



Application

01968 - 2014 Roadway Reconstruction/Modernization

02134 - Brooklyn Boulevard Improvements (49th Avenue to just beyond Bass Lake Road) - City of Brooklyn Center/Hennepin County

Regional Solicitation - Roadways Including Multimodal Elements

Status: Submitted  
Submitted Date: 11/26/2014 1:50 PM

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## Primary Contact

**Name:** Mr. Steven L. Lillehaug  
Salutation First Name Middle Name Last Name

**Title:** City Engineer/Director of Public Works

**Department:** Public Works

**Email:** slillehaug@ci.brooklyn-center.mn.us

**Address:** 6301 Shingle Creek Parkway

**\*** Brooklyn Center Minnesota 55430  
City State/Province Postal Code/Zip

**Phone:** 763-569-3340  
Phone Ext.

**Fax:**

**What Grant Programs are you most interested in?** Municipal Inflow and Infiltration Grants (I&I)

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## Organization Information

**Name:** BROOKLYN CENTER EDA

**Jurisdictional Agency (if different):**

**Organization Type:**

City

**Organization Website:**

**Address:**

ECONOMIC DEVELOPMENT

6301 SHINGLE CREEK PKWY

\*

BROOKLYN  
CENTER

Minnesota

55430

City

State/Province

Postal Code/Zip

**County:**

Hennepin

**Phone:\***

763-569-3320

Ext.

**Fax:**

**PeopleSoft Vendor Number**

0000026811A2

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## Project Information

**Project Name**

Brooklyn Boulevard Reconstruction/Modernization

**Primary County where the Project is Located**

Hennepin

**Jurisdictional Agency (If Different than the Applicant):**

Hennepin County

The proposed Brooklyn Boulevard reconstruction/modernization project will improve roadway safety, enhance traffic operations, reduce access points, and provide improved bicycle and pedestrian facilities for a 1.3-mile segment of the corridor in Brooklyn Center between 49th Avenue and Bass Lake Road. The project will enhance bicycle and pedestrian travel by adding a trail, improving sidewalks, adding streetscaping and landscaping, and improving the functionality of intersections with modified turn lanes. Several free right turn lanes will be reconfigured to improve sight lines. Overhead utilities will be moved underground.

Brooklyn Boulevard is an A Minor Arterial roadway, which serves as a reliever route for TH 100 and serves as an important freight route for the northbound TH 100 to westbound I-94/694 movements. The proposed project also provides a direct connection to the former Brookdale Mall site and surrounding parcels, which is an identified job concentration center, as well as a manufacturing and distribution center. It is also within the one-mile threshold for an educational institution. Existing safety and geometric issues include the 51st Avenue intersection and insufficient turn lane configurations at multiple other intersections. The project is located within a Racially Concentrated Area of Poverty and will provide improvements for a range of mode choices to enable low-income populations and people of color to access jobs. The project will improve corridor access to Brooklyn Center Transit Center, a few blocks away from Brooklyn Boulevard, which provides connections to 15 bus routes. The Twin Lakes Regional Trail crosses Brooklyn Boulevard with a substandard trail crossing where the trail becomes a narrow sidewalk with insufficient ramps; the project will install a crosswalk and widen the sidewalk to a trail.

The project will capitalize on recent and anticipated

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

future investments within and adjacent to the project corridor, including:

Anticipated future transitway improvements (Chicago-Fremont and C Line Arterial BRT lines would run on Brooklyn Boulevard and terminate at Brooklyn Center Transit Center) would benefit from improved multimodal connections and streetscaping.

Brooklyn Blvd/TH 100 bridge redecking (construction completed Fall 2014), which is located within the project area.

The City of Minneapolis completed resurfacing of Osseo Road (CSAH 152) from 44th Ave to 49th Ave (southern project limits), which added a bike lane.

Major redevelopment efforts in and around the former Brookdale Mall site (now Shingle Creek Crossing).

The project will also improve bus stop amenities, relocate problematic (mid-block) bus stops, add streetscaping, a landscaped median, and gateway signage.

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

**Project Length (Miles)**

1.3

**Connection to Local Planning:**

*Reference the name of the appropriate comprehensive plan, regional/statewide plan, capital improvement program, corridor study document [studies on trunk highway must be approved by MnDOT and the Metropolitan Council], or other official plan or program of the applicant agency [includes Safe Routes to School Plans] that the project is included in and/or a transportation problem/need that the project addresses. List the applicable documents and pages.*

Brooklyn Boulevard Corridor Study (all pages)

**Connection to Local Planning**

City of Brooklyn Center Comprehensive Plan, 2010 (pages 2-7; 3-11-3-13)

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## 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** \$2,310,000.00

*Minimum of 20% of project total*

**Project Total** \$9,310,000.00

**Match Percentage** 24.81%

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

**Source of Match Funds** City of Brooklyn Center

**Preferred Program Year**

**Select one:** 2018

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## MnDOT State Aid Project Information: Roadway Projects

**County, City, or Lead Agency** City of Brooklyn Center

**Functional Class of Road** A Minor Arterial

**Road System** CSAH

*TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET*

**Name of Road** Brooklyn Boulevard (CSAH 152)

*Example; 1st ST., MAIN AVE*

**Zip Code where Majority of Work is Being Performed** 55429

**(Approximate) Begin Construction Date** 03/01/2018

**(Approximate) End Construction Date** 11/30/2018

**LOCATION**

**From:**  
**(Intersection or Address)** 49th Ave N

*Do not include legal description;*  
*Include name of roadway if majority of facility runs adjacent to a single corridor.*

**To:**  
**(Intersection or Address)** Bass Lake Road

**Type of Work** Roadway (grading, aggregates, paving), curb & gutter, sidewalks, traffic control, landscaping, streetscaping, trail, storm sewer, utilities

*Examples: grading, aggregate base, bituminous base, bituminous surface, sidewalk, signals, lighting, guardrail, bicycle path, ped ramps, bridge, Park & Ride, etc.)*

Old Bridge/Culvert?

New Bridge/Culvert?

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

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## Specific Roadway Elements

| CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES               | Cost                  |
|--|-----------------------|
| Mobilization (approx. 5% of total cost)                    | \$300,000.00          |
| Removals (approx. 5% of total cost)                        | \$120,000.00          |
| Roadway (grading, borrow, etc.)                            | \$1,320,000.00        |
| Roadway (aggregates and paving)                            | \$1,760,000.00        |
| Subgrade Correction (muck)                                 | \$0.00                |
| Storm Sewer  | \$680,000.00          |
| Ponds  | \$0.00                |
| Concrete Items (curb & gutter, sidewalks, median barriers) | \$760,000.00          |
| Traffic Control  | \$460,000.00          |
| Striping   | \$30,000.00           |
| Signing  | \$50,000.00           |
| Lighting   | \$200,000.00          |
| Turf - Erosion & Landscaping                               | \$360,000.00          |
| Bridge   | \$0.00                |
| Retaining Walls  | \$100,000.00          |
| Noise Wall   | \$0.00                |
| Traffic Signals  | \$480,000.00          |
| Wetland Mitigation   | \$0.00                |
| Other Natural and Cultural Resource Protection             | \$0.00                |
| RR Crossing  | \$0.00                |
| Roadway Contingencies                                      | \$0.00                |
| Other Roadway Elements                                     | \$1,250,000.00        |
| <b>Totals</b>  | <b>\$7,870,000.00</b> |

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## Specific Bicycle and Pedestrian Elements

| CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES | Cost |
|--|------|
|--|------|

|  |                       |
|--|-----------------------|
| Path/Trail Construction                                | \$120,000.00          |
| Sidewalk Construction                                  | \$0.00                |
| On-Street Bicycle Facility Construction                | \$0.00                |
| Right-of-Way   | \$0.00                |
| Pedestrian Curb Ramps (ADA)                            | \$0.00                |
| Crossing Aids (e.g., Audible Pedestrian Signals, HAWK) | \$0.00                |
| Pedestrian-scale Lighting                              | \$0.00                |
| Streetscaping  | \$1,320,000.00        |
| Wayfinding   | \$0.00                |
| Bicycle and Pedestrian Contingencies                   | \$0.00                |
| Other Bicycle and Pedestrian Elements                  | \$0.00                |
| <b>Totals</b>  | <b>\$1,440,000.00</b> |

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## Specific Transit and TDM Elements

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

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## Transit Operating Costs

| <b>OPERATING COSTS</b>  | <b>Cost</b>   |
|-------------------------|---------------|
| Transit Operating Costs | \$0.00        |
| <b>Totals</b>           | <b>\$0.00</b> |

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## Totals

|                                |                |
|--------------------------------|----------------|
| <b>Total Cost</b>              | \$9,310,000.00 |
| <b>Construction Cost Total</b> | \$9,310,000.00 |

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## Requirements - All Projects

### All Projects

1. The project must be consistent with the goals and policies in these adopted regional plans: Thrive MSP 2040 (2014), the 2030 Transportation Policy Plan (amended 2013), the 2030 Regional Parks Policy Plan (amended 2013), and the 2030 Water Resources Management Policy Plan (2005).

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

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

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

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

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

4. The requested funding amount must be more than or equal to the minimum award and less than or equal to the maximum award. The cost of preparing a project for funding authorization can be substantial. For that reason, minimum federal amounts apply. Other federal funds may be combined with the requested funds for projects exceeding the maximum award, but the source(s) must be identified in the application. Expansion, reconstruction/modernization, and bridges must be between \$1,000,000 and \$7,000,000. Roadway system management must be between \$250,000 and \$7,000,000.

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

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

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

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

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

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

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

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

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

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

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

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

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

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## Requirements - Roadways Including Multimodal Elements

## Expansion and Reconstruction/Modernization Projects Only

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

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

2. Federal funds are available for roadway construction and reconstruction on new alignments or within existing right-of-way, including associated construction and excavation, bridges, or installation of traffic signals, signs, utilities, bikeway or walkway components and transit components.

The project must exclude costs for right-of-way, studies, preliminary engineering, design, or construction engineering. Noise barriers, drainage projects, fences, landscaping, etc., are not eligible for funding unless included as part of a larger project, which is otherwise eligible.

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

## Bridge Projects Only

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Bridge Replacement Projects Only

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

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

## Bridge Rehabilitation Projects Only

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

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

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## Other Attachments

| File Name  | Description                    | File Size |
|--|--------------------------------|-----------|
| Brooklyn Boulevard Concept Layout for Grant Application 141107.pdf | Project Layout                 | 594 KB    |
| CSAH   |                                |           |
| 152_RegSolic_SupportLetter_Hennepin Co.pdf                         | Hennepin County Support Letter | 304 KB    |
| RdwayAreaDef.pdf   | Roadway Area Definition        | 842 KB    |
| RegionalEcon.pdf   | Regional Economy               | 1.5 MB    |
| SocioEcon.pdf  | Socio Economic                 | 1.5 MB    |
| TransitCon.pdf   | Transit Connections            | 1.6 MB    |

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### Reliever: Freeway Facility or

|  |        |
|--|--------|
| Facility being relieved  | TH 100 |
| Number of hours per day volume exceeds capacity (based on the Congestion Report) | 2.0    |

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### Reliever: Non-Freeway Facility or

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

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### Non-Freeway Facility Volume/Capacity Table

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

11:00am - 12:00pm  
12:00pm - 1:00pm  
1:00pm - 2:00pm  
2:00pm - 3:00pm  
3:00pm - 4:00pm  
4:00pm - 5:00pm  
5:00pm - 6:00pm  
6:00pm - 7:00pm  
7:00pm - 8:00pm  
8:00pm - 9:00pm  
9:00pm - 10:00pm  
10:00pm - 11:00pm  
11:00pm - 12:00am

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## Expander/Connector/Augmentor/Non-Freeway Principal Arterial

Select one:

|                  |                             |
|------------------|-----------------------------|
| Area             | 3.947                       |
| Project Length   | 1.208                       |
| Average Distance | 3.2674                      |
| Upload Map       | Roadway Area Definition.pdf |

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## Measure B: Current Heavy Commercial Traffic

|   |  |
|---|--|
| Location                                      | Brooklyn Boulevard south of Bass lake Road |
| Current daily heavy commercial traffic volume | 372.0                                      |

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

Select all that apply

|  |     |
|--|-----|
| Direct connection to or within a mile of a Job Concentration                   | Yes |
| Direct connection to or within a mile of a Manufacturing/Distribution Location | Yes |
| Direct connection to or within a mile of an Educational Institution            | Yes |

Project provides a direct connection to or within a mile of an existing local activity center identified in an adopted county or city plan

County or City Plan Reference (Limit 700 characters; approximately 100 words)

Upload Map

Regional Economy.pdf

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### Measure A: Current Daily Person Throughput

|  |  |
|--|--|
| Location                               | South of CSAH 10                       |
| Current AADT Volume                    | 24600.0                                |
| Existing Transit Routes on the Project | 5, 19, 22, 32, 717, 721, 723, 724, 761 |

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### Response: Current Daily Person Throughput

|  |         |
|--|---------|
| Average Annual Daily Transit Ridership | 5838.0  |
| Current Daily Person Throughput        | 37818.0 |

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### Measure B: 2030 Forecast ADT

Use Metropolitan Council model to determine forecast (2030) ADT volume

METC Staff - Forecast (2030) ADT volume 0

OR

Approved county or city travel demand model to determine forecast (2030) ADT volume Yes

Forecast (2030) ADT volume 28200.0

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### Measure A: Project Location and Impact to Disadvantaged Populations

Select one:

Project located in Racially Concentrated Area of Poverty Yes

Project located in Concentrated Area of 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 1,400 characters; approximately 200 words)

The Brooklyn Boulevard Project is located within an RCAP. The Met Councils Choice, Place and Opportunity: An Equity Assessment of the Twin Cities Region noted that there was growth of black and immigrant populations during the 2000s. During the 2000s this RCAP grew faster than any other in the metro region, driving the need for better infrastructure and investment. Improving access to jobs and education is especially critical for RCAP populations. The proposed project is connected all three ThriveMSP 2040 maps: a Job Concentration, Manufacturing/Distribution Location, and an Educational Institution.

The project provides multimodal benefits: mobility and safety improvements for drivers, and enhanced bicycle and pedestrian facilities which also benefit transit users, in particular RCAP populations. The improvements improve livability by balancing traffic needs with a comfortable bicyclist and pedestrian environment and set the stage for future transitway improvements.

The project improvements would improve safety and comfort for children, the elderly, and people with disabilities by widening sidewalks and trails and improving crosswalks and ramps. The project would also improve connections to Northport Elementary School.

Adverse impacts would be minimized and mitigated by maintaining access to homes and businesses during construction for drivers, bicyclists, and pedestrians.

Upload Map

Socio-Economic Conditions.pdf

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## Measure B: Affordable Housing

| City/Township   | Segment Length (Miles) |
|-----------------|------------------------|
| Brooklyn Center | 1.3                    |
|                 | 1                      |

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## Total Project Length

Total Project Length 1.3

## 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 |
|-----------------|------------------------|----------------------|-------|-----------------------------|---|
| Brooklyn Center | 1.3                    | 1.3                  | 34.0  | 1.0                         | 34.0  |
|                 |                        | 1                    | 34    | 1                           | 34  |

## Affordable Housing Scoring - To Be Completed By Metropolitan Council Staff

Total Project Length (Miles) 1.3  
 Total Housing Score 34.0

## Measure A: Year of Roadway Construction

| Year of Original Roadway Construction or Most Recent Reconstruction | Roadway Segment Length (Miles) | Calculation | Calculation 2 |
|---|--------------------------------|-------------|---------------|
| 1984.0  | 1.3                            | 2579.2      | 1984.0        |
|   | 1                              | 2579        | 1984          |

## Average Construction Year

Weighted Year 1984.0

## Total Segment Length (Miles)

Total Segment Length 1.3

## Measure B: Geometric, Structural, or Infrastructure Improvements

Brooklyn Boulevard north of TH 100 will be reconstructed to improve the service life of the road. This portion of the road has higher traffic volumes and speeds which increases wear and tear on the roadway.

The road has several problematic free right turn lanes that will be reconfigured to improve sightlines.

The Twin Lakes Regional Trail crossing at 55th Avenue is deficient the trail transitions to a narrow sidewalk instead of a 10 foot multiuse trail.

Other sidewalks in the project area are primarily less than the minimum standard of six feet. The project will widen sidewalks and add a boulevard to provide better spacing between pedestrians and vehicles. The current sidewalks and crosswalks are not in compliance with Americans with Disabilities standards. The project will improve all crossings to be ADA compliant.

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

The project includes turn lane improvements to meet turn length standards. Current turn lane lengths in several locations are too short based on design standards.

The project will relocate problematic mid-block bus stop locations to better align with intersections to discourage illegal pedestrian crossings.

The project will address access control issues at 51st Avenue and will address frontage road spacing distance issues at 55th Avenue.

The project will also replace the aging storm sewer.

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## Measure A: Cost Effectiveness of Vehicle Delay Reduction

|   |                           |
|---|---------------------------|
| Total Project Cost from Cost Sheet                | \$9,310,000.00            |
| Total Peak Hour Vehicle Delay Without The Project | 87265.0                   |
| Total Peak Hour Vehicle Delay With The Project    | 67560.0                   |
| Total Peak Hour Vehicle Delay Reduced by Project  | 19705.0                   |
| Cost Effectiveness                                | \$472.47                  |
| Synchro or HCM Reports                            | Synchro Brooklyn Blvd.pdf |

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## Measure B: Cost Effectiveness of Emissions Reduction

|  |                           |
|--|---------------------------|
| Total Project Cost from Cost Sheet           | \$9,310,000.00            |
| Total Peak Hour Kilograms Reduced by Project | 0.43                      |
| Cost Effectiveness                           | \$21,651,162.79           |
| Synchro or HCM Reports                       | Synchro Brooklyn Blvd.pdf |

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## Measure A: Benefit/Cost of Crash Reduction

|                            |                                       |
|----------------------------|---------------------------------------|
| Project Benefit/Cost Ratio | 1.72                                  |
| Worksheet Attachment       | CSAH 152 Completed Crash Analysis.pdf |

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## Measure A: Transit Connections

|  |   |
|--|---|
| Existing Routes Directly Connected to the Project  | 5, 19, 22, 32, 717, 721, 723, 724, 761    |
| Planned Transitways directly connected to the project (alignment and mode determined and identified in the 2030 TPP) | Chicago Ave BRT, Emerson/Fremont Aves BRT |
| Upload Map   | Transit Connections.pdf                   |

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## Response

*Met Council Staff Data Entry Only*

|                      |             |
|----------------------|-------------|
| Route Ridership      | 1.1883608E7 |
| Transitway Ridership | 6742400.0   |

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## Measure B: Bicycle and Pedestrian Connections

The corridor connects to newly constructed bicycle facilities in Minneapolis, including an on-street bike lane on 49th Avenue and paved shoulder on Osseo Road, as well as the sidewalk network in Minneapolis.

