Appendix L
Draft 4(f) Evaluation Update Supporting Documentation

Index

[1] In response to the SWLRT Project's request for information, the MPRB included: use reports for Bryn Mawr Park, Cedar Lake Park, Lake of the Isles, Park Siding Park; boat rental and beach attendance reports for Lake Calhoun; and Minneapolis Bicyclist and Pedestrian Count reports. Due to the length of this content and the detail included, these appendices are not included in this appendix.

1. U.S. Department of the Interior comment letter on the DEIS/Draft Section 4(f) Evaluation, 2012

Comment #234

"Darby, Valincia"
<valincia_darby@ios.doi.gov>

12/07/2012 10:24 AM

To <swcorridor@co.hennepin.mn.us>
cc Lindy Nelson <lindy_nelson@ios.doi.gov>
bcc
Subject FTA Southwest Transitway Construction and Operation Light Rail- DEIS comments

Ms. Simon

DOI correspondence on the subject DEIS is attached. If there are questions please contact this office at (215) 597-5378.

Regards,

Valincia Darby

--

Valincia Darby

Regional Environmental Protection Assistant

Department of the Interior, OEPC

200 Chestnut Street, Rm. 244

Philadelphia, PA 19106

Phone: (215) 597-5378 Fax: (215) 597-9845

Valincia_Darby@ios.doi.gov

Comment #234
Attachment #1

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904

IN REPLY REFER TO:

December 7, 2012

9043.1
ER 12/751

Ms. Marisol Simon
Regional Administrator, Region V
Federal Transit Administration
200 West Adams Street, Suite 320
Chicago, Illinois 60606

Dear Ms. Simon:

The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement and Section 4(f) Evaluation for the Southwest Transitway, Hennepin County, Minnesota. The Department offers the following comments and recommendations for your consideration.

Section 4(f) Evaluation Comments

The Federal Transit Administration (FTA), along with the Hennepin County Regional Railroad Authority (HCRRA) and the Metropolitan Council Regional Transit Board (RTB), have proposed the construction and operation of a 15-mile light rail transit (LRT) line in the Minneapolis/St. Paul region. The draft Section 4(f) Evaluation identified several properties in the project study area eligible to be considered under Section 4(f) of the Department of Transportation Act of 1966 (48 U.S.C. 1653(f)). The proposed Southwest Transitway connects downtown Minneapolis to the cities of St. Louis Park, Hopkins, Edina, Minnetonka, and Eden Prairie. The intent is to improve access and mobility to the jobs and activity centers in the Minneapolis Central Business District, as well as to the expanding suburban employment centers. The Southwest Transitway was identified by the RTB in the late 1990s as warranting a high-level of transit investment to respond to increasing travel demand in a highly congested area of the region.

The analysis of impacts to eligible 4(f) properties is not entirely straightforward, and it seems much of the decision-making has been postponed for further analysis and consultation. What is understood from the evaluation is that alternatives are anticipated to result in the use of relatively small amounts of parkland; the impacts are estimated to range between 0.002 to 1.12 acres of permanent use depending on the alternative selected. For historic properties, there is the potential for Section 4(f) uses between one and five historic properties/districts, depending on the alternative selected. These uses would consist of affecting historic channels, replacing historic bridges, and placing LRT facilities within eligible or listed sites and a historic district. Consultation on design features may result in a *de minimis* finding under Section 4(f). However,

the historic Regan Brothers Bakery (historic structure) would likely be demolished if a certain facility location is selected and the facility is constructed.

The Section 4(f) Evaluation appears rather preliminary. Therefore, the Department cannot concur with the FTA that there are no feasible or prudent avoidance alternatives to the any of the alternatives presented which result in impacts to Section 4(f) properties. A preferred alternative has not been selected and it would appear that each alternative has some level of impact. It is unclear whether any of the impacts proposed in the evaluation would even be subject to a *de minimis* finding. All discussion of impact mitigation for all Section 4(f) properties are being postponed until more design information is available and consultation with the Minnesota State Historic Preservation Officer (SHPO) and other consulting parties has proceeded. Therefore, the Department cannot concur that all possible planning needed to minimize harm to Section 4(f) resources has been employed. The Department will withhold its final concurrence that there are no feasible or prudent avoidance alternatives and that all possible planning needed to minimize harm to the 4(f) resources has been employed until a preferred alternative is selected and mitigation measures have been determined.

The Department has a continuing interest in working with the FTA to ensure impacts to resources of concern to the Department are adequately addressed. For continued consultation and coordination with the issues concerning historic resources identified as Section 4(f) resources, please contact Regional Environmental Coordinator Nick Chevance, Midwest Regional Office, National Park Service, 601 Riverfront Drive, Omaha, Nebraska 68102, telephone 402-661-1844.

We appreciate the opportunity to provide these comments.

Sincerely,

Lindy Nelson
Regional Environmental Officer,

cc:
MN-SHPO (Barbara.howard@mnhs.org)
Ms. Katie Walker, AICP
Senior Administrative Manager
Hennepin County
Housing, Community Works & Transit
701 Fourth Avenue South, Suite 400
Minneapolis, Minnesota 55415
(swcorridor@co.hennepin.mn.us)

2. Data request letter from SWLRT to MPRB (January 2015) and MPRB response and attachments (February 2015)

January 29, 2015

Jennifer Ringold
Minneapolis Park & Recreation Board
2117 West River Road
Minneapolis, MN 55411

Re: Section 4(f) Evaluation for the Southwest LRT (METRO Green Line) Project

Dear Ms. Ringold

The purpose of this letter is to request assistance from the Minneapolis Park and Recreation Board (MPRB) as the Southwest Light Rail Transit (SWLRT) Project continues to conduct its review of potential impacts and mitigation to parks and recreation areas located within the Project's park and recreation study area. The project's park and recreation study area, as defined in the Draft Environmental Impact Statement (DEIS), is 350 feet on either side of the proposed light rail alignment (see purple dashed line in the adjacent figure). In particular, the Metropolitan Council's SWLRT Project Office (SPO) and Federal Transit Administration (FTA) are working to update the project's Federal Section 4(f) analysis and documentation. Section 4(f) is a requirement that Federal transportation projects for publically-owned, publically-accessible and locally-significant parks and recreation areas, as well as any historic property that is listed or eligible to be listed on the National Register of Historic Places. For historic resources, including historic park and recreation areas, we are working with Minnesota Department of Transportation Cultural Resources Unit (MnDOT CRU), the Minnesota State Historic Preservation Office (MnSHPO) staff and SWLRT Section 106 consulting parties to complete the project's Section 106 historic preservation review process. Over the next few months, SPO and FTA will be coordinating with the MPRB concerning park and recreation areas that they own and manage to develop the update to the Section 4f analysis. It is FTA's intent to publish an update to the Section 4(f) analysis, with coordination with the MPRB, in the supplemental DEIS.

As part of the Section 4(f) effort, we are requesting information from MPRB to help develop the analysis and documentation of proposed impacts on publically-owned parks and recreation properties within the project's park and recreation area study area. SPO and FTA have identified the following publically-owned, publically-accessible parks and recreation areas within the project's park and recreation study area that are under the jurisdiction of the MPRB:

- Alcott Triangle

- Park Siding Park
- Kenilworth Lagoon Recreation Easement
- Lake of the Isles/Kenilworth Lagoon
- Cedar Lake Park
- Lake of the Isles Park
- Bryn Mawr Meadows

For these park and recreation areas, we respectfully request the following:

1. Confirmation that MPRB owns and manages these properties.
2. Identification of any other jurisdiction that has ownership or management responsibility for these properties (e.g., through a shared use agreement or a management agreement).
3. Confirmation that these properties are of local recreational significance.
4. Identification of the applicable adopted master plan or other plans for each property.
5. Identification any future adopted planned physical improvements for each property.
6. If available, provide maps of prominent facilities and brief descriptions of the key recreational activities that occur within each property (or source documents where this information can be obtained).
7. If available, data on the frequency and type of use for each property.
8. Identification of any other properties that the MPRB owns within the park and recreation study area that are primarily used for park and recreation purposes, that are publically-accessible and that are of local significance, including permanent recreation easements.

In addition to this information related to specific parks and recreation areas, SPO and FTA staff would like the following information in order to move the Section 4f analysis forward:

- To satisfy the requirements of Section 4(f), in some instances, written concurrence is required by FTA for the Section 4(f) evaluation and determination. Please describe MPRB processes for obtaining written concurrences for park business.
    - Name/title of MPB staff who is responsible for written concurrences under the "official with jurisdiction" designation for the Section 4f process
    - Do these types of concurrences require legal review? Or Board approval?
    - What is the schedule for signature of a concurrence letter?
- Management agreement, if one exists, between the MPRB and the City of Minneapolis for the recreational easement property.
    - Is MPRB the sole agency with jurisdiction over the parks, or does MPB share this responsibility with the City of Minneapolis?
- Pertaining to the permanent recreational easement across the Kenilworth Channel:
    - Has the recreational easement been amended since it was initially acquired (e.g., to allow for the demolition of the prior freight railroad bridge and construction of the existing wood pile bridges)?
    - Does MPRB believe that the existing recreational easement would need to be permanently amended for the project to construct a light rail bridge across the

channel and to remove and replace the existing freight rail and trail bridges across the channel? If so, could you please provide a summary of your rationale?

- Confirmation that the Comprehensive Plan MPRB 2007-2020, approved October 17, 2007, is the latest master plan document and that we do not need to review any additional documents to get the full breadth of management goals for recreational properties.
- Is there an approved management plan for MPRB parks and recreational areas that provides more specific information on the parks within the study area?

The information requested within this letter will be considered as FTA updates the determinations of which properties are protected under Section 4(f) and as it updates its determination of the official(s) with jurisdiction for each Section 4(f) property. Throughout the continuation of the project's Section 4(f) process, FTA and the SPO will continue coordination with the MPRB concerning Section 4(f) properties for which it is the official with jurisdiction. Based on Section 4(f) requirements and depending on forthcoming analyses and considerations, this coordination could include consultation on such things as: all possible planning to minimize harm (i.e., incorporation of reasonable mitigation measures) and least overall harm analysis for properties with a non-*de minimis* Section 4(f) use; Section 4(f) *de minimis* impact determinations; and temporary occupancy exemptions. This type of additional coordination between FTA, the SPO and the MPRB will be conducted through additional future meetings, correspondence and documentation.

Please let me know if you need any clarification on this request. SPO and FTA are requesting receipt of this information by Friday, February 6, 2015. We look forward to working with you on updating the Section 4(f) analysis for the SWLRT project.

Thank you,
Nani

Nani M. Jacobson
Assistant Director, Environmental & Agreements

MetroTransit- Transit Systems Development
Southwest Light Rail Transit Project Office
6465 Wayzata Boulevard, Suite 500
St. Louis Park, MN 55426
Direct: 612.373.3808 | Cellular: 808.497.0405 | Fax: 612.373.3899
nani.jacobson@metrotransit.org

Minneapolis
Park & Recreation Board

Administrative Offices
2117 West River Road
Minneapolis, MN 55411-2227

Operations Center
3800 Bryant Avenue South
Minneapolis, MN 55409-1000

Phone
612-230-6400
Fax
612-230-6500

www.minneapolisparks.org

February 12, 2015

Nani M. Jacobson
Assistant Director, Environmental & Agreements
MetroTransit-Transit Systems Development
Southwest Light Rail Transit Project Office
6465 Wayzata Boulevard, Suite 500
St. Louis Park, MN 55426

Re: Section 4(f) Evaluation

Dear Ms. Jacobson:

In response to your letter of January 29, 2015, requesting information about several of our parks, below and enclosed is the following information:

For the seven parks listed in your letter, here are answers to the first seven questions. Note that much of the information on master plans or future planned improvements, as well as frequency and use data, are contained on the enclosed flash drive.

Alcott Triangle

1. MPRB owns and manages this property.
2. There is no other jurisdiction with ownership/management responsibilities for this park.
3. This park is of local recreational significance.
4. There is no master plan or other plan for this park.
5. There are no future planned physical improvements for this park within our five year capital improvement plan.
6. This park does not have any recreational infrastructure so there is no map of prominent facilities and key recreational activities conducted there. It is used primarily as open space.
7. There is no segregated data on frequency and type of use for this park, as our data collection systems in current use focus on regional parks and parks with reserve-able, programmable spaces and features.

Park Siding Park

1. MPRB owns and manages this property.
2. There is no other jurisdiction with ownership/management responsibilities for this park.
3. This park is of local recreational significance.
4. Master Plan or other plan (see enclosed Park Siding folder).
5. There are no additional planned physical improvements within our five year capital improvement plan.
6. See **enclosed plan** showing recently installed prominent facilities and key recreational activities conducted there.

7. There is no segregated data on frequency and type of use for this park, as our data collection systems in current use focus on regional parks and parks with reserve-able, programmable spaces and public facilities. The playground and other recreational amenities in this park are open to public use on a first come, first served basis during park hours and not available for exclusive reservation.

Kenilworth Channel

1. MPRB owns and manages this property (we hold an easement interest only for the railroad portion of the channel. The remainder of the channel property is owned in fee title.)
2. The only other jurisdiction with ownership/management responsibilities is the railroad bridge over channel, currently held by BNSF Railroad.
3. This park is of local recreational significance, as part of both the Minneapolis Chain of Lakes Regional Park and the larger Grand Rounds Historic District (eligible).
4. See attached Chain of Lakes Improvement Plan from 1997.
5. For planned physical improvements, see documents in Kenilworth Channel folder
6. We will forward a map of prominent facilities and key recreational activities for this and all following parks with a follow-up letter.
7. For primary use data on the Minneapolis Chain of Lakes Regional Park, see the Annual Use Estimates for the Metropolitan Regional Parks System report. These annual reports are produced by Metropolitan Council Park Division staff in coordination with all regional park implementing agencies. The purpose of preparing the annual use estimates is to determine the number of visits to each regional park and trail within the system, by park implementing agency. The visit estimate is used to inform the formulas for calculating the distribution of regional, State and Legacy funds for capital as well as for operations and maintenance purposes.

For more specific data sets on public use of this property, including permits issued for various purposes, see Frequency and Use Reports Folder (enclosed). For bicycle and pedestrian counts for this property, see the City of Minneapolis Count report published yearly from 2010-2014, in Frequency and Use Reports folder.

Lake of the Isles Park (including Kenilworth Lagoon)

1. MPRB owns and manages this property.
2. Any other jurisdiction with ownership/management responsibilities – none.
3. Of local recreational significance – yes.
4. See attached Chain of Lakes Improvement Plan from 1997.
5. There are no planned physical improvements for this park in our five year capital improvement plan.
6. We will forward a map of prominent facilities and key recreational activities for this and all following parks with a follow-up letter.
7. For primary use data on the Minneapolis Chain of Lakes Regional Park, see the Annual Use Estimates for the Metropolitan Regional Parks System report. These annual reports are produced by Metropolitan Council Park Division staff in coordination with all regional park implementing agencies. The purpose of preparing the annual use estimates is to determine the number of visits to each regional park and trail within the system, by park implementing agency. The visit estimate is used to inform the formulas for calculating the distribution of regional, State and Legacy funds for capital as well as for operations and maintenance purposes.

For more specific data sets on public use of this property, including permits issued for various purposes, see Frequency and Use Reports folder. For bicycle and pedestrian counts for this property, see the City of Minneapolis Count report published yearly from 2010-2014, in Frequency and Use Reports folder.

Cedar Lake Park

1. MPRB owns and manages this property.
2. Any other jurisdiction with ownership/management responsibilities – none.
3. Of local recreational significance – yes.
4. See attached Chain of Lakes Improvement Plan from 1997.
5. There are no planned physical improvements for this park in our five year capital improvement plan.
6. We will forward a map of prominent facilities and key recreational activities for this and all following parks with a follow-up letter.
7. For primary use data on the Minneapolis Chain of Lakes Regional Park, see the Annual Use Estimates for the Metropolitan Regional Parks System report. These annual reports are produced by Metropolitan Council Park Division staff in coordination with all regional park implementing agencies. The purpose of preparing the annual use estimates is to determine the number of visits to each regional park and trail within the system, by park implementing agency. The visit estimate is used to inform the formulas for calculating the distribution of regional, State and Legacy funds for capital as well as for operations and maintenance purposes.

For more specific data sets on public use of this property, including permits issued for various purposes, see the Cedar Lake Park Folder (enclosed). For bicycle and pedestrian counts for this property, see the City of Minneapolis Count report published yearly from 2010-2014, in Frequency and Use Reports folder.

Bryn Mawr Meadows Park

1. MPRB owns and manages this property.
2. Any other jurisdiction with ownership/management responsibilities – none.
3. Of local recreational significance – yes.
4. There is at this time no master plan for this park.
5. In 2019-2020, this park is slated to have $3.5 million in athletic field, site and playground improvements.
6. We will forward a map of prominent facilities and key recreational activities for this and all following parks with a follow-up letter.
7. For data on frequency and type of use, see attached Bryn Mawr Use Report.

To answer question number eight in your letter, there are no other properties in the Southwest Light Rail Transit area besides the above parks that meet 4(f) guidelines for study.

MPRB's process for conducting business will include staff review of all proposals, followed by recommendations to the Superintendent, review by legal counsel, and then will require full board approval of any action on behalf of the organization. Our "official with jurisdiction" designee for the Section 4(f) process is our President of the Board, Liz Wielinski. Any documents requiring board approval

will need to be finalized between MPRB and other parties involved, including legal counsel review and recommendations as necessary. The final document is included in a recommended board resolution on an approximate four-week approval schedule. Board meetings are held the first and third Wednesday of most months.

MPRB and the City of Minneapolis are separate entities, with separate legal charters and governing documents. The City of Minneapolis has no involvement in the ownership, management or any decisions regarding MPRB's park property, whether held in fee or by other rights.

MPRB's Comprehensive Plan 2007-2020, approved October 17, 2007, is the most recent comprehensive plan document for our park system.

We are still compiling additional information in response to the questions in your letter and will forward same as soon as possible.

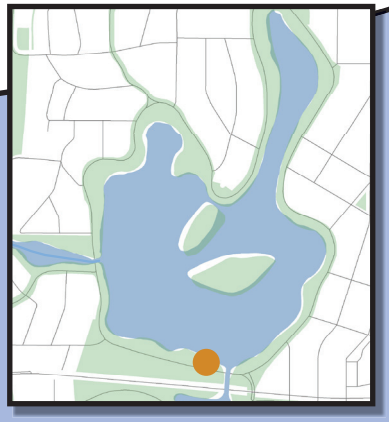
Sincerely,

Michael Schroeder
Assistant Superintendent for Planning

cc: Jennifer B. Ringold, MPRB Deputy Superintendent
Renay Leone, MRPB Real Estate Planner

Lake of the Isles S. Canoe Rack Locations

Minneapolis
Park & Recreation Board



paths

201 204
202 205
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225 228
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227 230

231 234
232 235
233 236

light pole

237 240
238 241
239 242

243 246
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250 253
251 254

255 258
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257 260

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262 265
263 266

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274 277
275 278

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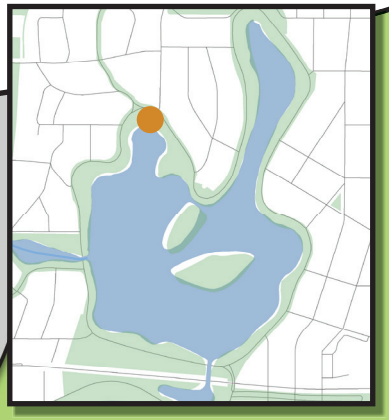
281 284

W. Lake of the Isles Pkwy.

MPRB 2012

Lake of the Isles N. Canoe Rack Locations

Minneapolis
Park & Recreation Board



W. Lake of the Isles Pkwy.

Penn Ave. So.

paths

922	925	
923	926	
924	927	

949	946	
950	947	
951	948	

943	940	
944	941	
945	942	

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959	962	
960	963	

994	991	
995	992	
996	993	

988	985	
989	986	
990	987	

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981	978	

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975	972	

967	964	
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969	966	

982	901	
983	902	
984	903	

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905	908	
906	909	

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911	914	
912	915	

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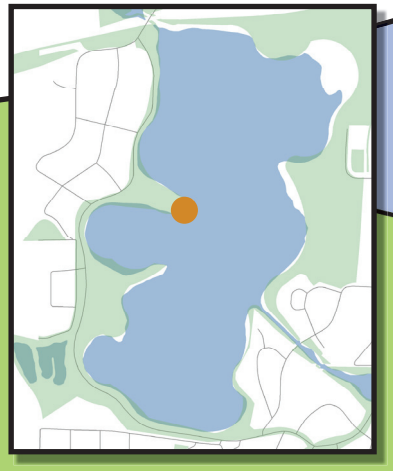
917	920	
918	921	

MPRB 2012

Cedar Lake Canoe Rack Locations

Minneapolis
Park & Recreation Board



301	304	
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303	306	
307	310	
308	311	
309	312	
313	316	
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315	318	
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320	323	
321	324	
325	328	
326	329	
327	330	
331	334	
332	335	
333	336	
337	340	
338	341	
339	342	

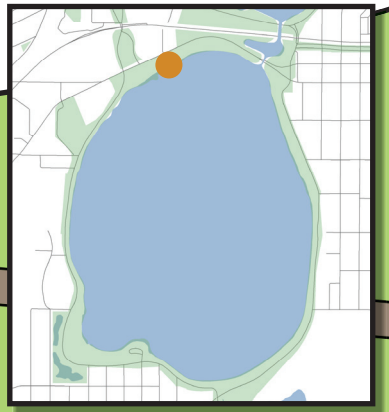
lifeguard chair

path

MPRB 2012

Calhoun Canoe Rack Locations

Minneapolis
Park & Recreation Board



Midtown Greenway

building

Thomas Ave. S.

West Lake Street

parking lot

paths

Lake Calhoun

North Beach

101 104 102 105 103 106	107 110 108 111 109 112	113 116 114 117 115 118	119 122 120 123 121 124	125 128 126 129 127 130	131 134 132 135 133 136	137 140 138 141 139 142	143 146 144 147 145 148	149 152 150 153 151 154

MPRB 2013

MINNEAPOLIS PARK AND RECREATION BOARD
CANOE RACKS FOR 2011

BROWNIE LAKE (12)

401	404	407	410
402	405	408	411
403	406	409	412

CEDAR LAKE (42)

301	304	307	310	313	316	319	322
302	305	308	311	314	317	320	323
303	306	309	312	315	318	321	324
325	328	331	334	337	340		
326	329	332	335	338	341		
327	330	333	336	339	342		

LAKE OF THE ISLES SOUTH (84)

201	204	207	210	213	216	219	222	225	228
202	205	208	211	214	217	220	223	226	229
203	206	209	212	215	218	221	224	227	230
231	234	237	240	243	246	249	252	255	258
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233	236	239	242	245	248	251	254	257	260
261	264	267	270	273	276	279	282		
262	265	268	271	274	277	280	283		
263	266	269	272	275	278	281	284		

LAKE CALHOUN (54)

128	125	122	119	116	113	110	107	104	101
129	126	123	120	117	114	111	108	105	102
130	127	124	121	118	115	112	109	106	103
152	149	146	143	140	137	134	131		
153	150	147	144	141	138	135	132		
154	151	148	145	142	139	136	133		

LAKE HARRIET NORTHEAST (72)

801	804	807	810	813	816	819	822	825	828
802	805	808	811	814	817	820	823	826	829
803	806	809	812	815	818	821	824	827	830
831	834	837	840	843	846	849	852	855	858
832	835	838	841	844	847	850	853	856	859
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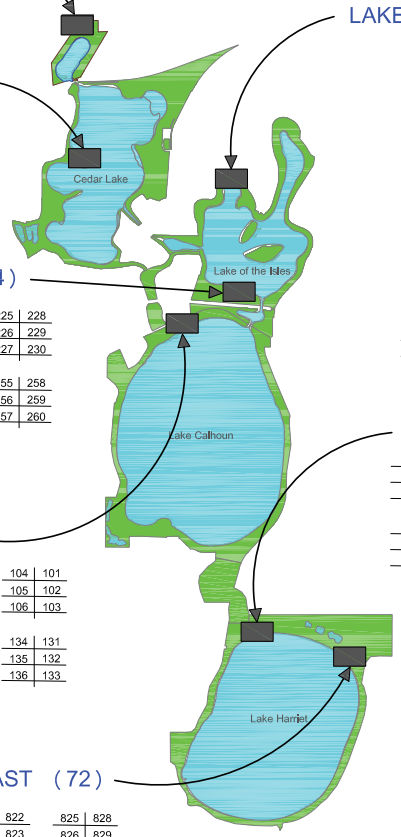
861	864	867	870						
862	865	868	871						
863	866	869	872						



LAKE OF THE ISLES NORTH (96)

961	958	955	952	928	931						
962	959	956	953	929	932						
963	960	957	954	930	933						
934	937	940	943	946	949						
935	338	941	944	946	950						
936	939	942	945	948	951						
925	922	919	916	913	910						
926	923	920	917	914	911						
927	924	921	918	915	912						
907	904	901	982	985	988	991	994				
908	905	902	983	986	989	992	995				
909	906	903	984	987	990	993	996				
964	967	970	973	976	979						
965	968	971	974	977	980						
966	969	972	975	978	981						

LAKE HARRIET NORTHWEST (54)

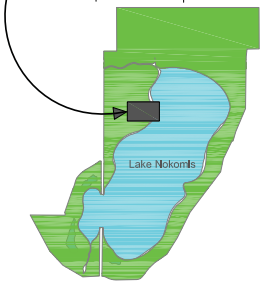
1	4	7	10	16	13	22	19	28	25
2	5	8	11	17	14	23	20	29	26
3	6	9	12	18	15	24	21	30	27
34	31	40	37	46	43	52	49		
35	32	41	38	47	44	53	50		
36	33	42	39	48	45	54	51		

North

NOT TO SCALE

LAKE NOKOMIS (24)

501	504	507	510	513	516	519	522		
502	505	508	511	514	517	520	523		
503	506	509	512	515	518	521	524		



2011 CANOE RACK RENTAL

Minneapolis Park & Recreation Board

Cedar, Isles, Calhoun, Harriet, & Nokomis
Minneapolis, Minnesota
Lakes and Minnehaha Districts

Canoe Rack Rental

In-House: YES

SHEET
L1

CEDAR / KENILWORTH CHANNEL & WALL RECONSTRUCTION

			SLOPE BANK		SHEET WALL	
ITEM	UNIT COST	UNITS	UNITS	TOTAL	UNITS	TOTAL
ENGINEERING / DESIGN	$100,000	Plan/Spec	1	$100,000	1	$100,000
MNDNR PERMIT	$1,000	Permit	1	$1,000	1	$1,000
USACOE PERMIT	$500	Permit	1	$500	1	$500
MCWD PERMIT	$10,000	Permit	1	$10,000	1	$10,000
SHPO STUDY/REVIEW	$15,000	Permit	1	$15,000	1	$15,000
DEWATERING	$120,000		1	$120,000	1	$120,000
REMOVALS	$300	linear ft	1,200	$360,000	1,200	$360,000
FILL / GRADE	$10	cubic yd	4,000	$40,000	400	$4,000
TREE REMOVAL	$50	tree	50	$2,500		
TREE REPLACEMENT	$200	tree	150	$30,000		
DREDGING	$15	cubic yd	400	$6,000	400	$6,000
SHEET WALL	$500	linear ft			1,200	$600,000
CONCRETE FORM LINER	$50	sq ft			6,000	$300,000
CONCRETE CAP	$100	linear ft			1,200	$120,000
SHORE RESTORATION	$70	linear ft	1,200	$84,000		
EROSION CONTROL	$40,000	lump	1	$40,000	1	$40,000
			SUBTOTAL	$809,000		$1,676,500
			25% contingency	$202,250		$419,125
			GRAND TOTAL:	**$1,011,250**		**$2,095,625**

TO: JUDD RIETKERK, ASSISTANT SUPERINTENDENT FOR PLANNING

FROM: TIM P. BROWN, P.E., PARKS ENGINEER

DATE: FEBRUARY 19, 2002

RE: CONSTRUCTION ESTIMATE FOR REHABILITATION OF THE CEDAR LAKE / KENILWORTH CHANNEL

Early in this century the MPRB constructed a channel between Cedar Lake and Lake of the Isles. The 1915 wooden walls that hold the channel margins have begun to fail causing erosion and degradation of the channel itself. Some adjacent property owners have requested the MPRB look into rebuilding these walls. I have prepared the attached construction estimate for rebuilding the channel between the Burnham Blvd. Bridge and Cedar Lake under two options.

The first option would reconstruct the channel to look like a natural flowage. Sloped banks rather than walls, would be constructed as close to natural as the sometimes narrow corridor will allow. In some places the minimum slope would be approximately 2:1 with slopes down to 3:1 possible toward the western end of the channel. The most expensive item for this project is expected to be the removal of the old wall. The difficult access and the sensitive nature of the shoreline makes this a difficult item to quantify. This option might be popular with environmentalists and the MCWD but probably wouldn't be as popular with the adjacent property owners. This option involves higher maintenance costs than the second option, due to needs for long term weeding/vegetation maintenance and keeping the channel open enough for emergency access.

The second option would reconstruct the channel with a rigid wall on wither side. The wall would consist of metal sheet piling faced with concrete made to look like stone. The sheet wall itself is the most expensive item for this estimate. This option is twice as costly as the first but has the advantage of needing very little maintenance when complete.

Both of the above options are probably relatively stable and cost efficient compared with other types of bank treatments. Although the wood there now probably dates from 1915, the cost and long term stability of wood in today's world makes it undesirable. Similarly, a wall of real stone probably wouldn't last as long as the sheet pile and would cost much more to construct.

TKDA

ENGINEERS • ARCHITECTS • PLANNERS

TOLTZ, KING, DUVALL, ANDERSON
AND ASSOCIATES, INCORPORATED

1500 PIPER JAFFRAY PLAZA
444 CEDAR STREET
SAINT PAUL, MINNESOTA 55101-2140
PHONE: 651/292-4400 FAX: 651/292-0083

June 3, 2002

Mr. Tim P. Brown, P.E.
Minneapolis Park & Recreation Board
200 Grain Exchange
400 South Fourth Street
Minneapolis, Minnesota 55415-1400

Re: Kenilworth Channel Investigation
Minneapolis Park & Recreation Board
TKDA Commission No. 12550-01

Dear Mr. Brown:

Introduction

Minneapolis Park and Recreation Board has authorized TKDA to conduct a condition survey of the wood retaining walls on the Kenilworth Channel. The purpose of the survey is to provide our opinion as to the structural condition of the wall and to provide an estimate of the remaining useful life of the wall.

The Kenilworth Channel is located between Cedar Lake and Lake of the Isles. The wood retaining walls line the north and south banks of the channel from Burnham Road to Cedar Lake. This is a length of approximately 580 feet. Based upon discussions with yourself, there are no drawings showing the existing wall construction. It is not known when the walls were built.

Field Investigation

On Wednesday May 8, 2002, a field inspection of the walls was completed. The inspection was made from the water side by a boat furnished by the Park Board. The inspection was conducted by William Deitner, P.E. Also present was Mr. Tim Brown, P.E. and the boat operator. Observations were made by floating adjacent to both the north and south walls.

From our observations it was determined that the basic wall is constructed from full 2 by 6 lumber driven into the ground. Running continuously along the top of the wall is a 4 x 4. At four foot intervals a 5/8" diameter tie rod extends back into the embankment. The rods appeared under tension. However, we were not able to determine the configuration or presence of the dead

man anchors on these ties. From two planks found alongside the wall, the length of the 2 x 6s are eight feet. At one end of these planks a hand chiseled tapered end was noted. On average there is approximately four feet of the wood planking above the channel bottom and four feet of plank embedded below the channel bottom. The water depth varies, but averages about two feet. This leaves approximately two feet of the wood plank exposed above the water line.

At several locations along both the north and south walls the remnants of a second wall were noted. This second wall was located landward from the current wall. Only the upper portion of this was visible. The wall was sloped toward the channel. Presumably this wall was replaced by the current wall. Only the upper 18 inches or so is visible.

The wall system in general was found to be in poor condition with many areas that have actually failed. Most of the failed areas are associated with tree growth or windfalls on the banks. The tree growth has displaced the wall towards the channel. In most cases this has resulted in splitting of the 4 x 4s running along the top of the wall and cracking of the 2 x 6 wall boards. Windfalls have caused localized areas of complete loss of the wall system above the channel bed. Another mode of failure noted was the deterioration of the top of the wall due to rotting. Deterioration of the top of the 2 x 6s and the 4 x 4s resulted in the wall displacing towards the channel. The tie rods were found to be in fair condition with some surface corrosion. No rotting of the wood 2 x 6s was found below the water line. Some areas of the wall have been repaired. The repairs have been made with preservative treated wood of nominal size (actual size 1-1/2" x 5-1/2").

Structural Calculations

A basic structural analysis was performed using information obtained from the field. In addition, specific wood and soil properties were assumed. The purpose of the analysis was to get a general feeling as to the adequacy of the wall and not to quantitatively measure its condition.

The results of the analysis indicates that the wall is in general conformance with current design standards except as noted. The length of the wall sheets and the placement of the tie backs are consistent with current design practices. The calculated bending stresses in the wall exceed current design values.

Conclusion

The wood retaining walls on the Kenilworth Channel are in poor overall condition. We believe that they have seen their useful life and that replacement should be planned. Continued damage from the adjoining trees can be expected. Damage from the rotting will continue and eventually accelerate causing additional failures along the length of the walls. Due to the nature of the wall configuration, we would expect that as the failures occur they will be localized and that a global

failure of the wall system is not expected. With the property lines located 30 feet behind the wall, it is our opinion that an imminent failure resulting in damage to the private property is not likely.

It is not possible for us to place an exact time frame on the remaining serviceability of the walls. We recommend that maintenance be continued on the wall system. Maintenance should consist of replacing the damaged wall boards with treated 2 x 6's eight feet long and repairing the 4 x 4's at the top of the wall between the tie rods. Damaged areas should be repaired with like materials to minimize erosion from behind the wall.

Cost Estimate

Our work scope also included preparing a conceptual estimate of construction costs to replace the wall. Our estimate is based on a steel sheet pile wall with a concrete cap. General condition costs such as permits and engineering fees have not been included in this estimate.

Item	Quantity	Unit Price	Total
Mobilization	1 LS	$25,000.00	$25,000.00
Clearing	23,200 SF	$0.50	$11,600.00
Sheet Pile	11,600 SF	$40.00	$464,000.00
Concrete Cap	1160 LF	$75.00	$87,000.00
Earthwork	1000 CY	$15.00	$15,000.00
Landscaping	1 LS	$70,000.00	$70,000.00
Demobilization	1 LS	$15,000.00	$10,000.00
		TOTAL	$682,600.00

Sincerely,

William E. Deitner, P.E.
Minnesota License No. 16523

TO: JUDD RIETKERK, ASSISTANT SUPERINTENDENT FOR PLANNING

FROM: TIM P. BROWN, P.E., PARKS ENGINEER

DATE: FEBRUARY 19, 2002

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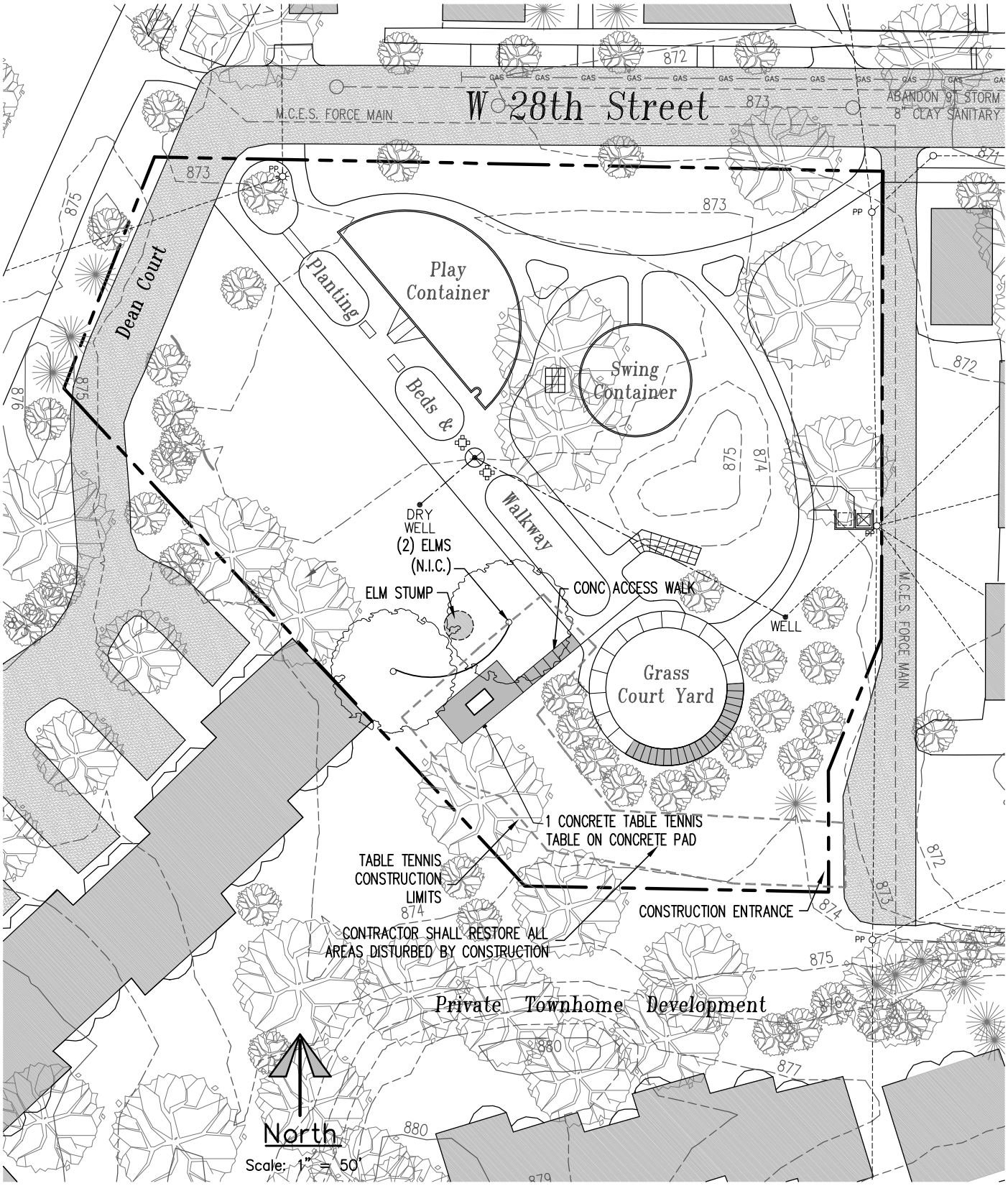


Minneapolis Park & Recreation Board

2117 West River Road
Minneapolis, Minnesota 55411-2227
612-230-6400
(Fax) 612-230-6506

Project Name: Park Siding 2012 NRP Project	File Name: Bid Document – Sheets 1 & 2		Park No: 2511–205

Revised: 6.8.2012	Date: 1.17.2012	Overall Site Plan	SHEET 1 of 7
Revised: 7.11.2012	Drawn: Jim H	PARK SIDING PARK	
Revised:	Checked: Deb B		

Sources and References Cited

Minneapolis Park and Recreation Board, prepared by Rachel B Ramadhyani. 1997. *Chain of Lakes Master Planning Study Summary Report*. Available at: https://www.minneapolisparks.org/_asset/0kwy85/chain_of_lakes_master_plan_summary.pdf

Minneapolis Park and Recreation Board. 1997. *Chain of Lakes Comprehensive Plan with the Future of Water Quality in Mind.* Available at: https://www.minneapolisparks.org/_asset/3jxds4/cal-harr-chain_of_lakes_comprehensive_plan_1997.pdf.

Dean Parkway Trail Improvement Project

Minneapolis Park & Recreation Board

City of Minneapolis, MN

Preferred Concept

LAKE OF THE ISLES PARKWAY

DEAN PARKWAY

BENTON BLVD

CEDAR LAKE PARKWAY

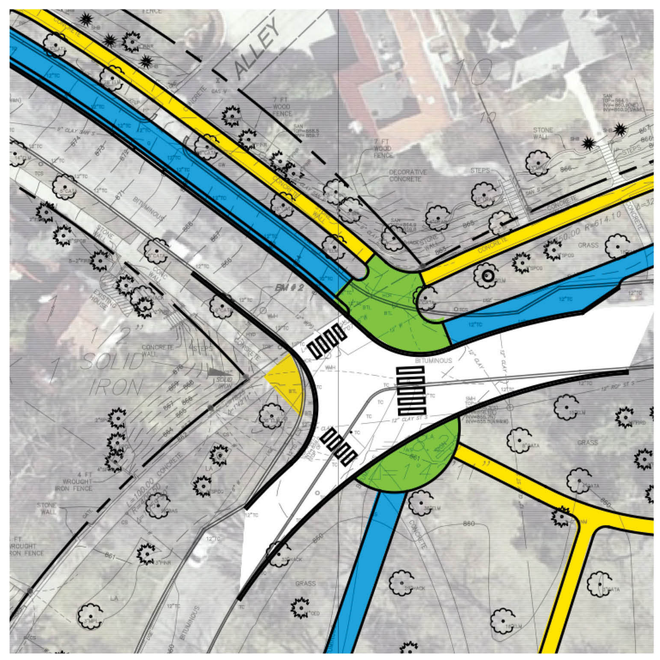
Dean Parkway & West Cedar Lake Intersection

Dean Parkway Intersection

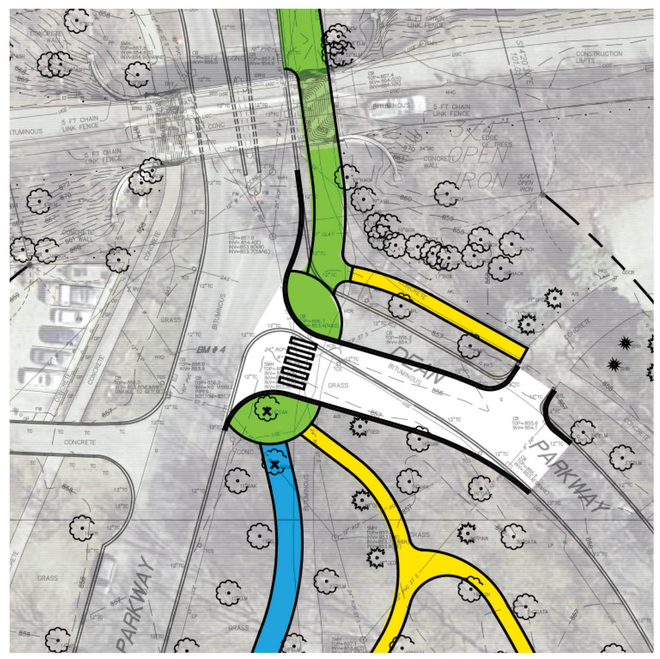
MIDTOWN GREENWAY

LAKE STREET

DEAN PARKWAY & WEST CEDAR LAKE INTERSECTION



DEAN PARKWAY INTERSECTION



LEGEND

- Pedestrian Trail
- Bicycle Trail
- Shared-Use

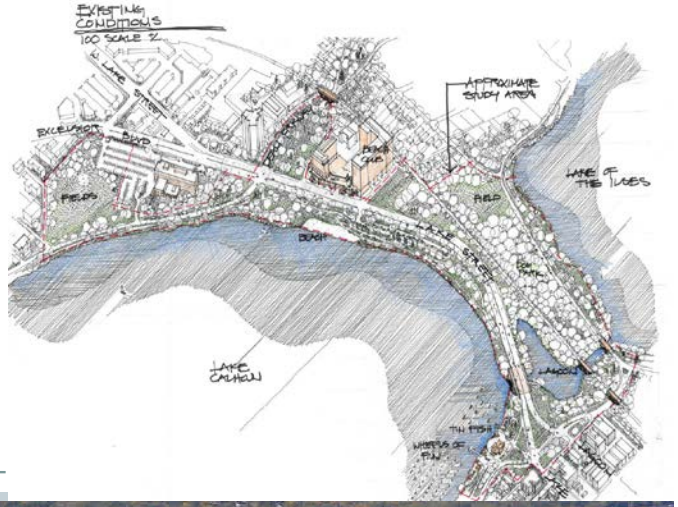
0' 50' 100' 150'

Graphic Scale

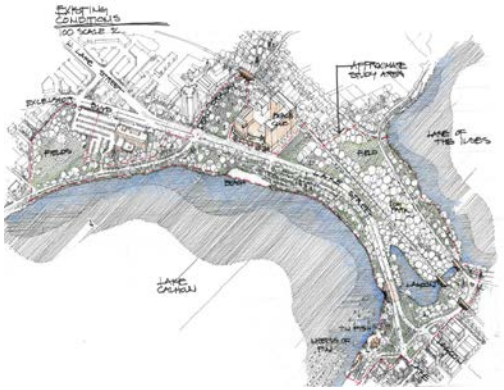
WSB

Project #01165-810
March 14th, 2013

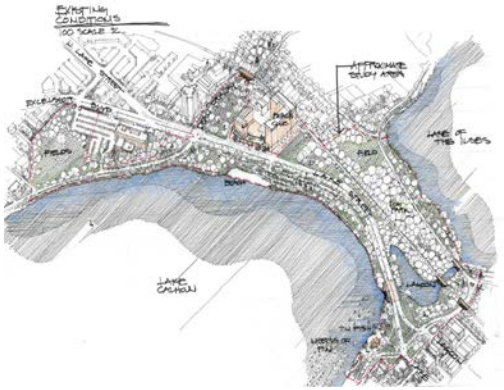
North Lake Calhoun / South Lake of the Isles



North Lake Calhoun / South Lake of the Isles



North Lake Calhoun / South Lake of the Isles



Issues & Opportunities

- Increasing visitation
  - Midtown Greenway
  - 1.5 million annually to Lake Calhoun
  - 5 million annually to Chain of Lakes (#1 park destination in Minnesota)
- Congestion at NE corner of Lake Calhoun
  - Tin Fish
  - Sailing School
  - Sailing Club
  - Wheel of Fun
  - Boat launch
  - trails
- Trail safety concerns
  - Tight corners
  - Street crossings
  - Shared trails
- Re-weaving the landscape
  - Lake Street & Midtown Greenway - barriers for a Century… how to transform
- Leveraging the Southwest LRT project
- Informing future private development
- Preparing for 2015 & 2016 regional park funding ($3.7 million)

Approach

- Facilitate a community design charrette
  - Explore a wide range of possibilities
  - Engage the community
  - Establish a body of design analysis for use by future CAC
- Establish core principles
  - respect current uses
  - solve problems
  - envision a positive inter-relationship between park and development
  - re-weave the landscape
- Leverage the charrette for the next stage of the project
  - new ideas
  - partnerships
  - “fodder” for future CAC
  - incremental improvements

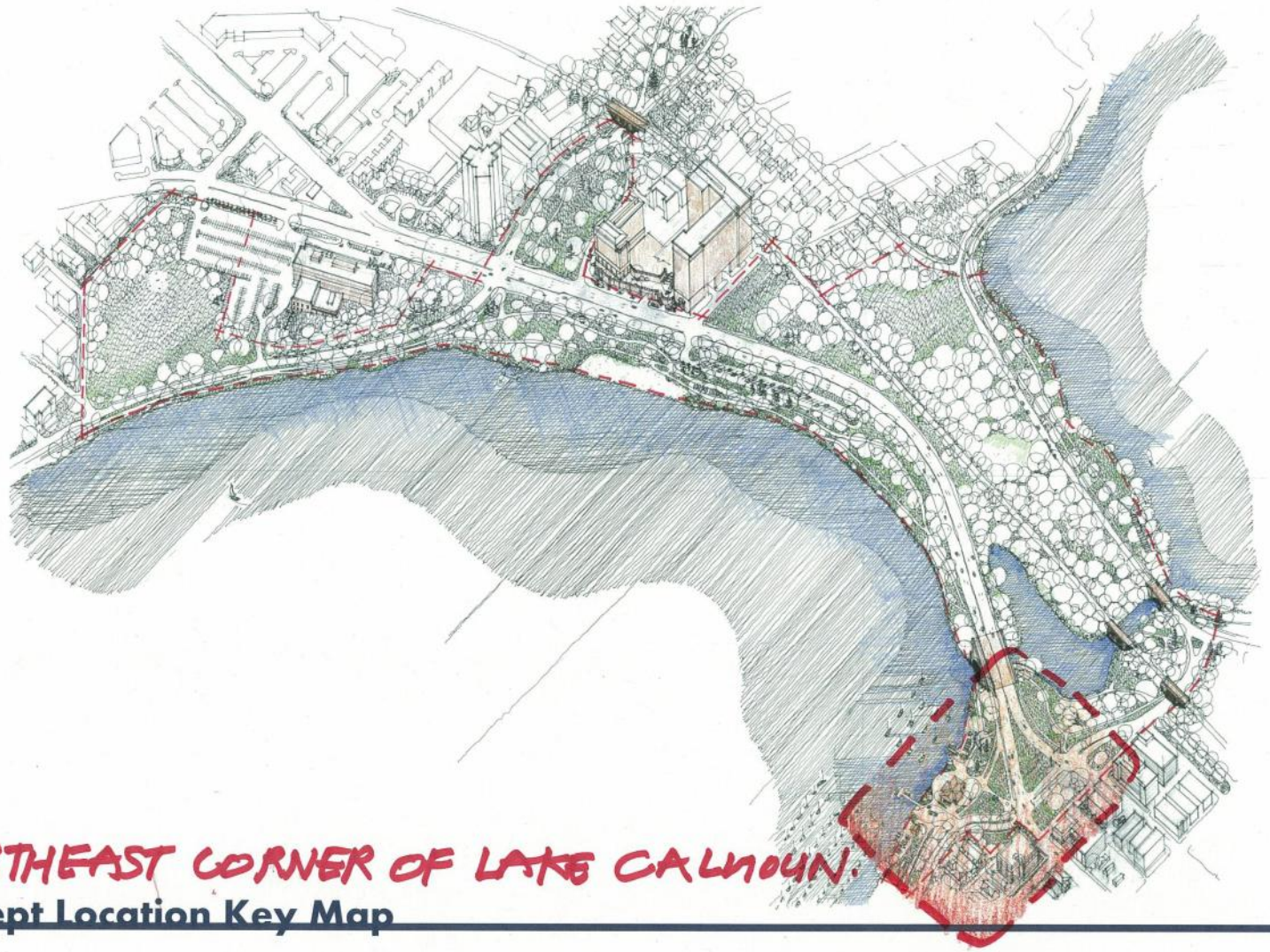
Process

- October 9 – 13, 2012 community design charrette
  - Understand project objectives, constraints & opportunities
  - Integrate the community with the design process
  - Explore a full range of early design ideas
  - Gain public critique & feedback
- Since then
  - Additional options for Tin Fish area (based on community input)
  - Coordination with SW LRT
  - Discussions with City of Minneapolis, Hennepin County & neighborhoods
  - Determination of next steps

October Design Charrette - What we heard from the community

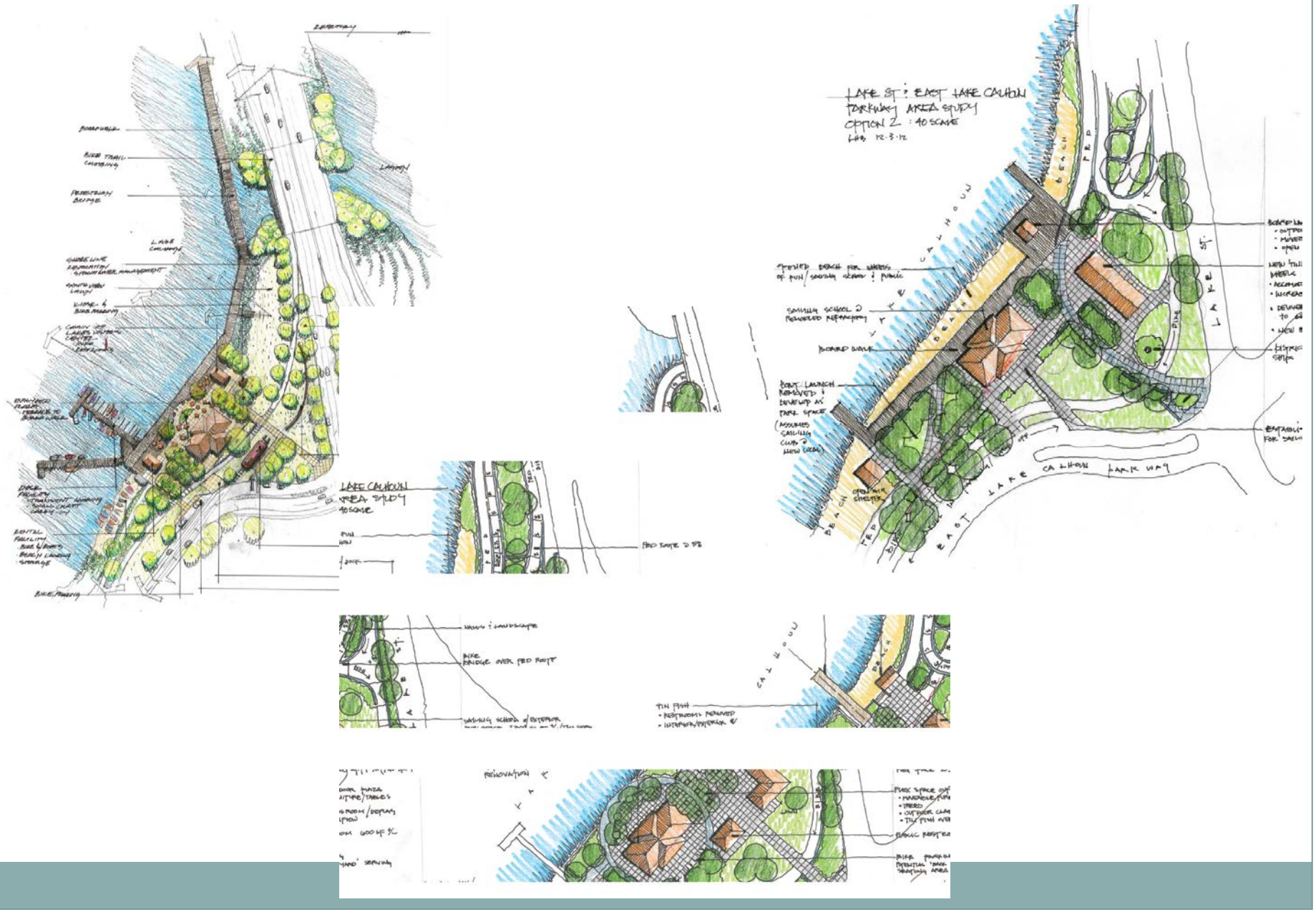
- SAFE TRAIL AND STREET CROSSINGS
- ENVIRONMENTAL QUALITY
- BEAUTIFICATION OF LAKE STREET
- CONTINUED ENERGY AND SUCCESS OF TIN FISH AREA
- SUPPORT FOR SAILING SCHOOL AND CLUB
- BETTER CONNECTIONS BETWEEN CALHOUN / GREENWAY / ISLES
- BETTER VISITOR FACILITIES (SUCH AS RESTROOMS)
- CONTINUED INVOLVEMENT

Northeast Quad

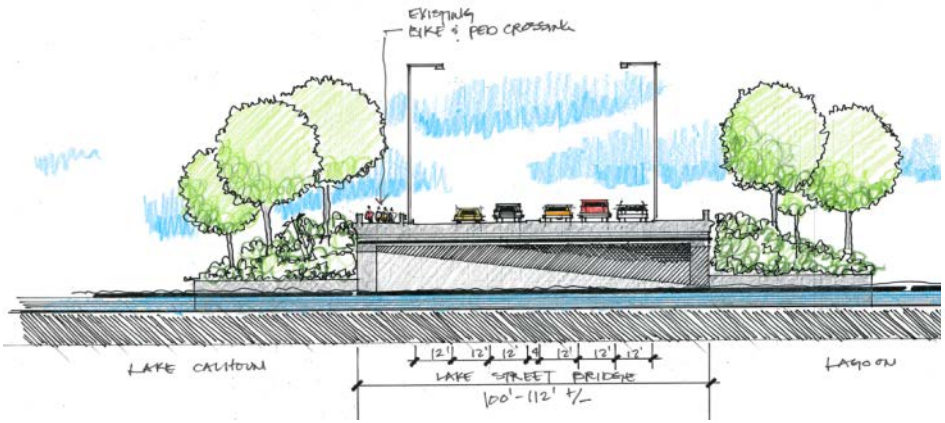


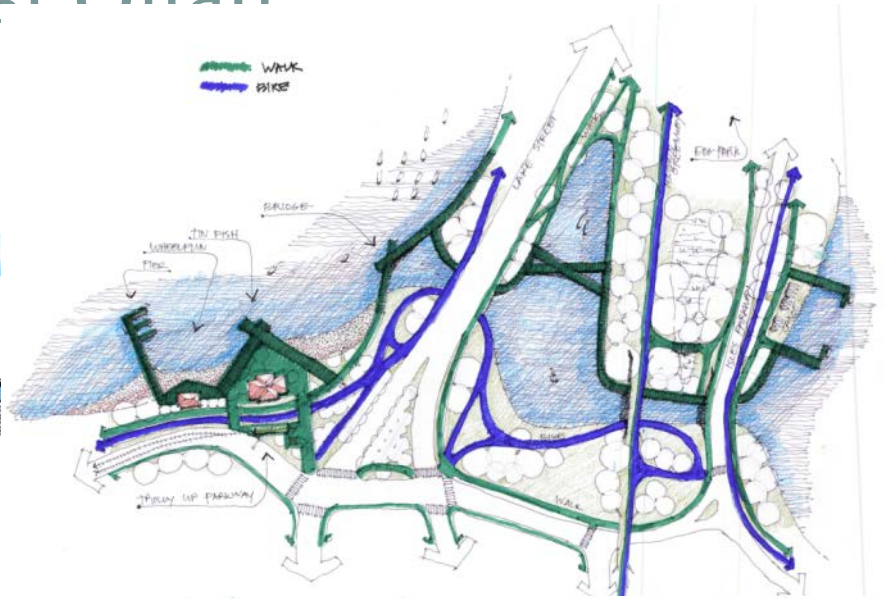
Concept Location Key Map

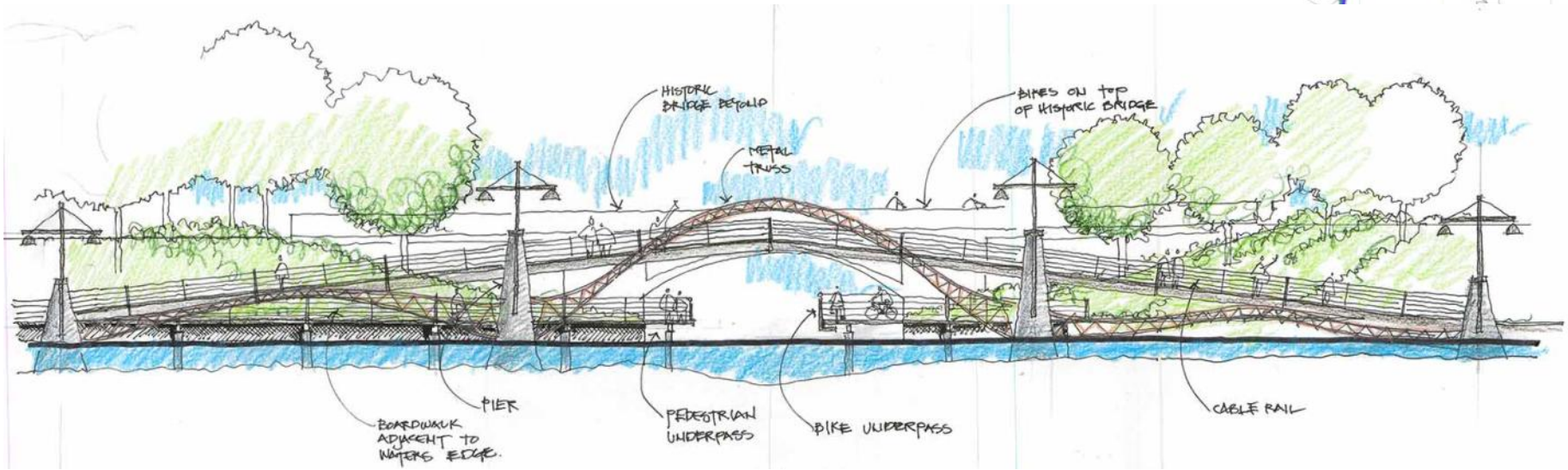
Northeast Quad



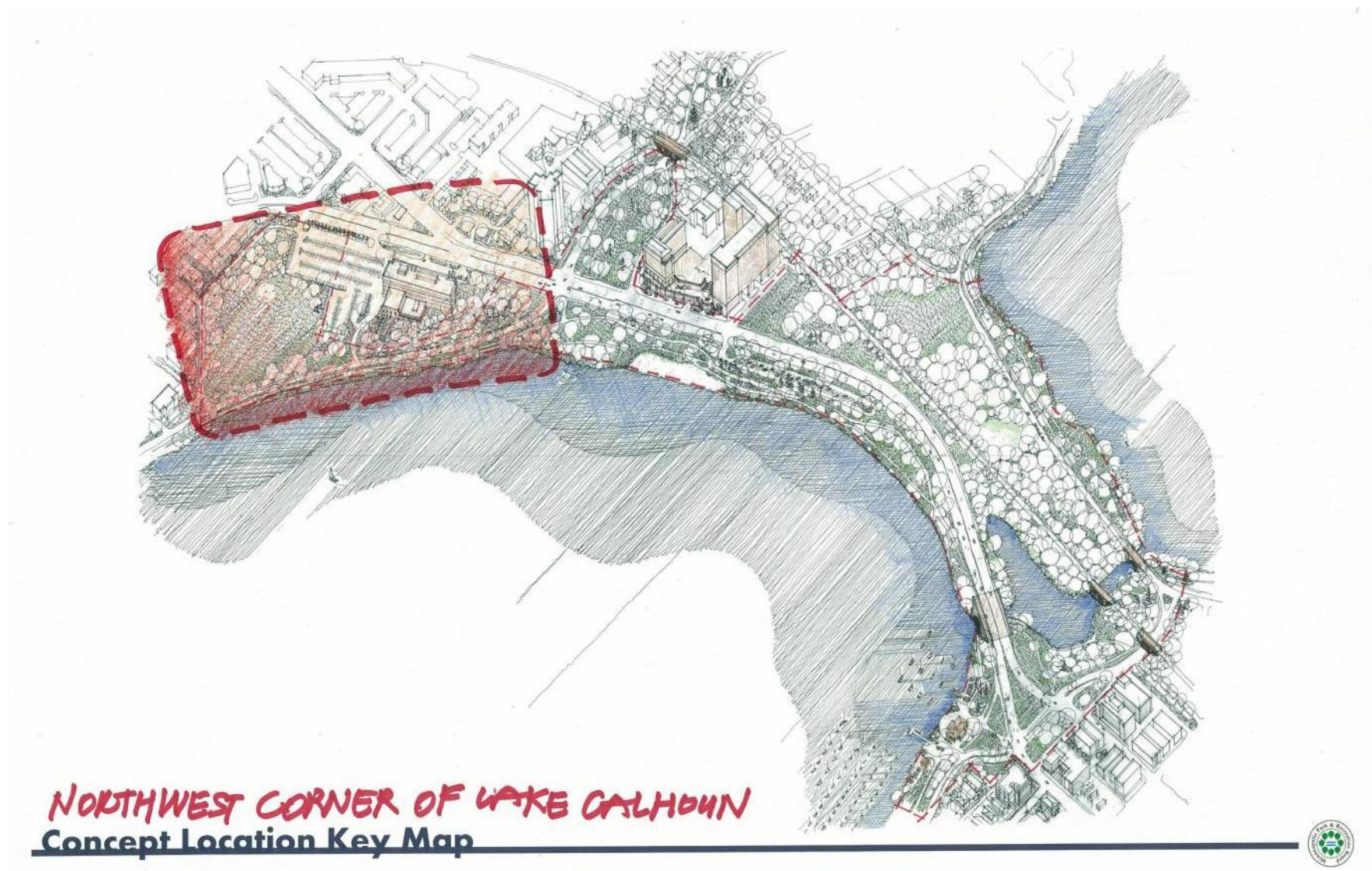
Northeast Quad



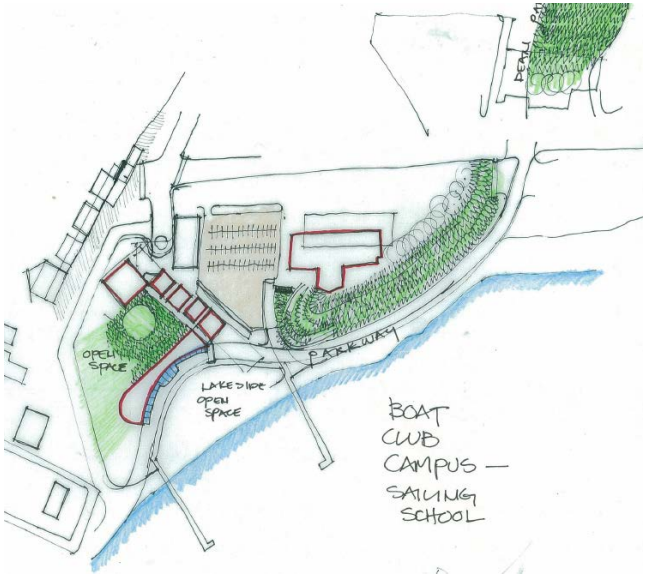


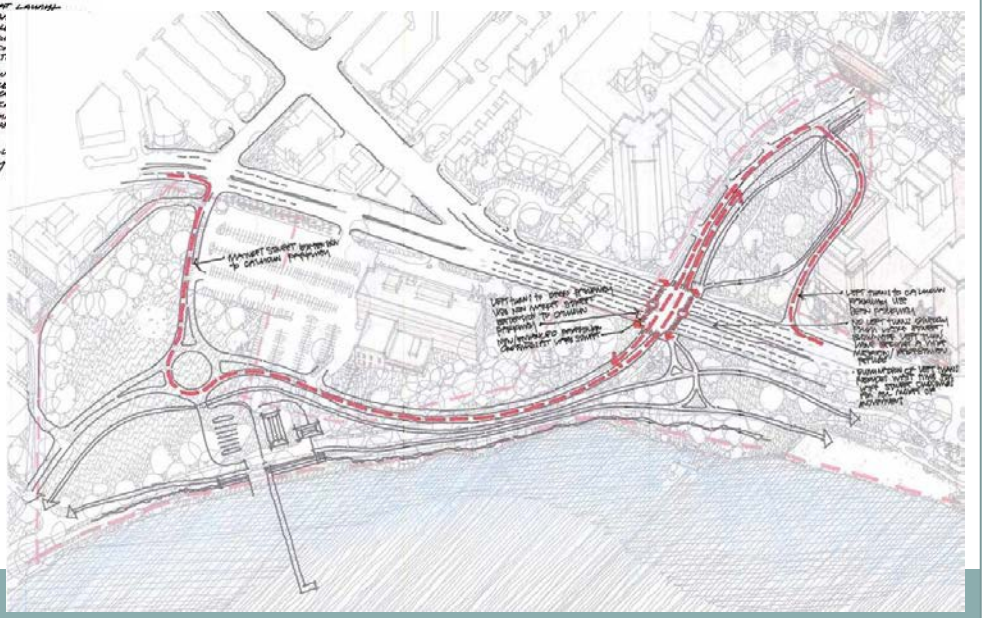


Northwest Quad



Northwest Quad

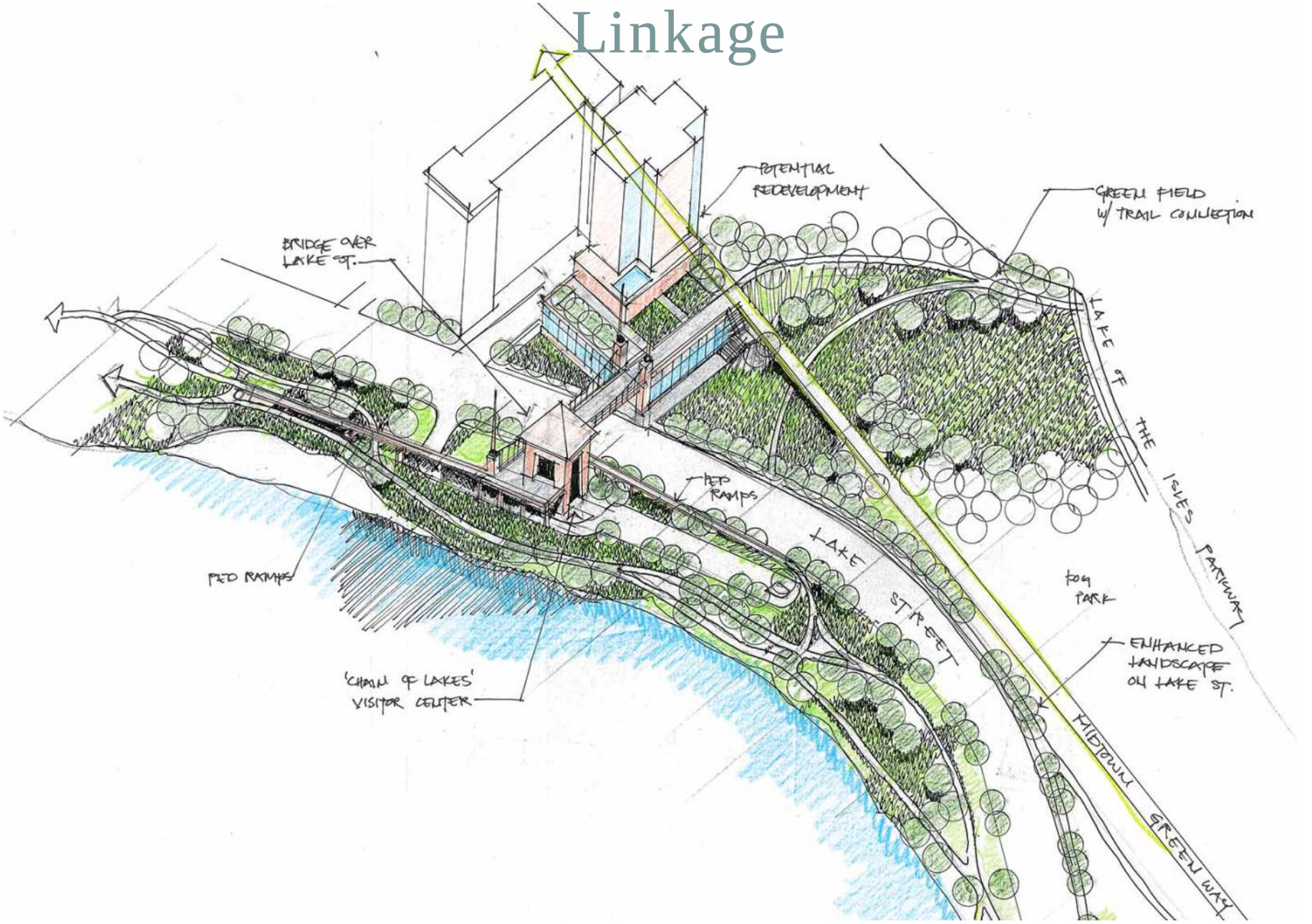




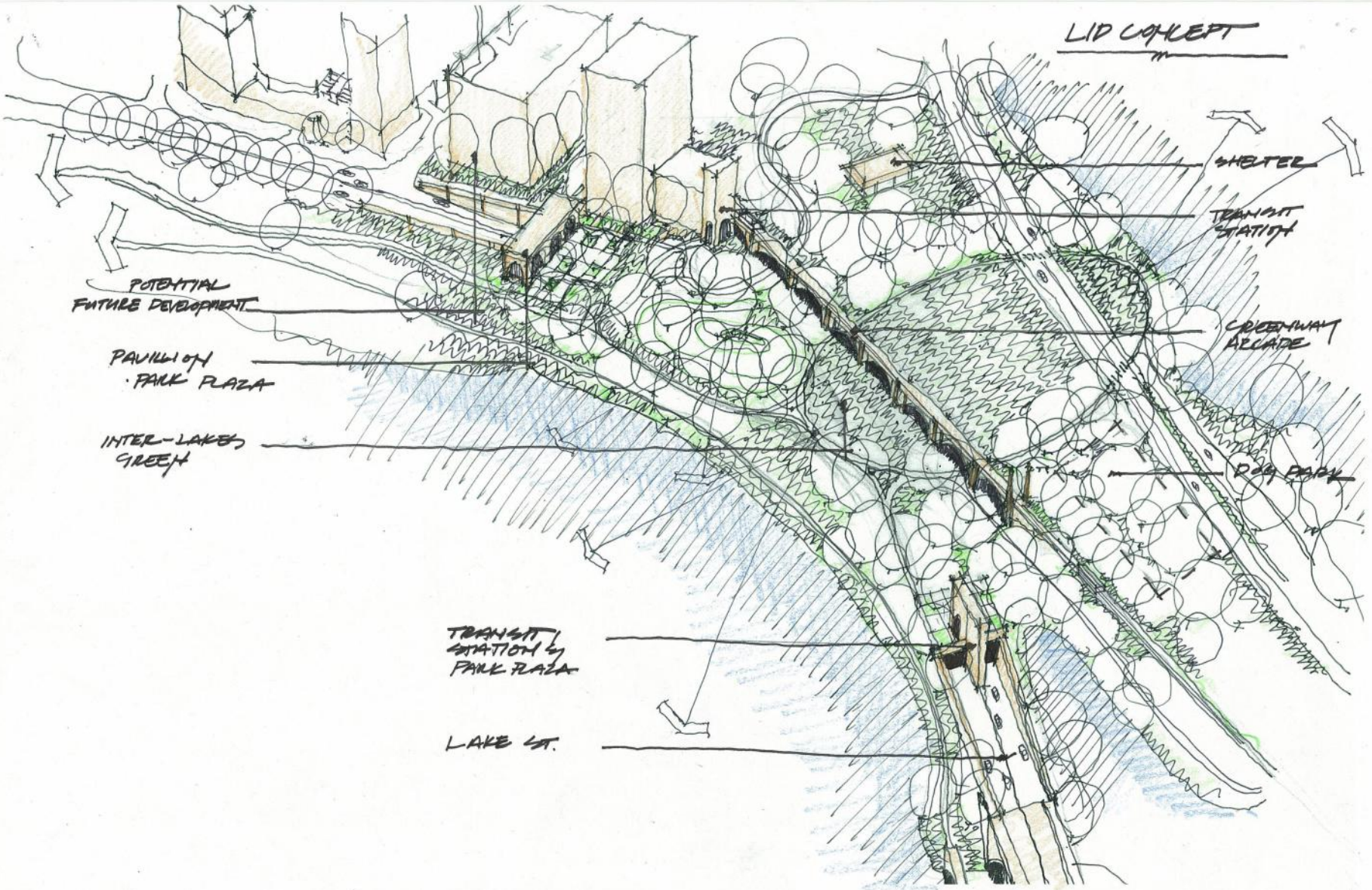
Linkage

Concept Location Key Map

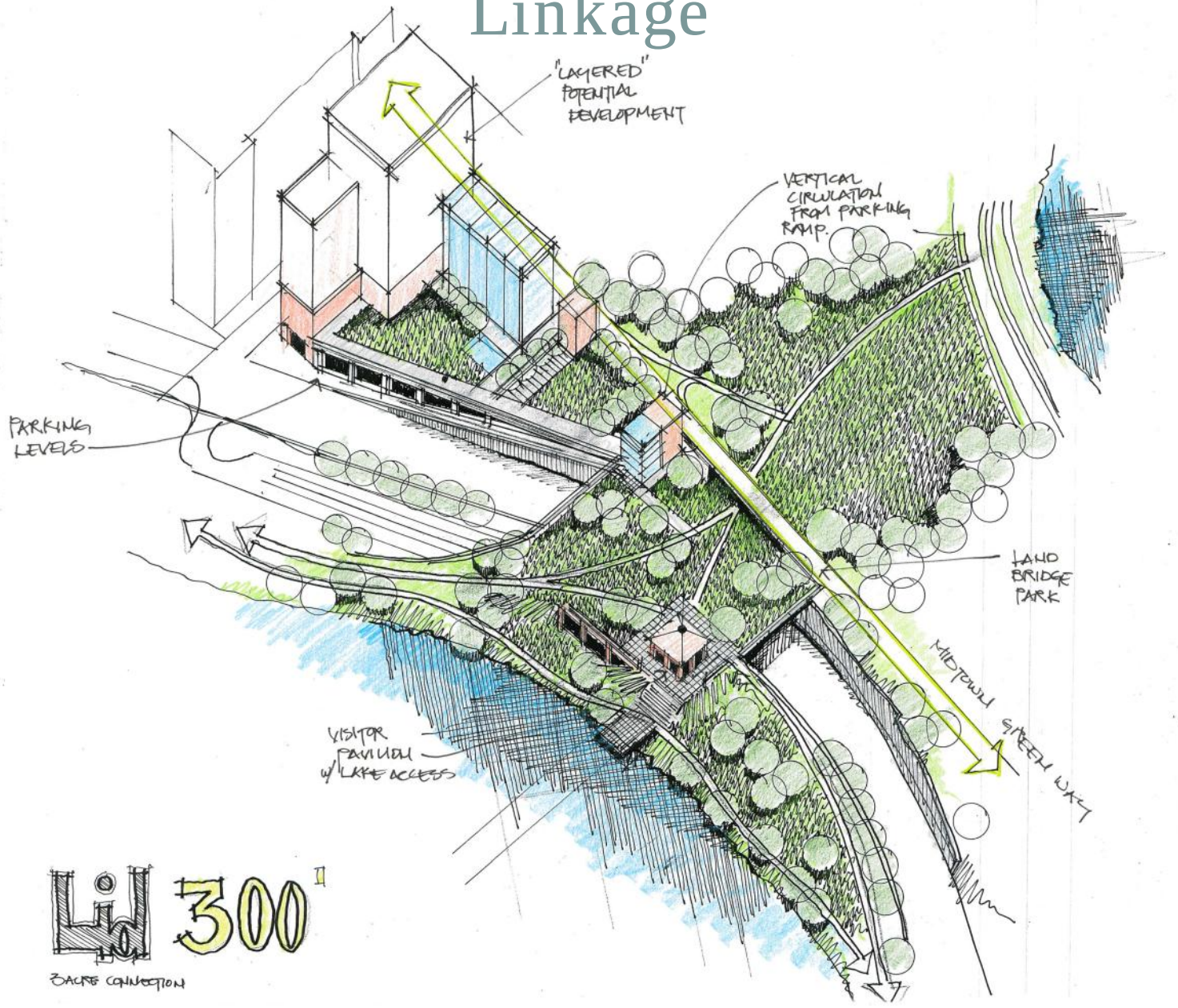
Linkage


POTENTIAL REDEVELOPMENT
GREEN FIELD W/ TRAIL CONNECTION
BRIDGE OVER LAKE ST.
LAKE OF THE ISLES PARKWAY
PED RAMPS
LAKE STREET
PED RAMPS
FOG PARK
ENHANCED LANDSCAPE ON LAKE ST.
'CHAIN OF LAKES' VISITOR CENTER
KENILWORTH GREEN WAY

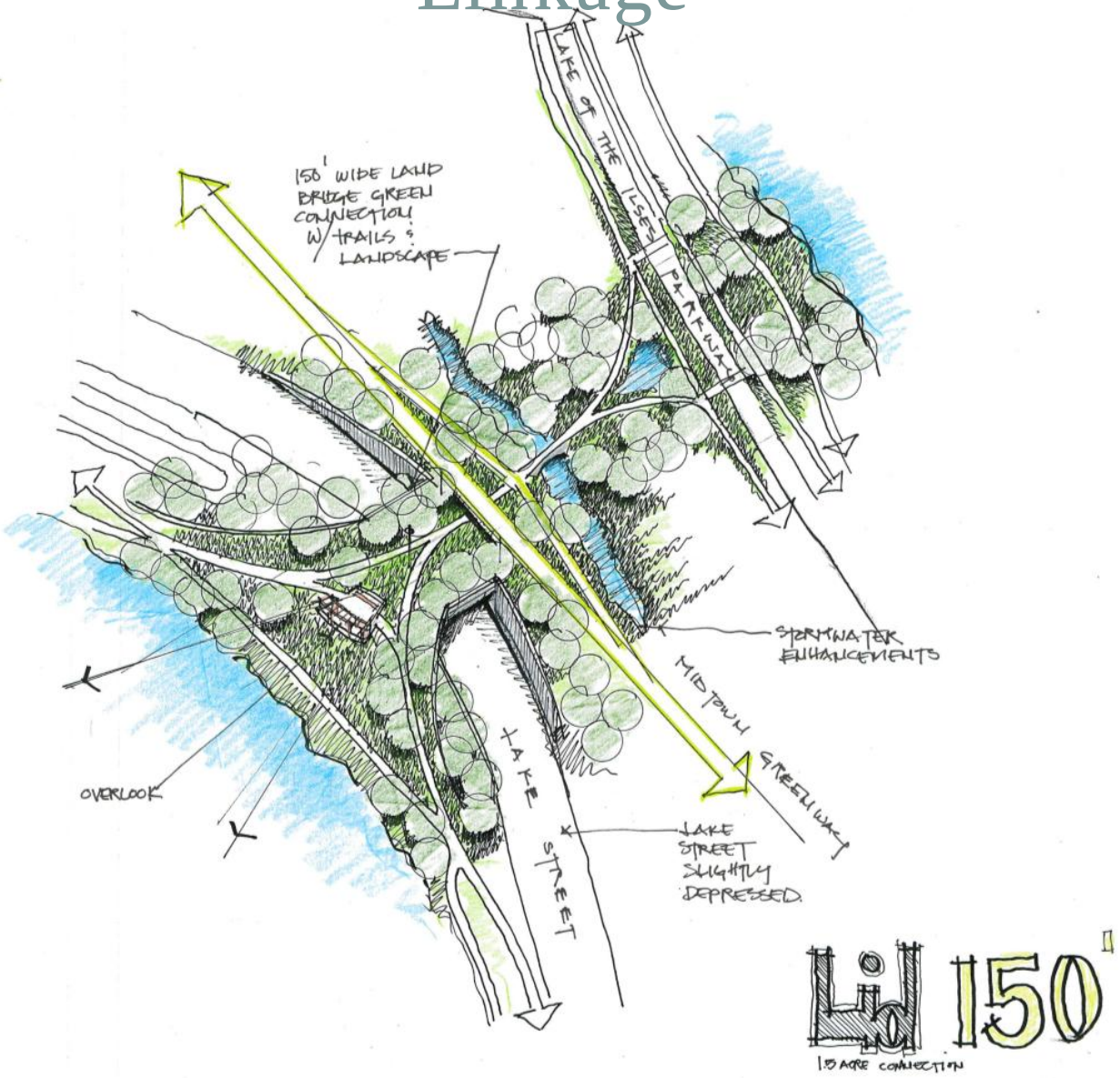
Linkage


LID CONCEPT
SHELTER
TRANSIT STATION
POTENTIAL FUTURE DEVELOPMENT
GREENWAY ARCADE
PAVILION · PARK PLAZA
INTER-LAKES GREEN
DOG PARK
TRANSIT STATION & PARK PLAZA
LAKE ST.

