

**CENTRAL CORRIDOR (GREEN LINE)  
LIGHT RAIL TRANSIT PROJECT  
OPERATIONS AND MAINTENANCE AGREEMENT  
BOARD OF WATER COMMISSIONERS OF THE CITY OF SAINT PAUL  
AND METROPOLITAN COUNCIL  
DRAFT: 11/28/2016**

This Operations and Maintenance Agreement (“Agreement”) is entered into by and between the Metropolitan Council, a public corporation and political subdivision of the State of Minnesota (“Council”) and the Board of Water Commissioners of the City of Saint Paul, a municipal corporation of the State of Minnesota (“Board”), hereinafter collectively referred to as the “Parties”.

**WHEREAS**, the Council has constructed the Central Corridor Light Rail Transit, a metropolitan electric railway system with the ability to operate short trains along rights-of-way at ground level and to board and discharge passengers at track or car floor level running between Downtown Minneapolis and Downtown St. Paul, generally via Washington and University Avenues (“LRT”); and

**WHEREAS**, pursuant to Minn. Stat. § 473.411 the Council owns and operates the LRT on City streets and County roadways; and

**WHEREAS**, this Agreement will define the Parties’ roles and responsibilities with respect to the operation and maintenance of the LRT; and

**WHEREAS**, Minnesota Statutes Chapters 471 and 473 and other applicable statutes, authorize the Parties to enter into this Agreement;

**NOW, THEREFORE**, for mutual and valuable consideration, the sufficiency of which has been agreed to by the Parties, the Board and Council agree as follows:

**ARTICLE 1 – DEFINITIONS**

The following terms shall have the following meanings for purposes of this Agreement:

**“Board”** shall mean the Board of Water Commissioners of the City of Saint Paul, its employees or agents.

**“Cathodic Protection”** shall mean the prevention of electrolytic corrosion of the Board’s iron, copper and brass water facilities, accomplished by causing the facilities to act as the cathode of an electrochemical cell.

**“Cathodic Protection System”** shall mean the system installed within the Corridor that is intended to provide Cathodic Protection.

**“Cathodic Protection Testing”** shall mean the procedures used to monitor the Cathodic Protection System.

**“Cathodic Protection Testing Station”** shall mean all wiring, wiring connections and terminals necessary to test the Cathodic Protection System, along with all terminal enclosures that provide access to same.

**“Council”** shall mean the Metropolitan Council, its employees, agents or contractors.

**“Field and Permit Contacts”** shall mean the Rail Control Center – 612-341-5710, Saint Paul Regional Water Services engineering department – 651-266-6270.

**“LRT Area”** shall mean the area that includes the area within the LRT Work Zone, LRT System and LRT Stations as those terms are defined herein, and the real property or easements owned by the Council that will be used for the operation and maintenance of the LRT System.

**“LRT Station”** shall mean the passenger loading facilities for the LRT System, including but not limited to, platforms, canopies and railings, pedestrian access walkways, special handicap access facilities and all functional and architectural features.

**“LRT System”** shall mean all equipment and facilities owned by the Council and associated with the operation of the LRT, including but not limited to, the tracks, raised curb, stations, transit operating systems, equipment including gate arms, flashing lights, warning devices, LRT system signage, LRT train control equipment, overhead catenary system (OCS), LRT traction power substations, LRT gate crossing houses, LRT signal/communication houses, Council owned artwork and LRT vehicles.

**“LRT Work Zone”** shall mean the area where work is performed within the area described as follows:

- On, over or under a street that crosses at-grade within twelve (12) feet of each side of the center line of each track.

**“LRT Work Zone Access Procedures”** shall mean the Council’s procedures, as updated and amended, for working in, on, or around the LRT System, including track allocation procedures, work scheduling requirements, notification procedures and work permit procedures. A current copy of the Council’s LRT Work Zone Access Procedures are shown in Exhibit B, attached hereto and incorporated herein.

**“Metro Transit”** shall mean the operating division of the Metropolitan Council that is responsible for the LRT.

**“Overhead Catenary System” or “OCS”** shall mean all facilities for the overhead traction power distribution to the light rail system including, but not limited to, OCS poles, overhead wires, underground wires, hardware and appurtenances.

## **ARTICLE 2 – PURPOSE AND GENERAL RESPONSIBILITIES**

2.1 Purpose. The purpose of the Agreement is to define the operational and maintenance responsibilities of each Party with respect to the LRT System in the City of Saint Paul, the geographic limits of which are shown in Exhibit A, attached hereto and incorporated herein.

2.2 General Board Responsibilities. Except as otherwise provided in this Agreement, the Board is responsible for all operations and maintenance related to their infrastructure.

2.3 General Council Responsibilities. Except as otherwise provided in this Agreement, the Council is responsible for LRT System maintenance.

