Application

04774 - 2016 Roadway Modernization

04972 - Lyndale Avenue Complete Streets Project

Regional Solicitation - Roadways Including Multimodal Elements

Status:	Submitted
Submitted Date:	07/15/2016 2:41 PM

Primary Contact

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

Organization Information

Name:	RICHFIELD,CITY OF

Jurisdictional Agency (if different):

Organization Type: City

Organization Website:

Address: 6700 PORTLAND AVE S

*	RICHFIELD	Minnesota	55423
	City	State/Province	Postal Code/Zip

County: Hennepin

Phone:* 612-861-9700 Ext.

Fax:

PeopleSoft Vendor Number 0000004028A1

Project Information

Project Name Lyndale Avenue Complete Streets

Primary County where the Project is Located Hennepin

Jurisdictional Agency (If Different than the Applicant):

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

The Lyndale Avenue Complete Streets Project follows a series of guiding principles (see attachment) adopted by the City of Richfield through a public participation process. Lyndale Avenue, formerly US Highway 65, is classified as an "A' Minor Arterial that functions as a Reliever roadway and is planned to be modernized specifically to encourage multimodal transportation. Modernization improvements will increase safety, promote alternative modes of transportation, and improve transportation system connectivity within the corridor and surrounding communities.

This project includes reconstruction of Lyndale Avenue between TH 62 and 77th Street excluding areas to be reconstructed with 66th Street in 2018. The new roadway cross-section would be consistent with the recommended concept alternative identified in the 2009 Richfield Arterial Roads Study (3-lane section), with final design to be determined through preliminary design and public input processes. A possible roundabout at 65th Street will also be examined.

This project is a connected action of the Richfield Complete Streets Policy, Richfield Bicycle Master Plan, and Richfield Arterial Road Study. A roundabout was approved at 66th and Lyndale Avenue on February 24th, 2015. Construction on 66th Street will begin in 2018.

The Lyndale Avenue Complete Streets Project would reconstruct 1.904 miles of the undivided roadway. To modernize the street, this project's objectives are to integrate multimodal infrastructure, reduce traffic speeds, and improve safety for all modes of transportation planned for the corridor.

The following safety improvements will be included:

-Conversion from four lanes to three to improve safety and traffic flow and create better sight lines;

-Potential implementation of a roundabout at 65th Street to eliminate common signalized intersection crashes and improve multimodal safety;

-On-street bicycle lanes with pedestrian facilities and landscaped boulevards for safety;
-New signing and striping for crosswalks and bicycle trails for better visibility;
-Raised concrete medians for bicycle and pedestrian refuge,

-Improved street intersections including ADA compliant ramps and accessible pedestrian signals; and,

-Widened and improved pedestrian facilities (sidewalks, trails, and crosswalks with safety markings and countdown features).

Safety features will be complemented by other project modernization and impact avoidance enhancements, including:

-Construction of a possible two-lane section with turn lanes where warranted in areas of constricted right-of-way to reduce property impacts;

-Improved street lighting and transit facilities to promote alternative modes of transportation; and,

-Improved and added public art and landscaping to enhance visual quality.

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

TIP Description Guidance (will be used in TIP if the project is selected for funding)	LYNDALE AVE S FROM TH 62 ST TO 77TH ST, ROADWAY MODERNIZATION
Project Length (Miles)	1.9

Project Funding

Are you applying for funds from another source(s) to implement this project?	Yes
If yes, please identify the source(s)	City of Richfield
Federal Amount	$7,000,000.00
Match Amount	$3,789,577.10

Minimum of 20% of project total

Project Total	$10,789,577.00
Match Percentage	35.12%

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

Source of Match Funds	Street Reconstruction Bonds

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

Preferred Program Year

Select one: 2020

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

Additional Program Years:

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

Specific Roadway Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Mobilization (approx. 5% of total cost)	$500,000.00
Removals (approx. 5% of total cost)	$500,000.00
Roadway (grading, borrow, etc.)	$321,000.00
Roadway (aggregates and paving)	$1,405,096.00
Subgrade Correction (muck)	$0.00
Storm Sewer	$1,375,807.00
Ponds	$0.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$912,883.00
Traffic Control	$60,000.00
Striping	$211,387.10

Signing	$50,756.00
Lighting	$742,000.00
Turf - Erosion & Landscaping	$333,703.15
Bridge	$0.00
Retaining Walls	$118,930.00
Noise Wall (do not include in cost effectiveness measure)	$0.00
Traffic Signals	$1,044,750.00
Wetland Mitigation	$0.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$1,519,062.45
Other Roadway Elements	$19,000.00
Totals	**$9,114,374.70**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Path/Trail Construction	$258,780.00
Sidewalk Construction	$271,980.00
On-Street Bicycle Facility Construction	$443,466.00
Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$188,312.00
Crossing Aids (e.g., Audible Pedestrian Signals, HAWK)	$84,000.00
Pedestrian-scale Lighting	$0.00
Streetscaping	$149,464.00
Wayfinding	$0.00
Bicycle and Pedestrian Contingencies	$279,200.40
Other Bicycle and Pedestrian Elements	$0.00
Totals	**$1,675,202.40**

Specific Transit and TDM Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Fixed Guideway Elements	$0.00
Stations, Stops, and Terminals	$0.00

Support Facilities	$0.00
Transit Systems (e.g. communications, signals, controls, fare collection, etc.)	$0.00
Vehicles	$0.00
Contingencies	$0.00
Right-of-Way	$0.00
Other Transit and TDM Elements	$0.00
Totals	**$0.00**

Transit Operating Costs

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

Totals

Total Cost	$10,789,577.40
Construction Cost Total	$10,789,577.40
Transit Operating Cost Total	$0.00

Requirements - All Projects

All Projects

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

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

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

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

Transportation System Stewardship A1, A2

Safety and Security B1 B4 B6

Access to Destinations C1 C2 C4 C7 C9 C10 C15 C17

Competitive Economy D1 D3

Healthy Environment E3 E4

Investments to Guide Land Use F1 F2 F7 F8

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

List the applicable documents and pages:

City of Richfield documents: Comprehensive Plan, Ch. 6 (pp. 1-52), Arterials/Complete Streets Plan (pp.5-20), Bike Master Plan (pp.6-32), Parks Master Plan (pp.6-18), Safe Routes to School (pp. 1-23), ADA Transition Plan, and CIP Budget and Plan (2017 Revision).
Three Rivers Park District: Nine Mile Creek Regional Trail Master Plan (pp.1-70)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Roadways Including Multimodal Elements

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

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

Roadway Expansion and Reconstruction/Modernization projects only:

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

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

Bridge Rehabilitation/Replacement projects only:

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

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

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

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

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

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

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

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

Requirements - Roadways Including Multimodal Elements

Project Information-Roadways

County, City, or Lead Agency	City of Richfield
Functional Class of Road	"A" Minor Arterial
Road System *TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET*	MSAS
Road/Route No. *i.e., 53 for CSAH 53*	
Name of Road *Example; 1st ST., MAIN AVE*	Lyndale Avenue South
Zip Code where Majority of Work is Being Performed	55423
(Approximate) Begin Construction Date	03/01/2020
(Approximate) End Construction Date	12/31/2021

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

From: **(Intersection or Address)**	TH 62 and Lyndale Ave S
To: **(Intersection or Address)** *DO NOT INCLUDE LEGAL DESCRIPTION*	77th Street and Lyndale Ave S
Or At	
Primary Types of Work *Examples: GRADE, AGG BASE, BIT BASE, BIT SURF, SIDEWALK, CURB AND GUTTER,STORM SEWER, SIGNALS, LIGHTING, GUARDRAIL, BIKE PATH, PED RAMPS, BRIDGE, PARK AND RIDE, ETC.*	GRADE, AGG BASE, BIT BASE, BIT SURF, SIDEWALK, CURB AND GUTTER, STORM SEWER, SIGNALS, LIGHTING, BIKE PATH, PED RAMPS

BRIDGE/CULVERT PROJECTS (IF APPLICABLE)

Old Bridge/Culvert No.:

New Bridge/Culvert No.:

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

Expander/Augmentor/Connector/Non-Freeway Principal Arterial

Select one:	
Area	2.683
Project Length	1.904
Average Distance	1.4091
Upload Map	1466792210612_Roadway Area Definition.pdf

Reliever: Relieves a Principal Arterial that is a Freeway Facility

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

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

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

Non-Freeway Facility Volume/Capacity Table

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

9:00am - 10:00am	0
10:00am - 11:00am	0
11:00am - 12:00pm	0
12:00pm - 1:00pm	0
1:00pm - 2:00pm	0
2:00pm - 3:00pm	0
3:00pm - 4:00pm	0
4:00pm - 5:00pm	0
5:00pm - 6:00pm	0
6:00pm - 7:00pm	0
7:00pm - 8:00pm	0
8:00pm - 9:00pm	0
9:00pm - 10:00pm	0
10:00pm - 11:00pm	0
11:00pm - 12:00am	0

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

Existing Employment within 1 Mile:	8618
Existing Manufacturing/Distribution-Related Employment within 1 Mile:	496
Existing Students:	1820
Upload Map	1466792309415_Regional Economy.pdf

Measure C: Current Heavy Commercial Traffic

Location:	North of 70th Street
Current daily heavy commercial traffic volume:	120
Date heavy commercial count taken:	11/24/2015

Measure D: Freight Elements

Response (Limit 1,400 characters; approximately 200 words)	This project includes modernization of Lyndale Avenue to shift remaining freight traffic to other more appropriate corridors. The northern segment of this project consists of commercial businesses, so improvements to local freight access will be included as part of this plan. This includes adding on street bicycle lanes. On street bicycle lanes improve sight distance, provide lateral clearance, and minimize erratic maneuvers on the part of motorists attempting to avoid trucks. A goal of this project is to limit freight traffic to local destination traffic only. Entrances to businesses will be combined, where possible, to improve access management for local deliveries. The southern portion of this project will have traffic calming measures in an attempt to reduce the amount of freight traffic using residential streets.

Measure A: Current Daily Person Throughput

Location	near 68th Street
Current AADT Volume	13200
Existing Transit Routes on the Project	4, 18, 558
For New Roadways only, list transit routes that will be moved to the new roadway	
Upload Transit Map	1468333787844_Transit Connections.pdf

Response: Current Daily Person Throughput

Average Annual Daily Transit Ridership	0
Current Daily Person Throughput	17160.0

Measure B: 2040 Forecast ADT

Use Metropolitan Council model to determine forecast (2040) ADT volume	Yes
If checked, METC Staff will provide Forecast (2040) ADT volume	
OR	
Identify the approved county or city travel demand model to determine forecast (2040) ADT volume	

Forecast (2040) ADT volume

Measure A: Project Location and Impact to Disadvantaged Populations

Select one:

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

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

Residential neighborhoods along Lyndale Avenue consist of a range of housing from low to high density residential, including single family, multifamily, and manufactured housing units. Newer high density residential areas have been planned to accommodate diverse, low-moderate income, and aging populations in need of multimodal transportation choices, especially transit. Business redevelopments are targeting new opportunities to access aging populations in the area. To enhance the safety, access, convenience and comfort of all ages and abilities, including pedestrians (including people requiring mobility aids), bicyclists, transit users, motorists, and freight drivers, the following improvements will be made:

-Filling in gaps in the sidewalk network for those using transit or active transportation as a primary mode.

-Richfield High School is located just off of Lyndale Avenue on 70th Street and the Academy of Holy Angels is located just off of 66th Street within one-quarter mile of Lyndale Avenue. Improved sidewalks will enhance safety for students walking to and from school. Richfield High School has a diversity score of 0.72 (State average of 0.32) with over half the students eligible for free or reduced lunch.

-Replacement of aged sidewalk segments, pedestrian ramps, and street lighting in residential areas.

-Installation of landscaping elements and buffering along pedestrian routes.

-Upgraded transit shelters for safety and cover from the elements.

-Improvements to existing crossings at Wood Lake Nature Center. This includes improvements of street striping and signing, street lights and signals. The sidewalk on Lyndale along the Wood Lake Nature Center will be widened and a buffer will be added between the street and sidewalk to create a safer walking environment. Bicycle and Pedestrian trails will both be available.

- Freight traffic will be reduced from residential streets lowering environmental impacts on disadvantaged communities.
During construction, there will be impacts on those that rely on this corridor for active transportation. Proper advanced notification and temporary traffic control will help to alleviate these inconveniences. Resources for non-English speakers and visual/auditory impaired residents will be made available.

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

Upload Map 1466792406428_Socio-Economic Conditions.pdf

Measure B: Affordable Housing

City/Township	Segment Length in Miles (Population)
Richfield	1.904
	2

Total Project Length

Total Project Length (Total Population) 1.9

Affordable Housing Scoring - To Be Completed By Metropolitan Council Staff

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

Affordable Housing Scoring - To Be Completed By Metropolitan Council Staff

Total Project Length (Miles)	1.904
Total Housing Score	0

Measure A: Year of Roadway Construction

Year of Original Roadway Construction or Most Recent Reconstruction	Segment Length	Calculation	Calculation 2
1977	1.904	3764.208	1977.0
	2	**3764**	**1977**

Average Construction Year

Weighted Year	1977

Total Segment Length (Miles)

Total Segment Length	1.904

Measure B: Geometric, Structural, or Infrastructure Improvements

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

Response (Limit 700 characters; approximately 100 words)

This project includes modernization of Lyndale Ave. to shift remaining non-local freight to more appropriate corridors. Freight improvements to the northern commercial area will include adding and expanding paved shoulders. These improvements will increase sight distance, provide lateral clearance, and minimize erratic maneuvers on the part of motorists. Longer turn lanes will have a safer stopping distance and increase maneuverability providing an extra space for clearance of other drivers. Entrances to businesses will be combined to allow for easier access for local deliveries. The southern segment will use traffic calming measures to reduce non-local freight traffic in residential areas.

Improved clear zones or sight lines:

Yes

Response (Limit 700 characters; approximately 100 words)

A four to three lane conversion will clearly separate slower from faster-moving traffic. This will create better sight lines for cars turning off of Lyndale Avenue. Fewer lanes to cross reduces the number of blind spots to avoid. This four-lane conversion is outlined in the Richfield Arterial Complete Streets Study. Previous studies to incorporate the 66th Street roundabout assume a 3-lane conversion as a connected action. Wider shoulders will also create better sight triangles and clear zones for pedestrians and bicyclists. With this conversion bicyclists and pedestrians will only have to cross three lanes of vehicular traffic, eliminating the "multiple-threat" from vehicles.

Improved roadway geometrics:

Yes

Response (Limit 700 characters; approximately 100 words)

Roadway reprioritization is needed. Pedestrian amenities are non-existent at places. Hazardous sidewalk panels make it unsafe to travel even on paved walkways. Sidewalks are set too close to the roadway with no buffer or boulevard. There are no designated bicycle lanes or demarcations, so bicyclists have to fend for themselves competing with cars. There are no pull out areas at bus stops making access to public transportation hazardous for both pedestrians and cars that may be overtaken by buses.

Access management enhancements:

Yes

Response (Limit 700 characters; approximately 100 words)

Access to the Wood Lake Nature Center needs to be improved for pedestrian mobility and safety. Improving street lighting and adding a crosswalk would help accomplish this. The northern commercial section of this project has an excessive number of driveways. Consolidation efforts will create a streamline flow for both customers and deliveries being made through this section.

Vertical/horizontal alignments improvements:

Yes

Response (Limit 700 characters; approximately 100 words)

This section of Lyndale Avenue is relatively flat. A closer look at topography shows that no vertical alignment improvements need to be made. Visibility studies show that no horizontal improvements need to be made.

Improved stormwater mitigation:

Yes

Response (Limit 700 characters; approximately 100 words)	This project will introduce two six-foot green boulevards that will separate the roadside sidewalk (west) and path (east) from the roadbed, breaking up the impervious surfaces. The boulevards will provide space for trees that do not exist today. The project area is within the Richfield Lake and Wood Lake drainage areas, both water bodies have perimeter ponds which were constructed to protect the main water bodies from direct run-off and offer easy maintenance opportunities. The future Lyndale Avenue will also enjoy roundabouts at 66th Street and potentially 65th Street which will also reduce the impervious footprint.
Signals/lighting upgrades:	Yes
Response (Limit 700 characters; approximately 100 words)	There is very little pedestrian scale lighting along this project area. Energy efficient LED street lights will be added. Hooded lights will also diminish the amount of light pollution in the neighborhood. This will reduce emission impacts while creating a safer more illuminated environment for all pedestrians and bicyclists.
Other Improvements	Yes
Response (Limit 700 characters; approximately 100 words)	Other improvements include instituting bicycle parking and park benches. There is no ADA pad/access to transit stations, so improvements in ADA requirements will need to be addressed. There is a lack of bus shelters for transit safety and convenience.

Measure A: Congestion Reduction/Air Quality

Total Peak Hour Delay Per Vehicle Without The Project	Total Peak Hour Delay Per Vehicle With The Project	Total Peak Hour Delay Per Vehicle Reduced by Project	Volume (Vehicles per hour)	Total Peak Hour Delay Reduced by the Project:	EXPLANATION of methodology used to calculate railroad crossing delay, if applicable.	Synchro or HCM Reports

8.3	6.1	2.2	1222	2688.4	not applicable	1468007000286_PM Lyndale-67th (with and without the project).pdf
16.1	8.5	7.6	1691	12851.6	not applicable	1468006968754_PM Lyndale-65th (with and without the project).pdf
4.3	5.1	-0.8	1355	-1084	not applicable	1468007021855_PM Lyndale-70th (with and without the project).pdf
4.1	5.8	-1.7	1331	-2262.7	not applicable	1468007047396_PM Lyndale-73rd (with and without the project).pdf

Total Delay

Total Peak Hour Delay Reduced	12193.3

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

Total (CO, NOX, and VOC) Peak Hour Emissions Per Vehicle without the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions Per Vehicle with the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions Reduced Per Vehicle by the Project (Kilograms):	Volume (Vehicles Per Hour):	Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):
2.47	2.01	0.46	1691.0	777.86
1.97	1.86	0.11	1222.0	134.42
2.39	2.44	-0.05	1355.0	-67.75
2.44	2.04	0.4	1331.0	532.4

9	8	5599	1377

Total

Total Emissions Reduced:	1376.93
Upload Synchro Report	1468246135954_Lyndale-intersections emission (with and without the project).pdf

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

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

Total Parallel Roadways

Emissions Reduced on Parallel Roadways	0
Upload Synchro Report	1468422838516_Emissions.pdf

New Roadway Portion:

Cruise speed in miles per hour with the project:	0
Vehicle miles traveled with the project:	0
Total delay in hours with the project:	0
Total stops in vehicles per hour with the project:	0
Fuel consumption in gallons:	0
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced or Produced on New Roadway (Kilograms):	0
EXPLANATION of methodology and assumptions used:(Limit 1,400 characters; approximately 200 words)	N/A
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):	0.0

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

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

Transit Projects Not Requiring Construction

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

Check Here if Your Transit Project Does Not Require Construction

Measure A: Risk Assessment

1)Project Scope (5 Percent of Points)

Meetings or contacts with stakeholders have occurred	Yes

100%

Stakeholders have been identified

40%

Stakeholders have not been identified or contacted

0%

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

Layout or Preliminary Plan completed

100%

Layout or Preliminary Plan started	Yes

50%

Layout or Preliminary Plan has not been started

0%

Anticipated date or date of completion 11/30/2017

3)Environmental Documentation (5 Percent of Points)

EIS

EA

PM Yes

Document Status:

Document approved (include copy of signed cover sheet)

100%

Document submitted to State Aid for review

75% date submitted

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

50%

Document not started

0%

Anticipated date or date of completion/approval 11/30/2017

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

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

100%

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

80%

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

40%

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

0%

Anticipated date or date of completion of historic/archeological review: 11/30/2017

Project is located on an identified historic bridge

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

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

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

100%

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

100%

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

80%

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

50%

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

30%

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

0%

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

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

100%

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

100%

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

75%

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

50%

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

25%

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

0%

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

0%

Anticipated date or date of acquisition 03/30/2018

7)Railroad Involvement (25 Percent of Points)

No railroad involvement on project Yes

100%

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

100%

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

60%

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

40%

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

0%

Anticipated date or date of executed Agreement

8)Interchange Approval (15 Percent of Points)*

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

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

Yes

100%

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

100%

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

0%

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

Construction plans completed/approved (include signed title sheet)

100%

Construction plans submitted to State Aid for review

75%

Construction plans in progress; at least 30% completion

Yes

50%

Construction plans have not been started

0%

Anticipated date or date of completion

01/31/2017

10)Letting

Anticipated Letting Date

03/01/2020

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

Crash Modification Factor Used:	0.75
Rationale for Crash Modification Selected:	Lyndale Avenue will be converted to a three-lane section with the center lane being a two-way left turn lane. At public intersections the center lane will be an exclusive left turn lane. The two-way left turn lane is being provided to accommodate all of the private driveways and access points along the corridor. The study on which the modification factor was based provided a high quality and robust data set and was given 4 out of 5 stars.
(Limit 1400 Characters; approximately 200 words)	
Project Benefit ($) from B/C Ratio	$4,678,896.00
Worksheet Attachment	1468516772718_HSIP worksheet-Lyndale Ave STP application.pdf

Roadway projects that include railroad grade-separation elements:

Current AADT volume:	0
Average daily trains:	0
Crash Risk Exposure eliminated:	0

Measure A: Multimodal Elements and Existing Connections

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

The Lyndale Avenue Complete Streets Project follows a series of guiding principles (see attachment) adopted by the City of Richfield through a public participation process. Lyndale Avenue, formerly US Highway 65, is planned to be modernized specifically to encourage multimodal transportation. Multimodal elements will include new facilities for bicyclists,pedestrians,and transit users in the corridor.

Multimodal elements will include the following:

- Bicyclists: Bicycle lanes will be included to improve mobility and safety for commuter and recreational bicyclists. These lanes will separate bicycle and vehicular traffic with landscaped boulevards buffering new pedestrian facilities. The project will provide a critical bicycle facility connection and eliminate a missing link in the regional trail system through planned infrastructure that will connect the modes with a nexus at 76th Street.

- Pedestrians: New sidewalks will replace existing facilities on both sides of the street and existing utility obstructions will be removed. Safety improvements will include ADA-compliant ramps, accessible pedestrian signals, and countdown timers. New pedestrian crossing improvements will be integrated and a new pedestrian trail will be constructed to provide access to existing Wood Lake Nature Center entrances. Medians with pedestrian refuge will be considered first priority as final intersection designs are determined. The proposed roundabout at the 66th Street and possible roundabout at 65th Street crossings would provide documented pedestrian safety benefits. Lastly, the addition of public art will improve visual quality and create a more inviting pedestrian-scale

streetscape.

- Transit: There are 17 bus stops located along the project corridor. Lyndale's conversion will allow enhanced shelters to be provided. Pedestrian elements (benches and open space queuing areas) will be provided where warranted, and bicycle storage will be made available.

Bicycle, Pedestrian, and Transit Connections:

Bicycle facilities will connect:

-Minneapolis on-street lanes on Lyndale Avenue

-66th Street cycle-tracks (2018 const.)

-70th Street bicycle lanes (2017 const.)

-76th Street bicycle lanes

-Nine Mile Creek Regional Trail (planned connection through Hennepin County providing trail connections between Lake Minnetonka, Minneapolis Chain of Lakes, Minnesota River Bluffs, and State parks and refuge centers.

All pedestrian facilities will connect with existing facilities at public street crossings.

With the project, Metro Transit will assess its current transit stop locations and determine potential changes that may be needed to better serve existing and future transit users along the Lyndale corridor.

Measure A: Cost Effectiveness

Total Project Cost (entered in Project Cost Form):	$10,789,577.40

Enter Amount of the Noise Walls:	$0.00
Total Project Cost subtract the amount of the noise walls:	$10,789,577.00
Points Awarded in Previous Criteria	
Cost Effectiveness	$0.00

Other Attachments

File Name	Description	File Size
Guiding Principles.pdf	Guiding Principles	2.1 MB
Kimley Horn Roadway Plans.pdf	Plan for Northern Section	2.0 MB
Layout Lyndale Avenue.pdf	Layout Lyndale Avenue	2.0 MB
Lyndale Ave STP Resolution.pdf	Local Match Resolution	45 KB
Metro Transit Support Letter.pdf	Metro Transit Support Letter	26 KB
Reliever Description.pdf	A Note to the Reviewer	108 KB
Richfield High School Letter.pdf	Richfield School District Support Letter	125 KB
WoodLakeLetterofSupport.pdf	Letter of Support Wood Lake Nature Center	424 KB

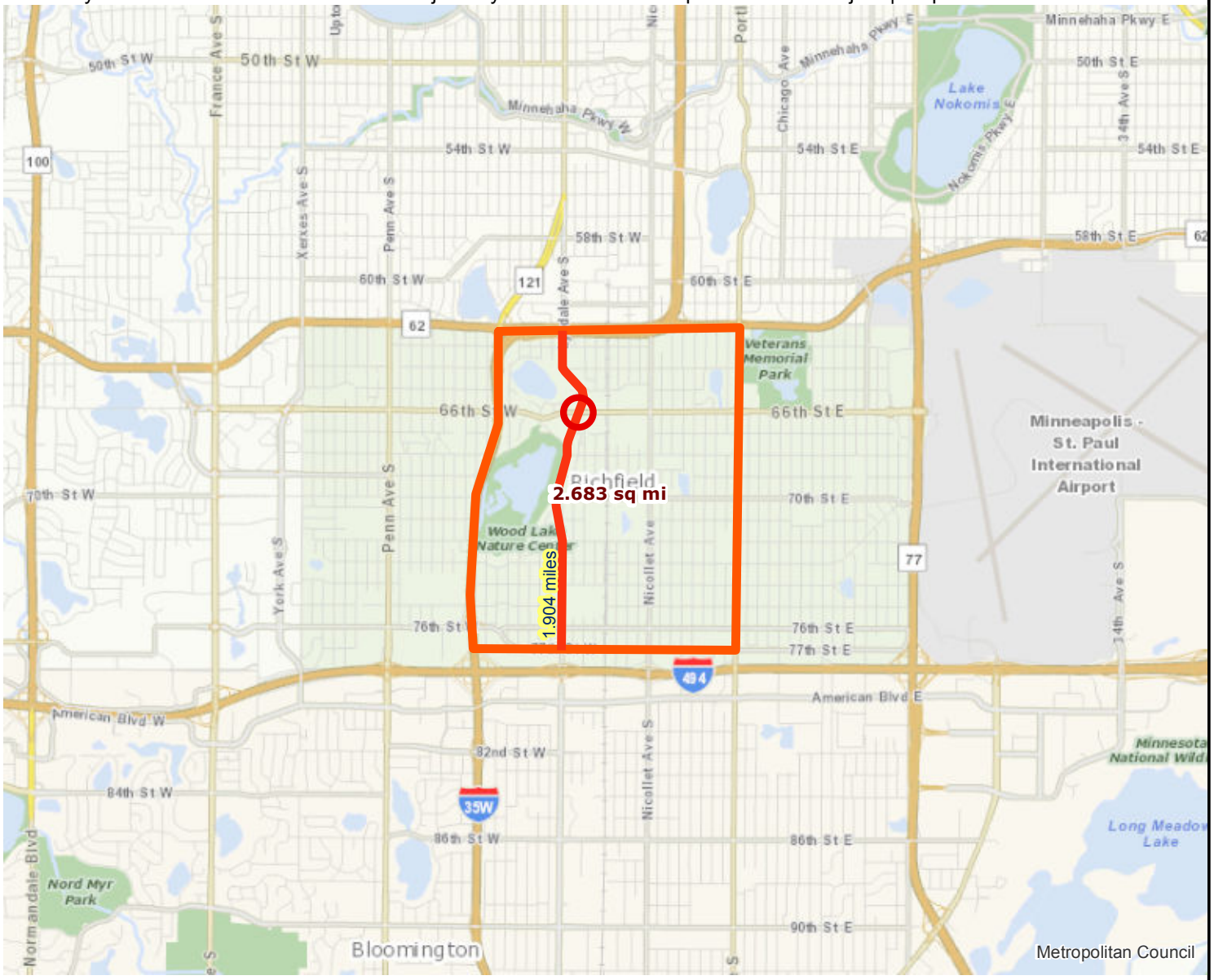
Roadway Area Definition

Roadway Reconstruction/Modernization Project: Lyndale Avenue Complete Streets Project | Map ID: 1466791522748

Results

Project Length: 1.904 miles

Project Area: 2.683 sq mi



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

0 0.5 1 2 3 4 Miles

Created: 6/24/2016
LandscapeRSA1

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

METROPOLITAN COUNCIL

Regional Economy

Roadway Reconstruction/Modernization Project: Lyndale Avenue Complete Streets Project | Map ID: 1466791522748

