CERTIFICATION

FINAL – 1/27/2016

Study Report

for

County Highway 83 (Canterbury Road) Corridor Readiness Study
City of Shakopee
CH 16 to County Highway 101
T42.109988

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By:_____
Christopher Chromy, P.E.. P.T.O.E
License No. 51692

Date: 01/27/2016

City Council Acceptance Date: _____

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STUDY MANAGEMENT TEAM

Representative	Agency	Title
Bruce Loney	City of Shakopee	Public Works Director/City Engineer
Jeff Weyandt	City of Shakopee	Assistant City Engineer
Samantha DiMaggio	City of Shakopee	Economic Development Coordinator
Lisa Freese	Scott County	Transportation Planning Director
Stacy Crakes	Scott County CDA	Business Development Manager
Kevin Schwartz	MnDOT	Signal Optimization Engineer
Diane Langenbach	MnDOT	South Area Engineer
David Sheen	MnDOT	Traffic Engineer
Chris Chromy	Bolton & Menk	Consultant Project Manager
Angie Bersaw	Bolton & Menk	Senior Transportation Planner
Jacob Bongard	Bolton & Menk	Project Engineer

AGENCY PARTICIPATION

This study was conducted by Bolton & Menk, Inc., with oversight, public involvement participation and direction provided by a Study Management Team (SMT). The SMT included representatives from the City of Shakopee, Scott County, and MnDOT.

Appendix A includes minutes from the SMT meetings.

Public participation was also a key component of the study. Public outreach included individual meetings with property owners and two public open houses.

EXECUTIVE SUMMARY

The City of Shakopee, in collaboration with Scott County and the Minnesota Department of Transportation (MnDOT), initiated a study to identify a long-term vision for roadway network improvements on and near County Highway (CH) 83 (Canterbury Road) in order to support and sustain economic development in the region. The study was funded in part by a Corridor Readiness Grant from the Scott County Community Development Agency. The study area includes nearly 1.7 miles of the corridor from CH 16 on the south to County Highway 101 on the north.

The CH 83 corridor currently exhibits safety and operational issues in a few key locations, has multiple public and private access points, and lacks continuous pedestrian/bicycle facilities. Recent and anticipated development and business expansions in the surrounding area is anticipated to bring in thousands of new jobs. The City, County and MnDOT desire to address existing safety and operational issues as well as plan for and support the additional economic growth so that adequate corridor operations can be maintained.

STUDY APPROACH

The CH 83 study included a comprehensive analysis of traffic safety and operations at intersections within the study corridor. Improvement strategies were identified based on existing needs and projected growth. Multiple concepts were developed and presented to the study management team, business and land owners, and the general public for comments and review. A phased approach to implementing these improvements was developed.

IMPLEMENTATION PLAN

One of the goals of this study was to identify improvements that could be phased in over time as conditions within the corridor change. This was achieved through the identification of a Near Term Project and Future Concepts which are development driven.

Near Term Project

Signal modification and phasing improvements at the CH 83/12th Avenue signal are programmed for 2016. Improvements at the CH 83/4th Avenue intersection are currently under design and programmed for construction in 2017 to accommodate additional traffic associated with the Amazon Distribution Center, currently under construction west of CH 83. The remainder of the Near Term Project improvements (turn lane additions, lane addition on west leg of 12th Avenue and trail additions) are not currently funded but could be implemented in the near future without substantial cost or right-of-way implications.

Future Concepts (Development/Opportunity Driven)

This study has also identified two Future Concepts that could be completed in the future as development/redevelopment occurs along the CH 83 corridor. These improvements will set the groundwork for further changes in traffic control and access spacing to accommodate the additional traffic generated by growth in the study area.

NEXT STEPS

Through public involvement and stakeholder outreach, it was clear the Near-Term Project can be supported immediately. It is likely these improvements will serve the area well for many years. Because of the uncertainty in the timing and scale of the Canterbury Park redevelopment, the timing of the need for implementation of any Future Concept is unknown at this time. There was support and opposition on both sides of the two Future Concepts. Therefore, it is recommended that the City and County keep both concepts in consideration for future implementation at this time.

The City and County must also continue to work together to further plan, obtain funding, design, and implement the improvement projects as conditions dictate. All partners have an active role in implementing these improvements as there are benefits to both the local road and county highway system. A partnership will be required between Scott County and the City of Shakopee to accomplish the overall vision for the CH 83 corridor including the supporting local roadway system and its associated benefits to CH 83. For instance, right-of-way is constrained within the developed portions of the CH 83 corridor. Scott County may be able to assist in acquiring right-of-way for CH 83 and local roadway system improvements in these constrained areas. Conversely, the City may be able to assist Scott County in reserving right-of-way for CH 83 expansion and local roadway system improvements through the development review process in areas where additional development is being considered. This partnership will be important to both agencies in order to accomplish the overall corridor vision. All competitive funding sources should be considered. Agencies should also update their comprehensive and transportation plans to include these findings to better leverage funding sources.

INTRODUCTION

The City of Shakopee, in collaboration with Scott County and the Minnesota Department of Transportation (MnDOT), initiated this study to identify a long-term vision for roadway network improvements on and near County Highway (CH) 83 (Canterbury Road) in order to support and sustain economic development in the region. The study was funded in part by a Corridor Readiness Grant from the Scott County Community Development Agency. The purpose of this program is to assist communities in completing land use, transportation and environmental studies intended to maximize development and/or redevelopment opportunities and the investment of capital within the top ten commercial corridors as established by the Scott County Association for Leadership and Efficiency (SCALE) and the Transportation and Economic Development Committee. CH 83 was identified by the SCALE committee as a top ten commercial corridor. The study area includes nearly 1.7 miles of CH 83 from CH 16 on the south to County Highway 101 on the north. See **Figure 1** for an illustration of the study area.

The CH 83 corridor currently exhibits safety and operational issues in a few key locations, has multiple access points, and lacks continuous pedestrian/bicycle facilities. Recent and anticipated development and business expansions in the surrounding area is anticipated to bring in thousands of new jobs due to the addition of large employers such as Amazon among others. SCALE identifies CH 83 as one of the top 10 commercial corridors in the county. The City, County and MnDOT desire to address existing safety and operational issues as well as plan for and support the additional economic growth so that adequate corridor operations can be maintained. The study identified four goals to support safe and efficient operations and economic growth along the CH 83 corridor. They are as follows:

- Understand existing and future traffic demands
- Identify improvements to accommodate growth
- Develop a blueprint for future access
- Identify an implementation plan

SHAKOPEE

County Highway (CH) 83 Corridor Readiness Study

City of Shakopee

Study Area

BOLTON & MENK Engineers & Surveyors

FIGURE 1

Map Document: \\Arcserver1\gis\SHAKIT42109988\ESRI\Maps\StudyArea_Final Report.mxd
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PUBLIC INVOLVEMENT

PROPERTY OWNER MEETINGS

Several property owners along the corridor were identified throughout the study as possessing a unique position regarding potential changes to access along the corridor. Some had plans to reconfigure property to accommodate other uses and expand economic viability while others were in position where potential access reconfigurations were being considered. Meetings were held with these specific property owners to solicit feedback as the study concepts were developed and evaluated. Below is a summary of those meetings.

Kin Properties

Kin Properties owns the property and building that houses operations for Polaris and Cokem, two large industrial employers along the east side of the CH 83 corridor. The Kin property currently has two accesses to CH 83. Their southerly access provides access to large trucks entering/exiting the property. A security checkpoint with truck stacking area is provided at their south driveway to CH 83. The north driveway is used for employee parking.

Several meetings and teleconferences were held with Kin Properties between August and November 2015 to discuss concept alternatives and how they relate to the company's short-term and long-term plans for the property. Kin Properties recently invested several million dollars to ready the property for Polaris and Cokem which included the addition of loading docks on the eastern end of the building. The company is also working with the City of Shakopee to explore a redevelopment of the southwest corner of the property for a commercial use such as a restaurant.

United Properties

A meeting with United Properties was held on September 14th, 2015 to discuss study concepts under consideration. United Properties owns the industrial property south of Kin Properties along 12th Avenue E. United Properties leases the entire building to Cyber Power. United Properties was open to consideration of a potential new city roadway located near the west side of their property as long as their existing parking is maintained. They would like to maintain parking on the west side of the building for flexibility in the future if the building space were ever split to accommodate multiple tenants.

Canterbury Park

Canterbury Park is a large employer for the region and a major draw for traffic into the area, particularly during the summer months when racing and special events are at their peak. Several meetings with Canterbury representatives were held between August and November 2015 to discuss their current operations and potential future redevelopment plans. Although plans are only preliminary at this point, Canterbury has discussed redeveloping a portion of their property currently containing horse stables into a mixed use development accommodating a range of retail and hospitality uses and mixed density residential units. This redevelopment would likely occur in phases over time.

Feedback from Canterbury indicated if redevelopment is pursued, ideally they would like to see event traffic served by 12th Avenue and traffic to new development areas served by an access to CH 83 north of 12th Avenue. Roundabouts were not viewed favorably by Canterbury as the primary access off CH 83 to a future commercial/retail development on Canterbury's site.

OPEN HOUSE

Two public open house meetings were held as a part of this study to inform the public of progress and to share ideas and solicit input. Notices were sent to properties within the study area and a notice in the local newspaper was published prior to each meeting.

Open House #1 (June 30, 2015)
The purpose of the first open house was to introduce the study and gather initial input on the issues and needs for improvements. Approximately 30 business representatives and interested citizens signed in at the open house. Information on area development growth, existing traffic operations, crash history, existing access, and land use within the study area was displayed for review and comments.

Participants confirmed the needs of improvements identified including high crash locations, delays, and lack of pedestrian facilities. In addition, several business owners commented on the uncertainty of their trip in using CH 101 from the study area due to railroad activity and associated delays. Public perception is that trip times to and from CH 101 are unreliable and therefore there is an overreliance on TH 169.

Open House #2 (November 16th, 2015)
The purpose of the second open house was to gather public and business input on the range of roadway and access improvement concepts under consideration. Approximately 22 business representatives and interested citizens signed in. There was a formal presentation during the meeting to discuss growth anticipated, need for improvements, and to review each of the concept alternatives under consideration.

Participants supported additional pedestrian/bicycle facilities along the CH 83 as well as 12th Avenue. Comments also reflected support for additional turn lanes and near term improvements at the 12th Avenue/CH 83 intersection. The other comments received were related to individual business owner views on Future Concept 1 and Future Concept 2. These are summarized in more detail in Roadway Improvement Concepts section of this report.

Appendix B contains summaries of each open house.

WEBSITE

The City of Shakopee hosted a project website for the CH 83 study throughout the entire process. Study documents, concept alternatives and public involvement notices were posted on the website at key study milestones. The County's website also had a reference link to the City's project website under Current and Future Projects.

PURPOSE AND NEED FOR IMPROVEMENTS

PROJECT PURPOSE

The purpose of the study is to create a long-term vision for CH 83 that supports economic development for existing businesses and future development as well as addresses existing operations and safety issues along the corridor. The improvements identified in this study should reaffirm the corridor function as one of the top ten commercial corridors in Scott County while accommodating traffic for 25 years of growth and maintaining driver and pedestrian safety.

PROJECT NEED

CH 83 is a minor arterial roadway providing access to substantial commercial and industrial land uses and serving as a significant transportation connection between TH 169 and CH 101. The four-lane roadway carries average daily traffic volumes ranging from 18,800 vehicles per day between CH 16 and 12th Avenue E and 7,700 per day between 12th Avenue E and CH 101.

The corridor has an average of 12 access points per mile. Scott County guidelines for minimum access spacing specify a minimum ¼ mile spacing between access points where local and collector streets intersect minor arterial roadways. Several access points are too closely spaced for compliance with the County guidelines including CH 101 and 4th Avenue E, 4th Avenue E and Valley Industrial Boulevard S, and 12th Avenue E and the SB Ramp of TH 169 among others. Furthermore, 10 private commercial driveways and private streets exist between TH 169 and CH 101 which are not permitted along minor arterial roadways according to the County guidelines.