2.4 Annual Meeting. The Parties shall meet annually on or before June 1 of each year during the term of this Agreement, or as needed, to resolve any operation or maintenance issues related to the LRT System. The meeting shall be chaired by Metro Transit's Deputy Chief Operation Officer for Rail, or their designee, the Board's General Manager, or their designees.

## **ARTICLE 3 – OPERATION OF LRT SYSTEM**

3.1 Operation of the LRT System in City Streets and County Roadways. Pursuant to its powers under Minnesota Statutes 473.411, Subd. 5 and in accordance with this Agreement, Council may operate the LRT System on, across, under and over City streets and County roadways.

3.2 Work within the LRT Work Zone.

A. Annual Council Permit. Each year, the Board shall obtain from the Council an annual work permit for anticipated work occurring within the LRT Work Zone. These annual permits shall provide a comprehensive listing of all work activities that may be conducted under the permit and shall specifically identify work having the potential to encroach within the LRT Work Zone. This work includes, but is not limited to, Gopher State One Call locates, valve exercise, uni-directional flushing, water service turn on/shut off, and meter set/removal. For work identified by the Board in the annual permit as having the potential to encroach within the LRT Work Zone, the Board will be required to provide advance notice to the Rail Control Center of the commencement of the activity and its anticipated duration. The Council agrees to provide timely resources necessary for the safe execution of this work including, the provision of reasonable and sufficient worker protections. The annual work permit will require the Board to require its contractors to indemnify the Council and name the Council as an additional insured on insurance appropriate for the work to be performed. If the Board intends to perform work under the work permit with its own employees, the Board will provide a letter of self-insurance showing coverage consistent with the limits of Minn. Stat. Ch. 466.

B. Standard Council Permit. Because of safety concerns, any party looking to work within or encroach upon the LRT Work Zone, including the Board or its contractors, if the work

is outside of its Annual Permit as defined above, must obtain a permit from the Council. The permit will require the Board to require its contractors to indemnify the Council and name the Council as an additional insured on insurance appropriate for the work to be performed. If the Board intends to perform work under the work permit with its own employees, the Board will provide a letter of self-insurance showing coverage consistent with the limits of Minn. Stat. Ch. 466. The Board or its contractors shall make a written request for right of entry according to the Council's LRT Work Zone Access Procedures. No party shall unreasonably withhold such permission in this area. The Council shall not disallow work, encroachment, or other activities within the LRT Work Zone unless the Council determines, in its sole discretion, that such activities are in direct conflict with the safe and efficient operation of the LRT System including the inability of the Council to provide sufficient worker protections.

C. Emergency Access to LRT Work Zone for Board. In the case where the Board needs access to the LRT Work Zone for emergency work, the Board must contact the Rail Control Center at 612-341-5710 prior to commencement of the work and commence their work only after receiving approval to do so.

D. LRT Work Zone Considerations. The Council acknowledges that, from time to time, work activities proposed by the Board or contractors working for the Board may require the Council to adjust train operations, de-energize power lines or temporarily remove the LRT System equipment. In such cases, the Council shall not charge the Board and/or its contractors for revenue lost due to these work activities, nor shall the Board charge the Council for Board work required to be conducted outside of normal working hours. Board staff shall confer with Council staff in planning work required to operate and maintain the Parties' respective infrastructure so as to minimize the potential for LRT System disruption occurring from routine activities. The Board shall ensure that its employees and contractors performing maintenance within the LRT Work Zone have completed, before working in the LRT Work Zone, an On Track Safety training program, which shall be provided by the Council without charge to the Board and its contractors.

3.3 Board Infrastructure Emergencies. The Board or its designees shall have the authority to contact the Rail Control Center and order a stoppage of LRT operations if they believe a situation exists which threatens public safety. LRT operations shall not resume until the threat to public safety has been resolved or mitigated to the satisfaction of the person making the call in coordination with the Council's designee for Rail Operations.

## **ARTICLE 4 –MAINTENANCE OF LRT SYSTEM**

### **4.1 LRT System Infrastructure.**

A. The Council is responsible for maintenance of all LRT related infrastructure located in the LRT System.

B. If new water service is requested by a property owner that impacts infrastructure located within the LRT System, the Board agrees to require that the property owner be responsible for the cost of all repairs of impacted infrastructure at no expense to the Council.

C. When possible and prior to excavation necessary for Board-required work within the LRT Work Zone that has not been requested by a property owner, the Board will consult and confer with the Council in an effort to minimize the impact on Council's assets. The Council agrees that any apparatus or equipment that by its nature exists solely for the operation, maintenance, or control of Light Rail Transit, including, but not limited to, traction power, rail signaling, and rail control equipment, which must be relocated, repaired or replaced due to such excavation will be performed at no cost to the Board. The Board agrees to replace, restore, or repair any other infrastructure affected by such excavation.

