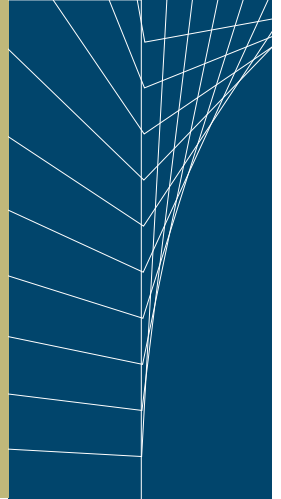


TRANSPORTATION MUNICIPAL/ENVIRONMENTAL STRUCTURAL
LAND DEVELOPMENT LANDSCAPE ARCHITECTURE
PLANNING/COMMUNICATIONS GIS/MAPPING



City of Edmonton

Final Report

Terwillegar Park Concept Plan Study

Table of Contents

1.0	Background	1
1.1	Study Process	1
1.2	Acknowledgments	3
1.3	Context	4
1.4	A Vision for Terwillegar Park	5
1.5	Supporting Documents	5
2.0	Program Statement	8
2.1	A “Unique Natural Park”	8
2.2	Design Themes	9
2.3	Program Elements	10
3.0	Terwillegar Park Concept Plan	21
3.1	Four Concept Plan Options	21
3.2	Two Concept Plan Options	21
3.3	Final Concept Plan	22
3.4	Public Open House	28
4.0	Concept Plan Implementation	32
4.1	Park Management Guidelines	32
4.2	Estimated Capital Costs	36
4.3	Development Phasing	38
4.4	Summary and Recommendations	41

List of Figures

Figure 1.0	Context	page 4
Figure 3.1	Final Concept	after page 27
Figure 3.2	Final Concept – Restoration	after page 27
Figure 3.3	Final Concept- Activity Area Enlargement	after page 27
Figure 3.4	Interpretive and Amenities Plan	after page 27

Appendices

Appendix A	Opportunities and Constraints Analysis
Appendix B	Access and Servicing Review
Appendix C	Park Visitation Estimates
Appendix D	Concept Plan Options
Appendix E	Public Consultation Summary Report

1.0 Background

Planning for Terwillegar Park began in 2005 with the preparation of “A Vision for Terwillegar Park” (Randall Conrad & Associates), a City wide public consultation and visioning exercise. The outcome of that study was a public vision for Terwillegar Park as a **“unique natural park within the City’s river valley”**. The report also defined key values, preferred activities, and required infrastructure to meet the needs and wishes of users, stakeholders and the citizens of Edmonton. The report also recommended specific site and environmental analysis be completed and that a concept plan be prepared to define a clear path for the future development of Terwillegar Park.

The purpose of the **Terwillegar Park Concept Plan Study** is to define an overall conceptual plan, management guidelines, and an implementation strategy for Terwillegar Park for the next ten years. Using “A Vision for Terwillegar Park” as a foundation, the Terwillegar Park Concept Plan Study was undertaken to advance the planning for the Park with the completion of site and environmental analysis, program development, preparation and refinement of concept plan options, consideration of management requirements, and identification of an overall implementation plan.

Based on the public input that was gathered during the preparation of “A Vision for Terwillegar Park”, it was clear that all users placed a high value on the protection of the unique environments of the Park, however, there were polarized views related to existing and potential uses. It was also clear from ongoing concerns about the parking, entrance road, trail erosion, habitat degradation and lack of amenities, that the “do nothing” or “leave it alone” approach was not an acceptable option. With growing population and increased use, the existing infrastructure and the natural environment within the Park would deteriorate over time if a combination of infrastructure upgrades, additional amenities, environmental restoration and Park management were not planned and implemented.

Recognizing these factors, the planning team adopted an approach that would seek common ground between user groups with the objective of finding the right balance between protecting the environment, meeting the needs of current users, and providing facilities and amenities to meet the needs of a growing City. To assist in trying to achieve this balance, a citizen advisory committee comprised of community members was established, and was tasked with a central role in providing input to the consultant team during preparation of concept options and refinement into a final concept plan. As defined in this report, this approach has resulted in a concept plan that provides a clear direction for the development of Terwillegar Park as a “unique natural park”.

1.1 Study Process

To meet the objectives of the project, the City of Edmonton retained the services of a multidisciplinary consulting team (the design team) led by ISL Engineering and Land Services. The design team reported to the City’s project team which was made up of senior staff from several City departments. The design team was in turn supported by the Terwillegar Park Citizen’s Advisory Committee. Regular working meetings with the committee allowed the design team to present findings, learn historical and environmental details about the Park, discuss potential program features, and develop and refine concept options. The Terwillegar Park Citizen’s Advisory Committee proved to be a hard working, knowledgeable and well spoken group that was an invaluable resource to the design team throughout the Study.

The Terwillegar Park Concept Plan Study involved two major phases of work with subphases and a number of tasks included in each phase:

- Phase 1: Analysis & Concept Development – this phase included preparation of the public consultation and communications plan, the site and environmental analysis, and the preliminary concept development
- Phase 2: Concept Plan & Report – this phase included concept plan refinement, public consultation and preparation of the final concept plan and report.

A public consultation plan was prepared by IMI Strategics at the beginning of the Study to ensure that the concept planning process would build on the consultation completed during the preparation of “A Vision for Terwillegar Park”, while providing opportunities throughout the Study for stakeholders and the public to provide critical input into the concept designs. The public consultation process included the following components:

- Public Consultation Plan - City Corporate Public Involvement Framework
- Communications Plan – internal and external communications
- Terwillegar Park Citizen’s Advisory Committee – regular working meetings to input to the design team throughout the concept design process
- Stakeholder Consultation – workshop and meetings to gather input and technical information from stakeholders and park users
- Advertising, roadside signs and website (www.terwillegarpark.com)
- Public Open Houses – two open houses to gather input on two concept options
- Public Open House – present preferred concept plan in the spring of 2008

The initial work by the design team included background review and field analysis leading to the preparation of three technical reports (available under separate cover): a *Historical Resources Impact Assessment*, a *Phase 1 Environmental Site Assessment*, and a *Biophysical Review of Sensitivities and Opportunities* (Section 1.4). All of this work provided information for the preparation of the *Opportunities and Constraints Analysis Report* which provides an overview of site conditions, features, uses and issues as a framework for concept plan preparation.