Over the past five years, there have been 175 crashes within the corridor between CH 16 and CH 101. Several intersections were identified as having crash rates above the state average including two of six traffic signal controlled intersections, three of six thru-stop intersections and the only all-way stop intersection. The intersections of 12th Avenue E and CH 16 exhibit above expected crash counts including pedestrian and bicycle crashes within the five-year period. Overall, intersection delays throughout the corridor are within acceptable levels. The intersections of CH 83 with Eagle Creek Boulevard and 12th Avenue E are the closest to reaching capacity during certain peak periods. Elevated traffic delays have been observed in the evening at the intersection of 12th Avenue E turning south onto CH 83 from the east. Evening and morning delays have been observed at the intersection of the TH 169 SB Ramp when turning north onto CH 83 from the east and when turning west onto the ramp from CH 83. Both the eastern portion of 12th Avenue at CH 83 and the TH 169 SB Ramp entering CH 83 exhibit extended vehicle back-ups in the evenings.

There is a lack of continuous pedestrian and bicycle facilities north of TH 169. The only existing stretch of trail is located between the interchange and 12th Avenue E along the eastern side of CH 83. Public open house participants expressed a desire to extend a trail connecting to the Minnesota Valley State Trail north of CH 101 to accommodate a growing number of employees observed walking and biking along the corridor as seen in the photo to the right. Participants also mentioned difficulty crossing the corridor suggesting a safer crossing could exist near Culver's and Super America.

As land is developed, additional traffic will use CH 83. Major commercial and industrial entities have chosen to locate in proximity to CH 83 to utilize its access from TH 169 and CH 101. Large employers such as Amazon, Polaris and the Data Card Group have chosen to locate and/or expand in the study area and responsible for a part of the well over 2000 new jobs coming online in this area in the near future. Other property owners along the corridor are planning to implement redevelopment of portions of their properties to accommodate additional commercial uses. The development scenarios of these properties will directly influence traffic levels along the corridor. See **Appendix C** for more specific information regarding trip generation as completed in the Traffic Considerations Memorandum.

BACKGROUND INFORMATION

STUDY AREA

CH 83 provides direct access to a substantial entertainment district and supporting commercial businesses. This area is home to some of the largest attractions in the metro including Canterbury Park, Valley Fair, Mystic Lake Casino, and supporting services for attraction visitors. In addition to serving these large entertainment areas, CH 83 provides an important economic development function for the City of Shakopee and Scott County. It has been identified as one of the SCALE Top 10 commercial corridors. These corridors are targeted by SCALE to make improvements that enhance economic development with the goal of filling at least 50% of Scott County jobs with Scott County residents.

CH 83 also provides access to a significant concentration of industrial development and future economic development areas in Shakopee. The intact industrial parks within this part of Shakopee top the charts as the largest privately held industrial parks in the State of Minnesota. Most of the 35,000 jobs reported in Scott County's current Comprehensive Plan are located in northern Scott County; 43% of those are located in Shakopee. The Shakopee Mdewakanton Sioux Community (SMSC) tribal lands and enterprise operations are also served by CH 83. As the largest employer in Scott County, SMSC employs more than 4,100 people and creates a major draw for entertainment at Mystic Lake Casino for people across the state and beyond.

The City of Shakopee is experiencing an increase in development in the entertainment, commercial, and industrial areas surrounding CH 83. The list of development/expansion sites observed within this study includes Amazon, Polaris, AmerisourceBergen, Emerson Process Management, Century Link, and several others. As a result of these developments, over 2,800 jobs have been recently added or will be online soon. Other large developments such as a potential redevelopment of a portion of Canterbury Park, a major landholder along CH 83, are in discussion. With several undeveloped parcels adjacent to and within close proximity to CH 83, there is potential for continued commercial/industrial growth.

TRAFFIC AND ROADWAY CHARACTERISTICS

CH 83 is one of few minor arterial roadways providing north/south continuity through the City of Shakopee and into Prior Lake. This north/south function is important for local traffic as well as regional traffic making connections between Trunk Highway (TH) 169 and other regional facilities such as CH 101, 16, 42 and 82.

CH 83 is a four-lane roadway carrying approximately 7,200 vehicles per day near CH 101 and 18,300 to 23,900 vehicles per day near the TH 169 interchange. The corridor consists of both signals and side street stop control conditions with turn lanes at some, but not all intersections. The existing traffic conditions produce delays and safety issues during events at Canterbury Park and Mystic Lake Casino, especially when these events occur during weekday peak hour traffic.

An analysis of existing and anticipated traffic demand was completed in order to create a cohesive plan to address capacity, safety and supporting roadway network needs for the study area. The following sections outline the primary methodology and results of this analysis. A full copy of the Traffic Considerations Memorandum is included in **Appendix C**.

DATA COLLECTION

A traffic analysis was completed to evaluate operations at 13 intersections on or near the CH 83 corridor. Three-hour traffic counts were collected from 4:00 pm to 7:00 pm in March of 2015. These counts were used to establish a base condition of the amount of traffic that typically utilizes the corridor. Thirteen-hour traffic counts were collected in June of 2015 from 6:00 am to 7:00 pm. A Thursday in June was selected to capture both typical Valley Fair traffic as well as traffic related to events at Canterbury Park. Using this data, three peak hour traffic volumes were established: AM peak hour (7:00-8:00 AM), PM peak hour (4:30-5:30 PM), and Shift Change peak hour (6:00-7:00 PM). The Shift Change Peak Hour was established to evaluate traffic conditions during Canterbury Park events in the summer months and anticipated Amazon employee shift changes year-round. The 13-hour counts were collected at the following intersections:

- CH 83 at CH 101
- CH 83 at Valley Industrial Boulevard. N.
- CH 83 at 4th Avenue E.
- CH 83 at Valley Industrial Boulevard. S.
- CH 83 at Barenscheer Boulevard.
- CH 83 at 12th Avenue
- CH 83 at Secretariat Drive
- CH 83 at North TH 169 Ramp
- CH 83 at South TH 169 Ramp
- CH 83 at Dean Lakes Boulevard.
- CH 83 at CH 16
- Eagle Creek Boulevard. at Vierling Drive
- Vierling Drive at 12th Avenue

See **Figure 2 and 3** for existing traffic volumes collected as part of this study. The data was used to analyze existing traffic operations through the study area.

OPERATIONS

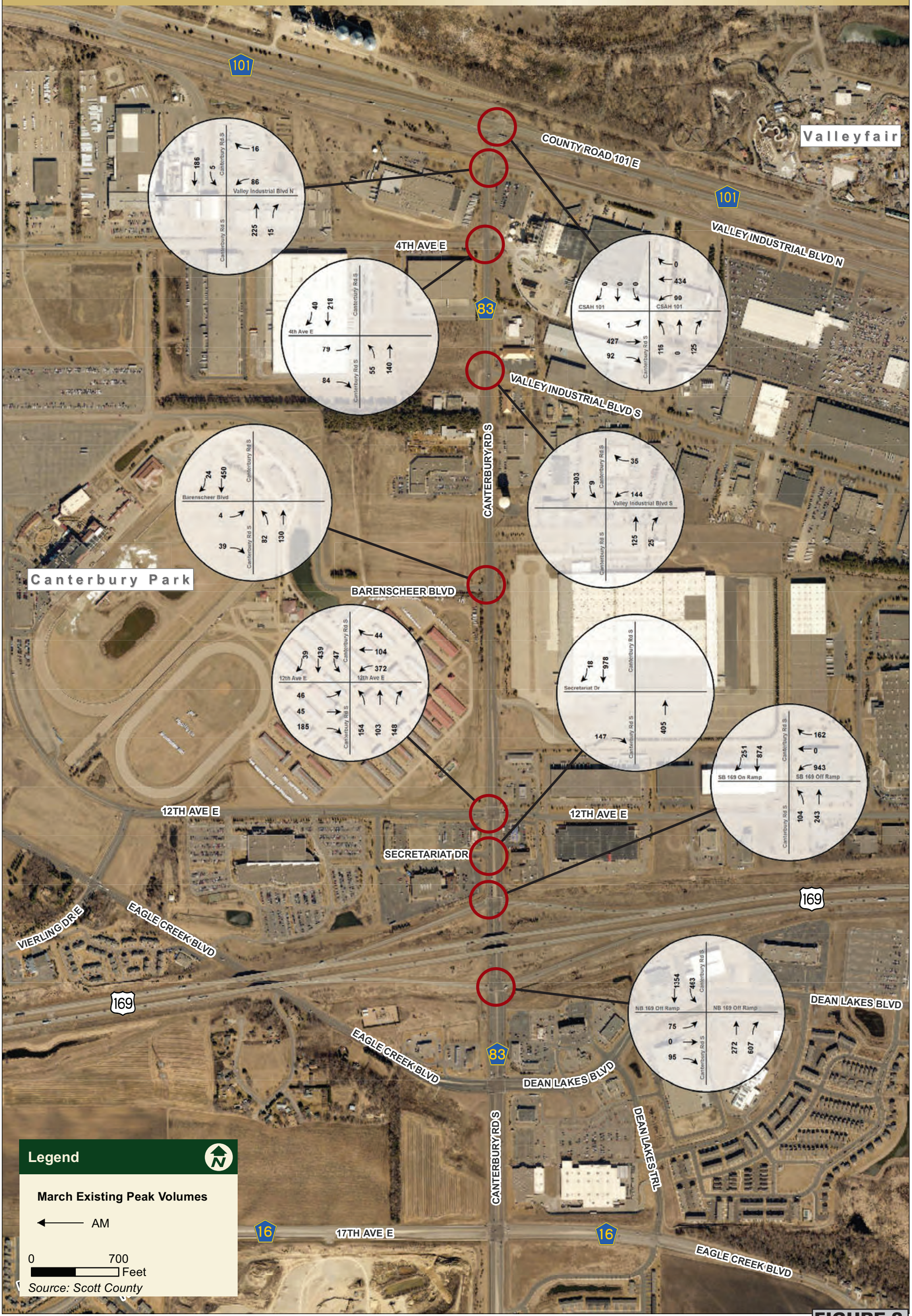
Data was collected in March of 2015 for select intersections along the study corridor which served as base condition data for the existing traffic operations. Data was also collected June of 2015 (referred to as summer) for all primary and secondary public intersections in the study area. Existing traffic operations analysis indicates two intersections presenting unacceptable conditions during the existing summer peak periods. These include the intersections of CH 83 at 12th Avenue and Eagle Creek Boulevard/Dean Lakes Boulevard. Individual movements of concern were also identified along CH 83 between 12th Avenue and CH 16. The intersections along CH 83 at 12th Avenue, North TH 169 Ramp, South TH 169 Ramp, Eagle Creek Boulevard, and CH 16 all exhibited limiting movement delays with unacceptable operations. This is a safety concern and it is anticipated to be amplified during events.

See **Appendix C** for more detailed information regarding the existing operational analysis completed.