Linkage


"LAYERED" POTENTIAL DEVELOPMENT
VERTICAL CIRCULATION FROM PARKING RAMP.
PARKING LEVELS
LAND BRIDGE PARK
MIDTOWN GREEN WAY
VISITOR PAVILION w/ LAKE ACCESS
LiU 300
3 ACRE CONNECTION

Linkage


150' WIDE LAND BRIDGE GREEN CONNECTION W/TRAILS & LANDSCAPE
LAKE OF THE ISLES PARKWAY
STORMWATER ENHANCEMENTS
MIDTOWN GREENWAY
LAKE STREET SLIGHTLY DEPRESSED
LAKE STREET
OVERLOOK
Lid 150'
15 ACRE CONNECTION

Next Steps

- Lake Street “lid” feasibility study
  - Hopeful 2013 effort
  - Partnerships (Hennepin County, City, neighborhoods)
  - Secure funding (est. $200,000 - $250,000)
  - Engage the community
  - Inform future adjacent private development
  - Possible inclusion of district traffic study (additional $200,000)
- 2014 launch of community advisory committee
  - Use charrette materials as basis for CAC work
  - Establish pathway for Sailing School and Sailing Club facilities
  - Inform 2015/16 regional park investments
- Lake Street “Lid” as 2014 State bonding request?
  - Feasibility study will inform design and budget
  - Highest traveled Hennepin County roadway
  - Most visited park in Minnesota
  - Hundreds of thousands of annual bike/ped crossings of Lake Street

3. Materials from MPRB Regular Meetings in February and March 2015

KENILWORTH CROSSING ALTERNATIVES

Prudence assessment

February 4, 2015

Revised February 5, 2015

Slides 34 and 47

Overview

- Definitions
- Feasibility, cost and schedule for tunnel alternatives
- Prudence assessment

Critical definitions

- Feasible is defined as:
  - Able to be accomplished as a matter of sound engineering judgment
- Feasibility factors
  - Conformance with SWLRT Design Criteria
  - Engineering
  - Cost
  - Constructability
  - Resource impacts
  - User impacts
  - Overall schedule, staging and sequencing
  - Light rail operations

Critical definitions

- An alternative is not prudent if:
  - It compromises the project to a degree that it is unreasonable to proceed in light of the project's stated purpose and need (i.e., the alternative doesn't address the purpose and need of the project);
  - It results in unacceptable safety or operational problems;
  - After reasonable mitigation, it still causes severe social, economic, or environmental impacts; severe disruption to established communities; severe or disproportionate impacts to minority or low-income populations; or severe impacts to environmental resources protected under other Federal statutes;
  - It results in additional construction, maintenance, or operational costs of extraordinary magnitude;
  - It causes other unique problems or unusual factors; or
  - It involves multiple factors as outlined above that, while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

“Built-up” costs for tunnel options

MPRB OPTION 1 - CUT AND COVER SHALLOW TUNNEL				
		($M BASE YR)		($M YOE)
Tunnel (South)	$	(6.1)	$	(12.4)
Tunnel (Under Channel)	$	41.5	$	84.6
Other (LRT Channel Bridge Deduct, Add'l LRT DF Track)	$	(0.4)	$	(0.8)
ADD'L CAPITAL COST (Δ FROM SPO CURRENT DESIGN)	**$**	**35.0**	**$**	**71.4**

ADD'L CAPITAL COST (Δ FROM SPO CURRENT DESIGN): $60 M - $75 M

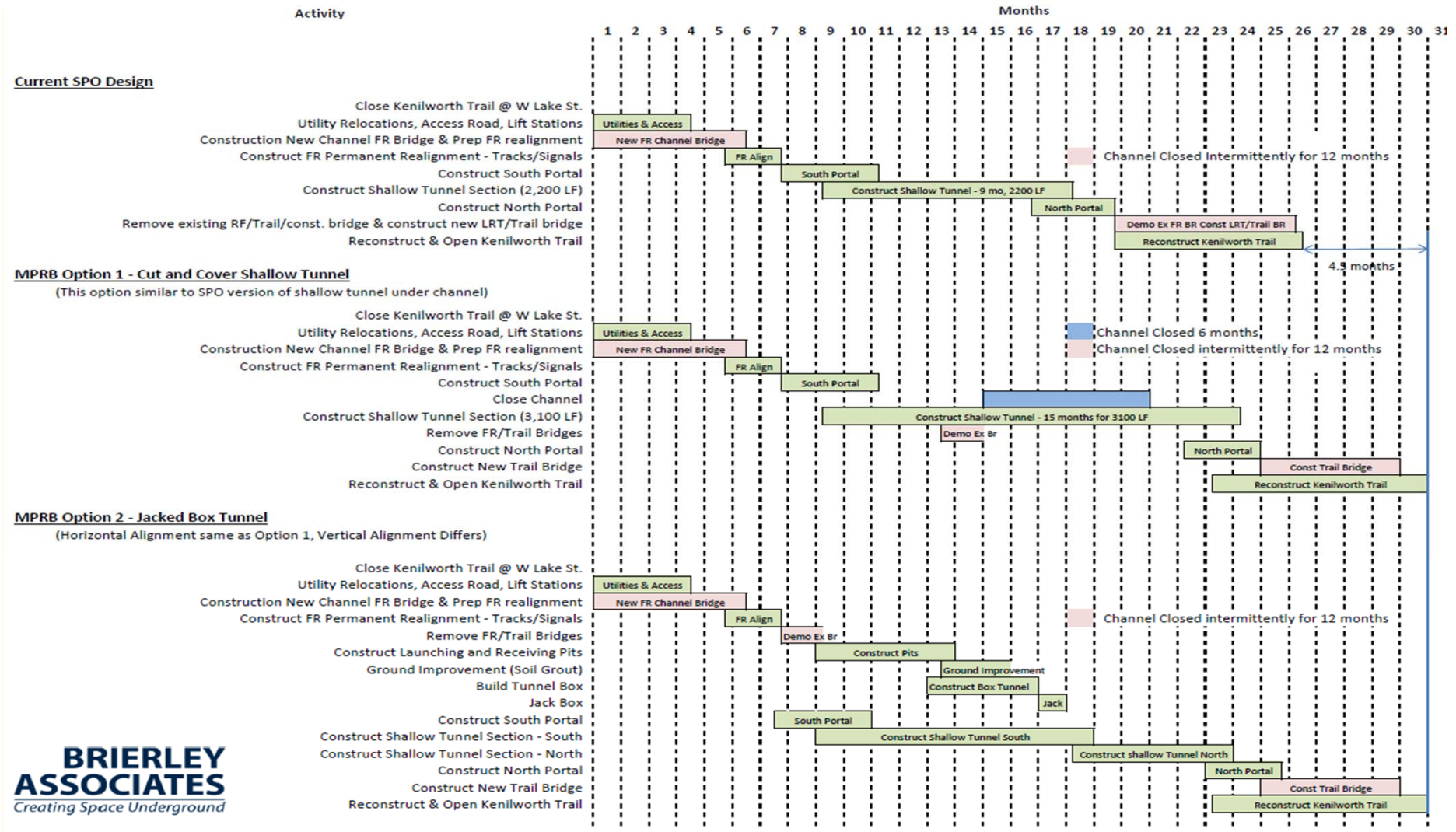
MPRB OPTION 2 - JACKED BOX TUNNEL				
		($M BASE YR)		($M YOE)
Tunnel (South)	$	(6.1)	$	(12.4)
Tunnel (Under Channel)	$	51.1	$	104.3
Other (LRT Channel Bridge Deduct, Add'l LRT DF Track)	$	(0.4)	$	(0.8)
ADD'L CAPITAL COST (Δ FROM SPO CURRENT DESIGN)	**$**	**44.6**	**$**	**91.1**

ADD'L CAPITAL COST (Δ FROM SPO CURRENT DESIGN): $80 M - $95 M

“Built-up” costs for tunnel options

- Cost parameters
  - “Built-up” costs include FTA contingencies and escalation for year of expenditure
  - Costs reflect the cost delta beyond the bridge option
- Cost estimates as additional capital cost
  - Cut and cover tunnel
    - $60M to $75M
  - Jacked box tunnel
    - $80M to $95M
  - The difference in costs between the tunnel options is $9.6M in base year dollars.
- Estimates do not reflect the costs resulting from additional time that may be required for reviews and approvals under Municipal Consent

Comparison of schedules for alternative crossings



BRIERLEY ASSOCIATES
Creating Space Underground

Comparison of schedules for alternative crossings

- Bridge option
  - 25.5 months to construct
  - 12 months of intermittent channel closure
  - 0 months of full channel closure
- Cut and cover tunnel option
  - 30 months to construct
  - 12 months of intermittent channel closure
  - 6 months of full channel closure
- Jacked box tunnel option
  - 30 months to construct
  - 12 months of intermittent channel closure
  - 0 months of full channel closure

Comparison of schedules for alternative crossings

- While there may be some disagreement over the length of the construction period, MPRB and SPO agree on the general schedule
- If there is a need for “de-overlapping” tunnel activities indicated in the schedule as concurrent, the tunnel option may “bump” against critical path construction items

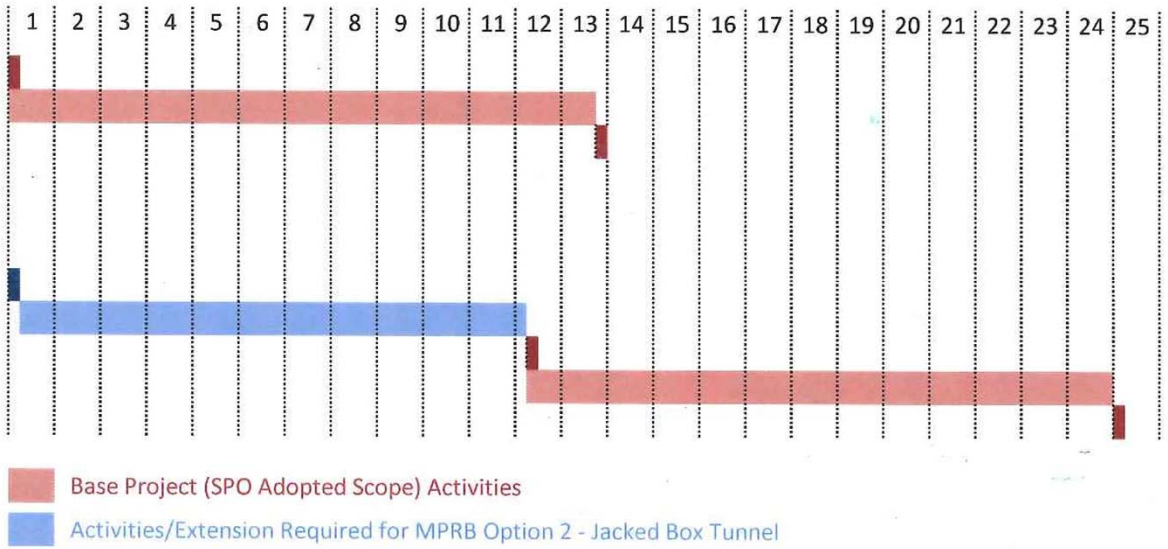
Schedule adjustment for additional review and approval

Current SPO Design

Publish SDEIS Notice of Availability
FEIS/ROD Development & Approval
FEIS/Record of Decision

MPRB Option #2: Jacked Box Tunnel

Decision on Jacked Box
Design/SDEIS Development & Approval/Municipal Consent Approval
Publish SDEIS Notice of Availability
FEIS/ROD Development & Approval
FEIS/Record of Decision

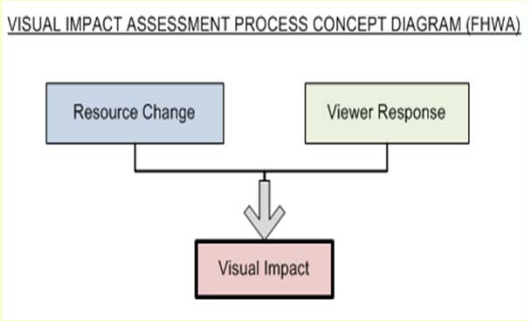


Prudence assessment

- Focus areas
  - Visual quality
  - Noise and vibration
  - Cultural resources (archeology and historical)
  - Water resources (surface water, species movement, ground water)
- FHWA 4(f) impact
- Status of assessment
  - Methodologies indicated
  - Summary of findings presented however final report may include additional background or provide information that reinforces findings
  - Identification of least impactful alternative for each focus area
  - Mitigation measures have not been framed

Visual quality

- Methodology based on Federal Highway Administration Visual Impact Assessment Guidelines



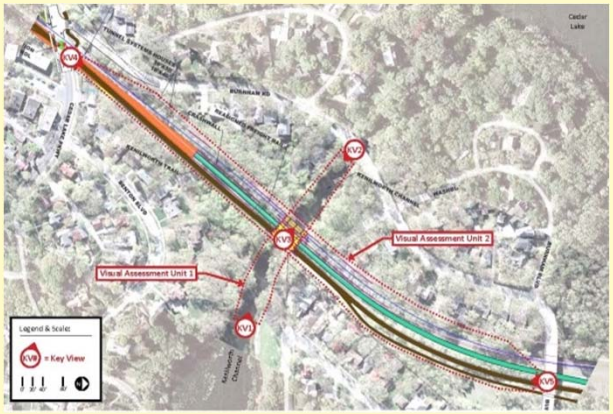
VISUAL ASSESSMENT UNIT	KEY VIEW (KV)	Bridge Option			Tunnel Options 1 & 2		
		Resource Change	Viewer Response	Visual Impact	Resource Change	Viewer Response	Visual Impact
1-Kenilworth Channel	1	MH	H	H	ML	H	MH
	2	M	M	M	ML	M	M
	3	H	H	H	ML	H	MH
2-Kenilworth Trail Corridor	4	M	MH	MH	ML	MH	M
	5	MH	M	MH	H	M	MH

Visual impact assessment process

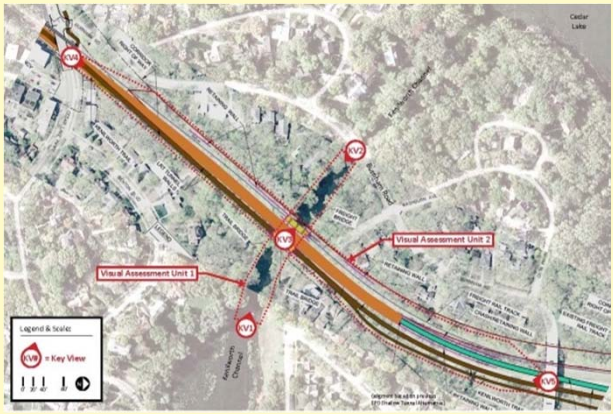
1) Define the project location and setting.
2) Identify **visual assessment units** and **key views**.
3) Analyze existing visual resources, resource change and viewer response.
4) Depict *(or describe)* the visual appearance of project alternatives.
5) Assess the visual impacts of project alternatives.
6) Propose mitigation measures to offset visual impacts.

Visual assessment units and key views

Existing Conditions



Bridge Option



Tunnel Options 1 & 2

Alignment based on SWLRT preliminary plans released September 2014
Alignment based on SWLRT short tunnel under channel alternative released March 2014

Visualizations for Key View 1
(view from Kenilworth Channel)

Existing Conditions

Bridge Option

Tunnel Options 1 & 2

Visualizations based on SPO arched pier bridge concept renderings released 11/25/14

Trail-only bridge at Key View 1
(view from Kenilworth Channel)

Modified SPO bridge
Concrete arched in-channel piers

Pedestrian and bicycle bridge
Vaulted steel structure, no in-channel piers

Visualizations based on SPO arched pier bridge concept renderings released 11/25/14

Visualizations for Key View 2
(view from Burnham Road Bridge)

Existing Conditions

Bridge Option

Tunnel Options 1 & 2

Visualizations based on SPO arched pier bridge concept renderings released 11/25/14

Visualizations for Key View 3
(view from Kenilworth Trail Bridge)

Existing Conditions

Bridge Option

Tunnel Options 1 & 2

Visualizations based on SPO arched pier bridge concept renderings released 11/25/14

Visual Impact Summary

VISUAL ASSESSMENT UNIT	KEY VIEW (KV)	Bridge Option			Tunnel Options 1 & 2		
		Resource Change	Viewer Response	Visual Impact	Resource Change	Viewer Response	Visual Impact
1-Kenilworth Channel	1	MH	H	H	ML	H	MH
	2	M	M	M	ML	M	M
	3	H	H	H	ML	H	MH
2-Kenilworth Trail Corridor	4	M	MH	MH	ML	MH	M
	5	MH	M	MH	H	M	MH

Compare impact ratings

Tunnel options result in *lesser cumulative visual impacts* to Kenilworth Channel water trail and Kenilworth trail users than the bridge option

Noise and Vibration

- Methodology based on Federal Transportation Administration Noise and Vibration Assessment Guidelines
- Land use category is a critical determinant for the channel

Table 3-2. Land Use Categories and Metrics for Transit Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq}(h)^*$	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)^*$	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.

* L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.

Land Use Categories

- DEIS (2012) evaluated channel as Category 3, however MPRB comments indicated the resource should be aligned with Category 1 due to the nature of the resource
  - Category 3: "...Certain historical sites and parks are also included...."
  - Category 1 "...includes lands set aside for serenity and quiet...."
- Additional detail specific to parks in FTA guidance:
  - "Parks are a special case. Whether a park is noise-sensitive depends on how it is used. Most parks used primarily for active recreation would not be considered noise-sensitive. However, *some parks---even some in dense urban areas---are used for passive recreation* like reading, conversation, meditation, etc. These places are valued as havens from the noise and rapid pace of everyday city life *and they should be treated as noise-sensitive*.... The state or local agency with jurisdiction over the park should be consulted on questions about how the park is used and how much use it gets." [emphasis added]

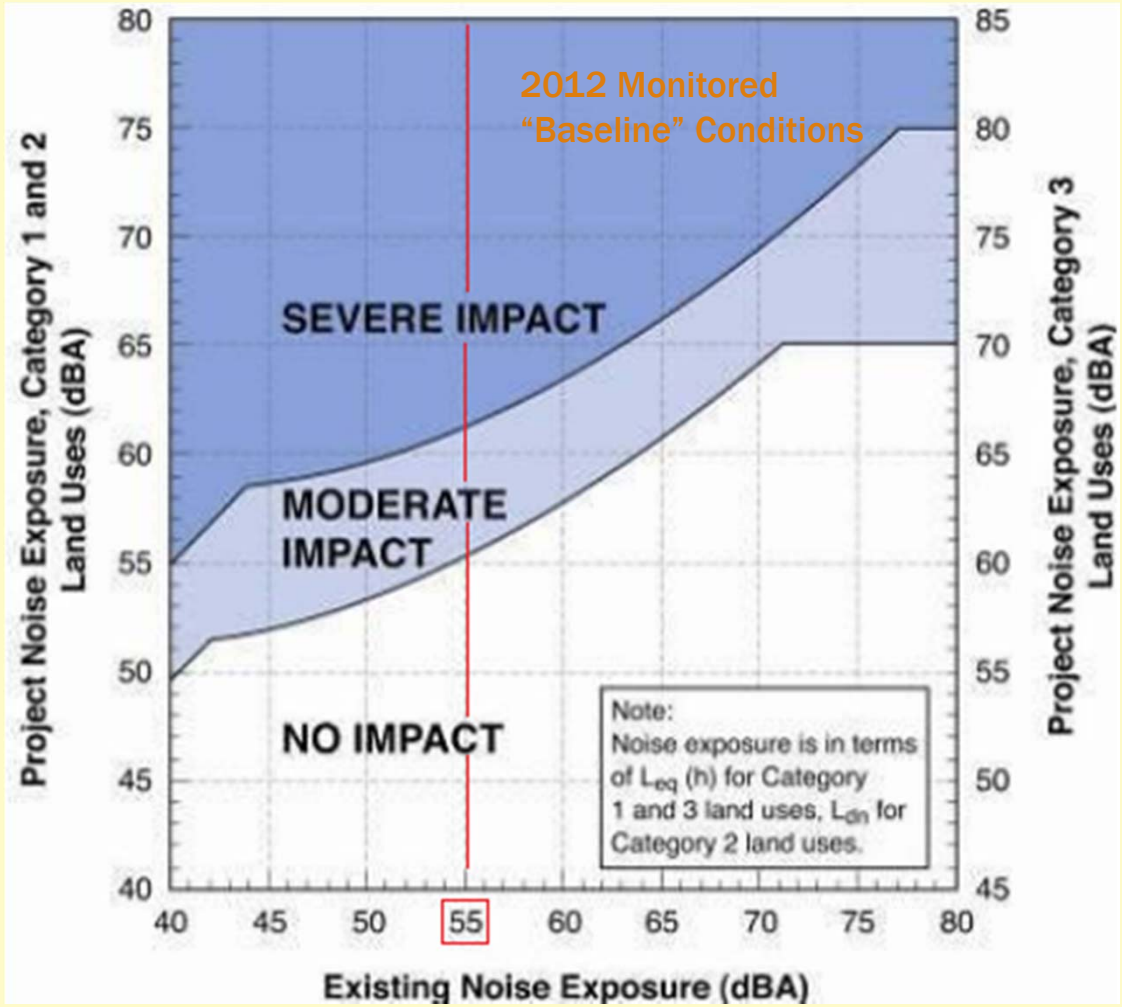
Basics of noise analysis

- Baseline noise levels according to SPO 2012 monitoring were 55 dBA
- Process requires a comparison of existing noise conditions to predicted exposure
  - Moderate impacts are clearly noticeable but may not necessarily yield complaints
  - Severe impacts are expected to yield a significant percentage of highly annoyed receivers
  - According to FTA guidance, noise mitigation is generally specified unless not feasible or reasonable

Noise impacts on channel

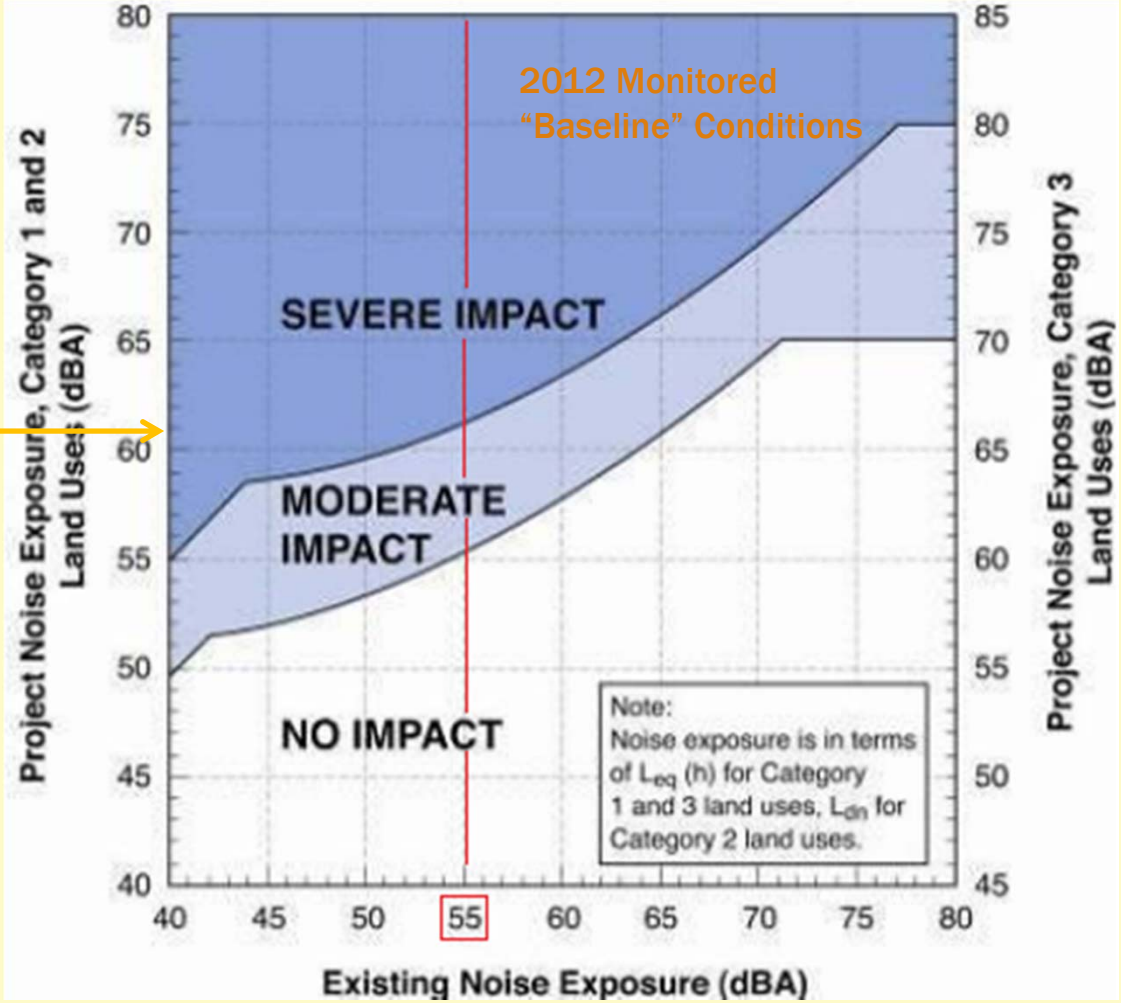
- Example channel user @ 97’ from LRT

Modeled noise impacts



Modeled noise impacts

Bridge option modeling
61 dBA @ 97 feet

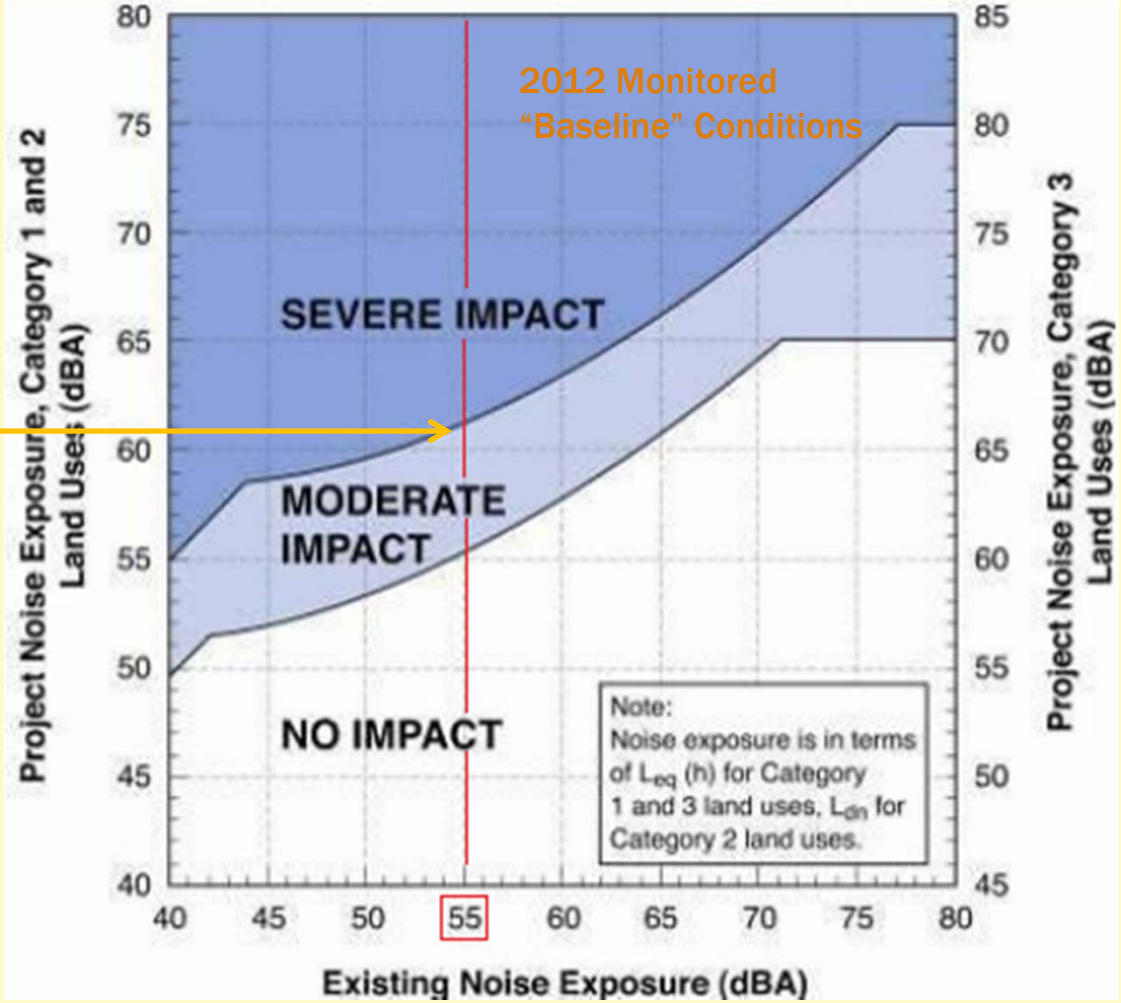


Modeled impact of LRT projected using FTA method for a given distance

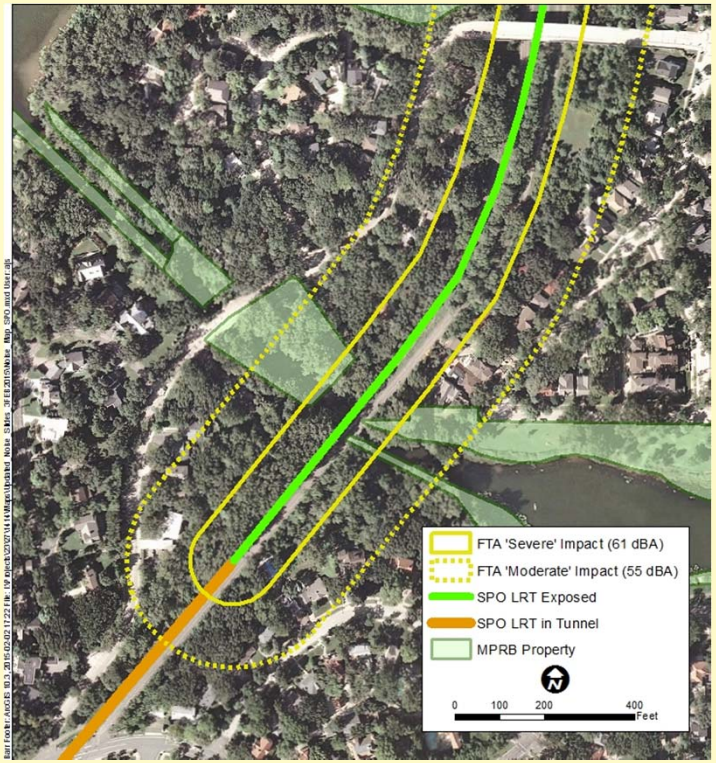
Modeled noise impacts

Bridge option modeling
61 dBA @ 97 feet

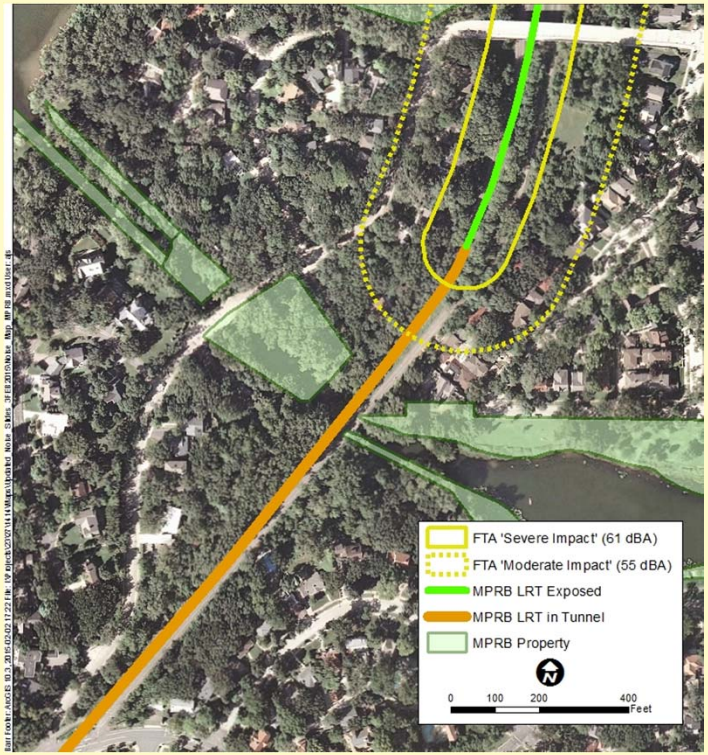
Intersection of existing noise and projected noise determines expected impact



Mapped noise impact



Proposed Bridge Option



Tunnel Options 1 & 2

Other noise and vibration considerations

- Vibration impacts are not expected to vary significantly between crossing options
  - From FTA: “Ground-borne vibration is almost never annoying to people who are outdoors”
  - Ground-borne vibration from tunnel options expected to be lower due to additional decay distance provided by depth
- Construction noise will have mixed impacts
  - Additional piling placement required for construction of tunnel options
  - Activity below grade will be screened by terrain
- Operational noise from tunnel options is less impactful
  - Bridge noise impacts to channel are greater than tunnel options

Tunnel options are the least impactful alternative for crossing Kenilworth Channel

Cultural resources

- Archeological Assessment are being completed in a manner that meets Section 106 of the National Historic Preservation Act as well as Minnesota Statutes 138.31 -138.42 (the “Field Archaeology Act”) and 307.08 (the “Private Cemeteries Act”).

Archeology

- Judging by records reviews that have been completed to date, areas that would be impacted by the tunnel options generally lack Native American and historic Euro-American archaeological potential, a possible exception being the two portal segments where some aspects of the records search still are in progress
- Should any archaeological issues be identified along either of these tunnel options, they could likely be mitigated
- The results of the initial SWLRT cultural resources review have already indicated that the corresponding segment of the bridge option lacks archaeological potential

Historical

- Process focused on performing above-ground cultural resources assessment, noting the following resources:
  - Grand Rounds
  - Kenilworth Channel
  - Frieda and Henry J. Neils House
  - Potential effects on Lake of Isles Residential Historic District
  - Potential effects on Kenwood Parkway Residential Historic District
- If identified, historical issues could likely be mitigated for each of the channel crossing options

GRAND ROUNDS
NATIONAL SCENIC BYWAY

Surface Water

- Total Suspended Solids (TSS) and Total Phosphorus (TP) loading calculated for bridge area would be reduced depending on treatment method (filtration vs. infiltration)
- Imperviousness includes ballast and hard surfaces
- All options will likely meet City of Minneapolis and Minnehaha Creek Watershed District runoff and water quality requirements

Surface Water

Comparison Feature	Bridge	Cut/Cover Tunnel	Jacked Box Tunnel
Impervious Area (acre) Sta 2793+00 to 2819+50	5.07	4.369	4.268
Impervious Area (acre) Bridges (E3-6)	0.47	0.243	0.243
Annual TSS Loading from Bridges (lbs)	154	80	80
Annual TP Loading from Bridges (lbs)	0.85	0.44	0.44

For surface water considerations, the tunnel options offer the least impactful alternative for Kenilworth Channel

Species movement

- Kenilworth Channel currently facilitates aquatic and terrestrial species movement
- An “openness ratio” is used to determine terrestrial species movement
  - (Height x Width)/Length
  - Impairment level at 0.75
  - Tunnel Option = 10.0, Bridge Option= 3.28, Existing = 4.28
  - While no impairment anticipated, the tunnel option are least impactful when completed
- No permanent impacts for aquatic and terrestrial species passage are anticipated
- Channel closure during construction may impact movement for spawning

Literature cited

- Arizona Game and Fish Department, Habitat Branch. 2006. Guidelines for Bridge Construction or Maintenance to Accommodate Fish & Wildlife Movement and Passage. http://www.azgfd.gov/hgis/pdfs/BridgeGuidelines.pdf
- Maine Department of Transportation. 2008. Waterway and Wildlife Crossing Policy and Design Guide, For Aquatic Organism, Wildlife Habitat, and Hydrologic Connectivity, Environmental Office, Augusta, Maine.
- Minnesota Department of Natural Resources. 2009. Lake Survey of Cedar Lake and Lake Calhoun, Hennepin County; accessed via LakeFinder at: http://www.dnr.state.mn.us/lakefind/index.html.
- National Marine Fisheries Service Southwest Region, 2001. "Guideline for Salmonid Passage at Stream Crossings." National Oceanic and Atmospheric Administration.

Species movement

Comparison Feature	Bridge	Cut/Cover Tunnel	Jacked Box Tunnel
Openness Ratio (lower is worse)	3.28	10.0	10.0
Channel Closures-intermittent (months)	12	12	12
Channel Closures-complete (months)	0	6	0
Total Impacted Months	12	18	12

Bridge and jacked box tunnel offer the least impactful alternative from the perspective of aquatic species movement in the Kenilworth Channel

Groundwater

- Groundwater analysis methodology includes:
  - Adding local detail to the Metro Model 3 groundwater model
  - Simulating the dewatering effects of a jacked box tunnel
  - Evaluating four “effective permeability” conditions of construction pits

Groundwater modeling

- The induced seepage rates from the nearby lakes are modest, provided they are not permanent (i.e. only for construction)
- The local water balance will be unaffected, provided the pumped water is either (1) allowed to re-infiltrate or (2) returned directly to one of the lakes (or channel)
- The rate of dewatering will depend on how effective pile walls and poured floor are at reducing seepage into the pits

Groundwater modeling

Shallow groundwater flow direction

- Neither the bridge or tunnel options were found to have any discernable effect on shallow or deep groundwater flow directions upon completion of construction
- Shallow groundwater flow extends to depths below construction

Section 4(f)

- Section 4(f) is part of the Department of Transportation Act intended to prevent conversion of specific types of property to transportation use, including, among others, publicly owned land of a park with national, state or local significance.
  - Significance is determined by the national, state or local officials with jurisdiction over the resource
  - For the Kenilworth Channel, the MPRB has jurisdiction

Section 4(f)

- In addition, the project proposer intending to use the Section 4(f) resource must demonstrate that there is no feasible and prudent alternative and the action includes all possible planning to minimize the use of the resource.
- For Section 4(f), a “use” is:
  - Temporary: generally viewed as construction phase
  - Direct/Permanent: land from Section 4(f) resource is permanently removed from resource and is incorporated into the transportation use
  - Constructive: due to the proximity of the transportation use, the impact is so significant that it impairs use of the resource

Section 4(f)

- The Section 4(f) methodology requires documentation of the proposed project, as well as its purpose and need
- Resources are listed and mapped, the jurisdiction over the resource is defined, and the amenities or characteristics of the resources are identified and mapped
- Impacts to the amenities or characteristics are then classified as temporary, direct/permanent, or constructive, and avoidance alternatives are framed
- Coordination with the party having jurisdiction of the Section 4(f) resource is required

Section 4(f)

- For the Kenilworth Channel, the amenities or characteristics to be considered under Section 4(f) include the channel and adjacent green areas that provide space for:
  - Active uses
    - canoeing/kayaking, fishing, ice skating and skiing in the channel
    - biking, walking, running, in line skating near the channel
  - Aesthetic and visual experiences
  - Passive experiences
  - Quietude

Section 4(f)

- In general, the types of impacts considered in the assessment include:
  - Temporary: closure or impeded access and noise or visual impacts occurring during construction
  - Direct/Permanent: right of way/property loss, obstruction in channel; or
  - Constructive: noise and visual impacts

Section 4(f)

- Because each crossing alternative varies in its temporary, direct/permanent, and constructive impacts, each amenity or characteristic was assessed separately.
- A technical review of each aspect of each alternative was performed, and then the alternative with the least impact upon the resource was defined.
- No overall evaluation was performed
  - The authority having jurisdiction over the resource should determine the nature of impacts
  - Because some amenities or characteristics may, in the opinion of that jurisdiction, be weighted more heavily for the resource being assessed

Section 4(f) methodology

- Document the proposed project and its purpose and need
- Compile Section 4(f) resource information:
- Identify the types of impacts that may occur to each amenity or characteristic and categorize as temporary, direct or constructive.
- Identify avoidance alternatives (point at which feasible and prudence comes into play)
- Identify minimization and mitigation measures
- Coordinate with the party having jurisdiction over the Section 4(f) resource

Distinguishable 4(f) impacts
(impacts sufficient to distinguish between alternatives)

Uses/Alternatives	Bridge		Cut Cover Tunnel		Jacked Box Tunnel	
Canoeing/Kayaking in channel	Increased noise and vibration immediately overhead; shadow/shelter from bridge will reduce natural light in channel; immensity of bridges overhead will result in visual impact	Severe noise impact	~~Increased noise directed toward channel~~; portal & crash or retaining walls not likely to be visible from channel	• 6 months of closure for construction • Trail bridge may be less visually dominant	Portal & crash or retaining walls not likely to be visible from channel	• Trail bridge may be less visually dominant
Fishing	Increased noise and vibration immediately overhead; immensity of bridges overhead will result in visual impact		~~Increased noise directed toward channel;~~ portal & crash or retaining walls not likely to be visible from channel		Portal & crash or retaining walls not likely to be visible from channel	
Ice skating/skiing in the channel	Increased noise and vibration immediately overhead; shadow/shelter from bridge will reduce natural light in channel & snow accumulation may be hindered; immensity of bridges overhead will result in visual impact		~~Increased noise directed toward channel;~~ portal & crash or retaining walls not likely to be visible from channel		Portal & crash or retaining walls not likely to be visible from channel	
Biking, walking, running, in line skating near the channel	Increased noise and vibration immediately adjacent to user; continued inability to see channel; view of portal & crash or retaining walls, and introduction of a large, yellow, fast moving vehicle	•	~~User will now have a direct view of the portal and associated walls;~~ user may view crash or retaining walls		User may view crash or retaining walls	
Passive use within grass areas along bank of channel (incl. quietude and aesthetic/visual experience)	Increased noise and vibration; possibility to reduce bank area for passive use, and introduction of a large, yellow, fast moving vehicle		~~Increased noise directed toward channel bank; portal & crash or retaining walls may be visible from channel bank;~~ user may view crash or retaining walls		User may view crash or retaining walls	

Indistinguishable 4(f) impacts
(impacts are indistinguishable between alternatives)

- Temporary construction disturbance of soils and vegetation
- Construction noise
- Intermittent closures for construction
- Visual impacts from construction
- Construction Vibration
- At least a moderate increase in noise

Summary

- Feasibility
  - All options (bridge and tunnels) are feasible from the perspective of sound engineering judgment
- Prudence
  - Visual quality: tunnel options pose the least impactful alternative
  - Noise and vibration: tunnel options pose the least impactful alternative
  - Cultural resources (archeology and historical): While more investigation is needed, any option with archeological or historical issues is likely to have the potential for mitigation
  - Water resources (surface water, species movement, ground water):
    - All options will meet requirements for surface water management
    - While no options presents significant impacts for species movement, the tunnel options pose the least impactful alternative
    - There were no discernable differences in groundwater impacts among the options
  - FHWA 4(f) impacts: The tunnel options pose the least impactful alternative

Definition of prudence

- An alternative is not prudent if:
  - It compromises the project to a degree that it is unreasonable to proceed in light of the project's stated purpose and need (i.e., the alternative doesn't address the purpose and need of the project);
  - It results in unacceptable safety or operational problems;
  - After reasonable mitigation, it still causes severe social, economic, or environmental impacts; severe disruption to established communities; severe or disproportionate impacts to minority or low-income populations; or severe impacts to environmental resources protected under other Federal statutes;
  - It results in additional construction, maintenance, or operational costs of extraordinary magnitude;
  - It causes other unique problems or unusual factors; or
  - It involves multiple factors as outlined above that, while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

Kenilworth Crossing Alternatives

- Questions

Minneapolis Park and Recreation Board

Regular Meeting

2117 West River Road N
Minneapolis, MN 55411
www.minneapolisparks.org

March 4, 2015 | **~ Minutes ~** | **Wednesday 5:00 PM**

I. CALL TO ORDER

The time being 5:01 PM, President, Commissioner District 1 Liz Wielinski called the meeting to order.

President, Commissioner District 1 Liz Wielinski: Present, Vice President, Commissioner District 3 Scott Vreeland: Present, Commissioner District 6 Brad Bourn: Present, Commissioner At Large John Erwin: Present, Commissioner At Large Meg Forney: Present, Commissioner District 5 Steffanie Musich: Present, Commissioner District 2 Jon Olson: Present, Commissioner District 4 Anita Tabb: Present, Commissioner At Large Annie Young: Present.

II. APPROVAL OF AGENDA

Approved as amended: Remove Resolution 2015-137 from Consent Business to allow for discussion.

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Scott Vreeland, Vice President, Commissioner District 3
SECONDER:	John Erwin, Commissioner At Large
AYES:	Wielinski, Vreeland, Bourn, Erwin, Forney, Musich, Tabb, Young
ABSENT:	Jon Olson

III. APPROVAL OF MINUTES

Minneapolis Park and Recreation Board - Regular Meeting - Feb 18, 2015 5:00 PM

RESULT:	**ACCEPTED [UNANIMOUS]**
MOVER:	Scott Vreeland, Vice President, Commissioner District 3
SECONDER:	John Erwin, Commissioner At Large
AYES:	Wielinski, Vreeland, Bourn, Erwin, Forney, Musich, Tabb, Young
ABSENT:	Jon Olson

IV. REPORTS OF OFFICERS

Jayne Miller, Superintendent

Superintendent Miller reported that the Forestry Department will be receiving two

Minnesota Community Forestry Awards on March 17th during a presentation at the Shade Tree Short Course for Outstanding Project Award and Practitioners Award of Excellence to Craig Pinkalla, Arborist in the Forestry Department; Youth Basketball Tournament will run March 2-10; Citywide Youth Wrestling Meet will be held on Saturday, March 14; MPRB Cinderella Ball was held on Sat, February 28 at Columbia Manor with 110 children and 150 adults in attendance, Thanks to Board President Wielinski for supervising the event again this year as our resident Fairy Godmother; St. Patty's Senior Luncheon at Creekview Park; Wearing of the Green Party for adults with disabilities at Windom South Park; Summer Rec Plus citywide registration is March 17th; Rec Plus is excited to offer Explorakits at the parks and upcoming Public Meetings.

V. REPORTS OF APPOINTEES TO OUTSIDE BOARDS, COMMISSIONS OR COMMITTEES

VI. CONSENT BUSINESS

(All items on the Consent Agenda are considered to be routine and have been made available to Commissioners prior to the meeting; the items will be enacted by one motion. There will be no separate discussion of these items unless a Commissioner so requests, in which event the item will be removed from this Agenda and considered under separate motion.)

6.1 That the Board adopt Resolution 2015-137 captioned as follows:

Resolution 2015-137

Resolution Authorizing Approval of Contracts for the Purchase of Trees as Requested Per O.P. #8060 at an Estimated Total Expenditure of $900,000

VII. CONSENT BUSINESS (continued)

2 That the Board adopt Resolution 2015-138 captioned as follows:

Resolution 2015-138

Resolution Approving the Negotiated Full, Final and Complete Settlement with Future Medical Expenses Closed and an Employment Release as Discussed in a Closed Session on March 4, 2015 for Work Injuries Sustained While Working for the Minneapolis Park and Recreation Board

RESULT:	**ADOPTED [7 TO 0]**
MOVER:	Scott Vreeland, Vice President, Commissioner District 3
SECONDER:	Anita Tabb, Commissioner District 4
AYES:	Wielinski, Vreeland, Erwin, Forney, Musich, Olson, Tabb
ABSTAIN:	Brad Bourn, Annie Young

VII. REPORTS OF STANDING COMMITTEES

A. Planning Committee

7.A.1 That the Board adopt Resolution 2015-121 captioned as follows:

Resolution 2015-121

Resolution to Approve the Master Plan for Nokomis-Hiawatha Regional Park

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Annie Young, Commissioner At Large
SECONDER:	Steffanie Musich, Commissioner District 5
AYES:	Wielinski, Vreeland, Bourn, Erwin, Forney, Musich, Olson, Tabb, Young

7.A.2 That the Board adopt Resolution 2015-133 captioned as follows:

Resolution 2015-133

Resolution Approving the Master Plan for Theodore Wirth Regional Park

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Annie Young, Commissioner At Large
SECONDER:	John Erwin, Commissioner At Large
AYES:	Wielinski, Vreeland, Bourn, Erwin, Forney, Musich, Olson, Tabb, Young

B. Administration and Finance Committee

7.B.1 That the Board adopt Resolution 2015-135 captioned as follows:

Resolution 2015-135

Resolution Amending Professional Services Agreement #C-37983 with Miller Dunwiddie Architecture Related to the Existing HVAC System Evaluation at Minnehaha Park Refectory in the Amount of $1,000 for a New Contract Total of $96,500

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Anita Tabb, Commissioner District 4
SECONDER:	Scott Vreeland, Vice President, Commissioner District 3
AYES:	Wielinski, Vreeland, Bourn, Erwin, Forney, Musich, Olson, Tabb, Young

VIII. PETITIONS AND COMMUNICATIONS

8.1 MPRB Construction Permits - 2015 Permit Log 1/17/15 Thru 2/17/2015

8.2 Planning Project List - March 2015

IX. 5:30 p.m. OPEN TIME

Bob Again Carney Jr., 42xx Colfax Ave S - stated that he was concerned that after 3 business days after announcing an agreement with the Met Council the Board is voting on it, adding that he feels that this needs more public input.

Art Higinbotham 34xx St. Louis Ave, concerned about safety issues in the corridor both in construction and operational with collocated freight rail line and light rail line, Requested Commissioners to reconsider the approval of the MOU.

Patty Schmitz, 28xx Dean Parkway, stated that she was opposed to SWLRT in the Kenilworth Corridor, and requested the preservation of the Park lands.

Dave Vanhattum 35xx Pleasant Ave S, Transit for Livable Communities, spoke in strong support for Resolution 2015-139 and requested approval of the resolution.

Kathy Low 21xx W. Franklin Ave, requested the Board not to vote for Resolution 2015-139 because they do not have the full Draft Environmental Impact statement.

Jeanette Colby, 22xx Sherudan Ave S, urged the board to table a vote on Resolution 2015-139, stating that she doesn't feel it is ready, then read a note from Louise Erdrich, 21xx Newton Ave S thanked the Board for their service to the residents of Minneapolis, independent Park Board, requesting please vote no tonight.

Shelley Fitzmaurice, 26xx Burnham Road, stated that our responsibility is to protect our lakes, expressed concerns of derailment and approving a Resolution with out all studies being complete.

George Puzak, 17xx Girard Ave S, urged the Commissioners to vote no on the MOU with the Met Council, stating that it is premature and that the Board lacks critical information that Met Council is required to provide, requesting please uphold your mission to preserve, protect and enhance our parks and lakes.

Carol Kummer, 48xx 30th Ave S, stated that as the Board would be prioritizing the process/implementation of the Lake Hiawatha/Lake Nokomis Master Plan, urging the Board to put off closing Lake Hiawatha Beach until the very end.

Russ Adams, 33xx 14th Ave S, Alliance for Metropolitan Stability, encouraged the Board to pass Resolution 2015-139 and encouraged the removal of the freight rail lines from this corridor.

Arlene Fried, 11xx Xerxes Ave S, suggested that a solution for additional parking at Graco was to use one of it's surface lots to build a parking ramp.

Susu Jeffrey, 10xx Antoinette, urged the Commissioners to vote no against any plan that would take the SWLRT through the parks.

Gordon Everest, 46xx 28th Ave S, came to speak against closing the beach at Lake Hiawatha stating he, his family and friends would be very disappointed if the Lake Hiawatha was closed

Charlie Casserly, 47xx 27th Ave S, urged the Board to stop the permanent removal of the Lake Hiawatha Beach in the master plan, and that it was not representative of the public comments.

Edna Brazaitis, 4x Grove Street, stated Graco agreed to supported the Mississippi River trail and provided an easement to the MPRB on their property between the river and their headquarters when the money became available and requested that Graco to uphold this agreement.

X. UNFINISHED BUSINESS

The time being 6:26 p.m., President Wielinski recessed the Regular Meeting for the purpose of convening the Planning Committee

The time being 7:55 p.m., President Wielinski reconvened the Regular Meeting

10.1 That the Board adopt Resolution 2015-139 captioned as follows:

Resolution 2015-139

Resolution Determining that the Minneapolis Park and Recreation Board (MPRB) Will Not Pursue Tunnel Crossing Options for the Southwest Light Rail Transit (SWLRT) Project; Approving a Legally Binding Memorandum of Understanding with the Metropolitan Council that 1) Establishes a Process that Recognizes Parks and Park Resources in the Transit Project Development Process, 2) Outlines a Process for Collaboration Between the Southwest Project Office and MPRB on Design of Bridge Crossings at the Kenilworth Channel, and 3) Results in an

Agreement Between the Metropolitan Council and the MPRB to Facilitate Approval and Construction of the SWLRT Project; and Authorizing the Superintendent to Initiate Agreements with Metropolitan Council to Reimburse the MPRB for Costs Related to Its Work on the SWLRT Project and the Blue Line Light Rail Transit Extension (Bottineau) Project ;

Approved as Amended (Olson & Erwin amendment) on a roll call vote

RESULT:	**ADOPTED [6 TO 3]**
MOVER:	Scott Vreeland, Vice President, Commissioner District 3
SECONDER:	Brad Bourn, Commissioner District 6
AYES:	Wielinski, Vreeland, Bourn, Erwin, Musich, Olson
NAYS:	Meg Forney, Anita Tabb, Annie Young

That the Board adopt Resolution 2015-139 captioned as follows:

Resolution 2015-139

Resolution Determining that the Minneapolis Park and Recreation Board (MPRB) Will Not Pursue Tunnel Crossing Options for the Southwest Light Rail Transit (SWLRT) Project; Approving a Legally Binding Memorandum of Understanding with the Metropolitan Council that 1) Establishes a Process that Recognizes Parks and Park Resources in the Transit Project Development Process, 2) Outlines a Process for Collaboration Between the Southwest Project Office and MPRB on Design of Bridge Crossings at the Kenilworth Channel, and 3) Results in an Agreement Between the Metropolitan Council and the MPRB to Facilitate Approval and Construction of the SWLRT Project; and Authorizing the Superintendent to Initiate Agreements with Metropolitan Council to Reimburse the MPRB for Costs Related to Its Work on the SWLRT Project and the Blue Line Light Rail Transit Extension (Bottineau) Project ;

Amend Resolution 2015-139 as follows,

The caption of Resolution:

Resolution Determining that the Minneapolis Park and Recreation Board (MPRB) Will Not Pursue Tunnel Crossing Options for the Southwest Light Rail Transit (SWLRT) Project; Approving a <u>Legally Binding</u> Memorandum of Understanding with the Metropolitan Council that...

The resolved clause of Resolution:

Resolved, That the Board of Commissioners approve a Legally Binding Memorandum of Understanding between the Metropolitan Council and the MPRB that...

The Memorandum of Understanding, Now therefore, section 3:

~~3. The MPRB agrees to work with the Metropolitan Council to facilitate the approval and construction of any LRT project.~~

RESULT:	**AMENDMENT ADOPTED [7 TO 0]**
MOVER:	Jon Olson, Commissioner District 2
SECONDER:	John Erwin, Commissioner At Large
AYES:	Wielinski, Vreeland, Bourn, Erwin, Forney, Musich, Olson
ABSTAIN:	Anita Tabb, Annie Young

That the Board adopt Resolution 2015-139 captioned as follows:

Resolution 2015-139

Resolution Determining that the Minneapolis Park and Recreation Board (MPRB) Will Not Pursue Tunnel Crossing Options for the Southwest Light Rail Transit (SWLRT) Project; Approving a Legally Binding Memorandum of Understanding with the Metropolitan Council that 1) Establishes a Process that Recognizes Parks and Park Resources in the Transit Project Development Process, 2) Outlines a Process for Collaboration Between the Southwest Project Office and MPRB on Design of Bridge Crossings at the Kenilworth Channel, and 3) Results in an Agreement Between the Metropolitan Council and the MPRB to Facilitate Approval and Construction of the SWLRT Project; and Authorizing the Superintendent to Initiate Agreements with Metropolitan Council to Reimburse the MPRB for Costs Related to Its Work on the SWLRT Project and the Blue Line Light Rail Transit Extension (Bottineau) Project ;

That the Board Table resolution 2015-139

Forney Tabb amendment fail on a roll call vote

RESULT:	**AMENDMENT DEFEATED [3 TO 6]**
MOVER:	Meg Forney, Commissioner At Large
SECONDER:	Anita Tabb, Commissioner District 4
AYES:	Meg Forney, Anita Tabb, Annie Young
NAYS:	Wielinski, Vreeland, Bourn, Erwin, Musich, Olson

XI. NEW BUSINESS

XII. ADJOURNMENT

RESULT:	**ADOPTED [UNANIMOUS]**
MOVER:	Scott Vreeland, Vice President, Commissioner District 3
SECONDER:	John Erwin, Commissioner At Large
AYES:	Wielinski, Vreeland, Bourn, Erwin, Forney, Musich, Olson, Tabb, Young

Regular Meeting adjourned at 9:04 PM

Minneapolis Park and Recreation Board

Regular Meeting

2117 West River Road N
Minneapolis, MN 55411
www.minneapolisparks.org

March 4, 2015 | **~ Agenda ~** | **Wednesday 5:00 PM**

Meeting Times are subject to change based on discussion from previous meetings.

I. CALL TO ORDER

Liz Wielinski	President, Commissioner District 1
Scott Vreeland	Vice President, Commissioner District 3
Brad Bourn	Commissioner District 6
John Erwin	Commissioner At Large
Meg Forney	Commissioner At Large
Steffanie Musich	Commissioner District 5
Jon Olson	Commissioner District 2
Anita Tabb	Commissioner District 4
Annie Young	Commissioner At Large

II. APPROVAL OF AGENDA

III. APPROVAL OF MINUTES

Wednesday, February 18, 2015

IV. REPORTS OF OFFICERS

Jayne Miller, Superintendent

V. REPORTS OF APPOINTEES TO OUTSIDE BOARDS, COMMISSIONS OR COMMITTEES

VI. 5:30 p.m. OPEN TIME

Persons wishing to speak can call in before 3:00 p.m. on the day of the meeting by calling 612-230-6400 to be placed on the agenda or can sign up at the Board meeting prior to the start of "Open Time". As stated in Board Rules “Open Time” shall not exceed a total of 15 minutes with up to three minutes allowed for citizen testimony, with the time limit to be allotted by the President.

VII. CONSENT BUSINESS

(All items on the Consent Agenda are considered to be routine and have been made available to Commissioners prior to the meeting; the items will be enacted by one motion. There will be no separate discussion of these items unless a Commissioner so requests, in which event the item will be removed from this Agenda and considered under separate motion.)

7.1 That the Board adopt Resolution 2015-137 captioned as follows:

Resolution 2015-137

Resolution Authorizing Approval of Contracts for the Purchase of Trees as Requested Per O.P. #8060 at an Estimated Total Expenditure of $900,000

7.2 That the Board adopt Resolution 2015-138 captioned as follows:

Resolution 2015-138

Resolution Approving the Negotiated Full, Final and Complete Settlement with Future Medical Expenses Closed and an Employment Release as Discussed in a Closed Session on March 4, 2015 for Work Injuries Sustained While Working for the Minneapolis Park and Recreation Board

VIII. REPORTS OF STANDING COMMITTEES

A. Planning Committee

8.A.1 That the Board adopt Resolution 2015-121 captioned as follows:

Resolution 2015-121

Resolution to Approve the Master Plan for Nokomis-Hiawatha Regional Park

8.A.2 That the Board adopt Resolution 2015-133 captioned as follows:

Resolution 2015-133

Resolution Approving the Master Plan for Theodore Wirth Regional Park

B. Administration and Finance Committee

8.B.1 That the Board adopt Resolution 2015-135 captioned as follows:

Resolution 2015-135

Resolution Amending Professional Services Agreement #C-37983 with Miller Dunwiddie Architecture Related to the Existing HVAC System Evaluation at Minnehaha Park Refectory in the Amount of $1,000 for a New Contract Total of $96,500

IX. UNFINISHED BUSINESS

9.1 That the Board adopt Resolution 2015-139 captioned as follows:

Resolution 2015-139

Resolution Determining that the Minneapolis Park and Recreation Board (MPRB) Will Not Pursue Tunnel Crossing Options for the Southwest Light Rail Transit (SWLRT) Project; Approving a Memorandum of Understanding with the Metropolitan Council that 1) Establishes a Process that Recognizes Parks and Park Resources in the Transit Project Development Process, 2) Outlines a Process for Collaboration Between the Southwest Project Office and MPRB on Design of Bridge Crossings at the Kenilworth Channel, and 3) Results in an Agreement Between the Metropolitan Council and the MPRB to Facilitate Approval and Construction of the SWLRT Project; and Authorizing the Superintendent to Initiate Agreements with Metropolitan Council to Reimburse the MPRB for Costs Related to Its Work on the SWLRT Project and the Blue Line Light Rail Transit Extension (Bottineau) Project ;

X. NEW BUSINESS

XI. PETITIONS AND COMMUNICATIONS

11.1 MPRB Construction Permits - 2015 Permit Log 1/17/15 Thru 2/17/2015
11.2 Planning Project List - March 2015

XII. ADJOURNMENT

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding is between the Minneapolis Park & Recreation Board (MPRB) and the Metropolitan Council as of March 12, 2015.

WHEREAS,

1. The Metropolitan Council has authority under Minnesota Statutes sections 473.399 to 473.3999 to plan, design, acquire, construct and equip light rail transit (LRT) facilities in the seven-county metropolitan area, as defined in Minnesota Statutes section 473.121, subdivision 2. Further, the Metropolitan Council has authority under Minnesota Statutes section 473.405, subdivision 4, and other applicable statutes, to engineer, construct, equip, and operate transit systems projects, including LRT, in the metropolitan area.

2. The Metropolitan Council is developing the Southwest Light Rail Transit (SWLRT) Project, a proposed approximately 15.8 mile extension of the METRO Green Line, which would operate from downtown Minneapolis to Eden Prairie.

3. The Metropolitan Council is working cooperatively with the Hennepin Country Regional Rail Authority (HCRRA) on the Bottineau Light Rail Transit (BLRT) Project, a proposed approximately 13 mile extension of the METRO Blue Line, which would operate from downtown Minneapolis to Brooklyn Park.

4. The MPRB is responsible for maintaining and developing the Minneapolis Park system to meet the needs of Minneapolis citizens and is the official with jurisdiction relating to Section 4(f) for park and recreational areas within its jurisdiction.

5. LRT projects involve numerous statutory and regulatory processes and coordination or engagement between multiple government units or other entities. The Parties discussed these processes with respect to property owners of park and recreation areas. A summary of those discussions is attached as Attachment A. Attachment B is a visual representation of the coordination of these activities.

6. The SWLRT Project's current scope and budget include the use of bridges to cross the Kenilworth Channel for freight rail, LRT and the Kenilworth Trail. The Parties discussed process and design considerations in the event the final design utilizes a bridge crossing. These process and design considerations are set forth in Attachment C.

NOW THEREFORE, the Parties set forth their understandings as follows:

1. The Metropolitan Council agrees to the terms and processes outlined in Attachments A and B with respect to park and recreation areas under the jurisdiction of the MPRB.

2. The Metropolitan Council and the MPRB agree to the Kenilworth Channel Crossing Process and Design Considerations for Bridge Concepts as outlined in Attachment C.

3. The MPRB agrees to work with the Metropolitan Council to facilitate the approval and construction of any LRT project.

4. .Nothing in this MOU shall be construed as limiting or affecting the legal authorities of the Parties, or as requiring the Parties to perform beyond their respective authorities.

5. The Parties acknowledge that the planning and construction of any LRT project will require numerous federal, state, and local processes, approvals and funding commitments. The SWLRT Project is currently in the Project Development phase of the federal New Starts program and a substantial amount of design, engineering, environmental review, and funding commitments must occur before construction can begin. Any LRT project cannot proceed without the issuance of the Record of Decision by the FTA and funding of the Project, including the Full Funding Grant Agreement from the FTA.

6. Nothing in this MOU shall require the Metropolitan Council or the MPRB to take any action or make any decision that will prejudice or compromise any processes required under state or federal environmental or other laws or regulations. This MOU further does not limit the alternatives or mitigative measures that the Metropolitan Council may undertake in the development and construction of any LRT project.

MINNEAPOLIS PARK & RECREATION BOARD

By _____
Its: President

By _____
Its: Secretary

Date _____

METROPOLITAN COUNCIL

By _____
Its: Regional Administrator

Date _____

Approved as to form:

Attorney

Attachment A
LRT Project Coordination
Park and Recreation Areas

Attachment B outlines critical coordination opportunities and process changes that will be implemented by the Metropolitan Council with property owners of park and recreation areas. These processes are designed to support the protection of park and recreation areas by fully integrating consideration of these important resources into project development, engineering and construction processes and activities. This includes exercising full authority under the National Environmental Policy Act of 1969 (NEPA), the Minnesota Environmental Policy Act (MEPA) and Section 4(f) of the Department of Transportation Act of 1966. Specifically, these coordination opportunities ensure the protection of park and recreation areas are addressed early under these processes and continue through the construction of the LRT project. The exhibit identifies five new coordination opportunities and process changes (see below) that will be incorporated into the appropriate Metropolitan Council's LRT Project Office Procedures. The Metropolitan Council agrees to update these administrative procedures effective March 12, 2015.

Coordination Opportunities and Process Changes

1. Scoping and Planning Engagement: In accordance with NEPA and Section 4(f) requirements, the lead project agency(ies) will work with park and recreation area property owners to identify park properties and conduct a preliminary review of potential impacts to parks and Section 4(f) avoidance and mitigation alternatives during the scoping and planning process. Since this element of the process would likely be led by the responsible regional railroad authority, the Metropolitan Council will coordinate with the regional railroad authority to address issues and concerns for park properties during the scoping process and review the Scoping Report and/or applicable planning documentation on park and recreation areas when it assumes responsibility for the project.
2. Park and Recreation Area Issue Resolution Team (IRT): In addition to other identified IRTs, there will be an IRT specifically focused on park and recreation areas within the project study area. The IRT will be comprised of property owners of those park and recreation areas in the project study area. The purpose of the IRT will be to incorporate the protection of park properties and the Draft Section 4(f) Evaluation into the design adjustment process. The IRT process will also include other applicable topics that would involve affected park properties, including but not limited to design adjustments, Section 106 status, Section 4(f) status, NEPA/MEPA status, Municipal Consent Plans, and 30% design plans.
3. Park and Recreation Area Property Owner Resolution: Prior to the Metropolitan Council action to adopt the scope and budget initiating the Municipal Consent process, the park and recreation area property owner may take a resolution indicating its position on the project scope and budget.
4. Park and Recreation Area Property Owner Notification of Changes: If, during the Municipal Consent process, the Metropolitan Council, city , town, or county propose a substantial change to the preliminary design plans for a park or recreation area, the Metropolitan Council will notify

the park and recreation area property owner of the proposed change and identify the next steps and timeframe in the Municipal Consent process, thereby allowing the property owner to provide input to the Council, city, town, or county.

5. Advanced Design Meetings: Park and recreation area property owners will have the opportunity to participate in the advanced design process including design coordination on project elements that impact park and recreation areas, as well as conducting 60% and 90% design plan reviews.