Results

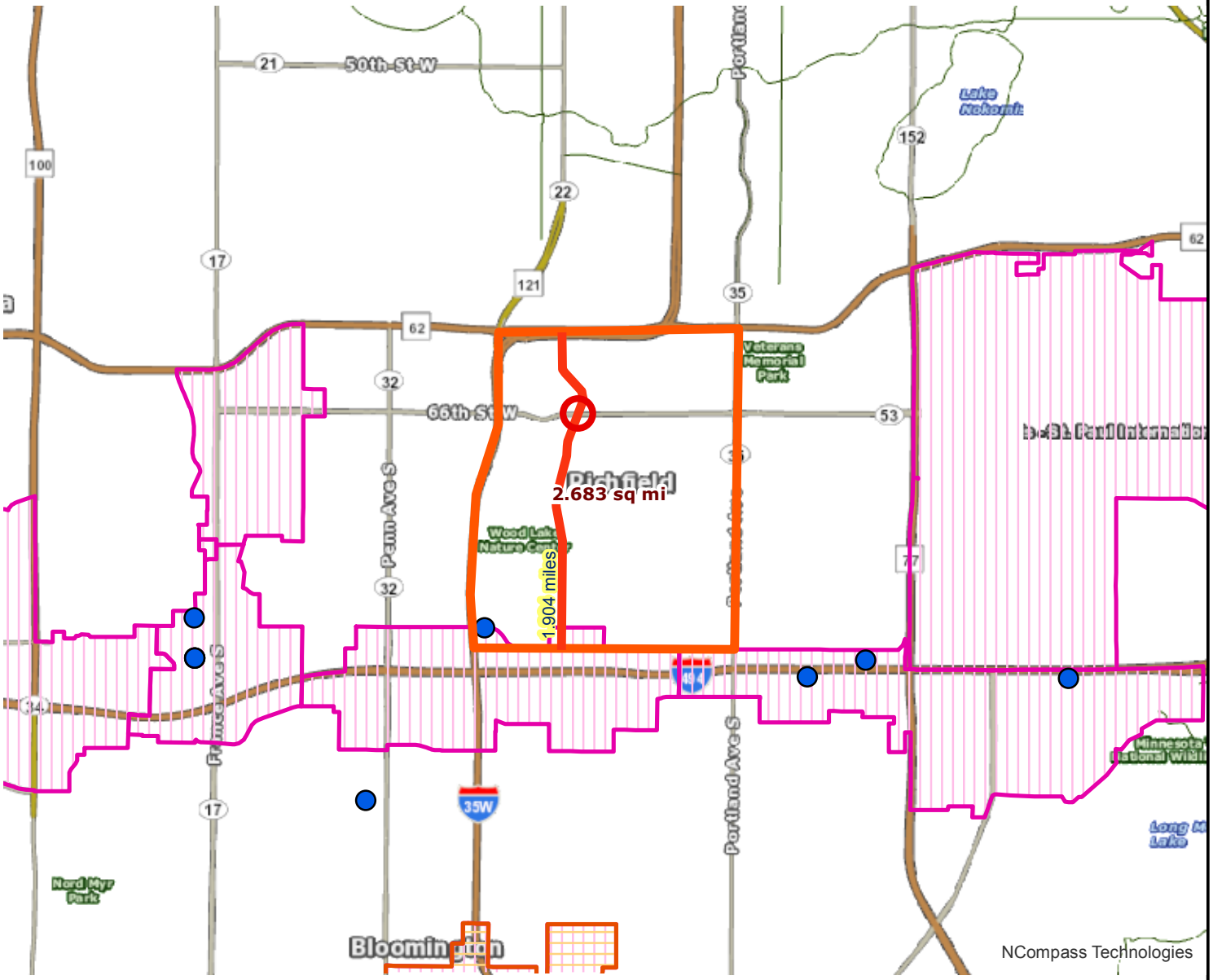
WITHIN ONE MI of project:

Totals by City:

Minneapolis
Population: 7647
Employment: 3158
Mfg and Dist Employment: 381

Richfield
Population: 19526
Employment: 5460
Mfg and Dist Employment: 115

Postsecondary Students:
1820



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

0 0.5 1 2 3 4 Miles

Created: 6/24/2016
LandscapeRSA5

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METROPOLITAN COUNCIL

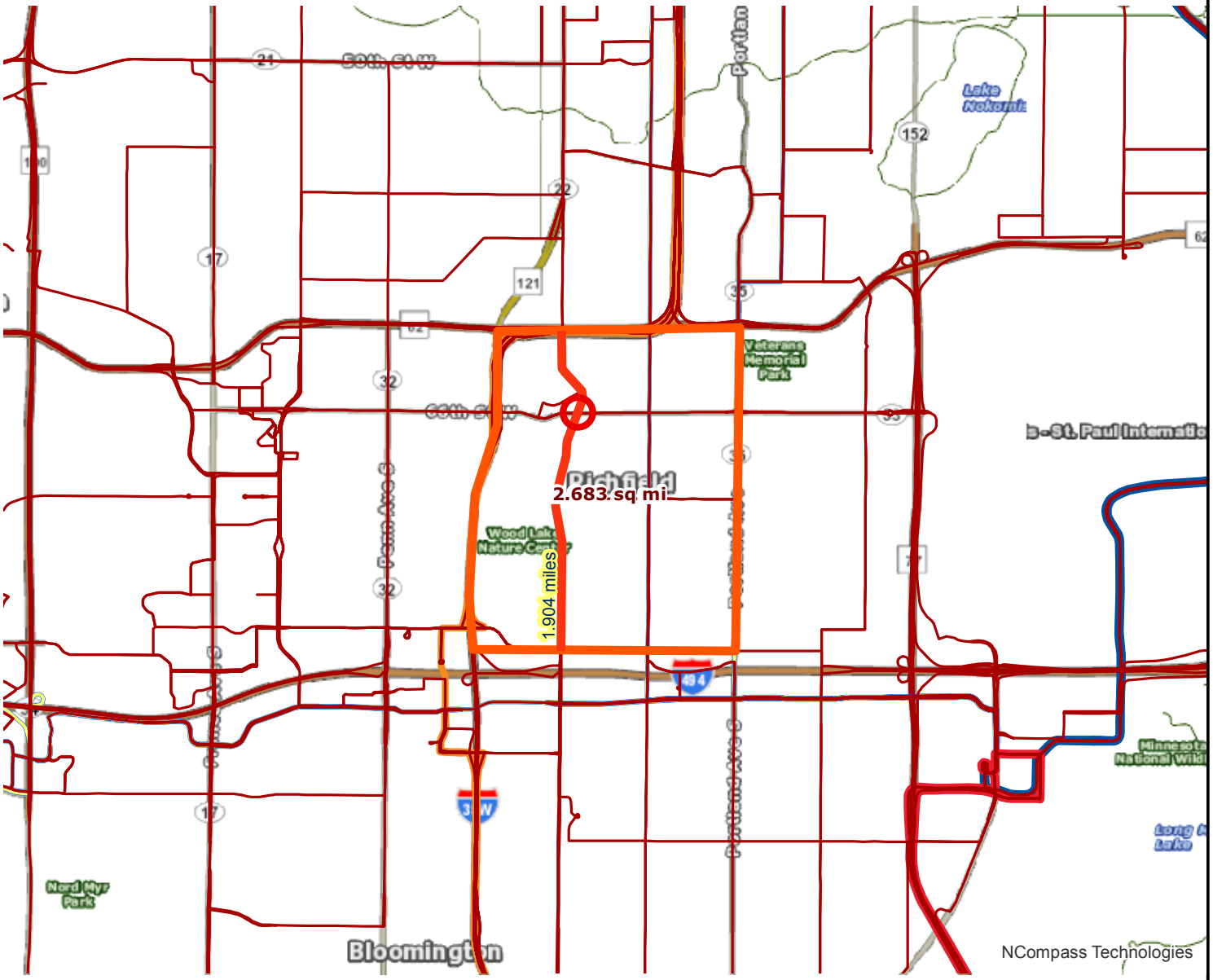
Transit Connections

Roadway Reconstruction/Modernization Project: Lyndale Avenue Complete Streets Project | Map ID: 1466791522748

Results

Transit with a Direct Connection to project:
4 18 460 464 465 467 491 515 535 540 542
558 578 579 597 684 694 695
*Orange Line
*Orange Line

**indicates Planned Alignments*



Project Points — Transit Routes — Red Line — BRT, Orange Line

Project

Project Area

Transitway

Blue Line

Planned Alignments

Arterial BRT

0 0.5 1 2 3 4 Miles

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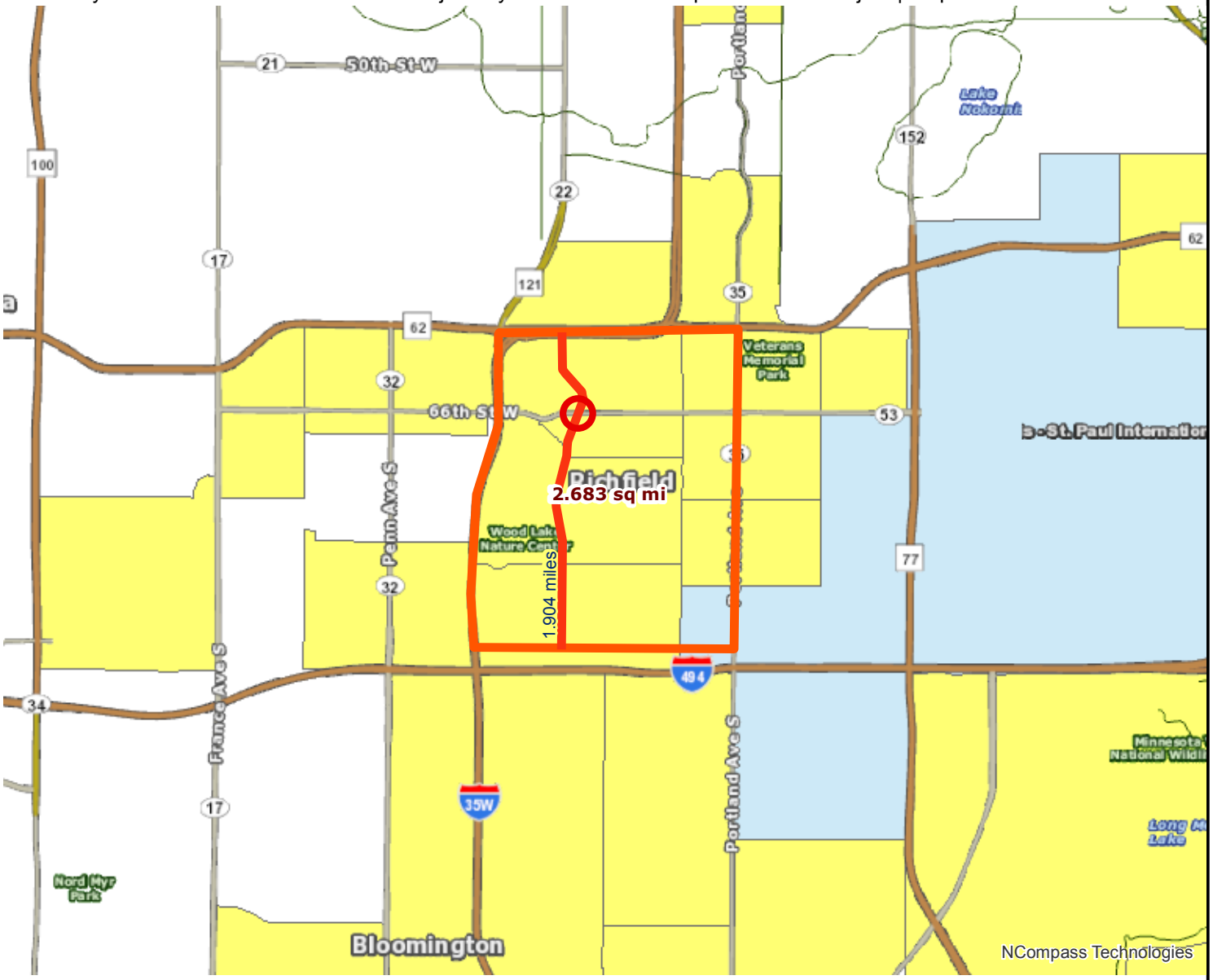
METROPOLITAN COUNCIL

Socio-Economic Conditions

Roadway Reconstruction/Modernization Project: Lyndale Avenue Complete Streets Project | Map ID: 1466791522748

Results

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



Project Points
Project
Project Area

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

0 0.5 1 2 3 4 Miles

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LandscapeRSA2

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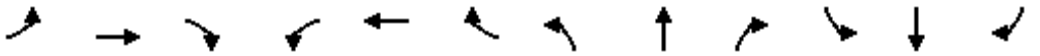
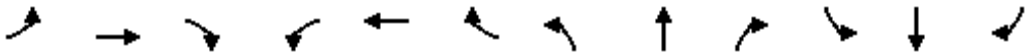
METROPOLITAN COUNCIL



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	3	18	73	1	80	10	516	39	27	422	17
Future Volume (vph)	16	3	18	73	1	80	10	516	39	27	422	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		50	0		50	40		0	70		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor							1.00	1.00				
Frt			0.850			0.850		0.990			0.994	
Flt Protected		0.959			0.953		0.950			0.950		
Satd. Flow (prot)	0	1786	1583	0	1775	1583	1770	3498	0	1770	3518	0
Flt Permitted		0.731			0.714		0.484			0.423		
Satd. Flow (perm)	0	1362	1583	0	1330	1583	900	3498	0	788	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			109		15			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		609			787			2056			1302	
Travel Time (s)		13.8			17.9			46.7			29.6	
Confl. Peds. (#/hr)							2		2			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	3	19	78	1	85	11	549	41	29	449	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	19	0	79	85	11	590	0	29	467	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												

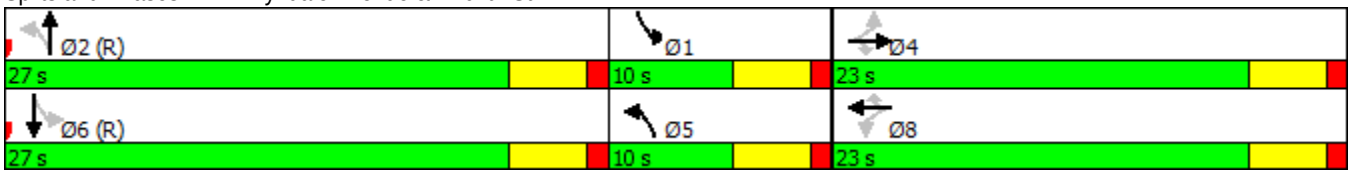


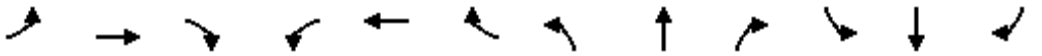
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5		9.5	22.5	
Total Split (s)	23.0	23.0	23.0	23.0	23.0	23.0	10.0	27.0		10.0	27.0	
Total Split (%)	38.3%	38.3%	38.3%	38.3%	38.3%	38.3%	16.7%	45.0%		16.7%	45.0%	
Maximum Green (s)	18.5	18.5	18.5	18.5	18.5	18.5	5.5	22.5		5.5	22.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0			0	
Act Effct Green (s)		8.8	8.8		8.8	8.8	44.6	41.1		45.5	43.1	
Actuated g/C Ratio		0.15	0.15		0.15	0.15	0.74	0.68		0.76	0.72	
v/c Ratio		0.10	0.06		0.41	0.26	0.01	0.25		0.04	0.18	
Control Delay		21.7	0.3		28.7	5.7	3.5	6.2		3.9	8.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		21.7	0.3		28.7	5.7	3.5	6.2		3.9	8.1	
LOS		C	A		C	A	A	A		A	A	
Approach Delay		11.3			16.8			6.2			7.9	
Approach LOS		B			B			A			A	
90th %ile Green (s)	12.4	12.4	12.4	12.4	12.4	12.4	5.5	28.6		5.5	28.6	
90th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Max	Coord		Max	Coord	
70th %ile Green (s)	10.2	10.2	10.2	10.2	10.2	10.2	0.0	30.8		5.5	40.8	
70th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Skip	Coord		Max	Coord	
50th %ile Green (s)	8.7	8.7	8.7	8.7	8.7	8.7	0.0	42.3		0.0	42.3	
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Skip	Coord		Skip	Coord	
30th %ile Green (s)	7.2	7.2	7.2	7.2	7.2	7.2	0.0	43.8		0.0	43.8	
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Skip	Coord		Skip	Coord	
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.5		0.0	55.5	
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Skip	Skip	Coord		Skip	Coord	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 40.7%		ICU Level of Service A	

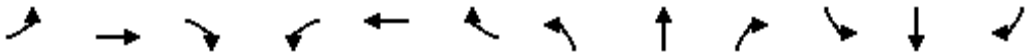
Analysis Period (min) 15

Splits and Phases: 11: Lyndale Avenue & W 67th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	3	18	73	1	80	10	516	39	27	422	17
Future Volume (vph)	16	3	18	73	1	80	10	516	39	27	422	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		50	300		0	300		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00	1.00		1.00	1.00	
Frt			0.850			0.850		0.990			0.994	
Flt Protected		0.959			0.953		0.950			0.950		
Satd. Flow (prot)	0	1786	1583	0	1775	1583	1770	1841	0	1770	1850	0
Flt Permitted		0.728			0.714		0.479			0.402		
Satd. Flow (perm)	0	1356	1583	0	1330	1583	891	1841	0	748	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			30			85		10			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		609			787			2056			1302	
Travel Time (s)		13.8			17.9			46.7			29.6	
Confl. Peds. (#/hr)							2		2	2		2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	3	19	78	1	85	11	549	41	29	449	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	19	0	79	85	11	590	0	29	467	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	

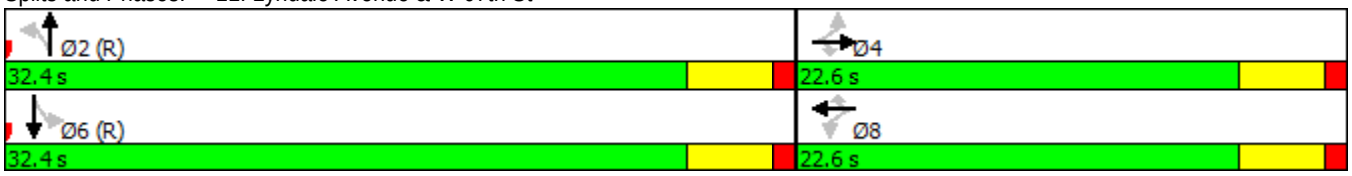


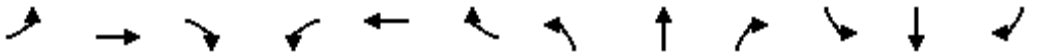
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	22.6	22.6	22.6	22.6	22.6	22.6	32.4	32.4		32.4	32.4	
Total Split (%)	41.1%	41.1%	41.1%	41.1%	41.1%	41.1%	58.9%	58.9%		58.9%	58.9%	
Maximum Green (s)	18.1	18.1	18.1	18.1	18.1	18.1	27.9	27.9		27.9	27.9	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)		8.5	8.5		8.5	8.5	40.4	40.4		40.4	40.4	
Actuated g/C Ratio		0.15	0.15		0.15	0.15	0.73	0.73		0.73	0.73	
v/c Ratio		0.10	0.07		0.38	0.27	0.02	0.44		0.05	0.34	
Control Delay		19.4	6.6		25.5	7.7	3.8	5.6		2.5	2.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		19.4	6.6		25.5	7.7	3.8	5.6		2.5	2.8	
LOS		B	A		C	A	A	A		A	A	
Approach Delay		13.2			16.3			5.5			2.8	
Approach LOS		B			B			A			A	
90th %ile Green (s)	11.9	11.9	11.9	11.9	11.9	11.9	34.1	34.1		34.1	34.1	
90th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord		Coord	Coord	
70th %ile Green (s)	9.9	9.9	9.9	9.9	9.9	9.9	36.1	36.1		36.1	36.1	
70th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord		Coord	Coord	
50th %ile Green (s)	8.4	8.4	8.4	8.4	8.4	8.4	37.6	37.6		37.6	37.6	
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord		Coord	Coord	
30th %ile Green (s)	7.0	7.0	7.0	7.0	7.0	7.0	39.0	39.0		39.0	39.0	
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord		Coord	Coord	
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	0.0	50.5	50.5		50.5	50.5	
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Skip	Coord	Coord		Coord	Coord	

Intersection Summary	
Area Type:	Other
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 6.1	Intersection LOS: A

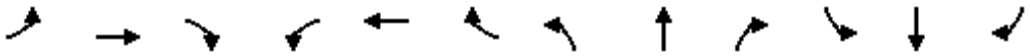
Intersection Capacity Utilization 49.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 11: Lyndale Avenue & W 67th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	123	39	54	148	69	36	415	60	131	438	93
Future Volume (vph)	85	123	39	54	148	69	36	415	60	131	438	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	175		0	120		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00			1.00		0.99	1.00		1.00	1.00	
Frt		0.976			0.962			0.981			0.974	
Flt Protected		0.983			0.990		0.950			0.950		
Satd. Flow (prot)	0	3386	0	0	3357	0	1770	3465	0	1770	3432	0
Flt Permitted		0.766			0.830		0.950			0.950		
Satd. Flow (perm)	0	2636	0	0	2813	0	1759	3465	0	1767	3432	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			70			27			49	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		784			1014			1302			897	
Travel Time (s)		17.8			23.0			29.6			20.4	
Confl. Peds. (#/hr)	4		5	5		4	13		3	3		13
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	87	126	40	55	151	70	37	423	61	134	447	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	253	0	0	276	0	37	484	0	134	542	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

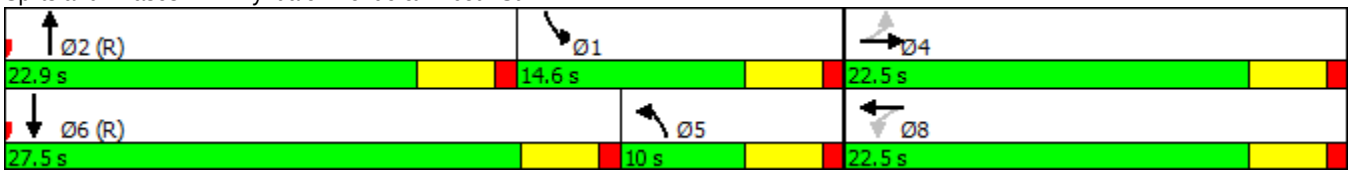


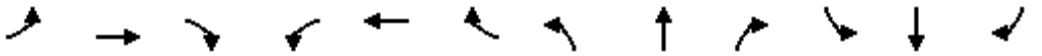
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.5	22.5		22.5	22.5		10.0	22.9		14.6	27.5	
Total Split (%)	37.5%	37.5%		37.5%	37.5%		16.7%	38.2%		24.3%	45.8%	
Maximum Green (s)	18.0	18.0		18.0	18.0		5.5	18.4		10.1	23.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		10.2			10.2		5.5	29.5		8.9	36.8	
Actuated g/C Ratio		0.17			0.17		0.09	0.49		0.15	0.61	
v/c Ratio		0.53			0.51		0.23	0.28		0.51	0.26	
Control Delay		22.8			19.6		22.3	16.6		30.5	6.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		22.8			19.6		22.3	16.6		30.5	6.7	
LOS		C			B		C	B		C	A	
Approach Delay		22.8			19.6			17.0			11.4	
Approach LOS		C			B			B			B	
90th %ile Green (s)	13.8	13.8		13.8	13.8		5.5	22.6		10.1	27.2	
90th %ile Term Code	Gap	Gap		Hold	Hold		Max	Coord		Max	Coord	
70th %ile Green (s)	11.7	11.7		11.7	11.7		5.5	24.7		10.1	29.3	
70th %ile Term Code	Gap	Gap		Hold	Hold		Max	Coord		Max	Coord	
50th %ile Green (s)	10.2	10.2		10.2	10.2		0.0	26.5		9.8	40.8	
50th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Coord		Gap	Coord	
30th %ile Green (s)	8.8	8.8		8.8	8.8		0.0	29.4		8.3	42.2	
30th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Coord		Gap	Coord	
10th %ile Green (s)	6.7	6.7		6.7	6.7		0.0	44.3		0.0	44.3	
10th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Coord		Skip	Coord	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 54.5%		ICU Level of Service A	

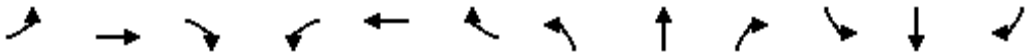
Analysis Period (min) 15

Splits and Phases: 4: Lyndale Avenue & W 65th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	123	39	54	148	69	36	415	60	131	438	93
Future Volume (vph)	85	123	39	54	148	69	36	415	60	131	438	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		200	300		260
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.99		0.99		0.99	1.00		0.98
Frt		0.976			0.962				0.850			0.850
Flt Protected		0.983			0.990		0.950			0.950		
Satd. Flow (prot)	0	3381	0	0	3348	0	1770	1863	1583	1770	1863	1583
Flt Permitted		0.767			0.831		0.481			0.498		
Satd. Flow (perm)	0	2634	0	0	2808	0	891	1863	1560	926	1863	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			70				61			95
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		784			1027			1302			897	
Travel Time (s)		17.8			23.3			29.6			20.4	
Confl. Peds. (#/hr)	4		5	5		4	13		3	3		13
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	87	126	40	55	151	70	37	423	61	134	447	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	253	0	0	276	0	37	423	61	134	447	95
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	23.0		23.0	23.0		32.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	41.8%	41.8%		41.8%	41.8%		58.2%	58.2%	58.2%	58.2%	58.2%	58.2%
Maximum Green (s)	18.5	18.5		18.5	18.5		27.5	27.5	27.5	27.5	27.5	27.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)		9.7			9.7		36.3	36.3	36.3	36.3	36.3	36.3
Actuated g/C Ratio		0.18			0.18		0.66	0.66	0.66	0.66	0.66	0.66
v/c Ratio		0.51			0.50		0.06	0.34	0.06	0.22	0.36	0.09
Control Delay		20.2			17.7		1.9	2.6	0.4	5.6	5.8	1.5
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.2			17.7		1.9	2.6	0.4	5.6	5.8	1.5
LOS		C			B		A	A	A	A	A	A
Approach Delay		20.2			17.7			2.3			5.1	
Approach LOS		C			B			A			A	
90th %ile Green (s)	13.1	13.1		13.1	13.1		32.9	32.9	32.9	32.9	32.9	32.9
90th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord
70th %ile Green (s)	11.1	11.1		11.1	11.1		34.9	34.9	34.9	34.9	34.9	34.9
70th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord
50th %ile Green (s)	9.7	9.7		9.7	9.7		36.3	36.3	36.3	36.3	36.3	36.3
50th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord
30th %ile Green (s)	8.4	8.4		8.4	8.4		37.6	37.6	37.6	37.6	37.6	37.6
30th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord
10th %ile Green (s)	6.4	6.4		6.4	6.4		39.6	39.6	39.6	39.6	39.6	39.6
10th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord

Intersection Summary	
Area Type:	Other
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 29 (53%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 8.5	Intersection LOS: A

Intersection Capacity Utilization 61.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Lyndale Avenue & W 65th St

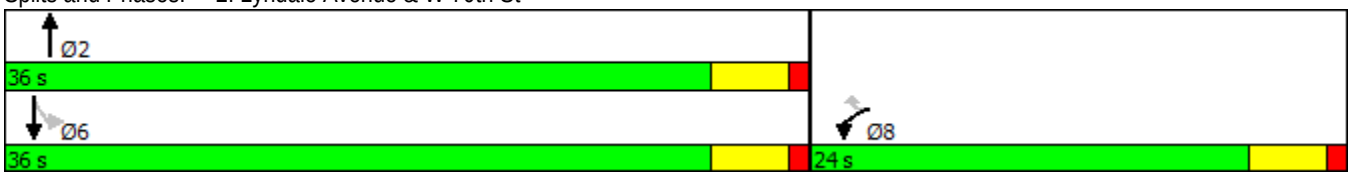
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	56	61	586	65	77	510
Future Volume (vph)	56	61	586	65	77	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor			1.00			1.00
Frt		0.850	0.985			
Flt Protected	0.950					0.993
Satd. Flow (prot)	1770	1583	3477	0	0	3514
Flt Permitted	0.950					0.810
Satd. Flow (perm)	1770	1583	3477	0	0	2866
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		64	30			
Link Speed (mph)	30		30			30
Link Distance (ft)	852		1984			2056
Travel Time (s)	19.4		45.1			46.7
Confl. Peds. (#/hr)				3	3	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	58	64	610	68	80	531
Shared Lane Traffic (%)						
Lane Group Flow (vph)	58	64	678	0	0	611
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phase	8	8	2		6	6
Switch Phase						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	22.5	22.5	22.5		22.5	22.5
Total Split (s)	24.0	24.0	36.0		36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%		60.0%	60.0%
Maximum Green (s)	19.5	19.5	31.5		31.5	31.5
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	4.5	4.5	4.5			4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	7.2	7.2	40.3			40.3
Actuated g/C Ratio	0.13	0.13	0.75			0.75
v/c Ratio	0.24	0.24	0.26			0.28
Control Delay	21.9	8.3	3.2			3.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	21.9	8.3	3.2			3.5
LOS	C	A	A			A
Approach Delay	14.8		3.2			3.5
Approach LOS	B		A			A
90th %ile Green (s)	9.0	9.0	31.5		31.5	31.5
90th %ile Term Code	Gap	Gap	MaxR		MaxR	MaxR
70th %ile Green (s)	7.8	7.8	32.8		32.8	32.8
70th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
50th %ile Green (s)	7.2	7.2	39.8		39.8	39.8
50th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
30th %ile Green (s)	6.2	6.2	46.5		46.5	46.5
30th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
10th %ile Green (s)	0.0	0.0	46.5		46.5	46.5
10th %ile Term Code	Skip	Skip	Dwell		Dwell	Dwell

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 53.6			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.28			
Intersection Signal Delay: 4.3		Intersection LOS: A	
Intersection Capacity Utilization 50.1%		ICU Level of Service A	
Analysis Period (min) 15			

90th %ile Actuated Cycle: 49.5
70th %ile Actuated Cycle: 49.6
50th %ile Actuated Cycle: 56
30th %ile Actuated Cycle: 61.7
10th %ile Actuated Cycle: 51