The development of the concept plan options began with the development of a preliminary program statement (Section 2.0) based on the findings of the “A Vision for Terwillegar Park”, the *Opportunities and Constraints Analysis*, and the design team’s discussion of the potential program elements that fit with the vision of a “*unique natural park*”. A facilitated workshop was held to allow invited stakeholders, representing a broad cross section of current and potential users, an opportunity to provide input to the design team and identify preferred program options. With consideration of this input, the design team finalized the program statement and began developing concept plan options for the future of Terwillegar Park.

Initially four concept plan options (Section 3.1) were prepared by the design team and then reviewed with the City Project Team and the Terwillegar Park Citizen’s Advisory Committee. Based on input and ideas provided by these groups, the design team revised and refined the four concepts into two concept plan options (Section 3.2) which were then presented to the public at two open house events in March 2008 (Section 3.3). Based on the input received at the open houses and then discussions with the Terwillegar Park Citizen’s Advisory Committee, the design team prepared a draft of the Final Concept Plan (Section 4.0).

In support of the Final Concept Plan, management guidelines and an implementation strategy were prepared as a guide for the long term development and operations of

Terwillegar Park. All of this information was presented to the public for feedback at an open house in May 2008. Based on input from the public, the City Project Team and the Terwillegar Park Citizen's Advisory Committee, the design team made refinements and prepared this report to document the process, findings and recommendations of the Terwillegar Park Concept Plan Study.

1.2 Acknowledgments

ISL Engineering and Land Services would like to acknowledge the following individuals and firms for their involvement in the Study and their commitment to the process and results:

Terwillegar Park Citizen's Advisory Committee

- | | |
|------------------------|------------------------------------|
| ➤ Greg Falkenstein | Community at Large |
| ➤ Tom Greenwood-Madsen | Terwillegar/Riverbend Area Council |
| ➤ Bruce Laverty | Outdoor Recreation Interests |
| ➤ Mark Lund | Academic Community |
| ➤ Scott Osinchuk | Cycling |
| ➤ Laura Shanner | Off-Leash Dog Walkers |
| ➤ Flo Slomp | Community at Large |
| ➤ Stephen Wills | Environmental Interests |
| ➤ Gordon Murrie | Water-based, Paddling Interests |

The City of Edmonton Project Planning Team

- Lyall Brenneis
- Rob Marchak
- Leslie McWeeny
- Chris Kopf
- Darren Grove
- Wanda Goulden
- Doug Costigan
- Wendy Kinsella
- Enrique Peris
- Laurie Pettigrew
- Jim Black

The ISL Design Team

- ISL Engineering and Land Services
- IMI Strategics
- Spencer Environmental Management Services
- EDS Group
- Thurber Engineering
- The Archaeology Group

1.3 Context

Terwillegar Park is 174 hectares (430 acre) of parkland surrounded by the North Saskatchewan River on three sides (Figure 1.0). The Park is accessible by vehicle from the west end of Rabbit Hill Road and on foot or by bike along approximately five informal trails. Development within the park is limited to a parking lot and many informal trails. Terwillegar Park is well situated in the growing southwest part of Edmonton. Existing residential communities line the road leading into the Park while newly established, growing and emerging residential communities are located to the southwest and west. Adjacent land to the north includes the Edmonton Golf and Country Club while the E.L. Smith Water Treatment Facility is located to the southwest. Terwillegar Park is identified as a key “river valley attraction” as part of the River Valley Alliance’s Capital Region River Valley Park.

