersections will operate at an acceptable overall LOS A during the p.m. peak hour without the County Road C2 connection, and with existing traffic control and geometric layout. All side-street delays are considered acceptable and do not require mitigation. Under year 2030 conditions with the County Road C2 connection, all key intersections will operate at an acceptable overall LOS C or better during the p.m. peak hour with existing traffic control and geometric layout. The side-street at the Lexington Avenue North and County Road C2 intersection will operate at LOS F with an eastbound side-street delay of approximately two minutes. Side-street delays of this magnitude are generally considered unacceptable to motorists and warrant mitigation.

- o To improve the side-street delays at the Lexington Avenue North and County Road C2 intersection under year 2030 conditions with the County Road C2 connection, an eastbound right-turn lane should be constructed. With the recommended right-turn lane, the Lexington Avenue North and County Road C2 intersection will operate at LOS B/F. Side-street delays along County Road C2 will be approximately 90 seconds.
- o If the side-street delays are considered unacceptable by the City, installation of a traffic signal would mitigate this condition. Based on a preliminary review of the p.m. peak hour traffic volumes, the Lexington Avenue North and County Road C2 intersection will likely meet the peak hour traffic signal warrant under year 2030 conditions with the County Road C2 connection.
- The current alignment of the truncated section of County Road C2 is straight and in line, and as such presents no significant impacts to adjacent properties due to potential horizontal alignment connections.
- The combination of the rolling terrain and short vertical curves along County Road C2 in this area cause deficiency in the roadway design such that the current configuration does not meet the design standards for 30 mph in several areas. If the roadway is improved or connected, it is recommended that the vertical curve lengths be constructed to meet current standards.

QUESTIONS FROM THE PUBLIC REGARDING THE COUNTY ROAD C-2 TRAFFIC STUDY

1. Who determines a road to be an MSA road?
RESPONSE: *The City of Roseville designates street segments as Municipal state-aid roads. This designation is approved by the Commissioner of Transportation. In order for a street to be an MSA street, it needs to meet certain criteria. A road may be designated as a municipal state-aid road if it:*
A. is projected to carry a relatively heavier traffic volume or is functionally classified as collector or arterial as identified on the urban municipality's functional classification plan;
B. connects the points of major traffic interest, parks, parkways, or recreational areas within an urban municipality; and
C. provides an integrated street system affording, within practical limits, a state-aid street network consistent with projected traffic demands.
2. How much of the cost of an MSA road is the city's responsibility?
RESPONSE: *According to current City of Roseville Assessment policy, 25% of the cost to construct a 32 foot wide 7-ton road is assessed to all abutting property owners. The City uses MSA funds to pay for the remaining costs. MSA routes are constructed to a 10-ton design, with a width sometimes exceeding 32 feet.*
3. What determines a road to be a collector road, especially since this portion of County Road C2 goes only from Snelling to Victoria and not to the east or west boundaries of Roseville as do County Road C, B2, B, Highway 36 and Larpenteur?
RESPONSE: *The collector system provides connections between neighborhoods. Collector roadways are designed to serve shorter trips that can reasonably be completed without utilizing roads with a higher classification, and to move traffic from local neighborhoods to roadways of higher classification. Mobility and access are equally important. Collector roadways are typically spaced at one-half mile intervals within developed areas.*
4. By what percentage will traffic increase on County Road C2 between Lexington and Victoria for the year 2011 if C2 were connected?
RESPONSE: *Year 2011 daily traffic volumes along County Road C2 can be expected to increase by approximately 25 percent west of Hamline Avenue, approximately 400 percent between Hamline Avenue and Lexington Avenue, and approximately 30 percent east of Lexington.*
5. If C2 were connected, would there be more traffic on Josephine Road or on County Road C2 between Snelling and Victoria for the year 2011? For the year 2030?
RESPONSE: *Based on our understanding of travel pattern shifts with County Road C2 connected, more traffic would be on County Road C2 between Snelling Avenue and Victoria Street under year 2011 and year 2030 conditions.*
6. If a stop light has to eventually be installed at Lexington and C2, does the city absorb the entire cost? Does the county have to approve the stop light?
RESPONSE: *Since Lexington Avenue is under County jurisdiction, the County would need to approve the installation of a streetlight at that location. No signal would be proposed unless the intersection met the criteria required for signal installation. The cost of the light would be shared by the City and County based on the County's cost share policy and available funds.*

