Application

04774 - 2016 Roadway Modernization

05139 - CSAH 32 (Penn Ave) Reconstruction

Regional Solicitation - Roadways Including Multimodal Elements

Status:	Submitted
Submitted Date:	07/15/2016 10:41 AM

Primary Contact

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

Organization Information

Name:	HENNEPIN COUNTY

Jurisdictional Agency (if different):

Organization Type: County Government

Organization Website:

Address: DPT OF PUBLIC WORKS

1600 PRAIRIE DR

*	MEDINA	Minnesota	55340
	City	State/Province	Postal Code/Zip

County: Hennepin

Phone:* 763-745-7600 Ext.

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PeopleSoft Vendor Number 0000028004A9

Project Information

Project Name CSAH 32 (Penn Ave) Reconstruction Project

Primary County where the Project is Located Hennepin

Jurisdictional Agency (If Different than the Applicant):

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

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

The CSAH 32 (Penn Ave) Reconstruction Project will reconstruct a 1.26 mile section of Penn Ave in Richfield. The existing roadway has reached the end of its useful life and warrants a full reconstruction. The project objectives are to improve safety and operations, and to facilitate vehicle, freight, transit, bicycle, and pedestrian movements through the area. Penn Ave is classified as an "A-Minor" Arterial roadway that functions as a Reliever.

The proposed cross section will maintain a 3-lane roadway for a majority of the project length to provide access to the surrounding trip generators, support the county's Complete Streets Policy, and address safety concerns. However, a 4-lane roadway will be provided for 1 block on the north and south ends of the project to provide additional through lane capacity at relatively congested signalized intersections. The project will include, but not limited to, the following elements:

- Pedestrian improvements such as ADA compliant ramps and sidewalk, Accessible Pedestrian Signals (APS), durable crosswalk markings, countdown timers, streetscaping, and landcaping.

- Bicycle improvements such as a new dedicated bicycle facility
- Safety improvements such as traffic signal and lighting upgrades, removal of free right islands, and installation of turn lanes (when warranted by traffic patterns and safety concerns)

- Roadway improvements such as a new pavement surface, curb and gutter, stormwater structures, and durable pavement markings.

TIP Description Guidance (will be used in TIP if the project is selected for funding)	CSAH 32 (PENN AVE) FROM 0.03 MILE S OF W 76TH ST to 0.02 MI S OF CSAH 53 (W 66TH ST) IN RICHFIELD - RECONSTRUCT ROADWAY, CURB AND GUTTER, SIDEWALK, TRAFFIC SIGNALS, AND STREETSCAPING. INSTALL BIKEWAY FACILITY.
Project Length (Miles)	1.26

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	$3,310,000.00
Minimum of 20% of project total	
Project Total	$10,310,000.00
Match Percentage	32.1%
Minimum of 20% *Compute the match percentage by dividing the match amount by the project total*	
Source of Match Funds	Local

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:

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)	$390,000.00
Removals (approx. 5% of total cost)	$390,000.00
Roadway (grading, borrow, etc.)	$580,000.00
Roadway (aggregates and paving)	$1,280,000.00
Subgrade Correction (muck)	$10,000.00
Storm Sewer	$1,020,000.00
Ponds	$110,000.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$610,000.00

Traffic Control	$440,000.00
Striping	$140,000.00
Signing	$40,000.00
Lighting	$540,000.00
Turf - Erosion & Landscaping	$540,000.00
Bridge	$0.00
Retaining Walls	$80,000.00
Noise Wall (do not include in cost effectiveness measure)	$0.00
Traffic Signals	$580,000.00
Wetland Mitigation	$0.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$2,030,000.00
Other Roadway Elements	$0.00
Totals	**$8,780,000.00**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Path/Trail Construction	$0.00
Sidewalk Construction	$570,000.00
On-Street Bicycle Facility Construction	$480,000.00
Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$100,000.00
Crossing Aids (e.g., Audible Pedestrian Signals, HAWK)	$30,000.00
Pedestrian-scale Lighting	$0.00
Streetscaping	$0.00
Wayfinding	$0.00
Bicycle and Pedestrian Contingencies	$350,000.00
Other Bicycle and Pedestrian Elements	$0.00
Totals	**$1,530,000.00**

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
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	$10,310,000.00
Construction Cost Total	$10,310,000.00
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 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.

A) Transportation System Stewardship: The existing roadway has reached the end of its useful life and warrants a full reconstruction. The reconstruction of CSAH 32 provides a new and structurally adequate roadway that accommodates 2040 forecast traffic volumes. CSAH 32 carries 11,200 vehicles daily and is classified as an "A-Minor" Arterial that functions as a Reliever.

B) Safety/Security: Improves pedestrian safety by replacing deteriorating sidewalks, adding boulevards, removing free right islands and pedestrian obstructions, and installing ADA compliant ramps. Through a variety of signal improvements and lane realignments, the overall average crash reduction expected is 52% (48% crash modification factor). The lighting has reached the end of its useful life and will be replaced.

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

C) Access to Destinations: This roadway section serves numerous Metro Transit routes. The proposed 76th Street Station (Orange Line BRT), is within walking distance of this project. The proposed ped/bike enhancements connect population and employment hubs directly to transit stations. Students at Richfield Middle School and South Education Center will also benefit from these enhancements.

D) Competitive Economy: With 41,169 employees within 1 mile, this corridor serves as an employment hub. Penn Ave & 66th St is a popular commercial center with many locally owned businesses. Pedestrian and bicycle amenities and overall improvements to the roadway will enhance the general character of the area, attracting customers and generating future investment to the area.

E) Healthy Environment: This project provides first/last mile connections to numerous existing Metro Transit routes, which capitalizes on ridership potential. With the current roadway drainage deficiencies, the county has already initiated partnership opportunities with the local governing units to research stormwater BMPs to go beyond compliance to reduce runoff.

F) Leveraging Transportation Investments to Guide Land Use: Richfield is a relatively dense city with a street network based on the grid system that provides exceptional transportation connections for all modes. Multifamily housing and apartment buildings are common along CSAH 32, interspersed with single family homes and commercial destinations. The multi-modal enhancements made through this project support the optimization of existing infrastructure.

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.

The CSAH 32 (Penn Ave) Reconstruction Project is included in the Hennepin County board approved 2016-2020 Capital Improvement Program as a provisional project. Although there is no funding currently allocated for this project, the county board acknowledges a need to reconstruct Penn Ave in Richfield (Attachment 5A).

Penn Ave is identified as a recommended bikeway network in the Hennepin County Bicycle Transportation Plan as well as the Richfield Bicycle Master Plan (Attachments 5B and 5C).

List the applicable documents and pages:

The CSAH 32 (Penn Ave) Reconstruction Project provides improvements that will directly benefit users of the future Orange BRT Line that has a station proposed at 76th St in Richfield (Attachment 5D).

Additionally, the City of Richfield completed a Revitalization Master Plan for Penn Ave in 2008. This reconstruction project will include some improvements to support the goals listed in the plan (Attachment 5E).

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	Hennepin County
Functional Class of Road	CSAH 32 (Penn Ave) is classified as an "A" Minor Arterial that functions as a Reliever.
Road System *TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET*	CSAH - County State Aid Highway
Road/Route No. *i.e., 53 for CSAH 53*	32
Name of Road *Example; 1st ST., MAIN AVE*	Penn Ave
Zip Code where Majority of Work is Being Performed	55423
(Approximate) Begin Construction Date	07/06/2020
(Approximate) End Construction Date	11/22/2021
TERMINI:(Termini listed must be within 0.3 miles of any work)	
From: **(Intersection or Address)**	150' south of West 76th Street
To: **(Intersection or Address)** *DO NOT INCLUDE LEGAL DESCRIPTION*	100' south of CSAH 53 (West 66th Street)
Or At	
Primary Types of Work *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.*	Grading, aggregate base, bituminous base and surfacing, curb and gutter, storm sewer, lighting, ped ramps, sidewalks, bikeway, and traffic signals.

BRIDGE/CULVERT PROJECTS (IF APPLICABLE)

Old Bridge/Culvert No.:

New Bridge/Culvert No.:

Structure is Over/Under (Bridge or culvert name):

Expander/Augmentor/Connector/Non-Freeway Principal Arterial

Select one:	
Area	1.904
Project Length	1.259
Average Distance	1.5123
Upload Map	1466530755523_01 - CSAH 32 (Penn Ave) Reconstruction - Roadway Area Definition.pdf

Reliever: Relieves a Principal Arterial that is a Freeway Facility

Facility being relieved	Interstate 35W
Number of hours per day volume exceeds capacity (based on the Congestion Report)	3.0

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:	41169
Existing Manufacturing/Distribution-Related Employment within 1 Mile:	2187
Existing Students:	2823
Upload Map	1466530850997_04 - CSAH 32 (Penn Ave) Reconstruction - Regional Economy.pdf

Measure C: Current Heavy Commercial Traffic

Location:	North of West 75th Street
Current daily heavy commercial traffic volume:	905
Date heavy commercial count taken:	05/11/2016 - 05/13/2016

Measure D: Freight Elements

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

The CSAH 32 (Penn Ave) Reconstruction Project will reconstruct the existing 10-ten roadway to provide a new and structurally adequate roadway that can accommodate the 2040 forecast traffic volumes. CSAH 32 serves as a north/south reliever to I-35W in Bloomington and Richfield, especially during times of excessive congestion on the freeway system. Two schools, Richfield Middle School and South Education Center, are located directly off CSAH 32 and generate daily school bus traffic. Businesses such as Car-X Tire and Auto, Sandy's Tavern, and BP Gas Station are located along this portion of CSAH 32 and require deliveries by commercial vehicles to re-supply their inventory of products.

Additional improvements to facilitate freight movements include, but are not limited to:

- Continuous left-turn lane to accommodate roadway users

- Dedicated turn lanes of adequate length at signalized intersections whenever warranted

- Enhanced traffic signal operations to reduce traffic signal delay and improve safety through the implementation of flashing yellow arrows, signal retiming, and current signal indication technologies

- Replacement of curb and gutter to define roadway limits

Measure A: Current Daily Person Throughput

Location	South of 70 1/2th Street
Current AADT Volume	11200
Existing Transit Routes on the Project	4, 515, 535, 538, 539, 540, 542, 558, 694
For New Roadways only, list transit routes that will be moved to the new roadway	
Upload Transit Map	1466539156614_03 - CSAH 32 (Penn Ave) Reconstruction - Transit Connections.pdf

Response: Current Daily Person Throughput

Average Annual Daily Transit Ridership	0
Current Daily Person Throughput	14560.0

Measure B: 2040 Forecast ADT

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

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:	Yes
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:	

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

CSAH 32 (Penn Ave) has primarily functioned as a 4-lane undivided roadway between I-494 and TH-62 within Richfield since its last reconstruction in 1964. An overlay in 2014 converted a portion of the corridor to a 3-lane section to better facilitate turning movements and provide bikeable shoulders. However, the overlay activity did not address remaining needs of the corridor; including deteriorated sidewalk facilities, stormwater structures, curb, and lack of streetscaping.

This project will transform the corridor into a friendly environment to connect the residential land uses on the south end to the commercial businesses on the north end. Three churches (St. Richard's, Woodlake, and St. Nicholas) and two schools (South Education Center and Richfield Middle) are located within one block of the project. Diverse services and goods are provided by the numerous restaurants, convenience stores, and businesses that are located directly on CSAH 32 near 66th St. These destinations generate north/south traffic during all times of the day.

Pedestrian Improvements

The existing sidewalks warrant replacement because they were constructed to a width of 5 feet and exhibit significant deterioration, especially near the businesses located on the north end. A majority of the pedestrian ramps have not been upgraded to current ADA standards and are poorly oriented and obstructed by traffic signal poles. This project will provide new pedestrian facilities; including sidewalks, pedestrian ramps, countdown timers, and Accessible Pedestrian Facilities to improve walking connections for all users.

Bicycle Improvements

Existing bikeable shoulders provide users with a route along CSAH 32. However, they currently lack signage and pavement marking symbols to clearly indicate its purpose and function to bicyclists and vehicles. This project will construct a bicycle facility that will be well defined, safe, and comfortable for all ages and abilities.

Transit Improvements

Richfield's grid roadway system provides a great network to serve transit routes. Both local and express transit routes are located along CSAH 32. This project will evaluate bus stop locations to address safety and accessibility concerns. Furthermore, the CSAH 32 project will provide exceptional north/south pedestrian and bicycle facilities for future Orange Line BRT users, specifically those who utilize the 76th St/Knox Ave station.

During the planning and design phases of the CSAH 32 Reconstruction Project, a partnership will be developed among the county, city, Metro Transit, and local residents to discuss detailed design elements for the corridor. Those who walk, bike, or use transit for transportation will be provided with a safe and accessible network to further enhance their quality of life.

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

Upload Map

1467212161778_02 - CSAH 32 (Penn Ave) Reconstruction - Socio Economic Conditions.pdf

Measure B: Affordable Housing

City/Township	Segment Length in Miles (Population)
Richfield	1.26

Total Project Length

Total Project Length (Total Population)	1.26

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)	1.26
Total Housing Score	0

Measure A: Year of Roadway Construction

Year of Original Roadway Construction or Most Recent Reconstruction	Segment Length	Calculation	Calculation 2
1964	0.75	1473.0	1169.048
1999	0.12	239.88	190.381
1964	0.12	235.68	187.048
2001	0.16	320.16	254.095
1987	0.11	218.57	173.468
	1	**2487**	**1974**

Average Construction Year

Weighted Year	1974

Total Segment Length (Miles)

Total Segment Length	1.26

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)

CSAH 32 is currently a 10-ton roadway, however, this project will include additional elements to improve the transportation of commercial goods and services. The pavement structure along the edges of CSAH 32, specifically near 66th St, has experienced significant stress and loading due to delivery trucks serving businesses located on CSAH 32. Also, the project will replace driveway aprons along the corridor, many of which are damaged and poorly designed, providing improved access to better facilitate truck turning movements. Furthermore, utility improvements will supplement this project by adjusting manholes, many of which have settled due to heavy truck traffic, to reduce their obstruction.

Improved clear zones or sight lines: Yes

Response (Limit 700 characters; approximately 100 words)

The roadway network within Richfield is built on the grid system that includes relatively straight north/south and east/west streets, thus providing adequate sight distance at most intersections. Additionally, a 3-lane section provides better sight lines than a 4-lane section. However, the elevation of CSAH 32 is significantly lower than the surrounding topography at both 70th and 69th Streets, resulting in poor sight lines for cars turning onto CSAH 32. This project will address these locations to make all feasible improvements to reduce obstructions. Furthermore, all fencing, retaining walls, lighting, signs, and landscaping will be designed to not obstruct sight lines along the corridor.

Improved roadway geometrics: Yes

Response (Limit 700 characters; approximately 100 words)	CSAH 32 (Penn Ave) was restriped from a 4-lane undivided roadway to a 3-lane roadway in 2014 as part of a pavement overlay project between 75th St and 67th St to improve safety along the corridor. This reconstruction project will further enhance safety by implementing the following: - Removal of free right islands - Additiona of a boulevard area to serve as a buffer for pedestrian facility - Installation of dedicated left-turn lanes - Installation of a bicycle facility - Replacement of curb and gutter - Improved transitions when entering and exiting 3-lane section
Access management enhancements:	Yes

The land use along CSAH 32 (Penn Ave) between 76th St and 68th St is mainly residential with driveway access directly onto Penn Ave. These residents will continue to benefit from the 3-lane configuration that reduces speed and the potential for rear-end and left-turn conflicts.

Response (Limit 700 characters; approximately 100 words)

The land use along CSAH 32 (Penn Ave) between 68th St and CSAH 53 (66th St) shifts to commercial with relatively small off-street surface parking lots for customers. Hennepin County will work with the City of Richfield through the public engagement process to determine if any of the following are feasible:

- Full or partial closure of driveways

- Consolidation of access points

Vertical/horizontal alignments improvements:

Yes

Response (Limit 700 characters; approximately 100 words)

CSAH 32 was restriped from a 4-lane roadway to a 3-lane in 2014. The transition areas on either side of the 3-lane section are currently striped at the minimum length which seem uncomfortable or unsafe for drivers. Additionally, the recent expansion of the Penn Ave/76th St intersection shifted the southbound travel lanes to the west. This project will allow for better transition lengths and lane alignments to improve safety and operations.

Additionally, multiple overlay activities have resulted in a swelling of the pavement at the intersection of CSAH 32/69th St which obstructs east/westbound vehicles traveling through the intersection (to be addressed with this project).

Improved stormwater mitigation:

Yes

The project is within the boundaries of the Minnehaha Creek Watershed District (MCWD) and Richfield-Bloomington Watershed Management Organization (RBWMO). While the project is not directly adjacent to an impaired waterbody, localized flooding is an issue.

Response (Limit 700 characters; approximately 100 words)

The county will meet all of the watershed and local stormwater management rules triggered by the project. Furthermore, the county has already initiated conversations with the local governing units to research opportunities to partner on additional stormwater BMPs (e.g., stormwater reuse for irrigation on public parcels, permeable pavement in the parking areas and tree trenches) to go beyond compliance to further reduce runoff volume.

Signals/lighting upgrades:

Yes

There are currently three signals located within the project area. Signal improvements along CSAH 32 at 76th and 69th Streets will include the following

- Flashing yellow arrow (FYA) operation

- Proper location of signal poles and handholes to avoid obstructing pedestrians

- Adequate number of primary signal heads

Response (Limit 700 characters; approximately 100 words)

The signal at 75th St was replaced as part of a local project. However, this project will retrofit FYAs.

The current lighting has reached the end of its useful life. These units will be replaced with new technology to improve safety and user experience. The specific type and location of lighting will be consistent with the 2008 Penn Ave Corridor Revitalization Master Plan.

Other Improvements

Yes

The sidewalk facilities warrant a full reconstruction, especially along the north end of the project. Driveways, marquee signs, and boulevard trees have caused significant deterioration of the sidewalk facilities and/or pose as obstructions for disabled users. This project will fully reconstruct the pedestrian realm to create a comfortable experience that will promote healthy and active living. Furthermore, this project is an opportunity to strengthen bicycle and pedestrian connections for students due to its close proximity to Richfield Middle School and South Education Center.

Response (Limit 700 characters; approximately 100 words)

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
31.0	25.0	6.0	4132	24792.0		1468513213656_01 - CSAH 032 & 76th St - Synchro Results.pdf

Total Delay

Total Peak Hour Delay Reduced	24792.0

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):
10.63	10.11	0.52	4132.0	2148.64
11	**10**		**4132**	**2149**

Total

Total Emissions Reduced:	2148.64
Upload Synchro Report	1468513260546_01 - CSAH 032 & 76th St - Synchro Results.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	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	05/28/2018

3)Environmental Documentation (5 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% 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 07/01/2019

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

80%

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

40%

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

0%

Anticipated date or date of completion of historic/archeological review: 03/04/2019

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

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 — Yes

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

25%

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

0%

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

0%

Anticipated date or date of acquisition — 03/02/2020

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	
50%	
Construction plans have not been started	Yes
0%	
Anticipated date or date of completion	01/20/2020

10)Letting

Anticipated Letting Date	04/06/2020

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

Crash Modification Factor Used:	48.0

Rationale for Crash Modification Selected:

The following is a list of Crash Modification Factors accessed from the CMF Clearinghouse database. Multiple CMF's were applied to each crash based since the CSAH 32 (Penn Ave) Reconstruction Project will include more than one improvement to address safety. The overall average crash reduction expected is 52% (Based on a 48% crash modification factor).

- Improvement type (CMF ID, crash reduction)

01) Improve signal timing (380, 2%)

02) Add primary signal head (1414, 28%)

03) Improve pavement friction (2263, 20%)

04) Change from protected only to FYA protected/permissive left turn with time of day operation (7690, 10%)

05) Provide left turn lanes on both major approaches (271, 42%)

06) Change from permitted only to FYA protected/permissive left turn operation (7682, 6.5%)

07) Implement traffic signal coordination along arterial roadway (3072, 83%)

08) Increase sight triangle distance (307, 48%)

19) Narrow cross section from 4 to 3 lanes with TWLTL (874, 37%)

(Limit 1400 Characters; approximately 200 words)

Project Benefit ($) from B/C Ratio

$4,680,000.00

Worksheet Attachment

1468514589890_CSAH 032 (Penn Ave) Reconstruction - BC Worksheets.pdf

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

CSAH 32 (Penn Avenue) is in dire need of upgrades for people who walk and bike along this corridor. Currently, sidewalks in most locations are approximately 5 feet wide and in varying states of disrepair. A narrow strip of approximately 2 feet of bituminous is the only buffer between people walking and vehicular traffic. Due to repeated mill and overlays over the past 50 years, the curb height has been reduced such that the sidewalk is almost level with the roadway. Sidewalks in some areas are uneven and experience ponding during rain events. Curb ramps in most locations do not meet current ADA standards and crosswalks are faded. The pedestrian access route is obstructed by traffic signal elements and marquee signs for local businesses.

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

A recent 4 to 3 lane restriping project, as part of a mill and overlay activity, provided bikeable shoulders. This project plans significant improvements for people walking and biking and is a primary reason that the City of Richfield requested reconstruction of this corridor. Richfield is a relatively dense city with a grid structure that has the potential to provide good transportation connections for all modes. Multifamily housing and apartment buildings are common along CSAH 32, interspersed with single family homes and commercial destinations. CSAH 32 is a significant bus route, which makes it especially important to improve safety and comfort for pedestrians.

This project will transform CSAH 32 from an auto-oriented corridor into one that is also pleasant for people who walk, bike, or use transit by reallocating space. On both sides of the street, Hennepin County plans to widen sidewalks and add a boulevard with trees. This will vastly improve pedestrian safety and comfort. A dedicated bike

facility will provide space for bicycle traffic and reduce the likelihood that they will ride on the sidewalk. This matches with recommendation from Richfield's council approved 2012 Bike Plan. Crossings will be improved by minimizing curb radii to slow turning vehicles and adding high visibility crosswalks and countdown timers where they do not already exist.

Improving the pedestrian experience on CSAH 32 will have benefits for people who rely on transit by making it safer and more comfortable to access bus stops and to walk along CSAH 32. Hennepin County will work with Metro Transit and the City of Richfield to renovate and improve bus stops along CSAH 32. The 76th Street Station, along the proposed Orange Line BRT, is within walking distance of this project.

