Application

01967 - 2014 Roadway Expansion

02216 - TH 101 Expansion

Regional Solicitation - Roadways Including Multimodal Elements

Status:	Submitted
Submitted Date:	12/01/2014 10:50 AM

Primary Contact

Name:*		Paul	Robert	Oehme
	Salutation	First Name	Middle Name	Last Name
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Department:	Engineering			
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	P.O.Box 147			
*	Chanhassen	Minnesota	55317	
	City	State/Province	Postal Code/Zip	
Phone:*	952-227-1169			
	Phone		Ext.	
Fax:				
What Grant Programs are you most interested in?	Regional Solicitation - Roadways Including Multimodal Elements			

Organization Information

Name:	CHANHASSEN, CITY OF

Jurisdictional Agency (if different):

Organization Type: City

Organization Website:

Address: 7700 MARKET BLVD

PO BOX 147

*	CHANHASSEN	Minnesota	55317
	City	State/Province	Postal Code/Zip

County: Carver

Phone:* 952-227-1100 Ext.

Fax:

PeopleSoft Vendor Number 0000020930A2

Project Information

Project Name TH 101 Expansion

Primary County where the Project is Located Carver

Jurisdictional Agency (If Different than the Applicant): MnDOT

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

The proposed TH 101 Expansion project involves 1.2 miles of safety and capacity improvements between Pioneer Trail (CSAH 14) and Flying Cloud Drive (CSAH 61) in the City of Chanhassen. The project includes reconstruction and realignment of TH 101 from a two-lane undivided roadway to a four-lane divided roadway with turn lanes at key intersections. A paved multi-use trail is proposed along both sides of TH 101 from Pioneer Trail to Creekwood Street and along the east side of TH 101 from Creekwood Street to Flying Cloud Drive. On the south end, the project will tie into the newly designed TH 101/Flying Cloud Drive intersection which is planned to be reconstructed from a wye intersection to a roundabout. See layout in Figure 3.

System Continuity: TH 101 serves as an important component of the regional transportation system by providing an essential link for Carver, Hennepin, and Scott Counties, and the surrounding cities of Chanhassen, Eden Prairie, Chaska, and Shakopee. The project builds on the momentum of the recent TH 101 MN River Crossing project. The proposed project provides the missing four-lane link between the MN River and the freeway system (TH 212). The expansion to four lanes will be able to meet the 2030 travel needs of the segment with a forecast volume of 19,500.

Safety: The corridor has several major safety concerns based on its current design. Steep grades (up to 13%) and numerous curves along the roadway necessitate warning signs with 15 mph advisory speeds, and difficult travel conditions are caused by slick pavement during inclement weather. Inadequate sight distances create blind intersections with roadways, driveways, and a trail crossing (see Figure 2). A crash analysis performed as part of a 2007 Corridor Scoping and

Environmental Screening Study identified crash and severity rates more than twice the average for two-lane rural highways. The predominant crash type was run-off-the road, a symptom of poor sight conditions, tight curves, and undulating terrain through the project area.

Regional Connectivity: TH 101 (between the MN River and TH 212) is a logical and direct link that serves travel demands to and from the Twin Cities area. TH 101, between the communities of Shakopee and Chanhassen, serves as one of only a few options available for travelers seeking to cross the MN River in the area. With severe congestion on the TH 169 bridge and the fact that the TH 41 bridge often closes during flooding, the regional importance of this connection cannot be understated for both automobiles and freight traffic. With the proposed improvements, TH 101 has the potential to serve as an alternative roadway connection for all vehicles, particularly freight traffic, seeking an alternative to these congested river crossings.

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

Project Length (Miles) 1.21

Connection to Local Planning:

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 MnDOT 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.

City of Chanhassen 2030 Comprehensive Plan, Transportation Chapter, Page 7-12

Connection to Local Planning

Carver County Roadway Systems Plan (2010-2030), Page 23

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	$7,000,000.00
Match Amount	$6,500,000.00
Minimum of 20% of project total	
Project Total	$13,500,000.00
Match Percentage	48.15%
Minimum of 20% *Compute the match percentage by dividing the match amount by the project total*	
Source of Match Funds	State Turnback Funds

Preferred Program Year

Select one:	2019

MnDOT State Aid Project Information: Roadway Projects

County, City, or Lead Agency	City of Chanhassen
Functional Class of Road	A Minor Arterial
Road System	TH
TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET	
Name of Road	TH 101
Example; 1st ST., MAIN AVE	
Zip Code where Majority of Work is Being Performed	55317
(Approximate) Begin Construction Date	03/01/2019
(Approximate) End Construction Date	10/30/2020

LOCATION

From: **(Intersection or Address)**	Pioneer Trail (CSAH 14)
Do not include legal description; *Include name of roadway if majority of facility runs adjacent to a single corridor.*	
To: **(Intersection or Address)**	Flying Cloud Drive (CSAH 61)
Type of Work	GRADE, AGG BASE, BIT SURF, SIDEWALK, CURB AND GUTTER, STORM SEWER, SIGNALS, BIKE PATH
Examples: grading, aggregate base, bituminous base, bituminous surface, sidewalk, signals, lighting, guardrail, bicycle path, ped ramps, bridge, Park & Ride, etc.)	
Old Bridge/Culvert?	No

New Bridge/Culvert?	No
Structure is Over/Under (Bridge or culvert name):	N/A

Specific Roadway Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Mobilization (approx. 5% of total cost)	$400,800.00
Removals (approx. 5% of total cost)	$311,200.00
Roadway (grading, borrow, etc.)	$3,823,000.00
Roadway (aggregates and paving)	$4,064,000.00
Subgrade Correction (muck)	$75,000.00
Storm Sewer	$1,535,000.00
Ponds	$200,000.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$395,000.00
Traffic Control	$75,000.00
Striping	$18,000.00
Signing	$18,000.00
Lighting	$10,000.00
Turf - Erosion & Landscaping	$167,000.00
Bridge	$0.00
Retaining Walls	$1,000,000.00
Noise Wall	$0.00
Traffic Signals	$0.00
Wetland Mitigation	$50,000.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$1,155,000.00
Other Roadway Elements	$0.00
Totals	**$13,297,000.00**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Path/Trail Construction	$200,000.00

Sidewalk Construction	$0.00
On-Street Bicycle Facility Construction	$0.00
Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$3,000.00
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	**$203,000.00**

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
Transit and TDM Contingencies	$0.00
Other Transit and TDM Elements	$0.00
Totals	**$0.00**

Transit Operating Costs

OPERATING COSTS	Cost
Transit Operating Costs	$0.00
Totals	**$0.00**

Totals

Total Cost	$13,500,000.00
Construction Cost Total	$13,500,000.00
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 2030 Transportation Policy Plan (amended 2013), the 2030 Regional Parks Policy Plan (amended 2013), and the 2030 Water Resources Management Policy Plan (2005).

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

2.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

3.Applicants must not submit an application for the same project in more than one funding sub-category.

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

4.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. Expansion, reconstruction/modernization, and bridges must be between $1,000,000 and $7,000,000. Roadway system management must be between $250,000 and $7,000,000.

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

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

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

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

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

7.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

8.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

9.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

10.The project applicant must send written notification regarding the proposed projected to all affected communities and other levels and units of government prior to submitting the application.

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

Requirements - Roadways Including Multimodal Elements

Expansion and Reconstruction/Modernization Projects Only

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

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

2.Federal funds are available for roadway construction and reconstruction on new alignments or within existing right-of-way, including associated construction and excavation, bridges, or installation of traffic signals, signs, utilities, bikeway or walkway components and transit components.
The project must exclude costs for right-of-way, studies, preliminary engineering, design, or construction engineering. Noise barriers, drainage projects, fences, landscaping, etc., are not eligible for funding unless included as part of a larger project, which is otherwise eligible.

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

Bridge Projects Only

3.The bridge project 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.

4.Bridges selected in previous Bridge Improvement and Replacement solicitations (1994 2011) are not eligible. A previously selected project is not eligible unless it has been withdrawn or sunset prior to the deadline for proposals in this solicitation.

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

5.Projects requiring a grade-separated crossing of a Principal Arterial of freeway design 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.

6.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 sub-categories. Rail-only bridges are ineligible for funding.

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

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

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

8.Project limits for bridge projects are limited from abutment to abutment.

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

9.The project must exclude costs for studies, preliminary engineering, design, construction engineering, and right-of-way.

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

Bridge Replacement Projects Only

10.The bridge must have a sufficienty rating less than 50. Additionally, it must also be classified as structurally deficient or functionally obsolete.

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

Bridge Rehabilitiation Projects Only

11.The bridge must have a sufficienty rating less than 80. Additionally, it must also be classified as structurally deficient or functionally obsolete.

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

Other Attachments

File Name	Description	File Size
141110_Canterbury Park.pdf	Letter - Canterbury Park	37 KB
141118_Resolution of Support_Shakopee.pdf	Letter - City of Shakopee	423 KB
141125_MnDOT TH 101 letter.pdf	Letter - MnDOT	38 KB
Figure 1_TH101_Expansion.pdf	Figure 1 - Project Limits	1.2 MB
Figure 2_Steep Slopes.pdf	Figure 2 - Steep Slopes	359 KB
Figure 3_Layout.pdf	Figure 3 - Layout	2.5 MB
Grant Application Resolutions_Chanhassen.pdf	Letter - City of Chanhassen	557 KB
RdwayAreaDef.pdf	Roadway Area Definition	740 KB
RegionalEcon.pdf	Regional Economy	1.4 MB
Resolution 63-14_Carver County.pdf	Letter - Carver County	129 KB
SocioEcon.pdf	Socio Economic	1.4 MB
TransitCon.pdf	Transit Connections	1.4 MB

Reliever: Freeway Facility or

Facility being relieved

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

Reliever: Non-Freeway Facility or

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

Expander/Augmentor/Non-Freeway Principal Arterial

Select one:	Expander
Area	3.622
Project Length	1.253
Average Distance	2.8907
Upload Map	TH 101_MetC Maps_Rdwy Area Def.pdf

Measure B: Current Heavy Commercial Traffic

Location	TH 101 south of Creekwood Drive
Current daily heavy commercial traffic volume	149.0

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

Select all that apply

Direct connection to or within a mile of a Job Concentration	
Direct connection to or within a mile of a Manufacturing/Distribution Location	
Direct connection to or within a mile of an Educational Institution	
Project provides a direct connection to or within a mile of an existing local activity center identified in an adopted county or city plan	Yes
	The project is located less than one mile to the north of downtown Shakopee, a local activity center as identified in the City of Shakopees 2030 Land Use Plan. TH 101 provides access to the northern part of Shakopee, which contains many of the Citys government buildings & community centers.
County or City Plan Reference (Limit 700 characters; approximately 100 words)	As indicated in a letter from Canterbury Park, TH 101 is an important roadway in the southwest metro that connects entertainment destinations such as Canterbury Park, Valley Fair, Mystic Lake Casino, and the Renaissance Fair. These are important economic centers that collectively draw over 10 million visitors each year. A good transportation system is critical to continued economic growth in the area.
Upload Map	TH 101_MetC Maps_RgnlEcon.pdf

Measure A: Current Daily Person Throughput

Location	TH 101 between Pioneer Trail and Flying Cloud Driv
Current AADT Volume	5000.0
Existing Transit Routes on the Project	N/A

Response: Current Daily Person Throughput

Average Annual Daily Transit Ridership	0
Current Daily Person Throughput	6500.0

Measure B: 2030 Forecast ADT

Use Metropolitan Council model to determine forecast (2030) ADT volume	No

METC Staff - Forecast (2030) ADT volume	0
OR	
Approved county or city travel demand model to determine forecast (2030) ADT volume	Yes
Forecast (2030) ADT volume	19500.0

Measure A: Project Location and Impact to Disadvantaged Populations

Select one:

Project located in Racially Concentrated Area of Poverty	
Project located in Concentrated Area of 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

TH 101 is an important regional connection because it serves as a MN River crossing and a link to TH 212 that provides surrounding cities with better access to jobs. Many of these cities, including Chaska & Shakopee, contain areas that are above the regional average for populations of race/poverty. Shakopees commercial and industrial sectors have experienced tremendous growth in recent years, adding many blue collar jobs. The proposed improvements will provide a better link for all users accessing this area from the north. Also, 40 rental units located at the existing intersection of TH 101 and Flying Cloud Drive are low income housing.

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

The proposed trails along TH 101 will offer benefits to all trail users, including children and the disabled, and will be compliant with the Americans with Disabilities Act (ADA). Nearly 36 percent of residents in the projects census tract are children as compared to only 27 percent within the seven-county regional area. Families with children would be common users of the new trail along TH 101 and its connection to the MN River Bluffs Regional Trail. Additionally, people without automobiles are not currently able to safely use the project segment of TH 101 because of its steep grades and lack of shoulders. Bikes and pedestrians must divert 0.7 mile to the east to access the MN River Bluffs Regional Trail at Pioneer Trail and continue south.