CSAH 83 Corridor Readiness Study

City of Shakopee

March Existing



Legend

March Existing Peak Volumes

AM

0 700 Feet

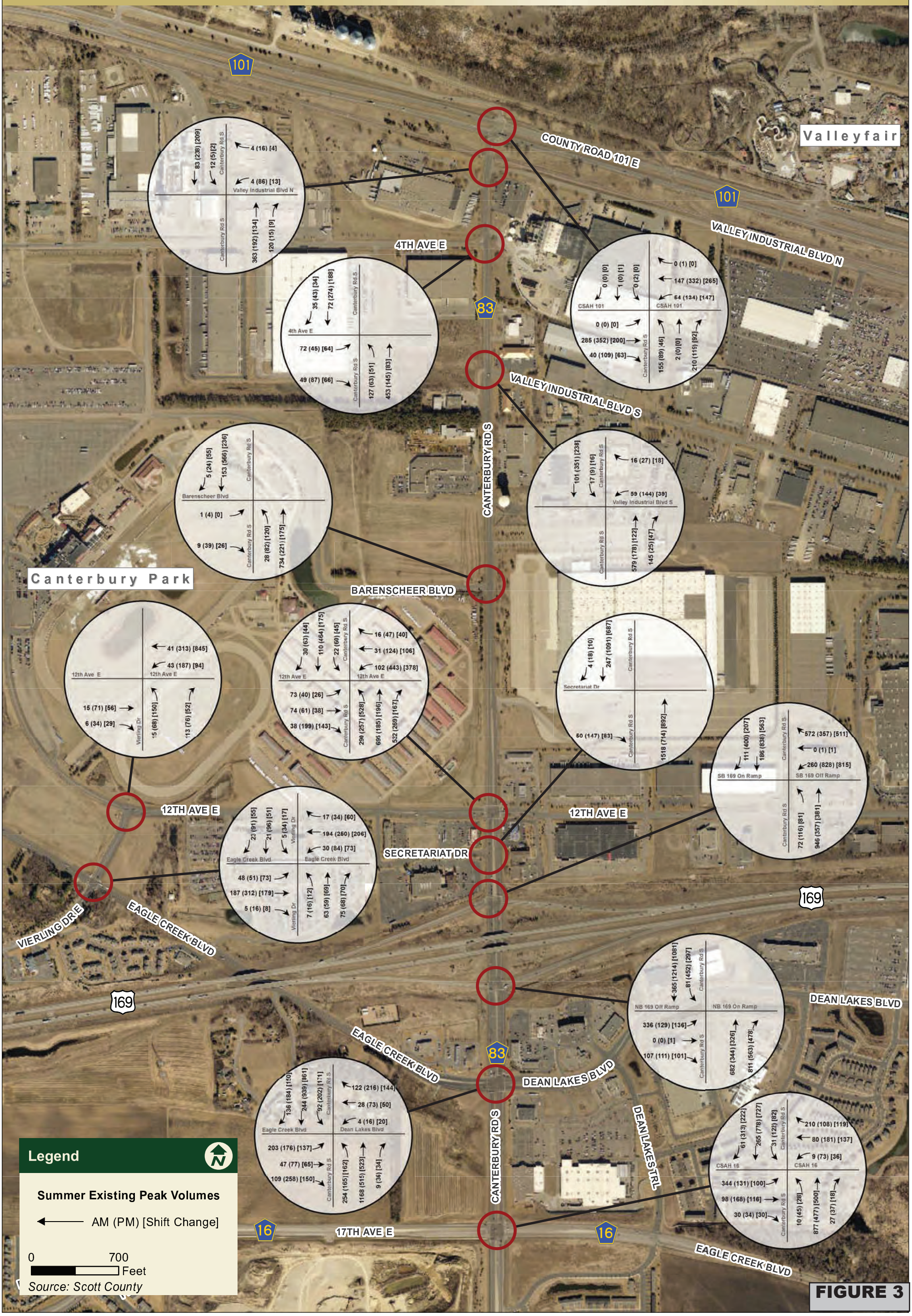
Source: Scott County

FIGURE 2

CSAH 83 Corridor Readiness Study

City of Shakopee

Summer Existing



Legend

Summer Existing Peak Volumes

AM (PM) [Shift Change]

0 700 Feet

Source: Scott County

FIGURE 3

SAFETY ANALYSIS

There have been a total of 175 crashes within the study area over the past five years (2010-2014). No fatal crashes were documented during this time period. However, two incapacitating crashes and 12 non-capacitating injuries occurred. The remaining crashes involved possible injury or property damage only.

Table 1 shows the crash rate at each intersection including the State averages expected for the specific type of intersection. A crash rate is a method of conveying crash frequency per certain number of vehicles and is a way to compare crash numbers at intersections that have different traffic levels. However, the most statistically reliable method for identifying hazardous crash locations is the identification of a critical crash rate which accounts for design of facility, type of intersection control, amount of exposure, and the random nature of crashes. An intersection is considered unsafe if the crash rate is greater than the critical crash rate.

Table 1 – Intersection Crash Rates (2010-2014)

Intersection	Traffic Control	Total Crashes	Crash Rate	Statewide Average	Severity Rate	Statewide Average	Crash Rate	//	Critical Crash Rate
CSAH 83 at CSAH 101	Traffic Signal	10	0.38	0.64	0.81	0.96	0.38	<	1.06
CSAH 83 at Valley Industrial Blvd N	Thru-Stop	4	0.29	0.19	0.44	0.27	0.29	<	0.52
CSAH 83 at 4th Ave E	Thru-Stop	8	0.45	0.19	0.62	0.27	0.45	<	0.48
CSAH 83 at Valley Industrial Blvd S	Thru-Stop	4	0.23	0.19	0.28	0.27	0.23	<	0.48
CSAH 83 at Shenandoah Dr	Thru-Stop	1	0.05	0.18	0.10	0.26	0.05	<	0.53
CSAH 83 at 12th Ave	Traffic Signal	39	0.80	0.43	0.97	0.62	0.80	>	0.68
CSAH 83 at Secretariat Dr	Thru-Stop	6	0.14	0.19	0.16	0.27	0.14	<	0.37
CSAH 83 at North TH 169 Ramp	Traffic Signal	19	0.32	0.43	0.42	0.62	0.32	<	0.66
CSAH 83 at South TH 169 Ramp	Traffic Signal	13	0.21	0.43	0.28	0.62	0.21	<	0.65
CSAH 83 at Dean Lakes Blvd	Traffic Signal	20	0.34	0.43	0.54	0.62	0.34	<	0.66
CSAH 83 at CSAH 16	Traffic Signal	37	0.73	0.43	1.30	0.62	0.73	>	0.68
Eagle Creek Blvd at Vierling Dr	All-Way Stop	14	0.65	0.42	0.79	0.59	0.65	<	0.81
Vierling Dr at 12th Ave	Thru-Stop	0	0.00	0.19	0.00	0.27	0.00	<	0.00

*** Railroad crossing between CSAH 101 and Valley Industrial Blvd N experienced 3 crashes between 2010-2014**

CH 83 at 12th Avenue (39 crashes reported) and CH 16 (37 crashes reported) display crash rates greater than the critical crash rates. The intersections on CH 83 located at Valley Industrial Boulevard. N, 4th Avenue E. and Valley Industrial Boulevard. S., as well as Eagle Creek Boulevard at Vierling Drive, all display rates greater than statewide average but do not display the same amount of risk as the rates remain below the critical crash rate.

Figure 4 includes a graphical representation of the crash history in the study area.

CSAH 83 Corridor Readiness Study

City of Shakopee, MN

Crash History 2010 - 2014

3 railroad crossing crashes

Incapacitating right angle crash 2013

10 of 14 crashes were right angle

12 left turn crashes (9 of 12 occurred on EB/WB movements)

Greater than 50% of crashes involved an injury

Incapacitating right angle crash 2013

Greater than 60% of crashes involved an injury

175 TOTAL REPORTED CRASHES FROM 2010 - 2014

Legend

- Pedestrian/Bicycle Crash

Access Locations with Number of Crashes

- Crash Count Below Expected Number
- Crash Count Above Expected Number
- (1) Number of Vehicle Crashes

Roads Classification

- Principal Arterial
- A Minor Arterial
- B Minor Arterial
- Collector

0 1,000 2,000 Feet

Source: Scott County MN

Map Document: \\Arcserver1\gis\SHAKT4210998\ESRI\Maps\Reported Crashes from 2010 - 2014.mxd
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FIGURE 4

ASSESSMENT OF EXISTING ACCESSES

Access Management Guidelines

Scott County Minimum Access Spacing Guidelines state that for a minor arterial roadway, the spacing between two public, full movement intersections is to be ¼ mile or greater where local and collector streets intersect. Traffic signals should not be spaced closer than ½ mile along a minor arterial. In addition, commercial driveways and private streets are not permitted on minor arterial roadways in Scott County. Where there is an opportunity for private or public access on more than one public roadway, access shall be taken on the lower functional roadway.

Existing Access Spacing

Scott County Minimum Access Spacing Guidelines are not met at the intersections of 4th Avenue, 12th Avenue, and multiple commercial driveways along the CH 83 corridor. There are a total of 21 access points (11 public and 10 private) which equates to approximately 12 accesses per mile.

Each access along CH 83 was classified as primary or secondary based on the access control guidelines highlighted above. Primary intersections are those where all turning movements are allowed to occur. Secondary intersections typically involve the connection of a more minor roadway and may not necessarily allow all turning movements to occur.

The primary public accesses identified are:

- CH 101
- 4th Avenue E
- Valley Industrial Boulevard S
- 12th Avenue E
- TH 169 SB Ramp
- TH 169 NB Ramp
- Eagle Creek Boulevard
- CH 16 (17th Avenue E)

The secondary public accesses identified are:

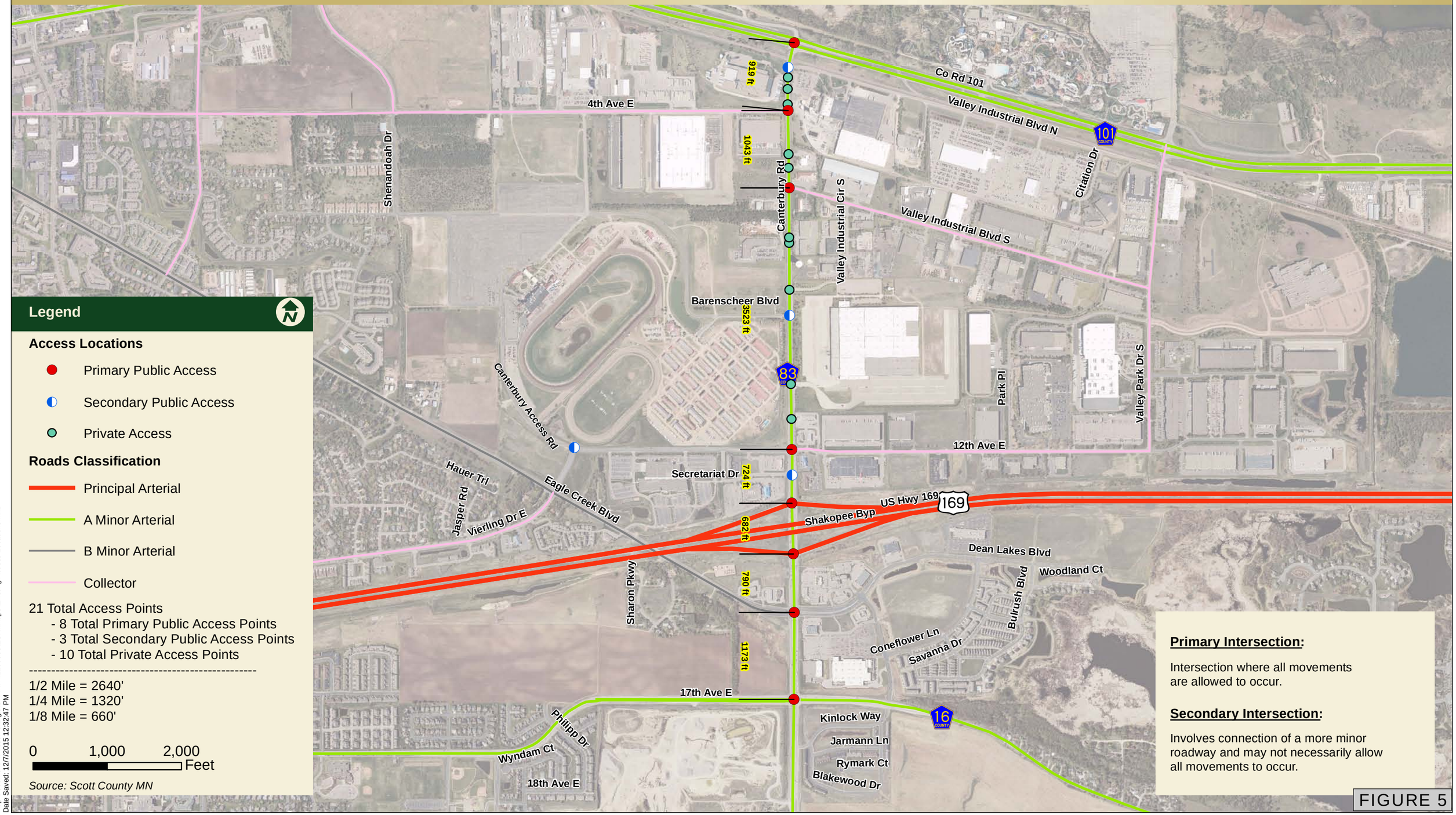
- Valley Industrial Boulevard N
- Barenscheer Boulevard
- Secretariat Drive

Figure 5 shows the existing access locations.