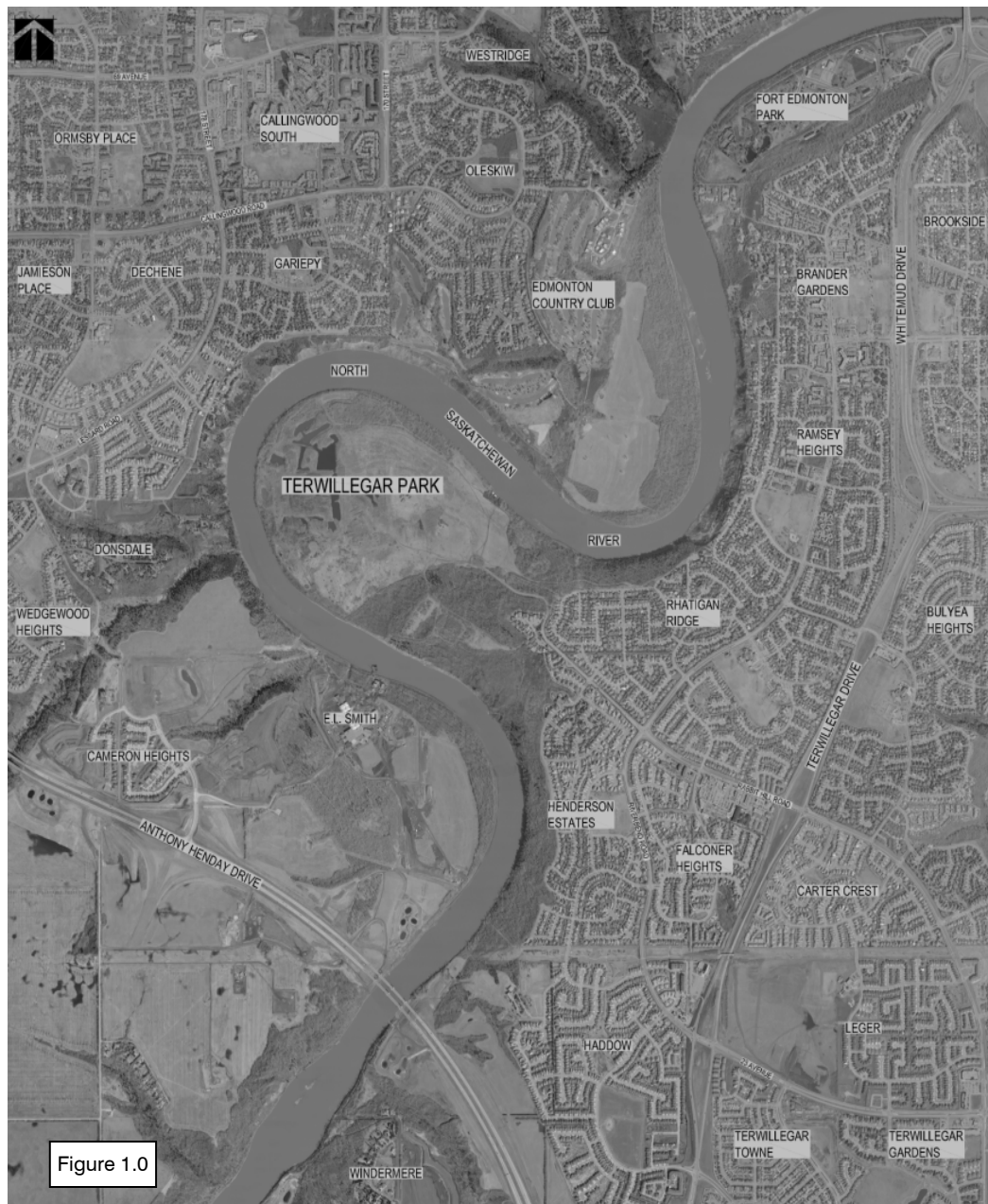


Figure 1.0

1.4 A Vision for Terwillegar Park

“A Vision for Terwillegar Park” was a needs assessment and visioning project approved by City Council, which was the first step in the planning process for the long term development and management of Terwillegar Park. “A Vision for Terwillegar Park”, prepared through an extensive community consultation process, defines key values, preferred activities, and required infrastructure to meet the needs and wishes of users, stakeholders and the citizens of Edmonton. The approved vision for Terwillegar Park is: **“A Unique Natural Park within the City of Edmonton’s River Valley Park System”**.

“A Vision for Terwillegar Park” defined Terwillegar Park as a place where all people can:

- find solace from the pressures of urban lifestyles;
- Appreciate and learn about nature and how to preserve it;
- Participate, including all levels of ability or disability, in both passive and active leisure pursuits in a safe natural setting, thereby contributing to their mental, physical and social well being;
- Discover new things in nature, new friends and new pursuits; and
- Enjoy nature and recreate in harmony with mutual respect for each other’s needs.

Key values identified in “A Vision for Terwillegar Park” included keeping Terwillegar Park as:

- A natural park – preservation, escape, diversity of experience in a natural setting;
- A shared resource – respect for others, access for all, trust and accountability;
- An outdoor classroom – educate visitors on the value of nature;
- A connected resource – connections to the river valley, to nature and to people.

Preferred activities and infrastructure identified in the Vision Plan included:

- All current activities to continue but for the future to be designed and managed to ensure that all City-wide residents can access the Park
- Opportunities to learn about the natural attributes of the Parks environment
- Basic services such as washrooms, paved road and parking
- A continuous link of the river valley trail through the Park with careful consideration of trail alignment

Throughout the Concept Plan process, the design team, Terwillegar Park Citizen’s Advisory Committee, stakeholders and the public have referenced “A Vision for Terwillegar Park” as the foundation for considering, selecting and evaluating whether potential program elements and concept design decisions fit within the vision of a *“unique natural park”*.

1.5 Supporting Documents

A number of supporting documents were prepared as part of this Study to provide a comprehensive foundation for the preparation of the Concept Plan. All of the assessment work was undertaken based on recommendations of “A Vision for Terwillegar Park”. The overall objective of the analysis phase was to establish a clear and common understanding of the opportunities and constraints for developing new features and amenities within Terwillegar Park, while at the same time improving existing uses and protecting and enhancing the unique environmental resources of the Park.

The site and environmental analysis was completed throughout the summer of 2007 as background review, field inventories, assessments and mapping provided information for the preparation of the Opportunities and Constraints Analysis Report (Appendix A). This report provides an overview of site conditions, features, uses and issues as a framework for concept plan preparation. The technical reports that were prepared in support of the Opportunities and Constraints Analysis Report included a *Historical Resources Impact Assessment*, a *Phase 1 Environmental Site Assessment*, and a *Biophysical Review of Sensitivities and Opportunities*, all of which are available under separate cover. An *Access and Servicing Review* (Appendix B) was also prepared to define the site infrastructure and access issues and options. The final supporting document is the *Public Consultation Summary Report* (Appendix E) which provides an overview of the public consultation activities and feedback that were such an important part of this Study.

1.5.1 Historical Resources Impact Assessment

The *Historical Resources Impact Assessment* was prepared by The Archaeology Group and included historical air photo analysis and field analysis. The study revealed no evidence of a previous settlement on the site and no archeological or historic sites of significance. The report was approved by the Province and no further exploration is required.

1.5.2 Phase 1 Environmental Site Assessment

The *Phase One Environmental Site Assessment* of Terwillegar Park completed by Thurber Engineering revealed that there was no historical or visual evidence of contamination found on the site. The assessment confirmed evidence of the presence of non-native fill material, which was consistent with the waste material (e.g. cement blocks, tires, a car body and other refuse) uncovered during site restoration work related to the dry-docking of the Edmonton River Queen in 2007. A more detailed sampling and testing program would be required to determine the location and extent of the materials and the potential impacts on the environment and on construction requirements, scheduling and costs.