Upload Map

TH 101_MetC Maps_SocioEcon.pdf

Measure B: Affordable Housing

City/Township	Segment Length (Miles)
City of Chanhassen	1.21

Total Project Length

Total Project Length	1.21

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
City of Chanhassen	1.21	1.21	44.0	1.0	44.0
		1	**44**	**1**	**44**

Affordable Housing Scoring - To Be Completed By Metropolitan Council Staff

Total Project Length (Miles)	1.21
Total Housing Score	44.0

Measure A: Year of Roadway Construction

Year of Original Roadway Construction or Most Recent Reconstruction	Roadway Segment Length (Miles)	Calculation	Calculation 2
1946.0	1.21	2354.66	1946.0
	1	**2355**	**1946**

Average Construction Year

Weighted Year	1946.0

Total Segment Length (Miles)

Total Segment Length	1.21

Measure A: Cost Effectiveness of Vehicle Delay Reduction

Total Project Cost from Cost Sheet	$13,500,000.00
Total Peak Hour Vehicle Delay Without The Project	154814.0
Total Peak Hour Vehicle Delay With The Project	58406.4

Total Peak Hour Vehicle Delay Reduced by Project	96407.6
Cost Effectiveness	$140.03
Synchro or HCM Reports	TH 101 and FCD_HCM Combined.pdf

Measure B: Cost Effectiveness of Emissions Reduction

Total Project Cost from Cost Sheet	$13,500,000.00
Total Peak Hour Kilograms Reduced by Project	2.59
Cost Effectiveness	$5,212,355.21
Synchro or HCM Reports	TH 101 and FCD HCM_Emissions.pdf

Measure A: Benefit/Cost of Crash Reduction

Project Benefit/Cost Ratio	0.53
Worksheet Attachment	Hwy 101 Complete_Crashes.pdf

Measure A: Transit Connections

Existing Routes Directly Connected to the Project	N/A
Planned Transitways directly connected to the project (alignment and mode determined and identified in the 2030 TPP)	N/A
Upload Map	TH 101_MetC Maps_Transit.pdf

Response

Met Council Staff Data Entry Only

Route Ridership	0
Transitway Ridership	0

Measure B: Bicycle and Pedestrian Connections

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

The proposed project will include trails along the reconstructed TH 101 corridor that connect to existing trails at Pioneer Trail on the north and Flying Cloud Drive on the south. These trails fill a major gap in the local bicycle and pedestrian system, which extends from downtown Chanhassen and to downtown Shakopee (see Figure 1). Both downtown areas are village centers identified in their respective Comprehensive Plans with mixed-used development and high pedestrian traffic. The proposed trails along TH 101 are identified in Carver Countys Master Trail Plan. The proposed trail on the east side of TH 101 will connect to the MN River Bluffs Regional Trail which crosses TH 101 at an at-grade intersection approximately 0.2 miles north of Flying Cloud Drive. The existing trail crossing has safety deficiencies that make it difficult for TH 101 drivers to see trail users as they approach the intersection (see Figure 2). The City of Chanhassen is planning to construct a trail bridge crossing over TH 101, as identified in the Citys 2030 Comprehensive Plan. The City is seeking funding opportunities so the trail crossing could be constructed concurrently with this TH 101 Expansion project. The proposed trails along TH 101 will allow local users to connect to the MN River Bluffs Trail, which provides a direct, paved connection to downtown Chaska, a high-density, mixed-use city center.

Measure C: Multimodal Facilities

The proposed project will improve multi-modal connections to nearby transit facilities, as well as improve safety for all users along TH 101.

Currently, there are no bicycle or pedestrian facilities along TH 101 in the project area. This section of TH 101 is a dangerous corridor for these users because of steep grades, numerous curves, inadequate sight distances, and lack of shoulders. The proposed trails will improve safety and travel experience for bikes/pedestrians traveling along TH 101, including local users connecting to existing trails on the north at Pioneer Trail and on the south at Flying Cloud Drive.

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

TH 101 roadway and trail construction will improve multi-modal access for vehicles and bikes/pedestrians to reach transit facilities along TH 212 to the north. The Southwest Village Park and Ride is located at the intersection of TH 101/TH 212, and the planned Southwest Light Rail Transit Mitchell Station will be located along TH 212 in Eden Prairie (see Green Line on Transit Map). Transit is not directly incorporated into this project, because there are no existing transit routes in the project area to provide opportunities for connections. The transit lack of service is consistent with the project areas designation as Transit Market Area IV by the Met Council (i.e. an area that only supports only support dial-a-ride and peak period express/commuter service).

Transit Projects Not Requiring Construction

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

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 Yes

100%

Stakeholders have been identified

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 10/01/2015

3)Environmental Documentation (10 Percent of Points)

EIS

EA Yes

PM

Document Status:

Document approved (include copy of signed cover sheet)

100%

Document submitted to State Aid for review

75%

Document in progress; environmental impacts identified Yes

50%

Document not started

0%

Anticipated date or date of completion/approval 10/01/2015

4)Review of Section 106 Historic Resources (15 Percent of Points)

No known potential for archaeological resources, no historic resources known to be eligible for/listed on the National Register of Historic Places 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%

Unknown impacts to historic/archaeological resources

0%

Anticipated date or date of completion of historic/archeological review: — 10/01/2015

Project is located on an identified historic bridge

5)Review of Section 4f/6f Resources (15 Percent of Points)

(4f is publicly owned parks, recreation areas, historic sites, wildlife or waterfowl refuges; 6f is outdoor recreation lands where Land and Water Conservation Funds were used for planning, acquisition, or development of the property)

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

100%

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%

Adverse effects (land conversion) to Section 4f/6f resources likely

30%

Unknown impacts to Section 4f/6f resources in the project area

0%

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

Right-of-way or easements not required

100%

Right-of-way or easements has/have been acquired

100%

Right-of-way or easements required, offers made

75%

Right-of-way or easements required, appraisals made — Yes

50%

Right-of-way or easements required, parcels identified

25%

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

0%

Right-of-way or easements identification has not been completed

0%

Anticipated date or date of acquisition 10/01/2015

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)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 10/01/2015

9)Letting

Anticipated Letting Date 04/01/2019

November 10, 2014

Mr. Todd Gerhardt
City Manager
City of Chanhassen
7700 Market Blvd.
P.O. Box 147
Chanhassen, MN 55317

Re: Support for Highway 101 Improvements from Pioneer Trail to Flying Cloud Drive

Dear Mr. Gerhardt:

I understand the City of Chanhassen is actively pursuing federal funding to make improvements to Highway 101 from Pioneer Trail to Flying Cloud Drive. Canterbury Park strongly supports the effort to obtain federal funding and upgrade Highway 101.

Highway 101 is a key connection from the southwest metro to the RiverSouth entertainment destinations (Canterbury Park, Valley Fair, Mystic Lake Casino, Minnesota Renaissance, etc.). Collectively, over 10 million people visit these attractions every year. A good transportation system is critical to continued economic growth in the southwest metro area.

Highway 101 is also a vital regional link between Hennepin, Scott and Carver counties. Residents that travel this stretch of road on a daily basis know that these highway improvements are necessary to improve safety, add additional capacity and create roadway continuity.

Thank you for your efforts and for taking the lead to make improvements to Highway 101.

Sincerely,

Randall D. Sampson
President & CEO
Canterbury Park

CANTERBURY PARK HOLDING CORPORATION
1100 CANTERBURY ROAD SHAKOPEE, MINNESOTA 55379
TELEPHONE 952-445-7223 FAX 952-496-6400 WWW.CANTERBURYPARK.COM

RESOLUTION NO. 7487

A Resolution in Support for Improvements to Highway 101 between Pioneer Trail (CSAH 14) and Flying Cloud Drive (CSAH 16) in the City of Chanhassen, Carver County

WHEREAS, the City of Shakopee has been contacted by the City of Chanhassen regarding support of the City's application for federal funding to make improvements to Highway 01; and,

WHEREAS, Highway 101 is a critical regional transportation link between Shakopee, eastern Carver County and Hennepin County; and,

WHEREAS, Highway 101 from Flying Cloud Drive to Pioneer Trail has safety issues, geometric problems and capacity constraints that need to be addressed to realize Highway 101 as a regional corridor; and,

WHEREAS, the City of Shakopee is a partner on the Highway 101 Minnesota River Flood Mitigation Project; and,

WHEREAS, Carver County, in conjunction with the City of Chanhassen and the Minnesota Department of Transportation (Mn/DOT), completed a corridor and environmental screening study for Highway 101 in May, 2007, from Lyman Boulevard to the Carver/Scott County line and are currently working on environmental documentation and preliminary design for the section of Highway 101 from Pioneer Trail to Flying Cloud Drive.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SHAKOPEE, MINNESOTA:

1. Federal funding is necessary for advancement of this project which will provide needed safety and capacity improvements.

2. The City of Shakopee supports the City of Chanhassen federal funding application and making improvements to Highway 101.

Adopted in Reg. session of the City Council of the City of Shakopee, Minnesota, held this 18th day of November, 2014.

Mayor of the City of Shakopee

ATTEST:

City Clerk

Minnesota Department of Transportation
Metro District
1500 West County Road B-2
Roseville, MN 5511

November 25, 2014

Paul Oehme
Public Works Director/City Engineer
7700 Market Blvd.
Chanhassen, MN 55317

RE: Regional Solicitation Application for improvements on TH 101 from Pioneer Trail to Flying Cloud Drive

Dear Mr. Oehme:

Thank you for requesting a letter of support from MnDOT for the Metropolitan Council's 2014 Regional Solicitation. Your application for improvements on TH 101 from Pioneer Trail to Flying Cloud Drive impacts MnDOT right of way on Highway 101.

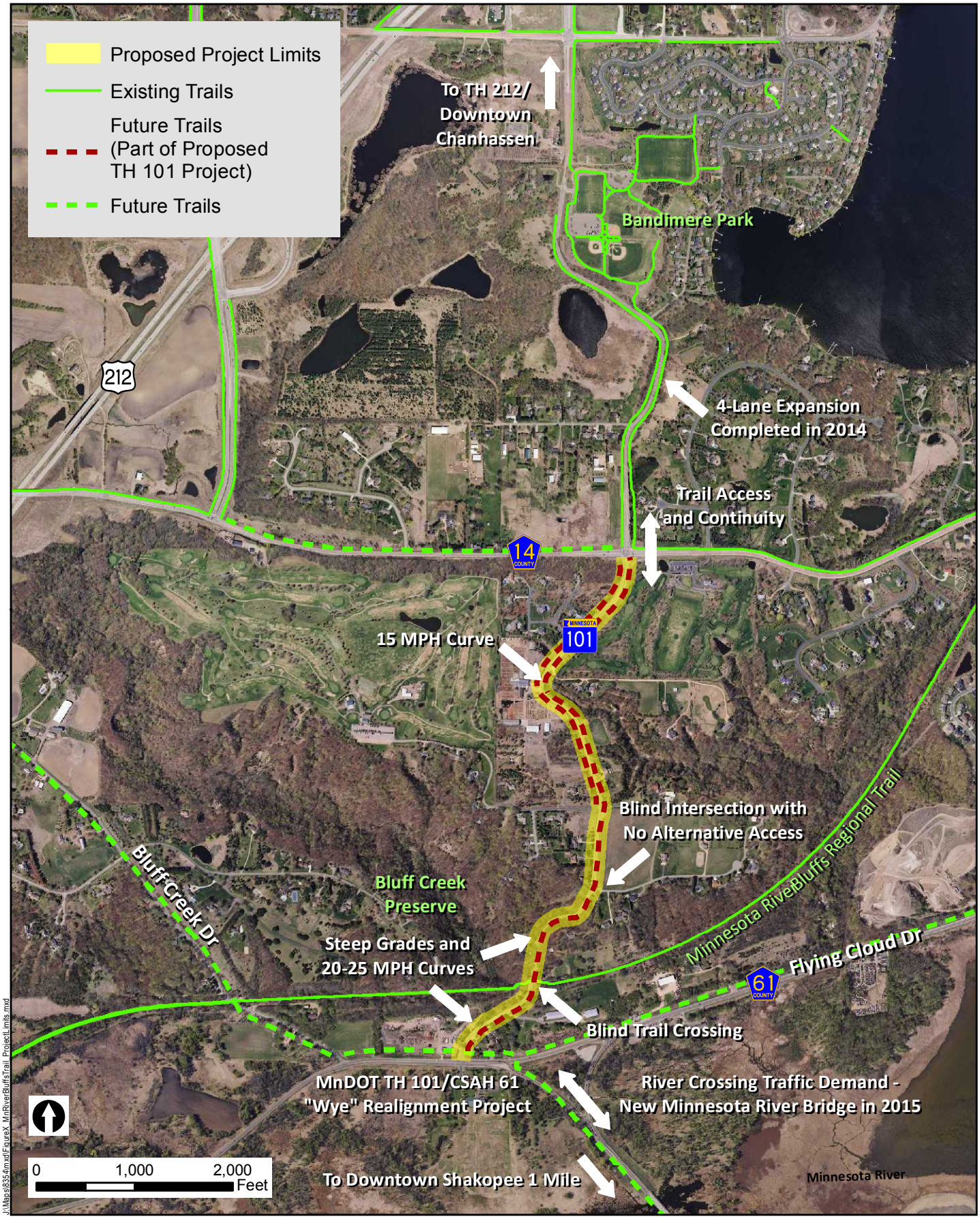
MnDOT, as the agency with jurisdiction over Highway 101, supports the application for improvements on TH 101 from Pioneer Trail to Flying Cloud Drive. Details of a future maintenance agreement with the county will be determined during project development to define how the project will be maintained for the project's useful life.

This project currently has no funding from MnDOT.