Measure A: Cost Effectiveness

Total Project Cost (entered in Project Cost Form):	$10,310,000.00
Enter Amount of the Noise Walls:	$0.00
Total Project Cost subtract the amount of the noise walls:	$10,310,000.00
Points Awarded in Previous Criteria	
Cost Effectiveness	$0.00

Other Attachments

File Name	Description	File Size
Attachment 01 - City of Richfield - Letter of Support.pdf	Attachment 01 - City of Richfield - Letter of Support	904 KB
Attachment 02 - Hennepin County - Traffic Volume Count.pdf	Attachment 02 - Hennepin County - Traffic Volume Count	514 KB
Attachment 03 - Hennepin County - Heavy Commercial Count.pdf	Attachment 03 - Hennepin County - Heavy Commercial Count	524 KB
Attachment 04 - Hennepin County - Turning Movement Counts.pdf	Attachment 04 - Hennepin County - Turning Movement Counts	614 KB
Attachment 05A - MnDOT - 2013 to 2015 Crash Data.pdf	Attachment 05A - MnDOT - 2013 to 2015 Crash Data	616 KB
Attachment 05B - FHWA - Crash Modification Factors.pdf	Attachment 05B - FHWA - Crash Modification Factors	688 KB
Attachment 06 - Hennepin County - Preliminary Layout.pdf	Attachment 06 - Hennepin County - Preliminary Layout	3.4 MB
Figure 01 - Hennepin County - Project Location Map.pdf	Figure 01 - Project Location Map	500 KB
Figure 02 - Hennepin County - Project Aerial Maps.pdf	Figure 02 - Project Aerial Maps	4.1 MB
Figure 03 - Hennepin County - Existing Roadway Elements.pdf	Figure 03 - Existing Roadway Elements	717 KB
Figure 04 - Hennepin County - Proposed Typical Sections.pdf	Figure 04 - Proposed Typical Sections	686 KB
Figure 05A - Hennepin County - 2016-2020 Capital Improvement Program.pdf	Figure 05A - 2016-2020 Hennepin County Capital Improvement Program	1.0 MB
Figure 05B - Hennepin County - Bicycle Transportation Plan.pdf	Figure 05B - Hennepin County Bicycle Transportation Plan	1.9 MB
Figure 05C - City of Richfield - Bicycle Master Plan - Preferred Routes.pdf	Figure 05C - City of Richfield Bicycle Master Plan	3.8 MB
Figure 05D - MetroTransit - Orange Line Station Area Maps - W 76th St Station.pdf	Figure 05D - Metro Transit - W 76th St Station	802 KB
Figure 05E - City of Richfield - Penn Ave Revitalization Master Plan.pdf	Figure 05E - City of Richfield - Penn Ave Revitalization Plan	6.8 MB
Figure 06 - MnDOT - 2015 Metro Congestion Map.pdf	Figure 06 - MnDOT - 2015 Metro Congestion	753 KB

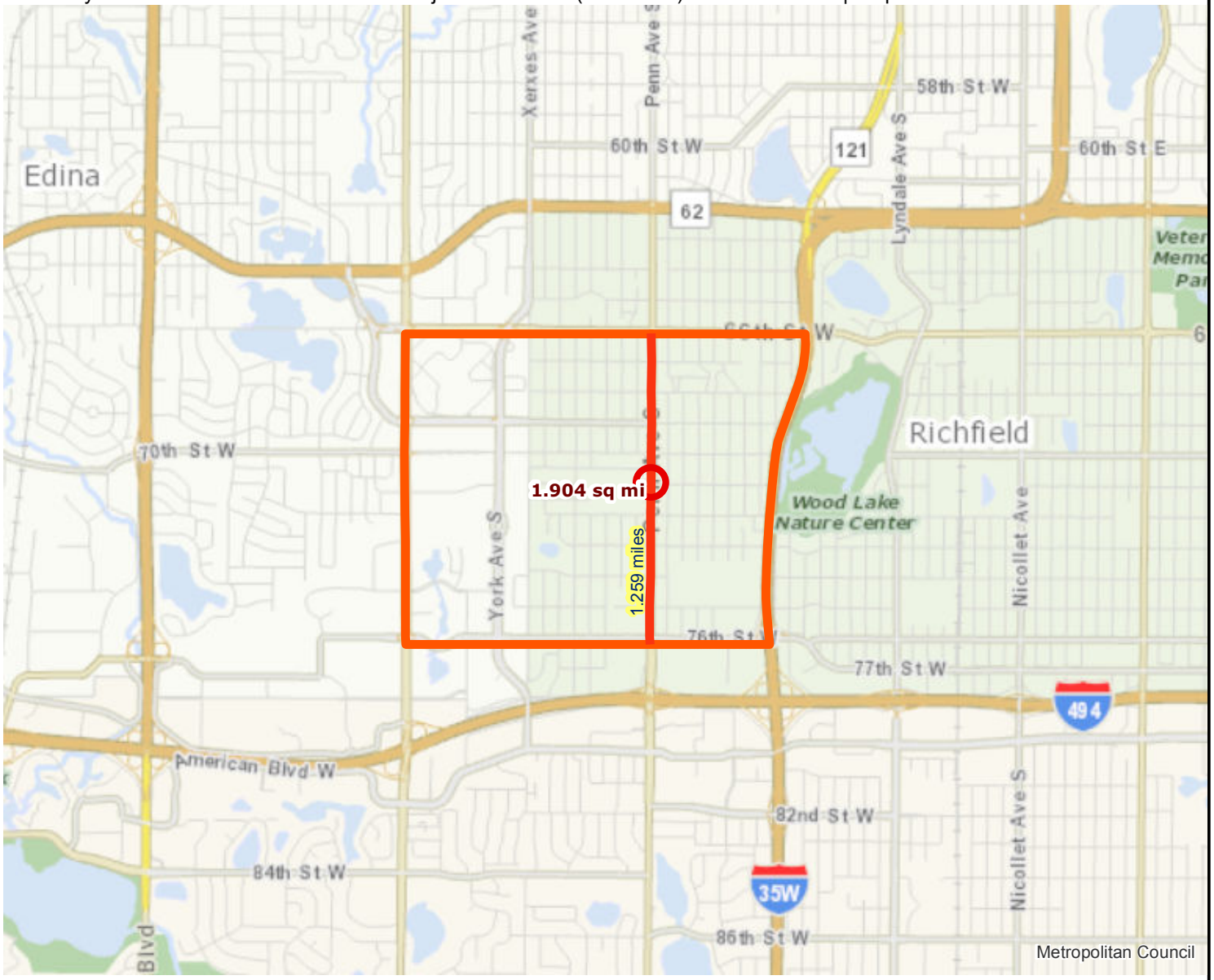
Roadway Area Definition

Roadway Reconstruction/Modernization Project: CSAH 32 (Penn Ave) Reconstruction | Map ID: 1466459925252

Results

Project Length: 1.259 miles

Project Area: 1.904 sq mi



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

0 0.4 0.8 1.6 2.4 3.2 Miles

Created: 6/20/2016
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 (Penn Ave) Reconstruction | Map ID: 1466459925252

Results

WITHIN ONE MI of project:

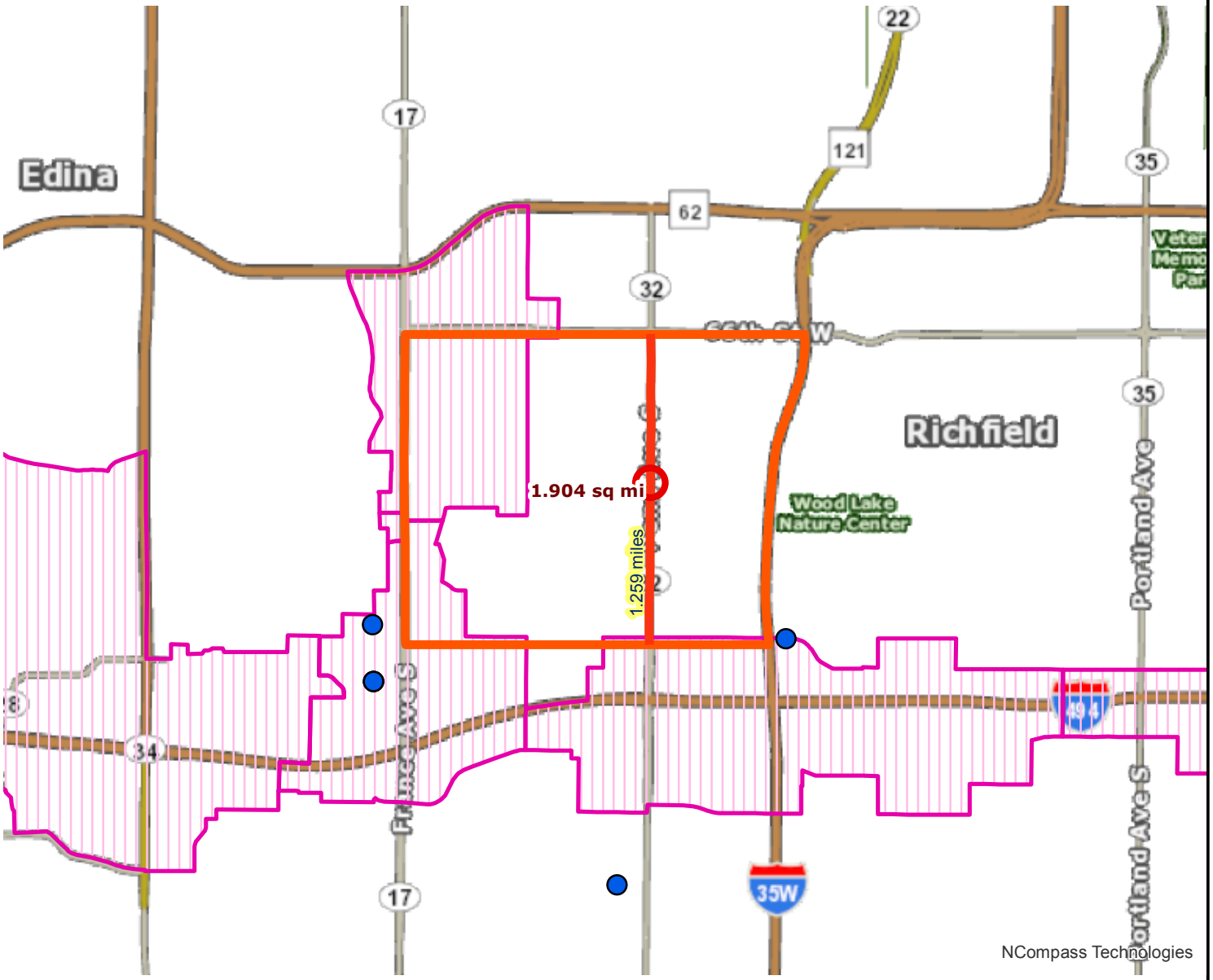
Totals by City:

Bloomington
- Population: 0
- Employment: 8697
- Mfg and Dist Employment: 1219

Edina
- Population: 8818
- Employment: 22026
- Mfg and Dist Employment: 432

Richfield
- Population: 15839
- Employment: 10446
- Mfg and Dist Employment: 536

Postsecondary Students:
2823



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

0 0.4 0.8 1.6 2.4 3.2 Miles

Created: 6/20/2016
LandscapeRSA5

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

METROPOLITAN COUNCIL

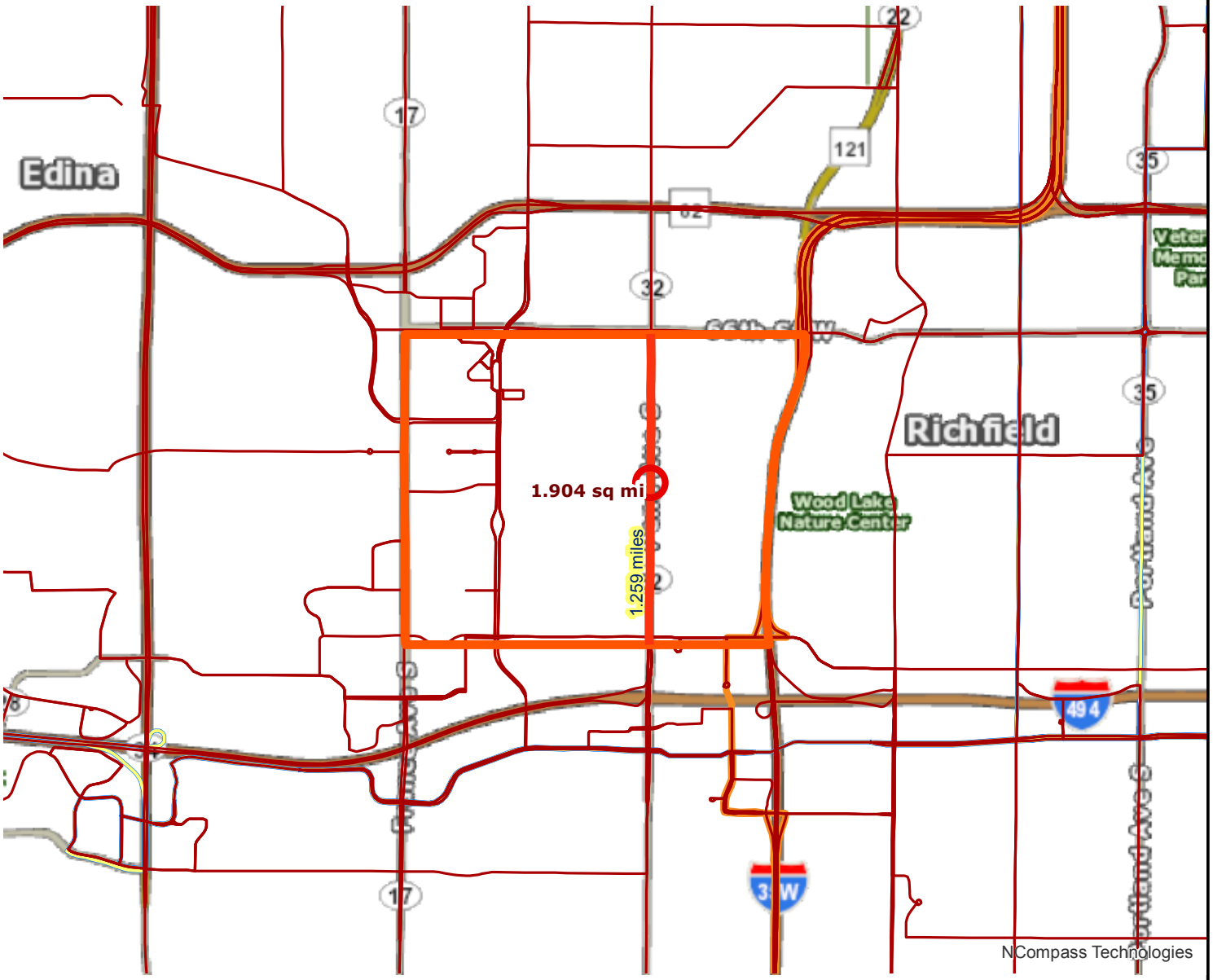
Transit Connections

Roadway Reconstruction/Modernization Project: CSAH 32 (Penn Ave) Reconstruction | Map ID: 1466459925252

Results

Transit with a Direct Connection to project:
4 515 535 538 539 540 542 558 694

**indicates Planned Alignments*



Project Points | Project Area | **Planned Alignments** | BRT, Orange Line

Project | Transit Routes | Arterial BRT

0 0.4 0.8 1.6 2.4 3.2 Miles

Created: 6/20/2016
LandscapeRSA3

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

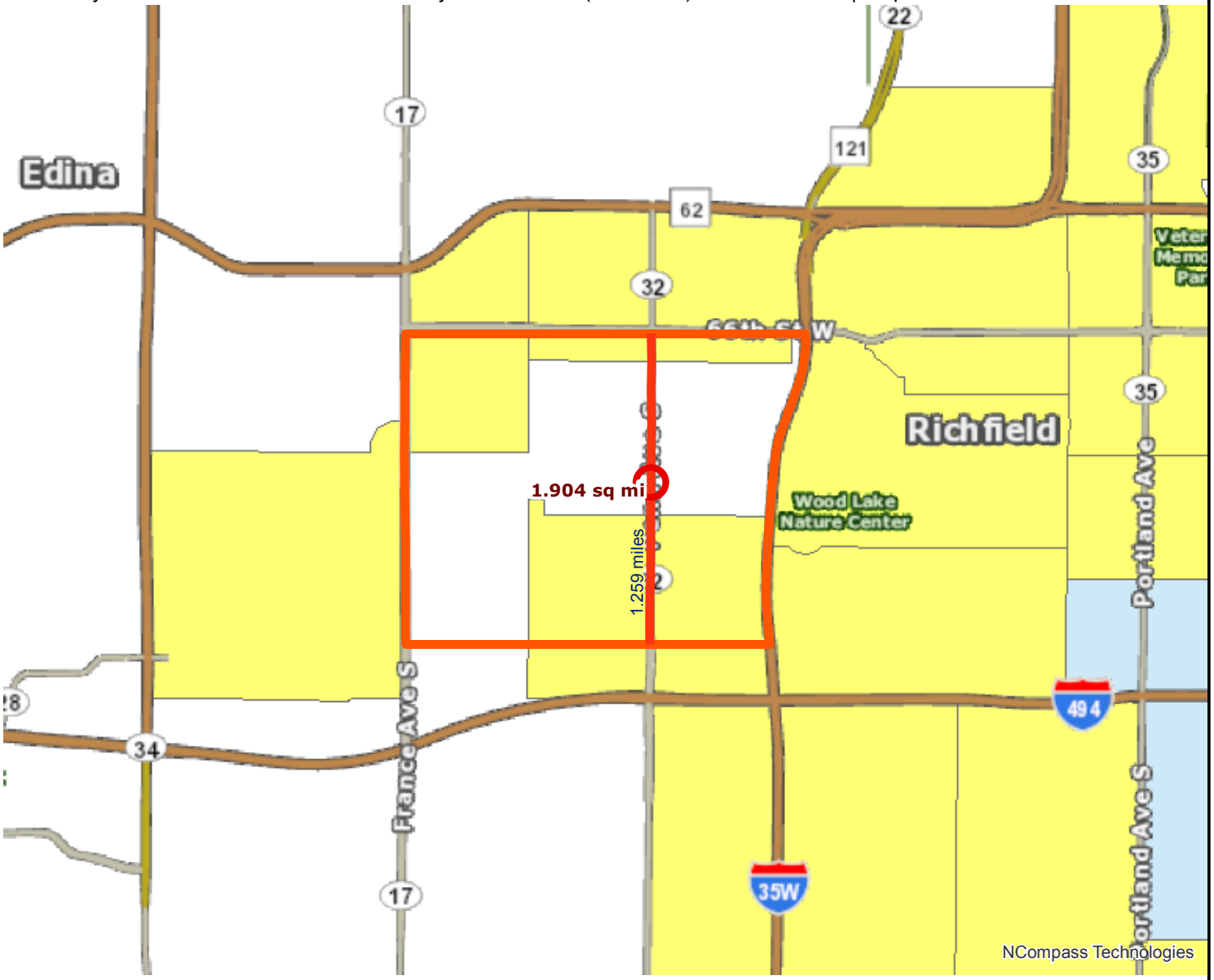
METROPOLITAN COUNCIL

Socio-Economic Conditions

Roadway Reconstruction/Modernization Project: CSAH 32 (Penn Ave) Reconstruction | Map ID: 1466459925252

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 0.4 0.8 1.6 2.4 3.2 Miles

Created: 6/20/2016
LandscapeRSA2

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

METROPOLITAN COUNCIL

1: CSAH 32 & 76th St (Existing Conditions)

Direction	All
Future Volume (vph)	4132
Total Delay / Veh (s/v)	31
CO Emissions (kg)	7.45
NOx Emissions (kg)	1.45
VOC Emissions (kg)	1.73

1: CSAH 32 & 76th St (Proposed Conditions)

Direction	All
Future Volume (vph)	4132
Total Delay / Veh (s/v)	25
CO Emissions (kg)	7.09
NOx Emissions (kg)	1.38
VOC Emissions (kg)	1.64

1: CSAH 32 & 76th St (Existing Conditions)

Direction	All
Future Volume (vph)	4132
Total Delay / Veh (s/v)	31
CO Emissions (kg)	7.45
NOx Emissions (kg)	1.45
VOC Emissions (kg)	1.73

1: CSAH 32 & 76th St (Proposed Conditions)

Direction	All
Future Volume (vph)	4132
Total Delay / Veh (s/v)	25
CO Emissions (kg)	7.09
NOx Emissions (kg)	1.38
VOC Emissions (kg)	1.64

B/C worksheet

Control Section	T.H. / Roadway	Location	Beginning Ref. Pt.	Ending Ref. Pt.	State, County, City or Township	Study Period Begins	Study Period Ends
	CSAH 32	At West 76th St	3.20	3.26	Hennepin County	1/1/2013	12/31/2015

Description of Proposed Work

Improve signal timing (CMF ID 380)
Add primary signal head (CMF ID 1414)
Improve pavement friction (CMF ID 2263)
Change from protected only to flashing yellow arrow - protected/permissive with time of day operation (CMF ID 7690)

Accident Diagram Codes			1	2	3	5	4, 7	8, 9	Pedestrian	6, 90, 98, 99 Other	Total
Study Period: Number of Crashes	Fatal	F									
	Personal Injury (PI)	A				1					1
		B									
		C	1								1
	Property Damage	PD	4	1			1				6
% Change in Crashes *Use FHWA cmfclearinghouse for Crash Reduction Factors	Fatal	F									
	PI	A				-49.0%					
		B									
		C	-49.0%								
	Property Damage	PD	-49.0%	-49.0%			-49.0%				
Change in Crashes = No. of crashes **x** % change in crashes	Fatal	F									
	PI	A				**-0.49**					**-0.49**
		B									
		C	**-0.49**								**-0.49**
	Property Damage	PD	**-1.96**	**-0.49**			**-0.49**				**-2.94**

Year (Safety Improvement Construction) **2020**

Project Cost (exclude Right of Way)	**$ 10,310,000**
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			$ 1,140,000	
A	-0.49	-0.16	$ 570,000	$ 93,185
B			$ 170,000	
C	-0.49	-0.16	$ 83,000	$ 13,569
PD	-2.94	-0.98	$ 7,600	$ 7,455
Total				$ 114,209

B/C= 0.19

Using present worth values,

B= $ 1,997,962

C= $ 10,310,000

See "Calculations" sheet for amortization.

Updated 12-10-2015

B/C worksheet

Control Section	T.H. / Roadway	Location	Beginning Ref. Pt.	Ending Ref. Pt.	State, County, City or Township	Study Period Begins	Study Period Ends
	CSAH 32	At West 75th St	3.33	3.39	Hennepin County	1/1/2013	12/31/2015

Description of Proposed Work

Provide a left-turn lane on major approaches (CMF ID 271)
Improve signal timing (CMF ID 380)
Improve pavement friction (CMF ID 2263)
Convert left turn phasing from permitted only to flashing yellow arrow protected/permissive (CMF ID 7682)
Add primary signal head (CMF ID 1414)

			Accident Diagram Codes 1	2	3	5	4, 7	8, 9	Pedestrian	6, 90, 98, 99 Other	Total
Study Period: Number of Crashes	Fatal	**F**									
	Personal Injury (PI)	**A**									
		B									
		C	1					1	1		3
	Property Damage	**PD**		1			1	1			3
% Change in Crashes *Use FHWA cmfclearinghouse for Crash Reduction Factors	Fatal	**F**									
	PI	**A**									
		B									
		C	-58%					-58%	-58%		
	Property Damage	**PD**		-58%			-58%	-58%			
Change in Crashes = No. of crashes **x** % change in crashes	Fatal	**F**									
	PI	**A**									
		B									
		C	**-0.58**					**-0.58**	**-0.58**		**-1.74**
	Property Damage	**PD**		**-0.58**			**-0.58**	**-0.58**			**-1.74**

Year (Safety Improvement Construction) **2020**

		Type of Crash	Study Period: Change in Crashes	Annual Change in Crashes	Cost per Crash	Annual Benefit
Project Cost (exclude Right of Way)	**$ 10,310,000**					
Right of Way Costs (optional)		**F**			**$ 1,140,000**	
Traffic Growth Factor	**3%**	**A**			**$ 570,000**	
Capital Recovery		**B**			**$ 170,000**	
1. Discount Rate	**4.5%**	**C**	**-1.74**	**-0.58**	**$ 83,000**	**$ 48,184**
2. Project Service Life (n)	**20**	**PD**	**-1.74**	**-0.58**	**$ 7,600**	**$ 4,412**
		Total				**$ 52,596**

B/C= 0.09

Using present worth values,

B= $ 920,111

C= $ 10,310,000

See "Calculations" sheet for amortization.

Updated 12-10-2015

B/C worksheet

Control Section	T.H. / Roadway	Location	Beginning Ref. Pt.	Ending Ref. Pt.	State, County, City or Township	Study Period Begins	Study Period Ends
	CSAH 32	At West 69th St	4.07	4.13	Hennepin County	1/1/2013	12/31/2015

Description of Proposed Work
Improve signal timing (CMF ID 380)
Change from permissive only to FYA protected/permissive left turn phasing (CMF ID 7682)
Implement signal coordination along arterial roadway (CMF ID 3072)
Increase sight triangle distance (CMF ID 307)

			Accident Diagram Codes 1	2	3	5	4, 7	8, 9	Pedestrian	6, 90, 98, 99 Other	Total
Study Period: Number of Crashes	Fatal	**F**									
	Personal Injury (PI)	**A**									
		B									
		C	2			1					3
	Property Damage	**PD**	1								1
% Change in Crashes *Use FHWA cmfclearinghouse for Crash Reduction Factors	Fatal	**F**									
	PI	**A**									
		B									
		C	-84%			-52%					
	Property Damage	**PD**	-84%								
Change in Crashes = No. of crashes **x** % change in crashes	Fatal	**F**									
	PI	**A**									
		B									
		C	**-1.68**			**-0.52**					**-2.20**
	Property Damage	**PD**	**-0.84**								**-0.84**

Year (Safety Improvement Construction)	**2020**
Project Cost (exclude Right of Way)	**$ 10,310,000**
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			**$ 1,140,000**	
A			**$ 570,000**	
B			**$ 170,000**	
C	**-2.20**	**-0.73**	**$ 83,000**	**$ 60,922**
PD	**-0.84**	**-0.28**	**$ 7,600**	**$ 2,130**
Total				**$ 63,052**

B/C= 0.11

Using present worth values,

B= $ 1,103,031

C= $ 10,310,000

See "Calculations" sheet for amortization.