7. Please explain why there are inconsistencies in assumptions around traffic patterns pertaining to County Road C2. Specifically, the corner of Lexington Ave. North and County Road C2 was projected to be at an A/D and a C/F “Level of Service” rating in years 2011 and 2030, respectively, *if* County Road C2 were connected. (See Table 3 on page 16 and Table 4 on page 19.) Mr. Vaughn explained that a major contributor to these ratings was that left turns from County Road C2 onto Lexington could take up to 1.5 minutes during peak evening hours. HOWEVER, when estimating “Travel Time Comparisons” in Table 1 (page 11), the 1.5 minute wait does not appear to have been factored in. For example, using the top box of Table 1 which outlines “Southwest to/from Northeast”, Route A via County Road C2 is listed as taking 125 seconds. Route A has a left turn from C2 onto Lexington. If the left turn takes 90 seconds, that would mean that the remainder of the route (traveling north on Hamline, East on County Road C2, then north onto Lexington after the left hand turn) takes only 35 seconds. This seems highly improbable. If the assumptions were consistent, then C2 would EITHER have long waits at the Lexington intersection OR faster drive times. . . not both.

RESPONSE: *The travel time estimations are based on year 2011 conditions. The roadway travel time (based on posted and statutory speed) and the turning movement delays (estimated from the simulation model) based on year 2011 conditions were included in the travel time calculations. The travel times are an average of both directions of travel. Year 2011 conditions were used to estimate the vehicular demand a County Road C2 connection would yield. Please note that the one and one-half minute delay mentioned above is the total side-street delay at the intersection of Lexington Avenue/County Road C2 under an unmitigated year 2030 condition with County Road C2 connected.*

8. Both Deb Bloom, City Engineer, and the SRF consultant mentioned that the traffic volumes projected for 2030 have been reduced primarily to reflect the economic downturn. If that's the case, one would expect traffic volumes to be reduced somewhat consistently across the entire area. However, in comparing data from the 2030 Plan to the new projections in the SRF Study's Figure 12 (page 18), 2030 base traffic projections for Josephine have been reduced by 37% (from 6,500 to 4,100) yet County Road C has only been reduced by 21% (from 15,400 to 12,200). Would you please explain why counts on Josephine were reduced significantly more than County Road C's and potentially more than other roads?

RESPONSE: *Growth assumptions, travel patterns and roadway characteristics affect each roadway differently; therefore, forecasts are unique to each roadway segment and not directly comparable across the board. The current forecasts use data available from the year 2010 US census, the most recently approved comprehensive plans in the region and roadway assumptions from the year 2010 Metropolitan Council Transportation Policy Plan.*

9. Would you also please clarify exactly what reductions in 2030 traffic projections, if any, were assigned to *each* of the other roadways that were projected to shift traffic onto C2 in 2030? These other roadways include Snelling Ave., County Road B2, TH 36, County Road E, etc. as described on page 12 of the report. This is an important question. If the traffic projections for these other roadways weren't reduced at a similar rate as Josephine Rd. was, the study would be drastically OVERstating the negative impact to County Road C2 if it were opened (as a larger number of cars would be projected to shift to it than would actually happen if the base traffic counts had been adjusted downward like Josephine Rd's) and drastically UNDERstating the positive impact to other collectors such as Josephine Rd. and Lydia Ave. (as potentially fewer cars would be available to shift from Josephine).

RESPONSE: *Specific impacts to roadways such as Snelling Avenue, County Road B2, TH 36, and County Road E are outside the scope of this study area. A more detailed*

analysis would need to be completed to determine the specific impacts to each of these individual roadways.