Attachment B: LRT Project Coordination

Parks and Recreation Areas

PROJECT ACTIVITIES	SECTION 4(f)	SECTION 106
SCOPING		
1 COORDINATION ON PARK AND REC ISSUES WITH PROPERTY OWNERS *(Lead: Regional Railroad Authority)*	Initiate Consultation	Initiate Consultation
PROJECT DEVELOPMENT		
0-10% CONCEPTUAL ENGINEERING		
DEIS *(Lead: Regional Railroad Authority)* + Public Comment Period	Draft 4(f) evaluation in DEIS + Public Comment Period	Ongoing Consultation - Design review/input - Determination of effect - Mitigation development
DESIGN ADJUSTMENT PROCESS *(Lead: Met Council)*		
2 Issue Resolution Teams (IRTs) — *New significant impact* → SDEIS: As needed for new potential significant impacts not included in DEIS + Public Comment Period	Official With Jurisdiction (OWJ) Coordination - Temp. Occupancy - Use - *De minimis* - Constructive use Includes written OWJ response	Survey Work / Reporting
BAC/CAC/CMC Resolutions on scope & budget		
3 Park Agency Resolution — *New park use* → SUPPLEMENTAL DRAFT 4(f) EVALUATION: As needed for new park/rec area use + Public Comment Period		
MUNICIPAL CONSENT		
Met Council action to adopt scope & budget		
Municipal Consent plans released		
4 Park & Rec Area Property Owner Notification		
City/County approval/disapproval		
30-60% ENGINEERING		
ADVANCED DESIGN PROCESS		
5 Advanced Design Meetings		
FEIS ROD / Determination of Adequacy		
ENGINEERING		
	Review Draft Final Eval.	Section 106 Agreement
	Final 4(f) Evaluation (Standalone or in FEIS)	
	4(f) Finding (In ROD)	
90% ENGINEERING		
100% ENGINEERING		
CONSTRUCTION		
Implement Mitigation	Implement Mitigation	Implement Mitigation

COORDINATION OPPORTUNITIES

Existing | New

1 *SCOPING ENGAGEMENT*
Identify park properties and preliminary review of park impacts

2 *PARK AND REC AREA ISSUE RESOLUTION TEAM (IRT)*
In addition to regular IRTs, to incorporate park properties and draft 4(f) evaluation into design adjustment process (w/ park owners and project office)

IRT presentations as requested by stakeholders:
- design adjustments
- 106 status
- 4(f) status
- NEPA status
- Municipal Consent plans
- 30% plans

3 *PARK AGENCY RESOLUTION*
On park and recreation area impacts based on current design

4 *PARK AND REC AREA PROPERTY OWNER NOTIFICATION*
Notice of any changes to municipal consent plans that may impact park and rec areas

5 *ADVANCED DESIGN MEETINGS*
Address park properties in design process (with park owners and project office) including:
- design coordination
- 60% plan review
- 90% plan review

ACRONYMS:

DEIS: Draft Environmental Impact Statement
FEIS: Final Environmental Impact Statement
OWJ: Official With Jurisdiction
ROD: Record of Decision
SDEIS: Supplemental Draft Environmental Impact Statement

Attachment C
Kenilworth Channel Crossing
Process and Design Considerations for Bridge Concepts

20 February 2015

Overview

To aid in advancing the design of bridge concepts for the crossing of the Kenilworth Channel, this document frames a process of collaboration between the Southwest LRT Project Office (SPO) and the Minneapolis Park and Recreation Board (MPRB) and outlines a set of parameters intended to guide further exploration of bridge concepts beginning with a conceptual perspective and eventually arriving at a mutually supportable design.

In describing both a process to follow as well as design principles, it is understood there is work that *has been accomplished* and additional work that will continue using the design principles outlined in this attachment. The goals of this effort are to:

- encourage collaboration between SPO and MPRB in defining design directions that satisfy concerns raised by MPRB in its review of the SWLRT alignment in the area of the Kenilworth Channel;
- incorporate strategies or features in the design of a bridge that respond to findings of MPRB's study of channel crossing concepts; and
- allow for the eventual implementation of bridge crossings of the channel for freight rail, light rail, and the Kenilworth Trail in ways that maintain the feasibility, budget and schedule of the SWLRT project.

In pursuing a process focused on design, SPO and MPRB recognize the effort to be more aspirational than prescriptive. Steps of the design process may focus on history, user experience, environmental context, or structure relationships in varying ways.

Process

The process pursued in the design of the bridges recognizes concurrent and ongoing required reviews facilitated by SPO and other project design work in the same corridor, some of which may influence bridge designs as a result of proximity to the Kenilworth Channel. Bridge design activities will be coordinated to align with existing schedules established by SPO for Section 4(f) and Section 106, and the Kenilworth Landscape Design Consultant activities. Schedules for those processes will be defined separately from this document.

Bridge concepts and design refinements will be presented by SPO as a part of meetings that address topics related to the Kenilworth corridor or areas near the Kenilworth Channel that are influenced by the alignment of SWLRT. For these efforts, MPRB staff may participate in presentations to support the design.

SPO and MPRB commit the resources of key staff to effect the process of creating a supportable bridge design.

Design Milestones

Work related to bridge design will begin immediately and be pursued according to the following schedule (note that reviews noted above will be required as a part of the schedule described below; note also that the term "bridge," as used in the following table, may apply to any configuration of single or multiple bridges required for the channel crossing):

Task			
1	Establish design criteria, environmental mitigation strategies, and concept directions (narrative descriptions)	SPO/MPRB	Q1 2015
2	Review and finalize design criteria, environmental mitigation strategies, and narrative concepts; compare to directions from previous bridge design work	SPO/MPRB	
3	Explore initial design directions based on narrative concepts	SPO	
4	Develop a range of bridge design concepts	SPO	
5	Update MPRB Board of Commissioners on bridge design process; gain input on preferred directions	SPO/MPRB	
6	Coordinate with ongoing Section 4(f), Section 106 and Kenilworth Landscape Design Consultant activities	SPO	Ongoing
6	Select a preferred bridge design direction	MPRB	
7	Develop 60 percent bridge design documents	SPO	
8	Conduct 60 percent formal reviews	MPRB	Q3 2015
9	Develop 90 percent bridge design documents	SPO	
10	Conduct 90 percent formal reviews	MPRB	Q1 2016
11	Complete final bridge design	SPO	Q2 2016

The tasks described will be pursued collaboratively to the extent practicable, with production work related to concept documentation, design refinements, and presentation materials being the primary responsibility of SPO with coordination and review by MPRB.

Design Principles

The design of the bridge crossing may introduce forms other than those defined in previously shared bridge design concepts. The process should result in distinct bridge concepts that can be assessed for their ability to resolve impacts identified by MPRB in its process of studying tunnel alternatives. [1]

The bridge designs may follow the following conceptual design principles:

a) Bridges are defined primarily by structural design requirements, and considering, at a minimum:
    a. Separation of freight, LRT, and trail bridges
    b. Exploration of pier and deck configurations aimed at reducing piers in the channel while maintaining desired vertical clearances in the channel
    c. Use of other structure types based on structural requirements (loading, deflection)
b) Bridges are defined primarily by the context of the channel and its users, and considering, at a minimum:
    a. User-focused experience with few or no penetrations of the channel
    b. Elimination of roosts on the underside of the bridge or piers
    c. Minimization of continuous deck expanse in order to bring more light to channel
c) Bridges are defined primarily by the context of the Grand Rounds, and considering, at a minimum:
    a. Reference to other bridges in the Chain of Lakes Regional Park, using the form, scale, materials, color, and details to influence the design without mimicry
    b. Creation of a contrast with historical channel elements (WPA walls) to clearly separate the newly introduced structures from those elements currently considered contributing to its historic nature
    c. Recognition that there was no trail bridge at this location, that the railroad bridge that was constructed does not match other nearby railroad bridges, and that new bridges may not need to reference those other structures
d) Bridges are defined primarily by their relationships to one another, and considering, at a minimum:
    a. Creation of a series of bridges all based on the same structural system, style, mass, and detail (no distinction by use)
    b. Establishment of freight and rail bridges based on the same structural system, style, mass, and detail, with a trail bridge employing a different structural system, style, mass, and detail (distinction by use)
    c. Creation of a “family” of structures, focused on coherency but allowing each to be different based on structure type and use

Through the Section 106 consultation process, directions for bridge form, configuration, and details have been proposed and may be incorporated into the conceptual design principles described above, including:

a) Related to Bridge Concepts:

[1] The MPRB undertook a study of the channel crossing and determined visual quality and noise as the MPRB’s highest priorities for consideration in the design of the bridge.

   a. Design investigation in coordination with Section 106 process and Secretary of Interior Standards
   b. Tested with structural engineering

b) Aesthetic Considerations
   a. Space for banks between abutments and water
   b. Symmetry
   c. Consistency of elevations: curbs, railings and fencing

c) Summary of Consulting Party input (Nov. 2014)
   a. Maximize natural light between bridges
   b. Importance of bank engagement: vegetation restoration and bank walls; bridge abutments and retaining wall
   c. Create more space for skiers and kayakers
   d. Natural materials, dark colors
   e. Utilitarian, non-ornamental
   f. Re-interpretation of existing bridge
   g. Modern construction techniques

Designs shall demonstrate the relationship to the concepts framed (or as refined through the process) through illustrations and supporting narrative descriptions and be augmented by precedent images or other information supportive of the concept.

My Passport for Mac:michaelschroeder:Desktop:Minneapolis Park and Recreation Board:SWLRT:Kenilworth Crossing bridges, process and design, 20150218.docx

March __, 2015

Minneapolis Parks and Recreation Board
Superintendent Jayne Miller
2117 W River Road
Minneapolis, MN 55411

Re: Engineering Consultant's Report on the Kenilworth Channel

Dear Superintendent Miller:

This letter is a follow-up to recent discussions between the Metropolitan Council (Council) and the Minneapolis Park and Recreation Board (MPRB) about the Kenilworth Channel and 4(f) analysis under Section 4(f) of the Department of Transportation Act of 1966. The MPRB is an official with jurisdiction under the federal 4(f) statutes and regulations and hired an engineering consultant to study a tunnel option under the Kenilworth Channel.

The Council will benefit from analysis conducted by the Park Board commissioned engineering study to further evaluate tunnel alternatives under the channel. This information will help inform the 4(f) analysis that will be addressed in the Supplemental Environmental Impact Statement (SDEIS) and the final 4(f) analysis. The Council proposes the following:

1. To help cover the costs of the MPRB's consultant study, the Council will reimburse the MPRB: (a) fifty percent (50%) of the MPRB's engineering consultant costs or $250,000, whichever amount is less; and (b) $21,500 for MPRB staff work associated with the preparation of that report. The $21,500 is in addition to the reimbursement for engineering consultant costs.

2. The MPRB will provide the Council with a copy of the report and any underlying data that may have been collected for the report if those data will help the Council complete its 4(f) analysis.

3. The MPRB will submit an invoice with supporting documentation showing actual MPRB expenditures for the consultant report.

4. The Council will reimburse the MPRB within thirty days after receiving the invoice and supporting documentation.

5. The Council will reimburse the MPRB for any future MPRB staff work performed on behalf of the SWLRT Project consistent with the Project's standard protocol for reimbursement of Project partners' staff work and pursuant to the terms of a future Master Funding Agreement and Subordinate Funding Agreements between the MPRB and the Council.

If this reimbursement proposal is acceptable to the MPRB, please sign below and return a copy of this letter to me for the Council's contract files.

Accepted on behalf of the
Minneapolis Park and Recreation Board

By: _____

Sincerely,

Patrick P. Born
Regional Administrator

4. Materials from Official With Jurisdiction Meetings, February and March 2015 (agenda, notes, handouts)

Meeting Title: Section 4(f) Coordination – Parks within the City of Minneapolis

Date: 02/13/2015 **Time:** 1:00 p.m. **Duration:** 1.5 hour

Location: SPO Conf. Rm. A
Call in #: 1 (872) 240-3412; code: 751-213-109
GoToMeeting: https://global.gotomeeting.com/join/751213109

Meeting called by: Nani Jacobson, Assistant Director, Environmental & Agreements

Invitees: MPRB: Jennifer Ringold, Renay Leone, Michael Schroeder
City of Minneapolis: Paul Miller
Hennepin County: Kimberly Zlimen
FTA (phone): Maya Sarna, Amy Zaref
SPO: Jim Alexander, Ryan Kronzer, Mark Bishop, Jeanne Witzig, Leon Skiles, Michael Hoffman (phone)

Purpose of Meeting: Discuss 4(f) properties under jurisdiction of the City and/or MPRB, 4(f) process and analysis.

Agenda	
1:00 – 1:05 pm	1. Welcome and Introductions
1:05-1:15 pm	2. Overview of Section 4(f) Requirements (handout)
1:15 – 1:30 pm	3. Overview of SWLRT 4(f) Process (handout)
1:30 – 2:00 pm	4. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – with potential Section 4(f) Use, *de minimis* Use or Temporary Occupancy (handout): a. Kenilworth Lagoon Recreational Easement (MPRB/City of Minneapolis) b. Cedar Lake Park – East Cedar Beach (MPRB) c. Cedar Lake Park – Cedar Lake Junction (MPRB) d. Bryn Mawr Park (MPRB)
2:00 – 2:15pm	5. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – with potential proximity impacts (handout): a. Alcott Triangle (MPRB) b. Park Siding Park (MPRB) c. Lake of the Isles Park (MPRB)
2:15 – 2:30pm	6. Next Steps a. Continued Coordination b. Review and discussion of Preliminary Section 4(f) Determinations c. Consultation on Mitigation d. Meetings: i. February 20, 2015 from 1:00-2:30

	ii. February 27, 2015 from 2:00-3:30 iii. March 6, 2015 – not scheduled

DISCUSSION:

ACTION ITEMS:	PERSON RESPONSIBLE:	DEADLINE:

SIGN-IN SHEET

SOUTHWEST
Green Line LRT Extension

Section 4(f) Officials With Jurisdiction Coordination Meeting
February 13, 2015 1:00 – 2:30

Name	Organization	Email	Phone
Jeanne Witzig	Kimley-Horn	jeanne.witzig@kimley-horn.com	651-643-0447
Paul Miller	City of Mpls	paul.miller@minneapolismn.gov	612-673-3603
Rachel Haase	Kimley-Horn	rachel.haase@kimley-horn.com	651-643-0412
Mark Bishop	SPO	mark.bishop@metrotransit.org	6515923785
Kim Zlimen	HCRRA		
Jessica Galatz	HCRRA	jessica.galatz@hennepin.us	
Jennifer Ringold	MPRB		
Miander Scamuffa	MPRB		
JIM ALEXANDER	SPO		
Kim Proia	SPO		
Renay Leone	MPRB	rleone@minneapolisparks.org	612-230-6427

Meeting Title: Section 4(f) Coordination – Parks within the City of Minneapolis – MEETING NOTES

Date: 02/13/2015 **Time:** 1:00 p.m. **Duration:** 1.5 hour

Location: SPO Conf. Rm. A
Call in #: 1 (872) 240-3412; code: 751-213-109
GoToMeeting: https://global.gotomeeting.com/join/751213109

Meeting called by: Nani Jacobson, Assistant Director, Environmental & Agreements

Attendees: MPRB: Jennifer Ringold, Renay Leone, Michael Schroeder
City of Minneapolis: Paul Miller
Hennepin County: Kimberly Zlimen, Jessica Galatz, Nelrae Succio (phone)
FTA (phone): Maya Sarna, Amy Zaref
SPO: Jim Alexander, Ryan Kronzer, Mark Bishop, Jeanne Witzig, Leon Skiles (phone), Michael Hoffman (phone), Kim Proia, Rachel Haase

Purpose of Meeting: Discuss 4(f) properties under jurisdiction of the City and/or MPRB, 4(f) process and analysis.

Agenda	
1:00 – 1:05 pm	1. Welcome and Introductions
1:05-1:15 pm	2. Overview of Section 4(f) Requirements (handout)
1:15 – 1:30 pm	3. Overview of SWLRT 4(f) Process (handout)
1:30 – 2:00 pm	4. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – with potential Section 4(f) Use, *de minimis* Use or Temporary Occupancy (handout): a. Kenilworth Lagoon Recreational Easement (MPRB/City of Minneapolis) b. Cedar Lake Park – East Cedar Beach (MPRB) c. Cedar Lake Park – Cedar Lake Junction (MPRB) d. Bryn Mawr Park (MPRB)
2:00 – 2:15pm	5. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – with potential proximity impacts (handout): a. Alcott Triangle (MPRB) b. Park Siding Park (MPRB) c. Lake of the Isles Park (MPRB)
2:15 – 2:30pm	6. Next Steps a. Continued Coordination b. Review and discussion of Preliminary Section 4(f) Determinations c. Consultation on Mitigation d. Meetings: i. February 20, 2015 from 1:00-2:30

	ii. February 27, 2015 from 2:00-3:30 iii. March 6, 2015 – not scheduled

DISCUSSION:

1. Welcome and Introductions

2. Overview of Section 4(f) Requirements
   - *Refer to handout titled "Section 4f of the Department of Transportation Act Overview"*
   - Section 4(f) is a DOT law that prohibits transportation projects from using a qualifying park/recreation area, historic site, or wildlife/waterfowl refuge unless there is no prudent and feasible avoidance alternative or the use would be *de minimis*
   - The 4(f) evaluation to date in the Draft EIS identified all 4(f) properties that would be impacted by the project
   - The list of impacted properties has been updated based on advances in design – able to avoid some properties, some information was corrected, and some new 4(f) properties that could be impacted were identified
   - "Use" is permanent incorporation of any portion of a 4(f) property into a project through the fee simple acquisition of the property or acquiring a property right that allows permanent access to the property (e.g., easement)
   - See handout for other definitions of impacts under Section 4(f) including:
     - Constructive use
     - *De minimis* impact
     - Temporary occupancy
   - Eligibility requirements for a 4(f) park/recreation area include:
     - Primary purpose of the property is recreation
     - Property is publically owned, publically accessible, and of local significance
   - Who is the Official with Jurisdiction (OWJ) for 4(f) properties?
     - Parks: the agency/agencies that own or administer the 4(f) property
     - Historic sites: State Historic Preservation Office (SHPO)
   - How are Section 4(f) and Section 106 related?
     - The Section 106 process determines the eligibility of historic/archaeological resources for potential 4(f) protection and the level of 4(f) use

3. Overview of SWLRT 4(f) Process
   - *Refer to handout titled "Southwest LRT Section 4(f) Process"*
   - The Draft EIS included a Draft Section 4(f) Evaluation with a comment period
     - The Department of Interior (DOI) commented on the 4(f) evaluation but did not say it needed to be redone
   - Following the publication of the Draft EIS, the Locally Preferred Alternative (LPA) underwent design adjustments as the Project advanced from conceptual design to preliminary design

- There were significant changes during that time (e.g., changed location of freight rail – went from relocation to co-location, which required a Supplemental Draft EIS (SDEIS))
- Process concluded in July 2014 and the Metropolitan Council adopted the project's scope and budget

- Preliminary Engineering (PE) plans identified historic properties, started to identify avoidance, minimization, and mitigation measures
- Currently the project is in the impact determination stage for historic properties (106 process)
  - Will be working with SHPO on the Kenilworth Lagoon/Channel and Grand Rounds Historic District
- The SDEIS will be published with an update to the Draft 4(f) Evaluation
- The Final EIS and Record of Decision (ROD) will include a Final Section 4(f) Evaluation and Determination

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2. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – with potential Section 4(f) Use, *de minimis* Use, or Temporary Occupancy:
   - *Refer to handout titled "Southwest LRT Project: Current Preliminary Status of Section 4(f) Park Properties within the City of Minneapolis"*

3. Kenilworth Lagoon Recreational Easement (MPRB/City of Minneapolis)
   - Per Nani: Project has the easement from 1912 with City and MPRB for recreational use of the channel, therefore considers both as Officials With Jurisdiction (OWJ)
   - Clarification from MPRB:
     - Condemned right-of-way for channel for park purposes
     - Condemnation by the Park Board (separate from the City)
     - Agreement was between the Park Board and the parties named in the condemnation (two railroads and an individual)
     - Language in condemnation was likely along the lines of "City acting by and through" (needs to be verified)
     - City was not signatory to agreement
     - MPRB legal counsel can be engaged to help explain relationship
   - There is overlap between the recreational easement and the Grand Rounds Historic District
     - The Kenilworth Lagoon (as part of the Grand Rounds Historic District) will be forwarded in the Section 4(f) analysis under two distinct property classes—the historic property and the easement property.
       - The historic property definition received an "adverse effect" determination under the Section 106 process; therefore, an individual Section 4(f) evaluation will be prepared under a non-de minimis "use" analysis. The MPRB "jacked box" tunnel alternative will be evaluated within this individual evaluation process.
       - FTA and the SPO believe the easement property definition may be forwarded under a de minimis "use" analysis.
     - **Action: FTA and SPO would like feedback from MPRB on the type of use under Section 4(f)- specifically for the easement property.**
     - If it is a *de minimis* use: document in project file and move forward with design (would

need written concurrence from OWJ for completion of documentation)
    - If it is a non-*de minimis* use: prepare an individual 4(f) evaluation
- All construction and permanent impacts stay within the combined boundary of the BNSF and HCRRA parcels
    - Parcel lines are based on Alta land survey and the project has full title work for the parcels (worked with MnDOT right-of-way staff to obtain titles, etc.)
        a. **Action: MPRB requested the final title work**
    - The easement overlaps the BNSF and HCRRA properties in the channel area
        a. New (replacement) piers placed in channel are being discussed as part of the 106 process
    - There will be temporary impacts to the channel as part of construction – the project is further defining what these impacts would be based on design and construction plans
- There will be a Section 4(f) use – permanent incorporation of piers into the channel in the recreational easement
    - The piers will be in different location than the current piers
    - There may be fewer piers that currently exist based on the design of the bridge. Longer spans are being considered as part of the evaluation (longer spans would require larger structures)
- FTA (Maya):
    - The OWJ will have multiple opportunities to comment and provide input on how the 4(f) evaluation should move forward, including input on mitigation and avoidance alternatives
    - FTA needs to understand how the MPRB wants to move forward for the easement property definition.
    - The easement is essentially receiving double analysis (from both the park/recreation and historic sides of Section 4(f))
    - FTA believes the impact would qualify as *de minimis* as the project would not change any attributes related to why the easement was provided (recreational use) but understands that the MPRB has a significant view on it too

4. Cedar Lake Park – East Cedar Beach (MPRB)
    - There was a memorandum of understanding (MOU) between the City and Met Council last year to determine improvements as part of project, which included:
        - Improvements to access to East Cedar Beach: wayfinding kiosks, improving connection to beach (walkway connection from 21st Street station area to the beach)
            a. Stakeholder process last summer
            b. Incorporate into municipal consent documents and then plans
    - Key issue: Sidewalk would transition from public street to MPRB property. **Action: Would it be a city sidelwalk or owned by the MPRB?**
        - Could stop the sidewalk short of MPRB property but that might not accomplish the intent of the MOU
        - Ownership of the sidewalk on park property will inform 4(f) engagement.
        - If owned by others than MPRB – What type of use does the MPRB consider that (*de*

minimis or non-*de minimis*)?
    - If the sidewalk were owned by the MPRB then it would likely be a Temporary Occupancy under 4(f)
    - Issues to consider:
        a. The City would most likely do snow removal on its part of the sidewalk
        b. The MPRB would be doing snow plowing on the Kenilworth Trail
- FTA and SPO seeking feedback from MPRB on the type of Section 4(f) analysis to forward for this property, regardless of ownership decisions.
- The BNSF parcel nearby is about 52 feet wide
    - The MPRB believes that in the 1950s BNSF transferred a piece of the parcel to the MPRB and reiterated that they would like to see the title work
    - The Project is currently proceeding as if BNSF owns the whole parcel

5. Cedar Lake Park – Cedar Lake Junction (MPRB)
    - The existing North Cedar Lake Trail is within park property
    - Current design has Cedar Lake Trail crossing over the Kenilworth Trail on a bridge structure and tying into the existing trail network
    - The bridge structure would start on HCRRA property and extend onto MPRB property
    - The revised trail alignment and new bridge structure would be on park property
    - **Action: Who is going to own it?**
        - If the MPRB owned the pedestrian overpass, then the impact would be temporary occupancy during construction
    - If it were owned by someone else, then it would be temporary occupancy plus *de minimis* or non-*de minimis* useFTA and SPO seeking feedback from MPRB on the type of Section 4(f) analysis to forward for this property.
        - Considerations:
            a. The Three Rivers Park District's ownership of the Cedar Lake Trail starts west of Hwy 100
            b. The City built the trail so it is thought of as a City owned trail on others property (i.e., MPRB, HCRRA, Three Rivers Park District)
            c. City does inspections
            d. Data will be needed to understand what would be agreed to with ownership
                i. Maintenance equipment – need proper bridge design to accommodate
                ii. Loring Park bike bridge that connects to Bryant might be an example

6. Bryn Mawr Park (MPRB)
    - Luce Line Trail bridge built as part of I-394 project and owned by MnDOT; MPRB does maintenance
    - Project would be removing existing bridge and replacing it with a bridge on a new alignment
        - Part of MOU discussions last year

- The bridge would parallel/sit in MPRB property – some retaining walls and grading would be needed to tie back into the existing trail in the park
- SPO would like any information on easements or other documentation regarding how the trail bridge sits in the park currently
- The new bridge alignment was put in as placeholder – still need to sort out true alignment of what it wants to be
  - The bridge is meant to minimize the impact to the park as much as possible – there could be a more optimal alignment with more impacts to park but that would need to be discussed
  - Also need to consider the location of overhead power lines
- **Action: Who will own the portion on park property?**
- **Action: Who will own the portion outside of park property?**
  - Up for discussion – MnDOT would prefer not to own the bridge moving forward
- Stations areas will ultimately be owned by the Met Council

General discussion regarding Section 4(f) Properties with potential Section 4(f) use, *de minimis* use, or Temporary Occupancy

- How do we move along the ownership questions for the sidewalk in Cedar Lake Park – East Cedar Beach, the bridge in Cedar Lake Park – Cedar Lake Junction, and the bridge in Bryn Mawr Park?
  - Conversations around long term ownership and maintenance responsibilities will take longer to figure out but would like to start soon
- Who will own the bridge over the Kenilworth Channel?
  - Existing bridges owned by HCRRA (freight rail and trail)
  - In the future – freight would be publically owned by an agency to be determined (but not HCRRA)
    a. LRT bridge would be owned by the Met Council
    b. Pedestrian bridge ownership is to be determined
  - Does easement change parties as well?
    a. Easement tied to title and transfers with title under property acquisition or transfer

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4. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – with potential proximity impacts (handout):
   - *Refer to handout titled "Southwest LRT Project: Current Preliminary Status of Section 4(f) Park Properties within the City of Minneapolis"*
   - Proximity impacts occur when the project is not physically on park property
     - The study area is 350 feet on either side of alignment
   - The following parks are within the study area but there will be no physical incorporation of the park into the project
     - Alcott Triangle (MPRB)
     - Park Siding Park (MPRB)
     - Lake of the Isles Park (MPRB)

- Cedar Lake Pkwy is being treated as a historic resource – preliminary finding of no adverse impacts based on current design; working with SHPO
- Looking at tunnel under the parkway so there would be a very small shift in elevation (few inches) – reestablishment of exiting conditions in terms of freight tracks and trails

5. Next Steps
    - Continued Coordination
        - Essential questions that need to be answered for the evaluation in the SDEIS
            - Type of use for the Lagoon easement property
            - Ownership questions – might not be possible to have answers in next couple weeks; Nani and Maya to discuss 4(f) evaluation for those areas for which we aren't sure of the 4(f) landscape yet
                - Don't want to hold up SDEIS for ownership questions
                - MPRB will provide a path to resolve ownership questions
                - City will have internal discussion re: their ownership process
                - City and MPRB may set up preliminary conversation to discuss
        - SPO to provide parcel info to the MPRB
        - Would be ideal for FTA if all questions raised today could be answered, otherwise there is a chance the 4(f) evaluation would be published and then new information could cause a second 4(f) evaluation to be needed; FTA would prefer to avoid that
        - FTA indicated that MPRB's can make preliminary determination on how to forward the Section 4(f) analysis for the properties where ownership determination is unknown currently
        - Met Council will be meeting with all OWJs separately (Eden Prairie – Purgatory Creek Park and SHPO – historic properties)
    - Review and Discussion of Preliminary Section 4(f) Determinations
    - Consultation on Mitigation
        - Farther down the road
    - Meetings
        - February 20, 2015 from 1:00-2:30
            - Planned to be used to discuss the canal right of way easement
        - February 27, 2015 from 2:00-3:30
        - March 6, 2015 – to be scheduled
        - March 13, 2015 – to be scheduled

ACTION ITEMS:	PERSON RESPONSIBLE:	DEADLINE:
Provide title work to MPRB for all areas impacting parks	SPO – Nani Jacobson	Complete – 3/3/15
MPRB to provide information requested from SPO on 1/29/2015	MPRB	First installation – Complete – 2/16/2015 Remaining information – TBD
Meeting to discuss canal ROW easement	All	March
Determine ownership of ped bridges and East Cedar Beach project elements	City, MPRB	City/MPRB to hold meetings and continue discussion; provide status at next meeting
Provide feedback on Channel/Lagoon use(s)	MPRB	TBD – next few weeks
Input on preliminary 4(f) determinations	MPRB and City	TBD – next few weeks

February 6, 2015 – DRAFT Work in Process

Section 4(f) of the Department of Transportation Act
Overview

1. **What is the intent of Section 4(f)?**

- To prohibit a transportation project from using a qualifying park/recreation area, historic site or wildlife/ waterfowl refuge, unless there is no prudent and feasible avoidance alternative or the use would be *de minimis*

2. **What is a 4(f) *Use*?**

- The permanent incorporation of any portion of a 4(f) property into a project through the fee simple acquisition of the property or acquiring a property right that allows permanent access to the property (e.g., easement)
- Use has a greater than *de minimis* impact (*de minimis* = no adverse effect to the activities, features or attributes of the 4(f) property, after minimization and mitigation)
- A *proximity impact* (e.g., noise, visual) that *substantially impairs* use of the property = *Constructive Use*
- A short-term construction use that cannot meet five *Temporary Occupancy* criteria

3. **What is a *de minimis* impact?**

- (1) For historic sites, a Section 106 finding of no adverse effect or no historic properties affected on a historic property, or (2) For parks, recreation areas, and wildlife and waterfowl refuges, the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section 4(f).

4. **What is a Constructive Use?**

- Occurs when the transportation project does not incorporate land from a Section 4(f) property, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features or attributes of the property are substantially diminished.

5. **What is a Temporary Occupancy?**

- Temporary occupancies of land that are so minimal as to not constitute a use under 4(f). These must meet:
  - Duration must be temporary, i.e. less than the time needed for construction of the project and no change in ownership of the land
  - Scope of work must be minor, i.e. both the nature and magnitude of the changes to the 4(f) property are minimal
  - No anticipated permanent adverse physical impacts, nor will it interfere with protected activities, features or attributes of the property
  - The land being used must be fully restored (returned to a condition which is at least as good as that which existed prior to the project)
  - Documented agreement with the official(s) with jurisdiction

6. **How is the eligibility of a 4(f) park/recreation area determined?**

- Primary purpose of the property is recreation
- Property is publically-owned, publically-accessible and of local significance

7. **What is an Official with Jurisdiction?**

- Parks: Officials with the agency/ies that own or administer the 4(f) property
- Historic sites: SHPO

8. How are Section 4(f) and Section 106 related?

- Section 106 process determines the eligibility of historic/archaeological resources for potential 4(f) protection
- Section 106 determines level of 4(f) *use* (e.g., use + no adverse effect = *de minimis*; use + adverse effect = non-*de-minimis* 4(f) use)
- 106 Agreement documents 4(f) *All Possible Planning to Minimize Harm*

9. **What is a *Feasible and Prudent Avoidance Alternative?***

- Completely avoids the permanent use of a 4(f) property
- Feasibility: Can be built as a matter of sound engineering
- Prudence: No severe problems that outweigh protecting the 4(f) property, considering:
  - Meeting Purpose/Need
  - Safety
  - Severe impacts (after mitigation)
  - Extraordinary costs
  - Unique problems/factors
  - Cumulative impact of multiple factors

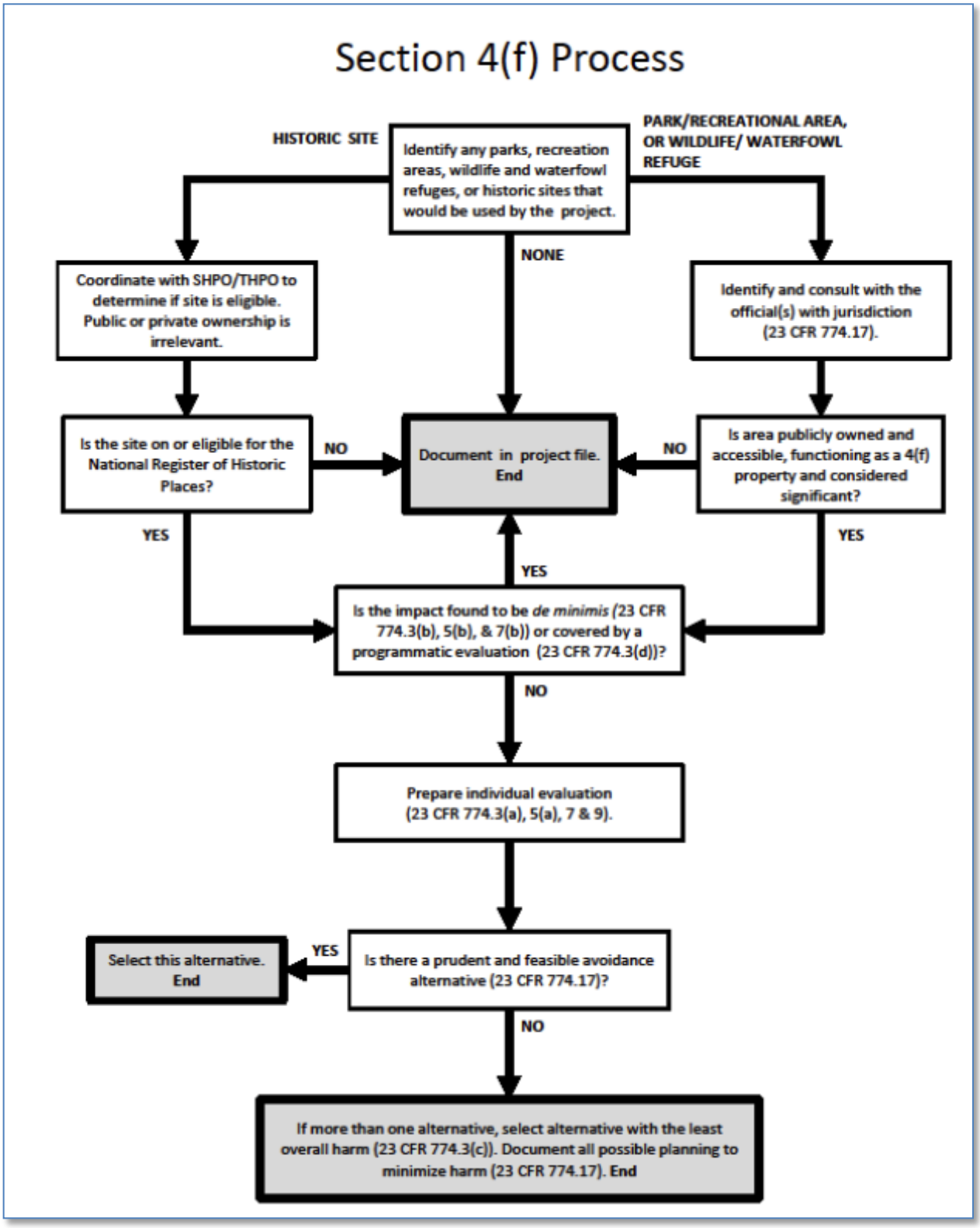
10. What happens if the LPA *uses* a protected property?

- FTA issues a 4(f) Evaluation (draft and final), including three required determinations:
  - There is ***No Prudent/Feasible Avoidance Alternative***
  - ***All Possible Planning to Minimize Harm*** has occurred (includes all reasonable mitigation measures)
  - LPA must have ***Least Overall Harm*** compared to other alternatives that have a 4(f) use

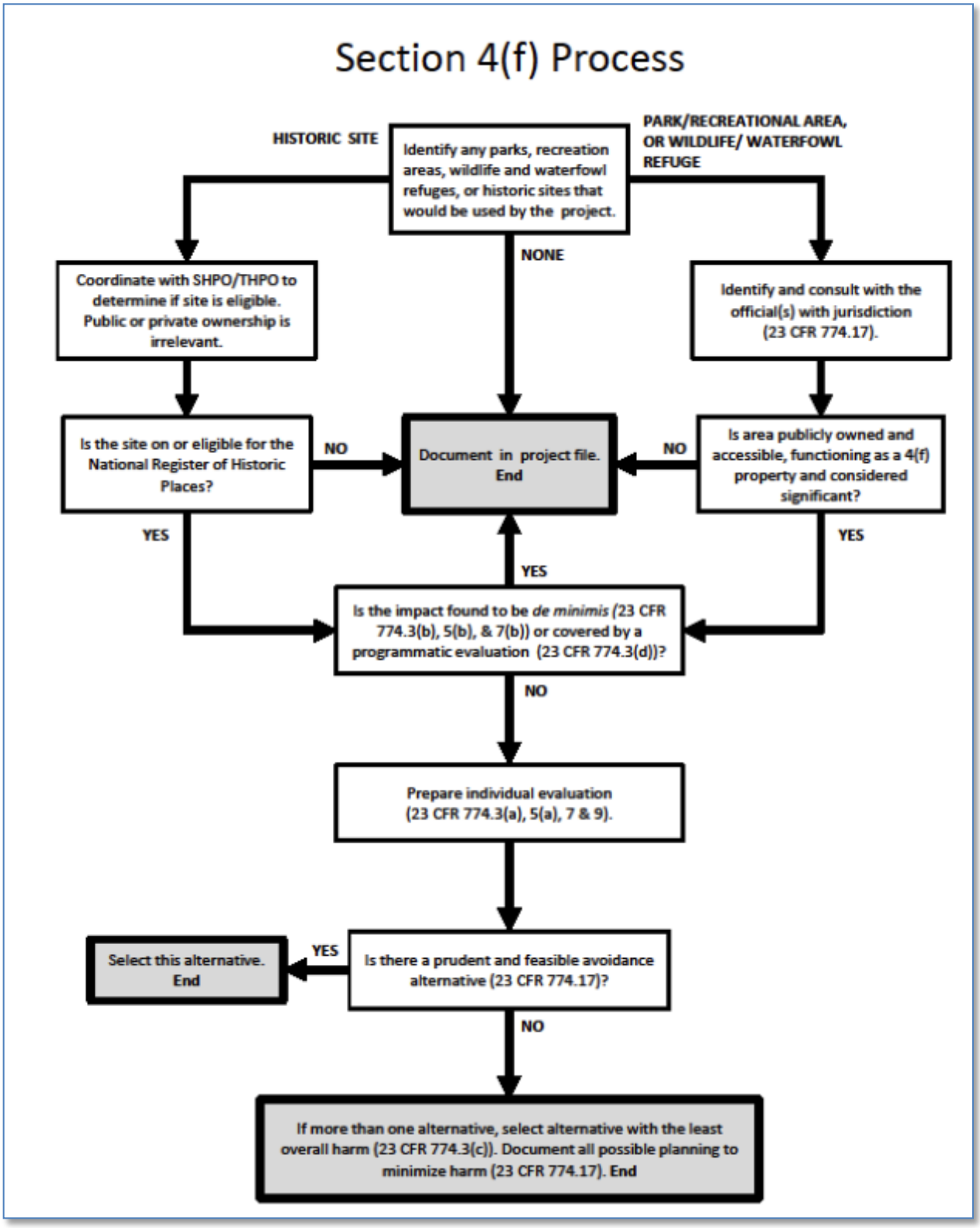
11. What is a Least Overall Harm Analysis?

- When there is no feasible and prudent avoidance alternative, the comparison of the LPA with other alternatives under consideration that would have a use of any 4(f) property
- Comparative criteria used to reach the determination:
  - Relative value of and impacts to 4(f) properties, after similar mitigation efforts – criteria:
    - Ability to mitigate adverse impacts to each 4(f) property
    - Relative severity of harm to protected characteristics of the 4(f) properties (after mitigation)
    - Relative significance of the 4(f) properties
    - Views of officials with jurisdiction over the 4(f) properties
  - Consideration of substantial problem/s – criteria:
    - Degree to which the alternative meets P&N
    - Magnitude of adverse impacts to non-4(f) resources (after mitigation)
    - Substantial cost differences
- Only the alternative/s with the Least Overall Harm may be approved by FTA

Sources: 23 USC 138; 49 USC 303; 23 CFR Part 774; *Section 4(f) Policy Paper* (USDOT: July 20, 2012)



Source: *Section 4(f) Policy Paper* (p. 62; USDOT: July 20, 2012)



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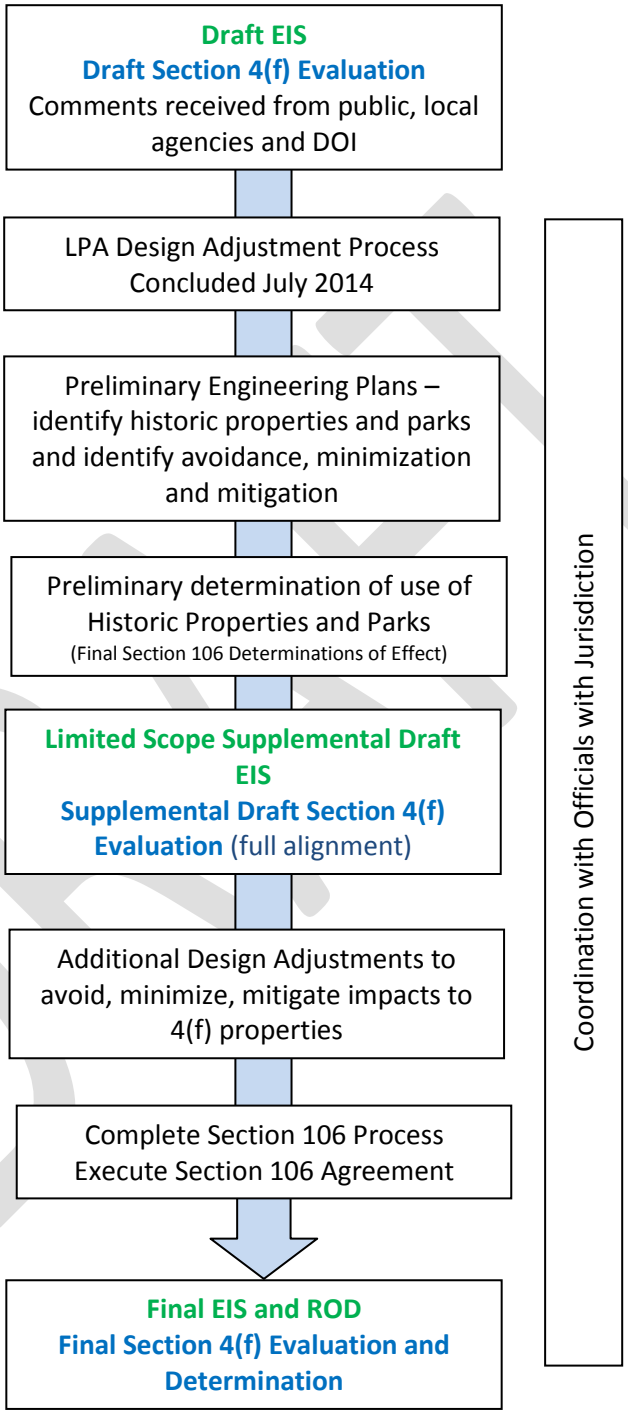
Southwest LRT
Section 4(f) Process



Legend

- Recreation Easement
- Grand Rounds Historic District
- Hennepin County Parcels

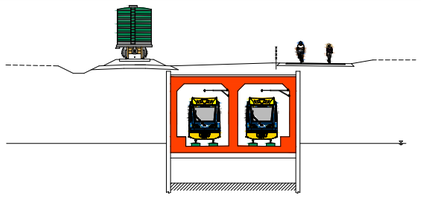
1:860

DRAFT - WORK IN PROCESS

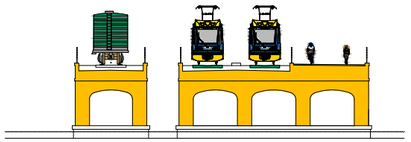
0 0.025 0.05 0.1 Miles

Map created 2/10/15

SOUTHWEST Green Line LRT Extension



TYPICAL SECTION AT TUNNEL



TYPICAL SECTION AT BRIDGE

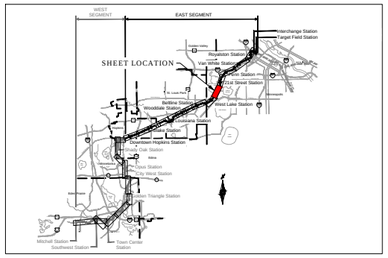
SOUTHWEST LRT ALIGNMENT

SEGMENT E3 - MINNEAPOLIS

CEDAR LAKE PKWY CROSSING

PRELIMINARY ENGINEERING PLAN

COLOR LEGEND			
LRT TRACK AREA		EXISTING SIGNALIZED INTERSECTION	
PEDESTRIAN / SIDEWALK AREA		PROPOSED SIGNALIZED INTERSECTION	
STATION PLATFORM		TRACTION POWER SUBSTATION	
TUNNEL		SYSTEMS BUILDING (DESIGN VARIES)	
ROADWAY		GATE ARM	
TRAIL / BIKEWAY		TOTAL PROPERTY ACQUISITION	
SURFACE PARKING		PARTIAL PROPERTY ACQUISITION	
BRIDGE		RIGHT OF WAY	PROPERTY LINE
RETAINING WALL		TEMPORARY CONSTRUCTION EASEMENT	



SOUTHWEST Green Line LRT Extension

METROPOLITAN COUNCIL

SEPTEMBER 2014

SCALE 0 25 50 100 HORIZONTAL IN FEET

EAST CEDAR BEACH

CONNECTION TO EAST CEDAR BEACH

S UPTON AVE

BEGIN FREIGHT RAIL GUARD RAIL

END FREIGHT RAIL GUARD RAIL

TUNNEL SYSTEMS HOUSES
8'X10'
10'X30'

END FREIGHT RAIL GUARD RAIL

FREIGHT RAIL ON EXISTING ALIGNMENT

21ST STREET STATION

BURNHAM BLVD

BURNHAM RD

THOMAS AVE S

W 21ST ST

BUS STOP

KISS AND RIDE

KENILWORTH TRAIL

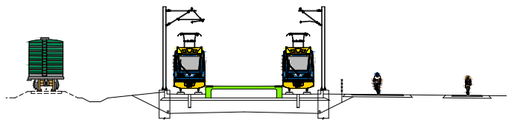
TRACTION POWER SUBSTATION
(TPSS-SW-03)

SHERIDAN AVE S

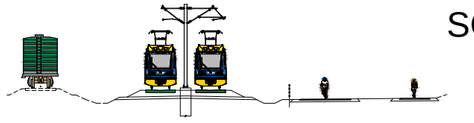
W 24TH ST

W 22ND ST

KENWOOD PKWY



TYPICAL SECTION AT STATION



TYPICAL SECTION AT TRACK

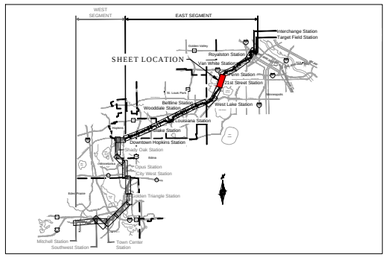
SOUTHWEST LRT ALIGNMENT

SEGMENT E3 - MINNEAPOLIS

21ST ST STATION

PRELIMINARY ENGINEERING PLAN

COLOR LEGEND	
LRT TRACK AREA	EXISTING SIGNALIZED INTERSECTION
PEDESTRIAN / SIDEWALK AREA	PROPOSED SIGNALIZED INTERSECTION
STATION PLATFORM	TRACTION POWER SUBSTATION
TUNNEL	SYSTEMS BUILDING (DESIGN VARIES)
ROADWAY	GATE ARM
TRAIL / BIKEWAY	TOTAL PROPERTY ACQUISITION
SURFACE PARKING	PARTIAL PROPERTY ACQUSITION
BRIDGE	RIGHT OF WAY / PROPERTY LINE
RETAINING WALL	TEMPORARY CONSTRUCTION EASEMENT



SEPTEMBER 2014

SCALE HORIZONTAL 0 25 50 100 IN FEET

CEDAR LAKE RD S
LAUREL AVE W
OLIVER AVE S
NEWTON AVE S
MORGAN AVE S
N 2ND AVE
VAN WHITE MEMORIAL BLVD (FUTURE BRIDGE)
VAN WHITE MEMORIAL BLVD (EXISTING BRIDGE)
VERTICAL CIRCULATION
LUCE LINE TRAIL
VAN WHITE STATION
PLATFORM HOUSE 10'x30'
BUS STOP
KISS AND RIDE
FREIGHT RAIL ON EXISTING ALIGNMENT
EXISTING TRAIL BRIDGE (TO BE REMOVED)
CEDAR LAKE TRAIL
LINDEN AVE W
TH 394
I-394
DUNWOODY BLVD
PLATFORM HOUSE 10'x30'
SIGNAL BUNGALOW 10'x30'
CEDAR LAKE TRAIL
PEDESTRIAN SIGNAGE AND LIGHTNING
TRACTION POWER SUBSTATION (TPSS-SW-02)

TYPICAL SECTION AT TRACK

TYPICAL SECTION AT STATION

SOUTHWEST LRT ALIGNMENT

SEGMENT E4 - MINNEAPOLIS

VAN WHITE STATION

PRELIMINARY ENGINEERING PLAN

COLOR LEGEND

LRT TRACK AREA	EXISTING SIGNALIZED INTERSECTION
PEDESTRIAN / SIDEWALK AREA	PROPOSED SIGNALIZED INTERSECTION
STATION PLATFORM	TRACTION POWER SUBSTATION (GENERAL AREA)
TUNNEL	SIGNAL BUNGALOW (GENERAL AREA)
ROADWAY	GATE ARM
TRAIL / BIKEWAY	TOTAL PROPERTY ACQUISITION
SURFACE PARKING	PARTIAL PROPERTY ACQUISITION
BRIDGE	RIGHT OF WAY / PROPERTY LINE
RETAINING WALL	TEMPORARY CONSTRUCTION EASEMENT

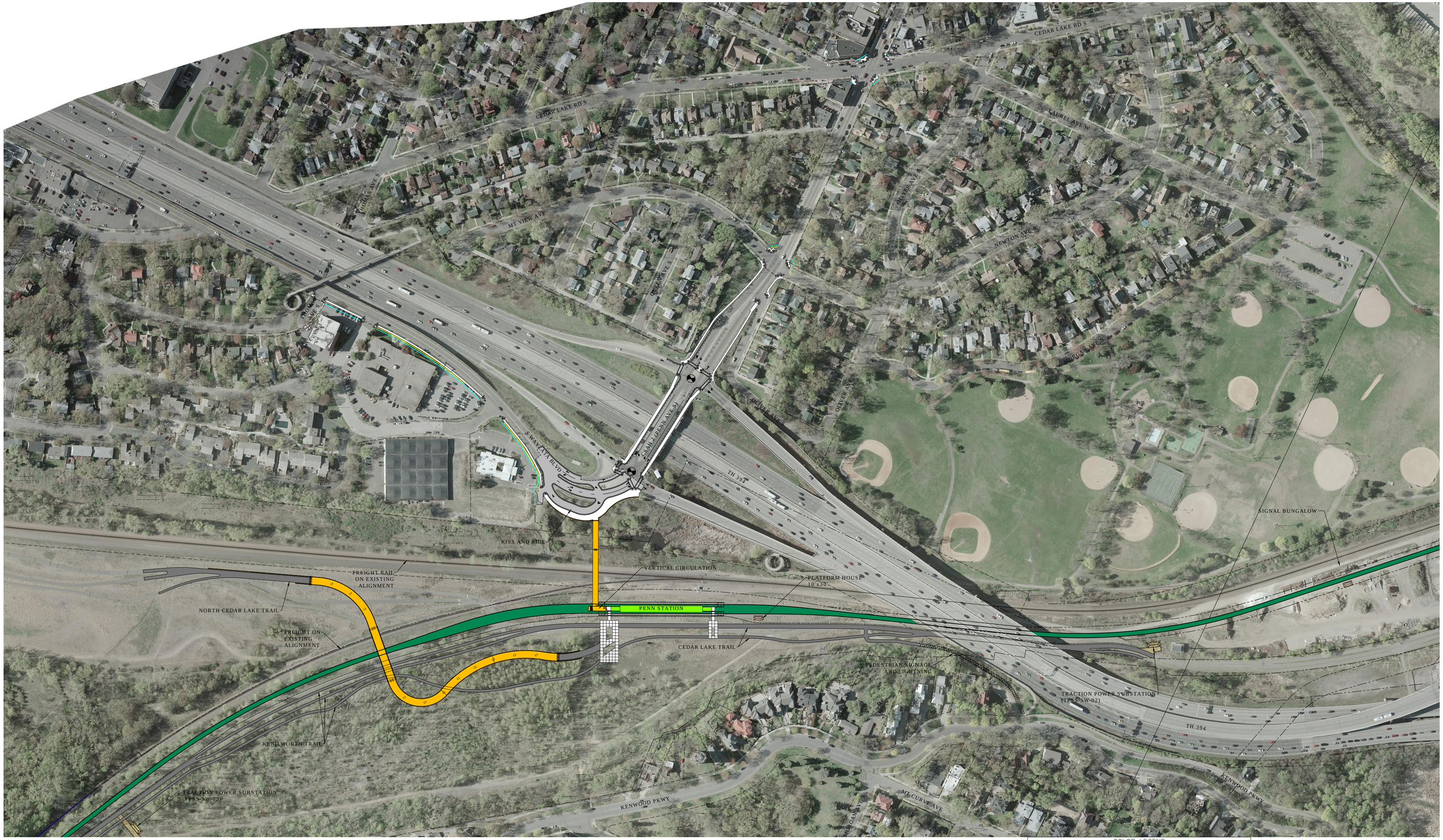
SHEET LOCATION

SEPTEMBER 2014

SCALE 0 25 50 100 HORIZONTAL IN FEET

Southwest LRT Project Current Preliminary Status of Section 4(f) Park Properties within the City of Minneapolis				
Section 4(f) Property	**Section 4(f) Eligibility/Official with Jurisdiction and Potential for Permanent 4(f) Use**	**Potential for Temporary 4(f) Use**	**Addressed in Draft EIS or Draft 4(f) Evaluation?**	**Addressed in SDEIS & Supplemental Draft 4(f) Evaluation**
Alcott Triangle (park)	Publicly-owned, publicly-accessible park (MPRB) • No permanent use • Determination of local significance pending • No long-term proximity impacts	• No temporary use during construction	Yes	Yes[a]
Park Siding Park (park)	Publicly-owned, publicly-accessible park (MPRB) • No permanent use • Long-term proximity impacts	• No temporary use during construction	Yes	Yes[a]
Kenilworth Lagoon (recreation area)	Permanent publicly-owned recreation easement (MPRB/City) • Removal of existing freight rail and trail bridge • Construction of two new bridges over the lagoon, piers within the lagoon, new abutments, work along banks within the easement, etc. • Section 4(f) use to be determined	• No temporary use during construction outside of the area of permanent improvements	No	Yes
Lake of the Isles Park (park)	Publicly-owned, publicly-accessible park (MPRB) • No permanent use • Long-term proximity impacts	• No temporary use during construction	Yes	Yes[a]
Cedar Lake Park (park)	Publicly-owned, publicly-accessible park (MPRB) • Section 4(f) use to be determined (at East Cedar Beach and at North Cedar Lake Trail)	• Temporary use during construction for trail reconstruction at East Cedar Beach and in the NE corner of the park to allow for the grade separation of the North Cedar Lake Trail over the existing freight rail and proposed light rail alignment	Yes	Yes
Bryn Mawr Meadows (park)	Publicly-owned, publicly-accessible park (MPRB) • Section 4(f) use to be determined	• Temporary use during construction	Yes	Yes

[a] To be addressed briefly, noting that proximity impacts would not substantially impair the activities, features and attributes of the property.



TYPICAL SECTION AT TRACK

TYPICAL SECTION AT STATION

SOUTHWEST LRT ALIGNMENT

SEGMENT E4 - MINNEAPOLIS

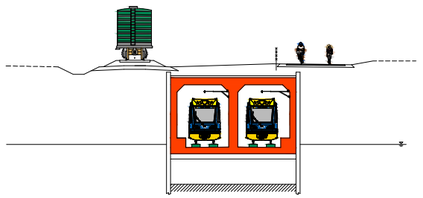
PENN STATION

PRELIMINARY ENGINEERING PLAN

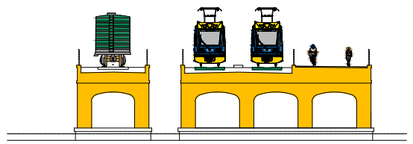
COLOR LEGEND	
LRT TRACK AREA	EXISTING SIGNALIZED INTERSECTION
PEDESTRIAN / SIDEWALK AREA	PROPOSED SIGNALIZED INTERSECTION
STATION PLATFORM	TRACTION POWER SUBSTATION (GENERAL AREA)
TUNNEL	SIGNAL BUNGALOW (GENERAL AREA)
ROADWAY	GATE ARM
TRAIL / BIKEWAY	TOTAL PROPERTY ACQUISITION
SURFACE PARKING	PARTIAL PROPERTY ACQUISITION
BRIDGE	RIGHT OF WAY / PROPERTY LINE
RETAINING WALL	TEMPORARY CONSTRUCTION EASEMENT

SEPTEMBER 2014

SCALE 0 25 50 100 HORIZONTAL IN FEET



TYPICAL SECTION AT TUNNEL



TYPICAL SECTION AT BRIDGE

SOUTHWEST LRT ALIGNMENT

SEGMENT E3 - MINNEAPOLIS

CEDAR LAKE PKWY CROSSING

PRELIMINARY ENGINEERING PLAN

COLOR LEGEND	
LRT TRACK AREA	EXISTING SIGNALIZED INTERSECTION
PEDESTRIAN / SIDEWALK AREA	PROPOSED SIGNALIZED INTERSECTION
STATION PLATFORM	TRACTION POWER SUBSTATION
TUNNEL	SYSTEMS BUILDING (DESIGN VARIES)
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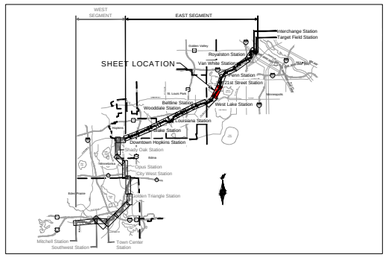


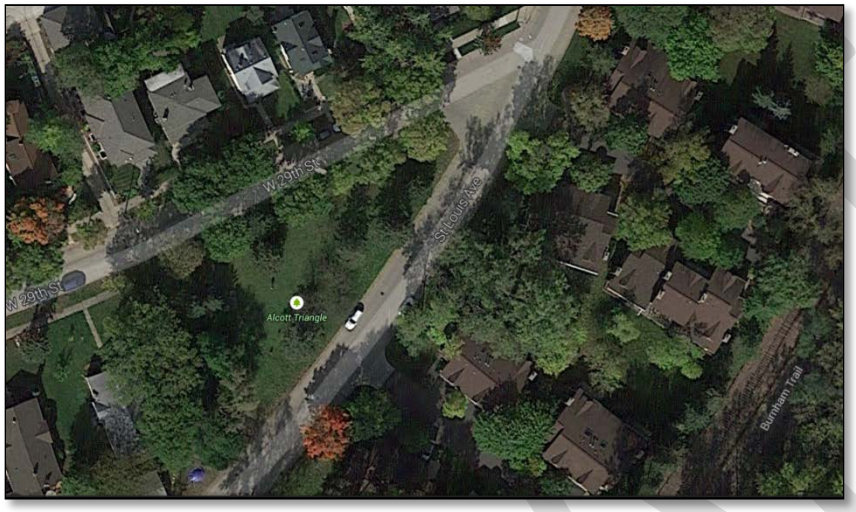
SEPTEMBER 2014

SCALE 0 25 50 100 HORIZONTAL IN FEET

Southwest Light Rail Transit Project
Parks in Minneapolis with Potential Proximity Impacts

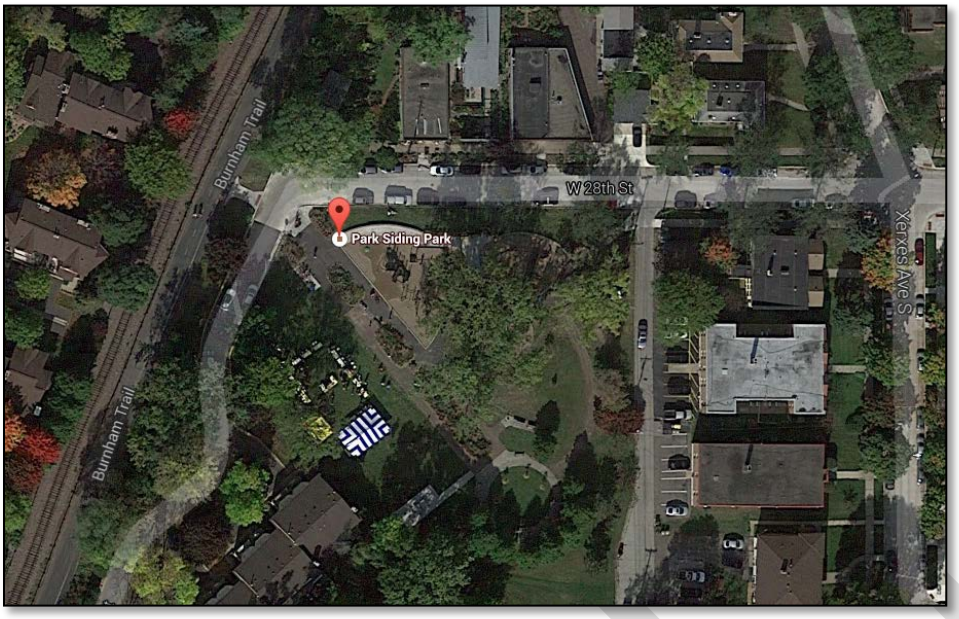
- For SWLRT, *Proximity Impacts* to parks and recreation areas = effects on visual, noise, access
- If proximity impacts would *substantially impair* the activities, features and attributes of the 4(f) property, there would be a *Constructive Use* of the property (23 CFR 774.15)

a. Alcott Triangle



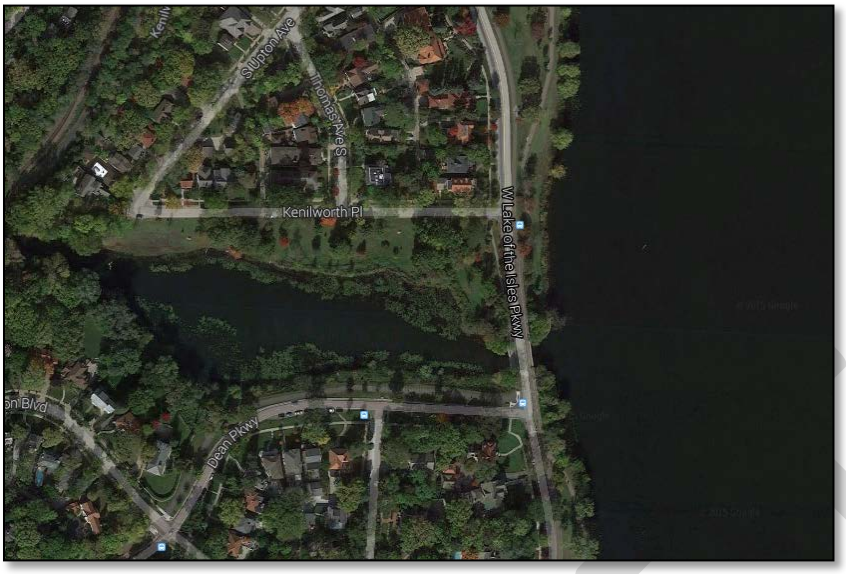
1. Within the parks and recreation study area
2. Owned by MPRB, publically- accessible
3. Does MPRB consider the Alcott Triangle to be a locally-significant park/recreation area?
4. DEIS: Identified as “open space” – no proximity impacts identified
5. Draft SDEIS: there would be no proximity impacts, due to its distance from the proposed light rail alignment (approximately 300-350 feet)

b. Park Siding Park



1. Within the parks and recreation study area
2. Owned by MPRB, publically-accessible, locally-significant
3. Identified in the DEIS as “open space”
    i. Identified 0.016-acre temporary occupancy during construction for a trail detour (LRT 3A and LRT 3A-1)
4. Draft SDEIS:
    i. No permanent use or temporary occupancy required
    ii. Proximity impacts would include increased noise, change in the visual environment and change in access, due to its close proximity to the proposed light rail alignment
    iii. Proximity impacts would not substantially impair the activities, features and attributes of the park

c. Lake of the Isles Park



1. Within the parks and recreation study area
2. Includes the Kenilworth Lagoon, east of the HCRRA ROW
3. Owned by MPRB, publically-accessible, locally-significant
4. Identified in the DEIS as a park with numerous recreational activities, features and attributes
    i. LRT 3A: no permanent or temporary use of the park
    ii. LRT 3A-1: 0.01-acre of permanent use and temporary use undetermined
5. Draft SDEIS LPA:
    i. No permanent use or temporary occupancy required
    ii. Proximity impacts to the western portion of the lagoon would include increased noise, change in the visual environment and change in access, due to its close proximity to the proposed light rail alignment
    iii. Proximity impacts would not substantially impair the activities, features and attributes of the park

Meeting Title: Section 4(f) Coordination – Parks within the City of Eden Prairie

Date: 02/20/2015 **Time:** 2:30 p.m. **Duration:** 30 Minutes

Location: SPO Conf. Rm. A
Call in #: 1 (646) 749-3122; Access Code: 342-433-709
GoToMeeting: https://global.gotomeeting.com/join/342433709

Meeting called by: Nani Jacobson, Assistant Director, Environmental & Agreements

Invitees: City of Eden Prairie: Robert Ellis, Randy Newton, Jay Lotthammer
FTA (phone): Maya Sarna, Amy Zaref
SPO: Jim Alexander, Ryan Kronzer, Kim Proia, Jeanne Witzig, Leon Skiles (phone), Michael Hoffman (phone)

Purpose of Meeting: Discuss 4(f) properties under jurisdiction of the City of Eden Prairie and the 4(f) process and analysis.

Agenda	
9:00 – 9:05 am	1. Welcome and Introductions
9:05 – 9:10 am	2. Overview of Section 4(f) Requirements (handout)
9:10 – 9:25 am	3. Purgatory Creek Park – Preliminary Temporary Occupancy Determination a. City of Eden Prairie's Status as a Section 4(f) Official With Jurisdiction b. Section 4(f) Temporary Occupancy Criteria c. Description of Area, Duration and Type of Construction Activities within the Park d. Avoidance, Mimimization and Mitigation Measures to Address the Construciton Activities within the Park e. Written Concurrence from the City that the Construciton Activities within the Park Meet the Section 4(f) Tempoary Occupancy Criteria
9:25 – 9:30 am	4. Next Steps a. 4(f) Determination and Documentation b. Discusion of Potential Mitigation of Permanent Proximity Impacts to Purgatory Creek Park (i.e., visual, noise, access)

DISCUSSION:

ACTION ITEMS:	PERSON RESPONSIBLE:	DEADLINE:

Meeting Title: Section 4(f) Coordination – Parks within the City of Eden Prairie – MEETING NOTES

Date: 02/20/2015 **Time:** 2:30 p.m. **Duration:** 1 hour

Location: SPO Conf. Rm. A
Call in #: 1 (646) 749-3122; Access Code: 342-433-709
GoToMeeting: https://global.gotomeeting.com/join/342433709

Meeting called by: Nani Jacobson, Assistant Director, Environmental & Agreements

Attendees: City of Eden Prairie: Robert Ellis, Randy Newton, Jay Lotthammer, Rod Rue, Stu Fox
FTA (phone): Maya Sarna
SPO: Ryan Kronzer, Rachel Haase, Leon Skiles (phone), Don Demers, Mark Bishop, Dan Pfeiffer, Nani Jacobson

Purpose of Meeting: Discuss 4(f) properties under jurisdiction of the City of Eden Prairie and the 4(f) process and analysis.

Agenda	
2:00 – 2:05 pm	1. Welcome and Introductions
2:05 – 2:10 pm	2. Overview of Section 4(f) Requirements (handout)
2:10 – 2:25 pm	3. Purgatory Creek Park – Preliminary Temporary Occupancy Determination a. City of Eden Prairie's Status as a Section 4(f) Official With Jurisdiction b. Section 4(f) Temporary Occupancy Criteria c. Description of Area, Duration and Type of Construction Activities within the Park d. Avoidance, Minimization and Mitigation Measures to Address the Construction Activities within the Park e. Written Concurrence from the City that the Construction Activities within the Park Meet the Section 4(f) Temporary Occupancy Criteria
2:25 – 2:30 pm	4. Next Steps a. 4(f) Determination and Documentation b. Discussion of Potential Mitigation of Permanent Proximity Impacts to Purgatory Creek Park (i.e., visual, noise, access)

DISCUSSION:

1. Welcome and Introductions

2. Overview of Section 4(f) Requirements
    a. Refer to handout "Section 4(f) of the Department of Transportation Act Overview" for Section 4(f) definitions
        i. Use – *de minimis* and non-*de minimis*
        ii. Temporary occupancy
        iii. Constructive use
    b. There are two parts of 4(f) process – parks/rec and historic sites
        i. We're only focusing on parks/rec today

3. Overview of Section 4(f) Requirements
    a. Description of Area, Duration, and Type of Construction Activities within the Park
        i. The project would have no permanent improvements or easements within the park. There would be a new elevated LRT alignment along the NE park boundary parallel to Prairie Center Drive – the LRT alignment would be within street right-of-way that contains a sidewalk/path and landscaping.
        ii. The Project needs a staging area during construction that would be within the park property, as illustrated in the handout map.
            1. Used for cranes, materials storage
            2. May be some impacts to sewer and water infrastructure during construction of bridge foundation, but those impacts will be defined later during final design and when existing utilities are finally located
        iii. Bridge construction would take 1 ½ to 2 construction seasons (duration for the temporary use of land for the staging area)
            1. Exact timing of other Project construction work (track, etc.) might lag behind the bridge, the details aren't known yet and will be determined during future design
        iv. There is existing sidewalk/trail directly beneath the bridge and outside of the park that would remain in public road right-of-way – the trail would be maintained during construction or a detour will be provided.
        v. No permanent part of the Project would be constructed on park property
        vi. Some closures of the access to the park from Prairie Center Drive are expected
            1. The access road off of Technology Drive would not be impacted by the Project and would remain open during construction
        vii. The existing park roadway is located 25-30 feet from the edge of the proposed LRT bridge
        viii. The outer edge of the hatched area indicating where the temporary occupancy would occur within the park is 40-50 feet from the existing road right-of-way. Refer to handout "Purgatory Creek Park Temporary Occupancy Impacts"

ix. An alternate route for pedestrian access between the sidewalk/path along Prairie Center Drive into the park would be designated if needed to maintain access
x. City of Eden Prairie (City) would prefer if the access road from Prairie Center Drive/Flagship Office Building parking remained open as much as possible during construction (currently included in hatched area on handout)
    1. SPO noted that the driveway access off of Prairie Center Drive may need to be closed for short periods at off-peak times for placement of piers
xi. The City noted that there may need to be adjustments in the location of existing message signs and other items in the park due to the location of bridge piers
    1. SPO noted that the new LRT bridge (in particular, its piers) may impact how the design of the existing pedestrian entrance to the park (i.e., the existing sidewalk/path connection from the park to the sidewalk/path at the intersection of Technology Drive and Prairie Center Drive). There may be a desire to permanently re-designed that connect once the precise pier size, location and design is know; this issue will be addressed in advanced design
xii. SPO staff noted that the use of the park during construction would be temporary, and that the construction use in the park (about two construction seasons) would be shorter than the duration of construction for the project (up to about four years) – which would meet FTA's criteria for a temporary occupancy under Section 4(f).

b. Avoidance, Minimization, and Mitigation Measures to Address the Construction Activities within the Park
    i. Minimizing impacts inside park property is important for Section 4(f)
    ii. When construction is complete, any construction related impacts, as illustrated in the handout (hatched area) would be reconstructed to existing conditions or better (e.g., replacing trees in kind if any are removed, replacing sidewalk if torn up for utilities) in consultation with the City.
        1. The City staff noted that when restoration happens, the City wants to make sure it is coordinated with whatever the new circulation or design plan is (this fits with the requirement to replace to existing conditions *or better*)
        2. SPO staff noted that advanced design meetings will be held between SPO and the City to discuss restoration of the park
    iii. The City noted that it wants to maintain as much access as possible during construction
    iv. Facilities in roadway/street right-of-way outside what is officially park property are not addressed in the Section 4(f) Evaluation, however, these areas would be addressed during the advanced design process
    v. The City noted that it wants to be able to tell people what they can likely expect as to construction within the park when they visit the park, as the park is a highly used area that is booked up to about a year in advance
        1. Events include weddings, 5ks, daytime concerts for kids
        2. Lots of daily walkers, mainly on the south end of the lake but start in parking lot
        3. Large weekend events use the Flagship Office Building parking lot (via driveway from Prairie Center Drive)
    vi. The SPO staff noted that the Project will obtain construction permits, which restrict hours

of operation, and will have a construction plan so the City knows when anticipated activities will occur

vii. **Action: SPO will create a revised figure with area of impact split into two – one shows area of closures for duration of bridge construction, one shows area with intermittent or short-term closures to maintain the south access**

viii. SPO staff noted that mitigation measures will include a public communication plan and signage regarding access closures (e.g., closure of a portion of the park parking lot)

ix. SPO staff noted that the Project will be sensitive to any special events as construction activities are scheduled and will coordinate construction activities with the City so they aren't adversely impacted (e.g., Memorial Day event)

x. There will be regular coordination between the Project and the City on construction activities and communication to the public

xi. Mitigation for impacts to facilities in roadway/street right-of-way (beyond the footprint of the temporary occupancy area and outside of park property) will be addressed in the parks section of the NEPA documents (not in the 4(f) process)

1. The NEPA process, and specifically the Supplemental Draft Environmental Impact Statement (SDEIS) will include an assessment of park impacts (e.g., visual, noise) – the City can comment on these other impacts and related proposed mitigation when the SDEIS is published
2. Mitigation commitments will be made in the Final EIS and Record of Decision

c. Section 4(f) Temporary Occupancy Criteria

i. The following criteria must be met for an impact to be considered a temporary occupancy (Refer to handout "Section 4(f) of the Department of Transportation Act Overview" which has as its source 23 CFR Part 774]:

1. Duration must be temporary
2. Scope of work must be minor
3. No anticipated permanent adverse physical impacts, nor will it interfere with protected activities, features, or attributes of the property
4. The land used must be fully restored
5. The official(s) with jurisdiction provides documented agreement

ii. If the City does not agree the impact is a temporary occupancy, the avoidance alternative would be closing one or both southbound lanes on Prairie Center Drive to use as a staging area

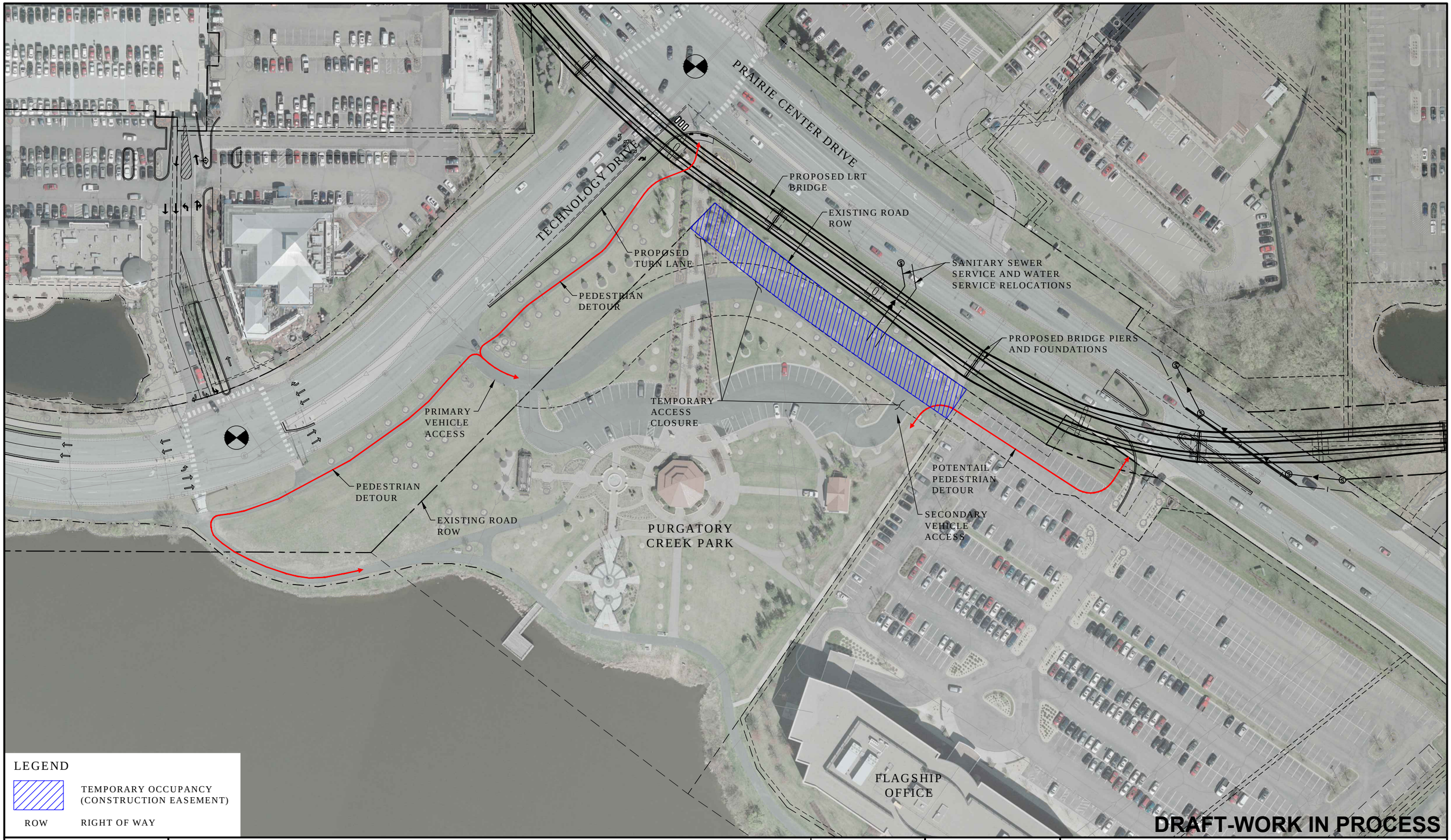
d. Written Concurrence from the City that the Construction Activities within the Park meet the Section 4(f) Temporary Occupancy Criteria

i. Action: SPO staff noted that the Project will send a letter to the City in the coming weeks asking for concurrence with the temporary occupancy determination and the City would respond

1. The revised figure will be sent as an attachment to the letter
2. The letter will lay out the anticipated activities in the park, the estimated duration, the criteria for a temporary occupancy, and construction mitigation measures

ii. The temporary occupancy determination will be an iterative process to make sure everyone is in agreement

ACTION ITEMS:	PERSON RESPONSIBLE:	DEADLINE:
1. Create a revised figure with area of impact split into two – one shows areas of closures for duration of bridge construction, one shows area with intermittent or short-term closures to maintain the south access	SPO	To be sent with determination request letter to the City
2. Send determination request letter to the City	SPO	TBD



SOUTHWEST LIGHT RAIL

PURGATORY CREEK PARK
TEMPORARY OCCUPANCY IMPACTS

IRT: #1

REV: 0

DATE : 09/03/2014

NORTH

0 25 50 100

SOUTHWEST Green Line LRT Extention

METROPOLITAN COUNCIL

AECOM

SRF Consulting Group, Inc.

