

**City of Edmonton
Valley Line-Stage 1
Light Rail Transit (LRT) Project
Environmental Impact Screening Assessment**

Final Report

Prepared for:

**LRT D and C
Transportation Services
City of Edmonton
Edmonton, Alberta**

Prepared by:

**Spencer Environmental
Management Services Ltd.
Edmonton, Alberta**

Under Contract to:

**AECOM
Connected Transit Partnership
Edmonton Alberta**

Project Number EP - 522

July 2013

Distribution List

# of Hard Copies	# CDs Required	Association / Company Name
5	1	Glinis Buffalo, Sustainable Development, C of E
6	6	LRT D and C, C of E
3	1	AECOM



SPENCER ENVIRONMENTAL MANAGEMENT SERVICES LTD.

Suite #402, 9925-109 Street Edmonton, Alberta T5K 2J8
Phone (780) 429-2108 Fax (780) 429-2127
www.spencerenvironmental.ab.ca

Glinis Buffalo, RPP, MCIP
Environmental Planner
Urban Planning and Environment
City of Edmonton
6th Floor, HSBC Bank Place
10250 - 101 Street
Edmonton, AB T5J 3P4

26 July 2013
Our File: EP-522

Dear Ms. Buffalo,

Re: LRT Valley Line-Stage 1, Bylaw 7188 –EISA (Final Report)
Your file: Posse 131150741-003

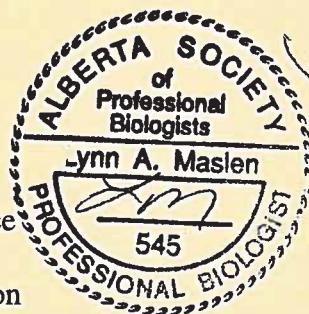
On behalf of LRT D and C and as part of Connected Transit Partnership, we are pleased to submit the final Environmental Impact Screening Assessment (EISA) for the above-noted project. This final report reflects comments received from various City reviewers. We enclose five (5) hard copies and once electronic (pdf) copy.

Please contact the undersigned with any questions. Thank you for your assistance to date.

**Spencer Environmental
Management Services Ltd.**

Lynn Maslen, M.Sc.
Vice President, Science Practice

cc: Jeff Ward, City of Edmonton
Josh Jones, AECOM



Richard B. Spencer, M.Sc.
President

EXECUTIVE SUMMARY

In keeping with the City of Edmonton Transportation Master Plan, Transportation Services, LRT Design and Construction is planning the City's next LRT extension, the Valley Line - Stage 1, connecting the city centre to communities in southeast Edmonton. The new line will comprise an urban style, low-floor LRT, and will cross the North Saskatchewan River Valley in the vicinity of Louise McKinney and Gallagher Parks. The project is nearing completion of preliminary design. In October 2012, City Council elected to pursue a P3 approach for project delivery and is now actively working toward procuring a P3 Contractor to design, build, finance, operate and maintain the new line. The P3 project will be governed by a detailed contract that is under development by the City. As of early April 2013, project design had been advanced to approximately 30%; this 30% design represents the Reference Design, upon which this impact assessment was based.

Within the river valley, the new LRT corridor will be approximately 1.6 km long and will follow an alignment that enters the valley via a tunnel and portal structure in the north valley wall, crosses the river on a bridge following the alignment of the Cloverdale pedestrian bridge, crosses 98th Avenue on an elevated guideway, and exits the valley on an at-grade track that parallels existing roads. The selected river valley corridor is in a centrally-located, highly-visible and highly-valued portion of the river valley that supports important views, events and facilities. The project therefore intersects with City parks, Natural Areas, and recreational facilities/infrastructure, creating potential for impacts to both physical and socio-cultural environments in the river valley.

The project falls within the boundaries of the City of Edmonton's *North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188)*, which governs all development within the river valley. The project is, therefore, subject to an environmental review. Several additional City bylaws and policies, including the *Parkland Bylaw*, *Natural Area Systems Policy* and *Corporate Tree Management Policy*, also apply. The project is likely to require various federal and provincial permits or approvals, including approval pursuant to the *Navigable Waters Protection Act*, a *Fisheries Act* Authorization, License of Occupation under Alberta's *Public Lands Act* and clearance under Alberta's *Historical Resources Act*. This report identifies legislation and policies that are currently applicable/relevant to the project; however, due to the relatively preliminary stage of design, specific permitting requirements will have to be revisited during detailed design.

