Application

04774 - 2016 Roadway Modernization

05308 - CSAH 31 (Pilot Knob Rd) at CSAH 32 (Cliff Rd) Intersection in Eagan

Regional Solicitation - Roadways Including Multimodal Elements

Status:	Submitted
Submitted Date:	07/14/2016 4:06 PM

Primary Contact

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What Grant Programs are you most interested in?	Regional Solicitation - Roadways Including Multimodal Elements			

Organization Information

Name:	DAKOTA COUNTY

Jurisdictional Agency (if different):

Organization Type: County Government

Organization Website:

Address: TRANSPORTATION DEPT

14955 GALAXIE AVE

*	APPLE VALLEY	Minnesota	55124
	City	State/Province	Postal Code/Zip

County: Dakota

Phone:* 952-891-7100 Ext.

Fax:

PeopleSoft Vendor Number 0000002621A15

Project Information

Project Name CSAH 31 (Pilot Knob Rd) at CSAH 32 (Cliff Rd) Intersection Improvements

Primary County where the Project is Located Dakota

Jurisdictional Agency (If Different than the Applicant):

Brief Project Description (Limit 2,800 characters; approximately 400 words)

The project improves safety and mobility at the intersection of County State Aid Highway (CSAH) 31 (Pilot Knob Rd) and CSAH 32 (Cliff Rd) in the City of Eagan. CSAH 31 is a four-lane divided, A-Minor Expander roadway. The northbound/southbound approach geometrics consist of an exclusive left turn lane, two through lanes, and a right turn lane. The 2014 Average Annual Daily Traffic AADT 2014 (2030) is 20,700 (28,000) north of CSAH 32 and 21,200 (32,000) to the south. The current speed limit is 45 miles per hour.

County State Aid Highway (CSAH) 32 (Cliff Rd) is a four-lane divided, A-Minor Expander roadway. The eastbound/westbound approach geometrics consist of an exclusive left turn lane, two through lanes, and a right turn lane. The 2014 Average Annual Daily Traffic AADT 2014 (2030) is 18,300 (23,000) west of CSAH 31 and 13,400 (20,000) to the east. The current speed limit is 50 miles per hour.

This is a heavily traveled intersection providing regional access westerly to I-35E (1.7 miles); TH 77 (2.7 miles); TH 13 (3.7 miles) and I-35 (6.2 miles); and access northerly to I-35E (2.7 miles); I-494 (4.9 miles) and TH 55 (5.9 miles).

The project objectives are to improve safety and operations, and facilitate transit, bicycle and pedestrian movements through the area.
The project includes the following elements:
10-Ton pavement design;

Intersection improvements, including dual left turn lanes on all four approaches;

Replacement of aged Traffic Signal, median, ADA compliant ramps, turn lanes and lighting.
Installation of the required ADA compliant crossing elements at the intersection, some examples of

crossing elements include: pedestrian ramps, countdown timers, median islands, accessible pedestrian signals

Replacement of curb & gutter, sidewalks, storm sewer and lighting. This includes removal of identified sidewalk/trail obstructions currently located within the pedestrian access route. The CSAH 31 and CSAH 32 corridors are both identified on the Regional Bicycle Transportation Network (RBTN) Corridors as Tier I (CSAH 31) and Tier II (CSAH 32). The project area trails connect users to recreational opportunities (Lebanon Hills Regional Park & various city parks), commercial, business and industrial areas.
Dakota County is committed to operating and maintaining this facility for it's useful life of the improvement.

Include location, road name/functional class, type of improvement, etc.

TIP Description Guidance (will be used in TIP if the project is selected for funding)

CSAH 31 (Pilot Knob Rd) at CSAH 32 (Cliff Rd) Intersection Improvements in Eagan

Project Length (Miles)

0.36

Project Funding

Are you applying for funds from another source(s) to implement this project?

No

If yes, please identify the source(s)

Federal Amount

$3,134,000.00

Match Amount

$784,700.00

Minimum of 20% of project total

Project Total

$3,918,700.00

Match Percentage

20.02%

Minimum of 20%
Compute the match percentage by dividing the match amount by the project total

Source of Match Funds

Dakota County, City of Eagan

A minimum of 20% of the total project cost must come from non-federal sources; additional match funds over the 20% minimum can come from other federal sources

Preferred Program Year

Select one:

2020

For TDM projects, select 2018 or 2019. For Roadway, Transit, or Trail/Pedestrian projects, select 2020 or 2021.

Additional Program Years: 2019

Select all years that are feasible if funding in an earlier year becomes available.

Specific Roadway Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Mobilization (approx. 5% of total cost)	$151,300.00
Removals (approx. 5% of total cost)	$77,300.00
Roadway (grading, borrow, etc.)	$405,400.00
Roadway (aggregates and paving)	$905,200.00
Subgrade Correction (muck)	$0.00
Storm Sewer	$541,000.00
Ponds	$0.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$250,000.00
Traffic Control	$11,850.00
Striping	$50,100.00
Signing	$18,700.00
Lighting	$0.00
Turf - Erosion & Landscaping	$48,350.00
Bridge	$0.00
Retaining Walls	$804,700.00
Noise Wall (do not include in cost effectiveness measure)	$0.00
Traffic Signals	$608,500.00
Wetland Mitigation	$0.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$0.00
Other Roadway Elements	$0.00
Totals	**$3,872,400.00**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Path/Trail Construction	$39,900.00

Sidewalk Construction	$0.00
On-Street Bicycle Facility Construction	$0.00
Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$6,400.00
Crossing Aids (e.g., Audible Pedestrian Signals, HAWK)	$0.00
Pedestrian-scale Lighting	$0.00
Streetscaping	$0.00
Wayfinding	$0.00
Bicycle and Pedestrian Contingencies	$0.00
Other Bicycle and Pedestrian Elements	$0.00
Totals	**$46,300.00**

Specific Transit and TDM Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Fixed Guideway Elements	$0.00
Stations, Stops, and Terminals	$0.00
Support Facilities	$0.00
Transit Systems (e.g. communications, signals, controls, fare collection, etc.)	$0.00
Vehicles	$0.00
Contingencies	$0.00
Right-of-Way	$0.00
Other Transit and TDM Elements	$0.00
Totals	**$0.00**

Transit Operating Costs

Number of Platform hours	0
Cost Per Platform hour (full loaded Cost)	$0.00
Substotal	$0.00
Other Costs - Administration, Overhead,etc.	$0.00

Totals

Total Cost	$3,918,700.00

Construction Cost Total	$3,918,700.00
Transit Operating Cost Total	$0.00

Requirements - All Projects

All Projects

1.The project must be consistent with the goals and policies in these adopted regional plans: Thrive MSP 2040 (2014), the 2040 Transportation Policy Plan, the 2040 Regional Parks Policy Plan (2015), and the 2040 Water Resources Policy Plan (2015).

Check the box to indicate that the project meets this requirement. Yes

2.The project must be consistent with the 2040 Transportation Policy Plan. Reference the 2040 Transportation Plan objectives and strategies that relate to the project.

Goal: A. Transportation System Stewardship (p. 2.17)

Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets. Objectives: A. Efficiently preserve and maintain the regional transportation system in a state of good repair.: A1. Regional transportation partners will pace the highest priority for transportation investments on strategically preserving, maintaining, and operating the transportation system. A2. Regional transportation partners should regularly review planned preservation and maintenance projects to identify cost-effective opportunities to incorporate improvements for safety, lower-cost congestion management and mitigation, transit, bicycle, and pedestrian facilities. (p. 2.18)

List the goals, objectives, strategies, and associated pages:

Goal: B Safety and Security (p. 2.20) The regional transportation system is safe and secure for all users.

Objectives: A. Reduce crashes and improve safety and security for all modes of passenger travel and freight transport. Strategies: B1. Regional transportation partners will incorporate safety and security considerations for all modes and users throughout the processes of planning, funding, construction, operations. (p. 2.20) B6. Regional transportation partners will use best practices to provide and improve facilities for safe walking and bicycling, since pedestrians and bicyclists are the most vulnerable users of the transportation system. (p. 2.23)

Goal: C. Access to Destinations People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the

region and beyond.

Objectives: B. Increase travel time reliability and predictability for travel on highway and transit systems.

E. Improve multimodal travel options for people of all ages and abilities to connect to jobs and other opportunities, particularly for historically under-represented populations. Strategies: C2. Local units of government should provide a system of interconnected arterial roads, streets, bicycle facilities, and pedestrian facilities to meet local travel needs using Complete Streets principles. (p. 2.25)

3.The project or the transportation problem/need that the project addresses must be in a local planning or programming document. Reference the name of the appropriate comprehensive plan, regional/statewide plan, capital improvement program, corridor study document [studies on trunk highway must be approved by the Minnesota Department of Transportation and the Metropolitan Council], or other official plan or program of the applicant agency [includes Safe Routes to School Plans] that the project is included in and/or a transportation problem/need that the project addresses.

List the applicable documents and pages:

Dakota County 2030 Transportation Plan, June 2012

Goal 1: Limited Resources are Directed to the Highest Priority Needs of the Transportation System. The emphasis of this goal is for the County to develop the best transportation system to provide for safe movement of people and goods within financial constraints. p. 1-4

Goal 4: Management to Increase Transportation System Efficiency, Improve Safety and Maximize Existing Highway Capacity

The strategies and policies within this goal aim to optimize the capacity and safety of the existing transportation system with recognition that fiscal, social and environmental constraints limit the ability of conduction only accelerated road construction to achieve safe travel.

CIP Investment Categories - Safety & management, Signal Projects p. 1-9

Goal 5: Replace Deficient Elements of the System

This goal provides measures, strategies and policies aimed at replacement of four important elements of the transportation system - bridges, highways, traffic signals and gravel roads.

Dakota County Highway Capacity Deficiencies 2030, Figure 5 p. 2-16 (& Figure 43 p. 9-6)

In 2030 CSAH 31 (Pilot Knob Rd) will be over capacity

Intersections Approaching Capacity Figure 45 p. 9-13

4.The project must exclude costs for studies, preliminary engineering, design, or construction engineering. Right-of-way costs are only eligible as part of bicycle/pedestrian projects, transit stations/stops, transit terminals, park-and-ride facilities, or pool-and-ride lots. Noise barriers, drainage projects, fences, landscaping, etc., are not eligible for funding as a standalone project, but can be included as part of the larger submitted project, which is otherwise eligible.

Check the box to indicate that the project meets this requirement. Yes

5.Applicants that are not cities or counties in the seven-county metro area with populations over 5,000 must contact the MnDOT Metro State Aid Office prior to submitting their application to determine if a public agency sponsor is required.

Check the box to indicate that the project meets this requirement. Yes

6.Applicants must not submit an application for the same project elements in more than one funding application category.

Check the box to indicate that the project meets this requirement. Yes

7.The requested funding amount must be more than or equal to the minimum award and less than or equal to the maximum award. The cost of preparing a project for funding authorization can be substantial. For that reason, minimum federal amounts apply. Other federal funds may be combined with the requested funds for projects exceeding the maximum award, but the source(s) must be identified in the application. Funding amounts by application category are listed below.
***Roadway Expansion:** $1,000,000 to $7,000,000*
***Roadway Reconstruction/ Modernization:** $1,000,000 to $7,000,000*
***Roadway System Management** $250,000 to $7,000,000*
***Bridges Rehabilitation/ Replacement:** $1,000,000 to $7,000,000*

Check the box to indicate that the project meets this requirement. Yes

8.The project must comply with the Americans with Disabilities Act.

Check the box to indicate that the project meets this requirement. Yes

9.The project must be accessible and open to the general public.

Check the box to indicate that the project meets this requirement. Yes

10.The owner/operator of the facility must operate and maintain the project for the useful life of the improvement.

Check the box to indicate that the project meets this requirement. Yes

11.The project must represent a permanent improvement with independent utility. The term independent utility means the project provides benefits described in the application by itself and does not depend on any construction elements of the project being funded from other sources outside the regional solicitation, excluding the required non-federal match. Projects that include traffic management or transit operating funds as part of a construction project are exempt from this policy.

Check the box to indicate that the project meets this requirement. Yes

12.The project must not be a temporary construction project. A temporary construction project is defined as work that must be replaced within five years and is ineligible for funding. The project must also not be staged construction where the project will be replaced as part of future stages. Staged construction is eligible for funding as long as future stages build on, rather than replace, previous work.

Check the box to indicate that the project meets this requirement. Yes

13.The project applicant must send written notification regarding the proposed project to all affected state and local units of government prior to submitting the application.

Check the box to indicate that the project meets this requirement. Yes

Roadways Including Multimodal Elements

1.All roadway and bridge projects must be identified as a Principal Arterial (Non-Freeway facilities only) or A-Minor Arterial as shown on the latest TAB approved roadway functional classification map.

Check the box to indicate that the project meets this requirement. Yes

Roadway Expansion and Reconstruction/Modernization projects only:

2.The project must be designed to meet 10-ton load limit standards.

Check the box to indicate that the project meets this requirement. Yes

Bridge Rehabilitation/Replacement projects only:

3.Projects requiring a grade-separated crossing of a Principal Arterial freeway must be limited to the federal share of those project costs identified as local (non-MnDOT) cost responsibility using MnDOTs Cost Participation for Cooperative Construction Projects and Maintenance Responsibilities manual. In the case of a federally funded trunk highway project, the policy guidelines should be read as if the funded trunk highway route is under local jurisdiction.

Check the box to indicate that the project meets this requirement.

4.The bridge must carry vehicular traffic. Bridges can carry traffic from multiple modes. However, bridges that are exclusively for bicycle or pedestrian traffic must apply under one of the Bicycle and Pedestrian Facilities application categories. Rail-only bridges are ineligible for funding.

Check the box to indicate that the project meets this requirement.

5.The length of the bridge must equal or exceed 20 feet.

Check the box to indicate that the project meets this requirement.

6. The bridge must have a sufficiency rating less than 80 for rehabilitation projects and less than 50 for replacement projects. Additionally, the bridge must also be classified as structurally deficient or functionally obsolete.

Check the box to indicate that the project meets this requirement.

Requirements - Roadways Including Multimodal Elements

Project Information-Roadways

County, City, or Lead Agency	Dakota County - 19
Functional Class of Road	A Minor Arterial - Expander (CSAH 31) A Minor Arterial - Expander (CSAH 32)
Road System *TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET*	County State Aid Highway (CSAH)
Road/Route No. *i.e., 53 for CSAH 53*	31
Name of Road *Example; 1st ST., MAIN AVE*	CSAH 31 (Pilot Knob Road) CSAH 32 (Cliff Road)
Zip Code where Majority of Work is Being Performed	55122
(Approximate) Begin Construction Date	02/01/2019
(Approximate) End Construction Date	11/24/2019

TERMINI:(Termini listed must be within 0.3 miles of any work)

From:
(Intersection or Address)

To:
(Intersection or Address)

DO NOT INCLUDE LEGAL DESCRIPTION

Or At	CSAH 31 at CSAH 32 Intersection
Primary Types of Work	grade, agg base, bit base, bit surf, bike/ped trail, curb & gutter, storm sewer, signal, retaining wall, ped ramps, ADA elements

Examples: GRADE, AGG BASE, BIT BASE, BIT SURF, SIDEWALK, CURB AND GUTTER,STORM SEWER, SIGNALS, LIGHTING, GUARDRAIL, BIKE PATH, PED RAMPS, BRIDGE, PARK AND RIDE, ETC.