10. Please explain why the vendor rounded up the percent difference in travel times between routes, when doing so overstates the number of cars that would be shifted to County Road C2? For example, using the first section of Table 1 (page 11) again, the travel time difference between "Route 2" (which uses Hamline & Josephine) and "Route A" (which uses County Road C2) is a 7.4% difference. Using the conversion graph in Figure 4 on page 6 would mean that approx. 26% of cars would stay on the non-minimum path (Route 2) and that 74% would switch to County Road C2. Instead, the vendor rounded the 7.4% to 10%, which resulted in projecting that 80% of cars would switch to County Road C2. That 6% difference (80%-74%) results in an overstatement of 156 cars in 2011 and 246 cars in 2030 that were erroneously projected to shift from Josephine to County Road C2. Hamline counts were not provided, but the overstatement for that street would be more than double that of Josephine. If similar "rounding up" errors occurred throughout the study, the number of cars projected to shift to County Road C2 would be significantly OVERstated. Would the vendor please provide the *actual* percentages and resulting shifts to provide a clearer and more accurate account of what will likely happen?

RESPONSE: *The travel times and percent differences were rounded to simplify the information for presentation purposes. The results portray the answers appropriately based on the actual calculations. Again please note that the travel time estimations are based on year 2011 conditions; the roadway travel time (based on posted and statutory speed) and the turn movement delays (estimated from the simulation model) based on year 2011 conditions were included in the travel time calculations; and the travel times are estimations based on an average of both directions of travel.*

11. The vendor made two very important comments during the July 13 public forum that he failed to make when presenting to the City Council on July 18. At the July 13 meeting, he addressed the County Road C2 residents concerns about perceived "roller coaster" conditions on C2 by stating that the slope was 8% and fell below the official problem level of 11%. He did acknowledge there may be line of sight issues, but that these could be addressed by painting right and left turn lanes on the road. He said if that weren't enough, the City could ultimately consider putting in a traffic signal at County Road C2 and Lexington. We ask that the vendor please put those comments in writing as part of this Q&A activity.

RESPONSE: *The discussion referenced here pertains to a number of items identified as part of the "Roadway Design Review" section contained in the traffic study document. The study states that "The existing maximum grade in this segment (of County Road C2) is eight percent (8%), which by itself does not pose an issue with design compliance as the length is less than 500 feet and is less than the 11.0% maximum grade suggested by MnDOT Road Design Manual Table 3-4.02A. However, the combination of the rolling terrain and short vertical curves, cause deficiency in the design such that the existing configuration does not meet the design standards for 30 mph in several areas."*

Through informal discussion with residents during the July 13th open house we acknowledged the potential for sight line issues at the intersection of Lexington Avenue/County Road C2 based on resident observations not SRF's. The right- and left-turn lane delineation recommended in the study is the first step in an attempt to mitigate the heavy side-street delays that may occur under year 2030 conditions with a County Road C2 connection at the intersection of Lexington Avenue/County Road C2. In the event the residual side-street delay following this improvement are not satisfactory the study states that "...installation of a traffic signal would mitigate this condition (under year 2030 conditions with a County Road C2 connection)."

12. The economy tends to be cyclical. Does significantly downgrading 20-year traffic projections from the 2030 study, which was much more robust than the recent traffic studies, make sense based on a current 2-3 year economic downturn? The SRF consultant pointed out that economic upturns and downturns cancel themselves out over the long run. If so, what's really driving the significant drop in the projected traffic volume on Josephine Rd. and others?
- RESPONSE:** *Based on our engineering judgment and the specific data collected as part of this project, the revised traffic volume projected on Josephine Road (with or without the County Road C2 connection) is reasonable. The forecasts take into account the stable development in the immediate area, observed travel patterns, modeled understanding of regional growth and connectivity (including Twin Lakes redevelopment area), and connections to adjacent neighborhoods.*
13. The study data indicates traffic on a connected C2 will increase 400% by diverting traffic from Josephine Road, Woodhill, County Road C and other established collector and arterial roadways. Why is connecting C2 preferable to using these already established roadways, particularly when data shows traffic on these roads is either decreasing or far less than predicted?
- RESPONSE:** *If County Road C2 were connected, traffic using already established roadways may find County Road C2 to be a more desirable route based on travel time differential.*
14. What is the daily traffic volume number needed for a 2-way collector roadway, such as Josephine Road, to be considered at or approaching capacity?
- RESPONSE:** *Planning level capacity of a two-lane undivided urban roadway that is approaching or at capacity can range from 8,500 vehicles per day (vpd) to 10,000 vpd.*
15. What is the current daily traffic volume for Josephine Road?
- RESPONSE:** *Based on the most recent Annualized Average Daily Traffic (AADT) data available, the current daily traffic volume along Josephine Road is approximately 2,600 vpd.*
16. What is the most recent projected daily traffic volume for Josephine Road for the year 2030?
- RESPONSE:** *Based on the County Road C2 Subarea Origin-Destination Study the year 2030 projected daily traffic volume along Josephine Road will be 4,100 vpd (without a County Road C2 connection).*
17. What is the daily traffic volume number needed for minor arterial roadway County Road C to be considered at or approaching capacity?
- RESPONSE:** *Planning level capacity of a three-lane urban roadway (two-lane divided with turn lanes) that is approaching or at capacity can range from 14,500 vpd to 17,000 vpd.*
18. What is the current (2011) daily traffic volume for County Road C?
- RESPONSE:** *Based on the most recent Annualized Average Daily Traffic (AADT) data available, the current daily traffic volume along County Road C is approximately 8,900 vpd.*
19. What is the most recent projected daily traffic volume for County Road C for the year 2030?
- RESPONSE:** *Based on the County Road C2 Subarea Origin-Destination Study the year 2030 projected daily traffic volume along County Road C is 12,200 vpd.*