Sincerely,

Scott McBride, P.E.
Metro District Engineer

Cc: Elaine Koustsoukos, Metropolitan Council
Jon Solberg, MnDOT Metro District - South Area Manager

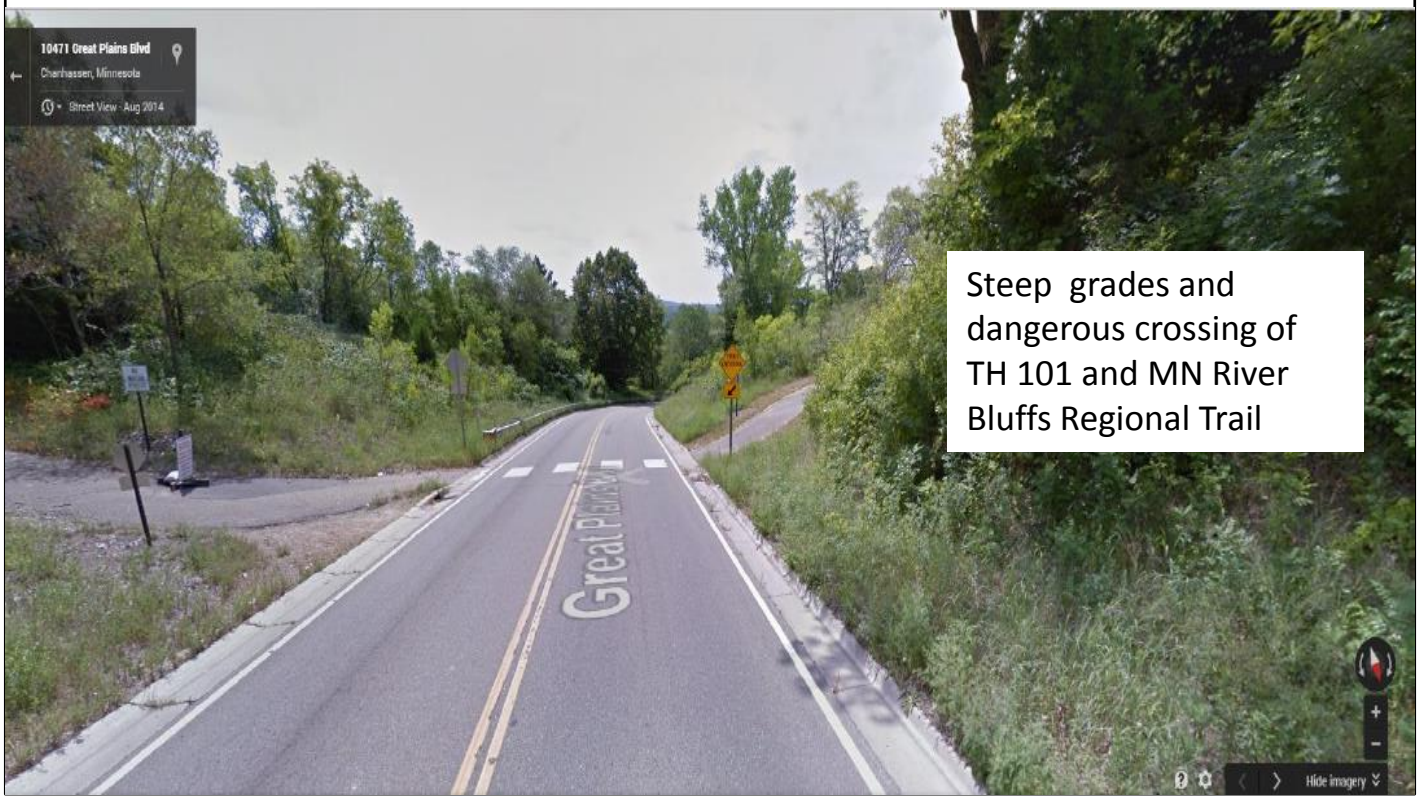


Project Limits

TH 101 Expansion

Chanhassen Regional Solicitation Roadway Expansion Application

Figure 1



TH 101 Steep Grades

Figure 2

TH 101 Expansion

Chanhassen Regional Solicitation Roadway Expansion Application

Communications/Projects/8625 Chanhassen Regional Solicitations-CG/8625 Figure 3.indd

Project Layout

TH 101 Expansion
Chanhassen Regional Solicitation Roadway Expansion Application

Figure 3

CITY OF CHANHASSEN
CARVER AND HENNEPIN COUNTIES, MINNESOTA

DATE: October 27, 2014 **RESOLUTION NO:** 2014-66

MOTION BY: Laufenburger **SECONDED BY:** Ernst

RESOLUTION IN SUPPORT OF FEDERAL FUNDING FOR PEDESTRIAN TRAIL IMPROVEMENTS AT TH 101 FROM FLYING CLOUD DRIVE TO PIONEER TRAIL PROJECT NO. 14-08

WHEREAS, a corridor scoping study was completed in 2007 and identified safety and mobility needs for TH 101 from Flying Cloud Drive to Pioneer Trail; and

WHEREAS, the City of Chanhassen, Carver County and MnDOT are currently working on environmental documentation and preliminary design for TH 101 from Flying Cloud Drive to Pioneer Trail; and

WHEREAS, it is determined a grade separated crossing of the Three Rivers Park District, Minnesota River Bluffs LRT Regional Trail at TH 101 is needed; and

WHEREAS, paving the Minnesota River Bluffs LRT Regional Trail from Bluff Creek Drive to TH 101 is recommended.

NOW, THEREFORE, BE IT RESOLVED, that the City Council is in support of federal funding application for the pedestrian trail improvements to the Three Rivers Park District, Minnesota River Bluffs LRT Regional Trail in conjunction with TH 101 improvements (Flying Cloud Drive to Pioneer Trail).

Passed and adopted by the Chanhassen City Council this 27th day of October, 2014.

ATTEST:

Todd Gerhardt, City Manager

Thomas A. Furlong, Mayor

YES	NO	ABSENT
Furlong	None	None
Ernst		
Laufenburger		
McDonald		
Tjornhom		

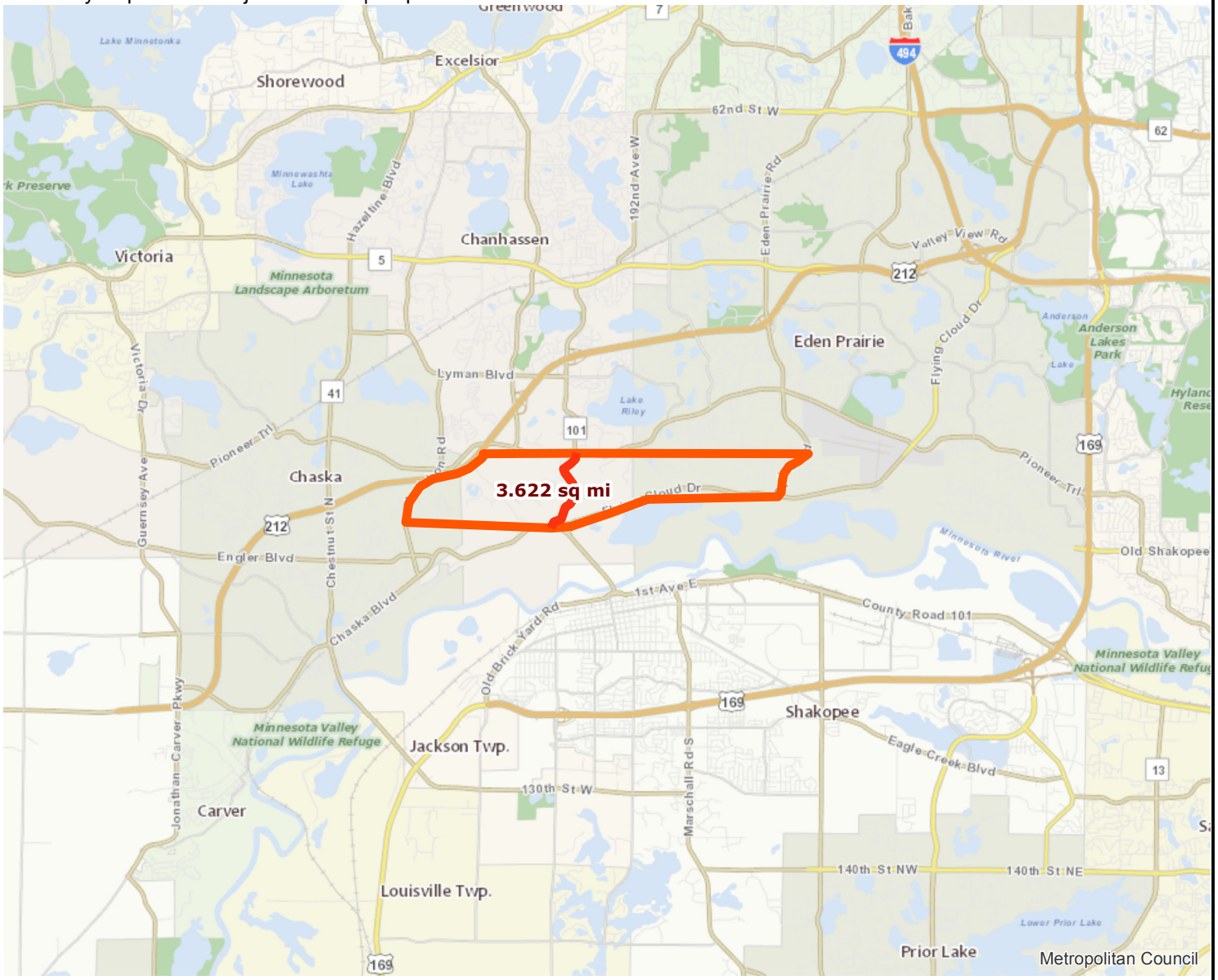
Roadway Area Definition

Roadway Expansion Project: TH101 | Map ID: 1419886877908

Results

Project Length: 1.253 miles

Project Area: 3.622 sq mi



Project

Project Area

0 1.25 2.5 5 7.5 10 Miles

Created: 12/29/2014

LandscapeRSA1

METROPOLITAN COUNCIL

Regional Economy

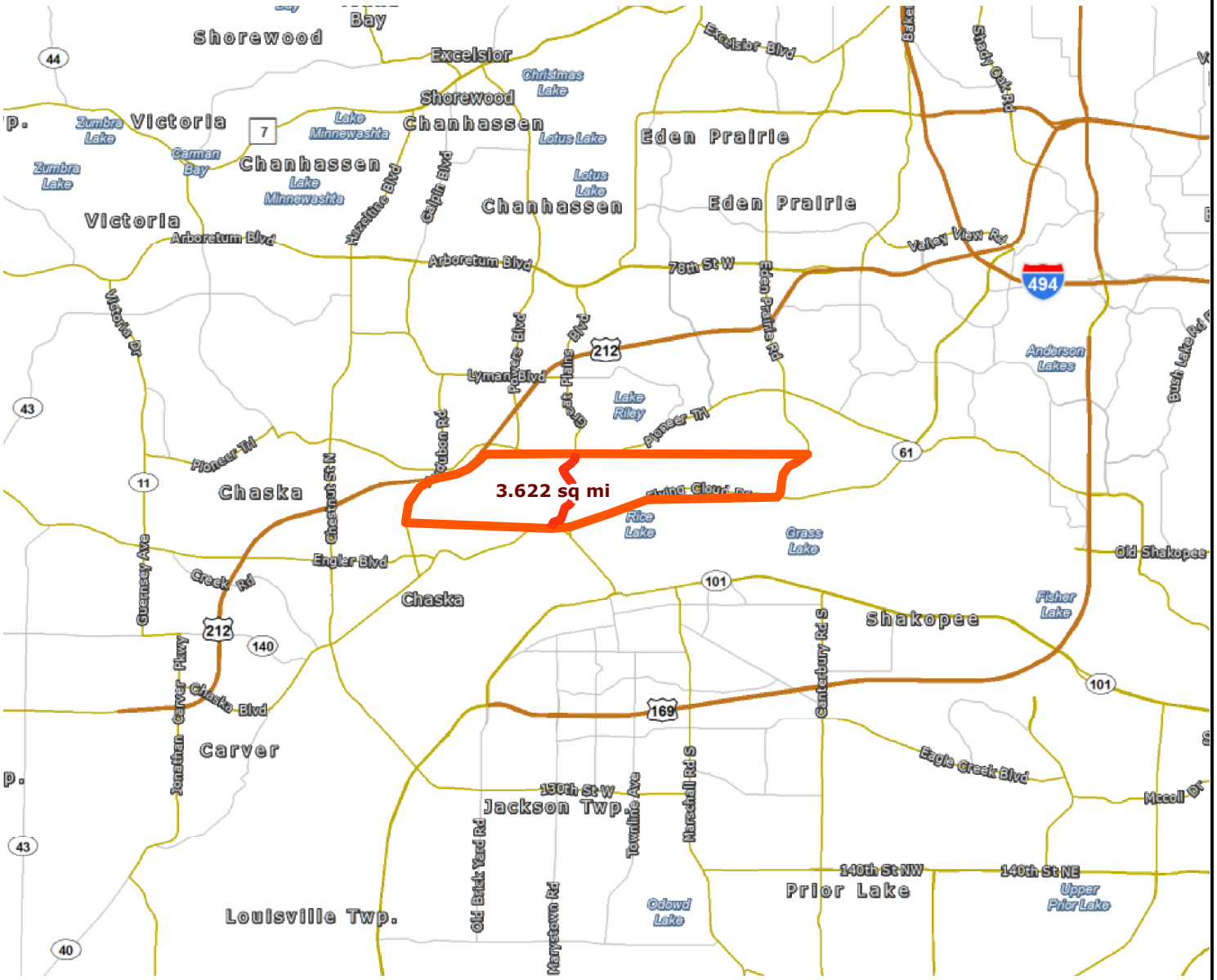
Roadway Expansion Project: TH101 | Map ID: 1419886877908

Results

Project **NOT IN** area of Job Concentration.

Project **NOT IN** to area of Manufacturing and Distribution.

Project **NOT CONNECTED** to area of Education Institutions.