Updated 12-10-2015

B/C worksheet

Control Section	T.H. / Roadway	Location	Beginning Ref. Pt.	Ending Ref. Pt.	State, County, City or Township	Study Period Begins	Study Period Ends
	CSAH 32	Between 76th St and 66th St (CSAH 53)	3.26	4.45	Hennepin County	1/1/2013	12/31/2015

Description of Proposed Work: Improve pavement friction (CMF ID 2263)
Narrow cross section from 4 to 3 lanes with two way left turn lane (CMF ID 874)

			Accident Diagram Codes 1	2	3	5	4, 7	8, 9	Pedestrian	6, 90, 98, 99 Other	Total
Study Period: Number of Crashes	Fatal	F									
	Personal Injury (PI)	A									
		B									
		C				3	2			1	**6**
	Property Damage	PD	2		1	1	2			1	**7**
% Change in Crashes *Use FHWA cmfclearinghouse for Crash Reduction Factors	Fatal	F									
	PI	A									
		B									
		C				-20.0%	-20.0%			-20.0%	
	Property Damage	PD	-20.0%		-20.0%	-35.0%	-35.0%			-50.0%	
Change in Crashes = No. of crashes **x** % change in crashes	Fatal	F									
	PI	A									
		B									
		C				**-0.60**	**-0.40**			**-0.20**	**-1.20**
	Property Damage	PD	**-0.40**		**-0.20**	**-0.35**	**-0.70**			**-0.50**	**-2.15**

Year (Safety Improvement Construction)	**2020**
Project Cost (exclude Right of Way)	**$ 10,310,000**
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			$ 1,140,000	
A			$ 570,000	
B			$ 170,000	
C	-1.20	-0.40	$ 83,000	$ 33,230
PD	-2.15	-0.72	$ 7,600	$ 5,452
Total				$ 38,682

B/C= 0.07

Using present worth values,

B= $ 676,700

C= $ 10,310,000

See "Calculations" sheet for amortization.

Updated 12-10-2015

Letter of Support
Attachment 01A

City Council
www.cityofrichfield.org

March 16, 2016

Mr. James Grube
Hennepin County Transportation Department
Director and County Engineer
Public Works Facility
1600 Prairie Drive
Medina, MN 55340-5421

RE: Letter of Support for **CSAH 32 (Penn Avenue) – Roadway Reconstruction**
2016 Metropolitan Council Regional Solicitation for Federal Transportation Funding

Dear Mr. Grube:

The City of Richfield expresses much support for Hennepin County's CSAH 32 (Penn Avenue) Project grant application to be included in the 2020/2021 State Transportation Improvement Program (STIP) for reconstruction of the Penn Avenue corridor within the City from 76th Street to the Crosstown Highway. The project would address many existing issues and provide a much needed improvement to the quality of life for the users of this corridor, including:

- Foster revitalization of the Penn Central neighborhood
- Four-to-three lane conversions to provide improved safety where feasible
- Improved pedestrian accommodations (including ADA)
- Improved snow storage with boulevards
- Improved / enhanced transit facilities
- Bicycle accommodations (planned for in Hennepin County Bicycle System Plan)
- Undergrounding of parallel overhead utilities

Hennepin County's CSAH 32 (Penn Avenue) Reconstruction Project is consistent with Richfield's Comprehensive Plan which supports major improvements along this corridor in response to the aging infrastructure and lack of multi-modal accommodations.

Thank you for seeking funding for this project, the City of Richfield is looking forward to working with Hennepin County on its implementation.

Sincerely,

Debbie Goettel, Mayor

Steven L. Devich, City Manager

Traffic Volume Count
Attachment 02

HENNEPIN COUNTY
TRANSPORTATION PLANNING DIVISION

TOTAL VOLUME DATA
CSAH 32 S. OF 70 1/2 St.
STUDY # 4046

Site: 05

Weekly Volume, per Channel

N.B.

Interval Start	Mon 5/9/2016	Tue 5/10/2016	Wed 5/11/2016	Thu 5/12/2016	Fri 5/13/2016	Sat 5/14/2016	Sun 5/15/2016	Mon - Fri Average	Weekly Average
12:00 AM	-	-	-	19	28	-	-	23.5	23.5
1:00 AM	-	-	-	13	17	-	-	15.0	15.0
2:00 AM	-	-	-	11	8	-	-	9.5	9.5
3:00 AM	-	-	-	9	7	-	-	8.0	8.0
4:00 AM	-	-	-	8	14	-	-	11.0	11.0
5:00 AM	-	-	-	48	37	-	-	42.5	42.5
6:00 AM	-	-	-	166	176	-	-	171.0	171.0
7:00 AM	-	-	-	389	351	-	-	370.0	370.0
8:00 AM	-	-	-	365	352	-	-	358.5	358.5
9:00 AM	-	-	-	340	328	-	-	334.0	334.0
10:00 AM	-	-	-	390	370	-	-	380.0	380.0
11:00 AM	-	-	-	424	433	-	-	428.5	428.5
12:00 PM	-	-	440	433	-	-	-	436.5	436.5
1:00 PM	-	-	390	426	-	-	-	408.0	408.0
2:00 PM	-	-	458	448	-	-	-	453.0	453.0
3:00 PM	-	-	526	550	-	-	-	538.0	538.0
4:00 PM	-	-	788	779	-	-	-	783.5	783.5
5:00 PM	-	-	771	806	-	-	-	788.5	788.5
6:00 PM	-	-	500	482	-	-	-	491.0	491.0
7:00 PM	-	-	331	358	-	-	-	344.5	344.5
8:00 PM	-	-	283	339	-	-	-	311.0	311.0
9:00 PM	-	-	180	168	-	-	-	174.0	174.0
10:00 PM	-	-	92	75	-	-	-	83.5	83.5
11:00 PM	-	-	47	45	-	-	-	46.0	46.0
Totals	0	0	4806	7091	2121	0	0	7009.0	7009.0
Peak Hours									
12:00 AM - 12:00 PM	-	-	-	11:00 AM	11:00 AM	-	-	11:00 AM	11:00 AM
Volume	-	-	-	424	433	-	-	428.5	428.5
12:00 PM - 12:00 AM	-	-	4:00 PM	5:00 PM	-	-	-	5:00 PM	5:00 PM
Volume	-	-	788	806	-	-	-	788.5	788.5

NB Volume: 7,009
SB Volume: 5,877
Total Volume: 12,886

Total Volume: 12,886
Adjustment Factor: 1.146
2016 AADT: 11,244

2016 AADT: 11,200

Traffic Volume Count
Attachment 02

HENNEPIN COUNTY
TRANSPORTATION PLANNING DIVISION

TOTAL VOLUME DATA
CSAH 32 S. OF W. 70 1/2 St.
STUDY # 4046

Site: 05

Weekly Volume, per Channel

S.B.

Interval Start	Mon 5/9/2016	Tue 5/10/2016	Wed 5/11/2016	Thu 5/12/2016	Fri 5/13/2016	Sat 5/14/2016	Sun 5/15/2016	Mon - Fri Average	Weekly Average
12:00 AM	-	-	-	21	29	-	-	25.0	25.0
1:00 AM	-	-	-	11	11	-	-	11.0	11.0
2:00 AM	-	-	-	9	10	-	-	9.5	9.5
3:00 AM	-	-	-	4	3	-	-	3.5	3.5
4:00 AM	-	-	-	15	17	-	-	16.0	16.0
5:00 AM	-	-	-	50	58	-	-	54.0	54.0
6:00 AM	-	-	-	175	156	-	-	165.5	165.5
7:00 AM	-	-	-	470	397	-	-	433.5	433.5
8:00 AM	-	-	-	546	18	-	-	282.0	282.0
9:00 AM	-	-	-	372	17	-	-	194.5	194.5
10:00 AM	-	-	-	334	82	-	-	208.0	208.0
11:00 AM	-	-	-	413	118	-	-	265.5	265.5
12:00 PM	-	-	443	428	-	-	-	435.5	435.5
1:00 PM	-	-	411	403	-	-	-	407.0	407.0
2:00 PM	-	-	422	452	-	-	-	437.0	437.0
3:00 PM	-	-	500	525	-	-	-	512.5	512.5
4:00 PM	-	-	568	606	-	-	-	587.0	587.0
5:00 PM	-	-	552	629	-	-	-	590.5	590.5
6:00 PM	-	-	397	434	-	-	-	415.5	415.5
7:00 PM	-	-	336	316	-	-	-	326.0	326.0
8:00 PM	-	-	248	216	-	-	-	232.0	232.0
9:00 PM	-	-	146	158	-	-	-	152.0	152.0
10:00 PM	-	-	69	73	-	-	-	71.0	71.0
11:00 PM	-	-	42	44	-	-	-	43.0	43.0
Totals	0	0	4134	6704	916	0	0	5877.0	5877.0
Peak Hours									
12:00 AM - 12:00 PM	-	-	-	8:00 AM	7:00 AM	-	-	7:00 AM	7:00 AM
Volume	-	-	-	546	397	-	-	433.5	433.5
12:00 PM - 12:00 AM	-	-	4:00 PM	5:00 PM	-	-	-	5:00 PM	5:00 PM
Volume	-	-	568	629	-	-	-	590.5	590.5

Heavy Commercial Count
Attachment 03

HENNEPIN COUNTY
TRANSPORTATION PLANNING DIVISION

VEHICLE CLASSIFICATION DATA
CSAH 32 N. OF 76 th. St. W.
STUDY # 4022

Wednesday, 5/11/2016 12:00 PM -
Friday, 5/13/2016 12:00 PM

Classification Grand Totals

Hourly Averages

N.B.

Interval Start	Total	Motor Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Tailgating
12:00 AM	43.5	0.0	37.0	4.0	1.0	1.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
1:00 AM	28.5	0.0	26.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2:00 AM	13.0	0.0	11.5	0.5	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 AM	7.0	0.0	6.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4:00 AM	15.0	0.0	12.0	0.5	2.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5:00 AM	43.5	0.0	31.5	9.0	2.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
6:00 AM	163.0	0.5	134.5	18.0	5.0	3.0	1.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
7:00 AM	371.0	4.0	268.5	46.0	16.5	12.0	3.0	0.0	16.0	1.0	0.0	3.0	0.0	1.0	0.0
8:00 AM	301.0	0.5	233.0	35.5	15.5	7.0	2.0	0.0	5.0	0.0	0.0	2.5	0.0	0.0	0.0
9:00 AM	324.0	0.0	262.0	41.5	4.5	8.5	0.5	0.0	5.5	1.0	0.0	0.0	0.0	0.5	0.0
10:00 AM	357.5	1.5	284.0	49.5	7.5	7.5	0.5	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0
11:00 AM	447.5	0.5	359.5	57.5	4.5	13.5	0.0	0.0	9.5	0.0	0.0	2.0	0.0	0.5	0.0
12:00 PM	442.5	1.0	361.5	52.0	8.0	10.0	0.5	0.0	8.0	0.5	0.0	0.5	0.0	0.5	0.0
1:00 PM	413.5	1.5	319.0	57.5	8.0	9.5	0.0	0.0	15.0	0.5	0.0	1.5	0.0	1.0	0.0
2:00 PM	458.5	1.5	356.0	65.0	10.0	13.0	0.0	0.0	10.0	0.0	0.0	2.5	0.0	0.5	0.0
3:00 PM	498.0	2.5	403.0	56.5	14.5	7.5	0.5	0.0	11.5	0.0	0.0	1.5	0.0	0.5	0.0
4:00 PM	669.5	3.0	555.0	54.5	21.5	7.0	0.5	0.5	16.0	1.0	0.0	7.0	0.5	3.0	0.0
5:00 PM	688.5	3.0	567.5	62.5	22.0	7.5	0.0	0.5	18.0	0.0	0.5	5.5	0.0	1.5	0.0
6:00 PM	483.5	2.5	408.0	38.0	15.0	5.5	0.5	0.0	11.5	0.0	0.0	2.5	0.0	0.0	0.0
7:00 PM	350.0	0.5	302.0	37.0	3.0	3.0	0.0	0.0	2.5	0.0	0.0	2.0	0.0	0.0	0.0
8:00 PM	319.5	0.0	271.5	34.0	5.0	4.0	0.0	0.0	4.5	0.0	0.0	0.5	0.0	0.0	0.0
9:00 PM	213.5	0.0	194.5	14.0	2.0	0.5	0.0	0.0	2.0	0.0	0.0	0.5	0.0	0.0	0.0
10:00 PM	125.5	0.0	108.5	12.5	1.5	2.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
11:00 PM	70.5	0.0	61.5	8.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Daily Average	6847.5	22.5	5573.5	757.5	169.0	123.5	10.5	1.0	143.5	5.0	0.5	31.5	0.5	9.0	0.0

Study Grand Totals

	Total	Motor Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Tailgating
N.B.	13695	45	11147	1515	338	247	21	2	287	10	1	63	1	18	0
		0.3 %	81.4 %	11.1 %	2.5 %	1.8 %	0.2 %	0.0 %	2.1 %	0.1 %	0.0 %	0.5 %	0.0 %	0.1 %	0.0 %

NORTHBOUND ONLY - SUM OF THE DAILY AVERAGE OF CLASSES 4 THROUGH 13 = 497
SOUTHBOUND ONLY - SUM OF THE DAILY AVERAGE OF CLASSES 4 THROUGH 13 = 408

DAILY TOTAL OF HEAVY COMMERCIAL VEHICLES = *905*

Heavy Commercial Count
Attachment 03

HENNEPIN COUNTY
TRANSPORTATION PLANNING DIVISION

VEHICLE CLASSIFICATION DATA
CSAH 32 N. OF 76 th. St. W.
STUDY # 4022

Site: 01
Wednesday, 5/11/2016 12:00 PM -
Friday, 5/13/2016 12:00 PM

Classification Grand Totals

Hourly Averages

S.B.

Interval Start	Total	Motor Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Tailgating
12:00 AM	21.5	0.0	17.0	1.5	1.0	1.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
1:00 AM	10.0	0.0	7.5	1.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2:00 AM	10.5	0.0	9.0	0.5	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 AM	8.5	0.0	7.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4:00 AM	27.5	0.0	24.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5:00 AM	76.0	0.0	56.0	15.5	1.0	3.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
6:00 AM	219.5	0.0	166.5	42.5	3.5	5.5	0.5	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
7:00 AM	496.0	1.5	374.5	85.5	9.5	15.0	1.0	0.0	7.5	0.0	0.0	1.0	0.0	0.5	0.0
8:00 AM	582.0	2.0	435.5	105.0	10.5	16.5	1.0	0.0	8.5	1.0	0.0	2.0	0.0	0.0	0.0
9:00 AM	388.5	1.0	299.0	62.0	4.5	14.0	3.0	0.5	3.5	1.0	0.0	0.0	0.0	0.0	0.0
10:00 AM	356.5	0.0	264.0	67.0	4.5	16.5	0.0	0.0	3.5	0.0	0.0	0.5	0.0	0.5	0.0
11:00 AM	437.5	1.0	331.0	75.5	7.0	17.5	1.5	0.0	3.5	0.5	0.0	0.0	0.0	0.0	0.0
12:00 PM	445.5	1.0	330.5	87.0	7.5	10.5	0.5	0.0	7.5	0.0	0.0	1.0	0.0	0.0	0.0
1:00 PM	421.0	0.0	323.5	76.5	6.5	11.0	0.5	0.0	2.5	0.5	0.0	0.0	0.0	0.0	0.0
2:00 PM	495.0	1.5	341.5	105.0	6.5	30.0	0.5	0.0	9.5	0.0	0.0	0.5	0.0	0.0	0.0
3:00 PM	530.5	1.0	407.0	84.0	11.0	12.5	1.5	0.5	11.5	0.0	0.0	1.5	0.0	0.0	0.0
4:00 PM	572.0	0.5	458.5	84.5	8.5	8.0	0.5	0.0	9.0	0.0	0.0	2.0	0.0	0.5	0.0
5:00 PM	530.5	0.5	408.0	94.5	9.0	7.5	1.5	0.0	9.0	0.5	0.0	0.0	0.0	0.0	0.0
6:00 PM	411.0	0.5	330.0	66.5	5.5	4.5	0.0	0.0	3.0	0.0	0.0	1.0	0.0	0.0	0.0
7:00 PM	334.5	1.0	269.5	54.0	3.0	5.0	0.0	0.0	1.5	0.0	0.0	0.5	0.0	0.0	0.0
8:00 PM	248.5	0.0	203.0	38.0	2.0	4.5	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
9:00 PM	146.0	0.0	118.0	23.0	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10:00 PM	72.0	0.0	61.0	8.5	1.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11:00 PM	42.5	0.0	33.0	8.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Daily Average	6883.0	11.5	5274.5	1191.0	107.5	187.5	12.0	1.0	82.5	4.0	0.0	10.0	0.0	1.5	0.0

Study Grand Totals

	Total	Motor Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Tailgating
S.B.	13766	23	10549	2382	215	375	24	2	165	8	0	20	0	3	0
		0.2 %	76.6 %	17.3 %	1.6 %	2.7 %	0.2 %	0.0 %	1.2 %	0.1 %	0.0 %	0.1 %	0.0 %	0.0 %	0.0 %

Turning Movement Counts
Attachment 04

Hennepin County

Department of Public Works
Transportation Planning Division
Traffic Movement Study

CSAH 032 & 76th St
Turning Movement Study
Thursday 7 AM - 9 AM
Thursday 4 PM - 6 PM

File Name : STDY 4004
Site Code : 4004
Start Date : 5/12/2016
Page No : 1

Groups Printed- Cars + - Trucks

	CSAH 032 Southbound					76th St Westbound					CSAH 032 Northbound					76th St Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
****BREAK																					
07:00 AM	6	61	18	0	85	13	90	25	0	128	68	43	14	1	126	24	39	1	2	66	405
07:15 AM	4	57	22	0	83	33	98	36	1	168	77	54	23	1	155	23	44	3	0	70	476
07:30 AM	14	89	35	0	138	44	153	49	0	246	81	69	22	1	173	39	56	7	1	103	660
07:45 AM	16	100	32	0	148	36	160	56	2	254	75	82	25	3	185	32	49	10	5	96	683
Total	40	307	107	0	454	126	501	166	3	796	301	248	84	6	639	118	188	21	8	335	2224
08:00 AM	19	122	32	1	174	48	251	65	1	365	101	66	20	0	187	32	57	5	0	94	820
08:15 AM	21	78	51	1	151	31	154	57	0	242	105	58	31	1	195	30	57	3	1	91	679
08:30 AM	12	86	45	2	145	21	159	53	0	233	96	38	22	1	157	29	64	5	0	98	633
08:45 AM	10	66	44	0	120	25	111	49	2	187	88	69	23	2	182	28	51	3	1	83	572
Total	62	352	172	4	590	125	675	224	3	1027	390	231	96	4	721	119	229	16	2	366	2704
****BREAK																					
04:00 PM	8	123	27	0	158	44	99	90	2	235	70	92	42	0	204	39	138	15	0	192	789
04:15 PM	8	97	37	2	144	54	114	94	1	263	58	137	59	1	255	48	184	21	3	256	918
04:30 PM	4	81	44	2	131	63	124	97	6	290	67	88	46	1	202	42	193	22	0	257	880
04:45 PM	10	132	33	1	176	66	143	104	3	316	74	138	52	0	264	62	219	23	1	305	1061
Total	30	433	141	5	609	227	480	385	12	1104	269	455	199	2	925	191	734	81	4	1010	3648
05:00 PM	5	88	49	2	144	84	163	102	0	349	78	117	60	5	260	42	248	13	0	303	1056
05:15 PM	8	122	53	4	187	68	136	122	3	329	84	147	69	3	303	46	190	13	1	250	1069
05:30 PM	5	86	49	4	144	57	161	84	4	306	74	117	49	3	243	48	229	10	0	287	980
05:45 PM	9	79	45	1	134	45	124	79	0	248	73	125	50	4	252	33	159	19	0	211	845
Total	27	375	196	11	609	254	584	387	7	1232	309	506	228	15	1058	169	826	55	1	1051	3950
****BREAK																					
Grand Total	159	1467	616	20	2262	732	2240	1162	25	4159	1269	1440	607	27	3343	597	1977	173	15	2762	12526
Apprch %	7	64.9	27.2	0.9		17.6	53.9	27.9	0.6		38	43.1	18.2	0.8		21.6	71.6	6.3	0.5		
Total %	1.3	11.7	4.9	0.2	18.1	5.8	17.9	9.3	0.2	33.2	10.1	11.5	4.8	0.2	26.7	4.8	15.8	1.4	0.1	22.1	
Cars +	153	1431	611	10	2205	723	2203	1121	20	4067	1231	1411	596	23	3261	589	1949	171	9	2718	12251
% Cars +	96.2	97.5	99.2	50	97.5	98.8	98.3	96.5	80	97.8	97	98	98.2	85.2	97.5	98.7	98.6	98.8	60	98.4	97.8
Trucks	6	36	5	10	57	9	37	41	5	92	38	29	11	4	82	8	28	2	6	44	275
% Trucks	3.8	2.5	0.8	50	2.5	1.2	1.7	3.5	20	2.2	3	2	1.8	14.8	2.5	1.3	1.4	1.2	40	1.6	2.2

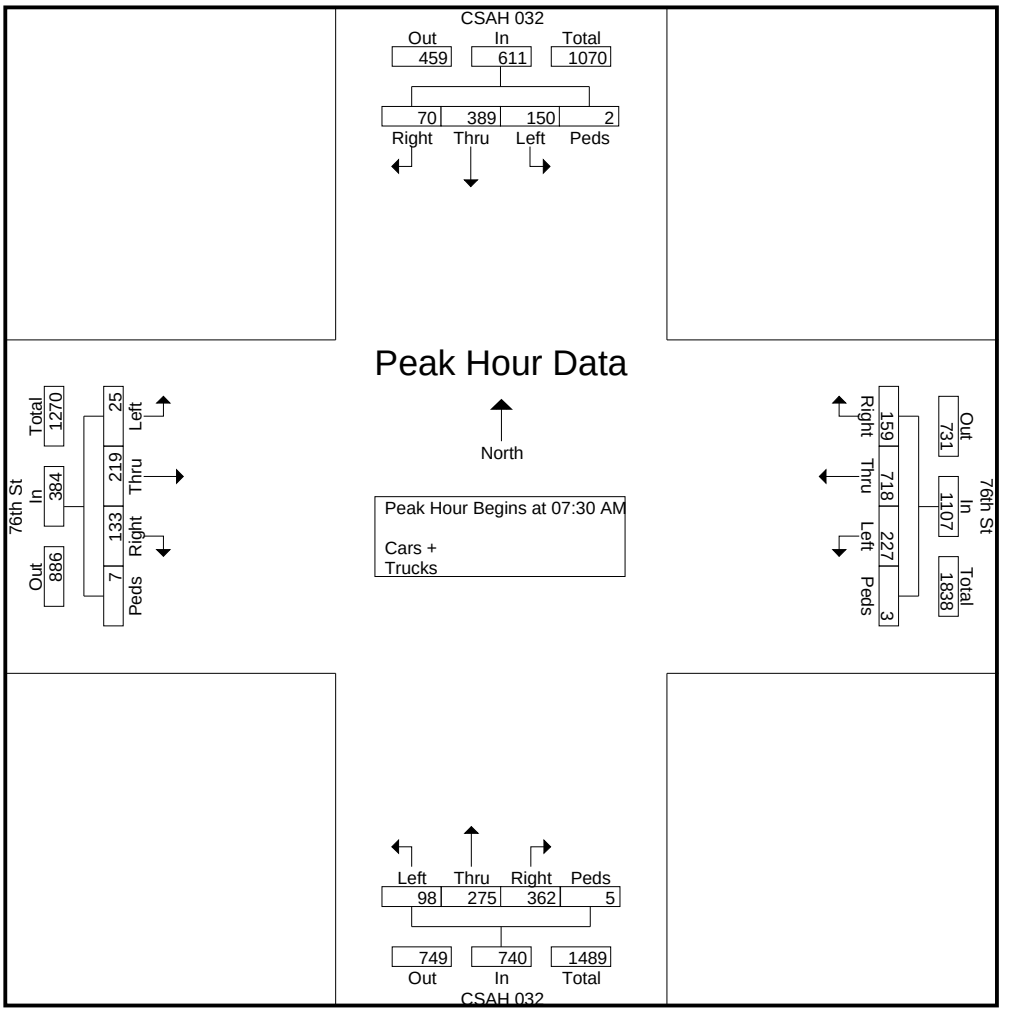
Turning Movement Counts
Attachment 04

Hennepin County

Department of Public Works
Transportation Planning Division
Traffic Movement Study

File Name : STDY 4004
Site Code : 4004
Start Date : 5/12/2016
Page No : 4

	CSAH 032 Southbound					76th St Westbound					CSAH 032 Northbound					76th St Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	14	89	35	0	138	44	153	49	0	246	81	69	22	1	173	**39**	56	7	1	**103**	660
07:45 AM	16	100	32	0	148	36	160	56	**2**	254	75	**82**	25	**3**	185	32	49	**10**	**5**	96	683
08:00 AM	19	**122**	32	**1**	**174**	**48**	**251**	**65**	1	**365**	101	66	20	0	187	32	**57**	5	0	94	**820**
08:15 AM	**21**	78	**51**	1	151	31	154	57	0	242	**105**	58	**31**	1	**195**	30	57	3	1	91	679
Total Volume	70	389	150	2	611	159	718	227	3	1107	362	275	98	5	740	133	219	25	7	384	2842
% App. Total	11.5	63.7	24.5	0.3		14.4	64.9	20.5	0.3		48.9	37.2	13.2	0.7		34.6	57	6.5	1.8		
PHF	.833	.797	.735	.500	.878	.828	.715	.873	.375	.758	.862	.838	.790	.417	.949	.853	.961	.625	.350	.932	.866