Splits and Phases: 2: Lyndale Avenue & W 70th St



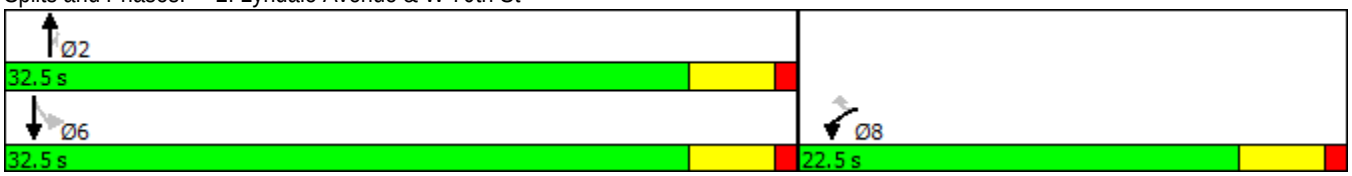
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	56	61	586	65	77	510
Future Volume (vph)	56	61	586	65	77	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		300	300	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98	1.00	
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.950				0.403	
Satd. Flow (perm)	1770	1583	1863	1545	750	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		64		68		
Link Speed (mph)	30		30			30
Link Distance (ft)	851		1984			2056
Travel Time (s)	19.3		45.1			46.7
Confl. Peds. (#/hr)				3	3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	58	64	610	68	80	531
Shared Lane Traffic (%)						
Lane Group Flow (vph)	58	64	610	68	80	531
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	6	20	20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	Perm	NA

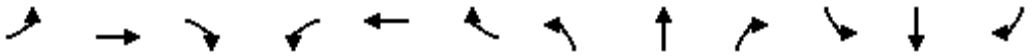
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	32.5	32.5	32.5	32.5
Total Split (%)	40.9%	40.9%	59.1%	59.1%	59.1%	59.1%
Maximum Green (s)	18.0	18.0	28.0	28.0	28.0	28.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	7.1	7.1	37.7	37.7	37.7	37.7
Actuated g/C Ratio	0.15	0.15	0.79	0.79	0.79	0.79
v/c Ratio	0.22	0.22	0.42	0.06	0.14	0.36
Control Delay	19.2	7.7	4.7	1.4	4.0	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	7.7	4.7	1.4	4.0	4.3
LOS	B	A	A	A	A	A
Approach Delay	13.2		4.4			4.2
Approach LOS	B		A			A
90th %ile Green (s)	8.8	8.8	28.0	28.0	28.0	28.0
90th %ile Term Code	Gap	Gap	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	7.6	7.6	29.2	29.2	29.2	29.2
70th %ile Term Code	Gap	Gap	Dwell	Dwell	Dwell	Dwell
50th %ile Green (s)	7.1	7.1	36.3	36.3	36.3	36.3
50th %ile Term Code	Gap	Gap	Dwell	Dwell	Dwell	Dwell
30th %ile Green (s)	0.0	0.0	43.0	43.0	43.0	43.0
30th %ile Term Code	Skip	Skip	Dwell	Dwell	Dwell	Dwell
10th %ile Green (s)	0.0	0.0	43.0	43.0	43.0	43.0
10th %ile Term Code	Skip	Skip	Dwell	Dwell	Dwell	Dwell

Intersection Summary			
Area Type:	Other		
Cycle Length: 55			
Actuated Cycle Length: 47.8			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.42			
Intersection Signal Delay: 5.1		Intersection LOS: A	
Intersection Capacity Utilization 50.5%		ICU Level of Service A	

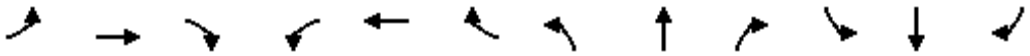
Analysis Period (min) 15
90th %ile Actuated Cycle: 45.8
70th %ile Actuated Cycle: 45.8
50th %ile Actuated Cycle: 52.4
30th %ile Actuated Cycle: 47.5
10th %ile Actuated Cycle: 47.5

Splits and Phases: 2: Lyndale Avenue & W 70th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	6	18	23	9	9	33	579	4	7	563	47
Future Volume (vph)	33	6	18	23	9	9	33	579	4	7	563	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		0.99			1.00			1.00			1.00	
Frt		0.957			0.970			0.999			0.989	
Flt Protected		0.972			0.973			0.997			0.999	
Satd. Flow (prot)	0	1724	0	0	1753	0	0	3525	0	0	3487	0
Flt Permitted		0.798			0.793			0.905			0.949	
Satd. Flow (perm)	0	1415	0	0	1426	0	0	3198	0	0	3312	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			10			1			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		989			1003			1438			1984	
Travel Time (s)		22.5			22.8			32.7			45.1	
Confl. Peds. (#/hr)	1		4	4		1	11		3	3		11
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	36	7	20	25	10	10	36	629	4	8	612	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	45	0	0	669	0	0	671	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												

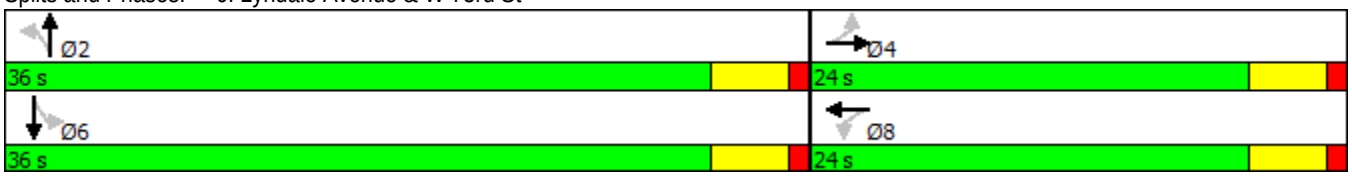


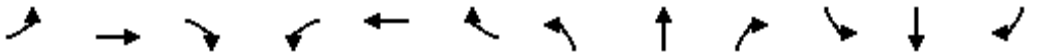
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	24.0	24.0		24.0	24.0		36.0	36.0		36.0	36.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%		60.0%	60.0%	
Maximum Green (s)	19.5	19.5		19.5	19.5		31.5	31.5		31.5	31.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		7.1			7.1			41.3			41.3	
Actuated g/C Ratio		0.14			0.14			0.80			0.80	
v/c Ratio		0.30			0.22			0.26			0.25	
Control Delay		18.1			18.3			3.0			2.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.1			18.3			3.0			2.9	
LOS		B			B			A			A	
Approach Delay		18.1			18.3			3.0			2.9	
Approach LOS		B			B			A			A	
90th %ile Green (s)	9.2	9.2		9.2	9.2		31.5	31.5		31.5	31.5	
90th %ile Term Code	Gap	Gap		Hold	Hold		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	7.8	7.8		7.8	7.8		32.5	32.5		32.5	32.5	
70th %ile Term Code	Gap	Gap		Hold	Hold		Dwell	Dwell		Dwell	Dwell	
50th %ile Green (s)	7.0	7.0		7.0	7.0		40.7	40.7		40.7	40.7	
50th %ile Term Code	Gap	Gap		Hold	Hold		Dwell	Dwell		Dwell	Dwell	
30th %ile Green (s)	0.0	0.0		0.0	0.0		46.5	46.5		46.5	46.5	
30th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell		Dwell	Dwell	
10th %ile Green (s)	0.0	0.0		0.0	0.0		46.5	46.5		46.5	46.5	
10th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell		Dwell	Dwell	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 51.5			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.30			
Intersection Signal Delay: 4.1		Intersection LOS: A	
Intersection Capacity Utilization 51.2%		ICU Level of Service A	
Analysis Period (min) 15			

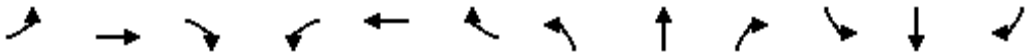
90th %ile Actuated Cycle: 49.7
70th %ile Actuated Cycle: 49.3
50th %ile Actuated Cycle: 56.7
30th %ile Actuated Cycle: 51
10th %ile Actuated Cycle: 51

Splits and Phases: 6: Lyndale Avenue & W 73rd St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	6	18	23	9	9	33	579	4	7	563	47
Future Volume (vph)	33	6	18	23	9	9	33	579	4	7	563	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.99		1.00	1.00		1.00	1.00	
Frt		0.957			0.970			0.999			0.988	
Flt Protected		0.972			0.973		0.950			0.950		
Satd. Flow (prot)	0	1718	0	0	1750	0	1770	1861	0	1770	1837	0
Flt Permitted		0.798			0.793		0.373			0.390		
Satd. Flow (perm)	0	1410	0	0	1422	0	692	1861	0	725	1837	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			10			1			11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		989			1003			1438			1984	
Travel Time (s)		22.5			22.8			32.7			45.1	
Confl. Peds. (#/hr)	1		4	4		1	11		3	3		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	7	20	25	10	10	36	629	4	8	612	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	45	0	36	633	0	8	663	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

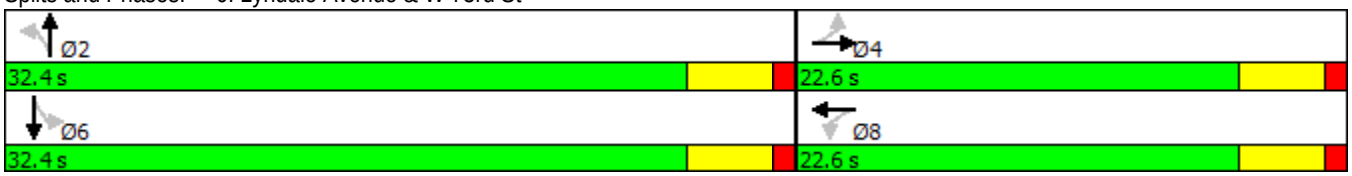


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	22.6	22.6		22.6	22.6		32.4	32.4		32.4	32.4	
Total Split (%)	41.1%	41.1%		41.1%	41.1%		58.9%	58.9%		58.9%	58.9%	
Maximum Green (s)	18.1	18.1		18.1	18.1		27.9	27.9		27.9	27.9	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		7.0			7.0		37.7	37.7		37.7	37.7	
Actuated g/C Ratio		0.15			0.15		0.79	0.79		0.79	0.79	
v/c Ratio		0.28			0.21		0.07	0.43		0.01	0.46	
Control Delay		16.4			16.5		3.7	4.8		3.4	5.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		16.4			16.5		3.7	4.8		3.4	5.0	
LOS		B			B		A	A		A	A	
Approach Delay		16.4			16.5			4.8			5.0	
Approach LOS		B			B			A			A	
90th %ile Green (s)	9.0	9.0		9.0	9.0		27.9	27.9		27.9	27.9	
90th %ile Term Code	Gap	Gap		Hold	Hold		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	7.6	7.6		7.6	7.6		28.7	28.7		28.7	28.7	
70th %ile Term Code	Gap	Gap		Hold	Hold		Dwell	Dwell		Dwell	Dwell	
50th %ile Green (s)	6.7	6.7		6.7	6.7		37.1	37.1		37.1	37.1	
50th %ile Term Code	Gap	Gap		Hold	Hold		Dwell	Dwell		Dwell	Dwell	
30th %ile Green (s)	0.0	0.0		0.0	0.0		42.9	42.9		42.9	42.9	
30th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell		Dwell	Dwell	
10th %ile Green (s)	0.0	0.0		0.0	0.0		42.9	42.9		42.9	42.9	
10th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell		Dwell	Dwell	

Intersection Summary			
Area Type:	Other		
Cycle Length: 55			
Actuated Cycle Length: 47.8			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.46			
Intersection Signal Delay: 5.8		Intersection LOS: A	
Intersection Capacity Utilization 45.5%		ICU Level of Service A	

Analysis Period (min) 15
90th %ile Actuated Cycle: 45.9
70th %ile Actuated Cycle: 45.3
50th %ile Actuated Cycle: 52.8
30th %ile Actuated Cycle: 47.4
10th %ile Actuated Cycle: 47.4

Splits and Phases: 6: Lyndale Avenue & W 73rd St

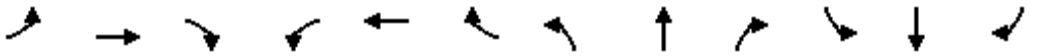


4: Lyndale Avenue & W 65th St

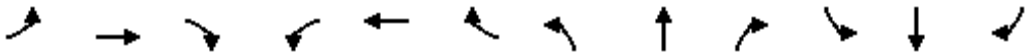
Direction	All
Future Volume (vph)	1690
Control Delay / Veh (s/v)	16
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	16
Total Delay (hr)	8
Stops / Veh	0.61
Stops (#)	1035
Average Speed (mph)	18
Total Travel Time (hr)	18
Distance Traveled (mi)	327
Fuel Consumed (gal)	25
Fuel Economy (mpg)	13.2
CO Emissions (kg)	1.73
NOx Emissions (kg)	0.34
VOC Emissions (kg)	0.40
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0

4: Lyndale Avenue & W 65th St

Direction	All
Future Volume (vph)	1691
Control Delay / Veh (s/v)	8
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	8
Total Delay (hr)	4
Stops / Veh	0.39
Stops (#)	667
Average Speed (mph)	22
Total Travel Time (hr)	15
Distance Traveled (mi)	328
Fuel Consumed (gal)	20
Fuel Economy (mpg)	16.3
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	123	39	54	148	69	36	415	60	131	438	93
Future Volume (vph)	85	123	39	54	148	69	36	415	60	131	438	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	175		0	120		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00			1.00		0.99	1.00		1.00	1.00	
Frt		0.976			0.962			0.981			0.974	
Flt Protected		0.983			0.990		0.950			0.950		
Satd. Flow (prot)	0	3386	0	0	3357	0	1770	3465	0	1770	3432	0
Flt Permitted		0.766			0.830		0.950			0.950		
Satd. Flow (perm)	0	2636	0	0	2813	0	1759	3465	0	1767	3432	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			70			27			49	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		784			1014			1302			897	
Travel Time (s)		17.8			23.0			29.6			20.4	
Confl. Peds. (#/hr)	4		5	5		4	13		3	3		13
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	87	126	40	55	151	70	37	423	61	134	447	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	253	0	0	276	0	37	484	0	134	542	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

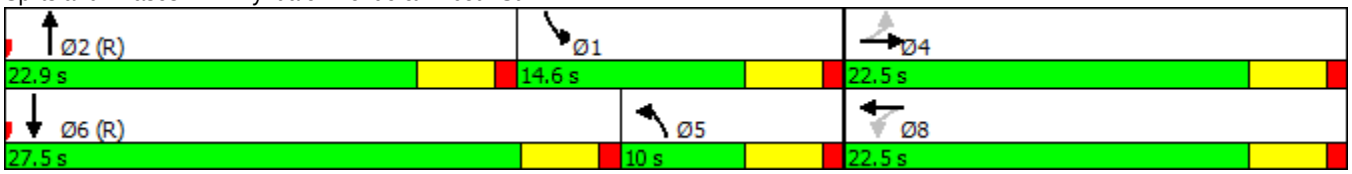


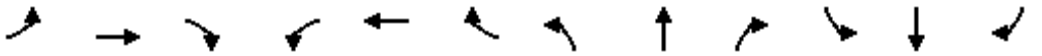
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.5	22.5		22.5	22.5		10.0	22.9		14.6	27.5	
Total Split (%)	37.5%	37.5%		37.5%	37.5%		16.7%	38.2%		24.3%	45.8%	
Maximum Green (s)	18.0	18.0		18.0	18.0		5.5	18.4		10.1	23.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		10.2			10.2		5.5	29.5		8.9	36.8	
Actuated g/C Ratio		0.17			0.17		0.09	0.49		0.15	0.61	
v/c Ratio		0.53			0.51		0.23	0.28		0.51	0.26	
Control Delay		22.8			19.6		22.3	16.6		30.5	6.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		22.8			19.6		22.3	16.6		30.5	6.7	
LOS		C			B		C	B		C	A	
Approach Delay		22.8			19.6			17.0			11.4	
Approach LOS		C			B			B			B	
90th %ile Green (s)	13.8	13.8		13.8	13.8		5.5	22.6		10.1	27.2	
90th %ile Term Code	Gap	Gap		Hold	Hold		Max	Coord		Max	Coord	
70th %ile Green (s)	11.7	11.7		11.7	11.7		5.5	24.7		10.1	29.3	
70th %ile Term Code	Gap	Gap		Hold	Hold		Max	Coord		Max	Coord	
50th %ile Green (s)	10.2	10.2		10.2	10.2		0.0	26.5		9.8	40.8	
50th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Coord		Gap	Coord	
30th %ile Green (s)	8.8	8.8		8.8	8.8		0.0	29.4		8.3	42.2	
30th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Coord		Gap	Coord	
10th %ile Green (s)	6.7	6.7		6.7	6.7		0.0	44.3		0.0	44.3	
10th %ile Term Code	Gap	Gap		Hold	Hold		Skip	Coord		Skip	Coord	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 54.5%		ICU Level of Service A	

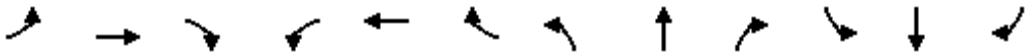
Analysis Period (min) 15

Splits and Phases: 4: Lyndale Avenue & W 65th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	123	39	54	148	69	36	415	60	131	438	93
Future Volume (vph)	85	123	39	54	148	69	36	415	60	131	438	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		200	300		260
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.99		0.99		0.99	1.00		0.98
Frt		0.976			0.962				0.850			0.850
Flt Protected		0.983			0.990		0.950			0.950		
Satd. Flow (prot)	0	3381	0	0	3348	0	1770	1863	1583	1770	1863	1583
Flt Permitted		0.767			0.831		0.481			0.498		
Satd. Flow (perm)	0	2634	0	0	2808	0	891	1863	1560	926	1863	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			70				61			95
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		784			1027			1302			897	
Travel Time (s)		17.8			23.3			29.6			20.4	
Confl. Peds. (#/hr)	4		5	5		4	13		3	3		13
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	87	126	40	55	151	70	37	423	61	134	447	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	253	0	0	276	0	37	423	61	134	447	95
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	23.0	23.0		23.0	23.0		32.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	41.8%	41.8%		41.8%	41.8%		58.2%	58.2%	58.2%	58.2%	58.2%	58.2%
Maximum Green (s)	18.5	18.5		18.5	18.5		27.5	27.5	27.5	27.5	27.5	27.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)		9.7			9.7		36.3	36.3	36.3	36.3	36.3	36.3
Actuated g/C Ratio		0.18			0.18		0.66	0.66	0.66	0.66	0.66	0.66
v/c Ratio		0.51			0.50		0.06	0.34	0.06	0.22	0.36	0.09
Control Delay		20.2			17.7		1.9	2.6	0.4	5.6	5.8	1.5
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		20.2			17.7		1.9	2.6	0.4	5.6	5.8	1.5
LOS		C			B		A	A	A	A	A	A
Approach Delay		20.2			17.7			2.3			5.1	
Approach LOS		C			B			A			A	
90th %ile Green (s)	13.1	13.1		13.1	13.1		32.9	32.9	32.9	32.9	32.9	32.9
90th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord
70th %ile Green (s)	11.1	11.1		11.1	11.1		34.9	34.9	34.9	34.9	34.9	34.9
70th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord
50th %ile Green (s)	9.7	9.7		9.7	9.7		36.3	36.3	36.3	36.3	36.3	36.3
50th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord
30th %ile Green (s)	8.4	8.4		8.4	8.4		37.6	37.6	37.6	37.6	37.6	37.6
30th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord
10th %ile Green (s)	6.4	6.4		6.4	6.4		39.6	39.6	39.6	39.6	39.6	39.6
10th %ile Term Code	Gap	Gap		Hold	Hold		Coord	Coord	Coord	Coord	Coord	Coord

Intersection Summary	
Area Type:	Other
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 29 (53%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 8.5	Intersection LOS: A

Intersection Capacity Utilization 61.4% ICU Level of Service B
Analysis Period (min) 15

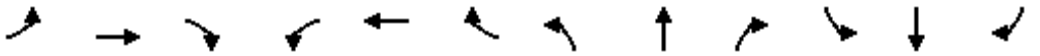
Splits and Phases: 4: Lyndale Avenue & W 65th St

11: Lyndale Avenue & W 67th St

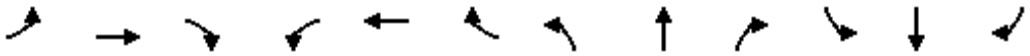
Direction	All
Future Volume (vph)	1222
Control Delay / Veh (s/v)	8
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	8
Total Delay (hr)	3
Stops / Veh	0.42
Stops (#)	508
Average Speed (mph)	24
Total Travel Time (hr)	15
Distance Traveled (mi)	362
Fuel Consumed (gal)	20
Fuel Economy (mpg)	18.3
CO Emissions (kg)	1.38
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.32
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0

11: Lyndale Avenue & W 67th St

Direction	All
Future Volume (vph)	1222
Control Delay / Veh (s/v)	6
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	6
Total Delay (hr)	2
Stops / Veh	0.35
Stops (#)	422
Average Speed (mph)	26
Total Travel Time (hr)	14
Distance Traveled (mi)	362
Fuel Consumed (gal)	19
Fuel Economy (mpg)	19.3
CO Emissions (kg)	1.31
NOx Emissions (kg)	0.25
VOC Emissions (kg)	0.30
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	3	18	73	1	80	10	516	39	27	422	17
Future Volume (vph)	16	3	18	73	1	80	10	516	39	27	422	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		50	0		50	40		0	70		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor							1.00	1.00				
Frt			0.850			0.850		0.990			0.994	
Flt Protected		0.959			0.953		0.950			0.950		
Satd. Flow (prot)	0	1786	1583	0	1775	1583	1770	3498	0	1770	3518	0
Flt Permitted		0.731			0.714		0.484			0.423		
Satd. Flow (perm)	0	1362	1583	0	1330	1583	900	3498	0	788	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109			109		15			8	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		609			787			2056			1302	
Travel Time (s)		13.8			17.9			46.7			29.6	
Confl. Peds. (#/hr)							2		2			
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	17	3	19	78	1	85	11	549	41	29	449	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	19	0	79	85	11	590	0	29	467	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	5	2		1	6	
Switch Phase												

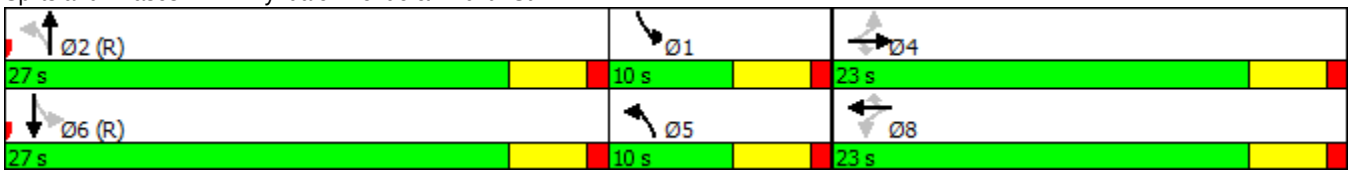


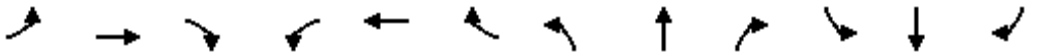
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	9.5	22.5		9.5	22.5	
Total Split (s)	23.0	23.0	23.0	23.0	23.0	23.0	10.0	27.0		10.0	27.0	
Total Split (%)	38.3%	38.3%	38.3%	38.3%	38.3%	38.3%	16.7%	45.0%		16.7%	45.0%	
Maximum Green (s)	18.5	18.5	18.5	18.5	18.5	18.5	5.5	22.5		5.5	22.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0			0	
Act Effct Green (s)		8.8	8.8		8.8	8.8	44.6	41.1		45.5	43.1	
Actuated g/C Ratio		0.15	0.15		0.15	0.15	0.74	0.68		0.76	0.72	
v/c Ratio		0.10	0.06		0.41	0.26	0.01	0.25		0.04	0.18	
Control Delay		21.7	0.3		28.7	5.7	3.5	6.2		3.9	8.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		21.7	0.3		28.7	5.7	3.5	6.2		3.9	8.1	
LOS		C	A		C	A	A	A		A	A	
Approach Delay		11.3			16.8			6.2			7.9	
Approach LOS		B			B			A			A	
90th %ile Green (s)	12.4	12.4	12.4	12.4	12.4	12.4	5.5	28.6		5.5	28.6	
90th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Max	Coord		Max	Coord	
70th %ile Green (s)	10.2	10.2	10.2	10.2	10.2	10.2	0.0	30.8		5.5	40.8	
70th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Skip	Coord		Max	Coord	
50th %ile Green (s)	8.7	8.7	8.7	8.7	8.7	8.7	0.0	42.3		0.0	42.3	
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Skip	Coord		Skip	Coord	
30th %ile Green (s)	7.2	7.2	7.2	7.2	7.2	7.2	0.0	43.8		0.0	43.8	
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Skip	Coord		Skip	Coord	
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.5		0.0	55.5	
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Skip	Skip	Coord		Skip	Coord	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 40.7%		ICU Level of Service A	

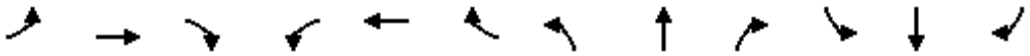
Analysis Period (min) 15

Splits and Phases: 11: Lyndale Avenue & W 67th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	3	18	73	1	80	10	516	39	27	422	17
Future Volume (vph)	16	3	18	73	1	80	10	516	39	27	422	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	0		50	300		0	300		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00	1.00		1.00	1.00	
Frt			0.850			0.850		0.990			0.994	
Flt Protected		0.959			0.953		0.950			0.950		
Satd. Flow (prot)	0	1786	1583	0	1775	1583	1770	1841	0	1770	1850	0
Flt Permitted		0.728			0.714		0.479			0.402		
Satd. Flow (perm)	0	1356	1583	0	1330	1583	891	1841	0	748	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			30			85		10			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		609			787			2056			1302	
Travel Time (s)		13.8			17.9			46.7			29.6	
Confl. Peds. (#/hr)							2		2	2		2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	3	19	78	1	85	11	549	41	29	449	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	20	19	0	79	85	11	590	0	29	467	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	

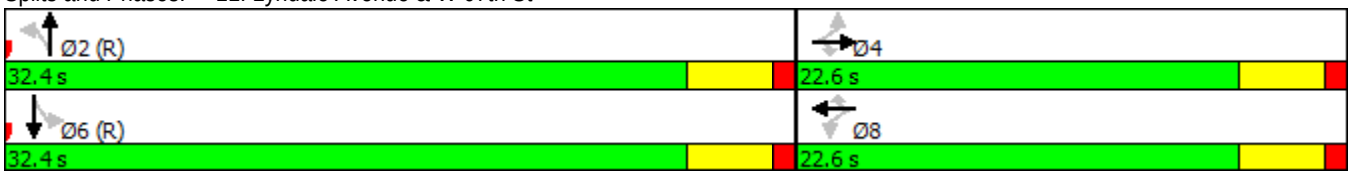


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	22.6	22.6	22.6	22.6	22.6	22.6	32.4	32.4		32.4	32.4	
Total Split (%)	41.1%	41.1%	41.1%	41.1%	41.1%	41.1%	58.9%	58.9%		58.9%	58.9%	
Maximum Green (s)	18.1	18.1	18.1	18.1	18.1	18.1	27.9	27.9		27.9	27.9	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)		8.5	8.5		8.5	8.5	40.4	40.4		40.4	40.4	
Actuated g/C Ratio		0.15	0.15		0.15	0.15	0.73	0.73		0.73	0.73	
v/c Ratio		0.10	0.07		0.38	0.27	0.02	0.44		0.05	0.34	
Control Delay		19.4	6.6		25.5	7.7	3.8	5.6		2.5	2.8	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		19.4	6.6		25.5	7.7	3.8	5.6		2.5	2.8	
LOS		B	A		C	A	A	A		A	A	
Approach Delay		13.2			16.3			5.5			2.8	
Approach LOS		B			B			A			A	
90th %ile Green (s)	11.9	11.9	11.9	11.9	11.9	11.9	34.1	34.1		34.1	34.1	
90th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord		Coord	Coord	
70th %ile Green (s)	9.9	9.9	9.9	9.9	9.9	9.9	36.1	36.1		36.1	36.1	
70th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord		Coord	Coord	
50th %ile Green (s)	8.4	8.4	8.4	8.4	8.4	8.4	37.6	37.6		37.6	37.6	
50th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord		Coord	Coord	
30th %ile Green (s)	7.0	7.0	7.0	7.0	7.0	7.0	39.0	39.0		39.0	39.0	
30th %ile Term Code	Hold	Hold	Hold	Gap	Gap	Gap	Coord	Coord		Coord	Coord	
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	0.0	50.5	50.5		50.5	50.5	
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Skip	Coord	Coord		Coord	Coord	

Intersection Summary	
Area Type:	Other
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 6.1	Intersection LOS: A

Intersection Capacity Utilization 49.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 11: Lyndale Avenue & W 67th St



2: Lyndale Avenue & W 70th St

Direction	All
Future Volume (vph)	1355
Control Delay / Veh (s/v)	4
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	4
Total Delay (hr)	2
Stops / Veh	0.33
Stops (#)	444
Average Speed (mph)	27
Total Travel Time (hr)	18
Distance Traveled (mi)	492
Fuel Consumed (gal)	24
Fuel Economy (mpg)	20.6
CO Emissions (kg)	1.67
NOx Emissions (kg)	0.33
VOC Emissions (kg)	0.39
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0

2: Lyndale Avenue & W 70th St

Direction	All
Future Volume (vph)	1355
Control Delay / Veh (s/v)	5
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	5
Total Delay (hr)	2
Stops / Veh	0.37
Stops (#)	506
Average Speed (mph)	27
Total Travel Time (hr)	18
Distance Traveled (mi)	492
Fuel Consumed (gal)	24
Fuel Economy (mpg)	20.1
CO Emissions (kg)	1.71
NOx Emissions (kg)	0.33
VOC Emissions (kg)	0.40
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0