Sep, 15 2014 08:31 am H:\Projects\7984\3200_PEC-WI\CAD\SEGMENT-WI\EXHIBITS\CIVIL\EXHB-CIV-PURGATORY CREEK-ROW.dwg By: abosch

Section 4(f) of the Department of Transportation Act Overview

1. What is Section 4(f)?

- Section 4(f) refers to the original section within the U.S. Department of Transportation Act of 1966 which established the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development.

2. What are Section 4(f) properties?

- Section 4(f) properties include publicly owned public parks, recreation areas, and wildlife or waterfowl refuges, or any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.

3. What does Section 4(f) require?

- Before approving a project that uses Section 4(f) property, FTA must either (1) determine that the impacts are de minimis (see discussion below), or (2) undertake a Section 4(f) Evaluation. If the Section 4(f) Evaluation identifies a feasible and prudent alternative that completely avoids Section 4(f) properties, it must be selected. If there is no feasible and prudent alternative that avoids all Section 4(f) properties, FFTA has some discretion in selecting the alternative that causes the least overall harm (see discussion below). FTA must also find that all possible planning to minimize harm to the Section 4(f) property has occurred.

4. What is a Section 4(f) *Use*?

- The permanent incorporation of any portion of a 4(f) property into a project through the fee simple acquisition of the property or acquiring a property right that allows permanent access to the property (e.g., easement)
- Temporary occupancy of land that is adverse in terms of the statute's preservation purpose
- When there is a constructive use (a project's proximity impacts are so severe that the protected activities, features, or attributes of a property are substantially impaired)
- Note: The regulation lists various exceptions and limitations applicable to this general definition

5. What is a *de minimis* impact?

For publicly owned public parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact is one that will not adversely affect the activities, features, or attributes of the property. For historic sites, a *de minimis* impact means that FHWA has determined (in accordance with 36 CFR Part 800) that either no historic property is affected by the project or that the project will have "no adverse effect" on the historic property. A *de minimis* impact determination does not require analysis to determine if avoidance alternatives are feasible and prudent, but consideration of avoidance, minimization, mitigation or enhancement measures should occur. There are certain minimum coordination steps that are also necessary.

6. What is a Constructive Use?

- Occurs when the transportation project involves no physical use of the from a Section 4(f) property via permanent incorporation of land or a temporary occupancy of land into a transportation facility. A constructive use occurs when:
  - The project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired
  - The value of the resource, in terms of its Section 4(f) purpose and significance will be meaningfully reduced or lost
- The types of impacts that may qualify as constructive use, such as increased noise level that would substantially interfere with the use of a noise sensitive feature such as an outdoor amphitheater are addressed in the Section 4(f) regulations
- A project's proximity to a Section 4(f) property is not in itself an impact that results in constructive use.
- The assessment for constructive use should be based upon the impact that is directly attributable to the project under review, not the overall combined impacts to a Section 4(f) property from multiple sources over time

7. What is a Temporary Occupancy?

- Temporary occupancies of land that are so minimal as to not constitute a use under 4(f). These must meet:
  - Duration must be temporary, i.e. less that the time needed for construction of the project and no change in ownership of the land
  - Scope of work must be minor, i.e. both the nature and magnitude of the changes to the 4(f) property are minimal
  - No anticipated permanent adverse physical impacts, nor will it interfere with protected activities, features or attributes of the property
  - The land being used must be fully restored (returned to a condition which is at least as good as that which existed prior to the project
  - Documented agreement with the official(s) with jurisdiction

8. What is an Official with Jurisdiction?

- Parks: Officials with the agency/ies that own or administer the 4(f) property
- Historic sites: SHPO

9. How are Section 4(f) and Section 106 related?

- Section 106 process determines the eligibility of historic/archaeological resources for potential 4(f) protection
- A key difference is Section 106 is essentially a consultative procedural requirement, while Section 4(f) precludes project approval if the specific findings cannot be made

10. What is a *Feasible and Prudent Avoidance Alternative?*

- Completely avoids the permanent use of a 4(f) property
- Feasibility: Can be built as a matter of sound engineering
- Prudence: No severe problems that outweigh protecting the 4(f) property, considering:
  - Meeting Purpose/Need
  - Safety
  - Severe impacts (after mitigation)
  - Extraordinary costs
  - Unique problems/factors
  - Cumulative impact of multiple factors

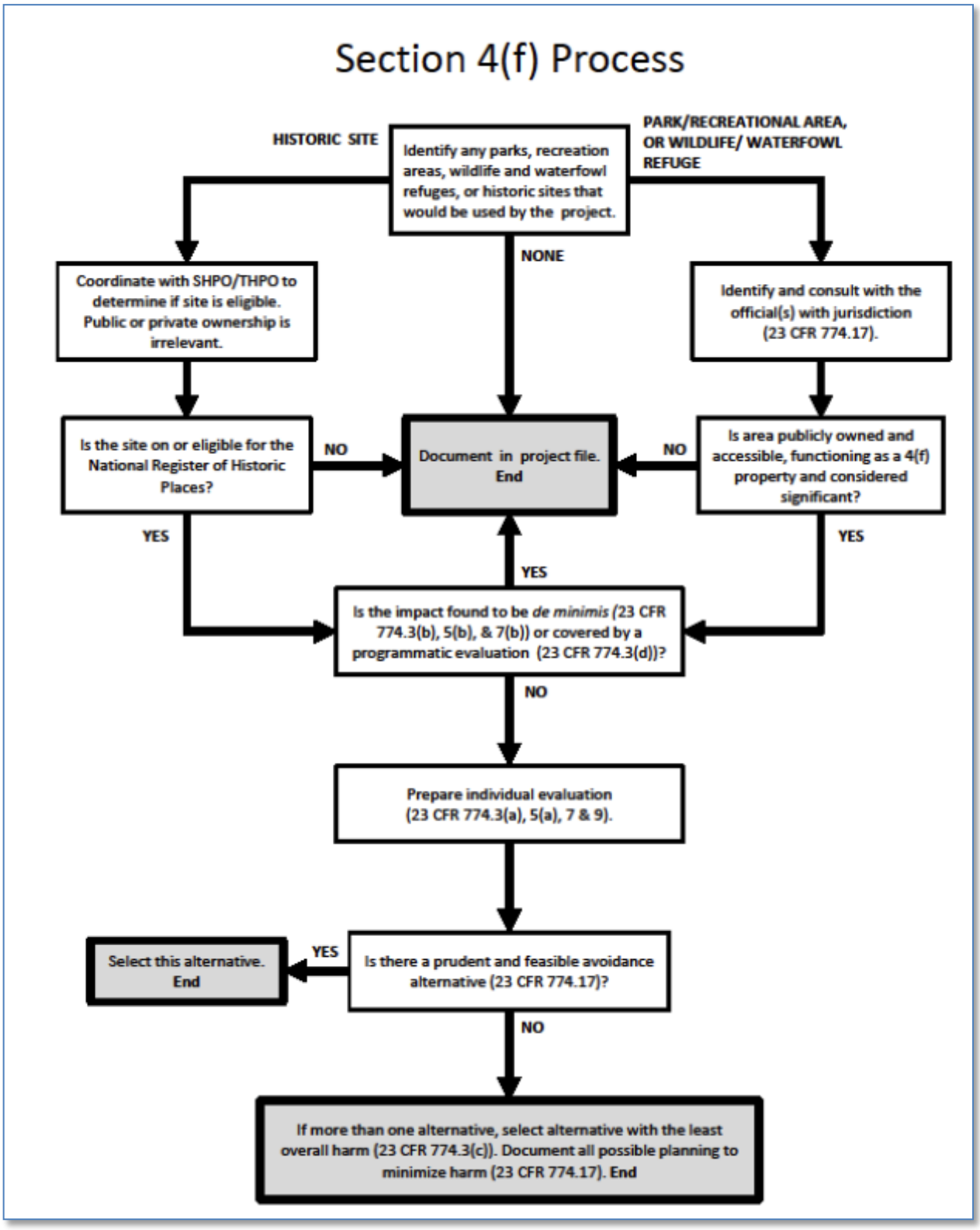
11. What happens if the LPA *uses* a protected property?

- FTA completes a Section 4(f) Evaluation (draft and final), including three required determinations:
  - There is ***No Prudent/Feasible Avoidance Alternative***
  - ***All Possible Planning to Minimize Harm*** has occurred (includes all reasonable mitigation measures)
  - LPA must have ***Least Overall Harm*** compared to other alternatives that have a 4(f) use

12. What is a Least Overall Harm Analysis?

- When there is no feasible and prudent avoidance alternative, the comparison of the LPA with other alternatives under consideration that would have a use of any 4(f) property
- Comparative criteria used to reach the determination:
  - Relative value of and impacts to 4(f) properties, after similar mitigation efforts – criteria:
    - Ability to mitigate adverse impacts to each 4(f) property
    - Relative severity of harm to protected characteristics of the 4(f) properties (after mitigation)
    - Relative significance of the 4(f) properties
    - Views of officials with jurisdiction over the 4(f) properties
  - Consideration of substantial problem/s – criteria:
    - Degree to which the alternative meets P&N
    - Magnitude of adverse impacts to non-4(f) resources (after mitigation)
    - Substantial cost differences
- Only the alternative/s with the Least Overall Harm may be approved by FTA

Sources: 23 USC 138; 49 USC 303; 23 CFR Part 774; *Section 4(f) Policy Paper* (USDOT: July 20, 2012)



Source: *Section 4(f) Policy Paper* (p. 62; USDOT: July 20, 2012)

Meeting Title: Section 4(f) Coordination – MnSHPO

Date: 03/02/2015 **Time:** 9:30 a.m. **Duration:** 1 hour

Location: MnDOT; 395 John Ireland Blvd., St. Paul, MN; Conference Room 702
Call in #: 1-888-742-5095; code: 943-510-1712#

Meeting called by: Nani Jacobson, Assistant Director, Environmental & Agreements

Invitees: SHPO: Sarah Beimers
FTA (phone): Maya Sarna, Amy Zaref
SPO: Greg Mathis, Mark Bishop, Jeanne Witzig, Leon Skiles (phone), Rachel Haase, Jessica Laabs
Hennepin County: Nelrae Succio, Kim Zlimen

Purpose of Meeting: Discuss 4(f) properties under jurisdiction of the MnSHPO, 4(f) process and analysis.

Agenda	
9:30 – 9:35 am	1. Welcome and Introductions
9:35 – 9:40 am	2. Overview of Section 4(f) Requirements (handout)
9:40 – 9:45 am	3. MnSHPO Status as Section 4(f) Official with Jurisdiction
9:45 – 9:50 am	4. Preliminary *de minimis* Determination for the MStP&M/Great Northern Railway Historic District (handout) a. Determination of district's boundary at Cedar Lake Junction b. Notice that a 106 "no adverse effect" finding will be used by FTA to reach a 4(f) de minimis determination c. Schedule and documentation for final finding of effect
9:50 – 9:55 am	5. Preliminary Temporary Occupancy Determination for Cedar Lake Parkway a. FTA criteria for a temporary occupancy b. MnSHPO written concurrence that the criteria would be met for Cedar Lake Parkway
9:55 – 10:10 am	6. Section 4(f) non-*de minimis* Use of Grand Rounds Historic District/Kenilworth Lagoon a. Section 106 Agreement minimization/mitigation measures = 4(f) All Possible Planning to Minimize Harm b. Coordination on Preliminary Least Overall Harm Analysis c. Schedule and documentation for final finding of effect and draft/final Section 106 Agreement
10:20 – 10:25 am	7. Archaeological Sites (handout) a. Sites used by LPA with a preliminary Section 106 Adverse Effect (in the vicinity of the Royalston Station):

	i. Site 21HE0436 ii. Site 21HE0437 b. SHPO concurrence mitigation (i.e., completion and implementation of Phase III Data Recovery Plan; and incorporation of interpretation into the design of the Royalston Station) c. Exempt from Section 4(f)
10:25 – 10:30 am	8. Next Steps a. Continued consultation and documentation as needed

DISCUSSION:

ACTION ITEMS:	PERSON RESPONSIBLE:	DEADLINE:

SIGN-IN SHEET

SOUTHWEST Green Line LRT Extension

SWLRT Section 4(f) Officials With Jurisdiction Coordination Meeting – MnSHPO
March 2, 2015 9:30 – 1030 am MNDOT

Name	Organization	Email	Phone
Sarah Beimers	MnSHPO	sarah.beimers@mnhs.org	651 259-3456
GREG MATHIS	MnDOT	greg.mathis@state.mn.us	651-366-4292
Kim Zlimen	Hennepin County	Kimberly.zlimen@hennepin.us	612-396-7618
Jessica Laabs	Kimley-Horn	jessica.laabs@kimley-horn.com	651-643-0437
Nani Jacobson	SPO		
Leon Skiles - phone	SPO		
Amy Zaug - phone			
Maya Sarna - phone			

Meeting Title: Section 4(f) Coordination – MnSHPO

Date: 03/02/2015 **Time:** 9:30 a.m. **Duration:** 1 hour

Location: MnDOT; 395 John Ireland Blvd., St. Paul, MN; Conference Room 702
Call in #: 1-888-742-5095; code: 943-510-1712#

Meeting called by: Nani Jacobson, Assistant Director, Environmental & Agreements

Attendees: SHPO: Sarah Beimers
FTA (phone): Maya Sarna, Amy Zaref
SPO: Greg Mathis, Jessica Laabs

Purpose of Meeting: Discuss Section 4(f) properties under jurisdiction of the MnSHPO, Section 4(f) process and analysis.

Agenda	
9:30 – 9:35 am	1. Welcome and Introductions
9:35 – 9:40 am	2. Overview of Section 4(f) Requirements (handout)
9:40 – 9:45 am	3. MnSHPO Status as Section 4(f) Official with Jurisdiction
9:45 – 9:50 am	4. Preliminary *de minimis* Determination for the StPM&M/GN Rwy Historic District a. Determination of district's boundary at Cedar Lake Junction b. Notice that a Section 106 "no adverse effect" finding will be used by FTA to reach a Section 4(f) de minimis determination c. Schedule and documentation for final finding of effect
9:50 – 9:55 am	5. Preliminary Temporary Occupancy Determination for Cedar Lake Parkway a. FTA criteria for a temporary occupancy b. MnSHPO written concurrence that the criteria would be met for Cedar Lake Parkway
9:55 – 10:10 am	6. Section 4(f) non-*de minimis* Use of Grand Rounds Historic District/Kenilworth Lagoon a. Section 106 Agreement minimization/mitigation measures = Section 4(f) All Possible Planning to Minimize Harm b. Coordination on Preliminary Least Overall Harm Analysis c. Schedule and documentation for final finding of effect and draft/final Section 106 Agreement
10:20 – 10:25 am	7. Archaeological Sites a. Sites used by LPA with a preliminary Section 106 Adverse Effect (in the vicinity of the Royalston Station): a. Site 21HE0436 b. Site 21HE0437 b. SHPO concurrence mitigation (i.e., completion and implementation of Phase III

	Data Recovery Plan; and incorporation of interpretation into the design of the Royalston Station) c. Exempt from Section 4(f)
10:25 – 10:30 am	8. Next Steps a. Continued consultation and documentation as needed

DISCUSSION:

1. Welcome and Introductions

2. Overview of Section 4(f) Requirements
   a. Refer to handout titled "Section 4f of the Department of Transportation Act Overview"
   b. Section 4(f) is a DOT law that prohibits transportation projects from using a qualifying park/recreation area, historic site, or wildlife/waterfowl refuge unless there is no prudent and feasible avoidance alternative or the use would be *de minimis*
   c. The Section 4(f) evaluation in the Draft EIS identified all Section 4(f) properties that would be impacted by the project
   d. The list of impacted properties has been updated based on advances in design – able to avoid some properties, some information was corrected, and some new Section 4(f) properties that could be impacted were identified
   e. "Use" is permanent incorporation of any portion of a Section 4(f) property into a project through the fee simple acquisition of the property or acquiring a property right that allows permanent access to the property (e.g., easement)
   f. See handout for other definitions of impacts under Section 4(f) including:
      i. Constructive use
      ii. *De minimis* impact
      iii. Temporary occupancy
   g. Eligibility requirements for a Section 4(f) park/recreation area include:
      i. Primary purpose of the property is recreation
      ii. Property is publically owned, publically accessible, and of local significance
   h. Who is the Official with Jurisdiction (OWJ) for Section 4(f) properties?
      i. Parks: the agency/agencies that own or administer the Section 4(f) property
      ii. Historic sites: State Historic Preservation Office (SHPO)
   i. How are Section 4(f) and Section 106 related?
      i. The Section 106 process determines the eligibility of historic/archaeological resources for potential Section 4(f) protection and the level of Section 4(f) use

3. MnSHPO Status as Section 4(f) Official with Jurisdiction
   a. SHPO is the OWJ for historic sites in the context of Section 4(f)
   b. Sarah's knowledge has been mostly on FHWA projects; not much involvement with FTA projects

c. If historic property does not have an adverse effect under Section 106, it is considered under Section 4(f) as *de minimis* - requires concurrence from official with jurisdiction; could also be a *de minimis* after incorporating minimization and mitigation

d. If the effect remains adverse, it stays a use and must go through a process of preparing an individual evaluation including analysis for prudent and feasible avoidance alternative(s) and select alternative(s) with least overall harm

4. Preliminary *de minimis* Determination for the StPM&M/GN Rwy Railway Historic District

a. *Refer to handout titled "–Southwest LRT SDEIS – Architecture/History Area of Potential Effect and Resources – St. Louis Park/Minnepolis Segment, March 2, 2015 – Draft Work in Process"*

b. Resource extends for large distance east and west – resource identified as the freight track

c. Sarah asked what are the boundaries of the historic resource at Cedar Lake Junction?

   i. Greg confirmed that the whole BNSF mainline to the Minnesota-North Dakota border has been determined eligible. The Project's Section 106 survey documentation focused on the area within the APE and it did not describe in detail the boundary of the resource; it does, however, say that the resource's boundary generally includes the historic right-of-way for the railway. SPO is developing a map of the boundaries for the resource within the Project's right-of-way that is based on the railway's right-of-way.

d. SPO will need to acquire small amounts of property rights within the right-of-way boundary that would be within the historic boundary – this is the Section 4(f) use

e. To move forward with *de minimis* impact determination, SHPO would need to concur with FTA's no adverse effect determination

f. Steps in the Section 4(f) process

   i. publish as a preliminary *de minimis* finding and go through public process; document the Section 106 process with understanding that FTA will make a final finding

   ii. Section 4(f) will use the determination of effect under Section 106 – this would occur before a final Section 4(f) determination

   iii. Section 4(f) doesn't add anything to the process for the Section 106 property other than the notice from FTA to the SHPO that FTA will use outcome of Section 106 process to reach Section 4(f) determination

g. SDEIS will include Section 106 preliminary effects tables and FTA will make preliminary Section 4(f) determination

h. No official correspondence from SHPO needed at this time. Before publication of FEIS, the *de minimis* finding will be finalized in the FEIS and SHPO will have to concur in writing –concurrence on final determination of effects will also be requested sometime between Supplemental Draft (SDEIS) and Final EIS (FEIS)

i. Sarah agreed with the process outlined for this property, including inclusion in Section 4(f) in the SDEIS as a preliminary *de minimis* determination

5. Preliminary Temporary Occupancy Determination for Cedar Lake Parkway

a. *Refer to handout titled "–Southwest LRT SDEIS – Architecture/History Area of Potential Effect and Resources – St. Louis Park/Minnepolis Segment, March 2, 2015 – Draft Work in Process"*

b. There would be temporary construction within the boundary of Cedar Lake Parkway (address through temporary occupancy determination)

c. There would not be a permanent incorporation of the resource into the Project

d. There are 5 criteria for temporary use – duration of occupancy shorter than construction schedule; long-term effects are minor; resource restored to it's original condition; effects during construction are not adverse; written concurrence from official with jurisdiction (*Refer to handout titled "Section 4f of the Department of Transportation Act Overview")*

e. Sarah expressed preference to reference this property as Grand Rounds Historic District/ Cedar Lake Parkway (attributed to Grand Rounds Historic District)

f. Documentation would be same path as *de minimis*

g. Sarah agreed with the process outlined for this property, including inclusion in Section 4(f) in the SDEIS as a preliminary Temporary Occupancy determination

6. Section 4(f) non-*de minimis* Use of Grand Rounds Historic District/Kenilworth Lagoon

a. *Refer to handout titled "–Southwest LRT SDEIS – Architecture/History Area of Potential Effect and Resources – St. Louis Park/Minnepolis Segment, March 2, 2015 – Draft Work in Process"*

b. If there is an adverse effect under Section 106 and a use of the property, there is a preliminary non-*de minimis* use under Section 4(f)

c. Section 4(f) Evaluation must document there is no feasible and prudent complete avoidance alternative

d. Once mitigation is incorporated, Section 4(f) evaluation will compare effects of project on the resource and on other protected environmental resources to determine which alternative has least overall harm

e. Coordination with SHPO will continue throughout the Section 106 and Section 4(f) processes

f. The minimization/mitigation measures identified during the Section 106 process and included in the the Section 106 agreement will be included in/referenced in the the Section 4(f) evaluation

g. Sarah indicated this property is also of interest to the Park Board's because of the use of the property – is there some sort of consultation with Park Board? Seems they also have jurisdiction as a recreational resource; how is that taken into account?

   i. Nani explained that coordination with Park Board is occuring through the Section 106 process as a consulting party and through Section 4(f) in their role as an OWJ for the recreational use of the park. Their role as an owner of a recreational area, triggers their involvement in Section 4(f). This will be published as a preliminary *de minimis* use for the property, including easement/use of land, and will be included in the SDEIS.

h. Leon gave a summary of what a Section 4(f) evaluation looks like: description of how the property is used, how the project impacts it, and addresses if there are prudent and feasible alternative(s). If there is not prudent and feasible alternative, go through comparative analysis, including analysis of avoidance alternatives, all possible planning to minimize harm/mitigation, determination of least overall harm. "Least overall harm" is intended to balance Section 4(f) and historic effects but also includes taking into account other environmental resources

i. NEPA is perceived as procedural; Section 4(f) is procedural and substantive – have to reach a certain threshold to move forward – the no prudent or feasible question is that threshold

j. Sarah asked about alternatives for the freight rail relocation.

   i. Maya indicated that within the Section 4(f) analysis, we would look at feasible alternatives. The

analysis of relocating freight rail already occurred through the design and engineering process and would not be looked at as an alternative in the Section 4(f) process.

k. Sarah agreed with the process outlined for this property, including inclusion in Section 4(f) in the SDEIS as a Sectin 4(f) Use

7. Archaeological Sites

a. *Refer to handout titled "East – Volumne 1 (CIVIL) – Segment 4 – Track Sheet Layout Index" exhibit*.
b. Greg and Leon explained:

   i. For an archaeological site to qualify as a Section 4(f) property, it must meet both of these criteria: site used by the project; requires preservation in place

   ii. Mitigation has been discussed, but no agreement has been reached

   iii. Based on Phase I/II Archaeological Survey, Royalston was presented during the Section 106 consultation process

   iv. Reports indicated potential for more archaeological sites but couldn't access them because they are located under roadway – will be accessed during construction. A new report is being prepared now for additional sites identified near the Royalston sites.

   v. Recognition that historic sites would be used for implementation of Royalston Station led to preliminary adverse effect under Section 106 (SHPO has preliminarily agreed)

   vi. These two historic sites are exempt as Section 4(f) property since they will not be preserved in place – so even though they are used, they will not go through Section 4(f) process

c. Sarah agreed with the process outlined for this property, including not including these sites as Section 4(f) properties in the SDEIS

8. Next Steps

a. Preliminary determinations will be included in the SDEIS (preliminary Section 4(f) and Section 106 findings)

b. Items 4, 5, 6, and 7 on this agenda will be covered in the SDEIS

c. Sarah asked if SPO wants any specific comment from SHPO on the SDEIS?

   i. Maya indicated that SHPO should probably comment that consultation under both Section 4(f) and Section 106 is accurate, and SHPO is waiting to make a determination at time FTA publishes the final determination. Official concurrence from SHPO will come at that time.

d. Nani will schedule additional consultation meetings with SHPO to discuss Section 4(f) as needed.

e. SDEIS publication date will hopefully be in next few months. When SPO has the date pinned down, will let SHPO know. Will be a 45-day public comment period.

f. Planning to proceed with publishing the SDEIS with preliminary determinations, letting public have opportunity to comment on preliminary effects before they are finalized. However, Greg will continue to work on final determinations of effect over the coming months.

g. A draft Section 106 agreement will not be in the SDEIS; it will be covered in general terms. The draft agreement will be part of the FEIS. Minimization/mitigation of adverse effects to historic properties will be included in the Section 106 agreement.

h. Nani indicated that Section 106 information will be included in other open houses and public meetings throughout the year, including a series of upcoming station design open houses. These meetings are

planned for early to mid April.

i. Open houses on the Kenilworth landscape design will occur in May-June and will also be an opportunity to incorporate Section 106 materials. Could also be good to have landscape design consultant speak to Section 106 consulting parties during a future consultation meeting

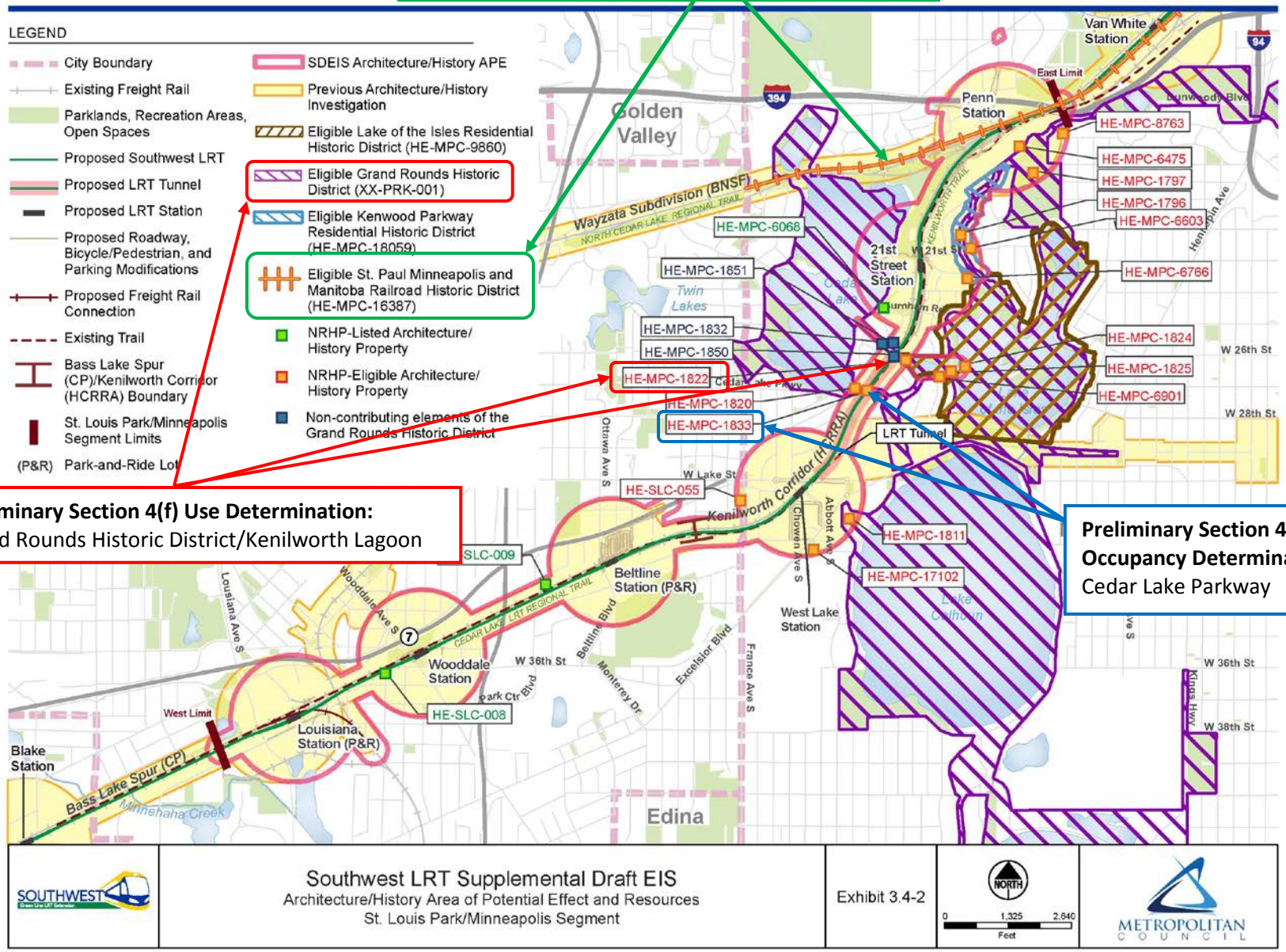
j. Maya would like to discuss Grand Rounds District in more detail, but hoping to do that at next consultation meeting after speaking with Greg and SPO.

Action: Discuss Grand Rounds Historic District at a future Consultation Meeting

k. FTA will likely advocate a Memorandum of Agreement instead of a Programmatic Agreement. FEIS will likely have the draft 106 agreement, and the Record of Decision will include the executed agreement.

ACTION ITEMS:	**PERSON RESPONSIBLE:**	**DEADLINE:**
Continue discussion on Grand Rounds in future consultation meeting	Greg/Maya/Nani	
Provide draft meeting notes for SHPO review	Greg/Nani	

Preliminary Section 4(f) *de minimis* Determination:
Great Northern Historic Railway District



Preliminary Section 4(f) Use Determination:
Grand Rounds Historic District/Kenilworth Lagoon

Preliminary Section 4(f) Temporary Occupancy Determination:
Cedar Lake Parkway

March 2, 2015 – DRAFT Work in Process

Section 4(f) of the Department of Transportation Act Overview

1. What is Section 4(f)?

- Section 4(f) refers to the original section within the U.S. Department of Transportation Act of 1966 which established the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development.

2. What are Section 4(f) properties?

- Section 4(f) properties include publicly owned public parks, recreation areas, and wildlife or waterfowl refuges, or any publicly or privately owned historic site listed or eligible for listing on the National Register of Historic Places.

3. What does Section 4(f) require?

- Before approving a project that uses Section 4(f) property, FTA must either (1) determine that the impacts are de minimis (see discussion below), or (2) undertake a Section 4(f) Evaluation. If the Section 4(f) Evaluation identifies a feasible and prudent alternative that completely avoids Section 4(f) properties, it must be selected. If there is no feasible and prudent alternative that avoids all Section 4(f) properties, FFTA has some discretion in selecting the alternative that causes the least overall harm (see discussion below). FTA must also find that all possible planning to minimize harm to the Section 4(f) property has occurred.

4. What is a Section 4(f) *Use*?

- The permanent incorporation of any portion of a 4(f) property into a project through the fee simple acquisition of the property or acquiring a property right that allows permanent access to the property (e.g., easement)
- Temporary occupancy of land that is adverse in terms of the statute's preservation purpose
- When there is a constructive use (a project's proximity impacts are so severe that the protected activities, features, or attributes of a property are substantially impaired)
- Note: The regulation lists various exceptions and limitations applicable to this general definition

5. What is a *de minimis* impact?

For publicly owned public parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact is one that will not adversely affect the activities, features, or attributes of the property. For historic sites, a *de minimis* impact means that FHWA has determined (in accordance with 36 CFR Part 800) that either no historic property is affected by the project or that the project will have "no adverse effect" on the historic property. A *de minimis* impact determination does not require analysis to determine if avoidance alternatives are feasible and prudent, but consideration of avoidance, minimization, mitigation or enhancement measures should occur. There are certain minimum coordination steps that are also necessary.

6. What is a Constructive Use?

- Occurs when the transportation project involves no physical use of the from a Section 4(f) property via permanent incorporation of land or a temporary occupancy of land into a transportation facility. A constructive use occurs when:
  - The project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired
  - The value of the resource, in terms of its Section 4(f) purpose and significance will be meaningfully reduced or lost
- The types of impacts that may qualify as constructive use, such as increased noise level that would substantially interfere with the use of a noise sensitive feature such as an outdoor amphitheater are addressed in the Section 4(f) regulations
- A project's proximity to a Section 4(f) property is not in itself an impact that results in constructive use.
- The assessment for constructive use should be based upon the impact that is directly attributable to the project under review, not the overall combined impacts to a Section 4(f) property from multiple sources over time

7. What is a Temporary Occupancy?

- Temporary occupancies of land that are so minimal as to not constitute a use under 4(f). These must meet:
  - Duration must be temporary, i.e. less that the time needed for construction of the project and no change in ownership of the land
  - Scope of work must be minor, i.e. both the nature and magnitude of the changes to the 4(f) property are minimal
  - No anticipated permanent adverse physical impacts, nor will it interfere with protected activities, features or attributes of the property
  - The land being used must be fully restored (returned to a condition which is at least as good as that which existed prior to the project
  - Documented agreement with the official(s) with jurisdiction

8. What is an Official with Jurisdiction?

- Parks: Officials with the agency/ies that own or administer the 4(f) property
- Historic sites: SHPO

9. How are Section 4(f) and Section 106 related?

- Section 106 process determines the eligibility of historic/archaeological resources for potential 4(f) protection
- A key difference is Section 106 is essentially a consultative procedural requirement, while Section 4(f) precludes project approval if the specific findings cannot be made

10. What is a *Feasible and Prudent Avoidance Alternative?*

- Completely avoids the permanent use of a 4(f) property
- Feasibility: Can be built as a matter of sound engineering
- Prudence: No severe problems that outweigh protecting the 4(f) property, considering:
  - Meeting Purpose/Need
  - Safety
  - Severe impacts (after mitigation)
  - Extraordinary costs
  - Unique problems/factors
  - Cumulative impact of multiple factors

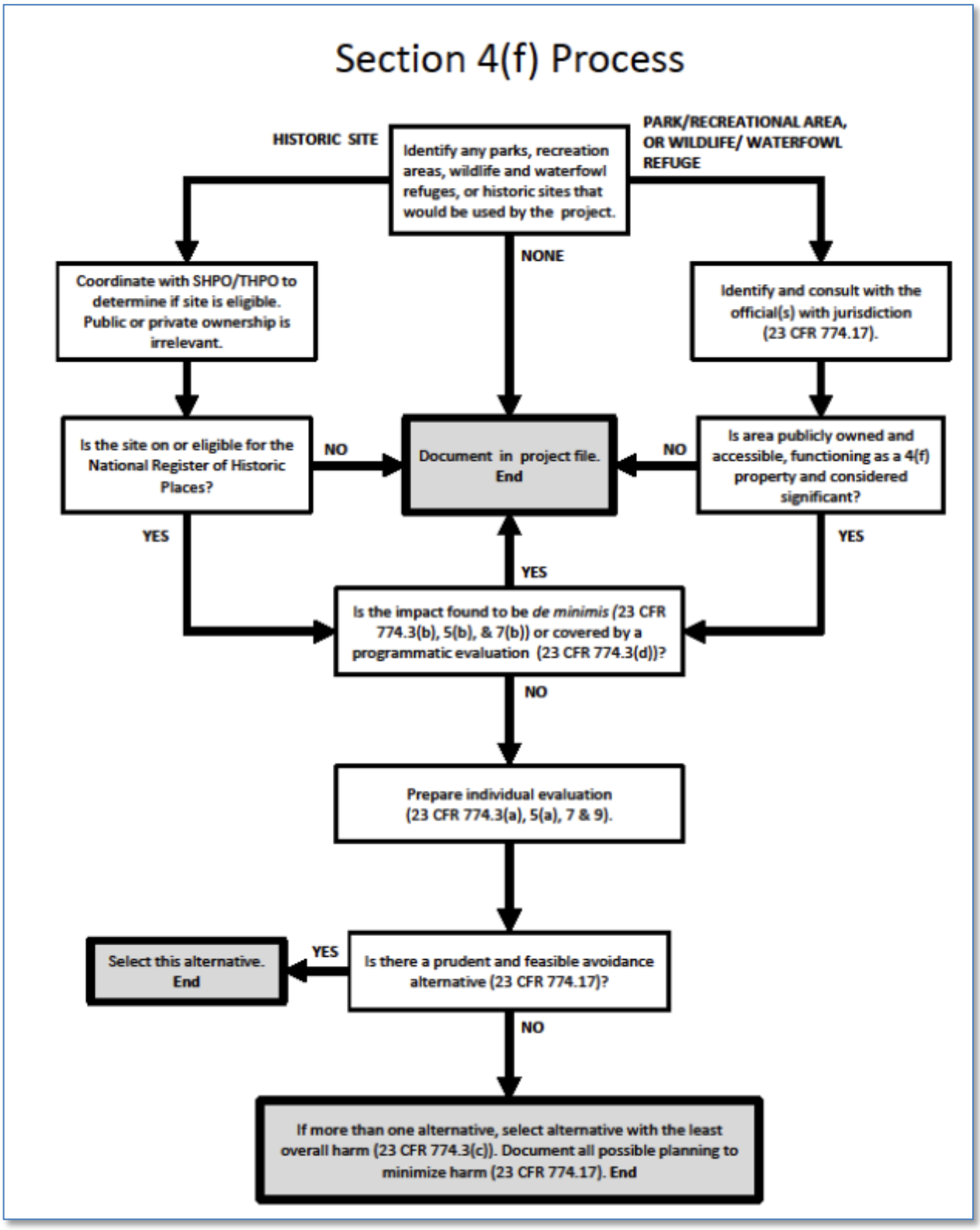
11. What happens if the LPA *uses* a protected property?

- FTA completes a Section 4(f) Evaluation (draft and final), including three required determinations:
  - There is ***No Prudent/Feasible Avoidance Alternative***
  - ***All Possible Planning to Minimize Harm*** has occurred (includes all reasonable mitigation measures)
  - LPA must have ***Least Overall Harm*** compared to other alternatives that have a 4(f) use

12. What is a Least Overall Harm Analysis?

- When there is no feasible and prudent avoidance alternative, the comparison of the LPA with other alternatives under consideration that would have a use of any 4(f) property
- Comparative criteria used to reach the determination:
  - Relative value of and impacts to 4(f) properties, after similar mitigation efforts – criteria:
    - Ability to mitigate adverse impacts to each 4(f) property
    - Relative severity of harm to protected characteristics of the 4(f) properties (after mitigation)
    - Relative significance of the 4(f) properties
    - Views of officials with jurisdiction over the 4(f) properties
  - Consideration of substantial problem/s – criteria:
    - Degree to which the alternative meets P&N
    - Magnitude of adverse impacts to non-4(f) resources (after mitigation)
    - Substantial cost differences
- Only the alternative/s with the Least Overall Harm may be approved by FTA

Sources: 23 USC 138; 49 USC 303; 23 CFR Part 774; *Section 4(f) Policy Paper* (USDOT: July 20, 2012)



Source: *Section 4(f) Policy Paper* (p. 62; USDOT: July 20, 2012)

Meeting Title: Section 4(f) Coordination – Parks within the City of Minneapolis

Date: 03/06/2015 **Time:** 1:00 p.m. **Duration:** 1.5 hour

Location: SPO Conf. Rm. A
Call in #: 1 (646) 749-3131; code: 446-618-573
GoToMeeting: https://global.gotomeeting.com/join/446618573

Meeting called by: Nani Jacobson, Assistant Director, Environmental & Agreements

Invitees: MPRB: Jennifer Ringold, Renay Leone, Michael Schroeder
City of Minneapolis: Paul Miller
Hennepin County: Kimberly Zlimen
FTA (phone): Maya Sarna, Amy Zaref
SPO: Jim Alexander, Ryan Kronzer, Mark Bishop, Jeanne Witzig, Leon Skiles, Michael Hoffman (phone)
MnDOT: Aaron Tag, Lee Williams, Danielle Holder

Purpose of Meeting: Continued discussion of 4(f) properties under jurisdiction of the MPRB, 4(f) process and analysis.

Agenda
1. Welcome and Introductions
2. Review Action Items
3. Edits/Comments to 2/13/2015 Meeting Notes (due 3/11/15)
4. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – Preliminary *de minimis* Use: a. Easment for Canal Right-of-Way in the Kenilworth Channel b. Cedar Lake Park – East Cedar Beach c. Cedar Lake Park – Cedar Lake Junction d. Bryn Mawr Park
5. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – Properties with no 4(f) Use: a. Alcott Triangle b. Park Siding Park c. Lake of the Isles Park
6. Next Steps a. Consultation on Mitigation b. Meetings: i. March 13, 2015 – TBD

DISCUSSION:

ACTION ITEMS:	PERSON RESPONSIBLE:	DEADLINE:
Provide title work to MPRB for all areas impacting parks	SPO – Nani Jacobson	Complete – 3/3/15
MPRB to provide information requested from SPO on 1/29/2015	MPRB	First installation – Complete – 2/16/2015 Remaining information – TBD
Meeting to discuss canal ROW easement	All	March
Determine ownership of ped bridges and East Cedar Beach project elements	City, MPRB	City/MPRB to hold meetings and continue discussion; provide status at next meeting
Input on preliminary 4(f) determinations	MPRB and City	TBD – next few weeks

SIGN-IN SHEET

SOUTHWEST Green Line LRT Extension

SWLRT Section 4(f) Officials With Jurisdiction Coordination Meeting – MPRB
March 6, 2015 1:00 – 2:30 pm SPO Conference Room A

Name	Organization	Email	Phone
Paul Miller	City of Mpls	paul.miller@minneapolismn.gov	612-673-3603
Kim Zlimen	Hennepin Co.	kimberly.zlimen@hennepin.us	612-396-7618
David Jaeger	HC	david.jaeger@hennepin.us	612-348-5714
Nani Jacobson	SPO		
Mark Bishop	SPO		
Rachel Haase	Kimley-Horn	rachel.haase@kimley-horn.com	651-643-0447
Jeanne Witzig	Kimley-Horn	jeanne.witzig@kimley-horn.com	
LEON SKILLES	SPO	SKILLESL@COMCAST.NET	
Ryan Kronzer	SPO		
Jennifer Ringold	MPRB	on file	on file
Michael Schroeder	MPRB		

Meeting Title: Section 4(f) Coordination – Parks within the City of Minneapolis – Meeting Notes

Date: 03/06/2015 **Time:** 1:00 p.m. **Duration:** 1.5 hour

Location: SPO Conf. Rm. A
Call in #: 1 (646) 749-3131; code: 446-618-573
GoToMeeting: https://global.gotomeeting.com/join/446618573

Meeting called by: Nani Jacobson, Assistant Director, Environmental & Agreements

Attendees: MPRB: Jennifer Ringold, Michael Schroeder
City of Minneapolis: Paul Miller
Hennepin County: Kimberly Zlimen, Dave Jaeger, Nelrae Succio
FTA (phone): Maya Sarna, Amy Zaref
SPO: Ryan Kronzer, Mark Bishop, Jeanne Witzig, Leon Skiles, Rachel Haase

Purpose of Meeting: Continued discussion of 4(f) properties under jurisdiction of the MPRB, 4(f) process and analysis.

Agenda

1. Welcome and Introductions
2. Review Action Items
3. Edits/Comments to 2/13/2015 Meeting Notes (due 3/11/15)
4. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – Preliminary *de minimis* Use:
   a. Easement for Canal Right-of-Way in the Kenilworth Channel
   b. Cedar Lake Park – East Cedar Beach
   c. Cedar Lake Park – Cedar Lake Junction
   d. Bryn Mawr Park
5. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – Properties with no Section 4(f) Use:
   a. Alcott Triangle
   b. Park Siding Park
   c. Lake of the Isles Park
6. Next Steps
   a. Consultation on Mitigation
   b. Meetings:
      A. March 13, 2015 – TBD

DISCUSSION:

2. Review Action Items
    a. Provided title work to MPRB – SPO has given two transmittals of title work and maps to Renay
    b. MPRB information to SPO outlined in SPO's data request – SPO received the 1st installation of that information on 2/16/15 (the transmittal letter noted that additional information requested was under development). Information in this transmittal included SPO requested information on seven parks including confirmation on park ownership and confirmation that the parks are of local recreational significance. MPRB staff indicated there is no additional information to transmit, therefore a second installation is not needed.
    c. Discuss canal right-of-way easement – Not a 4(f) issue as the easement has triggered Section 4(f) for the property. A separate meeting will be discussed to review the title work and easement, to be scheduled
    d. Determine ownership of pedestrian bridges and East Cedar Beach project elements – to be discussed today
    e. Section 4(f) determinations – preliminary Section 4(f) determinations will be made within the Draft Section 4(f) Evaluation Update to be published within the forthcoming SDEIS. Final Section 4(f) determinations will be made by FTA, reflecting consideration of comments on the preliminary determinations and on continued consultation with the Officials with Jurisdiction. Those final determinations will be included in the Final Section 4(f) Evaluation, which will be documented in the ROD.

3. Edits/Comments to 2/13/2015 Meeting Notes
    a. Comments due by 3/11/15 (none received)

4. SPO staff described the Section 4(f) Properties within the City of Minneapolis and the Project Study Area that are proposed to have a preliminary *de minimis* Use determination in the Draft Section 4(f) Update that will be published in the SDEIS:
    a. Easement for Canal Right-of-Way in the Kenilworth Channel (Refer to handout "Kenilworth Lagoon - Construction Access" exhibit)
        i. SPO staff referenced the exhibit for limits of the channel easement, HCRRA property, BNSF property, and the Ground Rounds Historic District boundary that would be impacted by the project
        ii. SPO described the 4(f) use would be within the HCRRA and BNSF-owned property and the MPRB easement, including permanent incorporation of piers in the channel from the new bridges constructed over the channel
        iii. SPO staff noted that there will be a public notice in the SDEIS for the preliminary *de minimis* determination (concurrent with 45 day comment period on SDEIS)
        iv. SPO staff noted that following preliminary public review FTA can ask for official concurrence from Officials with Jurisdiction (OWJ) on the *de minimis*

determination

v. MPRB staff did not have any objections to the proposed preliminary *de minimis* use determination

b. Cedar Lake Park – East Cedar Beach (Refer to handout "East Cedar Beach Connection - Construction Access" exhibit)
   i. SPO staff referenced the exhibit illustrating the proposed project changes within and near East Cedar Beach and where proposed use of the park property would occur, including a new sidewalk roughly between the pro[posed 21st Station and the entrance to the trail to East Cedar Beach
   ii. SPO staff noted that an approximately 8-foot sidewalk extension on the south side of the street would follow public street right-of-way then extend into park property, following existing curb lines
   iii. SPO requested that MPRB clarify the ownership of sidewalk as it crosses into park property
      A. Renay is following up on ownership but MPRB does not anticipate that determining ownership of the sidewalk will be an issue
   iv. City staff noted that the proposed design of proposed bicycle and pedestrian improvements in the vicinity of East Cedar Beach does meet the City's expectation of the agreement in the July 2014 MOU, but the City has not yet discussed ownership of the sidewalk that would be constructed within park property
   v. MPRB and City staff noted that based on winter maintenance practice, the MPRB would already be out plowing various trails
   vi. MPRB noted that on the other side of 21st Street there is sidewalk in public right-of-way adjacent to park property and the City and MPRB would look into how that is currently handled? Perhaps new sidewalk segment could have the same arrangement.
   vii. SPO staff noted that if the new sidewalk in the park is to be owned by MPRB, the impact would be a temporary occupancy because the end result is MPRB-owned property as part of the park
   viii. Further, SPO noted that if some jurisdiction other than MPRB would own the sidewalk, it would be *de minimis*
      A. This is currently assumed for the SDEIS
   ix. MPRB staff did not have any objections to the proposed preliminary *de minimis* use determination

c. Cedar Lake Park – Cedar Lake Junction (Refer to handout "North Cedar Lake Trail Bridge – Construction Access" exhibit)
   i. SPO staff referred to the exhibit illustrating the proposed project changes within and near Cedar Lake Junction and where proposed use of the park property would occur, specifically with the construction of a new pedestrian/trail overpass crossing existing freight tracks and proposed LRT tracks
   ii. SPO staff noted that trail use within the park would be detoured/maintained during construction, generally illustrated in the exhibit, which shows that a

portion of existing trail network that extends to the east park boundary would be removed, likely relatively early in construction, and temporarily and then permanently replaced

iii. The proposed new bridge that would carry the North Cedar Lake Trail would span the existing freight and the proposed LRT tracks

iv. Width of bridge is greater than 12 feet (30% plans show dimension)

v. MPRB staff agreed a preliminary *de minimis* is also applicable here, noting that:

A. Questions remain on ownership, cost to maintain, etc.

B. MPRB, the City and SPO will need to work through more detailed design for the bridge and the affected trails and trail connections

vi. MPRB staff also note that there are some questions about current property ownership in the yellow hatched area on figure, noting that the:

A. Hardest part to determine is who actually owns the current trail and who has an easement with the crossings

B. Underlying ownership of hatched area is MPRB, Renay is looking into easements

Action: MPRB to review area for easements.

C. Meeting to discuss ownership in this area is also needed between the City and the MPRB

vii. SPO requested any easements or documentation MPRB may have with TC&W that would be helpful for this review (for short segment of railroad tracks that are in park property)

A. In response, MPRB noted that is does not have additional documentation, but it has concerns about the railroad location – property line is currently right on tracks, not space for a clear zone, if one was needed it could impact vegetation in the area

B. SPO responded that it will continue to work with MPRB on their concern.

viii. SPO staff noted that Met Council is developing a landscape plan for the Kenilworth Corridor that will be completed in coordination with the City and MPRB

ix. MPRB staff did not have any objections to the proposed preliminary *de minimis* use determination, with the noted items listed under c.v.

d. Bryn Mawr Park (Refer to handout "Luce Line Trail Bridge – Construction Access" exhibit)

i. SPO staff referenced the exhibit illustrating the proposed project changes within and near Cedar Lake Junction and where proposed use of the park property would occur including:

A. Black hatched area – proposed improvements within park property

B. Yellow hatched area – proposed temporary construction limits with park property

C. Existing Luce Line trail bridge (currently owned by MnDOT with bridgehead in Bryn Mawr Park) will be demolished and removed

D. The proposed new Luce Line trail bridge alignment would also cross

over LRT and BNSF tracks, but it would follow alignment of park/BNSF right-of-way line to the east, before turning south to connect to the station and other trails

E. Slight redesign of trail network would be needed to tie back in to the realigned Luce Line Trail as it crosses the new bridge.

ii. SPO staff noted that temporarily accessing the bridge site during construction will be challenging (for equipment, staff, materials, etc.), and is proposed to be:
   A. Access through park (from the park parking lot)
   B. A laydown area east of and in the eastern portion of the cricket playing field (but not within the cricket field during cricket season)

iii. SPO staff noted that all areas of the park that would be temporarily changed during construction would be restored to a condition as good as or better than before, can also incorporate mitigation in plan for park

iv. MPRB staff asked of the timing when the access road would be needed?
   A. SPO responded it would likely be needed for one construction season – discussion for when it would fit best with use of park needs to occur

v. MPRB staff noted that it has funding set aside for the development of a master plan for this park
   A. It would be beneficial if the access road would match the alignment of the future trail due to soil compaction
   B. Timing of park improvements scheduled for 2018/2019
   C. SPO and MPRB staff noted that final impacts and how things get laid out in the park can be coordinated with the master planning process and that the Project and MPRB will coordinate as project design continues and as the park master planning process continues

vi. MPRB staff noted that a portion of Basset's Creek Trail (which extends north from the Luce Line Trail) won't be viable while the bridge is being built – might be a possible location for access road

vii. If MPRB owns the bridge on park board property, then the impact would be a temporary occupancy because there would be no change in park property ownership, which is required for a Section 4(f) use to occur
   A. If someone else owns the bridge, it would be a *de minimis* impact

viii. MPRB staff asked who would own the portion of the bridge not on park property?
   A. SPO responded that MnDOT currently owns bridge, but they do not want to own the future bridge
   B. Paul stated that for bridges that are entirely in a park, the bridge is owned by the park and the City does inspections

ix. City and MPRB staff noted that they need to have conversations about ownership of proposed improvements within Cedar Lake Park at East Cedar Beach and Cedar Lake Junction and within Bryn Mawr Meadows Park (items b, c, and d, respectively, within agenda item 4)

x. SPO staff noted that construction activities will be scheduled so they do not intrude on important park activities (applies to all park properties) and that

will be included within the mitigation sections of the Section 4(f) Evaluation

xi. MPRB staff did not have any objections to the proposed preliminary *de minimis* use determination

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5. Section 4(f) Properties within the City of Minneapolis and the Project Study Area – Properties with no 4(f) Use (Refer to handout "Segment E3 – Minneapolis – Cedar Lake Pkwy Crossing – Preliminary Engineering Plan, September 2014" exhibit):
    a. Alcott Triangle
        i. Within park and recreation area study area (350 feet from centerline)
        ii. There would be no use or temporary occupancy of this park
        iii. MPRB staff did not have any objections to the proposed no 4(f) Use for this property
    b. Park Siding Park
        i. Within park and recreation area study area (350 feet from centerline)
        ii. No permanent incorporation of park property or temporary occupancy (although shown in Draft EIS)
        iii. MPRB noted that it is no longer concerned about constructive use since LRT is in the tunnel in this segment
        iv. MPRB staff did not have any objections to the proposed no 4(f) Use for this property
    c. Lake of the Isles Park
        i. The project would not be physically in the park
        ii. Lake of Isles Park is a segment of the full regional park (Minneapolis Chain of Lakes Regional Park)
        iii. SPO could not find a boundary for Cedar Lake Park in MPRB's comprehensive plan. MPRB provided the following clarification:
            A. Cedar Lake Park is part of the Chain of Lakes Regional Park in the comprehensive plan map of regional parks
            B. Cedar Lake Park boundary would follow property boundaries
        iv. SPO may request GIS layer from MPRB depending on what data SPO has
        v. MPRB is concerned about constructive use
            A. In response, SPO staff noted that the definition of Constructive use is that there is no permanent incorporation of park property into the project, but the project has an adverse impact on park property that is substantial enough to cause substantial impairment of the park's qualifying activities, features and attributes
            B. MPRB staff asked what would happen if the SDEIS says there is no 4(f) use, but there ends up being a constructive use?
                a. SPO staff proposed a potential solution to this question at this location – which is to treat this property as part of one park property, as described above (spanning several property parcels, including the easement area). The actual physical use would be at the channel, but effects would be considered throughout the

property

b. SPO continued that then the issue of constructive use would not need to be considered under this approach as there would be a physical use of the Channel/Lagoon and the noise impacts would be considered along with the proposed physical use of the park property.

c. SPO also continued that if the use is determined to be a *de minimis* use due to permanent incorporation of piers in the water, the mitigation process would be triggered that would consider visual, noise, and other impacts for the park beyond the pier locations

d. SPO staff also noted that you can't have a *de minimis* constructive use – that is, constructive use implies an adverse effect

C. The group agreed with the proposed approach and agreed to call this area the Kenilworth Channel/Lagoon that is an element of the Minneapolis Chain of Lakes Regional Park – this would capture all parcels of land within the park area, not all of which have unique names. This revised approach effectively modified details discussed under agenda item 4.A to reflect this agreed upon approach:

a. Lake of the Isles side of Minneapolis Chain of Lakes Regional Park (i.e., the wide lagoon and its banks that is east of the HCRRA right-of-way)

b. Cedar Lake side of Minneapolis Chain of Lakes Regional Park (the narrow channel west of the BNSF right-of-way)

c. Canal easement area within the BNSF and HCRRA rights-of-way.

vi. SPO summarized that under this approach (to treat the Kenilworth Channel/Lagoon as a single park property under Section 4(f), Item 5c of this agenda (i.e., Lake of the Isles Park) gets included under Item 4.a (i.e., Kenilworth Lagoon/Channel) and will be a preliminary *de minimis* use – that is, the wide lagoon portion of the Lagoon is treated under 4.a as an element of the Kenilworth Channel/Lagoon which is an element of the Minneapolis Chain of Lakes Regional Park. Further, the Channel/Lagoon also includes the Canal Easement, and the narrow potion of the waterway to the west of the Kenilworth Corridor

i. With incorporation of the incorporation of the single park property as a element of the Minneapolis Chain of Lakes Regional Park, MPRB staff did not have any objections to including this property under 4.a, thus having a proposed preliminary *de minimis* use determination

2. Next Steps
   a. Consultation on Mitigation
      i. Focus will shift to mitigation in future meetings, ownership questions will continue

ACTION ITEMS:	PERSON RESPONSIBLE:	DEADLINE:
Provide title work to MPRB for all areas impacting parks	SPO – Nani Jacobson	Complete – 3/3/15
MPRB to provide second set information, noted in their initial response, requested by SPO on 1/29/2015	MPRB	First installation – Complete – 2/16/2015 Remaining information – None – 3/6/15
Meeting to discuss canal ROW easement	All	March 13, 2015
Determine ownership of ped bridges and East Cedar Beach project elements	City, MPRB	City/MPRB to hold meetings and continue discussion; provide status at next meeting
Input on preliminary 4(f) determinations	MPRB and City	Complete – 3/6/15
Develop new Kenilworth Channel/Lagoon (as an element of the Chain of Lakes Regional Park) exhibit	SPO	TBD - March
Provide easements for Cedar Lake Park – Cedar Lake Junction area	MPRB - Renay	TBD

KENILWORTH LAGOON

MPRB ROW

BNSF ROW

330+00

335+00

2800+00

2805+00

HCRRA ROW

MPRB EASEMENT FOR CHANNEL ROW

GRAND ROUNDS HISTORIC DISTRICT BOUNDARY

MPRB ROW

DRAFT-WORK IN PROCESS

SOUTHWEST
Green Line LRT Extension

SOUTHWEST LIGHT RAIL

KENILWORTH LAGOON
CONSTRUCTION ACCESS

Rev 0
03/06/2015

NORTH

0 10 20 40
SCALE

METROPOLITAN COUNCIL

Kimley»Horn

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SOUTHWEST LIGHT RAIL

EAST CEDAR BEACH CONNECTION
CONSTRUCTION ACCESS

Rev 0
03/06/2015

NORTH
0 10 20 40
SCALE

SOUTHWEST Green Line LRT Extension

METROPOLITAN COUNCIL

Kimley»Horn

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MPRB ROW

EXISTING TRAIL CLOSED

TRAIL DETOUR ROUTE

BNSF

TRAIL DETOUR ROUTE

BNSF ROW

EXISTING RAILROAD CROSSING

14' TEMPORARY ACCESS ROAD

MPRB

MPRB ROW

LAY DOWN AREA

EXISTING TRAIL CLOSED

TRAIL DETOUR ROUTE

PENN STATION

SINGLE SPAN TRUSS

TEMPORARY CONSTRUCTION AREA

PERMANENT MAINTENANCE EASEMENT

HCRRA

LAY DOWN AREA

DRAFT-WORK IN PROCESS

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SOUTHWEST
Green Line LRT Extension

SOUTHWEST LIGHT RAIL

NORTH CEDAR LAKE TRAIL BRIDGE
CONSTRUCTION ACCESS

Rev 0
03/06/2015

NORTH

0 30 60 120
SCALE

METROPOLITAN COUNCIL

Kimley»Horn

BASSETT'S CREEK TRAIL

PROPOSED SOCCER FIELD OFFSET

TEMPORARY ACCESS

12' TEMPORARY ACCESS (AGGREGATE) ROAD

TEMPORARY CONSTRUCTION AREA

MPRB ROW

MAINTAIN TRAIL ACCESS

PERMANENT MAINTENANCE EASEMENT

CONTROLLED CROSSING

BITUMINOUS ROAD

MAINTAIN EXISTING PARKING

LAY DOWN AREA

NON USE DURING CRICKET SEASON

150'

150'

BNSF ROW

DEMOLITION OF EXISTING PEDESTRIAN BRIDGE

BRYN MAWR MEADOWS

MAINTAIN TRAIL ACCESS

MPRB ROW

BNSF

2895+00

2890+00

MINNEAPOLIS ROW

DRAFT-WORK IN PROCESS

SOUTHWEST LIGHT RAIL

LUCE LINE TRAIL BRIDGE
CONSTRUCTION ACCESS

Rev 0
03/06/2015

NORTH
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SCALE

SOUTHWEST Green Line LRT Extension

METROPOLITAN COUNCIL

Kimley»Horn

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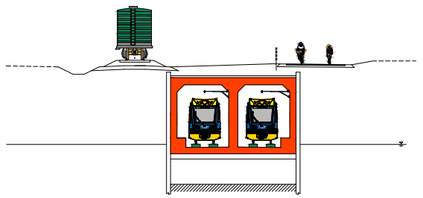
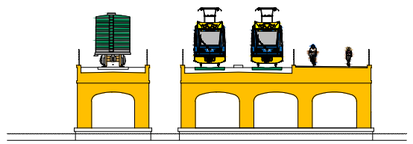


TYPICAL SECTION AT TUNNEL



TYPICAL SECTION AT BRIDGE

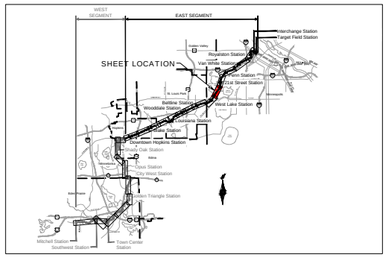
SOUTHWEST LRT ALIGNMENT

SEGMENT E3 - MINNEAPOLIS

CEDAR LAKE PKWY CROSSING

PRELIMINARY ENGINEERING PLAN

COLOR LEGEND	
LRT TRACK AREA	EXISTING SIGNALIZED INTERSECTION
PEDESTRIAN / SIDEWALK AREA	PROPOSED SIGNALIZED INTERSECTION
STATION PLATFORM	TRACTION POWER SUBSTATION
TUNNEL	SYSTEMS BUILDING (DESIGN VARIES)
ROADWAY	GATE ARM
TRAIL / BIKEWAY	TOTAL PROPERTY ACQUISITION
SURFACE PARKING	PARTIAL PROPERTY ACQUISITION
BRIDGE	RIGHT OF WAY / PROPERTY LINE
RETAINING WALL	TEMPORARY CONSTRUCTION EASEMENT



SEPTEMBER 2014

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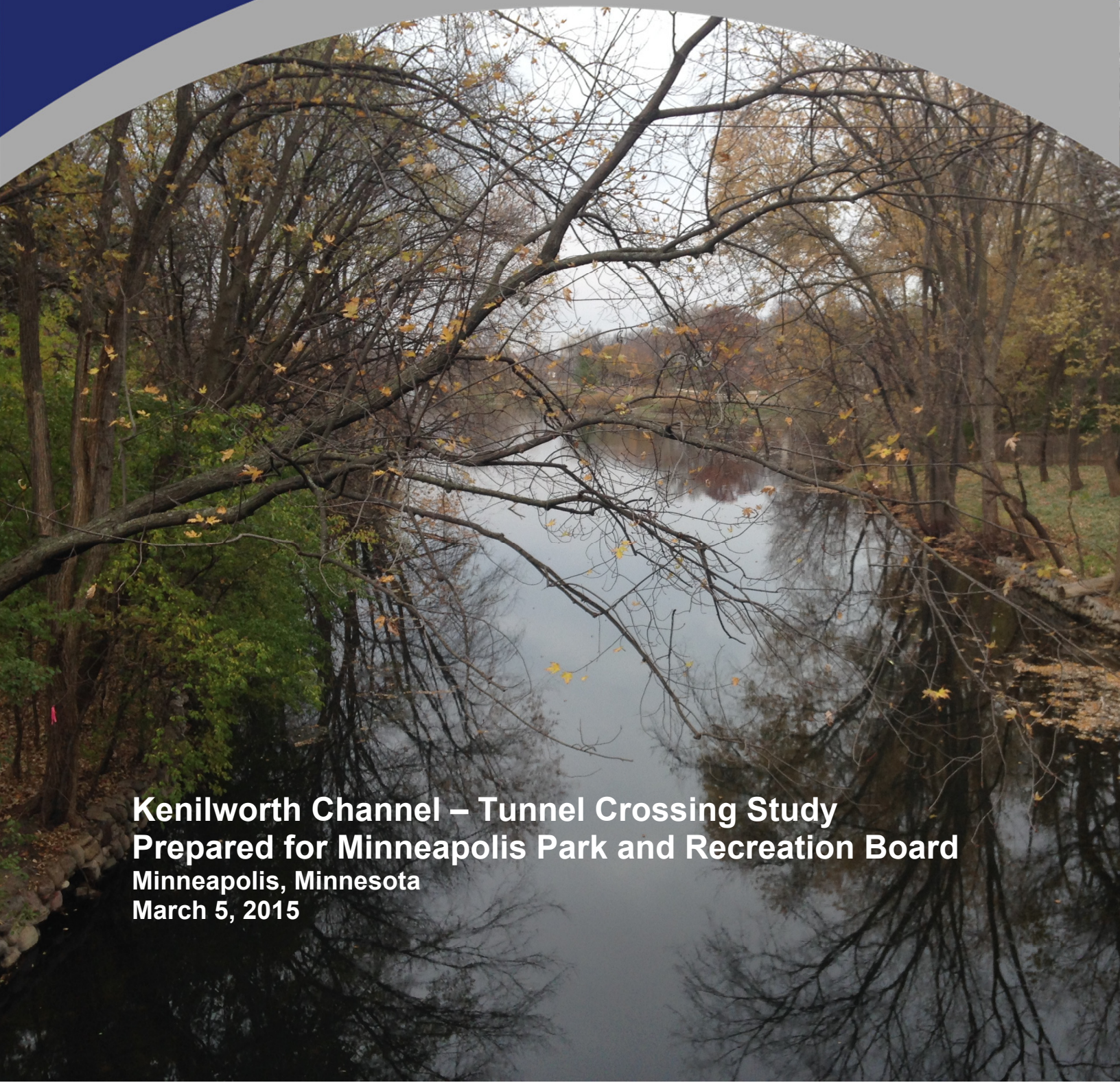
5. Kenilworth Channel – Tunnel Crossing Study, draft Memorandum of Study Findings Prepared for Minneapolis Park and Recreation Board, Minneapolis, Minnesota, March 5, 2015; Prepared by Brierley Associates

BRIERLEY ASSOCIATES

Creating Space Underground



Kenilworth Channel – Tunnel Crossing Study

Prepared for Minneapolis Park and Recreation Board

Minneapolis, Minnesota

March 5, 2015

BRIERLEY ASSOCIATES
Creating Space Underground

March 5, 2015
File Number: 414044-000

Sent via email PDF format

Minneapolis Park & Recreation Board
2117 West River Road
Minneapolis, MN

Attention: Michael Schroeder
Assistant Superintendent for Planning

Subject: Kenilworth Channel – Tunnel Crossing Study
Draft Memorandum of Study Findings

Mr. Schroeder:

Submitted herewith is our draft report detailing the results of an engineering Study performed by Brierley Associates Corporation (Brierley) of alternative crossing options at the Kenilworth Channel for the proposed Green Line extension of Metro Transit's Light Rail Transit system. The Study is a result of a team effort including Brierley, Barr Engineering Company, and David Evans Associates. The work has been performed pursuant to the Professional Services Agreement between Brierley and Minneapolis Park and Recreation Board, dated November 20, 2014 and the Amendment Number 1 to the PSA dated December 31, 2014.

On behalf of the Brierley/Barr/DEA team, we want to thank you for the opportunity to work with you on this project. Once your team has had an opportunity to review this DRAFT Study, we look forward to meeting with you to determine next steps and finalization of the Study. If we can be of further assistance, or if you have any questions, please contact this office.

Sincerely,
BRIERLEY ASSOCIATES

Todd Christopherson, PE
Great Lakes Region Manager

Gregg Sherry, PE
Vice President

ATTACHED DOCUMENTS

Attachment 1 – Soil Profile
Attachment 2 – Brierley Associates – Plans dated January 30, 2015
Attachment 3 –Slides presented to MPRB Board meeting - 1/7/15
Attachment 4 – Slides presented to MPRB Board meeting - 1/21/15
Attachment 5 – Slides presented to MPRB Board meeting - 2/5/15
Attachment 6 – Schedule Comparison of Options by Brierley Assoc.

APPENDIX A - LRT Alignment, Profile, and Operations - Technical Memorandum
(Appendix A prepared by David Evans Associates)
APPENDIX B - Visual Impacts
APPENDIX C – Noise and Vibration
APPENDIX D - Section 4(f) Impacts
APPENDIX E – Groundwater Impacts
APPENDIX F - Surface Water Impacts
APPENDIX G - Wildlife Impacts/Movement
APPENDIX H - Archeology Impacts
APPENDIX I - Historical Impacts
(Appendices B through I were prepared by Barr Engineering)

Executive Summary

The proposed Green Line extension of the Light Rail Transit (LRT) system will pass through the Minneapolis Chain of Lakes Regional Park, specifically, through the Kenilworth Corridor. The design of the project is approximately 30% complete and includes a bridge for the double LRT track to cross over the Kenilworth Channel. The Kenilworth Channel is a scenic and peaceful area that connects Cedar Lake to Lake of the Isles as part of the city's park system. The Channel is used for various activities year round and the Minneapolis Park & Recreation Board (MPRB) desires to minimize the impact of the planned LRT to the users of this area. While the project's designer, the Southwest Project Office (SPO), had previously considered a tunnel under the Kenilworth Channel, they later ruled out the tunnel as being not feasible due to its additional cost and perceived risk considerations.

The MPRB enlisted an independent engineering study by the Brierley Associates team to determine if an alternative to the bridge crossing could be developed as a feasible design option and to assess all crossing options to determine an option with the least impact on park resources. The Brierley team reviewed extensive engineering work previously prepared by the SPO and also developed independent studies of various alternatives to the planned bridge.

The Brierley team concluded that at least two tunnel options are feasible for crossing the Kenilworth Channel. The two options that are considered in detail with this Study are the original SPO "cut and cover" shallow tunnel design and a "jacked box" tunnel concept.

1. INTRODUCTION

Brierley Associates Corporation (Brierley) was contracted by the Minneapolis Park & Recreation Board (MPRB) in November, 2014 to conduct this Study to explore the feasibility of alternative crossing(s) of the Kenilworth Channel in lieu of the bridge that is currently planned by the Southwest LRT Project Office (SPO). MPRB did not task Brierley with designing a tunnel or other features of the LRT project; rather, MPRB asked Brierley to investigate alternative options for crossing the channel and determine feasibility of one or more viable options and to determine which of the feasible options creates the least impact on park resources.

2. TEAM MEMBERS

Brierley Associates is a national consulting engineering firm with headquarters in Denver, Colorado. The firm has a Regional office located in Burnsville. Brierley specializes in underground engineering including design of tunnels, deep shafts, support of excavation, and other geo-structural challenges. In order to provide a complete and responsive Study for the MPRB, Brierley augmented its team with Light Rail Transit (LRT) and Environmental Engineering expertise, respectively provided by the David Evans Associates and Barr Engineering firms. Barr Engineering is a regional engineering firm with headquarters in Edina and David Evans Associates is a national engineering firm with headquarters in Portland, Oregon.

During the initial phases of the Study, personnel from out of town offices of the team established a project office in Burnsville to facilitate better collaboration and communication for the team as well as with MPRB personnel.

3. SCOPE OF WORK

The Scope of Work for this Study was separated into three Phases. Phase 1 and 1A were authorized by MPRB with the initial PSA. Additional Scope of Work was authorized later by Amendment 1 to the PSA and is identified below as Phase 2.