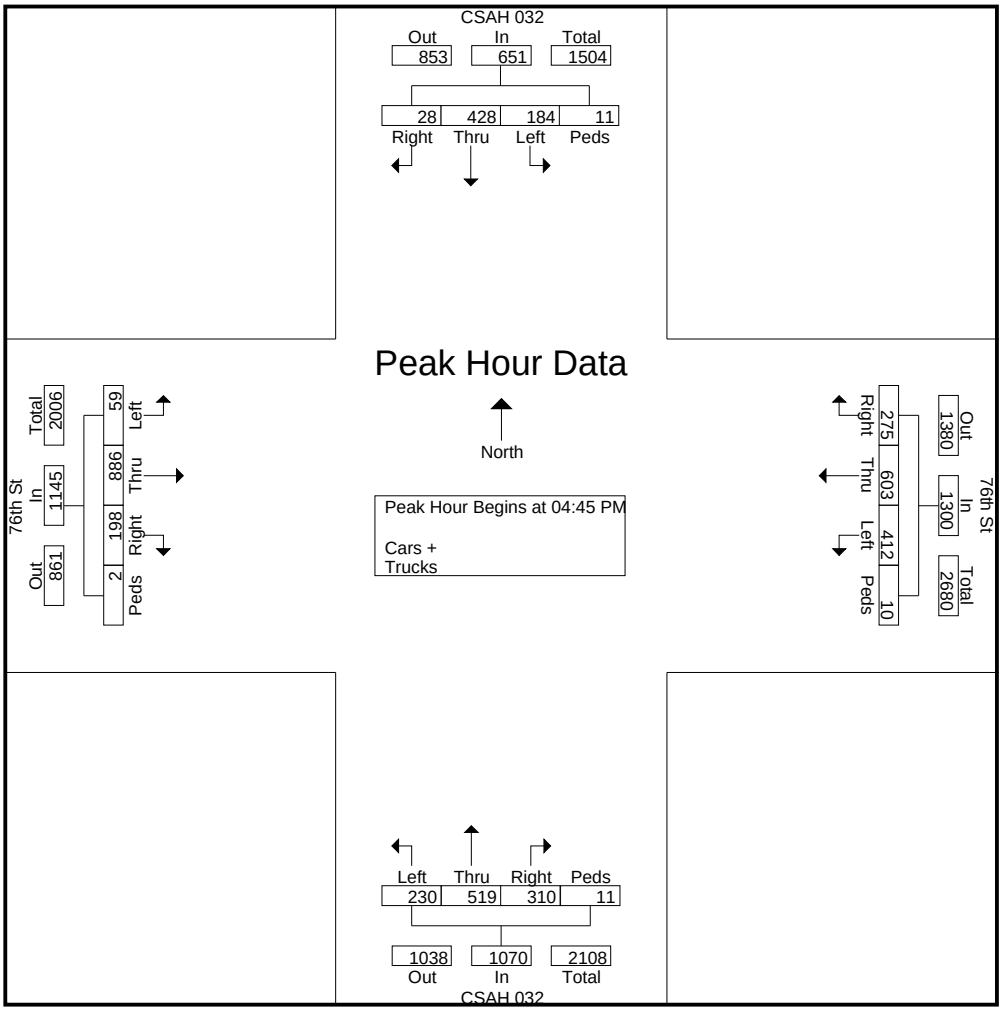
Turning Movement Counts
Attachment 04

Hennepin County

Department of Public Works
Transportation Planning Division
Traffic Movement Study

File Name : STDY 4004
Site Code : 4004
Start Date : 5/12/2016
Page No : 6

	CSAH 032 Southbound					76th St Westbound					CSAH 032 Northbound					76th St Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 07:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**10**	**132**	33	1	176	66	143	104	3	316	74	138	52	0	264	**62**	219	**23**	**1**	**305**	1061
05:00 PM	5	88	49	2	144	**84**	**163**	102	0	**349**	78	117	60	**5**	260	42	**248**	13	0	303	1056
05:15 PM	8	122	**53**	**4**	**187**	68	136	**122**	3	329	**84**	**147**	**69**	3	**303**	46	190	13	1	250	**1069**
05:30 PM	5	86	49	4	144	57	161	84	**4**	306	74	117	49	3	243	48	229	10	0	287	980
Total Volume	28	428	184	11	651	275	603	412	10	1300	310	519	230	11	1070	198	886	59	2	1145	4166
% App. Total	4.3	65.7	28.3	1.7		21.2	46.4	31.7	0.8		29	48.5	21.5	1		17.3	77.4	5.2	0.2		
PHF	.700	.811	.868	.688	.870	.818	.925	.844	.625	.931	.923	.883	.833	.550	.883	.798	.893	.641	.500	.939	.974



2013 to 2015 Crash Data
Crashes Highlighted in Red Were Not Included in the Benefit/Cost Calculation
Attachment 05A

CSAH 32 at 76th St - Intersection

2013-2015 Crash Data Provided by MNDOT TIS Office

											PERSON1											PERSON2										
SYS	ATP	CO	CITY	DOW	MONTH	DAY	YEAR	TIME	SEV	ACC_NUM	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX
04	DRIVER OF VEHICLE 1 SAID SHE WAS MAKING A LEFT TURN FROM WESTBOUND 76TH ST ONTO SOUTHBOUND PENN AVE	27	3210	6-Fri	12	26	2014	1420	C	143600087	3	98	6	1	1	1	N	4	1	27	M	1	98	6	1	1	1	N	4	1	56	F
05	SEE CN: 14002622 FOR MORE INFORMATION. NOTE: JENNIFER MARIE LESCH (DOB: 4/25/1981) (651-829-0276)	27	3210	1-Sun	8	10	2014	1408	A	142250028	1	3	1	5	3	1	A	99	99	21	M	1	1	1	1	0	1	B	99	1	52	F
05	UNIT 1 WAS TRAVELING NB ON PENN AVE S AND FAILED TO STOP AT THE RED LIGHT AT W 76TH ST STRIKING UNI	27	3210	6-Fri	10	17	2014	0841	C	142900048	3	7	1	1	0	1	N	4	1	41	F	1	3	1	1	0	1	C	4	1	44	M
05	UNIT#1 SLOWING IN TRAFFIC FOR RED LIGHT. UNIT#2 ALSO SLOWING FOR RED LIGHT. DRIVER OF UNIT#2 STATED	27	3210	6-Fri	12	6	2013	1643	N	133410248	3	7	10	1	1	1	N	4	1	42	F	3	7	10	46	61	1	N	4	1	38	F
05	UNIT 1 WAS STOPPED AT THE RED LIGHT IN THE LEFT TURN LANE WB 76TH STREET WHEN IT REAR ENDED BY UNIT	27	3210	3-Tue	1	29	2013	0554	N	130290082	1	7	11	1	0	1	N	4	1	40	F	3	7	57	3	0	1	N	4	1	38	F
05	ON 12/06/2013 AT 1920 HOURS, I WAS DISPATCHED TO 76TH STREET WEST AND PENN AVENUE SOUTH IN REGARDS	27	3210	6-Fri	12	6	2013	1920	N	133410022	1	7	1	1	0	1	N	4	1	33	M											
05	UNIT 1 WAS EB ON 76TH ST WHEN IT WAS REAR ENDED BY UNIT 2. DRIVER OF UNIT 1 STATED THAT THERE WERE	27	3210	7-Sat	9	7	2013	1508	C	132500105	1	3	11	1	0	1	N	4	1	29	F	1	3	1	15	0	1	N	4	1	30	M
05	VEHICLE #1 WAS E/B ON 76TH IN THE R/LANE. VEHICLE #2 WAS E/B ON 76TH APPROACHING PENN IN THE R/LANE	27	3210	6-Fri	7	12	2013	1152	N	131940060	1	3	14	2	8	1	N	4	1	68	M	4	3	1	1	0	1	N	4	1	32	F

2013 to 2015 Crash Data
Crashes Highlighted in Red Were Not Included in the Benefit/Cost Calculation
Attachment 05A

CSAH 32 at 75th St - Intersection

2013-2015 Crash Data Provided by MNDOT TIS Office

											PERSON1											PERSON2									
SYS	ATP	CO	CITY	DOW	MONTH	DAY	YEAR	TIME	SEV	ACC_NUM	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX
04	UNIT 1 STATED WAS AT THE INTERSECTION OF 75TH ST AND PENN AVE, ON CENTER LANE FACING NORTH. LIGHT C	27	3210	4-Wed	9	18	2013	1147	C	132620026	33	1	1	4	0	1	N	4	1	28	M	1	8	6	1	0	1	C	4	1	29	F
04	DRIVER OF VEHICLE 1 SAID HE WAS GOING NORTH ON PENN AVE S AND HAD A GREEN LIGHT WHEN VEH 2 TURNED I	27	3210	3-Tue	2	18	2014	0709	C	140490052	1	1	1	1	1	1	C	4	1	28	M	3	5	6	2	1	1	C	4	1	34	F
04	SIGNAL. WITNESSES ALSO STATED THAT SEVERAL CARS TRAVELLING NORTH ON PENN HAD TO SWERVE TO AVOID HI	27	3210	3-Tue	2	25	2014	0758	C	140580110	1	98	1	1	0	1	N	4	99	17	M	51	98	39	5	0	25	C	98	1	19	M
04	ON 07-10-15 AT 0731 HOURS, I RESPONDED TO A PROPERTY DAMAGE HIT AND RUN ACCIDENT IN THE AREA OF 65T	27	3210	6-Fri	7	10	2015	0731	N	151960057	33	1	1	2	0	1	N	99	1	42	M	1	1	1	1	0	1	N	4	1	26	F
04	ON 10/18/2015 AT 1130 HOURS, U1 MADE A LH TURN FROM 75TH STREET WEST ONTO PENN AVENUE SOUTH INTO TH	27	3210	1-Sun	10	18	2015	1130	N	152910058	1	5	54	1	0	1	N	4	1	90	F											
10	UNIT 2 WAS EASTBOUND ON 75TH STREET AND APPROACHING PENN AVENUE SOUTH. UNIT 1 WAS MAKING A RIGHT T	27	3210	7-Sat	12	7	2013	1252	N	133410169	1	5	5	16	0	1	N	4	1	16	M	1	3	1	1	0	1	N	4	1	65	F

2013 to 2015 Crash Data
Crashes Highlighted in Red Were Not Included in the Benefit/Cost Calculation
Attachment 05A

CSAH 32 from 75th St to CSAH 53 (66th St) - Segment

2013-2015 Crash Data Provided by MNDOT TIS Office

											PERSON1											PERSON2										
SYS	ATP	CO	CITY	DOW	MONTH	DAY	YEAR	TIME	SEV	ACC_NUM	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX
04		27	3210	3-Tue	2	5	2013	0800	N	130660050	1	1	10	0	0	1	N	4	0	30	F											
04	UNIT 2 WAS UNOCCUPIED AND LEGALLY PARKED ON PENN AVENUE NORTH OF 67TH STREET. UNIT 1 ATTEMPTED TO	27	3210	3-Tue	11	5	2013	1259	N	133090118	7	5	12	9	0	1	N	4	1	59	M											
04	D1 STATED HE WAS MAKING A DELIVERY AT 7220 PENN AVE. S. AND WAS IN THE BACK OF HIS VAN PREPARING TO	27	3210	7-Sat	12	14	2013	1127	C	133480140	31	98	21	1	0	1	C	98	1	36	M	3	5	1	15	0	1	N	4	1	18	M
04	ON 01/02/2013 AT 1706 I WAS SENT FOR A TWO CAR CRASH. UPON ARRIVAL, I SPOKE WITH ANDREA NICOLE MAR	27	3210	5-Thu	1	2	2014	1706	N	140070105	1	3	1	2	0	1	N	4	1	19	F	1	5	1	1	0	1	N	4	1	66	F
04		27	3210	4-Wed	8	6	2014	1130	N	142520067	1	1	6	0	0	1	N	4	0	17	M	1	1	1	0	0	1	N	0	0	25	M
04	OFFICERS RESPONDED TO A PI CRASH INVOLVING TWO VEHICLES AT 74TH AND PENN AVE S. UNIT 1 STRUCK UNIT	27	3210	3-Tue	12	2	2014	1617	C	143390027	3	1	1	1	0	1	C	4	1	34	M	4	3	1	15	5	1	C	4	1	36	F
04	U1 WAS TRAVELING NB ON PENN AVE S, AND WAS IN THE CENTER TURN LANE. D1 STATED THAT HE HAD HIS FOOT	27	3210	6-Fri	1	23	2015	1844	N	150240114	1	1	6	90	2	1	N	4	1	34	M	1	5	1	1	0	1	N	4	1	34	F
04	VEHICLE #2 WAS PULLING OUT FROM E/B 68TH STREET ONTO N/B PENN AVENUE. THE DRIVER OF VEHICLE #2, NIC	27	3210	1-Sun	4	19	2015	1500	C	151190026	1	1	1	1	0	1	C	4	1	41	M	4	2	6	2	15	1	C	4	1	38	F
04	ON 6/15/15 AT 1207 HOURS I, OFFICER BLAINE, WAS DISPATCHED TO 70 1/2 STREET AND PENN AVENUE IN RESP	27	3210	2-Mon	6	15	2015	1207	C	151700094	1	5	1	21	0	1	C	4	90	84	F											
04	UNIT #1 WAS TRAVELING SOUTH BOUND ON PENN AVE S WHEN IT STRUCK A LIGHT POLE, KNOCKING IT OVER AND D	27	3210	1-Sun	9	6	2015	1044	C	152490084	1	5	1	90	15	1	C	4	99	23	M											
04	ON 11/30/15, OFFICERS WERE DISPATCHED TO A PI CRASH INVOLVING THREE VEHICLES. AFTER UNIT 1 WAS STR	27	3210	2-Mon	11	30	2015	0806	C	153340239	1	1	1	1	0	1	N	4	1	31	F	3	5	1	1	0	1	N	4	1	60	M
10	ON 2/20/2014 AT 2312 HOURS, OFFICERS WERE DISPATCHED TO 72ND ST AND PENN AVE S ON REPORT OF A VEHIC	27	3210	5-Thu	2	20	2014	2312	N	140520401	1	98	0	0	0	1	N	0	0	902	Z											
05	ON 01/02/2014 AT 0942 HOURS I SAW TWO CARS THAT APPEARED TO HAVE BEEN INVOLVED IN A CRASH IN THE LE	27	3210	5-Thu	1	2	2014	0942	N	140020102	3	1	1	4	0	1	N	4	1	27	F	3	1	1	1	0	1	N	4	1	50	F

2013 to 2015 Crash Data
Crashes Highlighted in Red Were Not Included in the Benefit/Cost Calculation
Attachment 05A

CSAH 32 at 65th St - Intersection

2013-2015 Crash Data Provided by MNDOT TIS Office

											PERSON1											PERSON2										
SYS	ATP	CO	CITY	DOW	MONTH	DAY	YEAR	TIME	SEV	ACC_NUM	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX
04	ON 2-7-2014 AT 1802 HRS, UNIT #1 WAS TRAVELLING NORTH ON PENN AVE SO AT JUST SOUTH OF 69TH STREET W	27	3210	6-Fri	2	7	2014	1802	C	140390009	1	1	1	4	0	1	N	4	1	51	M	1	1	11	1	1	1	C	4	1	46	M
04	TO UNIT 1; HE TRIED TO SWERVE AWAY TO THE RIGHT BUT NOT IN TIME. HE COMPLAINED OF BACK PAIN BUT RE	27	3210	5-Thu	10	30	2014	1720	C	143070017	1	1	10	4	3	1	C	4	1	39	M	2	1	11	1	0	1	N	4	1	56	M
05	ON 2/7/14 AT 1703 HRS I OFFICER BATAGLIA WAS DISPATCHED TO A PD ACCIDENT AT 69TH/PENN. UPON ARRIVAL	27	3210	6-Fri	2	7	2014	1703	C	140380247	1	2	6	1	0	1	C	4	1	36	F	1	5	1	1	0	1	N	4	1	34	F
10	UNIT #1 SB PENN, STOPPED BEHIND TRAFFIC AT RED LIGHT. UNIT #2 SB PENN. DRIVER OF UNIT #2 STATED	27	3210	6-Fri	5	15	2015	1528	N	151360003	4	5	10	1	1	1	N	4	1	40	F	1	5	1	15	15	1	N	4	1	69	F

2013 to 2015 Crash Data
Crashes Highlighted in Red Were Not Included in the Benefit/Cost Calculation
Attachment 05A