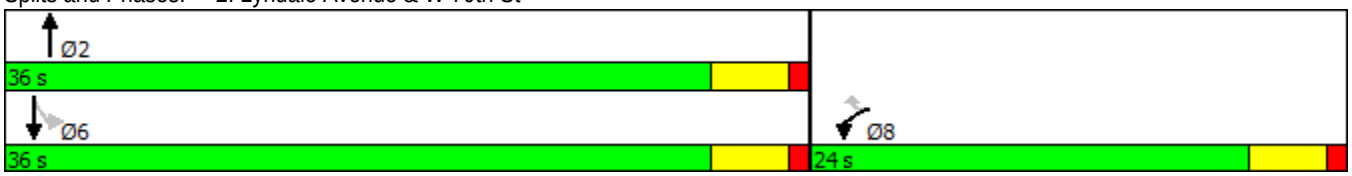
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	56	61	586	65	77	510
Future Volume (vph)	56	61	586	65	77	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor			1.00			1.00
Frt		0.850	0.985			
Flt Protected	0.950					0.993
Satd. Flow (prot)	1770	1583	3477	0	0	3514
Flt Permitted	0.950					0.810
Satd. Flow (perm)	1770	1583	3477	0	0	2866
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		64	30			
Link Speed (mph)	30		30			30
Link Distance (ft)	852		1984			2056
Travel Time (s)	19.4		45.1			46.7
Confl. Peds. (#/hr)				3	3	
Confl. Bikes (#/hr)						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	58	64	610	68	80	531
Shared Lane Traffic (%)						
Lane Group Flow (vph)	58	64	678	0	0	611
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2		1	2
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (ft)	20	20	100		20	100
Trailing Detector (ft)	0	0	0		0	0
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phase	8	8	2		6	6
Switch Phase						

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	22.5	22.5	22.5		22.5	22.5
Total Split (s)	24.0	24.0	36.0		36.0	36.0
Total Split (%)	40.0%	40.0%	60.0%		60.0%	60.0%
Maximum Green (s)	19.5	19.5	31.5		31.5	31.5
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0			0.0
Total Lost Time (s)	4.5	4.5	4.5			4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0		3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0		0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0		0.0	0.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	7.2	7.2	40.3			40.3
Actuated g/C Ratio	0.13	0.13	0.75			0.75
v/c Ratio	0.24	0.24	0.26			0.28
Control Delay	21.9	8.3	3.2			3.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	21.9	8.3	3.2			3.5
LOS	C	A	A			A
Approach Delay	14.8		3.2			3.5
Approach LOS	B		A			A
90th %ile Green (s)	9.0	9.0	31.5		31.5	31.5
90th %ile Term Code	Gap	Gap	MaxR		MaxR	MaxR
70th %ile Green (s)	7.8	7.8	32.8		32.8	32.8
70th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
50th %ile Green (s)	7.2	7.2	39.8		39.8	39.8
50th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
30th %ile Green (s)	6.2	6.2	46.5		46.5	46.5
30th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
10th %ile Green (s)	0.0	0.0	46.5		46.5	46.5
10th %ile Term Code	Skip	Skip	Dwell		Dwell	Dwell

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 53.6			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.28			
Intersection Signal Delay: 4.3		Intersection LOS: A	
Intersection Capacity Utilization 50.1%		ICU Level of Service A	
Analysis Period (min) 15			

90th %ile Actuated Cycle: 49.5
70th %ile Actuated Cycle: 49.6
50th %ile Actuated Cycle: 56
30th %ile Actuated Cycle: 61.7
10th %ile Actuated Cycle: 51

Splits and Phases: 2: Lyndale Avenue & W 70th St



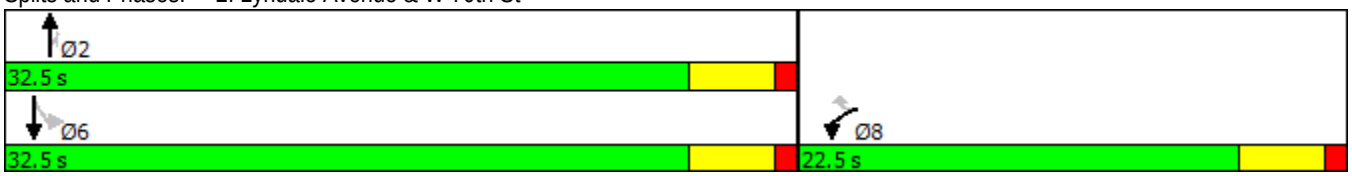
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	56	61	586	65	77	510
Future Volume (vph)	56	61	586	65	77	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		300	300	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.98	1.00	
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.950				0.403	
Satd. Flow (perm)	1770	1583	1863	1545	750	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		64		68		
Link Speed (mph)	30		30			30
Link Distance (ft)	851		1984			2056
Travel Time (s)	19.3		45.1			46.7
Confl. Peds. (#/hr)				3	3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	58	64	610	68	80	531
Shared Lane Traffic (%)						
Lane Group Flow (vph)	58	64	610	68	80	531
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	6	20	20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	Perm	NA

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	32.5	32.5	32.5	32.5
Total Split (%)	40.9%	40.9%	59.1%	59.1%	59.1%	59.1%
Maximum Green (s)	18.0	18.0	28.0	28.0	28.0	28.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	7.1	7.1	37.7	37.7	37.7	37.7
Actuated g/C Ratio	0.15	0.15	0.79	0.79	0.79	0.79
v/c Ratio	0.22	0.22	0.42	0.06	0.14	0.36
Control Delay	19.2	7.7	4.7	1.4	4.0	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	7.7	4.7	1.4	4.0	4.3
LOS	B	A	A	A	A	A
Approach Delay	13.2		4.4			4.2
Approach LOS	B		A			A
90th %ile Green (s)	8.8	8.8	28.0	28.0	28.0	28.0
90th %ile Term Code	Gap	Gap	MaxR	MaxR	MaxR	MaxR
70th %ile Green (s)	7.6	7.6	29.2	29.2	29.2	29.2
70th %ile Term Code	Gap	Gap	Dwell	Dwell	Dwell	Dwell
50th %ile Green (s)	7.1	7.1	36.3	36.3	36.3	36.3
50th %ile Term Code	Gap	Gap	Dwell	Dwell	Dwell	Dwell
30th %ile Green (s)	0.0	0.0	43.0	43.0	43.0	43.0
30th %ile Term Code	Skip	Skip	Dwell	Dwell	Dwell	Dwell
10th %ile Green (s)	0.0	0.0	43.0	43.0	43.0	43.0
10th %ile Term Code	Skip	Skip	Dwell	Dwell	Dwell	Dwell

Intersection Summary			
Area Type:	Other		
Cycle Length: 55			
Actuated Cycle Length: 47.8			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.42			
Intersection Signal Delay: 5.1		Intersection LOS: A	
Intersection Capacity Utilization 50.5%		ICU Level of Service A	

Analysis Period (min) 15
90th %ile Actuated Cycle: 45.8
70th %ile Actuated Cycle: 45.8
50th %ile Actuated Cycle: 52.4
30th %ile Actuated Cycle: 47.5
10th %ile Actuated Cycle: 47.5

Splits and Phases: 2: Lyndale Avenue & W 70th St

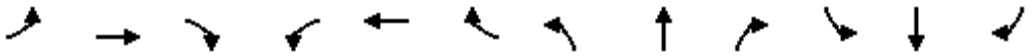


6: Lyndale Avenue & W 73rd St

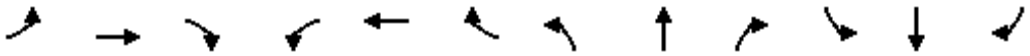
Direction	All
Future Volume (vph)	1331
Control Delay / Veh (s/v)	4
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	4
Total Delay (hr)	2
Stops / Veh	0.30
Stops (#)	398
Average Speed (mph)	27
Total Travel Time (hr)	15
Distance Traveled (mi)	418
Fuel Consumed (gal)	21
Fuel Economy (mpg)	20.4
CO Emissions (kg)	1.43
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.33
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0

6: Lyndale Avenue & W 73rd St

Direction	All
Future Volume (vph)	1331
Control Delay / Veh (s/v)	6
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	6
Total Delay (hr)	2
Stops / Veh	0.41
Stops (#)	552
Average Speed (mph)	26
Total Travel Time (hr)	16
Distance Traveled (mi)	418
Fuel Consumed (gal)	22
Fuel Economy (mpg)	19.2
CO Emissions (kg)	1.53
NOx Emissions (kg)	0.30
VOC Emissions (kg)	0.35
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	6	18	23	9	9	33	579	4	7	563	47
Future Volume (vph)	33	6	18	23	9	9	33	579	4	7	563	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		0.99			1.00			1.00			1.00	
Frt		0.957			0.970			0.999			0.989	
Flt Protected		0.972			0.973			0.997			0.999	
Satd. Flow (prot)	0	1724	0	0	1753	0	0	3525	0	0	3487	0
Flt Permitted		0.798			0.793			0.905			0.949	
Satd. Flow (perm)	0	1415	0	0	1426	0	0	3198	0	0	3312	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			10			1			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		989			1003			1438			1984	
Travel Time (s)		22.5			22.8			32.7			45.1	
Confl. Peds. (#/hr)	1		4	4		1	11		3	3		11
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	36	7	20	25	10	10	36	629	4	8	612	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	45	0	0	669	0	0	671	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												

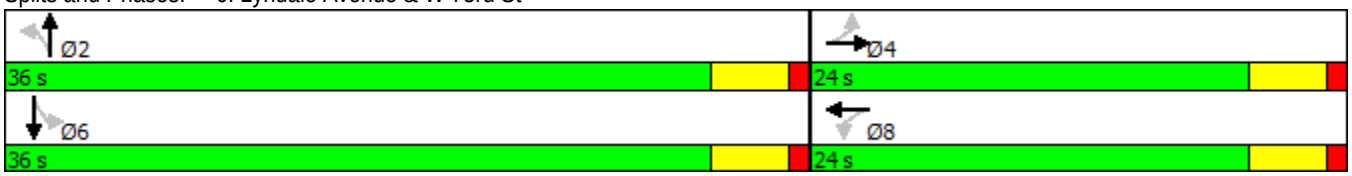


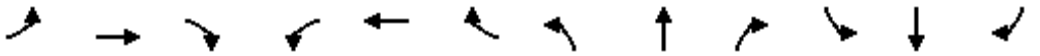
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	24.0	24.0		24.0	24.0		36.0	36.0		36.0	36.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%		60.0%	60.0%	
Maximum Green (s)	19.5	19.5		19.5	19.5		31.5	31.5		31.5	31.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		7.1			7.1			41.3			41.3	
Actuated g/C Ratio		0.14			0.14			0.80			0.80	
v/c Ratio		0.30			0.22			0.26			0.25	
Control Delay		18.1			18.3			3.0			2.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.1			18.3			3.0			2.9	
LOS		B			B			A			A	
Approach Delay		18.1			18.3			3.0			2.9	
Approach LOS		B			B			A			A	
90th %ile Green (s)	9.2	9.2		9.2	9.2		31.5	31.5		31.5	31.5	
90th %ile Term Code	Gap	Gap		Hold	Hold		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	7.8	7.8		7.8	7.8		32.5	32.5		32.5	32.5	
70th %ile Term Code	Gap	Gap		Hold	Hold		Dwell	Dwell		Dwell	Dwell	
50th %ile Green (s)	7.0	7.0		7.0	7.0		40.7	40.7		40.7	40.7	
50th %ile Term Code	Gap	Gap		Hold	Hold		Dwell	Dwell		Dwell	Dwell	
30th %ile Green (s)	0.0	0.0		0.0	0.0		46.5	46.5		46.5	46.5	
30th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell		Dwell	Dwell	
10th %ile Green (s)	0.0	0.0		0.0	0.0		46.5	46.5		46.5	46.5	
10th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell		Dwell	Dwell	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 51.5			
Natural Cycle: 45			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.30			
Intersection Signal Delay: 4.1		Intersection LOS: A	
Intersection Capacity Utilization 51.2%		ICU Level of Service A	
Analysis Period (min) 15			

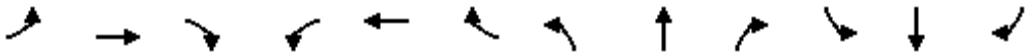
90th %ile Actuated Cycle: 49.7
70th %ile Actuated Cycle: 49.3
50th %ile Actuated Cycle: 56.7
30th %ile Actuated Cycle: 51
10th %ile Actuated Cycle: 51

Splits and Phases: 6: Lyndale Avenue & W 73rd St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	6	18	23	9	9	33	579	4	7	563	47
Future Volume (vph)	33	6	18	23	9	9	33	579	4	7	563	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	300		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.99		1.00	1.00		1.00	1.00	
Frt		0.957			0.970			0.999			0.988	
Flt Protected		0.972			0.973		0.950			0.950		
Satd. Flow (prot)	0	1718	0	0	1750	0	1770	1861	0	1770	1837	0
Flt Permitted		0.798			0.793		0.373			0.390		
Satd. Flow (perm)	0	1410	0	0	1422	0	692	1861	0	725	1837	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			10			1			11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		989			1003			1438			1984	
Travel Time (s)		22.5			22.8			32.7			45.1	
Confl. Peds. (#/hr)	1		4	4		1	11		3	3		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	7	20	25	10	10	36	629	4	8	612	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	45	0	36	633	0	8	663	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	

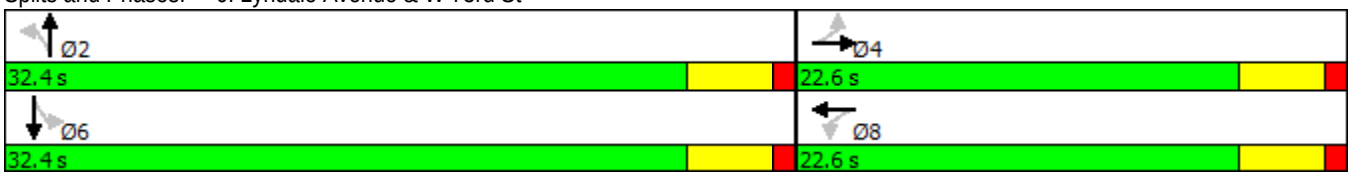


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	22.6	22.6		22.6	22.6		32.4	32.4		32.4	32.4	
Total Split (%)	41.1%	41.1%		41.1%	41.1%		58.9%	58.9%		58.9%	58.9%	
Maximum Green (s)	18.1	18.1		18.1	18.1		27.9	27.9		27.9	27.9	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		7.0			7.0		37.7	37.7		37.7	37.7	
Actuated g/C Ratio		0.15			0.15		0.79	0.79		0.79	0.79	
v/c Ratio		0.28			0.21		0.07	0.43		0.01	0.46	
Control Delay		16.4			16.5		3.7	4.8		3.4	5.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		16.4			16.5		3.7	4.8		3.4	5.0	
LOS		B			B		A	A		A	A	
Approach Delay		16.4			16.5			4.8			5.0	
Approach LOS		B			B			A			A	
90th %ile Green (s)	9.0	9.0		9.0	9.0		27.9	27.9		27.9	27.9	
90th %ile Term Code	Gap	Gap		Hold	Hold		MaxR	MaxR		MaxR	MaxR	
70th %ile Green (s)	7.6	7.6		7.6	7.6		28.7	28.7		28.7	28.7	
70th %ile Term Code	Gap	Gap		Hold	Hold		Dwell	Dwell		Dwell	Dwell	
50th %ile Green (s)	6.7	6.7		6.7	6.7		37.1	37.1		37.1	37.1	
50th %ile Term Code	Gap	Gap		Hold	Hold		Dwell	Dwell		Dwell	Dwell	
30th %ile Green (s)	0.0	0.0		0.0	0.0		42.9	42.9		42.9	42.9	
30th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell		Dwell	Dwell	
10th %ile Green (s)	0.0	0.0		0.0	0.0		42.9	42.9		42.9	42.9	
10th %ile Term Code	Skip	Skip		Skip	Skip		Dwell	Dwell		Dwell	Dwell	

Intersection Summary			
Area Type:	Other		
Cycle Length: 55			
Actuated Cycle Length: 47.8			
Natural Cycle: 55			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.46			
Intersection Signal Delay: 5.8		Intersection LOS: A	
Intersection Capacity Utilization 45.5%		ICU Level of Service A	

Analysis Period (min) 15
90th %ile Actuated Cycle: 45.9
70th %ile Actuated Cycle: 45.3
50th %ile Actuated Cycle: 52.8
30th %ile Actuated Cycle: 47.4
10th %ile Actuated Cycle: 47.4

Splits and Phases: 6: Lyndale Avenue & W 73rd St



Note to Reviewers: We believe we only need to report emissions reductions for “Total Parallel Roadways” if we are constructing a new roadway segment, which we are not. We are under Measure B: Roadway projects that do not include new roadway segments or railroad grade separation elements.

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
n/a	Lyndale Ave	TH 62 to 76th Street in Richfield, MN	000+00.237	001+00.958	Hennepin Co.	1/1/2013	12/31/2015

Description of Proposed Work: Reconstruction of Lyndale Avenue between TH 62 and 76th Street

Accident Diagram Codes			1 Rear End	2 Sideswipe Same Direction	3 Left Turn Main Line	5 Right Angle	4,7 Ran off Road	8, 9 Head On/ Sideswipe - Opposite Direction	Pedestrian	6, 90, 99 Other	Total
Study Period: Number of Crashes	Fatal	F									
	Personal Injury (PI)	A				1					1
		B								1	1
		C	9		2	6	1	2		5	25
	Property Damage	PD	8	2	5	5	4	2		5	31
% Change in Crashes *Use Desktop Reference for Crash Reduction Factors	Fatal	F									
	PI	A				-25.2%					
		B								-25.2%	
		C	-25.2%		-25.2%	-25.2%	-25.2%	-25.2%		-25.2%	
	Property Damage	PD	-25.2%	-25.2%	-25.2%	-25.2%	-25.2%	-25.2%		-25.2%	
Change in Crashes = No. of crashes x % change in crashes	Fatal	F									
	PI	A				-0.25					-0.25
		B								-0.25	-0.25
		C	-2.27		-0.50	-1.51	-0.25	-0.50		-1.26	-6.30
	Property Damage	PD	-2.02	-0.50	-1.26	-1.26	-1.01	-0.50		-1.26	-7.81

Year (Safety Improvement Construction): 2020

Project Cost (exclude Right of Way): $ 10,789,577

Right of Way Costs (optional):

Traffic Growth Factor[1]: 1.0%

Capital Recovery

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

Type of Crash	Study Period: Change in Crashes	Annual Change in Crashes	Cost per Crash	Annual Benefit
F			$ 1,140,000	
A	-0.25	-0.08	$ 570,000	$ 47,924
B	-0.25	-0.08	$ 170,000	$ 14,293
C	-6.30	-2.10	$ 83,000	$ 174,459
PD	-7.81	-2.61	$ 7,600	$ 19,808
Total				$ 256,485

B/C= 0.43

Using present worth values,

B= $ 4,678,896

C= $ 10,789,577

See "Calculations" sheet for amortization.

Office of Traffic, Safety and Technology **August 2015**

[1]Traffic Growth Factor was calculated using Richfield's 2030 Comprehensive Plan, comparing 2006 Volumes (14,100) and Projected 2030 Volumes (17,900).

[2]Project Service Life chosen as 20 years, in accordance with Appendix C from HSIP guidance, "Recommended Service Life"

Guiding Principles

Transportation • Land Use • Public Realm • Open Space

Richfield
Transportation
Commission

I. Multimodal Design

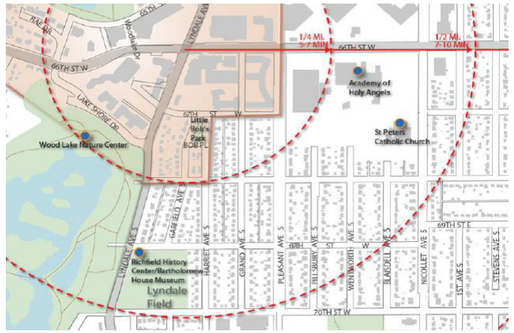
Multimodal Design *of public rights of way will be consistent with the City's Complete Streets policy and will utilize innovative and non-traditional design standards in a way that is equitable for all modes/ users, inter-modal activities, and is respectful of the surrounding community.*

- Provide pedestrian facilities and amenities within the right of way
- Provide bike lanes at least 5 feet wide
- Include transit facilities, plan for intermodal transfers, and provide bike lockers & racks
- Add bike rentals and Nice Ride stations

II. Connectivity and Public Realm

The street and public right-of-way network will be used to connect various **Public Realm** *amenities so that a range of inter-modal activities (walking, biking, driving, etc.) support how neighborhood residents travel to and from destinations such as schools, parks/open space, shops and businesses.*

- Provide a well-connected network of streets, paths & transit
- Accomodate multimodal connections to local destinations
- Enhance connections to the regional transit and bicycle networks
- Implement signage and way-finding



III. Local Economy

Community improvements and reinvestment will reinforce and support all businesses in the **Local Economy** *and provide a safe and more convenient way to access and connect for neighbors, residents, pedestrians, cyclists and motorists.*

- Maintain/improve visibility and convenient access to businesses
- Employ parking strategies that provide safe access for all users and modes of movement
- Provide wider retail sidewalks that support a variety of users and uses
- Promote building use and type that reinforces street enclosure and defines the public realm

IV. Design for People

How people use community amenities and facilities is the most important criteria regarding the planning, engineering, implementation and maintenance of any improvement. **Design for People** *will address universal accessibility as well as comfort, safety, and convenience for all users.*

- Provide comfortable places to sit and walk
- Employ Complete Streets design that emphasizes all users
- Design streets that are a human scale with narrower lane widths, bump-outs, etc.
- Plant boulevard and shade trees

V. Community Character and Identity

The design and implementation of community facilities and improvements will recognize the **Community Character** *of single family residential scale and pattern and will also respond to local features such as natural resources, public art, aesthetics and gateways.*

- Respond to residential neighborhood use and scale with appropriate street size and speeds
- Design wayfinding that represents local character
- Maintain a mature tree canopy
- Incorporate opportunities for public art

VI. Sustainable Solutions

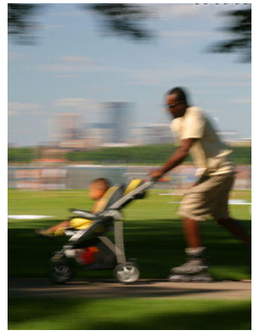
New improvements, growth and development will utilize **Sustainable Solutions** *that are adaptable, flexible, built to last and that consider implications of long term maintenance to ensure the future economic, environmental and social health of the community.*

- Understand the environmental setting and context of the area
- Incorporate green stormwater practices such as rain gardens, tree trenches and pervious pavers
- Bury utilities where possible
- Accommodate future maintenance and operations with dedicated funding sources

VII. Healthy and Active Lifestyles

Elements will be incorporated into planning and design efforts to encourage comfortable corridors and places to walk and bike to, safe and well-landscaped routes that inter-connect the community, and promote **Healthy and Active Lifestyles.**

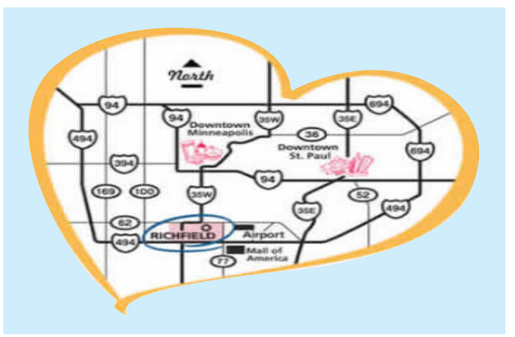
- Create safe, convenient, and fun non-motorized travel opportunities
- Design a safe, well-defined network of routes to walk and bike to school
- Provide well-marked, designed, and visible street crossings
- Implement signage and way-finding



VIII. Unique Location

Community and transportation improvements will support a well-designed and functional regional system which complements local land uses, and capitalizes on Richfield's **Unique Location** *through enhanced access to the regional multimodal transportation system to improve livability and convenience.*

- Emphasize design that accommodates local traffic over through traffic
- Enhance regional transit and trail connections
- Maintain convenient freeway access



City Council

Debbie Goettel, *Mayor*
Pat Elliott
Tom Fitzhenry
Edwina Garcia
Sue Sandahl

Transportation Commission

Martin Kirsch, *Chair*
Terry Ahlstrom
Ghislaine Ball
Tim Carter
Steve Hurvitz
Gary Ness
Kenneth Severson
Patrick Sorenson
David Taylor

Workshop Participants

Gerry Charnitz, *Chair, Community Services Commission*
Bob Shotwell, *Community Services Commission*
Jennifer Bornholdt, *Chamber of Commerce*
Laura Barrett, *Chamber of Commerce*
Joe Hoover, *Resident*
MaryKaye Champa, *Arts Commission*
Kevin Klos, *Arts Commission*
Dan Kitzberger, *Planning Commission*
Joshua Root, *Planning Commission*
Chris Olson, *Advisory Board of Health*
Kathy Rappos, *Bike Advisory Group*
Flynn Rico-Johnson, *Do.town*
Katherine Bass, *Edina Transportation Commission*
Maury Hooper, *Hennepin County*

Staff

Mike Eastling, *Public Works Director*
Kristin Asher, *City Engineer*
Karen Barton, *Community Development Manager*
Jeff Pearson, *Transportation Engineer*
John Stark, *Community Development Director*
Liz Finnegan, *Civil Engineer*
Jack Broz, *HR Green, Inc*
Mike Lamb, *Barr Engineering*
Tim Lamkin, Jr, *HR Green, Inc*
Dan Edgerton, *HR Green, Inc*

Contact Information:

City of Richfield Public Works
Mike Eastling, *Director*
Kristin Asher, *Assistant Director & City Engineer*
Jeff Pearson, *Transportation Engineer*

1901 E. 66th Street
Richfield, MN 55423
612.861.9170

MINNESOTA DEPARTMENT OF TRANSPORTATION

THE CITY OF RICHFIELD
HENNEPIN COUNTY

LYNDALE AVENUE ROADWAY IMPROVEMENTS

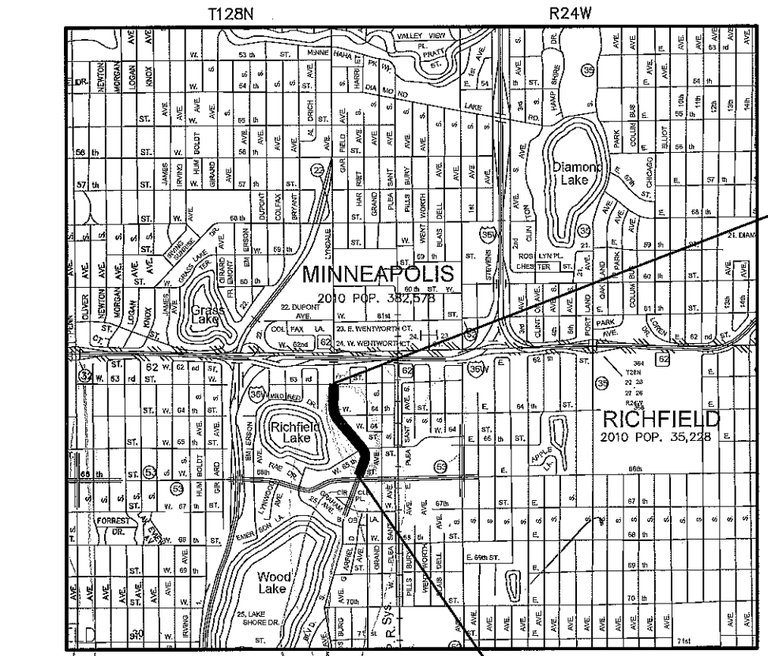
66TH STREET W TO 63RD STREET W
RICHFIELD CITY PROJECT NO. 41014
S.A.P. NO. 157-363-030

CONSTRUCTION PLANS FOR SEAL COATING, SIGNING, STRIPING, PAVEMENT MARKING, PEDESTRTIAN CROSSING SYSTEM, AND LANDSCAPING

LOCATED ON: LYNDALE AVENUE BETWEEN 66TH STREET WEST AND 63RD STREET WEST (GEOGRAPHIC DESCRIPTION)

LYNDALE AVENUE
STATE AID PROJ. NO. 157--363--030

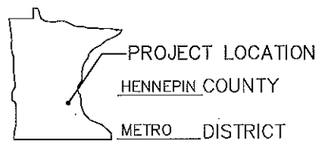
GROSS LENGTH	2,151	FEET	0.407	MILES
BRIDGE LENGTH	0	FEET	0	MILES
EXCEPTION LENGTH	0	FEET	0	MILES
NET LENGTH	2,151	FEET	0.407	MILES



PLAN SET SCALES

LOCATION MAP 0 1500 3000

PLAN 0 25 50



DESIGN DESIGNATION: LYNDALE AVENUE – (S.A.P. 157-363-030)
STA. 0+40.00 TO 21+91.00

Functional Classification: MINOR RELIEVER

No. of Traffic Lanes	= 4	No. of Parking Lanes = 0	
ADT (Current Year) 2013	= 14,700	Design Speed 35 mph	
ADT (Future Year) 2033	= 16,300	Based on STOPPING Sight Distance	
DHV (Design Hr. Vol.)	= N.A.	Height of eye 3.5 Height of Object 2.0'	
D (Directional Distr.)	= 50 %	Design Speed not achieved at: N.A.	
T (Heavy Commercial)	= 2 %	STA. N.A. TO STA. N.A. MPH N.A.	
R-Value N.A.	20 YR ESALS N.A.	Design Load 10 ton	

GOPHER STATE ONE CALL SYSTEM.....1-800-252-1166

GOVERNING SPECIFICATIONS

THE 2014 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AND THE 2014 EDITION OF THE "MATERIALS LAB SUPPLEMENTAL SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

INDEX

THIS PLAN SET CONTAINS 17 SHEETS

Kimley»Horn

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

DATE 07/07/2014 REG. NO. 43835

ENGINEER
WILLIAM C. KLINGBEIL, P.E.