The Twin Lakes Regional Trail crosses Brooklyn Boulevard at 55th Avenue and extends west to Crystal Lake and east to the Mississippi River. This trail also connects with the Shingle Creek Regional Trail approximately 0.5 miles east of Brooklyn Boulevard which connects to recreation destinations.

Shingle Creek Crossing is a major destination and is identified as a mixed-use area in the Brooklyn Center 2030 Comprehensive Plan. This redevelopment area includes retail and service businesses which serve both regional and neighborhood customers.

Northport Elementary School is located along the project area at 55th Avenue, but inadequate pedestrian and bicycle facilities make it difficult for students to get to school on foot or by bike from surrounding neighborhoods.

The Brooklyn Center Transit Center is located along Bass Lake Road, a few blocks away from Brooklyn Boulevard. Bass Lake Road currently has sidewalks and on-street bicycle facilities are planned. The project would improve connections to the Brooklyn Center Transit Center from surrounding residential areas and commercial destinations along Brooklyn Boulevard.

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

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## Measure C: Multimodal Facilities

The Brooklyn Boulevard project will safely integrate all modes of transportation, including pedestrians, bicyclists, and transit users, through the following improvements:

Adding a multi-use trail with a boulevard on the west side of the road , where only a narrow sidewalk currently exists

Improving the Twin Lakes Regional Trail connection at 55th Avenue, including a striped crosswalk

Reconstructing the sidewalk along the east side of the road to current design standards, and adding boulevards

Enhancing bus stops with amenities (benches, trash receptacles, etc.)

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

Relocating several bus stops to align with intersections (currently mid-block locations)

Modifications to the roadway will also improve the comfort and functionality of the corridor for multimodal users:

Removal of the free right-turn onto Bass Lake Road

Reconfiguration of TH 100 northbound off-ramp to a signalized intersection so that vehicles must slow before merging onto Brooklyn Blvd. The current movement occurs at an angle that is poor for watching for pedestrians.

Establish improved bicycle and pedestrian network for future transitway improvements (Chicago-Fremont and C Line Arterial BRT routes)

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

**Check Here if Your Transit Project Does Not Require Construction**

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## 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 Yes

100%

Layout or Preliminary Plan started

50%

Layout or Preliminary Plan has not been started

0%

Anticipated date or date of completion 01/11/2013

### 3) Environmental Documentation (10 Percent of Points)

EIS

EA

PM Yes

**Document Status:**

Document approved (include copy of signed cover sheet) 100%

Document submitted to State Aid for review 75%

Document in progress; environmental impacts identified Yes  
50%

Document not started

0%

Anticipated date or date of completion/approval

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

**No known potential for archaeological resources, no historic resources known to be eligible for/listed on the National Register of Historic Places located in the project area, and project is not located on an identified historic bridge** Yes

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%

**Unknown impacts to historic/archaeological resources**

0%

**Anticipated date or date of completion of historic/archeological review:**

**Project is located on an identified historic bridge**

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

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

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

100%

**Project is an independent bikeway/walkway project covered by the bikeway/walkway Negative Declaration statement; letter of support received**

100%

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

80%

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

30%

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

0%

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

**Right-of-way or easements not required**

100%

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

100%

**Right-of-way or easements required, offers made** Yes

75%

**Right-of-way or easements required, appraisals made**

50%



**Right-of-way or easements required, parcels identified**

25%

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

0%

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

0%

**Anticipated date or date of acquisition**

01/31/2018

**7)Railroad Involvement (25 Percent of Points)**

**No railroad involvement on project**

Yes

100%

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

100%

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

60%

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

40%

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

0%

**Anticipated date or date of executed Agreement**

**8)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%

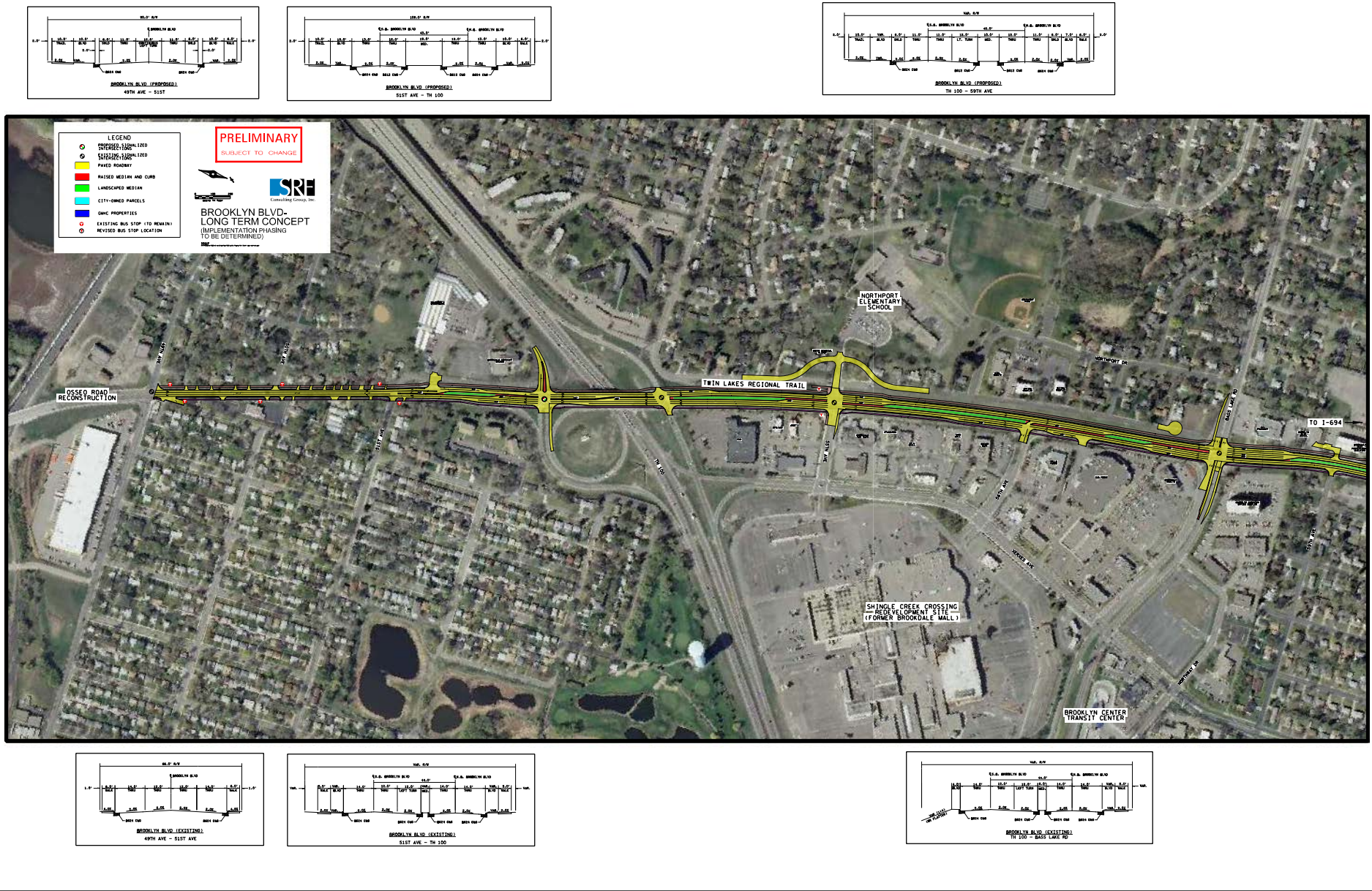
**Anticipated date or date of completion**

06/30/2016

**9)Letting**

**Anticipated Letting Date**

02/28/2018



# Brooklyn Boulevard Concept Layout

Brooklyn Boulevard Project  
City of Brooklyn Center Roadway Reconstruction / Modernization Application

Note: A free right at the TH 100 south bound ramp will be included, which is not reflected in this figure.

Figure 1





## Hennepin County Public Works

Transportation Department  
Public Works Facility  
1600 Prairie Drive  
Medina, MN 55340-5421

Phone: 612-596-0300  
Fax: 612-321-3410  
Web: [www.hennepin.us](http://www.hennepin.us)

November 21, 2014

Steven L. Lillehaug, P.E., P.T.O.E  
City Engineer/Director of Public Works  
City of Brooklyn Center  
6301 Shingle Creek Parkway  
Brooklyn Center, Minnesota 55430

RE: CSAH 152 (Brooklyn Boulevard) between 49th Avenue North and 59th Avenue North  
Regional Solicitation Funding Submittal

Dear Mr. Lillehaug:

Hennepin County has been notified that the City of Brooklyn Center is submitting an application for regional solicitation funding for the proposed CSAH 152 (Brooklyn Boulevard) project. This project includes the reconstruction of CSAH 152 between 49th Avenue N. and 59th Avenue N., in addition to adding pedestrian and bicycle facilities. Hennepin County supports this funding application and acknowledges that the county will have jurisdictional authority over the roadway. Hennepin County will operate and maintain CSAH 152 for the useful life of the improvement.

Hennepin County is willing to provide a portion of the local match funds for this project. The county and city will work together to determine the appropriate split in local match funds amongst agencies if the city is successful in securing regional solicitation funding from the Met Council.

Sincerely,

A handwritten signature in blue ink that reads 'James N. Grube'.

James N. Grube, P.E.  
Director of Transportation and County Engineer

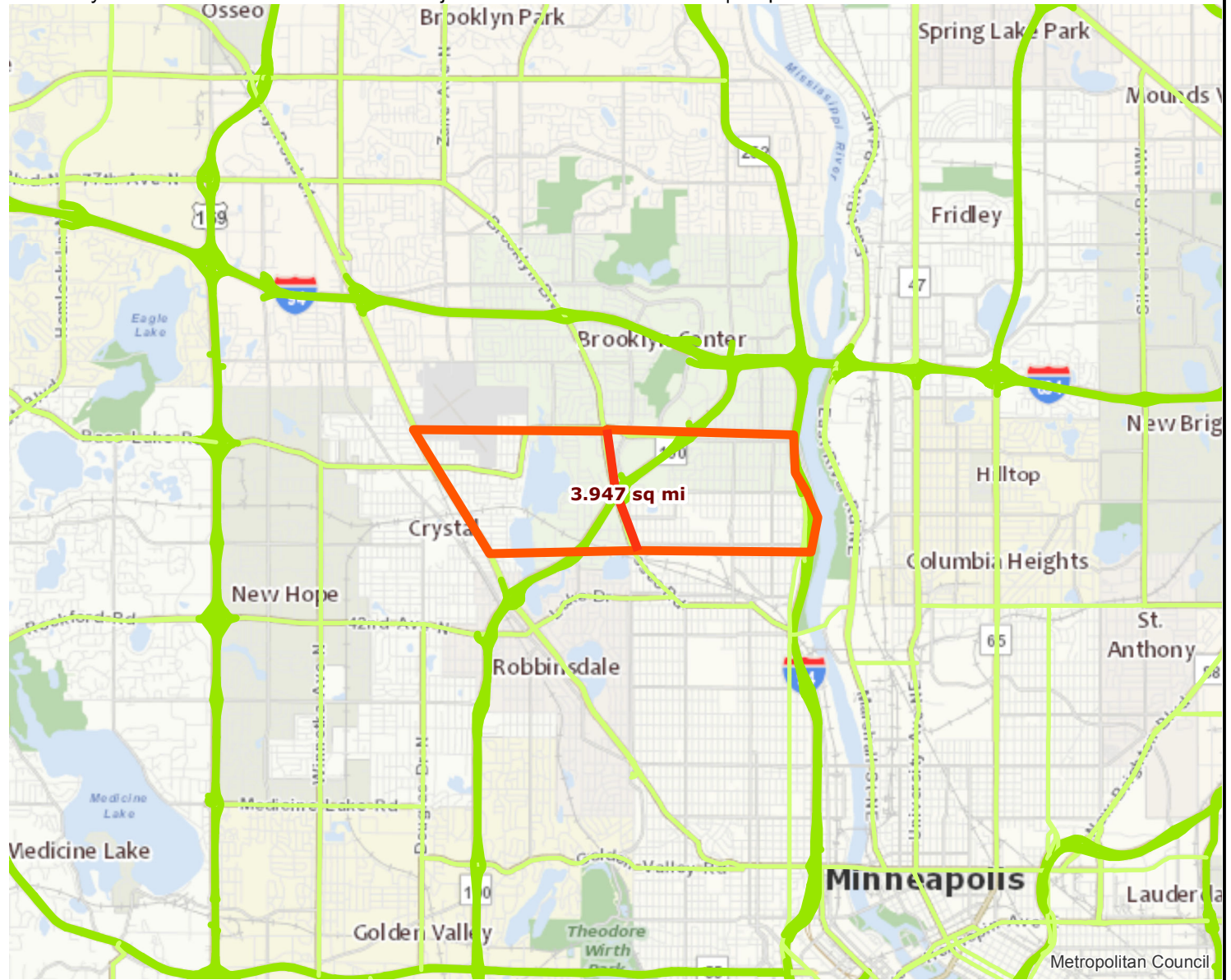
# Roadway Area Definition

Roadway Reconstruction/Modernization Project: Cсах86 Cсах23 to TH3 | Map ID: 1419955026246

## Results

Project Length: 1.208 miles

Project Area: 3.947 sq mi



- Project
- Project Area
- Principal Arterials
- A Minor Arterials
- Principal Arterials Planned
- A Minor Arterials Planned



Created: 12/30/2014  
LandscapeRSA1

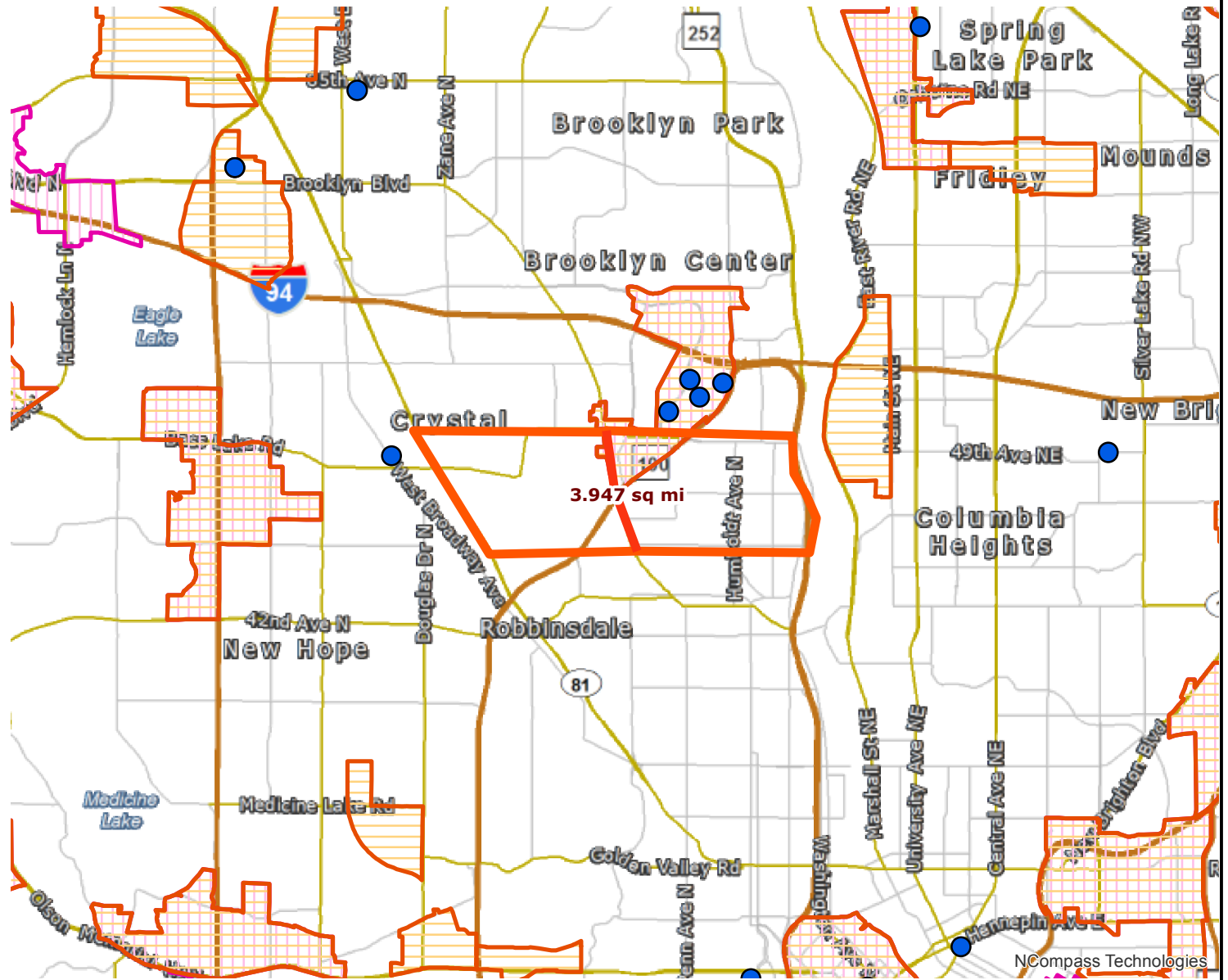


For complete disclaimer of accuracy, please visit <http://giswebsite.metc.state.mn.us/gissitenew/notice.aspx>



# Regional Economy

Roadway Reconstruction/Modernization Project: Cсах86 Cсах23 to TH3 | Map ID: 1419955026246



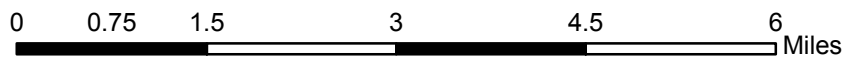
## Results

Project **IN** area of Job Concentration.

Project **IN** area of Manufacturing and Distribution.

Project **WITHIN ONE MI** of area of Education Institutions.