BRIDGE/CULVERT PROJECTS (IF APPLICABLE)

Old Bridge/Culvert No.:	n/a
New Bridge/Culvert No.:	
Structure is Over/Under (Bridge or culvert name):	

Expander/Augmentor/Connector/Non-Freeway Principal Arterial

Select one:	Expander
Area	1.503
Project Length	0.36
Average Distance	4.175
Upload Map	1467479130417_CSAH31-RAD.pdf

Reliever: Relieves a Principal Arterial that is a Freeway Facility

Facility being relieved	
Number of hours per day volume exceeds capacity (based on the Congestion Report)	0

Reliever: Relieves a Principal Arterial that is a Non-Freeway Facility

Facility being relieved	
Number of hours per day volume exceeds capacity (based on the table below)	0

Non-Freeway Facility Volume/Capacity Table

Hour	NB/EB Volume	SB/WB Volume	Capacity	Volume exceeds capacity
12:00am - 1:00am			0	
1:00am - 2:00am			0	
2:00am - 3:00am			0	
3:00am - 4:00am			0	
4:00am - 5:00am			0	
5:00am - 6:00am			0	
6:00am - 7:00am			0	
7:00am - 8:00am			0	
8:00am - 9:00am			0	
9:00am - 10:00am			0	
10:00am - 11:00am			0	
11:00am - 12:00pm			0	
12:00pm - 1:00pm			0	
1:00pm - 2:00pm			0	
2:00pm - 3:00pm			0	
3:00pm - 4:00pm			0	
4:00pm - 5:00pm			0	
5:00pm - 6:00pm			0	
6:00pm - 7:00pm			0	
7:00pm - 8:00pm			0	
8:00pm - 9:00pm			0	
9:00pm - 10:00pm			0	
10:00pm - 11:00pm			0	
11:00pm - 12:00am			0	

Measure B: Project Location Relative to Jobs, Manufacturing, and Education

Existing Employment within 1 Mile:	1187
Existing Manufacturing/Distribution-Related Employment within 1 Mile:	46
Existing Students:	0
Upload Map	1467479202873_CSAH31-RegEcon.pdf

Measure C: Current Heavy Commercial Traffic

Location:	CSAH 31 (Pilot Knob) south of CSAH 32 (Cliff Rd) in Eagan
Current daily heavy commercial traffic volume:	433
Date heavy commercial count taken:	06/14/2016

Measure D: Freight Elements

Response (Limit 1,400 characters; approximately 200 words)

Freight will be safely integrated within the corridor. Utilizing the following freight elements will improve efficiency, security or safety. The CSAH 32 at CSAH 31 intersection will be designed/constructed to 10-ton, include longer/dual left turning lanes, and accommodate turning radius needs of larger trucks. Dakota County 2030 Transportation Plan (Figure 32) identifies CSAH 31 (Pilot Knob) as a proposed 10 Ton Highway and CSAH 32 (Cliff Rd) a proposed/contingent 10 ton highway. Implementation of traffic management technologies on county highways, such as signal operations and signal coordination benefit/improve freight efficiencies by maintaining delivery schedules/traffic flow. Currently, fiber optic cable for signal interconnection is being installed along three miles of CSAH 32 (Cliff Rd) from Slater Rd (Burnsville/Eagan border) including the high volume TH 77 on/off ramp signalized intersection and I-35 on/off ramp signalized intersection to CSAH 31 (project area) in Eagan. In 2019 fiber optic cable for signal interconnection will be installed along four miles of CSAH 31 (Pilot Knob) from CSAH 32 (Cliff Rd) to CSAH 26 (Lone Oak) in Eagan. The installation of fiber optic cable will provide for enhanced traffic management, improved traffic flow, reduced traffic congestion and reduce harmful vehicle emissions along the project corridor

Measure A: Current Daily Person Throughput

Location	CSAH 31 (Pilot Knob) south of CSAH 32 (Cliff)
Current AADT Volume	21200

Existing Transit Routes on the Project	N/A
For New Roadways only, list transit routes that will be moved to the new roadway	
Upload Transit Map	1467131368338_CSAH31-Transit.pdf

Response: Current Daily Person Throughput

Average Annual Daily Transit Ridership	0
Current Daily Person Throughput	27560.0

Measure B: 2040 Forecast ADT

Use Metropolitan Council model to determine forecast (2040) ADT volume

If checked, METC Staff will provide Forecast (2040) ADT volume

OR

Identify the approved county or city travel demand model to determine forecast (2040) ADT volume	Dakota County Traffic Department 32,000 ADT 2030_using MnDOT projection factor 1.2 Dakota County
Forecast (2040) ADT volume	35000

Measure A: Project Location and Impact to Disadvantaged Populations

Select one:

Project located in Area of Concentrated Poverty with 50% or more of residents are people of color (ACP50):	
Project located in Area of Concentrated Poverty:	
Projects census tracts are above the regional average for population in poverty or population of color:	
Project located in a census tract that is below the regional average for population in poverty or populations of color or includes children, people with disabilities, or the elderly:	Yes

Response (Limit 2,800 characters; approximately 400 words)

The northerly project area contains areas of above average concentration of race and poverty as shown in census tracts 246, 252 & 253. The project corridor connects areas of employment, commercial, industrial, residential & natural (Lebanon Hills Regional Park, multiple city park) areas. The primary benefit to the community will be realized through increased safety and reduced delays at the intersection for motorists, pedestrian, & transit users. A shared multi-use trail on both sides of the major/minor legs of the intersection will provide for ADA compliant safe crossings for all users. Trails along CSAH 31 Tier I & CSAH 32 Tier II are shown in the Regional Bicycle Transportation Network (RBTN) Corridor map.

The project will include improvements to the multi-use trail, pedestrian ramps and traffic signals which will provide a benefit to those who rely on walking as a mode of transportation, ADA compliant pedestrian ramps will be installed to provide smooth transitions form the sidewalk to the roadway at intersections. Countdown timers will be installed at the intersection to display the time remaining in the pedestrian crossing phase to pedestrians.

Dakota County began a study to help transit planners focus on new east-to-west connections in Dakota County. The CSAH 32 (Cliff Rd) corridor will be evaluated as part of this study. The demand for suburb-to-suburb routes in Dakota County has the potential to be high. According to U.S. census date from 2013?recent year available-nearly half of Dakota county workers live in the county.

Areas below the regional average (poverty/color/disability/elderly) rely heavily on transit. Minnesota Valley Transit Authority (MVTA) provides transit in the project area. At the northerly limits of the project area, the Eagan Transit Station serves bus routes #437,445,446,470,480, & 484. Routes 470 & 480 are direct routes to/from St Paul. Route 446 provides connectivity between the USPS

National Distribution Center, Pro Act, Eagandale Center, Mendota Heights Business Park, Brown College, Eagan City Hall, Library, High School & Middle School. Route 484 provides connectivity between multi-housing areas (apartment), senior living, to Cedar Grove Transit Station (Cedar BRT Red Line) and access to business campus areas (Blue Cross/Blue Shield, Delta Dental). Approximately 1.4 miles to the west of the intersection is the Blackhawk Park & Ride serving MVTA routes 438,470,472, & 480. Route 470 runs along the employment corridors of 35E,494,I-35. Route 438 connects to the Cedar Grove Transit Station (Cedar BRT Red Line).

The response should address the benefits, impacts, and mitigation for the populations affected by the project.

Upload Map 1468333268999_CSAH31-SocEcon.pdf

Measure B: Affordable Housing

City/Township	Segment Length in Miles (Population)
City of Eagan	0.36
	0

Total Project Length

Total Project Length (Total Population) 0.36

Affordable Housing Scoring - To Be Completed By Metropolitan Council Staff

City/Township	Segment Length (Miles)	Total Length (Miles)	Score	Segment Length/Total Length	Housing Score Multiplied by Segment percent
		0	**0**	**0**	**0**

Affordable Housing Scoring - To Be Completed By Metropolitan Council Staff

Total Project Length (Miles) 0.36

Total Housing Score 0

Measure A: Year of Roadway Construction

Year of Original Roadway Construction or Most Recent Reconstruction	Segment Length	Calculation	Calculation 2
1988	0.36	715.68	1988.0
	0	**716**	**1988**

Average Construction Year

Weighted Year 1988

Total Segment Length (Miles)

Total Segment Length 0.36

Measure B: Geometric, Structural, or Infrastructure Improvements

Improving a non-10-ton roadway to a 10-ton roadway: Yes

Response (Limit 700 characters; approximately 100 words)

The project will construct the CSAH 31 (Pilot Knob) and CSAH 32 (Cliff Rd) intersection to 10-ton roadway standards. Dakota County 2030 Transportation Plan (Figure 32) identifies CSAH 31 (Pilot Knob) as a proposed 10 Ton Highway and CSAH 32 (Cliff Rd) a proposed/contingent 10 ton highway. As opportunities present themselves, the roadways in their entirety will be reconstructed to 10-ton standards. Dakota County 2030 Transportation Plan, Management Policy M4, 10-Ton Route System Implementation: Work with local jurisdictions in implementing a 10-ton route system.

Improved clear zones or sight lines: Yes

Response (Limit 700 characters; approximately 100 words)

The project is designed for clear zones that allow a driver to stop safely, or regain control of a vehicle that has left the roadway. Sign supports within the clear zone will be breakaway or shielded by a barrier. Trees are the single most commonly struck objects in serious roadside collisions; all trees will be removed from the clear zone. Left turns from main highways across two or three lanes will be designed-aligned to provide good visibility. Intersection sight lines, visibility will be improved with updated LED intersection lighting.

Improved roadway geometrics:

Yes

Response (Limit 700 characters; approximately 100 words)

Intersection configuration will be four lanes divided, concrete median, dedicated right turn lane and dedicated dual left turn lanes. Existing traffic signal is obsolete, new signal will have improved signal heads, vehicle detection & lighting. Intersection will be reconstructed to improve operations, safety, water quality (storm sewer) & deterioration that occurred over the years. Dual left turn lanes will reduce red-light running and increase throughput on the roadways. Project will be designed to ensure that all roadway geometrics, such as turning radii, pavement depths &road widths accommodate the range of transit vehicles in operating service; and large trucks.

Access management enhancements:

Yes

Response (Limit 700 characters; approximately 100 words)

Project meets access spacing guidelines. Dakota County stipulates specific access spacing requirements for highway types through: 2030 Transportation Plan; Plat Commission; permits & corridor studies. Strategies to ensure access & mobility are properly balanced consistent with the function of the roadway will reduce delay, improve traffic movement & create a safer system through implementing access management principles to allow the highway system to perform at an acceptable level of service, thus preserve/maximize roadway safety/efficiency. County will pursue access spacing opportunities as new plats come under review/approval of the County Plat Commission.

Vertical/horizontal alignments improvements:

Yes

Response (Limit 700 characters; approximately 100 words)

The projects horizontal and vertical alignments are consistent with the topography, preserve the developed properties along the road and incorporate community values. The project alignment follows the natural contours of the land and does not affect aesthetic, scenic, historic, or cultural resources. Vertical alignment will be determined by natural terrain, number of trucks or other heavy vehicles in the traffic stream, basic roadway cross-section, and avoidance where possible of natural environmental factors (wetlands, historic, cultural & community resources). The project will meet all applicable State & Federal design requirements.

Improved stormwater mitigation:

Yes

Response (Limit 700 characters; approximately 100 words)

Reconstruction of the intersection provide a smooth surface & improves drainage. Drainage structures & utility manholes require adjustments to address settlement and deterioration that has occurred over the years. Existing curb & gutter is in need of replacement due to settlement and impacts from snow maintenance. Drainage improvements to the project will be constructed with the installation of additional turn lanes & new impervious surfaces including upgrading the existing storm sewer for capacity and providing necessary ponding per the National Pollutant Discharge Elimination System (NPDES) and Local Watershed requirements.

Signals/lighting upgrades:

Yes

Response (Limit 700 characters; approximately 100 words)

The aging (1988) signal system/controller cabinet, has surpassed the useful life and be replaced as part of this project. The signal system will have P-T-Z cameras mounted to allow for real time intersection monitoring. Dual left turns will increase vehicle throughput. Intersection will be ADA compliant (pedestrian ramps, countdown timers, median islands, accessible pedestrian signals & crosswalk markings). This intersection will be fiber interconnected with 3-miles of CSAH 32 east/west signals & 4-miles of CSAH 31 north/south signals. New intersection lighting will be energy efficient LED technology that will help to increase safety/visibility at the intersection.

Other Improvements

Yes

Response (Limit 700 characters; approximately 100 words)	The existing signage along the corridor is faded and requires replacement to improve wayfinding and driver compliance. The Dakota County East/West Transit Study has identified the CSAH 32 corridor as a transit corridor for analysis in the Study. CSAH 32 (Tier II) & CSAH 31 (Tier I) are identified in the ?proposed? Regional Bicycle Transportation Network (RBTN) Corridor map. The trials along CSAH 31 & CSAH 32 connect directly to Lebanon Hills Regional Park as well as numerous city parks in the project area. Seven miles of fiber interconnected traffic signals will improve roadway operations.

Measure A: Congestion Reduction/Air Quality

Total Peak Hour Delay Per Vehicle Without The Project	Total Peak Hour Delay Per Vehicle With The Project	Total Peak Hour Delay Per Vehicle Reduced by Project	Volume (Vehicles per hour)	Total Peak Hour Delay Reduced by the Project:	EXPLANATION of methodology used to calculate railroad crossing delay, if applicable.	Synchro or HCM Reports
43.0	32.0	11.0	3383	37213.0	n/a	1467480359026_CH31CH32 Synchro - PM - Peak Hour Report.pdf

Total Delay

Total Peak Hour Delay Reduced	37213.0

Measure B:Roadway projects that do not include new roadway segments or railroad grade-separation elements

Total (CO, NOX, and VOC) Peak Hour Emissions Per Vehicle without the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions Per Vehicle with the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions Reduced Per Vehicle by the Project (Kilograms):	Volume (Vehicles Per Hour):	Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):
0.005	0.004	0.001	3383.0	3.383
0	**0**		**3383**	**3**

Total

Total Emissions Reduced:	3.383
Upload Synchro Report	1467480692078_CH31CH32 Synchro - PM - Peak Hour Report.pdf

Measure B: Roadway projects that are constructing new roadway segments, but do not include railroad grade-separation elements (for Roadway Expansion applications only):

Total (CO, NOX, and VOC) Peak Hour Emissions Per Vehicle without the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions Per Vehicle with the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions Reduced Per Vehicle by the Project (Kilograms):	Volume (Vehicles Per Hour):	Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):
0	**0**		**0**	**0**

Total Parallel Roadways

Emissions Reduced on Parallel Roadways	0
Upload Synchro Report	

New Roadway Portion:

Cruise speed in miles per hour with the project:	0
Vehicle miles traveled with the project:	0
Total delay in hours with the project:	0
Total stops in vehicles per hour with the project:	0
Fuel consumption in gallons:	0
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced or Produced on New Roadway (Kilograms):	0

EXPLANATION of methodology and assumptions used:(Limit 1,400 characters; approximately 200 words)	
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):	0.0

Measure B:Roadway projects that include railroad grade-separation elements

Cruise speed in miles per hour without the project:	0
Vehicle miles traveled without the project:	0
Total delay in hours without the project:	0
Total stops in vehicles per hour without the project:	0
Cruise speed in miles per hour with the project:	0
Vehicle miles traveled with the project:	0
Total delay in hours with the project:	0
Total stops in vehicles per hour with the project:	0
Fuel consumption in gallons (F1)	0
Fuel consumption in gallons (F2)	0
Fuel consumption in gallons (F3)	0
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):	0
EXPLANATION of methodology and assumptions used:(Limit 1,400 characters; approximately 200 words)	

Transit Projects Not Requiring Construction

If the applicant is completing a transit or TDM application that is operations only, check the box and do not complete the remainder of the form. These projects will receive full points for the Risk Assessment.
Park-and-Ride and other transit construction projects require completion of the Risk Assessment below.

Check Here if Your Transit Project Does Not Require Construction

Measure A: Risk Assessment

1)Project Scope (5 Percent of Points)

Meetings or contacts with stakeholders have occurred

100%

Stakeholders have been identified	Yes

40%

Stakeholders have not been identified or contacted

0%

2)Layout or Preliminary Plan (5 Percent of Points)

Layout or Preliminary Plan completed

100%

Layout or Preliminary Plan started Yes

50%

Layout or Preliminary Plan has not been started

0%

Anticipated date or date of completion 12/01/2018

3)Environmental Documentation (5 Percent of Points)

EIS

EA

PM Yes

Document Status:

Document approved (include copy of signed cover sheet)

100%

Document submitted to State Aid for review

75% date submitted

Document in progress; environmental impacts identified; review request letters sent

50%

Document not started Yes

0%

Anticipated date or date of completion/approval 06/01/2018

4)Review of Section 106 Historic Resources (10 Percent of Points)

No known historic properties eligible for or listed in the National Register of Historic Places are located in the project area, and project is not located on an identified historic bridge

100%

Historic/archeological review under way; determination of no historic properties affected or no adverse effect anticipated Yes

80%

Historic/archaeological review under way; determination of adverse effect anticipated

40%

Unsure if there are any historic/archaeological resources in the project area

0%

Anticipated date or date of completion of historic/archeological review: 04/01/2018

Project is located on an identified historic bridge

5)Review of Section 4f/6f Resources (10 Percent of Points)

4(f) Does the project impacts any public parks, public wildlife refuges, public golf courses, wild & scenic rivers or public private historic properties?
6(f) Does the project impact any public parks, public wildlife refuges, public golf courses, wild & scenic rivers or historic property that was purchased or improved with federal funds?