CSAH 32 - Out of Limits

2013-2015 Crash Data Provided by MNDOT TIS Office

											PERSON1											PERSON2									
SYS	ATP	CO	CITY	DOW	MONTH	DAY	YEAR	TIME	SEV	ACC_NUM	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX	VTYPE	DIR	ACT	FAC1	FAC2	POSN	INJ	EQP	PHYS	AGE	SEX
04	VEH1 WAS NB ON PENN VEH2 WAS SB ON PENN DR1 BEGAN TO TURN LEFT, TO GO WB ON HWY62, AND STRUCK VEH2	27	3210	6-Fri	1	25	2013	1004	N	130250079	1	1	6	2	0	1	N	4	1	72	F	3	5	1	1	0	1	N	4	1	38	M
04	V/1 WAS S/B AND SIGNALED AND BRAKED TO TURN E/B ON 65TH STREET AND STOPPED FOR ON COMMING TRAFFIC.	27	3210	3-Tue	2	19	2013	0838	N	130500056	4	5	6	1	0	1	N	4	1	59	M	1	5	1	15	0	1	N	4	1	24	M
04		27	3210	6-Fri	1	18	2013	1030	N	130510078	1	1	6	0	0	1	N	0	0	26	F	1	3	6	0	0	1	N	0	0	32	F
04	D1 STATED WAS NB ON PENN AND BEGAN TO TURN RIGHT INTO THE ALDI LOT. D1 STATED VIEW OD SB TRAFFIC BL	27	3210	5-Thu	6	13	2013	1702	N	131700079	1	1	6	2	0	1	N	4	1	24	F	1	5	1	1	0	1	N	4	1	23	F
04	THE LIGHT WAS GREEN FOR HER. WITNESS SAID UNIT 2 RAN THE RED LIGHT. DRIVER OF UNIT 2 WAS CITED. N	27	3210	1-Sun	6	23	2013	1625	N	131740100	4	7	6	1	0	1	N	4	1	25	F	1	5	1	5	0	1	N	4	1	59	F
04		27	3210	3-Tue	8	13	2013	1015	N	132600048	1	0	6	0	0	1	N	0	0	30	F	1	5	1	0	0	1	N	4	0	67	F
04	STATED WAS SORRY, BUT HAD SLEEP APNEA, STATED HAD NOT BEEN ABLE TO SLEEP IN THREE DAYS. STATED WAS	27	3210	3-Tue	11	5	2013	1725	N	133110059	1	5	11	1	0	1	N	4	1	32	F	1	5	1	21	0	1	N	4	1	53	F
04	DV1 STATED THAT SHE WAS HEADING EB MNTH 62 IN THE MIDDLE LANE AND SLOWED TO A CRAWL DUE TO TRAFFIC	27	3210	7-Sat	10	26	2013	1847	N	133200173	3	3	10	1	0	1	N	4	1	56	F	1	3	11	1	0	1	N	4	1	52	F
04	UNIT #1 WAS TRAVELING NORTH ON PENN AVE APPROACHING 64TH ST WHEN SLOWING TO TURN INTO THE HUB HOBBY	27	3210	2-Mon	12	23	2013	1836	N	133570288	3	1	1	1	0	1	N	4	1	42	F	1	1	1	61	0	1	N	4	1	20	F
04	ON 12/24/2013 AT 1321 HOURS I WAS SENT TO 64TH & PENN AVENUE FOR A CRASH. UPON ARRIVAL, I SPOKE WI	27	3210	2-Mon	12	23	2013	1321	N	133580103	3	5	1	1	0	1	N	4	1	37	F	1	0	0	0	0	1	N	0	0	902	Z
04	UNIT 1 WAS STOPPED IN TRAFFIC IN THE LEFT TURN LANE ON PENN AVE. UNIT 2 SIDEWIPED UNIT 1 WHILE TRYI	27	3210	5-Thu	12	26	2013	1238	N	133600107	3	1	14	15	0	1	N	4	1	76	F	1	1	11	1	0	1	N	4	1	27	F
04	ON 01/22/2014 AT 1901 HOURS I, OFFICER HOIUM, WAS DISPATCHED TO THE PARKING LOT OF CARQUEST AUTO PA	27	3210	4-Wed	1	22	2014	1901	N	140230010	4	5	1	1	0	1	N	4	1	17	F	1	1	6	1	0	1	N	4	1	84	M
04		27	3210	5-Thu	12	19	2013	1600	N	140350110	3	1	1	0	0	1	N	0	0	18	M	1	1	11	0	0	1	N	4	0	20	M
04	ON 4/16/14 AT 2143 HOURS I, OFFICER HOIUM, WAS DISPATCHED TO A PROPERTY DAMAGE ACCIDENT THAT HAD OC	27	3210	4-Wed	4	16	2014	2143	C	141070022	1	1	11	1	0	1	C	4	1	33	F	1	1	1	15	0	1	C	4	1	24	F
04	UNIT 1 WAS STARTING FROM STOPPED IN THE LEFT TURN LANE FROM EB 66 TO NB PENN, UNIT 2 WAS STARTING F	27	3210	6-Fri	4	25	2014	0922	N	141150059	3	1	6	10	0	1	N	4	1	45	M	3	1	6	1	0	1	N	4	1	35	F
04	V1 STOPPED (IN LINE FOR RED LIGHT) NORTHBOUND IN LEFT LANE OF PENN AVE S AND HWY 62 OVERPASS. V2 TU	27	3210	2-Mon	4	28	2014	0713	N	141180020	35	5	6	8	0	1	N	99	99	902	Z	1	1	1	1	0	1	N	4	1	30	M
04	V1 NORTHBOUND PENN AVE STOPPED SUDDENLY AT AVOID COLLISION WITH CAR AHEAD OF IT THAT ALSO STOPPED S	27	3210	7-Sat	5	3	2014	1515	N	141230087	1	1	57	1	0	1	N	4	1	50	F	3	1	1	4	0	1	N	4	1	49	F
04		27	3210	1-Sun	4	13	2014	1250	N	141350020	1	5	11	0	0	1	N	4	0	83	M	1	5	11	0	0	1	N	0	0	80	M
04	D1 STATED THAT THE LIGHT TURNED GREEN AND HE STARTED MOVING WHEN THE OTHER CARS BEGAN MOVING, THE	27	3210	6-Fri	5	16	2014	1229	N	141360064	2	1	1	15	0	1	N	4	98	64	M	1	1	1	1	0	1	N	4	1	59	F
04	UNIT 1 MADE A SOUTHBOUND TURN FROM WESTBOUND HWY 62 RAMP AND THE TRAILER STRUCK UNIT 2	27	3210	2-Mon	6	9	2014	1156	N	141600091	33	5	6	90	0	1	N	99	0	49	M	1	1	1	1	0	1	N	99	0	71	M
04	U1 IN THE LEFT NB LANE ON PORTLAND AVE S AT THE INTERSECTION WITH 64TH ST E. U2 WAS BEHIND U1. D1	27	3210	4-Wed	6	11	2014	1247	C	141620105	3	1	1	4	0	1	N	4	1	32	F	1	1	1	1	0	1	C	4	1	66	F
04	ON 6/24/14 AT 1101 HOURS, I WAS DISPATCHED TO 65TH STREET AND PENN AVENUE ON A TWO VEHICLE PROPERTY	27	3210	3-Tue	6	24	2014	1101	N	141780032	1	4	5	2	0	1	N	4	1	63	F	1	5	1	0	0	1	N	4	1	20	F
04	ON 8/16/14 AT 1343 HOURS, UNIT ONE WAS TRAVELLING SOUTH ON PENN AVE S. UNIT TWO WAS EXITING THE PA	27	3210	7-Sat	8	16	2014	1343	N	142280068	1	98	1	1	0	1	N	4	1	80	M	1	98	1	2	0	1	N	4	1	42	M
04	UNIT 1 HAD BEEN STOPPED AT A RED LIGHT IN THE FAR RIGHT LANE HEADING WB ON 66TH STREET AT PENN AV S	27	3210	6-Fri	10	3	2014	0823	N	142760041	3	7	1	1	0	1	N	4	1	56	F	1	7	1	4	0	1	N	4	1	27	F
04	OFFICERS WERE DISPATCHED TO A CRASH AT 64TH AND PENN AVE S. UPON OFFICERS ARRIVAL, DRIVER OF UNIT 1	27	3210	5-Thu	10	30	2014	0943	C	143030082	1	6	5	2	0	1	N	4	1	62	F	1	5	1	1	0	1	C	4	1	19	F
04	ON 10/5/2014 AT 1102 HOURS, UNITS ONE AND TWO WERE TRAVELLING SOUTHBOUND ON PENN AVE S AT 65TH ST.	27	3210	4-Wed	11	5	2014	1102	N	143090158	2	98	1	1	0	1	N	4	1	60	M	3	98	1	8	0	1	N	4	1	69	F
04	UNIT 1 STATED THAT TRAFFIC HAD COME TO A STOP IN THE FAR RIGHT LANE SB PENN AVE S TO ALLOW HIM TO E	27	3210	2-Mon	11	10	2014	0835	N	143140058	35	5	5	2	0	1	N	4	1	37	M	8	5	1	1	0	1	N	4	1	64	M
04	UNIT 1 WAS STOPPED IN THE FAR RIGHT LANE FACING SB ON PENN AVE S AT A RED LIGHT AT THE INTERSECTION	27	3210	7-Sat	11	15	2014	1215	N	143200051	3	5	11	1	0	1	N	4	1	31	F	3	5	1	61	4	1	N	4	1	40	F
04	D1 STATED THAT HE WAS DRIVING HIS VEHICLE SB ON PENN AVE S THROUGH THE INTERSECTION OVER HWY 62 ON	27	3210	4-Wed	11	19	2014	1509	N	143240106	1	5	1	99	0	1	N	99	1	26	M	1	3	6	99	0	1	N	99	1	67	M
04	VEH #1 WAS S/B ON PENN AVENUE IN THE RIGHT LANE WHEN VEH #2, WHICH WAS N/B ON PENN AVENUE MADE A LE	27	3210	1-Sun	11	23	2014	1315	N	143270088	2	5	1	1	1	1	N	4	1	28	F	1	8	54	2	15	1	N	4	1	19	M
04	D1 STATED THAT SHE WAS DRIVING NB ON PENN AVE S WHEN U2 WAS DRIVING SB ON PENN AVE S. D1 STATED THA	27	3210	6-Fri	11	28	2014	0658	N	143320058	1	5	6	46	61	1	N	4	1	24	F	3	1	1	46	61	1	N	4	1	56	F
04	BUS TRAVELLING WB AND VEHICLE TRAVELLING NB COLLIDED AT INTERSECTION. BOTH DRIVERS STATE THEY HAD G	27	3210	4-Wed	12	3	2014	2130	C	143370260	8	7	1	5	99	1	N	98	98	58	F	1	1	99	5	99	1	N	99	98	22	M
04	U2 NB PENN AV. U1 SB PENN AV. U1 MADE LEFT TURN TO GO ONTO RAMP TO MN-62 EB AND STRUCK U2. AT REST	27	3210	4-Wed	2	11	2015	1701	C	150420266	1	5	6	2	0	1	N	4	1	20	F	1	1	1	1	0	1	C	4	1	60	M
04	D2 SOUTHBOUND ON PENN AVE WHEN D1 MADE LEFT (WESTBOUND) TURN FROM NORTHBOUND PENN AVE. FIRE DEPT.	27	3210	5-Thu	2	19	2015	1925	C	150510020	1	1	6	2	0	1	C	4	1	25	M	4	5	1	1	0	1	C	4	1	33	M
04	THAT SHE COULDNT STOP UNTIL IT WAS TOO LATE. D1 STATED THAT SHE HAD A YELLOW LIGHT WHILE IN THE I'	27	3210	5-Thu	2	26	2015	1653	B	150570180	3	3	1	99	0	1	N	4	1	19	F	51	98	32	99	0	25	B	98	99	58	M
04	D1 SB PENN AV TRYING TO MAKE LEFT TURN INTO 6317 PENN AV. VEH STOPPED IN LEFT LANE OF NB PENN AV W	27	3210	4-Wed	3	11	2015	1512	N	150710156	1	1	1	1	0	1	N	4	1	63	F	1	5	54	2	0	1	N	4	1	44	M
04		27	3210	1-Sun	2	22	2015	1127	B	150830088	1	5	1	0	0	1	B	4	0	29	M	1	3	1	0	0	1	N	0	0	22	M
04	ON 4/11/15 AT 1401 HOURS I, OFFICER BLAINE, WAS DISPATCHED TO A TWO-VEHICLE CRASH AT 66TH STREET AN	27	3210	7-Sat	4	11	2015	1401	N	151020025	1	5	1	1	0	1	N	4	1	49	M	1	5	37	8	0	1	N	4	1	24	F
04	ON 4/24/15 AT 1547 HOURS I, OFFICER BLAINE, RESPONDED TO 63RD STREET AND PENN AVENUE IN RESPONSE TO	27	3210	6-Fri	4	24	2015	1547	N	151150024	4	3	37	2	0	1	N	99	99	37	F	1	5	1	1	0	1	N	4	1	73	F
04	DRIVER OF VEHICLE #1 CORNELISON WAS IN THE LEFT LANE ON MNTH 62 NEAR PENN AVE WHEN HER FRONT LEFT	27	3210	2-Mon	5	11	2015	0735	N	151340252	4	3	1	42	0	1	N	4	1	47	F											
04	DVR 1 STATED SHE WAS IN THE CENTER LANE MAKING A LEFT ONTO SB PENN AVE WHEN STRUCK FROM BY V1. DVR	27	3210	4-Wed	5	6	2015	1713	N	151400201	1	6	6	1	0	1	N	4	1	40	F	1	6	6	8	10	1	N	4	1	30	M
04	V1 MERGED ONTO PENN AVE FROM WB MNTH 62. DV1 FIRST STATED THAT SHE THOUGHT THE SEMAPHORE WAS GR	27	3210	4-Wed	5	27	2015	1359	N	151490292	1	7	3	15	0	1	N	4	1	57	F	1	1	1	1	0	1	N	4	1	57	M
04	VEH 2 WAS NORTHBOUND ON PENN AV S. VEH 1 WAS STOPPED WESTBOUND ON THE OFF RAMP OF 62, GOING ACROSS	27	3210	3-Tue	6	2	2015	1450	N	151530120	3	7	1	1	0	1	N	4	1	62	F	3	1	1	5	0	1	N	4	1	60	F
04	U1 WAS EXITING THE ALDI FOOD LOT AND WAS MAKING A LEFT TURN TO GO NB ON PENN AVE S. U2 WAS SB ON PE	27	3210	5-Thu	7	23	2015	1202	C	152040103	1	2	6	2	0	1	N	4	1	36	F	1	5	1	1	0	1	C	4	1	77	M
04	V1 WAS IN THE FAR LEFT TURNING LANE TO PENN AVE. V1 WAS MAKING A LEFT HAND TURN ONTO SB PENN AVE (C	27	3210	5-Thu	7	23	2015	1335	N	152070190	2	7	6	1	0	1	N	4	1	64	M	1	7	6	15	8	1	N	4	1	22	M
04	U2 WAS NB ON PENN AVE S IN THE LEFT LANE DRIVING THROUGH THE INTERSECTION WITH 65TH ST W. U1 WAS WB	27	3210	4-Wed	8	12	2015	1217	C	152240153	3	7	1	2	0	1	N	4	1	44	F	1	1	1	1	0	1	N	4	1	27	M
04		27	3210	3-Tue	7	21	2015	1352	N	152360053	1	1	11	0	0	1	N	0	0	903	Z											
04	U2 (SCHOOL BUS #834) WAS STOPPED IN THE RIGHT LANE ON NB PENN AVE S PREPARING TO UNLOAD SCHOOL CHIL	27	3210	6-Fri	9	25	2015	1640	C	152740131	1	1	1	15	0	1	N	4	1	61	F	8	1	90	1	0	1	C	4	1	35	F
04	UNIT #1 WAS TRAVELING NORTHBOUND IN THE RIGHT LANE ON PENN AVE S WHEN SHE REAR ENDED THE VEHICLE IN	27	3210	3-Tue	10	27	2015	1529	C	153030080	4	1	11	1	0	1	N	4	1	33	F	1	1	1	1	0	1	N	4	1	16	F
04	THE DRVR OF UNIT 1 STATED SHE WAS TRAVELING WB IN THE RIGHT LANE ON I-494. SHE STATED SHE WAS TRAV	27	3210	4-Wed	10	28	2015	0737	N	153070337	1	7	16	4	15	1	N	4	1	37	M	3	7	11	1	0	1	N	4	1	26	F
04	ON 11/17/2015 A MINOR CRASH OCCURRED ON PENN AVENUE NEAR 63RD STREET. THE CRASH INVOLVED TWO VEHIC	27	3210	3-Tue	11	17	2015	0705	N	153270193	1	5	1	1	0	1	N	4	1	44	M	1	5	14	99	0	1	N	99	99	904	Z
04	DV2 STATED THAT SHE HAD BEEN TRAVELING SB ON PENN AVE TO MAKE A LEFT TURN TO HEAD EB ON MNTH 62. ST	27	3210	2-Mon	11	30	2015	1826	N	153360303	3	3	11	1	0	1	N	4	1	61	M	4	3	6	3	61	1	N	4	1	31	F

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 380

Modify change plus clearance interval to ITE 1985 Proposed Recommended Practice

Description:

Prior Condition: No Prior Condition(s)

Category: Intersection traffic control

Study: Changes in Crash Risk Following Re-Timing of Traffic Signal Change Intervals, Retting, R.A. and Chapline, J.F., 2002

Star Quality Rating:	★★★☆☆

Crash Modification Factor (CMF)	
Value:	0.92
Adjusted Standard Error:	0.1
Unadjusted Standard Error:	0.09

Crash Reduction Factor (CRF)	
Value:	8 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	10
Unadjusted Standard Error:	9

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	

Speed Limit:	
Area Type:	Not Specified
Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
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?	Yes. HSM lists this CMF in bold font to indicate that it has the highest reliability since it has an adjusted standard error of 0.1 or less. However, it also includes an asterisk (*) to indicate that the CMF value itself is within the range 0.90 to 1.10, but that the confidence interval defined by the CMF ± two times the standard error may contain the value 1.0. This is important to note since a treatment with such an CMF could potentially result in (a) a reduction in crashes (safety benefit), (b) no change, or (c) an increase in crashes (safety disbenefit). HSM recommends that this CMF should be used with caution.
Date Added to Clearinghouse:	
Comments:	Countermeasure name changed from "retiming signal change intervals to ITE standards" to match HSM

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 1414

Add signal (additional primary head)

Description:

Prior Condition: Intersection has one primary signal head per approach

Category: Intersection traffic control

Study: Safety Benefits of Additional Primary Signal Heads, Felipe et al., 1998

Star Quality Rating:	★★★☆☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.72
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	28 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	

Area Type:	Urban
Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	
Municipality:	Richmond, British Columbia
State:	
Country:	Canada
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	Sites
Before Sample Size Used:	8 Sites
After Sample Size Used:	8 Sites

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	
Comments:	The authors state that "three year of data were used for this analysis" (p. 7). This statement does not indicate if the before period was 3 years, the after period was 3 years, both were 3 years, or the total time period was 3 years (i.e. 1.5 years for before period and 1.5 years for after period).

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 2263

Improve pavement friction (increase skid resistance)

Description:

Prior Condition: Sections of pavement with both a high proportion (35-40%) of wet-road crashes and low friction numbers (<32).

Category: Roadway

Study: Safety Effects of a Targeted Skid Resistance Improvement Program, Lyon and Persaud, 2008

Star Quality Rating:	★★★★☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.797
Adjusted Standard Error:	0.052
Unadjusted Standard Error:	0.052

Crash Reduction Factor (CRF)	
Value:	20.3 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	5.2
Unadjusted Standard Error:	5.2

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	

Speed Limit:	
Area Type:	All
Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	1994 to 2003
Municipality:	
State:	NY
Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	Site-years
Before Sample Size Used:	348 Site-years
After Sample Size Used:	309 Site-years

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

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 7690

Change from protected only to FYA - protected/permissive left turn with time of day operation

Description: Change from protected only to FYA - protected/permissive left turn with time of day operation

Prior Condition: Protected phasing

Category: Intersection traffic control

Study: Safety Effectiveness of Flashing Yellow Arrow: Evaluation of 222 Signalized Intersections in North Carolina, Simpson and Troy, 2015

Star Quality Rating:	★★★★☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.901
Adjusted Standard Error:	
Unadjusted Standard Error:	0.048

Crash Reduction Factor (CRF)	
Value:	9.9 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	4.8

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	

Speed Limit:	35-45
Area Type:	Not specified
Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	Minimum of 19000 to Maximum of 41000 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	Minimum of 3000 to Maximum of 32000 Annual Average Daily Traffic (AADT)

Development Details	
Date Range of Data Used:	2003 to 2013
Municipality:	
State:	NC
Country:	
Type of Methodology Used:	Other before/after
Sample Size Used:	

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

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 271

Provide a left-turn lane on both major-road approaches

Description:

Prior Condition: No Prior Condition(s)

Category: Intersection geometry

Study: Safety Effectiveness of Intersection Left- and Right-Turn Lanes, Harwood et al., 2002

Star Quality Rating:	★★★★★

Crash Modification Factor (CMF)	
Value:	0.58
Adjusted Standard Error:	0.04
Unadjusted Standard Error:	0.03

Crash Reduction Factor (CRF)	
Value:	42 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	4
Unadjusted Standard Error:	3

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	

Area Type:	Urban
Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	Minimum of 4600 to Maximum of 40300 Average Daily Traffic (ADT)
Minor Road Traffic Volume:	Minimum of 100 to Maximum of 13700 Average Daily Traffic (ADT)

Development Details	
Date Range of Data Used:	
Municipality:	
State:	
Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details	
Included in Highway Safety Manual?	Yes. HSM lists this CMF in **bold** font to indicate that it has the highest reliability since it has an adjusted standard error of 0.1 or less.
Date Added to Clearinghouse:	
Comments:	Countermeasure name changed to match HSM

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 7682

Change from permissive only to FYA - protected/permissive left turn

Description: Change from permissive only to FYA - protected/permissive left turn

Prior Condition: Permissive phasing

Category: Intersection traffic control

Study: Safety Effectiveness of Flashing Yellow Arrow: Evaluation of 222 Signalized Intersections in North Carolina, Simpson and Troy, 2015

Star Quality Rating:	★★★☆☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.935
Adjusted Standard Error:	
Unadjusted Standard Error:	0.1

Crash Reduction Factor (CRF)	
Value:	6.5 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	10

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	

Speed Limit:	35-45
Area Type:	Not specified
Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	Minimum of 7000 to Maximum of 24000 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	Minimum of 1100 to Maximum of 9300 Annual Average Daily Traffic (AADT)

Development Details	
Date Range of Data Used:	2003 to 2013
Municipality:	
State:	NC
Country:	
Type of Methodology Used:	Other before/after
Sample Size Used:	

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

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 3072

Change number of traffic signal cycles per hour on arterial with signal coordination from X to Y

Description:

Prior Condition: No Prior Condition(s)

Category: Intersection traffic control

Study: Safety Effect of Arterial Signal Coordination, Wei and Tarko, 2011

Star Quality Rating:	★★★☆☆ [View score details]

Crash Modification Factor (CMF)	
Value:	$100 * (1 - e^{-0.0444(Y-X)})$
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	$e^{-0.0444(Y-X)}$
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability	
Crash Type:	Rear end
Crash Severity:	All
Roadway Types:	All
Number of Lanes:	1 to 3

Road Division Type:	
Speed Limit:	30-50 mph
Area Type:	Urban and suburban
Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	
Traffic Control:	Signalized
Major Road Traffic Volume:	Maximum of 1840 veh/hr/ln Vehicles Per Hour
Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	2003 to 2006
Municipality:	
State:	IN
Country:	USA
Type of Methodology Used:	Regression cross-section
Sample Size Used:	324 Crashes

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

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 307

Increase triangle sight distance

Description:

Prior Condition: No Prior Condition(s)

Category: Roadside

Study: Handbook of Road Safety Measures, Elvik, R. and Vaa, T., 2004

Star Quality Rating:	★★★☆☆

Crash Modification Factor (CMF)	
Value:	0.53
Adjusted Standard Error:	0.29
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	48 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	29
Unadjusted Standard Error:	

Applicability	
Crash Type:	All
Crash Severity:	Serious injury,Minor injury
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	

Area Type:	Not specified
Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Not specified
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	
Municipality:	
State:	
Country:	
Type of Methodology Used:	Meta-analysis
Sample Size Used:	

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

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 874

Narrow cross section (4 to 3 lanes with two way left-turn lane)

Description:

Prior Condition: Four-lane cross-section, two in each direction.

Category: Roadway

Study: The Safety and Operational Effects of Road Diet Conversion in Minnesota, Gates et al., 2007

Star Quality Rating:	★★★☆☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.63
Adjusted Standard Error:	
Unadjusted Standard Error:	0.00632455532034

Crash Reduction Factor (CRF)	
Value:	37 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	0.632455532034

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	4
Road Division Type:	Undivided
Speed Limit:	

Area Type:	Urban
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:	MN
Country:	
Type of Methodology Used:	Simple before/after
Sample Size Used:	Crashes
Before Sample Size Used:	516 Crashes
After Sample Size Used:	811 Crashes

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

[View the Full Study Details]

Export PDF

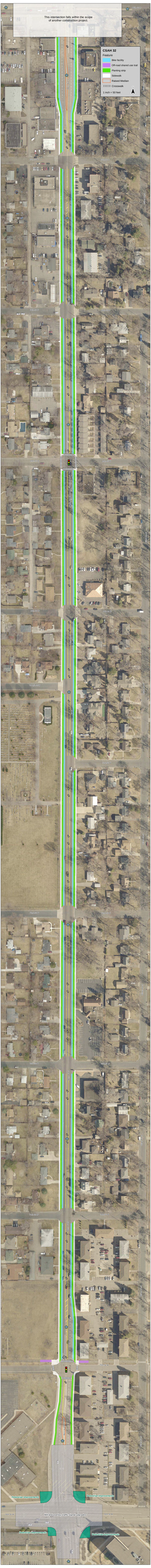
Export this detail page as a PDF file

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

For more information, contact **Karen Scurry,** *FHWA Office of Safety Programs* 609-637-4207

Preliminary Layout

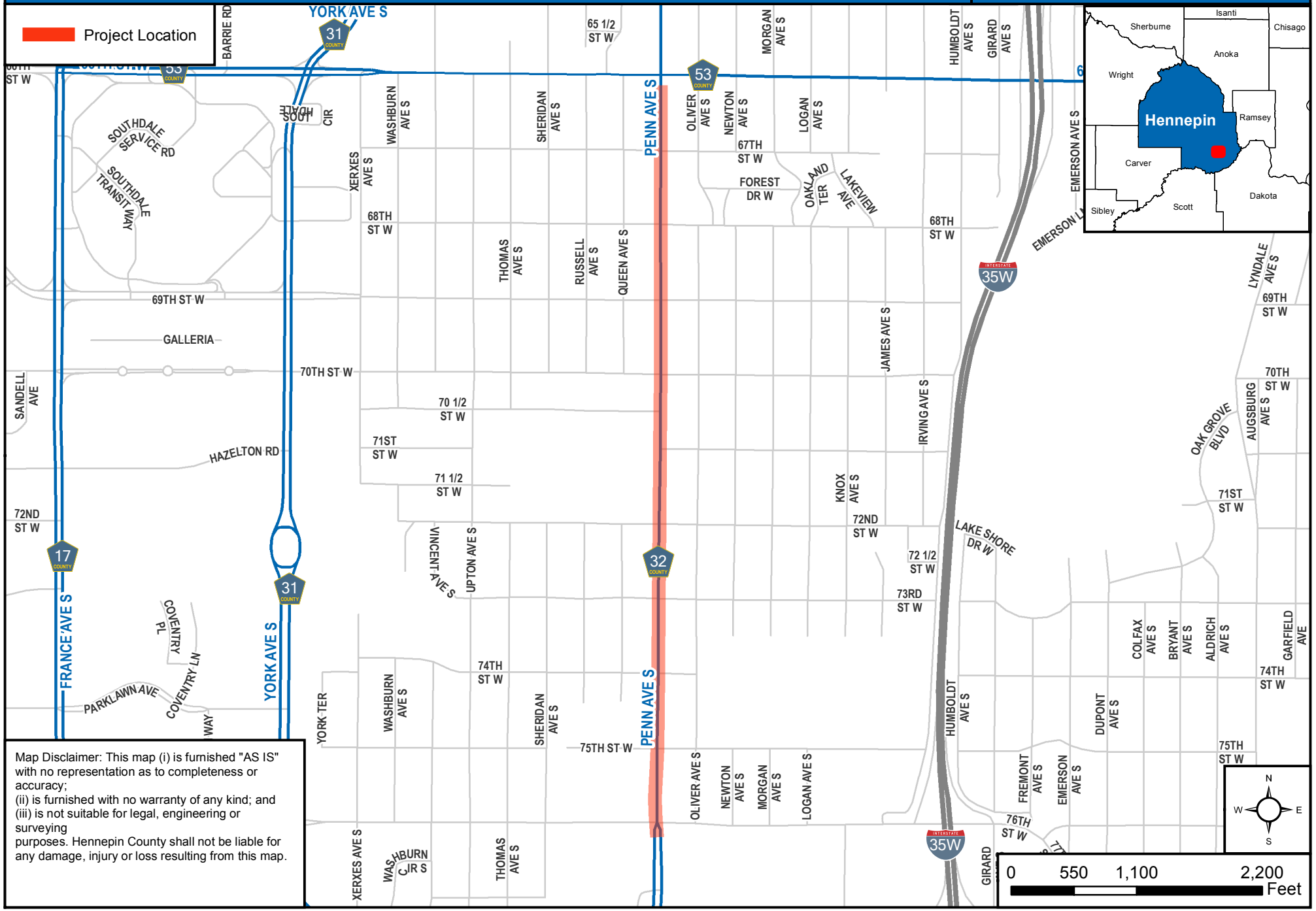
Attachment 06



CSAH 032 (Penn Ave) Reconstruction Project

Figure 01 - Project Location Map

Hennepin Transportation Planning
www.hennepin.us
04/01/2016



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(ii) is furnished with no warranty of any kind; and
(iii) is not suitable for legal, engineering or surveying
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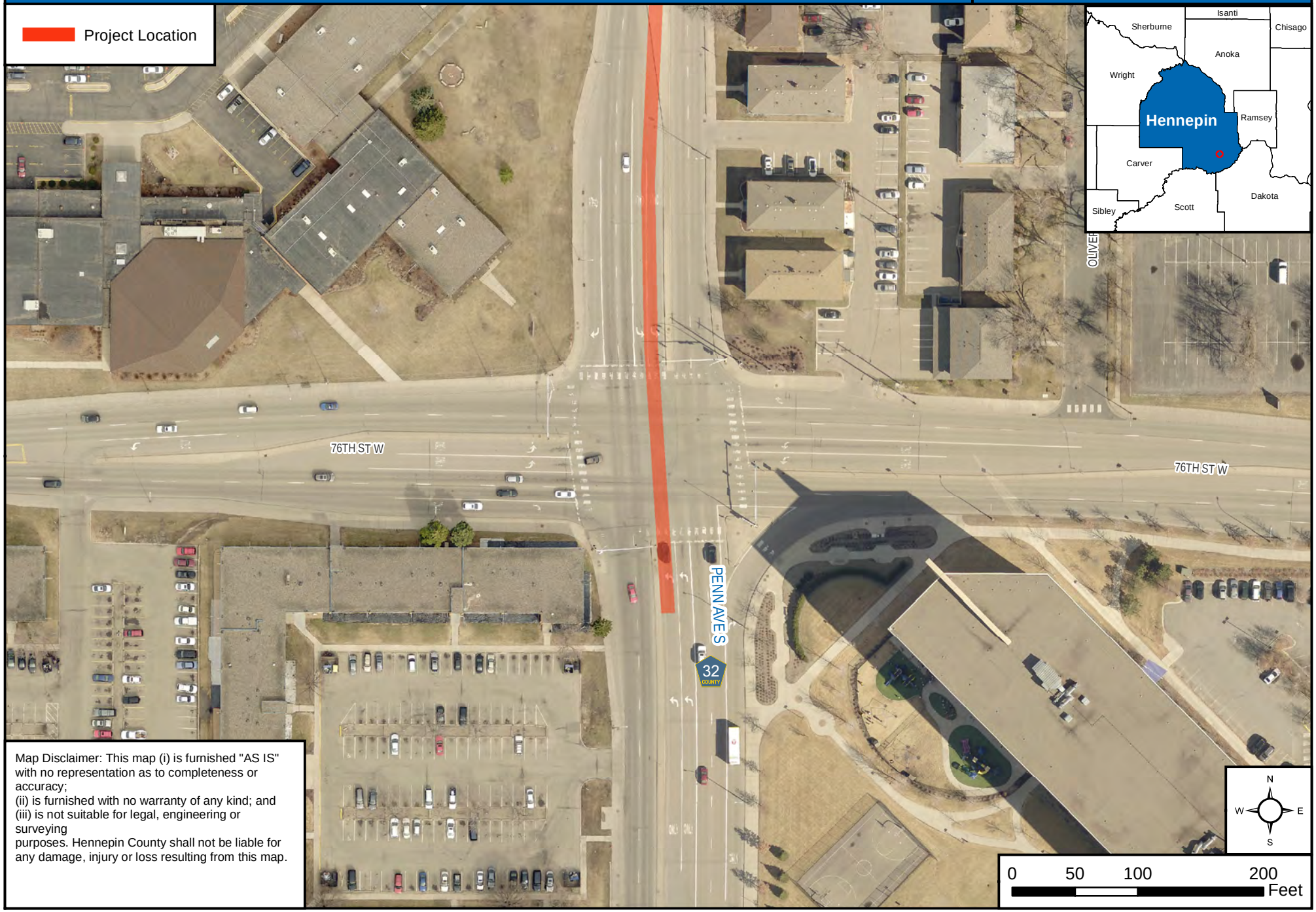
CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Transportation Planning
www.hennepin.us
04/01/2016