CSAH 83 Corridor Readiness Study

City of Shakopee, MN

Existing Access Locations



Legend

Access Locations

- Primary Public Access
- Secondary Public Access
- Private Access

Roads Classification

- Principal Arterial
- A Minor Arterial
- B Minor Arterial
- Collector

21 Total Access Points
- 8 Total Primary Public Access Points
- 3 Total Secondary Public Access Points
- 10 Total Private Access Points

1/2 Mile = 2640'
1/4 Mile = 1320'
1/8 Mile = 660'

0 1,000 2,000 Feet

Source: Scott County MN

Primary Intersection:

Intersection where all movements are allowed to occur.

Secondary Intersection:

Involves connection of a more minor roadway and may not necessarily allow all movements to occur.

FIGURE 5

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ENVIRONMENTAL CHARACTERISTICS

A high-level environmental screening using publicly available GIS datasets was conducted to identify any potential environmental resources within the study area as future roadway improvements were considered. No fatal flaws to roadway improvements were identified within the study area as part of this preliminary screening. Additional formal environmental documentation may be necessary as individual roadway improvement projects are pursued in the future. The environmental screening conducted as part of this study is included in **Appendix D**.

CORRIDOR VISION

SYSTEM CONNECTIVITY OPTIONS

Prior to developing improvement concepts, the project management team developed a plan for adequately spacing primary and secondary access points along the corridor. Scott County access guidelines were applied where possible; however, because most of the CH 83 corridor is already developed and several access points are spaced closer than desired, complete adherence to access guidelines is not feasible in all locations. Two different options for future primary and secondary access locations were developed along with a system of public local road connections to support CH 83 operations and business access/economic development. This is consistent with Scott County's policy that new intersections with the county highway are made through public street connections.

Figures 6 and 7 show the two options for future primary and secondary access locations along with the system of recommended roadway network improvements that would support these modifications to existing access along CH 83. The major difference between the two system connectivity options is where the first primary intersection north of the TH 169 North Ramp is located. The rationale behind the difference in access spacing of primary intersections between the two system connectivity options is further defined in the Roadway Improvements section of this report.

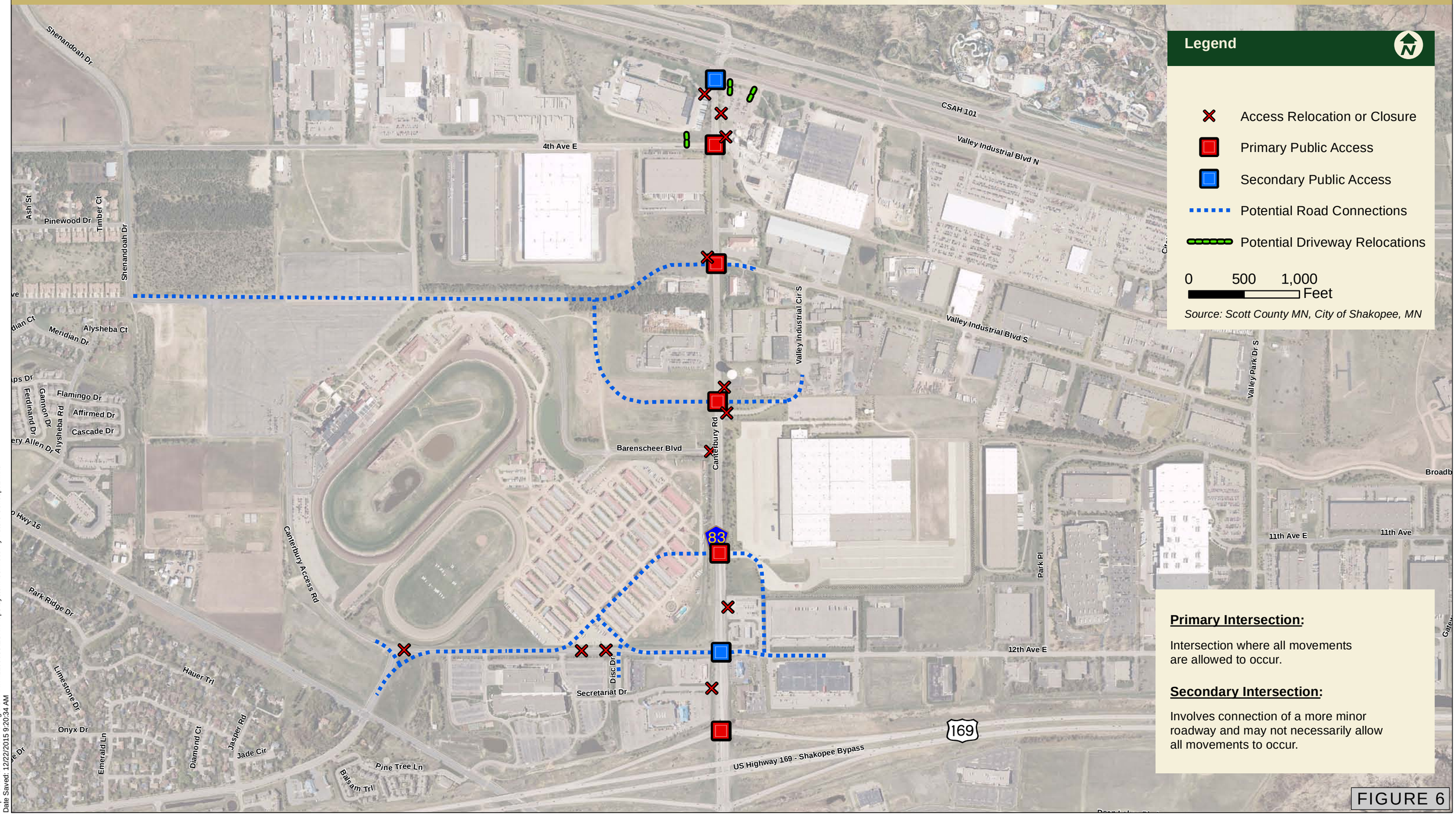
The development of a supporting local road system will provide operational and safety benefits to CH 83 by maximizing access spacing along the corridor. System Connectivity Option 1 creates a new primary intersection approximately ¼ mile north of the TH 169 North Ramp and the existing 12th Avenue intersection becomes a secondary intersection. New local roadways are needed to connect the new primary intersection into existing 12th Avenue on both the west and east sides of CH 83. Both system connectivity options also create a new primary intersection approximately ¼ mile north of the existing Barenscheer Boulevard intersection to allow for adequate spacing between the primary intersections. A system of local roadways are needed to connect the new Barenscheer Boulevard intersection location in with an extension of Valley Industrial Boulevard S on the west side of CH 83 to Shenandoah Drive and a new connection on the east side from CH 83 to Valley Industrial Circle S.

A partnership will be required between Scott County and the City of Shakopee to accomplish the overall vision for the CH 83 corridor including the supporting local roadway system and its associated benefits to CH 83. For instance, right-of-way is constrained within the developed portions of the CH 83 corridor. Scott County may be able to assist in acquiring right-of-way for CH 83 and local roadway system improvements in these constrained areas. Conversely, the City may be able to assist Scott County in reserving right-of-way for CH 83 expansion and local roadway system improvements through the development review process in areas where additional development is being considered. This partnership will be important to both agencies in order to accomplish the overall corridor vision.

CH 83 Corridor Readiness Study

City of Shakopee, MN

System Connectivity Option 1



Legend

- Access Relocation or Closure
- Primary Public Access
- Secondary Public Access
- Potential Road Connections
- Potential Driveway Relocations

0 500 1,000 Feet

Source: Scott County MN, City of Shakopee, MN

Primary Intersection:

Intersection where all movements are allowed to occur.

Secondary Intersection:

Involves connection of a more minor roadway and may not necessarily allow all movements to occur.

FIGURE 6

Map Document: \\Arcserver1\gis\SHAK\T42109988\ESRIMaps\System Connectivity Future Concept 1.mxd
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CH 83 Corridor Readiness Study

City of Shakopee, MN

System Connectivity Option 2

Legend

- Access Relocation or Closure
- Primary Public Access
- Secondary Public Access
- Potential Road Connections
- Potential Driveway Locations

0 500 1,000 Feet

Source: Scott County MN, City of Shakopee, MN

Primary Intersection:

Intersection where all movements are allowed to occur.

Secondary Intersection:

Involves connection of a more minor roadway and may not necessarily allow all movements to occur.

FIGURE 7

Map Document: \\Arcserver1\gis\SHAK\T42109988\ESRI\Maps\System Connectivity Future Concept 2.mxd
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ROADWAY IMPROVEMENT CONCEPTS

This study originally considered the segment of CH 83 from CH 16 to CH 101. As the study progressed it became clear that the critical segment of roadway requiring the most change was from the north TH 169 interchange ramp to CH 101.The CH 83 corridor from the south TH 169 interchange ramp to CH 16 is full built out as a four-lane divided highway with left and right turn lanes and signalization at each of the major intersections. There is no direct access to CH 83 within this area and no significant operational or safety issues that need to be addressed with additional corridor capacity at this time. There may be some signal timing/optimization work that could improve operations in this area in the future as needed.

Several improvement concept alternatives focused on the CH 83 corridor between the north TH 169 ramp and CH 101 were generated throughout the planning process. Agency and stakeholder review contributed to refinements resulting in the eventual development of three improvement concepts on which recommendations were based. These include:

- Near Term Project: Identifies needed mitigation strategies at the intersections of CH 83 at 12th Avenue and includes the 2017 4th Avenue Project. The near term project could occur by itself or prior to a future project.
- Future Concept 1: development driven concept focused on accommodating new development at Canterbury Park as well as realignments of several streets and trail additions along to the corridor that aim to improve multi-modal access.
- Future Concept 2: Development driven concept focused on maintaining the mitigation measures at the 12th Avenue intersection and addressing access locations to better meet the County spacing guidelines.