20. Are any east-west roadways in the traffic study area considered at or approaching capacity for the year 2011 or projected to be at capacity by the year 2030?
RESPONSE: *The east-west roadways included within this study have sufficient capacity to accommodate current daily traffic volumes and year 2030 daily traffic forecasts.*
21. By what percentage will traffic increase on County Road C2 between Hamline and Lexington for the year 2011 if C2 were connected?
RESPONSE: *Year 2011 daily traffic volumes along County Road C2 can be expected to increase by approximately 400 percent between Hamline Avenue and Lexington Avenue with County Road C2 connected.*
22. By what percentage will traffic decrease on Josephine Road, between Hamline and Lexington, for the year 2011 if C2 were connected?
RESPONSE: *Year 2011 daily traffic volumes along Josephine Road can be expected to decrease by approximately 25 percent with County Road C2 connected.*
23. By what percentage will traffic decrease on County Road C between Hamline and Lexington for the years 2011 and projected year 2030 if C2 were connected?
RESPONSE: *Year 2011 and Year 2030 daily traffic volumes along County Road C can be expected to decrease by approximately 5 percent between Hamline Avenue and Lexington Avenue with County Road C2 connected.*
24. By what percentage will traffic decrease on Josephine Road for the year 2011 should C2 be connected?
RESPONSE: *See question 10 above.*
25. If C2 were connected, would there be more traffic on Josephine Road or on County Road C2 between Snelling and Lexington for the year 2011? For the year 2030?
RESPONSE: *If County Road C2 were connected, the year 2011 daily traffic volume along Josephine Road can be expected to be 1,940 vpd.
If County Road C2 were connected, the year 2011 daily traffic volume along County Road C2 between Snelling Avenue and Lexington Avenue can be expected to range from 2,510 to 2,950 vpd.
If County Road C2 were connected, the year 2030 daily traffic volume along Josephine Road can be expected to be 3,200 vpd.
If County Road C2 were connected, the year 2030 daily traffic volumes along County Road C2 between Snelling Avenue and Lexington Avenue will range from 3,400 to 3,950 vpd.*
26. According to page 23 of the study, all key intersections currently operate at an acceptable LOS (level of service) during the p.m. peak hour without the County Road C2 connection, both now in 2011 and at 2030 projected traffic volumes, with the exception of 2030 LOS degradation to "F" at Lexington and C2. What is the reason to open C2 if doing so will not only have no positive impact on overall traffic levels of service at key intersections, but will actually cause future deteriorating LOS where none exists now?
RESPONSE: *The scope of the study was to identify the impacts associated with a potential connection of County Road C2. No specific recommendation regarding connecting this roadway is included in this study.*
27. According to reports from the Roseville Police Department for the period 2005 to present, there were 13 motor vehicle incidents involving property damage and personal injury at Hamline and C2 compared to 4 incidents over the same period at Hamline and

Josephine. How will opening C2 impact this already dangerous intersection at Hamline Avenue?