No Section 4f/6f resources located in the project area

100%

No impact to 4f property. The project is an independent bikeway/walkway project covered by the bikeway/walkway Negative Declaration statement; letter of support received

100%

Section 4f resources present within the project area, but no known adverse effects Yes

80%

Project impacts to Section 4f/6f resources likely coordination/documentation has begun

50%

Project impacts to Section 4f/6f resources likely coordination/documentation has not begun

30%

Unsure if there are any impacts to Section 4f/6f resources in the project area

0%

6)Right-of-Way (15 Percent of Points)

Right-of-way, permanent or temporary easements not required

100%

Right-of-way, permanent or temporary easements has/have been acquired

100%

Right-of-way, permanent or temporary easements required, offers made

75%

Right-of-way, permanent or temporary easements required, appraisals made

50%

Right-of-way, permanent or temporary easements required, parcels identified Yes

25%

Right-of-way, permanent or temporary easements required, parcels not identified

0%

Right-of-way, permanent or temporary easements identification has not been completed

0%

Anticipated date or date of acquisition 12/01/2018

7)Railroad Involvement (25 Percent of Points)

No railroad involvement on project Yes

100%

Railroad Right-of-Way Agreement is executed (include signature page) 100%

Railroad Right-of-Way Agreement required; Agreement has been initiated

60%

Railroad Right-of-Way Agreement required; negotiations have begun

40%

Railroad Right-of-Way Agreement required; negotiations not begun

0%

Anticipated date or date of executed Agreement

8)Interchange Approval (15 Percent of Points)*

**Please contact Karen Scheffing at MnDOT (Karen.Scheffing@state.mn.us or 651-234-7784) to determine if your project needs to go through the Metropolitan Council/MnDOT Highway Interchange Request Committee.*

Project does not involve construction of a new/expanded interchange or new interchange ramps Yes

100%

Interchange project has been approved by the Metropolitan Council/MnDOT Highway Interchange Request Committee

100%

Interchange project has not been approved by the Metropolitan Council/MnDOT Highway Interchange Request Committee

0%

9)Construction Documents/Plan (10 Percent of Points)

Construction plans completed/approved (include signed title sheet)

100%

Construction plans submitted to State Aid for review

75%

Construction plans in progress; at least 30% completion Yes

50%

Construction plans have not been started

0%

Anticipated date or date of completion 09/01/2018

10)Letting

Anticipated Letting Date 02/07/2019

Measure A: Roadway Projects that do not Include Railroad Grade-Separation Elements

Crash Modification Factor Used: 1543.0

Rationale for Crash Modification Selected:

Used CMF 1543,1544,1545 (unable to list all above)

Crash Modification Factors do not have star ratings and are not in the Highway Safety Manual. They were developed Gan et al for the Florida Transportation Department and included a survey of other State Departments of Transportation. Specific Values were chosen as they are very similar to those published in Chapter 12 of the Signalized Intersections: Informational Guide published by the FHWA.http://www.fhwa.dot.gov/publications/research/safety/04091/12.cfm#c1212 (Attached 1543,1544,1545)

(Limit 1400 Characters; approximately 200 words)

Project Benefit ($) from B/C Ratio $1,886,973.00

Worksheet Attachment 1468336830709_benefit-cost-worksheet-aug2015- CSAH 31 & CSAH 32.xls

Roadway projects that include railroad grade-separation elements:

Current AADT volume: 0

Average daily trains: 0

Crash Risk Exposure eliminated: 0

Measure A: Multimodal Elements and Existing Connections

Response (Limit 2,800 characters; approximately 400 words)

Bike/Pedestrian trails and crosswalks will be upgraded to current ADA standards as part of the project. The 27 year old trails & traffic signal at CSAH 31 & CSAH 32 will be replaced with new signal system/controller cabinet, accessible & audible pedestrian signal, count down timers, & ADA standards being applied to provide safe pedestrian and bicycle movements through the intersection.
The bike/pedestrian trails on both sides of CSAH 31 (Tier I) and CSAH 32 (Tier II) are included in the proposed Regional Bicycle Transportation Network (RBTN) Corridors map. Trails connect people to housing, recreation (city parks, Lebanon Hills Regional Park, Big Rivers Regional Trail) employment (commercial, office park, retail, industrial) and transit. MVTA Eagan Transit Station is located directly to the north of the project area (across I-35). This Eagan Transit Station features parking deck, with some 750 parking spaces for bus passengers and retail patrons. The Blackhawk Park & Ride Station is 1.4 miles west of the intersection project. Dakota County is developing a comprehensive transit system, bicycle and pedestrian network and other non-automobile modes for people to maximize the efficiency of the transportation system by providing safe, timely and efficient connections between communities, activity generators and employment centers.

Pedestrian and bicycle facilities in the cities of Dakota County are serving the dual role of providing recreational value as well as viable options for commuters (for work or shopping). The expansion of commuter pedestrian and bicycle use is expected into the future with the expansion of transit facilities, providing an alternative to increased costs of automobile travel. The County is working closely with local communities to improve walkability, and develop opportunities for residents to w walk and bike for transportation and

recreation.

The County has begun a study to plan for new east-west transit connections in Dakota County. The CSAH 32 (Cliff Rd) corridor will be evaluated as part of this study. The demand for suburb-to-suburb routes in Dakota County has the potential to be high. According to U.S. census data from 2013 (most recent year available), nearly half of Dakota county workers also live in the county. Current transit in the metro region is "hub and spoke" to/from the core. There's more demand for services that don't follow this traditional model.

Measure A: Cost Effectiveness

Total Project Cost (entered in Project Cost Form):	$3,918,700.00
Enter Amount of the Noise Walls:	$0.00
Total Project Cost subtract the amount of the noise walls:	$3,918,700.00
Points Awarded in Previous Criteria	
Cost Effectiveness	$0.00

Other Attachments

File Name	Description	File Size
(CSAH 31) Pilot Knob Rd. @ (CSAH 32) Cliff Rd. (2013 - 2015).xls	MnDOT Crash	151 KB
1543.pdf	CRF 1543	125 KB
1544.pdf	CRF 1544	125 KB
1545.pdf	CRF 1545	125 KB
31 & 32 LAYOUT DUAL TURN LANES.pdf	Layout: CSAH 31 (Pilot Knob) at CSAH 32 (Cliff) Intersection in City of Eagan	3.0 MB
benefit-cost-worksheet-aug2015- CSAH 31 & CSAH 32.xls	Bene/Cost Worksheet	84 KB
CSAH31-10TonSystem.pdf	Dakota County 10 Ton System Project Location	444 KB
CSAH32-PlanCoverSheet.pdf	CSAH 31 (Pilot Knob) at CSAH 32 (Cliff Rd) intersection constructed in 1988 as part of larger roadway construction plan	927 KB
Dakota County Resolution June 21 2016.pdf	Dakota County Resolution	178 KB
Eagan - Fed Fund Support 31-32 June 2016.pdf	Eagan Letter - Fund/Support Project	39 KB
Existing_PM_Timing - Report.pdf	Existing PM Timing Report	41 KB
FHWA Publication- Dbl Lefts.pdf	FHWA Publication - Double Lefts	128 KB
MVTA-TransitRoutes.pdf	Minnesota Valley Transit Authority (MVTA) Transit Routes near CSAH 31 at CSAH 32 in Eagan	377 KB
Proposed_PM_Timing - Report.pdf	Proposed PM Timing Report	38 KB
RADCsah32DakoRM.pdf	RADCsah32DakoRM	223 KB
RBTN Corridors.pdf	CSAH 31 & CSAH 32 Intersection Project Location in relation to Regional Bicycle Transportation Network Corridors (Tier I & Tier II)	1.5 MB
RECCsah32DakoRM.pdf	RECCsah32DakoRM	293 KB
SECCsah32DakoRM.pdf	SECCsah32DakoRM	253 KB
Synchro - PM - Peak Hour Report.pdf	Synchro PM Peak Hour Report	80 KB
TRNCsah32DakoRM.pdf	TRNCsah32DakoRM	322 KB
Trucks-CSAH 31CSAH 32 6-14-16.pdf	Heavy Commercial Count June 14, 2016	39 KB

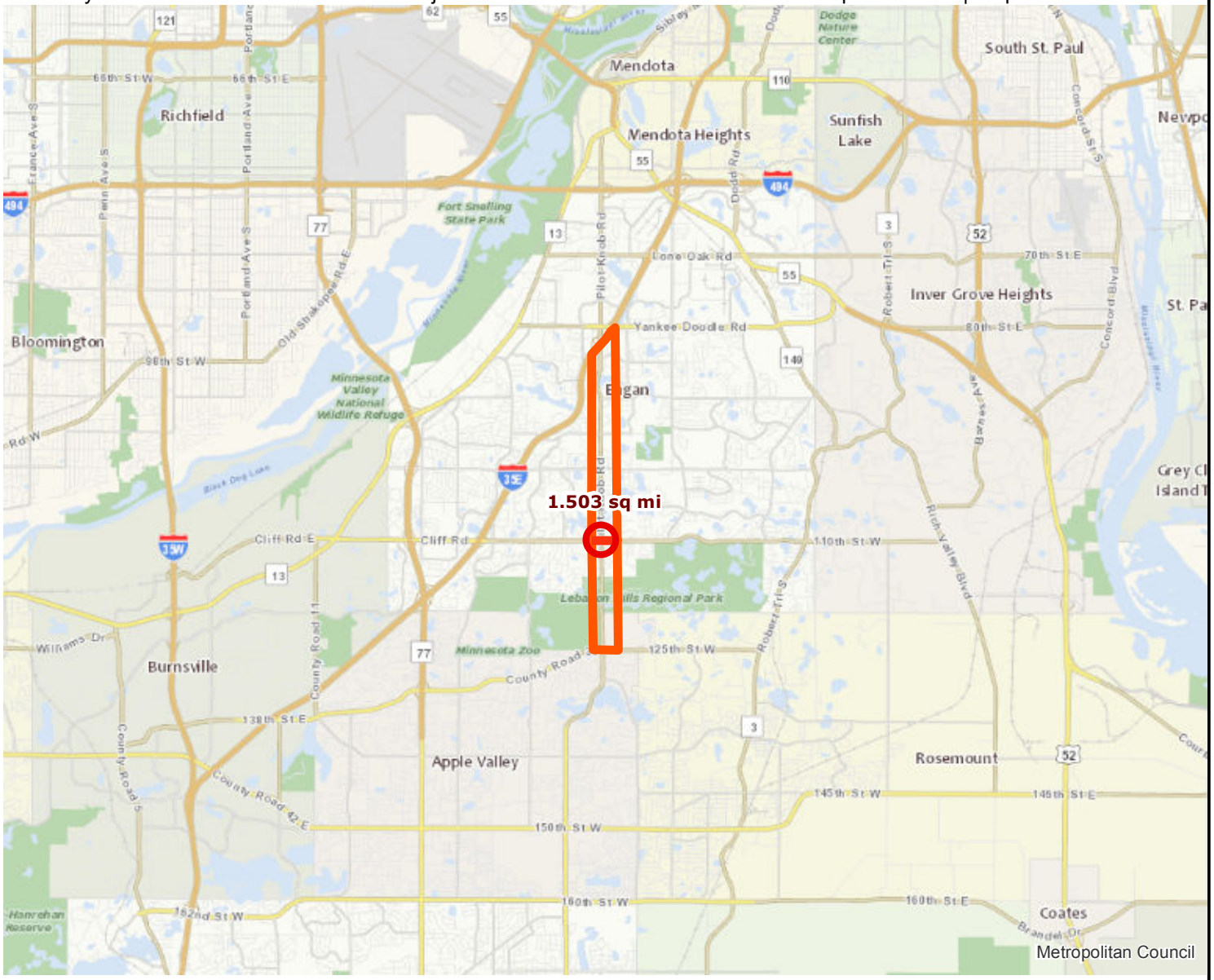
Roadway Area Definition

Roadway Reconstruction/Modernization Project: CSAH 32 at CSAH 31 Intersection Improvements | Map ID: 1466189428988

Results

Project Length: 0.36 miles

Project Area: 1.503 sq mi



Project Points Project Area

Project

0 1.25 2.5 5 7.5 10 Miles

Created: 6/17/2016
LandscapeRSA1

For complete disclaimer of accuracy, please visit
http://giswebsite.metc.state.mn.us/gissitenew/notice.aspx

METROPOLITAN COUNCIL

Regional Economy

Roadway Reconstruction/Modernization Project: CSAH 32 at CSAH 31 Intersection Improvements | Map ID: 1466189428988

Results

WITHIN ONE MI of project:

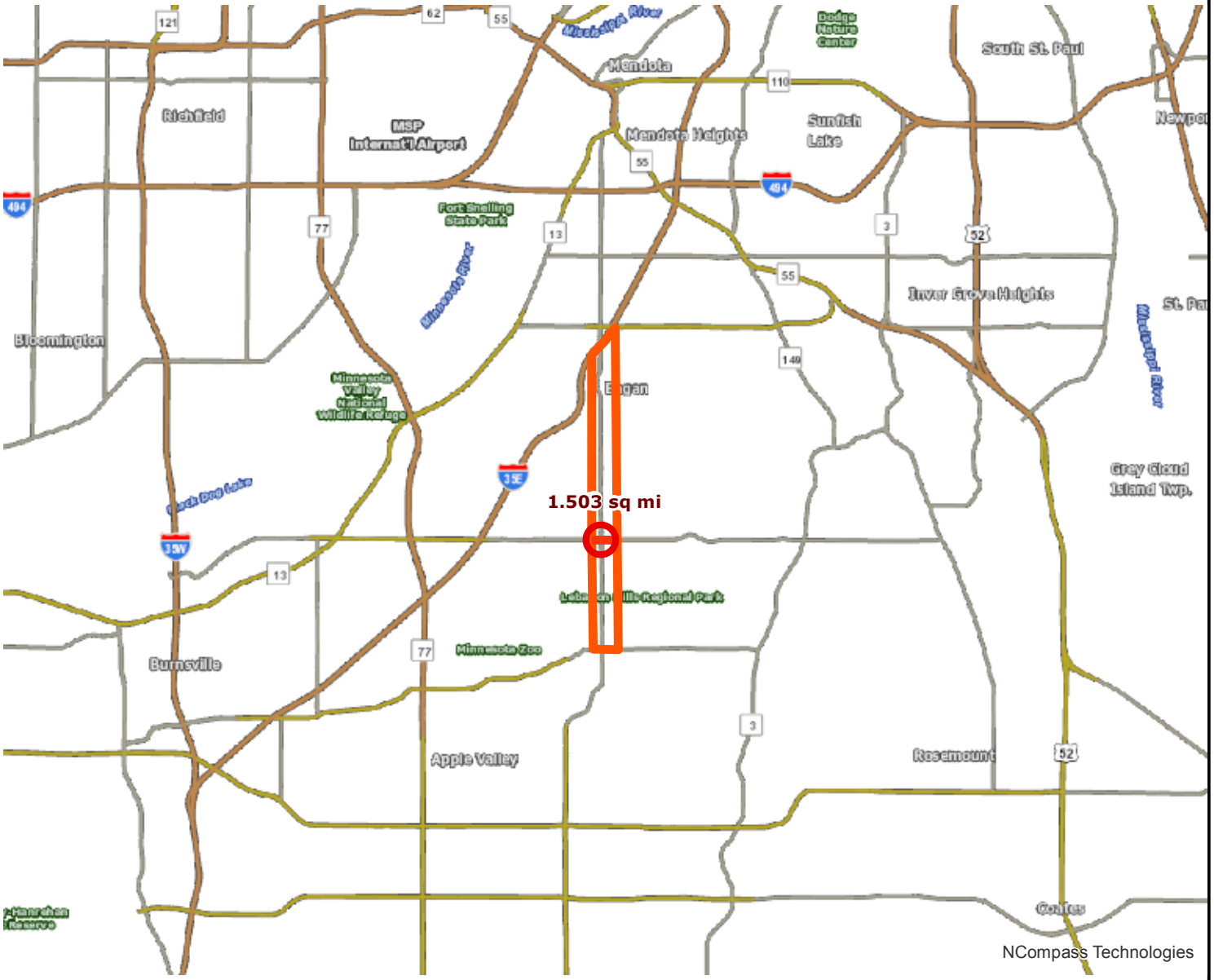
Totals by City:

Apple Valley
- Population: 596
- Employment: 102
- Mfg and Dist Employment: 0

Eagan
- Population: 10525
- Employment: 1076
- Mfg and Dist Employment: 43

Rosemount
- Population: 193
- Employment: 9
- Mfg and Dist Employment: 3

Postsecondary Students:
0



Project Points
Project Area
Project

0 1.25 2.5 5 7.5 10 Miles

Created: 6/17/2016
LandscapeRSA5

For complete disclaimer of accuracy, please visit
http://giswebsite.metc.state.mn.us/gissitenew/notice.aspx

METROPOLITAN COUNCIL

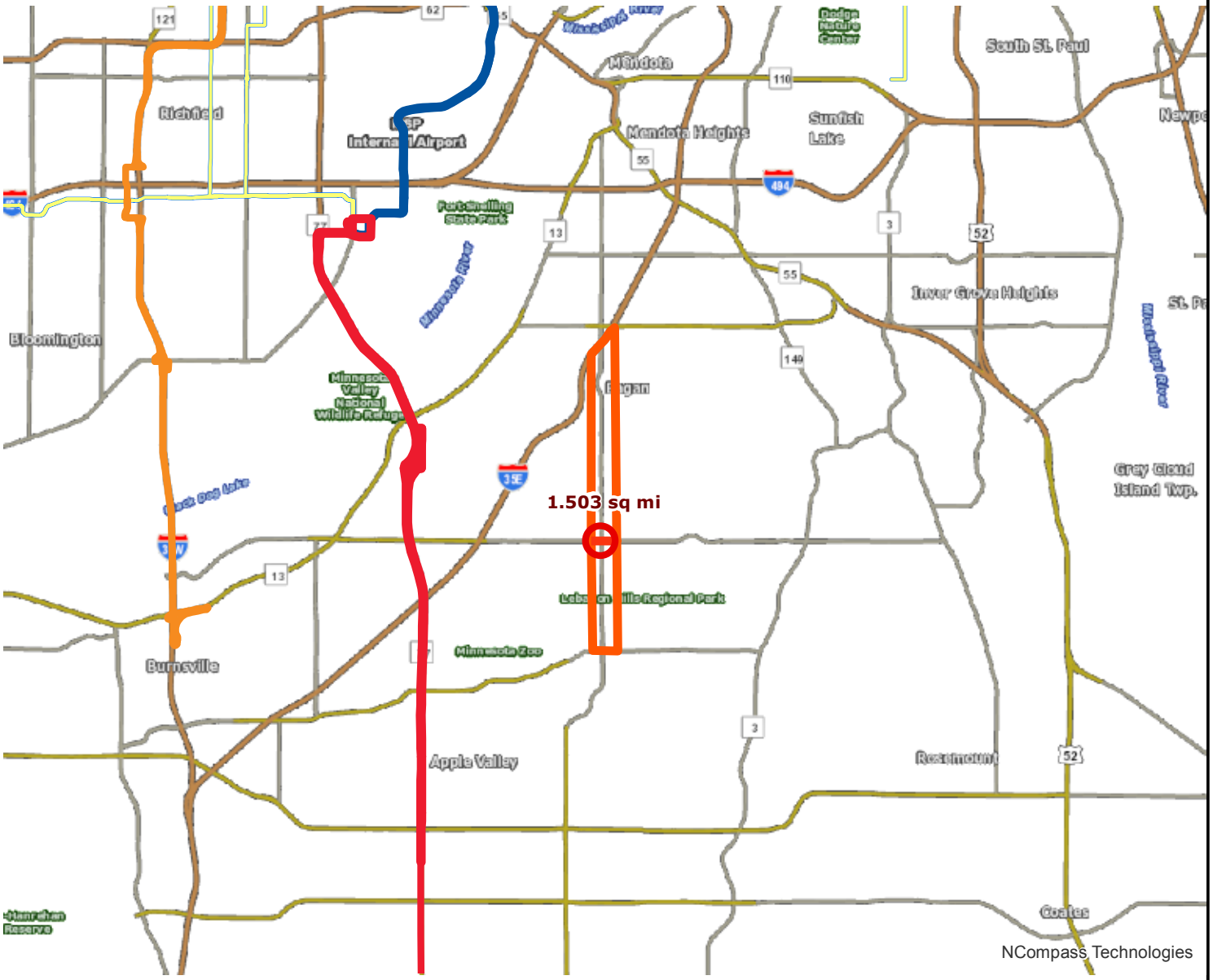
Transit Connections

Roadway Reconstruction/Modernization Project: CSAH 32 at CSAH 31 Intersection Improvements | Map ID: 1466189428988

Results

Transit with a Direct Connection to project:
-- NONE --

**indicates Planned Alignments*



Project Points
Project
Project Area

Transitway
Blue Line
Red Line

Planned Alignments
BRT, Red Line - Phase 2
Arterial BRT
BRT, Orange Line

0 1.25 2.5 5 7.5 10 Miles

Created: 6/17/2016
LandscapeRSA3

For complete disclaimer of accuracy, please visit
http://giswebsite.metc.state.mn.us/gissitenew/notice.aspx

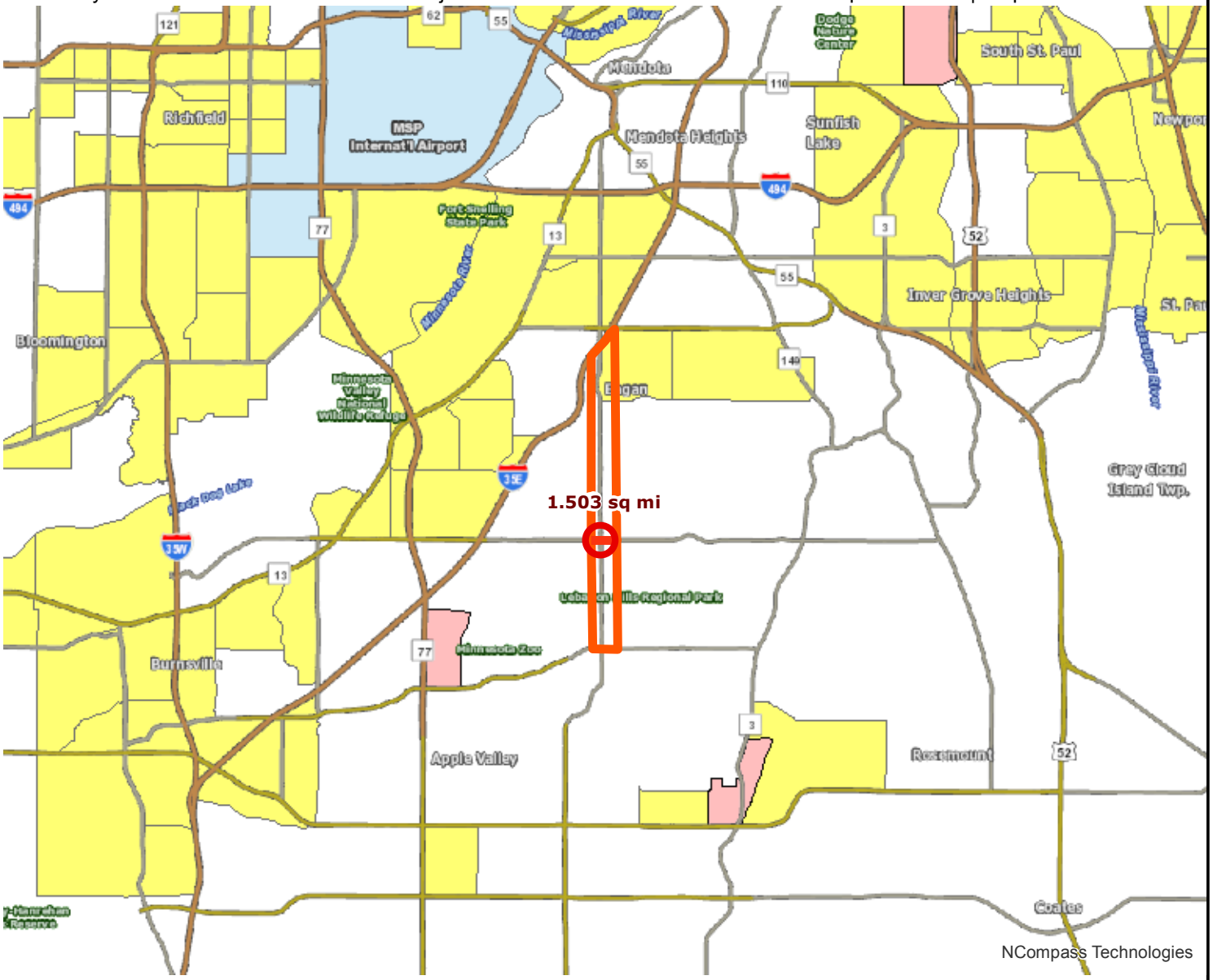
METROPOLITAN COUNCIL

Socio-Economic Conditions

Roadway Reconstruction/Modernization Project: CSAH 32 at CSAH 31 Intersection Improvements | Map ID: 1466189428988

Results

Project located in
a census tract that is below
the regional average for
population in poverty
or populations of color,
or includes children,
people with disabilities,
or the elderly:
(0 to 12 Points)



Project Points
Project
Project Area

Area of Concentrated Povertry > 50% residents of color
Area of Concentrated Poverty
Above reg'l avg conc of race/poverty

0 1.25 2.5 5 7.5 10 Miles

Created: 6/17/2016
LandscapeRSA2

For complete disclaimer of accuracy, please visit
http://giswebsite.metc.state.mn.us/gissitenew/notice.aspx

METROPOLITAN COUNCIL

54: CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)

Direction	All
Future Volume (vph)	3383
Total Delay / Veh (s/v)	43
CO Emissions (kg)	10.87
NOx Emissions (kg)	2.12
VOC Emissions (kg)	2.52

54: CSAH 31 & CSAH 32

Direction	All
Future Volume (vph)	3383
Total Delay / Veh (s/v)	32
CO Emissions (kg)	10.32
NOx Emissions (kg)	2.01
VOC Emissions (kg)	2.39

5. Congestion Reduction / Air Quality RESPONSE A (Calculation):

CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)
•Total Peak Hour Delay/Vehicle without the Project (Seconds/Vehicle): 43 sec/veh
•Total Peak Hour Delay/Vehicle with the Project (Seconds/Vehicle): 32 sec/veh
•Total Peak Hour Delay/Vehicle Reduced by the Project (Seconds/Vehicle): 11 sec/veh
•Volume (Vehicles Per Hour): 3383 vph
•Total Peak Hour Delay Reduced by the Project (Seconds): 37213 sec

5. Congestion Reduction / Air Quality RESPONSE B (Calculation):

CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)
•Total (CO, NOX, and VOC) Peak Hour Emissions/Vehicle without the Project (Kilograms): 0.0046 kg
•Total (CO, NOX, and VOC) Peak Hour Emissions/Vehicle with the Project (Kilograms): 0.0044 kg
•Total (CO, NOX, and VOC) Peak Hour Emissions Reduced/Vehicle by the Project (Kilograms): 0.0002 kg
•Volume (Vehicles Per Hour): 3383 vph
•Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms): 0.677 kg

54: CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)

Direction	All
Future Volume (vph)	3383
Total Delay / Veh (s/v)	43
CO Emissions (kg)	10.87
NOx Emissions (kg)	2.12
VOC Emissions (kg)	2.52

54: CSAH 31 & CSAH 32

Direction	All
Future Volume (vph)	3383
Total Delay / Veh (s/v)	32
CO Emissions (kg)	10.32
NOx Emissions (kg)	2.01
VOC Emissions (kg)	2.39

5. Congestion Reduction / Air Quality RESPONSE A (Calculation):

CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)
•Total Peak Hour Delay/Vehicle without the Project (Seconds/Vehicle): 43 sec/veh
•Total Peak Hour Delay/Vehicle with the Project (Seconds/Vehicle): 32 sec/veh
•Total Peak Hour Delay/Vehicle Reduced by the Project (Seconds/Vehicle): 11 sec/veh
•Volume (Vehicles Per Hour): 3383 vph
•Total Peak Hour Delay Reduced by the Project (Seconds): 37213 sec

5. Congestion Reduction / Air Quality RESPONSE B (Calculation):

CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)
•Total (CO, NOX, and VOC) Peak Hour Emissions/Vehicle without the Project (Kilograms): 0.0046 kg
•Total (CO, NOX, and VOC) Peak Hour Emissions/Vehicle with the Project (Kilograms): 0.0044 kg
•Total (CO, NOX, and VOC) Peak Hour Emissions Reduced/Vehicle by the Project (Kilograms): 0.0002 kg
•Volume (Vehicles Per Hour): 3383 vph
•Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms): 0.677 kg

CMF / CRF Details

CMF ID: 1543

Install left-turn lane (double)

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Intersection geometry

Study: ***Update of Florida Crash Reduction Factors and Countermeasures to Improve the Development of District Safety Improvement Projects*****, Gan et al., 2005**

Star Quality Rating:	Cannot Be Rated

Crash Modification Factor (CMF)	
Value:	0.71
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)

Value:	29 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability

Crash Type:	Rear end
Crash Severity:	Fatal,Serious injury,Minor injury
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	
Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	

Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	
Municipality:	
State:	
Country:	
Type of Methodology Used:	Simple before/after
Sample Size Used:	

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	
Comments:	

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in the CMF Clearinghouse does not constitute a standard, specification, or regulation, nor is it a substitute for sound engineering judgment.