#### 4.2 Cathodic Protection.

A. A Cathodic Protection System exists in the Corridor and provides Cathodic Protection for the LRT System, for the Board, and for other utilities.

B. The Council shall own and maintain the wiring, wiring connections, terminals and all other such similar apparatus of the Cathodic Protection Testing Station. The Board shall own and maintain the terminal enclosures that provide access and protection to said apparatus.

C. The Council developed a Cathodic Protection Testing Plan as shown in Exhibit "C" and agree to implement annual testing in accordance with this plan. Future changes in the Cathodic Protection Testing Plan shall be submitted for Board approval thirty (30) days prior to implementation, and such approval shall not be unreasonably withheld. The Council agrees to provide the Board with data generated by such testing on an annual basis and in an acceptable digital format as soon as practicable. The Council agrees to immediately notify the Board of any test results that fall outside of acceptable parameters.

D. The Council is responsible for the mitigation of stray current if detected and if deemed related to LRT or related infrastructure.

#### 4.3 Coordination of Routine Track and Roadway Maintenance to Minimize Disruption.

A. The Board and Council will coordinate their maintenance efforts to minimize disruption to the other Party and to the general public.

B. The Council designates the Rail Control Center for the coordination of track, roadway and utility maintenance to minimize disruption to the general public.

C. The Board designates Saint Paul Regional Water Services (SPRWS) for the coordination of maintenance to minimize the disruption to the general public.

## ARTICLE 5 –OTHER PROVISIONS

5.1 Employees. All employees of each Party and all persons engaged by each Party in the performance of any work or services required or provided for herein to be performed by each Party shall not be considered employees of any other Party and that any and all claims that may or might arise under the Worker's Compensation Act or the Unemployment Compensation Act of the State of Minnesota on behalf of said employees while so engaged, and any and all claims made by any third parties as a consequence of any act or omission on the part of said employees while so engaged, on any work or services provided to be rendered herein, shall in no way be the obligation or responsibility of any other Party.

5.2 Applicable Provisions of Law. The Parties agree to comply with applicable provisions of Minnesota state law, federal law and any applicable local ordinances which shall be considered a part of this Agreement as though fully set forth herein.

5.3 Entire Agreement. It is understood and agreed that the entire Agreement between the Parties is contained herein and that this Agreement supersedes all oral agreements and negotiations between the Parties relating to the subject matter hereof. All items referred to in this Agreement are incorporated or attached and are deemed to be part of this Agreement. Any alterations, variations, modifications or waivers of provisions of this Agreement shall only be valid when they have been reduced to writing as an amendment to this Agreement signed by the Parties hereto.

5.4 Severability. The provisions of this Agreement shall be deemed severable. If any part of this Agreement is rendered void, invalid or unenforceable, such rendering shall not affect the validity and enforceability of the remainder of this Agreement unless the parts which are void, invalid or otherwise unenforceable shall substantially impair the value of the entire Agreement with respect to the Parties. One or more waivers by said Party of any provision, term, condition or covenant shall not be construed by the other Parties as a waiver of a subsequent breach of the same by other Parties.

5.5 Governing Law. This Agreement is entered into in and under the laws of the State of Minnesota and shall be interpreted in accordance therewith.

5.6 Notices. Any notice or demand, which may or must be given or made by a Party hereto, under the terms of this Agreement or any statute or ordinance, shall be in writing and shall be sent certified mail or delivered in person to the Parties as follows:

**Board of Water Commissioners  
of the City of Saint Paul**  
General Manager  
1900 Rice Street  
Saint Paul, MN 55113

**Metropolitan Council**  
Regional Administrator  
390 Robert Street North  
St. Paul, MN 55101

5.7 Contract Administration. In order to coordinate the activities of the Parties as to accomplish the purposes of this Agreement, the following individuals, or their designees or successors shall manage this Agreement on behalf of the Parties:

**Board of Water Commissioners of the City of Saint Paul**

General Manager  
1900 Rice Street  
Saint Paul, MN 55113

**Metropolitan Council**

General Manager  
Metro Transit  
560 Sixth Avenue North  
Minneapolis, MN 55411-4398

5.8 Availability of Financial Records. The Parties agree that each Party hereto, the Legislative Auditor, the State Auditor, or any of their duly authorized representatives at any time during normal business hours, and as often as they reasonably deem necessary, shall have access to and the right to examine, audit, excerpt, and transcribe any books, documents, papers, or records which are pertinent to the accounting practices and procedures of the other Party hereto and involve transactions relating to this Agreement. The parties shall retain such documents for a minimum of six years from the last date they were effective or applicable to operation of the LRT System (whichever is last) or any part thereof.

5.9 Data Privacy. The Parties agree to abide by all applicable state and federal laws and regulations and confidential information concerning individuals and/or data including but not limited to information made non-public by such laws or regulations.