1.5.3 Biophysical Review of Sensitivities and Opportunities

The *Biophysical Review of Sensitivities and Opportunities* was prepared by Spencer Environmental Management Services Ltd. This study included extensive field research on the biophysical features and conditions in Terwillegar Park related to topography and drainage, vegetation and wildlife. From a drainage perspective, the study defined the 100-year and 25 year flood lines within the park which illustrated that flooding of the park would impact the potential location of structures, the integrity of the pond areas and the long-term maintenance of trails and other amenities.

The vegetation assessment revealed:

- Agricultural use and gravel extraction resulted in removal of native vegetation,
- poor reclamation practices following gravel operations resulted in a lack of topsoil in the open space areas,
- noxious and nuisance weeds dominate much of the site,
- three rare plant species were identified, and
- High species richness (number of different species) of songbirds

This study also confirmed that as part of the North Saskatchewan River regional ecosystem, and being somewhat disconnected from urban development, Terwillegar Park supports a great diversity of wildlife, none of which are of protected status. The study also confirmed that although highly disturbed, this Park displays high species richness (number of species) of songbirds. There were also three fish species found in open ponds which demonstrated that there was sufficient depth for over-wintering. There is also the presence of frogs, salamander, and reptiles, none of protected status.

One of the key opportunities that was established based on the report findings, was that despite species richness and significant ecological features, the park does not support any environmental features or species that are sensitive to the point that all development should be avoided.

1.5.4 Opportunities and Constraints Analysis

This report, prepared by EDS Group, provides an overview of site conditions, features, uses and issues as a framework for concept plan preparation. It uses the findings and recommendations of “A Vision for Terwillegar Park” and the above noted technical reports, as well as observations of the design team, to identify opportunities and constraints to recreational development within Terwillegar Park. A total of 23 opportunities and 18 constraints were identified and have been used as a framework for developing the program and the concept plan options. The complete report is provided in Appendix A.

1.5.5 Access and Servicing Review

This report was prepared by ISL Engineering and Land Services and provides a review and recommendations related to improving site access and provision of utility services to support the proposed development program. The report builds on a previous geotechnical report and provides an assessment and recommendations for upgrading and paving of the access road into the park, and for expansion and paving of the parking lot. The report also provides an overview of the servicing options for providing water, sanitary, power and natural gas services for the development of support buildings such as washrooms on the site. Part of the servicing review includes consideration of sustainable approaches to servicing any buildings that are proposed. The complete report is provided in Appendix B.

1.5.6 Public Consultation Summary Report

This report was prepared by ISL and IMI Strategics and includes an overview of the public consultation plan, a description of the various public consultation activities, a summary of the feedback, comments and ideas provided by stakeholders and the public, and an overview of the interpretation of the feedback and the resulting impacts on the preparation of the concept plan. The report also summarizes the important role played by the Terwillegar Park Citizen’s Advisory Committee during the Study. The complete summary report is provided in Appendix E. The detailed breakdown of the results of the various public consultation activities is not included, but was provided to and utilized by the design team, the City project team and the Terwillegar Park Citizen’s Advisory Committee throughout the Study.

2.0 Program Statement

The following program statement serves as the guide for the preparation of the concept plan options and the final concept plan for the future development of Terwillegar Park. The program statement was prepared by the design team with input from the City project team, the Terwillegar Park Citizen's Advisory Committee and stakeholders through a one day workshop.

A program statement is a concise, descriptive list of the potential features and outcomes that are envisioned for a development project. The development program should be based on an overall vision, should respond to site opportunities and constraints, and should reflect the experiential and physical needs of current and future users. There are three key parts to the program statement for Terwillegar Park:

- **Starts with a Vision** - in this case, 'A Vision for Terwillegar Park', which defined the vision for Terwillegar Park as *"Unique Natural Park within the City of Edmonton's River Valley Park System"*.
- **Design Themes** – these provide the overall framework for the design as they provide a point of reference for evaluating and selecting specific program elements.
- **Program Elements** – the 'Program' is a descriptive list of the features, uses, experiences, support infrastructure and management requirements. It is the 'palette', 'menu', 'shopping list', or 'kit of parts' that fit with the overall vision ("a unique natural park"), and support the overall design themes.

2.1 A "Unique Natural Park"

So what is a "unique natural park"? "A Vision for Terwillegar Park" provides direction in terms of key values, preferred activities and required infrastructure for the park. In terms of context for making design decisions, the concept plan design team provides the following three-part definition:

- Terwillegar Park is, and will be, **unique** in Edmonton's River Valley Park System in terms of its size, environmental richness, diversity of settings, and mix of activities.
- The **natural** environment of Terwillegar Park is to be preserved and enhanced, and the natural setting provides for a diversity of recreational and educational experiences.
- Terwillegar **Park** shall continue to be a public place that supports recreational activities that are nature based; individual, family or group oriented; accessible and safe for all.

2.2 Design Themes

Building on the public input received during “A Vision for Terwillegar Park”, and considering specific direction and ideas from City staff, the City project team, the Advisory Committee, and stakeholder group representatives, a number of strong design themes were identified. The design team considered these themes during the selection of the specific program elements and as concept plan alternatives were prepared.

- **Keep it Simple** – this has been one of the strongest messages: to keep development unobtrusive and minimal both in extent and in visual presence, i.e. design to compliment and blend in to the natural setting.
- **Connectivity** – a multiuse asphalt trail (MUT) through the park with connections across the river is necessary to provide connectivity to future development in and around the park. This trail must be included if the overall vision for Edmonton’s river valley is to be achieved as defined in the Ribbon of Green Master Plan and the River Valley Alliance ‘Capital Region River Valley Park’. The location and alignment of the trail will need to be carefully selected to minimize impacts to the site environment and the activities of users.
- **Quality of Place** – the design of all features and amenities in the park must be of a high standard, sustainable, fit with the natural setting and be aesthetically pleasing to promote a sense of pride and ownership for users.
- **Not all things to all people** – while it is recognized that the size and open space available in the park may make it suitable for a wide range of recreational activities, it is also clear that many activities may not fit within the vision for the park and should be located in other city parks to meet the recreational needs of Edmontonians.
- **Design for all Seasons** – one of the unique aspects of Terwillegar Park is that it supports a high level of use in all seasons. The design of features and amenities and the park management program must reflect this four season use.
- **Recognizing that use will increase** – concerns over increasing levels of use are well founded (population growth, active lifestyles, better access etc.) and improved infrastructure and management will be needed to ensure that the Park environment is sustainable and that user needs can be met.
- **Additional uses must fit the Vision** – the current uses in the park are to be maintained and improved infrastructure and management will be proposed to better meet the needs of those users. Any additional uses or activities that are proposed for the Park must be compatible with the vision of a “unique natural park”.