CMF / CRF Details

CMF ID: 1544

Install left-turn lane (double)

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Intersection geometry

Study: ***Update of Florida Crash Reduction Factors and Countermeasures to Improve the Development of District Safety Improvement Projects*****, Gan et al., 2005**

Star Quality Rating:	Cannot Be Rated

Crash Modification Factor (CMF)	
Value:	0.68
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)

Value:	32 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability

Crash Type:	Rear end
Crash Severity:	Property damage only (PDO)
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	
Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	

Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	
Municipality:	
State:	
Country:	
Type of Methodology Used:	Simple before/after
Sample Size Used:	

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	
Comments:	

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CMF / CRF Details

CMF ID: 1545

Install left-turn lane (double)

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Intersection geometry

Study: ***Update of Florida Crash Reduction Factors and Countermeasures to Improve the Development of District Safety Improvement Projects*****, Gan et al., 2005**

Star Quality Rating:	Cannot Be Rated

Crash Modification Factor (CMF)	
Value:	0.8
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)

Value:	20 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability

Crash Type:	Angle
Crash Severity:	Fatal,Serious injury,Minor injury
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	
Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	

Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	
Municipality:	
State:	
Country:	
Type of Methodology Used:	Simple before/after
Sample Size Used:	

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	
Comments:	

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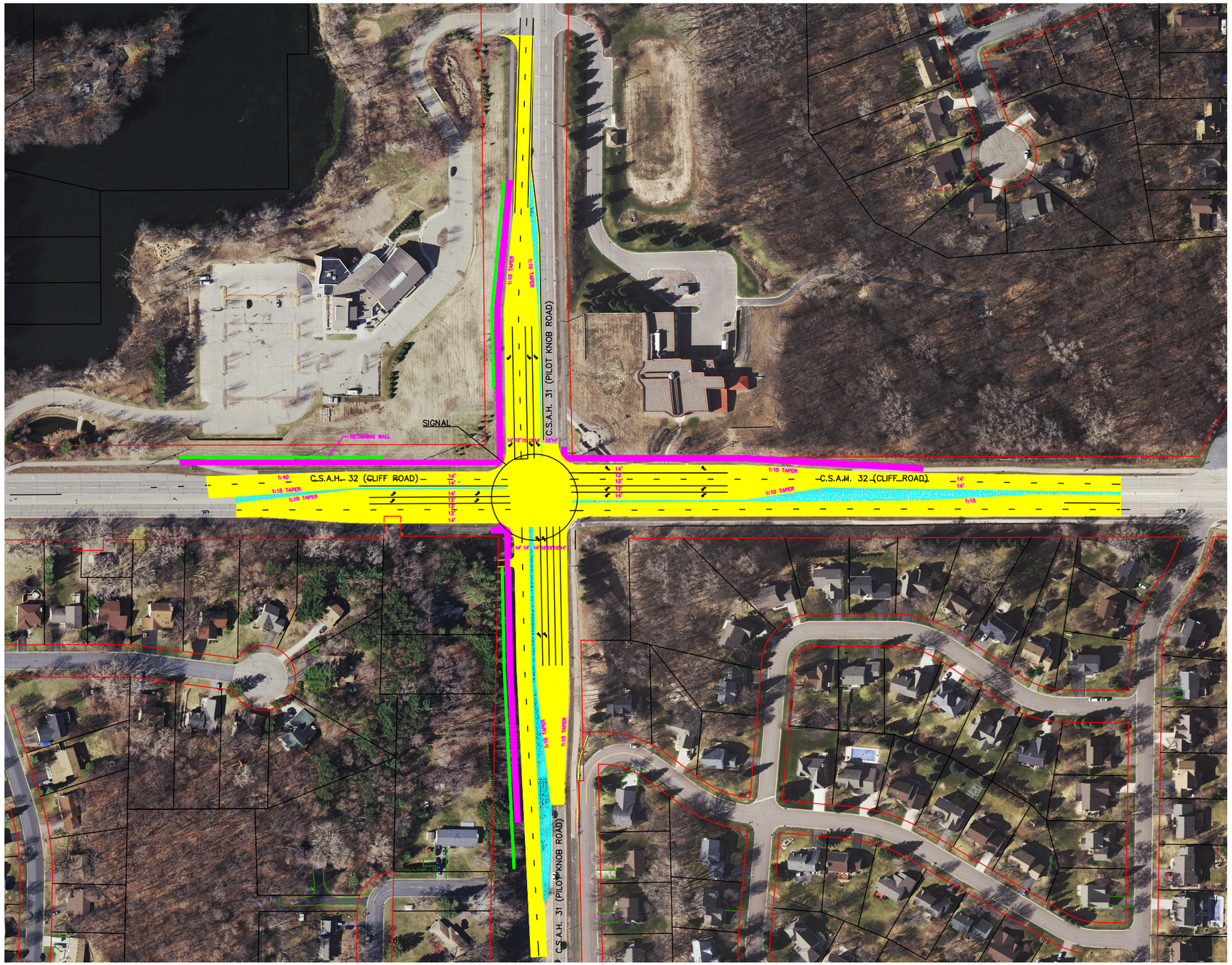
in the CMF Clearinghouse does not constitute a standard, specification, or regulation, nor is it a substitute for sound engineering judgment.

C.S.A.H. 31 (PILOT KNOB ROAD) & C.S.A.H. 32 (CLIFF ROAD)
INTERSECTION IMPROVEMENTS

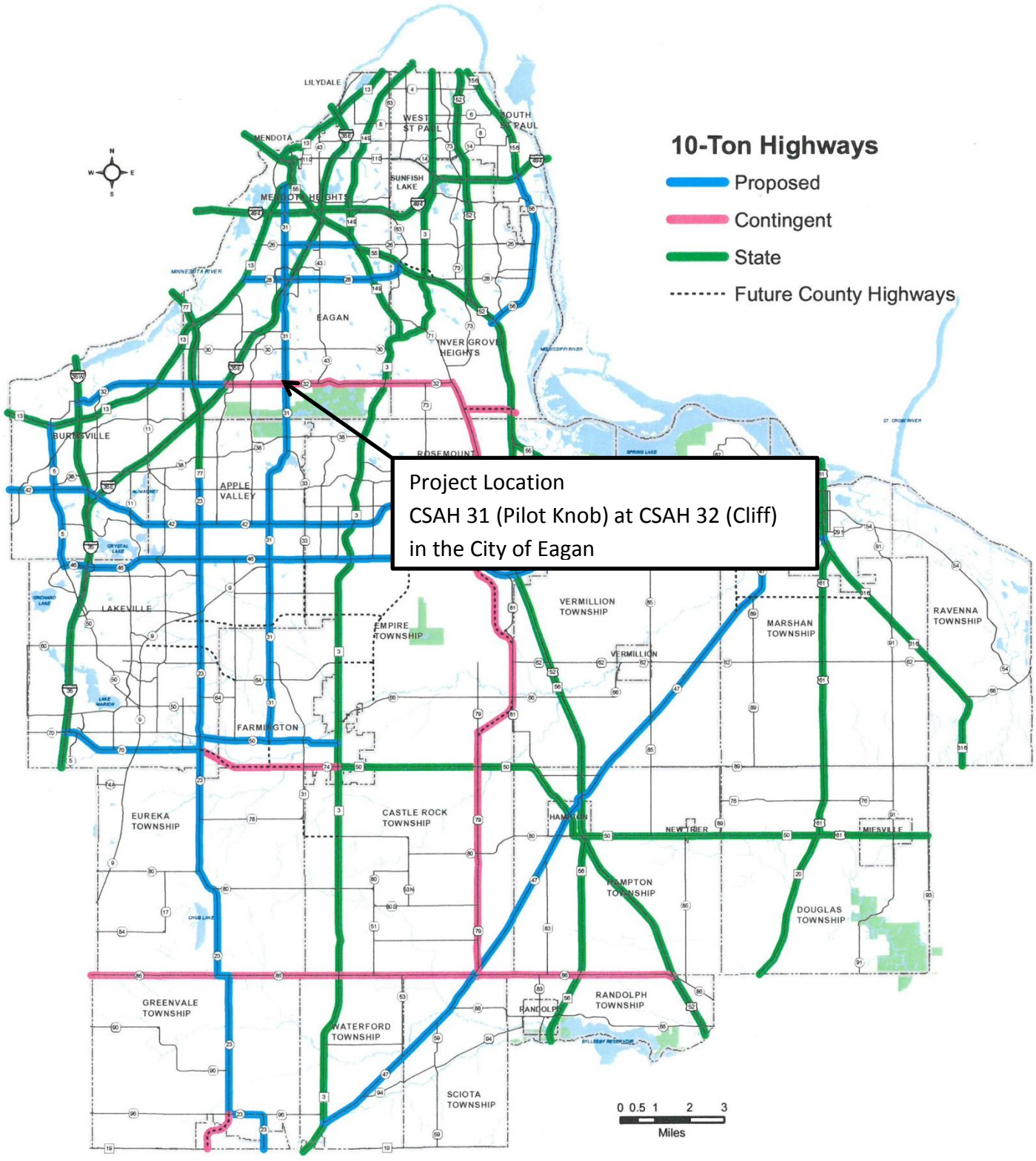


LEGEND

- CONCRETE SURFACE
- NEW PAVEMENT SURFACE
- BITUMINOUS TRAIL
- RETAINING WALL

PLAN — 200 100 0 200

10-Ton Highways



Prepared by:
Dakota County Office of GIS, 1/2012.

Dakota County 2030 Transportation Plan - Figure 21

MINNESOTA DEPARTMENT OF TRANSPORTATION

DAKOTA COUNTY

733

CONSTRUCTION PLAN FOR GRADING, R/W, BITUMINOUS SURFACING, DRAINAGE, WATERMAIN, & SIGNALS

DAKOTA COUNTY PROJECT NO. 31-21

S.A.P. 19 - 631 - 17 **LOCATED ON** PILOT KNOB ROAD **FROM** REBECCA LANE **TO** T.H. 35E

S.A.P. 19 - 632 - 11 **LOCATED ON** CLIFF ROAD **FROM** LAKE PARK DRIVE **TO** CHES MAR DRIVE

S.A.P. 19 - 630 - 03 **LOCATED ON** DIFFLEY ROAD **FROM** 2,100' (APPROXIMATELY) WEST OF PILOT KNOB RD. **TO** 2,600' (APPROXIMATELY) EAST OF PILOT KNOB RD.

STATE AID PROJ. NO. 19-631-17
MINN. PROJ. NO.

GROSS LENGTH	16,100 FEET	3.049	MILES
BRIDGES-LENGTH	C.00 FEET	0.000	MILES
EXCEPTIONS-LENGTH	000 FEET	0.000	MILES
NET LENGTH	16,100 FEET	3.049	MILES
MILE POINT	TO MILE POINT		

STATE AID PROJ. NO. 19-632-11
MINN. PROJ. NO.

GROSS LENGTH	2,525 FEET	0.478	MILES
BRIDGES-LENGTH	0.000 FEET	0.000	MILES
EXCEPTIONS-LENGTH	0.000 FEET	0.000	MILES
NET LENGTH	2,525 FEET	0.478	MILES
MILE POINT	TO MILE POINT		

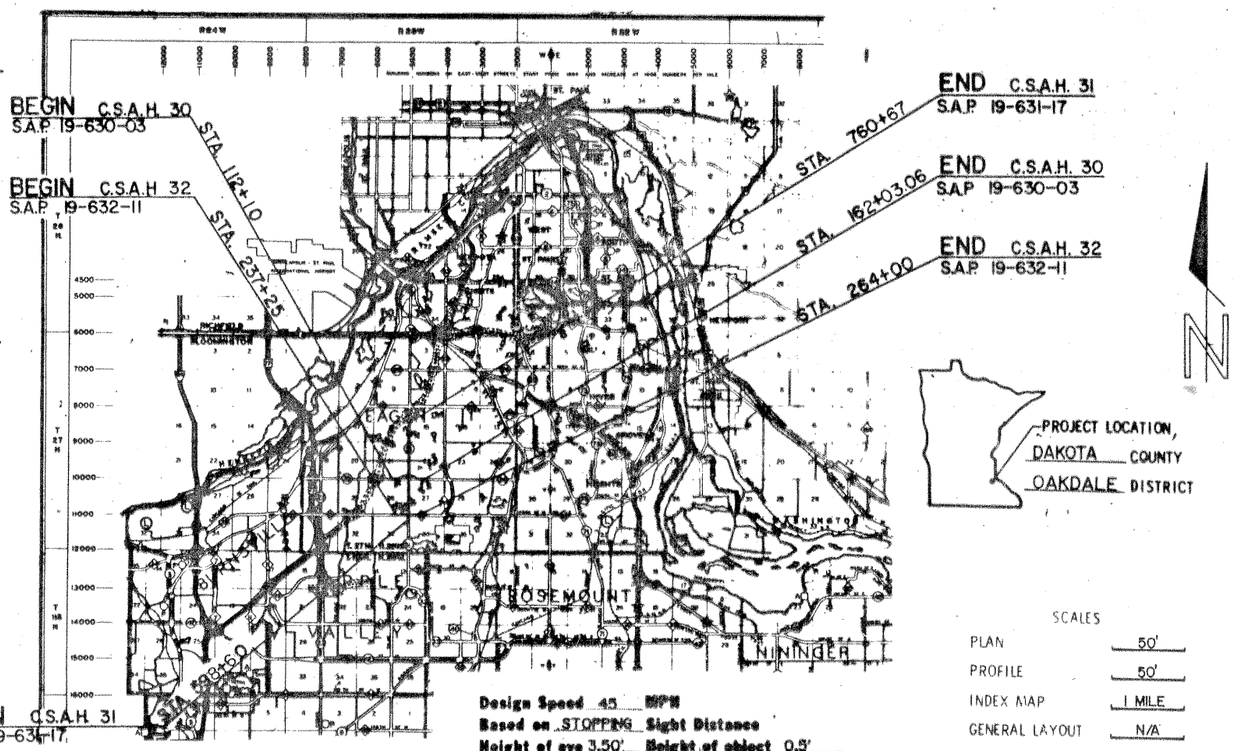
STATE AID PROJ. NO. 19-630-03
MINN. PROJ. NO.

GROSS LENGTH	4,775 FEET	0.904	MILES
BRIDGES-LENGTH	0.000 FEET	0.000	MILES
EXCEPTIONS-LENGTH	0.000 FEET	0.000	MILES
NET LENGTH	4,775 FEET	0.904	MILES
MILE POINT	TO MILE POINT		

STANDARD SYMBOLS (EXCEPT SIGNAL PLAN)

	EXISTING	PROPOSED
SECTION LINE		
QUARTER LINE		
SIXTEENTH LINE		
LOT LINE		
RIGHT OF WAY		
CENTER LINE		
POINT OF INTERSECTION	△	△
POINT ON LINE	○	○
EASEMENT		
BITUMINOUS CURB		
CONCRETE CURB & GUTTER		
PRECAST CONCRETE CURB		
CONCRETE SIDEWALK		
BITUMINOUS- PATHWAY		
BUILDING		
(LABELED)- FENCE	-x-x-x-	
GUARDRAIL		
SIGN		
SOIL BORING		
HANDHOLE		
SIGNAL LIGHT		
CONDUIT		
MANHOLE		
CATCHBASIN		
STORM SEWER		
SANITARY SEWER		
BENCHMARK		
GATE VALVE		
FIRE HYDRANT		
CURB STOP BOX		
WATERMAIN		
GAS VALVE		
GAS LINE		
TELE OR POWER MANHOLE		
TELE OR POWER POLE		
PETROLEUM PIPELINE	OIL	
BURIER POWER CONDUIT	P	
CULVERT		
BURIED TELEPHONE CABLE	T	
BURIED TELEPHONE CONDUIT	T-BUR	
POWER LINE	OHP	
CABLE TV BOX		
MAIL BOX		
TELEPHONE PEDESTAL		

* SEE TECHNICAL MANUAL FOR PLAN SYMBOLS ON SIGNAL PLAN



PROJECT LOCATION,
DAKOTA COUNTY
OAKDALE DISTRICT

SCALES

PLAN	50'
PROFILE	50'
INDEX MAP	1 MILE
GENERAL LAYOUT	N/A

DESIGN DESIGNATION
S.A.P. 19-631-17

ADT (Current Year) 1986	= 10,500
ADT (Future Year) 2006	= 24,300
DHV (Design Hr. Vol.)	= 10%
D (Directional Distr.)	= 60/40%
T (Heavy Commercial)	= 7.5%
R - VALUE	= 30
Σ N18 (20 Years)	= 1,611,791

DESIGN DESIGNATION
S.A.P. 19-632-11

ADT (Current Year) 1986	= 10,000
ADT (Future Year) 2006	= 13,200
DHV (Design Hr. Vol.)	= 10%
D (Directional Distr.)	= 60/40
T (Heavy Commercial)	= 7.5%
R - VALUE	= 30
Σ N18 (20 Years)	= 1,147,619

DESIGN DESIGNATION
S.A.P. 19-630-03

ADT (Current Year) 1986	= 6000
ADT (Future Year) 2006	= 17,400
DHV (Design Hr. Vol.)	= 10%
D (Directional Distr.)	= 60/40
T (Heavy Commercial)	= 7.5%
R - VALUE	= 30
Σ N18 (20 Years)	= 1,047,096

Design Speed 45 MPH
Based on STOPPING Sight Distance
Height of eye 3.50' **Height of object** 0.5'
Design Speed not achieved at: DIFFLEY ROAD (SAP 19-630-03)

STA 124+00	TO STA 132+05	MPH 40
STA 133+25	TO STA 134+17	MPH 35
STA 145+90	TO STA 153+90	MPH 35
STA. 112+56	TO STA 123+56	MPH 40

DESIGN LOADING — 9 TON

GOVERNING SPECIFICATIONS

THE 1983 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION AS AMENDED BY SUPPLEMENTAL SPECIFICATION. (CURRENT EDITION) SHALL GOVERN

MINN. PROJ. NO. .....