Phase 1

1. Gather and review key data: this task includes review of the draft EIS and other information prepared by the Southwest Project Office and provided by the MPRB. Information will be collected to emphasize review of the following:
    a. Geotechnical
    b. Hydrology/hydrogeology and water resources
    c. Survey including LRT horizontal and vertical alignment
    d. SWLRT proposed alignment
    e. SWLRT design criteria
    f. Cultural resources
    g. Visual quality
    h. Noise and Vibration
2. Meetings and Communications:
    a. Kickoff meeting with project team and MPRB staff
    b. Project communication including progress meetings and conferences calls
    c. Other meetings with Southwest project office and other agencies as directed by MPRB staff.
3. Develop one or more alternative Crossing Options:
    a. Analyze impacts of alternative option(s)
    b. Prepare conceptual drawings of alternative option(s)
4. Coordinate with MPRB staff and project team to prepare criteria for developing a matrix to compare options. This matrix will facilitate a comparative analysis of impacts associated with the current surface alternative with those of one or more potential concept alternatives including tunneling.
    a. Establish criteria
        i. Engineering
        ii. Cost
        iii. Constructability
        iv. Resource impacts
        v. User impacts
    b. Compare current bridge crossing with alternative option(s) for identified criteria
5. Analyze Feasibility of Alternative Option(s) based on established criteria identified in the matrix. Elements of feasibility may include:
    - Portal orientation, size and geometry as well LRT rail requirements relative to slope.
    - Limitations set forth by the owner/operator of the existing freight line
    - Areal extent of real-estate required to construct the portals
    - Tunnel geometry to meet the selected entry/exit portals
    - Subsurface conditions along the proposed project corridor
        - Geological characteristics
        - Groundwater levels and flow
    - Means of tunnel construction
    - Construction staging area

- Extent of land takings and easements required for construction and operation of the tunnel system
- Construction conflicts with existing underground and aboveground utilities
- Electrical power into and out of a tunnel
- Management and disposal of construction derived waste and tunnel muck
- Management and disposal of effluent generated by construction dewatering activities
- Mitigation and Monitoring of ground movement which has the potential to affect underground utilities, surface facilities and buildings.
- Construction of Cross Passages
- Final Lining System
- Life/Fire/Safety within the completed tunnel

6. Prepare opinion of construction costs

   For each crossing alternative and a probable means of construction identified a preliminary cost estimate for design and construction, including initial ground support, final lining design will be prepared. Other elements of this opinion of construction costs include electrical, mechanical, life/safety, architectural, signage/signalization and communications.

7. Identify additional investigations to assess prudence of alternative(s)

Phase 1A

1. Respond to questions from MPRB about Phase 1 deliverables – Alternative Option(s), comparison matrix, and feasibility/prudence analyses.
2. Coordinate with MPRB staff to identify further investigations that may be needed to assess feasibility and prudence for alternatives.
3. Refine and further develop one Alternative Crossing Option in response to questions and comments from MPRB.
4. Provide schematic constructability graphics and animation depicting the installation of an Alternative Option
5. Develop a Scope of Work and Schedule for Phase 2

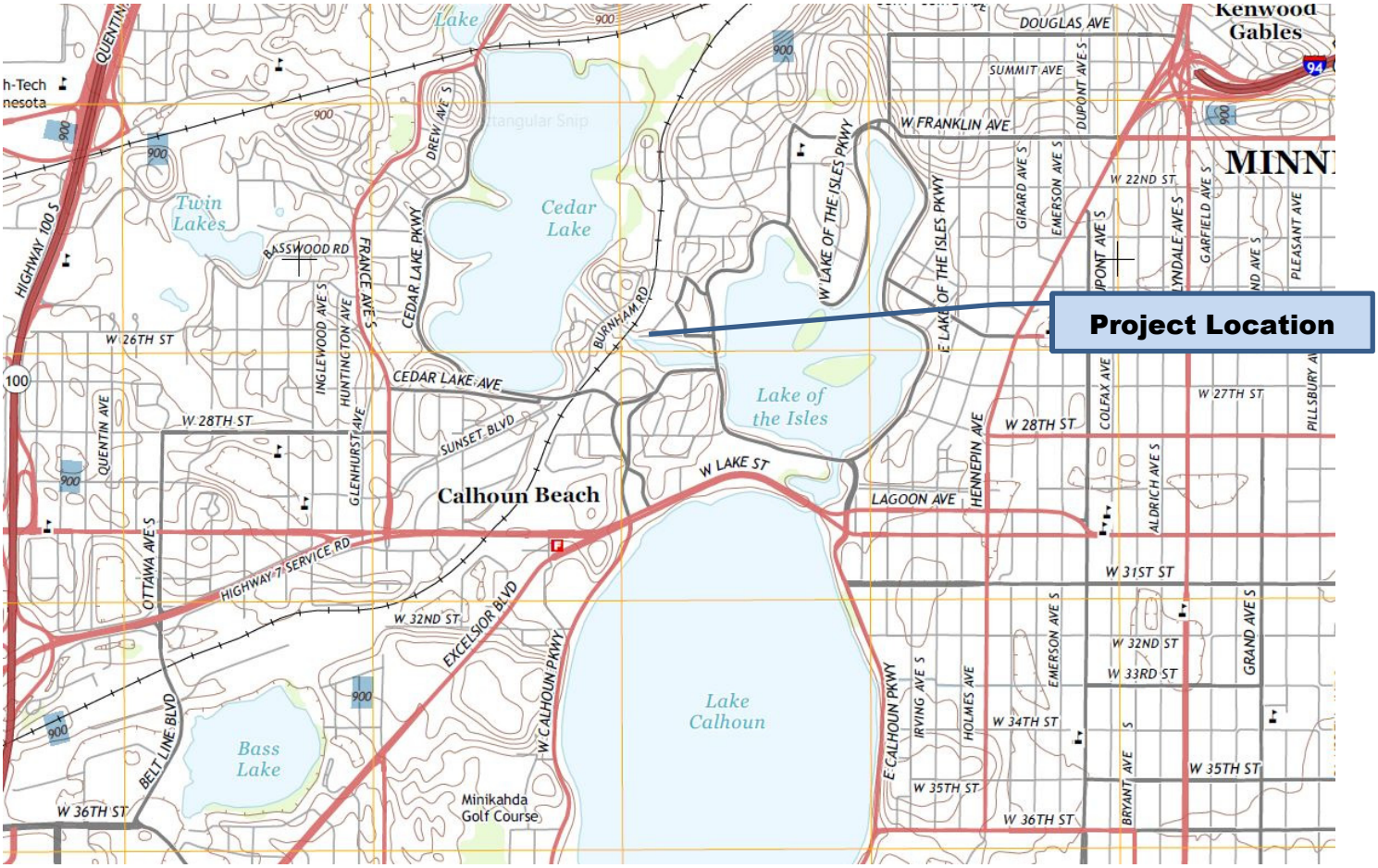
Phase 2

1. Verify schedule implications of two options and compare to baseline schedule provided by SPO
2. Confirm optimum constructability of options
3. Confirm water proofing during construction and for permanent condition
4. Visual Quality Assessment
5. Water Resources – Surface Water

6. Water Resources – Ground Water
7. Noise and Vibration Analysis
8. Cultural Resources – Archaeology
9. Cultural Resources – Historical
10. FHWA 4(f) Impact
11. Review Light Rail operations as related to tunnel options in lieu of bridge
12. Project Management and coordination of a multi-disciplinary, multi-firm approach for Brierley Associates, Barr Engineering, and David Evans Associates.
13. Address additional feasibility issues, if identified during this study.

4. PROJECT LOCATION AND DESCRIPTION

The Project is located in Minneapolis, between Cedar Lake and Lake of the Isles as shown on the map below:



5. GROUND CONDITIONS

This discussion provides a brief description of the ground conditions for approximately 1500 linear feet of proposed tunnel between alignment station (Sta) 2797+00 to 2812+00. The southerly end of this reach starts at the approximate location of the north tunnel portal as described in the AET geotechnical report dated August 25, 2014; and includes the portion of the reach underlying the Cedar Lake-Lake of the Isles Channel, and extending an additional 900 ft to the north near the Burnham Road crossing.

As described in the AET report, the two major soil types to be considered for this tunnel reach include Fill materials; and Alluvial soils originating from glacial outwash deposits. There is a small pocket of Marsh Deposit (organic) soil between the Fill and Alluvial soils south of the Kenilworth Channel. It is likely that this pocket would be removed during construction and replaced, therefore it is not considered in the conceptual design described in this Study.

Fill:

Across this portion of the tunnel reach the fill thickness varies from 7-ft to 25-ft, with an average thickness of 15 ft. The thickest fill areas are adjacent to the bridge crossing over the channel.

The fill materials generally comprise dark brown to brown to brown-gray Silty Sand and Sand with variable gravel and/or clay content; and with variable presence of organic fines, roots, wood, ash/cinders, occasional cobbles and brick fragments.

The fill soils range from loose to dense; SPT N-values ranging from 5 to 48 blows per foot (bpf) with an average of 17 bpf (medium dense).

Alluvium:

Alluvial soils ("Coarse Alluvium" per AET report) comprise mostly brown to brown-gray to gray-brown, loose to very dense, fine to medium Sand and generally accompanied by, or interlayered with, variable Sandy Silt and/or Gravelly Sand. Occasional layers or lenses of "fine Alluvium" consisting of Silt and Sandy Silt were also observed. SPT N-values ranged from 8 to 80 bpf, with an average of 22 bpf. (Note: the highest blow counts of 80 and 48 bpf were noted in boring 1041 ST at approximate Sta 2810+00 which may be due to presence of large gravel).

3 to 5-ft thick medium dense gravel layers were observed in borings 1153ST and 1042ST south of the channel and at depths ranging from 24 to 40-ft below ground surface. The greatest potential for encountering cobbles was observed at boring 1006ST at the north side of the channel and at depths ranging from 25 to 40-ft below ground surface.

Also, in the vicinity of borings 1153ST and 1142ST (approx. Sta 2799+00 to 2801+20), at approximate depth of 15 to 20-ft below ground surface, a remnant layer of Marsh deposits is present consisting of soft to medium stiff peat and organic clay/silt.

Some of the deepest borings in this reach (1005ST and 1006St) were taken to depths of 141 to 181-ft; in these borings the "coarse alluvium" extended to depths of 125 ft and 175 ft respectively at which depths Till-like soils were encountered.

Water/Groundwater:

Groundwater levels observed during drilling of the project boreholes in 2013 ranged from El 847 to 852 with an average of approx. El 850.5. Piezometric water levels observed in three wells installed within this reach ranged from El 849 to El 855, with an average of approx. El 852.5, over the period from October 2013 to August 2014.

Similarly, the water level in the Cedar Lake-Lake of the Isles Channel was measured over this same period and ranged from El 852 to El 856. The Channel is shown to extend to a depth equivalent to approximate El 850. Attachment 1 is a profile showing the soil types along the proposed alignment in this area.

Tunnelman's Ground Classification

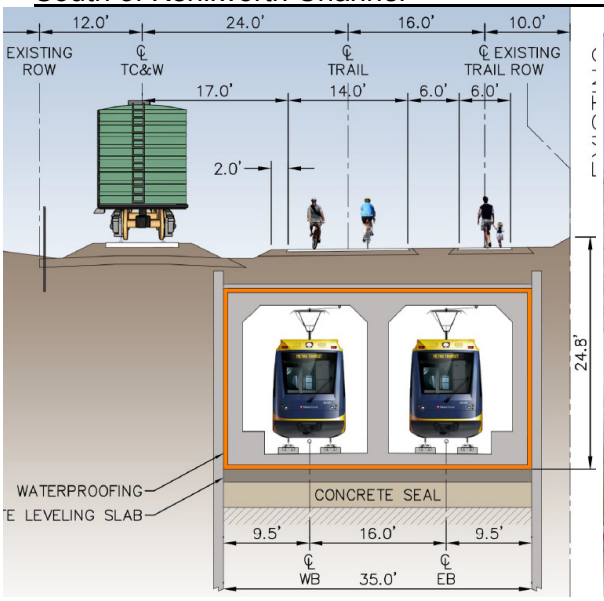
Assuming that most of or the entire tunnel profile will be below the prevailing groundwater levels, the alluvial soils will behave as Fast Raveling to Running conditions.

6. CURRENT DESIGN FOR KENILWORTH CROSSING - LRT BRIDGE

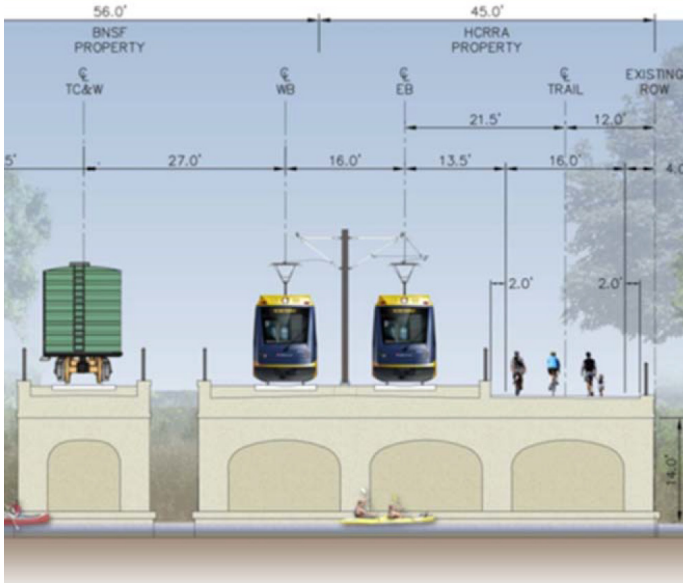
The current design for the LRT Kenilworth Crossing is as shown in the preliminary design documents provided by SPO. The documents provided to our team for review were prepared by Kimley Horn for the SPO. The SPO design includes a new bridge structure as shown in drawings dated September 2014. The PDF document included 126 drawing pages and was titled – "East Volume 1 (Civil) Segment 3".

These plans indicate a shallow, cut and cover tunnel to the south of the Kenilworth Channel, however, the alignment daylights through a portal just south of the Kenilworth Channel and then crosses Kenilworth Channel by means of a bridge. These two schematics are illustrated below: (drawings by SPO – Kimley Horn)

Typical Shallow Tunnel Section South of Kenilworth Channel



Typical Bridge Section at Kenilworth Channel



It's our understanding that the tunnel was considered during the SPO early designs; however, the tunnel crossing was abandoned for various reasons related to cost and perceived additional risks.

7. ALTERNATIVE OPTIONS FOR KENILWORTH CROSSING - LRT TUNNEL

The Brierley team made a thorough review of the design work previously completed and made available by SPO. The material included geotechnical reports, preliminary plans, Basis of Design memorandum, and the SPO's own study of the Shallow Tunnel Under Channel. Our review of their aforementioned documents and

our own, independent analysis indicates that the Shallow Cut and Cover Tunnel concept is feasible and could be extended approximately 900 feet to the north in order to cross under the channel.

In addition to the Cut and Cover tunnel that we refer to as Option 1, we identified another option – Option 2 – which is a Jacked Box tunnel.

Both of the Tunnel Options we have considered below result in additional cost (over the current SPO bridge design) and slightly longer duration to construct. The Cost and Schedule considerations as compared to the current SPO bridge design are addressed later in Section 8 and 9, respectively.

7.1 Cut and Cover Tunnel – Alternative Option 1

The Cut and Cover method of shallow tunnel construction is very common and is usually the most practical and cost effective means of constructing a shallow tunnel. Because the entire tunnel cross section would be submerged below the water table at Kenilworth, special consideration is given to waterproofing the tunnel and also to ensuring that the weight of the tunnel itself plus the weight of the ground above the tunnel is greater than the uplift (buoyancy) force on the submerged tunnel.

The buoyancy calculation is relatively simple and for most tunnel designs does not control design. The SPO has provided a design that includes additional safety factor above what is necessary for buoyancy. The design features for uplift include additional concrete slab thickness and helical piles for "hold down" support below the tunnel. While we find that there is room for simplification of this design for schedule and cost savings, we have maintained their design for the sake of comparison between tunnel options 1 and 2 and the current SPO bridge design. Refinement of the design (value engineering) is a process that would likely be incorporated into final design by the SPO design team, regardless of which option is selected for the channel crossing.

As discussed in the attached Appendix A Memorandum by David Evans Associates (DEA), the horizontal alignment of the LRT rails is considered identical for this option to the alignment considered by SPO in their current design. The vertical alignment is nearly identical and is for all intents and purposes the same as considered by SPO in their "Shallow Tunnel Under Channel" Study dated March, 2014.

Waterproofing of the tunnel is a significant concern for any of the options whenever the structure or portions thereof are below the design water table. We concur with the waterproofing as developed by SPO for this option and believe it is a good solution for the cut and cover tunnel. The methodology, details, and construction sequence are as shown in the Basis of Design report. These methods provide a very robust solution to keeping the ground water out of the tunnel – both during construction and later when operational.

Because the concept of a cut and cover tunnel is common and because SPO has done a thorough study that we do not disagree with, we have not gone into greater detail identifying details, construction methods and sequence, etc.

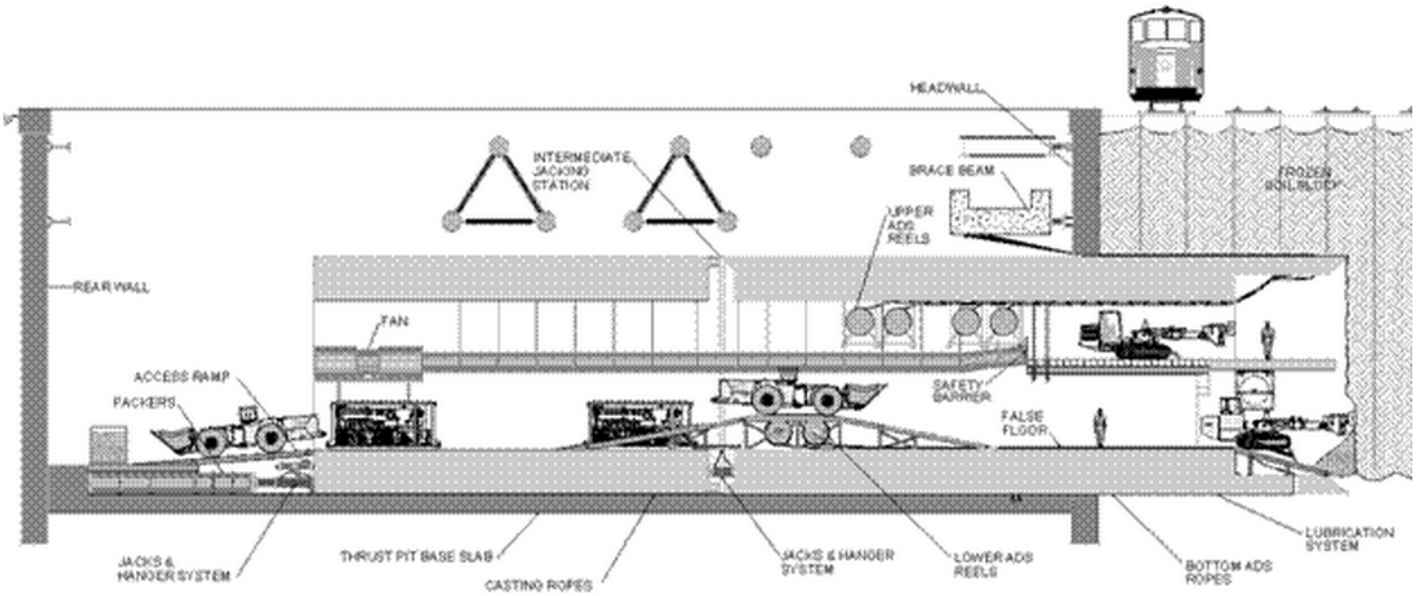
7.2 Jacked Box Tunnel – Alternative Option 2

The Jacked Box Tunnel Option 2 presents a less common approach than Option 1; however it is nonetheless a sound and proven methodology for shallow tunnel construction. The method of Jacked Box tunnel construction is quite common in Europe and Asia and is beginning to gain popularity in the US. The Federal Highway Administration (FHWA) includes a section in their design manual for this method including the submerged construction condition that is present at Kenilworth Channel. Additional information for this method is available in Chapter 12 of the FHWA Tunnel Design Manual at:

http://www.fhwa.dot.gov/bridge/tunnel/pubs/nhi09010/12.cfm.

In addition, available Slide presentations made to MPRB at public meetings in January and February include photos and narratives of the method as used by Brierley Associates for a recently completed Jacked Box

project in Lynchburg, Virginia. The Virginia project was of similar cross sectional area as the Kenilworth tunnel. The sketch below is from the FHWA manual and shows a jacked box being pushed under an active rail line. This example uses ground freezing to control the ground at the face. Note that the sketch does not show the receiving pit beyond.



The Jacked Box method involves digging a pit on either side of the Kenilworth Channel and supporting the pit walls in similar fashion to the cut and cover method (sheet pile walls with bracing and bottom slab). The pits are identified as launching and receiving pits, respectively. The launching pit is larger in order to accommodate the construction of the tunnel box. For Kenilworth, the box will be approximately 205 feet in length and the pit must be at least that large to allow the box and clearances for construction. The receiving pit on the opposite side of the channel is significantly smaller. The jacking process is accomplished by hydraulic equipment and can be done either by pulling the box with high strength steel cables or pushing it with hydraulic rams. We have chosen the pulling method as the most effective for Kenilworth as it also provides improved alignment tolerances compared to the pushing method.

Controlling the ground during the tunneling method is critical. As mentioned previously, the alluvial soils present along with a submerged condition result in a “flowing ground” condition without ground support. Controlling the ground at the open face of the tunnel can be accomplished by ground modification methods such as freezing, grouting with either chemical or cement grouts, or dewatering. Dewatering is not practical due to the high permeability of the soil, the shallow design, and the presence of the channel water as a nearly infinite source of water. Ground freezing is a good option; however, consideration should be given to potential for freezing of portions of the channel water. Grouting of the soil was chosen as the best option for ground improvement. The grouting will provide a stable face at the leading edge of the tunnel during construction, minimize ground water intrusion during construction, and will also serve to impede ground water permanently.

Permanent waterproofing of the tunnel box is imperative to prevent water intrusion and ice damming during cold months. The methods of membrane installation that are considered for the cut and cover tunnel are not practical for the jacked box method. For the Jacked Box method of construction, the tunnel can be effectively waterproofed by a combination of several design features:

- Reinforcement to minimize cracking of concrete

- Water Stops at all construction joints
- A high quality, low permeability, concrete mix design
- A waterproofing admixture in the concrete that effectively fills in microscopic pores in the hardened concrete matrix, reducing permeability. The admixture will also provide a "self-healing" mechanism for small cracks.
- A residual Prestress in the concrete can be developed in the longitudinal direction by standard post-tensioning methods. The Prestress force can eliminate cracking transverse to the tunnel alignment.
- A zone of grouted soil around the perimeter of the tunnel to reduce the permeability that will in turn significantly reduce the potential movement of ground water through the tunnel.

Final design and detailing using these methods will provide a dry tunnel installation.

The vertical alignment of this option is different from the Cut and Cover Option 1 Tunnel. Because the method is based on building a box and then jacking the box into place, there is a flat segment for the length of the box (205 feet.) Also, we've included additional cover between the bottom of channel and the top of the jacked box. With the flat portion and the additional depth for this method, David Evans Associates has created a vertical alignment that meets the SPO design criteria.

The north portal in this alignment is pushed further north and the U-section (transition from portal to on grade track) extends into the area below the existing Burnham Road bridge structure. We reviewed the as-built drawings for the Burnham Road Bridge and its foundations and we believe there is adequate width between bridge piers to accommodate the U section alongside the relocated freight rail. It is probably a tighter fit than desired, however, and we would recommend future final design consideration of shifting the east LRT line to the east side of the bridge pier. There is ample right of way in this area to accommodate this change in horizontal alignment if desired along with the trails to the east. Also, the City of Minneapolis intends to reconstruct the Burnham Road bridge, allowing further opportunity for coordination of LRT alignment.

8. COST CONSIDERATIONS

The cost of the two tunnel options was developed in order to compare the relative cost of each tunnel option with the current SPO bridge design. In order to be consistent and provide "apples to apples" comparisons, we first reviewed cost data provided by SPO for their previously considered shallow tunnel option. Because our Option 1 Cut and Cover Tunnel was nearly identical to the original tunnel crossing considered by SPO, we used the SPO provided cost estimate for this option as a basis for establishing assumptions and unit prices for our estimate of the Option 2 Jacked Box Tunnel.

Using the same unit prices for work scope items that are included in bridge and tunnel options, we developed independent verification of the costs. For work scope items that are unique to the Jacked Box Tunnel Option 2, we based our estimate on previous experience with similar, recent projects and also received informal cost estimates from contractors that are experienced in this type of construction (jacked box method, ground improvement, etc.).

Cost estimates were developed in current dollars. SPO staff then used a conversion for current dollar estimates to year-of-expenditure estimates which were provided to us for review and concurrence. The conversion formula accounts for estimated inflation and required Federal Transportation Administration design contingencies. We met again with SPO staff to review our estimate and methodology and then further refined our cost estimates which are presented in the following tables. The summary tables were provided by SPO.

MPRB OPTION 1 - CUT AND COVER SHALLOW TUNNEL				
		($M BASE YR)		($M YOE)
Tunnel (South)	$	(6.1)	$	(12.4)
Tunnel (Under Channel)	$	41.5	$	84.6
Other (LRT Channel Bridge Deduct, Add'l LRT DF Track)	$	(0.4)	$	(0.8)
ADD'L CAPITAL COST (Δ FROM SPO CURRENT DESIGN)	$	35.0	$	71.4

ADD'L CAPITAL COST (Δ FROM SPO CURRENT DESIGN): $60 M - $75 M

MPRB OPTION 2 - JACKED BOX TUNNEL				
		($M BASE YR)		($M YOE)
Tunnel (South)	$	(6.1)	$	(12.4)
Tunnel (Under Channel)	$	51.1	$	104.3
Other (LRT Channel Bridge Deduct, Add'l LRT DF Track)	$	(0.4)	$	(0.8)
ADD'L CAPITAL COST (Δ FROM SPO CURRENT DESIGN)	$	44.6	$	91.1

ADD'L CAPITAL COST (Δ FROM SPO CURRENT DESIGN): $80 M - $95 M

The Delta costs identified above are costs above and beyond the SPO current bridge design.

One further consideration that may be significant in comparing costs of the current design and the two tunnel options is the potential need for reconsideration of Municipal Consent by the City of Minneapolis and Hennepin County created by the design change. After concurring with our team's estimated costs for tunnel options, SPO stated that changing the design is likely a significant change that will require going through the municipal consent process again. They estimate this will take an additional year including redesign time and approval processes. This cost of an additional delay for a $1.6 Billion project is approximately $45 – 50 million based upon inflation of about 3% annually. At the time of this report draft, the need for this additional approval process has not been confirmed.

9. SCHEDULE CONSIDERATIONS

The impact on project schedule was analyzed for both tunnel options and compared to the currently planned SPO schedule for the LRT Bridge option. As with the cost comparison in section 8 above, existing data was received from SPO and reviewed by the Study team. Due to the preliminary nature of the design in this stage of planning, the schedules are conceptual in nature and based upon numerous assumptions. Our analysis of the schedule was focused on the portion of the project between Cedar Lake Parkway and the Burnham Road Bridge.

The schedules for LRT Tunnel Options 1 and 2 were developed in bar chart form and are shown on Attachment 6. The duration for both options is about 4.5 months longer than the SPO LRT Bridge option. In meeting with the SPO team to review our schedule, it was determined that there is "float" or "slack" time available within their baseline schedule for the work identified for the Kenilworth crossing. This means that increasing the duration for this specific work (Crossing the Kenilworth Channel, whether by bridge or tunnel) will not necessarily increase the duration for the overall project. The slightly longer schedule for tunnel

construction does not impact critical path of the overall project that is determined by other elements of SWLRT project construction. Further detailed development of the design and schedule will provide the project team with opportunities to shift project tasks and plan for concurrent work such that the overall project can be completed without additional time for the Tunnel options.

In addition to reviewing the schedule impact for the tunnel options, we considered the impact to the channel itself in terms of construction activity and the need to periodically close the channel during construction. As show on the attached schedule, we quantified the estimated duration of channel closures for each option. Periods of complete channel closure were identified as well as periods of intermittent channel closure. Based on this analysis, the Jacked Box Option 2 provides the least impact to the use of the channel during construction.

One additional consideration for schedule that may have significant impact is the potential project delay caused by a change in design from bridge to tunnel. It is likely, according to SPO personnel, that the change in design is significant enough to require the Municipal Consent process to be completed again. Based on SPO estimate, the additional time required to redesign the project and then apply for and achieve municipal consent is about one year. As noted in Section * Cost Considerations, the additional project cost if this is required is about $45 – 50 million. Our team believes that the change in design is not significant enough to warrant going through this approval process a second time. At the time of this report draft, this issue has not been confirmed.

10. IMPACTS TO PARK RESOURCES

A significant effort as part of the Study was devoted to investigation of various impacts to the park resources. These studies were conducted by the Barr Engineering team on behalf of our team and are included in the appendices to this report. Based primarily on the visual and noise impacts, it can be concluded that the tunnel options present less impact to the park resource and in particular, the Jacked Box Option 2 presents the least impact as it provides less visual and noise impact once constructed and during construction, it provides for the fewest closure days for the channel.

11. SUMMARY AND CONCLUSIONS

Based upon our team's study of feasibility and prudence factors, the two tunnel options considered for crossing the Kenilworth Channel are both found to be feasible.

Tunnel Option 1, a shallow cut and cover tunnel, is virtually identical to the tunnel crossing that was considered and later abandoned by SPO. The contractor means and methods to be employed by this option will be already implemented with the planned 2,200 lineal foot shallow tunnel south of Kenilworth. Continuing this construction method another 900 feet to cross the Kenilworth Channel will result in additional time and cost that can be calculated and planned for. The method is common and proven and does not present additional unknown cost, schedule, or performance risks.

Tunnel Option 2, a jacked box tunnel, is less disruptive to the use of the channel during construction. It is slightly more expensive than Option 1. While this method is not as common in the US, it has been used extensively in other parts of the world and is becoming more common in the US. The FHWA design manual includes a section on this method for use in difficult, submerged conditions. The additional time and cost associated with this method are presented and there is no additional unknown risk, cost, or schedule impact beyond what is shown herein.

Based upon park (Kenilworth Channel) user impacts analyzed by Barr Engineering (attached Appendices), the tunnel options present a preferred alternative. Changing the design from the planned bridge crossing to one of the two tunnel options at this time can be accomplished with minor impact to the overall project schedule.

Southwest Green Line LRT Extension
Kenilworth Channel Crossing Tunnel Alternative

LRT Alignment, Profile and Operations Technical Memorandum

March 5, 2015

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DAVID EVANS
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Table of Contents

1. Project Understanding

The Minneapolis Park & Recreation Board (MPRB) is concerned about the potential impacts to parklands under its jurisdiction of a light rail grade separation structure over the Kenilworth Crossing for the Southwest Green Line LRT Extension, proposed by the Metropolitan Council. The Kenilworth Channel provides a water course passage between Cedar Lake and Lake of the Isles. A grade separated structure (bridge) over the Kenilworth Crossing has the potential for noise, visual and other impacts to the park resources at the crossing. As a result of these potential impacts the MPRB engaged the study team to develop and assess the feasibility and prudence of extending the planned tunnel to the south of the Kenilworth Crossing so that the LRT line would pass under the Kenilworth Channel. The study team considered a range of design options for a light rail underpass of the Kenilworth Crossing and prepared conceptual designs and analysis for two options.

2. Design Criteria

The conceptual design of the retaining walls, crash walls, and pipe support system for the LRT underpass options was developed in accordance with the following manuals, guidelines, codes, and specifications:

- ***Southwest Green Line LRT Extension Design Criteria Manual***, August 29, 2014, Metropolitan Council. This manual will be hereinafter referred to as the "SPO Design Criteria".
- ***Manual for Railway Engineering***, 2010, American Railway Engineering and Maintenance-of-Way Association (AREMA).
- ***NFPA 130,*** Standard for Fixed Guideway Transit and Passenger Rail Systems, 2010 Edition, National Fire Protection Association (NFPA).

3. Design Speed

The design speed for the LRT is proposed to be 45 mph in the tunnel under Kenilworth Channel. This design speed is unchanged from the currently proposed SPO grade separation alternative over the channel.

4. Horizontal LRT Alignment

The horizontal LRT alignment in the tunnel under Kenilworth Crossing would follow the preliminary engineering alignment previously developed by SPO. The track center spacing would be 16'-0", which is unchanged from the SPO design. No changes are necessary to circular curve radii, spiral transition curve lengths or tangent lengths. The track under the channel is in tangent.

5. Vertical LRT Profile

The following are the design criteria limitations for lengths of vertical curves, tangent lengths between reversing vertical curves and tangential gradients. These values are taken from the SPO Design Criteria.

5.1. Vertical Curves, Tangents and Grade Design Criteria

Vertical Curve Lengths

Per Section 3.3.3 of the SPO Design Criteria, minimum length of vertical curves (LVC) shall be:

- Desirable length LVC = 200 x A
- Acceptable length LVC = 100 x A

The absolute minimum length of vertical curves shall be determined by the following formulas, rounded up to the next even 10-ft. length, and not less than 100-ft.

- Crest curves $LVC = (AV^2)/25$
- Sag curves $LVC = (AV^2)/45$

Where $A = (G_D - G_A)$ algebraic difference in gradients connected by the vertical curve, in percent, G_A is the approaching tangent and G_D is the departing tangent.

Tangent Lengths between Reversing Curves

Per Section 3.3.2 of the SPO Design Criteria, minimum length of constant grade between vertical curves (Lg) shall be:

Lg = 3V

Lg = 100’ (desirable minimum)

Lg = 50’ (absolute minimum)

Where: Lg = Length of constant profile grade (ft.)

V = Design velocity (miles per hour)

Gradients

Per Section 3.3.2 of the SPO Design Criteria, the following grade limitations apply:

- Maximum (sustained grade unlimited length) = 4.0%
- Maximum (sustained grade with up to 2500’ between PVI’s of vertical curves) = 6.0%
- Minimum (for drainage on direct fixation and embedded track) = 0.20%
- Minimum (for drainage on tie and ballasted track) = 0.00%

5.2. Cut and Cover Box Alternative

For the Cut and Cover Box tunnel alternative, refer to the tunnel profile graphic. The proposed gradients are:

Gradient	Slope	SPO Design Criteria Maximum[1] (%)	Algebraic Difference $A = (G_D-G_A)$
G_1	-0.30%	6.00%	
			-4.70%
G_2	-5.00%		
			10.85%
G_3	5.85%		
			-5.65%
G_4	0.20%		

[1] sustained grade up to 2500 ft. between PVIs of vertical curves

The proposed vertical curve lengths compared to SPO Design Criteria are:

Vertical Curve No.	Vertical Curve Proposed Length (ft.)	SPO Design Criteria			
		Desirable Minimum Length (ft.) (200A)	Acceptable Minimum Length (ft.) (100A)	Absolute Minimum Length (ft.) ($AV^2/25$)	Absolute Minimum Length (ft.) ($AV^2/45$)
VC1 (Crest)	390	940	470	390	-
VC2 (Sag)	490	2170	1090	-	490
VC3 (Crest)	460	1130	570	460	-

The proposed tangent lengths are:

Tangent No.	Tangent Proposed Length (ft.)	SPO Design Criteria	
		Desired 3V = 3 x 45 mph (ft.)	Desired Minimum (ft.)
1	120	135	100
2	336		

The choice of proposed gradients, vertical curve lengths and tangent lengths between vertical curves to develop the cut and cover tunnel profile were based on several factors. These included:

- To locate the deepest part of the cut and cover box near the center of the channel while maintaining a sufficient amount of earth cover over the tunnel box (8.1 ft.)
- To daylight to existing ground before or directly under the Burnham Road Overcrossing.

- Increasing the length of Tangent No. 1 would compromise the ability to daylight before or under the Burnham Road Overcrossing and potentially require retaining walls at the portal, which increases construction costs. The proposed length of Tangent No. 1 exceeds the SPO desired minimum length.
- The steepest profile grade reported by SPO elsewhere within the Minneapolis area LRT system is 5.85%.

5.3. Jacked Box Alternative

For the Jacked Box tunnel alternative, refer to the tunnel profile graphic. The proposed gradients are:

Gradient	Slope	SPO Design Criteria Maximum[1] (%)	Algebraic Difference $A = (G_D-G_A)$
G_1	-0.30%	6.00%	
			-5.10%
G_2	-5.40%		
			5.60%
G_3	0.20%		
			5.65%
G_4	5.85%		
			-5.65%
G_5	0.20%		

[1] sustained grade up to 2500 ft. between PVI's of vertical curves

The proposed vertical curve lengths are:

Vertical Curve No.	Vertical Curve Proposed Length (ft.)	SPO Design Criteria			
		Desirable Minimum Length (ft.) (200A)	Acceptable Minimum Length (ft.) (100A)	Absolute Minimum Length (ft.) ($AV^2/25$)	Absolute Minimum Length (ft.) ($AV^2/45$)
VC1 (Crest)	420	1020	510	420	-
VC2 (Sag)	260	1120	560	-	260
VC3 (Sag)	260	1130	570	-	260
VC4 (Crest)	460	1130	570	460	-

The proposed tangent lengths are:

Tangent No.	Tangent Proposed Length (ft.)	SPO Design Criteria	
		Desired 3V = 3 x 45 mph (ft.)	Desired Minimum (ft.)
1	107	135	100
2	205		
3	368		

The choice of proposed gradients, vertical curve lengths and tangent lengths between curves to develop the cut and cover tunnel profile were based on several factors. These included:

- To locate the center of the box near the center of the channel while maintaining a sufficient amount of earth cover over the tunnel box (9-10 ft.) for jacking of the box structure.
- Jacking of the tunnel box structure requires a tangential surface under the creek. This surface is sloped for collection of drainage water.
- Due to the tangent tunnel section under the channel, the jacked box alternative will daylight approximately 250 feet north of the Burnham Road Overcrossing at the tunnel portal. Under the bridge, the track slab will be partially submerged in a "U" shaped concrete structure with retaining walls that diminish in height as the track profile approaches existing grade. In reviewing existing drawings for the existing bridge structure and its foundations, it appears this will fit between the bridge piers adequately along with the relocated freight line. The fit may be tighter than desired and an alternative Split Option may be explored during advanced design phases as noted below (Section 6).

6. Horizontal LRT Alignment Split Option at the Burnham Road Overcrossing

For the Jacked Box Alternative, one alternative to the current SPO horizontal alignment would be to split LRT track centerlines between Bent No. 2 under the Burnham Road Overcrossing. Dividing the track centerlines with one on each side of the bridge pier affords some alignment configuration options that could simplify construction of the "U" shaped structure under the bridge and decrease the proximity to the bridge piers. The LRT track centerlines diverge as the proposed alignment approaches the 21st Street Station to accommodate a center-loading platform.

7. Tunnel Operational Considerations

Operational considerations within the tunnel must take into account fire-life safety requirements contained in NFPA 130, Standard for Fixed Guideway Transit and Passenger Rail Systems. This document outlines the fire-life safety requirements for Stations, Trainways, Emergency Ventilation, Communication, Lighting and other safety requirements.

7.1. Emergency Egress Underground

Exit Stairs

Per NFPA-130 Chapter 6, "Trainways," § 6.2.2.2, in underground or enclosed trainways, the maximum distance between exits shall not exceed 2,500 ft. The length of the tunnel (beginning approximately 700 ft. north of the proposed West Lake Station to the Burnham Road Overcrossing is almost 3,500 ft. in length). Therefore, at least one emergency exit would be required between tunnel portals. This emergency exit would likely consist of two stair towers (one for each LRT track) to provide an evacuation route to a suitable surface refuge location, such as an area adjacent to a roadway.

Cross-Passageways

In lieu of exit stairs to the surface, NFPA Chapter 6, § 6.2.2.3, permits cross-passages where trainways in tunnels are divided by a minimum 2 hour-rated firewall or where trainways are in twin bores.

7.2. Emergency Ventilation

Per NFPA Chapter 7, "Emergency Ventilation System," mechanical emergency ventilation is required in underground or enclosed trainways greater in length than 1,000 ft. The currently proposed SPO tunnel addresses the need for mechanical emergency ventilation at the southern portal. Based on a tunnel ventilation analysis, additional emergency ventilation fans may be required to support the added tunnel length for the Kenilworth Crossing.

7.3. Drainage

The currently proposed SPO tunnel drains to the north and would collect in a sump at the northern tunnel portal. The addition of a proposed tunnel extension under the Kenilworth Crossing would move this sump collection point northward under the channel. A suitably-sized sump pump and drain box would be required at the low point of the tunnel profile.

7.4. Emergency Lighting & Fire Protection

Emergency lighting and fire protection are required in underground trainways. These requirements are detained in NFPA 101, "Life Safety Code," and NFPA 14, "Standard for the Installation of Standpipe and Hose Systems". These systems are required for the currently proposed SPO tunnel without the Kenilworth Crossing tunnel extension and therefore not discussed in this memorandum.

Tunnel Profile Graphics

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BARR

Memorandum

To: Todd Christopherson, Brierley Associates
From: Eric Holt, Barr Engineering Co.
Subject: Kenilworth Channel Alternatives Assessment: Visual Impacts
Date: March 5, 2015
Project: 23271414.00
c: Michael Schroeder (MPRB), Jim Herbert (Barr)

The purpose of this memorandum is to provide a summary of the evaluation that assesses and identifies the least impactful alternative for the Southwest Light Rail Transit (SWLRT) crossing of the Kenilworth Channel, a property owned by the Minneapolis Park and Recreation Board (MPRB). Whereas the focus on Phase 1 of the project was to demonstrate the feasibility of a tunnel alternative under the Kenilworth Channel, the intent of Phase 2 of the project is to address impacts of the alternatives for crossing the channel relative to the park and park resources. The Kenilworth Channel crossing alternatives evaluated include:

- Alternative 1: SWLRT Project Office (SPO) Bridge Option
- Alternative 2: Cut and Cover Tunnel (Tunnel Option 1)
- Alternative 3: Jacked Box Tunnel (Tunnel Option 2)

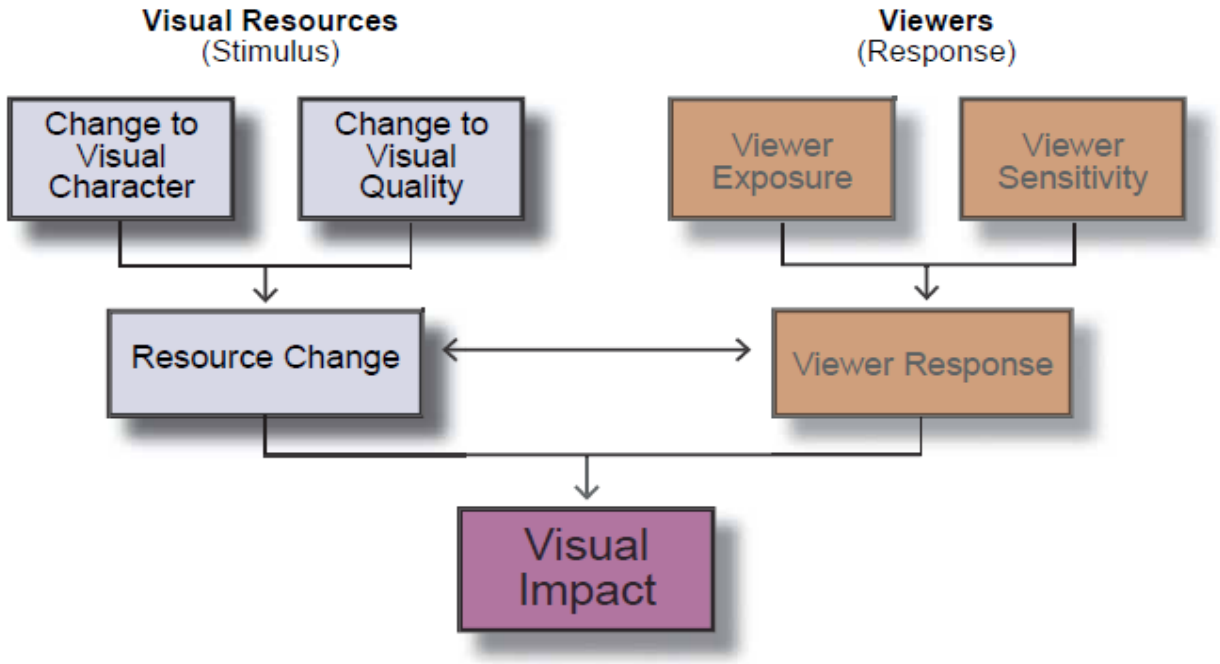
This memorandum is specifically related to the evaluation of the referenced focus area. The full visual impact assessment document is attached to this memorandum for reference.

Methodology

This Visual Impact Assessment (VIA) generally follows the guidance outlined in the publication Visual Impact Assessment for Highway Projects published by the Federal Highway Administration (FHWA) in March 1981 and the Updated Guidelines as described in the December 2014 issue of the 'Successes in Stewardship' newsletter from FHWA, as well as the Moderate Level Visual Impact Assessment document template developed by the California Department of Transportation. The following steps were followed to assess the potential visual impacts of the proposed project alternatives:

- Define the project location and setting.
- Identify visual assessment units and key views.
- Analyze existing visual resources, resource change and viewer response.
- Depict (or describe) the visual appearance of project alternatives.
- Assess the visual impacts of project alternatives.
- Propose measures to mitigate visual impacts.

The visual impact assessment process is illustrated in the following diagram, and each step is described in greater detail in the attached VIA document.



Identification

The study area is specifically focused on the intersection of the proposed SWLRT alignment, which runs along the existing Hennepin County freight rail and regional trail corridor, and the Kenilworth Channel, the MPRB-owned watercourse which connects Cedar Lake and Lake of the Isles. The landscape is characterized by open, maintained trail corridors lined with deciduous vegetation. These corridors are defined as the area of land or water that is visible from, adjacent to, and outside the regional trail and water trail and is determined by topography, vegetation, and viewing distance. The adjacent land use to the corridors is primarily urban, single-family residential housing, but also includes areas of public open space and parkland.

The project area has been divided into “outdoor rooms” or visual assessment units. Each visual assessment unit has its own visual character and visual quality. These visual assessment units are defined by the limits of the viewsheds of key views into and within the project area related to the Kenilworth Channel and Kenilworth Trail corridors. The following two visual assessment units and their associated Key Views (KV) have been identified below.

Visual impacts of the three channel crossing alternatives are assessed at each of these Key Views in the attached VIA document.

Assumptions (or Considerations)

This opinion of least impactful alternative is based on several assumptions, which may change as the project develops. The significant assumptions used to complete this evaluation are summarized below.

- Descriptions of resource change related to the design and layout of each alternative are based on information made available by the Southwest LRT Project Office (SPO) and the preliminary tunnel engineering design by Brierley Associates.

- All resource change descriptions and visualizations related to the new Kenilworth Channel bridges are based on the 'Arched Pier Bridge Concept' provided by the SPO. It is assumed that this bridge design represent the 'worst case scenario' that provides a benchmark for assessing visual impacts. Alternative bridge designs are discussed in this study as a mitigation strategy and should be considered in future permitting and design phases of the SWLRT project.

- Visualizations used to depict the visual appearance of project alternatives are based on illustrative renderings and schematic plans of the Kenilworth Channel bridge provided by the SPO, as well as Google Street View imagery and on site investigations.

Tools

This opinion of least impactful alterative is based on several qualitative and quantitative tools used in concert to assess visual impacts for each alternative at each Key View. These include the following:

- Narrative descriptions of resource change and visual impacts
- Illustrative depictions of resource change and visual impacts
- Worksheets that rate the degree of resource change and viewer response on a numerical scale

The results of these tools were compared for each alternative and evaluated for visual impacts to the users of the Kenilworth Channel based on available knowledge of the site and available information provided by MPRB and SPO. These narrative descriptions, illustrative depictions, and ratings worksheets can be found in the attached VIA document.

Results and Discussion

The table below summarizes and compares the ratings for visual resource change, viewer response and permanent visual impacts between alternatives for each Key View.

Summary of Visual Impact Ratings by Key View

VISUAL ASSESSMENT UNIT	KEY VIEW (KV)	ALT. 1: SPO Bridge Option			ALT. 2&3: MPRB Options 1&2		
		Resource Change	Viewer Response	Visual Impact	Resource Change	Viewer Response	Visual Impact
1-Kenilworth Channel	1	**MH**	**MH**	**MH**	**M**	**MH**	**MH**
	2	**M**	**ML**	**M**	**ML**	**ML**	**ML**
	3	**MH**	**M**	**MH**	**M**	**M**	**M**
2-Kenilworth Trail Corridor	4	**ML**	**M**	**M**	**ML**	**M**	**M**
	5	**MH**	**M**	**MH**	**ML**	**M**	**M**

For all Key Views in both visual assessment units identified in this study, permanent visual impacts of the proposed Alternatives 2 and 3 are less than or equal to permanent visual impacts of Alternative 1.

It is anticipated that temporary visual impacts to the Kenilworth Channel related to the construction of Alternative 3 would be less than those related to the construction of Alternative 1 and Alternative 2. Temporary impacts related to construction activity are discussed in greater detail in the attached VIA document.

Opinion of Least Impactful Alternative

When temporary construction impacts are combined with permanent impacts to assess overall cumulative visual impacts, Alternative 3: Jacked Box Tunnel (Tunnel Option 2) is considered the least impactful alternative for the Kenilworth Channel LRT crossing.

Mitigation Strategy

This section describes avoidance, minimization, and/or mitigation measures that should be considered to address specific visual impacts of the proposed alternatives in the Draft EIS and final design phases of the project. Mitigation treatments for visual impacts should be developed through discussion with affected communities, resource agencies, and stakeholders. Measures should be taken to ensure the design and construction of the selected alternative is sensitive to the existing visual quality of the corridor, its viewers, and key views.

Suggested visual mitigation measures include the following:

- Select context-sensitive materials for all bridge, LRT and train, and trail infrastructure visible to Kenilworth Trail and Kenilworth Channel water trail users. Priority should be given to considering form, line, texture, and color of the materials in order to blend these features into their surroundings in a visually harmonious and consistent manner
- Minimize scale of all new bridges over the Kenilworth Channel. Priority should be given to design structures that minimize bridge deck profile thickness and the number piers in order to maximize the clear span length over the channel corridor. This may also include separating the combined pedestrian/LRT bridge proposed in Alternative 1 into two separate bridges, allowing for the inclusion of a less massive pedestrian bridge. A visualization of a lightweight pedestrian/bicycle trail truss bridge as visual impact mitigation measure is included in the attached VIA document.
- Restore channel and bank plantings and walls to create a consistent shoreline along the Kenilworth Channel water trail
- Restore Kenilworth Trail corridor plantings to visually screen freight rail traffic and sound walls, screen walls, and retaining walls from pedestrians and cyclists where possible
- Restore Kenilworth Trail corridor plantings to visually screen LRT train traffic and associated above-ground infrastructure such as tunnel portal walls, fencing, and catenary poles from pedestrians and cyclists where possible
- Incorporate evergreen species into the vegetative screening to supplement deciduous vegetation buffers in leaf-off conditions

Attachments

Visual Impact Assessment SWLRT Kenilworth Channel Crossing Alternatives

Attachment 1:

VISUAL IMPACT ASSESSMENT
SWLRT Kenilworth Channel Crossing Alternatives

I. PURPOSE OF STUDY

The purpose of this visual impact assessment (VIA) is to document potential visual impacts caused by the proposed project alternatives and propose measures to lessen any detrimental impacts that are identified. Visual impacts are demonstrated by identifying visual resources in the project area, measuring the amount of change that would occur as a result of the project, and predicting how the affected public would respond to or perceive those changes.

II. PROJECT DESCRIPTION

Current plans for the Southwest Light Rail Transit Project (SWLRT) bring the alignment over the Kenilworth Channel, co-locating freight, light rail and trail in the Kenilworth corridor and requiring significant at-grade infrastructure in and around the Kenilworth Channel that will fundamentally and permanently affect and change park, recreation area, and historic property. As the agency with jurisdiction over the Kenilworth Channel, the MPRB Board of Commissioners passed a resolution and notified the SWLRT Project Office of the MPRB's concern about the project's effect on parkland and requested the SWLRT Project Office conduct preliminary engineering feasibility and cost analysis of tunneling under the Kenilworth Channel. The MPRB has stated its position that, based on SWLRT Project Office preliminary finding of feasibility, tunneling LRT under the Kenilworth Channel may be the only Section 4(f) prudent and feasible alternative.

This study will specifically address the visual impacts related to the infrastructure proposed for the project alternatives, including the removal, replacement, and expansion of bridges at the channel crossing, and the installation of retaining walls and safety fencing at the tunnel portal, as well as the trains, track, catenary poles and wires, signs, and other permanent elements related to the LRT fixed guideway. Temporary visual impacts related to construction methods and staging will also be discussed.

This VIA examines three alternatives, including both temporary construction impacts and permanent impacts. A no-build alternative is not considered in this assessment. The alternatives assessed in this study are:

- Alternative 1: SWLRT Project Office (SPO) Bridge Option
- Alternative 2: Cut and Cover Tunnel (Tunnel Option 1)
- Alternative 3: Jacked Box Tunnel (Tunnel Option 2)

For the purposes of this VIA, permanent visual impacts of Alternatives 2 and 3 on the Kenilworth Channel are considered to be identical and will be discussed as such. Temporary visual impacts related to the construction methods particular to Alternatives 2 and 3 are considered to have differing impacts and will be discussed individually.

III. PROJECT LOCATION AND SETTING

The study area location and setting provide the context for determining the type and severity of changes to the existing visual environment. The terms *visual character* and *visual quality* are defined below and are used to further describe the visual environment.

The study area is located within Segment 3 of the SWLRT alignment between the 21st Street Station and the West Lake Station in the Cedar-Isles-Dean neighborhood of the City of Minneapolis in Hennepin County, Minnesota. The study area is specifically focused on the intersection of the proposed SWLRT alignment, which runs along the existing Hennepin County freight rail and regional trail corridor, and the Kenilworth Channel, the MPRB-owned watercourse which connects Cedar Lake and Lake of the Isles. The landscape is characterized by open, maintained trail corridors lined with deciduous vegetation. These corridors are defined as the area of land or water that is visible from, adjacent to, and outside the regional trail and water trail and is determined by topography, vegetation, and viewing distance. The adjacent land use to the corridors is primarily urban, single-family residential housing, but also includes areas of public open space and parkland.

The Kenilworth Channel has been determined by the MPRB to be a FTA Section 4(f) resource due to its use as a public park, recreation area, and historic site. This VIA is intended to complement the Section 4(f) resource impact assessment study submitted with this report.

IV. ASSESSMENT METHOD

This VIA generally follows the guidance outlined in the publication *Visual Impact Assessment for Highway Projects* published by the Federal Highway Administration (FHWA) in March 1981 and the Updated Guidelines as described in the December 2014 issue of the 'Successes in Stewardship' newsletter from FHWA, as well as the Moderate Level Visual Impact Assessment document template developed by the California Department of Transportation.

The following steps were followed to assess the potential visual impacts of the proposed project:

A. Define the project location and setting.
B. Identify visual assessment units and key views.
C. Analyze existing visual resources, resource change and viewer response.
D. Depict *(or describe)* the visual appearance of project alternatives.
E. Assess the visual impacts of project alternatives.
F. Propose measures to mitigate visual impacts.

Resource change assumptions related to the design and layout of each alternative are based on information made available by the Southwest LRT Project Office (SPO) and the preliminary tunnel engineering design by Brierley Associates. All resource change descriptions and visualizations related to the new Kenilworth Channel bridges are based on the 'Arched Pier Bridge Concept' provided by the SPO. It is assumed that this bridge design represents the 'worst case scenario' that provides a benchmark for assessing visual impacts. Alternative bridge designs are discussed in this study as a mitigation strategy and should be considered in future permitting and design phases of the SWLRT project.

Visualizations used to depict the visual appearance of project alternatives are based on illustrative renderings and schematic plans of the Kenilworth Channel bridge provided by the SPO, as well as Google Street View imagery, and on site investigations.

V. VISUAL ASSESSMENT UNITS AND KEY VIEWS

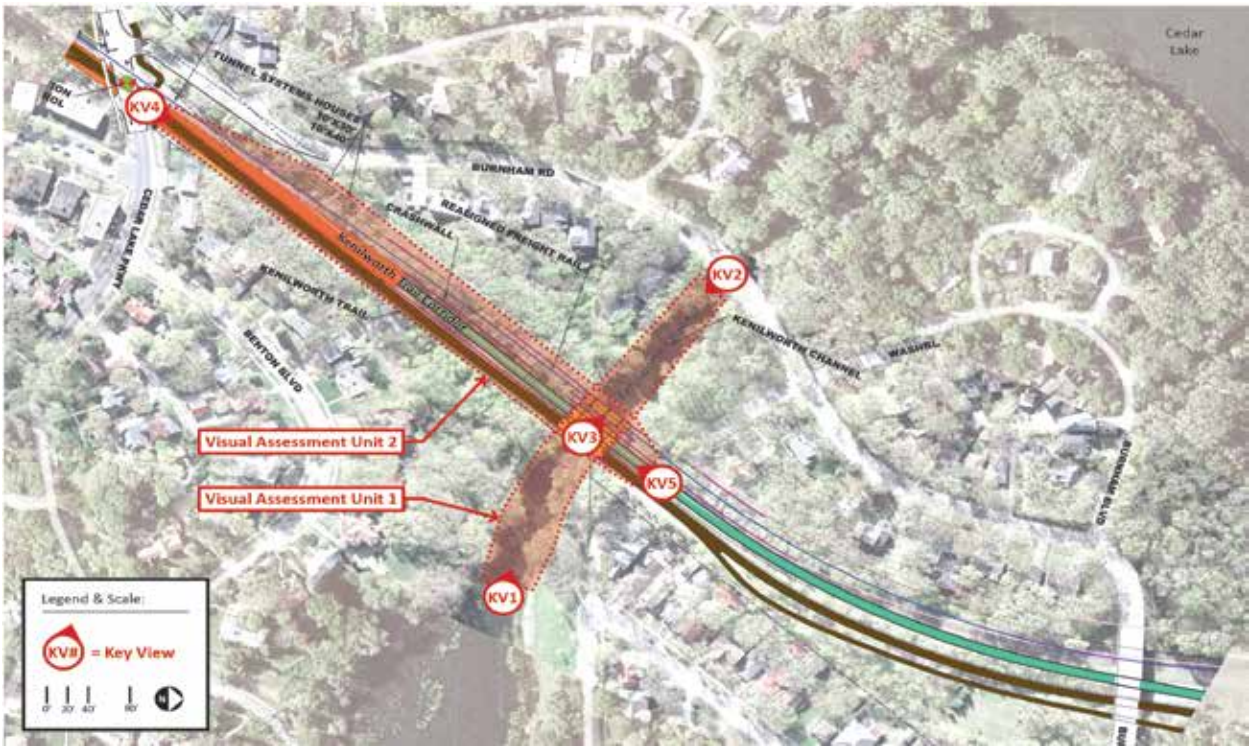
The project area has been divided into "outdoor rooms" or *visual assessment units*. Each visual assessment unit has its own visual character and visual quality. These visual assessment units are defined by the limits of the viewsheds of key views into and within the project area related to the Kenilworth Channel and Kenilworth Trail corridors. For this project, the following two visual assessment units and their associated Key Views (KV) have been identified:

- **Visual Assessment Unit 1: Kenilworth Channel Corridor**
  Defined by viewshed limits of Key View 1, looking westerly from within the Kenilworth Channel towards the trail and freight rail bridge, to Key View 2, looking easterly into the Kenilworth Channel from the Burnham Road channel bridge. Key View 3, looking westerly from the Kenilworth Trail Bridge down into the Kenilworth Channel, is also considered in this visual assessment unit.

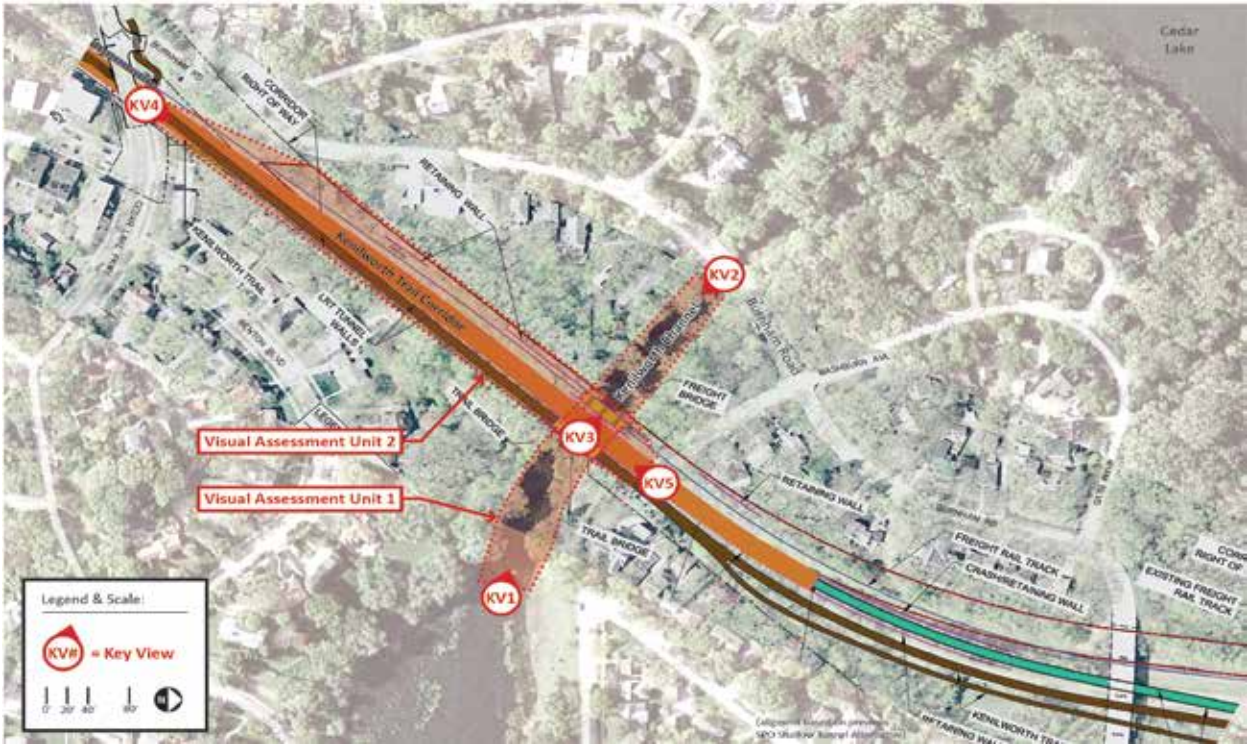
- **Visual Assessment Unit 2: Kenilworth Trail Corridor**
  Defined by viewshed limits of Key View 4, looking northerly from within the corridor from Cedar Lake Parkway towards the trail and freight rail bridges, to Key View 5, looking southerly down the corridor from the north side of the Kenilworth Trail Bridge over the Kenilworth Channel.

The figures below illustrate the visual assessment units and key views for the project, shown in the context of existing conditions and the design alternatives.

Visual Assessment Units Map Showing Existing Conditions



Visual Assessment Units Map Showing Proposed Design Alternative 1: SPO Bridge Option



Visual Assessment Units Map Showing Proposed Design Alternatives 2&3: Tunnel Options 1 & 2. Because detailed alignments and plan drawings were not prepared for this study, this figure is based on the previous SPO Short Tunnel Alignment alternative.

VI. VISUAL RESOURCES AND RESOURCE CHANGE

Resource change is assessed by evaluating the visual character and the visual quality of the visual resources that comprise the project area before and after the construction of the proposed project. Resource change is one of the two major variables in the equation that determines visual impacts (the other is *viewer response*, discussed below in *Section VII Viewers and Viewer Response*).

Visual Resources

Visual resources of the project setting are defined and identified below by assessing visual character and visual quality in the project area.

VISUAL CHARACTER

Visual character includes attributes such as form, line, color, and texture, and is used to describe, not evaluate; that is these attributes are neither considered good nor bad. However, a change in visual character can be evaluated when it is compared with the viewer response to that change. Changes in visual character can be identified by how visually compatible a proposed project would be with the existing condition by using visual character attributes as an indicator. For this project the following attributes were considered:

Form - visual mass or shape

Line - edges or linear definition

Dominance - position, size, or contrast

Scale - apparent size as it relates to the surroundings

The visual character of the proposed project alternatives will be somewhat compatible with the existing visual character of both Visual Assessment Units within the project area for all project alternatives considered. However, the degree of compatibility differs between Alternative 1 and Alternatives 2 and 3, and as seen from different Key Views.

VISUAL QUALITY

Visual quality is evaluated by identifying the vividness, intactness, and unity present in the project area. Public attitudes validate the assessed level of quality and predict how changes to the project area can affect these attitudes. This process helps identify specific methods for addressing each visual impact that may occur as a result of the project. The three criteria for evaluating visual quality are defined below:

Vividness is the extent to which the landscape is memorable and is associated with distinctive, contrasting, and diverse visual elements.

Intactness is the integrity of visual features in the landscape and the extent to which the existing landscape is free from non-typical visual intrusions.

Unity is the extent to which all visual elements combine to form a coherent, harmonious visual pattern.

The visual quality of the existing Visual Assessment Units within the project area will be altered by all proposed project alternatives. The degree to which the visual quality is altered varies between Alternative 1 and Alternatives 2 and 3, and as seen from different Key Views.

Resource Change

Existing Conditions: Visual Assessment Unit 1 – Kenilworth Channel Corridor

Shallow sloping banks and mature vegetation line the channel corridor for the length of the project area, creating an enclosed form and screening views to and from adjacent residential areas and parklands. The majority of the vegetation located along the corridor is deciduous, so screening is diminished during seasonal leaf-off conditions. The reflectivity of the water surface reinforces the linearity of the channel corridor, which is nearly symmetrical vertically and horizontally. The overhanging tree limbs and bridge piers and decking further reinforces the tunnel-like appearance of the corridor. This unified visual corridor is interrupted by the dominating scale and form of the bridge structures, which create a more vivid visual experience. The sunken channel is punctuated by rhythmic contrast of light and shadow, and the rectilinear form of bridge infrastructure becomes a defining part of the visual unity of the channel corridor. The bridge infrastructure combines with the surrounding vegetation creating a visual quality that is vivid though not very intact, though the dark-colored, minimally-scaled bridge materials blend well with the surrounding vegetation in a way that unifies the scene.

Existing Conditions: Visual Assessment Unit 2 – Kenilworth Trail Corridor

Mature vegetation buffers the gently curving corridor for the length of the project area, creating an enclosed form and screening views to and from adjacent residential areas and parklands. The majority of the vegetation located along the corridor is deciduous, so screening is diminished during seasonal leaf-off conditions. Freight trains of varying length travel in the corridor during the daytime and at night. Paved walking and biking trails parallel the freight rails, reinforcing the linearity of the corridor. At the Kenilworth Channel crossing, the trail crossing is defined by large open bridge decks punctuated by vertical, open railings and fencing which separate the rail and trail sections. Views from the bridge into the channel are relatively open and invite passersby to pause and look down the channel corridor, creating a vivid visual experience at this intersection. The bridge and trail infrastructure combine with the surrounding vegetation to set a visual precedent that is vivid though not very intact, though the dark colored, minimally-scaled bridge materials blend well with the surrounding vegetation in a way that unifies the scene.

Proposed Alternative 1: SPO Bridge Option

The Kenilworth Channel Corridor will be impacted due to the temporary demolition and removal of the existing bridge structure, as well as the permanent installation of a new freight rail bridge and an expanded trail bridge that will also accommodate the LRT tracks. These new massive concrete bridges will more than double the existing the scale of the bridges over the channel, fully enclosing the water trail and shading the channel from sunlight for approximately 80', with a 9' gap between the two bridges. This massive bridge deck will also screen the west view of the channel from the pedestrian bridge above, limiting views into the channel resource. The form and materials of the proposed bridges, although more consistent with other bridges in the adjacent parklands, will contrast greatly with the surrounding vegetation and landform. The addition of intermittent LRT trains crossing the bridge every 5-10 minutes will distract water trail users and greatly impact the visual quality of the scene.

The Kenilworth Trail Corridor will be widened to accommodate the co-located LRT and freight rail tracks and the regional trails. The resulting loss of vegetation will create a more expansive, open visual corridor, allowing users to see farther down the corridor. The corridor will also become less intact as disparate visual elements such as LRT tunnel portal walls, fencing, overhead lines, and other infrastructure are introduced. The tunnel portal itself will be installed adjacent to the south side of the channel, and be

highly visible from viewers on the pedestrian bridge. And the LRT trains running every 5-10 minutes through the project area will be increase the disturbance to the existing visual unity of the area.

Proposed Alternatives 2 and 3: Tunnel Options 1 and 2

The Kenilworth Channel Corridor will be impacted due to the temporary demolition and removal of the existing bridge structure, as well as the permanent installation of a new freight rail bridge and rebuilt, single-use trail bridge. The new freight and trail bridges will be approximately 26' wide and set 40' apart, thereby allowing sunlight and views from the pedestrian bridge to penetrate down into the channel between the bridges. The form and materials of the proposed bridges, although more consistent with other bridges in the adjacent parklands, will contrast greatly with the surrounding vegetation and landform.

The Kenilworth Trail Corridor will be widened to accommodate the co-located LRT and freight rail tracks and the regional trails. The resulting loss of vegetation will create a more expansive, open visual corridor, allowing users to see farther down the corridor. The corridor will also become less intact as disparate visual elements such as LRT tunnel portal walls, fencing and overhead lines, and other infrastructure are introduced. The tunnel portal will be installed far enough away from the Kenilworth Channel that, combined with the curving corridor, it will be screened from view from the channel trail bridge. In this location the portal infrastructure will have a greater impact on viewers from the Burnham Road Bridge over the trail corridor. The LRT trains running every 5-10 minutes through the project areas will be a high impact disturbance to the existing visual unity of the area.

Resource changes specific to each Key View are discussed and rated in *Section VIII: Visual Impacts*.

VII. VIEWERS AND VIEWER RESPONSE

The population affected by the project is composed of *viewers*. Viewers are people whose views of the landscape may be altered by the proposed project—either because the landscape itself has changed or their perception of the landscape has changed.

Viewers, or more specifically the response viewers have to changes in their visual environment, are one of two variables that determine the extent of visual impacts that will be caused by the construction and operation of the proposed project. The other variable is the change to visual resources discussed earlier in *Section VII Visual Resources and Resource Change*.

Types of Viewers

There are two major types of viewer groups considered in this study: Kenilworth Channel water trail users and Kenilworth Regional Trail users. A third group of viewers impacted by the proposed alternatives, Kenilworth Channel neighbors, are not considered in this study. Each viewer group has their own particular level of *viewer exposure* and *viewer sensitivity*, resulting in distinct and predictable visual concerns for each group which help to predict their responses to visual changes.

Kenilworth Channel Users

Channel Users include water trail users, people who have views *from* the channel *towards* the channel bridges at the project area, and Burnham Road bridge users that have views *from* the bridge down *into* the channel. For this project the following channel users were considered:

- Paddlers (summer use on the water trail)
- Skiers (winter use on the water trail)
- Pedestrians (winter use on the water trail, all seasons on the Burnham Bridge)
- Drivers (all seasons on the Burnham Bridge)

Kenilworth Trail Users

Trail Users are people who have views *from* the regional trail corridor, *towards* the channel bridges and *into* the channel, including views from the Cedar Lake Parkway intersection with the trail. For this project the following trail users were considered:

- Pedestrians (all seasons)
- Cyclists (all seasons)
- Drivers (all seasons)

Viewer Response

Viewer response is a measure or prediction of the viewer's reaction to changes in the visual environment and has two dimensions as previously mentioned, viewer exposure and viewer sensitivity.

VIEWER EXPOSURE

Viewer exposure is a measure of the viewer's ability to see a particular object. Viewer exposure has three attributes: location, quantity, and duration. *Location* relates to the position of the viewer in relationship to the object being viewed. The closer the viewer is to the object, the more exposure.

Quantity refers to how many people see the object. The more people who can see an object or the greater frequency an object is seen, the more exposure the object has to viewers. *Duration* refers to how long a viewer is able to keep an object in view. The longer an object can be kept in view, the more exposure. High viewer exposure helps predict that viewers will have a response to a visual change.

Kenilworth Channel Users

Viewer exposure for water trail users is considered moderate due the quantities of summer and winter users of the water trail, the long duration of views of the channel bridges (due to the long, linear viewshed corridor and the relatively slow-moving paddlers and skiers), and the adjacent location of the water trail to the channel bridges (users must pass the channel bridges). Viewer exposure for pedestrians and drivers crossing the Burnham Road Bridge over the channel is considered low, due to the length of the viewshed and the short duration of the view.

Kenilworth Trail Users

Viewer exposure for Kenilworth Trail users is moderate due the quantities of summer and winter users of the water trail, the mixed duration of views of the channel from the trail (due to the curving viewshed corridor and the varied speeds of the cyclist and pedestrian users), and the adjacent location of the water trail to the channel bridges (users view the channel from above while crossing the channel bridges). Cyclists should have a lower viewer exposure than pedestrians due to the decreased duration of view.

VIEWER SENSITIVITY

Viewer sensitivity is a measure of the viewer's recognition of a particular object. It has three attributes: activity, awareness, and local values. *Activity* relates to the preoccupation of viewers—are they preoccupied, thinking of something else, or are they truly engaged in observing their surroundings. The more they are actually observing their surroundings, the more sensitivity viewers will have of changes to visual resources. *Awareness* relates to the focus of view—the focus is wide and the view general or the focus is narrow and the view specific. The more specific the awareness, the more sensitive a viewer is to change. *Local values* and attitudes also affect viewer sensitivity. If the viewer group values aesthetics in general or if a specific visual resource has been protected by local, state, or national designation, it is likely that viewers will be more sensitive to visible changes. High viewer sensitivity helps predict that viewers will have a high concern for any visual change.

Kenilworth Channel Users

Viewer sensitivity for water trail users is considered high because low-impact recreational activities such as paddling and cross-country skiing allow users to be fully engaged in their surroundings. The long, linear viewshed corridor also focuses users' awareness on the channel bridges as a specific focal point. And water trail users who engage in these low-impact recreational activities typically value the quietude and calm beauty of unspoiled natural areas, and will be highly sensitive to visual impacts from transportation infrastructure. Viewer sensitivity for pedestrians and drivers crossing the Burnham Road Bridge over the channel is considered moderately-low, due to the viewers' awareness of the channel viewshed and the length of the viewshed.

Kenilworth Trail Users

Viewer sensitivity for regional trail users is considered moderate, because while walking allows users to be fully engaged in their surroundings, cycling on the busy trail will require users to be more pre-occupied with the activity at hand. The curving viewshed corridor also will lead users' awareness further down the corridor, but not necessarily focus users on the channel bridges as a specific focal point. And, relative to water trail users, most regional trail users are destination oriented in intent, and are using the trail for exercise or commuting, rather than to experience solitude in nature, and will be therefore be less sensitive to visual impacts from transportation infrastructure.

GROUP VIEWER RESPONSE

The narrative descriptions of viewer exposure and viewer sensitivity for each viewer group were merged to establish the overall viewer response of each group.

Kenilworth Channel Water Trail Users

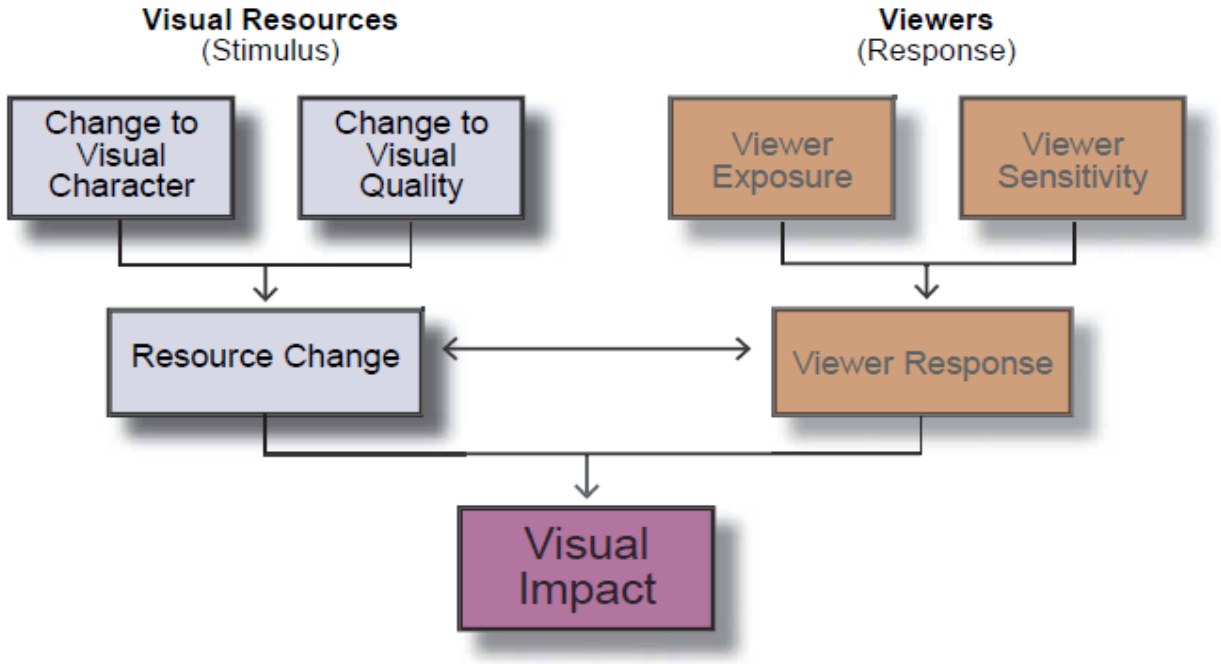
Group viewer response for water trail users is considered moderate-low to high. Viewer response varies for each Key View. See TABLE 2: Summary of Key View Narrative Ratings.