RESPONSE: *A crash analysis was not included within the scope of this study. In general terms, a potential County Road C2 connection would increase the traffic volume traveling along portions of this roadway and through certain intersections. However, an increase in traffic volumes does not necessarily increase the likelihood of crashes. Furthermore, predicting future crashes is difficult due to the random nature of traffic accidents. A detailed crash analysis would need to be completed, which calculates intersection crash rates and compares the statistical significance to other intersections with similar characteristics. Once again, a crash analysis was not included within the scope of this study.*

28. People living in and using the current C2 neighborhoods include many pedestrians and bikers, some of whom are elderly and disabled persons and young children. Given the study's projected traffic increase data, how does the city plan to protect the safety of these residents should C2 be connected?

RESPONSE: *The City's 2008 Pathway Master Plan recommends a pathway along County Road C-2 as well as on street bike lanes. This would be incorporated into a County Road C-2 reconstruction project.*

29. According to page 20 of the study, ". . . the combination of the rolling terrain and short vertical curves [is a] configuration that does not meet the design standards for 30 mph in several areas." If C2 is opened, how will the city address this?

RESPONSE: *The study provides a suggested design layout if County Road C-2 were reconstructed. Other alternatives, including signage, would be reviewed as a part of a Feasibility Report.*

30. Given that C2 currently doesn't meet 30 mph design standards as quoted on page 20 in the study, does the city incur liability for traffic accidents, injuries, and fatalities that result from a deficient road design if the city knowingly connects C2 for the sole purpose of increasing traffic capacity without correcting these deficiencies?

RESPONSE: *According to the City Attorney, the City would have limited liability under existing conditions, however, if there is a change in condition (i.e. the connection were constructed) then the design deficiencies should be mitigated.*

31. Given the significant increase in traffic and degraded safety the study predicts, would a connected C2 receive the same high quality, enhanced design considerations afforded to Josephine Road 10 years ago?

RESPONSE: *This would be reviewed as a part of a Feasibility Report.*

32. If C2 is opened, is the current street lighting adequate to handle the projected volume of through traffic, particularly in areas with poor sight lines?

RESPONSE: *A street lighting review was not included within the scope of this study.*

33. What are Minnesota State Aid (MSA) roads and what percentage of Roseville's roadways are designated as MSA roads?

RESPONSE: *MSA roads are streets that the City of Roseville receives funding from the State gas tax that function as an integrated network and provide more than only local access. The collector system provides connections between neighborhoods. Collector roadways are designed to serve shorter trips that can reasonably be completed without utilizing roads with a higher classification, and to move traffic from local neighborhoods to roadways of higher classification. Mobility and access are equally important. Collector roadways are typically spaced at one-half mile intervals within developed areas. 24.8% of the streets in Roseville are MSA.*

34. In the past 12 years, how much MSA money was spent on County Road C2 between Hamline and Lexington?
RESPONSE: None
35. In the past 12 years, how much MSA money was spent on Josephine Road?
Response:
RESPONSE: When Josephine Road was reconstructed in 2001 the total cost was \$641,628.02.
A breakdown of the cost: Municipal State Aid funds (\$517,220.02), City utility funds (\$42,161.97), and County Turnback funds (\$60,000). Private driveway work, paid for by property owners, made up \$22,246.04 of the construction cost.
36. Are MSA funds already allocated and committed for the next 5 years to existing Roseville transportation projects?
RESPONSE: The City's street Capital Improvement Plan has MSA street segments identified for construction that will spend our annual allocation. This is a 5 year plan that is updated every fall.
37. According to the June 20, 2011 public memo from Mayor Roe, Councilmember Johnson, City Manager Malinen, and Finance Director Miller, Roseville's 20-year projected capital need for infrastructure upgrades (water, sanitary sewer, storm water management, among other utilities) is \$218 million, \$148 million (68%) of which is unfunded by current sources. Should the city decide to connect C2, how does the city plan to pay for the required C2 construction?
RESPONSE: The project would likely be funded consistent with the City's policies. The proposed funding would depend on the level of improvements proposed. For MSA routes, 25% of reconstruction project costs are assessed with the remaining portion funded through MSA. Rehabilitation projects are funded by MSA funds. Funding would be discussed as a part of a feasibility report.
38. How might opening C2 impact the values of new homes slated for construction in the Josephine Woods development, especially those planned to be built directly connected to C2?
RESPONSE: This was not within the scope of this study.
39. What consideration is given to the significantly reduced home values which would occur in the C2 neighborhoods should C2 be connected?
RESPONSE: This was not within the scope of this study.
40. Given side street delays in 2030 are predicted to be LOS "F" (p 19 and 23 of the study), what interventions will be used to reduce these lengthy delays, avoid accidents, and deter unsafe driving behavior due to impatient or unprepared motorists?
RESPONSE: The right- and left-turn lane delineation recommended in the study is the first step in an attempt to mitigate the heavy side-street delays that may occur under year 2030 conditions with a County Road C2 connection at the intersection of Lexington Avenue/County Road C2. In the event the residual side-street delay following this improvement are not satisfactory the study states that "...installation of a traffic signal would mitigate this condition (under year 2030 conditions with a County Road C2 connection)."
41. For the year 2011, how many fewer cars will travel on Josephine Road during evening rush hour if C2 were opened? For the year 2030?