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CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin
Transportation Planning
www.hennepin.us
04/01/2016

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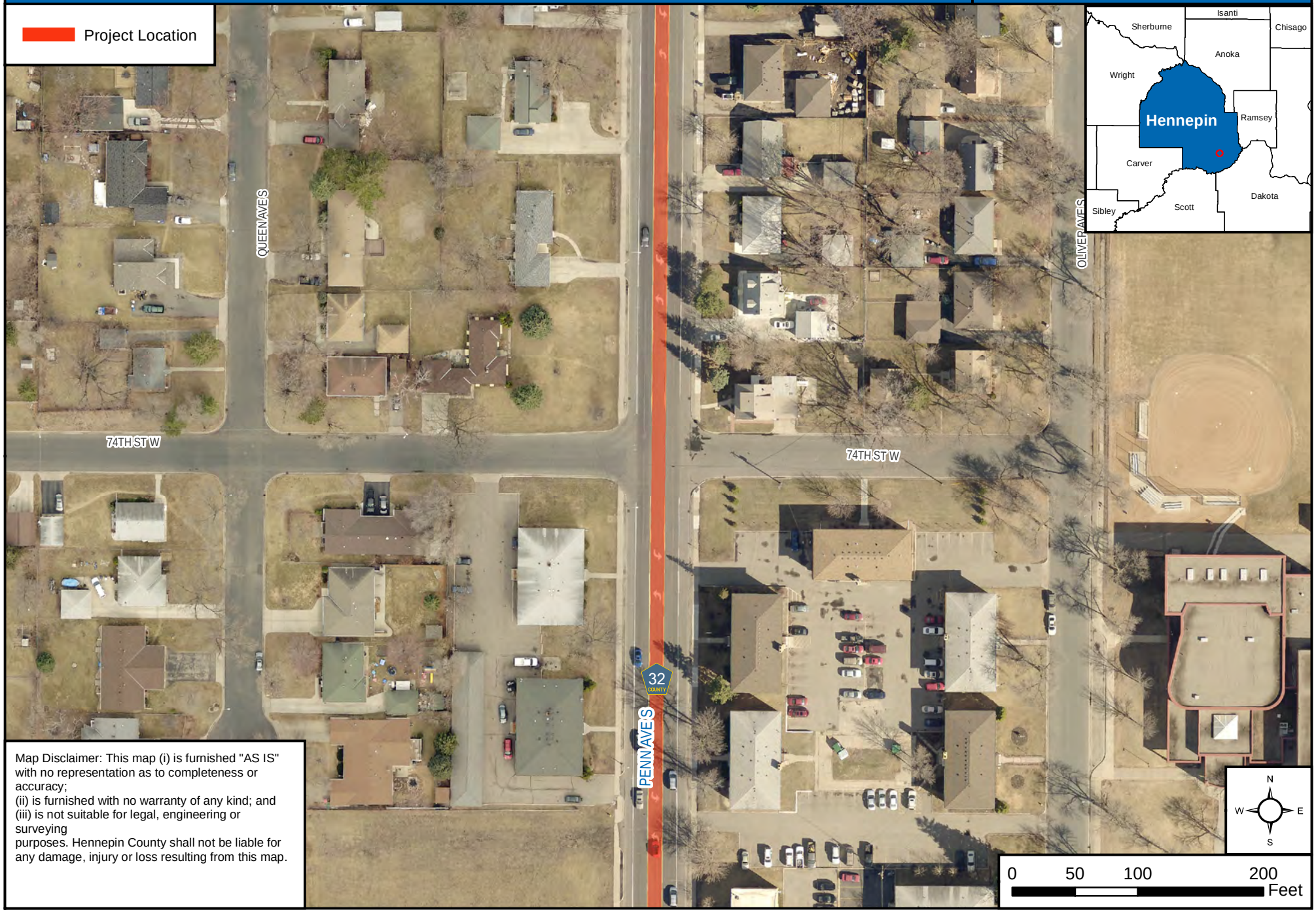
CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin
Transportation
Planning
www.hennepin.us
04/01/2016



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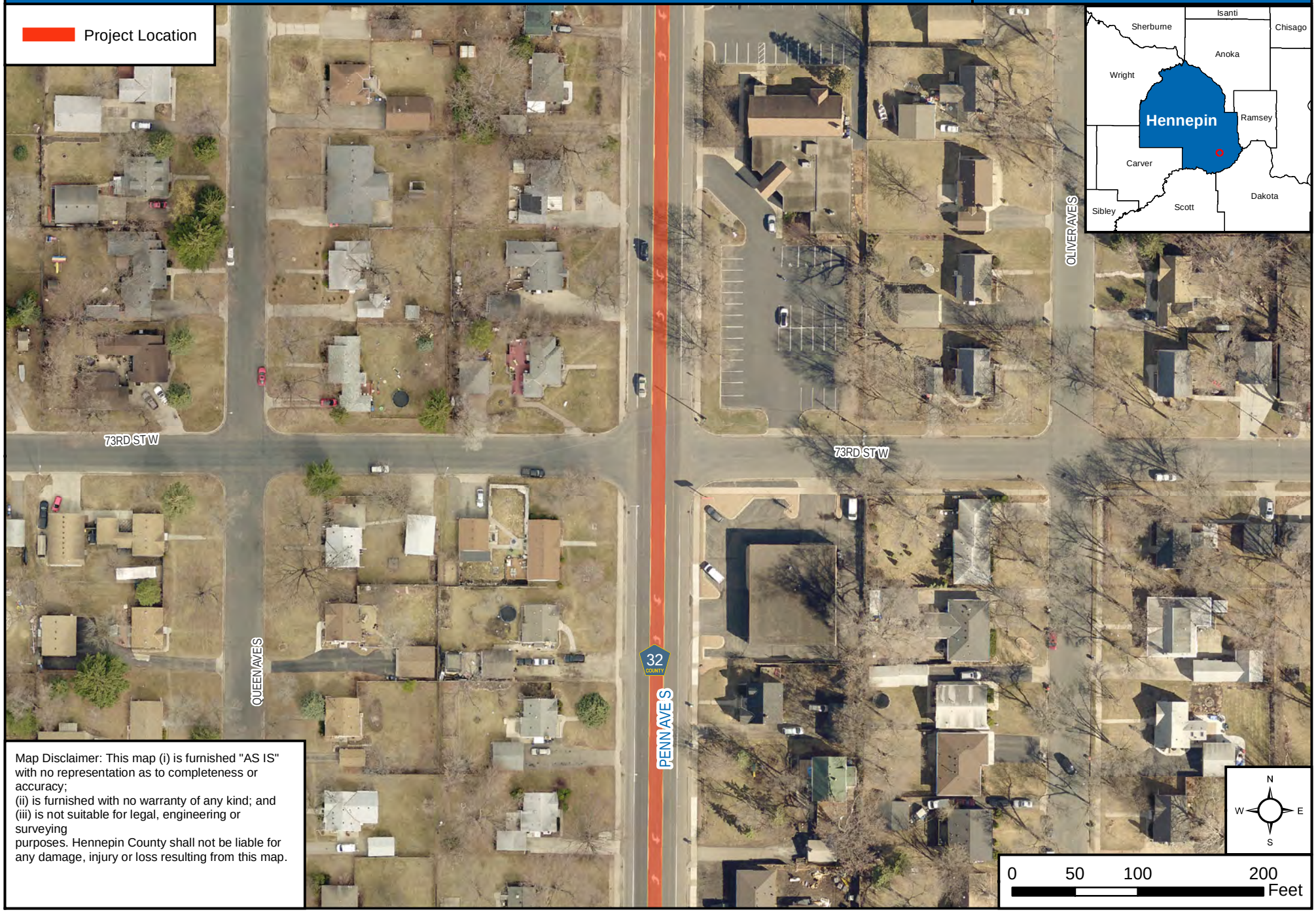
CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin Transportation Planning
www.hennepin.us
04/01/2016



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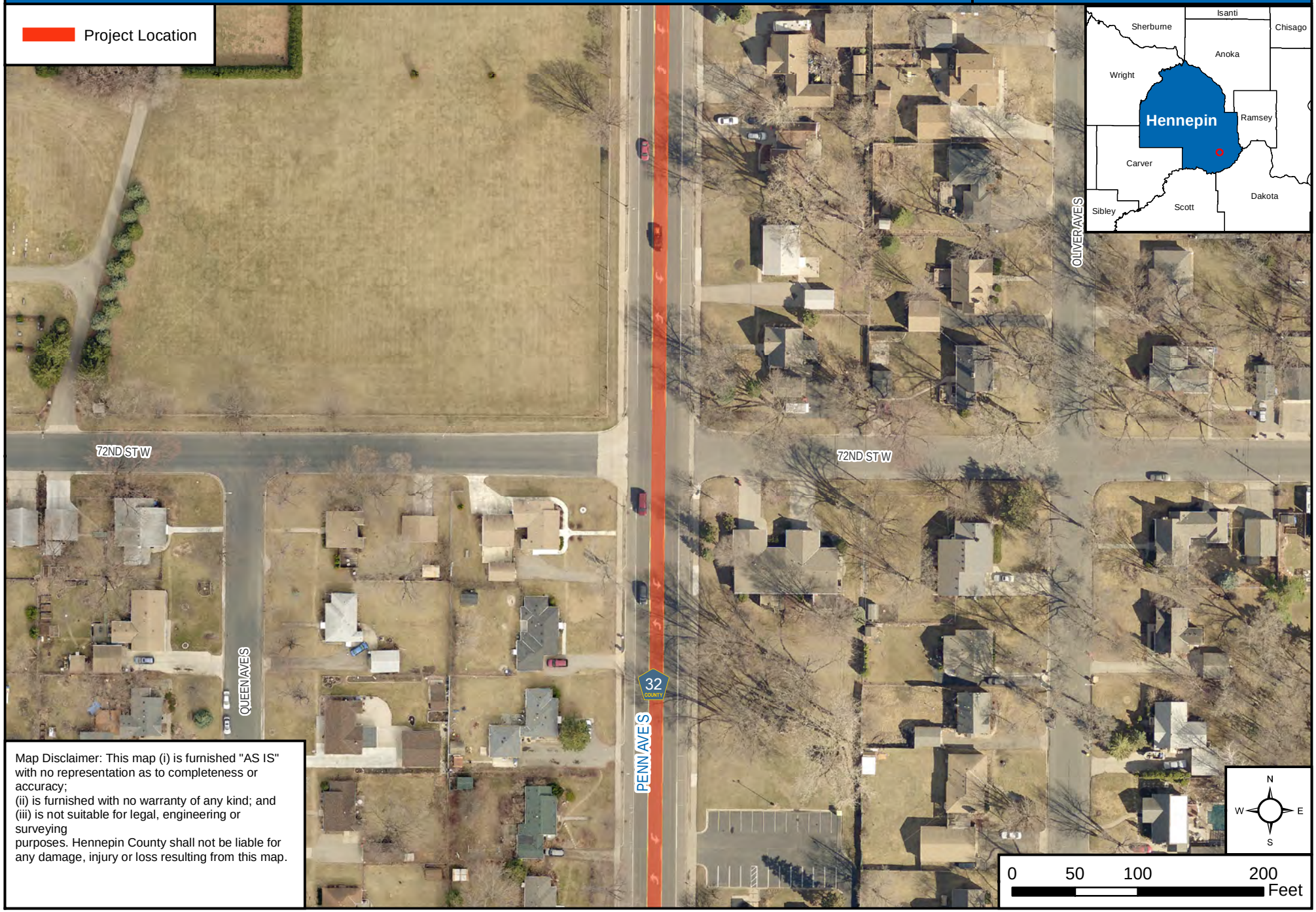
CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin
Transportation Planning
www.hennepin.us
04/01/2016



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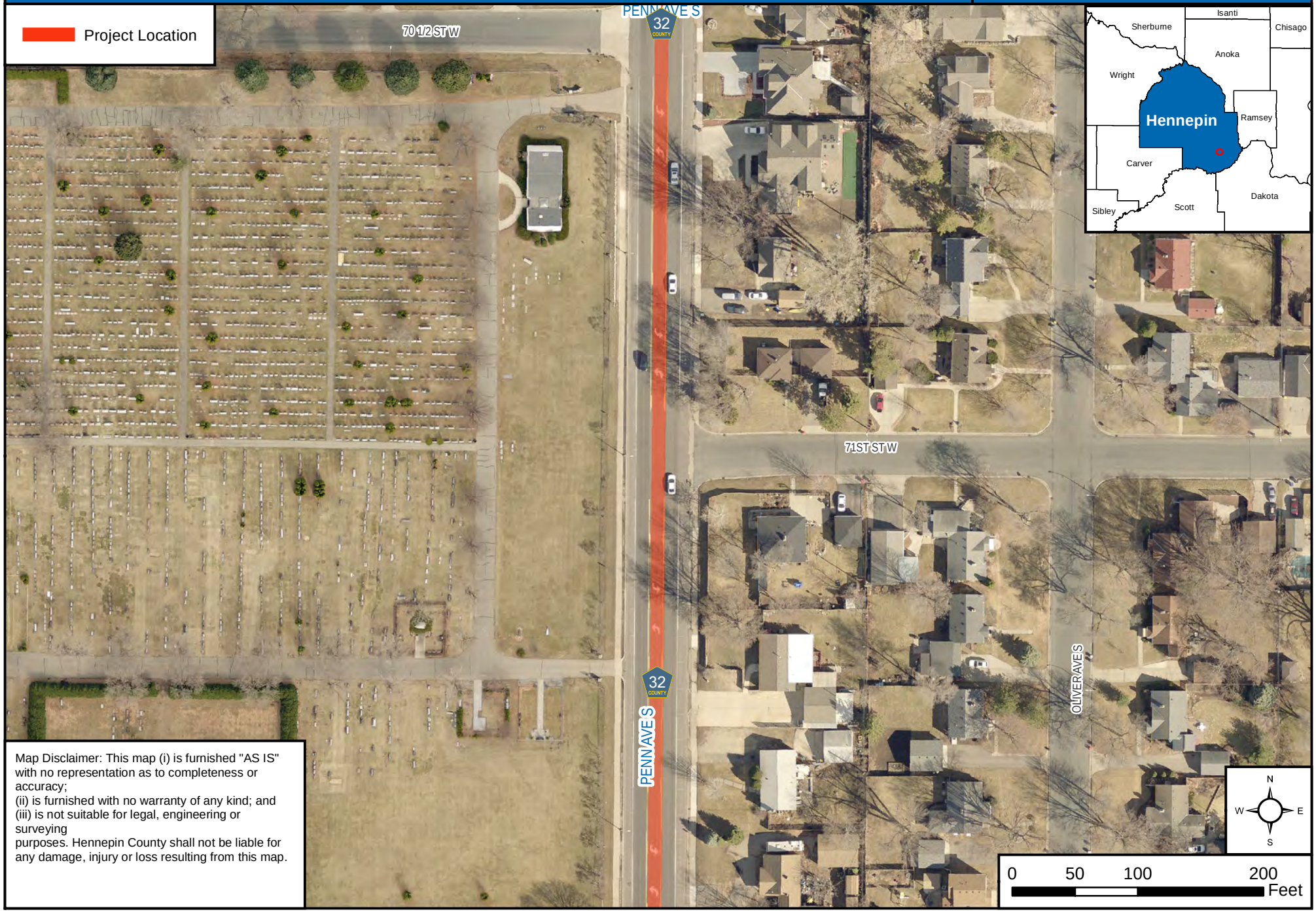
CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin
Transportation
Planning
www.hennepin.us
04/01/2016



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CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin Transportation Planning
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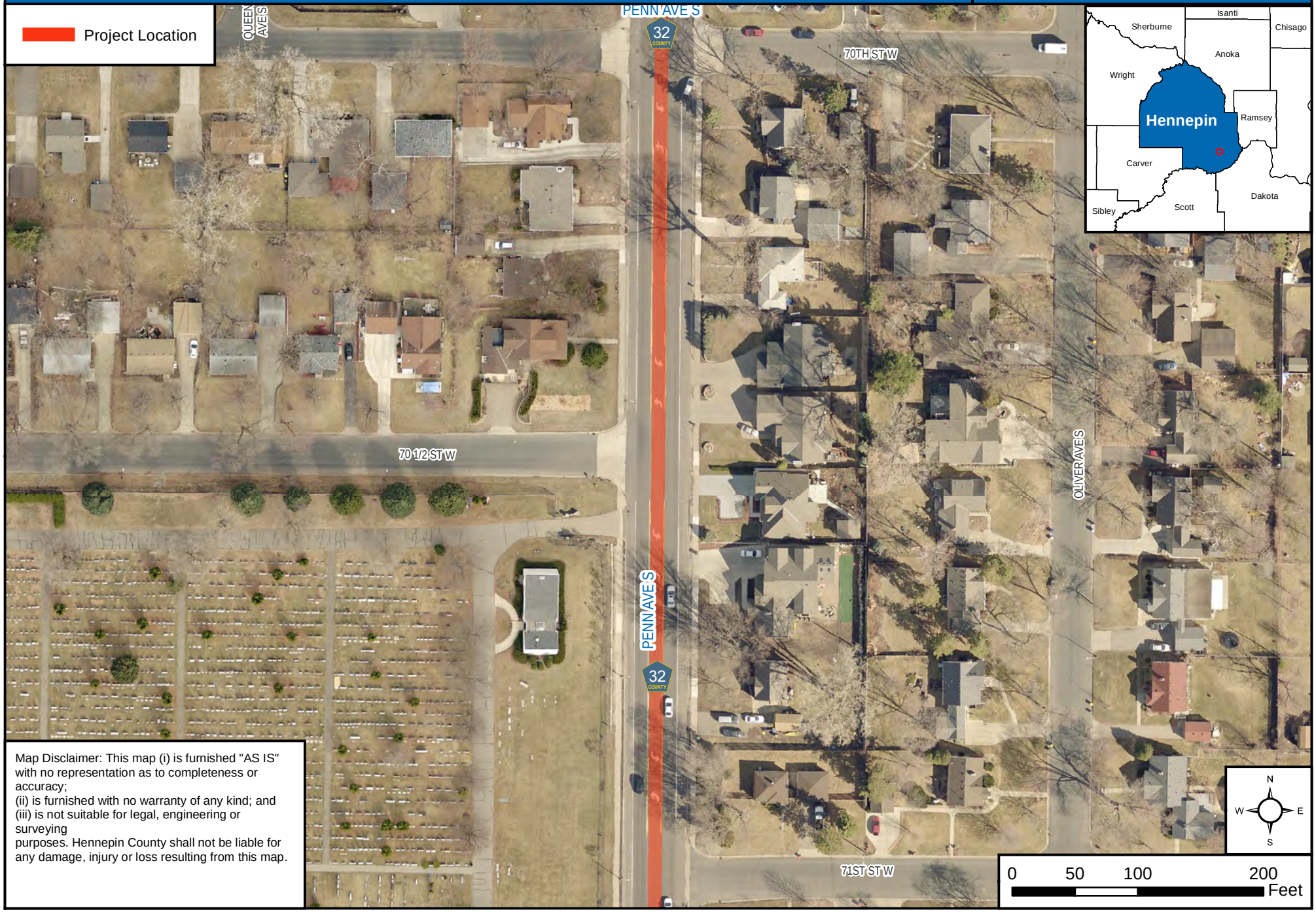
04/01/2016



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CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin Transportation Planning
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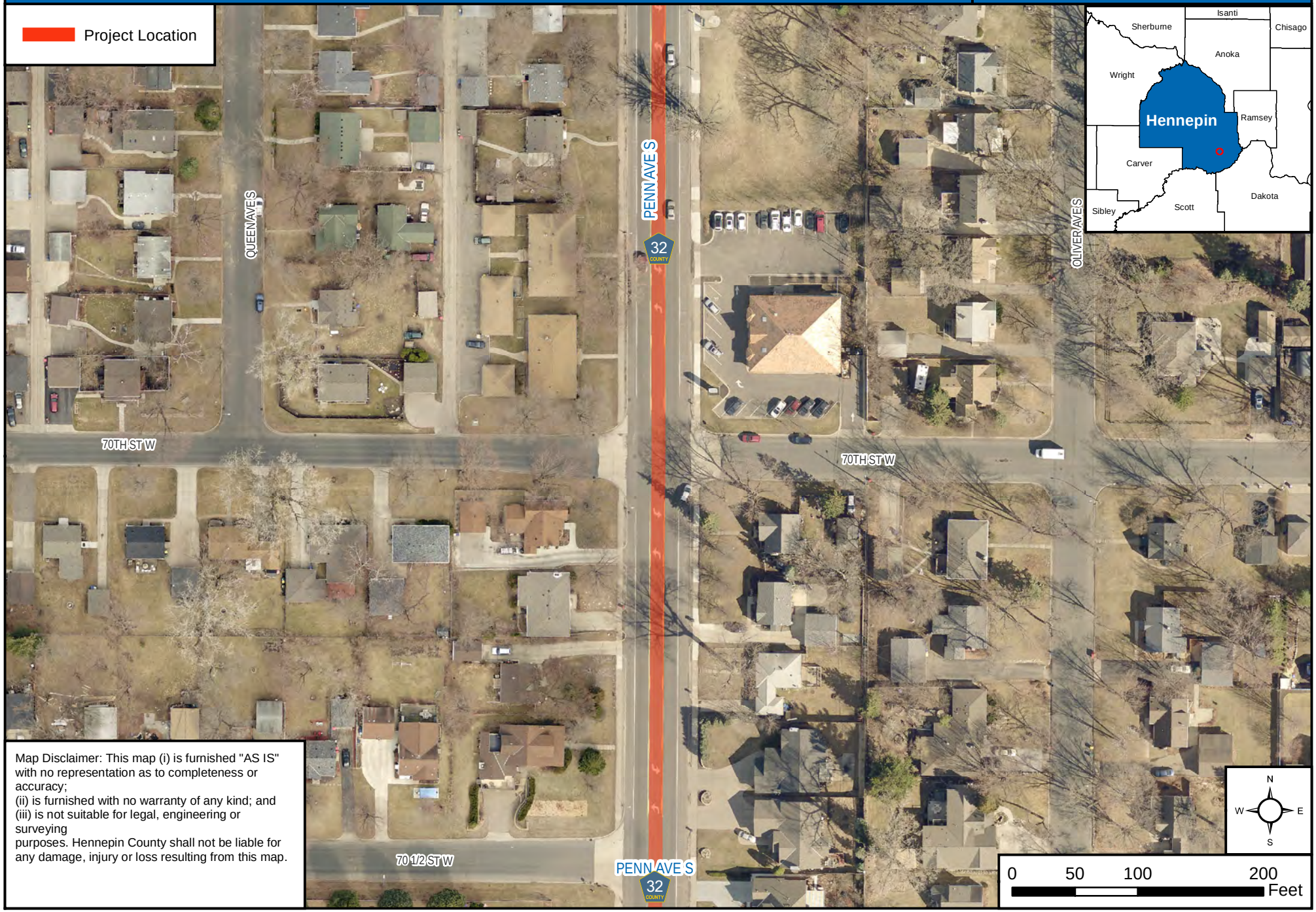
04/01/2016