Project

Project Area

0 1.25 2.5 5 7.5 10 Miles

Created: 12/29/2014
LandscapeRSA5

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

METROPOLITAN COUNCIL

BOARD OF COUNTY COMMISSIONERS
CARVER COUNTY, MINNESOTA

Date: November 18, 2014 Resolution No.: 63-14

Motion by Commissioner: Ische Seconded by Commissioner: Workman

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APPLICATION FOR FEDERAL FUNDING
TH 101 FROM FLYING CLOUD DRIVE (CSAH 61) TO PIONEER TRAIL (CSAH 14)

WHEREAS, Carver County, in conjunction with the City of Chanhassen and the Minnesota Department of Transportation (Mn/DOT), completed a corridor and environmental screening study for TH 101 in May, 2007, from Lyman Boulevard to the Carver/Scott County line; and,

WHEREAS, in June, 2009, the Carver County Board of Commissioners approved the findings of fact for the corridor and environmental screening study for TH 101; and,

WHEREAS, Project 1 (TH 101 from Lyman Boulevard to Pioneer Trail) was recently completed utilizing Federal funds. Project 2 (TH 101 from Flying Cloud Drive to Pioneer Trail) is the next project planned for construction. Construction funds are needed and proposed from Federal funds (80 percent) and State/Local funds (20 percent).

NOW, THEREFORE, BE IT RESOLVED by the Carver County Board of Commissioners:

1. Federal funding is necessary for the advancement of this project which will provide needed capacity and safety improvements for Project 2.
2. The City of Chanhassen will submit a Federal funding application for Project 2.
3. If selected to receive Federal funds, Carver County will participate with the City of Chanhassen and Mn/DOT in providing the matching construction funds if County Turnback Account dollars are made available to Carver County by Mn/DOT for this purpose. If County Turnback Account dollars are not made available, Carver County reserves the right to consider whether or not to contribute matching construction funds to the project from other funding sources.

	YES	ABSENT	NO
Degler			
Ische			
Lynch			
Maluchnik			
Workman			

STATE OF MINNESOTA
COUNTY OF CARVER

I, Dave Hemze, duly appointed and qualified County Administrator of the County of Carver, State of Minnesota, do hereby certify that I have compared the foregoing copy of this resolution with the original minutes of the proceedings of the Board of County Commissioners, Carver County, Minnesota, at its session held on the 18th day of November , 2014, now on file in the Administration office, and have found the same to be a true and correct copy thereof.

Dated this 18th day of November, 2014.

DocuSigned by:
David Hemze
County Administrator

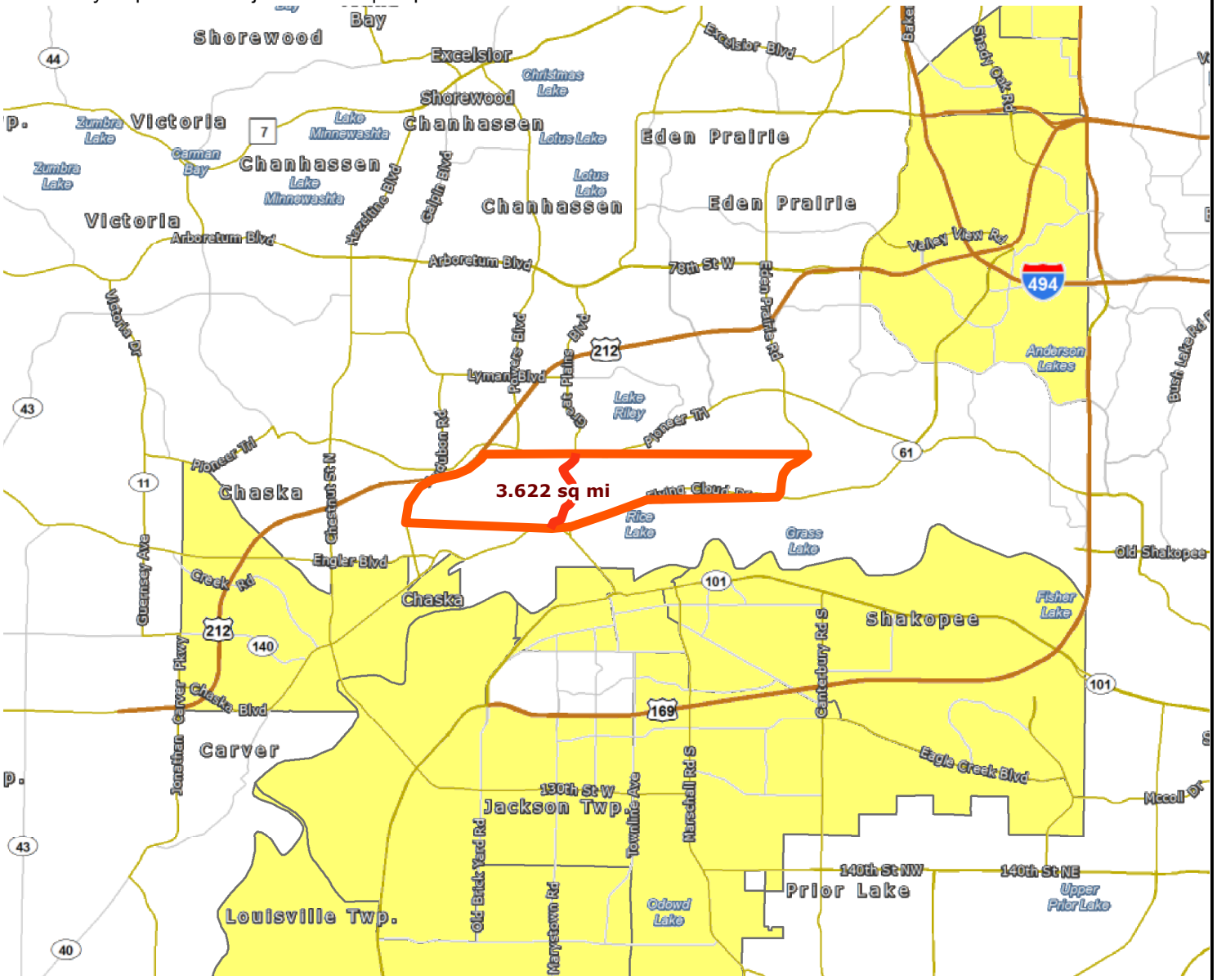
R:\Program Delivery\Transportation\ProjectApps

Socio-Economic Conditions

Roadway Expansion Project: TH101 | Map ID: 1419886877908

Results

Project **NOT IN** any area of concentrated poverty.