RESPONSE: *If County Road C2 were connected, the year 2011 p.m. peak hour volumes along Josephine Road can be expected to decrease by approximately 55 to 65 vehicles.*

If County Road C2 were connected, the year 2030 p.m. peak hour volumes along Josephine Road can be expected to decrease by approximately 70 to 90 vehicles.

42. Does the travel time data reflect the 20 mph speed limit on C2 from Merrill to Griggs?

RESPONSE: *There is no posted speed limit within this segment along County Road C2. Therefore, the statutory speed limit of 30 mph was used.*

43. Would travel time be expected to increase if a 4-way stop sign is put on C2 and Merrill due to safety issues presented by the terrain?

RESPONSE: *Yes, travel times along County Road C2 would increase if an all-way stop was implemented at Merrill Street.*

44. Would travel time be expected to increase if a traffic signal is necessary at C2 and Lexington? (i.e., what analysis year is being considered and what is the point of reference for travel time?)

RESPONSE: *Additional analysis would be required to determine the impact of a traffic signal at the County Road C2 and Lexington Avenue intersection*

45. If travel time on C2 were to increase due to added stop signs, a traffic signal and decreased speed limit, could we predict that people will be less likely to travel on C2 and revert back to other routes, including Josephine Road?

RESPONSE: *Yes if travel times along County Road C2 were to increase due to various factors, it is likely that traffic volumes on other roads such as Josephine Road may increase.*

46. If C2 were connected and a traffic signal became necessary at Lexington, how will having a traffic signal affect north and southbound traffic time on Lexington between Woodhill and County Road D (intersections where there are the closest traffic signals on that stretch of Lexington)?

RESPONSE: *A traffic signal at the County Road C2 and Lexington Avenue intersection would likely increase delays for northbound and southbound motorists along Lexington Avenue. However, a detailed analysis would need to be completed to determine the full impact of a traffic signal.*

47. If C2 were connected, it appears that more cars will be heading north on Lexington from County Road C2 from the evening rush hour. How will the added volume to Lexington affect the wait time on Josephine Road for those attempting to make a left hand turn north onto Lexington?

RESPONSE: *The increase in northbound volume at the Josephine Road and Lexington Avenue intersection is offset by the reduction of the eastbound left-turn movement on Josephine Road. Based on the operations analysis, delays for the eastbound left-turn movement to northbound Lexington Avenue will remain similar to the condition without the County Road C2 connection.*

48. The study appears to indicate that the proposed Twin Lakes redevelopment area will not have a significant impact on traffic on either Josephine Road or County Road C2, correct?

RESPONSE: *Yes, the Twin Lakes redevelopment is not expected to have a significant impact on either roadway.*

49. Page 12 of the traffic study indicates that traffic from Snelling, County Road C, County Road B2, Highway 36, County Road E and other roadways will be shifting to use County Road C2 by an average of 800 vehicles per day for 2011 if C2 were connected. Would this be considered "drive through" traffic or neighborhood traffic?

RESPONSE: *This traffic volume shift has been characterized as regional traffic and as such can be considered trips that do not have an origin or destination between Hamline Avenue and Lexington Avenue nor the immediate adjacent neighborhoods.*

50. County Road C2 between Snelling and Hamline would pick up 600 vehicles per day for 2011. Would this be considered drive-through traffic from Snelling?