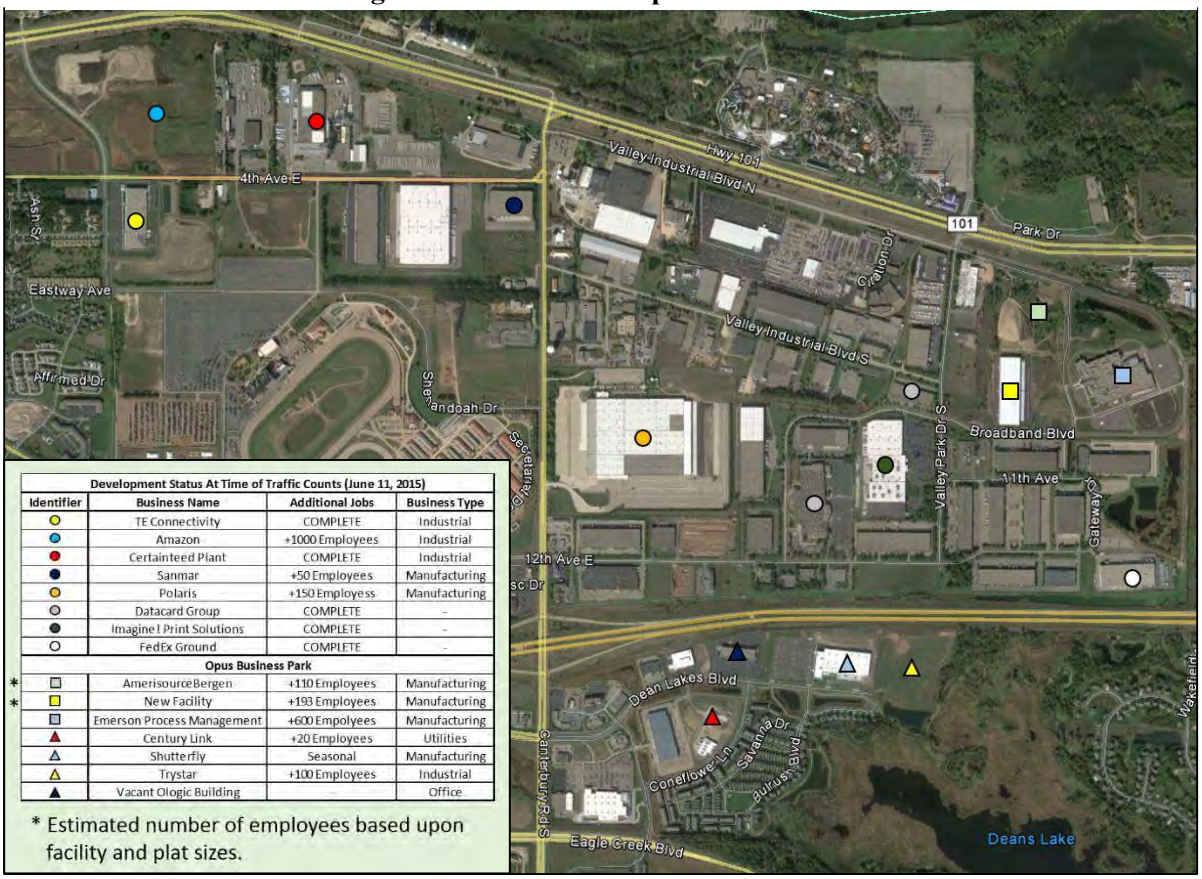
LAND USE ASSUMPTIONS

The improvement concepts were developed to accommodate an increase in traffic in the future due to anticipated development. The following summarizes land use assumptions identified by the City and County comprehensive plans, prior studies and anticipated economic development potential provided by the City:

- *Amazon Retail Distribution Center:* Amazon is locating a distribution center west of CH 83 in the northeast quadrant of the 4th Avenue/Shenandoah Drive intersection. The center is currently under construction and is anticipated to be fully operational by the 2016 holiday season. This facility will bring over 1,000 new jobs to the area with additional freight traffic along the corridor.
- *Additional Growth:* The City's Economic Development Coordinator was consulted regarding other potential development anticipated along and near the CH 83 corridor. Key parcels were identified that have completed recent expansion projects, are currently expanding, or are intending to expand in the future. The findings from this discussion are included in **Figure 8**.
- *Undeveloped Properties South of TH 169:* The final development incorporated within the 2037 traffic forecast involves the undeveloped properties located south of TH 169, adjacent to CH 83. The parcels identified in **Figure 9** are currently used for agricultural or mining purposes, but are anticipated to be redeveloped into commercial, residential and industrial properties in the future.

At the writing of this report, Canterbury Park had preliminary plans for a large mixed use development on unused/underused portions of their property. This redevelopment would include commercial/retail, office space and residential development. Because of the scale of this development and that it would require relocation of their barns, it is likely this would occur in phases over the course of 10-20 years or more. Because of the uncertainty with the timing and scale of this redevelopment, it was not included in the traffic forecasts for this study. The Traffic Considerations Memo in **Appendix C** provides additional details on analysis completed on a potential Canterbury redevelopment.

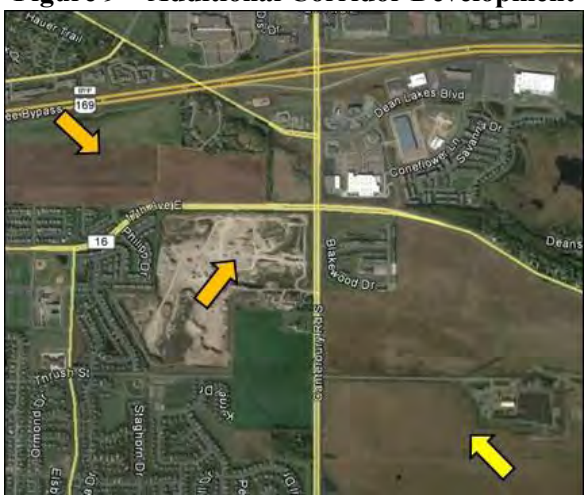
Figure 8 – CH 83 Development Forecasts



Development Status At Time of Traffic Counts (June 11, 2015)			
Identifier	Business Name	Additional Jobs	Business Type
○	TE Connectivity	COMPLETE	Industrial
○	Amazon	+1000 Employees	Industrial
○	Certainteed Plant	COMPLETE	Industrial
○	Sanmar	+50 Employees	Manufacturing
○	Polaris	+150 Employess	Manufacturing
○	Datacard Group	COMPLETE	-
○	Imagine! Print Solutions	COMPLETE	-
○	FedEx Ground	COMPLETE	-
Opus Business Park			
* □	AmerisourceBergen	+110 Employees	Manufacturing
* □	New Facility	+193 Employees	Manufacturing
□	Emerson Process Management	+600 Empolyees	Manufacturing
▲	Century Link	+20 Employees	Utilities
△	Shutterfly	Seasonal	Manufacturing
△	Trystar	+100 Employees	Industrial
▲	Vacant Ologic Building	-	Office

* Estimated number of employees based upon facility and plat sizes.

Figure 9 – Additional Corridor Development



TRAFFIC FORECASTS

Traffic forecasts were developed using future daily traffic volumes attained from the 2040 Scott County travel demand model in conjunction with information from prior studies and from the City of Shakopee. 2037 traffic forecasts were developed for the CH 83 corridor based on the land use assumptions outlined in the section prior.

The turning movement counts collected in June of 2015 were used as the baseline for developing 2037 peak hour turning movement counts for AM, PM, and Shift Change peak periods during the summer months as well as a Holiday time period. The summer time period was selected to evaluate conditions when the recreational vehicle traffic traveling to and from Canterbury Park and Valley Fair reaches its peak. The Holiday period was also considered to evaluate the influx of traffic generated by the seasonal hiring and increased production occurring at the large industrial and manufacturing facilities during the months of November and December. **Figures 10 and 11** provide the forecasted AM, PM and Shift Change Peak Hour traffic volumes for the Summer and Holiday evaluation periods.

INTERSECTION GUIDELINES

Traffic control changes will be required at several locations along CH 83 to accommodate the anticipated future growth in traffic volumes.

Appropriate Intersection Traffic Control

Based on intersection type (primary or secondary), different types of traffic control are appropriate for use. For primary intersections, traffic signals, roundabouts, all-way stops, and thru-stops are all appropriate types of traffic control. Modifications to intersection traffic control at these locations shall be based on an engineering study which would take into account traffic volumes and other relevant considerations.

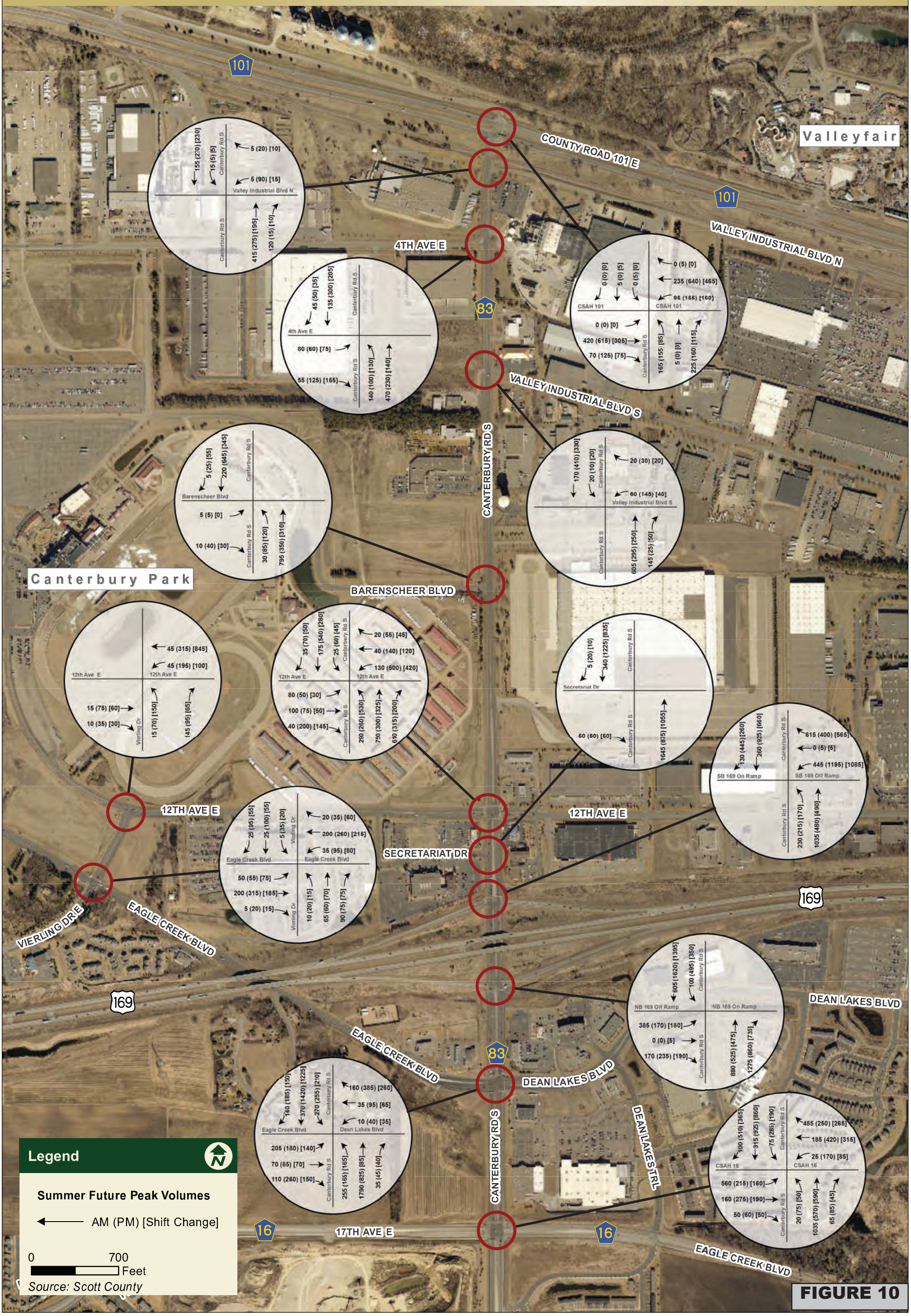
Unlike primary intersections, secondary intersections are not meant to necessarily accommodate all turning movements. Therefore, traffic control options at secondary intersections include thru-stops, right-in/right-outs, and three-quarter intersections. The latter two alternatives are considered reduced conflict intersections which are restricted to right turns only and right turns plus the lefts from the major street respectively.

The type of traffic control chosen for specific intersections is meant to efficiently manage conflicts between different movements within the intersection. This can be accomplished by either limiting movements sequentially as with a traffic signal or geometrically such as with roundabouts or reduced conflict intersections. See **Figure 12** for a graphical representation of conflict points for the various types of intersections. The illustrations depict the location of conflict areas between two or more vehicles by either an arrow, circle, or square based on the type of conflict. Fewer conflict points lead to fewer areas where crashes can occur, usually increasing safety. The type of conflict point can have an impact on crash severity as well. For example, crossing conflict points can produce more severe crashes compared to merging/diverging conflicts found in roundabouts.