Using the Reference Design and the probable project area required for construction and being cognizant of the as yet undeveloped construction methods and potential for change during detailed design by the P3 Contractor, this EISA identifies several *potential* environmental impacts that may occur as a result of this project. Major *potential* adverse impacts include slope instability concerns on the north and south valley walls, impacts to soil and water quality, release of contaminants to soils and water, loss of vegetation, impacts to wildlife habitat and movement, impacts to fish habitat and movement, temporary recreational trail closures, temporary effects on recreational user experience, changes to the visual and aesthetic environment in the project area, and construction-

related impacts on nearby residential areas. Many of these can be fully mitigated using measures described in this impact assessment, resulting in few residual impacts. Some impacts cannot be fully mitigated owing to the size of the project area and the likely four-year duration of the construction period; however, these residual impacts are generally limited to the construction phase of the project.

Importantly, this EISA also predicts some positive impacts, such as greater transit access to the river valley and its amenities and aesthetic improvements to certain locales. To some Edmontonians, the new bridge amenities will be an added attraction to the river valley.

Several impacts remain unresolved at this time, largely as a result of two factors: the preliminary state of project design and the implications of the P3 process. Appropriate mitigation for unresolved impacts can be developed by the City during P3 procurement and by the successful contractor during the detailed design phase. In order to ensure that this occurs, this EISA recommends that LRT Design and Construction:

- require bidding contractors to develop plans that demonstrate adequate consideration for and mitigation of unresolved impacts;
- require the successful contractor to implement a small number of key mitigation measures that will effectively mitigate multiple identified adverse impacts and to undertake some monitoring
- require the successful contractor to submit any changes to the reference design for review and approval by the City (as would be necessary regardless);
- develop a process for reviewing and approving detailed design that includes consideration of specific environmental impact mitigation measures; and
- undertake several resource specific studies, such as additional rare plant surveys and transplants.

At the time of writing, some design aspects and mitigation measures remain incomplete or under investigation. Completion of design, mitigation measures and associated investigations, and implementation of related recommendations is expected to adequately mitigate some currently-unresolved impacts.

The P3 delivery model adopted for this project presents some new challenges with respect to construction, impact mitigation and environmental management in Edmonton's river valley. The mitigation measures specified in this EISA provide effective means of addressing these challenges during P3 procurement and design and construction.

Table of Contents

Chapter	Page
1.0 INTRODUCTION.....	1
1.1 Background.....	1
1.2 SE LRT Project Rationale.....	1
1.3 Valley Line-Stage 1 Alignment	2
1.4 Location of the Project.....	3
1.5 Project Delivery Model.....	3
1.6 Environmental Assessment Objectives.....	5
1.7 Bylaw 7188 Environmental Review Process.....	7
1.8 Report Organization.....	9
2.0 PROJECT DESCRIPTION	10
2.1 Declaration.....	10
2.2 Project Setting.....	11
2.3 Key Project Components	11
2.3.1 Tunnel Through North Valley Wall.....	13
2.3.2 North Valley Wall Portal Structure.....	13
2.3.3 Portal Structure Maintenance/Emergency Access Road.....	14
2.3.4 North Saskatchewan River Bridge.....	14
2.3.5 98 th Avenue Bridge	18
2.3.6 Muttart Stop and TPSS	18
2.3.7 Existing Roadway Upgrades/Realignments.....	21
2.3.8 Realignment of Connors Road.....	21
2.3.9 Connors Road Pedestrian Bridge	25
2.3.10 LRT Track and Trains.....	25
2.3.11 Stormwater Management Infrastructure	28
2.3.12 Utility Installation and Relocation	30
2.3.13 Built-In Mitigation Measures.....	31
2.3.14 Edmonton Design Committee Review Process	32
2.4 Project Area	33
2.5 Project Phases	34
2.5.1 Site Preparation Phase.....	34
2.5.2 Construction Phase.....	34
2.5.3 Landscaping/Reclamation Phase	37
2.5.4 Operation and Maintenance Phase.....	37
2.6 Construction Protection Measures/Waste Management	38
2.7 Project Schedule.....	38
2.7.1 Overall Schedule.....	38
2.7.2 Construction Working Hours.....	39
2.8 Alternatives Considered.....	39
2.8.1 Portal Structure TPSS	39
2.8.2 New River Bridge	39
2.8.3 Connors Road Pedestrian Bridge	40
2.8.4 Drainage.....	40