RESPONSE: *Yes, this traffic would not have an origin or destination between Snelling Avenue and Hamline Avenue.*

51. Would the connection of County Road C2 have any significant impact on the traffic volume on Lydia Avenue or Hamline Avenue in 2011 or 2030?

RESPONSE: *The specific volume impact to these roadways was not reported as part of the study.*

52. Having worked on the supplier and receiving sides of research studies for 25 years, I know that combining data from two different studies (sampled at different times, with different subjects, in a different set of conditions) and trying to combine them as one study is professionally frowned upon. I realize we were budget-constrained, but I think this is a major limitation of the study and needs to be identified as such.

RESPONSE: *It is typical practice to utilize historical traffic volume data when available in the immediate project area and within a reasonable time period. The data available from the "Pulte Homes Traffic Study," dated February 22, 2011 falls within a reasonable time period. The 24-hour road tube data collected as part of the more recent "County Road C2 Subarea Origin-Destination Study" was used to validate and calibrate this data where necessary.*

53. Again, it seems a combination of historical and new traffic counts were melded together. When I look at the numbers, the only count in Figure 3 that seems to have changed from the first study is the corner of Josephine and Hamline. Was this the only intersection that was restudied or were others restudied, as well? The reason I ask is that I pointed out discrepancies in the first traffic study re: the counts on all of Josephine Rd. I would think all the data from that road (and possibly others in the first study) was suspect. . .not just one corner.

RESPONSE: *It is typical practice to utilize historical traffic volume data when available in the immediate project area and within a reasonable time period. The Hamline Avenue/Lydia Avenue intersection was the only turning movement count collected in May 2011. Data from this count was validated and calibrated using the 24-hour road tube data collected as part of the more recent "County Road C2 Subarea Origin-Destination Study" and the historical turning movement counts at the other key intersections.*

54. How were estimated travel times calculated? Were they measured multiple times by multiple researches, then averaged together? Since a matter of 5-10 seconds can make a HUGE difference in the calculations used to determine shifts, I would hope that it wasn't just a one time reading by one person. To me, that seems far too arbitrary.

RESPONSE: *The roadway travel time (based on posted and statutory speed) and the turn movement delays (estimated from the simulation model) based on year 2011 conditions were included in the travel time calculations. The travel times are an average of both directions of travel. Year 2011 conditions were used to estimate the vehicular demand a County Road C2 connection would yield.*

55. The first paragraph in this Pattern Shift section on Page 6 states that "the new route must be significantly quicker in order to get a large amount of people to change their current pattern". When asked what constituted "significant" at Wed.'s meeting, Craig said a 10% or more reduction in travel time. However, *Table 1* on page 11 shows significant shifts away from other roadways to Cty C2 for less a than 10% reduction in time. I'll just use one portion of the table as an example, but would appreciate it if you could explain the following:

- In looking at the Southwest to/from Northeast data from *Figure 5*, **Route 1** (a route via Hamline, Woodhill and Lexington) takes 125 seconds. By comparison, the alternate **Route A** (taking Hamline, to Cty C2 to Lexington) also takes 125 seconds. The times are identical, so there is no time savings. However, the table indicates that 50% of motorists will shift to the second route which utilizes County Road C2. Can you please explain the rationale? I would think that, all else being equal, the majority of drivers would stick with their historical route out of sheer habit vs. switch.
- Similar question re: **Route 2** (via Hamline, Josephine and Lexington), which is 135 seconds, vs. the alternate **Route A** (described above) at 125 seconds. The 10 second reduction in time for the second route is only a 7% overall reduction and seems negligible, yet the table shows that 80% of motorists will change their traffic pattern to travel on County Road C2. Again, if you could help me understand the rationale, I'd appreciate it. This also emphasizes my earlier point that being off by 5-10 seconds can have a HUGE impact on the results.

RESPONSE: *First, the travel time route diversion analysis is predicated on the fact that given a choice between two alternative routes with the same travel time individuals will choose their respective routes on a 50/50 basis (50 percent to one route and 50 percent to the other route). Travel time differential from this point is measured and analyzed using the route diversion curve presented in Figure 4 of the "County Road C2 Subarea Origin-Destination Study."*

Second, the travel times and percent differences were rounded to simplify the information for presentation purposes. The results portray the answers appropriately based on the actual calculations. Again please note that the travel time estimations are based on year 2011 conditions; the roadway travel time (based on posted and statutory speed) and the turn movement delays (estimated from the simulation model) based on year 2011 conditions were included in the travel time calculations; and the travel times are estimations based on an average of both directions of travel.