CSAH 83 Corridor Readiness Study

Summer Future Build Conditions

City of Shakopee



Legend

Summer Future Peak Volumes

AM (PM) [Shift Change]

0 700 Feet

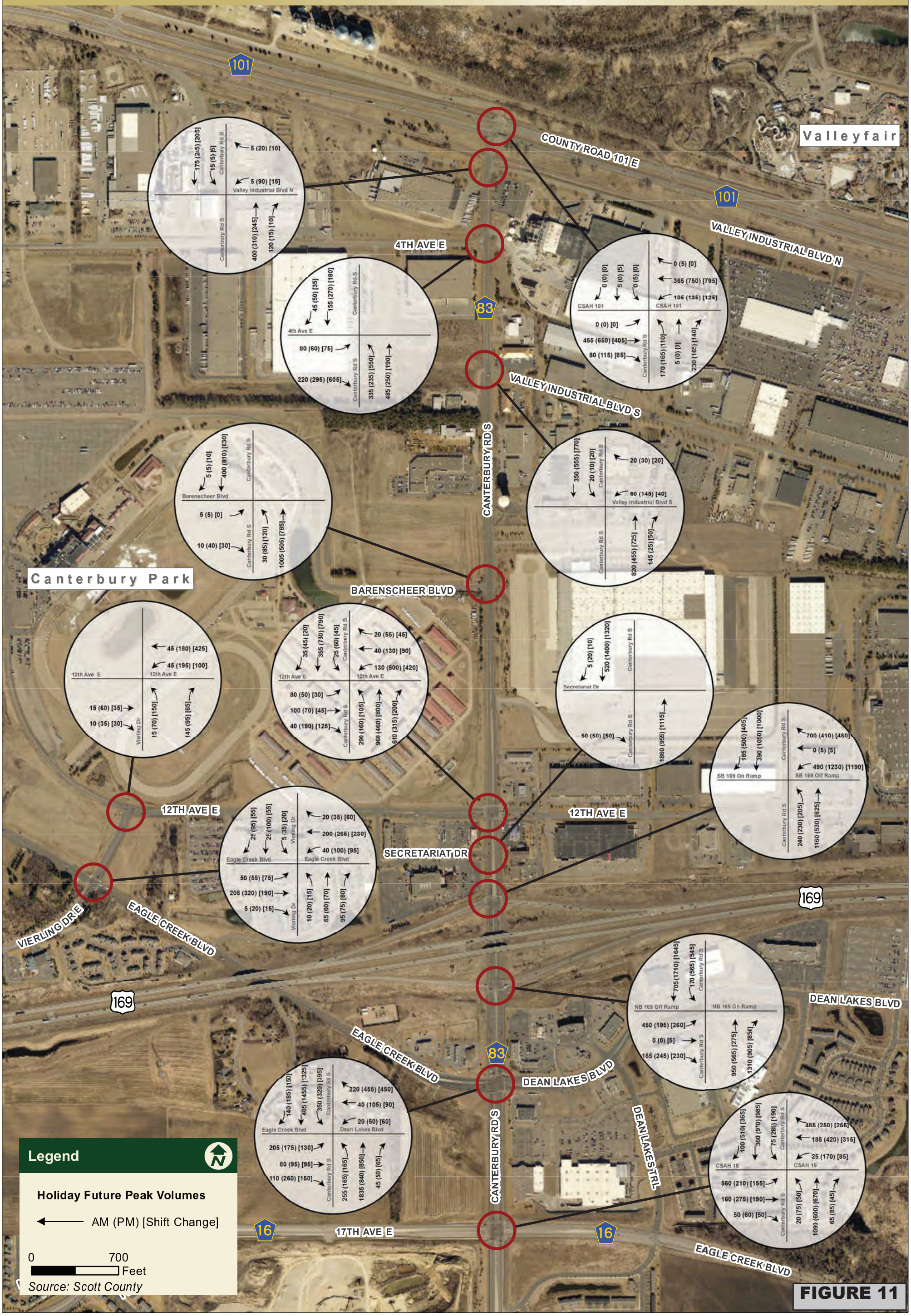
Source: Scott County

FIGURE 10

CSAH 83 Corridor Readiness Study

Holiday Future Build Conditions

City of Shakopee



Legend

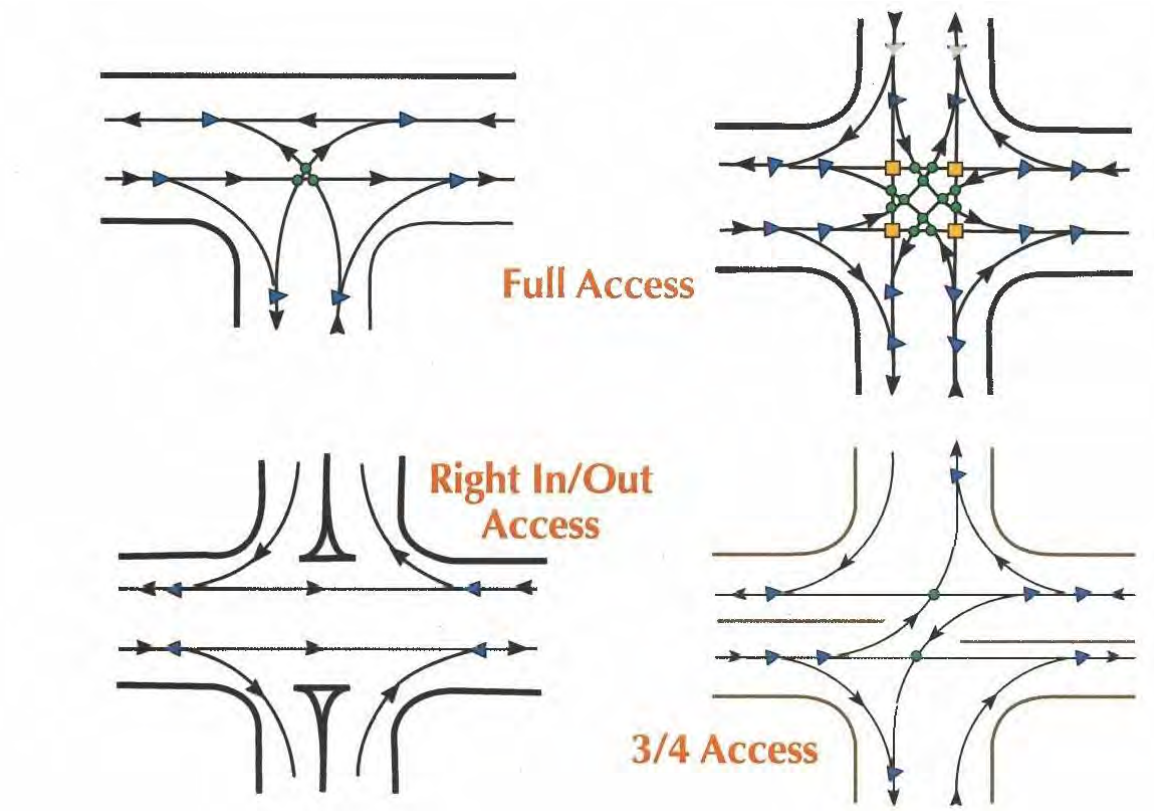
Holiday Future Peak Volumes

AM (PM) [Shift Change]

0 700 Feet

Source: Scott County

FIGURE 11



	Crossing	Turning	Merge/ Diverge	Total	Typical Crash Rate (crashes per mil. entering vehicles)
Full Access +	4	12	16	32	0.3 (1)
Full Access T	0	3	6	9	0.3 (2)
3/4 Access	0	2	8	10	0.2 (3)
Right In/Out Access	0	0	4	4	0.1 (3)
Roundabout	0	0	8	8	0.2 (2)

Figure 12 – Intersection Conflict Points (Source: MnDOT Traffic Safety Fundamentals Handbook)

Functional Intersection Area

An intersection is defined by both its physical and functional areas. Conflict points describe the internal influences and operations of the physical area of an intersection while the functional area describes the larger impact of intersections and how they can interact with each other. The functional area extends both upstream and downstream of the physical area and influences intersection spacing requirements. The functional area of the approach to an intersection consists of three basic elements:

- Perception-reaction distance: Area of an approach in which the typical driver detects, identifies, decides and responds to changes in the roadway or other drivers around them. This would include routing decisions to access different land uses off of CH 83.
- Deceleration-maneuver distance: Distance along an intersection approach where drivers physically slow down and alter their path in response to roadway changes or routing decisions. For example, a driver making a left turn would slow down and merge into the left turn lane in this distance.
- Queue-storage distance: Length associated with 95th percentile queues at intersection approaches for particular movements.

With no turn lane present for an approach, the functional area of the intersections consists only of the perception-reaction distance and maneuver distance. This is considered the same length as the stopping sight distance for the posted speed of the approach. See **Figure 13** for additional information regarding intersection functional area.

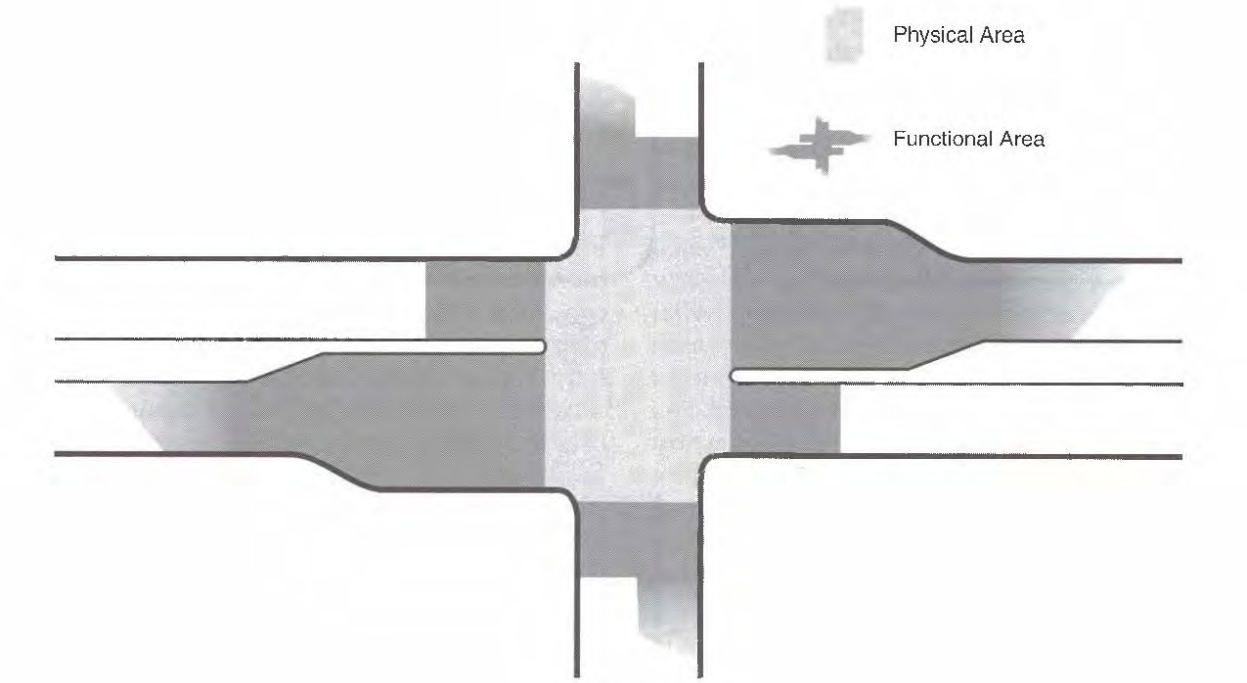


Figure 13 – Intersection Functional Area (Source: TRB Access Management Manual)

The following is a summary of the key features of each improvement concept, information on the operations and safety improvements, and a discussion of impacts to existing infrastructure and right-of-way.