Created: 12/29/2014
LandscapeRSA2

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

METROPOLITAN COUNCIL

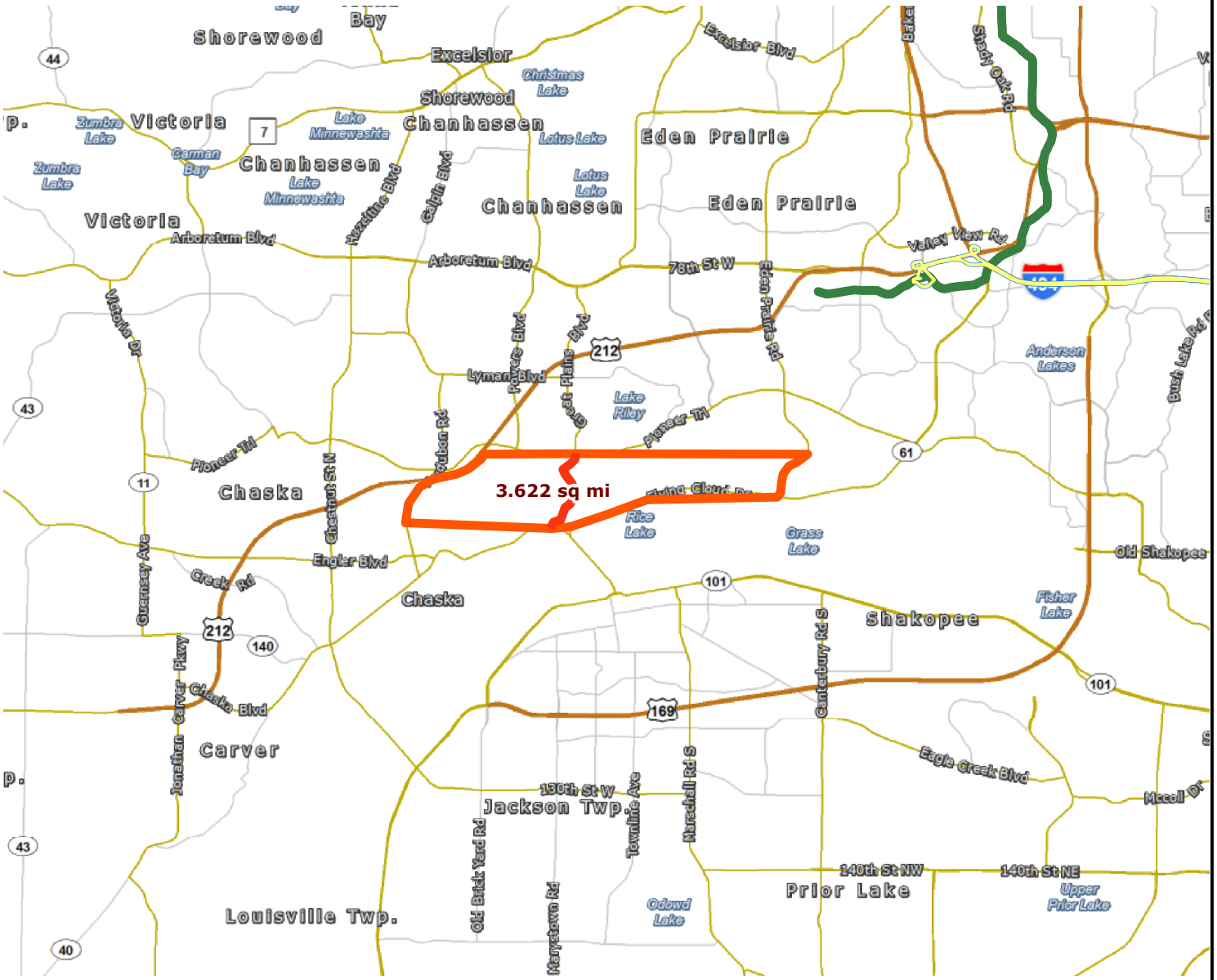
Transit Connections

Roadway Expansion Project: TH101 | Map ID: 1419886877908

Results

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

**indicates Planned Alignments*



Project
Project Area

Planned Alignments

Light Rail, Green Line Extension
Arterial BRT

0 1.25 2.5 5 7.5 10 Miles

Created: 12/29/2014
LandscapeRSA3

METROPOLITAN COUNCIL

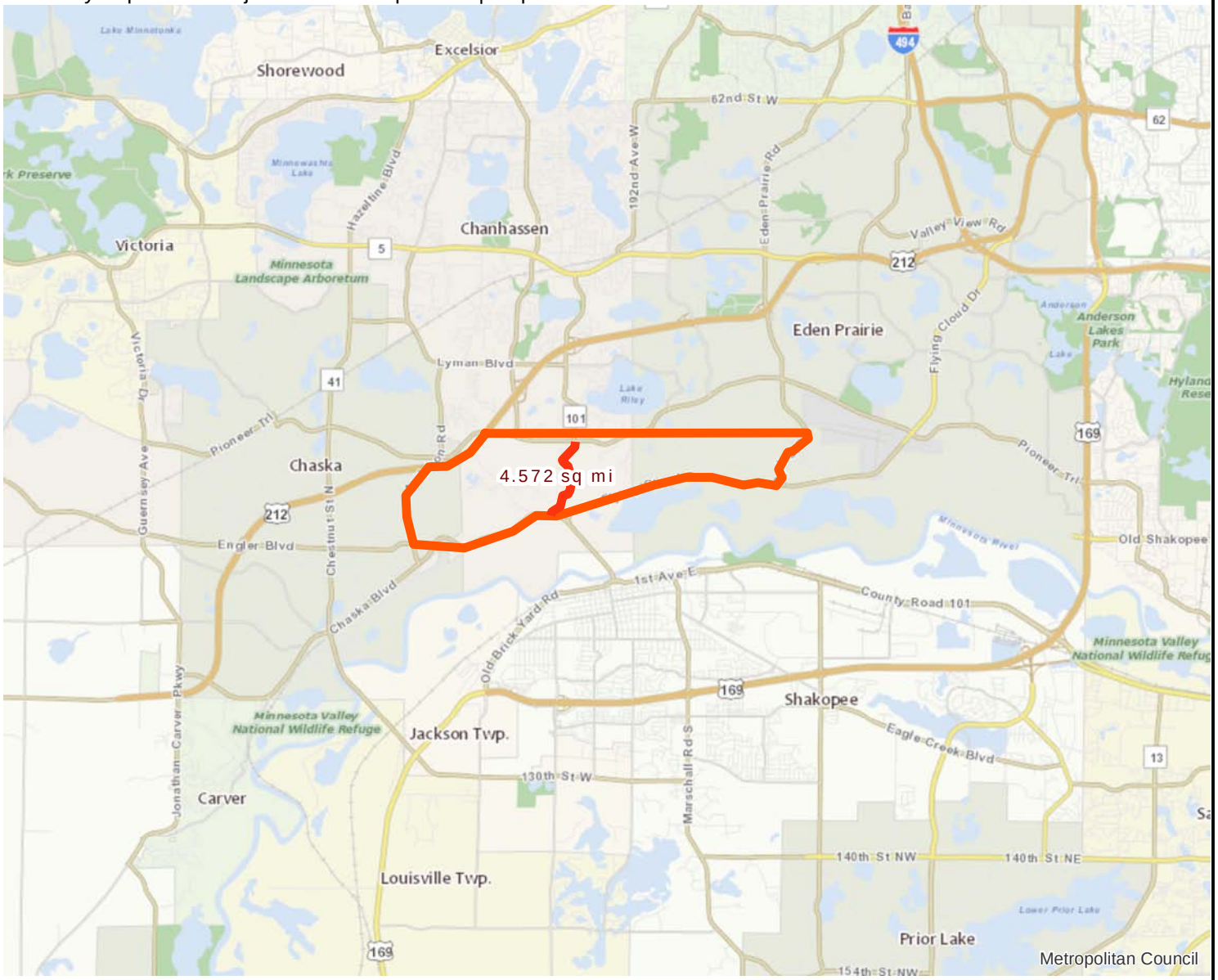
Roadway Area Definition

Roadway Expansion Project: TH 101 Expansion | Map ID: 1413919205928

Results

Project Length: 1.21 miles

Project Area: 4.572 sq mi



Project

Project Area

0 1.25 2.5 5 7.5 10 Miles

Created: 10/21/2014
LandscapeRSA1

METROPOLITAN COUNCIL

Regional Economy

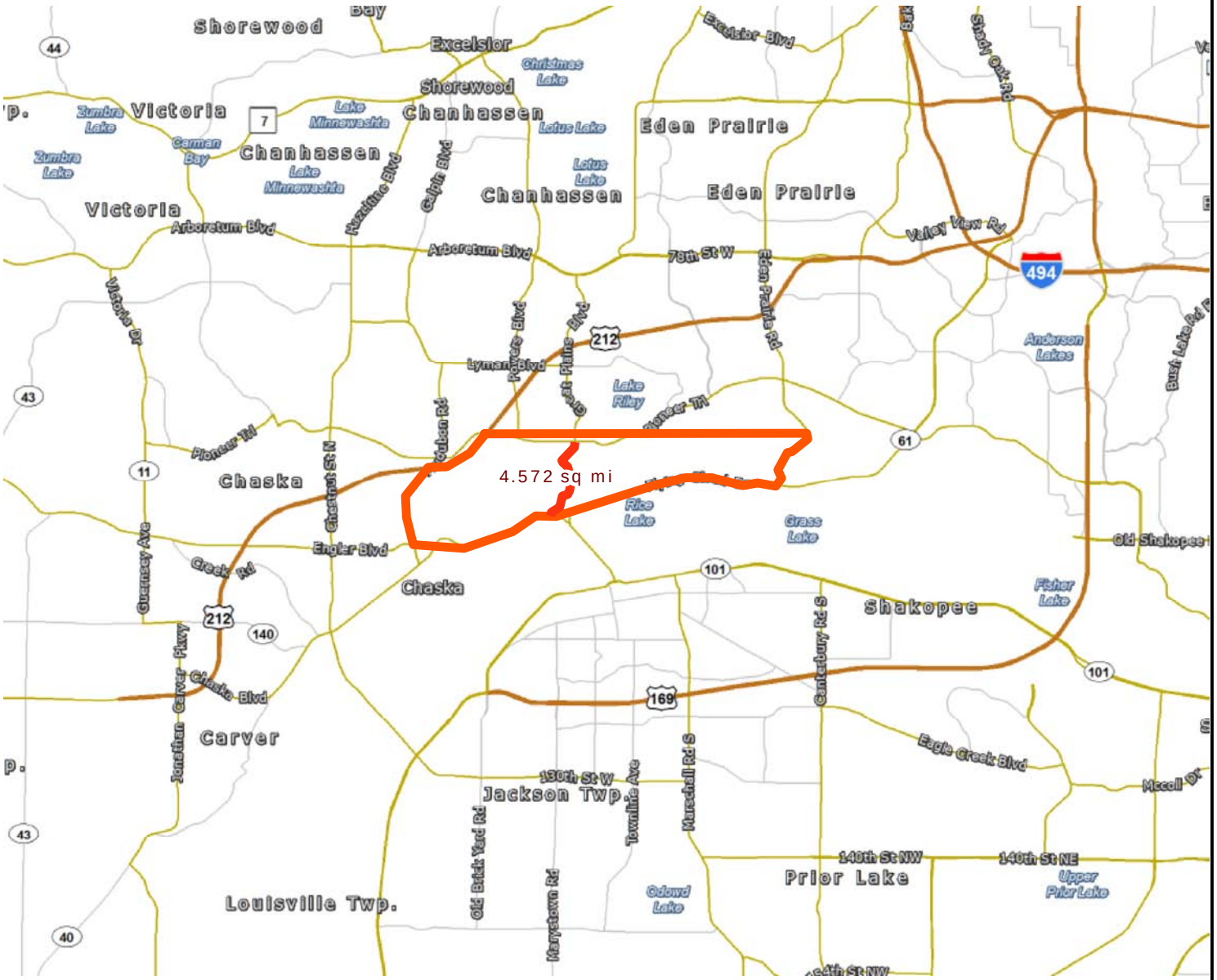
Roadway Expansion Project: TH 101 Expansion | Map ID: 1413919205928

Results

Project **NOT IN** area of Job Concentration.

Project **NOT IN** to area of Manufacturing and Distribution.

Project **NOT CONNECTED** to area of Education Institutions.



Project

Project Area

0 1.25 2.5 5 7.5 10 Miles

Created: 10/21/2014

LandscapeRSA5

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

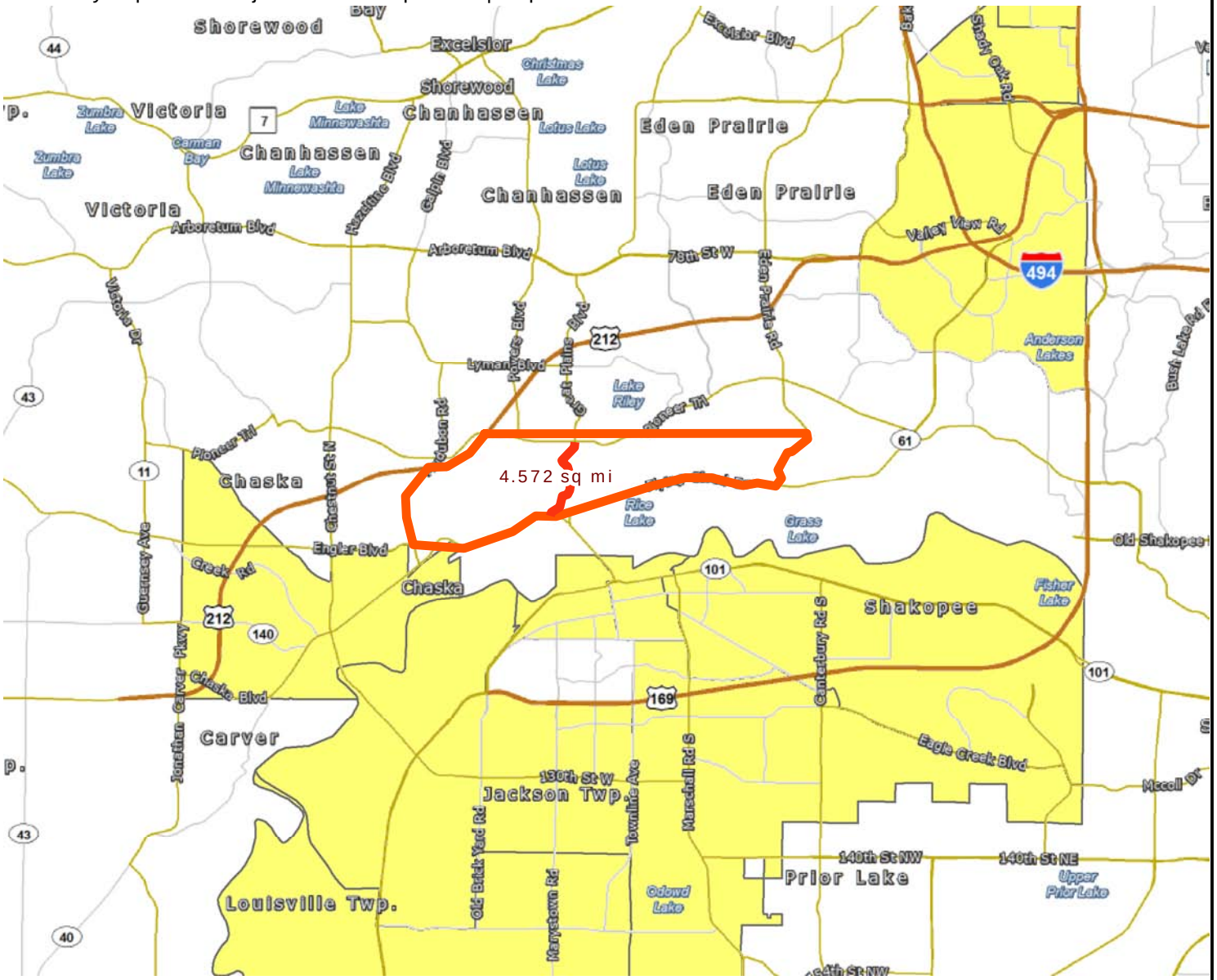
METROPOLITAN COUNCIL

Socio-Economic Conditions

Roadway Expansion Project: TH 101 Expansion | Map ID: 1413919205928

Results

Project **NOT IN** any area of concentrated poverty.



Project
Project Area
Racially concentrated area of poverty
Concentrated area of poverty
Above reg'l avg conc of race/poverty

0 1.25 2.5 5 7.5 10 Miles

Created: 10/21/2014
LandscapeRSA2

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

METROPOLITAN COUNCIL

3: TH 101 & Flying Cloud Dr

Direction	All
Volume (vph)	2497
Total Delay / Veh (s/v)	62
CO Emissions (kg)	3.50
NOx Emissions (kg)	0.68
VOC Emissions (kg)	0.81

3: TH 101 & Flying Cloud Dr

Direction	All
Volume (vph)	2496
Total Delay / Veh (s/v)	0
CO Emissions (kg)	1.68
NOx Emissions (kg)	0.33
VOC Emissions (kg)	0.39

Intersection	
Intersection Delay, s/veh	23.4
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	612	897	821	384
Demand Flow Rate, veh/h	625	915	837	392
Vehicles Circulating, veh/h	1011	589	157	1277
Vehicles Exiting, veh/h	612	128	1479	227
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	42.4	31.6	5.0	13.4
Approach LOS	E	D	A	B

Lane	Left	Right	Left	Right	Left	Right	Bypass	Left	Right	Bypass
Designated Moves	LT	R	L	TR	LT	TR	R	LT	TR	R
Assumed Moves	LT	R	L	TR	L	TR	R	LT	TR	R
RT Channelized							Free			Free
Lane Util	0.176	0.824	0.727	0.273	0.755	0.245		0.471	0.529	
Critical Headway, s	4.293	4.113	4.293	4.113	4.293	4.113		4.293	4.113	
Entry Flow, veh/h	110	515	665	250	423	137	277	163	183	46
Cap Entry Lane, veh/h	529	557	726	748	1004	1012	1938	434	462	1938
Entry HV Adj Factor	0.976	0.981	0.980	0.981	0.981	0.980	0.980	0.978	0.982	0.980
Flow Entry, veh/h	107	505	652	245	415	134	272	159	180	45
Cap Entry, veh/h	517	546	712	734	985	992	1900	424	454	1900
V/C Ratio	0.208	0.925	0.915	0.334	0.421	0.135	0.143	0.376	0.396	0.024
Control Delay, s/veh	9.8	49.4	40.0	9.0	8.4	4.9	0.0	15.4	15.0	0.0
LOS	A	E	E	A	A	A	A	C	C	A
95th %tile Queue, veh	1	11	12	1	2	0	0	2	2	0

The Flying Cloud Drive/TH 101 intersection does not have a before and after configuration that can be accurately analyzed as the Flying Cloud Drive/TH 101 intersection is currently split between four T-intersections. In order to analyze an "existing" model, all of the intersections were combined into one signalized intersection (removing the free EBR and WBT movements) that realigns TH 101. This best represents how the future "build" intersection will identify as, however, the build will be a multilane roundabout. Under the reconfigured existing intersection, delay and emissions can be identified and compared to those of build conditions.

3: TH 101 & Flying Cloud Dr

Direction	All
Volume (vph)	2497
Total Delay / Veh (s/v)	62
CO Emissions (kg)	3.50
NOx Emissions (kg)	0.68
VOC Emissions (kg)	0.81

3: TH 101 & Flying Cloud Dr

Direction	All
Volume (vph)	2496
Total Delay / Veh (s/v)	0
CO Emissions (kg)	1.68
NOx Emissions (kg)	0.33
VOC Emissions (kg)	0.39

HSIP worksheet

Control Section	T.H. / Roadway	Location	Beginning Ref. Pt.	Ending Ref. Pt.	State, County, City or Township	Study Period Begins	Study Period Ends
	Hwy 101	From south of Pioneer Trail to north of Flying Cloud Drive			Chanhassen	1/1/2011	12/31/2013

Description of Proposed Work: A Roadway expansion from 2 to 4 lanes and realinging the roadway (flattening horizontal curves)

		Accident Diagram Codes	1 Rear End	2 Sideswipe Same Direction	3 Left Turn Main Line	5 Right Angle	4,7 Ran off Road	8, 9 Head On/ Sideswipe - Opposite Direction	Pedestrian	6, 90, 99 Other	Total
Study Period: Number of Crashes	Fatal	F									
	Personal Injury (PI)	A									
		B					3				3
		C					4				4
	Property Damage	PD	1				13	1		1	16
% Change in Crashes *Use Crash Modification Factors Clearinghouse	Fatal	F									
	PI	A									
		B					-94%				
		C					-94%				
	Property Damage	PD	-87%				-94%	-94%		-91%	
Change in Crashes = No. of crashes **x** % change in crashes	Fatal	F									
	PI	A									
		B					-2.82				-2.82
		C					-3.76				-3.76
	Property Damage	PD	-0.87				-12.22	-0.94		-0.91	-14.94

Year (Safety Improvement Construction): 2019

Project Cost (exclude Right of Way): $ 13,500,000

Right of Way Costs (optional):

Traffic Growth Factor: 3%

Capital Recovery

1. **Discount Rate**: 4.5%
2. **Project Service Life (n)**: 20

Type of Crash	Study Period: Change in Crashes	Annual Change in Crashes	Cost per Crash	Annual Benefit
F			$ 1,100,000	
A			$ 550,000	
B	-2.82	-0.94	$ 160,000	$ 150,400
C	-3.76	-1.25	$ 81,000	$ 101,520
PD	-14.94	-4.98	$ 7,400	$ 36,852
Total				$ 288,772

B/C= 0.37

Using present worth values,

B= $ 5,051,754

C= $ 13,500,000

See "Calculations" sheet for amortization.