2.3 Program Elements

The following is the final list of program elements that were selected and that the design team believes fit within the vision of a “unique natural park” and also support the key design themes. The program elements have been organized into seven categories. The final category is management and maintenance which begins to identify some of the activities that will be required to manage the park and provides an outline for the management guidelines defined in Section 5.1.

It is important to note that all of the program elements listed below are included in the final concept plan. A broader list of program elements was used by the design team in developing and analyzing the alternative concept options. As the concept plan evolved through input by the City project team, the Terwillegar Park Citizen’s Advisory Committee and the public, some program elements were removed because it was agreed that they did not fit within the vision for the park.

2.3.1 Natural Environment

One of the key values expressed in “A Vision for Terwillegar Park” was the need to preserve the Park’s natural attributes, as well as its ability to regenerate naturally over time regardless of the recreational activities which occur. In terms of program, it is recommended that the concept plan include provisions for not only preserving the natural environment, but enhancing, interpreting and managing it as the key feature of Terwillegar Park. Some of the potential user experiences resulting from the provision of these program features includes nature education and appreciation, discovery, quiet enjoyment and contemplation. The following are the natural environment program elements:

- Naturalization and Habitat Enhancement – selective planting of native plant species to increase the extent and enhance wildlife habitat diversity in some parts of the Park.
- Open Space – designated areas of the park (central open space and along main trails) should be mowed one to two times per year to manage weeds and maintain conditions for users and for event use. Other open space areas could be managed for weed control and restored to a native prairie. Formal, mowed (manicured) lawn area will not be proposed and the overall mowed area may be reduced in support of the overall vision.
- Buffer Planting – planting of native tree and shrub species in large beds in different areas of the park will be used to create visual or physical buffers between use areas and in the parking lot to reduce the scale and improve the fit with the natural environment.
- Ponds – the ponds could be enhanced as natural features within the Park by reducing some of the side slopes, planting upland and riparian vegetation around the perimeter and by developing formal viewing/interpretive opportunities.
- River – river’s edge disturbance should be limited to a few designated locations to protect sensitive areas and provide users with physical and visual access. To protect the river, all other existing informal access locations should be reclaimed and further impacts should be discouraged through signage and maintenance.



- Education – there are tremendous environmental education and interpretive opportunities in the Park that should be formalized to enhance the park experience for all users.
- Weed Control - there are noxious and nuisance weeds throughout the Park; total eradication would be virtually impossible and it may not be desired or necessary. Some selective weed control may be desirable to allow native plant succession to occur.



2.3.2 Trails

An extensive network of informal trails of varying widths exists within the Park and is well used by a broad range of users. There are also approximately five informal trails providing access into the Park. To ensure that the trails can meet the long term needs of users, to provide for a broad range of experiences and to direct use so as to minimize impacts to the natural environment, a formal trail network should be established, constructed and maintained to City standards. Some of the potential user experiences resulting from the provision of these program elements includes family fun, nature appreciation, quiet enjoyment, exercise, fitness, skill development, socializing, challenge, thrill seeking, and four season enjoyment. Several categories of trails are recommended:

- Regional Trail – the development of a regional trail running through the Park and linking it as part of the overall ‘Capital Region River Valley Park’ vision, has been identified in a number of approved plans. Recognizing this as a critical link, a paved multiuse trail through the park with connections to proposed pedestrian bridges has been included. The regional trail would not be constructed until the bridges are in place. The trail alignment has been carefully selected to minimize impacts to the environment and other user activities and experiences.
- Enhanced Walking Trails – walking trails will be formalized and improved on some of the existing paths using compacted granular placed at 3.0 m wide for the main trails and at current widths for other informal trails, through forested and to access viewpoint and interpretive node locations. Some existing informal trails may be left as is or phased out and reclaimed based on management and/or habitat enhancement recommendations. Some new walking trails have been proposed to increase the range of trail experiences available to users or to provide a modified trail route in support of other proposed development.



- Universal Design Trail – trails developed using universal design principles provide barrier free access for users with all degrees of sensory awareness, all types of movement and all levels of physical and intellectual function. To ensure that people with all levels of ability have access to a range of the Parks unique environmental features, a universal design trail has been included from the parking lot through some of the forest at the east end of the site and along the river. Universal design principles should also be applied to the detailed design and construction of the enhanced walking trails so that some of these trails can also be designated as barrier free/universally accessible.



- Designated Dog Off/on-leash areas – the use of the Park by off-leash dogs will continue to be one of the primary program elements. Some areas of the Park (approximately 16% of the total Park area) will be designated for permanent restrictions requiring dogs to be on-leash to support a wider range of park activities and uses, minimize user conflicts and support habitat protection or restoration measures.

- Enhanced Mountain Bike Trails – the majority of existing single track trails will be retained and a designated route will be enhanced to improve mountain bike user experience, to make the trail sustainable, for safety reasons or to mitigate against environmental impacts. The enhancement of the trails should be assessed through a partnership between the City and users, and locations identified for enhancements to the surface, width, drainage, turns, and sightlines. These enhancements will be carefully designed and implemented through user consultation to ensure that user experience (challenge) is not reduced, while at the same time ensuring protection and management of the natural environment. Some existing single track trail routes may be phased out and reclaimed based on management and/or habitat enhancement recommendations.