5.10 Term. This Agreement shall take effect upon execution by all Parties hereto, and shall remain in effect for twenty-five (25) years unless terminated pursuant to Section 5.13 below. At each annual meeting held by the Parties pursuant to Article 2 of this Agreement, the Parties shall review and determine whether significant changes to the LRT system require amendment to this Agreement. If the representatives of the Parties as provided in Article 2 of this Agreement determine that an amendment to this Agreement is warranted due to significant changes in the LRT System, the respective representatives shall make such recommendation for amendment and submit the terms of such recommendation for amendment to the governing body of each respective party. Such amendment shall not be effective until agreed to in writing and approved by the governing body of each respective party (if required by such party's policies and procedures).

5.11 Recitals. The Recitals are incorporated into and made part of this Agreement.

5.12 Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed to be an original, but all of which shall constitute one and the same instrument.

5.13 Termination. This agreement may be terminated by any party to this Agreement for any reason by providing the other parties written notice of such termination at least two years (2) years prior to the effective date of such termination.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives on the dates indicated below.

**METROPOLITAN COUNCIL**

By: \_\_\_\_\_  
Its Regional Administrator

Date: \_\_\_\_\_

**BOARD OF WATER COMMISSIONERS  
OF THE CITY OF SAINT PAUL**

Approved as to form:

By: \_\_\_\_\_  
Stephen P. Schneider, General Manager  
Saint Paul Regional Water Services

Date: \_\_\_\_\_

By: \_\_\_\_\_  
Matt Anfang, President

Date: \_\_\_\_\_

By: \_\_\_\_\_  
Lisa Veith  
Assistant City Attorney

Date: \_\_\_\_\_

By: \_\_\_\_\_  
Mollie Gagnelius  
Secretary

Date: \_\_\_\_\_

By: \_\_\_\_\_  
Todd Hurley  
Director, Office of Financial Services

Date: \_\_\_\_\_

[illegible]

**EXHIBIT B**  
**LRT WORK ZONE ACCESS PROCEDURES**

Standard Operating Procedure: Rail Operations	Publication # 100.12	Revision #5 Date: 8-2013	Page 1 of 2
Title: Work Permit Procedure			
Distribution: All Rail Operations, Maintenance, and Rail Facility Employees			
Issued by: Standard Operating Procedures Committee		Approved by: Vince Pellegrin  Chief Operations Officer Metro Transit	
Supersedes: Standard Operating Procedures May, 2011 Edition			

**PURPOSE**

To obtain authorization to perform work on Metro Transit Light Rail Right-of-Way, Metro Transit Light Rail has a set protocol to ensure the safety of employees, workers, and passengers.

**WHEN TO USE IT**

This procedure is to be used anytime:

- Scheduled work will occur within 12-feet of centerline of the rails
- Scheduled work will occur within the adjacent roadway travel lane or the berthing lane
- Scheduled work occurs within any structure/premise that can affect train service (e.g. substation, communication signal house, passenger platforms)
- Scheduled work will affect the movement of passengers to or from trains
- Scheduled work will occur within 20-feet of the Over Head Catenary System that requires the use of a Crane or Derrick

**PROCEDURE AND RESPONSIBILITIES**

The Metro Transit Light Rail Right-of-Way Allocation Request form (Work Permit) is to be completed by any Metro Transit employee or outside contractor desiring to do work, as described above, on Metro Transit Light Rail Right-of-Way.

Before work begins, any persons requesting Metro Transit Light Rail Right-of-Way access, must first attend the On-Track Right-of-Way safety training program. After completion of the Training Program the requestor must attend the Right-of-Way Track Allocation meeting and be prepared to discuss the work in full detail. In most instances approval will be given to the requestor at this meeting.

**CONTRACTOR MUST**

- Produce proof of insurance and the Metro Transit Light Rail Right-of-Way training card or certificate at the Track Allocation Meeting
- Not begin work on the Metro Transit Light Rail Right-of-Way until the request has been approved and a Right-of-Way Permit has been issued
- The Right-of-Way training card must be in the possession of all persons entering Metro Transit Light Rail Right-of-Way

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Title: Work Permit Procedure		

- Establish a Stationary Work Zone prior to the start of work (SOP #400.02)
- Ensure compliance with all OSHA regulations

Internal departments must complete the form and attend the meeting one-week in advance of the work being requested.

Before work commences, on a daily basis, the On-Scene-Supervisor/Coordinator must call the Rail Control Center (612-341-5710) for daily activation of the Work Permit and notification on the Metro Transit Light Rail Right-of-Way.

The Metro Transit Light Rail Right-of-Way Track Allocation meetings will be held, unless otherwise specified, every Thursday at 2:00 pm, in the Operations and Maintenance Building (O & M) 3<sup>rd</sup> Floor, Conference Room. Completed forms should be faxed to 341-5677, Attention: Manager Rail Operations.