APPROVED _____ 2014
CITY OF RICHFIELD ENGINEER

_____ 2014
DISTRICT STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY

_____ 2014
APPROVED FOR STATE AID FUNDING: STATE AID ENGINEER

PLAN REVISONS

DATE	SHEET NO.	APPROVED BY

STATE AID PROJ. NO. 157-363-030 SHEET NO. 1 OF 17 SHEETS

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STATEMENT OF ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	FUNDING	
				ELIGIBLE QUANTITY	030 QUANTITY
2021.501	MOBILIZATION	LUMP SUM	1	0.53	0.47
2123.610	STREET SWEEPER (WITH PICKUP BROOM)	HOUR	4		4
2130.501	WATER	M GALLON			
2102.501	PAVEMENT MARKING REMOVAL	SQ FT	930		930
2104.501	REMOVE CONCRETE CURB	LIN FT	310	310	
2104.503	REMOVE CONCRETE WALK	SQ FT	960	960	
2104.505	REMOVE CONCRETE PAVEMENT	SQ YD	105	105	
2104.509	REMOVE SIGN PANEL TYPE C	EACH	4	4	
2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LIN FT	175	175	
2211.503	AGGREGATE BASE CLASS 5 (CV)	CU YD	11	11	
2301.608	DRILL & GROUT REINF BARS (EPOXY COATED)	POUND	150	150	
2356.506	BITUMINOUS SEAL COAT	SQ YD	16000		16000
2360.503	TYPE SP 12.5 WEARING COURSE MIX (2,B) 2.0" THICK	SQ YD	128	128	
2360.503	TYPE SP 12.5 NON-WEARING COURSE MIX (2,B) 2" THICK	SQ YD	64	64	
2521.501	4" CONCRETE WALK	SQ FT	625	625	
2531.502	CONCRETE CURB DESIGN B6	LIN FT	160	160	
2531.602	RECONSTRUCT PEDESTRIAN CURB RAMP	EACH	1	1	
2531.618	TRUNCATED DOMES	SQ FT	16	16	
2563.601	TRAFFIC CONTROL	LUMP SUM	1		1
2564.618	SIGN TYPE C	SQ FT	95		95
2565.601	TRAFFIC CONTROL SIGNALS	LUMP SUM	1	1	
2571.505	DECIDUOUS SHRUB NO 2 CONT	SHRUB	20		20
2571.505	DECIDUOUS SHRUB NO 3 CONT	SHRUB	20		20
2571.507	PERENNIAL NO 1 CONT	PLANT	111		111
2574.525	COMMON TOPSOIL BORROW	CU YD	66		66
2582.501	PAVT MSSG (BIKE LANE ARROW) EPOXY	EACH	15		15
2582.501	PAVT MSSG (BIKE SYMBOL) EPOXY	EACH	15		15
2582.501	PAVT MSSG (LT ARROW) EPOXY	EACH	12		12
2582.501	PAVT MSSG (RT ARROW) EPOXY	EACH	4		4
2582.502	4" DOTTED LINE WHITE-EPOXY	LIN FT	160		160
2582.502	4" BROKEN LINE YELLOW-EPOXY	LIN FT	150		150
2582.502	4" SOLID LINE WHITE-EPOXY	LIN FT	8600		8600
2582.502	4" SOLID LINE YELLOW-EPOXY	LIN FT	2000		2000
2582.502	4" DOUBLE SOLID LINE WHITE-EPOXY	LIN FT	500		500
2582.502	4" DOUBLE SOLID LINE YELLOW-EPOXY	LIN FT	600		600
2582.603	CROSSWALK MARKING-THERMOPLASTIC	SQ FT	930	162	768

THE FOLLOWING STANDARD PLATES, APPROVED BY FHWA, SHALL APPLY ON THIS PROJECT

MN/DOT STANDARD PLATES	
PLATE NO.	DESCRIPTION
7020K	CONCRETE CURB 2 OF 2
7038A	DETECTABLE WARNING SURFACE TRUNCATED DOMES
7113A	CONCRETE APPROACH NOSE DETAIL
8112H	PEDESTAL FOUNDATION (TRAFFIC CONTROL SIGNALS)
8114A	P.V.C. HAND HOLE/PULL BOX (NO VEHICLE LOAD)
8122F	PEDESTAL & PEDESTAL BASE (FOR TRAFFIC CONTROL SIGNALS SUPPORT)
8129A	SHIM AND WASHER (TRAFFIC CONTROL SIGNALS AND ROADWAY LIGHTING)

No.	Date	Revisions	App.

DRAWING NAME 160659002_SEQ.dwg

DESIGNED BY:	MTM
DRAWN BY:	RBC
CHECKED BY:	WCK
DATE:	07/07/2014
PROJECT NO.	160659002

Kimley»Horn

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WILLIAM C. KLINGBEIL, P.E.

DATE: 07/07/2014 MN LIC. NO. 43835

Richfield

CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

STATEMENT OF ESTIMATED QUANTITIES & STANDARD PLATES

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157-363-030
S.P.	

SHEET NO. 2 / 17

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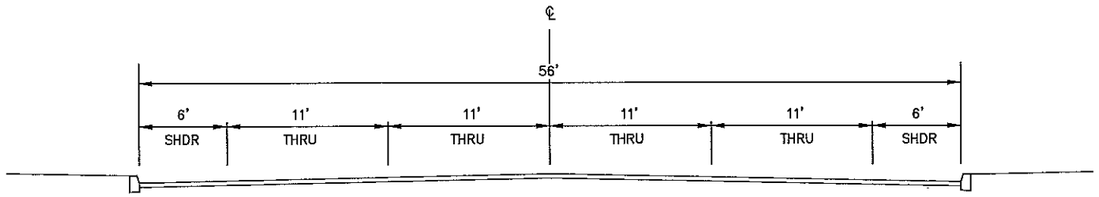
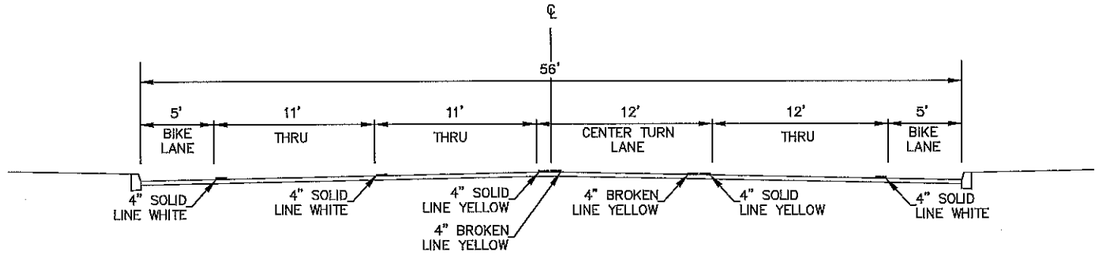
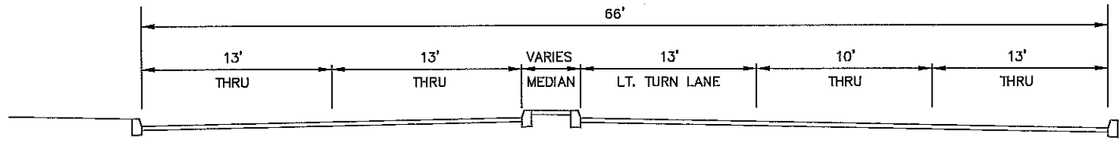


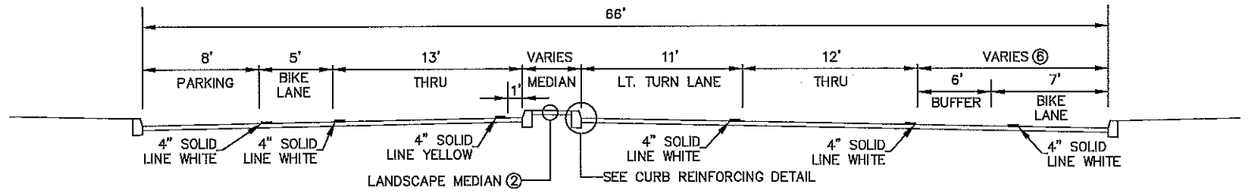
EXISTING TYPICAL SECTION
LYNDALE AVENUE



PROPOSED TYPICAL SECTION
LYNDALE AVENUE
STA. 17+60 – STA. 21+91

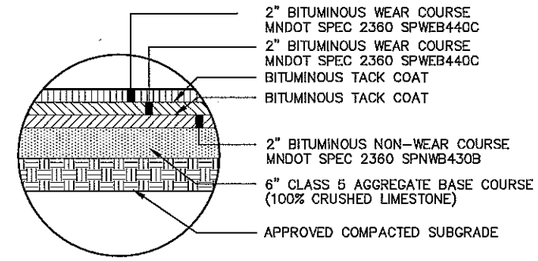


EXISTING TYPICAL SECTION W/MEDIAN
LYNDALE AVENUE

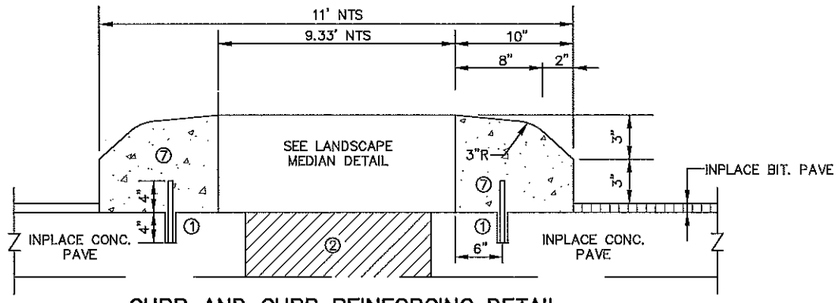


PROPOSED TYPICAL SECTION W/MEDIAN
LYNDALE AVENUE
STA. 0+40 – STA. 17+60

② SEE LANDSCAPE MEDIAN DETAIL.
⑥ VARIES STA 1+00 – STA 3+45
SEE SIGNING AND STRIPING PLAN

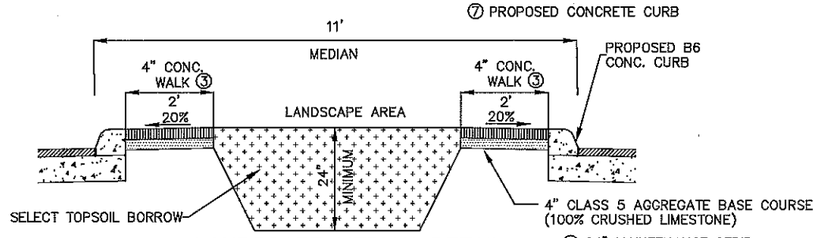


PROPOSED BITUMINOUS PAVEMENT SECTION

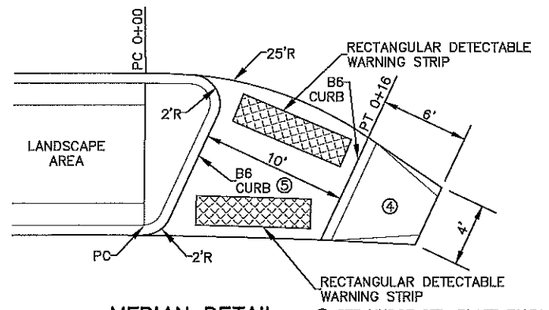


CURB AND CURB REINFORCING DETAIL

① PLACE 5/8" ØX8" REINFORCING BARS 2' C. TO C. (DRILL IN ANY EXIST. CONC. PAVEMENT AND MORTAR) AS DIRECTED BY THE ENGINEER.
② REMOVE INP PAVEMENT
⑦ PROPOSED CONCRETE CURB



LANDSCAPE MEDIAN DETAIL



MEDIAN DETAIL

④ SEE MNDOT STD. PLATE 7113A
⑤ CROSSING AT GRADE

No.	Date	Revisions	App.

DRAWING NAME	160659002_TS.dwg
DESIGNED BY:	MTM
DRAWN BY:	RBC
CHECKED BY:	WCK
DATE:	07/07/2014
PROJECT NO.	160659002

Kimley»Horn

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WILLIAM C. KLINGBEIL, P.E.
DATE: 07/07/2014 MN LIC. NO. 43835

Richfield

CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

TYPICAL SECTIONS AND DETAILS

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157-363-030
S.P.	

SHEET NO. 3 / 17

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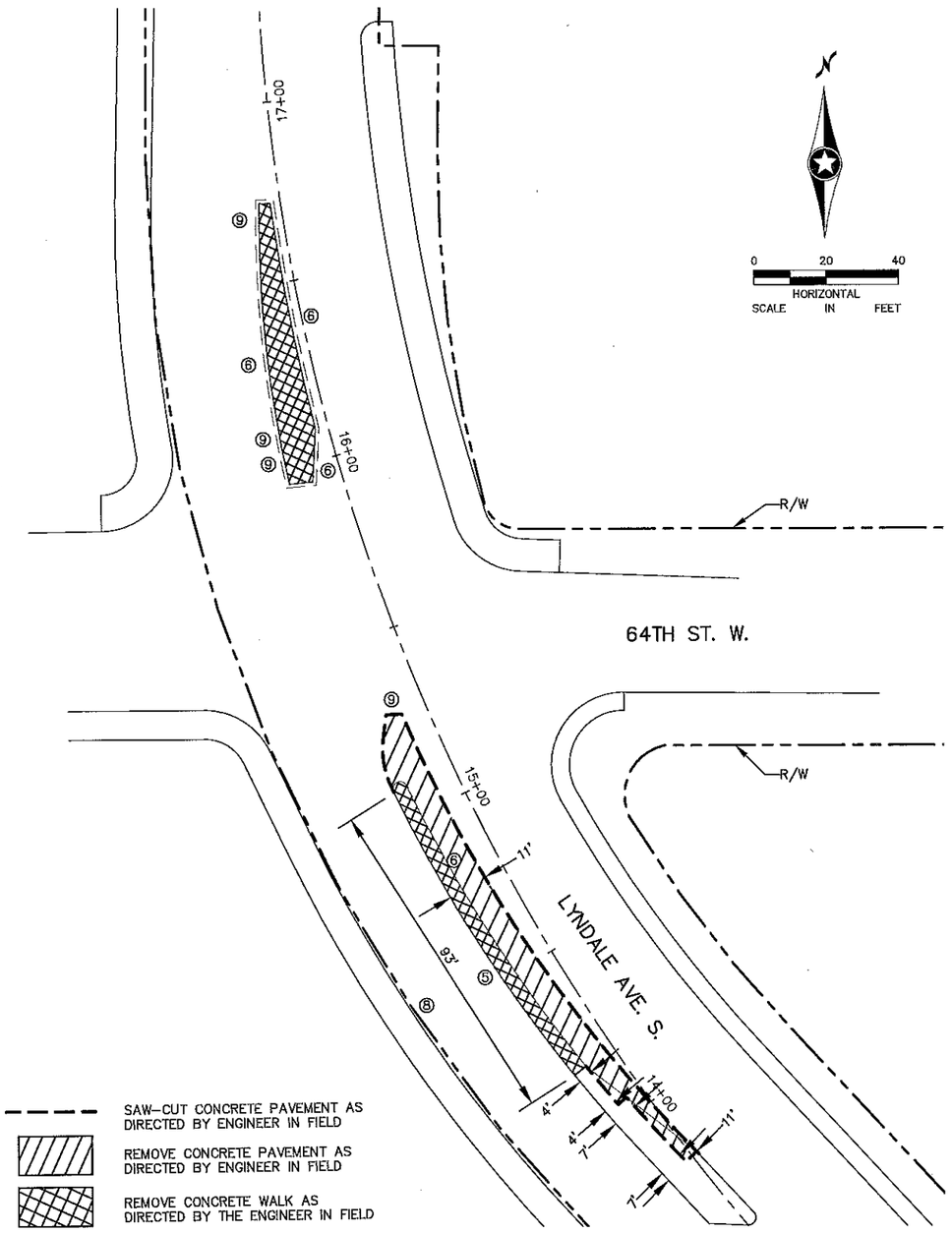
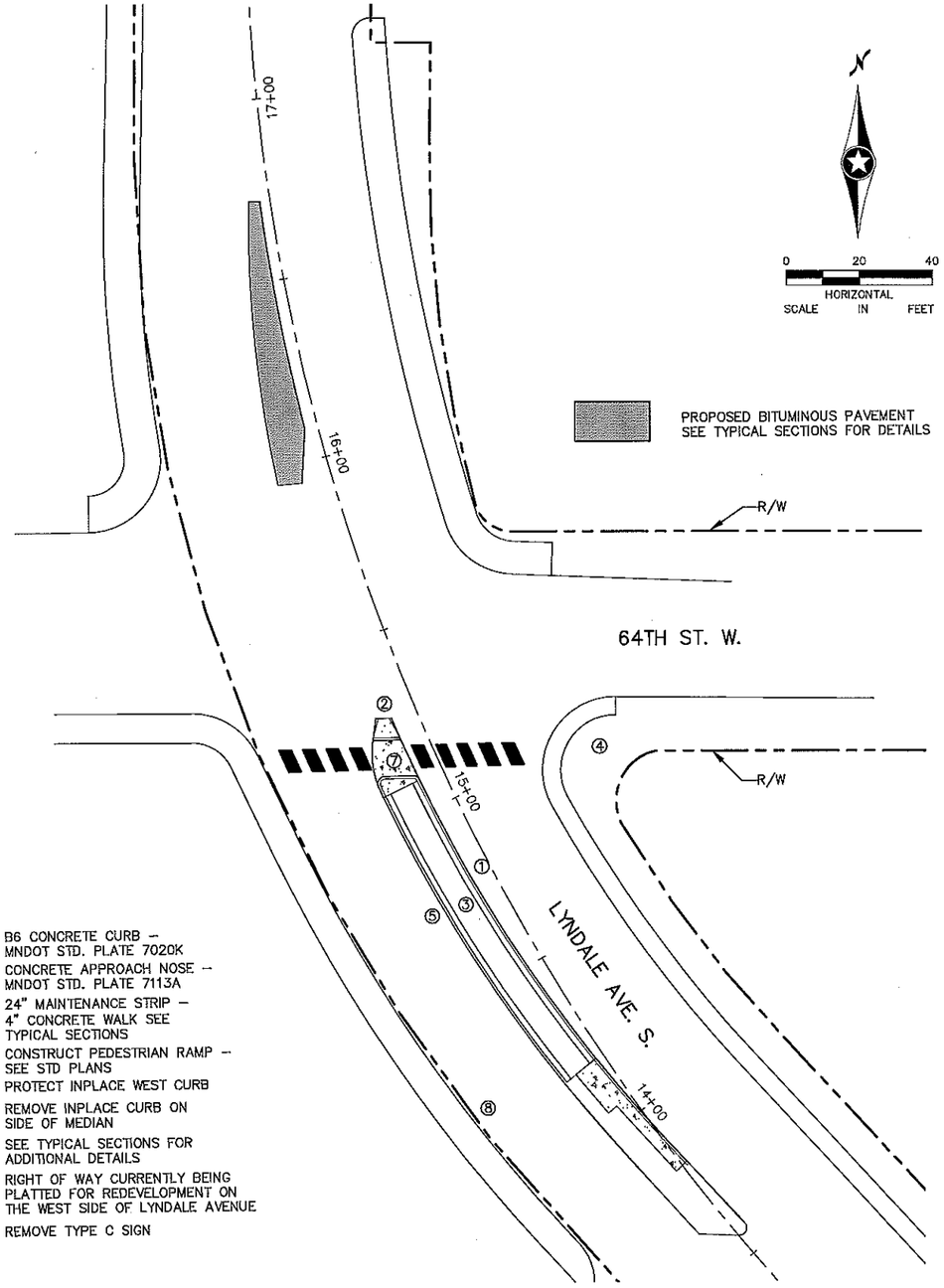


REMOVALS



CONSTRUCTION

No.	Date	Revisions	App.

DRAWING NAME 160659002_DET.dwg	
DESIGNED BY:	MTM
DRAWN BY:	RBC
CHECKED BY:	WCK
DATE:	07/07/2014
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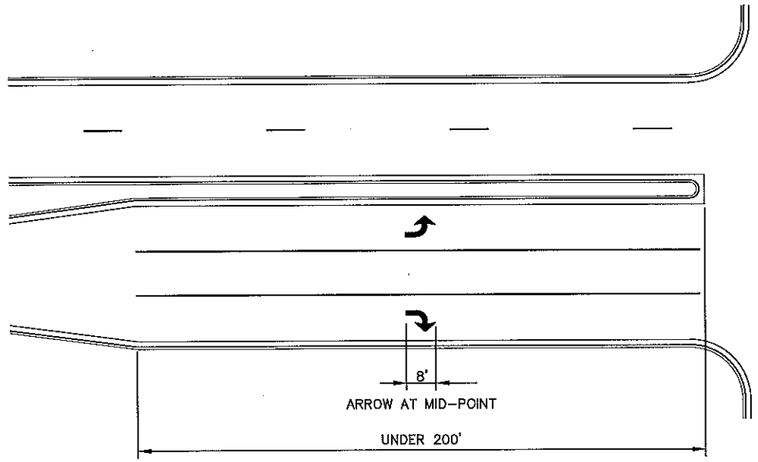
Richfield

CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

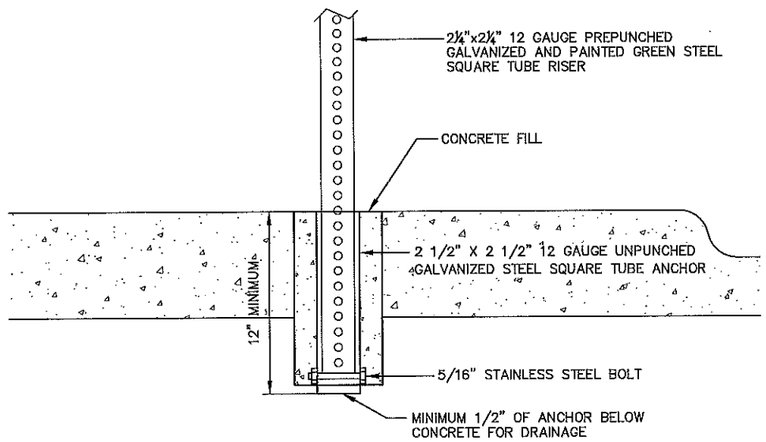
CONSTRUCTION DETAILS

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157-363-030
S.A.P.	

SHEET NO. 4 / 17

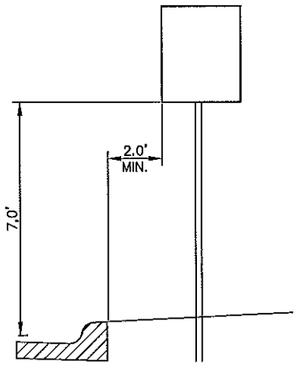


TYPICAL TURN LANE AND INTERSECTION STRIPING



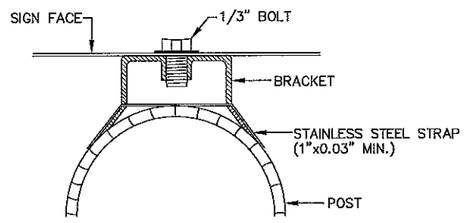
NOTES:
1. DRILL AN 8" DIAMETER HOLE THE FULL DEPTH OF THE ANCHOR.
2. DRILL 3/8" HOLES ON OPPOSITE SIDES OF THE UNPUNCHED GALVANIZED STEEL SQUARE TUBE ANCHOR APPROX. 1" FROM THE BOTTOM OF THE ANCHOR. INSERT A 5/16" STAINLESS STEEL BOLT THROUGH THE HOLES AND SECURE WITH A STAINLESS STEEL LOCK NUT WITH NYLON INSERT. THE PREPUNCHED GALVANIZEDAND PAINTED STEEL SQUARE TUBE RISER (TO BE INSERTED INSIDE THE UNPUNCHED GALVANIZED SQUARE TUBE ANCHOR) WILL REST ON BOLT.
3. INSERT THE ANCHOR IN THE HOLE.
4. AFTER INSTALLATION OF THE UNPUNCHED GALVANIZED STEEL SQUARE TUBE ANCHOR, FILL THE HOLE WITH A CONCRETE MIX APPROVED BY THE ENGINEER AND LEVEL OFF THE TOP OF CONCRETE.

TYPE C SIGNS, DELINEATORS & MARKERS IN CONCRETE



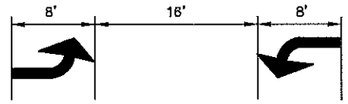
DIMENSIONS ARE IN ENGLISH UNITS

SIGN LOCATION DETAL



GALVANIZED OR STAINLESS STEEL BRACKET, BOLT AND WASHER.

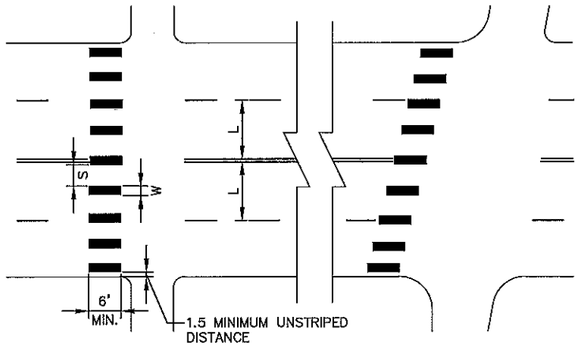
STRAP MOUNTING DETAIL FOR LIGHT POLE MOUNTING



TYPICAL CENTER LEFT TURN ARROWS

STRIPING DETAILS

(L) WIDTH OF INSIDE LANE	(W) WIDTH OF PAINTED AREA	(S) WIDTH OF SPACE
9'	2.0'	2.5'
10'	2.5'	2.5'
11'	2.5'	3.0'
12'	3.0'	3.0'
13'	3.0'	3.5'



NOTES:
1. PAINTED AREAS TO BE CENTERED ON CENTERLINE AND LANE LINES.
2. A MINIMUM OF 1.5 FT. CLEAR DISTANCE SHALL BE LEFT ADJACENT TO THE CURB. IF LAST PAINTED AREA FALLS INTO THIS DISTANCE IT MUST BE OMITTED.
3. ON TWO LANE TWO WAY STREETS, USE SPACING SHOWN FOR AN 11 FT. INSIDE LANE.
4. FOR DIVIDED ROADWAYS, ADJUSTMENTS IN SPACING OF THE BLOCKS SHOULD BE MADE IN THE MEDIAN SO THAT THE BLOCKS ARE MAINTAINED IN THEIR PROPER LOCATION ACROSS THE TRAVELED PORTION OF THE ROADWAY.
5. AT SKEWED CROSSWALKS, THE BLOCKS ARE TO REMAIN PARALLEL TO THE LANE LINES AS SHOWN.
6. STOP BARS SHALL BE 2 FT. WIDE AND 4 FT. UPSTREAM OF THE CROSSWALK.
6. LOCATION OF ZEBRA CROSSWALKS AND STOP BARS, SIGNAL LOOPS, AND PED RAMPS ARE APPROXIMATE. FINAL LOCATIONS ARE TO BE DETERMINED AND FIELD VERIFIED DURING CONSTRUCTION BY THE FIELD ENGINEER.

MARKINGS FOR PEDESTRIAN CROSSWALKS

No.	Date	Revisions	App.

DRAWING NAME 160659002_DET.dwg

DESIGNED BY:	MTM
DRAWN BY:	RBC
CHECKED BY:	WCK
DATE:	07/07/2014
PROJECT NO.	160659002

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DATE: 07/07/2014 MN LIC. NO. 43835

Richfield

CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

SIGNING AND STRIPING DETAILS

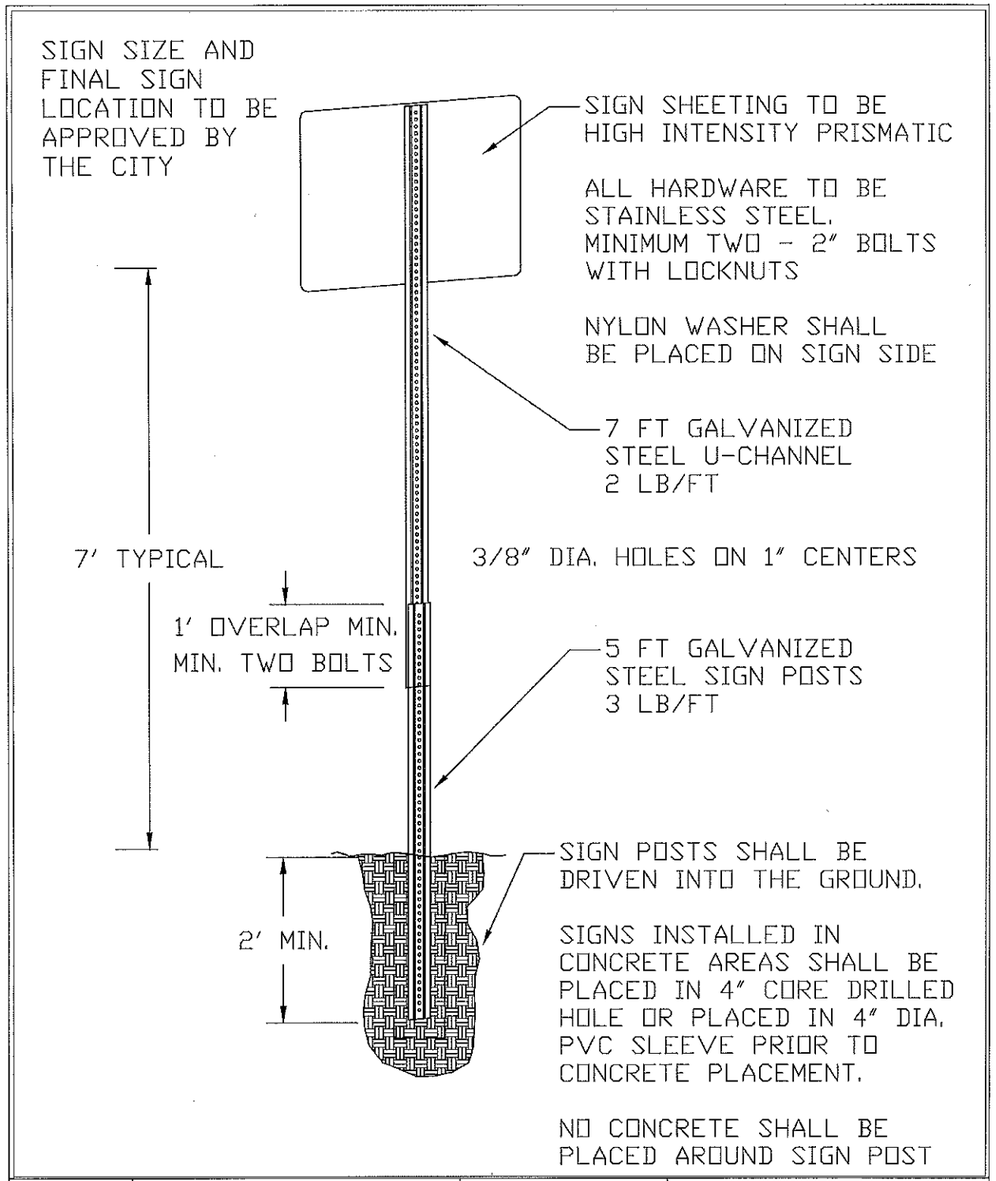
CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157-363-030
S.A.P.	