- Project
- Project Area
- PostSecondary Education Centers
- Job Concentration Centers
- Manufacturing/Distribution Centers



Created: 12/30/2014  
LandscapeRSA5



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

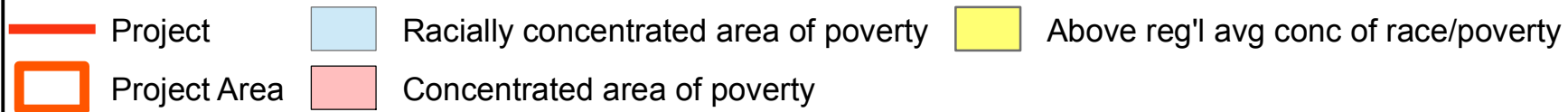
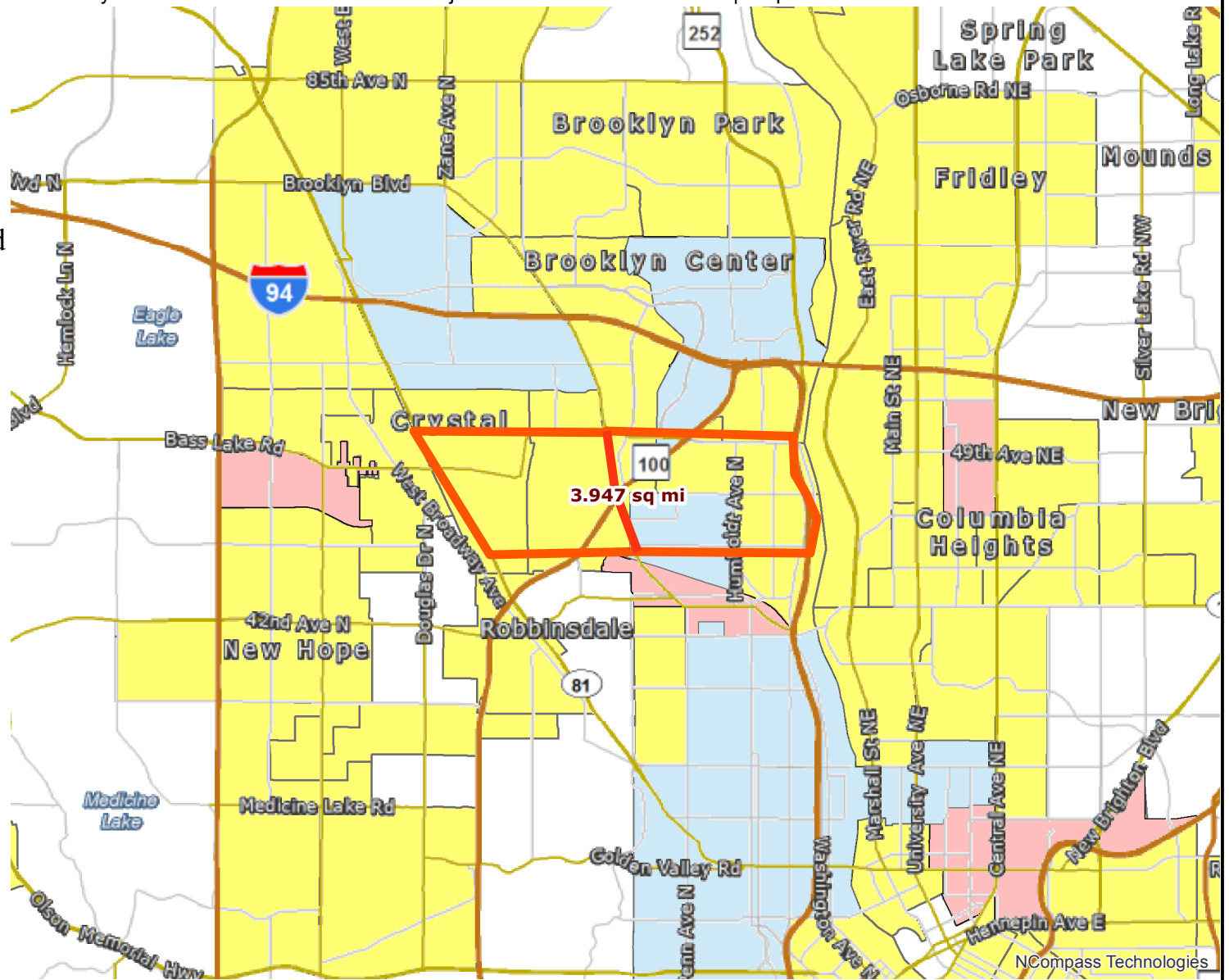


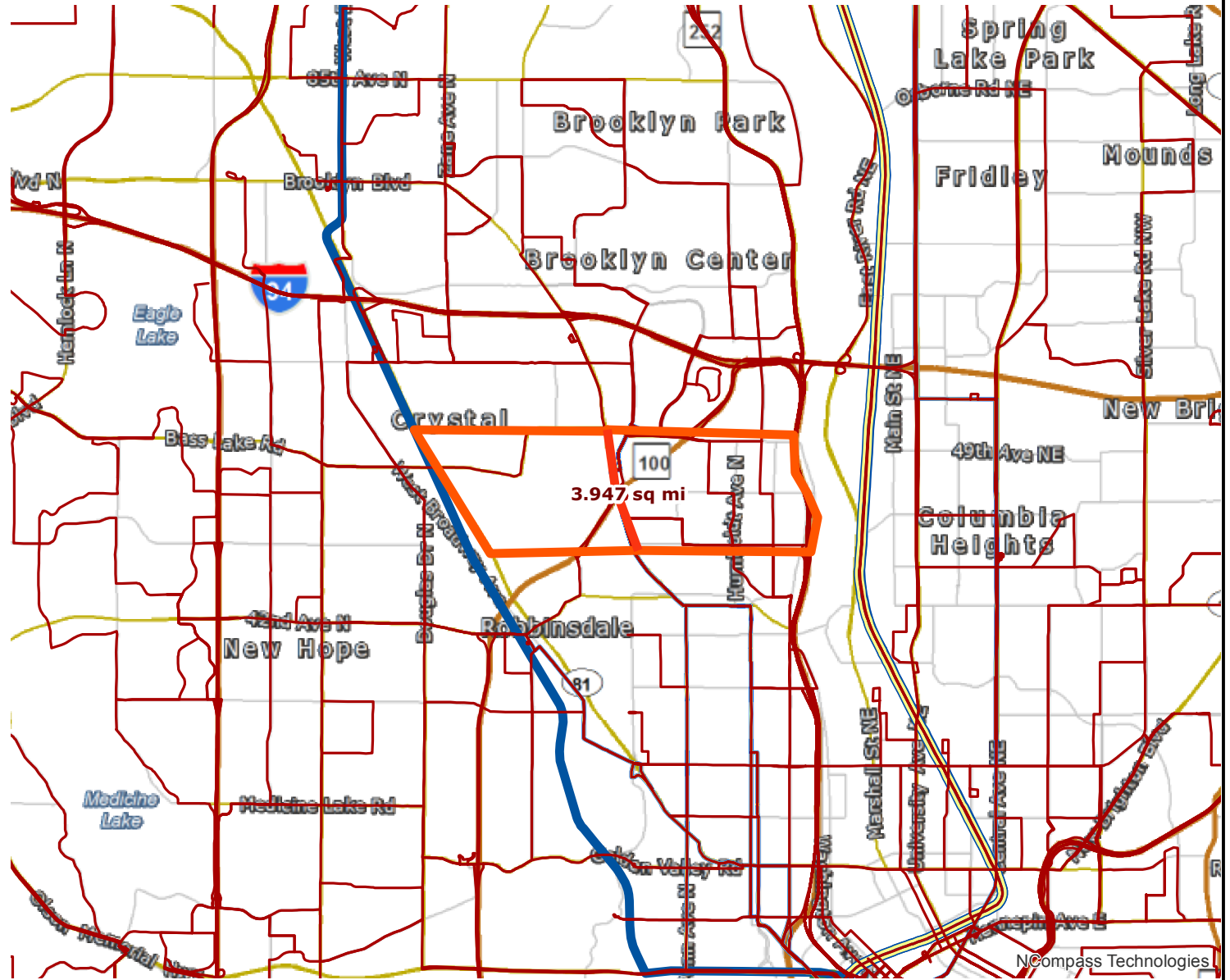
NCompass Technologies



Results

Project IN a racially concentrated area of poverty.





Results

Transit with a Direct Connection to project:

5 19 22 32 717 721 723 724 761

\*Chicago-Fremont

\*C Line

\*indicates Planned Alignments

- ▬ Project
- Project Area
- ▬ Transit Routes
- Transitway**
- ▬▬▬ Northstar Line
- ▬▬▬ Arterial BRT
- ▬▬▬ Light Rail, Blue Line Extension
- Planned Alignments**
- ▬▬▬ Light Rail, Green Line Extension



Created: 12/30/2014  
LandscapeRSA3



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



NCompass Technologies

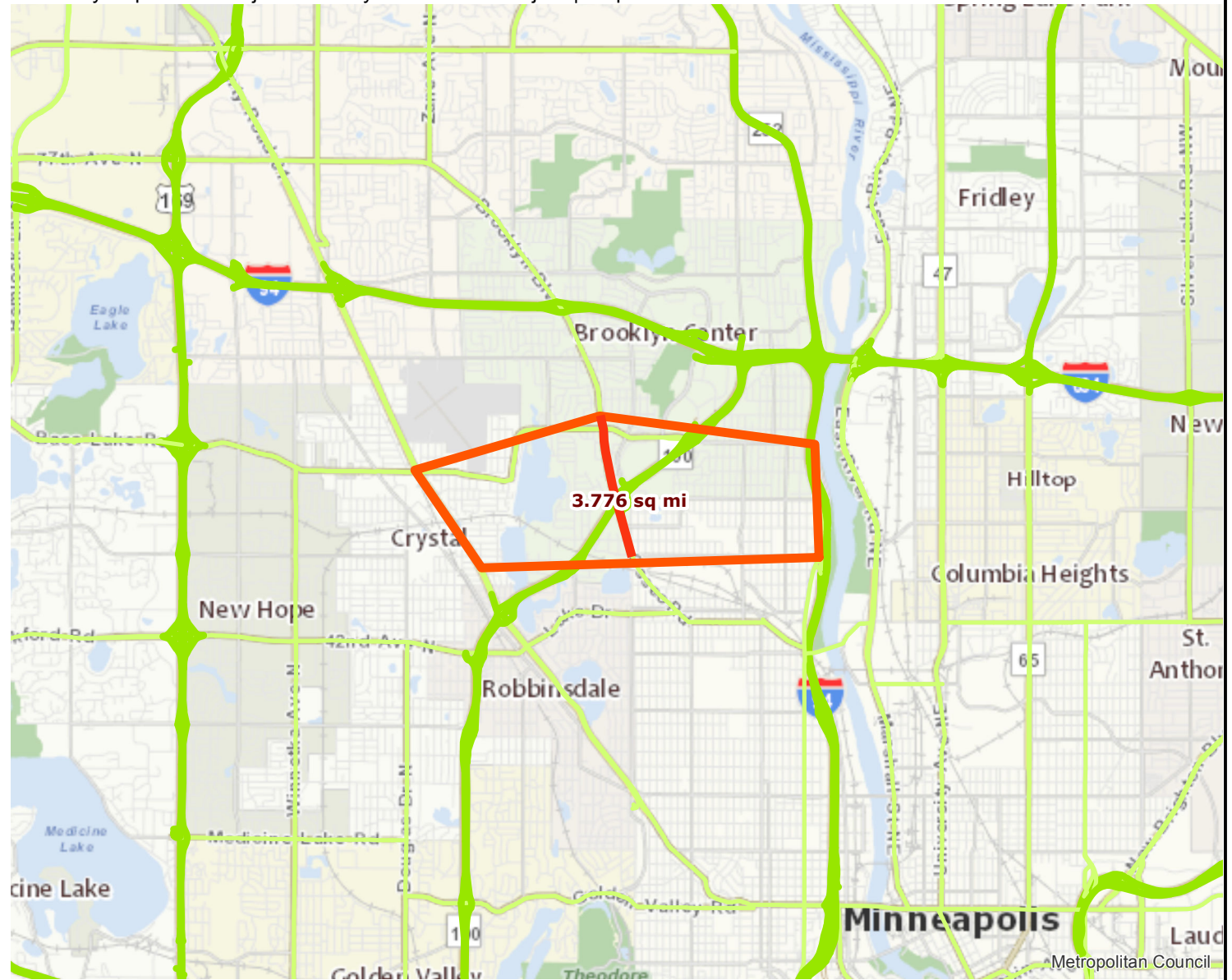
# Roadway Area Definition

Roadway Expansion Project: Brooklyn Boulevard Project | Map ID: 1413920497085

## Results

Project Length: 1.288 miles

Project Area: 3.776 sq mi



- Project
- Principal Arterials
- Principal Planned Arterial
- Project Area
- Minor Arterials
- Minor Planned Arterial



Created: 10/21/2014  
LandscapeRSA1



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





# Regional Economy

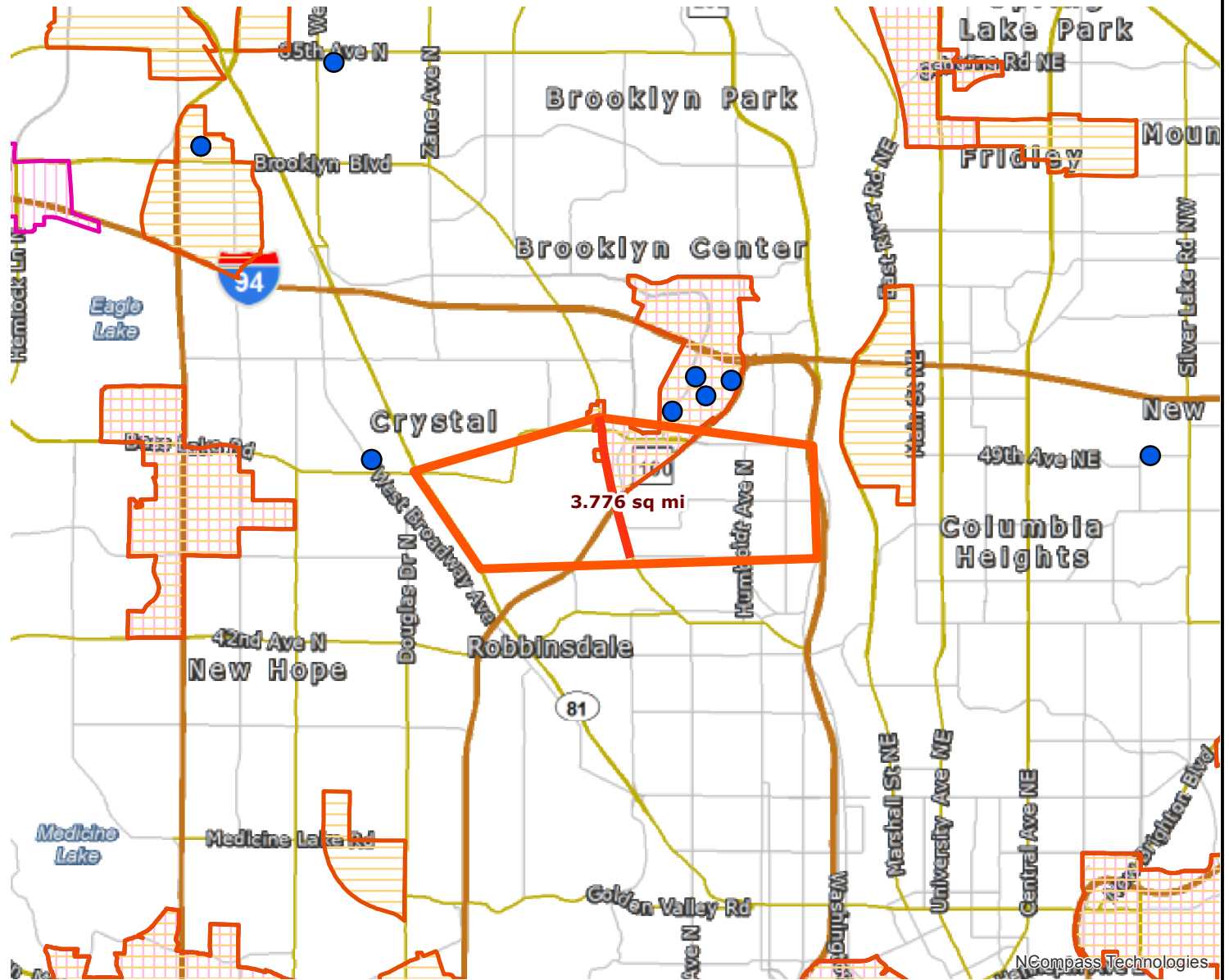
Roadway Expansion Project: Brooklyn Boulevard Project | Map ID: 1413920497085

## Results

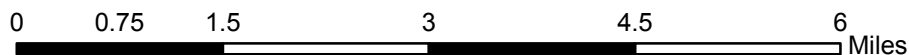
Project IN area of Job Concentration.

Project IN area of Manufacturing and Distribution.

Project NOT CONNECTED to area of Education Institutions.