INDEX

NOTE:
SHEET 120A HAS BEEN ADDED
THIS PLAN CONTAINS 248 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 3/27/87 REG. NO. 12007 ENGR. Howard A. Thurber

Approved David L. Lucas 4-3 1987
DAKOTA COUNTY ENGINEER

Approved Thomas A. Collett 5-21 1987
CITY ENGINEER, CITY OF EAGAN

Recommended for Approval ..... 19....
DISTRICT STATE AID PLANS ENGINEER

Recommended for Approval Julie Skallman (OS Reviewed 3/14/88) 19 87
STATE AID PLANS AND SPEC'S ENGINEER

Approved H. Wittenberg for L.G. E/T 7-2-1987
MN/DOT TRAFFIC ENGINEER

Approved 7/14 19 87 (DH)
STATE AID ENGINEER

Approved as revised 8-14-88 for State Aid Engineer

Right of Way Approval ..... 19....
DIRECTOR OF RIGHT OF WAY OPERATIONS

Recommended for Approval ..... 19....
HYDRAULICS ENGINEER

Recommended for Approval ..... 19....
DISTRICT ENGINEER

Recommended for Approval ..... 19....
TRANSPORTATION PLANS ENGINEER

Recommended for Approval ..... 19....
DESIGN SERVICES DIRECTOR

Approved ..... 19....
DIRECTOR, OFFICE OF ENGINEER SERVICES

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR ..... DATE .....

S.A.P. NO. 19 - 631 - 17 E1. Al DAKOTA CO. NO. 31-21 SHEET NO. 1 OF 247 SHEETS

BOARD OF COUNTY COMMISSIONERS
DAKOTA COUNTY, MINNESOTA

June 21, 2016 — Resolution No. 16-337
Motion by Commissioner Workman — Second by Commissioner Holberg

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Approval Of Grant Application Submittals For Transportation Advisory Board 2016 Federal Funding Solicitation Process

WHEREAS, the Transportation Advisory Board (TAB) is requesting project submittals for federal funding under the Fixing America's Surface Transportation (FAST) Act; and

WHEREAS, these federal programs fund up to 80 percent of project construction costs; and

WHEREAS, federal funding of projects reduces the burden local taxpayers for regional improvements; and

WHEREAS, non-federal funds must be at least 20 percent of the project costs; and

WHEREAS, project submittals are due on July 15, 2016; and

WHEREAS, all projects proposed are consistent with the adopted Dakota County Comprehensive Plan; and

WHEREAS, subject to federal funding award, the Dakota County Board of Commissioners would be asked to consider authorization to execute a grant agreement at a future meeting.

NOW, THEREFORE, BE IT RESOLVED, That the Dakota County Board of Commissioners hereby approves the following County led projects for submittal to the TAB for federal funding:

1. 179th Street Extension from ½ mile west of County State Aid Highway (CSAH) 31 to CSAH 31 and the existing 179th Street intersection with Flagstaff Avenue in Lakeville
2. CSAH 9 (Dodd Boulevard) from Heritage Way to CSAH 50 in Lakeville
3. CSAH 26 (Lone Oak Road/70th Street) from Trunk Highway (TH) 55 to TH 3 (Robert Street) in Eagan and Inver Grove Heights
4. CSAH 32 (Cliff Road) at its intersection with CSAH 31 (Pilot Knob Road) in Eagan
5. CSAH 23 (Foliage Avenue) from CSAH 86 (280th Street) to County Road 96 (320th Street) in Greenvale Township
6. CSAH 50 (202nd Street) from Holyoke Avenue to CSAH 23 (Cedar Avenue) in Lakeville
7. CSAH 86 (280th Street) from CSAH 23 (Galaxie Avenue) to TH 3 in Eureka, Greenvale, Castle Rock, and Waterford Townships
8. Minnesota River Greenway – Eagan Gap Segment in Eagan
9. River to River Greenway – TH 149 Underpass in Mendota Heights
10. River to River Greenway – Robert Street Crossing Connections in West St Paul
11. North Creek Greenway – CSAH 42 Underpass east of Flagstaff in Apple Valley; and

STATE OF MINNESOTA
County of Dakota

	VOTE
Slavik	Yes
Gaylord	Yes
Egan	Yes
Schouweiler	Yes
Workman	Yes
Holberg	Yes
Gerlach	Yes

I, Jennifer Reynolds, Clerk to the Board of the County of Dakota, State of Minnesota, do hereby certify that I have compared the foregoing copy of a resolution with the original minutes of the proceedings of the Board of County Commissioners, Dakota County, Minnesota, at their session held on the 21st day of June, 2016, now on file in the County Administration Department, and have found the same to be a true and correct copy thereof.

Witness my hand and official seal of Dakota County this 23rd day of June, 2016.

Jeni Reynolds

Clerk to the Board

12. CSAH 14 - Southview Boulevard from 20th Avenue to 3rd Avenue and 3rd Avenue from Southview Boulevard to Marie Avenue in South St. Paul; and

BE IT FURTHER RESOLVED, That the Dakota County Board of Commissioners hereby supports the following submittals by others:

13. 117th Street from CSAH 71 (Rich Valley Boulevard) to TH 52 – Lead Agency: Inver Grove Heights
14. Orange Line Extension – Lead Agency: Metro Transit
15. CSAH 73 (Oakdale Avenue) from CSAH 14 (Mendota Road) to CSAH 8 (Wentworth Avenue) – Lead Agency: West St. Paul
16. TH 149 (Dodd Road) from Mendota Heights Road to Decorah Lane and from Maple Street to Smith Avenue – Lead Agency: Mendota Heights
17. North Creek Greenway – Farmington Gap – Lead Agency: Farmington
18. CSAH 8 (Wentworth Avenue) from CSAH 63 (Delaware Avenue) to Humboldt Avenue – Lead Agency: West St. Paul
19. CSAH 8 (Wentworth Avenue) from TH 52 to 15th Avenue – Lead Agency: South St Paul; and

BE IT FURTHER RESOLVED, That, subject to federal funding award of the city led projects, the Dakota County Board of Commissioners will provide the local match for regional greenway projects, and for non-greenway projects will provide Dakota County's share of the matching funds consistent with Dakota County transportation cost share policies.

STATE OF MINNESOTA
County of Dakota

	VOTE
Slavik	Yes
Gaylord	Yes
Egan	Yes
Schouweiler	Yes
Workman	Yes
Holberg	Yes
Gerlach	Yes

I, Jennifer Reynolds, Clerk to the Board of the County of Dakota, State of Minnesota, do hereby certify that I have compared the foregoing copy of a resolution with the original minutes of the proceedings of the Board of County Commissioners, Dakota County, Minnesota, at their session held on the 21st day of June, 2016, now on file in the County Administration Department, and have found the same to be a true and correct copy thereof.

Witness my hand and official seal of Dakota County this 23rd day of June, 2016.

Jeni Reynolds

Clerk to the Board

City of Eagan

June 13, 2016

Mr. Mark Krebsbach, P.E.
Dakota County Transportation Director/Engineer
Western Service Center
14955 Galaxie Avenue South
Apple Valley, MN 55124

RE: Fixing America's Surface Transportation (FAST) Act
Letter of Support for Dakota County CSAH 32 (Cliff Road) and CSAH 31 (Pilot Knob Road) Intersection Improvements (Roadway Reconstruction / Modernization) Project

Dear Mark:

The City of Eagan is supportive of Dakota County's application for federal funding for signal reconstruction and geometric improvements to the intersection of County State Aid Highway (CSAH) 32 (Cliff Road) and CSAH 31 (Pilot Knob Road). This project would be a joint effort between the City of Eagan and Dakota County.

The City of Eagan is aware of and understands the proposed project will affect Dakota County CSAH 32 and CSAH 31. Dakota County has jurisdiction over CSAH 32 and CSAH 31 and commits to operate and maintain this roadway for its design life.

The City of Eagan supports this proposed project for federal funding and agrees to provide a financial commitment for the improvements directly related to CSAH 32 and CSAH 31, consistent with the current County cost participation policy. Thank you for making us aware of this application effort and the opportunity to provide support.

Sincerely,

John Gorder, P.E.
City Engineer

Municipal Center
3830 Pilot Knob Road
Eagan, MN 55122-1810
651.675.5000 phone
651.675.5012 fax
651.454.8535 TDD

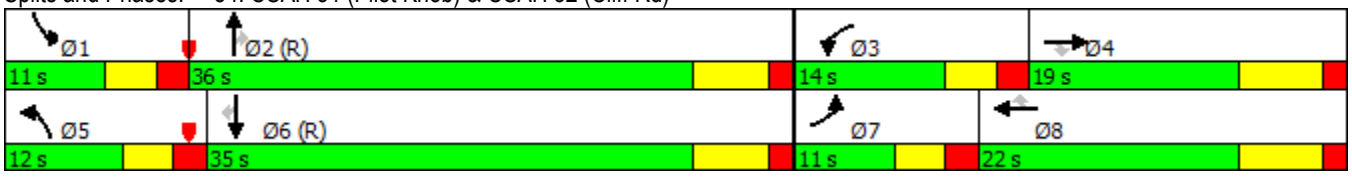
Maintenance Facility
3501 Coachman Point
Eagan, MN 55122
651.675.5300 phone
651.675.5360 fax
651.454.8535 TDD

www.cityofeagan.com

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	506	297	185	423	52	130	347	66	46	1128	117
Future Volume (vph)	86	506	297	185	423	52	130	347	66	46	1128	117
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	10.0	19.0	19.0	10.0	19.0	19.0	10.0	19.0	19.0	10.0	19.0	19.0
Total Split (s)	11.0	19.0	19.0	14.0	22.0	22.0	12.0	36.0	36.0	11.0	35.0	35.0
Total Split (%)	13.8%	23.8%	23.8%	17.5%	27.5%	27.5%	15.0%	45.0%	45.0%	13.8%	43.8%	43.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	5.8	12.5	12.5	9.0	17.7	17.7	7.0	34.4	34.4	5.7	29.0	29.0
Actuated g/C Ratio	0.07	0.16	0.16	0.11	0.22	0.22	0.09	0.43	0.43	0.07	0.36	0.36
v/c Ratio	0.67	0.92	0.73	0.93	0.54	0.11	0.84	0.23	0.08	0.37	0.88	0.17
Control Delay	66.4	67.3	25.3	127.2	31.6	0.4	96.7	16.1	0.2	44.2	34.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.4	67.3	25.3	127.2	31.6	0.4	96.7	16.1	0.2	44.2	34.8	1.3
LOS	E	E	C	F	C	A	F	B	A	D	C	A
Approach Delay		53.2			55.9			33.5			32.1	
Approach LOS		D			E			C			C	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 42.5	Intersection LOS: D
Intersection Capacity Utilization 81.4%	ICU Level of Service D
Analysis Period (min) 120	

Splits and Phases: 54: CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)



	shorter pedestrian delays due to shorter cycle length.	longer crossing time and exposure for pedestrians.
Physical	None identified.	Increased intersection size.
Socioeconomic	Travel time reduced. Vehicle emissions reduced.	Right-of-way and construction costs. Access restrictions to property.
Enforcement, Education, and maintenance	None identified.	None identified.

* Applies to situations where the left-turn lane is added by physical widening rather than restriping.

12.1.2 Multiple Left-Turn Lanes

Multiple left-turn lanes are becoming more widely used at signalized intersections where traffic volumes have increased beyond the design volume of the original single left-turn lane.

Multiple left-turn lanes can be used to address left-turn volumes that exceed or are expected to exceed a single turn lane. Multiple left-turn lanes allow for the allocation of green time to other critical movements or use of a shorter cycle length.

Applicability

Double and triple left-turn lanes are appropriate at intersections with significantly high left-turn volumes that cannot be adequately served in a single lane. As a rule of thumb, dual left-turn lanes are generally considered when left-turn volumes exceed 300 vehicles per hour (assuming moderate levels of opposing through traffic and adjacent street traffic). A left-turn demand exceeding 600 vehicles per hour indicates a triple left-turn may be appropriate.

While effective in improving intersection capacity, double or triple lefts are not appropriate where:

- A high number of vehicle-pedestrian conflicts occur.
- Left-turning vehicles are not expected to evenly distribute themselves among the lanes.
- Channelization may be obscured.
- Sufficient right-of-way is not available to provide for the design vehicle.

Design Features

The design of multiple left-turn lanes is similar to that of single turn lanes. In addition, the interaction between vehicles in adjacent lanes and also width of the receiving lanes should be considered. The following are design considerations for triple left-turn lanes provided by Ackeret.[191] These same considerations apply for double left-turn lanes:

- Widths of receiving lanes.
- Width of intersection (to accommodate three vehicles abreast).
- Clearance between opposing left-turn movements during concurrent maneuvers.
- Pavement marking visibility.
- Placement of stop bars for left-turning and through vehicles.
- Weaving movements downstream of turn.
- Potential for pedestrian conflict.

The previous section provided criteria for selecting the type of signal phasing to be used. In general, protected-only left-turn phasing is used for most double-lane and triple-lane left-turn movements, although some agencies have used protected-permissive phasing for double left turns.

Operational Features

Drivers may be confused when attempting to determine their proper turn path on an approach with multiple left-turn lanes. Providing positive guidance for the driver in the form of pavement markings can help

eliminate driver confusion and eliminate vehicle conflict by channeling vehicles in their proper turn path.

Delineation of turn paths is especially useful to drivers making simultaneous opposing left turns, as well as in some cases where drivers turn right when a clear path is not readily apparent. This strategy is also appropriate when the roadway alignment may be confusing or unexpected.

Delineation of turn paths is expected to improve intersection safety, though the effectiveness has not been well evaluated. The additional guidance in the intersection will help separate vehicles making opposing left turns, as well as vehicles turning in adjacent turn lanes.

Additional operational features of dual and triple left-turn lanes are identified below.

- Prominent and well-placed signing should be used with triple left-turn movements, especially in advance of the intersection.
- The excess green time for left-turn movements resulting from the additional lane should be allocated to other critical movements or removed from the entire cycle to reduce the cycle length.
- See tables 118 and 119 for left-turn phasing guidelines.

Safety Performance

A literature review shows that dual left-turn lanes with protected-only phasing generally operate with minimal negative safety impacts. Common crash types in multiple turn lanes are sideswipes between vehicles in the turn lanes. Turn path delineation guides drivers through their lane and can help reduce sideswipes at left-turn maneuvers.

A study of double and triple left-turn lanes in Las Vegas, NV, showed that about 8 percent of intersection-related sideswipes occur at double lefts, and 50 percent at triple lefts.(192) These sideswipes are 1.4 and 9.2 percent of all crashes at the intersections with double and triple lefts, respectively. Turn path geometry and elimination of downstream bottlenecks are important considerations for reducing sideswipes.

One study indicates that triple left-turn lanes have been shown to operate well, and drivers do not have trouble understanding the triple left turns.(193) In addition, construction of triple left-turn lanes has not resulted in unexpected or unacceptable crash experiences. Another study showed that 10 percent of the crashes at intersections with triple lefts occurred in the approach for the triple left. These are angle crashes that occur when left-turning vehicles collide with through traffic on the cross street. These crashes are attributed to short clearance intervals and limited sight distance, not operation of the triple left. Public education of the proper use of triple left turns will be necessary where these are being considered at an intersection.

Table 123 presents selected findings of the safety benefits of multiple left-turn lanes.

Table 123. Safety benefits associated with multiple left-turn lanes: Selected findings.

Treatment	Finding
Double left-turn lane(172)	29% estimated reduction in all fatal/injury collisions 26% estimated reduction in all PDO collisions 29% estimated reduction in fatal/injury rear-end collisions 47% estimated reduction in fatal/injury left-turn collisions 20% estimated reduction in angle fatal/injury collisions

Operational Performance

Multiple left-turn lanes can improve intersection operations by reducing the time allocated to the signal phase for the left-turn movement. Triple left-turn lanes have been constructed to meet the left-turn capacity demand without having to construct an interchange. This configuration can accommodate left-turn volumes of more than 600 vehicles per hour. Vehicle delays, intersection queues, and green time for the left-turn movement are all reduced, improving operation of the entire intersection.