- Cross Country Ski Trails – the designated cross country ski trail route will be maintained and modified to better meet the needs of cross country skiers. Signage will be provided to encourage walkers to respect the track that have been set. With the development of a program building in the park, an area could be designated for a teaching area.



- Trail Amenities – a range of trail amenities including benches, trash receptacles, viewpoints, water fountain and signage are recommended.

2.3.3 Infrastructure

“A Vision for Terwillegar Park” identified the need to provide basic infrastructure upgrades to the Park including a washroom, improved access and parking. All of these infrastructure improvements have been recommended to meet the long term needs of park users:

- Road – the access road has been evaluated (See Access and Servicing Review – Appendix B) and upgrading and paving of the road is recommended. Issues related to retaining walls, barriers, minor widening, drainage and storm water will all need to be addressed during detailed design. Provision for school bus access and turnaround has also been provided. A secondary emergency access will be provided by maintaining the ‘old road’ connection to Rooney Crescent as an enhanced walking trail. A secondary paved access road (shown in image as viewed from the north towards paved entrance road) has been recommended to provide access to the ‘Activity Area’ for program elements such as the canoe/kayak launch and the picnic area. Storm water from the entrance road and paved parking area will need to be managed to reduce potential impacts on the site and river and a small retention area or wetland has been proposed.



- Parking – expanding the parking area from approximately 80 stalls (includes parking on road) to 150 stalls (shown in image as viewed from west towards paved entrance road) to meet current needs and short term growth has been recommended based on an evaluation of past traffic counts, current use estimates and projected visitation (Appendix C). Additional parking (65 stalls) to support other park features is proposed using small satellite parking lots. A designated overflow and event parking area (300 cars) has also been proposed. The area would be graded, compacted and seeded with a durable low maintenance grass mix. The area would be defined by temporary fences during events only.



- Program/Washroom Building – a program building has been proposed to assist the City and other groups with the provision of outdoor education/recreation programs and events within the park. This building will provide externally accessible washrooms that will be open for use at all times when the park is open.



The program space may include flexible office and meeting space for event organizers, a flexible multipurpose room, as well as interior and exterior storage space. This space would be particularly valuable as a place for small groups to gather (eg. marshalling of a school groups). The program building would not be designed to support social bookings such as weddings. The building should be designed as a state-of-the-art ‘green’ building that is safe, vandal resistant and fits with the natural character of the site.

- Remote Toilets - small, pump-out tank style or composting toilets have been proposed at the west end of the Park and close to the canoe/kayak launch to meet the needs of both park users and those using the river.



- Maintenance Building and Yard – to better support management within the Park a small maintenance building and yard has been included with access off of the secondary access road (shown in image below). The maintenance building would support a full time Parks operation staff person as well as a seasonal crew for maintenance in the park and perhaps the district. The building and yard will be “tucked” into the forest edge

and will be well screened so as to fit into the park and should be designed as a state-of-the-art ‘green’ building. One of the benefits of the maintenance building would be to improve safety and security in the Park by having the regular presence of parks staff working with the Park – the concept of “eyes on the Park”.



- Utility Services – as indicated in the Access and Servicing Review (Appendix B), water, natural gas, and power service into the Park will be required in support of the proposed program/washroom building and the maintenance garage. These services could be provided within a public utility lot connecting the Park with Rooney Crescent, and/or they could be constructed within a corridor adjacent to improved access road. Street lighting (dark sky compliant) is recommended along the main access road and parking lot and should be considered along the secondary park road and satellite parking lots. A sanitary service into the site is not recommended (due to the requirement for a lift station) and so washrooms will be serviced through septic tanks that will require pumping. A water line would be provided to service the buildings and a looped water line would be provided for water fountains. During detailed design, sustainable design technology should be evaluated as part of the LEED design objectives. The use of high efficiency electrical fixtures combined with photovoltaics, high efficiency/waterless or composting toilets, rainwater harvesting and reuse, and in-floor space heating are all potential options for reducing or potentially eliminating some of the service requirements.

2.3.4 Amenities

The provision of proper amenities will enhance the experience of all users. Current amenities are limited to trash receptacles, dog bag dispensers, benches, minimal signage and a portable toilet.

- Park Entrance Node – a central location adjacent to the parking lot is recommended to provide a place where all users can pass through to gather or post up-to-date information on the park. This node would expand on the current notice board by providing a Park map(s), user information directed at the various user groups, current conditions, and environmental information. This node could also be the staging area for Park interpretation by providing details and directions for individuals or groups wishing to learn about the Park.



- Sheltered Viewpoints – sheltered viewpoints have been located at a few key points along the main walking trails to provide destinations where users can meet, rest, view the Park and river valley, find protection from the weather, and get interpretive information on the park.



- Seating – seating should be provided at key locations throughout the Park to provide places for rest, contemplation or at key view locations. Seating can be provided with benches or picnic tables, or through the use of natural materials such as large logs or boulders.



- Trash and Recycling – ‘oil drum’ style trash receptacles are provided throughout the Park primarily to meet the needs of the dog walking community. The City will replace some trash receptacles with in-ground style receptacles which are designed to hold more waste and reduce odors. Trash receptacles that are located where truck access is not feasible are to be replaced with metal containers with lids that better fit with the natural setting of the park. Additional trash receptacles should be added where necessary based on input from users. Bins for recycling should also be provided by the parking lot to allow users a place to deposit beverage cans and bottles.
- Dog Bag Dispensers – dog bag dispensers are located at key access points in the park. Additional dispensers should be added where necessary based on input from the off-leash dog community.

- Picnic Sites – to meet the needs of a potential user group (i.e. families), individual and group picnic sites have been proposed within the Park. To best support this activity, the sites are located in close proximity to parking and in an area separated from off-leash dog activities. The picnic sites would include picnic tables on gravel pads with available trash and recycling receptacles close by.