2.8.5	Aesthetics.....	40
2.9	Alternatives Currently Under Consideration	41
2.10	Environmental Permitting Requirements.....	41
2.10.1	Federal Government.....	41
2.10.2	Provincial Government	43
2.10.3	Municipal Regulatory and Permitting/Review Processes.....	44
3.0	METHODS	47
3.1	General Methods.....	47
3.2	Detailed Methods	48
3.2.1	Scoping the Assessment.....	48
3.2.2	Issue Identification.....	48
3.2.3	Selection of Valued Environmental Components.....	48
3.2.4	Assessment Spatial and Temporal Boundaries	49
3.3	Description of Existing Conditions.....	51
3.4	Impact Analysis	51
3.4.1	Potential Impacts.....	51
3.4.2	Potential vs. Residual Impacts	53
3.5	Public Involvement Process.....	53
4.0	KEY ENVIRONMENTAL AND SOCIO-ECONOMIC ISSUES.....	56
4.1	Valued Ecosystem Components	56
4.1.1	Geology/Geomorphology	56
4.1.2	Soils.....	56
4.1.3	Hydrology (Surface Water/Groundwater)	57
4.1.4	Fish.....	57
4.1.5	Vegetation.....	58
4.1.6	Wildlife	58
4.1.7	Habitat Connectivity	58
4.2	Valued Socio-Economic Components	58
4.2.1	Land Disposition and Land Use Zoning	58
4.2.2	Residential Land Use	59
4.2.3	Recreational Land Use.....	59
4.2.4	Visual Resources.....	60
4.2.5	Utilities.....	60
4.2.6	Worker and Public Safety	60
4.3	Valued Historic Components	61
4.3.1	Historical Resources	61
5.0	EXISTING CONDITIONS	62
5.1	Valued Ecosystem Components	62
5.1.1	Geology/Geomorphology	62
5.1.2	Soils.....	69
5.1.3	Hydrology - Surface Water/Groundwater.....	71
5.1.4	Fish and Fish Habitat	79
5.1.5	Vegetation.....	84
5.1.6	Wildlife	97

5.1.7	Habitat Connectivity	105
5.2	Valued Socio-Economic Components	109
5.2.1	Land Disposition and Land Use Zoning	109
5.2.1	Residential Land Use	110
5.2.2	Recreational Land Use	115
5.2.3	Visual Resources	128
5.2.4	Description	129
5.2.5	Utilities	137
5.2.6	Worker and Public Safety	137
5.3	Valued Historic Components	137
5.3.1	Historical Resources	137
6.0	IMPACT AND MITIGATION MEASURES.....	140
6.1	Environmental Resources	142
6.1.1	Geology/Geomorphology	142
6.1.2	Soils	147
6.1.3	Hydrology - Surface Water/Groundwater	153
6.1.4	Fish and Fish Habitat	160
6.1.5	Vegetation	168
6.1.6	Wildlife	177
6.1.7	Habitat Connectivity	181
6.2	Valued Socio-Economic Components	188
6.2.1	Land Disposition and Land Use Zoning	188
6.2.2	Residential Land Use	190
6.2.3	Recreational Land Use	195
6.2.4	Visual Resources	211
6.2.5	Utilities	224
6.2.6	Worker and Public Safety	226
6.3	Valued Historic Components	230
6.3.1	Historical Resources	230
7.0	SUMMARY ASSESSMENT	232
7.1	Summary of Residual Impacts	232
7.1.1	Adverse Impacts	232
7.1.2	'Adverse or Positive' Impacts	233
7.1.3	Positive and Neutral Impacts	234
7.1.4	Uncharacterized	234
7.2	Summary of Mitigation Measures	235
7.2.1	Deliverables Required by LRT D and C	235
7.2.2	Performance Measures	237
7.3	Summary of Monitoring Requirements	237
7.3.1	P3 Contractor Responsibilities	237
7.3.2	City of Edmonton Responsibilities	238
7.4	Unresolved Issues	238
7.5	Future Work	239
7.5.1	Studies in Progress	239
7.5.2	Further Studies Needed	239

7.6	Permitting.....	239
7.7	Resolution of Key Environmental Issues.....	240
7.7.1	Valued Ecosystem Components	240
7.7.2	Valued Socio-Economic Components	244
7.7.3	Valued Historic Components	248
7.8	Summary and Conclusions	248
8.0	REFERENCES.....	250
8.1	Literature Cited	250
8.2	Personal Communications	255
APPENDIX A. ADVANCES ON ALIGNMENT AT CONNORS ROAD		A1
APPENDIX B. MATERIALS CONSULTED IN PREPARATION OF PROJECT DESCRIPTION.....		B1
APPENDIX C. PUBLIC INVOLVEMENT PROCESS.....		C1
APPENDIX D. RIVER HYDRAULICS REPORT		D1
APPENDIX E. FISHERIES REPORTS.....		E1
APPENDIX F. VEGETATION DATA		F1
APPENDIX G. WILDLIFE SPECIES POTENTIALLY FOUND IN THE STUDY AREA		G1
APPENDIX H. HISTORICAL RESOURCES REPORTS		H1