56. The output of any model is highly dependent on the assumptions that are fed into it. Could SRF outline what assumptions were used in this model? It would be helpful to understand what's driving the shift from other roadways to Cty C2.

RESPONSE: *The model assumptions are held constant between alternatives with and without the County Road C2 connection to ensure the outcome is solely attributable to the roadway change being considered. The current forecasts use data available from the year 2010 US census, the most recently approved comprehensive plans in the region and roadway assumptions from the year 2010 Metropolitan Council Transportation Policy Plan.*

57. Deb, you mentioned that the projected traffic volumes projected for 2030 have been reduced primarily to reflect the economic downturn. If that's the case, one would expect traffic volumes to be reduced somewhat consistently across the entire area. However, when I compare data from the 2030 Plan to the new projections, it seems that the 2030 traffic projections for Josephine have been reduced by 37% (from 6,500 to 4,100) yet County Road C has only been reduced by 21% (from 14,100 to 12,200). Would you please explain? Would you also please clarify what reduction in 2030 traffic projections

were assigned to other roadways in the area? (These can't be discerned from the map, as they are not listed.)

Comment --the above is an extremely important point. The volumes attributed to County Road C2 are coming from a number of other roadways, to include Snelling Ave., County Road B2, TH 36, County Road E, etc. (as described on page 12). If no--or lesser--traffic count reductions were assigned to these other roadways, we would be drastically OVERstating the negative impact to County Road C2 if it were opened (as a larger number of cars would be projected to shift to it than would actually happen if the base traffic counts were adjusted downward like Josephine Rd's) and drastically UNDERstating the positive impact to Josephine Rd. (as potentially fewer cars would be available to shift from Josephine).

Even more general question -- The economy tends to be cyclical. Does significantly downgrading 20-year traffic projections from a more robust study make sense based on a current 2-3 year economic downturn? I believe Craig pointed out that economic upturns and downturns cancel themselves out over the long run. If so, what's really driving the significant drop in the projected traffic volume on Josephine Rd. and others?

RESPONSE: *First, growth assumptions, travel patterns and roadway characteristics affect each roadway differently; consequently, forecasts are unique to each roadway segment and not directly comparable across the board. The current forecasts use data available from the year 2010 US census, the most recently approved comprehensive plans in the region and roadway assumptions from the year 2010 Metropolitan Council Transportation Policy Plan.*

Second, based on our engineering judgment and the specific data collected as part of this project, the traffic volume projected on Josephine Road (with or without the County Road C2 connection) is reasonable. The forecasts take into account the stable development in the immediate area, observed travel patterns, modeled understanding of regional growth and connectivity (including Twin Lakes redevelopment area), and connections to adjacent neighborhoods.

58. Could you obtain the traffic accident reports that have occurred between Hamline Ave. and Lexington Ave. on County Road C-2. The following accidents reports are of specific interest.

(a) The report of a vehicle crash into the woods at C-2 and Fernwood Street. This vehicle's teenage driver excessive speed traveling down the C-2 hill from Merrill to Fernwood during icy conditions, resulted in a totaled vehicle and possible injuries due to the collision with the trees on the corner lot of the new Josephine Woods development.

(b) The report of a rear end collision of a driver backing out of his driveway onto C-2 near the intersection with Huron St.

(c) Any reports of accidents at the intersection of C-2 and Hamline.

RESPONSE: *Additional time would be needed to obtain copies of the individual accident reports.*

59. Question on what the increased rate of accidents at the intersection of C-2 and Hamline Ave. would be if C-2 were opened?

RESPONSE: *A crash analysis was not included within the scope of this study. In general terms, a potential County Road C2 connection would increase the traffic volume traveling along portions of this roadway and through certain intersections. However, an increase in traffic volumes does not necessarily increase the likelihood of crashes. Furthermore, predicting future crashes is difficult due to the random nature of traffic accidents. A detailed crash analysis would need to be completed, which calculates intersection crash rates and compares the statistical significance to other intersections with similar characteristics. Once again, a crash analysis was not included within the scope of this study.*