NEAR TERM IMPROVEMENTS

12th Avenue

It is anticipated that current operational issues present at the 12th Avenue intersection will worsen beyond acceptable levels and cause significant delays and queuing at multiple movements in the future as the area continues to grow. Traffic concerns at this intersection include northbound and westbound left turning movements. The westbound approach is most impacted as continued growth along 12th Avenue creates a larger demand while the existing capacity remains as it is today. **Figure 14** illustrates near term changes to that intersection. These improvements include:

- Add westbound left turn lane for a total of two left turn lanes and one thru right turn lane. Allow protected movement for westbound left turns.
- Add northbound left turn lane for a total of two left turn lanes, two thru lanes and one right turn lane. Allow protected movement for northbound left turns.
- Expand the segment of 12th Avenue west of CH 83 to Disc Drive from the existing variable one-lane/two-lane westbound exit lanes to a continuous two westbound lanes with dedicated turn lanes.
- Maintain the existing sidewalk on the east side of CH 83 between the TH 169 north ramp and 12th Avenue.
- Maintain existing curb and gutter to reduce right-of-way impacts. The addition of the dual northbound left turn lanes results in changes to the median and alignment for the north leg of the intersection. Any additional right-of-way necessary to construct the proposed expansion project at CH 83/12th Avenue would occur on the north side of the road.
- Install permitted-protected flashing yellow arrow heads for the single eastbound and westbound left turns at the intersection to improve operations and reduce vehicle queues.

12th Avenue intersection improvements will occur in multiple phases beginning with signal modifications in 2016. The other improvements at this intersection have not yet been funded.

The recommended improvements are anticipated to reduce queuing length to the allotted storage length for turn lanes at 12th Avenue and will work to decrease backups into the north TH 169 Ramp intersection. Intersection delays at 12th Avenue are anticipated to improve to acceptable LOS. Reducing the queue lengths and keeping turning vehicles in turn lanes are important safety measures. The addition of turn lanes to the intersection enhances its functional area allowing for vehicles to remove themselves from thru-traffic on CH 83.

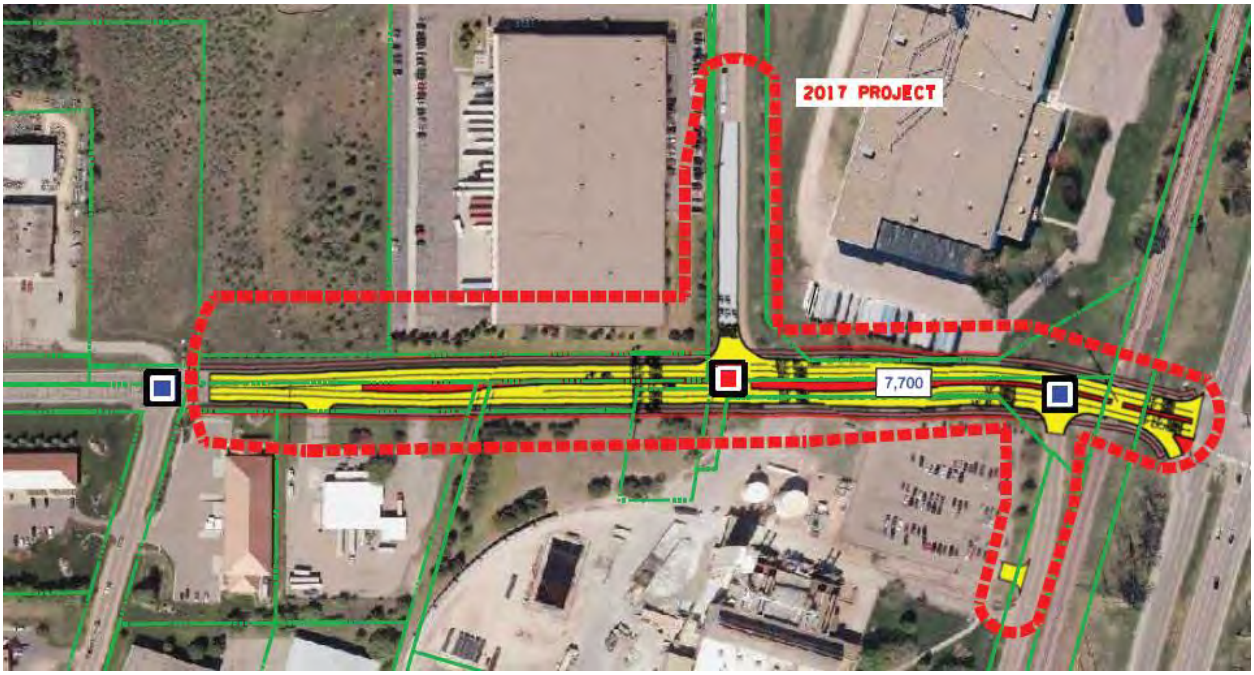
4th Avenue (2017)

Significant increases in traffic due to the Amazon Facility during the holiday season are anticipated to increase delays at the CH 83 and 4th Avenue intersection resulting in unacceptable LOS during the Shift Change period of the day. **Figure 15** illustrates the proposed changes to that intersection that will apply to the near term project and all future concepts. 4th Avenue intersection improvements are currently under design and programmed for construction in 2017. These improvements include:

- Add a northbound left turn lane and expand CH 83 to accommodate a center median
- Add an eastbound right turn lane

Figure 14 – Near Term Improvements at 12th Avenue

Figure 15 – Near Term Improvements at 4th Avenue



The proposed improvements are anticipated to reduce queuing length to allotted storage length for turn lanes at 4th Avenue and will work to decrease backups. Intersection delays at 4th Avenue are anticipated to improve to acceptable LOS. The addition of turn lanes to the intersection enhances its functional area allowing for vehicles accessing 4th Avenue to remove themselves from thru-traffic on CH 83.

There was a lot of support for the 12th Avenue Near Term Project improvements expressed by existing business owners at the final public open house. Several felt this would address issues for many years into the future.

FUTURE CONCEPTS

Future Concepts 1 and 2 were developed with current and anticipated development in mind and with the idea that the Near Term Project would be implemented. Primary intersection spacing of ¼ mile is maintained along CSAH 83. The following ideas were maintained for both future concepts:

- Provide a continuation of the existing 12th Avenue to Vierling Drive with a 30 mph curve to establish a continuous roadway. The existing Canterbury Park entrance connects to this road at a stop-controlled T-Intersection.
- Eliminate the skewed angle between CSAH 83 and Valley Industrial Blvd. South by curving road to meet CSAH 83 at a 90 degree angle.
- Re-route Barenscheer Blvd. along the north edge of Canterbury property connecting to CSAH 83 to form the fourth leg of the new Valley Industrial Blvd. South intersection. This becomes a new primary intersection along CSAH 83.
- Establish a Primary intersection between Valley Industrial Blvd. South and 12th Ave.
- Add turn lanes and medians along CSAH 83 from 12th Avenue to CSAH 101.

Future Concept 1

Future Concept 1 has a focus on addressing issues with the 12th Avenue intersection. The changes to 12th Avenue in this concept go beyond the recommended mitigation strategies described earlier by implementing improvements to intersection spacing, accommodating changes brought on by potential Canterbury Park development, creating new connections for east side businesses, realigning Valley Industrial Boulevard South and adding trails to accommodate pedestrians. **Figure 16** illustrates recommended changes for Future Concept 1 which include:

- Re-route 12th Avenue to the north where it intersects CH 83 roughly halfway between existing 12th Avenue and Barenscheer Blvd
- Mitigate the existing intersection of CH 83 and 12th Avenue to restrict access and allow only left turns to only northbound traffic. Minor approaches of existing 12th Avenue would be right-in/right-out only
- Construct a new roadway on the east side of Super America extending from the north side of 12th Avenue and curving to meet CH 83 at the new 12th Avenue intersection. This intersection is established as a primary intersection as the restricted access existing 12th Avenue would become a secondary intersection.

The proposed concept is anticipated to improve intersection operations and functionality of the segment of CH 83 immediately north of TH 169. The increase in primary intersection spacing from 1/8-mile to ¼-mile provides additional space for vehicle queuing and extra time for a motorist to merge over multiple lanes of traffic when traveling between TH 169 and 12th Avenue. Re-routing 12th Avenue would require the relocation of seven Canterbury horse stables. The new roadway on the east side of CH 83 is designed to allow for more storage for westbound traffic approaching CH 83. The operational benefits of increasing the spacing between primary intersections in Future Concept 1 allow for more flexibility in the future to accommodate increased levels of traffic in comparison to the existing geometry. This is important if

PRIMARY INTERSECTION:
INTERSECTION WHERE ALL MOVEMENTS ARE ALLOWED TO OCCUR.

SECONDARY INTERSECTION:
INVOLVES CONNECTION OF A MORE MINOR ROADWAY AND MAY NOT NECESSARILY ALLOW ALL MOVEMENTS TO OCCUR.

12TH AVE
3,050
12TH AVE
VIERLING DR
EAGLE CREEK BLVD
12TH AVE
1.4 ACRES
13 ACRES
1.8 ACRES
8.7 ACRES
3.6 ACRES
4,000
4TH AVE
2017 PROJECT
18,800
7,700
CANTERBURY ROAD (CSAH 83)
7,700
7,700
12,100
16,800
CSAH 101
VALLEY INDUSTRIAL BLVD N
25 MPH CURVE
LOSE 53 PARKING SPOTS
12TH AVE
VALLEY INDUSTRIAL BLVD S
4,950
SCALE IN FEET
SCALE IN FEET
SCALE IN FEET

DRAFT
12/23/2015

100 SCALE IN FEET

LAYOUT LEGEND

- BITUMINOUS TRAIL
- CURB AND GUTTER
- LANDSCAPING (GRASS, BUSHES, ETC.)
- ROADWAY
- SHOULDER
- EXISTING R/W
- PROPOSED R/W
- PRIMARY PUBLIC
- SECONDARY PUBLIC
- ACCESS CLOSURE
- EXISTING AADT VOLUMES

BOLTON & MENK
SHAKOPEE
Scott
MINNESOTA DEPARTMENT OF TRANSPORTATION

CSAH 83 CORRIDOR READINESS STUDY
SHAKOPEE, SCOTT COUNTY
FUTURE CONCEPT 1

FIGURE 16

Canterbury Park moves forward with a major redevelopment of portions of their property into commercial, retail, office space and residential.

Future Concept 1 supports economic development by improving operations on CH 83 between the TH 169 interchange and 12th Avenue and at the 12th Avenue intersection. However, the proposed improvements would change how existing businesses on the east side access CH 83. Future Concept 1 would also impact truck parking at Kin Properties (Polaris), United Properties and the strip mall properties in the area. The implementation of Future Concept 1 would require substantial investment and private cooperation.

This concept has the potential to create new parcels of varying sizes along CH 83 for future development. All of these parcels are potential revenue streams for property owners.

Future Concept 2

Future Concept 2 has its focus on maintaining the mitigation measures put in place by the Near Term Project at the 12th Avenue intersection maintaining it as a full access intersection. Future Concept 2 also relocates the next full access intersection to a ¼ mile distance from 12th Avenue, realigns Valley Industrial Boulevard to extend west and adds trails along CH 83. **Figure 17** illustrates recommended changes for Future Concept 2.

Summary Comparison of Future Concepts

Each of the Future Concepts provide adequate capacity for future traffic and will improve corridor operations and safety over the existing geometry. However, they are different in how much flexibility exists to accommodate future traffic fluctuations and in their impacts to existing businesses and future development areas. **Table 2** outlines the pros and challenges for each concept.