List of Figures

Figure 1.1.	Project Setting	4
Figure 1.2.	Project Area (Probable Construction Footprint).....	6
Figure 2.1.	Project Components.....	12
Figure 2.2.	Portal structure.....	15
Figure 2.3.	Bridge Rendering.....	16
Figure 2.4.	Bridge Design.....	17
Figure 2.5.	98 th Avenue Bridge.....	19
Figure 2.6.	Retaining Walls	20
Figure 2.7.	Muttart Stop.....	22
Figure 2.8.	TPSS	23
Figure 2.9.	Bridge Rendering.....	26
Figure 2.10.	Bridge Design.....	27
Figure 5.1.	Grierson Hill Slide –Plan View	68
Figure 5.2.	River Bathymetry	75
Figure 5.3.	Contour Plan.....	76
Figure 5.4.	(Pisces) Study Area Location	80
Figure 5.5.	Existing Plant Communities	87
Figure 5.6.	Wildlife Study Areas	98

Figure 5.7. Landscape Permeability.....	107
Figure 5.8. Existing Recreational Amenities	111
Figure 5.9. Neighbourhoods and Key Short-distance Viewpoints	112
Figure 6.1. Impacted Plant Communities	169
Figure 6.2. Revegetation Recommendations	172
Figure 6.3. Conceptual Wildlife Culvert.....	189
Figure 6.4. Direct Recreational Impacts	196

List of Tables

Table 5.1. Fish species recorded around the Cloverdale Pedestrian Bridge in 2010 and previously recorded upstream of the project area.	82
Table 5.2. North valley plant communities.....	88
Table 5.3. HME Park plant communities.....	88
Table 5.4. Mill Creek Ravine and Gallagher Park plant communities	89
Table 5.5. Bird species recorded at four point count stations during surveys conducted in summer 2012.....	100
Table 5.6. Bird species recorded during three fixed-width transect surveys conducted in summer 2012.....	101
Table 5.7. Select special status species that may occur in the regional study area.....	104
Table 5.8. Amenities and facilities located fully or partially within the project area....	128
Table 6.1 VEC/Impact Interaction Matrix	141
Table 6.2. Loss of natural plant communities associated with LRT development	170
Table 6.3. Loss of manicured plant communities associated with LRT development ..	171
Table 6.4. Predicted Pathway Impacts by Area/Amenity	199
Table 6.5. Socially-Important Amenities Within the Project Area.....	204

List of Plates

Plate 5.1. Steep slopes above the north river bank	65
Plate 5.2. The flat, low-lying river terrace, as seen from the north valley.....	65
Plate 5.3. View to north along Mill Creek channel, near the junction with the NSR.....	66
Plate 5.4. Graded slopes near the base of Connors Hill.....	66
Plate 5.5. Upstream view of the NSR north bank from the Cloverdale pedestrian bridge	72
Plate 5.6. View of the armoured north bank from the Cloverdale pedestrian bridge	73
Plate 5.7. View of the naturally vegetated NSR south bank from the Cloverdale pedestrian bridge.....	73
Plate 5.8. Abandoned reach of Mill Creek continues to convey water to.....	77
the NSR, April 2013	77
Plate 5.9. Water pooling in a former reach of Mill Creek ravine located in HME Park, April 2013	77
Plate 5.10. Smooth sweet cicely plants.....	92
Plate 5.11. Fruits, showing long styles and reflexed bractlets.....	93
Plate 5.12. The double involucre that is characteristic of tall anemone	93