Office of Traffic, Safety and Technology **September 2014**

HSIP worksheet

Control Section	T.H. / Roadway	Location	Beginning Ref. Pt.	Ending Ref. Pt.	State, County, City or Township	Study Period Begins	Study Period Ends
	Hwy 101	Pioneer Trail intersection			Chanhassen	1/1/2011	12/31/2013

Description of Proposed Work: A Roadway expansion from 2 to 4 lanes, including a full reconstruction of the roadway

			Accident Diagram Codes: 1 Rear End	2 Sideswipe Same Direction	3 Left Turn Main Line	5 Right Angle	4,7 Ran off Road	8, 9 Head On/ Sideswipe - Opposite Direction	Pedestrian	6, 90, 99 Other	Total
Study Period: Number of Crashes	Fatal	F									
	Personal Injury (PI)	A									
		B				1					1
		C				1					1
	Property Damage	PD									
% Change in Crashes *Use Crash Modification Factors Clearinghouse	Fatal	F									
	PI	A									
		B				-57%					
		C				-57%					
	Property Damage	PD									
Change in Crashes = No. of crashes **X** % change in crashes	Fatal	F									
	PI	A									
		B				**-0.57**					**-0.57**
		C				**-0.57**					**-0.57**
	Property Damage	PD									

Year (Safety Improvement Construction): **2019**

Project Cost (exclude Right of Way)	**$ 13,500,000**
Right of Way Costs (optional)	
Traffic Growth Factor	**3%**
Capital Recovery	
1. Discount Rate	**4.5%**
2. Project Service Life (n)	**20**

Type of Crash	Study Period: Change in Crashes	Annual Change in Crashes	Cost per Crash	Annual Benefit
F			$ 1,100,000	
A			$ 550,000	
B	-0.57	-0.19	$ 160,000	$ 30,400
C	-0.57	-0.19	$ 81,000	$ 15,390
PD			$ 7,400	
Total				**$ 45,790**

B/C= 0.06

Using present worth values,

B= $ 801,047

C= $ 13,500,000

See "Calculations" sheet for amortization.

Office of Traffic, Safety and Technology **September 2014**

HSIP worksheet

Control Section	T.H. / Roadway	Location	Beginning Ref. Pt.	Ending Ref. Pt.	State, County, City or Township	Study Period Begins	Study Period Ends
	Hwy 101	Flying Cloud Drive Intersections			Chanhassen	1/1/2011	12/31/2013

Description of Proposed Work: Roadway expansion from 2 to 4 lanes and changing from signal to multilane roundabout control

			Accident Diagram Codes: 1 Rear End	2 Sideswipe Same Direction	3 Left Turn Main Line	5 Right Angle	4,7 Ran off Road	8, 9 Head On/ Sideswipe - Opposite Direction	Pedestrian	6, 90, 99 Other	Total
Study Period: Number of Crashes	Fatal	F									
	Personal Injury (PI)	A									
		B									
		C	3								3
	Property Damage	PD	5	1	1	1		1			9
% Change in Crashes *Use Crash Modification Factors Clearinghouse	Fatal	F									
	PI	A									
		B									
		C	-75%								
	Property Damage	PD	-75%	-71%	-85%	-71%		-71%			
Change in Crashes = No. of crashes **X** % change in crashes	Fatal	F									
	PI	A									
		B									
		C	-2.25								-2.25
	Property Damage	PD	-3.75	-0.71	-0.85	-0.71		-0.71			-6.73

Year (Safety Improvement Construction): 2019

		Type of Crash	Study Period: Change in Crashes	Annual Change in Crashes	Cost per Crash	Annual Benefit
Project Cost (exclude Right of Way)	$ 13,500,000					
Right of Way Costs (optional)		F			$ 1,100,000	
Traffic Growth Factor	3%	A			$ 550,000	
Capital Recovery		B			$ 160,000	
1. Discount Rate	4.5%	C	-2.25	-0.75	$ 81,000	$ 60,750
2. Project Service Life (n)	20	PD	-6.73	-2.24	$ 7,400	$ 16,601
		Total				$ 77,351

B/C= 0.10

Using present worth values,

B= $ 1,353,166

C= $ 13,500,000

See "Calculations" sheet for amortization.

Office of Traffic, Safety and Technology **September 2014**

TH 101 - created on 11-03-2014 by imsd1jac

Crash data is managed by the Mn/DOT Office of Traffic, Safety, and Operations.

SYS	NUM	REF_POINT	GIS_ROUTE	GIS_TM	RD_DIR	ELEM	RELY	INV	R_U	ATP
~~10~~	~~06400071~~	~~000+00.000~~	~~1006400071~~	~~0.000~~	~~Z~~	~~—~~	~~3~~	~~2~~	~~U~~	~~D#1 STATED SHE WAS DRIVING NE ON LAKOTA LN. D#2 STATED V#2 WAS PARKED IN FRONT OF 415 LAKOTA LN ON~~
03	00000101	008+00.902	0300000101	8.902	Z		1	2	U	UNIT 1 WAS EAST ON CO. RD. 61 APPROACHING HWY 101. UNIT 1 STATED SHE WAS WATCHING THE CAR INFRONT
03	00000101	008+00.902	0300000101	8.902	Z		2	0	U	
03	00000101	008+00.902	0300000101	8.902	S		1	2	U	V2 WAS SLOWED TO MAKE A RIGHT TURN INTO 575 FLYING CLOUD DR. D2 SAID HE ACTIVATED THE TURN SIGNAL.
03	00000101	008+00.902	0300000101	8.902	Z		1	1	U	-BOTH VEHICLES N/B 101 -DV2 STOPPED IN TRAFFIC -DV1 SAID SHE LOOKED AWAY TO BLOW HER NOSE AND WHEN
03	00000101	008+00.902	0300000101	8.902	Z		1	1	U	-BOTH VEHICLES S/B 101 TO GO E/B CR 61 -DV2 STOPPED IN TRAFFIC AND YIELDED RIGHT OF WAY TO A N/B VE
03	00000101	008+00.902	0300000101	8.902	Z		1	2	U	ON 05/15/2013 AT 1651 HOURS, THERE WAS A MINOR PROPERTY DAMAGE CRASH AT THE INTERSECTION OF MNTH 10
03	00000101	008+00.902	0300000101	8.902	S		1	1	U	V1 STOPPED IN TRAFFIC. V2 WAS UNABLE TO STOP BEFORE HITTING V1. THEN V3 STRUCK V2 AND PUSHED INTO
03	00000101	008+00.902	0300000101	8.902	E		B	1	U	DV1 N/B 101 DV2 S/B 101 -V1 SLIDES INTO V2 -MINOR
03	00000101	009+00.022	0300000101	9.022	Z		A	1	U	V/1 AND V/2 BOTH HEADED EAST ON MNTH 101/CSAH 61 I
03	00000101	009+00.037	0300000101	9.037	Z		A	2	U	UNIT 1 WAS W/B ON CTY RD 61 AND THOUGHT SHE HAD A
03	00000101	009+00.037	0300000101	9.037	Z		1	2	U	V#2 STOPPED FOR LIGHT TO TURN TO SB HWY 101. V#1 BEHIND V#2 WAITING TO TURN SB 101. D#1 STATED HE
03	00000101	009+00.037	0300000101	9.037	N		1	2	U	UNIT 1 WAS DRIVING NORTH ON HWY 101 APPROACHING A GREEN LIGHT AT CO. RD. 61. UNIT 2 WAS NORTHBOUND
03	00000101	009+00.147	0300000101	9.147	Z		B	1	U	V1 WAS ON 101 SB AND LOST CONTROL OF VEHICLE. D1 W
03	00000101	009+00.173	0300000101	9.173	Z		A	2	U	AN UNKNOWN SOUTHBOUND HWY 101 VEHICLE RAN OFF THE
03	00000101	009+00.217	0300000101	9.217	Z		3	2	U	UNIT 1 WAS SOUTH ON 101, LOST CONTROL OF HER VEHICLE SLID OVER THE CENTERLINE, GRAZED UNIT 2 AND TH
03	00000101	009+00.262	0300000101	9.262	Z		1	0	U	
03	00000101	009+00.393	0300000101	9.393	Z		B	2	U	VEHICLE DRIVING NORTH UPHILL GRADE ON HWY 101. DR
03	00000101	009+00.433	0300000101	9.433	Z		A	2	U	V/1 WAS S/B HWY 101 APPROX. 300 FEET SOUTH OF LAKO
03	00000101	009+00.436	0300000101	9.436	Z		A	2	U	UNIT 1 WAS SOUTH ON HWY 101. UNIT 2 WAS NORTH ON
03	00000101	009+00.477	0300000101	9.477	Z		A	2	U	D#1 STATED HE WAS NB HWY 101, SOUTH OF LAKOTA LN.
03	00000101	009+00.493	0300000101	9.493	Z		1	2	U	ON 12/04/2013 AT 0930 HOURS, THERE WAS A ONE VEHICLE PROPERTY DAMAGE CRASH AT THE INTERESECTION OF
03	00000101	009+00.580	0300000101	9.580	Z		B	1	U	-DV1 N/B 101 -DV1 LOST CONTROL, LEFT THE ROADWAY,
03	00000101	009+00.979	0300000101	9.979	S		A	2	U	DRIVER OF UNIT 1 WAS SOUTH ON STATE HIGHWAY 101. D
03	00000101	009+00.979	0300000101	9.979	Z		A	2	U	THE DRIVER OF UNIT 1 SAID HE WAS SOUTHBOUND ON HWY
03	00000101	009+00.979	0300000101	9.979	Z		A	2	U	UNIT #1 TRAVELLING SB ON HWY. 101. UNIT #1 SKIDDED
03	00000101	009+00.979	0300000101	9.979	Z		A	2	U	UNIT 1 WAS SOUTHBOUND ON GREAT PLAINS BLVD AND ITS
03	00000101	009+00.979	0300000101	9.979	Z		A	2	U	UNIT 1 WAS SOUTHBOUND ON GREAT PLAINS BLVD/HWY 101
03	00000101	009+00.979	0300000101	9.979	Z		A	2	U	UNIT 1 RAN OFF THE ROAD TO THE RIGHT AND STRUCK A
03	00000101	009+00.979	0300000101	9.979	S		A	1	U	-V1 WAS S/B 101 -V1 LOST CONTROL WHILE GOING AROUN
03	00000101	009+00.979	0300000101	9.979	Z		A	2	U	DRIVER OF VEHICLE #1 WAS TRAVELLING SOUTH ON MN #1
03	00000101	009+00.990	0300000101	9.990	S		A	2	U	V1 WAS TRAVELING SOUTH THROUGH THE CURVE ON GREAT
03	00000101	010+00.000	0300000101	10.000	Z		A	2	U	UNIT 1 WAS SOUTHBOUND ON HWY 101/GREAT PLAINS BLVD
03	00000101	010+00.000	0300000101	10.000	Z		A	2	U	WHEN ASKED IF AMBULANCE NEEDED.
03	00000101	010+00.000	0300000101	10.000	Z		A	2	U	UNIT 1 WAS NORTH ON HWY 101 APPROACHING A SHARP CU
03	00000101	010+00.124	0300000101	10.124	Z		1	2	U	ON 11/22/2013 AT 1222 HOURS THERE WAS A TWO VEHICLE PROPERTY DAMAGE CRASH NEAR THE INTERSECTION OF
~~03~~	~~00000101~~	~~010+00.132~~	~~0300000101~~	~~10.132~~	~~Z~~	~~—~~	~~1~~	~~2~~	~~U~~	~~UNIT 1 WAS SOUTH ON HWY 101, NORTH OF BRAMBLE DR.I~~
03	00000101	010+00.261	0300000101	10.261	N		1	1	U	-V1 WAS E/B PIONEER TRL. -V2 WAS N/B 101 -V1 AND V2 COLLIDED IN THE INTERSECTION. -DRIVER OF V1 STA
03	00000101	010+00.262	0300000101	10.262	Z		1	2	U	VEHICLE 1 TRAVELING NB HIGHWAY 101 APPROACHING INTERSECTION WITH PIONEER TRAIL. DRIVER 1 STATED NB