- Project
- Project Area
- PostSecondary Education Centers
- Manufacturing/Distribution Centers
- Job Concentration Centers



Created: 10/21/2014  
LandscapeRSA5

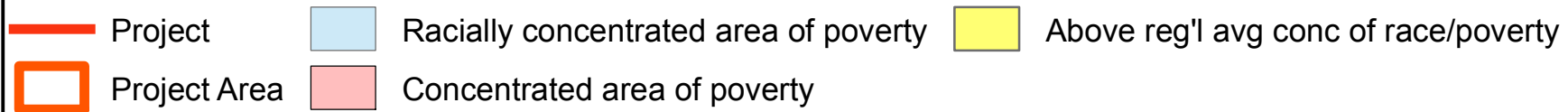
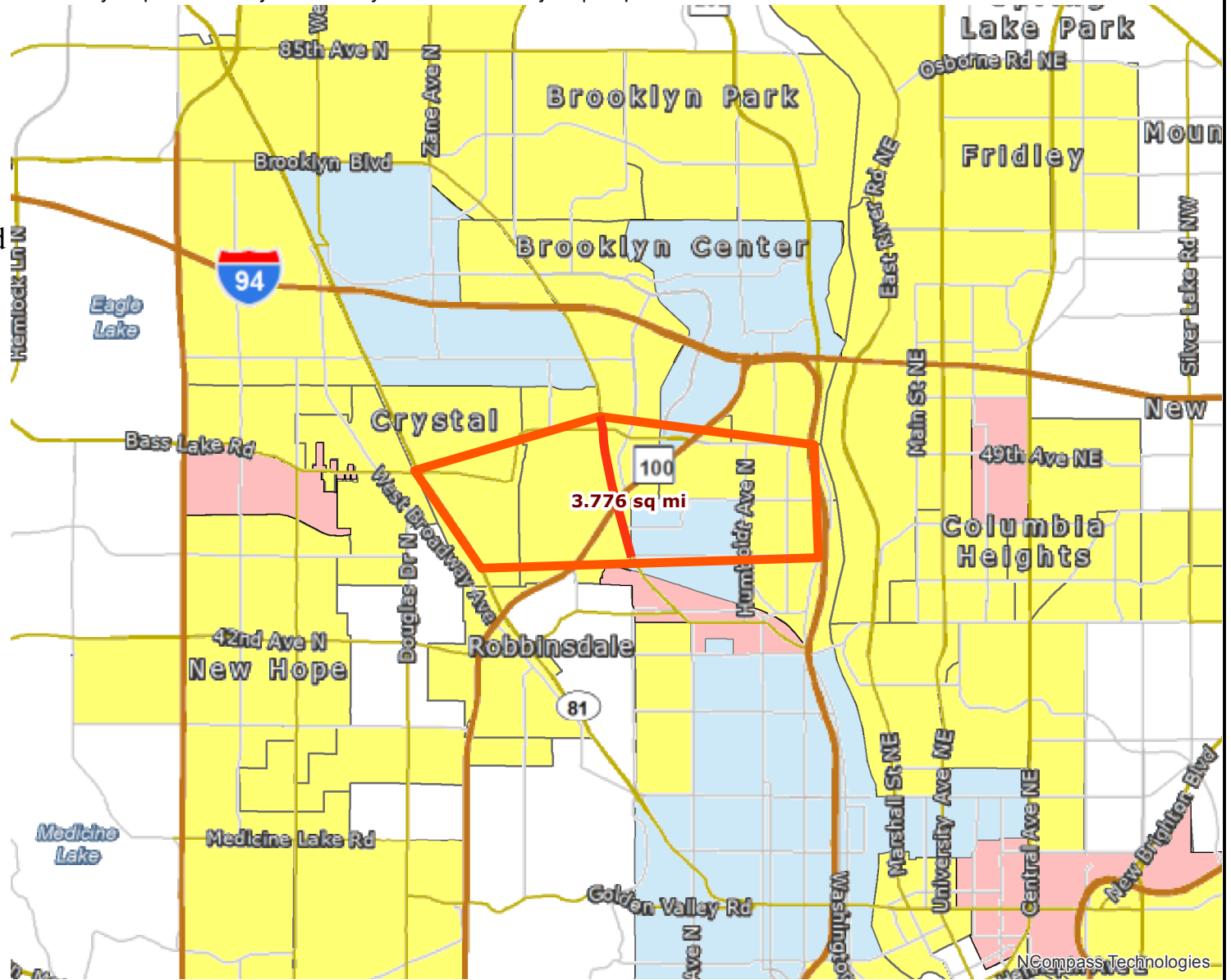


For complete disclaimer of accuracy, please visit <http://giswebsite.metc.state.mn.us/gissitenew/notice.aspx>



Results

Project IN a racially concentrated area of poverty.



3: Bass Lake Rd & Brooklyn Blvd

---

| Direction               | All  |
|-------------------------|------|
| Volume (vph)            | 2815 |
| Total Delay / Veh (s/v) | 31   |
| CO Emissions (kg)       | 3.22 |
| NOx Emissions (kg)      | 0.63 |
| VOC Emissions (kg)      | 0.75 |

3: Brooklyn Blvd & Bass Lake Rd

---

| Direction               | All  |
|-------------------------|------|
| Volume (vph)            | 2815 |
| Total Delay / Veh (s/v) | 24   |
| CO Emissions (kg)       | 2.92 |
| NOx Emissions (kg)      | 0.57 |
| VOC Emissions (kg)      | 0.68 |

3: Bass Lake Rd & Brooklyn Blvd

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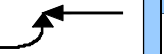

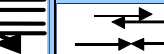
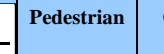
| Direction               | All  |
|-------------------------|------|
| Volume (vph)            | 2815 |
| Total Delay / Veh (s/v) | 31   |
| CO Emissions (kg)       | 3.22 |
| NOx Emissions (kg)      | 0.63 |
| VOC Emissions (kg)      | 0.75 |

3: Brooklyn Blvd & Bass Lake Rd

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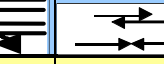

| Direction               | All  |
|-------------------------|------|
| Volume (vph)            | 2815 |
| Total Delay / Veh (s/v) | 24   |
| CO Emissions (kg)       | 2.92 |
| NOx Emissions (kg)      | 0.57 |
| VOC Emissions (kg)      | 0.68 |

| HSIP worksheet   |                      | Control Section              | T.H. / Roadway | Location  |                          |                  | Beginning Ref. Pt.                           | Ending Ref. Pt.  | State, County, City or Township | Study Period Begins | Study Period Ends |
|--|----------------------|------------------------------|----------------|---|--------------------------|------------------|--|--|---------------------------------|---------------------|-------------------|
|  |                      |                              | Brooklyn Blvd  | At Bass Lake Road   |                          |                  |  |  | Brooklyn Park                   | 1/1/2011            | 12/31/2013        |
| Accident Diagram Codes   |                      | Description of Proposed Work |                | Install a southbound dual left-turn lane and pavement improvement |                          |                  |  |  |                                 |                     |                   |
| 1 Rear End   |                      | 2 Sideswipe Same Direction   |                | 3 Left Turn Main Line   | 5 Right Angle            | 4,7 Ran off Road | 8, 9 Head On/ Sideswipe - Opposite Direction |  | Pedestrian                      | Other               | Total             |
|  |                      |                              |                |   |                          |                  |  |  |                                 |                     |                   |
| Study Period: Number of Crashes  | Fatal                | F                            |                |   |                          |                  |  |  |                                 |                     |                   |
|  | Personal Injury (PI) | A                            |                |   |                          |                  |  |  |                                 |                     |                   |
|  |                      | B                            |                |   |                          |                  |  | 1  |                                 |                     | 1                 |
|  |                      | C                            | 2              |   | 1                        | 1                |  |  |                                 | 1                   | 5                 |
| Property Damage  | PD                   | 5                            | 2              | 1   |                          |                  |  |  | 2                               | 10                  |                   |
| % Change in Crashes  | Fatal                | F                            |                |   |                          |                  |  |  |                                 |                     |                   |
|  | PI                   | A                            |                |   |                          |                  |  |  |                                 |                     |                   |
|  |                      | B                            |                |   |                          |                  |  | -85%   |                                 |                     |                   |
|  |                      | C                            | -79%           |   | -69%                     | -37%             |  |  |                                 | -41%                |                   |
| Property Damage  | PD                   | -80%                         | -41%           | -83%  |                          | -44%             |  |  | -41%                            |                     |                   |
| Change in Crashes<br><small>= No. of crashes X % change in crashes</small> | Fatal                | F                            |                |   |                          |                  |  |  |                                 |                     |                   |
|  | PI                   | A                            |                |   |                          |                  |  |  |                                 |                     |                   |
|  |                      | B                            |                |   |                          |                  |  | -0.85  |                                 |                     | -0.85             |
|  |                      | C                            | -1.58          |   | -0.69                    | -0.37            |  |  |                                 | -0.41               | -3.05             |
| Property Damage  | PD                   | -4.00                        | -0.82          | -0.83   |                          |                  |  |  | -0.82                           | -6.47               |                   |
| Year (Safety Improvement Construction)                                     |                      | 2018                         |                |   |                          |                  |  |  |                                 |                     |                   |
| Project Cost (exclude Right of Way)  |                      | \$ 9,310,000                 | Type of Crash  | Study Period: Change in Crashes                                   | Annual Change in Crashes | Cost per Crash   | Annual Benefit                               | <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>B/C= 0.27</b> </div> <p>Using present worth values,<br/> <b>B= \$ 2,512,873</b><br/> <b>C= \$ 9,310,000</b></p> <p>See "Calculations" sheet for amortization.</p> |                                 |                     |                   |
| Right of Way Costs (optional)  |                      |                              | F              |   |                          | \$ 1,100,000     |  |  |                                 |                     |                   |
| Traffic Growth Factor  |                      | 3%                           | A              |   |                          | \$ 550,000       |  |  |                                 |                     |                   |
| Capital Recovery   |                      |                              | B              | -0.85   | -0.28                    | \$ 160,000       | \$ 45,333                                    |  |                                 |                     |                   |
| 1. Discount Rate   |                      | 4.5%                         | C              | -3.05   | -1.02                    | \$ 81,000        | \$ 82,350                                    |  |                                 |                     |                   |
| 2. Project Service Life (n)  |                      | 20                           | PD             | -6.47   | -2.16                    | \$ 7,400         | \$ 15,959                                    |  |                                 |                     |                   |
|  |                      |                              | Total          |   |                          | \$ 143,643       |  |  |                                 |                     |                   |
| Office of Traffic, Safety and Technology<br>September 2014                 |                      |                              |                |   |                          |                  |  |  |                                 |                     |                   |

| HSIP worksheet  |                      | Control Section   | T.H. / Roadway  | Location  |   |  | Beginning Ref. Pt.  | Ending Ref. Pt.  | State, County, City or Township | Study Period Begins | Study Period Ends |
|---|----------------------|---|---|---|---|--|---|--|---------------------------------|---------------------|-------------------|
|   |                      |   | Brooklyn Blvd   | At 56th Avenue  |   |  |   |  | Brooklyn Park                   | 1/1/2011            | 12/31/2013        |
|   |                      | Description of Proposed Work  |   | Roadway reconstruction with pavement improvement                                  |   |  |   |  |                                 |                     |                   |
| Accident Diagram Codes  |                      | 1 Rear End  | 2 Sideswipe Same Direction  | 3 Left Turn Main Line   | 5 Right Angle   | 4,7 Ran off Road   | 8, 9 Head On/ Sideswipe - Opposite Direction  |  | 6, 90, 99                       |                     |                   |
|   |                      |  |  |  |  |  |  | Pedestrian   | Other                           | Total               |                   |
| Study Period: Number of Crashes   | Fatal                | F   |   |   |   |  |   |  |                                 |                     |                   |
|   | Personal Injury (PI) | A   |   |   |   |  |   |  |                                 |                     |                   |
|   |                      | B   |   |   |   |  |   |  |                                 |                     |                   |
|   |                      | C   |   |   |   | 1  |   |  | 1                               | 2                   |                   |
| Property Damage   | PD                   |   |   |   |   |  |   | 1  | 1                               |                     |                   |
| % Change in Crashes<br><small>*Use Crash Modification Factors Clearinghouse</small> | Fatal                | F   |   |   |   |  |   |  |                                 |                     |                   |
|   | PI                   | A   |   |   |   |  |   |  |                                 |                     |                   |
|   |                      | B   |   |   |   |  |   |  |                                 |                     |                   |
|   |                      | C   |   |   |   | -21%   |   |  | -41%                            |                     |                   |
| Property Damage   | PD                   |   |   |   |   |  |   | -41%   |                                 |                     |                   |
| Change in Crashes<br><small>= No. of crashes X % change in crashes</small>          | Fatal                | F   |   |   |   |  |   |  |                                 |                     |                   |
|   | PI                   | A   |   |   |   |  |   |  |                                 |                     |                   |
|   |                      | B   |   |   |   |  |   |  |                                 |                     |                   |
|   |                      | C   |   |   |   | -0.21  |   |  | -0.41                           | -0.62               |                   |
| Property Damage   | PD                   |   |   |   |   |  |   | -0.41  | -0.41                           |                     |                   |
| Year (Safety Improvement Construction)  |                      | 2018  |   |   |   |  |   |  |                                 |                     |                   |
| Project Cost (exclude Right of Way)   |                      | \$ 9,310,000  | Type of Crash   | Study Period: Change in Crashes   | Annual Change in Crashes  | Cost per Crash   | Annual Benefit  | <div style="border: 1px solid black; background-color: #FFDAB9; padding: 5px; display: inline-block;"> <b>B/C= 0.03</b> </div> |                                 |                     |                   |
| Right of Way Costs (optional)   |                      |   | F   |   |   | \$ 1,100,000   |   |  |                                 |                     |                   |
| Traffic Growth Factor   |                      | 3%  | A   |   |   | \$ 550,000   |   | Using present worth values,  |                                 |                     |                   |
| Capital Recovery  |                      |   | B   |   |   | \$ 160,000   |   | <b>B= \$ 310,540</b><br><b>C= \$ 9,310,000</b>   |                                 |                     |                   |
| 1. Discount Rate  |                      | 4.5%  | C   | -0.62   | -0.21   | \$ 81,000  | \$ 16,740   | See "Calculations" sheet for amortization.   |                                 |                     |                   |
| 2. Project Service Life (n)   |                      | 20  | PD  | -0.41   | -0.14   | \$ 7,400   | \$ 1,011  |  |                                 |                     |                   |
|   |                      |   | Total   |   |   | \$ 17,751  |   | Office of Traffic, Safety and Technology<br>September 2014   |                                 |                     |                   |





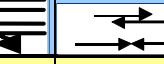



# HSIP worksheet

| Control Section   |   | T.H. / Roadway  | Location  |   |  |   | Beginning Ref. Pt. | Ending Ref. Pt.  | State, County, City or Township | Study Period Begins | Study Period Ends |
|---|---|---|---|---|--|---|--------------------|--|---------------------------------|---------------------|-------------------|
|   |   | Brooklyn Blvd   | At 55th Avenue  |   |  |   |                    |  | Brooklyn Park                   | 1/1/2011            | 12/31/2013        |
| Description of Proposed Work  |   | Install a southbound right-turn lane and pavement improvement                     |   |   |  |   |                    |  |                                 |                     |                   |
| Accident Diagram Codes  | 1 Rear End  | 2 Sideswipe Same Direction  | 3 Left Turn Main Line   | 5 Right Angle   | 4,7 Ran off Road   | 8, 9 Head On/ Sideswipe - Opposite Direction  |                    |  | 6, 90, 99                       |                     |                   |
|   |  |  |  |  |  |  |                    |  | Pedestrian                      | Other               | Total             |
| Study Period: Number of Crashes   | Fatal   | F   |   |   |  |   |                    |  |                                 |                     |                   |
|   | Personal Injury (PI)  | A   |   |   |  |   |                    |  |                                 |                     |                   |
|   |   | B   |   |   |  |   |                    |  |                                 |                     |                   |
|   |   | C   | 1   |   | 2  | 2   | 1                  | 2  |                                 |                     | 8                 |
| Property Damage   | PD  | 2   | 1   |   |  |   |                    |  | 1                               | 4                   |                   |
| % Change in Crashes<br><small>*Use Crash Modification Factors Clearinghouse</small> | Fatal   | F   |   |   |  |   |                    |  |                                 |                     |                   |
|   | PI  | A   |   |   |  |   |                    |  |                                 |                     |                   |
|   |   | B   |   |   |  |   |                    |  |                                 |                     |                   |
|   |   | C   | -73%  |   | -46%   | -28%  | -46%               | -46%   |                                 |                     |                   |
| Property Damage   | PD  | -71%  | -43%  |   |  |   |                    |  | -43%                            |                     |                   |
| Change in Crashes<br><small>= No. of crashes X % change in crashes</small>          | Fatal   | F   |   |   |  |   |                    |  |                                 |                     |                   |
|   | PI  | A   |   |   |  |   |                    |  |                                 |                     |                   |
|   |   | B   |   |   |  |   |                    |  |                                 |                     |                   |
|   |   | C   | -0.73   |   | -0.92  | -0.56   | -0.46              | -0.92  |                                 |                     | -3.59             |
| Property Damage   | PD  | -1.42   | -0.43   |   |  |   |                    |  | -0.43                           | -2.28               |                   |
| Year (Safety Improvement Construction)  |   | 2018  |   |   |  |   |                    |  |                                 |                     |                   |
| Project Cost (exclude Right of Way)   |   | \$ 9,310,000  | Type of Crash   | Study Period: Change in Crashes   | Annual Change in Crashes   | Cost per Crash  | Annual Benefit     | <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>B/C= 0.19</b> </div> <p>Using present worth values,<br/> <b>B= \$ 1,794,071</b><br/> <b>C= \$ 9,310,000</b></p> <p>See "Calculations" sheet for amortization.</p> |                                 |                     |                   |
| Right of Way Costs (optional)   |   |   | F   |   |  | \$ 1,100,000  |                    |  |                                 |                     |                   |
| Traffic Growth Factor   |   | 3%  | A   |   |  | \$ 550,000  |                    |  |                                 |                     |                   |
| Capital Recovery  |   |   | B   |   |  | \$ 160,000  |                    |  |                                 |                     |                   |
| 1. Discount Rate  |   | 4.5%  | C   | -3.59   | -1.20  | \$ 81,000   | \$ 96,930          |  |                                 |                     |                   |
| 2. Project Service Life (n)   |   | 20  | PD  | -2.28   | -0.76  | \$ 7,400  | \$ 5,624           |  |                                 |                     |                   |
|   |   |   | Total   |   |  | \$ 102,554  |                    |  |                                 |                     |                   |