Plate 5.13. Yellow lady’s slipper, showing the large yellow flower, hairy stem and sheathing leaves	95
Plate 5.14. Houses located along Cameron Avenue backing onto Louise McKinney. .	113
Plate 5.15. View from HME Park of condominiums and townhouses lining 98 th Avenue	114
Plate 5.16. Louise McKinney Park, as seen from the north, looking southeast (downstream).	116
Plate 5.17. Stone bridge in the Chinese Garden (Louise McKinney Park).....	117
Plate 5.18. The World Walk (Louise McKinney Park).	118
Plate 5.19. The Edmonton Queen Riverboat, docked at Rafter’s Landing, with the Riverfront Promenade on the opposite bank, viewed from downstream.....	119
Plate 5.20. Cloverdale pedestrian bridge	120
Plate 5.21. Picnic shelter at HME Park.....	121
Plate 5.22. Centennial Garden	121
Plate 5.23. The Muttart Conservatory.....	122
Plate 5.24. Staff parking and working greenhouses at the Muttart Conservatory	123
Plate 5.25. Muttart storage facility.....	123
Plate 5.26. The Edmonton Food Bank “Plant-a-Row, Grow-a-Row” vegetable plot....	124
Plate 5.27. Edmonton Ski Club slopes and lodge	125
Plate 5.28. Connors Road pedestrian bridge.....	127
Plate 5.29. Louise McKinney Park, looking south from Grierson Hill	129
Plate 5.30. The Cloverdale Bridge from the north valley slope, looking west from Louise McKinney Park (upstream).....	130
Plate 5.31. View north from the north end of Cloverdale pedestrian bridge,	130
(Louise McKinney Park).....	130
Plate 5.32. View of north valley slope.....	131
from the north end of Cloverdale pedestrian bridge	131
Plate 5.33. The view of Louise McKinney Park and the city skyline looking northwest from the Cloverdale pedestrian bridge.....	132
Plate 5.34. View north from north of The Landing condominium complex	132
Plate 5.35. View northwest into HME Park from the corner of	133
98 th Avenue and 96A Street.....	133
Plate 5.36. View from the top-of-bank at Strathearn	134
Plate 5.37. Looking west from the Muttart public parking lot.....	134
Plate 5.38. View north from near the top of Connors Road	135
Plate 5.39. View west from Connors Road pedestrian bridge	136
Plate 5.40. View to the east from the Connors Road pedestrian bridge	136
Plate 5.41. Current view from 98 th Avenue/Strathearn.....	216
Plate 5.42. Future view from 98 th Avenue/Strathearn	216
Plate 5.43. Current view looking west past the trailhead to the Cloverdale pedestrian bridge	218
Plate 5.44. Future view looking west past the trailhead to the Cloverdale pedestrian bridge	218
Plate 5.45. Current view from the top-of-bank above Louise McKinney Park	219
Plate 5.46. Future view from the top-of-bank at Louise McKinney Park.....	220

1.0 INTRODUCTION

1.1 Background

The City of Edmonton (the City) plans to construct a new urban style, low floor LRT line connecting the city centre to Mill Woods community. This SE LRT line, now known as the Valley Line-Stage 1, will cross the North Saskatchewan River Valley (NSRV) and thus requires an environmental review pursuant to the City of Edmonton's North Saskatchewan River Valley Area Redevelopment Plan (NSRV ARP)(Bylaw 7188). In 2011, discussion with Edmonton Sustainable Development, Urban Planning and Environment indicated that the nature of the project as a large-scale capital development project on public lands requires the review to take the form of an Environmental Impact Assessment. Thus, on behalf of the proponent, LRT Design and Construction (LRT D and C), this Environmental Impact Screening Assessment (EISA) document has been prepared in compliance with Bylaw 7188. While the EISA focuses on the section of the proposed line that will be situated in the NSRV, this chapter provides some necessary context for the entire Valley Line-Stage 1.

1.2 SE LRT Project Rationale

Edmonton has experienced recent rapid growth, with the population increasing by 30% within the past 20 years (City of Edmonton 2013a). This growth is projected to continue, with a 50% increase in population expected by 2040 (City of Edmonton 2010). The City recognizes that accommodating this growth in an ecologically, economically and socially sustainable manner will require a new model of urban design, one which is focused on increased urban density and a shift away from conventional, car-centered transportation systems. These goals are among the primary objectives laid out in the City's Municipal Development Plan, "The Way We Grow" (City of Edmonton 2010).

Planning in this direction has been ongoing for many years. In 2008, City of Edmonton Transportation Department undertook conceptual studies to determine appropriate alignments for an extension of the City's Light Rail Transportation (LRT) network. These extensions included a route linking downtown Edmonton to the community of Mill Woods (known then as the Southeast Extension). The Southeast Extension was included in the LRT Network Plan, approved by City Council in June 2009. Also in 2009, the City approved the current Transportation Master Plan ("The Way We Move", City of Edmonton 2009), which outlines strategic directions designed to meet the goals that have now been laid out in the Municipal Development Plan. In 2009, 77% of Edmontonians used personal vehicles for their everyday travel (City of Edmonton 2009). The Transportation Master Plan identifies public transit, including LRT, as a key component in shifting Edmonton's transportation system from a car-oriented system to one that emphasizes active and public modes of transportation. The City ultimately plans to construct five LRT lines, with the goal of connecting all sectors of the city (southwest, southeast, northwest, northeast, west and east) to the downtown by 2040. The City believes that a stronger, more efficient public transportation network will allow for the development of more compact communities throughout the city, thus lessening the

pressure that continued population growth will exert on the region's land base and existing transportation infrastructure.

Following a lengthy decision-making process, the "Connors Road Corridor" (the one assessed here) was selected in January 2011 as the recommended SE alignment and endorsed by City Council. In 2011, the City approved the concept plan for the Southeast to West LRT (SE-W LRT). Development of the SE-W line was divided into two segments: Mill Woods to City Centre (southeast leg), and City Centre to Lewis Farms (west leg). In June 2011, City Council approved funding for preliminary engineering for the SE to W LRT and design began shortly thereafter. In December 2011, additional funding was approved for land acquisition associated with LRT extensions, some of which was allocated to the Southeast Extension. While preliminary design is now near completion for both SE and West legs, in 2012 Council identified detailed design and construction of the Valley Line-Stage 1 as a City priority and began exploring delivery models.