CO	CITY	DOW	MONTH	DAY	YEAR	TIME	SEV	NUM_KILLED	NUM_VEH	JUNC	SL	TYPE	DIAG	LOC1	TCD	LIT	WTHR1	WTHR2
~~10~~	~~0640~~	~~4-Wed~~	~~3~~	~~20~~	~~2013~~	~~1145~~	~~N~~	~~0~~	~~2~~	~~1~~	~~30~~	~~2~~	~~2~~	~~1~~	~~98~~	~~1~~	~~1~~	~~1~~
10	0640	4-Wed	7	6	2011	1149	N	0	2	4	55	1	3	1	1	1	1	0
10	0640	3-Tue	2	22	2011	0740	N	0	2	0	50	1	1	0	98	1	4	0
10	0640	7-Sat	8	13	2011	1316	N	0	2	1	55	1	1	1	98	1	1	0
10	0640	3-Tue	11	13	2012	1649	C	0	2	1	50	1	1	1	98	1	2	0
10	0640	2-Mon	3	25	2013	1509	N	0	2	4	50	1	1	1	1	1	1	0
10	0640	4-Wed	5	15	2013	1651	N	0	2	2	30	1	1	1	1	1	1	0
10	0640	6-Fri	8	9	2013	1822	C	0	3	1	50	1	1	1	98	1	1	0
10	0640	4-Wed	3	23	2011	0918	N	0	2	2	50	3	9	1	1	1	4	0
10	0640	6-Fri	8	16	2013	1800	C	0	2	7	50	1	1	1	98	1	1	0
10	0640	4-Wed	1	30	2013	1050	N	0	2	4	50	1	5	1	1	1	2	0
10	0640	6-Fri	4	6	2012	1700	N	0	2	3	50	1	1	1	1	1	1	0
10	0640	6-Fri	8	17	2012	0709	N	0	2	2	50	1	2	1	1	1	1	0
10	0640	4-Wed	6	5	2013	0721	C	0	1	1	50	32	7	2	98	1	2	0
10	0640	3-Tue	1	8	2013	0735	N	0	1	1	30	34	4	2	98	1	2	0
10	0640	2-Mon	1	10	2011	1333	N	0	3	1	40	1	90	1	98	1	4	0
10	0640	3-Tue	5	1	2012	2100	C	0	1	0	40	39	7	0	98	7	3	0
10	0640	3-Tue	4	17	2012	1332	B	0	1	1	40	37	7	2	98	1	1	1
10	0640	7-Sat	12	3	2011	1828	N	0	1	1	40	30	4	4	98	6	4	0
10	0640	2-Mon	1	31	2011	0805	N	0	2	1	40	1	8	1	98	1	4	0
10	0640	1-Sun	7	15	2012	0924	N	0	1	1	40	37	7	1	98	1	2	2
10	0640	4-Wed	12	4	2013	0930	N	0	1	2	45	30	4	4	98	1	4	0
10	0640	2-Mon	2	11	2013	1249	C	0	1	1	40	30	7	3	98	1	2	0
10	0640	7-Sat	2	4	2012	1045	N	0	1	1	40	26	7	2	98	1	2	0
10	0640	1-Sun	7	22	2012	1613	B	0	1	1	45	37	7	4	98	1	1	0
10	0640	1-Sun	8	19	2012	1939	N	0	1	1	40	39	7	2	98	3	1	0
10	0640	7-Sat	9	29	2012	1133	B	0	1	1	45	39	7	8	98	1	1	0
10	0640	2-Mon	10	1	2012	1440	N	0	1	1	40	26	7	4	98	1	1	0
10	0640	2-Mon	10	8	2012	1928	N	0	1	1	40	41	7	2	98	4	1	0
10	0640	3-Tue	10	16	2012	1524	N	0	1	1	40	35	7	4	98	1	1	0
10	0640	5-Thu	10	25	2012	0530	N	0	1	1	15	26	7	2	98	4	3	8
10	0640	6-Fri	3	30	2012	1808	N	0	1	1	40	35	7	4	98	1	1	0
10	0640	2-Mon	12	19	2011	1331	N	0	1	1	45	30	7	8	98	1	1	0
10	0640	4-Wed	12	21	2011	1116	N	0	1	1	40	37	7	4	98	1	1	0
10	0640	6-Fri	1	27	2012	1439	C	0	1	1	40	35	4	90	98	1	1	4
10	0640	6-Fri	11	22	2013	1222	N	0	2	2	45	1	1	1	98	1	1	0
~~10~~	~~0640~~	~~3-Tue~~	~~6~~	~~28~~	~~2011~~	~~1120~~	~~N~~	~~0~~	~~1~~	~~1~~	~~40~~	~~8~~	~~98~~	~~1~~	~~98~~	~~1~~	~~1~~	~~0~~
10	0640	2-Mon	11	5	2012	1426	C	0	2	4	40	1	5	1	1	1	1	0
10	0640	7-Sat	11	10	2012	1309	B	0	2	4	50	1	5	1	1	1	2	2

				PERSON1											PERSON2			
SURF	CHAR	DESGN	ACC_NUM	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX	VTYPE	DIR	ACT	FAC1
~~3~~	~~5~~	~~90~~	~~130790117~~	~~31~~	~~1~~	~~1~~	~~7~~	~~0~~	~~1~~	~~N~~	~~4~~	~~1~~	~~43~~	~~F~~				
1	1	90	111880084	1	3	1	15	5	1	N	4	1	76	F	3	5	0	1
4	0	0	110960043	3	1	1	0	0	1	N	0	0	39	F	1	1	1	0
1	1	8	112250091	2	3	5	1	0	1	N	4	1	66	M	1	3	1	15
1	1	8	123180255	1	1	1	15	0	1	N	4	1	17	F	3	1	11	1
1	1	8	130880198	3	5	1	15	4	1	N	4	1	60	M	2	5	11	1
1	1	8	131360111	1	5	3	1	0	1	N	4	1	55	M	1	5	3	15
1	1	8	132260225	1	5	11	1	0	1	N	4	1	38	F	1	5	1	18
4	5	8	110820439	32	1	6	46	0	1	N	4	1	60	M	2	5	11	1
1	1	8	132290154	3	3	1	4	0	1	N	4	1	17	M	3	3	1	99
1	1	6	130300119	1	7	1	99	0	1	N	4	1	45	F	4	5	6	99
1	1	8	120970101	3	4	1	4	15	1	N	4	1	37	M	1	4	1	1
1	5	3	122300116	3	1	13	4	0	1	N	4	1	22	M	1	1	1	1
2	1	3	131880125	1	5	90	21	0	1	C	4	1	34	M	53	5	51	1
2	2	8	130080129	99	5	0	0	0	1	N	98	0	901	Z				
3	6	8	110110089	3	1	1	1	0	1	N	4	1	41	M	3	1	1	1
2	0	0	121560059	1	5	1	0	0	1	C	4	0	17	M	1	5	1	0
1	6	8	121080100	11	1	1	3	46	1	B	12	1	24	M				
5	6	8	113370208	1	5	1	1	0	1	N	4	1	27	F	1	5	1	1
3	6	8	110330163	3	1	1	1	0	1	N	4	1	899	M	1	5	1	61
2	6	8	122280056	4	1	1	3	0	1	N	4	1	18	M				
3	3	8	133380121	1	5	1	3	0	1	N	4	1	32	F				
2	6	8	130430253	1	1	1	3	90	1	C	4	90	29	F				
2	5	8	120350072	1	5	1	3	0	1	N	4	1	46	M	1	5	1	3
1	6	8	122040089	11	5	1	3	0	1	N	11	1	55	M	11	5	1	3
1	5	8	122330022	1	5	1	46	0	1	N	4	1	42	M	1	5	1	46
1	6	8	122730079	11	4	1	3	0	1	B	12	1	55	M				
1	6	8	122760016	3	5	1	21	0	1	N	4	1	46	F				
1	5	8	122830010	1	4	1	15	0	1	N	4	1	32	M				
1	5	8	122930222	1	5	1	3	0	1	N	4	1	18	M	1	5	1	3
2	5	8	122990204	1	5	1	3	61	1	N	4	1	20	F				
1	6	8	120900126	11	5	1	3	0	1	N	0	1	46	M				
1	6	8	113530108	3	5	1	3	0	1	N	4	1	67	M				
1	5	8	113550075	3	5	1	3	0	1	N	4	1	53	F				
2	5	8	120270118	2	1	1	18	0	1	C	99	2	80	M				
1	3	8	133260091	1	5	1	4	0	1	N	4	1	26	F	1	5	1	1
~~1~~	~~5~~	~~8~~	~~111790223~~	~~1~~	~~5~~	~~1~~	~~1~~	~~0~~	~~1~~	~~N~~	~~4~~	~~1~~	~~15~~	~~M~~	~~1~~	~~5~~	~~1~~	~~1~~
1	2	8	123190221	3	3	1	5	0	1	N	4	1	47	M	1	1	1	1
2	1	8	123150093	1	3	1	5	2	1	N	4	1	44	M	1	1	1	1

							PERSON3											PERSON4		
FAC2	POSN	INJ	EQP	PHYS	AGE	SEX	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX	VTYPE	DIR	ACT
0	1	N	4	1	49	M	3	5												
0	1	N	4	0	18	F	3	1												
0	1	N	4	1	27	F														
0	1	C	4	1	53	F														
0	1	N	4	1	53	M														
0	1	N	4	1	29	M														
0	1	C	4	3	54	M	1	5												
0	1	N	4	1	54	M														
0	1	C	4	1	35	F														
0	1	N	4	1	55	M														
1	1	N	4	1	49	F														
0	1	N	4	1	51	F														
0	34	N	98	1	42	U														
0	1	N	4	1	46	F	1	5												
0	3	C	4	98	18	F														
0	3	N	4	98	28	M														
0	1	N	4	1	45	M														
0	3	N	4	98	46	F														
0	14	B	11	98	50	F														
0	3	N	4	98	41	F														
0	3	N	4	98	18	M														
0	1	N	4	1	60	F														
~~0~~	~~3~~	~~N~~	~~4~~	~~98~~	~~47~~	~~M~~														
0	1	C	4	1	46	F														
1	1	B	4	1	46	M														

Countermeasure(s)	Crash Type	Crash Severity	Area Type	Road Type	Daily Traffic Volume (veh/day)	Ref	Effectiveness				Study Type
							Crash Reduction Factor / Function	Std Error	Range		
									Low	High	
Increase number of lanes	All	All			<5,000/lane	15	20				
	All	All			>5,000/lane	15	31				
	All	All				15	10				
	All	All				15	20				
	All	All				15	22				
	All	All				15	25				
	All	All				15	25				
	All	All				15	25				
	All	Fatal				15	39				
	All	Injury				15	23				
	All	PDO				15	27				
	Head-on	All			<5,000/lane	15	38				
	Head-on	All			>5,000/lane	15	44				
	Head-on	All				15	53				
	Head-on	All				15	53				
	Head-on	PDO				15	50				
	Left-turn	All				15	71				
	Left-turn	PDO				15	67				
	ROR	All				15	44				
	ROR	All				15	26				
	ROR	All				15	44				
	ROR	All				15	44				
	ROR	PDO				15	50				
	Overturn	All			<5,000/lane	15	42				
	Overturn	All			>5,000/lane	15	52				
	Rear-end	All			<5,000/lane	15	42				
	Rear-end	All			>5,000/lane	15	52				
	Rear-end	All				15	32				
	Rear-end	All				15	32				
	Rear-end	All				15	40				
	Rear-end	All				15	53				
	Rear-end	PDO				15	53				

Countermeasure(s)	Crash Type	Crash Severity	Area Type	Road Type	Daily Traffic Volume (veh/day)	Ref	Effectiveness				Study Type
							Crash Reduction Factor / Function	Std Error	Range		
									Low	High	
Increase number of lanes (cont'd)	Right-angle	All			<5,000/lane	15	35				
	Right-angle	All			>5,000/lane	15	45				
	Right-angle	All				15	15				
	Right-angle	PDO				15	46				
	Sideswipe	All			<5,000/lane	15	38				
	Sideswipe	All			>5,000/lane	15	44				
	Sideswipe	All				15	30				
	Sideswipe	All				15	30				
	Sideswipe	All				15	35				
	Sideswipe	PDO				15	64				
Increase vertical grade by 1%	All	All	Rural	2-lane		23	-1.6P; P=percent grade (absolute value)				
Install acceleration/ deceleration lanes	All	All				15	26				
	All	All	All	All		1	10				
	All	All				15	10				
	All	All				15	10				
	All	All				15	10				
	All	All				15	25				
	All	All				15	75				
	Rear-end	All				15	75				
	Sideswipe	All				15	75				
Install channelized lane	All	All				15	67				
	All	PDO				15	62				
	Rear-end	All				15	93				
Install climbing lane (where large difference between car and truck speed)	All	Fatal/ Injury	Rural	2-lane		38	33				

Countermeasure(s)	Crash Type	Crash Severity	Area Type	Road Type	Daily Traffic Volume (veh/day)	Ref	Effectiveness				Study Type
							Crash Reduction Factor / Function	Std Error	Range		
									Low	High	
GEOMETRIC COUNTERMEASURES											
Change shoulder type and/or width	All	All	Rural			21	100(1-((AMFWRA x AMFTRA-1.0)PRA+1.0)), AMFWRA=accident modification factor for related accidents based on shoulder width (for values of AMfWRA, refer to source), AMFTRA=accident modification factor for related accidents based on shoulder type (for values of AMFTRA, refer to source), PRA=proportion of total crashes constituted by related crashes.				Expert Panel
Flatten crest vertical curve	All	All	All	All		27	20	19			EB Before-After
	All	Fatal/ Injury	All	All		27	**51**	19			EB Before-After
	All	Fatal/ Injury	Rural	2-lane		38	50				
Flatten horizontal curve	All	All				15	39				
	All	All	All	All		1	40				
	All	All				15	35				
	All	All	Rural			21	100(1-((1.55Lc+80.2/R-0.012Is)/1.55Lc)); Lc=length of horizontal curve (mi) without spirial curve length, R=curve radius (ft), Is=presence of a spiral transition curve (1 if a spiral transition is present, 0 otherwise).				Expert Panel
	All	Fatal				15	87				
	All	Injury				15	87				
	All	PDO				15	87				
	Fixed object	All			<5,000/lane	15	68				