#### **EMPLOYEE RESPONSIBILITY**

Employee responsibilities are outlined in training and the applicable Metro Transit Light Rail Operating Rules (current version).

#### **REFERENCE**

Metro Transit Rail Operations Rule Book (current version).

**EXHIBIT C**

**Cathodic Protection / Stray Current Test Plan**

# Cathodic Protection / Stray Current Test Plan

The performance of stray current testing is used to evaluate the effectiveness of the corrosion control system. This includes corrosion control measures incorporated in the design of the rail lines.

Metro Transit will contract with a firm that has experience performing stray current /corrosion protection testing. They will perform the testing with the assistance from various Metro Transit Departments. The testing firm will provide a test report upon completion of testing and analysis of the test data. The report shall consist of the test locations results, their conclusions and recommendations on how to best mitigate any negative findings. This may require additional testing to localize the activity to a defined area.

Test locations are a statistical mixture of gas pipelines, water pipelines and structures such as transformer cases or storage tanks of the total stations on the system.

## **System Overview**

The Blue Line operates from Target Field Station 2 and tail tracks to the Mall of America. The contractor will test a statistical sampling of the corrosion control test points along the system.

The Green Line operates from Target Field Station 2 to the Union Depot Station and beyond to the LRV Maintenance facility including the yard. The contractor will test a statistical sampling from the St. Paul OMF and yard to the 35W Junction where it ties in directly with the Blue Line tracks.

## **Final Report**

The final report will consist of a system overview, executive summary, testing summary, individual test point findings and conclusions, areas of concern and recommendations for mitigation action. It should also include a summary table and test location drawing and graphs of the tests. The final report will be due after the testing data analysis is done.

MetroTransit Green Line  
Stray Current Study

Location	Primary Street	Cross Street	Cross Street 2	Structure	Direction	SPRWS Asset ID	Potential-to-Earth			
							Max (V)	Min (V)	Average (V)	Delta (V)
1	NE Cedar Ramp	Cedar Ave		Hydrant	N					
2	NE Cedar Ramp	Washington Ave		New	N					
2	NE Cedar Ramp	Washington Ave		Existing	N					
3	Washington Ave	Pleasant St		Hydrant	N					
4	Washington Ave	Pleasant St	Church St	New	N					
4	Washington Ave	Pleasant St	Church St	Existing	N					
5	Washington Ave	Church St		New	N					
5	Washington Ave	Church St		Existing	N					
6	Washington Ave	Church St		New	S					
6	Washington Ave	Church St		Casing	S					
7	Washington Ave	Union St		New	N					
7	Washington Ave	Union St		Casing	N					
8	Washington Ave	Union St		New	S					
8	Washington Ave	Union St		Casing	S					
9	Washington Ave	Harvard St		New	N					
9	Washington Ave	Harvard St		Casing	N					
10	Washington Ave	Harvard St		New	S					
10	Washington Ave	Harvard St		Existing	S					
11	Washington Ave	Walnut St		New	N					
11	Washington Ave	Walnut St		Casing	N					
12	Washington Ave	Walnut St		New	S					
12	Washington Ave	Walnut St		Existing	S					
13	Washington Ave	Walnut St		Gas TS	S					
14	Washington Ave	Oak St		New	N					
14	Washington Ave	Oak St		Existing	N					
15	Washington Ave	Oak St		New	S					
15	Washington Ave	Oak St		Existing	S					
16	Washington Ave	Ontario St		New	N					
16	Washington Ave	Ontario St		Existing	N					
17	Washington Ave	Ontario St		New	S					
17	Washington Ave	Ontario St		Existing	S					
18	Washington Ave	Ontario St		Gas TS	S					
19	University Ave	23rd Ave		New	ES					
19	University Ave	23rd Ave		Existing	ES					
20	Transitway	25th Ave		New	N					
20	Transitway	25th Ave		Existing	N					
21	Transitway	25th Ave		Gas TS	N					
22	Transitway	25th Ave		New	S					
22	Transitway	25th Ave		Existing	S					
23	4th St	29th Ave		Hydrant	W					
24	University Ave	29th Ave		New	NW					
24	University Ave	29th Ave		Casing	NW					
25	University Ave	Arthur Ave		Hydrant	S					
26	University Ave	30th Ave		Hydrant	N					
27	University Ave	Malcolm Ave		Hydrant	N					
28	University Ave	Malcolm Ave		Hydrant	S					
29	University Ave	Clarence Ave		Hydrant	N					
30	University Ave	Clarence Ave		Hydrant	S					
31	University Ave	Bedford Ave		New	N					
31	University Ave	Bedford Ave		Existing	N					
32	University Ave	Bedford Ave		Water TS	S					
33	University Ave	Bedford Ave		Gas TS	S					
34	University Ave	Emerald St		New	NW	0544115				
34	University Ave	Emerald St		Existing	NW	0544115				
35	University Ave	Emerald St		Water TS	S	544115				
36	University Ave	Emerald St		Gas TS	S	G				