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CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin
Transportation
Planning
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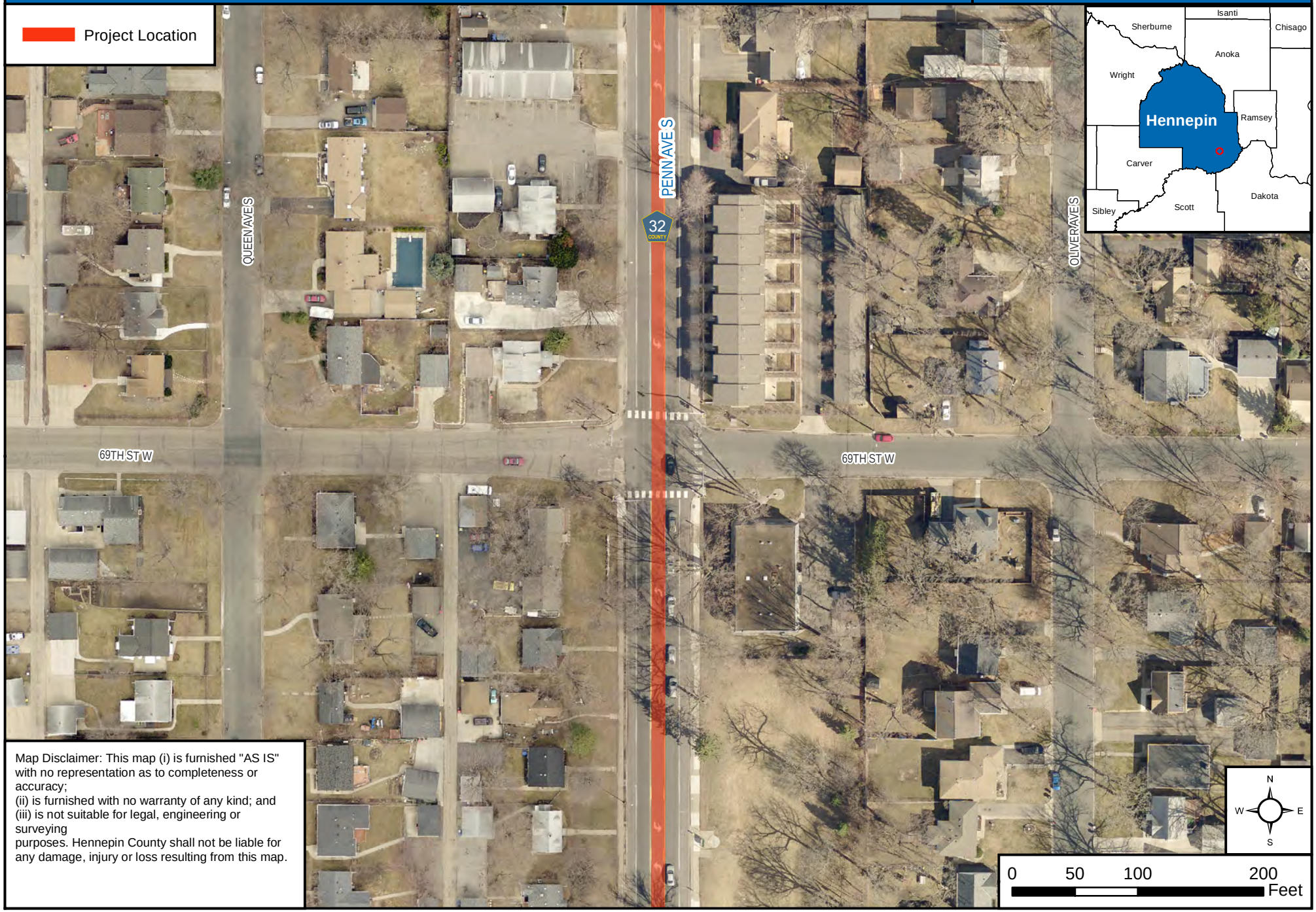
04/01/2016



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CSAH 032 (Penn Ave) Reconstruction Project

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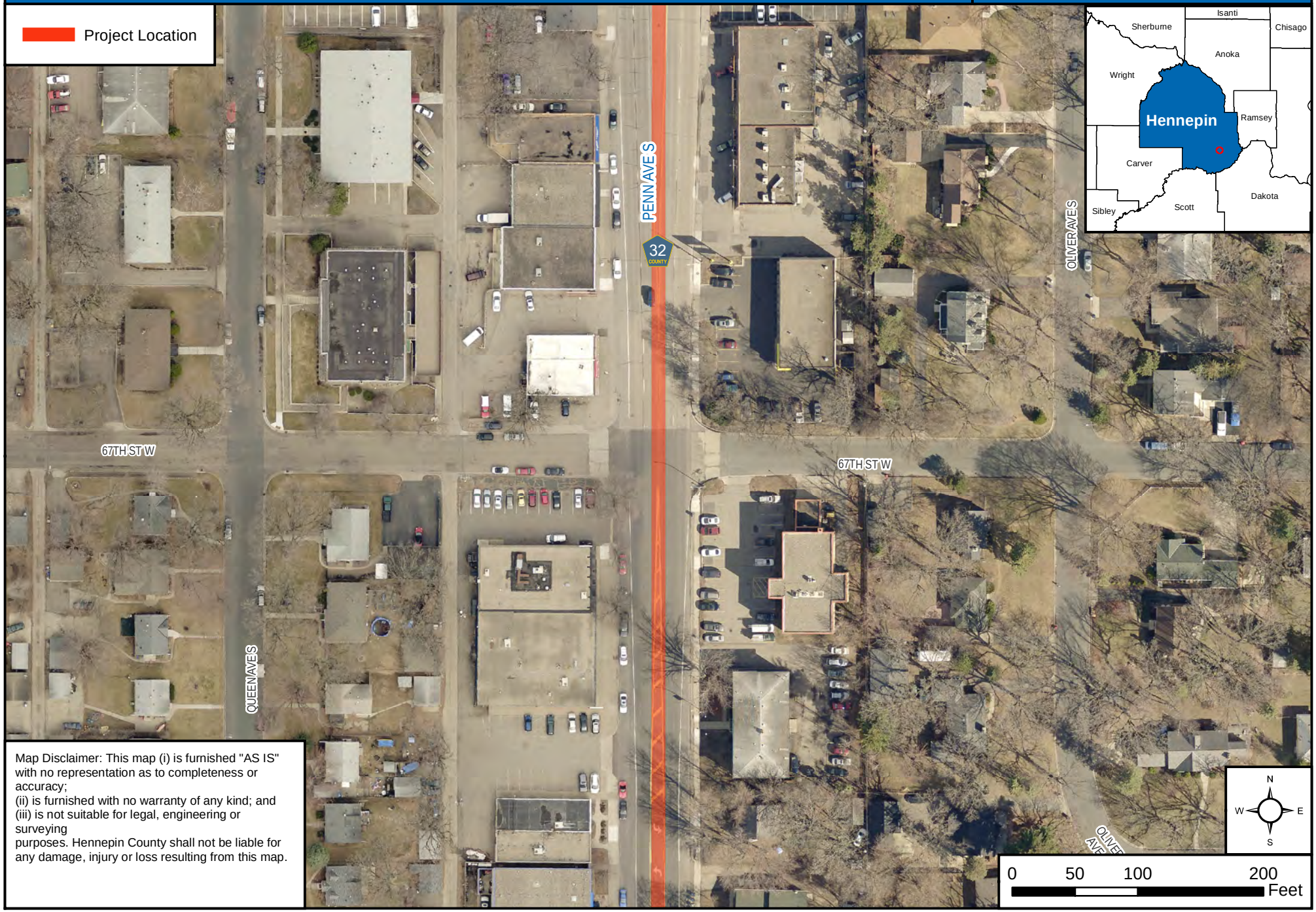

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CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin
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Planning
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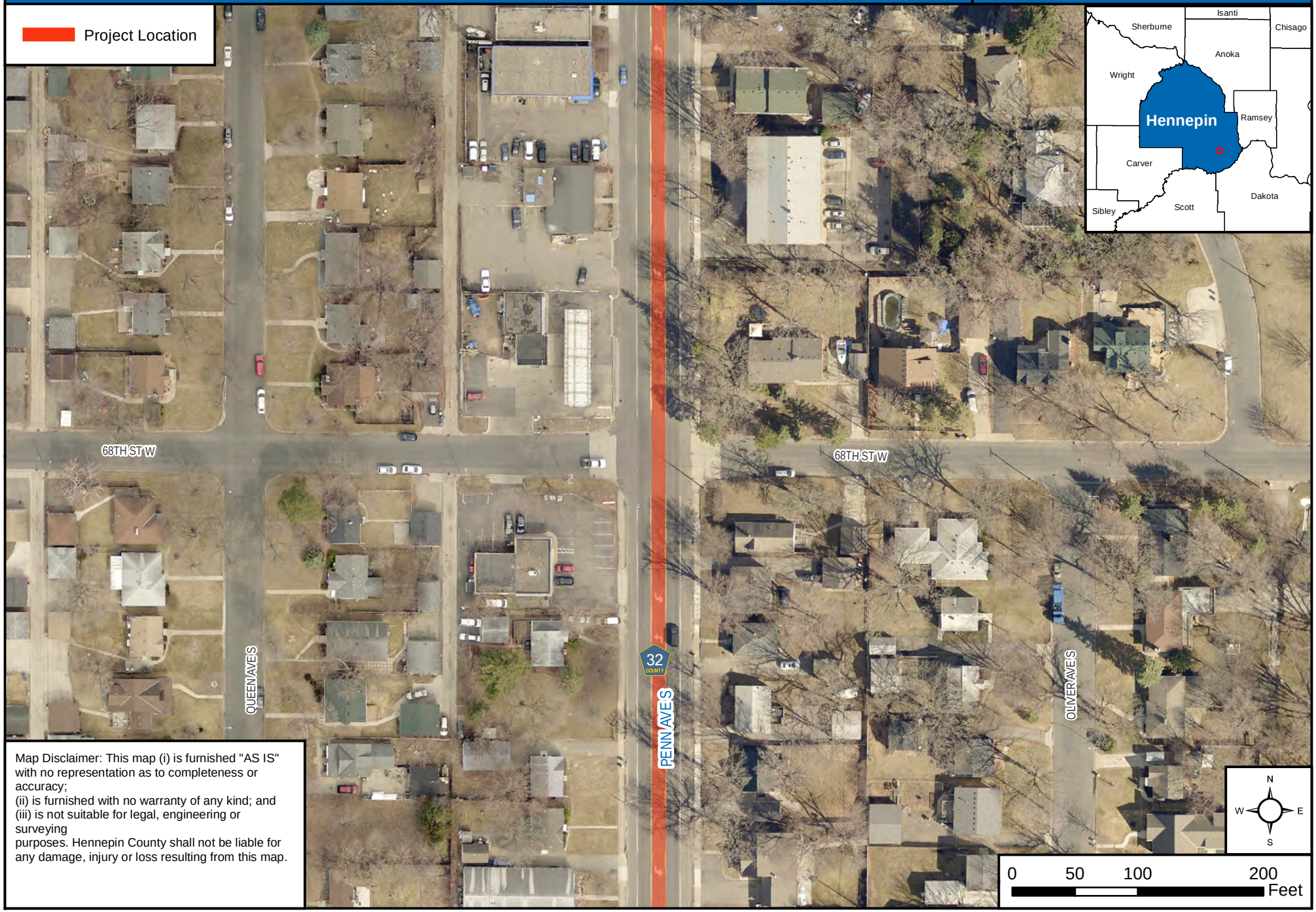
04/01/2016



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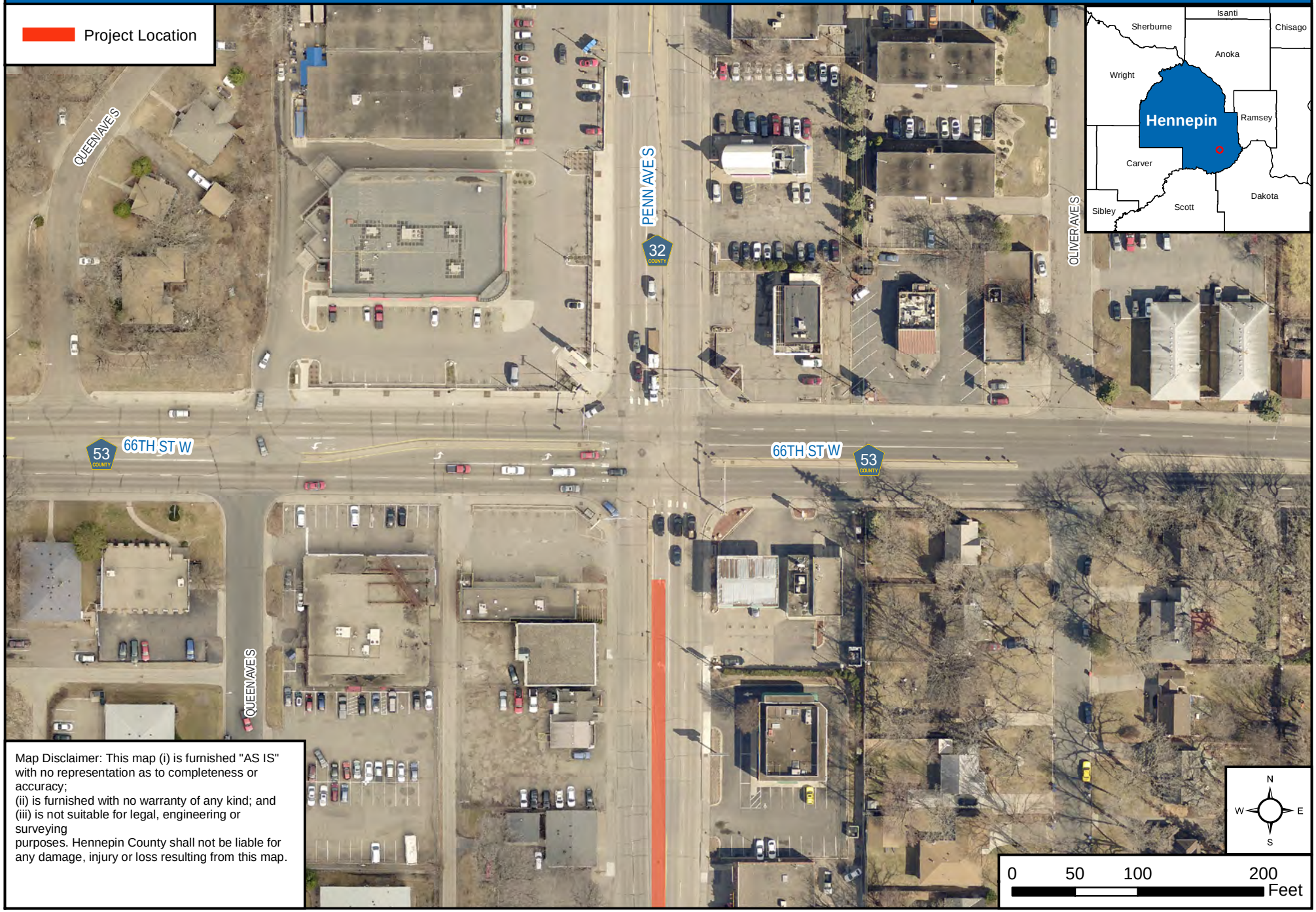
CSAH 032 (Penn Ave) Reconstruction Project

Figure 02 - Project Aerial Maps

Hennepin Transportation Planning
www.hennepin.us
04/01/2016



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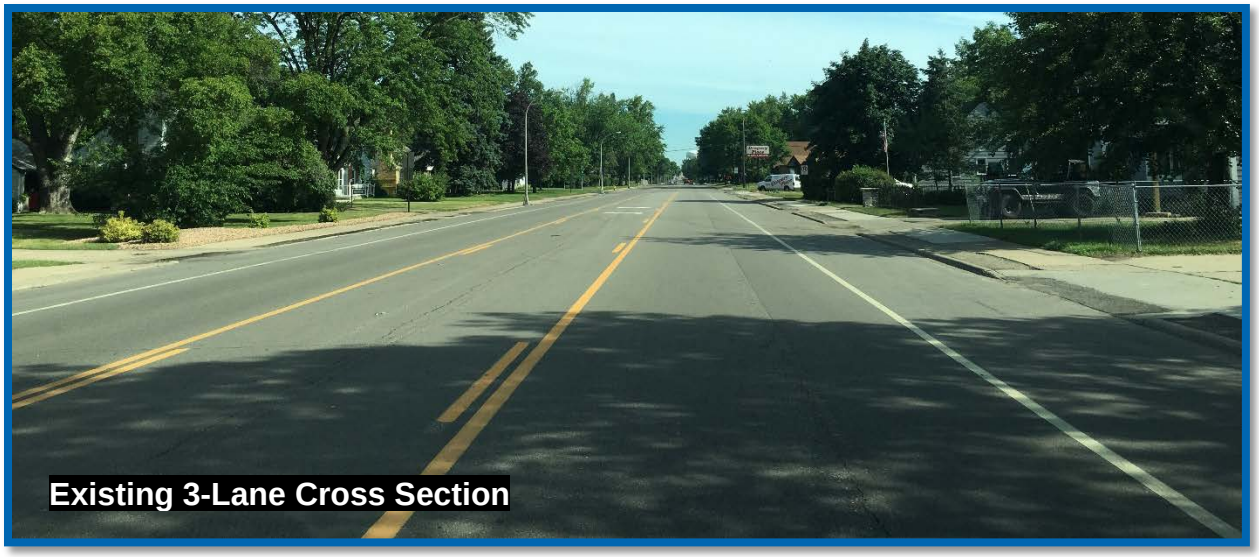
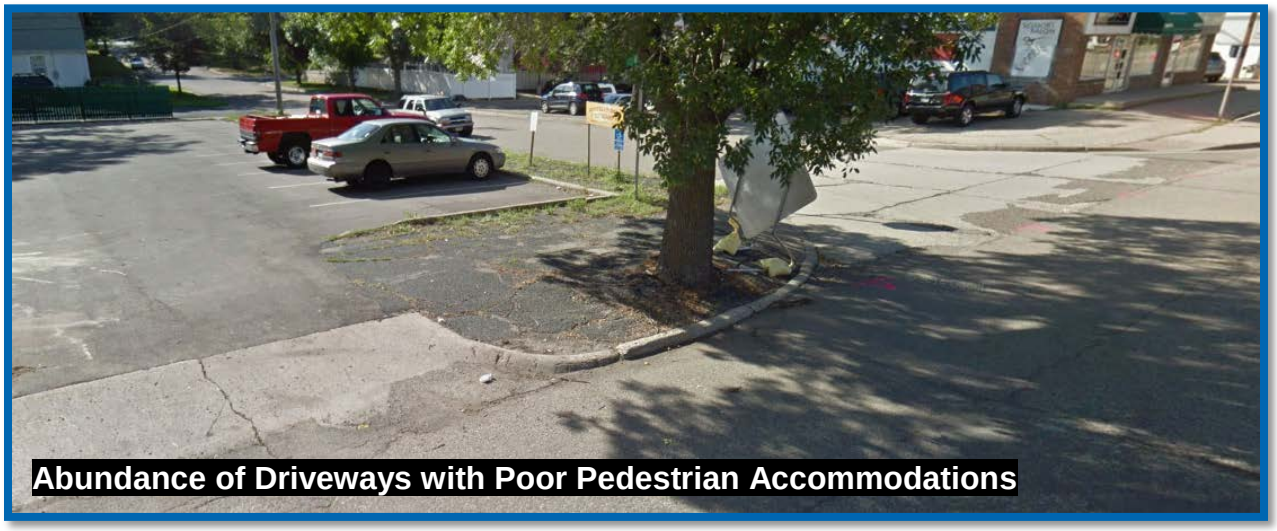
Existing Roadway Elements
Figure 03