While dual left-turn lanes are largely operated with protected-only phasing, some agencies use protected-permissive signal phasing. This signal phasing improves capacity for the left-turn movements, particularly during nonpeak times when opposing traffic volumes are lower. Many agencies have safety concerns regarding permissive left-turns in a double turn lane. In fact, many agencies only allow dual left-turn lanes to

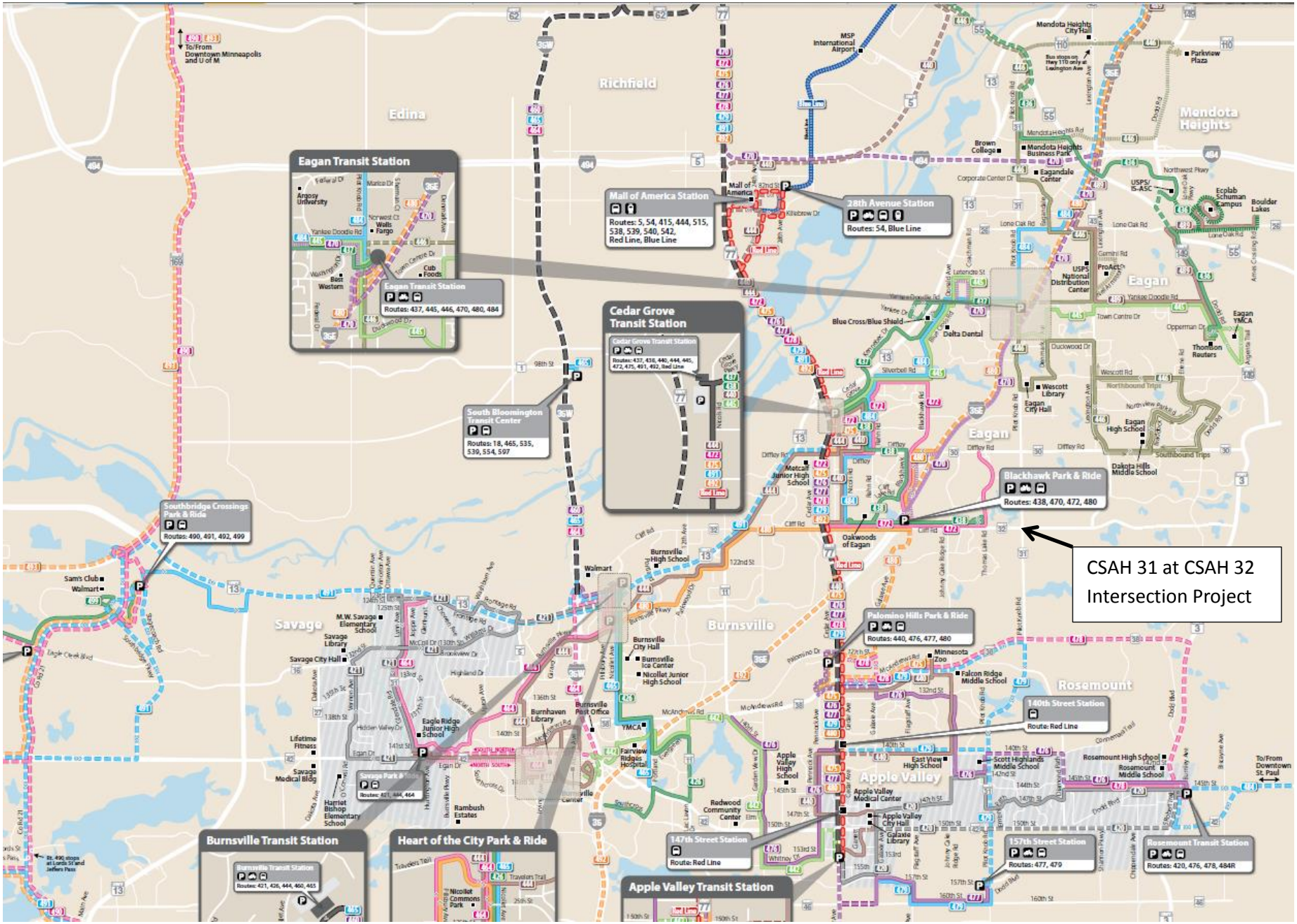
be run as protected-only phasing. However, some agencies overcome this concern by offsetting the dual left turn lanes.

Tucson, AZ, uses protected-permissive offset dual left-turns at approximately 30 intersections. The city has been using this treatment for about 30 years with limited reported problems, and continues to install them where needed. The protected-permissive "offset" dual lefts are used on very high volume city streets (with ADTs exceeding 80,000). The capacity of the left-turn movement increases 75 to 80 percent and left-turn crashes increase only insignificantly with the protected-permissive phasing is implemented. One potential issue is sight distance for the left-turning vehicles. The City of Tucson addresses this concern by offsetting the far lane by 1.2 to 1.5 m (4 to 5 ft) so that it has the same sight distance as a single left-turn lane, enabling drivers to see beyond the opposing left-turn vehicles, as shown in figure 119.(194)

For protected-permissive dual lefts, Tucson, AZ, also uses a lagging left-turn phase operation. The Arizona Insurance information association studied this operation in 2002.(195) The study found that tucson, AZ, had lower crash rates than the leading left-turn operations in the Phoenix, AZ, area, and this benefit was attributed in part to the use of lagging left phases.

On the other hand, in a study of four non-offset intersections with dual left-turn lanes in atlanta, GA, operating with protected-permissive signal phasing, it was shown that this signal phasing needs to be carefully considered.(196) The advantage of increased capacity compared to the disadvantage of increased vehicle conflicts illustrated that this type of phasing may not be appropriate. This study was based on a limited data set, and more sites should be studied to verify these results.

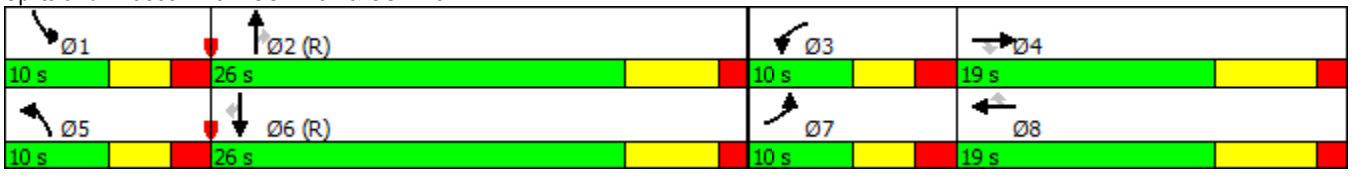
Portion of MVTA Route Map



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	506	297	185	423	52	130	347	66	46	1128	117
Future Volume (vph)	86	506	297	185	423	52	130	347	66	46	1128	117
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	10.0	19.0	19.0	10.0	19.0	19.0	10.0	19.0	19.0	10.0	19.0	19.0
Total Split (s)	10.0	19.0	19.0	10.0	19.0	19.0	10.0	26.0	26.0	10.0	26.0	26.0
Total Split (%)	15.4%	29.2%	29.2%	15.4%	29.2%	29.2%	15.4%	40.0%	40.0%	15.4%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.5	6.5	5.0	6.5	6.5	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	5.0	12.5	12.5	5.0	14.5	14.5	5.0	24.0	24.0	5.0	22.0	22.0
Actuated g/C Ratio	0.08	0.19	0.19	0.08	0.22	0.22	0.08	0.37	0.37	0.08	0.34	0.34
v/c Ratio	0.33	0.74	0.62	0.70	0.54	0.10	0.49	0.27	0.09	0.17	0.94	0.17
Control Delay	32.0	33.2	14.0	46.9	26.2	0.4	35.7	16.3	0.2	29.8	46.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	33.2	14.0	46.9	26.2	0.4	35.7	16.3	0.2	29.8	46.9	0.5
LOS	C	C	B	D	C	A	D	B	A	C	D	A
Approach Delay		26.7			30.0			19.0			42.1	
Approach LOS		C			C			B			D	

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 73.4%	ICU Level of Service D
Analysis Period (min) 120	

Splits and Phases: 54: CSAH 31 & CSAH 32



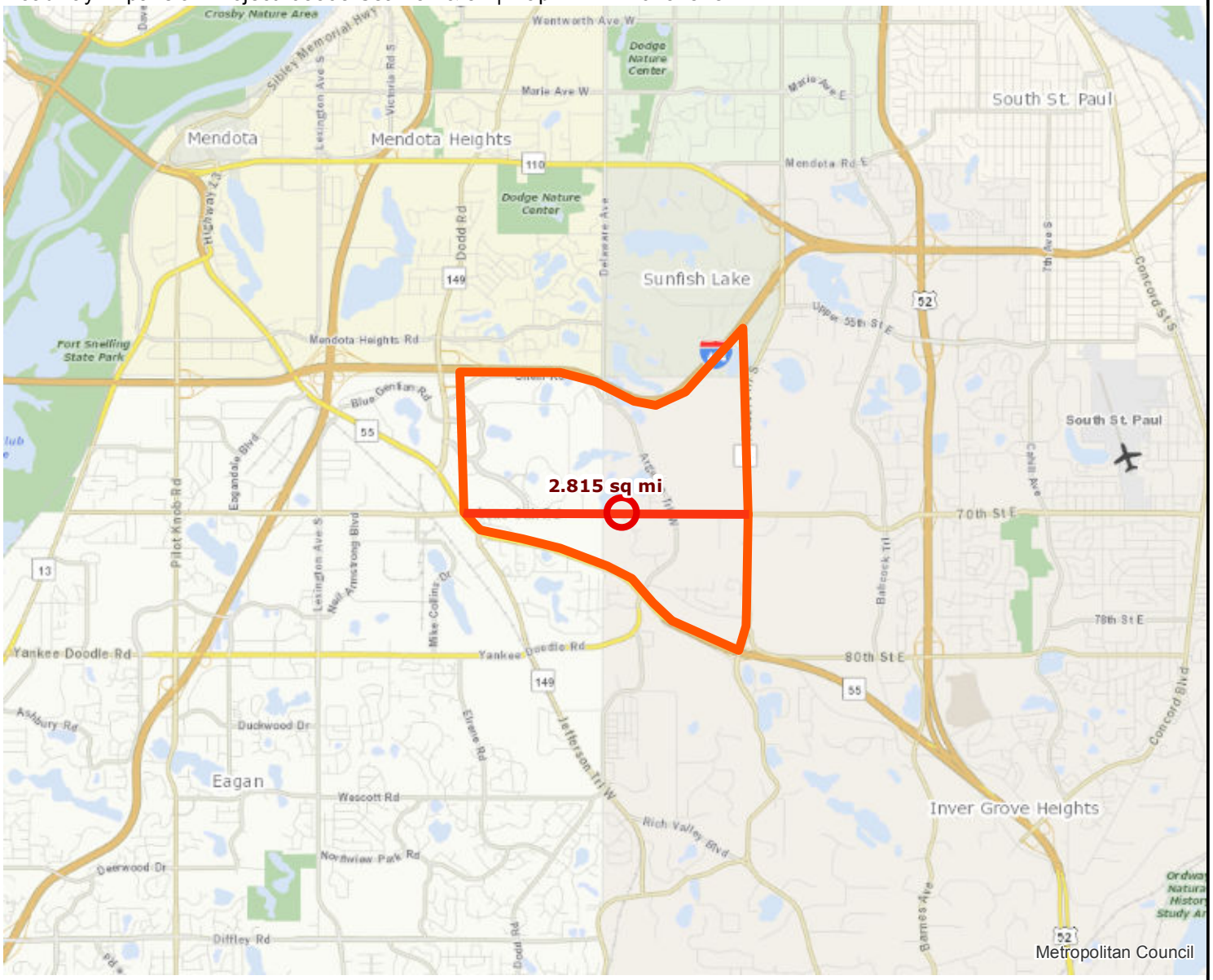
Roadway Area Definition

Roadway Expansion Project: 05308 Csah 31 & 32 | Map ID: 1472043282812

Results

Project Length: 2.008 miles

Project Area: 2.815 sq mi



Project Points
Project
Project Area
Principal Arterials
A Minor Arterials
Principal Arterials Planned
A Minor Arterials Planned

0 0.5 1 2 3 4 Miles

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LandscapeRSA1

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METROPOLITAN COUNCIL

Regional Bicycle Transportation Network (RBTN) Corridors

PROPOSED

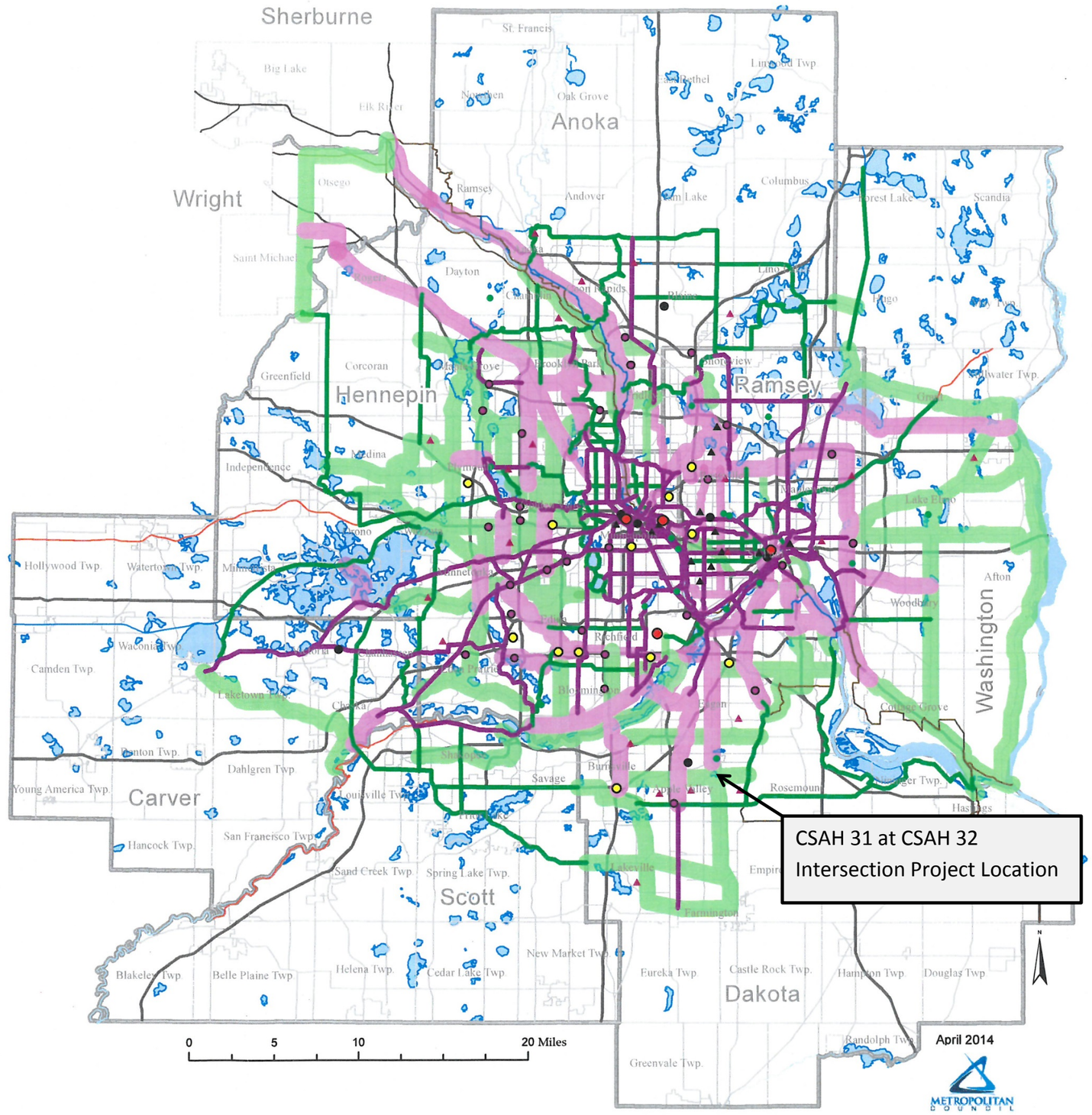
RBTN Corridors with Alignments
- Tier 1 Aligments
- Tier 2 Alignments