MetroTransit Green Line  
Stray Current Study

Location	Primary Street	Cross Street	Cross Street 2	Structure	Direction	SPRWS Asset ID	Potential-to-Earth			
							Max (V)	Min (V)	Average (V)	Delta (V)
37	University Ave	Berry St		Water TS	N	0540620				
38	University Ave	Curfew St		New	N	0544122				
38	University Ave	Curfew St		Existing	N	0544122				
39	University Ave	Curfew St		Hydrant	S	0544119				
40	University Ave	Eustis St		Hydrant	N	0544338				
41	University Ave	Eustis St		Water TS	S	0544126				
42	University Ave	Cromwell St		New	N	0544339				
42	University Ave	Cromwell St		Existing	N	0544339				
43	University Ave	Cromwell St		New	S	0544131				
43	University Ave	Cromwell St		Existing	S	0544131				
44	University Ave	Franklin Ave		New	S	0544340				
44	University Ave	Franklin Ave		Existing	S	0544340				
45	University Ave	Raymond Ave		New	N	0544343				
45	University Ave	Raymond Ave		Existing	N	0544343				
46	University Ave	Raymond Ave		New	S	0544132				
46	University Ave	Raymond Ave		Existing	S	0544132				
47	University Ave	Carleton St		New	N	0544157				
47	University Ave	Carleton St		Existing	N	0544157				
48	University Ave	LaSalle St		Water TS	N	0544163				
49	University Ave	LaSalle St		New	S	0544161				
49	University Ave	LaSalle St		Existing	S	0544161				
50	University Ave	Hampden Ave		New	N	0544171				
50	University Ave	Hampden Ave		Existing	N	0544171				
51	University Ave	Hampden Ave		New	S	0544168				
51	University Ave	Hampden Ave		Existing	S	0544168				
52	University Ave	Pillsbury St		New	N	0540318				
52	University Ave	Pillsbury St		Existing	N	0540318				
53	University Ave	Pillsbury St		Hydrant	S	0544420				
54	University Ave	Vandalia St		Hydrant	N	0532350				
55	University Ave	Vandalia St		New	S	0544187				
55	University Ave	Vandalia St		Existing	S	0544187				
56	University Ave	Montgomery St		Hydrant	S	0544195				
57	University Ave	Transfer		New	N	0540327				
57	University Ave	Transfer		Casing	N	0540327				
58	University Ave	Cleveland Ave		Hydrant	S	0544198				
59	University Ave	Transfer	Prior Ave	Water TS	N	0544208				
60	University Ave	Cleveland Ave	Prior Ave	New	S	0544204				
60	University Ave	Cleveland Ave	Prior Ave	Existing	S	0544204				
61	University Ave	Prior Ave		New	N	0544213				
61	University Ave	Prior Ave		Existing	N	0544213				
62	University Ave	Prior Ave		New	S	0540331				
62	University Ave	Prior Ave		Existing	S	0540331				
63	University Ave	Lynhurst Ave		Hydrant	N	0540341				
64	University Ave	Lynhurst Ave		Hydrant	S	0540340				
65	University Ave	Lynhurst Ave	Fairview Ave	Hydrant	S	0540537				
66	University Ave	Fairview Ave		New	N	0544221				
66	University Ave	Fairview Ave		Existing	N	0544221				
67	University Ave	Fairview Ave		New	S	0540348				
67	University Ave	Fairview Ave		Existing	S	0540348				
68	University Ave	Beacon St		New	N	0540349				
68	University Ave	Beacon St		Existing	N	0540349				
69	University Ave	Beacon St		New	S	0540352				
69	University Ave	Beacon St		Existing	S	0540352				
70	University Ave	Wheeler St		Hydrant	N	0532273				
71	University Ave	Wheeler St		Water TS	S	0540355				