Kenilworth Regional Trail Users

Group viewer response for regional trail users is considered moderate. Viewer response varies for each Key View. See TABLE 2: Summary of Key View Narrative Ratings.

VIII. VISUAL IMPACT

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. These impacts can be beneficial or detrimental. Cumulative impacts and temporary impacts due to the contractor's operations are also considered. A generalized visual impact assessment process is illustrated in the following diagram, and each step is described in greater detail below.



Assess Change to Visual Character – Since visual character is descriptive and non-evaluative, change alone is assessed at this stage. The change likely to be caused by the project is assessed according to the visual attributes of objects (Pattern Elements) and the relationships between those objects (Pattern Character) in the visual environment before and after the project is constructed. A two sided "pendulum" scale (3 to 0 to 3, with 5 units of change possible) is used to measure contrasting qualities in each category. For example, the existing and proposed viewshed would each be assessed for the qualities "curvilinear" and "rectilinear" under the category "line" in the pattern elements analysis. The amount of change between the existing and proposed viewshed for each category is determined, then the degree of change is expressed as a percentage of maximum change possible. The overall level of change to visual character is then assigned a value that ranges from low to high.

Change to Visual Character		
Amount of Change (Δ = E-P)	Degree of Change (% = Δ / 5)	Level of Change
3	60%	High
2.5	50%	Moderately High
2	40%	Moderate
1.5	30%	Moderately Low
1	20%	Low

Assess Change to Visual Quality – The second step of the process is to compare the visual quality of the existing resources with projected visual quality after the project is constructed. Existing and proposed intactness, unity and vividness are scored from one to five (five being highest). The amount of change in quality between the existing and proposed viewshed for each category is determined (with four units of change possible), then the degree of change is expressed as a percentage of maximum change possible. The overall level of change to visual quality is then assigned a value that ranges from low to high.

Change to Visual Quality		
Amount of Change (Δ = E-P)	Degree of Change (% = Δ / 4)	Level of Change
2.4	60%	High
2.0	50%	Moderately High
1.6	40%	Moderate
1.2	30%	Moderately Low
0.8	20%	Low

Assess View Response - Viewer response to changes in the visual environment is predicted by using existing viewer exposure and viewer sensitivity values, which are assumed to remain constant before and after the project is implemented. The viewer response to project changes is the average of viewer exposure and viewer sensitivity to the project.

Viewer Response	
Averaged Response Score	Level of Response
4.5 - 5.0	High
3.5 - 4.4	Moderately High
2.5 - 3.4	Moderate
1.5 - 2.4	Moderately Low
0 - 1.4	Low

The resulting level of visual impact is determined by averaging the degree of resource change with the extent to which people are likely to be affected by the change (viewer response). The table below provides a reference for determining levels of visual impact by combining resource change and viewer response.

Visual Impact Ratings Using Viewer Response and Resource Change						
	Viewer Response (VR)					
Resource Change (RC)		Low (L)	Moderate-Low (ML)	Moderate (M)	Moderate-High (MH)	High (H)
	Low (L)	L	ML	ML	M	M
	Moderate-Low (ML)	ML	ML	M	M	MH
	Moderate (M)	ML	M	M	MH	MH
	Moderate-High (MH)	M	M	MH	MH	H
	High (H)	M	MH	MH	H	H

Levels of visual impact are defined as:

Low (L) - Low negative change to existing visual resources, and low viewer response to that change. May or may not require mitigation.

Moderately Low (ML) – Low negative change to the visual resource with a moderate viewer response, or moderate negative change to the resource with a low viewer response. Impact can be mitigated using conventional practices.

Moderate (M) - Moderate negative change to the visual resource with moderate viewer response. Impact can be mitigated within five years using conventional practices.

Moderately High (MH) - Moderate negative visual resource change with high viewer response or high negative visual resource change with moderate viewer response. Extraordinary mitigation practices may be required. Landscape treatment required will generally take longer than five years to mitigate.

High (H) - A high level of negative change to the resource or a high level of viewer response to visual change such that extraordinary architectural design and landscape treatment may not mitigate the impacts below a high level. An alternative project design may be required to avoid high negative impacts.

Visual Impacts by Visual Assessment Unit and Alternative

Because it is not feasible to analyze all the views in which the proposed project would be seen, it is necessary to select a number of key views associated with visual assessment units that would most clearly demonstrate the change in the project's visual resources. Key views also represent the viewer groups that have the highest potential to be affected by the project considering exposure and sensitivity. In addition, these key views will be analyzed for each proposed alternative. This VIA does not consider the potential impacts of a No-Build Alternative.

The following section describes, illustrates, and quantifies permanent visual impacts to each Key view by visual assessment unit. Temporary visual impacts due to construction activity are discussed in *Section IX. Visual Impact Summary*.

VISUAL ASSESSMENT UNIT 1: KENILWORTH CHANNEL CORRIDOR

KEY VIEW (KV) 1 – Looking westerly from within the channel towards the trail and freight rail bridges. This view is representative of a water trail user, such as a canoe or kayak paddler.

KV-1 Existing Condition

The existing visual condition for Key View 1 is that of an enclosed, linear viewshed corridor, defined by the parallel vegetated banks of the channel which act as converging lines, leading the viewer to the focal point of the Burnham Road bridge in the background. The existing trail and freight rail bridge in the foreground is a dominant, contrasting form that divides and frames the view of the channel corridor. The water surface reflects the enclosure of the vegetative canopy and bridge pilings, and reinforces the focus on the viewshed terminus. The form and color of the bridge is somewhat contrasting with the color and texture of the water and foliage, but is consistent with the line, form, and color of the tree trunks and limbs lining the banks.

Viewer Response
Viewer response at Key View 1 to the proposed design alternatives is characterized as moderately-high due to the pronounced degree of viewer exposure and viewer sensitivity of water trail users passing through the channel and under the proposed bridge design (in Alternative 1 – SPO Bridge Option). The LRT guideway infrastructure and frequent train traffic on the bridge will also greatly impact viewers in this location.

KV-1 Proposed Condition – Alternative 1: SPO Bridge Option

Resource Change
In Alternative 1, the visual condition for Key View 1 is that of an enclosed, linear viewshed corridor defined by the parallel vegetated banks of the channel which act as converging lines, leading the viewer to the focal point of the Burnham Road bridge in the background. The water surface reflects the enclosure of the vegetative canopy and bridge pilings, and reinforces the focus on the viewshed terminus.

The combined trail and LRT bridge in the foreground divides and frames the view of the channel corridor. The monumental scale of this bridge dominates the view, and shades the channel from sunlight. The new freight rail bridge in the middle ground, adjacent to the trail and LRT bridge, further extends the visual scale of the structures within the channel. The form and color of the bridges also contrast greatly with the color and texture of the surrounding water and foliage. And LRT train traffic creates even greater dissonance in the visual character. These discordant elements result in reduced unity and intactness of the visual quality, and a more vivid, memorable experience for trail users due to the combined factors of the sheer size of the bridge structure and the visible train traffic overhead.

Overall resource change for Alternative 1 at Key View 1 is characterized as moderately-high.

Visual Impact
Based on resource change and viewer response, the overall visual impact of Alternatives 2 and 3 at Key View 1 is characterized as moderately-high.

KV-1 Proposed Condition – Alternatives 2&3: Tunnel Options 1&2

Resource Change

In Alternatives 2 and 3, the visual condition for Key View 1 is that of an enclosed, linear viewshed corridor defined by the parallel vegetated banks of the channel which act as converging lines, leading the viewer to the focal point of the Burnham Road bridge in the background. The water surface reflects the enclosure of the vegetative canopy and bridge piers, and reinforces the focus on the viewshed terminus.

The trail bridge in the foreground divides and frames the view of the channel corridor. The monumental scale of this bridge dominates the view, and shades the channel from sunlight, but to a lesser degree than the combined trail and LRT bridge proposed in Alternative 1. The new freight rail bridge in the middle ground is spaced further away from the trail bridge, reducing the perception of these bridges as a homogenous, monolithic structure and allowing light into the channel. The form and color of the bridges does contrast greatly with the color and texture of the surrounding water and foliage. The lack of LRT train traffic over the bridge also allows for greater harmony in the visual character and higher degrees of intactness of the visual quality than Alternative 1.

Overall resource change for Alternatives 2 and 3 at Key View 1 is characterized as moderate.

Visual Impact

Based on resource change and viewer response, the overall visual impact of Alternatives 2 and 3 at Key View 1 is characterized as moderately-high.

See next page for visual impact ratings worksheets for Key View 1.

Impact Assessment | Key View Analysis

Key View # 1 - Alternative 1

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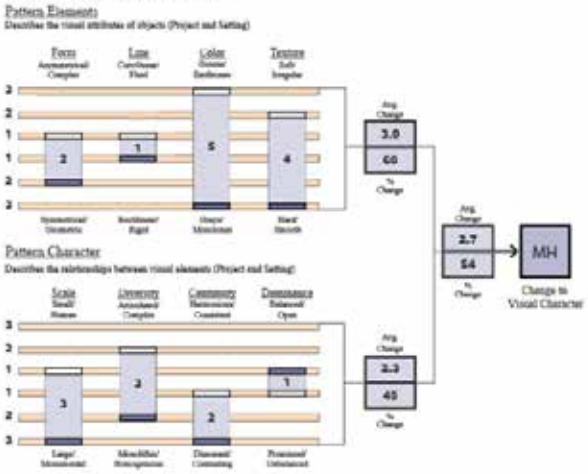
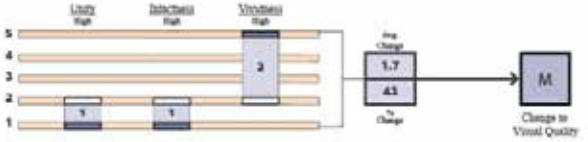
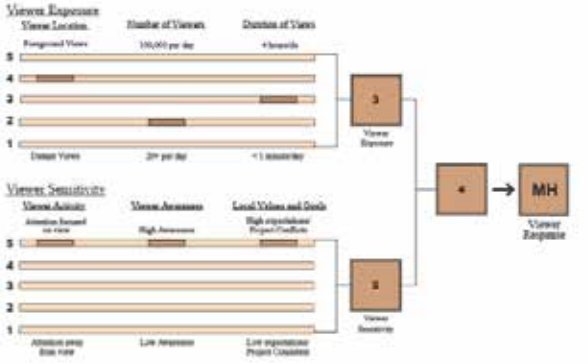


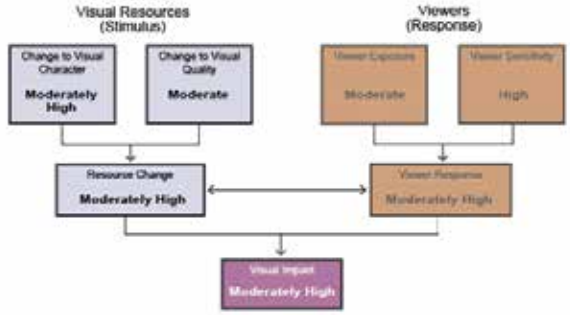
VISUAL QUALITY



VIEWER RESPONSE



ANALYSIS SUMMARY



Impact Assessment | Key View Analysis

Key View # 1 - Alternatives 2 & 3

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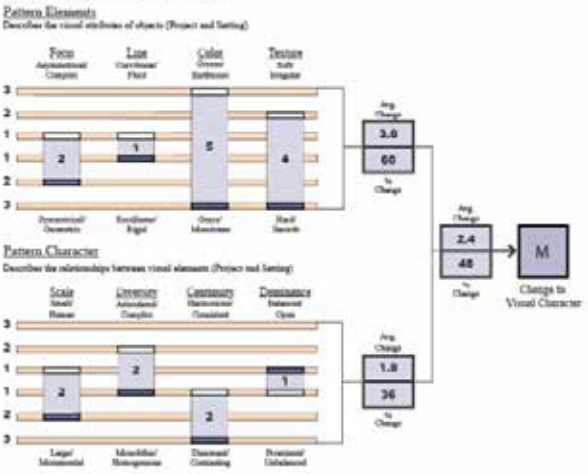

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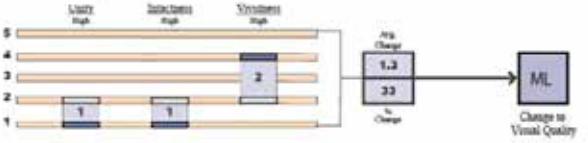
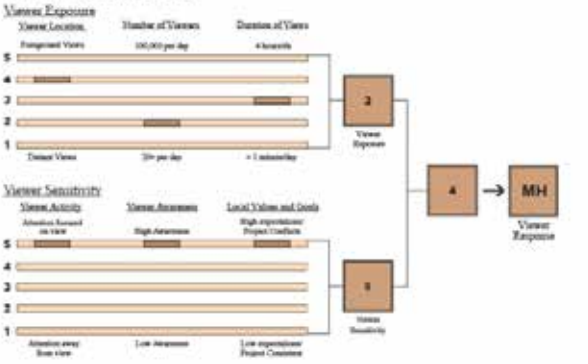


VIEWER RESPONSE



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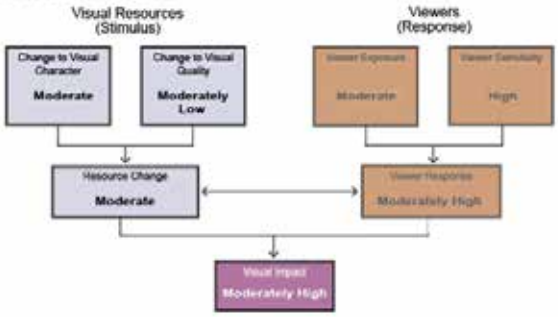


KEY VIEW (KV) 2 – Looking easterly into the channel from the Burnham Road channel bridge. This view is representative of a bridge user, such as a driver or pedestrian.

KV-2 Existing Condition

The existing visual condition for Key View 2 is an enclosed, linear viewshed corridor defined by the parallel vegetated banks of the channel which act as converging lines, leading the viewer to the focal point of the trail and freight rail bridge in the background. The water surface acts as a mirror, reflecting the enclosure of the vegetative canopy, and reinforcing the focus on the viewshed terminus. The bridge at the terminus is set far into the background of the view, so that it has a relatively low impact on both visual character and visual quality. At this scale, the form and color of the bridge structure blends with the color and texture of the water and foliage, resulting in a harmonious, intact view of the channel.

Viewer Response

Viewer response at Key View 2 to the proposed design alternatives is characterized as moderately-low due to the relatively low degree of viewer exposure and viewer sensitivity resulting from the great distance between Key View 2 and the proposed impacts.

KV-2 Proposed Condition – Alternative 1: SPO Bridge Option

Resource Change

In Alternative 1, the visual condition for Key View 2 is that of an enclosed, linear viewshed corridor defined by the parallel vegetated banks of the channel which act as converging lines, leading the viewer to the focal point of the new freight rail bridge and combined Kenilworth Trail pedestrian/ LRT bridge in the background. The water surface reflects the enclosure of the vegetative canopy and multiple bridge pilings, and reinforces the focus on this viewshed terminus.

The form and color of the new bridges contrast with the color and texture of the surrounding water and vegetation, and the LRT train traffic creates even greater dissonance in the visual character. These discordant elements result in reduced unity and intactness of visual quality, and a more vivid, memorable experience for users of the Burnham Road Bridge.

Overall resource change for Alternative 1 at Key View 2 is characterized as moderate.

Visual Impact

Based on resource change and viewer response, the overall visual impact of Alternative 1 at Key View 2 is characterized as moderate.

KV-2 Proposed Condition – Alternatives 2&3: Tunnel Options 1&2

Resource Change

In Alternatives 2 and 3, the visual condition for Key View 1 is that of an enclosed, linear viewshed corridor defined by the parallel vegetated banks of the channel which act as converging lines, leading the viewer to the focal point of the new freight rail bridge and separate Kenilworth Trail pedestrian bridge in the background. The water surface reflects the enclosure of the vegetative canopy and bridge pilings, and reinforces the focus on the viewshed terminus.

The form and color of the new bridges contrast with the color and texture of the surrounding water and vegetation, through the complexity of the bridge forms are less than in Alternative 1 due to the lesser number of bridge piers, and the new freight rail bridge in the middle ground is spaced further away from the trail bridge, reducing the perception of these bridges as a homogenous, monolithic structure, as compared to Alternative 1. The lack of LRT train traffic over the bridge also allows for greater harmony in the visual character and higher degrees of intactness of the visual quality than Alternative 1.

Overall resource change for Alternatives 2 and 3 at Key View 1 is characterized as moderately-low.

Visual Impact

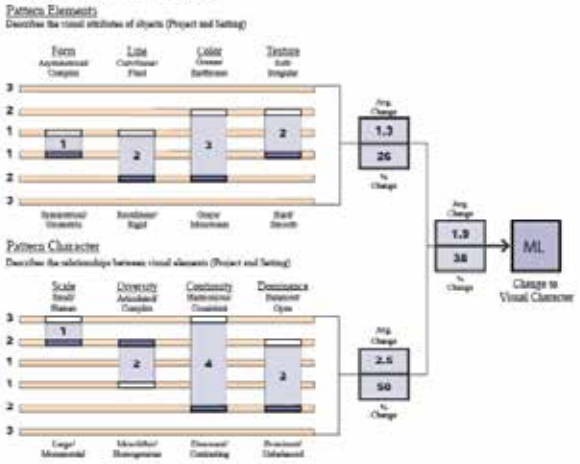
Based on resource change and viewer response, the overall visual impact of Alternatives 2 and 3 at Key View 2 is characterized as moderately-low.

See next page for visual impact ratings worksheets for Key View 2.

Impact Assessment | Key View Analysis

Key View # 2 - Alternative 1

VISUAL CHARACTER



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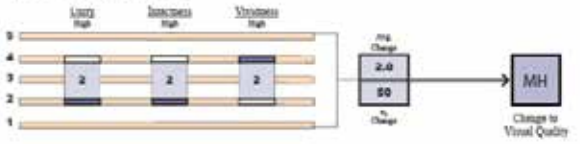
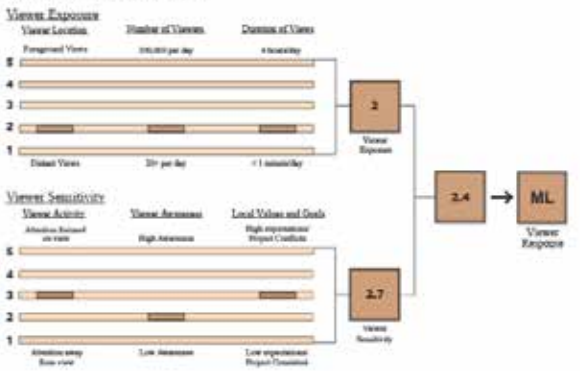
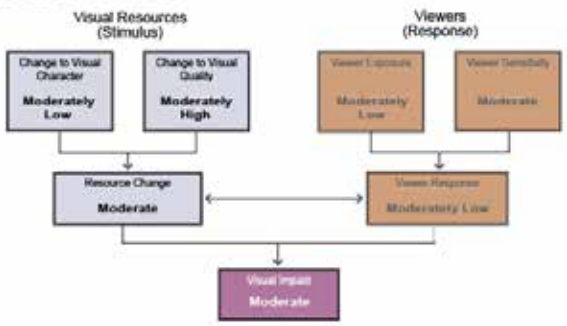


VIEWER RESPONSE



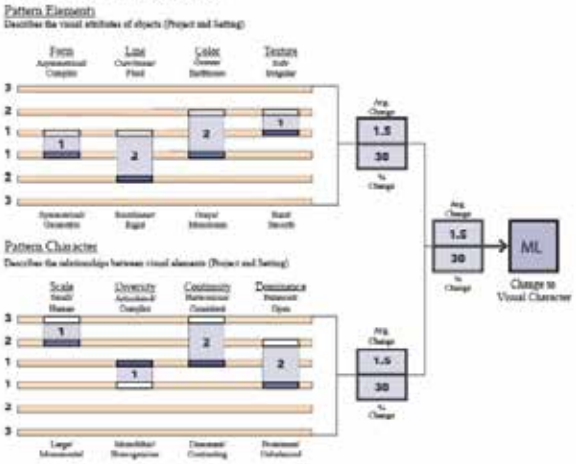
ANALYSIS SUMMARY



Impact Assessment | Key View Analysis

Key View # 2 - Alternatives 2 & 3

VISUAL CHARACTER



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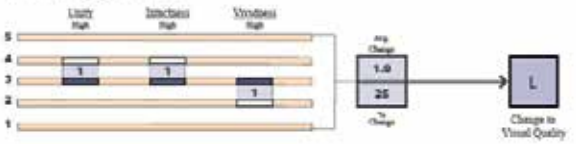
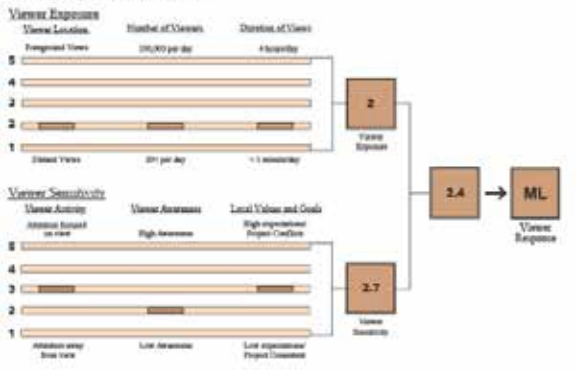


VIEWER RESPONSE



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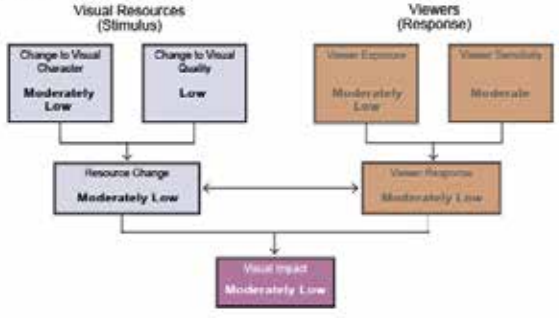


KEY VIEW (KV) 3 – Looking westerly from the Kenilworth Trail Bridge down into the channel.

KV-3 Existing Condition

The existing visual condition for Key View 3 is an enclosed, linear viewshed corridor defined by the parallel vegetated banks of the channel which act as converging lines, leading the viewer to the focal point of the trail and freight rail bridge in the background, as seen through an articulated foreground screen of chain-link fencing, freight bridge deck, and guardrail. The complexity of the foreground bridge infrastructure restricts views into the vegetated channel beyond, and reduces the overall visual quality of the existing view.

Viewer Response

Viewer response at Key View 3 to the proposed design alternatives is characterized as moderate based on the combination of the number of viewers, the relatively low duration of views of the majority of Kenilworth Trail users who bike and jog across the channel, and the moderate degree of viewer awareness of views beyond the fencing.

KV-3 Proposed Condition – Alternative 1: SPO Bridge Option

Resource Change

In Alternative 1, the dominance of the foreground bridge infrastructure over the distant view of the vegetated channel is intensified, due to the expansive foreground screen of fencing and bridge decking of the new combined LRT and Kenilworth Trail pedestrian bridge, and the new freight rail bridge deck beyond. LRT train traffic in the immediate foreground adds further complexity and dissonance to the visual character, and reduces the unity and intactness of the existing view. The LRT train traffic also greatly increases the vividness of the visual quality for Key View 3.

Overall resource change for Alternative 1 at Key View 3 is characterized as moderately-high.

Visual Impact

Based on resource change and viewer response, the overall visual impact of Alternative 1 at Key View 3 is characterized as moderately-high.

KV-3 Proposed Condition – Alternatives 2&3: Tunnel Options 1&2

Resource Change

In Alternatives 2 and 3, the dominance of the foreground bridge infrastructure over the distant view of the vegetated channel is minimized, due to the reduction of complex foreground elements. The low, decorative fencing and wide spacing between the new pedestrian bridge and the new freight rail bridge deck beyond allow foreground views into the Kenilworth channel. Although the form and color of the freight rail bridge does contrast greatly with the color and texture of the surrounding water and vegetation, the lack of LRT train traffic in the foreground allows for greater harmony in the visual character and higher degrees of intactness of the visual quality than Alternative 1.

Overall resource change for Alternatives 2 and 3 at Key View 3 is characterized as moderate.

Visual Impact

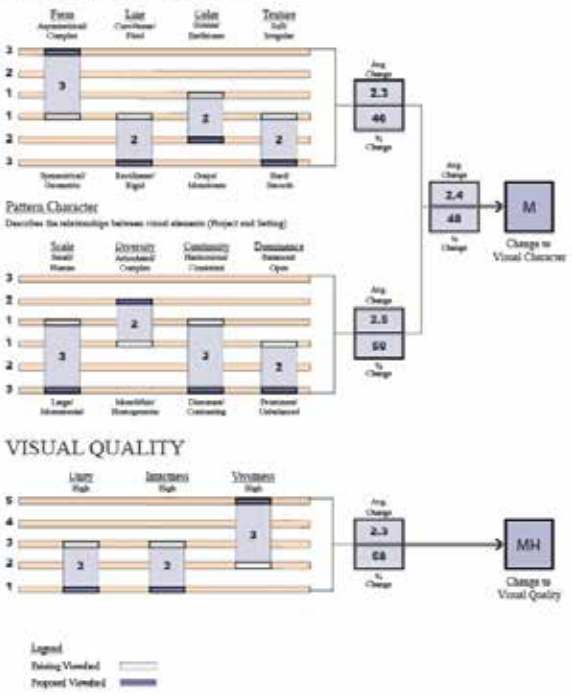
Based on resource change and viewer response, the overall visual impact of Alternatives 2 and 3 at Key View 3 is characterized as moderate.

See next page for visual impact ratings worksheets for Key View 3.

Impact Assessment | Key View Analysis

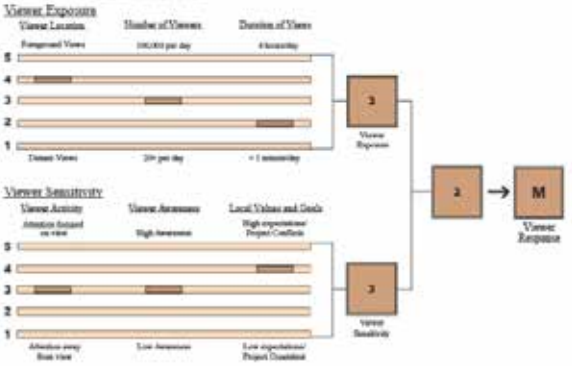
Key View # 3 - Alternative 1

VISUAL CHARACTER

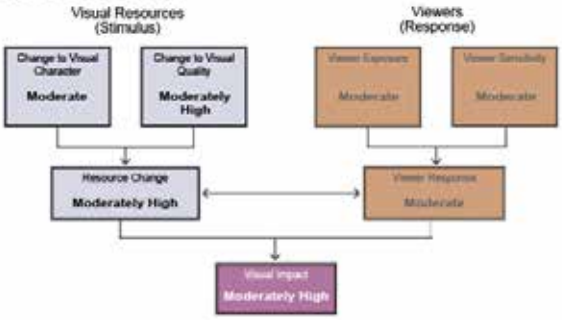


VISUAL QUALITY

VIEWER RESPONSE



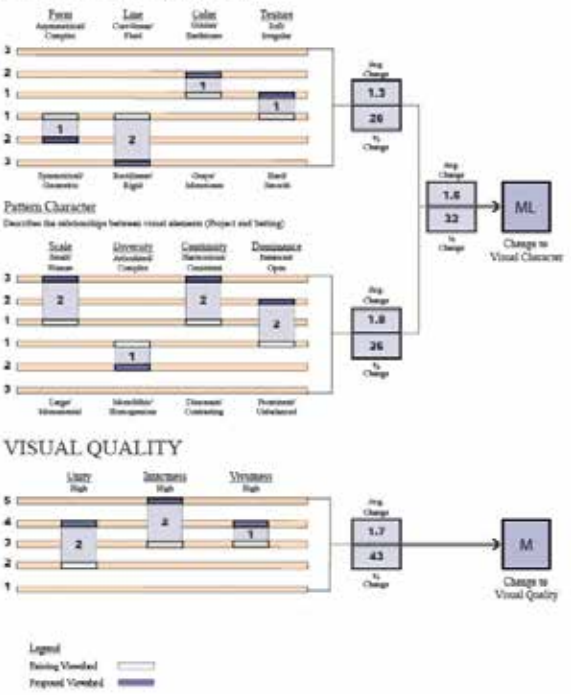
ANALYSIS SUMMARY



Impact Assessment | Key View Analysis

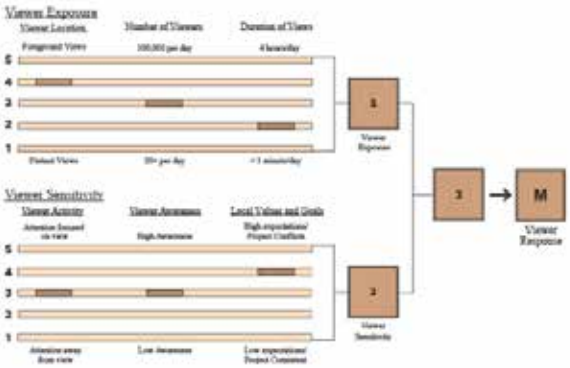
Key View # 3 - Alternatives 2 & 3

VISUAL CHARACTER

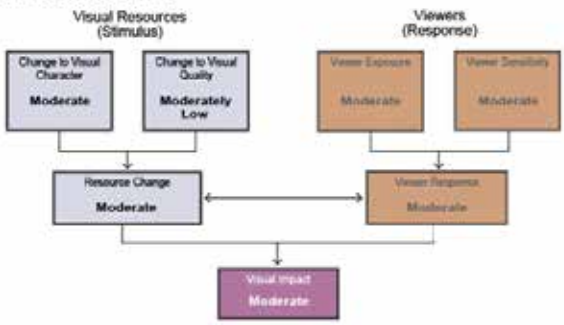


VISUAL QUALITY

VIEWER RESPONSE



ANALYSIS SUMMARY



VISUAL ASSESSMENT UNIT 2: KENILWORTH TRAIL CORRIDOR

KEY VIEW (KV) 4 – Looking northerly within the corridor from Cedar Lake Parkway towards the trail and freight rail bridges.

KV-4 Existing Condition

The existing visual condition for Key View 4 is an enclosed, linear viewshed corridor defined by the parallel vegetated walls of the corridor and parallel trail and freight rail, which act as converging lines, leading the view to the focal point of the trail and freight rail bridge in the background. Signage and other free-standing rail and trail amenities in the foreground add complexity and reduce the overall visual quality of the existing view.

Viewer Response

Viewer response at Key View 4 to the proposed design alternatives is characterized as moderate. This is based on the combination of a high number of viewers with a high degree of awareness focuses on the project area at the end of the corridor viewshed, with the relatively long distance of the viewshed from the project area.

KV-4 Proposed Condition – Alternative 1: SPO Bridge Option

Resource Change

In Alternative 1, the realignment of the freight rail causes the vegetated corridor to be widened, opening views farther down the corridor, and increasing the prominence of the bridge crossings at the Kenilworth Channel. Sound walls, crash walls, and fencing and catenary poles related to the LRT tunnel portal in the middle ground are contrasting visual elements that increase the dissonance of the visual character. These changes also result in reduced unity and intactness of the visual quality and viewers will be highly aware of the tunnel portal, adding to the vividness of the view. However, most of these impacts are minimized due to the relatively long distance of these resources changes from Key View 4.

Overall resource change for Alternative 1 at Key View 4 is characterized as moderately-low.

Visual Impact

Based on resource change and viewer response, the overall visual impact of Alternative 1 at Key View 4 is characterized as moderate.

KV-4 Proposed Condition – Alternatives 2&3: Tunnel Options 1&2

Resource Change

In Alternatives 2 and 3, the realignment of the freight rail causes the vegetated corridor to be widened; opening views farther down the corridor, but the lack of the visually contrasting LRT tunnel portal infrastructure could allow the wide median between the freight rail and the Kenilworth Trail to be vegetated. This planting could screen the channel bridges and freight rail sound walls from view, reducing the openness and perceived width of the trail corridor. These changes result in an increased unity and a reduced vividness in visual quality.

Overall resource change for Alternatives 2 and 3 at Key View 4 is characterized as moderately-low.

Visual Impact

Based on resource change and viewer response, the overall visual impact of Alternatives 2 and 3 at Key View 4 is characterized as moderate.

See next page for visual impact ratings worksheets for Key View 4.

Impact Assessment | Key View Analysis

Key View # 4 - Alternative 1

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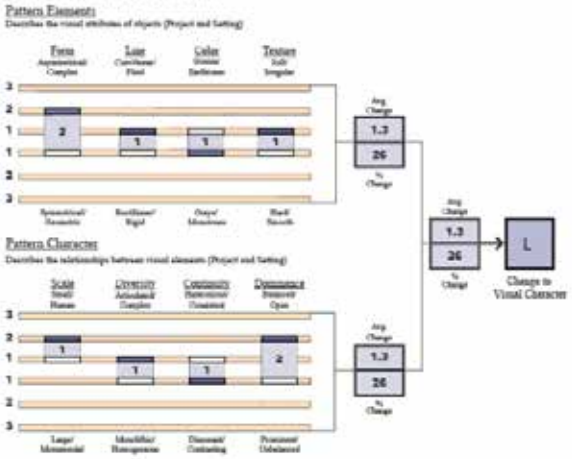
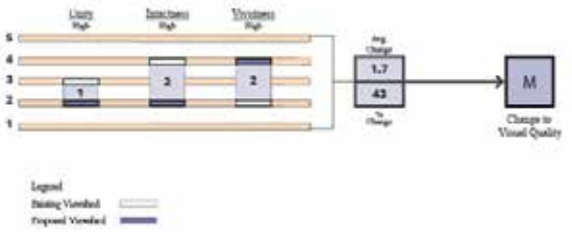
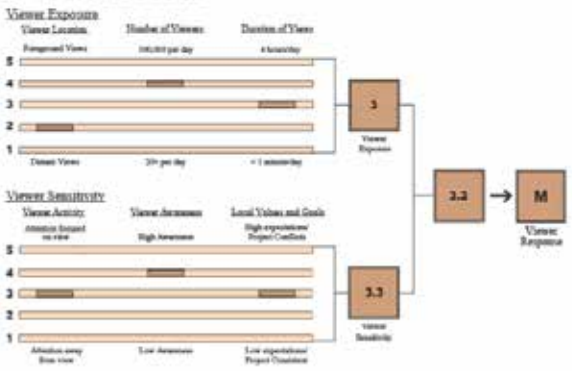


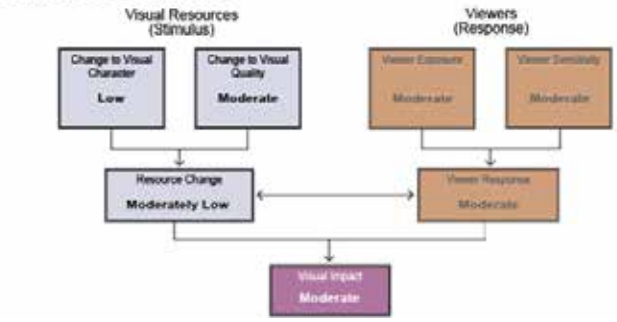
VISUAL QUALITY



VIEWER RESPONSE



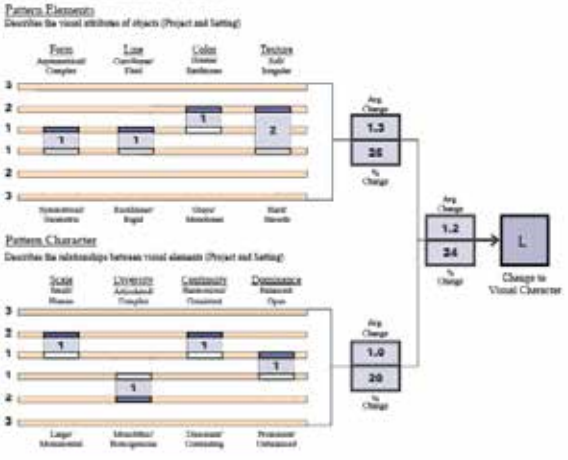
ANALYSIS SUMMARY



Impact Assessment | Key View Analysis

Key View # 4 - Alternatives 2 & 3

VISUAL CHARACTER



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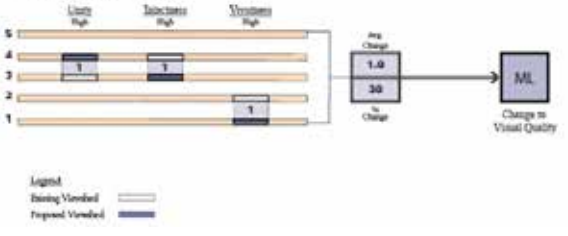

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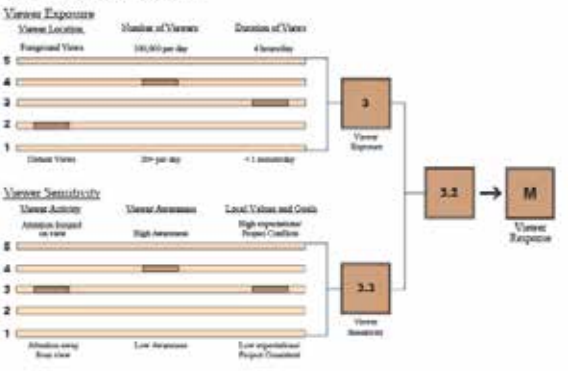
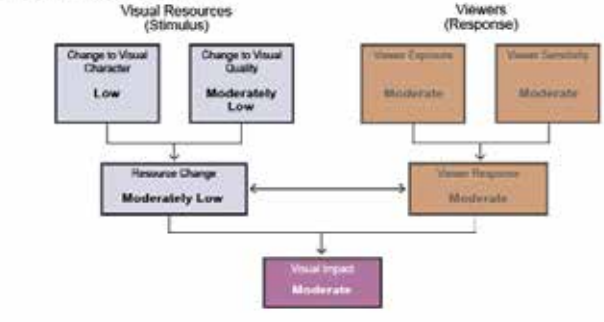


ANALYSIS SUMMARY



KEY VIEW (KV) 5 – Looking southerly into the corridor from the Burnham Road trail bridge.

KV-5 Existing Condition

The existing visual condition for Key View 5 is an enclosed, linear viewshed corridor defined by the parallel vegetated walls of the corridor and parallel trail and freight rail tracks and railings, which act as converging lines, leading the view to a focal point in the distance. Signage and other freestanding rail and trail amenities in the foreground add complexity reduces the overall visual quality of the existing view. Though the view is adjacent to the Kenilworth Channel bridge, the channel itself is obscured by the bridge infrastructure.

Viewer Response

Viewer response at Key View 5 to the proposed design alternatives is characterized as moderate, based on the combination of the number of viewers, the duration of view, and the focus of the view down the channel corridor, resulting in a low awareness of the Kenilworth Channel.

KV-5 Proposed Condition – Alternative 1: SPO Bridge Option

Resource Change

In Alternative 1, the realignment of the freight rail causes the vegetated corridor to be widened, opening views farther down the corridor. The dominance of the foreground bridge infrastructure over the distant view of the vegetated channel is intensified, due to the expansive foreground screen of fencing and bridge decking of the new combined LRT and Kenilworth Trail pedestrian bridge. LRT train traffic and catenary poles in the foreground and the LRT tunnel portal in the background, which dominates the viewshed terminus, add further complexity and dissonance to the visual character, and reduce the unity and intactness of the visual quality.

Overall resource change for Alternative 1 at Key View 5 is characterized as moderately-high.

Visual Impact

Based on resource change and viewer response, the overall visual impact of Alternative 1 at Key View 5 is characterized as moderately-high.

KV-5 Proposed Condition – Alternatives 2&3: Tunnel Options 1&2

Resource Change

In Alternatives 2 and 3, the realignment of the freight rail causes the vegetated corridor to be widened, opening views farther down the corridor. The dominance of the foreground bridge infrastructure is minimized in this alternative, and the low, decorative fencing and wide opening between the new pedestrian bridge and the new freight rail bridge allow foreground views into the Kenilworth channel. Although the form and color of the freight rail bridge does contrast greatly with the color and texture of the surrounding water and vegetation, the lack of LRT train traffic in the foreground allows for greater harmony in the visual character and higher degrees of intactness of the visual quality than Alternative 1. Also, the lack of LRT tunnel portal infrastructure could allow the wide median between the freight rail and the Kenilworth Trail to be vegetated. This planting would screens the freight rail and sound walls from view, reducing the openness and perceived width of the trail corridor.

Overall resource change for Alternatives 2 and 3 at Key View 3 is characterized as moderately-low.

Visual Impact

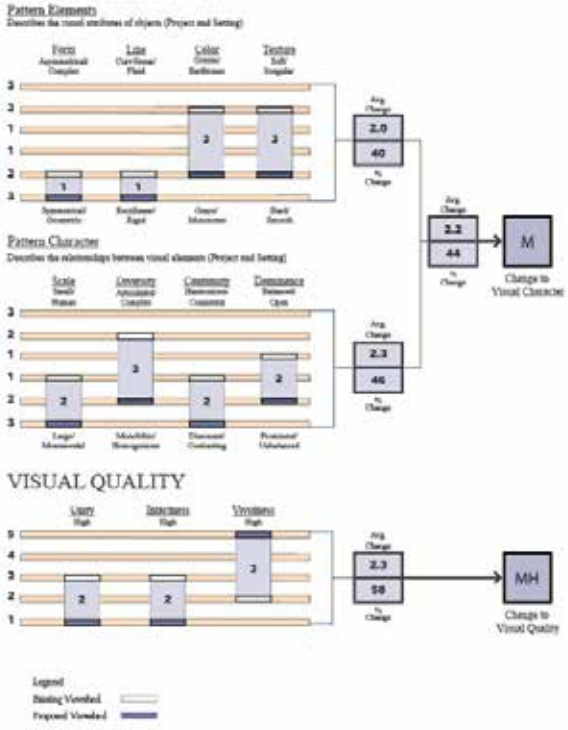
Based on resource change and viewer response, the overall visual impact of Alternatives 2 and 3 at Key View 5 is characterized as moderate.

See next page for visual impact ratings worksheets for Key View 5.

Impact Assessment | Key View Analysis

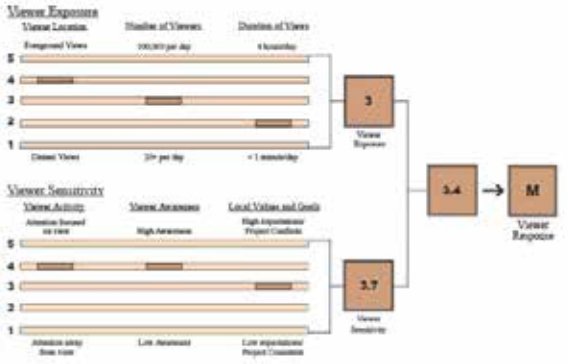
Key View # 5 - Alternative 1

VISUAL CHARACTER

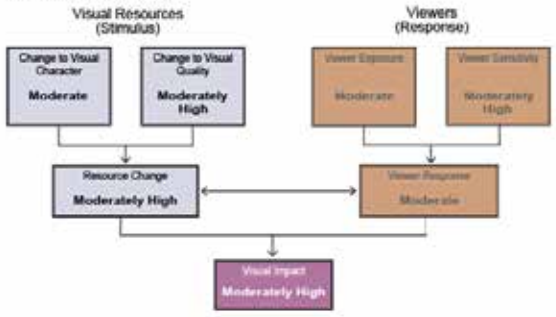


VISUAL QUALITY

VIEWER RESPONSE



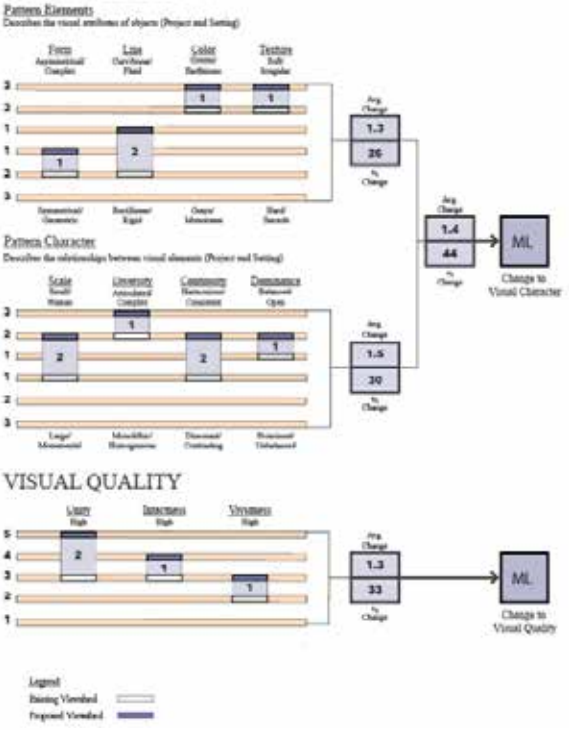
ANALYSIS SUMMARY



Impact Assessment | Key View Analysis

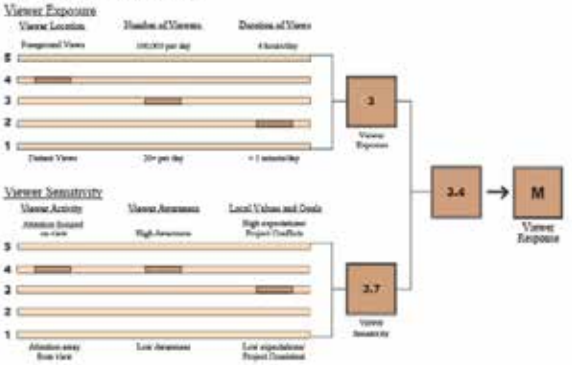
Key View # 5 - Alternatives 2 & 3

VISUAL CHARACTER

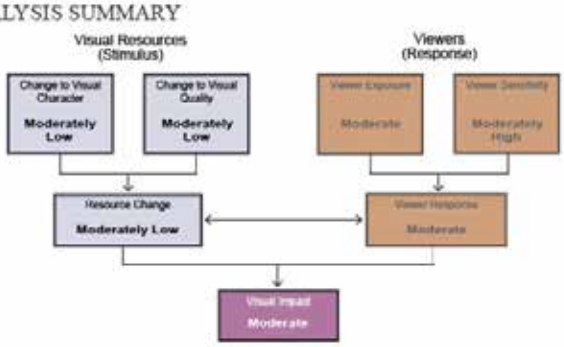


VISUAL QUALITY

VIEWER RESPONSE



ANALYSIS SUMMARY



IX. VISUAL IMPACT SUMMARY

Permanent Visual Impacts

The table below summarizes and compares the ratings for visual resource change, viewer response and permanent visual impacts between alternatives for each key view.

Summary of Visual Impact Ratings by Key View							
VISUAL ASSESSMENT UNIT	KEY VIEW (KV)	ALT. 1: SPO Bridge Option			ALT. 2&3: Tunnel Options 1&2		
		Resource Change	Viewer Response	Visual Impact	Resource Change	Viewer Response	Visual Impact
1-Kenilworth Channel	1	**MH**	**MH**	**MH**	**M**	**MH**	**MH**
	2	**M**	**ML**	**M**	**ML**	**ML**	**ML**
	3	**MH**	**M**	**MH**	**M**	**M**	**M**
2-Kenilworth Trail Corridor	4	**ML**	**M**	**M**	**ML**	**M**	**M**
	5	**MH**	**M**	**MH**	**ML**	**M**	**M**

Temporary Construction Visual Impacts

Temporary visual impacts are anticipated for each of the proposed alternative due to contractor operations such as material hauling and staging, equipment access, night lighting, dust, temporary structures and the duration of construction. However, the degree to which these activities impact the visual quality of the Kenilworth Channel vary between the different construction methods proposed for each alternative. Based on bridge construction methods described by the Southwest Project Office (for Alternative 1) and tunnel construction methods described by Brierley Associates (for Alternatives 2 & 3), potential temporary visual impacts related to these activities are described below.

It is anticipated that the Kenilworth Trail will be closed for the duration of the construction, so visual impacts to trail users (KV-3 and KV-5) are not considered. The Kenilworth Channel water trail (KV-1) will be closed intermittently during bridge demolition and construction, but views into the channel from the Burnham Road Bridge (KV-2) will be mostly unobstructed for the entire duration of construction.

Temporary visual impacts include activity and debris related to construction access and staging between the Kenilworth Channel and Cedar Lake Parkway, as well as demolition of existing vegetation along the west side of the Kenilworth Trail corridor to accommodate the new freight rail alignment that would be visible to Cedar Lake Parkway users (KV-4) and to a lesser degree Kenilworth Channel users (KV-1 and KV-2).

Bridge demolition, construction, and resulting shoreline disturbance at the Kenilworth Channel will be highly visible to channel water trail users (KV-1). Due to the expansive bridge structure proposed for the combined LRT and Kenilworth Trail pedestrian bridge, the duration of bridge construction for Alternative 1 is expected to be longer than the duration of bridge construction for Alternatives 2 and 3.

Alternative 1 also requires a temporary causeway for construction access across the channel between the existing bridge demolition and new bridge construction. This will prolong the visual impacts to channel users (KV-1).

Tunneling methods used in Alternatives 2 and 3 will both result in some temporary visual impacts to the Kenilworth Channel. Alternative 2, the 'cut and cover' tunnel method, will rely on the installation of temporary sheet pile across the channel, restricting access through the channel for the duration of the construction period, while Alternative 3, the 'jacked box' tunnel method, will burrow under the channel, allowing the water trail to remain open during the construction timeline with intermittent closures for bridge construction, ground improvement, and site restoration. Access pits and jacking equipment adjacent to the channel may be visible to channel water trail users.

It is anticipated that temporary visual impacts to the Kenilworth Channel related to the construction of Alternative 3 would be less than those related to the construction of Alternative 1 and Alternative 2.

X. SUGGESTED MITIGATION MEASURES

This section describes avoidance, minimization, and/or mitigation measures that should be considered to address specific visual impacts of the proposed alternatives in the Draft EIS and final design phases of the project. Mitigation treatments for visual impacts should be developed through discussion with affected communities, resource agencies, and stakeholders. Measures should be taken to ensure the design and construction of the selected alternative is sensitive to the existing visual quality of the corridor, its viewers, and key views.

Suggested visual mitigation measures include the following:

- Select context-sensitive materials for all bridge, train, and trail infrastructure visible to Kenilworth Trail and Kenilworth Channel water trail users. Priority should be given to considering form, line, texture, and color of the materials in order to blend these features into their surroundings in a visually harmonious and consistent manner
- Minimize scale of all new bridges over the Kenilworth Channel. Priority should be given to the design of structures that minimize bridge deck profile thickness and the number of piers in order to maximize the clear span length over the channel corridor. This may also include separating the combined pedestrian/LRT bridge proposed in Alternative 1 into two separate bridges, allowing for the inclusion of a less massive pedestrian bridge. A visualization of a lightweight pedestrian truss bridge as visual impact mitigation measure is shown below.
- Restore channel and bank plantings and walls to create a consistent shoreline along the Kenilworth Channel water trail
- Restore Kenilworth Trail corridor plantings to visually screen freight rail traffic and sound walls, screen walls, and retaining walls from pedestrians and cyclists where possible
- Restore Kenilworth Trail corridor plantings to visually screen LRT train traffic and associated above-ground infrastructure such as tunnel portal walls, fencing, and catenary poles from pedestrians and cyclists where possible
- Incorporate evergreen species into the vegetative screening to supplement deciduous vegetation buffers in leaf-off conditions

Depiction of a 'lightweight' pedestrian truss bridge used as a visual impact mitigation measure for the Kenilworth Channel crossing.

XI. CONCLUSIONS

For all Key Views in both visual assessment units identified in this study, permanent visual impacts of the proposed Alternatives 2 and 3 are less than or equal to permanent visual impacts of Alternative 1.

When temporary construction impacts are combined with permanent impacts to assess overall cumulative visual impacts, **Alternative 3: Jacked Box Tunnel (Tunnel Option 2) is considered the least impactful alternative** for the Kenilworth Channel LRT crossing.

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BARR

Memorandum

To: Todd Christopherson, Brierley Associates
From: Andrew Skoglund, Barr Engineering Co.
Subject: Kenilworth Channel Alternatives Assessment: Noise and Vibration Impacts
Date: March 5, 2015
Project: 23271414.00
c: Michael Schroeder (MPRB), Jim Herbert (Barr)

The purpose of this memorandum is to provide a summary of the evaluation that assesses and identifies the least impactful alternative for the Southwest Light Rail Transit (SWLRT) crossing of the Kenilworth Channel, a property owned by the Minneapolis Park and Recreation Board (MPRB). Whereas the focus on Phase 1 of the project was to demonstrate the feasibility of a tunnel alternative under the Kenilworth Channel, the intent of Phase 2 of the project is to address impacts of the alternatives for crossing the channel relative to the park and park resources. The Kenilworth Channel crossing alternatives evaluated include:

- SWLRT Project Office (SPO) Bridge Option
- Cut and Cover Tunnel (Tunnel Option 1)
- Jacked Box Tunnel (Tunnel Option 2)

This memorandum is specifically related to the evaluation of the referenced focus area.

Identification

Assessment of Noise and Vibration impacts to the Kenilworth Channel were the primary focus of the assessment.

Methodology

David Braslau Associates was retained to assist with the calculation of potential operational noise impacts. The evaluation used the methods described in Federal Transit Administration (FTA) guidance, Transit

Noise and Vibration Impact Assessment (May 2006). Details of this analysis are summarized in this memo and further described in the attached memorandum from David Braslau Associates.

Construction and vibration impacts were assessed at a high level with reference to FTA guidelines.

Assumptions

This opinion of least impactful alternative is based on several assumptions, which may change as the project develops. The significant assumptions used to complete this evaluation are summarized below:

- Number of LRT Trains per day: 198 daytime trains (7am – 10 pm). Equivalent to 13.2 trains per hour (15 hours of 'daytime')
- 3 car trains
- Welded, not embedded track
- Operations on the bridge considered aerial structure relative to the channel
- No intervening rows of buildings
- Travel speed through channel segment: 45 mph
- Impact differences between Tunnel Option 1 and Option 2 were assumed to be minimal relative to the channel given the relative location of the portal for the tunnel options.
- Background levels were derived from Location 30 in the 2012 Draft Environmental Impact Statement (DEIS) (L_{dn} = 55 dBA, $L_{eq(h)}$ = 54 dBA). These levels were monitored at street level, and may be higher than levels experienced within the channel [Day Night Average Sound Level (L_{dn}); Hourly equivalent Continuous Sound Level ($L_{eq(h)}$); decibel (dBA)].

Tools

This opinion of least impactful alternative relied on the FTA Noise impact assessment spreadsheet for calculation of impact contours. Short term noise impacts from trains crossing the bridge were derived using methods described in the FTA manual. Details of the analysis methods are described in the attached memorandum from David Braslau Associates.

The modeled outputs were compared for each alternative and evaluated for impacts to the users of the Kenilworth Channel based on available knowledge of the site and available information provided by MPRB and SPO. Additional noise analysis information was provided by SPO/FTA after the bulk of the

assessment was performed, but did not include Leq levels for the location 30 monitoring site, thus no revised background data for channel impact has been incorporated.

Results and Discussion

Channel noise impacts for the bridge option were modeled to exceed FTA Category 1 "severe" thresholds as far as 102 feet from the line. Initial calculations used for the February 4, 2015 MPRB presentation had yielded a distance of 97 feet, upon further review revised calculations went forward with 102 feet. Moderate Category 1 impacts were modeled to occur as far as 255 feet from the line. The baseline noise level is founded on 2010 monitoring in the neighborhood adjacent to the channel, as documented in the 2012 DEIS. Noise levels within the channel are expected to be lower, given the shielding from local noise sources provided by the depth of the channel corridor. Noise impacts from either tunnel option are not projected to exceed the severe or moderate impact thresholds at the channel.

Estimated levels for an individual train passby on the bridge option are 80 dBA at a distance of 90 feet from the bridge. Within 90 feet there is some shielding provided by the bridges themselves, which may result in a variety of complex interactions. Potential impacts within this distance were not evaluated given the additional complexity, uncertainty of final bridge design, and time available for analysis. Noise levels farther away in the channel may remain as high as 75 dBA on the water 400 feet from the bridge during passby of a train. The attached memo from David Braslau Associates details the calculations used to reach these values.

Construction noise is expected to be of mixed impact between scenarios. All potential options include the driving of pilings in the area. The bridge option would include pilings driven for the bridges, as well as along the tunnel alignment to the southwest. The cut and cover tunnel options would require piling along the tunnel alignment as well as across the channel area. The jacked-box tunnel option would require pilings throughout the tunnel alignment, with the exception of the channel area. Pile-driving impacts would occur over a longer period for the tunnel options. Offsetting this variation would be some of the equipment used in construction of the tunnel options operating within the cut for the tunnel, below grade. Sub-grade operation of equipment would provide an effective barrier for construction equipment noise.

Vibration impacts to the channel are not expected to be significant for any of the options. Vibration impacts to outdoor users, while potentially perceptible, are generally not associated with annoyance. Per the FTA guidance, "... train vibration may be perceptible to people who are outdoors, but it is very rare for outdoor vibration to cause complaints." Vibration from operations in a tunnel would be expected to be of lower magnitude at the surface than from at-grade operations, in large part due to the additional distance between source and receiver.

Opinion of Least Impactful Alternative

The tunnel options are expected to be the least impactful alternatives. The bridge option is expected to have lower construction noise impact, but significantly higher operational impact. There may be minor variation in construction impact between the two tunnel options, but detailed evaluation of construction noise would require additional construction detail that is outside the scope of the currently available design information. Impacts of the tunnel options in operation are expected to be comparable, and clearly less impactful than the bridge option.

Mitigation Strategy

FTA guidance recommends implementation of mitigation options for severely impacted receivers. An overview of mitigation strategies is detailed in the noise factsheet assembled by SPO[1]. The tunnel options can also be considered mitigation of the bridge option. Additionally there are several options identified in the SPO factsheet relative to source controls such as wheel and rail modifications, path control such as barriers or walls, and receiver controls such as additional insulation (less relevant to an outdoor user).

Attachments:

Memo from David Braslau Associates (March 5, 2015)
Figure 1 – Comparison of Tunnel and Bridge Noise Contours

[1] http://metrocouncil.org/Transportation/Projects/Current-Projects/Southwest-LRT/Environmental/Noise-and-Vibration.aspx (Retrieved February 18, 2015)

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MEMORANDUM

To: Andy Skoglund, Barr Engineering Co.

From: David Braslau, David Braslau Associates

Subject: Kenilworth Channel Alternatives Assessment – Noise Impacts

Date: March 5, 2015

Project: 23/27-1414

The purpose of this memorandum is to provide a summary of the evaluation of potential noise benefits and impacts associated with the proposed tunnel extension under the Kenilworth Channel. This assessment is limited to the area near the Channel and is based upon information derived from existing documentation or information provided by Barr Engineering Co.

IDENTIFICATION

This memorandum addresses potential changes in community noise near the proposed SWLRT corridor between Lake of the Isles and Cedar Lake in the Kennilworth neighborhood in Minneapolis. Specifically, noise levels on the water either side of the proposed bridge alternative benefited by the tunnel extension. Noise levels under the bridge itself will depend upon the specific bridge construction but could represent sudden increases in sound level.

The study area of interest is shown on the aerial in **Exhibit 1** which compares the current proposal and alternative with tunnel extension under the Kenilworth Channel.

METHODOLOGY

Determination of background level.

Background sound levels (specifically the Leq(h) or hourly equivalent sound level) are based upon data from Appendix H of the DEIS for the SWLRT project. Location of Noise Monitoring Site 30 which was used to establish the background level in the area is identified on **Exhibit 2.** Monitoring results are presented on **Exhibit 3.**

Evaluation of potential noise level benefits from the proposed tunnel extension

The improvement of the level of noise impact as determined by the Federal Transit Administration in the document Transit Noise and Vibration Impact Assessment (May 2006) is examined here. Quantitative prediction of sound level from rail traffic that will be eliminated with the tunnel extension is made with the Noise Impact Assessment Worksheet from the FTA that is derived from equations and methods contained in the above document. **Exhibit 4** identifies the land used categories evaluated for impact by the FTA. Note that Land Use 1 covers quiet and serene areas which would apply to the channel area in this assessment.

Evaluation of potential noise impact of the proposed bridge over the Channel.

The potential noise impact on the water either side of the proposed bridges is estimated based on the maximum pass-by sound level (based upon Table F-1 of the FTA document and design travel speed of 45 mph for trains at this location

ASSUMPTIONS

The following assumptions have been made for this assessment:

- Number of trains: 198 daytime hours (7 am to 10 pm) : 60 nighttime hours (10 pm to 7 am)
- 3 x 94 foot cars per train: total train length 282 ft
- Welded track; not embedded
- Travel speed through segment: 45 mph

No account has been taken of vegetative shielding, although existing foliage may not be dense enough to provide even 1 dBA reduction in 100 feet.

Shielding by rows of houses is not considered to be a factor up to 250 feet from the track.

An Leq(h) background sound level of 54 dBA was assumed for the recreation area impact, based on the monitored level at Site 30 (see **Exhibit 3)** although this could be lower on the channel itself as noted on a photograph of the channel on **Exhibit 5**.

TOOLS

For noise impacts/benefits from daily train operations, the FTA Noise Impact Assessment Spreadsheet was used to predict the level of impact and distance of impact contours from the track. The FTA manual also served as a reference. The FTA method for evaluating level of impact is shown on the chart on **Exhibit 6.**

For noise impacts from passing trains on the bridge over the channel, Table F-1 of the FTA manual was used to determine the maximum pass-by level, and EXCEL spreadsheet calculations estimated the sound level time history on the water either side of the bridge None of these impacts would occur with extension of the tunnel underneath the channel.

RESULTS AND DISCUSSION

Typical Hourly Sound Level Impact on the Channel with a Bridge

The impact on Land Use 1 area is based upon the daytime hourly level or Leq(h). The table below shows a severe noise impact extending 102 feet from the track where the channel surface is not shielded by the bridge structure itself and a moderate noise impact extending 255 feet from track. No impact is predicted 255 feet and greater from the track.

Project Results Summary	102 ft	150 ft	200 ft	255 ft	300 ft
Existing Leqh:	54 dBA	54 dBA	54 dBA	54 dBA	54 dBA
Total Project Leqh:	61 dBA	58 dBA	56 dBA	55 dBA	54 dBA
Total Noise Exposure:	62 dBA	60 dBA	58 dBA	57 dBA	57 dBA
Increase:	8 dB	6 dB	4 dB	3 dB	3 dB
Impact?:	**Severe**	**Moderate**	**Moderate**	**Moderate**	None

Estimated contours reflecting the level of impact are presented on **Exhibit 7.**

Train Pass-by Sound Level Impact on the Channel with a Bridge

An estimate of a maximum pass-by level is based upon the equation in Figure F-1 from the FTA Manual which is included here as **Exhibit 8**. The bridge cross section in **Exhibit 9** shows that train sound levels at the water level, unimpeded by barrier shielding by the bridge, can occur as

close as 90 feet from the bridge. Because of the track line source and water (or ice) surface, the level will drop less than 4.5 dBA per doubling of distance, probably at the 3 to 3.5 dBA level.

Also shown on the exhibit is an estimated sound level time history 90 feet from the bridge at water level of a train pass-by. The sound level rise and decay may be faster than that shown due to possible terrain shielding at water level. This shows a fairly sudden rise in sound level above an assumed 50 dBA ambient level to maximum level 80 dBA. This could possibly decrease to 74 or 75 dBA on the water 400 feet from the bridge.

OPINION OF LEAST IMPACTFUL ALTERNATIVE

Based upon the simple analysis presented here, the extended tunnel will have the least impact on sound levels on the water in the Kenilworth Channel.

MITIGATION STRATEGY

The tunnel extension is a very effective noise mitigation strategy for recreation activity at water (or ice) level along the Kenilworth Channel and the area near the Channel.

EXHIBIT 1 COMPARISON OF TUNNEL ALTERNATIVES

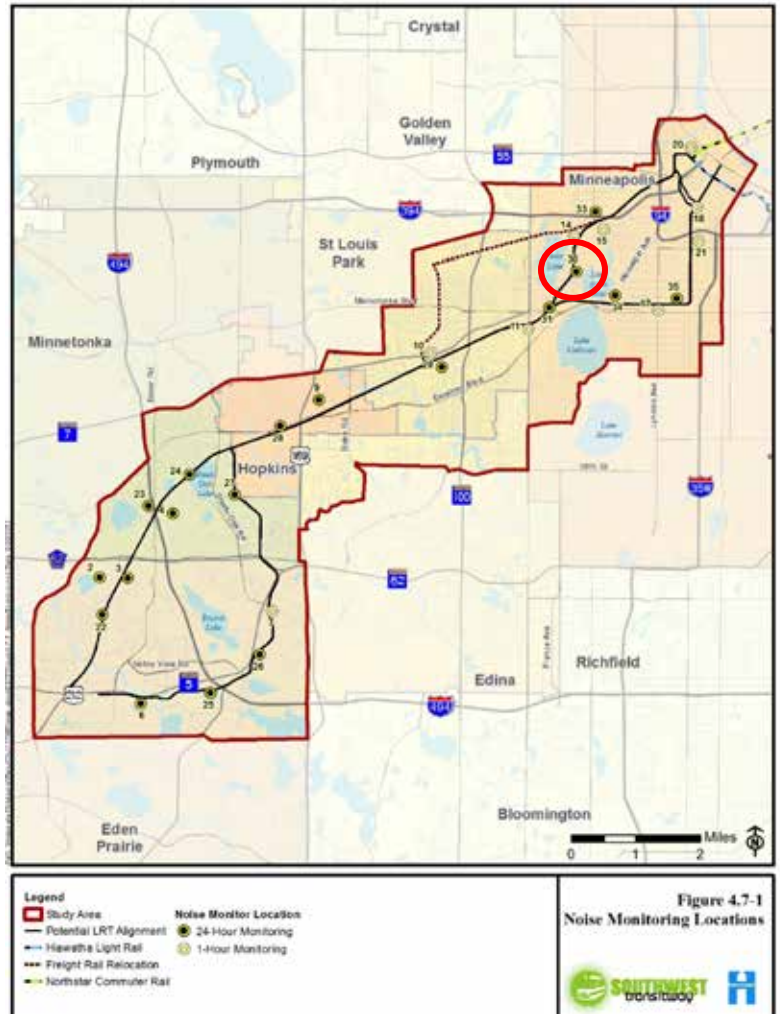


EXHIBIT 2 LOCATION OF MONITORING SITE 30

Site No.	Measurement Location Description	Start of Measurement		Meas. Time (hrs)	Noise Exposure (dBA)	
		Date	Time		Leq	Ldn
30	Kenilworth Place and South Upton Avenue: This site is at a single-family residence next to Lake of the Isles Park in Minneapolis. Airplane noise and local street traffic are the dominant noise sources. The noise of several CT&W train pass-by events was removed from the measurement data. This location is representative of noise-sensitive land use in the Kenwood Neighborhood, away from major thoroughfares.	3/29/2010	16:00	24	54[a,c]	55[c]

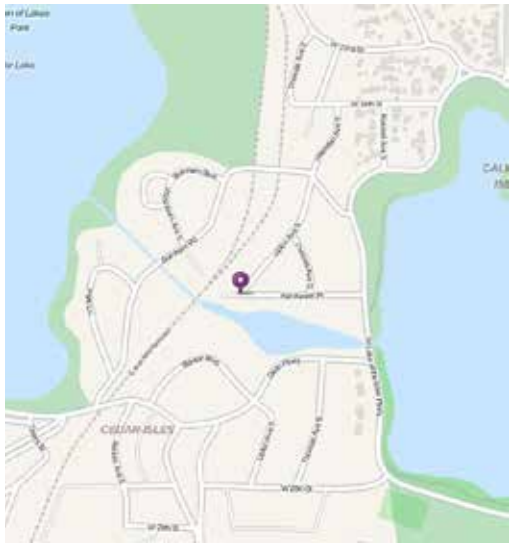


EXHIBIT 3 MONITORED SOUND LVELS AT SITE 30

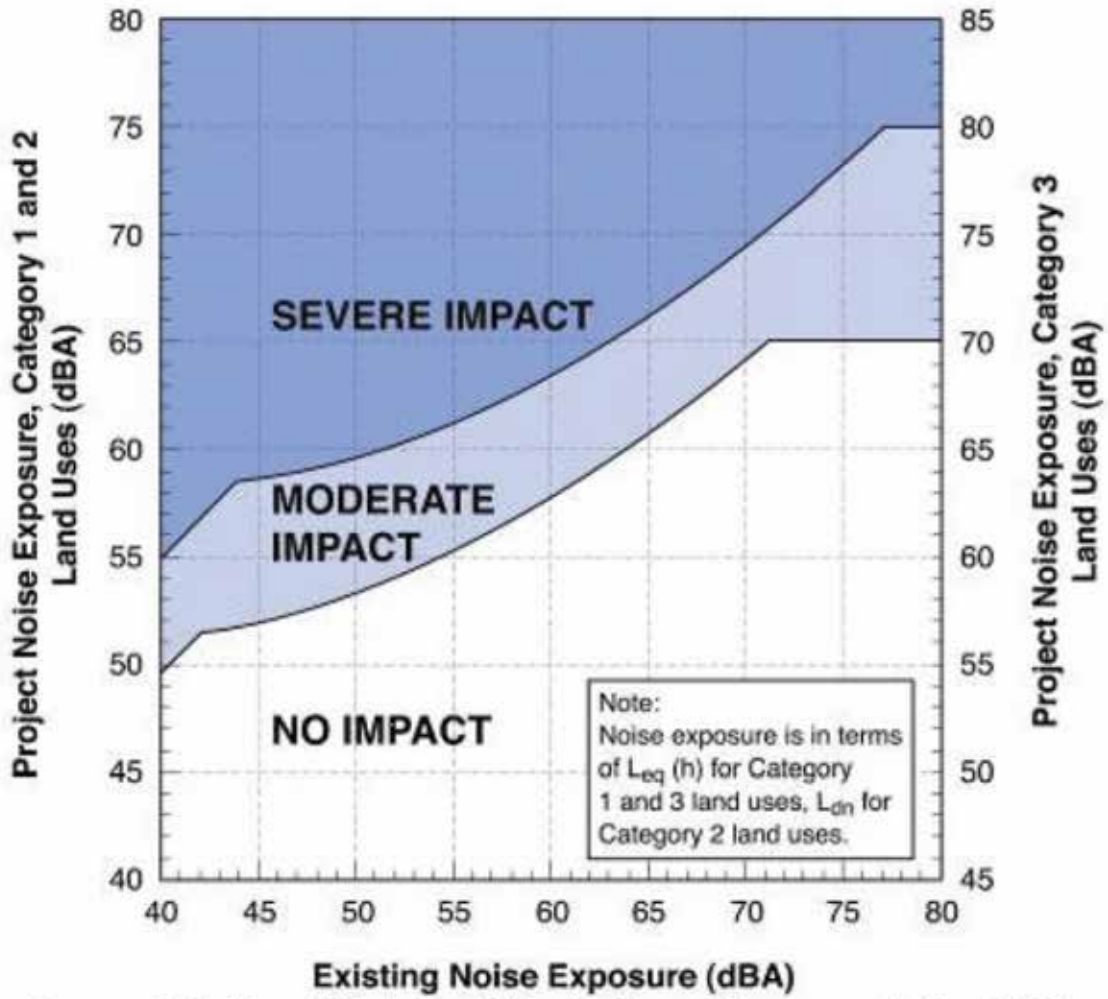
Table 3-2. Land Use Categories and Metrics for Transit Noise Impact Criteria		
Land Use Category	**Noise Metric (dBA)**	**Description of Land Use Category**
1	Outdoor $L_{eq}(h)^*$	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)^*$	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered to be in this category. Certain historical sites and parks are also included.
* L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.		

EXHIBIT 4 LAND USE CATEGORY USED TO EVALUATE IMPACTS

While no specific ambient level data are available on the channel itself, it should be noted that the ambient level was monitored at street level and not at water level in the channel. As can be seen from the photo below the channel would be additionally shielded from noise at street level, so that the impacts here are likely to be greater than those based upon the monitored data.