Countermeasure(s)	Crash Type	Crash Severity	Area Type	Road Type	Daily Traffic Volume (veh/day)	Ref	Effectiveness				Study Type
							Crash Reduction Factor / Function	Std Error	Range		
									Low	High	
Flatten horizontal curve (cont'd)	Fixed object	All			>5,000/lane	15	87				
	Head-on	All			<5,000/lane	15	67				
	Head-on	All			>5,000/lane	15	64				
	ROR	All			<5,000/lane	15	90				
	ROR	All			>5,000/lane	15	79				
	Overturn	All			<5,000/lane	15	73				
	Overturn	All			>5,000/lane	15	24				
	Rear-end	All			<5,000/lane	15	73				
	Rear-end	All			>5,000/lane	15	24				
	Rear-end	All				15	49				
Flatten horizontal curves (10 to 5 degrees)	All	All				15	45				
Flatten horizontal curves (15 to 5 degrees)	All	All				15	63				
Flatten horizontal curves (20 to 10 degrees)	All	All				15	48				
Flatten side slopes	All	All			<5,000/lane	15	43				
	All	All			>5,000/lane	15	45				
	All	All	All	All		1	30				
	All	All				15	25				
	All	All				15	30				
	All	All				15	32				
	All	All				15	35				
	Fixed object	All				15	62				
	ROR	All				15	10				

- Countermeasure: Improve pavement friction (increase skid resistance)

CMF	CRF(%)	Quality	Crash Type	Crash Severity	Area Type	Reference	Comments
0.799	20.1	★★★★☆	All	All	All	Lyon and Persaud, 2008	

-

0.667	33.3	★★★★☆	All	All	All	Lyon and Persaud, 2008	

-

0.819	18.1	★★★★☆	All	All	All	Lyon and Persaud, 2008	

-

0.797	20.3	★★★★☆	All	All	All	Lyon and Persaud, 2008	

-

1.271	-27.1	★★★★☆	All	All	All	Lyon and Persaud, 2008	

-

0.426	57.4	★★★★☆	Wet road	All	All	Lyon and Persaud, 2008	

-

0.372	62.8	★★★★☆	Wet road	All	All	Lyon and Persaud,	

0.575	42.5	★★★★☆	Rear end,Wet road	All		Lyon and Persaud, 2008
0.59	41	★★★☆☆	All	All	All	Lyon and Persaud, 2008
0.589	41.1	★★★☆☆	All	All	All	Lyon and Persaud, 2008
0.361	63.9	★★★☆☆	Wet road	All	All	Lyon and Persaud, 2008
0.304	69.6	★★★☆☆	Rear end	All	All	Lyon and Persaud, 2008
0.943	5.7	★★★☆☆	Rear end	All	All	Lyon and Persaud, 2008
0.504	49.6	★★★☆☆	Rear end	All	All	Lyon and Persaud, 2008

0.221	77.9	★★★☆☆	Rear end,Wet road	All	All	Lyon and Persaud, 2008
0.787	21.3	★★★☆☆	Angle	All	All	Lyon and Persaud, 2008
0.828	17.2	★★★☆☆	Angle	All	All	Lyon and Persaud, 2008
0.898	10.2	★★★☆☆	Angle	All	All	Lyon and Persaud, 2008
0.799	20.1	★★★☆☆	Angle,Wet road	All	All	Lyon and Persaud, 2008
0.47	53	★★★☆☆	Angle,Wet road	All	All	Lyon and Persaud, 2008
0.828	17.2	★★★☆☆	Angle,Wet road	All	All	Lyon and Persaud, 2008

Countermeasure(s)	Crash Type	Crash Severity	Area Type	Config	Control	Major Daily Traffic Volume (veh/day)	Minor Daily Traffic Volume (veh/day)	Ref	Obs	Effectiveness: Crash Reduction Factor / Function	Effectiveness: Std Error	Effectiveness: Range Low	Effectiveness: Range High	Study Type
OTHER GEOMETRIC COUNTERMEASURES														
Convert four-leg to two T-intersections	All	All		4-Leg	No signal			28		57				
	All	Fatal/Injury	Urban	4-Leg		<70%*	>30%*	13		**33**	6			Meta-analysis
	All	Fatal/Injury	Urban	4-Leg		>85%*	<15%*	13		**-35**	15			Meta-analysis
	All	Fatal/Injury	Urban	4-Leg		70-85%*	15-30%*	13		**25**	5			Meta-analysis
	All	PDO	Urban	4-Leg		<70%*	>30%*	13		**10**	5			Meta-analysis
	All	PDO	Urban	4-Leg		>85%*	<15%*	13		**-15**	6			Meta-analysis
	All	PDO	Urban	4-Leg		70-85%*	15-30%*	13		0	5			Meta-analysis
	All	All		4-Leg				51		57				Meta-analysis
Convert intersection to roundabout	All	All	All		All			50	55	**35**	3			EB Before-After
	All	All	All		Signal			50	9	**48**	5			EB Before-After
	All	All	All		Signal			21	23	40				EB Before-After
	All	All	All		Stop (2-way)			50	36	**44**	4			EB Before-After
	All	All	All		Stop (4-way)			50	10	-3	15			EB Before-After
	All	All	Rural	1-lane	Stop (2-way)			50	9	**72**	4			EB Before-After
	All	All	Rural		Stop	7,185-17,220		44		**58**	7			EB Before-After
	All	All		3-Leg				15		50				Simple Before-After
	All	All		4-Leg				15		75				Simple Before-After

* Percentage of Total Daily Traffic Volume

Countermeasure(s)	Crash Type	Crash Severity	Area Type	Config	Control	Major Daily Traffic Volume (veh/day)	Minor Daily Traffic Volume (veh/day)	Ref	Obs	Effectiveness: Crash Reduction Factor / Function	Effectiveness: Std Error	Effectiveness: Range Low	Effectiveness: Range High	Study Type
Convert intersection to roundabout (cont'd)	All	Fatal/Injury						55	181	65				Simple Before-After
	All	PDO						55	181	42				Simple Before-After
	Ped	All						55	181	89				Simple Before-After
	All	All	Urban		Stop	13,272-30,418		44		5	10			EB Before-After
	All	All	Urban		Signal	5,322-31,525		44		**35**	9			EB Before-After
	All	All	Urban		Signal			50	5	1	12			EB Before-After
	All	All	Urban		Signal			21	4	35				EB Before-After
	All	All	Urban		Stop (2-way)			50	27	**31**	6			EB Before-After
	All	All	Urban	1-lane	Stop (2-way)			50	16	**56**	6			EB Before-After
	All	All	Urban	2-lane	Signal			50	4	**67**	4			EB Before-After
	All	All	Urban	2-lane	Stop (2-way)			50	11	**18**	8			EB Before-After
	All	All	Urban		Stop	4,600-17,825		44		**72**	6			EB Before-After
	All	Fatal/Injury	All		All			50	55	**76**	3			EB Before-After
	All	Fatal/Injury	All		Signal			50	9	**78**	6			EB Before-After
	All	Fatal/Injury	All		Stop (2-way)			50	36	**82**	3			EB Before-After

Dual CRF for Hwy 101 from Pioneer Trail to North of the Hwy 101/Flying Cloud Drive intersection

Improvements include a 2 lane to 4 lane conversion and realigning the roadway (reducing curvature). It should be noted that each lane of the roadway is expected to have less than 5,000 vehicles per day.

CR1=Increase Number of Lanes
CR2=Flatten Horizontal Curvature

CR=1 – (1-CR1)*(1-CR2)

Other Crashes: CR=1 – (1-.31)*(1-.87) = .91
Run off Road/Head On/Sideswipe: CR=1 – (1-.44)*(1-.90) = .94
Right Angle: CR=1 – (1-.45)*(1-.87) = .93
Left-Turn: CR=1 – (1-.71)*(1-.87) = .96
Rear End: CR=1 – (1-.52)*(1-.73) = .87

Dual CRF for Hwy 101/Pioneer Trail

Improvements include a 2 lane to 4 lane conversion and reconstructing the roadway (improving pavement friction)

CR1=Increase Number of Lanes
CR2=Improve Pavement Friction

CR=1 – (1-CR1)*(1-CR2)

Right Angle: CR=1 – (1-.45)*(1-.21) = .57

Dual CRF for Hwy 101/Flying Cloud Drive intersections

Improvements include a 2 lane to 4 lane conversion and converting from signal control to multilane roundabout control.

CR1=Increase Number of Lanes
CR2=Convert from signal to roundabout

CR=1 – (1-CR1)*(1-CR2)

Other Crashes (PDO): CR=1 – (1-.31)*(1-.48) = .64
Other Crashes (Fatal/Injury): CR=1 – (1-.31)*(1-.78) = .85
Run off Road/Head On/Sideswipe: CR=1 – (1-.44)*(1-.48) = .71
Right Angle: CR=1 – (1-.45)*(1-.48) = .71
Left-Turn: CR=1 – (1-.71)*(1-.48) = .85
Rear End: CR=1 – (1-.52)*(1-.48) = .75

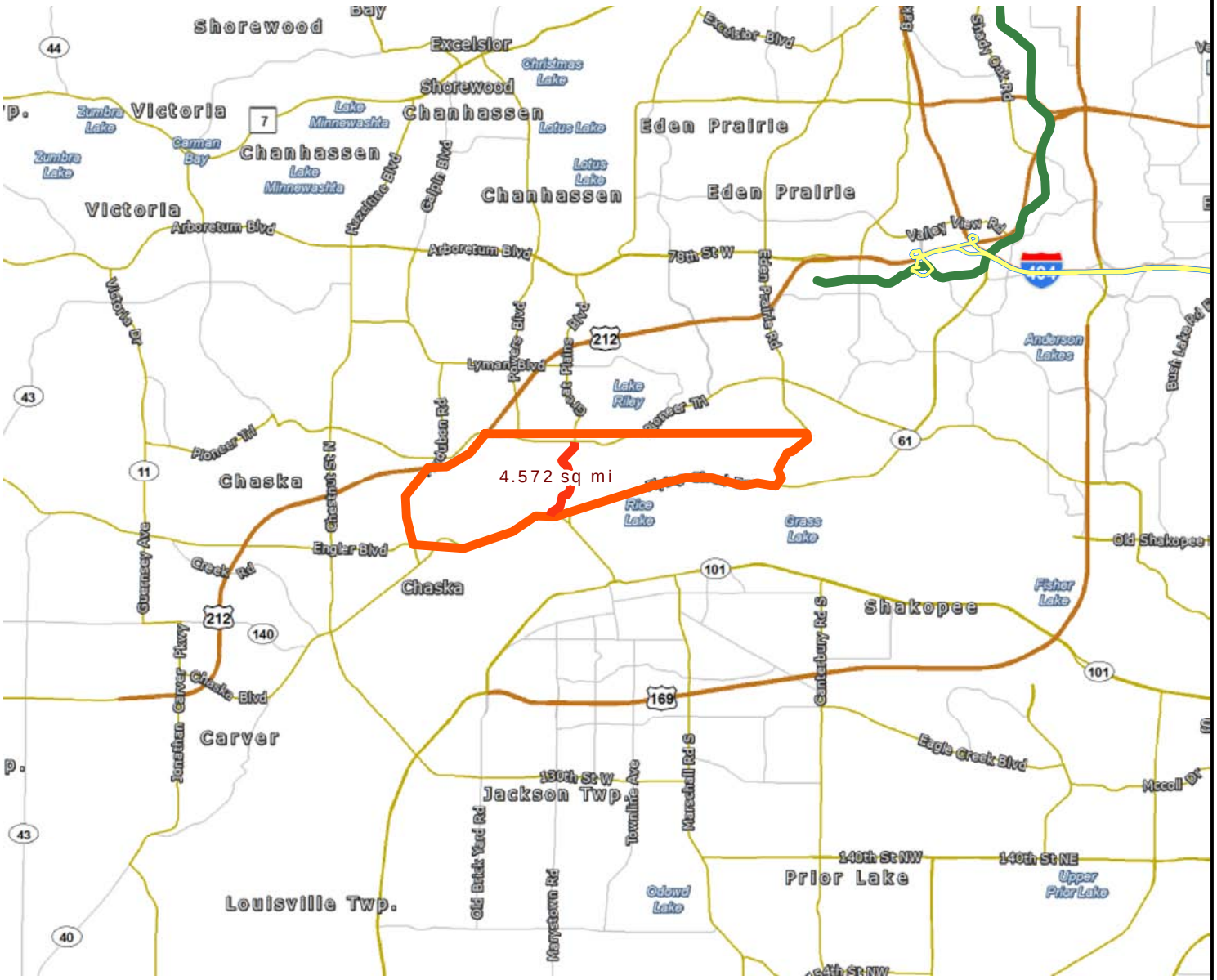
Transit Connections

Roadway Expansion Project: TH 101 Expansion | Map ID: 1413919205928

Results

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

**indicates Planned Alignments*



Project
Project Area

Planned Alignments

Light Rail, Green Line Extension
Arterial BRT

0 1.25 2.5 5 7.5 10 Miles

Created: 10/21/2014
LandscapeRSA3

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METROPOLITAN COUNCIL