In short, the current Valley Line-Stage 1 project is the culmination of many years of careful planning, including much public consultation and numerous decisions endorsed by Council. It is consistent with City planning policy at the highest level and furthers the City's goals to strengthen public transit services and optimize growth within City lands.

1.3 Valley Line-Stage 1 Alignment

The Valley Line-Stage 1 will be largely situated in a highly developed urban context, including residential neighbourhoods, commercial centres and industrial parks. The alignment moves from downtown through the Boyle Street neighbourhood and into the river valley. It crosses the North Saskatchewan River (NSR) on the west margin of Cloverdale community, travels out of the valley along Connors Road, and then moves south along major arterial roadways (95th Avenue, 83rd, 75th and 66th Streets) to Mill Woods Town Centre. While the majority of the route will be at-grade, a short portion of the alignment downtown will be underground, and elevated crossings will be constructed within the NSRV, and in the area between Argyll Road and 75th Street.

As currently conceived, the Valley Line-Stage 1 triggers a Bylaw 7188 review at one location only: the NSRV. Further south, the alignment skirts the east border of the Mill Creek Ravine, near 83rd Street and Argyll Road, but does not enter the NSRV ARP. Further south yet, the alignment crosses Natural Area SE 402, an abandoned section of Mill Creek ravine in Wagner Park that is **not** part of the NSRV ARP. A separate Natural Site Assessment and Natural Area Management Plan are in development for the Wagner Park crossing. At the direction of City of Edmonton Sustainable Development, this EISA focuses only on elements of the SE LRT line to be developed within the Bylaw 7188 boundary. Thus, for purposes of this EISA document, the project subject to this assessment, hereafter referred to as "the project", comprises those Valley Line-Stage 1 components that will occur within the NRSV in central Edmonton, and excludes all other SE LRT components. For a very few project components, lands outside the valley that are potentially affected by activities in the valley are also discussed.

1.4 Location of the Project

The Project is located in the Central Area of the NSRV ARP, in SE 4-53-24-W4M, NE 33-52-24-W4M, and SE 33-52-24-W4M. River valley infrastructure will occupy a relatively narrow corridor (ranging from 10 m to 35 m) and will be approximately 1.6 km in length. The alignment begins at the north valley wall, just inside Louise McKinney Park, travels south across the river to 98th Avenue, curves southwest to the Muttart Conservatory, south to Connors Road, and then curves east and travels upslope to the top of valley, paralleling Connors Road (Figure 1.1). That portion of the project in the south valley floodplain is located at the western limits of the Cloverdale Neighbourhood. The portion along Connors Road is located downslope of Bonnie Doon Neighbourhood.

1.5 Project Delivery Model

In October 2012, the City elected to pursue a P3 (public-private-partnership) approach for project delivery and is now actively working toward procuring a P3 Contractor. Through a rigorous, competitive process, the City will select a qualified P3 Contractor, to design, build, finance, operate and maintain the Valley Line-Stage 1. The P3 model is intended to promote innovation, cost savings and timely delivery of an operational system. The P3 project will be governed by a detailed contract that is under development by the City.

For the entire Valley Line-Stage 1, including the project within the river valley, preliminary design (i.e., approximately 30% of final design) is complete. Design of some components is advanced further than others and most of the River Valley LRT components are among those that are furthest advanced. This design, referred to as the Reference Design, will be carried forward and provided to the P3 Contractor. The P3 contract will specify acceptable Reference Design variance tolerances and will set out spatial, temporal, structural and methodological standards and specifications. Those notwithstanding, the P3 Contractor may propose innovative designs or methods beyond variances or other specifications. Any proposal outside of those tolerances or not meeting prescribed standards will be subject to review and approval following current standard City approval processes, including City environmental review processes.