EXHIBIT 5 PHOTO OF THE EXISTING BRIDGE OVER THE CHANNEL

FIGURE 4.6-2 FTA NOISE IMPACT CRITERIA



Source: FTA, "Transit Noise and Vibration Impact Assessment" (May 2006)

EXHIBIT 6 BASIS FOR FTA IMPACT CRITERIA

EXHIBIT 7 PROJECTED NOISE CONTOURS

Table F-1. Conversion to L_{max} at the Receiver, for a Single Train Passby	
Source	**Equation**
Locomotives	$L_{max,locos} = SEL_{locos} + 10\log\left(\frac{S}{50}\right) - 10\log\left(\frac{L}{50}\right) + 10\log(2\propto) - 3.3$
Rail Cars	$L_{max,cars} = SEL_{cars} + 10\log\left(\frac{S}{50}\right) - 10\log\left(\frac{L}{50}\right) + 10\log[2\propto + \sin(2\propto)] - 3.3$
Total Train	$L_{max,total} = \max[L_{max,locos} or L_{max,cars}]$
D = closest distance between receiver and source, in feet L = total length of measured group of locomotive(s) *or* rail car(s), in feet S = vehicle speed, in miles per hour $\propto = \arctan\left(\frac{L}{2D}\right)$, in radians	

EXHIBIT 8 TABLE F-1 FROM FTA MANUAL FOR CALCULATNG MAXIMUM PASS-BY LEVEL

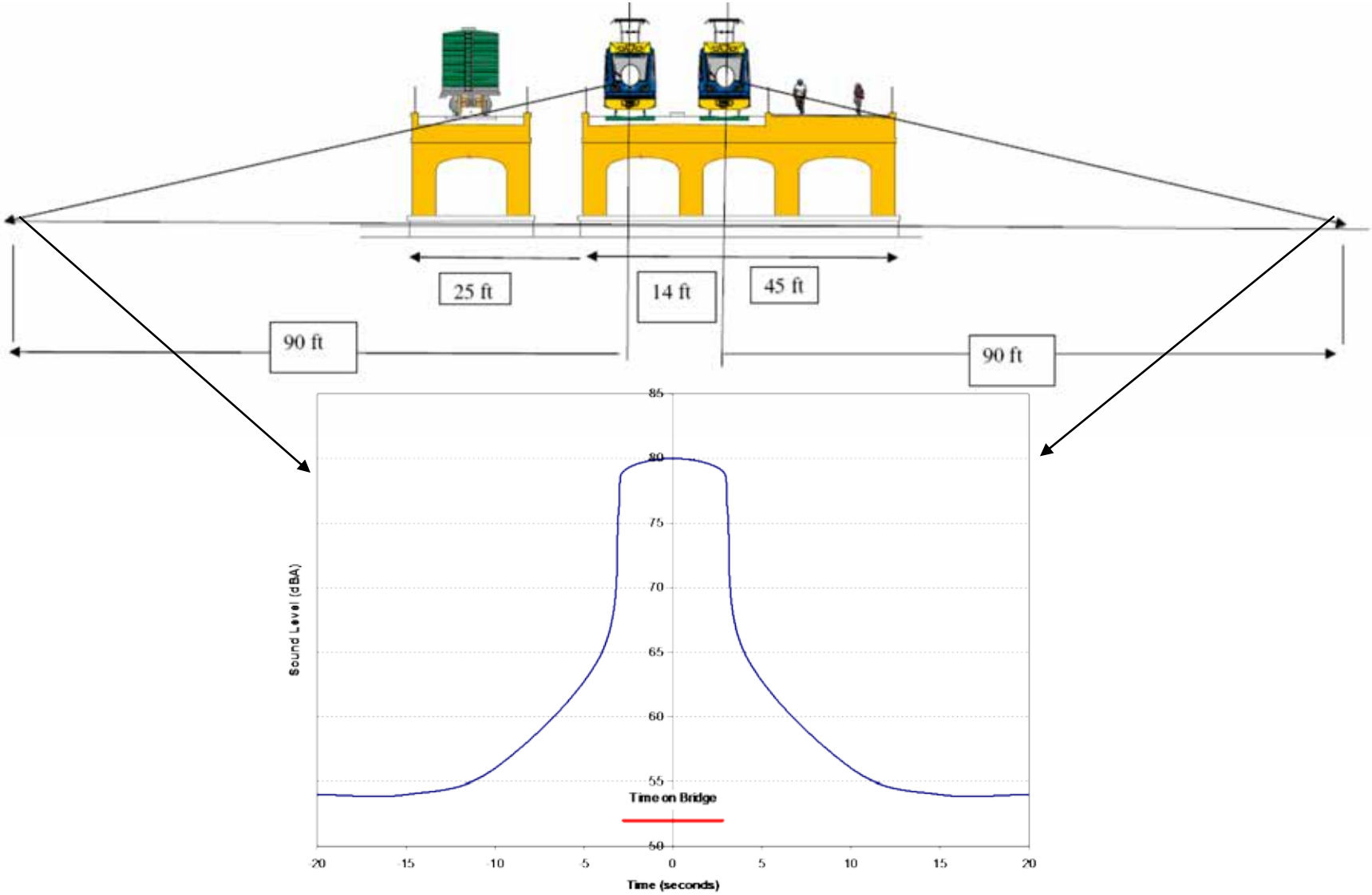
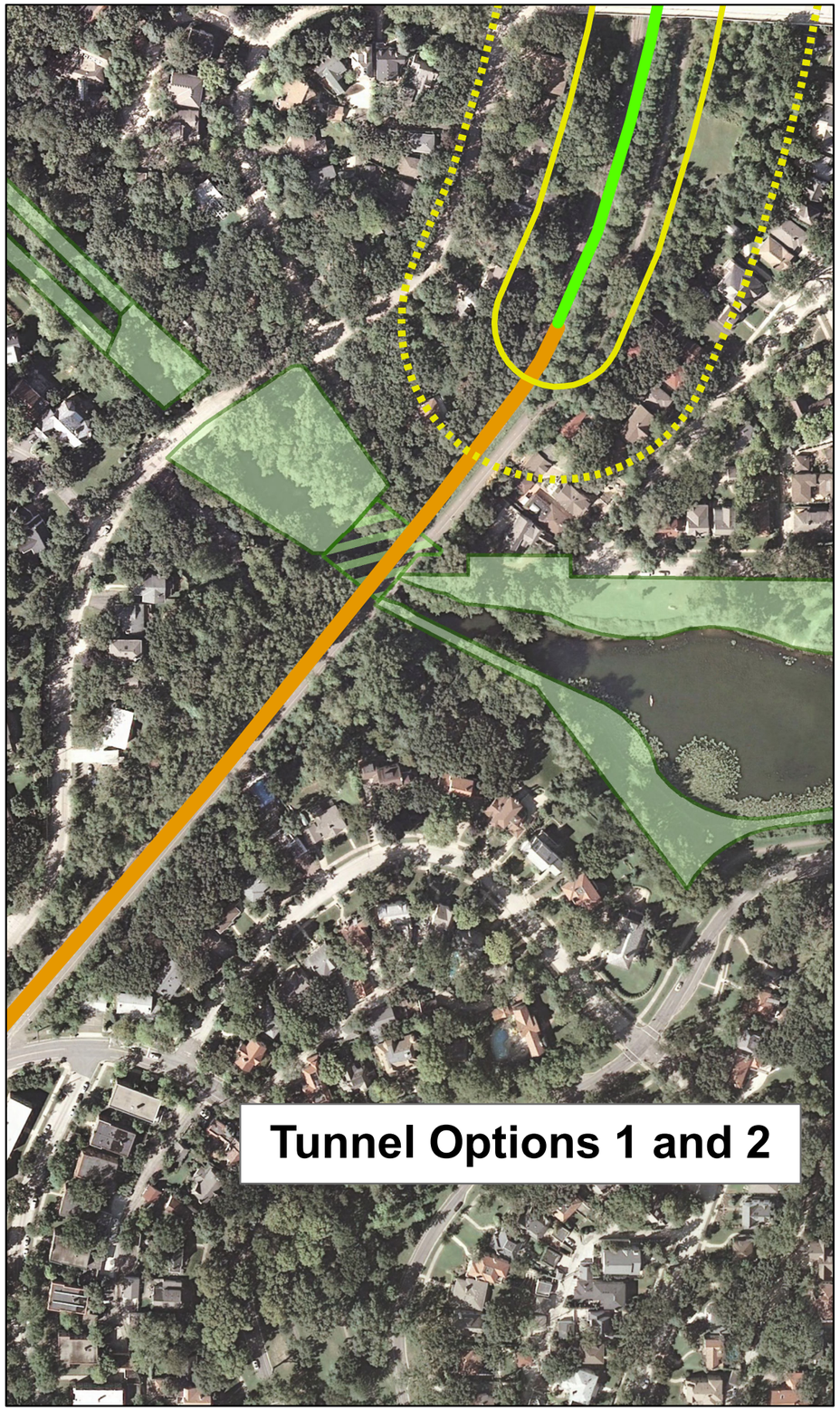


EXHIBIT 9 BRIDGE CROSS SECTION AND ESTIMATE PASS-BY TIME HISTORY ON WATER



FTA 'Severe' Impact
FTA 'Moderate' Impact
LRT Exposed
LRT in Tunnel
MPRB Property
MPRB Easement

N

Feet
100 0 100 200 300

Meters
25 0 25 50 75

BARR

Figure 1

COMPARISON OF BRIDGE
AND TUNNEL NOISE CONTOURS
Kenilworth Channel Alternatives Assessment
Minneapolis Park and Recreation Board
Minneapolis, MN

Memorandum

To: Todd Christopherson, Brierley Associates
From: Courtnay Bot, Barr Engineering Co.
Subject: Kenilworth Channel Alternatives Assessment: Section 4(f) Impacts
Date: March 5, 2015
Project: 23271414.00
c: Michael Schroeder (MPRB), Jim Herbert (Barr)

The purpose of this memorandum is to provide a summary of the evaluation that assesses and identifies the least impactful alternative for the Southwest Light Rail Transit (SWLRT) crossing of the Kenilworth Channel, a property owned by the Minneapolis Park and Recreation Board (MPRB). Whereas the focus on Phase 1 of the project was to demonstrate the feasibility of a tunnel alternative under the Kenilworth Channel, the intent of Phase 2 of the project is to address impacts of the alternatives for crossing the channel, relative to the park and park resources. The Kenilworth Channel crossing alternatives evaluated include:

- SWLRT Project Office (SPO) Bridge Option
- Cut and Cover Tunnel (Tunnel Option 1)
- Jacked Box Tunnel (Tunnel Option 2)

This memorandum is specifically related to the evaluation of the referenced focus area.

Identification

Section 4(f) is a U.S. Department of Transportation law intended to prevent conversion of "specific types" of property to transportation use. Specific types of property include publicly owned land of a park, recreation area or wildlife and waterfowl refuge, or land of historic site with national, state or local significance. Significance is determined by the national, state or local officials having jurisdiction over the resource. The desired outcome of a potential project's effects on Section 4(f) resources is that the project does not result in a net change in the existing amenities (uses) available for the users of the resource.

MPRB owns and has jurisdiction over the Kenilworth Channel, which it identifies as a Section 4(f) resource. The following is a list of the Section 4(f) resource uses:

- Canoeing/kayaking
- Fishing
- Ice Skating/skiing
- Biking/walking/running [a Three Rivers Park District permitted use on Hennepin County Regional Railroad Authority (HCRRA) property]
- Passive Uses

Methodology

The Federal Highway Administration (FHWA) method for completing a Section 4(f) evaluation was referenced for purposes of this assessment. The steps in the Section 4(f) evaluation are as follows:

1) Document the proposed project and its purpose and need
2) Compile Section 4(f) resource information
3) List and map Section 4(f) resources
4) Understand ownership/jurisdiction
5) List and map the amenities or characteristics of the resources
6) Identify the types of impacts that may occur to each amenity or characteristic and categorize as temporary, direct or constructive.
7) For public parks and publicly owned recreation areas, the distance used to assess noise impacts (constructive use) is 350 feet (Federal Transportation Agency [FTA] unobstructed screening distance).
8) Identify avoidance alternatives
9) Identify minimization and mitigation measures
10) Coordinate with the party having jurisdiction over the Section 4(f) resource

Barr Engineering Co. (Barr) used the elements of the FHWA Section 4(f) evaluation for this assessment; however, a complete Section 4(f) evaluation was not completed by Barr. The limited the scope of the

assessment included each of the elements identified above with the exception of item 1, which has already been established by the SPO.

Assumptions (or Considerations)

Focusing, as requested by the MPRB, on the Kenilworth Channel as the Section 4(f) resource, the Brierley Associates (Brierley) team assessed the SPO Bridge and SWLRT tunnel options by going through the FHWA Section 4(f) methodology laid out above in a step-by-step manner.

1) Document the proposed project and its purpose and need

   MPRB did not challenge the purpose and need provided in the DEIS. Please refer to DEIS for information regarding the purpose and need of the proposed project.

2) Compile Section 4(f) resource information

   The Brierley team was retained to review Section 4(f) resources under its jurisdiction; as such, this review was limited to the Kenilworth Channel. A map of the resource is attached (Figure 1). Note: the Three Rivers Park District trail (on HCRRA property) over the channel has been discussed throughout this evaluation but was not the primary focus of the Section 4(f) resource assessment.

3) List and map Section 4(f) resources

   This review focused primarily on the Kenilworth Channel; however, the Three Rivers Park District trail (on HCRRA property) over the channel has been noted in this assessment. See Figure 1 (attached) for the Kenilworth Channel Section 4(f) resource.

4) Understand ownership/jurisdiction

   In working with the MPRB, it was confirmed that the boundary on Figure 1 delineates the extent of the MPRB's ownership and jurisdiction over the Kenilworth Channel. MPRB has an easement for the channel directly under the bridge.

5) List and map the amenities or characteristics of the resources

   The Kenilworth Channel provides a connection between Cedar Lake and Lake of the Isles in MPRB's Chain of Lakes Regional Park and hosts a variety of active and passive public uses. The open water of the Kenilworth Channel allows canoeists and kayakers access to the northernmost portion of the Chain of Lakes Regional Park, Cedar Lake. The channel also serves as a public fishing amenity. In frozen conditions, the channel serves as a trail for cross country

skiers and ice skaters. The quiet, grassed areas along the banks of the channel offer opportunities for passive recreation in an otherwise developed/metropolitan setting. Figure 1 includes notes demonstrating the areas used by the various Section 4(f) users.

The amenities include: frozen or open water in the channel, grass areas along the channel, fish in the channel, quietude of the channel, overall visual experience of the natural passage between to waterbodies.

6) Identify the types of impacts that may occur to each amenity or characteristic and categorize as temporary, direct or constructive.

Per FHWA, a use or impact can result from:

- Temporary Use – generally viewed as short-term impacts only experienced during the construction phase
- Direct/Permanent – land from Section 4(f) resource is permanently removed from its present use and is incorporated into the transportation network
- Constructive – due to the proximity of the transportation use, the impact is so significant that it impairs amenities of the 4(f) resource.

Generally, temporary uses of the Kenilworth Channel would include closure or impeded access, construction equipment noise, and visual impacts during construction. A user will need to be present in order for there to be an impact. Direct/permanent uses of the resource would include the introduction of additional obstructions in the channel. Constructive uses of the Kenilworth Channel are primarily limited to operational noise and visual effects – impacts that do not physically alter the Section 4(f) resource.

Based on the Noise/Vibration technical memo prepared for this project, vibration impacts to the channel are not expected to be significant. In addition, removal of trees and vegetation are not expected to result in significant impacts to the Section 4(f) resource. Disturbed vegetation would be re-planted to match the surrounding vegetation upon construction completion and hardscape features would be softened through the project's landscaping plan.

Table 1 identifies the types of impacts that occur to each amenity or characteristic (which have be described by use/user – e.g., canoe/kayak). Note: Table 1 includes constructive impacts under the permanent impacts section (constructive impacts remain to be visual, shade/shadow, noise).

7) For public parks and publicly owned recreation areas, the distance used to assess noise impacts (constructive use) is 350 feet (FTA unobstructed screening distance).

Figure 2 identifies the 350 foot setback used to assess constructive noise impacts.

8) Identify avoidance alternatives

Per FHWA's Section 4(f) policy paper, review of avoidance alternatives should include the following considerations:

- No Build
- Location
- Alternative Actions
- Alignment Shifts
- Design Changes

The scope of the Brierley team's review during Phase I of the assessment was limited to design changes. It was determined that both alternatives are feasible.

A complete avoidance alternative (no build alternative) was not included in the Phase I assessment as MPRB recognizes the SWLRT's purpose and need cannot be met without construction of a build alternative. Additionally, MPRB accepts that SPO completed an analysis of the location, alternative actions and alignment shift alternatives (as documented in the DEIS).

During Phase 2 of the assessment, Barr evaluated each of the environmental factors to assist in the environmental aspect of the review of impacts for the build alternatives (Item 3 of FHWA's review, see below). The SPO Bridge Option, Cut Cover Tunnel Option 1 and Jacked Box Tunnel Option 2 were compared noting that, per the FHWA Section 4(f) policy paper, an alternative is not prudent if:

1. It compromises the project to a degree that it is unreasonable to proceed in light of the project's stated purpose and need (i.e., the alternative doesn't address the purpose and need of the project);
2. It results in unacceptable safety or operational problems;
3. After reasonable mitigation, it still causes severe social, economic, or environmental impacts; severe disruption to established communities; severe or disproportionate impacts to minority or low-income populations; or severe impacts to environmental resources protected under other Federal statutes;

4. It results in additional construction, maintenance, or operational costs of extraordinary magnitude;

5. It causes other unique problems or unusual factors; or

6. It involves multiple factors as outlined above that, while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

9) Identify minimization and mitigation measures

The Brierley team offers Table 1 as a demonstration of the minimized impacts associated with the Jacked Box Tunnel Option 2 compared to the SPO Bridge Option and Cut Cover Tunnel Option 1. Mitigation, specific to the most significant permanent impacts – noise/vibration and visual, is discussed in the Mitigation section below.

10) Coordinate with the party having jurisdiction over the Section 4(f) resource

The work completed by the Brierley team has all been completed on behalf of the MPRB, which has jurisdiction over the Kenilworth Channel.

Tools

The Federal Highway Administration (FHWA) model for Section 4(f) evaluation (per the FHWA Section 4(f) Policy Paper) was used as a tool for this assessment. A complete Section 4(f) was not completed as a part of this assessment.

Results and Discussion

It is unrefuted that the Kenilworth Channel is a Section 4(f) resource and the MPRB has jurisdiction over this resource.

Additionally, it is unrefuted that it is feasible to construct the SWLRT in a manner that minimizes and mitigates impacts to the Section 4(f) resource.

The most significant impacts, as identified in Table 1 involve the temporary noise/vibration and visual impacts during construction and the permanent noise and visual impacts. A user will need to be present in order for there to be an impact. Significance is determined by the national, state or local officials having jurisdiction over the resource. In this case, this is the MPRB. For more detailed discussion, refer to the Noise and Vibration Impacts and Visual Impacts technical memorandums.

The project proposer intending to use the Kenilworth Channel for the SWLRT project must demonstrate that there is:

- No feasible and prudent alternative to the Section 4(f) use AND
- The action includes all possible planning to minimize the use.

Opinion of Least Impactful Alternative

The tunnel options will have the least impact on the Section 4(f) resource (the Kenilworth Channel). Of the two tunnel options considered in this assessment, Jacked Box Option 2 has the least impact on the Kenilworth Channel – the subject Section 4(f) resource.

Mitigation Strategy

Mitigation is offered for the permanent visual impacts. The selection of the build alternative with the least temporary/least significant temporary construction impacts offers mitigation for the temporary construction impacts.

- Incorporate minimal pedestrian bridge design (i.e., clear span) versus building a bridge with more substantial deck, rails and the addition of piers in the channel.
- Incorporate a freight bridge that minimizes bridge deck, rail and piers.
- Integrate a landscaping plan that returns that reduces the intrusion of new hardscapes (e.g., concrete surfaces)

References

FHWA (July 20, 2012), Section 4(f) Policy Paper

Attachments:

Table 1 – Section 4(f) Matrix
Figure 1 – Section 4(f) Resource and Amenities Map
Figure 2 - 350-foot Setback for Noise Impacts

Minneapolis Park & Recreation Board

Chain of Lakes Regional Park

	Temporary impacts				Permanent impacts					
	Access	Noise	Channel Obstruction	Visual	Access	Noise	Channel Obstruction	Visual	Shade/ Shadow	R/W
SPO Bridge Option										
Canoe/Kayak	impeded access for safety purposes during construction	noise would be limited to overhead effects associated with pile driving and bridge construction; duration of construction noise impacts is expected to be shorter than with tunnel options	temporary in-channel obstructions during existing bridge demolition and pier construction of new bridge(s)	significant impacts during construction, including staging areas, with construction of bridge(s) over channel	no change from existing conditions	operational noise would exceed FTA severe thresholds within 102 feet from LRT line and would exceed FTA moderate thresholds within 225 feet from the LRT line; impact expected to be severe due to proximity of pedestrian bridge to LRT bridge. Impacts proximate to the bridge are somewhat reduced due to the shielding qualities of the bridge structure.	extent to be determined based on number of bridge piers and the associated locations	degree of impact will be based on bridge design and materials, including bridge spacing	reduced natural light minimizes the outdoor experience; dependent on sizing/spacing of new bridges	none
Fishing	impeded access for safety purposes during construction	noise would be limited to overhead effects associated with pile driving and bridge construction; duration of construction noise impacts is expected to be shorter than with tunnel options	likely less of an impact to navigation than for canoe/kayak; however, temporary in-channel obstructions existing during bridge demolition and pier construction of new bridge(s)	significant impacts during construction, including staging areas, with construction of bridge(s) over channel	no change from existing conditions	operational noise would exceed FTA severe thresholds within 102 feet from LRT line and would exceed FTA moderate thresholds within 225 feet from the LRT line; impact expected to be severe due to proximity of pedestrian bridge to LRT bridge. Impacts proximate to the bridge are somewhat reduced due to the shielding qualities of the bridge structure.	less of an impact for this user, compared to the canoe/kayak, because navigability is not as critical	degree of impact will be based on bridge design and materials, including bridge spacing	none	none
Ice Skating/Skiing	degree of severity dependent on construction method and timing	noise would be limited to overhead effects associated with pile driving and bridge construction; duration of construction noise impacts is expected to be shorter than with tunnel options	temporary in-channel obstructions during existing bridge demolition and pier construction of new bridge(s)	significant impacts during construction, including staging areas, with construction of bridge(s) over channel	no change from existing conditions	operational noise would exceed FTA severe thresholds within 102 feet from LRT line and would exceed FTA moderate thresholds within 225 feet from the LRT line; impact expected to be severe due to proximity of pedestrian bridge to LRT bridge. Impacts proximate to the bridge are somewhat reduced due to the shielding qualities of the bridge structure.	less of an impact for this user compared to the canoe/kayak; however, extent to be determined based on number of bridge piers and the associated locations	degree of impact will be based on bridge design and materials, including bridge spacing	shade/shadow based on bridge(s) to be constructed could affect visibility and also impact accumulation of snow needed for users to pass through the channel	none

Minneapolis Park & Recreation Board

Chain of Lakes Regional Park

	Temporary impacts				Permanent impacts					
	Access	Noise	Channel Obstruction	Visual	Access	Noise	Channel Obstruction	Visual	Shade/ Shadow	R/W
Biking/Walking/Running	impeded access during construction (trail would be closed) and potential reconfiguration of bridges above channel	noise would be limited to effects associated with adjacent bridge construction; duration of construction noise impacts is expected to be shorter than with tunnel options	not applicable to trail users	significant impacts during construction, including staging areas	users would be on a new bridge and may be adjacent to light rail vehicles on the bridge.	operational noise would exceed FTA severe thresholds within 102 feet from LRT line and would exceed FTA moderate thresholds within 225 feet from the LRT line; impact expected to be severe due to proximity of pedestrian bridge to LRT bridge.	none	user will have direct views of LRT infrastructure and LRT vehicles	none	none
Passive Use	impeded access for safety purposes during construction, staging may take place atop adjacent grassy, passive use areas.	noise would be limited to effects associated with adjacent bridge construction; duration of construction noise impacts is expected to be shorter than with tunnel options	not applicable to passive uses	significant impacts during construction, including staging areas, with construction on bridge(s) over channel	no change from existing conditions	operational noise would exceed FTA severe thresholds within 102 feet from LRT line and would exceed FTA moderate thresholds within 225 feet from the LRT line; impact expected to be severe to moderate due to proximity of passive use areas to LRT bridge.	none	degree of impact will be based on bridge design and materials, including bridge spacing	none	none

Minneapolis Park & Recreation Board

Chain of Lakes Regional Park

	Temporary impacts				Permanent impacts					
	Access	Noise	Channel Obstruction	Visual	Access	Noise	Channel Obstruction	Visual	Shade/ Shadow	R/W
Cut and Cover Tunnel (Tunnel Option 1)										
Canoe/Kayak	more impact than the bridge alternative as channel would be closed to construct tunnel and for limited times during construction of the rail and pedestrian bridges	during portions of the construction there will be noise disturbance, especially during pile driving for tunnel and bridges.	complete closure for duration of construction (approx 6 months)	none - users would not be present during construction as the channel would be closed	no change from existing conditions	no change from existing conditions	new and separate bridges would be constructed for rail and trail, but design has not been determined.	no LRT infrastructure visible from channel or banks	freight rail and trail bridges would result in shadowing, but less impact than Bridge Option.	no change from existing conditions
Fishing	more impact than the bridge alternative as channel would be closed to construct tunnel and for limited times during construction of the rail and pedestrian bridges	during portions of the construction there will be noise disturbance, especially during pile driving for tunnel and bridges.	complete closure for duration of construction (approx 6 months)	none - users would not be present during construction as the channel would be closed	no change from existing conditions	no change from existing conditions	new and separate bridges would be constructed for rail and trail, but design has not been determined.	no LRT infrastructure visible from channel or banks	freight rail and trail bridges would result in shadowing, but less impact than Bridge Option.	no change from existing conditions
Ice Skating/Skiing	more impact than the bridge alternative as channel would be closed to construct tunnel and for limited times during construction of the rail and pedestrian bridges	during portions of the construction there will be noise disturbance, especially during pile driving for tunnel and bridges.	complete closure for duration of construction (approx 6 months)	none - users would not be present during construction as the channel would be closed	no change from existing conditions	no change from existing conditions	new and separate bridges would be constructed for rail and trail, but design has not been determined.	no LRT infrastructure visible from channel or banks	freight rail and trail bridges would result in shadowing, but less impact than Bridge Option.	no change from existing conditions
Biking/Walking/Running	impeded access during construction (trail would be closed) and potential reconfiguration of bridges above channel	none - users would not be present during construction as there would be no pedestrian bridge	may be closed during certain portions of construction	none - users would not be present during construction as there would be no pedestrian bridge	users would be on a new bridge separated from freight rail	no change from existing conditions	new and separate bridges would be constructed for rail and trail, but design has not been determined.	no LRT infrastructure visible from channel or banks	freight rail and trail bridges would result in shadowing, but less impact than Bridge Option.	no change from existing conditions
Passive Use	access may be impeded for construction staging on adjacent grassy, passive use areas	during portions of the construction there will be noise disturbance, especially during pile driving for tunnel and bridges.	may be closed during certain portions of construction	if user is present, construction equipment and activities would be visible	no change from existing conditions	no change from existing conditions	no impact on passive use	no LRT infrastructure visible from channel or banks	no impact on passive use.	no change from existing conditions

Minneapolis Park & Recreation Board

Chain of Lakes Regional Park

	Temporary impacts				Permanent impacts					
	Access	Noise	Channel Obstruction	Visual	Access	Noise	Channel Obstruction	Visual	Shade/ Shadow	R/W
Jacked Box Tunnel (Tunnel Option 2)										
Canoe/Kayak	access may be closed for certain construction activities, but would generally remain open	during portions of the construction there will be noise disturbance, especially during pile driving. For launching and jacking pits and for bridges; construction activity would generally occur in locations below surrounding grade so construction noise may be limited.	access may be closed for certain construction activities, but would generally remain open	if user is present, construction equipment and activities may be visible, but significant work would be performed in the launching pit, which will be obscured due to its location below surrounding grade.	no change from existing conditions	no change from existing conditions	new and separate bridges would be constructed for rail and trail, but design has not been determined.	no LRT infrastructure visible from channel or banks	freight rail and trail bridges would result in shadowing, but less impact than Bridge Option.	no change from existing conditions
Fishing	access may be closed for certain construction activities, but would generally remain open	during portions of the construction there will be noise disturbance, especially during pile driving. For launching and jacking pits and for bridges; construction activity would generally occur in locations below surrounding grade so construction noise may be limited.	access may be closed for certain construction activities, but would generally remain open	if user is present, construction equipment and activities may be visible, but significant work would be performed in the launching pit, which will be obscured due to its location below surrounding grade.	no change from existing conditions	no change from existing conditions	new and separate bridges would be constructed for rail and trail, but design has not been determined.	no LRT infrastructure visible from channel or banks	freight rail and trail bridges would result in shadowing, but less impact than Bridge Option.	no change from existing conditions
Ice Skating/Skiing	access may be closed for certain construction activities, but would generally remain open	during portions of the construction there will be noise disturbance, especially during pile driving. For launching and jacking pits and for bridges; construction activity would generally occur in locations below surrounding grade so construction noise may be limited.	access may be closed for certain construction activities, but would generally remain open	if user is present, construction equipment and activities may be visible, but significant work would be performed in the launching pit, which will be obscured due to its location below surrounding grade.	no change from existing conditions	no change from existing conditions	new and separate bridges would be constructed for rail and trail, but design has not been determined.	no LRT infrastructure visible from channel or banks	freight rail and trail bridges would result in shadowing, but less impact than Bridge Option.	no change from existing conditions
Biking/Walking/Running	impeded access during construction (trail would be closed) and potential reconfiguration of bridges above channel	none - users would not be present during construction as there would be no pedestrian bridge	may be closed during certain portions of construction	if user is present, construction equipment and activities may be visible, but significant work would be performed in the launching pit, which will be obscured due to its location below surrounding grade.	users would be on a new bridge separated from freight rail	no change from existing conditions	new and separate bridges would be constructed for rail and trail, but design has not been determined.	no LRT infrastructure visible from channel or banks	freight rail and trail bridges would result in shadowing, but less impact than Bridge Option.	no change from existing conditions

Minneapolis Park & Recreation Board

Chain of Lakes Regional Park

	Temporary impacts				Permanent impacts					
	Access	Noise	Channel Obstruction	Visual	Access	Noise	Channel Obstruction	Visual	Shade/ Shadow	R/W
Jacked Box Tunnel (Tunnel Option 2)										no change from existing conditions
Passive Use	access may be impeded for construction staging on adjacent grassy, passive use areas	during portions of the construction there will be noise disturbance, especially during pile driving. For launching and jacking pits and for bridges; construction activity would generally occur in locations below surrounding grade so construction noise may be limited.	may be closed during certain portions of construction	if user is present, construction equipment and activities may be visible, but significant work would be performed in the launching pit, which will be obscured due to its location below surrounding grade.	no change from existing conditions	no change from existing conditions	no impact on passive use.	no LRT infrastructure visible from channel or banks	no impact on passive use.	none

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Memorandum

To: Todd Christopherson, Brierley Associates
From: Ray Wuolo, Barr Engineering Co.
Subject: Kenilworth Channel Alternatives Assessment: Groundwater Impacts
Date: March 5, 2015
Project: 23271414.00
c: Michael Schroeder (MPRB), Jim Herbert (Barr)

The purpose of this memorandum is to provide a summary of the evaluation that assesses and identifies the least impactful alternative for the Southwest Light Rail Transit (SWLRT) crossing of the Kenilworth Channel, a property owned by the Minneapolis Park and Recreation Board (MPRB). Whereas the focus on Phase 1 of the project was to demonstrate the feasibility of a tunnel alternative under the Kenilworth Channel, the intent of Phase 2 of the project is to address impacts of the alternatives for crossing the channel, relative to the park and park resources. The Kenilworth Channel crossing alternatives evaluated include:

- SWLRT Project Office (SPO) Bridge Option
- Cut and Cover Tunnel (Tunnel Option 1)
- Jacked Box Tunnel (Tunnel Option 2)

This memorandum is specifically related to the evaluation of the potential impacts to groundwater. More specifically, it addresses the potential effects of construction dewatering for a tunnel and the effects of a tunnel (post-construction) on groundwater elevations, groundwater flow direction; and interaction with nearby surface-water bodies.

Identification

A shallow tunnel that is constructed underneath the Kenilworth Channel between Cedar Lake and Lake of the Isles (either by cut and cover or jacked box tunnel construction methods) will involve work below the water table during construction and a tunnel feature below the water table after construction. Both construction and post-construction conditions may involve dewatering (groundwater pumping) and/or

groundwater seepage into structures below the water table, depending on the construction method. Construction dewatering and post-construction groundwater seepage involves the removal of groundwater by pumping and therefore has the potential to affect groundwater elevations, groundwater interaction with surface-water bodies, and the local water balance. Furthermore, post-construction, the tunnel feature and associated piling walls have the potential to disrupt the natural flow of groundwater in the area.

Methodology

Predicting the effects of tunnel dewatering on groundwater and groundwater-lake interaction requires the use of a computer model of groundwater flow that includes site-specific features, regional geologic and hydrologic features, and is calibrated to existing groundwater conditions. The model must have sufficient local detail to account for the depth of the tunnel construction features, as well as the tunnel after it is constructed.

The model was used to simulate existing conditions with respect to groundwater levels, groundwater flow directions, and interaction between groundwater and the surface-water features (e.g., Cedar Lake, Lake of the Isles, Lake Calhoun, and the Kenilworth Channel). The effects of constructing the jacked box tunnel on groundwater and surface waters were then evaluated because this alternative involves the deepest incursion into the water table and would therefore have the greatest construction-related hydrology effects. The effects of the constructed tunnel on groundwater flow direction and rate were then evaluated.

Assumptions

This opinion of least impactful alternative is based on several assumptions, which may change as the project develops. The significant assumptions used to complete this evaluation are summarized below:

- .For the jacked box tunnel alternative, the jacking pit and the launching pit were assumed to be constructed concurrently and to bottom elevation of approximately 813 feet above mean sea level, with sheet piling extending down to elevation 810 feet above mean sea level. The width and length of the two pits are as assumed by Brierley Associates in their conceptual drawings.
- Steady-state groundwater conditions are assumed to be achieved during the construction phase. Based on experience, this very likely will occur but if it does not, the modeling predictions will represent a maximum “worst-case” effect.

- The cut and cover tunnel alternative would be evaluated only if substantial impacts are predicted for the jacked box tunnel alternative (which is deeper and therefore more likely to induce greater groundwater and surface water impacts). As discussed below in this memo, evaluation of the cut and cover alternative was deemed unnecessary, based on the results of the modeling of the jacked box tunnel alternative.

- Lake water levels are assumed to be at average conditions.

- The hydraulic conductivity (permeability) of the geologic materials and the lake and channel sediments are assumed to be as derived from the calibration of the Metro Model 3 and were not changed as a part of this evaluation.

- Seepage and dewatering rates for the tunnel construction are dependent on how well the pit floor and walls are sealed. Because the amount of sealing is an unknown, several different assumptions of the sealing effectiveness were evaluated. Flow between the joints of a sheet-pile wall does not follow Darcy's Law but the overall wall's resistance to seepage can be represented as an equivalent permeability. These varying sealing conditions are represented as hydraulic conductivity (permeability) of the walls and floors in the simulations.

- For tunnel jacking, the soil between the launching and jacking pits (i.e. underneath the channel) will be pre-conditioned to lower the permeability of the soils prior to jacking through some method, such as grouting. For purposes of this evaluation, the resulting permeability was assumed to be equal to the permeability of the walls/floors in the pits.

Tools

To perform the evaluations, a local-scale groundwater-flow model of the Chain of Lakes region was constructed using the USGS groundwater modeling code MODFLOW-NWT (Niswonger et al., 2011). The local-scale model was extracted from the Metropolitan Council's regional 11-County metropolitan groundwater-flow model, Metro Model 3 (Metropolitan Council, 2014) through a process called "telescoping mesh refinement", or TMR. Metro Model 3 includes all major water features in the 11-County metro area, as well as all major aquifers, aquitards, pumping wells, and groundwater recharge. The TMR groundwater-flow model is of much smaller areal extent than the regional model but retains all of the geologic, hydrologic, and surface-water features of the regional model, as well as the regional groundwater flow effects, which are represented in the boundary conditions at the edges of the TMR model. Using a local-scale TMR model allows for the inclusion of more-detailed features than the regional

model can easily account for and problem-specific conditions, such as increased layering in the shallow aquifer. The extent of the TMR model in the context of the regional Metro Model 3 is shown on Figure 1.

For purposes of this evaluation, the local-scale model required further refinement. Refinements to the model include:

- decreased finite-difference grid-cell size to improve numerical accuracy and account for detailed features of tunnel alternatives;
- the addition of two more layers in the surficial aquifer to account for the depth of the tunnel and construction features (bringing the total number of layers representing the surficial aquifer in the area to four;
- refinement of the shapes of model features that represent Cedar Lake, Lake of the Isle, Lake Calhoun, and the Kenilworth Channel;
- modifications to values of hydraulic conductivity in the model to better account for the information obtain from soil boings performed in the area.

None of these refinements required re-calibration of the model. Model features for the local-scale model are shown on Figure 2.

The jacking pit and the launching pit were represented by the Drain Package in MODFLOW. The Drain Package requires specification of the hydraulic conductivity (permeability) of the walls and floor of the drain and the water elevation maintained in the drain. The water elevation in the two pits was assumed to be equal to the elevation of the proposed slab at the bottom of the pits (818 feet above mean sea level). The permeability of the floor and walls was assumed to be equal. The following permeability values were evaluated: 1×10^{-5} cm/s; 1×10^{-4} cm/s; 1×10^{-3} cm/s; and 1×10^{-2} cm/s. A permeability of 1×10^{-5} cm/s (0.03 ft/day) is a value that is typically used for unsealed sheet piling. Therefore these ranges likely represent the high end of what would be expected for permeability and thus, are conservative (i.e. tend toward the 'worst-case" conditions).

After construction of the tunnel (either a jacked box tunnel or a cut and cover tunnel), it is assumed that groundwater seepage into the tunnel will be negligible (less than a five gallons per minute). The completed tunnel would not result in any induced seepage from surface-water bodies or cause

groundwater drawdown. However, the tunnel might act as a buried obstruction to groundwater flow, causing changes in groundwater flow conditions and underground communication between the lakes. To evaluate this, the completed tunnel was simulated in the groundwater-flow model as an impermeable barrier with a length equal to the portion of tunnel below the water table and a depth equal to the bottom of the sheet piling or tunnel floor (whichever is deepest at any particular point). The groundwater particle tracking code MODPATH (Pollack, 2012) was used in conjunction with MODFLOW-NWT to predict the direction of groundwater flow with and without the tunnel. A comparison of these flow paths was then undertaken to determine the effect of the tunnel on groundwater flow direction.

The model outputs were compared for each alternative and evaluated for impacts to the users of the Kenilworth Channel based on available knowledge of the site and available information provided by MPRB and SPO.

Results and Discussion

Effects of Tunnel Construction Dewatering

The model's predictions for the effects of dewatering for the jacked box tunnel are shown on Figure 3. The predicted values for a permeability of 1×10^{-5} cm/s and 1×10^{-4} cm/s represent a condition in which the piling walls are not well-sealed (i.e., a worst-case condition). Results for a permeability value of 1×10^{-3} cm/s and 1×10^{-2} cm/s are extreme cases that are more indicative of construction methods with little seepage control.

Based on these results, it would be reasonable to expect dewatering rates during construction of less than 250 gallons per minute and very small (less than 50 gallons per minute) induced seepage from the nearby lakes and the Kenilworth Channel. It is assumed that pumped water during construction would be either infiltrated into the ground in the vicinity of the construction or directed back into the channel. With either method of water handling, the overall water balance of the Chain of Lakes would be unaffected. Lake levels would not be affected with this level of predicted seepage.

A similar modeling analysis for a cut and cover tunnel option was not performed but the results are expected to be similar or less than those predicted for the jacked box tunnel option.

Effects of Tunnel on Groundwater Flow

The regional groundwater-flow direction in the vicinity of Lake of the Isle and Cedar Lake is approximately west to east, toward the Mississippi River. This approximate west to east groundwater-flow direction is generally true for both the Quaternary (unconsolidated) aquifer(s) and bedrock aquifers, such as the Prairie du Chien-Jordan aquifer and the Tunnel City-Wonawac aquifer. The Quaternary aquifer is generally composed of sand and gravel, with discontinuous layers of clayey silt and organic deposits, such as wetland and peat deposits. In the vicinity of Lake of the Isle, Cedar Lake, and Lake Calhoun, these Quaternary deposits are up to 160-feet deep and fill a north-south trending buried bedrock valley.

The lakes and other hydrologic features in the vicinity of the Kenilworth Channel are surface expressions of the water table and influence the local direction of groundwater flow, particularly in the upper 50 feet of the saturated sand-and-gravel aquifer. Infiltrating precipitation provides local recharge to the aquifer and also affects local groundwater-flow direction, particularly in the upper 60 feet of the aquifer. Within these upper deposits, local groundwater-flow direction turn south-to-north between Cedar Lake and Lake of the Isle and then swing around to the east along the north side of Lake of the Isles, as shown in the model simulation of groundwater-direction on Figure 4.

The effects of the completed jacked box tunnel on shallow groundwater-flow direction are shown on Figure 5. Only those portions of the tunnel that extend below the water table were included as no-flow barriers. The depth of the tunnel's no-flow barrier condition extends to an elevation of approximately 810 feet below mean sea level for the jacked box tunnel sections in order to accommodate the construction sheet piling.

The results of the model simulations predict that the placement of the jacked box tunnel will have a very small effect on groundwater flow direction and rate in the close vicinity of the tunnel (within about 100 feet of the tunnel) and will not affect the overall groundwater flow directions in either the shallow or deep portions of the Quaternary sand-and-gravel aquifer. These results also provide evidence that a tunnel at this location would not impede the groundwater connections between the nearby lakes. These findings are due to (1) the very small cross-sectional thickness of the tunnel (@ 30-feet below the water table) compared to the overall saturated thickness of the sand-and-gravel aquifer (@ 150-feet thick); (2) the small hydraulic gradient (slope of the water table); and (3) the orientation of the tunnel in the

approximate direction of shallow groundwater flow (thereby further minimizing the cross sectional portion of the tunnel with respect to groundwater flow).

Based on the findings of the simulation of the jacked box tunnel, a similar simulation for a cut and cover tunnel was deemed to be unnecessary as this type of tunnel would have slightly less cross-sectional area. Therefore, these findings for the jacked box tunnel are applicable to a cut and cover constructed tunnel, as well.

Opinion of Least Impactful Alternative

Neither the bridge alternative nor either type of tunnel construction are judged to have adverse impacts on water-table elevation, seepage between groundwater and the nearby lakes, or groundwater-direction and rate. Proposed construction methodologies for the jacked box tunnel and the cut and cover tunnel will be protective of groundwater conditions, even if seepage rates into the excavations below the water table are greater than what would typically be expected using the proposed construction methods.

While bridge construction would not be expected to require dewatering, the footings, pilings and/or foundations for the bridge piers would likely be below the water table; it is not correct to say that a bridge alternative would have “no impact”. However, construction and post-construction effects on groundwater conditions for the bridge alternative, the cut and cover tunnel alternative, and the jacked box tunnel alternative are all negligible and the risks are deemed to be low and manageable. Therefore, there is no meaningful differentiation between the three alternatives in terms of impacts on groundwater.

Mitigation Strategy

For the tunnel construction, the proposed methods to minimize seepage into excavations below the water table are standard mitigation strategies. They include:

- Installation of interlocking sheet-pile walls around the excavations. Interlocking sheet-pile walls have an effective permeability of approximately 1×10^{-5} cm/s. The modeling results indicate that reducing this permeability further would likely not be necessary to control impacts to groundwater but additional methods to further reduce seepage through the sheet pile walls, such as the application of asphalt to the joints and injection grouting near the joints can make these walls practically impermeable.

- Excavation of the below-water table pits in "the wet" and installation of a poured concrete or mud floor. Conceptual construction methods would require a floor with a sufficient thickness and density to offset buoyancy forces and minimize seepage through the floor. A poured floor will provide a good seal between the floor and the sheet-pile walls.

- SPO's proposed conceptual construction method of using cells to perform cut and cover construction below the water table includes several elements to minimize seepage during construction. The groundwater modeling suggests that some of the methods proposed by SPO to reduce seepage to essentially zero may not be necessary in terms of the relative impact on groundwater conditions and lake seepage.

- The conceptual use of grouting or freezing to prepare the ground beneath the Kenilworth Channel before jacking the tunnel section should substantially control and minimize seepage and dewatering rates. Grouting is an effective and permanent means of reducing the natural permeability of the soils. Ground freezing is not permanent but has been proven to be effective at substantially reducing permeability of soils during construction.

- As tunnels age, there is a potential for some settlement and cracking of the tunnel walls, which may result in seepage into the tunnel. Various means are available to reduce seepage, such as crack sealing and grout injection. However, a more prudent approach will be to plan for some seepage into the tunnel and include sumps and small pumps to handle seepage, along with inflowing runoff from precipitation.

References Cited

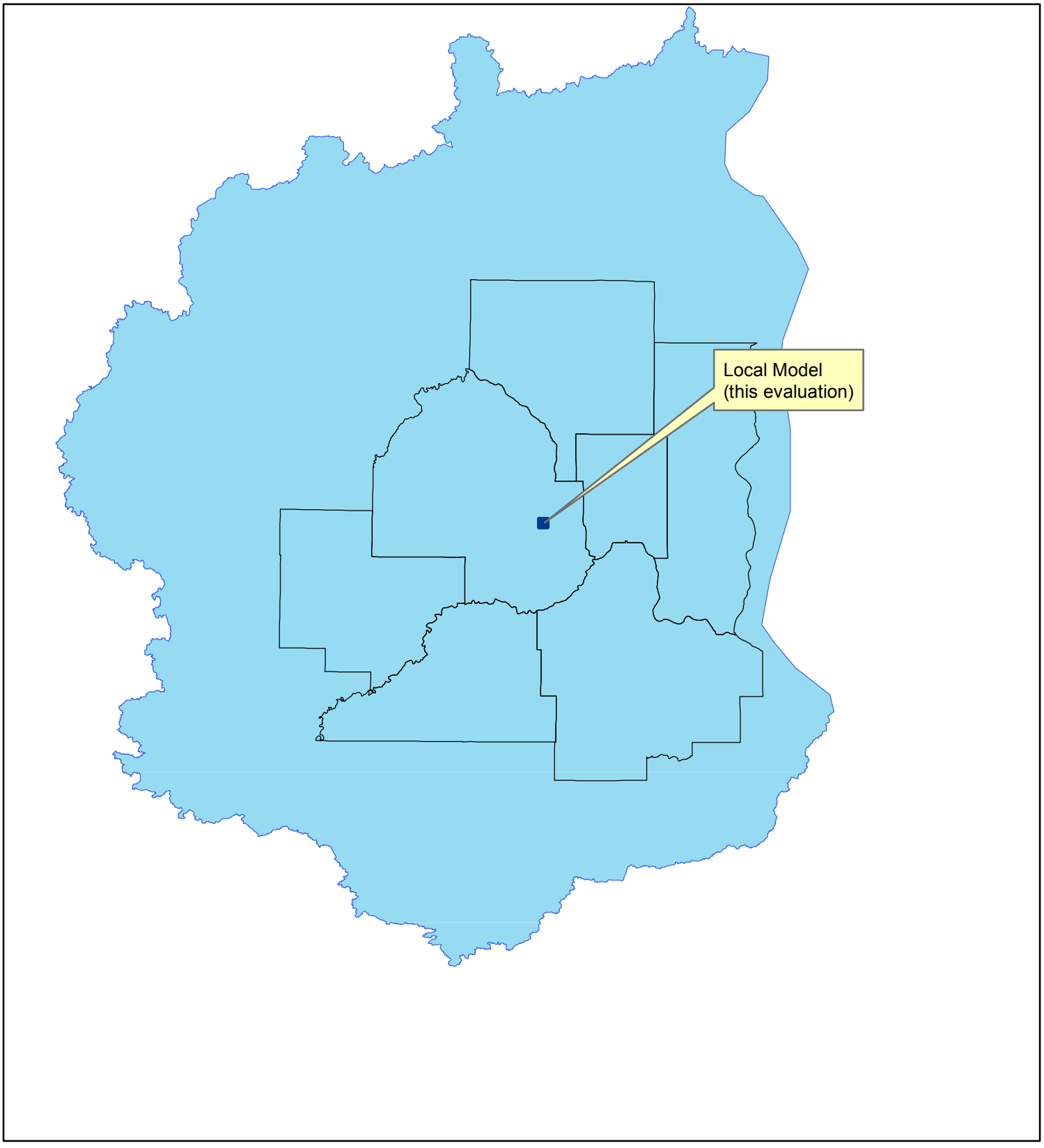
Metropolitan Council. 2014. Twin Cities Metropolitan Area Regional Groundwater Flow Model, Version 3.0. Prepared by Barr Engineering. Metropolitan Council: Saint Paul, MN.

Niswonger, R.G., Panday, Sorab, and Ibaraki, Motomu, 2011, MODFLOW-NWT, A Newton formulation for MODFLOW-2005: U.S. Geological Survey Techniques and Methods 6-A37, 44 p.

Pollock, D.W., 2012, User guide for MODPATH version 6—A particle-tracking model for MODFLOW: U.S. Geological Survey Techniques and Methods, book 6, chap. A41, 58 p.

Attachments

Figure 1
Figure 2
Figure 3
Figure 4
Figure 5



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Legend

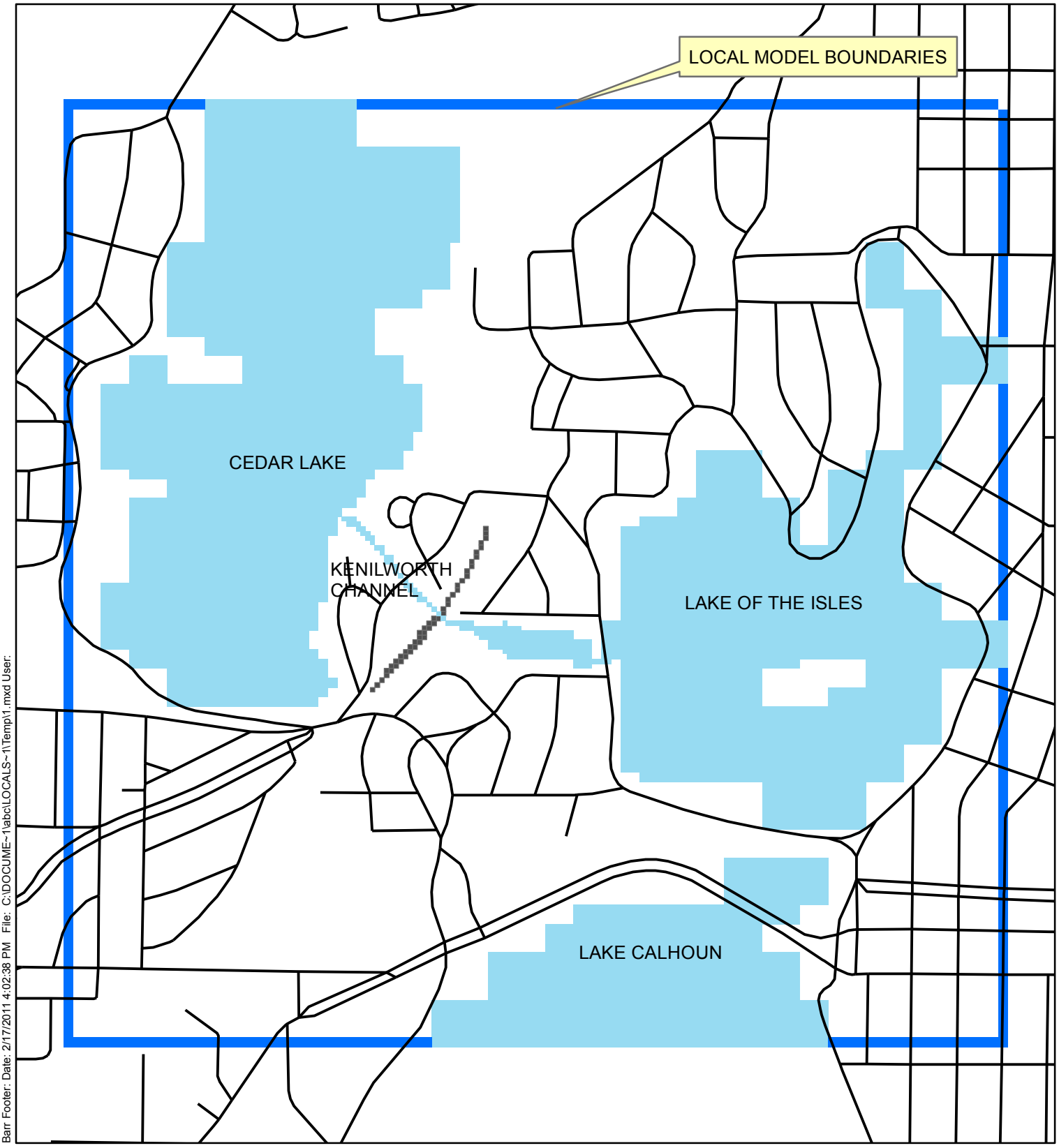
- Metro Model 3 Extent
- Local Model Extent (this evaluation)

Kilometers
20 0 20

Miles
10 0 10

Figure 1

EXTENT OF GROUNDWATER MODEL DOMAIN
Kenilworth Channel Assessment
MPRB, Minneapolis, MN



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Legend

Model Features

- Constant Head (boundary)
- Tunnel Area (approx)
- Lakes/Rivers

N

Kilometers
0.2 0 0.2

Miles
0.1 0 0.1

BARR

Figure 2

LOCAL-SCALE MODELFEATURES
Kenilworth Channel Assessment
MPRB, Minneapolis, MN

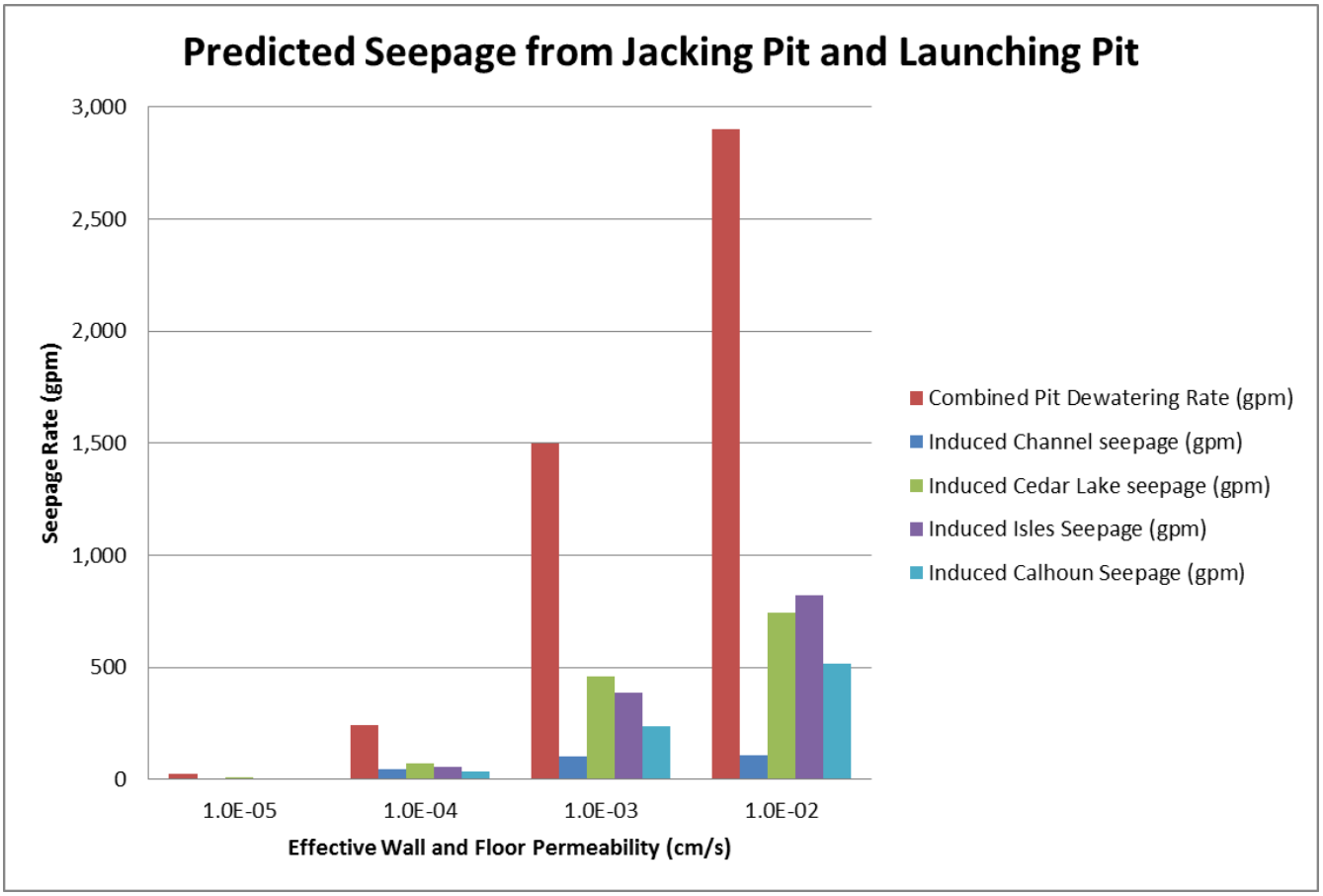
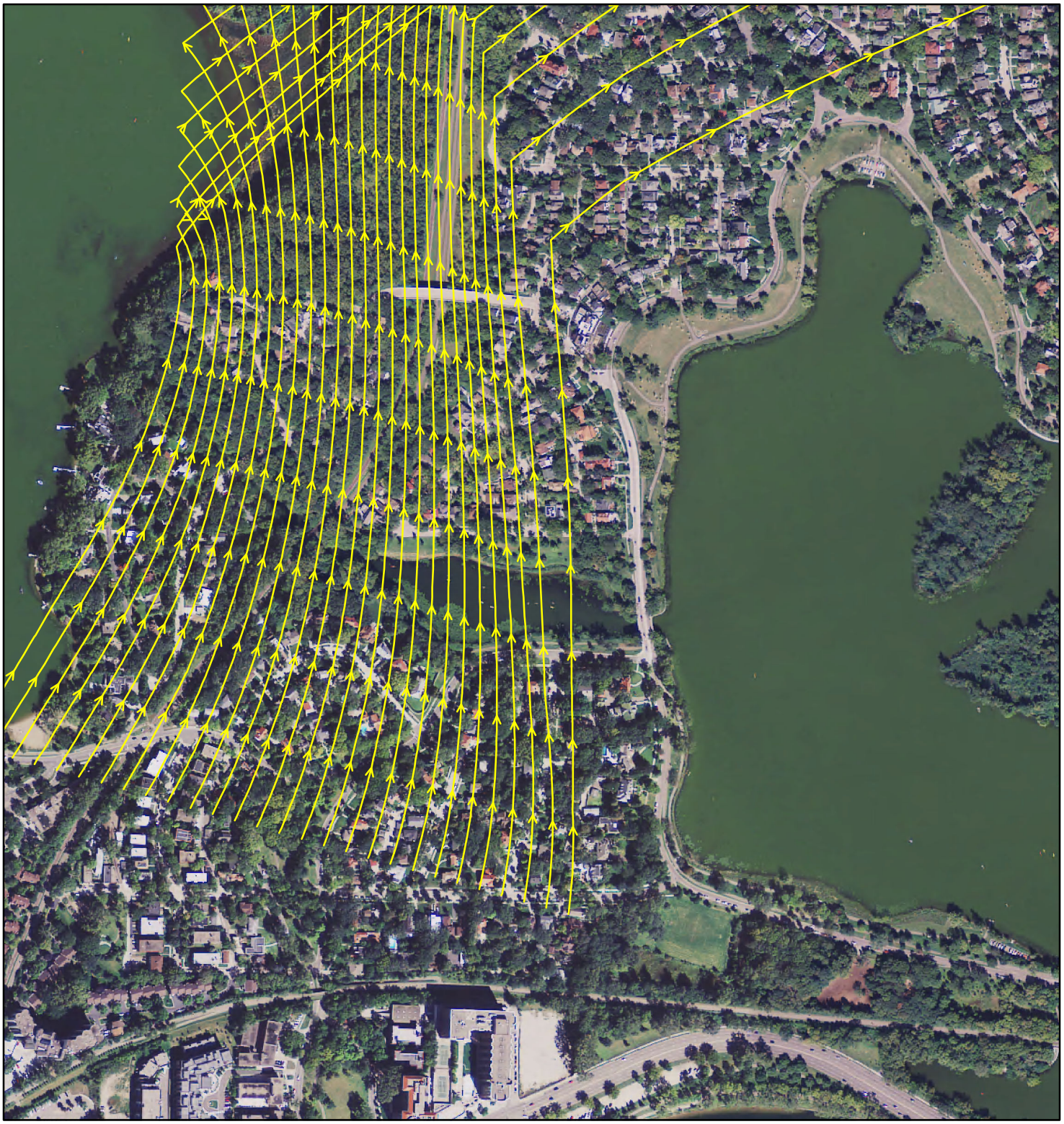


Figure 3

PREDICTED DEWATERING RATES
AND INDUCED SEEPAGE FROM LAKES
FOR JACKED TUNNEL CONSTRUCTION
Kenilworth Channel Assessment
MPRB, Minneapolis, MN



Shallow groundwater flow paths for depths to 60 feet below ground surface

Legend

Groundwater Flow Path

Feet

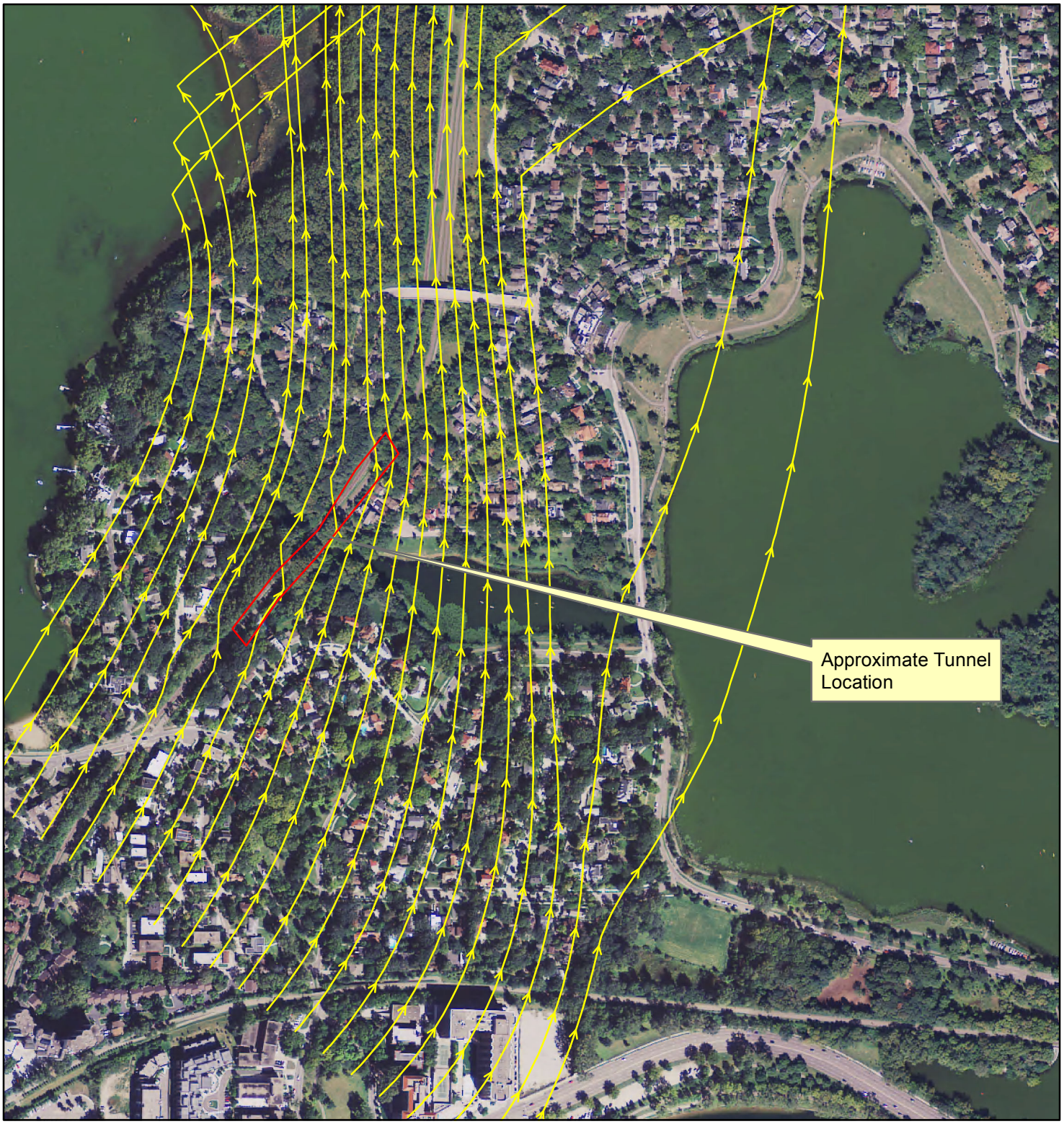
250 0 250 500

Meters

100 0 100

Figure 4

PREDICTED SHALLOW GROUNDWATER-FLOW DIRECTION: EXISTING CONDITIONS
Kenilworth Channel Assessment
MPRB, Minneapolis, MN



Shallow groundwater flow paths for depths to 60 feet below ground surface

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BARR

Legend

Groundwater Flow Path

Feet

250 0 250 500

Meters

100 0 100

Figure 5

PREDICTED SHALLOW GROUNDWATER-FLOW DIRECTION: WITH JACKED TUNNEL

Kenilworth Channel Assessment

MPRB, Minneapolis, MN

Memorandum

To: Todd Christopherson, Brierley Associates
From: Nathan Campeau, Barr Engineering Co.
Subject: Kenilworth Channel Alternatives Assessment: Surface Water Impacts
Date: March 5, 2015
Project: 23271414.00
c: Michael Schroeder (MPRB), Jim Herbert (Barr)

The purpose of this memorandum is to provide a summary of the evaluation that assesses and identifies the least impactful alternative for the Southwest Light Rail Transit (SWLRT) crossing of the Kenilworth Channel, a property owned by the Minneapolis Park and Recreation Board (MPRB). Whereas the focus on Phase 1 of the project was to demonstrate the feasibility of a tunnel alternative under the Kenilworth Channel, the intent of Phase 2 of the project is to address impacts of the alternatives for crossing the channel, relative to the park and park resources. The Kenilworth Channel crossing alternatives evaluated include:

- SWLRT Project Office (SPO) Bridge Option
- Cut and Cover Tunnel (Tunnel Option 1)
- Jacked Box Tunnel (Tunnel Option 2)

This memorandum is specifically related to the evaluation of the referenced focus area.

Identification

The proposed improvements for the SWLRT corridor will occur adjacent to and upgradient from the Kenilworth Channel, in addition to Cedar Lake and Lake of the Isles. Each of these water resources is owned by the MPRB and hydraulically connected. Each of the proposed alternatives involves the construction of impervious surfaces which will generate stormwater runoff to the adjacent receptors. Construction activities related to the proposed SWLRT improvements should consider the effects to the adjacent surface water receptors.

Methodology

To assess the potential stormwater impacts to the Kenilworth Channel, each alternative was analyzed for proposed impervious surface area, proposed stormwater treatment facilities, pollutant generation from the proposed impervious surfaces, and the resulting pollutant loading to the Kenilworth Channel after stormwater treatment. The stormwater pollutants assessed were total suspended solids (TSS) and total phosphorus (TP), which are two important pollutants in water quality analyses and are regulated by the City of Minneapolis and the Minnehaha Creek Watershed District (MCWD), the local governmental units responsible for managing stormwater at this location.

For this analysis, a 2,650-foot segment of the SWLRT alignment that encompasses the Kenilworth Channel crossing was chosen. This segment was chosen because it includes all changes in impervious surface area between the three alternatives, so a full comparison can be made. The 2,650-foot segment aligns with five (5) sub-segments of the SWLRT Segment E3 (sub-segments E3-5, E3-6, E3-7, E3-8, and E3-9) that match the SPO-proposed stormwater treatment facility locations. These five (5) sub-segments run from Station 279+300 to Station 281+950, and are identified in SPO's September 2014 report, "Preliminary Water Resources Design, East Segment."

SPO's September 2014 report identified proposed impervious surfaces for the SPO Bridge Option, as well as proposed stormwater treatment facility sizes. Figure 1 show the location of each sub-segment.

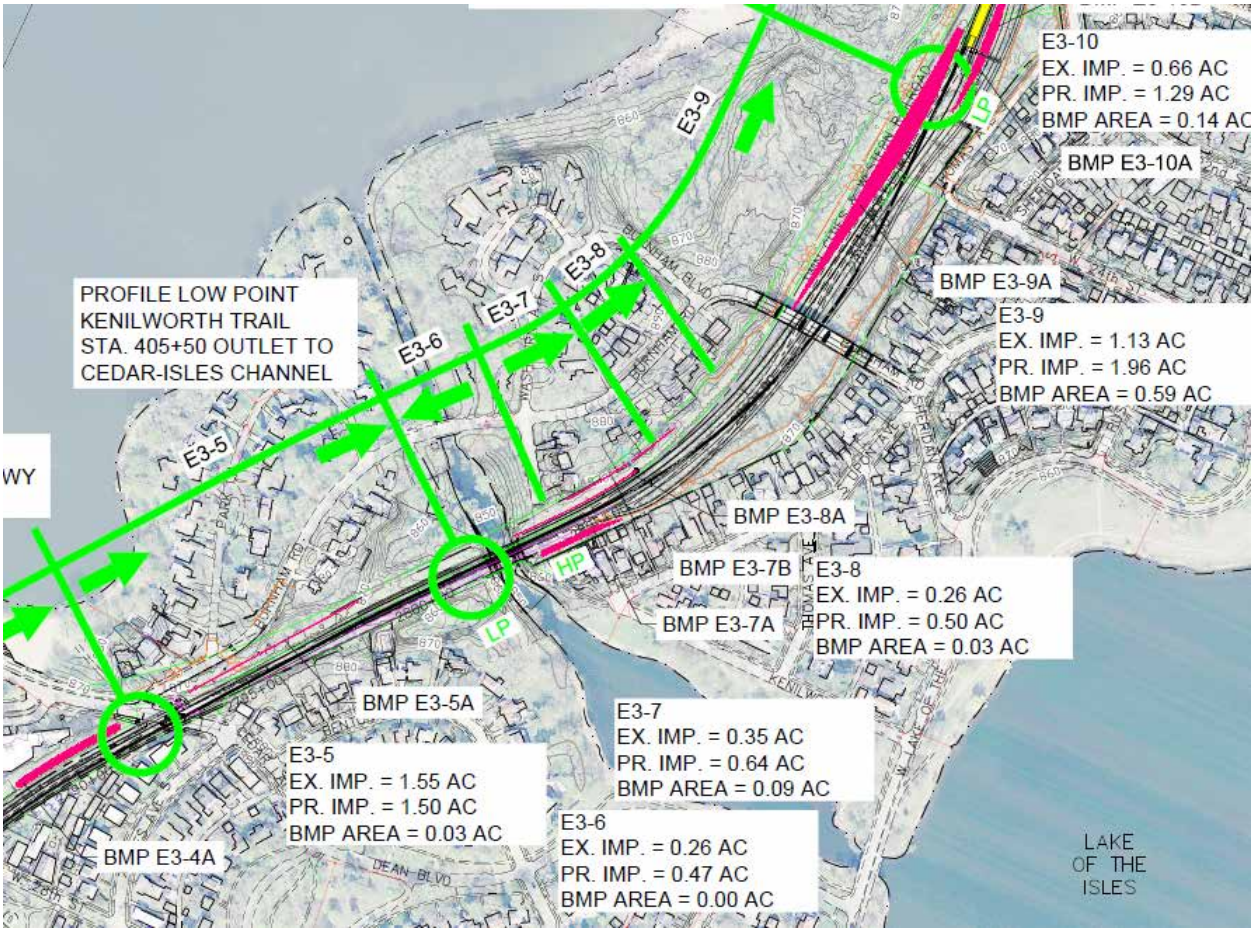


Figure 1 SPO Bridge Option Water Resources Proposed Conditions Map (Segment E3), SPO, September 2014

The total impervious area within this 2,650-foot segment was calculated using the available design plan and profile for each alternative. Impervious surfaces included in this assessment were limited to paved surfaces, rail surface course, and compacted aggregate base. The additional surfaces created for sound walls, visual buffers, and other features outside of the rail, fright, and recreation paths were not included. Table 1 displays the resulting impervious surfaces areas for each sub-segment.

The stormwater treatment facility volumes for each sub-segment in SPO Bridge Option were identified in SPO's September 2014 report, "Preliminary Water Resources Design, East Segment." No stormwater treatment of sub-segment E3-6, which includes the bridge over the Kenilworth Channel, was identified in the report; however, the other 4 sub-segments receive stormwater treatment. For the two (2) tunnel alternatives, stormwater treatment facilities were sized for each sub-segment to provide the same level of

treatment relative to the quantity of proposed impervious surface. For example, if for a particular sub-segment one of the tunnel alternatives resulted in 10% more impervious surface compared with the SPO Bridge Option, then the stormwater treatment facility for the tunnel alternative would be sized 10% larger than the SPO Bridge Option.

Table 1 displays the resulting impervious and stormwater treatment facility sizes for each sub-segment. Sub-segment E3-6 includes the bridge over the Kenilworth Channel.

Table 1 Sub-Segment Impervious Surface and Stormwater Treatment

			SPO Bridge Option		Tunnel Option 1 Cut and Cover Tunnel		Tunnel Option 2 Jacked Box Tunnel	
Sub-Segment	Begin Station	End Station	Proposed Imperv. Area (acre)	Stormwater Treatment Facility Volume (acre-feet)	Proposed Imperv. Area (acre)	Stormwater Treatment Facility Volume (acre-feet)	Proposed Imperv. Area (acre)	Stormwater Treatment Facility Volume (acre-feet)
E3-5	279+300	280+100	1.5	0.26	1.264	0.219	1.264	0.219
E3-6	280+100	280+400	0.47	0	0.243	0.000	0.243	0.000
E3-7	280+400	280+750	0.64	0.11	0.509	0.087	0.509	0.087
E3-8	280+750	281+100	0.5	0.04	0.411	0.033	0.294	0.023
E3-9	281+100	281+950	1.96	0.71	1.943	0.704	1.960	0.710
TOTAL	**2,650 feet**		**5.07**	**1.12**	**4.369**	**1.043**	**4.268**	**1.040**

Using the impervious areas and stormwater treatment facility volumes, the total stormwater pollutant loading was calculated using the water quality tool described below.

Assumptions

This review of surface water impacts is based on several assumptions, which may change as the project develops. The significant assumptions used to complete this evaluation are summarized below:

- Stormwater runoff produced by the chosen alternative will be treated by infiltration facilities before discharge to the groundwater or surface water, consistent with the assumptions made by the SPO in their September 2014 water resources report.

- Available plan set and documents provided by MPRB and SPO were used to calculate the impervious area created in each alternative.
- Surface water that flows towards the tunnel and groundwater seepage in each alternative will be collected by subsurface drainage systems that are capable of pumping and infiltrating stormwater and groundwater seepage up to the 100-year event. These volumes were not considered in this analysis.
- Temporary impacts due to stormwater runoff during construction activity at the ground surface were not assessed.
- In aggregate, all alternatives meet local stormwater quality requirements.
- Rate control was not considered for this analysis.

Tools

This review of surface water impacts relied on water quality calculations performed by the Minnesota Pollution Control Agency's (MPCA) Minimal Impact Design Standards (MIDS) Calculator, Version 2, released June 2014. The MIDS Calculator was developed by the MPCA using the water quality program "Program for Predicting Polluting Particle Passage thru Pits, Puddles, & Ponds", or P8. The MIDS Calculator is an accepted statewide water quality evaluation tool that determines average annual stormwater volume and pollutant (TSS and TP) generation as well as stormwater volume and pollutant removal by specific stormwater treatment facilities.

The total proposed impervious surface for each alternative was placed in the MIDS Calculator to determine the total pollutant loading generated by each alternative. To determine the pollutant removal of each alternative, the stormwater treatment facility volumes for each sub-segment that included a stormwater management facility were then entered into the MIDS Calculator as infiltration basins.

The MIDS Calculator was used to compare each of the three (3) alternatives and evaluate impacts to the Kenilworth Channel.

Results and Discussion

The results of the MIDS Calculator analysis for each alternative are included in Attachment 1. Table 2 displays a summary of the water quality analysis for each alternative.

Table 2 Water Quality Results by Alternative

	SPO Bridge Option	Tunnel Option 1 Cut and Cover Tunnel	Tunnel Option 2 Jacked Box Tunnel
Proposed Imperviousness (acre)	5.07	4.369	4.268
Pre-Treatment TSS Loading (lbs)	1,661	1,432	1,399
Post-Treatment TSS Discharge (lbs)	174	97	93
Pre-Treatment TP Loading (lbs)	9.15	7.88	7.69
Post-Treatment TP Discharge (lbs)	0.96	0.53	0.51
TSS and TP Removal (%)	90%	93%	93%

The tunnel alternatives result in the discharge of fewer pollutants to surface waters, each discharging at least 44% fewer pollutants than the SPO Bridge Option. Most of the decrease in pollutant discharge in the tunnel alternatives is due to the elimination of the impervious surfaces of the LRT bridge, which discharge stormwater and pollutants untreated to the Kenilworth Channel.