SHEET NO. 5 / 17

K:\TWC_Civil\City\RICHFIELD\Lyndale Ave\CAD\Plan Sheets\160659002_DET.dwg July 31, 2014 - 4:21pm

SPECIAL; 1.5" Radius, 0.4" Border, 0.4" Indent, Red on White; "NO" C; "PARKING" B 46% spacing; "HERE" C 115% spacing; "TO" C 140% spacing; "DRIVE" C 140% spacing;

SP–1



STANDARD DETAIL NO. STR-04	SIGN DETAIL	APPROVAL _____ 20____ CITY ENGINEER	CITY OF RICHFIELD ENGINEERING DIVISION

No.	Date	Revisions	App.

DRAWING NAME 160659002_DET.dwg

DESIGNED BY:	MTM
DRAWN BY:	RBC
CHECKED BY:	WCK
DATE:	07/07/2014
PROJECT NO.	160659002

Kimley»Horn

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

WILLIAM C. KLINGBEIL, P.E.
DATE: 07/07/2014 MN LIC. NO. 43835

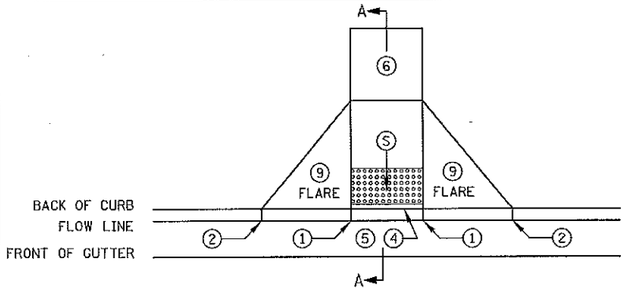
CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

SIGNING AND STRIPING DETAILS

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157–363–030
S.A.P.	

SHEET NO. 6 / 17

K:\TWC_Civil\City\RICHFIELD\Lyndale Ave\CAD\Plan Sheets\160659002_DET.dwg July 31, 2014 – 4:21pm



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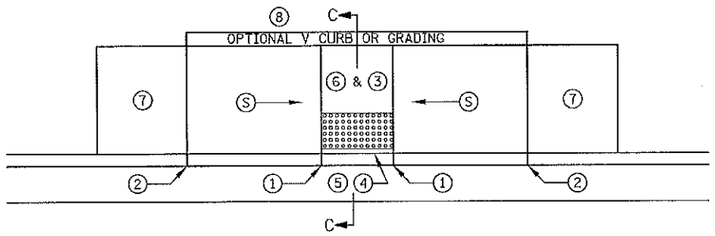

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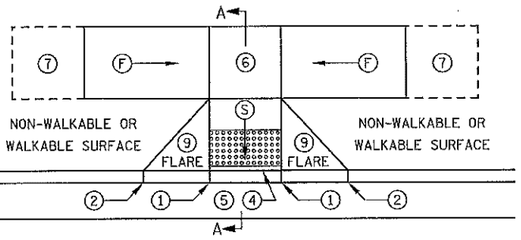

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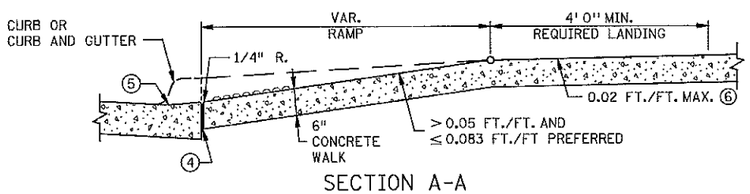
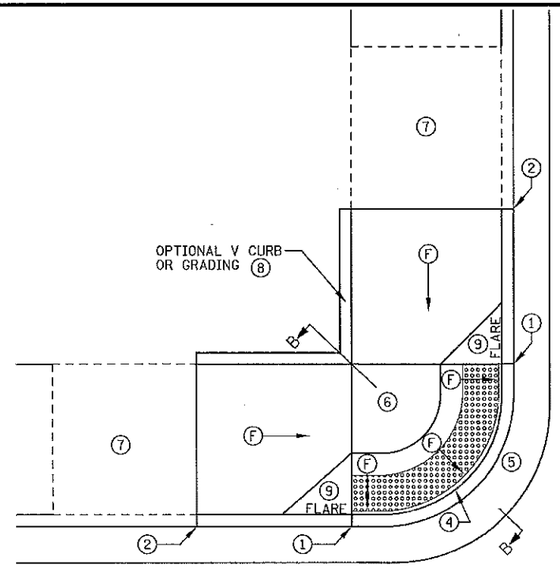


SECTION A-A

PERPENDICULAR/TIERED/DIAGONAL



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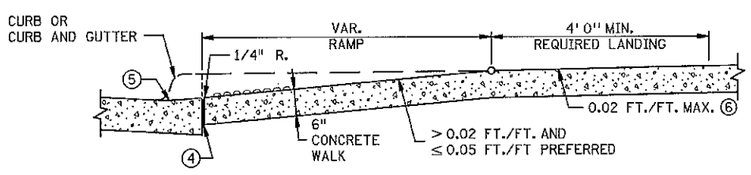

SECTION B-B

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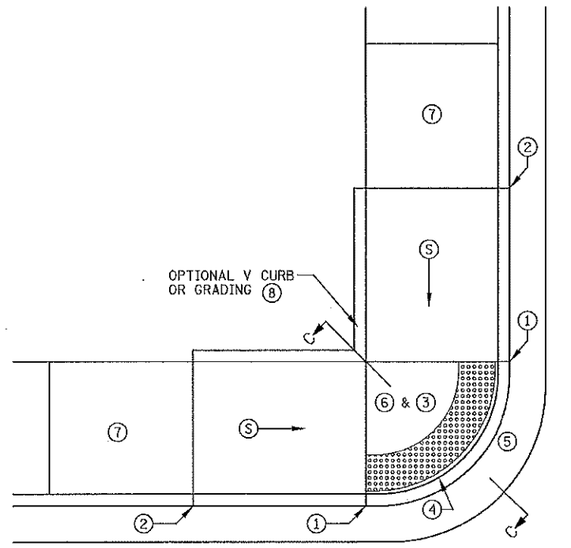
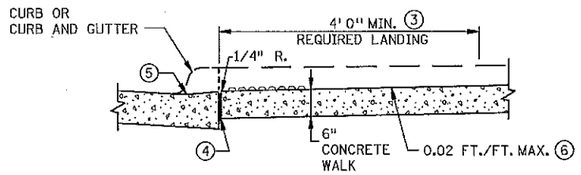
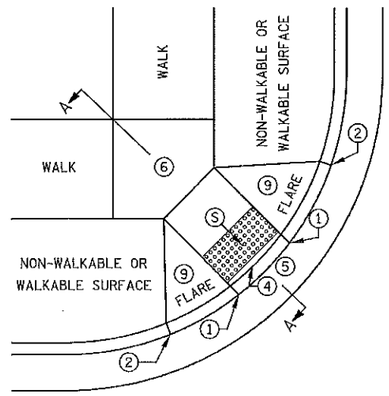


DEPRESSED CORNER



SECTION C-C

PARALLEL/DEPRESSED CORNER



DIAGONAL ⑩

NOTES:

LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE CHANGES DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%, AND IF THE APPROACHING WALK IS INVERSE GRADE.

INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE.

SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE WHEN THE LONGITUDINAL SLOPE IS GREATER THAN 5.0%.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS.

ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL.

TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONCTRUCTED, LANDINGS MAY BE CAST SEPARATELY. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 5 WHEN LANDINGS ARE CAST SEPARATELY.

ALL SLOPES ARE ABSOLUTE, RATHER THAN RELATIVE TO SIDEWALK/ROADWAY GRADES.

TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MINIMUM OF 24" IN THE PATH OF TRAVEL. SHARED USE PATHS SHALL HAVE DETECTABLE WARNING ACROSS THE ENTIRE WIDTH OF PATH WHEN THE PATH CROSSES A ROAD.

SEE STANDARD PLATE 7038 AND SHEET 4 OF 5 FOR ADDITIONAL DETAILS ON DETECTABLE WARNING.

(1) 0" CURB HEIGHT.

(2) FULL CURB HEIGHT.

(3) DETECTABLE WARNINGS MAY BE PART OF 4' X 4' LANDING AREA IF IT IS NOT FEASIBLE TO CONSTRUCT THE LANDING OUTSIDE OF THE DETECTABLE WARNING AREA.

(4) 1/2" PREFORMED JOINT FILLER MATERIAL AASHTO M 213. JOINT FILLER SHALL BE PLACED FLUSH WITH THE BACK OF CURB AND ADJACENT SIDEWALK. JOINT SHALL BE FREE OF DEBRIS. RECTANGULAR DETECTABLE WARNINGS SHALL BE SETBACK 3" FROM THE BACK OF CURB. RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB.

(5) SEE PEDESTRIAN ACCESS ROUTE CURB AND GUTTER DETAIL FOR INFORMATION ON CONSTRUCTING CURB AND GUTTER AT CURB OPENINGS. SEE SHEET NO. 3 OF 5.

(6) 4' BY 4' MIN. LANDING WITH MAX. 2.0% SLOPE IN ALL DIRECTIONS.

(7) IF LONGITUDINAL SLOPE IS GREATER THAN 5.0%, 4' X 4' MIN. LANDING WITH MAX 2.0% SLOPE IN ALL DIRECTIONS REQUIRED.

(8) V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. SEE SHEET 5 OF 5.

(9) SEE SHEET 4 OF 5, TYPICAL SIDE TREATMENT OPTIONS, FOR DETAILS ON FLARES AND RETURNED CURBS.

(10) DIAGONAL RAMPS SHOULD ONLY BE USED AFTER ALL OTHER CURB RAMP TYPES HAVE BEEN EVALUATED AND DEEMED IMPRACTICAL.

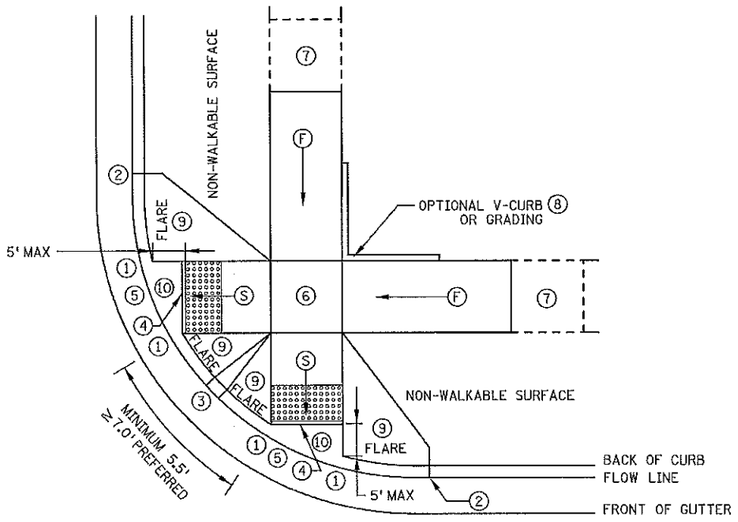
LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

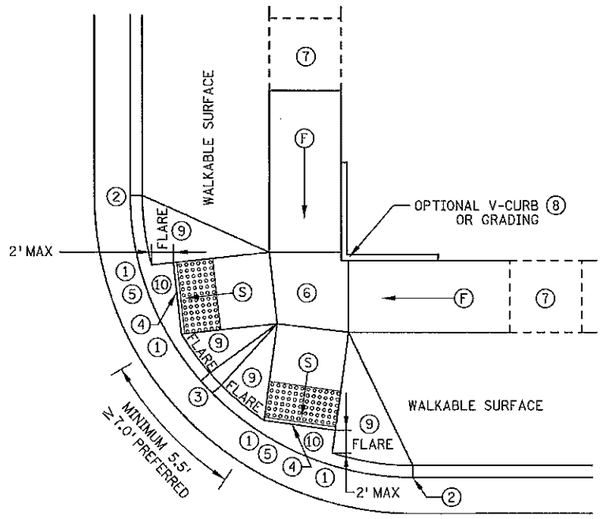
(S) INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%

(F) INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%

STANDARD PLAN SHEET NO. 5-297.250 (1 OF 5)	PEDESTRIAN CURB RAMP DETAILS
STANDARD APPROVED: APRIL 10, 2013	
STATE PROJ. NO. 157-363-030	SHEET NO. 7 OF 17 SHEETS

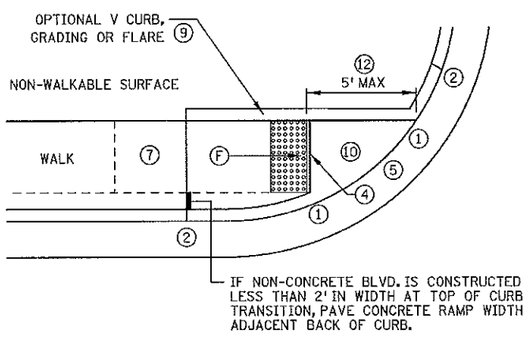


ADJACENT TO NON-WALKABLE SURFACE

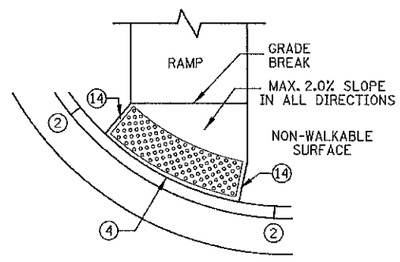


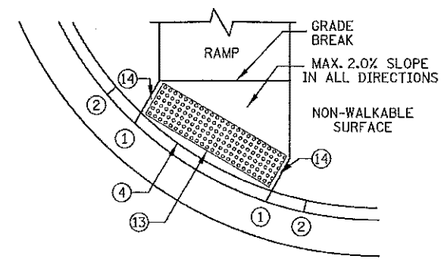
ADJACENT TO WALKABLE SURFACE

COMBINED DIRECTIONAL ⑮

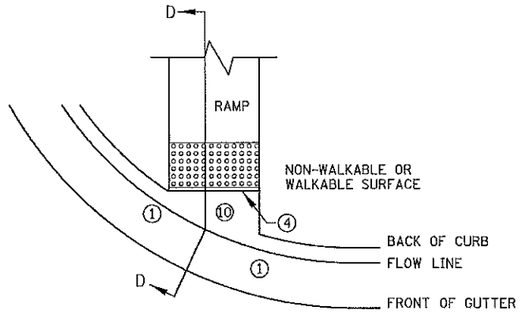


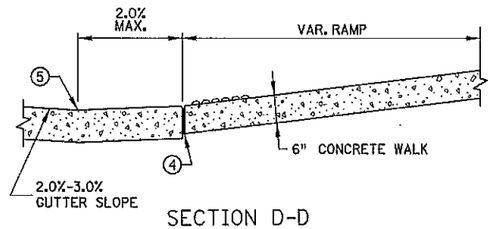
ONE-WAY DIRECTIONAL





DETECTABLE WARNING PLACEMENT WHEN
SETBACK CRITERIA IS EXCEEDED





SECTION D-D

CURB FOR DIRECTIONAL RAMPS ⑪

NOTES:

LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE CHANGES DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%, AND IF THE APPROACHING WALK IS INVERSE GRADE.

INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE.

SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE WHEN THE LONGITUDINAL SLOPE IS GREATER THAN 5.0%.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS.

ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL.

TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONCTRUCTED, LANDINGS MAY BE CAST SEPARATELY. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 5 WHEN LANDINGS ARE CAST SEPARATELY.

ALL SLOPES ARE ABSOLUTE, RATHER THAN RELATIVE TO SIDEWALK/ROADWAY GRADES.

TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MINIMUM OF 24" IN THE PATH OF TRAVEL. SHARED USE PATHS SHALL HAVE DETECTABLE WARNING ACROSS THE ENTIRE WIDTH OF PATH WHEN THE PATH CROSSES A ROAD.

SEE STANDARD PLATE 7038 AND SHEET 4 OF 5 FOR ADDITIONAL DETAILS ON DETECTABLE WARNING.

① 0" CURB HEIGHT.

② FULL CURB HEIGHT.

③ 3" MINIMUM CURB HEIGHT, 4" PREFERRED.

④ 1/2" PREFORMED JOINT FILLER MATERIAL AASHTO M 213. JOINT FILLER SHALL BE PLACED FLUSH WITH THE BACK OF CURB AND ADJACENT SIDEWALK. JOINT SHALL BE FREE OF DEBRIS. RECTANGULAR DETECTABLE WARNINGS SHALL BE SETBACK 3" FROM THE BACK OF CURB. RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MIN. TO 6" MAX. FROM THE BACK OF CURB.

⑤ SEE PEDESTRIAN ACCESS ROUTE CURB AND GUTTER DETAIL FOR INFORMATION ON CONSTRUCTING CURB AND GUTTER AT CURB OPENINGS. SEE SHEET NO. 3 OF 5.

⑥ 4' BY 4' MIN. LANDING WITH MAX. 2.0% SLOPE IN ALL DIRECTIONS.

⑦ IF LONGITUDINAL SLOPE IS GREATER THAN 5.0%, 4' X 4' MIN. LANDING WITH MAX 2.0% SLOPE IN ALL DIRECTIONS REQUIRED.

⑧ V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS.

⑨ SEE SHEET 4 OF 5, TYPICAL SIDE TREATMENT OPTIONS, FOR DETAILS ON FLARES AND RETURNED CURBS.

⑩ MAX. 2.0% SLOPE IN ALL DIRECTIONS IN FRONT OF GRADE BREAK AND DRAIN TO FLOW LINE. SHALL BE CONSTRUCTED INTEGRAL WITH CURB AND GUTTER.

⑪ TO BE USED FOR ALL DIRECTIONAL RAMPS.

⑫ PLACE DOMES AT THE BACK OF CURB WHEN ALLOWABLE SETBACK CRITERIA IS EXCEEDED.

⑬ RECTANGULAR DETECTABLE WARNINGS MAY BE SETBACK 9" FROM THE BACK OF CURB WITH CORNERS SET 3" FROM BACK OF CURB. IF 9" SETBACK IS EXCEEDED USE RADIAL DETECTABLE WARNINGS.

⑭ WHEN NO CONCRETE FLARES ARE PROPOSED, THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE BACK OF CURB. MAINTAIN 3" BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.

⑮ FRONT EDGE OF DETECTABLE WARNING SHALL BE SET BACK 2' MAXIMUM WHEN ADJACENT TO WALKABLE SURFACE, AND 5' MAXIMUM WHEN ADJACENT TO NON-WALKABLE SURFACE WITH ONE CORNER SET 3" FROM BACK OF CURB. WHETHER A SURFACE IS WALKABLE OR NOT SHALL BE DETERMINED BY THE ENGINEER

LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

Ⓢ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%

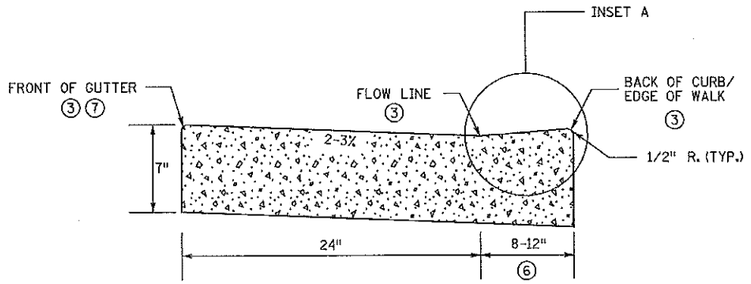
Ⓕ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%

STANDARD PLAN SHEET NO.
5-297.250 (2 OF 5)

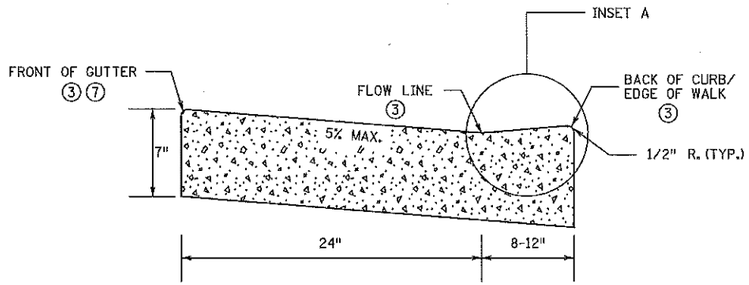
STANDARD APPROVED:
APRIL 10, 2013

PEDESTRIAN CURB RAMP DETAILS

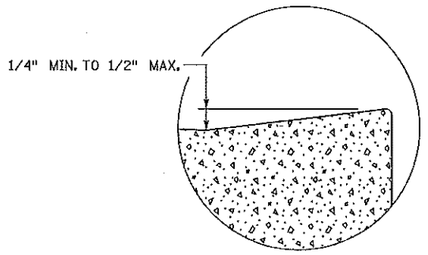
STATE PROJ. NO. 157-363-030 SHEET NO. 8 OF 17 SHEETS



NON PERPENDICULAR ①

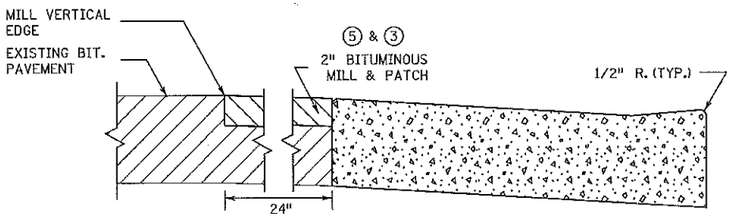


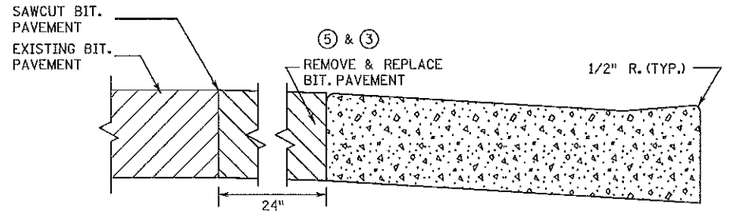
PERPENDICULAR ②

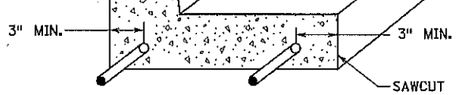


INSET A

PEDESTRIAN ACCESS ROUTE CURB & GUTTER DETAIL

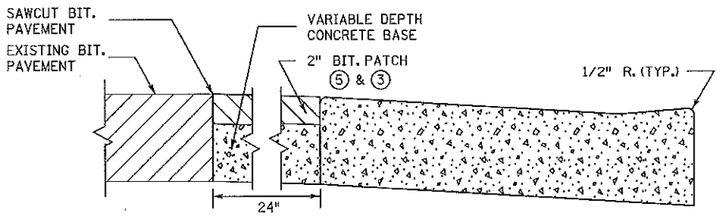


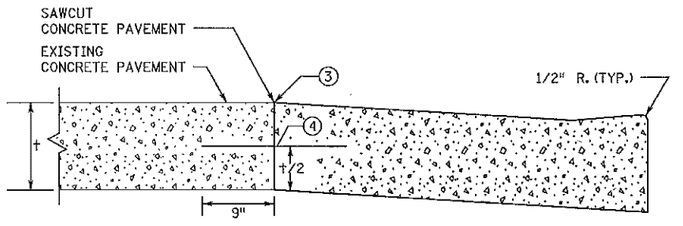




CURB AND GUTTER REINFORCEMENT ⑧

FOR USE ON CURB RAMP RETROFITS





PAVEMENT TREATMENT OPTIONS IN FRONT OF CURB & GUTTER

FOR USE ON CURB RAMP RETROFITS

NOTES:

POSITIVE FLOW LINE DRAINAGE SHALL BE MAINTAINED THROUGH THE PEDESTRIAN ACCESS ROUTE (PAR) AT A 2% MAXIMUM.

NO PONDING SHALL BE PRESENT IN THE PAR.

ANY VERTICAL LIP THAT OCCURS AT THE FLOW LINE SHALL NOT BE GREATER THAN 1/4 INCH.

① FOR USE AT CURB CUTS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED NON PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: FANS, DEPRESSED CORNERS, & ONE WAY AND COMBINED DIRECTIONALS.

② FOR USE AT CURB CUTS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: PERPENDICULAR, TIERED PERPENDICULAR, PARALLEL, AND DIAGONAL RAMPS.

③ THERE SHALL BE NO VERTICAL DISCONTINUITIES GREATER THAN 1/4".

④ DRILL AND GROUT NO. 4 EPOXY-COATED 18" LONG TIE BARS AT 30" CENTER TO CENTER INTO EXISTING CONCRETE PAVEMENT.

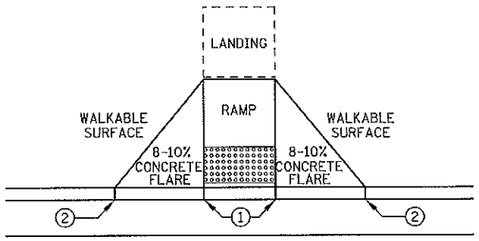
⑤ ELEVATION CHANGE TAKES PLACE FROM THE EXISTING TO NEW FRONT OF GUTTER. PATCH IS USED TO MATCH THE NEW GUTTER FACE INTO THE EXISTING ROADWAY.

⑥ VARIABLE WIDTH FOR DIRECTIONAL CURB APPLICATIONS.

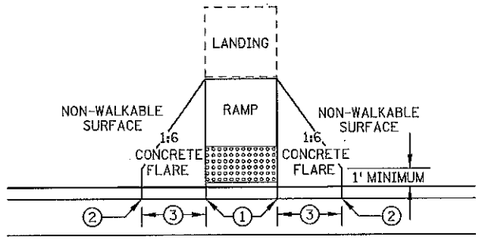
⑦ TOP FRONT OF GUTTER SHALL BE CONSTRUCTED FLUSH WITH PROPOSED ADJACENT PAVEMENT ELEVATION. PAR GUTTER SHALL NOT BE OVERLAID.

⑧ WHERE PLAN SPECIFIES, DRILL AND GROUT 2 - NO. 4 X 12" LONG REINFORCEMENT BARS (EPOXY COATED).