| HSIP worksheet   |                      | Control Section              | T.H. / Roadway | Location                                 |                          |                  | Beginning Ref. Pt.                           | Ending Ref. Pt.   | State, County, City or Township | Study Period Begins | Study Period Ends |
|--|----------------------|------------------------------|----------------|--|--------------------------|------------------|--|---|---------------------------------|---------------------|-------------------|
|  |                      |                              | Brooklyn Blvd  | At TH 100 North and South Ramps          |                          |                  |  |   | Brooklyn Park                   | 1/1/2011            | 12/31/2013        |
| Accident Diagram Codes   |                      | Description of Proposed Work |                | Install signals and pavement improvement |                          |                  |  |   |                                 |                     |                   |
| 1 Rear End   |                      | 2 Sideswipe Same Direction   |                | 3 Left Turn Main Line                    | 5 Right Angle            | 4,7 Ran off Road | 8, 9 Head On/ Sideswipe - Opposite Direction |   | Pedestrian                      | Other               | Total             |
|  |                      |                              |                |  |                          |                  |  |   |                                 |                     |                   |
| Study Period: Number of Crashes  | Fatal                | F                            |                |  |                          |                  |  |   |                                 |                     |                   |
|  | Personal Injury (PI) | A                            |                |  |                          |                  |  |   |                                 |                     |                   |
|  |                      | B                            | 2              |  |                          | 2                |  |   |                                 | 1                   | 5                 |
|  |                      | C                            | 4              |  |                          | 2                |  |   |                                 |                     | 6                 |
| Property Damage  | PD                   | 8                            |                |  | 2                        | 2                |  |   | 2                               | 14                  |                   |
| % Change in Crashes  | Fatal                | F                            |                |  |                          |                  |  |   |                                 |                     |                   |
|  | PI                   | A                            |                |  |                          |                  |  |   |                                 |                     |                   |
|  |                      | B                            | -59%           |  |                          | -74%             |  |   |                                 |                     |                   |
|  |                      | C                            | -59%           |  |                          | -74%             |  |   |                                 | -55%                |                   |
| Property Damage  | PD                   | -77%                         |                |  | -40%                     | -55%             |  |   | -55%                            |                     |                   |
| Change in Crashes<br><small>= No. of crashes X % change in crashes</small> | Fatal                | F                            |                |  |                          |                  |  |   |                                 |                     |                   |
|  | PI                   | A                            |                |  |                          |                  |  |   |                                 |                     |                   |
|  |                      | B                            | -1.18          |  |                          | -1.48            |  |   |                                 | 0.00                | -2.66             |
|  |                      | C                            | -2.36          |  |                          | -1.48            |  |   |                                 |                     | -3.84             |
| Property Damage  | PD                   | -6.16                        |                |  | -0.80                    | -1.10            |  |   | -1.10                           | -9.16               |                   |
| Year (Safety Improvement Construction)                                     |                      | 2018                         |                |  |                          |                  |  |   |                                 |                     |                   |
| Project Cost (exclude Right of Way)  |                      | \$ 9,310,000                 | Type of Crash  | Study Period: Change in Crashes          | Annual Change in Crashes | Cost per Crash   | Annual Benefit                               | <div style="border: 1px solid black; padding: 5px; display: inline-block;">B/C= 0.50</div><br><i>Using present worth values,</i><br><b>B= \$ 4,690,843</b><br><b>C= \$ 9,310,000</b><br><i>See "Calculations" sheet for amortization.</i> |                                 |                     |                   |
| Right of Way Costs (optional)  |                      |                              | F              |  |                          | \$ 1,100,000     |  |   |                                 |                     |                   |
| Traffic Growth Factor  |                      | 3%                           | A              |  |                          | \$ 550,000       |  |   |                                 |                     |                   |
| Capital Recovery   |                      |                              | B              | -2.66                                    | -0.89                    | \$ 160,000       | \$ 141,867                                   |   |                                 |                     |                   |
| 1. Discount Rate   |                      | 4.5%                         | C              | -3.84                                    | -1.28                    | \$ 81,000        | \$ 103,680                                   |   |                                 |                     |                   |
| 2. Project Service Life (n)  |                      | 20                           | PD             | -9.16                                    | -3.05                    | \$ 7,400         | \$ 22,595                                    |   |                                 |                     |                   |
|  |                      |                              | Total          |  |                          | \$ 268,141       |  |   |                                 |                     |                   |

# HSIP worksheet

| Control Section   |   | T.H. / Roadway  | Location  |   |  |   | Beginning Ref. Pt. | Ending Ref. Pt.   | State, County, City or Township | Study Period Begins | Study Period Ends |
|---|---|---|---|---|--|---|--------------------|---|---------------------------------|---------------------|-------------------|
|   |   | Brooklyn Blvd   | Between 51st Avenue and 49th Avenue   |   |  |   |                    |   | Brooklyn Park                   | 1/1/2011            | 12/31/2013        |
| Description of Proposed Work  |   | Reconstruction from a 4 to 3-lane roadway and parvemnt improvement                |   |   |  |   |                    |   |                                 |                     |                   |
| Accident Diagram Codes  | 1 Rear End  | 2 Sideswipe Same Direction  | 3 Left Turn Main Line   | 5 Right Angle   | 4,7 Ran off Road   | 8, 9 Head On/ Sideswipe - Opposite Direction  |                    |   | 6, 90, 99                       |                     |                   |
|   |  |  |  |  |  |  |                    |   |                                 |                     |                   |
| Study Period: Number of Crashes   | Fatal   | F   | 1   |   |  |   |                    |   |                                 | 1                   |                   |
|   | Personal Injury (PI)  | A   |   |   |  |   |                    |   |                                 |                     |                   |
|   |   | B   |   |   | 2  |   | 1                  | 1   |                                 |                     | 4                 |
|   |   | C   | 2   |   |  |   |                    |   |                                 |                     | 2                 |
|   | Property Damage   | PD  | 4   | 2   | 5  | 2   | 1                  | 2   |                                 |                     | 16                |
| % Change in Crashes<br><small>*Use Crash Modification Factors Clearinghouse</small> | Fatal   | F   | -56%  |   |  |   |                    |   |                                 |                     |                   |
|   | PI  | A   |   |   |  |   |                    |   |                                 |                     |                   |
|   |   | B   |   |   | -56%   |   | -56%               | -56%  |                                 |                     |                   |
|   |   | C   | -78%  |   |  |   |                    |   |                                 |                     |                   |
|   | Property Damage   | PD  | -77%  | -56%  | -56%   | -41%  | -56%               | -56%  |                                 |                     |                   |
| Change in Crashes<br><small>= No. of crashes X % change in crashes</small>          | Fatal   | F   | -0.56   |   |  |   |                    |   |                                 | -0.56               |                   |
|   | PI  | A   |   |   |  |   |                    |   |                                 |                     |                   |
|   |   | B   |   |   | -1.12  |   | -0.56              | -0.56   |                                 |                     | -2.24             |
|   |   | C   | -1.56   |   |  |   |                    |   |                                 |                     | -1.56             |
|   | Property Damage   | PD  | -3.08   | -1.12   | -2.80  | -0.82   | -0.56              | -1.12   |                                 |                     | -9.50             |
| Year (Safety Improvement Construction)  |   | 2018  |   |   |  |   |                    |   |                                 |                     |                   |
| Project Cost (exclude Right of Way)   |   | \$ 9,310,000  | Type of Crash   | Study Period: Change in Crashes   | Annual Change in Crashes   | Cost per Crash  | Annual Benefit     | <div style="border: 1px solid black; padding: 5px; display: inline-block;">B/C= 0.73</div><br><i>Using present worth values,</i><br><b>B= \$ 6,828,809</b><br><b>C= \$ 9,310,000</b><br><i>See "Calculations" sheet for amortization.</i> |                                 |                     |                   |
| Right of Way Costs (optional)   |   |   | F   | -0.56   | -0.19  | \$ 1,100,000  | \$ 205,333         |   |                                 |                     |                   |
| Traffic Growth Factor   |   | 3%  | A   |   |  | \$ 550,000  |                    |   |                                 |                     |                   |
| Capital Recovery  |   |   | B   | -2.24   | -0.75  | \$ 160,000  | \$ 119,467         |   |                                 |                     |                   |
| 1. Discount Rate  |   | 4.5%  | C   | -1.56   | -0.52  | \$ 81,000   | \$ 42,120          |   |                                 |                     |                   |
| 2. Project Service Life (n)   |   | 20  | PD  | -9.50   | -3.17  | \$ 7,400  | \$ 23,433          |   |                                 |                     |                   |
|   |   |   | Total   |   |  |   | \$ 390,353         | Office of Traffic, Safety and Technology<br>September 2014  |                                 |                     |                   |

## CSAH 152 - created on 11-03-2014 by imsd1jac

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

| SYS           | NUM                 | REF_POINT             | GIS_ROUTE             | GIS_TM           | RD_DIR       | ELEM | RELY         | INV          | R_U          |
|---------------|---------------------|-----------------------|-----------------------|------------------|--------------|------|--------------|--------------|--------------|
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | Z            |      | 2            | 0            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | S            |      | 1            | 3            | U            |
| <del>04</del> | <del>27000152</del> | <del>004+00.282</del> | <del>0427000152</del> | <del>4.282</del> | <del>Z</del> |      | <del>1</del> | <del>3</del> | <del>U</del> |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | Z            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | N            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | N            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | W            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | N            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | Z            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | S            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | Z            |      | 1            | 0            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | S            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.282            | 0427000152            | 4.282            | S            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.284            | 0427000152            | 4.284            | S            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.286            | 0427000152            | 4.286            | Z            |      | 1            | 0            | U            |
| 04            | 27000152            | 004+00.286            | 0427000152            | 4.286            | S            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.291            | 0427000152            | 4.291            | Z            |      | 1            | 0            | U            |
| 04            | 27000152            | 004+00.464            | 0427000152            | 4.464            | Z            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.464            | 0427000152            | 4.464            | N            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.484            | 0427000152            | 4.484            | S            |      | 1            | 3            | U            |
| <del>04</del> | <del>27000152</del> | <del>004+00.606</del> | <del>0427000152</del> | <del>4.606</del> | <del>N</del> |      | <del>2</del> | <del>3</del> | <del>U</del> |
| 04            | 27000152            | 004+00.684            | 0427000152            | 4.684            | S            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.684            | 0427000152            | 4.684            | Z            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.684            | 0427000152            | 4.684            | Z            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.685            | 0427000152            | 4.685            | S            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.699            | 0427000152            | 4.699            | Z            |      | 1            | 0            | U            |
| 04            | 27000152            | 004+00.701            | 0427000152            | 4.701            | N            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.701            | 0427000152            | 4.701            | E            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.701            | 0427000152            | 4.701            | S            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.701            | 0427000152            | 4.701            | S            |      | 1            | 3            | U            |
| 04            | 27000152            | 004+00.701            | 0427000152            | 4.701            | Z            |      | 1            | 90           | U            |

|               |                     |                       |                       |                  |              |     |              |              |              |
|---------------|---------------------|-----------------------|-----------------------|------------------|--------------|-----|--------------|--------------|--------------|
| 04            | 27000152            | 004+00.704            | 0427000152            | 4.704            | Z            |     | 1            | 3            | U            |
| 04            | 27000152            | 004+00.710            | 0427000152            | 4.710            | N            |     | 1            | 3            | U            |
| 04            | 27000152            | 004+00.725            | 0427000152            | 4.725            | W            |     | 1            | 1            | U            |
| 04            | 27000152            | 004+00.725            | 0427000152            | 4.725            | Z            |     | 2            | 0            | U            |
| <del>04</del> | <del>27000152</del> | <del>004+00.738</del> | <del>0427000152</del> | <del>4.738</del> | <del>N</del> |     | <del>2</del> | <del>3</del> | <del>U</del> |
| 04            | 27000152            | 004+00.741            | 0427000152            | 4.741            | S            |     | 1            | 3            | U            |
| 04            | 27000152            | 004+00.817            | 0427000152            | 4.817            | Z            |     | 4            | 0            | U            |
| 04            | 27000152            | 004+00.882            | 0427000152            | 4.882            | N            |     | 1            | 3            | U            |
| 04            | 27000152            | 004+00.935            | 0427000152            | 4.935            | S            |     | 2            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | Z            |     | 1            | 0            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | N            | 409 | 1            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | N            | C04 | 1            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | N            | 352 | 1            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | N            |     | 2            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | N            | 352 | 2            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | S            | 352 | 1            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | S            | B19 | 1            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | Z            | 352 | 1            | 0            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | Z            | 351 | 1            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | W            | 351 | 1            | 1            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | N            | C04 | 1            | 1            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | Z            | 351 | 2            | 0            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | N            | 409 | 2            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | E            | 352 | 2            | 1            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | S            | 351 | 1            | 3            | U            |
| 04            | 27000152            | 004+00.950            | 0427000152            | 4.950            | N            | 352 | 1            | 3            | U            |
| 04            | 27000152            | 004+00.963            | 0427000152            | 4.963            | Z            |     | 3            | 0            | U            |
| 04            | 27000152            | 004+00.978            | 0427000152            | 4.978            | S            |     | 1            | 3            | U            |
| 04            | 27000152            | 005+00.173            | 0427000152            | 5.173            | Z            |     | 1            | 0            | U            |
| 04            | 27000152            | 005+00.173            | 0427000152            | 5.173            | Z            |     | 1            | 0            | U            |
| 04            | 27000152            | 005+00.173            | 0427000152            | 5.173            | N            |     | 1            | 3            | U            |
| 04            | 27000152            | 005+00.173            | 0427000152            | 5.173            | Z            |     | 1            | 0            | U            |
| 04            | 27000152            | 005+00.173            | 0427000152            | 5.173            | Z            |     | 1            | 3            | U            |
| 04            | 27000152            | 005+00.173            | 0427000152            | 5.173            | Z            |     | 2            | 0            | U            |

|    |          |            |            |       |   |   |   |   |
|----|----------|------------|------------|-------|---|---|---|---|
| 04 | 27000152 | 005+00.173 | 0427000152 | 5.173 | S | 1 | 3 | U |
| 04 | 27000152 | 005+00.213 | 0427000152 | 5.213 | Z | 1 | 3 | U |
| 04 | 27000152 | 005+00.251 | 0427000152 | 5.251 | Z | 2 | 3 | U |
| 04 | 27000152 | 005+00.308 | 0427000152 | 5.308 | S | 1 | 3 | U |
| 04 | 27000152 | 005+00.308 | 0427000152 | 5.308 | Z | 1 | 3 | U |
| 04 | 27000152 | 005+00.308 | 0427000152 | 5.308 | Z | 1 | 3 | U |
| 04 | 27000152 | 005+00.437 | 0427000152 | 5.437 | Z | 1 | 3 | U |
| 04 | 27000152 | 005+00.441 | 0427000152 | 5.441 | N | 1 | 3 | U |
| 04 | 27000152 | 005+00.441 | 0427000152 | 5.441 | S | 1 | 3 | U |
| 04 | 27000152 | 005+00.441 | 0427000152 | 5.441 | Z | 1 | 3 | U |
| 04 | 27000152 | 005+00.441 | 0427000152 | 5.441 | Z | 1 | 3 | U |
| 04 | 27000152 | 005+00.441 | 0427000152 | 5.441 | Z | 1 | 3 | U |
| 04 | 27000152 | 005+00.441 | 0427000152 | 5.441 | Z | 1 | 3 | U |
| 04 | 27000152 | 005+00.441 | 0427000152 | 5.441 | Z | 1 | 3 | U |
| 05 | 04600114 | 000+00.550 | 0504600114 | 0.550 | Z | 1 | 3 | U |
| 05 | 04600124 | 000+00.000 | 0504600124 | 0.000 | Z | 1 | 0 | U |
| 05 | 25850263 | 000+00.003 | 0525850263 | 0.003 | S | 1 | 3 | U |
| 10 | 04600362 | 000+00.280 | 1004600362 | 0.280 | N | 2 | 3 | U |

**ATP**

V 1 WAS TRAVELING SB BROOKLYN BLVD AT COUNTY ROAD 10 WHEN IT SIDE SWIPED V2. V1 THEN FLEED AND V2 F  
#1 REAR ENDED #2. #1 WAS ARRESTED FOR 2ND DEGREE DUI REFUSAL. PLEASE SEE BROOKLYN CENTER POLICE REP  
~~ON 10/3/11 AT 1428 HOURS I, OFFICER LAO WAS DISPATCHED TO A CALL OF A HIT AND RUN ACCIDENT AT 5740~~

UNIT#3 COLLIDED WITH UNIT#2S REAR

DRIVER IN VEHICLE #1 STATED SHE WAS TURNING NORTH ONTO BROOKLYN BLVD FROM COUNTY 10 AND SLOWED TO M  
VEH#1 WAS SOUTHBOUND BROOKLYN BLVD MAKING A RIGHT TURN ON TO BASS LAKE RD. VEH#1 DRIVER STATED THAT  
VEH 1 WAS BEHIND VEH 2. BOTH HAD STOPPED FOR A PED. CROSSING AT THE CROSSWALK. VEH 2 BEGAN TO GO AN  
DRIVER 2 OF VEH 2 STATED HE WAS DRIVING SB ON BROOKLYN BLVD AND WAS IN THE LEFT TURN LANE. DRIVER 2  
VEH #1 WAS SOUTHBOUND BROOKLYN BLVD, SHE BELIEVED SHE WAS IN THE LEFT LANE LOOKED UP AND HAD A YELL

V1 REAR ENDED V2 STOPPED AT A RED LIGHT. D1 DIDNT REMEMBER THE ACCIDENT AND APPEARED TO HAVE INJUR'  
ON 12/19/2013 AT 1320 HOURS, I, OFFICER KOTECKI WAS DISPATCHED TO THE AREA OF 3245 CO RD 10 AND BRO  
VEH #1 WAS IN LEFT LANE LEGALLY STOPPED AT RED LIGHT SB BROOKLYN BL (BB) @ CO RD 10. VEH #2 WAS STO

V3, AND V2 WERE STOPPED IN THE CENTER LANE FOR SB BB TRAFFIC AT A RED LIGHT, WHEN V1 REAR ENDED V2

UNIT 1 TRAVELING NORTH ON BROOKLYN BLVD PAST 56TH AVE N. UNIT 1 DRIVER STATED REACHED TO PASSENGER  
VEHICLE #1 DRIVING NORTH ON BROOKLYN BLVD 5600 BLOCK IN THE LEFT LANE/INSIDE LANE. VEHICLE #2 NORTH  
VEH #1 SOUTHBOUND BKLYN BLVD MAKING A LEFT TURN ONTO 56TH AV N. VEH #2 NORTHBOUND BKLYN BLVD. VEH #  
~~UPON MY ARRIVAL PARTIES INVOLVED STATED THEY HAD ALREADY EXCHANGED INFORMATION AND DID NOT NEED POL~~  
ALL THREE VEHICLES WERE S/B BROOKLYN BLVD IN THE LEFT TURN LANE TO GO E/B 55TH AV N. VEH#1 THEN HIT  
#1 FAILED TO YIELD AND STRUCK #2 WHILE EXITING A COMMERCIAL AREA FRONTAGE RD. #1 WAS CITED FOR NO I  
#1 STRUCK #2 AFTER FAILING TO STOP FOR A TRAFFIC CONTROL DEVICE (RED LIGHT) WHILE TRAVELING N/B ON  
UNIT 1 REAR ENDED BY UNIT 2. UNIT 2 REAR ENDED BY UNIT 3. UNIT 2 PUSHED INTO UNIT 1 BY UNIT 3. A