Nevertheless, the current project proponent, LRT D and C wished to ensure that the project, as currently defined, was subject to the Bylaw 7188 environmental review process at this crucial point in project planning. Further, they wanted the EISA to be approved by Council prior to entering into a contract with the P3 Contractor. Therefore, while this EISA assesses the Reference Design resulting from the preliminary engineering exercise, as described in the Design Detail Reports issued by Connected Transit Partnership (CTP), it also acknowledges that design changes are likely to occur during the P3 process. Moreover, as with many EISAs, because the environmental assessment, public involvement and preliminary design processes identified design issues that required addressing and adjustment, design refinement of some specific project components continued during preparation of this EISA document. Development of an EISA for a project as large in scale as this is a lengthy process and requires that the design be “frozen” at the beginning of the assessment. This EISA, drafted in April and



Legend

- EISA Study Area
- Proposed LRT
- City of Edmonton River Valley Natural Areas (2010)
- Bylaw 7188 Boundary

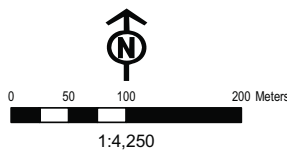


Figure 1.1 Project Setting

City of Edmonton LRT Valley Line - Stage 1

Aerial Photograph Date: May 2012
Date Map Created: 04 July 2013

early May 2013, reflects design as it was in early April 2013. In other words, design as was presented in the detailed design reports finalized in February, March and early April 2013. Importantly, since that date, in parallel with the draft EISA preparation and review, design work has progressed on the track corridor alignment along Connors Road. While this new work incorporated environmental assessment analysis, it was not possible to integrate those design advances into this EISA. To acknowledge the recent design advances on that project component, the options analysis, the environmental factors considered in option evaluation and the final alignment recommendation are presented in Appendix A.

The P3 delivery model approach has influenced the content of this EISA in several ways. Firstly, for some elements, design information is less detailed than typical for Bylaw 7188 EISAs, and for most elements, little is specified about construction methods. For some project components, this has resulted in some uncertainty in impact determination. Most uncertainties regarding potential for impact or type of impact have been addressed in this EISA through assumption of worst case scenarios and development of proactive mitigation measures in the form of constraints, specifications and specific future planning requirements. Mitigation measures noted as commitments will be carried forward into contract documents. This includes commitments to require the P3 contractor to provide specific planning documents and for LRT D and C to develop performance measures. Numerous other mitigation measures identified as recommended in this EISA are not final commitments but are intended to assist the City in developing contracts and variance tolerances during the P3 procurement phase.

Secondly, the P3 Contractor's freedom to innovate, including modifying design of project components and proposing innovative construction methods and/or project scheduling means that the design and construction methods assumed as the basis for this EISA are subject to change as detailed design proceeds. As noted above, the City will protect against the potential for innovation to result in unintended outcomes by developing specific tolerances for variation; however, these tolerances are not yet determined and thus could not be included in this EISA. In response to this, on the basis of professional judgment and through consultation with local contractors possessing relevant construction experience, the project team defined a probable construction footprint, or project area for the Reference Design and this was used for EISA purposes (Figure 1.2). This project area represents reasonable construction site limits for the NSRV components of the Reference Design. To protect against unanticipated environmental impacts resulting from innovation, any proposed innovations or activities that do not conform to contract specifications or that would require modification of lands or facilities situated *outside of the project area delineated here and on Bylaw lands*, will be subject to the Bylaw 7188 environmental review process, at the expense of the P3 Contractor.

1.6 Environmental Assessment Objectives

A review of environmental assessment requirements at all three levels of government, as of early 2013, indicated that the City of Edmonton is the primary regulator with respect to environmental assessment of this project. Although environmental approvals will be required from municipal, provincial and federal governments (see Section 2.10), only the



Legend

- EISA Study Area
- Project Area
- Proposed LRT
- City of Edmonton River Valley Natural Areas (2010)
- Bylaw 7188 Boundary

Figure 1.2 Project Area (Probable Construction Footprint)

City of Edmonton LRT Valley Line - Stage 1



1:4,250

Aerial Photograph Date: May 2012
Date Map Created: 04 July 2013

City of Edmonton has specific environmental assessment/review requirements (see Section 2.10.3.1). The EISA undertaken for this project was, therefore, based on the following primary objectives:

- Meet the requirements for an environmental impact assessment pursuant to Bylaw 7188.
- Obtain sufficient information about the area's Valued Environmental Components (VECs) to enable identification of potential impacts.
- Achieve an environmentally-sound preliminary design and provide adequate protection for the City's highly valued river valley resources.
- Identify environmental permitting requirements.
- Include information that is likely to be required for environmental permits at the municipal, provincial and federal level.
- Prepare a report that documents all of the above.
- Obtain approval of the EISA from City Council.

1.7 Bylaw 7188 Environmental Review Process

This EISA has been prepared specifically to address the informational needs of Edmonton's municipal government. As the Valley Line-Stage 1 Right of Way is considered a new transportation corridor within the NSRV ARP, a Site Location Study (SLS) was also required. In May 2013, the draft EISA and the SLS were submitted together, as required, to Sustainable Development, Urban Planning and Environment for review. These documents were circulated to representatives of several Edmonton departments, branches and offices for review. All comments were submitted to Urban Planning and Environment and forwarded to the proponent for review and response. The EISA and SLS documents were then modified in response to the comments, finalized and resubmitted to Sustainable Development. Reviewers then had an opportunity to comment on the modifications. Following this review, the reports were finalized (as shown here) for submission to Sustainable Development, and will be sent to Transportation Committee and City Council, in August 2013.