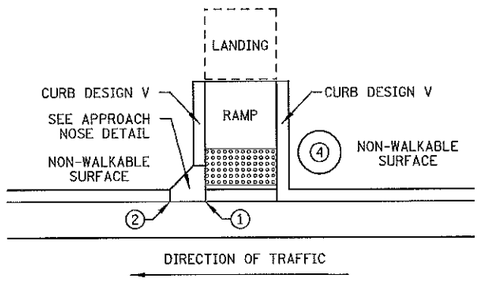
STANDARD PLAN SHEET NO. 5-297.250 (3 OF 5)	PEDESTRIAN CURB RAMP DETAILS
STANDARD APPROVED: APRIL 10, 2013	
STATE PROJ. NO. 157-363-030	SHEET NO.9 OF 17 SHEETS



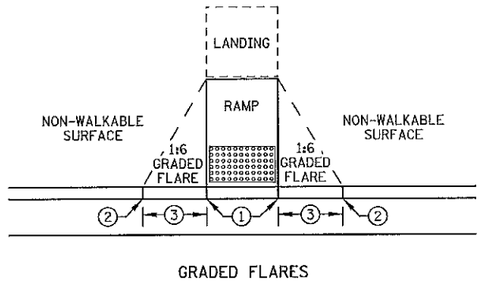
PAVED FLARES
ADJACENT TO WALKABLE SURFACE



PAVED FLARES
ADJACENT TO NON-WALKABLE SURFACE

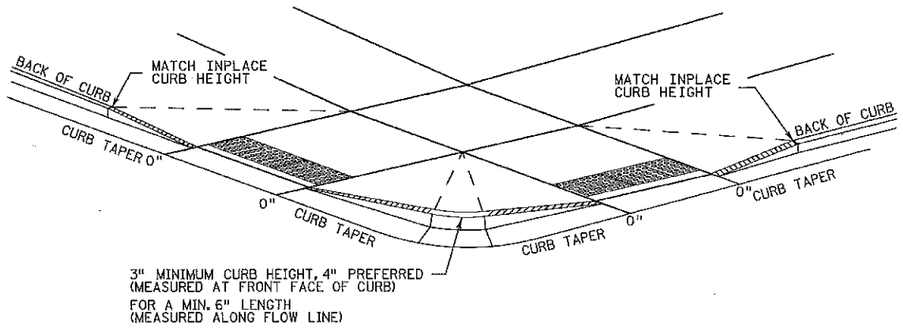


RETURNED CURB

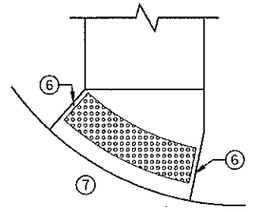


GRADED FLARES

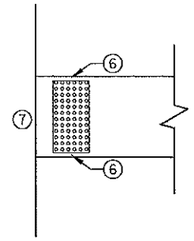
TYPICAL SIDE TREATMENT OPTIONS ⑤



DETECTABLE EDGE WITH
CURB AND GUTTER ⑧

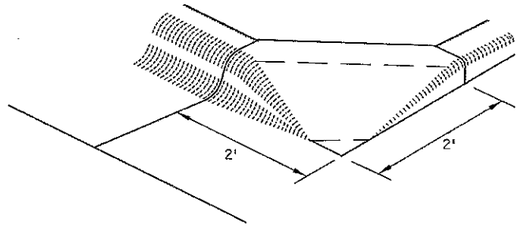


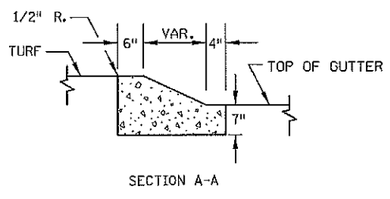
RADIAL DETECTABLE WARNING



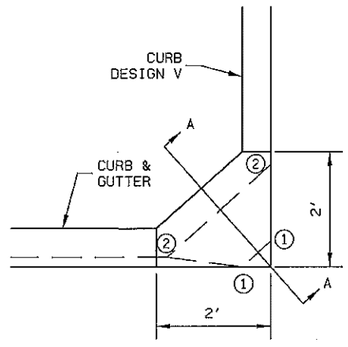
RECTANGULAR DETECTABLE WARNING

DETECTABLE EDGE WITHOUT CURB AND GUTTER





SECTION A-A



APPROACH NOSE DETAIL
FOR DOWNSTREAM SIDE OF TRAFFIC

NOTES:

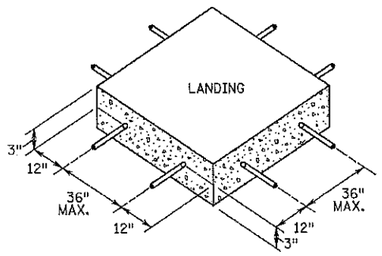
SEE STANDARD PLATE 7038 AND THIS SHEET FOR ADDITIONAL DETAILS ON DETECTABLE WARNING.

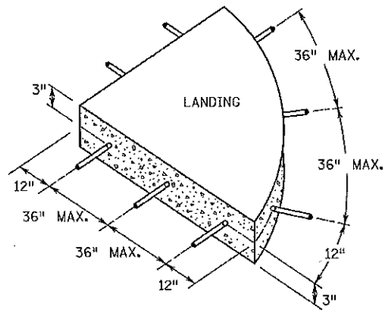
WHETHER A SURFACE IS WALKABLE OR NOT SHALL BE DETERMINED BY THE ENGINEER.

CONCRETE FLARE LENGTHS ADJACENT TO NON-WALKABLE SURFACES SHOULD BE LESS THAN 8'LONG MEASURED ALONG THE RAMPS FROM THE BACK OF CURB.

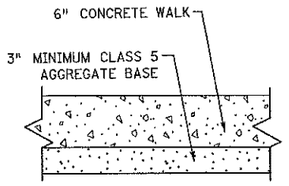
① 0" CURB HEIGHT.
② FULL CURB HEIGHT.
③ 2' - 3' FLARE.
④ IMMOVABLE OBJECT OR OBSTRUCTION.
⑤ SIDE TREATMENTS ARE APPLICABLE TO ALL RAMP TYPES AND SHOULD BE IMPLEMENTED AS NEEDED ON ALL RAMPS AS FIELD CONDITIONS DICTATE. THE ENGINEER SHALL DETERMINE THE RAMP SIDE TREATMENTS BASED ON MAINTENANCE OF BOTH ROADWAY AND SIDEWALK, ADJACENT PROPERTY CONSIDERATIONS, AND MITIGATING CONSTRUCTION IMPACTS.
⑥ WHEN NO CONCRETE FLARES ARE PROPOSED, THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE EDGE OF ROADWAY. MAINTAIN 3" BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.
⑦ IF NO CURB AND GUTTER IS PLACED IN RURAL SECTIONS, DETECTABLE WARNINGS SHALL BE PLACED 1' FROM THE EDGE OF ROADWAY TO PROVIDE VISUAL CONTRAST.
⑧ ALL CONSTRUCTED CURBS MUST HAVE A CONTINUOUS DETECTABLE EDGE FOR THE VISUALLY IMPAIRED. THIS DETECTABLE EDGE REQUIRES DETECTABLE WARNINGS WHEREVER THERE IS ZERO-INCH HIGH CURB. CURB TAPERS ARE CONSIDERED A DETECTABLE EDGE WHEN THE TAPER STARTS WITHIN 3" OF THE EDGE OF THE DETECTABLE WARNINGS AND UNIFORMLY RISES TO A 3-INCH MINIMUM CURB HEIGHT. ANY CURB NOT PART OF A CURB TAPER AND LESS THAN 3 INCHES IN HEIGHT IS NOT CONSIDERED A DETECTABLE EDGE AND THEREFORE IS NOT COMPLIANT WITH ACCESSIBILITY STANDARDS.

STANDARD PLAN SHEET NO. 5-297.250 (4 OF 5)	PEDESTRIAN CURB RAMP DETAILS
STANDARD APPROVED: APRIL 10, 2013	
STATE PROJ. NO. 157-363-030	SHEET NO. 10 OF 17 SHEETS

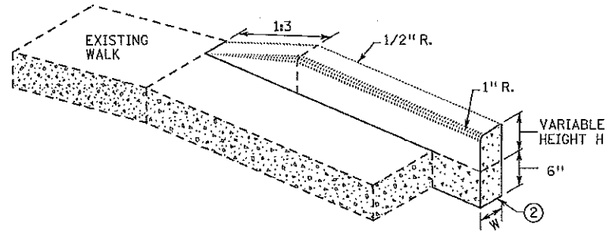




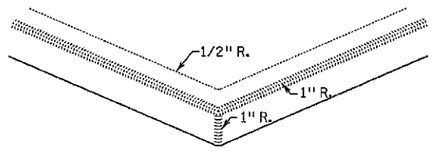
SIDEWALK REINFORCEMENT ⑤ ⑥



TYPICAL SIDEWALK SECTION WITHIN INTERSECTION CORNER

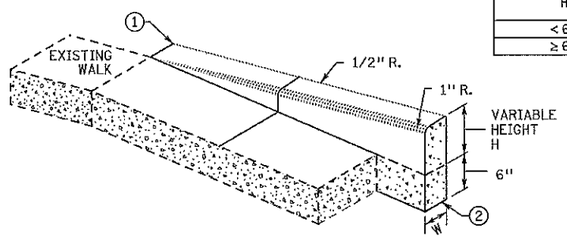


V CURB ADJACENT TO LANDSCAPE
CURB WITHIN SIDEWALK LIMITS

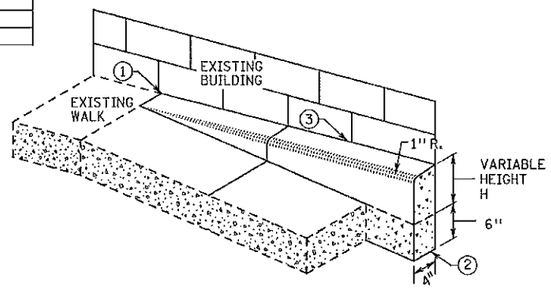


V CURB INTERSECTION

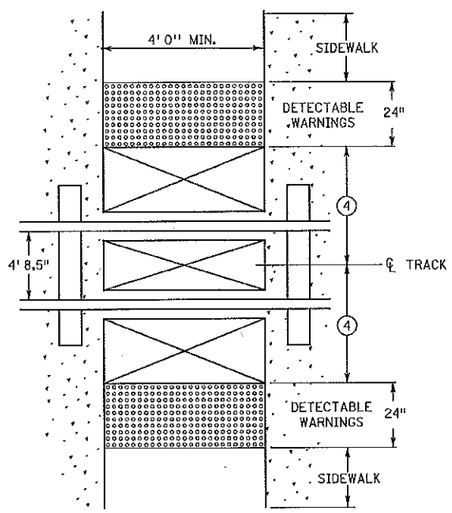
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
≤ 6"	4"
≥ 6"	6"



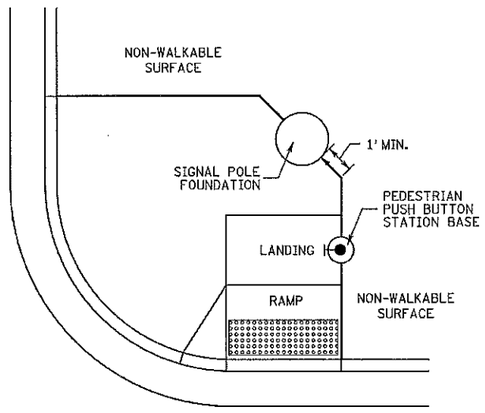
V CURB ADJACENT TO LANDSCAPE
CURB OUTSIDE SIDEWALK LIMITS



V CURB ADJACENT TO BUILDING OR BARRIER



RAILROAD CROSSING
PLAN VIEW



CONCRETE WALK EDGES ADJACENT
TO CONCRETE STRUCTURES

NOTES:

ALL V CURB CONTRACTION JOINTS SHALL MATCH CONCRETE WALK JOINTS.

WHERE RIGHT-OF-WAY ALLOWS, USE OF V CURB SHOULD BE MINIMIZED. GRADING ADJACENT TURF OR SLOPING ADJACENT PAVEMENT IS PREFERRED.

V CURB SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS.

V CURB NEXT TO BUILDING SHALL BE A 4" WIDTH AND SHALL MATCH PREVIOUS TOP OF SIDEWALK ELEVATIONS.

① END TAPERS AT TRANSITION SECTION SHALL MATCH INPLACE SIDEWALK GRADES.

② ALL V CURB SHALL MATCH BOTTOM OF ADJACENT WALK.

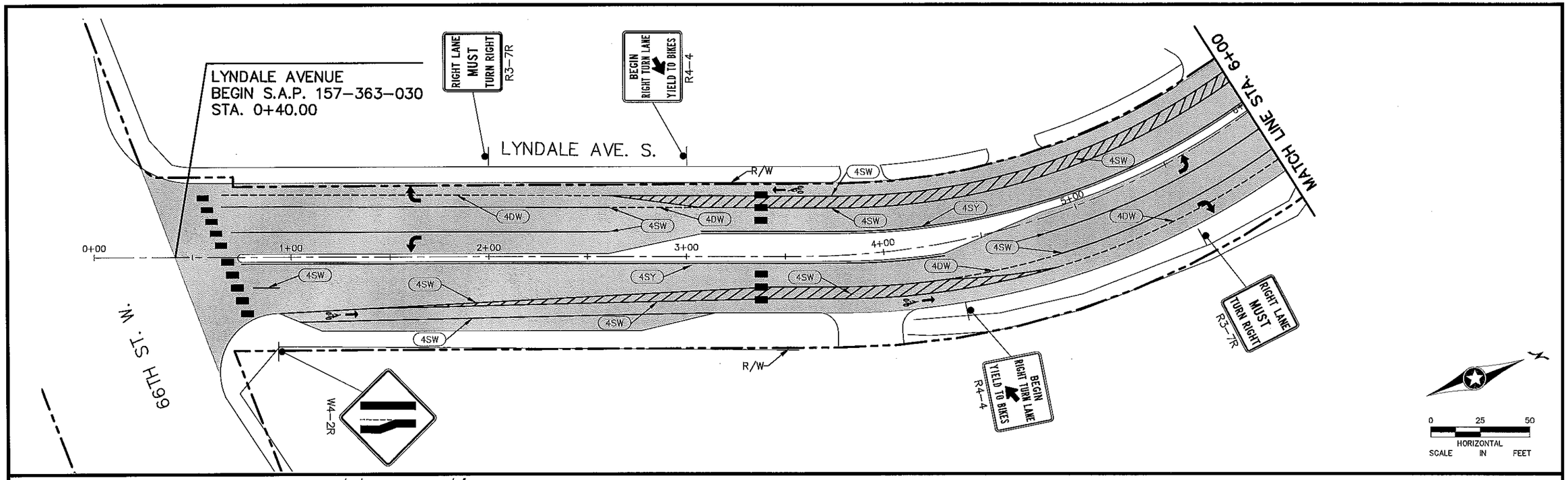
③ EDGE BETWEEN NEW V CURB AND INPLACE STRUCTURE SHALL BE SEALED AND BOND BREAKER SHALL BE USED BETWEEN EXISTING STRUCTURE AND PLACED V-CURB.

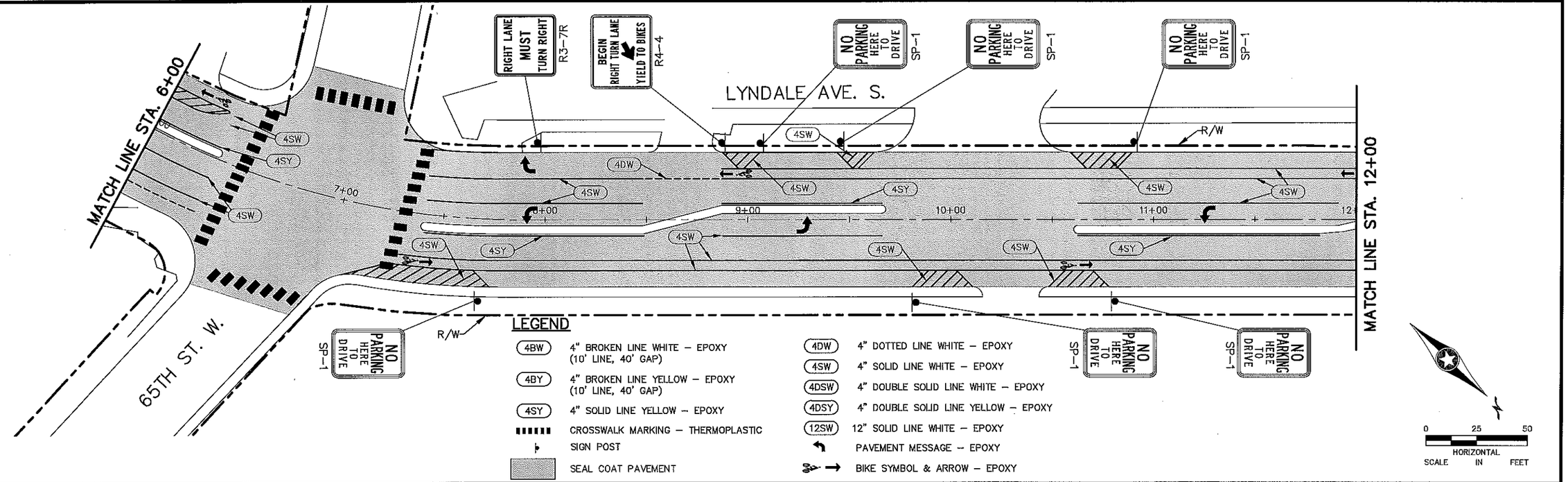
④ EDGE OF DETECTABLE WARNING SURFACES SHALL BE PLACED 15' MAXIMUM FROM THE CENTERLINE OF THE TRACK. WHEN PEDESTRIAN GATES ARE PROVIDED, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE SIDE OF THE GATES OPPOSITE THE RAIL, 17" - 19" FROM THE APPROACHING SIDE OF THE GATE ARM.

⑤ WHEN PLAN SPECIFIES, DRILL AND GROUT NO. 4 12" LONG REINFORCEMENT BARS AT 36" MAX. CENTER TO CENTER (EPOXY COATED).

⑥ TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONCTRUCTED, LANDINGS MAY BE CAST SEPARATELY. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON THIS SHEET WHEN LANDINGS ARE CAST SEPARATELY.

STANDARD PLAN SHEET NO. 5-297.250 (5 OF 5)	PEDESTRIAN CURB RAMP DETAILS
STANDARD APPROVED: APRIL 10, 2013	
STATE PROJ. NO. 157-363-030	SHEET NO. 11 OF 17 SHEETS





LEGEND

4BW	4" BROKEN LINE WHITE – EPOXY (10' LINE, 40' GAP)	4DW	4" DOTTED LINE WHITE – EPOXY
4BY	4" BROKEN LINE YELLOW – EPOXY (10' LINE, 40' GAP)	4SW	4" SOLID LINE WHITE – EPOXY
4SY	4" SOLID LINE YELLOW – EPOXY	4DSW	4" DOUBLE SOLID LINE WHITE – EPOXY
	CROSSWALK MARKING – THERMOPLASTIC	4DSY	4" DOUBLE SOLID LINE YELLOW – EPOXY
	SIGN POST	12SW	12" SOLID LINE WHITE – EPOXY
	SEAL COAT PAVEMENT		PAVEMENT MESSAGE – EPOXY
			BIKE SYMBOL & ARROW – EPOXY

No.	Date	Revisions	App.

DRAWING NAME 160659002_PC.dwg

DESIGNED BY:	MTM
DRAWN BY:	RBC
CHECKED BY:	WCK
DATE:	07/07/2014
PROJECT NO.	160659002

Kimley»Horn

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

WILLIAM C. KLINGBEIL, P.E.
DATE: 07/07/2014 MN LIC. NO. 43835

CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

SIGNING AND STRIPING PLAN

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157-363-030
S.A.P.	

SHEET NO. 12 / 17

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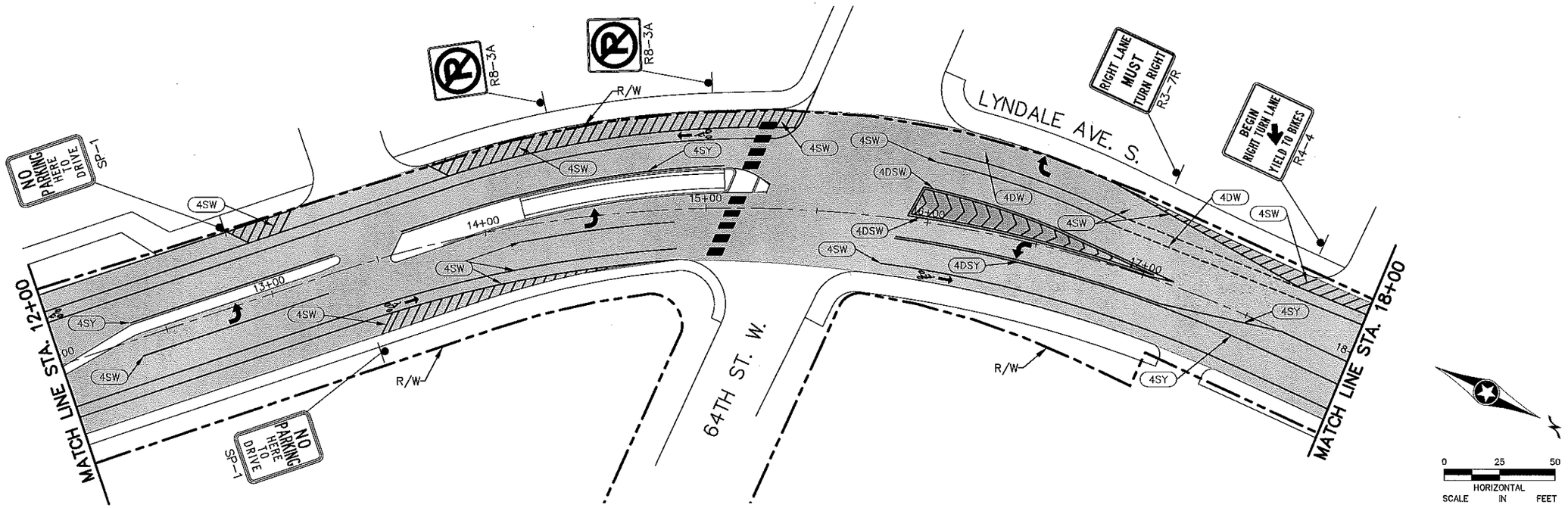

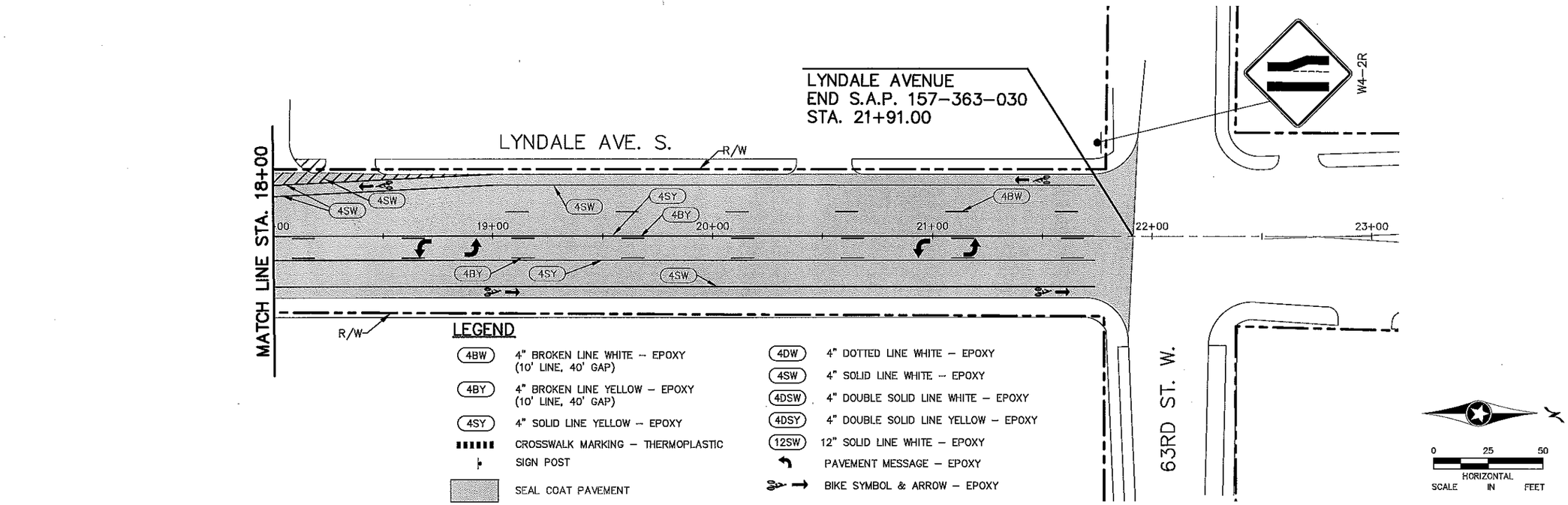

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Richfield

CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

SIGNING AND STRIPING PLAN

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157-363-030
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ABBREVIATIONS

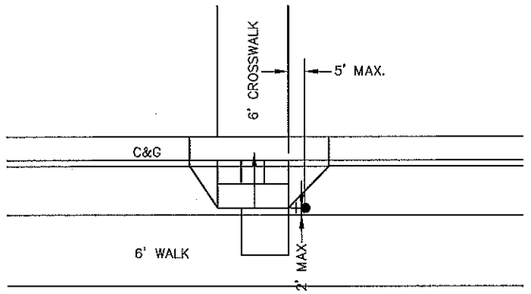
BL	BLUE
BL/BLK	BLUE WITH BLACK TRACER
BLK	BLACK
BLK/WH	BLACK WITH WHITE TRACER
EQ.G	EQUIPMENT GROUND
F&I	FURNISH AND INSTALL
G	GREEN
G/BLK	GREEN WITH BLACK TRACER
GLTA	GREEN LEFT TURN ARROW
GRN	GREEN
GR. RD.	GROUND ROD
HH	HANDHOLE
INP	INPLACE
INS. GR.	INSULATED GROUND
LED	LIGHT EMITTING DIODE
LHT	LIGHT
NEU	NEUTRAL
NMC	NONMETALLIC CONDUIT
O	ORANGE
O/BLK	ORANGE WITH BLACK TRACER
PB	PUSH BUTTON
PB2--1 (e.g.)	PUSH BUTTON (PHASE 2, NO. 1)
PEC	PHOTOELECTRIC CELL
PED	PEDESTRIAN
R	RED
R&S	REMOVE AND SALVAGE
R/BLK	RED WITH BLACK TRACER
RFB	RAPID FLASHING BEACON
RLTA	RED LEFT TURN ARROW
RSC	RIGID STEEL CONDUIT
RRFB	RECTANGULAR RAPID FLASHING BEACON
SOP	SOURCE OF POWER
SPR	SPARE
ST LHT	STREET LIGHT
STA	STATION
SW	SWITCH
SWD	SWITCHED
TYP	TYPICAL
WH	WHITE
WH/BLK	WHITE WITH BLACK TRACER
WLK	WALK
YEL	YELLOW
YLTA	YELLOW LEFT TURN ARROW
YRTA	YELLOW RIGHT TURN ARROW

SYMBOLS

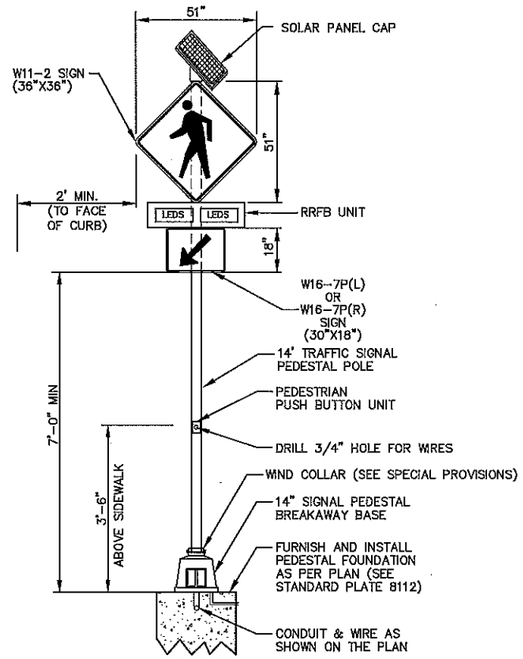
- SIGNAL BASE NO.
- HANDHOLE
- CABLE SPLICE
- NEUTRAL
- PEDESTAL POLE
- GROUNDING ROD/BOLT

GUIDELINES FOR LOCATING PUSH BUTTONS

- THIS IS A GENERAL DETAIL INTENDED TO SHOW THE REQUIREMENTS OF PUSH BUTTON LOCATION. FOR PROJECT SPECIFIC DETAILS REGARDING PEDESTRIAN RAMP LAYOUT, SEE THE PEDESTRIAN CURB RAMP AND SIDEWALK DETAILS.
- BUTTONS SHALL BE WITHIN 5' OF THE OUTSIDE EDGE OF THE CROSSWALK.
- THE FACE OF THE BUTTON SHALL BE PARALLEL WITH THE CROSSWALK.
- A MIN. 4'X4' LANDING AREA SHALL BE PROVIDED ADJACENT TO EACH BUTTON.
- BUTTONS SHALL BE WITHIN 10' OF THE BACK OF CURB OR EDGE OF ROADWAY.
- BUTTONS SHALL BE AT LEAST 10' APART.



TYPICAL PEDESTRIAN PUSH BUTTON LOCATION



DETAIL A – POLES ①, ②, ③
PEDESTAL POLE & PEDESTRIAN PUSH BUTTON PEDESTAL POLE MOUNT
NOT TO SCALE

STANDARD PLATES – SIGNAL SYSTEMS

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT

			DESCRIPTION			
▻	8110	E	TRAFFIC SIGNAL BRACKETING (POLE MOUNTED)	►	8122	F	PEDESTAL AND PEDESTAL BASE
▻	8111	E	TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED)	▻	8123	G	POLE AND MAST ARM
►	8112	G	PEDESTAL FOUNDATION	▻	8126	K	POLE FOUNDATION (PA90 AND PA100)
►	8114	A	PVC HANDHOLE/PULLBOX	▻	8127	C	LIGHT FOUNDATION – DESIGN E
▻	8117	F	PRECAST CONCRETE HAND HOLE	►	8129	A	SHIM AND WASHER
▻	8118	D	SERVICE EQUIPMENT AND POLE	▻	8130	E	SAW CUT LOOP DETECTORS
▻	8119	C	GROUND MOUNTED CABINET FOUNDATION	▻	8132	B	PREFORMED RIGID PVC CONDUIT LOOP DETECTOR
▻	8120	P	POLE FOUNDATION (PA-85)	▻	8133	A	POLE AND MAST ARM – TYPE BA
▻	8121	G	TRANSFORMER BASE AND POLE BASE PLATE	▻	8134	B	POLE FOUNDATION – TYPE BA

► STANDARD PLATES APPLICABLE TO THIS PROJECT

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CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

PEDESTRIAN CROSSING SYSTEM PLAN

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157-363-030
S.A.P.	