Table 2 – Summary Comparison of Future Concepts

CONCEPTS	PROS	CHALLENGES
Future Concept 1	• Accommodates higher level of future traffic • Favors future development	• Access and connectivity changes for existing businesses • Requires substantial investment and private cooperation
Future Concept 2	• Maintains full access at 12th Avenue • Favors existing businesses	• More limiting in ability to maintain future traffic flow at 12th Avenue • Less flexibility for future development • Still requires significant investment yet less than Future Concept 1

Public and business input on the future concepts is also an important consideration for the City and County as they strive to sustain and support economic development along CH 83. The following summarizes input received on each of the Future Concepts:

- Future Concept 1 (Realigns 12th Avenue)
    - The existing full access at 12th Avenue is important to businesses on the east side of CH 83. Super America, Culvers, Warner Stellian and Ashley Furniture expressed concern with loss of left-turns at the existing 12th Avenue with this concept. They rely on southbound CH 83 traffic accessing 12th Avenue to get to their businesses as much as northbound traffic. They said this is particularly important during the summer months when traffic is higher due to Valley Fair and Canterbury Park operations.

PRIMARY INTERSECTION:
INTERSECTION WHERE ALL MOVEMENTS ARE ALLOWED TO OCCUR.

SECONDARY INTERSECTION:
INVOLVES CONNECTION OF A MORE MINOR ROADWAY AND MAY NOT NECESSARILY ALLOW ALL MOVEMENTS TO OCCUR.

12TH AVE
3,050
VIERLING DR
EAGLE CREEK BLVD
12TH AVE
BARENSCHEER BOULEVARD
4,000
4TH AVE
2017 PROJECT
18,800
7,700
CANTERBURY ROAD (CSAH 83)
7,700
12,700
CSAH 101
VALLEY INDUSTRIAL BLVD N
16,800
4,950
12TH AVE
VALLEY INDUSTRIAL BLVD S

DRAFT
12/23/2015

LAYOUT LEGEND
- BITUMINOUS TRAIL
- CURB AND GUTTER
- LANDSCAPING (GRASS, BUSHES, ETC.)
- ROADWAY
- SHOULDER
- EXISTING R/W
- PROPOSED R/W
- PRIMARY PUBLIC
- SECONDARY PUBLIC
- ACCESS CLOSURE
- EXISTING AADT VOLUMES

CSAH 83 CORRIDOR READINESS STUDY
SHAKOPEE, SCOTT COUNTY
FUTURE CONCEPT 2

FIGURE 17

- Kin Properties appreciated the involvement the City has extended in planning for roadway access. Consultant staff worked on multiple iterations of Future Concept 1 to mitigate impacts to their site with the realignment of 12th Avenue. The final concept addresses many of the property owners concerns and have indicated they could support the realignment concept. They recognize, however, that redevelopment of the Canterbury site will ultimately determine this option's feasibility. Representatives of Kin Properties do not support a new public street extending across the north side of their property due to impacts to a rail spur in the northeast corner of the property. They indicate some acceptance of a public street extending from CSAH 83 to their employee parking and potential connection to Valley Industrial Circle.
- United Properties was open to consideration of this future concept as long as their existing parking on the west side of the building could be maintained.
- Canterbury Park understood the flexibility this concept provides for them as they plan for a future redevelopment of their property. This concept allows for a separation of event traffic from future development traffic on their site. They did express concerns with the reconfiguration of the 12th Avenue/Vierling Drive intersection. Their concern with the proposed configuration is that all event traffic exiting their site would have to stop at this intersection rather than free-flow which could cause backups.

- Future Concept 2
  - Many businesses on the east side of CH 83 support this option as it is less of a change from how they currently access CH 83. There is a general sentiment that making improvements (double left-turn lanes at 12th Avenue) will be sufficient to address issues and is less costly.
  - Kin Properties does not support anything less than full access at their south driveway to CH 83. A reduced conflict intersection would be detrimental to their truck operations and appeal of the site for industrial use. They recognize reconfiguration of their site may be necessary to maintain full access for truck ingress and egress to their north driveway. In that case, they would look to keep employee and truck traffic separated and may look to Valley Industrial Circle for their employee access. A public street from CSAH 83 to Valley Industrial Circle with separate and secure truck and employee access could be considered.
  - Canterbury Park felt this concept could also work with their future plans. They realize there is less flexibility in 12th Avenue being able to accommodate major traffic increases with this location due to redevelopment. They expressed concern with 12th Avenue/Vierling Drive reconfiguration as it would require all exiting Canterbury Park traffic to stop which will likely cause delays and safety concerns. They would rather see the free flow be on 12th Avenue.

GRADE-SEPARATED RAIL CROSSING OPTIONS

In addition to the evaluation of vehicular and pedestrian traffic along the CH 83 Corridor, a high level analysis was performed regarding the rail line crossing CH 83, south of CH 101. The Union Pacific Railroad currently utilizes a railroad track that runs adjacent to CH 101 though the north end of the study area and passes through the study area between the intersections of N. Industrial Boulevard and CH 101. Feedback from the public on several occasions has indicated that the railroad poses a problem as it blocks CH 83 and Valley Park Drive for 10 minutes or more at times and vehicles on Valley Park Drive make U-turns and use 12th Avenue/CH 83 to avoid waiting for the train. The following evaluation explores the opportunity to introduce a grade-separated crossing to alleviate the delays currently developed by passing trains.

CH 83 GRADE SEPARATED RAIL CROSSING

The first alternative explored included a grade separated crossing on CH 83. It was determined that an overpass of CH 83 over the railroad was not a feasible alternative, so an underpass was evaluated. The following assumptions were identified from the MnDOT Road Design Manual:

Bridge Deck

- Depth of railroad bridge deck = span (in feet) + 10 = depth of deck (in inches)
  - 80' + 10 = 90 inches = 7' 6"
- Minimum clearance for railroad underpass = 16' 4"
- Total clearance = 23' 20"

CH 83 Roadway Design

- Distance between CH 101 and Railroad (low point in road) = 125'
- Distance between Railroad (low point in road) and N. Industrial Boulevard = 70'

Based upon the above mentioned assumptions, it was determined that the approximate grade of the roadway to provide an underpass that meets minimum clearance requirements is 19% between CH 101 and the railroad and 34% between the railroad and N. Industrial Boulevard. This far exceeds the maximums allowable grades of 5-8% for a 30 mph roadway and 4-6% for a 50 mph roadway. **Figure 18** displays this information. Thus, it has been determined that a grade separated crossing on CH 83 is not feasible at this location.

Valley Park Drive presents similar spacing between the railroad and adjacent roadways and therefore this location also does not provide a feasible location for a grade separated crossing.

INNOVATION BOULEVARD GRADE SEPARATED CROSSING

Since grade separated railroad crossings were determined to be unfeasible along CH 83 and Valley Park Drive, a third alternative was explored along Innovation Boulevard and Checkered Flag Boulevard. This connection involves the installation of a bridge over the Union Pacific Railroad and roadway improvements to connect Innovation Boulevard to CH 101 at the existing Checkered Flag Boulevard west intersection. The following assumptions were identified from the MnDOT Road Design Manual:

Bridge Deck

- Depth of bridge deck = 5'
- Minimum clearance for railroad = 23'
- Total Clearance = 28'

Roadway Design

- Maximum roadway/bridge grade = 6%

A proposed alignment that abides by the above requirements is shown in **Figure 19**. The proposed connection would provide an alternative for local truck routes to access CH 101 without the conflict of an at-grade railroad crossing. While it is an alternative, establishing this connection would require significant land acquisition in addition to a high cost bridge and roadway extension.

Depth of RR bridge deck:
span(in ft)+10=depth of deck(in inches)
80'+10 = 90 inches = 7'6"

Minimum clearance for RR underpass:
16'4"

Total clearance:
23'10"

Maximum % Grades:
30 mph = 5-8%
50 mph = 4-6%

Depending on road classification

19%

12%

34%

125'

80'

70'

200'

CH 101

UNION PACIFIC RAILROAD

N. INDUSTRIAL BLVD

CANTERBURY RD (CH 83)

XX% Grade to reach minimum clearance

80

SCALE IN FEET

RAILROAD UNDERPASS

CSAH 83 CORRIDOR READINESS STUDY
SHAKOPEE, MN

BOLTON & MENK
Engineers & Surveyors

FIGURE 18

Depth of bridge deck: 5'
Minimum clearance for RR: 23'
Total clearance: 28'
Maximum % Grade: 6%

CSAH 101

CHECKERED FLAG BLVD

AC NELSON RV

FASTENAL

TITAN MACHINERY

6%

467'

467'

6%

UNION PACIFIC RAILROAD

ROSEMOUNT

INNOVATION BLVD

XX% Grade to reach minimum clearance

100

SCALE IN FEET

Maximum % Grades: 6%

RAILROAD OVERPASS

CSAH 83 CORRIDOR READINESS STUDY
SHAKOPEE, MN

BOLTON & MENK Engineers & Surveyors

FIGURE 19

IMPLEMENTATION PLAN

One of the goals of this study was to identify improvements that could be phased in over time as conditions within the corridor change. This was achieved through the identification of a Near Term Project and Future Concepts which are development driven.

Near Term Project

Signal modification and phasing improvements at the 12th Avenue signals are programmed for 2016. Improvements at 4th Avenue are currently under design and programmed for construction in 2017. The remainder of the Near Term Project improvements (turn lane additions, west leg on 12th Avenue and trail additions) are not currently funded but could be implemented in the near future without substantial cost or right-of-way implications. It is anticipated that the combination of the Near Term Project elements will serve the corridor for many years into the future and already have public support to implement. An important element of the Near Term Project is that it can occur prior to either of the two future concepts and will not result in a "throw away" investment for the City/County.

Future Concepts (Development/Opportunity Driven)

This study has also identified two Future Concepts that could be completed in the future as development/redevelopment occurs along the CH 83 corridor. These improvements will set the groundwork for further changes in traffic control and access spacing to accommodate the additional traffic generated by growth in the study area. Either of these improvement options could be implemented in the future when conditions dictate and could build upon the work of the Near Term Project. There are still many unknowns in terms of how areas along the corridor will develop and expand in the future. With the information on anticipated future land uses available at this time, it appears both Future Concept 1 and Future Concept 2 will accommodate CH 83 needs. The benefits, challenges and current public/business opinion on each concept were well documented through this Corridor Readiness Study and it is recommended that the City and County keep both concepts on the table for future consideration as growth occurs.

Grade Separated Rail Crossing

A primary concern for better utilization of CSAH 101 is the unpredictability of trip times due to crossing delays on the Union Pacific Railroad. Trip times can be delayed by more than 10 minutes due to train crossing and switching operations. A planning level review has determined grade-separation of the railroad is not feasible at CSAH 83 or Valley Park Drive. Grade separation may be possible on the east end of the industrial park where the railroad and CSAH 101 have greater distance between them. A planning level concept was reviewed for the extension of Innovation Blvd over the tracks and connecting to CSAH 101 at the Checkered Flag Blvd intersection. Additional analysis is recommended to determine feasibility and value of this connection.

NEXT STEPS

Through public involvement and stakeholder outreach, it was clear the Near-Term Project can be supported immediately. The City of Shakopee and Scott County should work together to identify funding to complete the turn lane additions, lane addition on the west leg of 12th Avenue, and trail additions of the Near Term Project. It is likely these improvements will serve the area well.

The City and County must also continue to work together to further plan, obtain funding, design, and implement the improvement projects as conditions dictate. All partners have an active role in implementing these improvements as there are benefits to both the local road and county highway system. A partnership will be required between Scott County and the City of Shakopee to accomplish the overall vision for the CH 83 corridor including the supporting local roadway system and its associated benefits to CH 83. For instance, right-of-way is constrained within the developed portions of the CH 83 corridor. Scott County may be able to assist in acquiring right-of-way for CH 83 and local roadway system improvements in these constrained areas. Conversely, the City may be able to assist Scott County in reserving right-of-way for CH 83 expansion and local roadway system improvements through the development review process in areas where additional development is being considered. This partnership will be important to both agencies in order to accomplish the overall corridor vision. All competitive funding sources should be considered. Agencies should also update their comprehensive and transportation plans to include these findings to better leverage funding sources.