MetroTransit Green Line  
Stray Current Study

Location	Primary Street	Cross Street	Cross Street 2	Structure	Direction	SPRWS Asset ID	Potential-to-Earth			
							Max (V)	Min (V)	Average (V)	Delta (V)
72	University Ave	Herschel St		Water TS	S	0540357				
73	University Ave	Aldine St		Water TS	S	0540361				
74	University Ave	Pierce St		New	S	0540375				
74	University Ave	Pierce St		Existing	S	0540375				
75	University Ave	Fry St		New	S	0540377				
75	University Ave	Fry St		Existing	S	0540377				
76	University Ave	Snelling Ave		Hydrant	N	0540378				
77	University Ave	Simpson St		New	NE	0541558				
77	University Ave	Simpson St		Existing	NE	0541558				
78	University Ave	Pascal St		New	NW	0541560				
78	University Ave	Pascal St		Existing	NW	0541560				
79	University Ave	Pascal St		New	S	0540396				
79	University Ave	Pascal St		Existing	S	0540396				
80	University Ave	Albert St		New	N	0540401				
80	University Ave	Albert St		Existing	N	0540401				
81	University Ave	Hamline Ave		New	N	0540405				
81	University Ave	Hamline Ave		Existing	N	0540405				
82	University Ave	Hamline Ave		New	S	0540408				
82	University Ave	Hamline Ave		Existing	S	0540408				
83	University Ave	Syndicate St		New	N	0544245				
83	University Ave	Syndicate St		Existing	N	0544245				
84	University Ave	Syndicate St		New	S	0540423				
84	University Ave	Syndicate St		Existing	S	0540423				
85	University Ave	Griggs Ave		Water TS	N	0540425				
86	University Ave	Griggs Ave		New	S	0540426				
86	University Ave	Griggs Ave		Existing	S	0540426				
87	University Ave	Dunlap St		Water TS	N	0541536				
88	University Ave	Dunlap St		New	S	0540427				
88	University Ave	Dunlap St		Existing	S	0540427				
89	University Ave	Lexington Pkwy		New	N	0540428				
89	University Ave	Lexington Pkwy		Existing	N	0540428				
90	University Ave	Lexington Pkwy		New	S	0540434				
90	University Ave	Lexington Pkwy		Existing	S	0540434				
91	University Ave	Oxford St		New	N	0540442				
91	University Ave	Oxford St		Existing	N	0540442				
92	University Ave	Oxford St		New	S	0540447				
92	University Ave	Oxford St		Existing	S	0540447				
93	University Ave	Chatsworth St	Milton St	Water TS	N	0544250				
94	University Ave	Victoria St		New	N	0540454				
94	University Ave	Victoria St		Existing	N	0540454				
95	University Ave	Victoria St		New	S	0540457				
95	University Ave	Victoria St		Existing	S	0540457				
96	University Ave	Avon St	Grotto St	Hydrant	N	0541541				
97	University Ave	Grotto St		New	N	0540459				
97	University Ave	Grotto St		Existing	N	0540459				
98	University Ave	St Albans St		Hydrant	N	0534105				
99	University Ave	St Albans St		Gas TS	N	G				
100	University Ave	St Albans St	Dale St	New	N	0544417				
100	University Ave	St Albans St	Dale St	Existing	N	0544417				
101	University Ave	Dale St		New	N	0540460				
101	University Ave	Dale St		Existing	N	0540460				
102	University Ave	Dale St		New	S	0544257				
102	University Ave	Dale St		Existing	S	0544257				

MetroTransit Green Line  
Stray Current Study

Location	Primary Street	Cross Street	Cross Street 2	Structure	Direction	SPRWS Asset ID	Potential-to-Earth			
							Max (V)	Min (V)	Average (V)	Delta (V)
103	University Ave	Kent St		Hydrant	N	0003715				
104	University Ave	Kent St		Hydrant	S	0007542				
105	University Ave	Mackubin St		New	N	0540464				
105	University Ave	Mackubin St		Existing	N	0540464				
106	University Ave	Mackubin St		Hydrant	S	0534156				
107	University Ave	Arundel St		New	N	0540467				
107	University Ave	Arundel St		Existing	N	0540467				
108	University Ave	Arundel St		New	S	0541546				
108	University Ave	Arundel St		Casing	S	0541546				
109	University Ave	Western Ave		New	N	0541430				
109	University Ave	Western Ave		Existing	N	0541430				
110	University Ave	Western Ave		New	S	0544275				
110	University Ave	Western Ave		Existing	S	0544275				
111	University Ave	Virginia St		New	N	0544278				
111	University Ave	Virginia St		Existing	N	0544278				
112	University Ave	Virginia St		New	S	0541561				
112	University Ave	Virginia St		Existing	S	0541561				
113	University Ave	Farrington St		New	N	0540472				
113	University Ave	Farrington St		Existing	N	0540472				
114	University Ave	Galtier St		Water TS	N	0540883				
115	University Ave	Galtier St		New	S	0544282				
115	University Ave	Galtier St		Existing	S	0544282				
116	University Ave	Marion St		New	N	0541429				
116	University Ave	Marion St		Existing	N	0541429				
117	University Ave	Marion St		Water TS	S	0540884				
118	University Ave	Rice St		New	N	0544301				
118	University Ave	Rice St		Existing	N	0544301				
119	University Ave	Rice St		New	S	0544304				
119	University Ave	Rice St		Existing	S	0544304				
120	University Ave	Park		New	N	0544317				
120	University Ave	Park		Existing	N	0544317				
121	University Ave	MLK Blvd		New	S	0544320				
121	University Ave	MLK Blvd		Existing	S	0544320				
122	University Ave	Capitol Blvd		New	N	0541445				
122	University Ave	Capitol Blvd		Existing	N	0541445				
123	University Ave	Capitol Blvd		New	SE	0541457				
123	University Ave	Capitol Blvd		Existing	SE	0541457				
124	University Ave	Cedar St		Water TS	N	0544404				
125	University Ave	Cedar St	Robert St	Water TS	N	0541463				
126	University Ave	Robert St		New	NE	0541462				
126	University Ave	Robert St		Existing	NE	0541462				
127	Robert St	MLK Blvd		Water TS	SW	0544351				
128	Robert St	14th St		New	E	0544355				
128	Robert St	14th St		Existing	E	0544355				
129	Robert St	14th St	12th St	Water TS	E	0544360				
130	Robert St	14th St	12th St	Gas TS	E	G				
131	Robert St	14th St	12th St	New	W	0544361				
131	Robert St	14th St	12th St	Existing	W	0544361				
132	12th St	Robert St		New	E	0544110				
132	12th St	Robert St		Existing	E	0544110				
133	12th St	Minnesota St		Water TS	S	0544365				
134	12th St	Cedar St		Water TS	NW	0541485				
135	12th St	Cedar St		New	SE	0544368				
135	12th St	Cedar St		Existing	SE	0544368				
136	Cedar St	11th St		New	E	0544106				
136	Cedar St	11th St		Existing	E	0544106				