SHEET NO. 14 / 17

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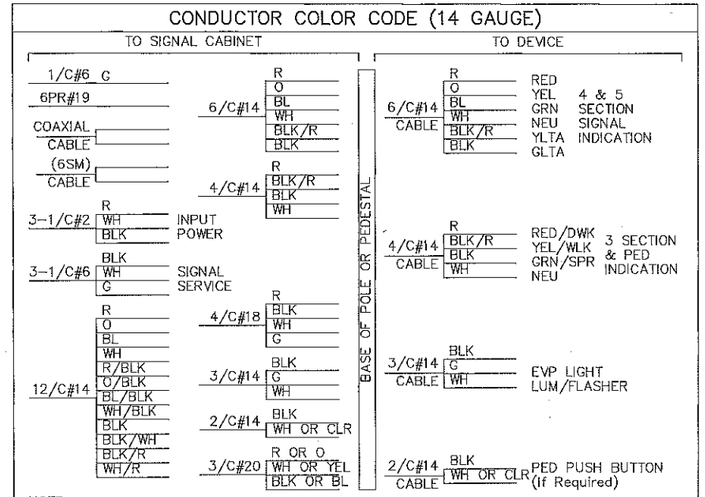
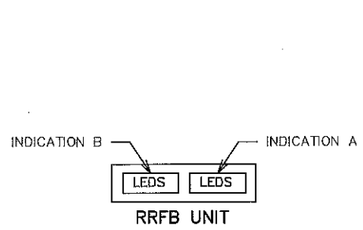
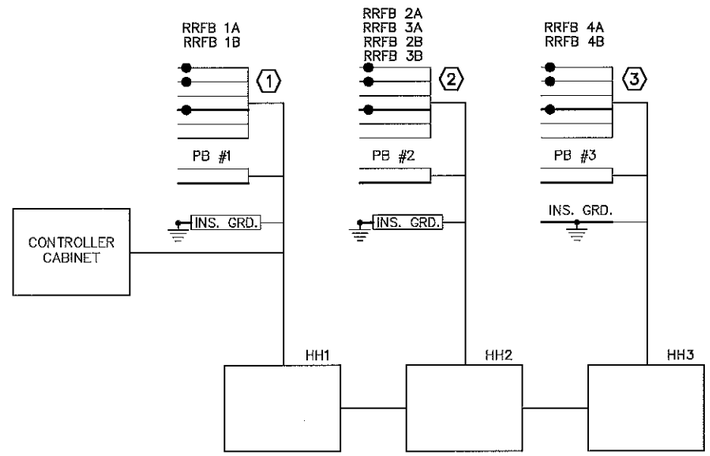
CONDUCTOR COLOR CODE (14 GAUGE)



NOTE:
ALL POLE CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.



RRFB UNIT



WIRING DIAGRAM

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CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

PEDESTRIAN CROSSING SYSTEM PLAN

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157-363-030
S.A.P.	

SHEET NO. 15 / 17

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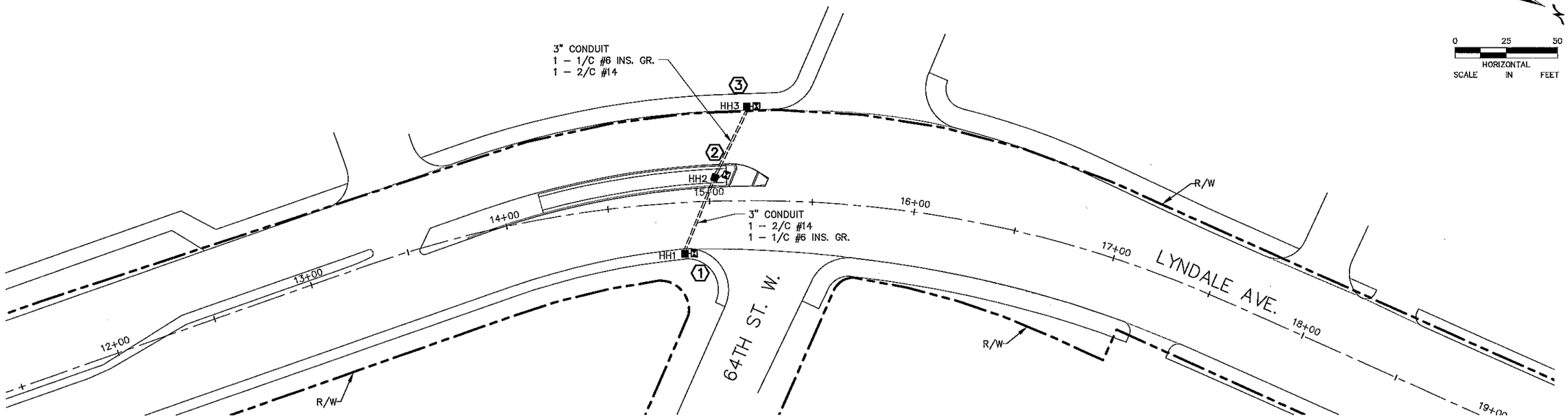

① PEDESTAL FOUNDATION
14' PEDESTAL POLE AND BASE
1 – SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON (RRFB #1)
1 – SIGN W11–2 (36" X 36")
1 – SIGN W16–7P(L) (30" X 18")
1 – SOLAR POWERED PEDESTRIAN PUSH BUTTON & SIGN (R10–25)
1 – POLE MOUNTED SYSTEM CONTROLLER AND CABINET
EXTEND TO HH1
3" CONDUIT
1 – 2/C #14
1 – 1/C #6 INS. GR.

② PEDESTAL FOUNDATION
14' PEDESTAL POLE AND BASE
2 – SOLAR POWERED RECTANGULAR RAPID FLASHING BEACONS (RRFB #2, RRFB #3)
2 – SIGN W11–2 (36" X 36")
2 – SIGN W16–7P(R) (30" X 18")
1 – SOLAR POWERED PEDESTRIAN PUSH BUTTON & SIGN (R10–25)
EXTEND TO HH2
3" CONDUIT
1 – 2/C #14
1 – 1/C #6 INS. GR.

③ PEDESTAL FOUNDATION
14' PEDESTAL POLE AND BASE
1 – SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON (RRFB #4)
1 – SIGN W11–2 (36" X 36")
1 – SIGN W16–7P(L) (30" X 18")
1 – SOLAR POWERED PEDESTRIAN PUSH BUTTON & SIGN (R10–25)
EXTEND TO HH3
3" CONDUIT
1 – 2/C #14
1 – 1/C #6 INS. GR.

NOTES:
1. ALL ITEMS ARE FURNISH AND INSTALL, UNLESS NOTED OTHERWISE.
2. THE EXACT LOCATION OF HANDHOLES, SIGNS AND POLES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
3. THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS AND CONTENTS WILL BE DETERMINED IN THE FIELD. ALL CONDUITS SHALL BE BORED.
4. ALL NEW CONDUIT SHALL BE PVC – SCHEDULE 80 OR HDPE SCHEDULE 80 AND SHALL CARRY 1/C#6 GREEN INSULATED GROUNDING CONDUCTOR AS SHOWN IN THE PLAN.
5. ONLY PVC HANDHOLES WITH METAL RINGS AND COVERS ARE TO BE USED ON THIS PROJECT.
6. THE CONTRACTOR SHALL SUBMIT RRFB AND SIGN PANEL ATTACHMENT DETAILS FOR APPROVAL TO THE ENGINEER. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL RRFB, SIGN PANEL, SIGNAL POLE AND ATTACHMENT HARDWARE.
7. SEE SPECIAL PROVISIONS FOR PEDESTAL POLE REQUIREMENTS.
8. SEE DETAIL SHEETS FOR PEDESTAL POLE, WIRING DIAGRAM, AND METER PEDESTAL DETAILS.

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CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

PEDESTRIAN CROSSING SYSTEM PLAN

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157–363–030
S.A.P.	

SHEET NO. 16 / 17

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PLANT SCHEDULE

SHRUBS

QTY	SYM	COMMON NAME	BOTANICAL NAME	SIZE & ROOT CONDITION	SPACING
8	PPR	PURPLE PAVEMENT ROSE	ROSA 'ROTESMEER'	#3 CONT.	30" OC.
20	SBB	SPIREA DOUBLE PLAY BIG BANG	SPIREA JAPONICA 'DOUBLE PLAY BIG BANG'	#2 CONT.	24" AC.
12	BCB	BARBERRY BURGANDY CAROUSEL	BERBERIS THURNBERGII 'BAILTWO'	#3 CONT.	48" OC.

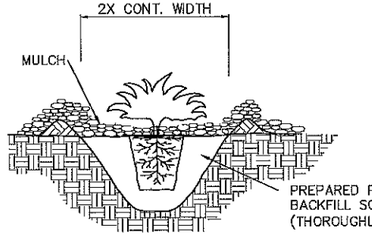
PERENNIALS

QTY	SYM	COMMON NAME	BOTANICAL NAME	SIZE & ROOT CONDITION	SPACING
36	LBS	LITTLE BLUESTEM	GR. SCHIZACHRYIUM SCOPARIUM 'CAROUSEL'	#1 CONT.	30" OC.
75	DSS	DAYLILY STELLA SUPREME	HEMEROCALLIS 'STELLA SUPREME'	#1 CONT.	18" AC.

NOTE TO CONTRACTOR: IF GRAPHIC REPRESENTATION OF PLANTINGS ON PLANS DOES NOT MATCH QUANTITIES IN PLANT LIST, GRAPHIC REPRESENTATION OF PLANTINGS ON PLANS WILL GOVERN. PLANTS SHALL BE SPACED ACCORDING TO EITHER OPPOSITE CENTER SPACING (OC) OR ALTERNATE CENTER SPACING (AC) AS STATED IN PLANTING SCHEDULE.

LANDSCAPE NOTES

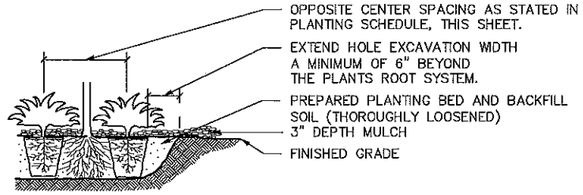
1. ALL PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE OF PESTS AND DISEASE.
2. ALL MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT BEFORE, DURING, AND AFTER INSTALLATION.
3. CONTRACTOR SHALL LOCATE ALL EXISTING UNDERGROUND UTILITIES AND NOTIFY LANDSCAPE ARCHITECT OF ANY CONFLICTS. CONTRACTOR SHALL EXERCISE CAUTION WHEN WORKING IN THE VICINITY OF UNDERGROUND UTILITIES.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY, SCHEDULE AND PROTECTION BETWEEN DELIVERY AND PLANTING TO MAINTAIN HEALTHY PLANT CONDITIONS.
5. ANY PLANT MATERIAL WHICH IS DISEASED, DISTRESSED, DEAD, OR REJECTED SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY, AND SIZE AND MEETING ALL PLANT LIST SPECIFICATIONS.
6. STANDARDS SET FORTH IN "AMERICAN STANDARD FOR NURSERY STOCK" REPRESENT GUIDELINE SPECIFICATIONS ONLY AND SHALL CONSTITUTE MINIMUM QUALITY REQUIREMENTS FOR PLANT MATERIAL.



CONTAINER STOCK

1. SCARIFY SIDES AND BOTTOM OF HOLE.
2. PROCEED WITH CORRECTIVE PRUNING OF TOP AND ROOT.
3. REMOVE CONTAINER AND SCORE OUTSIDE OF SOIL MASS TO REDIRECT AND PREVENT CIRCLING FIBROUS ROOTS. REMOVE OR CORRECT STEM GIRDLING ROOTS.
4. SET PLANT ON UNDISTURBED NATIVE SOIL OR THOROUGHLY COMPACTED PLANTING SOIL. INSTALL PLANT SO THE TOP OF THE ROOT FLARE IS AT OR UP TO 2" ABOVE THE FINISHED GRADE.
5. PLUMB AND BACKFILL WITH PLANTING SOIL.
6. WATER THOROUGHLY WITHIN 2 HOURS TO SETTLE PLANTS AND FILL VOIDS.
7. BACK FILL VOIDS AND WATER SECOND TIME.
8. PLACE SHREDDED HARDWOOD MULCH TO A DEPTH OF 3" WITHIN 48 HOURS OF THE SECOND WATERING UNLESS SOIL MOISTURE IS EXCESSIVE.

1/17 SHRUB PLANTING DETAIL



2/17 PLANTING DETAIL FOR MASS PLANTING BEDS

No.	Date	Revisions	App.

DRAWING NAME 160659002_LA.dwg

DESIGNED BY:	JLK
DRAWN BY:	MBN
CHECKED BY:	JLK
DATE:	07/07/2014
PROJECT NO.	160659002

Kimley»Horn

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

JENNIFER L. JACKSON, ASLA
DATE: 07/07/2014 MN LIC. NO. 50576

Richfield

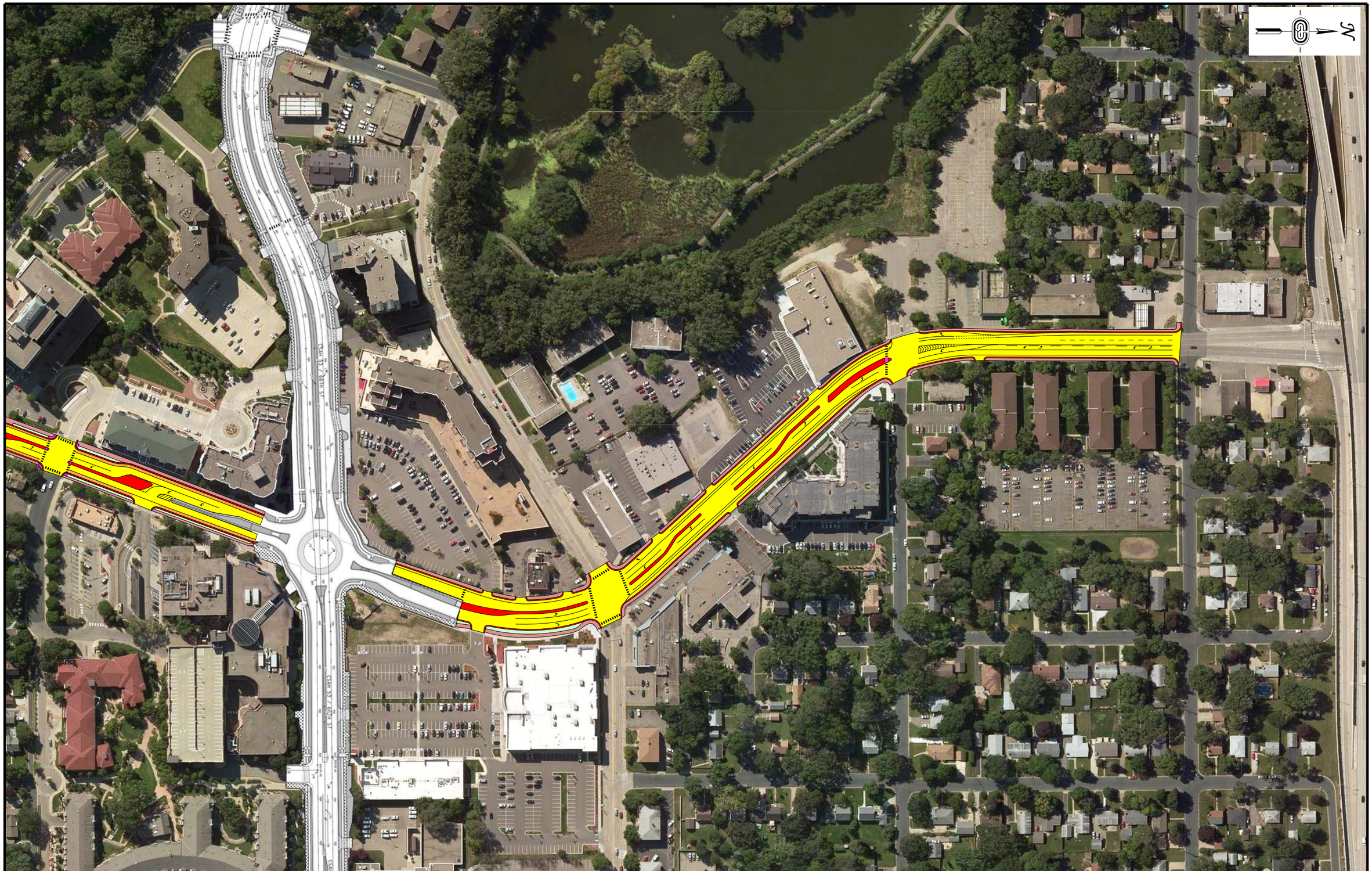
CITY OF RICHFIELD
LYNDALE AVENUE ROADWAY IMPROVEMENT PROJECT

LANDSCAPING PLAN AND DETAILS

CITY PROJECT	41014
COUNTY PROJECT	
S.A.P.	157-363-030
S.A.P.	

SHEET NO. 17 / 17

K:\TWC_Civil\City\RICHFIELD\Lyndale Ave\CAD\Plan Sheets\160659002_LA.dwg July 31, 2014 - 4:22pm



REV. NO.	DATE	BY	CHK	DESCRIPTION

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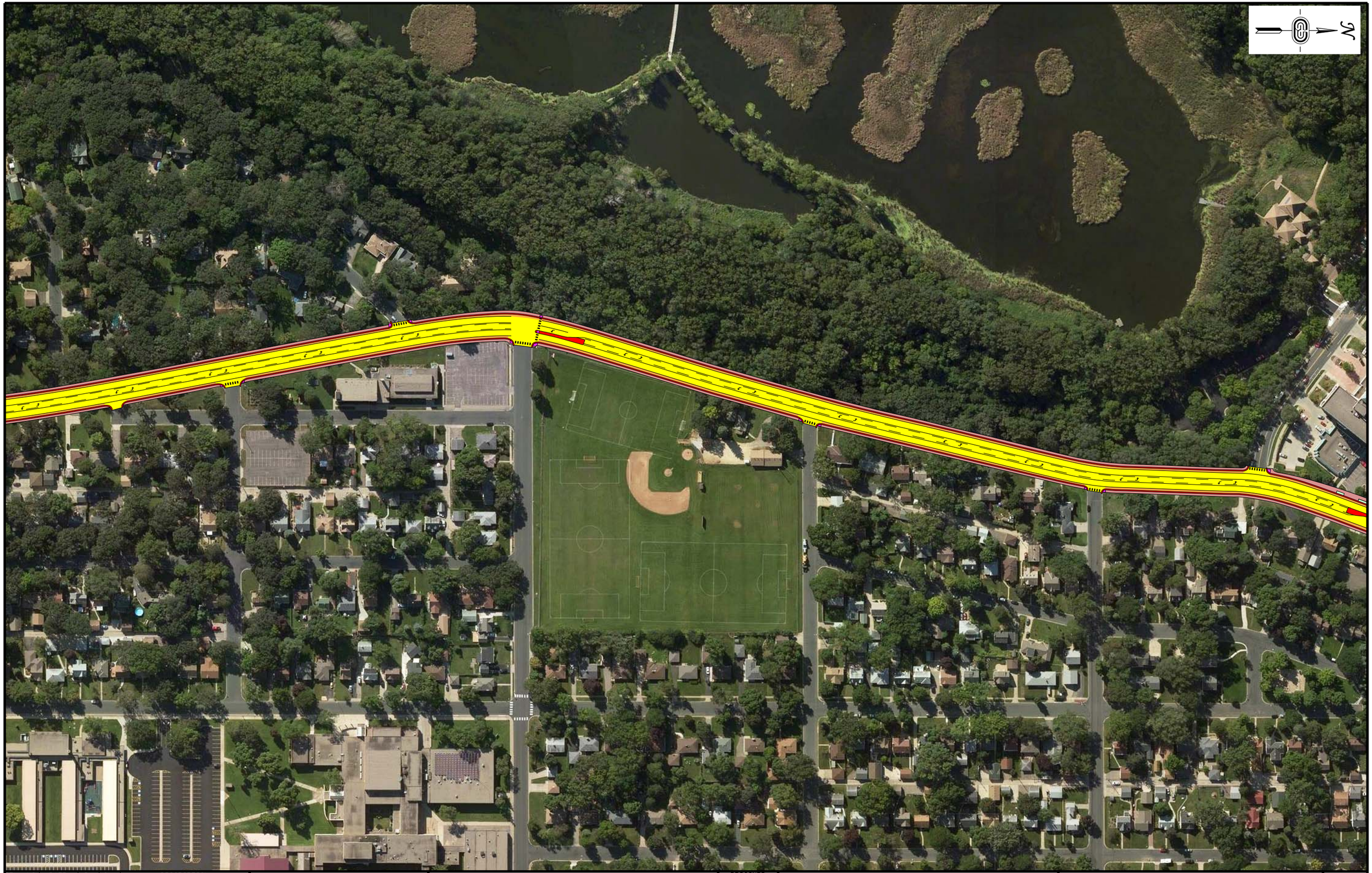
SCALE FEET

DESIGNED
DRAWN
CHECKED

Stonebrooke
Engineering Responsible Solutions™

SHEET
1
OF
3



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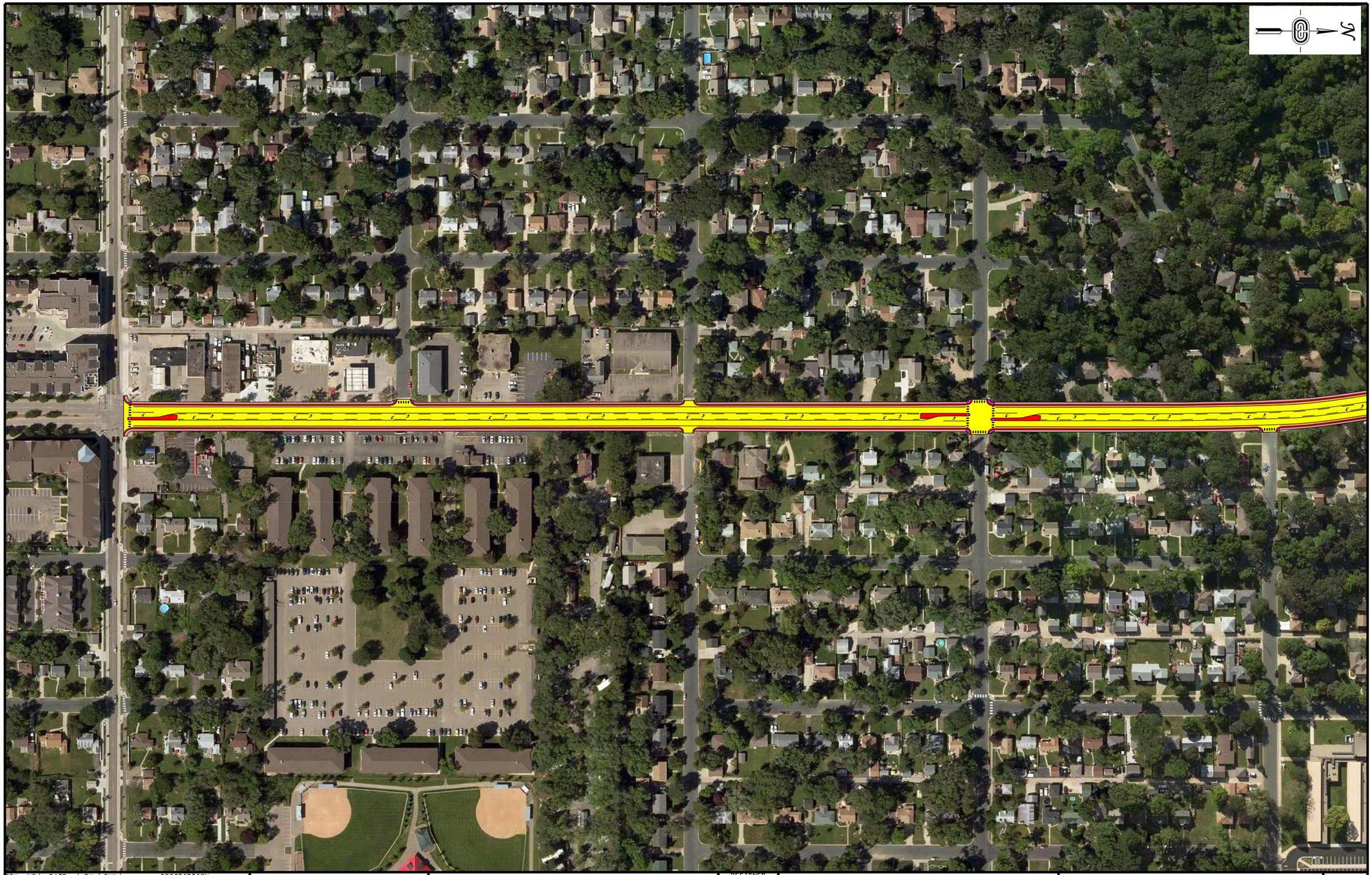

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Engineering Responsible Solutions

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OF
3

RESOLUTION NO. 11212

RESOLUTION AUTHORIZING SUBMISSION OF THE LYNDALE AVENUE PROJECT FUNDING APPLICATION FOR FEDERAL SURFACE TRANSPORTATION PROGRAM FUNDS

WHEREAS, the City of Richfield understands that the Lyndale Avenue pavement and utilities were constructed in 1977 or earlier and despite regular maintenance have significantly deteriorated since that time; and

WHEREAS, the City of Richfield has previously completed and approved an Arterial Roadway Study including Lyndale Avenue; and

WHEREAS, the City of Richfield has an approved Complete Streets Policy; and

WHEREAS, the City of Richfield has an approved Bicycle Master Plan including Lyndale Avenue; and

WHEREAS, the City of Richfield has completed a Guiding Principles process for major transportation projects; and

WHEREAS, the City of Richfield has determined that the Lyndale Avenue Project will create improved mobility and increased redevelopment opportunities along the corridor.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Richfield approves the submission of the Lyndale Avenue 2016 Application for Federal Surface Transportation Program funds. The application includes the reconstruction of Lyndale Avenue, an A Minor Arterial Reliever, from 63rd Street to 76th Street (excluding the intersection with 66th Street), and improved connections to destinations for walking, biking, and transit use along this corridor.

Adopted by the City Council of the City of Richfield, Minnesota this 14th day of June, 2016.

Debbie Goettel, Mayor

ATTEST:

Elizabeth VanHoose, City Clerk

Metro Transit

July 15, 2016

Jeff Pearson
City Engineer
City of Richfield
1901 E 66th Street
Richfield, MN 55423

RE: Letter of Support for Richfield's Regional Solicitation Application

Dear Mr. Pearson:

Metro Transit supports the City of Richfield's application for Surface Transportation Program (STP) funds under the current regional solicitation for Roadway Reconstruction and Modernization funding category. Funding is needed to improve multimodal facilities as part of the modernization of Lyndale Avenue South in Richfield. This funding will provide the opportunity to create a multimodal corridor that encourages transit use resulting in increased ridership and an improved transit rider experience.

The Lyndale Avenue Complete Streets project will replace and upgrade current sidewalks along Lyndale Avenue South and convert the roadway from four lanes to three meaning transit riders will only have to cross two lanes of traffic instead of four. More space on the shoulders will create safer boarding conditions for transit patrons. Improving the street lighting near transit stops will also increase safety for transit users. Richfield has invested significant time and resources involving the community in planning for jobs, neighborhoods, and recreation. The ability to structure these improvements will help balance the transit needs with the local vision.

Metro Transit supports the City in their efforts to fund this project.

Sincerely,

Adam Harrington
Director of Service Development

Note to the Reviewer: Under the section "Expander/Augmentor/Connector/Non-Freeway Principal Arterial" Section of the "Role in Regional Economy Page", we left the classification blank.

We still included the project area, length, and distance, as well as uploading the roadway area definition map.

Since our project is classified as a "Reliever: Relieves a Principal Arterial that is a Freeway Facility" we did not fit it with one of the label options.

Richfield Public Schools

7001 Harriet Ave. So., Richfield MN 55423

Independent School District 280
612.798.6000
www.richfield.k12.mn.us
STEVEN P. UNOWSKY, Superintendent

INSPIRE
EMPOWER
EXCEL

July 15, 2016

Kristin Asher
Public Works Director
City of Richfield
1901 E 66th Street
Richfield, MN 55423

RE: Letter of Support for Richfield's Regional Solicitation Application

Dear Ms. Asher:

I am writing in support of the City of Richfield's application for Surface Transportation Program (STP) funds under the current regional solicitation for Roadway Reconstruction and Modernization funding category. Richfield Public Schools have invested in Safe Routes to School projects and programs. Improving sidewalks and access to a safer bike lane on Lyndale will be very beneficial. Funding is needed to improve multimodal facilities as part of the modernization of Lyndale Avenue South in Richfield. This funding will provide the opportunity to create a multimodal corridor that encourages transit use and creates a safer transportation experience for all modes of transportation.

The Lyndale Avenue Complete Streets project will replace and upgrade current sidewalks, bicycle lanes and a multiuse path along Lyndale Avenue South and convert from a four lane to a three lane road. Pedestrians will only have to cross three lanes of traffic instead of four and the proposed medians will provide refuge for those crossings. I am excited that these improvements will provide safer and more efficient access to the Richfield schools.

On behalf of the Richfield School District, we strongly encourage and support approval of the City of Richfield to receive this funding to help realize the vision the city has for Lyndale Avenue South.

Sincerely,

Steven Unowsky
Superintendent

Recreation Services Department
Wood Lake Nature Center

July 11, 2016

Kristin Asher
Public Works Director
City of Richfield
1901 E 66th Street
Richfield, MN 55423

RE: Letter of Support for Richfield's Regional Solicitation Application

Dear Ms. Asher:

I am writing in support of the City of Richfield's application for Surface Transportation Program (STP) funds under the current regional solicitation for Roadway Reconstruction and Modernization funding category. At Wood Lake we have bike hikes and having access to a safer bike lane on Lyndale will be very beneficial. Funding is needed to improve multimodal facilities as part of the modernization of Lyndale Avenue South in Richfield. This funding will provide the opportunity to create a multimodal corridor that encourages transit use and creates a safer transportation experience for all modes of transportation.

The Lyndale Avenue Complete Streets project will replace and upgrade current sidewalks, bicycle lanes and a multiuse path along Lyndale Avenue South and convert from a four lane to a three lane road. Pedestrians will only have to cross three lanes of traffic instead of four and the proposed medians will provide refuge for those crossings. I am excited that these improvements will provide safer and more efficient access to the Wood Lake Nature Center.

On behalf of the Wood Lake Nature Center, we strongly encourage and support approval of the City of Richfield to receive this funding to help realize the vision the city has for Lyndale Avenue South.

Sincerely,

Karen Shragg
Manager
Wood Lake Nature Center