UNIT 1 WAS TRAVELING NORTHBOUND ON BROOKLYN BLVD WHEN IT COLLIDED WITH UNIT 2 WHICH WAS TRAVELING W  
OF THE CHEVY TRUCK AND THE CHEVY TRUCK HIT THE PONTIAC. SHE STATED THE PONTIAC WAS DRIVING WEST ON  
UNIT 1 WAS TRAVELLING SOUTHBOUND WHEN UNIT 2 REAR ENDED UNIT 1. UNIT WAS GAVE PLATE AND DESCRIPTION  
UNIT 1 STATES HE WAS TRAVELING SOUTHBOUND ON BROOKLYN BLVD MAKING LEFT TURN, ALSO EASTBOUND ONTO 55  
UNIT ONE WAS TRYING TO PASS A METRO TRANSIT BUS. BUS WAS GOING AROUND ANOTHER VEHICLE, UNIT ONE TRI

VEHICLE 1 WAS GOING NORTH ON BROOKLYN BLVD APPROACHING 55TH AVE. VEHICLE 2 WAS GOING WEST ON 55TH UNIT 1 TURNING WESTBOUND FROM BROOKLYN BLVD. UNIT 1 HAD GREEN ARROW TO TURN. UNIT 2 WENT THROUGH ALL VEHICLES WERE WB ON BROOKLYN BLVD. I MADE A TRAFFIC STOP AND THE VIOLATOR STOPPED IN THE LEF

~~UNIT 2 STARTING FROM DRIVEWAY IN PARKED POSITION FACING NORTH AT HOME ADDRESS OF 5323 BROOKLYN BLVD~~  
ON 10/17/13 AT 1707 HOURS I, OFFICER JOSH WHITTENBURG, WAS DISPATCHED FOR A PROPERTY DAMAGE ACCIDEN

V1 WAS FOLLOWING V2 ON ROADWAY TO CLOSE. V1 STATES V2 HAD SIGNAL ON TO TURN LEFT, BUT NEVER DID AND #1 STRUCK #2 CAUSING #2 TO STRIKE #3. #1 THEN FLED AND WAS NOT LOCATED. #1 WAS DESCRIBED AS A RED P

UNIT 1 NORTHBOUND ON BROOKLYN BLVD ON BRIDGE HIT UNIT 2 STOPPED FOR TRAFFIC LIGHT AT S HWY 100 RAMP ON 11/19/11 I, OFFICER JORDAN LUND, WAS DISPATCHED TO A PD ACCIDENT AT THE ENTRANCE RAMP OF NORTHBO VEHICLE 1 ON RAMP FROM SOUTH TH100, MAKING RIGHT TURN ONTO CR152 AT INTERSECTION. DRIVER 1 INDICATE UNKNOWN ACCIDENT. UNIT 1 DID NOT KNOW HOW ACCIDENT OCCURED...STATED RED PASSENGER CAR NO OTHER INFO ON 04/24/2012 AT AROUND 0330 HOURS, OFFICERS WERE DISPATCHED TO THE AREA OF BROOKLYN BLVD AND HWY 1 LEONHART STATED HE WAS SOUTH BOUND ON BROOKLY BLVD. HE APPROACHED THE INTERSECTION ON THE NORTH SID VEH 1 WAS MAKING A LEFT TURN FROM NORTH BROOKLYN BLVD TO GO SOUTH ONTO HWY 100. DRIVER 1 STATES HE

MOHAMED STATED HE HAD EXITED NORTH BOUND HWY 100 AND STOPPED AT THE STOP SIGN AT BROOKLYN BLVD. MOH V1 WAS WB ON BROOKLYN BLVD IN THE RIGHT LANE. V2 WAS EB BROOKLYN BLVD TURNING LEFT TO THE NB HWY 1 DRIVER OF V1 STATED HE WAS ENTERING NORTH HWY 100 FROM BROOKLYN BLVD AND LOST CONTROL AS HE CAME DO

ON 092613 AT 0745 I WAS SENT TO BROOKLYN BLVD/HWY 100 ON A PD ACCIDENT, THE VEHICLES HAD MOVED TO T V1 AND V2 TRAVELING WB ON BROOKLYN BLVD. V1 STOPPED IN TRAFFIC. V2 STRUCK V1. DRIVER OF V1 WANTED I, OFFICER POTTER, WAS SOUTH ON BROOKLYN BLVD AT HWY 100 WHEN I OBS A NORTH MEMORIAL AMBULANCE, #73 ON 11/15/2013 AT 2300 HOURS I, OFFICER IVERSON, WAS DISPATCHED TO A HIT AND RUN AT THE 5300 BLOCK O

METRO TRANSIT BUS WAS STOPPED AT THE BUS STOP IN THE RIGHT LANE FACING SOUTH BOUND. PEDESTRIAN EXIT

ON 12/07/2012 AT 2145 HOURS, OFFICERS WERE DISPATCHED TO THE LOCATION OF BROOKLYN BLVD AND 51ST AVE

ON 04/27/13 AT 1740 HOURS, I RESPONDED TO A PROPERTY DAMAGE ACCIDENT AT THE INTERSECTION OF BROOKLY



ON 8-10-13 AT 2151 HRS I, OFFICER IVERSON, WAS DISPATCHED TO A REPORT OF A HIT AND RUN. UPON ARRIV DRIVER OF UNIT 1 STATES HE WAS NORTHBOUND IN OUTMOST LANE OF BROOKLYN BLVD. UNIT 1 DRIVER STATES TH VEHICLE 1 SOUTH ON CR152 IN RIGHT LANE, ATTEMPTING TO AVOID VEHICLE THAT CHANGED LANES. VEHICLE 1 W UNIT 1 TRAVELING SOUTH BOUND BROOKLYN BLVD WAS REAR ENDED BY UNIT 2 TRAVELING BEHIND. FOR FURTHER FOR A MINUTE THEN NOTICED THE CAR STOPPED IN FRONT OF HIM. BRADY STATED HE WAS NOT TALKING ON A PH ON 3/28/13 AT 0906, THE DRIVER/OWNER OF UNIT 1 CALLED POLICE TO REPORT THAT AT APPROXIMATELY 0800 O VEHICLE 1 - WAS TRAVELING NB ON OSSEO RD / ENTERED INTERSECTION ON A GREEN LIGHT - AT 49 AV N - STR UNIT 1 STOPPED FOR THE POSTED STOP SIGN AND CHECEKED BOTH LEFT AND RIGHT BEFORE PROCEEDING INTO THR ON 012412 AT 1330 HOURS I, OFFICER POTTER, MET WITH DRIVER 2 WHO STATED HE WAS SOUTH ON BROOKLYN BL UNIT 1 WAS SOUTHBOUND ON OSSEO RD AND BEGAN TO TURN LEFT ON TO 49 AVE N AND HIT UNIT 2 THAT WAS NOR #1 WHO WAS OPERATING HIS MOTORCYCLE TRAVELING S/B ON BROOKLYN BLVD WITHOUT CURRENT REGISTRATION, IN SIGN CAUSING DAMAGE TO THE SIGN. THE DRIVERS EXCHANGED SOME INFORMATION AND THEN THE DRIVER OF UNI VEHICLE 1 WAS TRAVELING NORTHBOUND (NB) XERXES AVE N APPROACHING 49TH AVE N ON A GREEN LIGHT. VEHIC NO DIAGRAM, VEHICLES MOVED PRIOR TO POLICE ARRIVAL. VEH 1 WAS TRAVELING S/B ON BROOKLYN BOULEVARD A MV2 WAS TRAVELING SB ON OSSEO RD WAITING TO TURN EB ONTO 49TH AV WHEN MV1 HIT HER FROM BEHIND. MV2 #1 IS A METRO TRANSIT BUS WHICH WAS CHANGING LANES FROM THE RIGHT LANE TO THE LEFT WHEN ACCORDING T

| CO  | CITY            | DOW              | MONTH        | DAY           | YEAR            |
|---|-----------------|------------------|--------------|---------------|-----------------|
| 27  | 0460            | 6-Fri            | 1            | 7             | 2011            |
| 27  | 0460            | 3-Tue            | 4            | 12            | 2011            |
| <del>27</del>   | <del>0460</del> | <del>6-Fri</del> | <del>6</del> | <del>17</del> | <del>2011</del> |
| 27  | 0460            | 2-Mon            | 10           | 3             | 2011            |
| CAUSING UNIT#2 TO COLLIDED WITH UNIT#1'S REAR BUMPER. | 27              | 4-Wed6-Fri0      | 3            | 1             | 17              |
| 27  | 0460            | 6-Fri            | 4            | 13            | 2012            |
| 27  | 0460            | 2-Mon            | 8            | 27            | 2012            |
| 27  | 0460            | 2-Mon            | 10           | 1             | 2012            |
| 27  | 0460            | 1-Sun            | 2            | 17            | 2013            |
| 27  | 0460            | 4-Wed            | 6            | 26            | 2013            |
| 27  | 0460            | 1-Sun            | 6            | 23            | 2013            |
| 27  | 0460            | 2-Mon            | 11           | 25            | 2013            |
| 27  | 0460            | 5-Thu            | 12           | 19            | 2013            |
| 27  | 0460            | 7-Sat            | 5            | 7             | 2011            |
| 27  | 0460            | 7-Sat            | 11           | 19            | 2011            |
| 27  | 0460            | 7-Sat            | 4            | 7             | 2012            |
| 27  | 0460            | 5-Thu            | 5            | 16            | 2013            |
| 27  | 0460            | 2-Mon            | 3            | 14            | 2011            |
| 27  | 0460            | 1-Sun            | 5            | 19            | 2013            |
| 27  | 0460            | 6-Fri            | 12           | 23            | 2011            |
| <del>27</del>   | <del>0460</del> | <del>2-Mon</del> | <del>1</del> | <del>31</del> | <del>2011</del> |
| 27  | 0460            | 5-Thu            | 1            | 12            | 2012            |
| 27  | 0460            | 3-Tue            | 8            | 7             | 2012            |
| 27  | 0460            | 7-Sat            | 7            | 13            | 2013            |
| 27  | 0460            | 4-Wed            | 8            | 14            | 2013            |
| 27  | 0460            | 5-Thu            | 1            | 19            | 2012            |
| 27  | 0460            | 6-Fri            | 1            | 14            | 2011            |
| 27  | 0460            | 1-Sun            | 5            | 29            | 2011            |
| 27  | 0460            | 3-Tue            | 5            | 8             | 2012            |
| 27  | 0460            | 5-Thu            | 5            | 24            | 2012            |
| 27  | 0460            | 4-Wed            | 8            | 29            | 2012            |

|               |                 |                  |              |               |                 |
|---------------|-----------------|------------------|--------------|---------------|-----------------|
| 27            | 0460            | 4-Wed            | 9            | 25            | 2013            |
| 27            | 0460            | 6-Fri            | 6            | 28            | 2013            |
| 27            | 0460            | 5-Thu            | 7            | 4             | 2013            |
| 27            | 0460            | 4-Wed            | 7            | 3             | 2013            |
| <del>27</del> | <del>0460</del> | <del>5-Thu</del> | <del>6</del> | <del>14</del> | <del>2012</del> |
| 27            | 0460            | 5-Thu            | 10           | 17            | 2013            |
| 27            | 0460            | 3-Tue            | 12           | 24            | 2013            |
| 27            | 0460            | 6-Fri            | 4            | 20            | 2012            |
| 27            | 0460            | 7-Sat            | 8            | 24            | 2013            |
| 27            | 0460            | 2-Mon            | 3            | 14            | 2011            |
| 27            | 0460            | 6-Fri            | 7            | 8             | 2011            |
| 27            | 0460            | 7-Sat            | 11           | 19            | 2011            |
| 27            | 0460            | 2-Mon            | 11           | 21            | 2011            |
| 27            | 0460            | 3-Tue            | 12           | 27            | 2011            |
| 27            | 0460            | 3-Tue            | 4            | 24            | 2012            |
| 27            | 0460            | 2-Mon            | 10           | 8             | 2012            |
| 27            | 0460            | 7-Sat            | 10           | 20            | 2012            |
| 27            | 0460            | 4-Wed            | 11           | 7             | 2012            |
| 27            | 0460            | 1-Sun            | 1            | 6             | 2013            |
| 27            | 0460            | 3-Tue            | 7            | 23            | 2013            |
| 27            | 0460            | 1-Sun            | 7            | 28            | 2013            |
| 27            | 0460            | 5-Thu            | 8            | 22            | 2013            |
| 27            | 0460            | 5-Thu            | 9            | 26            | 2013            |
| 27            | 0460            | 2-Mon            | 10           | 14            | 2013            |
| 27            | 0460            | 1-Sun            | 11           | 3             | 2013            |
| 27            | 0460            | 6-Fri            | 11           | 15            | 2013            |
| 27            | 0460            | 3-Tue            | 12           | 4             | 2012            |
| 27            | 0460            | 3-Tue            | 4            | 16            | 2013            |
| 27            | 0460            | 7-Sat            | 5            | 14            | 2011            |
| 27            | 0460            | 6-Fri            | 6            | 17            | 2011            |
| 27            | 0460            | 6-Fri            | 12           | 7             | 2012            |
| 27            | 0460            | 1-Sun            | 12           | 2             | 2012            |
| 27            | 0460            | 7-Sat            | 4            | 27            | 2013            |
| 27            | 0460            | 7-Sat            | 4            | 27            | 2013            |

|    |      |       |    |    |      |
|----|------|-------|----|----|------|
| 27 | 0460 | 7-Sat | 8  | 10 | 2013 |
| 27 | 0460 | 5-Thu | 5  | 23 | 2013 |
| 27 | 0460 | 6-Fri | 12 | 7  | 2012 |
| 27 | 0460 | 4-Wed | 3  | 16 | 2011 |
| 27 | 0460 | 3-Tue | 3  | 27 | 2012 |
| 27 | 0460 | 5-Thu | 3  | 28 | 2013 |
| 27 | 2585 | 6-Fri | 12 | 20 | 2013 |
| 27 | 2585 | 7-Sat | 6  | 11 | 2011 |
| 27 | 2585 | 3-Tue | 1  | 24 | 2012 |
| 27 | 2585 | 4-Wed | 2  | 1  | 2012 |
| 27 | 2585 | 4-Wed | 3  | 14 | 2012 |
| 27 | 2585 | 3-Tue | 6  | 25 | 2013 |
| 27 | 2585 | 6-Fri | 6  | 28 | 2013 |
| 27 | 0460 | 2-Mon | 1  | 23 | 2012 |
| 27 | 0460 | 7-Sat | 7  | 7  | 2012 |
| 27 | 2585 | 3-Tue | 8  | 13 | 2013 |
| 27 | 0460 | 5-Thu | 6  | 6  | 2013 |

| TIME            | SEV          | NUM_KILLED   | NUM_VEH      | JUNC         | SL            | TYPE         | DIAG          | LOC1         | TCD           | LIT          |
|-----------------|--------------|--------------|--------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|
| 1730            | N            | 0            | 2            | 0            | 40            | 1            | 1             | 0            | 98            | 3            |
| 1557            | N            | 0            | 2            | 4            | 40            | 1            | 2             | 1            | 1             | 1            |
| <del>2217</del> | <del>C</del> | <del>0</del> | <del>2</del> | <del>1</del> | <del>35</del> | <del>1</del> | <del>1</del>  | <del>1</del> | <del>98</del> | <del>4</del> |
| 1428            | N            | 0            | 1            | 7            | 40            | 1            | 98            | 1            | 1             | 1            |
| 2012            | 1736         | C            | 0            | 3            | 1             | 40           | 2             | 1            | 1             | 98           |
| 2132            | N            | 0            | 2            | 4            | 35            | 1            | 1             | 1            | 1             | 4            |
| 1309            | B            | 0            | 1            | 4            | 35            | 25           | 8             | 4            | 1             | 1            |
| 1100            | N            | 0            | 2            | 7            | 40            | 1            | 1             | 1            | 1             | 1            |
| 1001            | C            | 0            | 2            | 4            | 40            | 1            | 3             | 1            | 1             | 1            |
| 1345            | C            | 0            | 3            | 5            | 40            | 1            | 5             | 1            | 1             | 1            |
| 1334            | N            | 0            | 2            | 0            | 35            | 1            | 90            | 0            | 1             | 1            |
| 1711            | C            | 0            | 2            | 4            | 40            | 1            | 1             | 1            | 1             | 4            |
| 1320            | C            | 0            | 2            | 7            | 40            | 1            | 98            | 1            | 98            | 1            |
| 0908            | N            | 0            | 3            | 4            | 40            | 1            | 3             | 1            | 1             | 1            |
| 1415            | N            | 0            | 2            | 0            | 35            | 1            | 1             | 0            | 1             | 1            |
| 1603            | N            | 0            | 3            | 4            | 40            | 1            | 1             | 1            | 1             | 1            |
| 1458            | C            | 0            | 3            | 0            | 40            | 1            | 1             | 0            | 1             | 1            |
| 0252            | C            | 0            | 1            | 1            | 40            | 26           | 8             | 1            | 98            | 4            |
| 1847            | N            | 0            | 2            | 8            | 40            | 1            | 98            | 1            | 98            | 1            |
| 1520            | C            | 0            | 2            | 7            | 40            | 1            | 5             | 1            | 5             | 1            |
| <del>0932</del> | <del>C</del> | <del>0</del> | <del>2</del> | <del>1</del> | <del>40</del> | <del>2</del> | <del>99</del> | <del>1</del> | <del>98</del> | <del>1</del> |
| 1531            | N            | 0            | 3            | 4            | 40            | 1            | 1             | 1            | 1             | 1            |
| 1800            | N            | 0            | 2            | 8            | 30            | 1            | 2             | 1            | 98            | 1            |
| 1358            | C            | 0            | 2            | 4            | 30            | 1            | 5             | 1            | 1             | 1            |
| 1755            | C            | 0            | 3            | 1            | 40            | 1            | 1             | 1            | 1             | 1            |
| 1605            | C            | 0            | 2            | 0            | 40            | 1            | 8             | 0            | 1             | 1            |
| 1835            | C            | 0            | 2            | 4            | 40            | 1            | 5             | 1            | 1             | 4            |
| 1823            | C            | 0            | 2            | 4            | 30            | 1            | 3             | 1            | 1             | 1            |
| 1452            | N            | 0            | 2            | 1            | 40            | 1            | 1             | 1            | 1             | 1            |
| 1857            | C            | 0            | 1            | 4            | 40            | 6            | 8             | 1            | 1             | 1            |
| 1639            | C            | 0            | 1            | 90           | 30            | 37           | 4             | 3            | 98            | 1            |