In recent past, the City's EISA Bylaw 7188 review process has included circulation of EA documents by proponents to appropriate federal and provincial government departments for review and comment, to ensure a coordinated approach to resource protection and that all regulatory concerns have been addressed. This was not done in this case for two reasons: recent federal regulatory changes have reduced review of EAs by federal agencies and undetermined construction methods provide little for those agencies to comment on. Federal and provincial agencies have been made aware of the upcoming project and basic project components. While information contained in this EISA should contribute significantly to the permitting information needs of federal and provincial agencies, permitting applications will require additional environmental information, specific to design detail and construction methods and will, therefore, be the responsibility of the P3 Contractor. The contractor may decide to submit this EISA as a supporting document.

Recognizing that the P3 delivery model may mean that the EISA review process may leave some important considerations temporarily unresolved, LRT D and C commits to soliciting further input and agreement from those City departments, branches and divisions (City Stakeholders) that participated in the EISA review. While the City's P3 process remains in development at time of writing, the process framework has been established. The process will comprise at least four stages that will involve issue and review of key documents and more detailed information will be available at each stage. Items not addressed with sufficient depth or certainty in the EISA can be addressed through this process. These stages/documents include the following:

Request for Qualifications (RFQ): This document sets out the project scope and P3 proponent requirements. City Stakeholders can provide input into the RFQ to ensure that their specific concerns can be adequately addressed by the shortlisted bidders.

Request for Proposals (RFP): Among other things, this document sets out the functional design requirements for the project and the performance requirements for the technical submissions that will be developed by each of the shortlisted P3 contracting teams as they move through the bidding (pursuit) process, and, details a Concession Agreement. City Stakeholders can provide input into the RFP regarding select technical submission requirements. Examples of relevant technical plans are: traffic management plan (including pedestrians), environmental management system, drainage design report.

Technical Submissions: During the procurement phase each shortlisted team in pursuit of the contract will provide a number of technical submissions for evaluation with respect to ability to meet the Concession Agreement requirements. This process may generate additional questions for the bidders. The Valley Line project team review will include preparation of comments and questions to be further addressed by the P3 contracting teams. City Stakeholders can participate in the review of relevant technical submissions and the associated preceding and follow-up questions. Material issues identified in the reviews not previously addressed in the RFP or Concession Agreement can be dealt with by addendum. City Stakeholders may also be asked for input at this point. Extreme confidentiality protocols are in effect around all information shared by proponents during the design review process.

Technical Plans: Following award of the contract any detailed technical plan requirements that have been identified in the contract documents are to be submitted by the successful P3 proponent for a contract conformance evaluation. City Stakeholders will have opportunity to participate in that review.

Finally, as noted earlier, if the P3 Contractor proposes a design or activity that necessitates work outside of the project area defined for this assessment and, if those works require modification of Bylaw lands or existing facilities, or, if the proposal is not within the design tolerances or other constraints established in the P3 contract, the proposal will be subject to additional environmental review, pursuant to Bylaw 7188, at the expense of the P3 Contractor.

1.8 Report Organization

This report comprises 8 chapters. Chapter 1 provides context and background information related to the project and describes the report structure. Chapter 2 is the detailed project description, including project justification, key components, key activities, alternatives considered and relevant environmental regulations. Chapter 3 outlines the impact assessment methods and summarizes the public involvement program to date. Chapter 4 sets out the key issues associated with the project, incorporating public, professional and regulatory concerns. Chapter 5 describes the existing conditions for all valued environmental components (VEC) considered. Chapter 6 describes the impacts related to project implementation, recommended mitigation measures, and the residual impacts anticipated following mitigation application. Chapter 7 summarizes findings of the assessment, identifies monitoring requirements and recommended follow-up work, summarizes steps taken to resolve issues identified during the assessment and describes important considerations moving forward with the P3 process. Chapter 8 provides all references and personal communications cited in the report.

As a whole, the document is generally organized around the selected VECs. Individual EISA reviewers may consider restricting their review to the sections of the document most pertinent to their specific interests. We recommend that the entire document be read to fully understand the project impacts. Some mitigation measures are applicable to more than one VEC. Where significant overlap occurs, the first instance is referenced in later sections and the reader should refer back to that section.

This report has eight appendices. Appendices comprising supporting study reports are provided in a compact disc attached to the back report cover. The remaining appendices follow Chapter 8, in hard copy.