RBTN Corridors (Alignments Undefined)
- Tier 1 Priority Regional Bicycle Transportation Corridor
- Tier 2 Regional Bicycle Transportation Corridors

Other Trail Systems
- Regional Trails (Regional Parks Policy Plan)
- Mississippi River Trail (US Route 45)
- State Trails (DNR)

Regional Destinations
- Metropolitan Job Centers (50,000+ jobs)
- Regional Job Centers (15,000 - 50,000 jobs)
- Subregional Job Centers (7,000 - 15,000 jobs)
- Large High Schools (2000+ Students)
- Colleges & Universities (2000+ Students)
- Major Sport & Entertainment Centers
- Highly Visited Regional Parks (400,00+ visits per year)

Reference Items
- Principal Arterial Roads
- Lakes and Rivers
- City Boundary
- County Boundary
- 2040 Municipal Urban Service Area MPO Area



Regional Economy

Roadway Expansion Project: 05308 Csah 31 & 32 | Map ID: 1472043282812

Results

WITHIN ONE MI of project:

Totals by City:

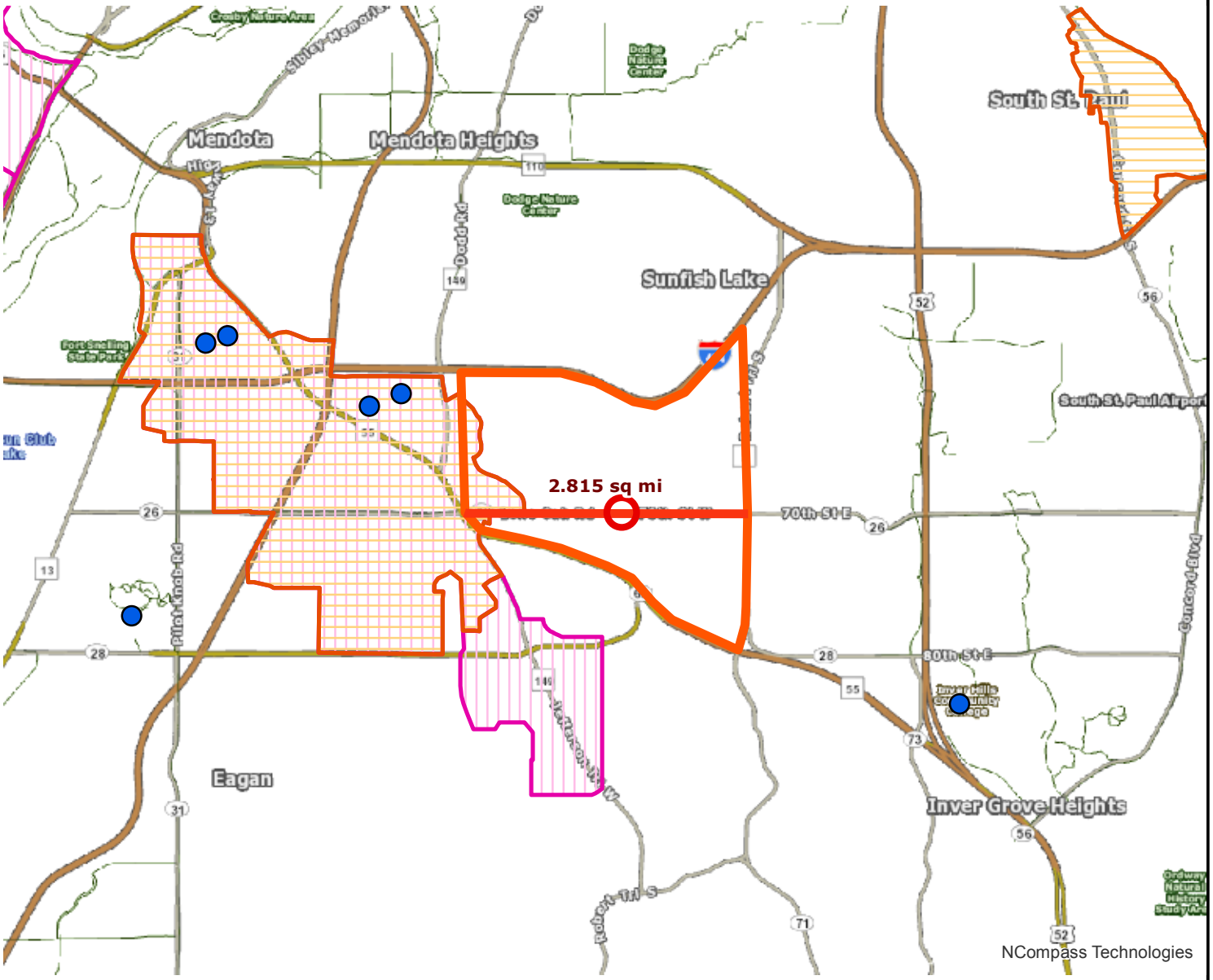
Eagan
- Population: 1550
- Employment: 8305
- Mfg and Dist Employment: 2580

Inver Grove Heights
- Population: 1328
- Employment: 210
- Mfg and Dist Employment: 25

Mendota Heights
- Population: 1553
- Employment: 78
- Mfg and Dist Employment: 20

Sunfish Lake
- Population: 485
- Employment: 14
- Mfg and Dist Employment: 8

Postsecondary Students:
0



Project Points
Project
Project Area
PostSecondary Education Centers
Manfacturing/Distribution Centers
Job Concentration Centers

0 0.5 1 2 3 4 Miles

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LandscapeRSA5

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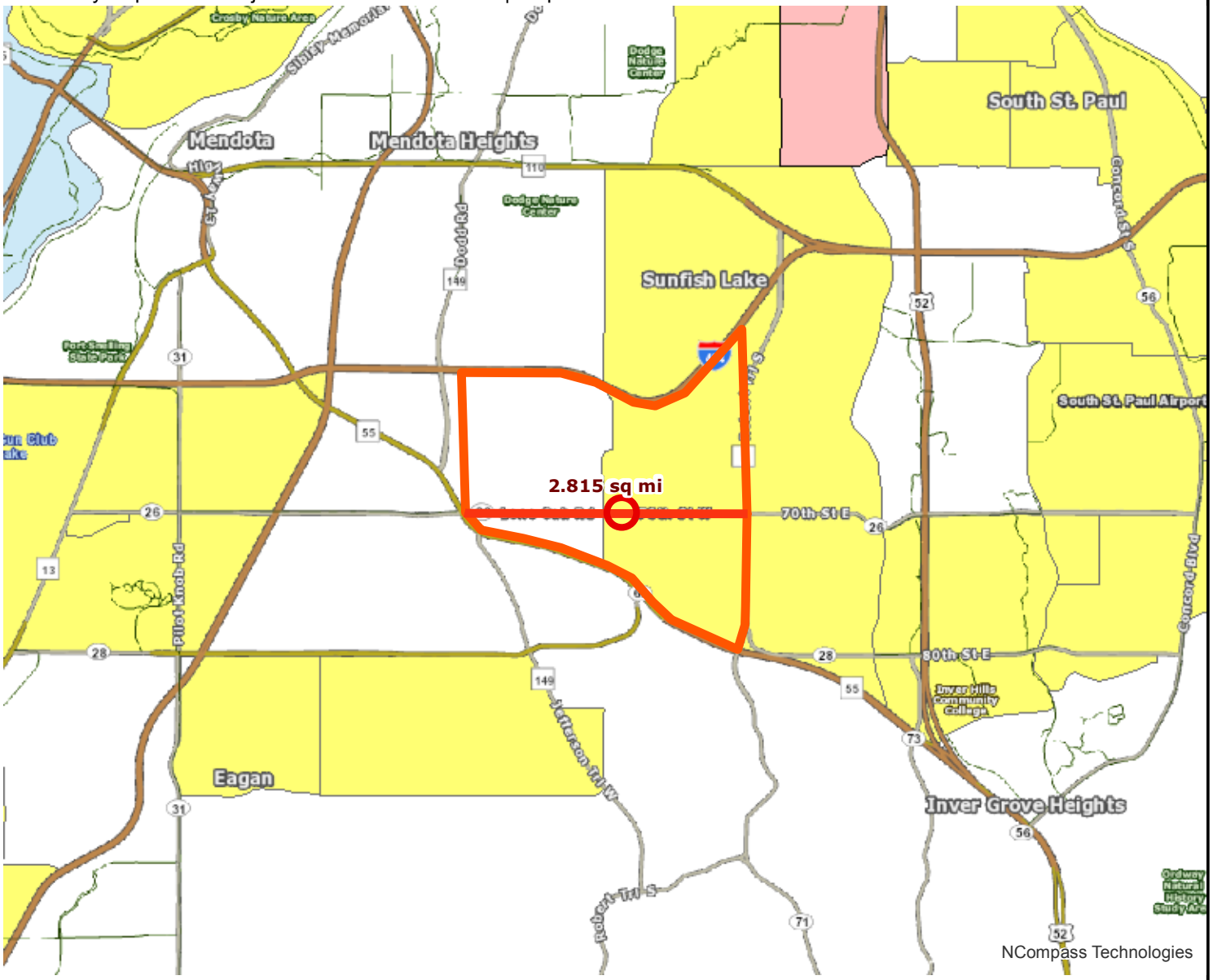
METROPOLITAN COUNCIL

Socio-Economic Conditions

Roadway Expansion Project: 05308 Csah 31 & 32 | Map ID: 1472043282812

Results

Project census tracts are above the regional average for population in poverty or population of color:
(0 to 18 Points)



Project Points
Project
Project Area

Area of Concentrated Povertry > 50% residents of color
Area of Concentrated Poverty
Above reg'l avg conc of race/poverty

0 0.5 1 2 3 4 Miles

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LandscapeRSA2

METROPOLITAN COUNCIL

54: CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)

Direction	All
Future Volume (vph)	3383
Total Delay / Veh (s/v)	43
CO Emissions (kg)	10.87
NOx Emissions (kg)	2.12
VOC Emissions (kg)	2.52

54: CSAH 31 & CSAH 32

Direction	All
Future Volume (vph)	3383
Total Delay / Veh (s/v)	32
CO Emissions (kg)	10.32
NOx Emissions (kg)	2.01
VOC Emissions (kg)	2.39

5. Congestion Reduction / Air Quality RESPONSE A (Calculation):

CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)
•Total Peak Hour Delay/Vehicle without the Project (Seconds/Vehicle): 43 sec/veh
•Total Peak Hour Delay/Vehicle with the Project (Seconds/Vehicle): 32 sec/veh
•Total Peak Hour Delay/Vehicle Reduced by the Project (Seconds/Vehicle): 11 sec/veh
•Volume (Vehicles Per Hour): 3383 vph
•Total Peak Hour Delay Reduced by the Project (Seconds): 37213 sec

5. Congestion Reduction / Air Quality RESPONSE B (Calculation):

CSAH 31 (Pilot Knob) & CSAH 32 (Cliff Rd)
•Total (CO, NOX, and VOC) Peak Hour Emissions/Vehicle without the Project (Kilograms): 0.0046 kg
•Total (CO, NOX, and VOC) Peak Hour Emissions/Vehicle with the Project (Kilograms): 0.0044 kg
•Total (CO, NOX, and VOC) Peak Hour Emissions Reduced/Vehicle by the Project (Kilograms): 0.0002 kg
•Volume (Vehicles Per Hour): 3383 vph
•Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms): 0.677 kg

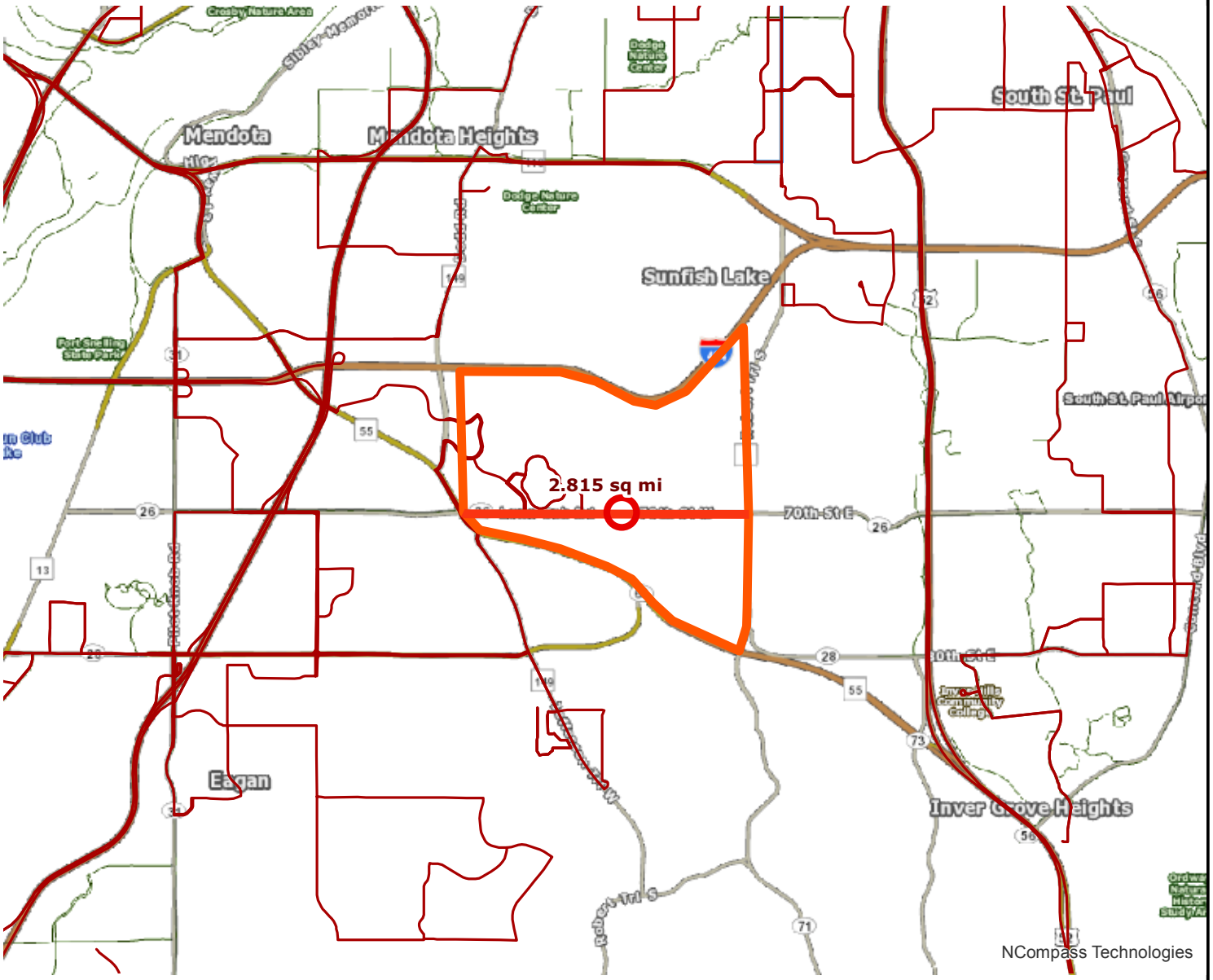
Transit Connections

Roadway Expansion Project: 05308 Csah 31 & 32 | Map ID: 1472043282812

Results

Transit with a Direct Connection to project:
436 489

**indicates Planned Alignments*



Project Points | Project Area | **Planned Alignments**

Project | Transit Routes | Arterial BRT

0 0.5 1 2 3 4 Miles

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METROPOLITAN COUNCIL

Traffic Data Inc

PO Box 16269
St. Louis Park, MN 55416

File Name : 43 - CSAH 31 & CSAH 32, 6-14-16
Site Code : 43
Start Date : 6/14/2016
Page No : 5

CSAH 31 & CSAH 32
Eagan, MN