|                 |              |              |              |              |               |              |              |              |               |              |
|-----------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|---------------|--------------|
| 1557            | N            | 0            | 2            | 4            | 40            | 1            | 90           | 1            | 1             | 1            |
| 1558            | N            | 0            | 2            | 4            | 40            | 1            | 3            | 1            | 1             | 1            |
| 1255            | N            | 0            | 2            | 4            | 40            | 1            | 1            | 1            | 1             | 1            |
| 0640            | N            | 0            | 2            | 0            | 30            | 1            | 1            | 0            | 4             | 1            |
| <del>1530</del> | <del>N</del> | <del>0</del> | <del>2</del> | <del>1</del> | <del>30</del> | <del>1</del> | <del>8</del> | <del>1</del> | <del>98</del> | <del>1</del> |
| 1705            | C            | 0            | 3            | 1            | 40            | 1            | 1            | 1            | 98            | 1            |
| 0905            | B            | 0            | 2            | 0            | 30            | 1            | 1            | 0            | 1             | 1            |
| 0954            | B            | 0            | 2            | 1            | 30            | 1            | 1            | 1            | 98            | 1            |
| 1744            | N            | 0            | 3            | 4            | 35            | 1            | 1            | 1            | 1             | 1            |
| 0647            | N            | 0            | 2            | 0            | 35            | 1            | 1            | 0            | 98            | 2            |
| 1315            | C            | 0            | 2            | 7            | 35            | 1            | 1            | 1            | 1             | 1            |
| 1458            | N            | 0            | 1            | 90           | 60            | 24           | 7            | 2            | 98            | 1            |
| 1330            | C            | 0            | 1            | 4            | 40            | 6            | 5            | 1            | 1             | 1            |
| 1730            | N            | 0            | 2            | 1            | 40            | 99           | 98           | 1            | 98            | 1            |
| 0300            | B            | 0            | 2            | 4            | 30            | 1            | 5            | 1            | 1             | 4            |
| 1420            | N            | 0            | 2            | 4            | 40            | 1            | 5            | 1            | 1             | 1            |
| 1645            | N            | 0            | 2            | 7            | 35            | 1            | 5            | 1            | 1             | 1            |
| 1020            | N            | 0            | 2            | 0            | 30            | 1            | 1            | 0            | 90            | 1            |
| 1154            | B            | 0            | 2            | 2            | 40            | 1            | 5            | 1            | 4             | 1            |
| 1800            | C            | 0            | 2            | 4            | 35            | 1            | 5            | 1            | 98            | 1            |
| 1653            | N            | 0            | 1            | 20           | 55            | 51           | 4            | 1            | 98            | 1            |
| 1600            | N            | 0            | 2            | 0            | 0             | 1            | 0            | 0            | 1             | 0            |
| 0740            | C            | 0            | 2            | 7            | 35            | 1            | 1            | 1            | 1             | 1            |
| 1248            | C            | 0            | 2            | 1            | 40            | 1            | 1            | 1            | 98            | 1            |
| 1136            | N            | 0            | 2            | 7            | 35            | 1            | 1            | 1            | 98            | 1            |
| 2300            | N            | 0            | 1            | 7            | 40            | 1            | 1            | 1            | 1             | 4            |
| 0705            | N            | 0            | 2            | 0            | 35            | 1            | 1            | 0            | 1             | 1            |
| 1505            | B            | 0            | 1            | 1            | 40            | 7            | 90           | 1            | 98            | 1            |
| 0230            | N            | 0            | 2            | 0            | 35            | 1            | 5            | 0            | 0             | 1            |
| 0900            | N            | 0            | 2            | 0            | 35            | 1            | 1            | 0            | 0             | 4            |
| 2145            | B            | 0            | 2            | 2            | 35            | 1            | 3            | 1            | 98            | 4            |
| 1514            | N            | 0            | 2            | 0            | 35            | 1            | 3            | 0            | 6             | 1            |
| 1745            | N            | 0            | 2            | 7            | 30            | 1            | 3            | 1            | 98            | 1            |
| 1545            | C            | 0            | 2            | 0            | 35            | 1            | 1            | 0            | 98            | 1            |

|      |   |   |   |   |    |    |   |   |    |   |
|------|---|---|---|---|----|----|---|---|----|---|
| 2151 | N | 0 | 1 | 7 | 30 | 1  | 3 | 1 | 98 | 4 |
| 1150 | N | 0 | 2 | 1 | 35 | 1  | 9 | 1 | 98 | 1 |
| 0725 | B | 0 | 1 | 1 | 35 | 25 | 7 | 4 | 98 | 2 |
| 0814 | C | 0 | 2 | 1 | 30 | 1  | 1 | 1 | 98 | 1 |
| 1546 | N | 0 | 2 | 2 | 35 | 1  | 1 | 1 | 4  | 1 |
| 0800 | N | 0 | 1 | 2 | 35 | 26 | 7 | 4 | 98 | 1 |
| 2144 | K | 1 | 1 | 7 | 35 | 7  | 2 | 1 | 1  | 4 |
| 2325 | B | 0 | 2 | 4 | 30 | 1  | 8 | 1 | 3  | 4 |
| 1300 | N | 0 | 2 | 7 | 35 | 1  | 1 | 1 | 1  | 1 |
| 0734 | N | 0 | 2 | 4 | 30 | 1  | 3 | 1 | 1  | 2 |
| 1315 | B | 0 | 2 | 1 | 35 | 1  | 3 | 1 | 98 | 1 |
| 1632 | N | 0 | 2 | 7 | 30 | 1  | 5 | 1 | 1  | 1 |
| 1654 | N | 0 | 2 | 4 | 30 | 1  | 3 | 1 | 1  | 1 |
| 0820 | N | 0 | 2 | 4 | 40 | 1  | 2 | 1 | 1  | 1 |
| 1830 | N | 0 | 2 | 0 | 30 | 1  | 9 | 0 | 98 | 1 |
| 1923 | N | 0 | 2 | 4 | 30 | 1  | 1 | 1 | 1  | 1 |
| 1522 | N | 0 | 2 | 1 | 35 | 1  | 2 | 1 | 98 | 1 |

Desktop Reference for Crash Reduction Factors

Intersection Crashes

| Countermeasure(s)               | Crash Type | Crash Severity | Area Type | Config        | Control   | Major                          | Minor      | Ref | Obs | Effectiveness                     |           |       | Study Type                     |      |
|---------------------------------|------------|----------------|-----------|---------------|-----------|--------------------------------|------------|-----|-----|-----------------------------------|-----------|-------|--------------------------------|------|
|                                 |            |                |           |               |           | Daily Traffic Volume (veh/day) |            |     |     | Crash Reduction Factor / Function | Std Error | Range |                                |      |
|                                 |            |                |           |               |           |                                |            |     |     |                                   |           | Low   |                                | High |
| Install left-turn lane (cont'd) | Left-turn  | All            | Rural     | 4-Leg (2 app) | Stop      | 1,100-32,400                   | 25-11,800  | 21  | 23  | 60                                |           |       | EB Before-After                |      |
|                                 | Left-turn  | All            |           |               | No signal |                                |            | 15  |     | 55                                |           |       |                                |      |
|                                 | Left-turn  | All            |           |               | No signal |                                |            | 15  |     | 55                                |           |       | Simple Before-After            |      |
|                                 | Left-turn  | All            |           |               | No signal |                                |            | 28  |     | 68                                | 50        | 86    |                                |      |
|                                 | Left-turn  | All            |           |               | Signal    | >5,000/lane(Total)             |            | 15  |     | 24                                |           |       | Simple Before-After            |      |
|                                 | Left-turn  | All            | Urban     | 4-Leg (1 app) | Signal    | 4,600-55,100                   | 100-26,000 | 21  | 35  | 13                                |           |       | Yorked Comparison Before-After |      |
|                                 | Left-turn  | All            | Urban     | 4-Leg (1 app) | Stop      | 1,520-40,600                   | 80-8,000   | 21  | 7   | 26                                |           |       | EB Before-After                |      |
|                                 | Left-turn  | All            | Urban     | 4-Leg (2 app) | Signal    | 4,600-55,100                   | 100-26,000 | 21  | 35  | 24                                |           |       | Yorked Comparison Before-After |      |
|                                 | Left-turn  | All            | Urban     | 4-Leg (2 app) | Stop      | 1,520-40,600                   | 80-8,000   | 21  | 7   | 45                                |           |       | EB Before-After                |      |
|                                 | Night      | All            |           |               | Signal    | >5,000/lane(Total)             |            | 15  |     | 28                                |           |       | Simple Before-After            |      |
|                                 | Overturn   | All            |           |               | Signal    | >5,000/lane(Total)             |            | 15  |     | 28                                |           |       | Simple Before-After            |      |
| Install left-turn lane (double) | Head-on    | Fatal/Injury   |           |               |           |                                |            | 15  |     | 75                                |           |       | Simple Before-After            |      |
|                                 | Left-turn  | Fatal/Injury   |           |               |           |                                |            | 15  |     | 47                                |           |       | Simple Before-After            |      |
|                                 | Left-turn  | PDO            |           |               |           |                                |            | 15  |     | 71                                |           |       | Simple Before-After            |      |
|                                 | ROR        | Fatal/Injury   |           |               |           |                                |            | 15  |     | 8                                 |           |       | Simple Before-After            |      |
|                                 | ROR        | PDO            |           |               |           |                                |            | 15  |     | 13                                |           |       | Simple Before-After            |      |
|                                 | Rear-end   | Fatal/Injury   |           |               |           |                                |            | 15  |     | 29                                |           |       | Simple Before-After            |      |
|                                 | Rear-end   | PDO            |           |               |           |                                |            | 15  |     | 32                                |           |       | Simple Before-After            |      |



Desktop Reference for Crash Reduction Factors

Intersection Crashes

| Countermeasure(s)                                | Crash Type  | Crash Severity | Area Type | Config | Control   | Major                          | Minor | Ref | Obs | Effectiveness                     |           |       | Study Type          |      |
|--|-------------|----------------|-----------|--------|-----------|--------------------------------|-------|-----|-----|-----------------------------------|-----------|-------|---------------------|------|
|  |             |                |           |        |           | Daily Traffic Volume (veh/day) |       |     |     | Crash Reduction Factor / Function | Std Error | Range |                     |      |
|  |             |                |           |        |           |                                |       |     |     |                                   |           | Low   |                     | High |
| Install left-turn lane (double) (cont'd)         | Right-angle | Fatal/Injury   |           |        |           |                                |       | 15  |     | 20                                |           |       | Simple Before-After |      |
|  | Right-angle | PDO            |           |        |           |                                |       | 15  |     | 8                                 |           |       | Simple Before-After |      |
|  | Sideswipe   | Fatal/Injury   |           |        |           |                                |       | 15  |     | 50                                |           |       | Simple Before-After |      |
| Install left-turn lane (painted separation)      | All         | All            |           |        |           | <5,000/lane(Total)             |       | 15  |     | 50                                |           |       | Simple Before-After |      |
|  | All         | Fatal/Injury   | Rural     | 3-Leg  |           | 5,000-15,000                   |       | 13  |     | 22                                | 14        |       | Meta-analysis       |      |
|  | All         | Fatal/Injury   | Rural     | 4-Leg  |           | 5,000-15,000                   |       | 13  |     | -28                               | 27        |       | Meta-analysis       |      |
|  | All         | PDO            | Rural     | 3-Leg  |           | 5,000-15,000                   |       | 13  |     | 20                                | 19        |       | Meta-analysis       |      |
|  | All         | PDO            | Rural     | 4-Leg  |           | 5,000-15,000                   |       | 13  |     | 26                                | 12        |       | Meta-analysis       |      |
|  | Left-turn   | All            |           |        |           | <5,000/lane(Total)             |       | 15  |     | 57                                |           |       | Simple Before-After |      |
|  | Left-turn   | All            |           |        |           | >5,000/lane(Total)             |       | 15  |     | 35                                |           |       | Simple Before-After |      |
|  | Overturn    | All            |           |        |           | <5,000/lane(Total)             |       | 15  |     | 54                                |           |       | Simple Before-After |      |
|  | Overturn    | All            |           |        |           | >5,000/lane(Total)             |       | 15  |     | 39                                |           |       | Simple Before-After |      |
|  | Rear-end    | All            |           |        |           | <5,000/lane(Total)             |       | 15  |     | 54                                |           |       | Simple Before-After |      |
|  | Rear-end    | All            |           |        |           | >5,000/lane(Total)             |       | 15  |     | 39                                |           |       | Simple Before-After |      |
|  | Right-angle | All            |           |        |           | <5,000/lane(Total)             |       | 15  |     | 62                                |           |       | Simple Before-After |      |
|  | Right-angle | All            |           |        |           | >5,000/lane(Total)             |       | 15  |     | 49                                |           |       | Simple Before-After |      |
| Install left-turn lane (physical channelization) | All         | All            | All       |        | No signal |                                |       | 1   |     | 35                                |           |       |                     |      |
|  | All         | All            | All       |        | Signal    |                                |       | 1   |     | 25                                |           |       |                     |      |
|  | All         | All            | Rural     | 3-Leg  | No signal |                                |       | 28  |     | 44                                |           |       |                     |      |

▪ Countermeasure: Improve pavement friction (increase skid resistance)

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

▪

|       |      |       |     |     |     |                        |  |
|-------|------|-------|-----|-----|-----|------------------------|--|
| 0.667 | 33.3 | ★★★★★ | All | All | All | Lyon and Persaud, 2008 |  |
|-------|------|-------|-----|-----|-----|------------------------|--|

▪

|       |      |       |     |     |     |                        |  |
|-------|------|-------|-----|-----|-----|------------------------|--|
| 0.819 | 18.1 | ★★★★★ | All | All | All | Lyon and Persaud, 2008 |  |
|-------|------|-------|-----|-----|-----|------------------------|--|

▪

|       |      |       |     |     |     |                        |  |
|-------|------|-------|-----|-----|-----|------------------------|--|
| 0.797 | 20.3 | ★★★★★ | All | All | All | Lyon and Persaud, 2008 |  |
|-------|------|-------|-----|-----|-----|------------------------|--|

▪

|       |           |       |     |     |     |                        |  |
|-------|-----------|-------|-----|-----|-----|------------------------|--|
| 1.271 | -<br>27.1 | ★★★★★ | All | All | All | Lyon and Persaud, 2008 |  |
|-------|-----------|-------|-----|-----|-----|------------------------|--|

▪

|       |      |       |          |     |     |                        |  |
|-------|------|-------|----------|-----|-----|------------------------|--|
| 0.426 | 57.4 | ★★★★★ | Wet road | All | All | Lyon and Persaud, 2008 |  |
|-------|------|-------|----------|-----|-----|------------------------|--|

▪

|       |      |       |          |     |     |                   |  |
|-------|------|-------|----------|-----|-----|-------------------|--|
| 0.372 | 62.8 | ★★★★★ | Wet road | All | All | Lyon and Persaud, |  |
|-------|------|-------|----------|-----|-----|-------------------|--|

0.575

42.5



Rear end, Wet road

All

Lyon and Persaud, 2008

0.59

41



All

All

All

Lyon and Persaud, 2008

0.589

41.1



All

All

All

Lyon and Persaud, 2008

0.361

63.9



Wet road

All

All

Lyon and Persaud, 2008

0.304

69.6



Rear end

All

All

Lyon and Persaud, 2008

0.943

5.7



Rear end

All

All

Lyon and Persaud, 2008

0.504

49.6



Rear end

All

All

Lyon and Persaud, 2008

0.221

77.9



Rear end,Wet road

All

All

Lyon and Persaud, 2008

0.787

21.3



Angle

All

All

Lyon and Persaud, 2008

0.828

17.2



Angle

All

All

Lyon and Persaud, 2008

0.898

10.2



Angle

All

All

Lyon and Persaud, 2008

0.799

20.1



Angle,Wet road

All

All

Lyon and Persaud, 2008

0.47

53



Angle,Wet road

All

All

Lyon and Persaud, 2008

0.828

17.2



Angle,Wet road

All

All

Lyon and Persaud, 2008

| Countermeasure(s)                  | Crash Type   | Crash Severity | Area Type     | Config        | Control   | Major                          | Minor      | Ref | Obs | Effectiveness                     |           |       |      | Study Type      |
|------------------------------------|--------------|----------------|---------------|---------------|-----------|--------------------------------|------------|-----|-----|-----------------------------------|-----------|-------|------|-----------------|
|                                    |              |                |               |               |           | Daily Traffic Volume (veh/day) |            |     |     | Crash Reduction Factor / Function | Std Error | Range |      |                 |
|                                    |              |                |               |               |           |                                |            |     |     |                                   |           | Low   | High |                 |
| Remove left-turn lane (cont'd)     | All          | All            | Urban         | 4-Leg (2 app) | Stop      |                                |            | 6   |     | -88                               |           |       |      |                 |
|                                    | All          | Fatal/Injury   | Rural         | 3-Leg         | Signal    |                                |            | 6   |     | -16                               |           |       |      |                 |
|                                    | All          | Fatal/Injury   | Rural         | 4-Leg (1 app) | Signal    |                                |            | 6   |     | -21                               |           |       |      |                 |
|                                    | All          | Fatal/Injury   | Rural         | 4-Leg (2 app) | Signal    |                                |            | 6   |     | -45                               |           |       |      |                 |
|                                    | All          | Fatal/Injury   | Urban         | 3-Leg         | Signal    |                                |            | 6   |     | -6                                |           |       |      |                 |
|                                    | All          | Fatal/Injury   | Urban         | 3-Leg         | Stop      |                                |            | 6   |     | -53                               |           |       |      |                 |
|                                    | All          | Fatal/Injury   | Urban         | 4-Leg (1 app) | Signal    |                                |            | 6   |     | -10                               |           |       |      |                 |
|                                    | All          | Fatal/Injury   | Urban         | 4-Leg (1 app) | Stop      |                                |            | 6   |     | -41                               |           |       |      |                 |
|                                    | All          | Fatal/Injury   | Urban         | 4-Leg (2 app) | Signal    |                                |            | 6   |     | -21                               |           |       |      |                 |
| All                                | Fatal/Injury | Urban          | 4-Leg (2 app) | Stop          |           |                                | 6          |     | -98 |                                   |           |       |      |                 |
| <b>RIGHT-TURN COUNTERMEASURES</b>  |              |                |               |               |           |                                |            |     |     |                                   |           |       |      |                 |
| Increase length of right-turn lane | All          | Fatal/Injury   | All           | All           | All       |                                |            | 58  |     | 15                                |           |       |      |                 |
| Install right-turn lane            | All          | All            | All           | 4-Leg (1 app) | Signal    | 4,200-55,100                   | 100-26,000 | 22  |     | <b>4</b>                          | 2         |       |      | EB Before-After |
|                                    | All          | All            | All           | 4-Leg (1 app) | Stop      | 1,100-40,600                   | 25-11,800  | 22  |     | <b>14</b>                         | 5         |       |      | EB Before-After |
|                                    | All          | All            | All           | 4-Leg (2 app) | Signal    | 4,200-55,100                   | 100-26,000 | 22  |     | <b>8</b>                          | 3         |       |      | EB Before-After |
|                                    | All          | All            | All           | 4-Leg (2 app) | Stop      | 1,100-40,600                   | 25-11,800  | 22  |     | <b>26</b>                         | 7         |       |      | EB Before-After |
|                                    | All          | All            | All           | All           | All       |                                |            | 58  |     | 35                                |           |       |      |                 |
|                                    | All          | All            | All           | All           | All       |                                |            | 1   |     | 25                                |           |       |      |                 |
|                                    | All          | All            | Rural         | 4-Leg (1 app) | No signal |                                |            | 28  |     | 14                                |           |       |      |                 |
|                                    | All          | All            | Rural         | 4-Leg (1 app) | No signal |                                |            | 28  |     | 21                                |           | 14    | 27   |                 |