Opinion of Least Impactful Alternative

While all alternatives meet, in aggregate, local governmental water quality requirements, the tunnel alternatives result in less impact to surface waters. Tunnel Option 2 discharges the fewest pollutants to the Kenilworth Channel; therefore in our opinion Tunnel Option 2 is the least impactful alternative to the surface waters of Kenilworth Channel.

Mitigation Strategy

Of the five (5) sub-segments considered, four (4) provide an adequate level of stormwater treatment. Sub-segment E3-6, however, does not have an identified stormwater treatment facility and the resulting runoff and pollutants discharge to the Kenilworth Channel untreated. This sub-segment includes the bridges that are directly over the Kenilworth Channel. Regardless of the alternative chosen, we recommend directing

stormwater runoff from the bridges (freight rail, SWLRT, and pedestrian) over the Kenilworth Channel to infiltration facilities, designed at least to the MCWD-standard of treating and infiltrating the first inch of runoff from the impervious surfaces, which would also meet the City's requirements for TSS removal.

Attachments

MIDS Calculator

APPENDIX F – Surface Water Impacts: Attachment 1

Project Information

Calculator Version:	Version 2: June 2014
Project Name:	Kenilworth Channel
User Name / Company Name:	Nathan Campeau, Barr
Date:	2/2/2015
Project Description:	SPO Option

Site Information

Retention Requirement (inches):	1.1
Site's Zip Code:	55416
Annual Rainfall (inches):	31
Phosphorus EMC (mg/l):	0.3
TSS EMC (mg/l):	54.5

Total Site Area

Land Cover	A Soils (acres)	B Soils (acres)	C Soils (acres)	D Soils (acres)	Total (acres)
Forest/Open Space - Undisturbed, protected forest/open space or reforested land					0
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed					0
				Impervious Area (acres)	5.07
				Total Area (acres)	5.07

Site Areas Routed to BMPs

Land Cover	A Soils (acres)	B Soils (acres)	C Soils (acres)	D Soils (acres)	Total (acres)
Forest/Open Space - Undisturbed, protected forest/open space or reforested land					0
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed					0
				Impervious Area (acres)	4.6
				Total Area (acres)	4.6

Summary Information

Performance Goal Requirement

Performance goal volume retention requirement:	20244	ft3
Volume removed by BMPs towards performance goal:	18113	ft3
Percent volume removed towards performance goal	**89**	**%**

Annual Volume and Pollutant Load Reductions

Post development annual runoff volume	11.1984	acre-ft
Annual runoff volume removed by BMPs:	10.023	acre-ft
Percent annual runoff volume removed:	**90**	**%**
Post development annual particulate P load:	5.03	lbs
Annual particulate P removed by BMPs:	4.5	lbs
Post development annual dissolved P load:	4.11	lbs
Annual dissolved P removed by BMPs:	3.69	lbs
Percent annual total phosphorus removed:	**90**	**%**
Post development annual TSS load:	1660	lbs
Annual TSS removed by BMPs:	1487	lbs
Percent annual TSS removed:	**90**	**%**

BMP Summary

Performance Goal Summary

BMP Name	BMP Volume Capacity (ft3)	Volume Recieved (ft3)	Volume Retained (ft3)	Volume Outflow (ft3)	Percent Retained (%)
E3-5	11326	5989	5989	0	100
E3-8	1742	1996	1742	254	87
E3-7	4792	2556	2556	0	100
E3-9	30928	7826	7826	0	100

Annual Volume Summary

BMP Name	Volume From Direct Watershed (acre-ft)	Volume From Upstream BMPs (acre-ft)	Volume Retained (acre-ft)	Volume outflow (acre-ft)	Percent Retained (%)
E3-5	3.3131	0	3.2829	0.0301999999	99
E3-8	1.1044	0	1.009	0.0954000000	91
E3-7	1.4136	0	1.402	0.0116000000	99
E3-9	4.3292	0	4.3292	0	100

Particulate Phosphorus Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
E3-5	1.49	0	1.48	0.01	99
E3-8	0.5	0	0.46	0.04	91
E3-7	0.63	0	0.62	0.01	99
E3-9	1.94	0	1.94	0	100

Dissolved Phosphorus Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
E3-5	1.22	0	1.21	0.01	99
E3-8	0.41	0	0.37	0.04	91
E3-7	0.52	0	0.52	0	99
E3-9	1.59	0	1.59	0	100

TSS Summary

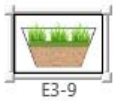
BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
E3-5	491	0	487	4	99
E3-8	164	0	150	14	91
E3-7	210	0	208	2	99
E3-9	642	0	642	0	100

BMP Schematic

E3-5

E3-7

E3-8



E3-9

Project Information

Calculator Version:	Version 2: June 2014
Project Name:	Kenilworth Channel
User Name / Company Name:	Nathan Campeau, Barr
Date:	2/16/2015
Project Description:	MPRB Tunnel Option 1, Cut and Cover

Site Information

Retention Requirement (inches):	1.1
Site's Zip Code:	55416
Annual Rainfall (inches):	31
Phosphorus EMC (mg/l):	0.3
TSS EMC (mg/l):	54.5

Total Site Area

Land Cover	A Soils (acres)	B Soils (acres)	C Soils (acres)	D Soils (acres)	Total (acres)
Forest/Open Space - Undisturbed, protected forest/open space or reforested land					0
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed					0
				Impervious Area (acres)	4.369
				Total Area (acres)	4.369

Site Areas Routed to BMPs

Land Cover	A Soils (acres)	B Soils (acres)	C Soils (acres)	D Soils (acres)	Total (acres)
Forest/Open Space - Undisturbed, protected forest/open space or reforested land					0
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed					0
				Impervious Area (acres)	4.127
				Total Area (acres)	4.127

Summary Information

Performance Goal Requirement

Performance goal volume retention requirement:	17445	ft3
Volume removed by BMPs towards performance goal:	16269	ft3
Percent volume removed towards performance goal	**93**	**%**

Annual Volume and Pollutant Load Reductions

Post development annual runoff volume	9.65	acre-ft
Annual runoff volume removed by BMPs:	9.0022	acre-ft
Percent annual runoff volume removed:	**93**	**%**
Post development annual particulate P load:	4.33	lbs
Annual particulate P removed by BMPs:	4.04	lbs
Post development annual dissolved P load:	3.54	lbs
Annual dissolved P removed by BMPs:	3.31	lbs
Percent annual total phosphorus removed:	**93**	**%**
Post development annual TSS load:	1431	lbs
Annual TSS removed by BMPs:	1335	lbs
Percent annual TSS removed:	**93**	**%**

BMP Summary

Performance Goal Summary

BMP Name	BMP Volume Capacity (ft3)	Volume Recieved (ft3)	Volume Retained (ft3)	Volume Outflow (ft3)	Percent Retained (%)
E3-5	9541	5047	5047	0	100
E3-8	1432	1641	1432	209	87
E3-7	3807	2032	2032	0	100
E3-9	30665	7758	7758	0	100

Annual Volume Summary

BMP Name	Volume From Direct Watershed (acre-ft)	Volume From Upstream BMPs (acre-ft)	Volume Retained (acre-ft)	Volume outflow (acre-ft)	Percent Retained (%)
E3-5	2.7919	0	2.7664	0.0255000000	99
E3-8	0.9078	0	0.8294	0.0784	91
E3-7	1.1243	0	1.115	0.0093000000	99
E3-9	4.2916	0	4.2916	0	100

Particulate Phosphorus Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
E3-5	1.25	0	1.24	0.01	99
E3-8	0.41	0	0.37	0.04	91
E3-7	0.5	0	0.5	0	99
E3-9	1.93	0	1.93	0	100

Dissolved Phosphorus Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
E3-5	1.03	0	1.02	0.01	99
E3-8	0.33	0	0.3	0.03	91
E3-7	0.41	0	0.41	0	99
E3-9	1.58	0	1.58	0	100

TSS Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
E3-5	414	0	410	4	99
E3-8	135	0	123	12	91
E3-7	167	0	166	1	99
E3-9	636	0	636	0	100

BMP Schematic

E3-5

E3-7

E3-8

E3-9

Project Information

Calculator Version:	Version 2: June 2014
Project Name:	Kenilworth Channel
User Name / Company Name:	Nathan Campeau, Barr
Date:	2/16/2015
Project Description:	MPRB Tunnel Option 2, Jacked Box

Site Information

Retention Requirement (inches):	1.1
Site's Zip Code:	55416
Annual Rainfall (inches):	31
Phosphorus EMC (mg/l):	0.3
TSS EMC (mg/l):	54.5

Total Site Area

Land Cover	A Soils (acres)	B Soils (acres)	C Soils (acres)	D Soils (acres)	Total (acres)
Forest/Open Space - Undisturbed, protected forest/open space or reforested land					0
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed					0
				Impervious Area (acres)	4.268
				Total Area (acres)	4.268

Site Areas Routed to BMPs

Land Cover	A Soils (acres)	B Soils (acres)	C Soils (acres)	D Soils (acres)	Total (acres)
Forest/Open Space - Undisturbed, protected forest/open space or reforested land					0
Managed Turf - disturbed, graded for yards or other turf to be mowed/managed					0
				Impervious Area (acres)	4.027
				Total Area (acres)	4.027

Summary Information

Performance Goal Requirement

Performance goal volume retention requirement:	17042	ft3
Volume removed by BMPs towards performance goal:	15928	ft3
Percent volume removed towards performance goal	**93**	**%**

Annual Volume and Pollutant Load Reductions

Post development annual runoff volume	9.4269	acre-ft
Annual runoff volume removed by BMPs:	8.8035	acre-ft
Percent annual runoff volume removed:	**93**	**%**
Post development annual particulate P load:	4.23	lbs
Annual particulate P removed by BMPs:	3.94	lbs
Post development annual dissolved P load:	3.46	lbs
Annual dissolved P removed by BMPs:	3.24	lbs
Percent annual total phosphorus removed:	**93**	**%**
Post development annual TSS load:	1397	lbs
Annual TSS removed by BMPs:	1306	lbs
Percent annual TSS removed:	**93**	**%**

BMP Summary

Performance Goal Summary

BMP Name	BMP Volume Capacity (ft3)	Volume Recieved (ft3)	Volume Retained (ft3)	Volume Outflow (ft3)	Percent Retained (%)
E3-8	1023	1174	1023	151	87
E3-7	3807	2032	2032	0	100
E3-5	9541	5047	5047	0	100
E3-9	30928	7826	7826	0	100

Annual Volume Summary

BMP Name	Volume From Direct Watershed (acre-ft)	Volume From Upstream BMPs (acre-ft)	Volume Retained (acre-ft)	Volume outflow (acre-ft)	Percent Retained (%)
E3-5	2.7919	0	2.7664	0.0255000000	99
E3-8	0.6494	0	0.5931	0.0563	91
E3-7	1.1243	0	1.115	0.0093000000	99
E3-9	4.3292	0	4.3292	0	100

Particulate Phosphorus Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
E3-5	1.25	0	1.24	0.01	99
E3-8	0.29	0	0.26	0.03	91
E3-7	0.5	0	0.5	0	99
E3-9	1.94	0	1.94	0	100

Dissolved Phosphorus Summary

BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
E3-5	1.03	0	1.02	0.01	99
E3-8	0.24	0	0.22	0.02	91
E3-7	0.41	0	0.41	0	99
E3-9	1.59	0	1.59	0	100

TSS Summary

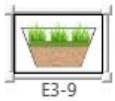
BMP Name	Load From Direct Watershed (lbs)	Load From Upstream BMPs (lbs)	Load Retained (lbs)	Outflow Load (lbs)	Percent Retained (%)
E3-5	414	0	410	4	99
E3-8	96	0	88	8	91
E3-7	167	0	166	1	99
E3-9	642	0	642	0	100

BMP Schematic

E3-5

E3-7

E3-8



E3-9

Memorandum

To: Todd Christopherson, Brierley Associates
From: Ron Koth, Barr Engineering Co.
Subject: Kenilworth Channel Alternatives Assessment: Wildlife Impacts/Movement
Date: March 5, 2015
Project: 23271414.00
c: Michael Schroeder (MPRB), Jim Herbert (Barr)

The purpose of this memorandum is to provide a summary of the evaluation that assesses and identifies the least impactful alternative for the Southwest Light Rail Transit (SWLRT) crossing of the Kenilworth Channel, a property owned by the Minneapolis Park and Recreation Board (MPRB). Whereas the focus on Phase 1 of the project was to demonstrate the feasibility of a tunnel alternative under the Kenilworth Channel, the intent of Phase 2 of the project is to address impacts of the alternatives for crossing the channel relative to the park and park resources. The Kenilworth Channel crossing alternatives evaluated include:

- SWLRT Project Office (SPO) Bridge Option
- Cut and Cover Tunnel (Tunnel Option 1)
- Jacked Box Tunnel (Tunnel Option 2)

This memorandum is specifically related to the evaluation of the referenced focus area.

Identification

Objectives:

1) Evaluate potential aquatic and terrestrial issues associated with shade and shadows associated with any changes from the existing wooden bridge.

2) Use guidance and/or criteria from other jurisdictions or Minnesota as the basis for evaluation.

3) Attempt to quantitatively describe any differences between options.

Existing bridge

SPO Bridge Option (at grade LRT/trail on bridge plus freight rail bridge)

Tunnel Option 1 and 2 with robust pedestrian bridge (LRT tunnel plus robust pedestrian bridge and freight rail bridge)

Tunnel Option 1 and 2 with vaulted pedestrian bridge (LRT tunnel plus vaulted pedestrian and freight rail bridge)

General site description

Bridges and light rail crossing/tunnel are proposed to be constructed on the existing Kenilworth Trail over the Kenilworth Channel between Cedar Lake and Lake of the Isles. An existing approximately 2-foot deep slow moving (west to east) flow of water is present in the Kenilworth Channel. No change to the water depth in the channel is proposed following final construction. The existing wooden bridge has a total width across the deck of approximately 44 feet with the deck approximately 14-feet above the surface of the water. The estimated opening width between the wooden bents is 15 feet. The area is within an urban parkland setting sees heavy human use and has a population of mammals commonly found in urbanized parklands associated with water bodies such as red fox, gray squirrel, mink, various mice, rabbits, deer etc. The Kenilworth Channel is likely used/inhabited by fishes common to both Cedar Lake and Lake of the Isles with the channel used seasonally for spawning movements and movements to and from winter cover found in Cedar Lake. Fishes common to both lakes include a variety of panfish, walleye, northern pike, black and yellow bullhead, with low numbers of rough fish such as carp Minnesota DNR (MDNR) Lake Finder fisheries survey 2009. MDNR (2009) noted that shore fishing is very popular on both Cedar Lake and Lake of the Isles; the assumption is made that some shore fishing and channel shoreline traverse by anglers may also occur in and along the Kenilworth Channel seasonally.

Methodology

Quantitative comparisons of proposed options for terrestrial wildlife passage were conducted using the metric known as openness ratio as used by the states of Arizona (2006) and Maine (2008) to evaluate openings of bridges and culverts as impediments to wildlife passage related to darkness and size. The openness ratio is based on data about animal behavior that indicates that an open field of view with habitat clearly visible on the other side of an opening correlates with reduced passage or movement impediments. The openness ratio is a straight-forward calculation (Height x Width)/Length. In this evaluation height is the distance of a bridge above the water surface, width is distance between in-water piers, and length is the width of the bridge deck. The threshold value for large animal passage impediment is 0.75. The higher the openness ratio the less potential impediment there will be for terrestrial wildlife passage or usage.

Quantitative comparisons of proposed options for aquatic organism passage were not conducted based on the expected future condition of no change to water depths in the Kenilworth Channel and the 2 fps maximum velocity expected during a 100-year event. At a flow less than a 100-year event it is expected that velocities will fall below 2 fps; where no passage impediment is anticipated.

Results and Discussion

The openness ratio was used to compare between options and existing conditions.

SPO Bridge Option (at grade LRT/trail bridge plus freight rail bridge)

Two bridges with approximate dimensions:

- 1 bridge 20.3-feet wide
- 1 bridge 53.5-feet wide
- 9-foot space between bridges
- estimated height above water surface = 14.5 feet
- average distance between piers= 22 feet'

This option as shown on the above drawing visually appears to cast a larger shadow on the Kenilworth Channel than the existing wooden bridge or other options considered. The openness ratio for this is 4.21 using the values above with both bridge widths combined due to the small separation between decks.

Tunnel Option 1 and 2 with robust pedestrian bridge (LRT tunnel plus robust pedestrian bridge and freight bridge)

Two bridges with approximate dimensions:

- 1 bridge 22.5–foot wide
- 1 bridge 20.3–foot wide
- 44.5 foot spacing between bridges
- estimated height above the water surface = 14.5 feet
- average distance between piers = 22 feet

The approximate 40-foot distance between the two bridges effectively creates separation for light penetration and visual separation. Calculation of the openness ratio metric used two separate bridge openings in consideration of this fact. The openness ratio for the 22.5–foot wide bridge is 14.2 and for the 20.3–foot wide bridge it is 15.7.

Tunnel Option 1 and 2 with vaulted pedestrian bridge (LRT tunnel plus vaulted pedestrian bridge and freight rail bridge)

Two bridges with approximate dimensions:

- 1 bridge (#1) estimate 22.5-feet wide
- 1 bridge (#2) 20.3-feet wide
- 44.5-foot spacing between bridges
- height above water bridge #2 = approx. 14.5 feet
- height above water bridge #1 = approx. 16.0 feet
- average distance between piers bridge #2 = 22 feet
- Channel span distance = 92 feet

This option has as shown improves the openness ratio with no piers in mid-channel for the pedestrian bridge. The openness ratio(s) are based on a 40-foot separation between the bridges so each openness ration is calculated separately. Openness ratio for the vaulted pedestrian bridge with no piers is: 65.6. Openness ratio for the LRT bridge is 15.7, similar to the previous scenario.

Terrestrial wildlife impacts

Openness ratio comparisons between the existing bridge and three potential scenarios indicate that the tunnel option with vaulted pedestrian bridge has a ratio of nearly a factor of 3.5 times greater than SPO Bridge Option and nearly a factor of 3 greater than the existing bridge that has an openness ratio of 4.8. Neither the existing conditions nor either SPO Bridge Option or Tunnel Options 1 and 2 with robust pedestrian bridge present any likely impediments to wildlife passage through the bridge openings based on the threshold openness ratio requirement of 0.75 for large mammals. Tunnel Options 1 and 2 with a clear span vaulted pedestrian bridge slightly higher off the water surface than other options increases the openness ratio for this structure to 65.2. None of the openness ratios indicate any impediments to terrestrial wildlife passage; however, these ratios do quantify the perceived visual differences in shading between existing conditions and any of the proposed options.

All option renderings show relatively steeply sloping banks under the bridges with the rendering of the tunnel options showing rock rip rap bank lining between the bridges; steep banks and use of rip rap may create passage difficulties for mammals, herpetofauna, or persons seeking to traverse the shoreline of the channel and is not recommended without provisions for a passage bench as recommended by (MDNR 2014).

Aquatic organism impacts

Aquatic organism passage or use of the channel is not anticipated to be measurably different from the existing or with either proposed option. Some increased use of the channel area under the wider bridge as proposed in SPO Bridge Option could take place as aquatic organisms seek shade for thermal shelter during high sun and hot summer periods, although the shallow water depth of 2 feet may not be preferred as deeper/cooler water is likely found in either Cedar Lake or Lake of the Isles during summer periods. No velocity barriers are expected with the generally low slope of the Kenilworth Channel and associated low velocity water flow from Cedar Lake to Lake of the Isles. Velocities in the channel are anticipated to be below 2 fps projected to occur during a 100-year flow event. The rough surface of the wooden bents of the existing bridge may afford more surface area for attached periphyton than the smooth concrete walls of either proposed future condition. Shading caused by any proposed option is not anticipated to impact fish passage; passage impediments are most commonly associated with sharp contrast between light and very dark. None of the options proposed have such circumstances. In dark culverts some agencies recommend consideration of lighting when a culvert is over 150–feet long culvert (NMFS 2001).

Temporary construction impacts

Construction related closures of the Kenilworth Channel range from approximately 12-18 months based on early schedule projections. Aquatic, avian and terrestrial organisms seeking to utilize the channel or riparian corridor adjacent to the channel will be adversely impacted during this period. Some fishes present in the Lake of the Isles that typically seek to move to Cedar Lake to seek preferred habitat conditions during seasonal periods of stress in the Lake of the Isles could suffer mortality if they are not able to find preferred habitat conditions by moving into Lake Calhoun as an alternate to Cedar Lake. Terrestrial wildlife travel corridors along the Kenilworth Channel will be disrupted by construction related activity; alternate routes will likely be sought by these animals during construction. Woody vegetation now present adjacent to the channel will likely be removed during construction. Avian wildlife now using these habitats will be displaced until woody vegetation is replaced and becomes established. No long-term adverse consequences to aquatic or terrestrial wildlife should, however, be anticipated due to temporary construction related impacts.

Opinion of Least Impactful Alternative

Comparison of the options using the openness metric and criteria as shown in Table 1 suggest that Tunnel Options 1 and 2 with vaulted pedestrian bridge has highest openness ratio and least potential adverse impacts to wildlife passage, however, none of the options evaluated using the openness ratio approach the 0.75 threshold where passage may be impeded by shading or wildlife behavioral avoidance. Comparisons of tunnel construction methods; cut/cover or jacked box have differing channel closure periods as discussed by others and may impact the time of channel closure leading to increased or decreased temporary construction impacts on terrestrial wildlife and aquatic species. None of the options evaluated are likely to have long-term adverse impacts on wildlife or aquatic organisms.

Table 1

Comparison Feature	SPO Bridge Option	Tunnel Option 1 and 2 with robust pedestrian bridge	Tunnel Option 1 and 2 with vaulted pedestrian bridge
Openness Ratio	4.21	14.2 / 15.7	65.2 / 15.7
Channel closures Intermittent (months)	12	18 (Option 1) 12 (Option 2)	18 (Option 1) 12 (Option 2)

Mitigation Strategy

The primary mitigation strategy for temporary wildlife and aquatic species movements is to reduce the length of time the channel and riparian corridor are completely closed due to construction. The primary long-term mitigation strategy for wildlife passage is to include a wildlife passage bench (MDNR 2014) on one or both sides of the channel.

Literature Cited

Arizona Game and Fish Department, Habitat Branch. 2006. Guidelines for Bridge Construction or Maintenance to Accommodate Fish & Wildlife Movement and Passage. http://www.azgfd.gov/hgis/pdfs/BridgeGuidelines.pdf

Maine Department of Transportation. 2008. Waterway and Wildlife Crossing Policy and Design Guide, For Aquatic Organism, Wildlife Habitat, and Hydrologic Connectivity, Environmental Office, Augusta, Maine.

Minnesota Department of Natural Resources. 2009. Lake Survey of Cedar Lake and Lake Calhoun, Hennepin County; accessed via LakeFinder at: http://www.dnr.state.mn.us/lakefind/index.html.

Minnesota Department of Natural Resources. 2014. Best Practices for Meeting DNR GP 2004-001; accessed at: http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/gp_2004_0001_manual.html

National Marine Fisheries Service Southwest Region, 2001. "Guidelines for Salmonid Passage at Stream Crossings." National Oceanic and Atmospheric Administration.

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Memorandum

To: Charlene Roise, Hess Roise and Company
From: Christina Harrison, Archeological Research
Subject: Kenilworth Channel Alternatives Assessment: Archeology Impacts
Date: March 5, 2015
c: Michael Schroeder (MPRB), Todd Christopherson (Brierley), Jim Herbert (Barr)

The purpose of this memorandum is to provide a summary of the evaluation that assesses and identifies the least impactful alternative for the Southwest Light Rail Transit (SWLRT) crossing of the Kenilworth Channel, a property owned by the Minneapolis Park and Recreation Board (MPRB). Whereas the focus on Phase 1 of the project was to demonstrate the feasibility of a tunnel alternative under the Kenilworth Channel, the intent of Phase 2 of the project is to address impacts of the alternatives for crossing the channel, relative to impacts on the park and park resources. The Kenilworth Channel crossing alternatives evaluated include:

- SWLRT Project Office (SPO) Bridge Option
- Cut and Cover Tunnel (Tunnel Option 1)
- Jacked Box Tunnel (Tunnel Option 2)

This memorandum is specifically related to the evaluation of the referenced focus area.

Identification

The proposed improvements for the SWLRT corridor at/near the Kenilworth Channel will affect property which, as parkland owned by the MPRB, comes under the purview of Section 4(f) of the Department of Transportation Act of 1966 – legislation which requires consideration of historic sites and archaeological resources of national, state or local significance in public ownership.

Methodology

In order to comply with Section 106 of the National Historic Preservation Act of 1966 and 36CFR800 (procedures of the Advisory Council on Historic Preservation), the methodology used to identify archaeological resources on 4(f) lands needs to meet the requirements of the Secretary of the Interiors Standards for Identification and Evaluation of historic properties.

Archaeological reviews conducted on non-federal public land and under a license issued by the Office of the State Archaeologist also need to be conducted in a manner that complies with Minnesota Statutes 138.31 -138.42 (the "Field Archaeology Act") and 307.08 (the "Private Cemeteries Act").

In order to identify any archaeological resources present within the study area, ARS staff conducted a records and literature search focused on sources described below under "Tools". Due to the timing of this review, which had to be completed during the months of December and January, the presence of a snow cover and the depth of ground frost prevented ARS from conducting the visual reconnaissance and subsoil testing that typically is the recommended/required second part of an identification (Phase 1) level archaeological survey.

"Tools"

As standard surface reconnaissance and subsoil testing could not be conducted for the above-referenced reasons, ARS had to base its conclusions regarding archaeological potential on careful review of the following resources:

- archaeological inventory and survey report files maintained by the Minnesota Historical Society (MHS) and the Office of the State Archaeologist (OSA) as well as historic insurance maps, plat maps, aerial photographs and field observations compiled by ARS for the Phase 1 Archaeological Survey of the SWLRT project;[1]

- soil boring profiles provided by Brierley Associates (Attachment 1).

Results and Discussion

The Phase I cultural resources review of the SWLRT corridor was conducted on the assumption that the proposed undertaking would utilize the existing railroad corridor and at that time, there had not yet been any consideration given to the possibility of a shallow tunnel option.

Periods of lower lake levels that have been documented for parts of the postglacial period would have created shorelines that more than likely attracted prehistoric Native American use but now are buried under more recent marsh deposits. Assuming (a) that this would be true also of the areas adjacent to the Kenilworth channel and (b) that soils within the existing railroad corridor would have been too deeply disturbed by railroad construction to retain meaningful historic Native American and Euro-American evidence that predates the railroad, the Phase I review concluded that the area of potential effect for what is now considered the SPO Bridge Option was completely lacking in archaeological potential.

[1] SWCA Environmental Consultants, 2012: Phase I Archaeological Survey for Southwest Light Rail Transit Project in Minneapolis, St. Louis Park, Hopkins, Minnetonka and Eden Prairie, Minnesota.

Soil boring profiles indicate that most of the construction and excavation activities associated with Options 1 and 2 only would impact soils that consist of fill placed on former marsh during the creation of the Kenilworth channel and lagoon in the early 1900s. Consequently, the areas that would be impacted by either the jacked box or the cut & cover tunnel options also appear to lack Native American and historic Euro-American archaeological potential, a possible exception being their portal segments where soils below the disturbed railroad embankment could contain archaeological evidence in a context that retains enough physical integrity to yield meaningful information. Should either of these options be considered for construction, Phase 1 level subsoil testing – under improved soil conditions -- would be warranted as well as, in case of positive results, further Phase 2 level intensive testing and evaluation of significance.

Opinion of Least Impactful Alternative

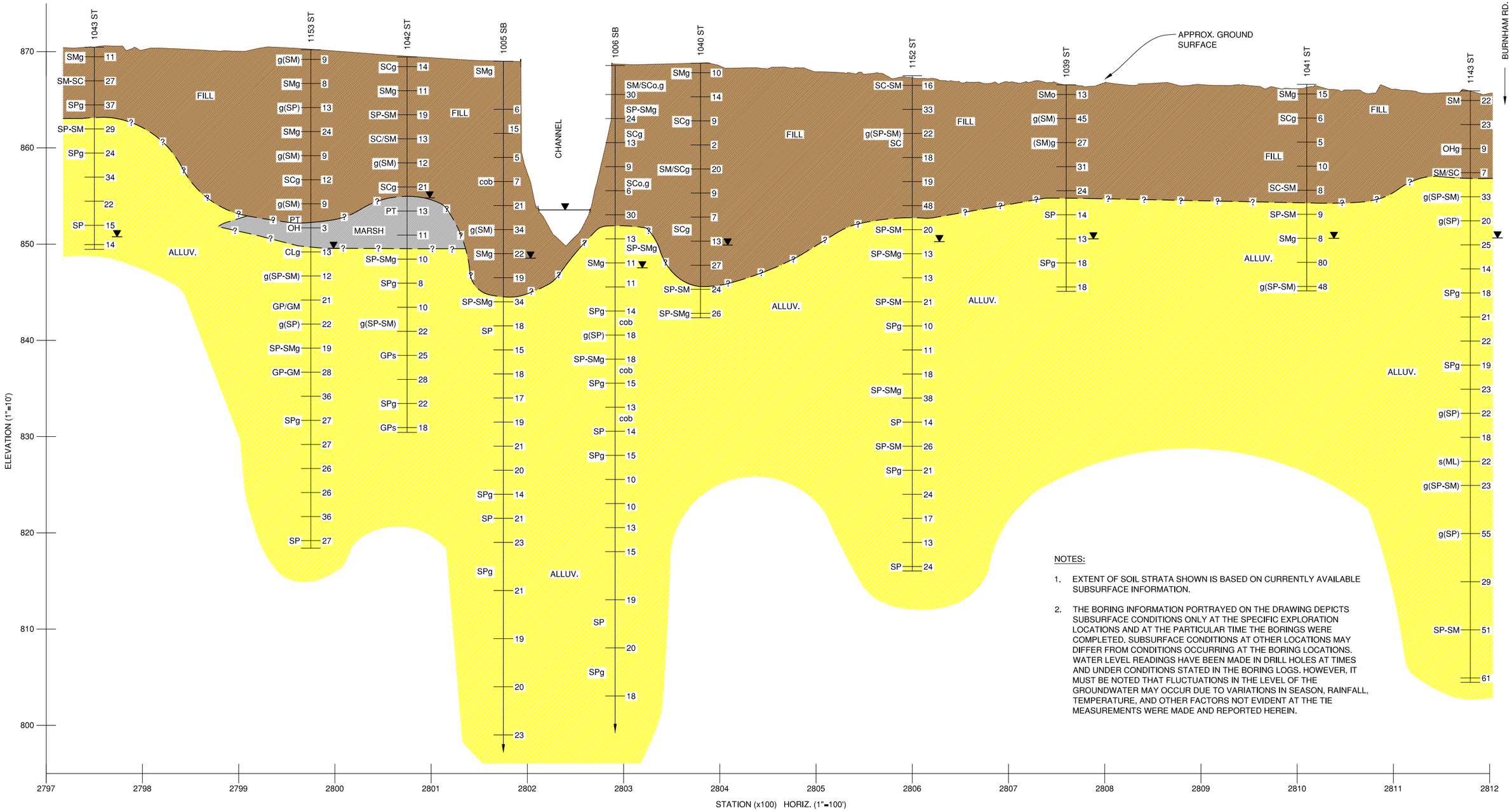
Results of completed records and literature searches indicate that the SPO Bridge Option could be completed without any impact to archaeological resources whereas in the case of Cut and Cover Tunnel Option 1 and Jacked Box Tunnel Option 2 there is equal though rather minimal risk that archeological evidence could be encountered during excavation for the portal segments.

Mitigation Strategy

Records search has already indicated that no Native American earthworks or traditional cultural properties have been recorded in the study area. Should any other archaeological evidence be encountered at either of the portal segments, it could most likely be fairly easily mitigated through Phase 3 data recovery.

Attachments

Drawings SH-1, SH-2, SH-3, SH-4, SH-5



NOTES:

1. EXTENT OF SOIL STRATA SHOWN IS BASED ON CURRENTLY AVAILABLE SUBSURFACE INFORMATION.
2. THE BORING INFORMATION PORTRAYED ON THE DRAWING DEPICTS SUBSURFACE CONDITIONS ONLY AT THE SPECIFIC EXPLORATION LOCATIONS AND AT THE PARTICULAR TIME THE BORINGS WERE COMPLETED. SUBSURFACE CONDITIONS AT OTHER LOCATIONS MAY DIFFER FROM CONDITIONS OCCURRING AT THE BORING LOCATIONS. WATER LEVEL READINGS HAVE BEEN MADE IN DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED IN THE BORING LOGS. HOWEVER, IT MUST BE NOTED THAT FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO VARIATIONS IN SEASON, RAINFALL, TEMPERATURE, AND OTHER FACTORS NOT EVIDENT AT THE TIE MEASUREMENTS WERE MADE AND REPORTED HEREIN.

LEGEND:

FILL

MARSH DEPOSITS

ALLUVIUM

NO.	DATE	REASON ISSUED/REVISED	DESIGN	DRAWN	CK
1	1/30/15	PRELIMINARY	GP	KB	TC

OWNER

CLIENT

Minneapolis Park & Recreation Board

GRAPHIC SCALE 0 ½" 1"

CADD FILE NAME 150130 COLOR PROFILE.DWG

BRIERLEY ASSOCIATES
Creating Space Underground

PROJECT
KENILWORTH CROSSING

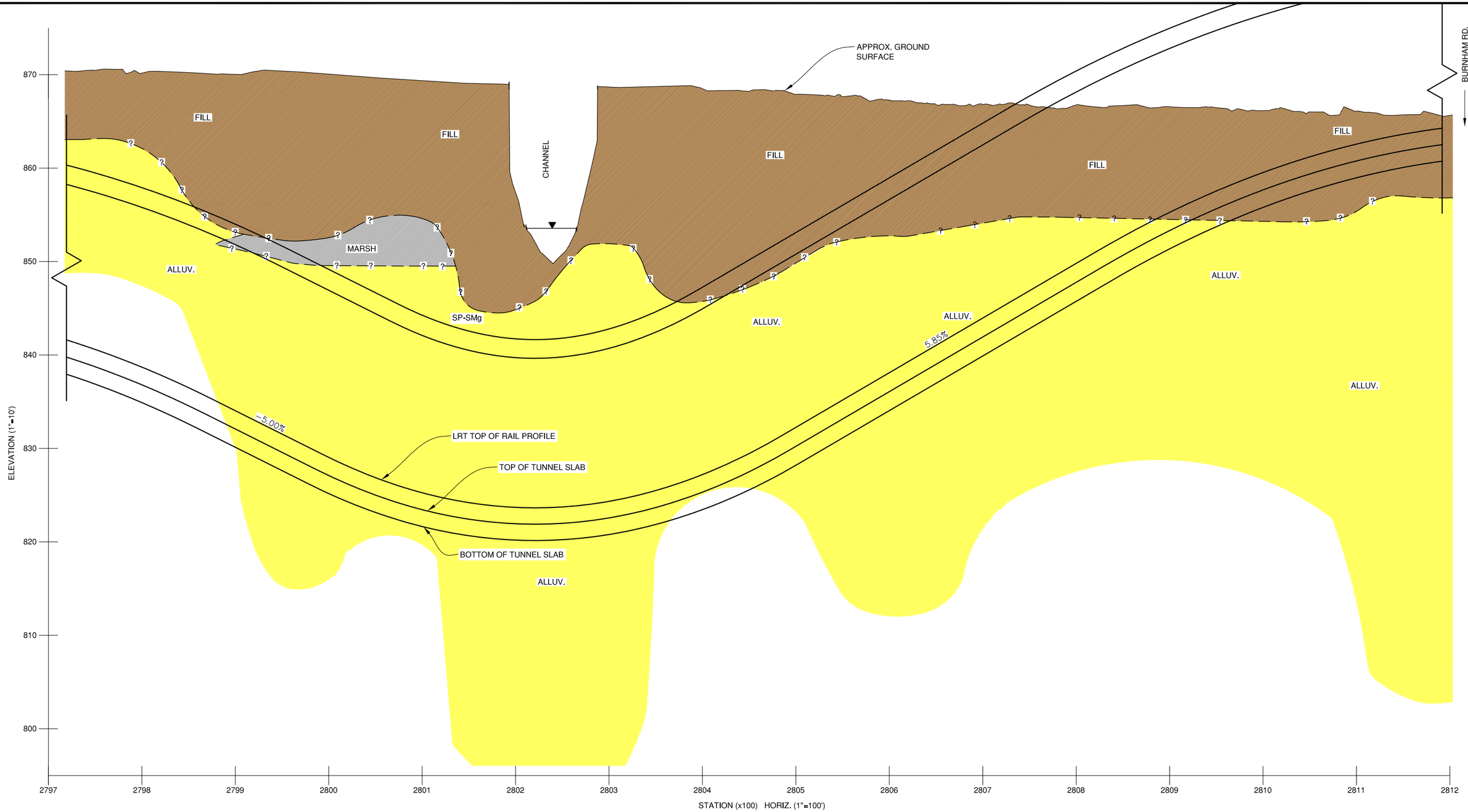
SHEET TITLE
SOIL PROFILE

PROJECT LOCATION
MINNEAPOLIS, MN

PROJECT NO.
414044-000

SHEET
SH-1

DRAWING NO.
1 OF 5



LEGEND:

FILL

MARSH DEPOSITS

ALLUVIUM

NO.	DATE	REASON ISSUED/REVISED	DESIGN	DRAWN	CK
1	1/30/15	PRELIMINARY	GP	KB	TC

OWNER

GRAPHIC SCALE 0 ½" 1"

CADD FILE NAME 150130 COLOR PROFILE.DWG

CLIENT Minneapolis Park & Recreation Board

BRIERLEY ASSOCIATES
Creating Space Underground

PROJECT KENILWORTH CROSSING

SHEET TITLE OPTION 1– CUT AND COVER ALIGNMENT SOIL PROFILE

PROJECT LOCATION MINNEAPOLIS, MN

PROJECT NO. 414044–000

SHEET SH-2

DRAWING NO. 2 OF 5

LAUNCHING PIT

RECEIVING PIT

APPROX. GROUND SURFACE

BURNHAM RD.

FILL

FILL

CHANNEL

FILL

FILL

FILL

ALLUV.

MARSH

ALLUV.

ALLUV.

ALLUV.

5.85%

PROPOSED BOX TUNNEL

LRT TOP OF RAIL PROFILE

TOP OF TUNNEL SLAB

BOTTOM OF TUNNEL SLAB

-5.40%

0.20%

ALLUV.

ELEVATION (1"=10')

870
860
850
840
830
820
810
800

2797 2798 2799 2800 2801 2802 2803 2804 2805 2806 2807 2808 2809 2810 2811 2812

STATION (x100) HORIZ. (1"=100')

LEGEND:

FILL

MARSH DEPOSITS

ALLUVIUM

NO.	DATE	REASON ISSUED/REVISED	DESIGN	DRAWN	CK
1	1/30/15	PRELIMINARY	GP	KB	TC

OWNER

GRAPHIC SCALE 0 ½" 1"

CADD FILE NAME 150130 COLOR PROFILE.DWG

CLIENT

Minneapolis Park & Recreation Board

BRIERLEY ASSOCIATES

Creating Space Underground

PROJECT

KENILWORTH CROSSING

SHEET TITLE

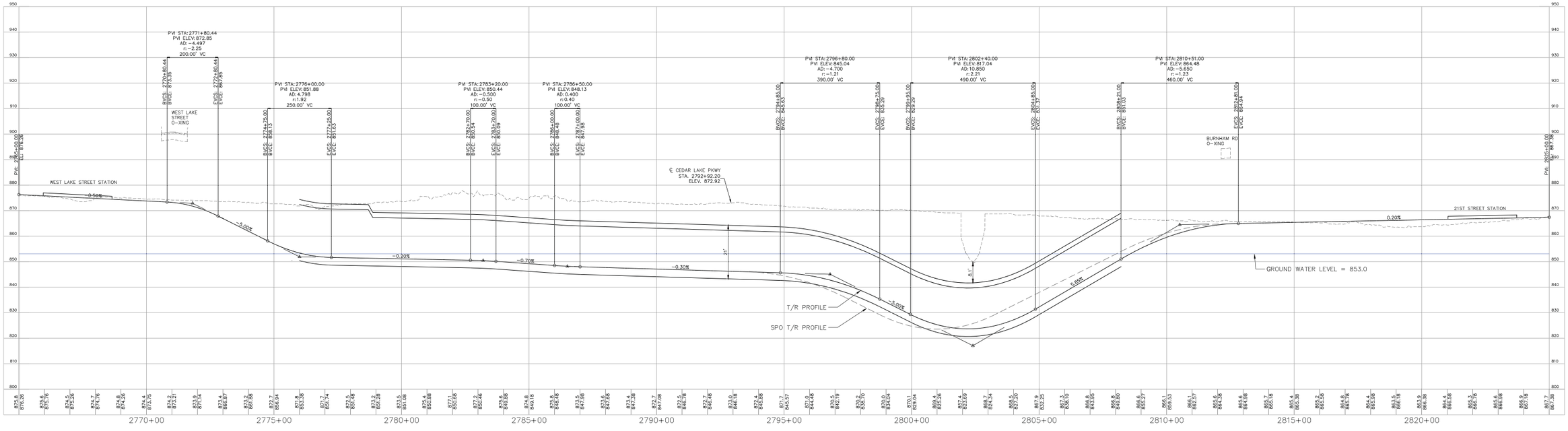
OPTION 2– JACKED BOX TUNNEL ALIGNMENT SOIL PROFILE

PROJECT LOCATION MINNEAPOLIS, MN

PROJECT NO. 414044-000

SHEET SH-3

DRAWING NO. 3 OF 5



Minneapolis Park & Recreation Board

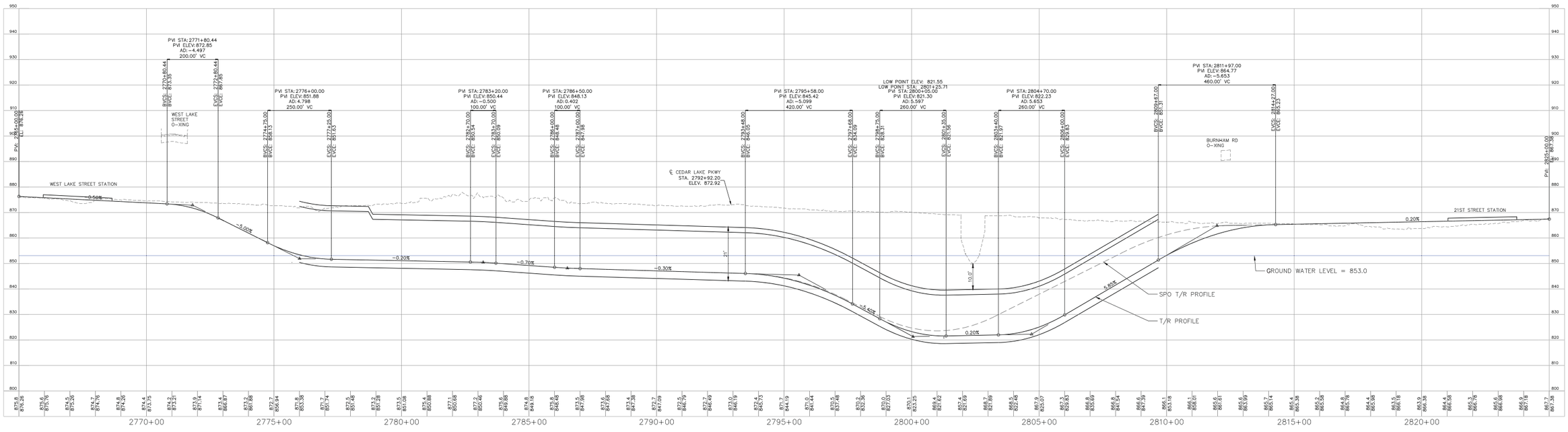
BRIERLEY ASSOCIATES
Creating Space Underground

DAVID WARE ARCHITECTS

KENILWORTH CROSSING

CUT & COVER TUNNEL PROFILE

SH-4



Minneapolis Park & Recreation Board

BRIERLEY ASSOCIATES
Creating Space Underground

DAVID EVANS AND ASSOCIATES INC.

KENILWORTH CROSSING

JACKED BOX TUNNEL PROFILE

SH-5

APPENDIX I-HISTORICAL IMPACTS

Memorandum

To: Jim Herbert, Barr Engineering

From: Charlene Roise,
Hess, Roise and Company, Historical Consultants
100 North First Street, Minneapolis, Minnesota 55401

Subject: Kenilworth Channel Alternatives Assessment: Historical Impacts

Date: February 23, 2015

This memorandum reviews three alternatives for the Southwest Light Rail Transit (SWLRT) crossing of the Kenilworth Channel in southwest Minneapolis and provides an assessment of the impacts of these alternatives on above-ground properties listed, or eligible for listing, in the National Register of Historic Places. The three alternatives are:

1. SWLRT Project Office (SPO) Bridge Option
2. Cut and Cover Tunnel (Tunnel Option 1)
3. Jacked Box Tunnel (Tunnel Option 2)

Consultants undertook extensive cultural resources investigations during preparation of the Draft Environmental Impact Statement for the SWLRT Project. At the outset, a research design was prepared that established a methodology, including a delineation of the project's Area of Potential Effects (APE).

The investigations produced four survey report volumes. A fifth volume was subsequently prepared to further analyze some properties in the survey areas. The methodology for the survey work and the findings were reviewed by the Federal Transit Administration (FTA) and the Hennepin County Railroad Authority per the FTA's responsibilities for compliance with Section 106 of the National Historic Preservation Act, as amended (36 CFR 800).

In addition, at the behest of the Metropolitan Council, Greg Mathis and Saleh Miller of the 106 Group prepared a detailed analysis titled "Kenilworth Lagoon/Channel Context, History, and Physical Description." Completed in November 2014, the study was specifically intended to "serve as a reference when considering the design of a new crossing structure for the Southwest Light Rail Transit project."[1]

As required under 36 CFR 800, the FTA has been consulting with the Advisory Council on Historic Preservation, the Minnesota State Historic Preservation Office (SHPO), and other interested parties to identify properties that are listed in the National Register of Historic Places or are eligible for that designation; to evaluate the effects of the proposed project on these

[1] Greg Mathis and Saleh Miller, "Kenilworth Lagoon/Channel Context, History, and Physical Description," November 2014, 1, prepared by the 106 Group as a subcontractor to CH2M Hill for the Metropolitan Council.

properties; to consider ways to avoid adverse effects; and to develop appropriate mitigation when adverse effects cannot be avoided.

Identification

For federal undertakings that have the potential to affect historic properties and are hence subject to review under Section 106, the National Register criteria for eligibility determine what is considered "historic." As mentioned above, the APE has been evaluated to identify properties that are listed or eligible for listing in the National Register. The FTA and the SHPO have agreed that the following properties in the vicinity of the Kenilworth Channel qualify for the National Register:

- Historic Districts (all are determined eligible)
    - Grand Rounds Historic District, including contributing elements (Cedar Lake, Cedar Lake Parkway, Kenilworth Lagoon, Dean Parkway, Park Board Bridge No. 4, Lake of the Isles Parkway, Lake of the Isles) and noncontributing elements (Park Board Bridge No. 6, Minneapolis and Saint Louis Railway Bridges over Kenilworth Lagoon/Channel)
    - Lake of the Isles Residential Historic District
    - Kenwood Parkway Residential Historic District
- Individually listed in the National Register:
    - Frieda and J. Neils House, 2801 Burnham Boulevard
- Determined eligible for individual listing in the National Register:
    - Mahalia and Zachariah Saveland House (also known as the Franklin-Kelly House), 2405 West 22nd Street
    - Frank and Julia Shaw House, 2036 Queen Avenue South
    - Park Board Bridge No. 4

Given the extensive work that has been done to identify and evaluate potentially historic properties in the APE, this group is accepted as representing all historic properties in the vicinity of the Kenilworth Channel. No additional survey or assessment has been undertaken for the preparation of this memorandum.

Methodology

To evaluate the impact of the three alternatives on historic properties, it was first necessary to consider if and how the properties identified above would likely be affected. The impact of the alternatives seemed minimal—and not discernably different between the alternatives—for the Neils House, Saveland/Franklin-Kelly House, and Shaw House, all of which are located at some distance from the proposed light-rail corridor, so these properties were removed from further analysis. While some properties in the Kenwood Parkway Residential Historic District overlook the corridor, they are northeast of the location of the tunnels and bridges and visually blocked by a curve in the corridor's alignment.

The extent of the impacts, and the difference between the alternatives, was considered for the remaining properties.

Information on character-defining features of the affected properties was obtained by reviewing existing studies of the properties and the area, as well as copies of historic sources available from in-house files. Further insights were derived from reconnaissance fieldwork.

Preliminary plans provided information on direct impacts; environmental studies prepared by Barr, particularly those related to noise and visual qualities, were consulted to establish the extent of indirect impacts.

Assumptions

Assumptions in the preparation of this memorandum include:

- Acceptance of the APE previously established for the SWLRT Project.
- Acceptance of conclusions from previous cultural resources evaluations and reviews by the FTA, SHPO, ACHP, and other interested parties regarding properties qualifying for the National Register.
- An understanding that impacts can be short-term (during the construction phase) and long-term.
- An understanding that impacts can be direct (physically affected by construction of the project) and indirect (e.g., noise, economic).
- The conclusion that the most damaging short-term impacts to above-ground properties that are listed in or eligible for the National Register are direct—namely, physical alterations resulting from construction activities.
- The conclusion that the most damaging long-term impacts to above-ground properties that are listed in or eligible for the National Register are direct and indirect. Direct impacts include new construction that permanently alters a historic element. Indirect impacts include environmental changes, particularly noise and visual.

Tools

The National Register delineates seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. These factors provide a guideline for assessing an action's impacts, and the intensity of those impacts, on historic properties.

Results and Discussion

Based on an evaluation of potential impacts, it appears that only three properties will be affected by any of the alternatives:

- Grand Rounds Historic District, including these contributing elements: Kenilworth Lagoon and Channel, Dean Parkway, Park Board Bridge No. 4, Lake of the Isles Parkway, Lake of the Isles
- Lake of the Isles Residential Historic District, particularly the Kenilworth Lagoon section
- Park Board Bridge No. 4

The following analysis focuses on the tunnel and bridge structures. The impact of additional elements associated with any of the alternatives, such as retaining walls and tunnel system houses, is not considered because sufficient information on the appearance, location, and extent of these elements is not available.

Historical Context

Frustrated by the city council's disinterest in park development in the late nineteenth century, citizens successfully petitioned the state legislature for a referendum to establish an independent board of park commissioners. Soon after the referendum passed in 1883, the board retained prominent landscape designer Horace Cleveland to prepare a park system master plan. A decade earlier, Cleveland had articulated a comprehensive vision for a network of parks for the fledgling Twin Cities. The plan for the Minneapolis system expanded along with the boundaries of the growing city. By the late nineteenth century, the loop of parks and parkways encircling the city had been christened the "Grand Rounds."

It took many decades for the system to be built out. An early priority was the Chain of Lakes. In a series of construction campaigns, the lakes were dredged, the shores planted, and parkways established in the late nineteenth and early twentieth centuries. Some of the lakes were linked with manmade canals, equalizing differences in elevation. Creation of the canals made it necessary to erect bridges for pedestrians, vehicles, and trains. The park commissioners hoped that these bridges would be "of a permanent, modern and durable construction, preferably reinforced concrete with attractive facing. They should be ornamental in design and in keeping and harmony with the landscape."[2] Railroad companies, however, were reluctant to invest in aesthetics, which sometimes delayed commitments for long-term solutions to their crossings.

Such was the case with the Minneapolis and Saint Louis Railroad. Company representatives came before the board of park commissioners on June 25, 1913, to explain that the company was "not ready at this time to erect a permanent bridge carrying its tracks over the canal connecting Cedar Lake and Lake of the Isles." As a result, they "asked that permission be given to erect a temporary bridge at the present time." The board grudgingly agreed. By November of that year, excavation of the canal was completed. At around the same time, the board, perhaps empathizing with the budget concerns of the railroad, voted to build a temporary vehicular bridge over the canal at Burnham Road (Park Board Bridge No. 6). The railroad's bridge managed to survive until the early 1950s, when it was replaced by a pair of utilitarian bridges that would have again disappointed the early twentieth-century commissioners. The "temporary" Bridge No. 6 lasted until 1961 when it was replaced by a bridge with a modern design.[3]

The Grand Rounds served as a catalyst to neighborhood development. This is exemplified by Lake of the Isles. While improvements began with the installation of a parkway and landscaping in 1888, it took many years of dredging to transform the mosquito-infested marsh into an attractive water feature. Between 1905 and 1930, these efforts succeeded in attracting affluent

[2] From the 1907 *Proceedings of the Minneapolis Board of Park Commissioners*, quoted in Mathis and Miller, 13.
[3] *Proceedings of the Board of Park Commissioners*, June 25, November 5, and December 17, 1913.

residents who built elegant homes around the lake, establishing a distinctive architectural framework.[4]

Summary of Historic Properties

The **Grand Rounds** has been determined eligible for the National Register as a historic district, and a nomination for the district is currently being drafted. Elements in the vicinity of the Kenilworth Channel that are included in the Chain of Lakes Segment that district include the Kenilworth Lagoon and Channel, Cedar Lake Parkway, Cedar Lake, Dean Parkway, Park Board Bridge No. 4, Lake of the Isles Parkway, Lake of the Isles, and Kenwood Parkway (see Figure 1).

The design intent for the lagoon was Picturesque, with manicured lawns sloping down to the shore. **Park Board Bridge No. 4**, which carries Lake of the Isles Parkway over the Kenilworth Channel, provides an elegant terminus to the east end of the lagoon and a formal transition between the lagoon and the lake.

During the 1930s, federal relief crews installed sheet-piling and riprap to stabilize the shoreline around bridges and along the canal. Another campaign of improvements was launched in the 1970s by the California landscape architectural firm Eckbo, Dean, Austin and Williams, which introduced a modern overlay without compromising the original design of the Grand Rounds.

Overlapping one section of the Grand Rounds is the **Lake of the Isles Residential Historic District**, which includes the houses fronting on the lake. Several attempts to officially designate the district locally or list it in the National Register have not succeeded because of the objections of property owners. As part of a cultural resources survey in 2006, a definitive map the historic district was prepared (see Figure 2). The district's eligibility was confirmed by the FTA and SHPO as part of the evaluation for the SWLRT Project. The district includes the Kenilworth Lagoon and adjacent land that is part of the park system. The lagoon section is bounded on the north by West Twenty-sixth Street and on the south by Dean Parkway and private property. The west end terminates at the bridge across the channel that carries pedestrian and bicycle paths. The overall setting—the lake, gently sloped grassy shores, informal plantings of trees and other vegetation, paths, a meandering drive, and a fine collection of the era's eclectic residential styles—creates a unique cultural landscape.

Impacts of Construction

Using the National Register's seven aspects of integrity to consider impacts associated with the Kenilworth crossing, the most pertinent appear to be:

- Design—"The composition of elements that constitute the form, plan, space, structure, and style of a property."
- Setting—"The physical environment of a historic property that illustrates the character of the place."

[4] Abigail Christman, Cynthia de Miranda, Denis Gardner, and Charlene Roise, "Lake of the Isles and Kenwood Park: An Assessment of Significance," December 1999, prepared by Hess, Roise and Company for the Minneapolis Park and Recreation Board.

- Materials—"The physical elements combined in a particular pattern or configuration to form the aid during a period in the past."
- Feeling—"The quality that a historic property has in evoking the aesthetic or historic sense of a past period of time."

The location of the resources will not change; workmanship is not as relevant for cultural landscapes; and association is more often tied to a person or event.

Construction of both the cut-and-cover tunnel and jacked-box tunnel could temporarily affect the Grand Rounds and Lake of the Isles Residential Historic Districts. Once in place, though, these alternatives should not impact any aspects of integrity of the historic districts or Park Board Bridge No. 4.

Developing an appropriate design for the proposed bridges over the Kenilworth Channel presents a challenge. When the park commissioner created the channel in the early twentieth century, they hoped that ornamental bridges would span the waterway. That is not, however, what happened. If the original railroad bridge and Bridge No. 6 had survived, they would be considered contributing parts of the Grand Rounds Historic District, despite the fact that their appearance disappointed contemporaries. Because these bridges have been replaced with newer structures, they have been determined to be non-contributing to the district. The design and materials that would be most sympathetic to the historical pattern would be a timber-trestle structure. This, however, would be the most damaging to the setting and feeling of the Grand Rounds and Lake of the Isles Residential Historic Districts and Bridge No. 4.

Noise from train operations on the Kenilworth Channel bridges will negatively affect the setting and feeling of the historic districts, which are within areas of moderate and severe noise impact (see in Addendum C, Figure 1). The visual impact will also be adverse (see Addendum B). There will be another visual impact to the Grand Rounds where the tunnel rises to grade directly north of Cedar Lake Road.

Option of Least Impactful Alternative

The cut-and-cover and jacked-box tunnels are the least impactful alternatives. Both would have short-term adverse impacts during construction, but not subsequent long-term impacts.

Mitigation Strategy

Tunnel construction activities should be planned to minimize construction-period impacts on historic properties.

If the channel is bridged, the design of the structures should be a balance between minimizing the structure's size and minimizing its visibility. Hence, a long span—as opposed to a trestle—will be the least intrusive for those using the channel, helping to counter the expanded covered length of the channel by opening up its width. At the same time, for those viewing the bridge's elevations, the design should blend with its naturalistic setting rather than take inspiration from the ornamental bridges that were historically installed in other locations.

Other appropriate mitigation includes preparing a documentation study for the Minnesota Historic Property Record of existing conditions before construction; interpretation on site and/or via print or digital media; and the preparation of National Register nominations for other eligible properties along the SWLRT corridor.

Mitigation strategies proposed to offset other impacts, such as walls to deflect sound, could create additional adverse impacts on the Grand Rounds and Lake of the Isles Residential Historic Districts. The design and placement of such interventions should avoid these adverse impacts to the greatest extent possible.

Attachments

Figure 1
Figure 2

Attachments

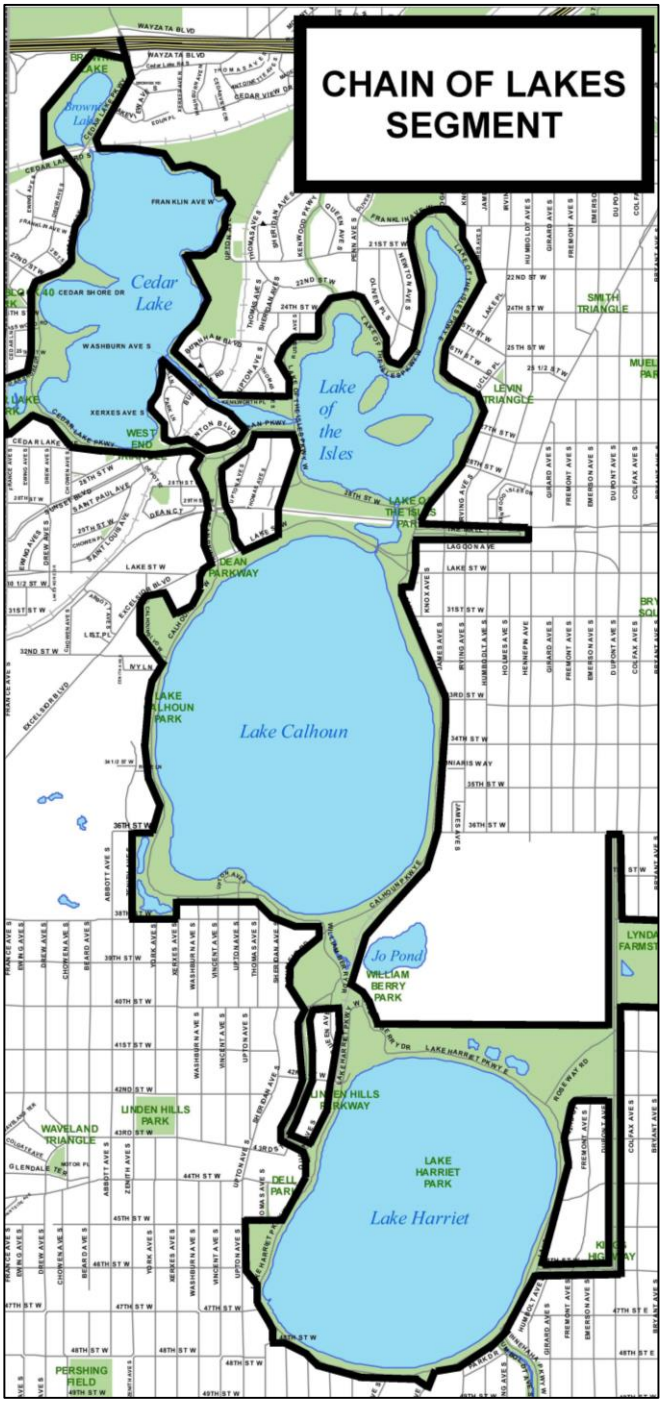


Figure 1—Proposed boundaries for Chain of Lakes Segment
of the Grand Rounds Historic District

(Prepared by Hess, Roise and Company for the Minnesota State Historic Preservation Office)

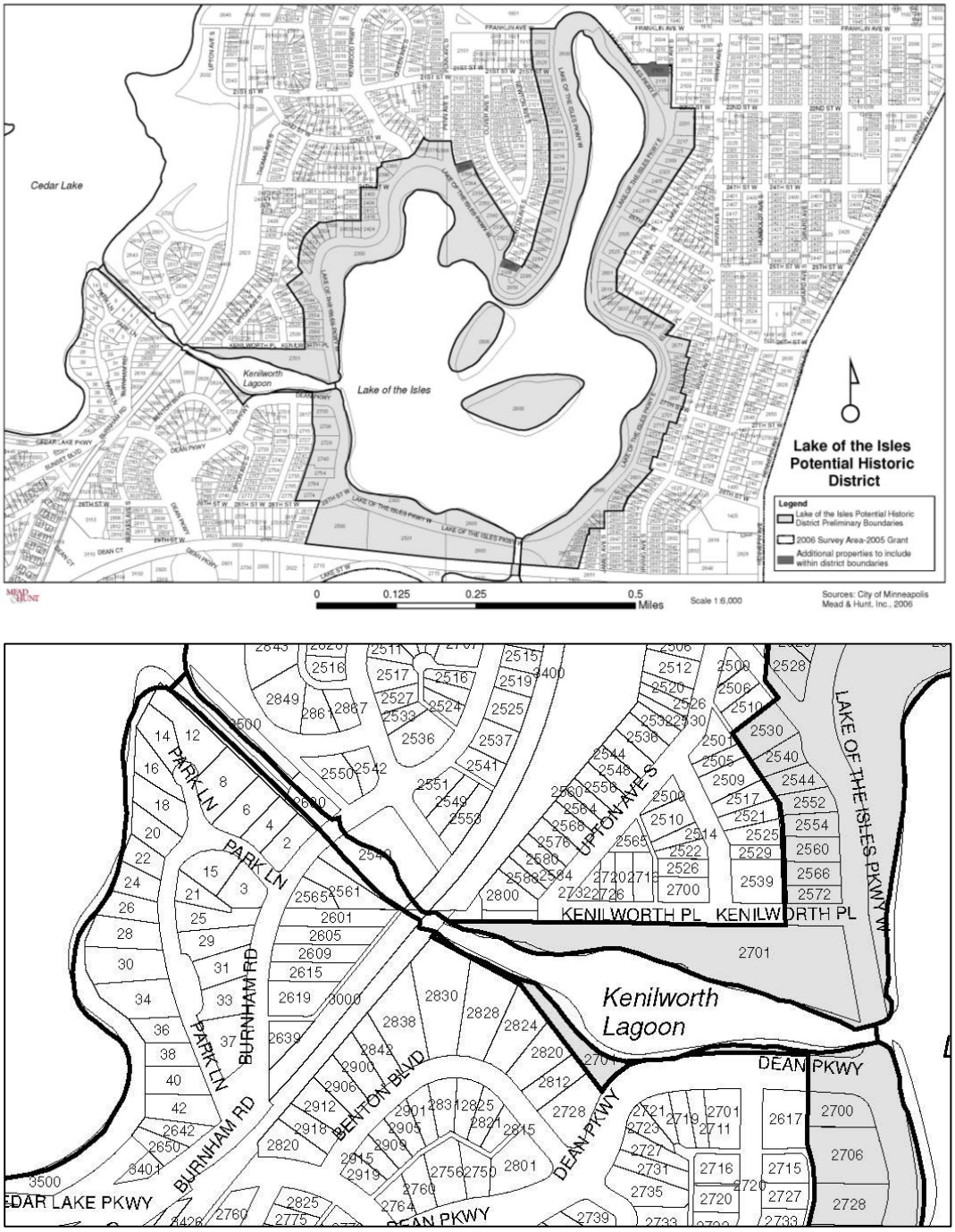


Figure 2—Lake of the Isles Potential Historic District and detail of Kenilworth Channel; the shaded area is included in the district.

("Final Report: Historic Resources Inventory, Portions of Calhoun-Isles Area, City of Minneapolis," prepared by Mead and Hunt for the City of Minneapolis Heritage Preservation Commission and Minnesota Historical State Historic Preservation Office, July 2006)

6. Minneapolis Park and Recreation Board Superintendent letter to Mark Fuhrmann, Metro Transit Program Director – New Starts, March 2015

Minneapolis
Park & Recreation Board

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March 5, 2015

Mark Fuhrmann
Program Director – New Starts
Metro Transit
Southwest Project Office
6465 Wayzata Boulevard, Suite 500
St. Louis Park, MN 55426

Dear Mr. Fuhrmann;

As you know from our numerous meetings and communications over the past few weeks, the Minneapolis Park and Recreation Board (MPRB) staff is committed to working with the Metropolitan Council and the SWLRT Project Office (SPO) to complete the processes required to obtain and provide the many approvals required for the funding and construction of the Southwest Light Rail Transit (SWLRT) Project. This effort resulted in the approval by our Board last night of the Memorandum of Understanding we have forged together to memorialize the commitment of our two agencies to cooperate and coordinate our efforts to make the SWLRT Project a reality.

Consultation and coordination on Section 4(f) issues relating to the proposed bridges over the channel connecting Lake of the Isles and Cedar Lake ("Kenilworth Channel") and design and environmental processes for the bridges crossing the Kenilworth Channel are the important areas where we will be working together. Attachment C of our MOU specifically addresses how we will approach the design of these bridges. The MPRB staff and Board recognize that the bridges are an integral and necessary design and alignment component of the proposed SWLRT Project. Last night our Board approved our staff and legal counsel recommendation to focus the MPRB's efforts on developing, with the SPO, a design and mitigation approach for the bridges that will mitigate any adverse impacts. Assuming that design and mitigation processes work, the FTA would make a preliminary Section 4(f) *de minimis* impact determination. The Park Board could then concur with a preliminary Section 4(f) *de minimis* impact determination by the FTA, should the FTA make such a finding. As part of its action last night approving the MOU, our Board also accepted the recommendation of staff and legal counsel, based on independent engineering studies, that the cost of the tunnel alternatives to the LRT bridge and the Project schedule impacts of modifying the design to replace the LRT bridge with a tunnel alternative would threaten the Project and not be prudent.

MPRB staff and SPO staff have also been reviewing the noise that may be generated by LRT trains on the bridges. Technical experts from both staffs have agreed the grassy area, including the bench, on the north bank of the Kenilworth Lagoon is for passive, more meditative purposes and should be classified as a Category 1 noise receptor. The experts also agree that activities on the Kenilworth Channel, e.g., canoeing, kayaking and Nordic skiing, are active uses of the channel and should be classified as a Category 3 noise receptor.

The Park Board is greatly anticipating the release of the Supplemental Draft Environmental Impact Statement (SDEIS) and the opportunity to review and comment on proposed changes to the SWLRT Project since publication of the Draft EIS (DEIS). The Park Board does not desire the ongoing coordination on Section 4(f) to delay publication of the SDEIS, rather the Park Board desires the SDEIS to update the evaluation included in the DEIS to allow for continued coordination and publication of the SDEIS as soon as possible. Further, the Park Board is committed to coordinating with SPO on the design of the proposed new bridges crossing the Kenilworth Channel, as well as identifying avoidance, minimization and mitigation measures for adverse impacts potentially caused by the Project. We understand that these coordination efforts are integral to the timely completion of both the NEPA and Section 4(f) processes and should continue through the Final EIS and completion of the Section 4(f) process.

MPRB staff and I look forward to working with SPO staff on the design and mitigation for the bridges as part of the ongoing environmental processes, including the National Environmental Policy Act, Minnesota Environmental Policy Act, Section 106 of the National Historic Preservation Act, and Section 4(f) of the Department of Transportation Act. I look forward to working together to successfully develop a design for the bridges that does not adversely affect the activities, features or attributes of the channel and that the Park Board will be able to, after review of more detailed design mitigation and public comment, concur with a *de minimis* impact determination by the FTA.

Sincerely,

Jayne Miller
Superintendent

7. Kenilworth Channel/Lagoon Park Property and Kenilworth Lagoon Historic Property Section 4(f) Classification Technical Memorandum, 2015

MEMORANDUM

DATE: April 10, 2015

TO: Nani Jacobson

FROM: Leon Skiles, Leon Skiles & Associates, Inc.

SUBJECT: Kenilworth Channel/Lagoon Park Property and Kenilworth Lagoon Historic Property Section 4(f) Classification

This memorandum provides a brief description of the Kenilworth Channel/Lagoon (as an element of the Minneapolis Chain of Lakes Regional Park) and the Kenilworth Lagoon (as a contributing element of the Grand Rounds Historic District) and the rationale for treating them as two distinct properties within the Southwest LRT Project's Draft Section 4(f) Evaluation Update (to be published within the project Supplemental Draft Environmental Impact Statement (EIS).

- **The Kenilworth Channel/Lagoon** (as an element of the Minneapolis Chain of Lakes Regional Park) includes the manmade waterway located between Cedar Lake and Lake of the Isles in Minneapolis, Minnesota. Recreational features within the channel/lagoon include the large curved lagoon to the east of the Kenilworth Corridor and the narrow and relatively straight channel to the west of the Kenilworth Corridor. Most of the area around the lagoon has relatively long and gently-sloping grass banks, where the banks of the channel are generally steeper, narrower, and have some remaining wood and stone retaining walls. The channel/lagoon is owned and operated by the Minneapolis Park and Recreation Board (MPRB), which designates it in its planning documents as parkland. As the park is a publicly owned, publicly accessible park of local significance, the Kenilworth Channel/Lagoon is considered by FTA to be a Section 4(f) protected property. The Section 4(f) boundary of the Kenilworth Channel/Lagoon (as an element of the Minneapolis Chain of Lakes Regional Park) is illustrated on Exhibit 1.
- **The Kenilworth Lagoon** (as a contributing element of the Grand Rounds Historic District) is a constructed body of water that connects Cedar Lake and Lake of the Isles in Minneapolis, Minnesota. Through the Southwest LRT Project's Section 106 process, FTA and the MnSHPO, in consultation with the Section 106 consulting parties, have determined that the Kenilworth Lagoon is a contributing element of the Grand Rounds Historic District, which is eligible for listing in the National Register of Historic Places based on Criteria A and C (areas of significance: Community Planning & Development, Entertainment/ Recreation, and Landscape Architecture). Contributing elements of the Kenilworth Lagoon include topographical features, vegetation, and WPA-era retaining walls. As a contributing element to an eligible historic district, the Kenilworth Lagoon is considered by FTA to be a Section 4(f) protected property.[1] The Section 4(f) boundary of the Kenilworth Lagoon (as an element of the Grand Rounds Historic District) is illustrated on Exhibit 2.

Following is a summary of the rationale for treating the Kenilworth Channel/Lagoon (as an element of the Minneapolis Chain of Lakes Regional Park) and the Kenilworth Lagoon (as a contributing element of the Grand Rounds Historic District) and as two distinct properties within the Southwest LRT Project's Draft Section 4(f) Evaluation Update:

1. **Different Property Boundaries.** While similar, the boundaries of the Kenilworth Channel/Lagoon (as an element of the Minneapolis Chain of Lakes Regional Park) and the Kenilworth Lagoon (as a contributing element of the Grand Rounds Historic District) differ, as illustrated in Exhibits 1 and 2, respectively. The boundary of the Kenilworth Channel/Lagoon (as an element of the Minneapolis Chain of Lakes Regional Park), is determined by the property currently owned and administered by the MPRB. While most of the

[1] Additional documentation on the Kenilworth Lagoon can be found in the *Kenilworth Lagoon/Channel Context, History, and Physical Description for the Proposed Southwest LRT Project* (Mathis, 2014).

land making up the Kenilworth Channel/Lagoon is owned fee simple by the MPRB, two areas approximately mid-point in the channel/lagoon (within the Kenilworth Corridor and where the corridor crosses the channel/lagoon) are owned fee simple by BNSF and the Hennepin County Regional Railroad Authority (HCRRA). Within those two areas (i.e., the portions of the channel/lagoon owned fee simple by BNSF and HCRRA), the MPRB owns, for park purposes, a permanent easement for a right-of-way for a canal connecting Lake of the Isles and Cedar Lake. The Section 4(f) boundary of the Kenilworth Lagoon (as an element of the Grand Rounds Historic District) is determined by FTA and the MnSHPO within the Section 106 determination of eligibility process, based on the historical boundaries of the lagoon and the Grand Rounds Historic District during the historic resource's period of historic significance[2].

2. **Different Qualifying Characteristics and Impacts.** The characteristics that qualify the Kenilworth Channel/Lagoon (as an element of the Minneapolis Chain of Lakes Regional Park) and the Kenilworth Lagoon (as a contributing element of the Grand Rounds Historic District) as Section 4(f) protected properties differ. The Kenilworth Channel/Lagoon (as an element of the Minneapolis Chain of Lakes Regional Park) qualifies as a Section 4(f) property based on the recreational activities, features, and attributes of the channel/lagoon (e.g., cross country skiing, paddle boarding, the waterway and banks, etc.). In contrast, the Kenilworth Lagoon (as a contributing element of the Grand Rounds Historic District) qualifies as a Section 4(f) property based on it being a contributing element of a historic district that meets NRHP Criteria A and C (areas of significance: Community Planning & Development, Entertainment/Recreation, and Landscape Architecture)[3]. Because the two properties qualify for Section 4(f) protection differently, impacts to the activities, features, and attributes of the recreational property can differ from the impacts to the qualifying characteristics of the historic resource. For example, one design could better accommodate existing recreational activities and have a greater adverse effect to the setting of the historic property.

3. **Different Officials with Jurisdiction.** The Kenilworth Channel/Lagoon (as an element of the Minneapolis Chain of Lakes Regional Park) and the Kenilworth Lagoon (as a contributing element of the Grand Rounds Historic District) each have different officials with jurisdiction. As per 23 CFR 774.17, the official with jurisdiction for the Kenilworth Channel/Lagoon (as an element of the Minneapolis Chain of Lakes Regional Park) is the MPRB, as the MPRB owns and administers the property; while the official with jurisdiction for the Kenilworth Lagoon (as a contributing element of the Grand Rounds Historic District) is the MnSHPO, as state SHPOs for historic properties[4] are the officials with jurisdiction for listed and eligible historic properties, independent of ownership.

[2] In the project vicinity, the boundaries of the Kenilworth Lagoon (as a contributing element of the Grand Rounds Historic District) and the Grand Rounds Historic District are identical.

[3] The Kenilworth Lagoon (as a contributing element of the Grand Rounds Historic District) is not eligible for NRHP listing as an individual resource.

[4] Unless the historic property is located on tribal land and then it would be the THPO.

EXHIBIT 1

Kenilworth Channel/Lagoon Recreational Resource (Element of the Minneapolis Chain of Lakes Regional Park)

EXHIBIT 2

Kenilworth Channel/Lagoon (Element of the Grand Rounds Historic District)