Location	Primary Street	Cross Street	Cross Street 2	Structure	Direction	SPRWS Asset ID	Potential-to-Earth			
							Max (V)	Min (V)	Average (V)	Delta (V)
137	Cedar St	10th St		New	E	0544373				
137	Cedar St	10th St		Existing	E	0544373				
138	Cedar St	10th St		New	W	0544380				
138	Cedar St	10th St		Existing	W	0544380				
139	Cedar St	Exchange St		New	E	0541489				
139	Cedar St	Exchange St		Existing	E	0541489				
140	Cedar St	Exchange St		Water TS	W	0541488				
141	Cedar St	Exchange St	7th St	New	E	0541493				
141	Cedar St	Exchange St	7th St	Casing	E	0541493				
142	Cedar St	7th St		New	E	0544099				
142	Cedar St	7th St		Existing	E	0544099				
143	Cedar St	7th St		Water TS	S	0541498				
144	Cedar St	7th St		Gas TS	S	G				
145	Cedar St	7th St	6th St	New	W	0540497				
145	Cedar St	7th St	6th St	Existing	W	0540497				
146	Cedar St	6th St		New	E	0540480				
146	Cedar St	6th St		Existing	E	0540480				
147	Cedar St	6th St		New	W	0540483				
147	Cedar St	6th St		Existing	W	0540483				
148	Cedar St	5th St		New	E	0540484				
148	Cedar St	5th St		Existing	E	0540484				
149	Cedar St	5th St		New	W	0540487				
149	Cedar St	5th St		Existing	W	0540487				
150	4th St	Minnesota St		Water TS	N	0540491				
151	4th St	Minnesota St		New	S	0540492				
151	4th St	Minnesota St		Existing	S	0540492				
152	4th St	Robert St		New	N	0544403				
152	4th St	Robert St		Existing	N	0544403				
153	4th St	Robert St		New	S	0544402				
153	4th St	Robert St		Casing	S	0544402				
154	4th St	Jackson St		New	N	0540509				
154	4th St	Jackson St		Casing	N	0540509				
155	4th St	Jackson St		New	S	0540508				
155	4th St	Jackson St		Casing	S	0540508				
156	4th St	Sibley St		New	N	0544406				
156	4th St	Sibley St		Existing	N	0544406				
157	4th St	Sibley St		New	S	0540510				
157	4th St	Sibley St		Existing	S	0540510				
158	4th St	Wacouta St		New	N	0540513				
158	4th St	Wacouta St		Existing	N	0540513				
159	4th St	Wacouta St		New	S	0540516				
159	4th St	Wacouta St		Existing	S	0540516				
160	4th St	Wall St		Water TS	N	0540528				
161	4th St	Wall St		New	S	0540533				
161	4th St	Wall St		Existing	S	0540533				
162	4th St	Broadway St		Water TS	N	0544114				
163	4th St	Broadway St		Water TS	S	0540536				
164	4th St	Broadway St		Gas TS	S	G				

Color Code		
	Activity Level	< 75 mV
	Activity Level	≥ 75 mV
	Activity Level	≥ 150 mV
	Full Cathodic Protection Observed	
	Partial Cathodic Protection Observed	