Desktop Reference for Crash Reduction Factors

Intersection Crashes

| Countermeasure(s)                                 | Crash Type  | Crash Severity | Area Type | Config        | Control   | Major                          | Minor      | Ref | Obs | Effectiveness                     |           |       | Study Type          |                     |
|---|-------------|----------------|-----------|---------------|-----------|--------------------------------|------------|-----|-----|-----------------------------------|-----------|-------|---------------------|---------------------|
|   |             |                |           |               |           | Daily Traffic Volume (veh/day) |            |     |     | Crash Reduction Factor / Function | Std Error | Range |                     |                     |
|   |             |                |           |               |           |                                |            |     |     |                                   |           | Low   |                     | High                |
| Install right-turn lane (cont'd)                  | All         | All            |           | All           | No signal |                                |            | 28  |     | 27                                |           | 24    | 30                  |                     |
|   | All         | All            |           |               |           |                                |            | 15  |     | 25                                |           |       |                     |                     |
|   | All         | All            |           |               |           |                                |            | 15  |     | 25                                |           |       |                     | Cross-section       |
|   | All         | All            |           |               |           |                                |            | 15  |     | 25                                |           |       |                     | Simple Before-After |
|   | All         | All            |           |               |           |                                |            | 15  |     | 25                                |           |       |                     | Simple Before-After |
|   | All         | Fatal/Injury   | All       | 4-Leg (1 app) | Signal    | 4,200-55,100                   | 100-26,000 | 22  |     | <b>9</b>                          | 3         |       |                     | EB Before-After     |
|   | All         | Fatal/Injury   | All       | 4-Leg (1 app) | Stop      | 1,100-40,600                   | 25-11,800  | 22  |     | <b>23</b>                         | 7         |       |                     | EB Before-After     |
|   | All         | Fatal/Injury   | All       | All           | No signal |                                |            | 58  |     | 35                                |           |       |                     |                     |
|   | All         | Fatal/Injury   | All       | All           | Signal    |                                |            | 58  |     | 35                                |           |       |                     |                     |
|   | All         | Fatal/Injury   | All       | All           |           |                                |            | 51  |     | 40                                |           |       |                     |                     |
|   | All         | Fatal/Injury   | Rural     | All           | All       |                                |            | 58  |     | 35                                |           |       |                     |                     |
|   | All         | Fatal/Injury   | Urban     | All           | All       |                                |            | 58  |     | 30                                |           |       |                     |                     |
|   | Rear-end    | All            |           |               |           |                                |            | 15  |     | 65                                |           |       |                     | Simple Before-After |
|   | Right-angle | All            |           |               |           |                                |            | 15  |     | 50                                |           |       |                     | Simple Before-After |
|   | Right-turn  | All            |           |               |           |                                |            | 15  |     | 53                                |           |       |                     |                     |
|   | Right-turn  | All            |           |               |           |                                |            | 15  |     | 56                                |           |       |                     | Simple Before-After |
|   | Right-turn  | All            |           |               |           |                                |            | 15  |     | 50                                |           |       |                     | Cross-section       |
| Sideswipe   | All         |                |           |               |           |                                | 15         |     | 20  |                                   |           |       | Simple Before-After |                     |
| Install right-turn lane (painted separation)      | All         | Fatal/Injury   | All       | All           | All       |                                |            | 58  |     | 30                                |           |       |                     |                     |
| Install right-turn lane (physical channelization) | All         | Fatal/Injury   | All       | All           | All       |                                |            | 58  |     | 35                                |           |       |                     |                     |

- Countermeasure: Install a traffic signal

| CMF         | CRF(%) | Quality | Crash Type | Crash Severity | Area Type | Reference           | Comments  |
|-------------|--------|---------|------------|----------------|-----------|---------------------|---|
| 0.56<br>[B] | 44     | ★★★★★   | All        | All            | Rural     | Harkey et al., 2008 | Countermeasure name has been slightly ... <a href="#">[read more]</a> |

- |             |    |       |       |     |       |                     |  |
|-------------|----|-------|-------|-----|-------|---------------------|--|
| 0.23<br>[B] | 77 | ★★★★★ | Angle | All | Rural | Harkey et al., 2008 | Countermeasure name changed to match ... <a href="#">[read more]</a> |
|-------------|----|-------|-------|-----|-------|---------------------|--|

- |      |    |       |       |                                     |       |                    |   |
|------|----|-------|-------|-------------------------------------|-------|--------------------|---|
| 0.33 | 67 | ★★★★☆ | Angle | Fatal, Serious Injury, Minor Injury | Urban | McGee et al., 2003 | Countermeasure name has been slightly ... <a href="#">[read more]</a> |
|------|----|-------|-------|-------------------------------------|-------|--------------------|---|

- |            |    |       |           |     |       |                     |  |
|------------|----|-------|-----------|-----|-------|---------------------|--|
| 0.4<br>[B] | 60 | ★★★★☆ | Left turn | All | Rural | Harkey et al., 2008 | Countermeasure name changed to match ... <a href="#">[read more]</a> |
|------------|----|-------|-----------|-----|-------|---------------------|--|

- |             |     |       |          |     |       |                     |   |
|-------------|-----|-------|----------|-----|-------|---------------------|---|
| 1.58<br>[I] | -58 | ★★★★☆ | Rear end | All | Rural | Harkey et al., 2008 | Countermeasure name has been slightly ... <a href="#">[read more]</a> |
|-------------|-----|-------|----------|-----|-------|---------------------|---|

- |       |      |       |     |     |               |                          |   |
|-------|------|-------|-----|-----|---------------|--------------------------|---|
| 0.656 | 34.4 | ★★★★☆ | All | All | Not specified | Wang and Abdel-Aty, 2014 | CMF applies to intersections with ... <a href="#">[read more]</a> |
|-------|------|-------|-----|-----|---------------|--------------------------|---|

- |       |   |       |     |     |     |      |                |
|-------|---|-------|-----|-----|-----|------|----------------|
| 1.119 | - | ★★★★☆ | All | All | Not | Wang | CMF applies to |
|-------|---|-------|-----|-----|-----|------|----------------|



11.9 specified and Abdel-Aty, 2014 intersections with ... [\[read more\]](#)

■

0.76 24 ★★★★★ All All Not specified Wang and Abdel-Aty, 2014 CMF applies to intersections with ... [\[read more\]](#)

■

0.768 23.2 ★★★★★ All All Not specified Wang and Abdel-Aty, 2014 CMF applies to intersections with ... [\[read more\]](#)

■

0.684 31.6 ★★★★★ All Fatal,Serious injury,Minor injury Not specified Wang and Abdel-Aty, 2014 CMF applies to intersections with ... [\[read more\]](#)

■

0.86 14 ★★★★★ All Fatal,Serious Injury,Minor Injury Urban McGee et al., 2003 Countermeasure name has been slightly ... [\[read more\]](#)

■

0.77 23 ★★★★★ All Fatal,Serious Injury,Minor Injury Urban McGee et al., 2003 Countermeasure name has been slightly ... [\[read more\]](#)

■

0.604 39.6 ★★★★★ All Fatal,Serious injury,Minor injury Not specified Wang and Abdel-Aty, CMF applies to intersections with ... [\[read more\]](#)

2014

0.502

49.8



All

All

Not specified

Wang and Abdel-Aty, 2014

CMF applies to intersections with ... [\[read more\]](#)

0.402

59.8



All

Fatal, Serious injury, Minor injury

Not specified

Wang and Abdel-Aty, 2014

CMF applies to intersections with ... [\[read more\]](#)

1.184

-18.4



All

Fatal, Serious injury, Minor injury

Not specified

Wang and Abdel-Aty, 2014

CMF applies to intersections with ... [\[read more\]](#)

0.791

20.9



All

Fatal, Serious injury, Minor injury

Not specified

Wang and Abdel-Aty, 2014

CMF applies to intersections with ... [\[read more\]](#)

0.66

34



All

Fatal, Serious Injury, Minor Injury

Urban

McGee et al., 2003

Countermeasure name has been slightly ... [\[read more\]](#)

1.38

-38



Rear end

Fatal, Serious Injury, Minor Injury

Urban

McGee et al., 2003

Countermeasure name has been slightly ... [\[read more\]](#)

- Countermeasure: Converting four-lane roadways to three-lane roadways with center turn lane (road diet)

| CMF  | CRF(%) | Quality | Crash Type | Crash Severity | Area Type | Reference            | Comments |
|------|--------|---------|------------|----------------|-----------|----------------------|----------|
| 0.47 | 53     | ★★★★☆   | All        | All            | Suburban  | Persaud et. al, 2010 |          |

- 

|       |      |       |     |     |       |                        |  |
|-------|------|-------|-----|-----|-------|------------------------|--|
| 0.748 | 25.2 | ★★★★☆ | All | All | Urban | Pawlovich et al., 2006 | CMF calculation is for reduction ... <a href="#">[read more]</a> |
|-------|------|-------|-----|-----|-------|------------------------|--|

- 

|       |      |       |     |     |       |                        |  |
|-------|------|-------|-----|-----|-------|------------------------|--|
| 0.812 | 18.8 | ★★★★☆ | All | All | Urban | Pawlovich et al., 2006 | CMF calculation is for reduction ... <a href="#">[read more]</a> |
|-------|------|-------|-----|-----|-------|------------------------|--|

### Dual CRF for Brooklyn Blvd at Bass Lake Road

Improvements include the installation of a southbound dual left-turn lane and pavement improvement.

CR1=Install dual left-turn lanes

CR2=Pavement improvement

$$CR=1 - (1-CR1)*(1-CR2)$$

$$\text{Rear-End Property Damage Crash: } CR=1 - (1-.32)*(1-.70) = .80$$

$$\text{Rear-End Injury Crash: } CR=1 - (1-.29)*(1-.70) = .79$$

$$\text{Head-On Injury Crash: } CR=1 - (1-.75)*(1-.41) = .85$$

$$\text{Left-Turn Property Damage Crash: } CR=1 - (1-.71)*(1-.41) = .83$$

$$\text{Left-Turn Injury: } CR=1 - (1-.47)*(1-.41) = .69$$

$$\text{Right-Angle Injury Crash: } CR=1 - (1-.20)*(1-.21) = .37$$

### Dual CRF for Brooklyn Blvd at 55th Avenue

Improvements include the installation of a southbound right-turn lane and pavement improvement.

CR1=Install right-turn lane

CR2=Pavement improvement

$$CR=1 - (1-CR1)*(1-CR2)$$

$$\text{Rear-End Property Damage Crash: } CR=1 - (1-.04)*(1-.70) = .71$$

$$\text{Rear-End Injury Crash: } CR=1 - (1-.09)*(1-.70) = .73$$

$$\text{Head-On, Left-Turn and Ran Off Road Injury Crash: } CR=1 - (1-.09)*(1-.41) = .46$$

$$\text{Right-Angle Injury Crash: } CR=1 - (1-.09)*(1-.21) = .28$$

$$\text{Sideswipe and Other Property Damage Crash: } CR=1 - (1-.04)*(1-.41) = .43$$

### Dual CRF for Brooklyn Blvd at TH 100 North and South Ramps

Improvements include the installation of signals and pavement improvement.

CR1=Install signals

CR2=Pavement improvement

$$CR=1 - (1-CR1)*(1-CR2)$$

$$\text{Rear-End Property Damage Crash: } CR=1 - (1-.24)*(1-.70) = .77$$

$$\text{Rear-End Injury Crash: } CR=1 - (1+.38)*(1-.70) = .59$$

$$\text{Right-Angle Property Damage Crash: } CR=1 - (1-.24)*(1-.21) = .40$$

$$\text{Right-Angle Injury Crash: } CR=1 - (1-.67)*(1-.21) = .74$$

$$\text{Ran Off Road Property Damage Crash: } CR=1 - (1-.24)*(1-.41) = .55$$

$$\text{Other Property Damage and Injury Crash: } CR=1 - (1-.24)*(1-.41) = .55$$

### Dual CRF for Brooklyn Blvd between 51st Avenue to 49th Avenue

Improvements include the reconstruction from a 4 to 3 lane facility and pavement improvement.

CR1=4 to 3 lane reconstruction

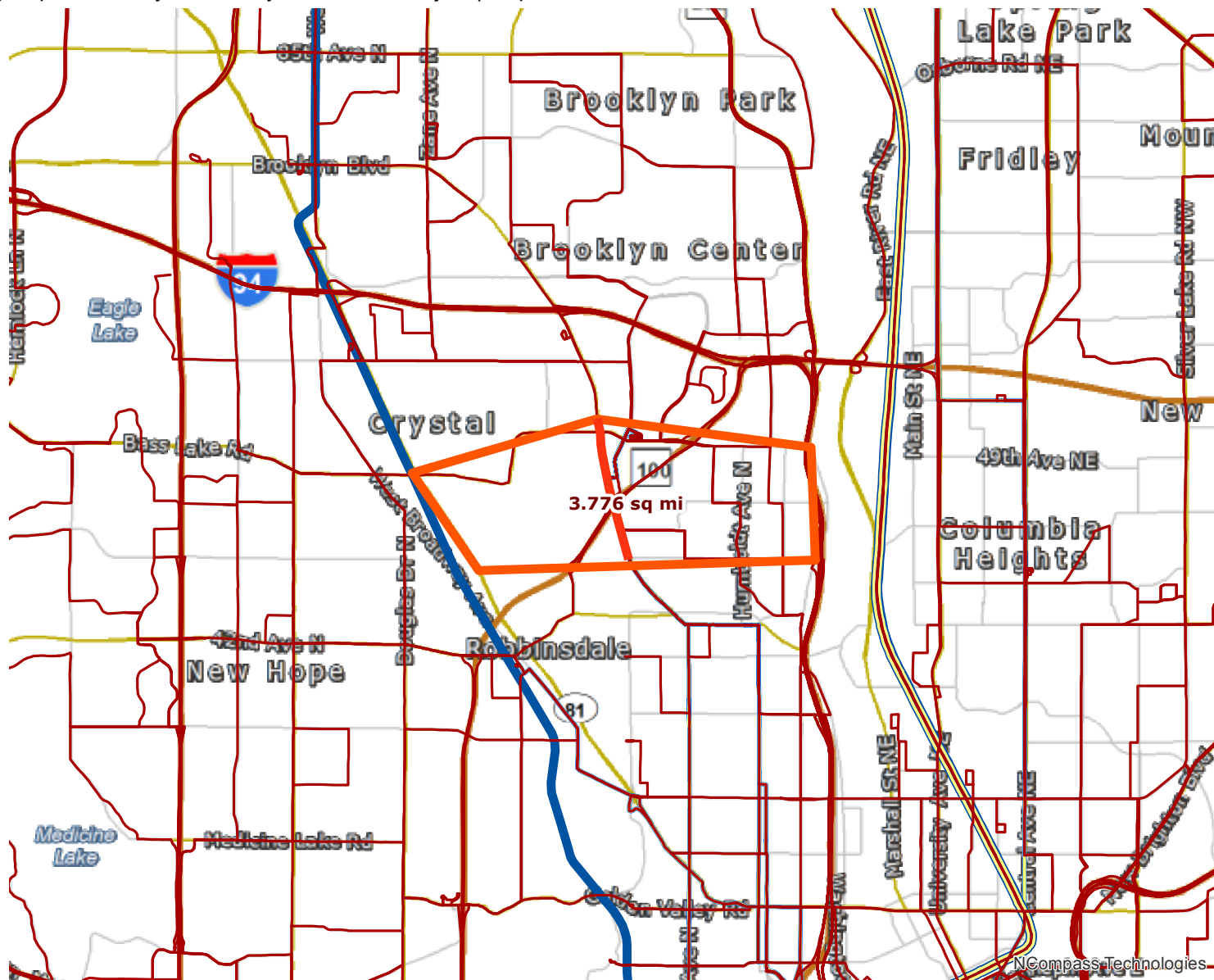
CR2=Pavement improvement

$$CR=1 - (1-CR1)*(1-CR2)$$

$$\text{Rear-End Crash: } CR=1 - (1-.25)*(1-.70) = .78$$

$$\text{Right-Angle Crash: } CR=1 - (1-.25)*(1-.21) = .41$$

$$\text{Left-Turn, Sideswipe, Ran Off Road and Head On Crash: } CR=1 - (1-.25)*(1-.41) = .56$$



Results

Transit with a Direct Connection to project:

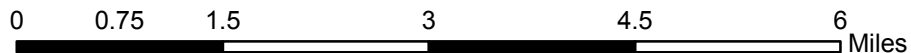
5 19 22 32 717 721 723 724 761

\*Chicago-Fremont

\*C Line

\*indicates Planned Alignments

- ▬ Project
- Project Area
- ▬ Transit Routes
- ▬ Light Rail, Blue Line Extension
- ▬ Transitway
- ▬ Northstar Line
- ▬ Planned Alignments
- ▬ Arterial BRT



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INGompass Technologies