- Nature Playground – related to the provision of picnic sites in the Park a nature-based playground is proposed to meet the needs of families. The nature playground would be designed to blend into the site and would utilize natural materials and features such as logs, boulders, trails, and vegetation to provide a range of play, imaginative and physical challenges for children of all ages.



- Bluphones – additional Bluphones should be added at primary trail access locations (eg. Pedestrian bridges) to increase safety and security within the Park.
- Signage – a formal signage program based on City of Edmonton standards will be recommended to provide users with a range of information including interpretive, directional, safety and regulatory. To fit with the vision of the Park the signage program should not result in a proliferation of signs throughout the Park but should be designed for the specific user groups, provide for universal design, encourage appropriate and shared use and enhance rather than restrict user experiences. The trail signs for the mountain bike trails should also provide information on the type/difficulty of the trail and should be developed to International Mountain Bike Association (IMBA) standards



- Use and Management Signs – education includes knowing how to properly use and enjoy the Park and how to respect the activities of other users. To meet this need, and to ensure that the ‘shared resource’ value remains strong as activity increases, use and management signage will need to be provided in the Park.
- Drinking Fountain – a drinking fountain and “doggy” fountain are proposed on the outside of the program/washroom building to meet the needs of users. A water fountain will also be provided in the Amenity area and would be serviced with a looped water line.

2.3.5 Ponds, Lake and River

As identified in the Opportunities and Constraints Analysis, the ponds present a range of opportunities related to improved water fowl habitat, nature interpretation, access for off-leash dogs and for paddling. Due to the size, shape and access from all sides, not all of the program activities can occur without impacting the others and as such a constructed recreation lake has been proposed as a new feature of the park. Surrounding the Park on three sides, the North Saskatchewan River is a significant feature of the Park and supports a range of activities and experiences for users. Access to, and protection of, the river's edge are critical to the long term vision for the Park.

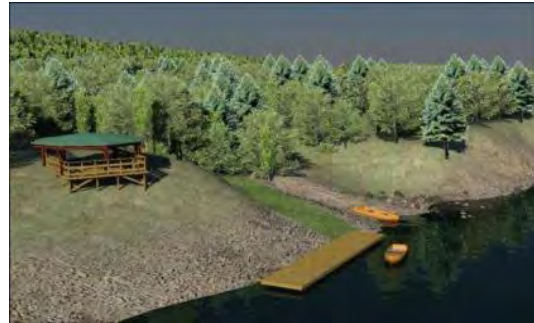
- Restoration – modification of some of the pond shoreline slopes is proposed to promote the growth of riparian vegetation and improve the ponds as waterfowl habitat. The addition of topsoil and planting using native riparian and upland species is proposed for the proposed restoration area.
- Pond Shoreline Access – improved, designated access for people and/or dogs has been proposed by formalizing some of the trail access points, improving edge conditions (eg. gravel or boardwalk) and removing steeper slopes. Providing formal and directed access locations could work in conjunction with habitat restoration by encouraging users to only access specific locations which will in turn minimize the extent of impacts and disturbance along the shoreline.
- Paddling Lake - a new designated lake is proposed to provide a facility for teaching canoeing and kayaking and providing flat water recreational paddling opportunities as a new use within the Park, while maintaining the existing ponds for habitat. The paddling lake would not be open to off leash dogs and a combination of boulders, native planting and rock/rip-rap would define the shoreline to ensure that it fit with the Park but wasn't attractive to waterfowl. Material excavated from the construction of the lake would be placed in locations within the Park and fine graded to look like natural landforms. It is important to note that the Concept Plan Study did not include any geotechnical or hydrogeological studies related to the construction of a lake, and so assumptions have

been made regarding construction and lake management. Two options have been discussed for the construction of the lake. In the first option the lake would be excavated to below river water elevation and it has been assumed that the lake



would function hydraulically in the same manner as the existing ponds (ie. rise and fall with the river level). In the second option, the lake would be excavated to a suitable depth (approx. 3.0m) and size (approx. 2.0 ha), a pvc liner would be installed, and the lake would be filled with either river water or from a well that would be drilled in the Park. With both options there are regulatory and public health issues related to water quality which at times may place restrictions on the direct water contact programs such as kayaking.

- River Shoreline Access and Restoration – informal access locations along the river bank which are dangerous or are causing erosion issues should be restored using a combination of erosion control materials (boulders, rip rap, ecoblankets) and naturalization planting. These locations should be identified by Parks operation staff on an ongoing basis and temporary access control measures (fencing) combined with signage may be needed to allow the restoration to succeed. Popular existing river access locations at the “beach”, at the west end of the park and opposite EL Smith should be maintained and improved to allow safe access to the rivers edge.



- River Access Infrastructure – a formal canoe/kayak launch is proposed to provide a suitable location for river access/egress and in support of the Voyageur Canoe program. The access would be graded, protected (from river action) and maintained, and a seasonal dock will be provided to facilitate safer loading and tie-up for park users. To better support this use, a gated access road with turn around as well as a satellite parking area has also been proposed.

- The ‘Beach’ – the ‘beach’ area is a heavily used area of the Park and should be retained to provide good access to the river’s edge. The slopes and river edge will require ongoing maintenance to allow safe and reasonable access to the rivers edge and gravel bars that are downstream. The Edmonton River Queen was dry docked in the ‘Beach’ area for maintenance in 2007 which closed the ‘Beach’ to users. The River Queen ownership group is being encouraged to evaluate other options outside of Terwillegar Park for dry docking.





2.3.6 Interpretive, Events and Programs

One of the key values identified in “A Vision for Terwillegar Park” was the development of Terwillegar Park as an outdoor classroom. The users and stakeholders did not identify the need to provide a formal educational/interpretive facility, but rather, to provide opportunities throughout the Park for all users to combine their recreational/social activities with opportunities for seeing and learning about the natural features of the Park.