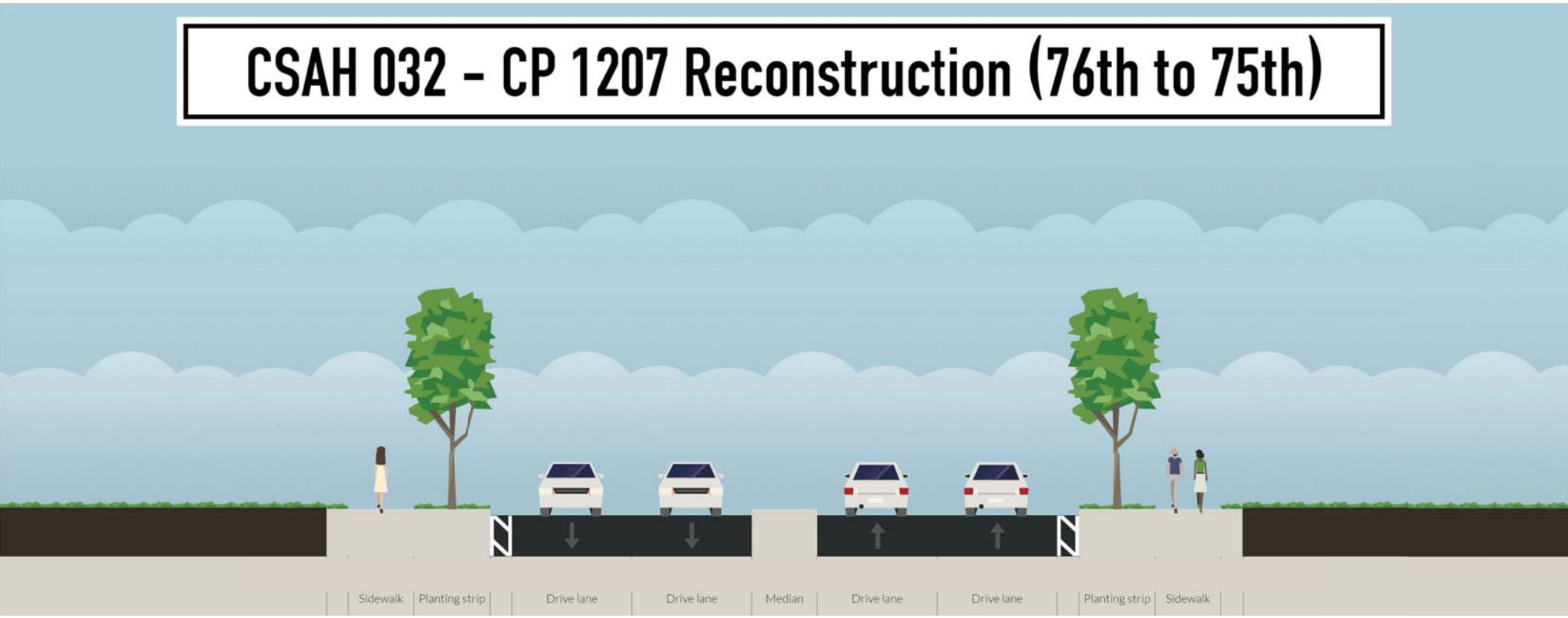

Existing 3-Lane Cross Section


Channelized Right Turn Lane with Wide Radius

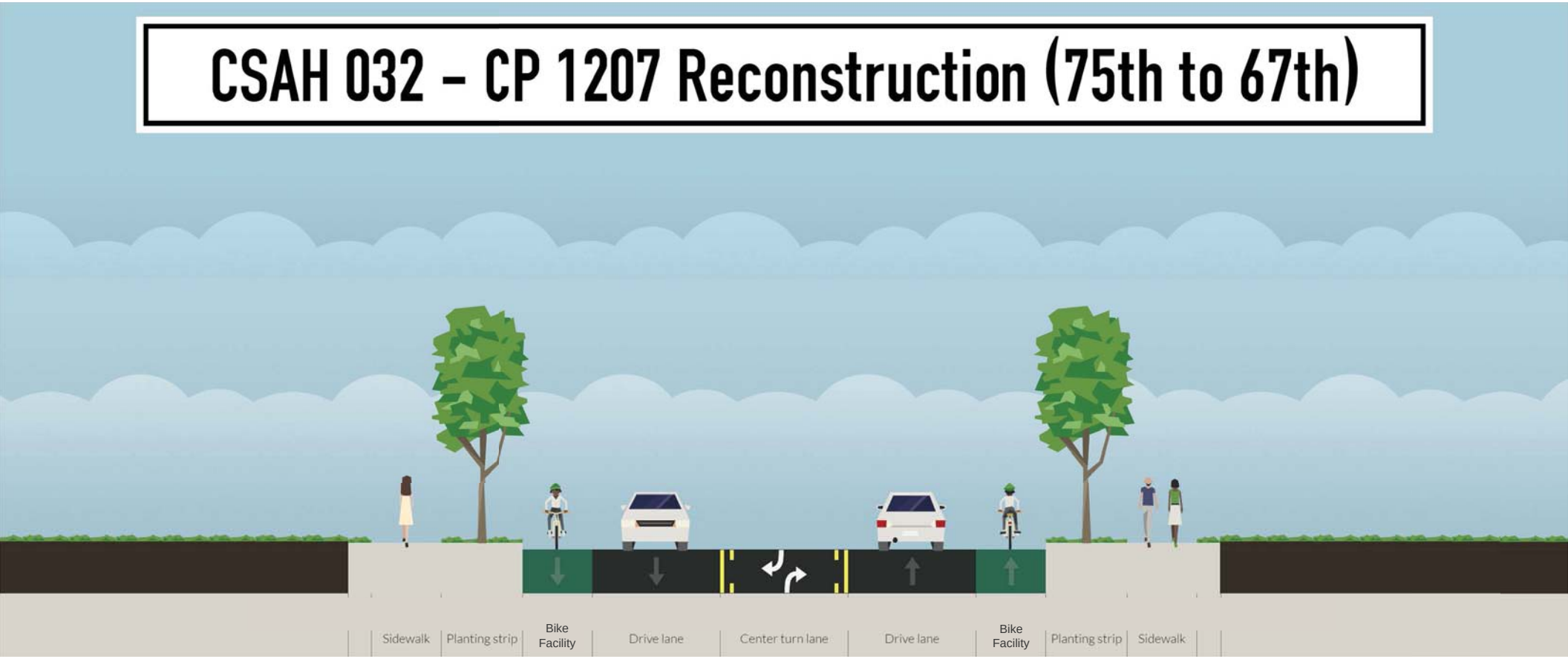

Existing Narrow Sidewalk with Non-Conforming Ped Ramp and Lack of Boulevard


Abundance of Driveways with Poor Pedestrian Accommodations

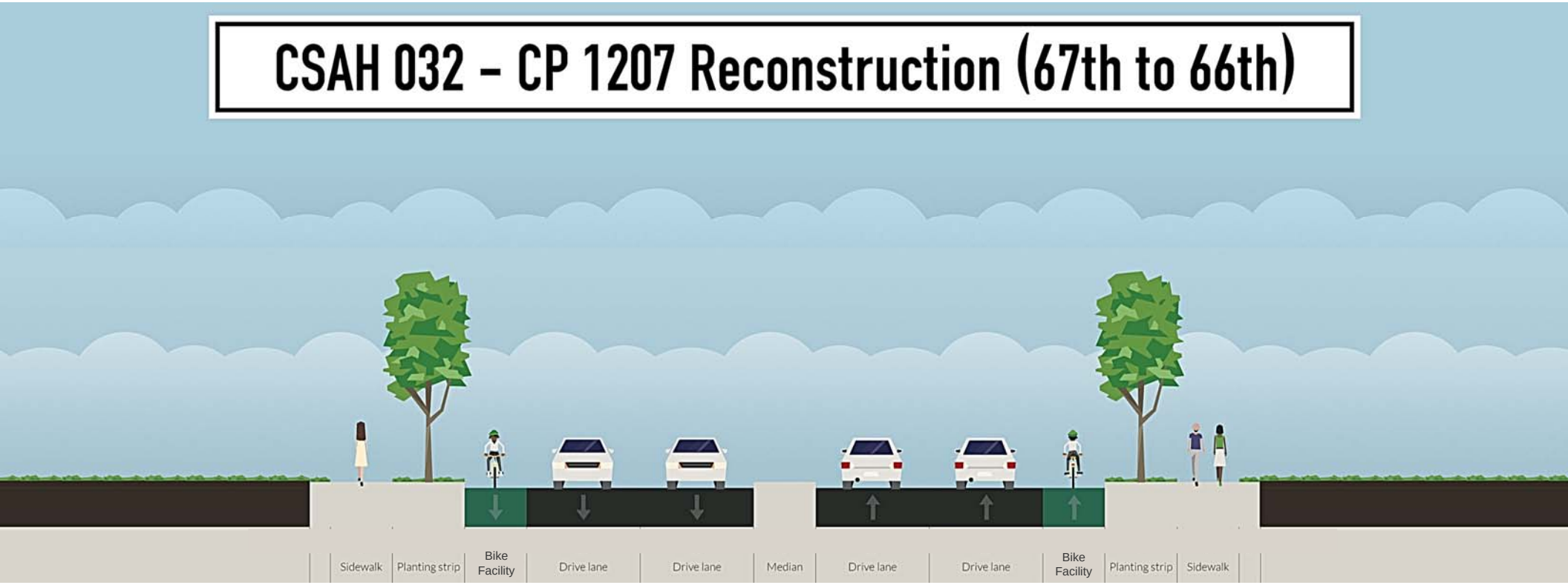
Proposed Typical Sections
Figure 04



Proposed Typical Sections
Figure 04



Proposed Typical Sections
Figure 04



2016-2020 Hennepin County Capital Improvement Program
Figure 05A

BOARD APPROVED: 2016 CAPITAL BUDGET AND 2016-2020 CAPITAL IMPROVEMENT PROGRAM

Project Name: 2120700 CSAH 32 - Reconst Rd fr S of W 75th Street to TH 62
Major Program: Public Works
Department: Transportation Provisional Roads & Bridges Projects

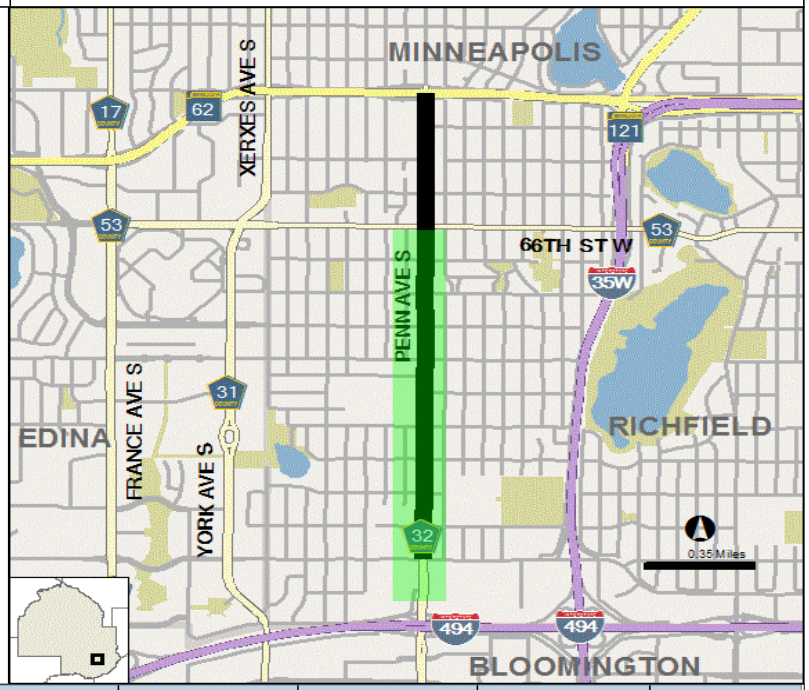
Funding Start: 2018
Completion: 2018

Description:

The project consists of reconstructing CSAH 32 (Penn Avenue S.) with channelized left turn lanes, median islands, reconstructed sidewalks, and new accessibility elements (ADA) from south of W 75th Street to TH 62 in the City of Richfield. This is a provisional project dependent upon the availability of funding.

Purpose & Justification:

The purpose of the project is to improve safety, pavement condition and drivability; provide new sidewalks; support ADA compliance; and upgrade utilities. The project has been requested by the City of Richfield.



Revenues	Budget to Date	12/31/15 Act & Enc	Balance	2016 Budget	2017 Estimate	2018 Estimate	2019 Estimate	2020 Estimate	Beyond 2020	Total
Property Tax	-	-	-	-	-	-	-	-	-	-
County Bonds	-	-	-	-	-	-	-	-	-	-
Federal	-	-	-	-	-	-	-	-	-	-
State	-	-	-	-	-	-	-	-	-	-
Enterprise Income	-	-	-	-	-	-	-	-	-	-
Other Revenues	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Expenditures	Budget to Date	12/31/15 Act & Enc	Balance	2016 Budget	2017 Estimate	2018 Estimate	2019 Estimate	2020 Estimate	Beyond 2020	Total
Land	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	13,919,000	-	-	-	13,919,000
Consulting	-	-	-	-	-	-	-	-	-	-
Equipment	-	-	-	-	-	-	-	-	-	-
Furnishings	-	-	-	-	-	-	-	-	-	-
Other Costs	-	-	-	-	-	-	-	-	-	-
Contingency	-	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**-**	**-**	**-**	**13,919,000**	**-**	**-**	**-**	**13,919,000**

Hennepin County Bicycle Transportation Plan
Planned bikeway system - January 2015

Hennepin County Bicycle Transportation Plan
Figure 05B

Wright

Ramsey

Dakota

Scott

Downtown Minneapolis
see inset above

Penn Ave
Reconstruction Project

LEGEND

Bikeway Search Corridor

Off-street bikeway system

Existing off-street bikeway

Planned off-street bikeway

On-street bikeway system

Existing on-street bikeway

Planned on-street bikeway

For this map "existing" means greater or equal to 7 feet wide for off road, greater or equal to 5 feet wide for on road bikeways.

For this map on street and/or off street bikeways are shown with one line regardless of if they are one side or both sides of the street.

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Hennepin County Bicycle Plan
Planned Bikeway System
January 2015

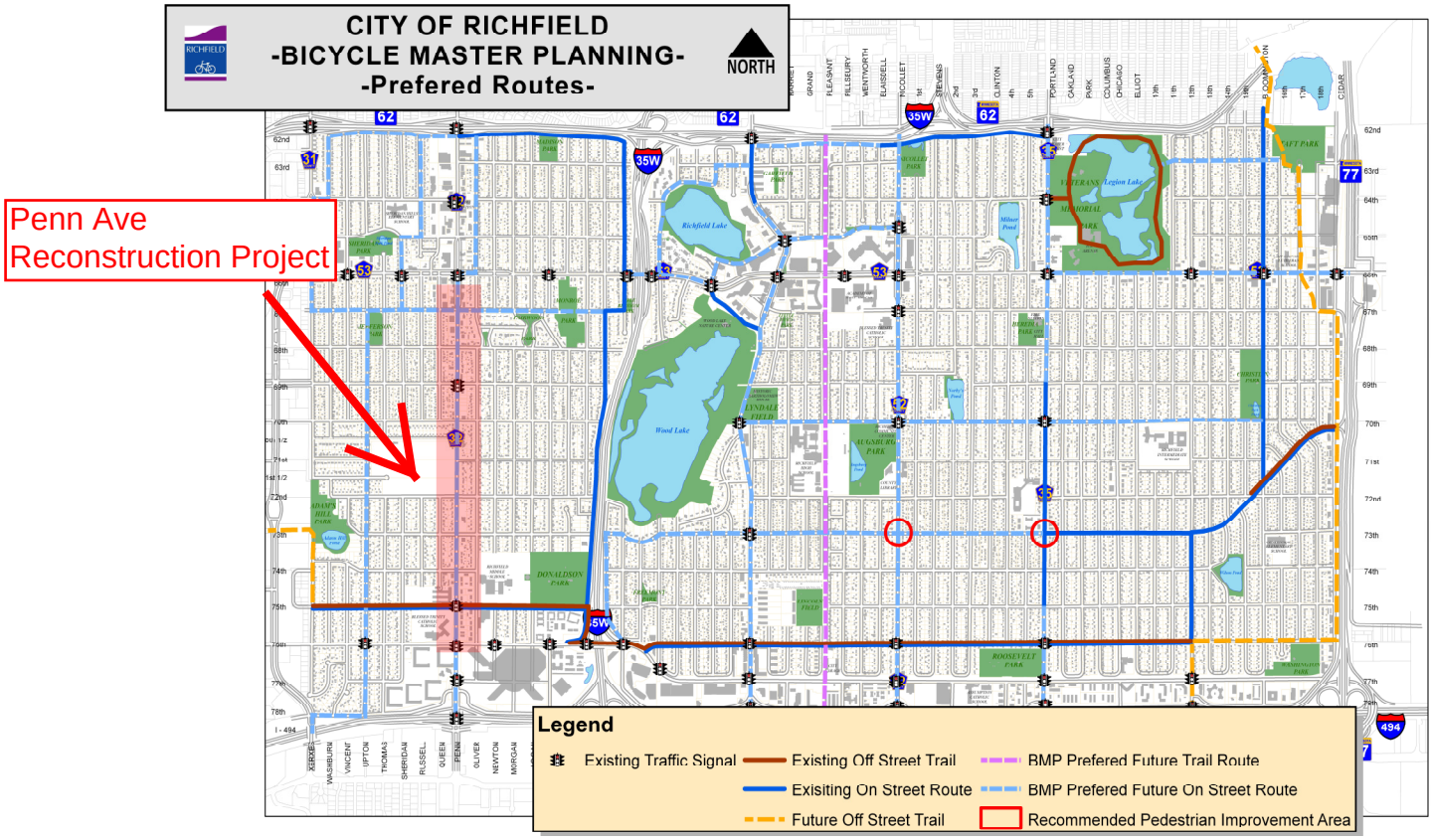
File Path: \\Yonkers\PWpwTEAM\Geospatial\Bike_Plan_2013\Final_MXDs\A003_2015_1_16_Planned_Bikeway_System_MAP.mxd

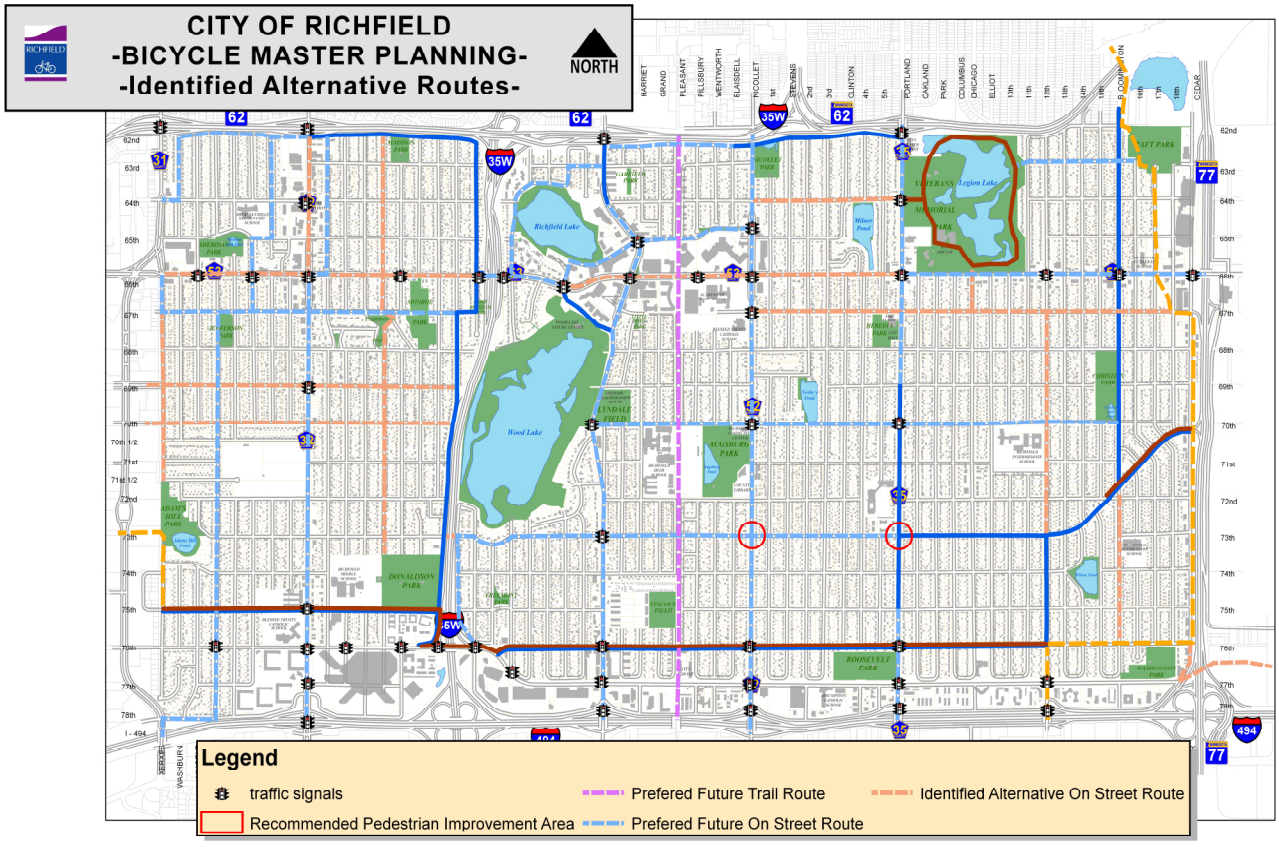
Miles
0 1 2 4

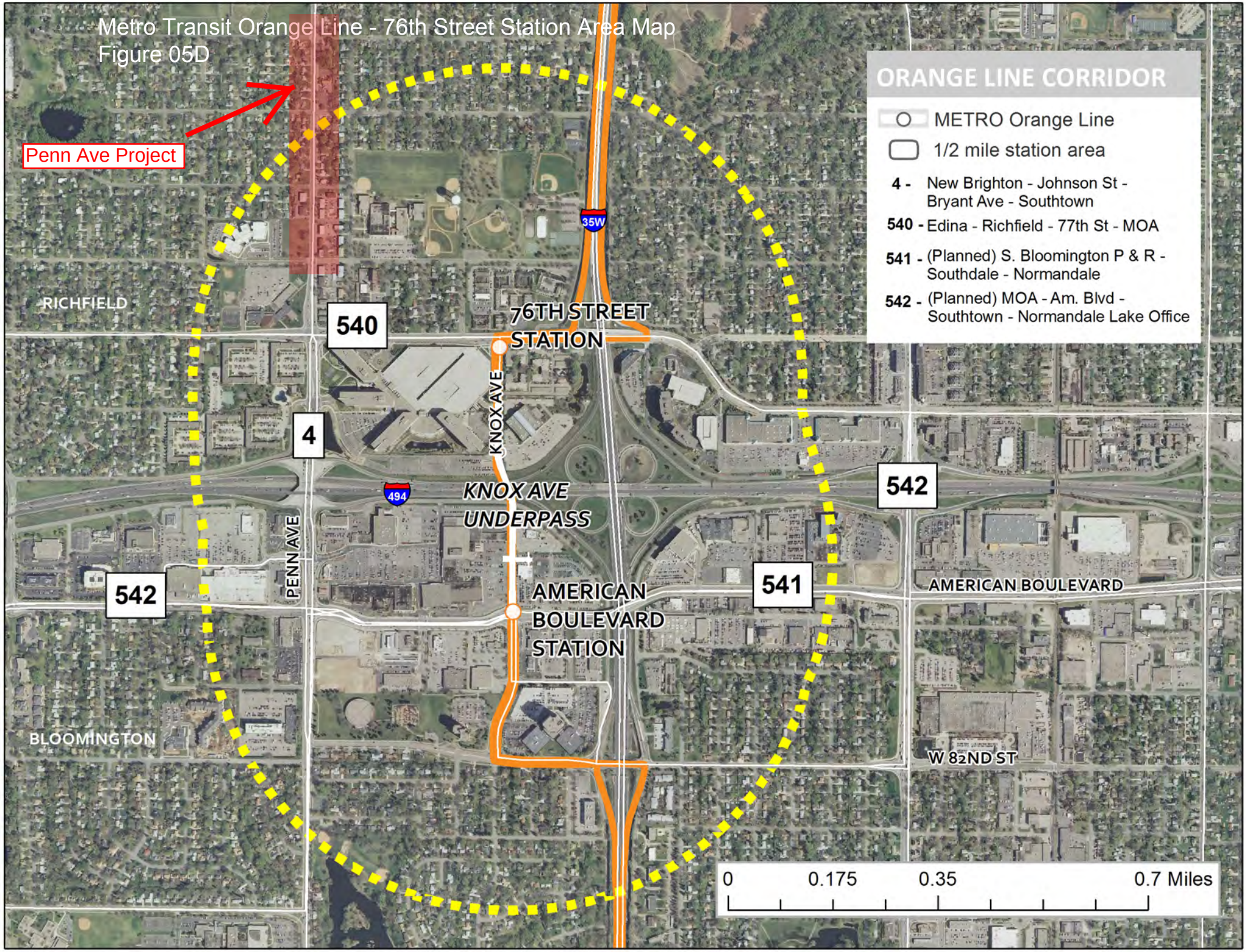
Hennepin County
Transportation Department

ThreeRivers PARK DISTRICT

4.7 Bike Master Plan Route Maps (*Full size documents located in Appendix*)






Metro Transit Orange Line - 76th Street Station Area Map
Figure 05D
Penn Ave Project
ORANGE LINE CORRIDOR
METRO Orange Line
1/2 mile station area
4 - New Brighton - Johnson St - Bryant Ave - Southtown
540 - Edina - Richfield - 77th St - MOA
541 - (Planned) S. Bloomington P & R - Southdale - Normandale
542 - (Planned) MOA - Am. Blvd - Southtown - Normandale Lake Office
RICHFIELD
540
76TH STREET STATION
KNOX AVE
4
494
KNOX AVE UNDERPASS
542
PENN AVE
542
AMERICAN BOULEVARD STATION
541
AMERICAN BOULEVARD
BLOOMINGTON
W 82ND ST
35W
0
0.175
0.35
0.7 Miles

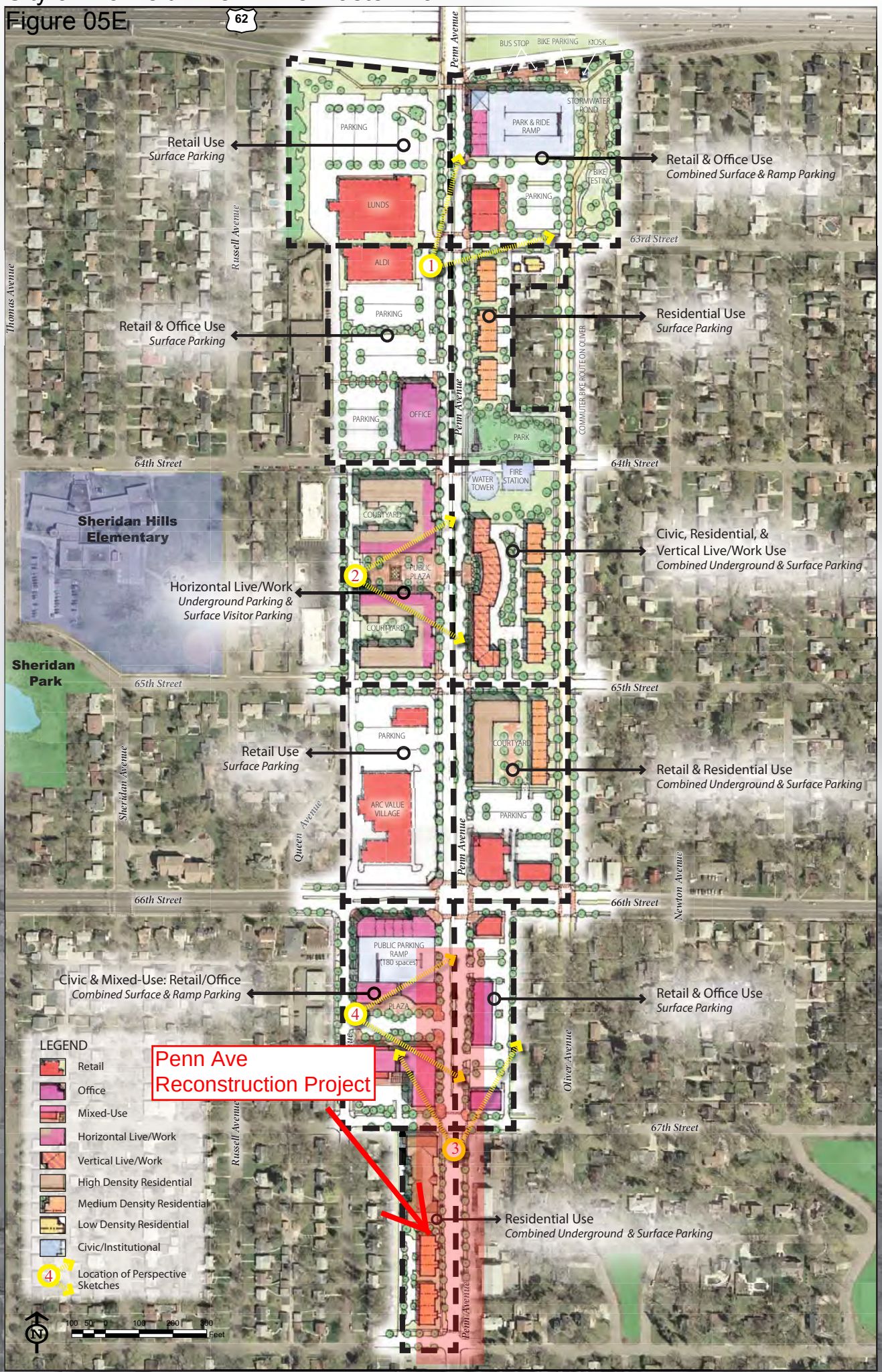
Penn Avenue Revitalization

city of richfield

City of Richfield - Penn Ave Master Plan

Figure 05E

Proposed Master Plan



Hoisington Koegler Group, Inc.
Planning | Landscape Architecture | Urban Design

MnDOT 2015 Metro Congestion Map
Figure 06

Appendix B: Daily Congestion Map