- Interpretive Signs – a comprehensive interpretive signage program should be developed and implemented. The final concept plan identifies potential locations and themes throughout the Park.



- Interpretive Viewpoints – formal interpretive viewpoint areas have been proposed within the Park as well as along the river to provide designated and controlled locations for viewing the Park and learning about its features.
- Events – the Park already supports a number of significant events including the Klondike Raft Races, sanctioned mountain bike races (Alberta Biking Association and Corporate Challenge), and orienteering competitions (Edmonton Overlanders Orienteering and Corporate Challenge). Any additional events proposed for the Park should fit within the context of the natural setting, require minimal infrastructure or manicured open space, and minimize impacts activities of users.
 
- Programs – programs in the Park are currently limited to public schools grade 4 Voyageur canoe trip from Terwillegar Park to Fort Edmonton, as well as other small scale school use activities. With the network of trails and diversity of natural features, the Park is well suited to host a range of City, school, community, and recreational user group programs which would have an environmental or outdoor education focus. All season, active programming within the Park should be developed following the implementation of support amenities and infrastructure such as interpretive signage, a program building, washrooms, and bus access.
 
- Infrastructure – events that utilize the Park make do with temporary infrastructure and facilities such as signage, tents, parking, additional power and controls (eg. barriers, fencing). Improved road access and parking, a washroom building and a program building would better support event and programs within the Park.

2.3.7 Management and Maintenance

The management and maintenance of Terwillegar Park will be the responsibility of the River Valley Parks unit of the City of Edmonton Parks Branch. Under the new Urban Parks Management Plan (June, 2006), Terwillegar Park is classified as a River Valley and Ravine Park and will be managed based on the guidelines for that category. In support of the proposed program and concept plan for Terwillegar Park management guidelines have been prepared (See Section 4.3). The following are some of the management considerations that will be addressed through guidelines and ultimately operational practices.

- Natural Environment - management activities may include ongoing restoration planting, seasonal access restrictions for habitat protection, weed control, and mowing. Grass in the open field and along the walking trails would continue to be mowed twice per year.
- Trails – formal trails management guidelines should be developed and fostered through consultation and a partnership between the City and the trail users to ensure that the trails are meeting the needs of users and that they are sustainable. Management activities may include regular trail inspections, vegetation clearing, erosion controls, surface repairs, ski track setting and maintenance of trail structures and amenities. Signage will be a key element in trails management providing information to users in trail rules, location, direction, distance, and difficulty.

- **Park Maintenance** – The primary maintenance activity will continue to be trash collection (once per week). Additional resources will be required to maintain built amenities such as viewpoints, signage and shelters. Some infrastructure management activities will be reduced once the road is paved, however, cleaning, snow clearing and building maintenance would increase.
- **Buildings** – the program/washroom building, the maintenance building and the remote washrooms will all require at least daily maintenance checks as well as scheduled maintenance to ensure that they are kept clean and suitable for use. For the program/washroom building, maintenance schedules will need to be established to correspond to use schedules. As a bookable facility, users should be required to take responsibility for managing access (ie. opening/locking the building), and for general cleanliness after each use.
- **Ponds, Lake & River** – management activities may include ongoing restoration planting, weed control, pest control, trail/access maintenance or even seasonal access restrictions. Water quality issues will need to be addressed to ensure public safety for direct contact recreation activities. There may be a wide range of management activities along the rivers edge which will focus on protecting the river banks from erosion as well as to maintain limited but safe access to the water. These activities may include restoration planting, weed control, trail maintenance and access restrictions.
- **Education and Safety** – a good communication/public relations plan to educate park users on the range of available activities, experiences and responsibilities to ensure the shared enjoyment of the Park. From a safety perspective, Crime Prevention Through Environmental Design (CPTED) standards will be applied in the design of the parks facilities and amenities.
- **Bylaw Control** – Park Rangers will patrol and monitor the Park for safety, to educate users on appropriate behaviours, and to enforce bylaws when needed. The proposed Maintenance building and yard would increase the level of operations staff in the Park which may also assist in ensuring positive activities in the Park. Local rules may be applied in the application of the City Parks Bylaw.
- **Emergency Response** – EMS access will be provided along all 3.0 m wide trails. Some area will remain difficult to access especially in winter. Bluphones and trail signs with location markers will make it easier for EMS to respond. A secondary access/egress route into the Park is provided by the ‘old road’ trail leading to Rooney Crescent for extreme circumstances.
- **Signage** – a few signs can be placed to remind users of the “Rules of the Park” and to encourage the ‘shared resource’ value. Management activities may include sign maintenance and repair, as well as updating and changing out signs to keep the information current seasonally as well as over the long term as succession in the Park occurs and environments change.
- **River Valley Event Guidelines** – the City of Edmonton has a set of general terms and conditions of use as well as clear requirements to ensure that event organizers follow the rules for park use, safety, public notification, signage, vehicle access and environment that must be followed.

3.0 Terwillegar Park Concept Plan

Once the initial program statement was completed, the design team began developing concept plan options for the future of Terwillegar Park. Initially four concept plan options were prepared by the design team and then reviewed with the City Project Team and the Terwillegar Park Citizen's Advisory Committee. Based on input and ideas provided by these groups, the design team revised and refined the four concepts into two concept plan options which were then presented to the public at two open house events in March 2008.

Following the open houses, the Terwillegar Park Citizen's Advisory Committee met with the design team and members of the City project team. The ideas, comments and suggestions received from the public during the open houses and through the project website were discussed and used as a foundation for developing the final concept plan. Based on the input received, the design team recommended that Concept Option 2 be used as the base for developing the final concept plan (Section 3.3), which was then refined and presented to the public at an open house in May, 2008.

3.1 Four Concept Plan Options

Each of the four initial concept plan options contained a mix of the various program elements with varying levels in terms of the number of elements, the relationship between elements and the proposed level of overall development. The design team's goal was to have a balance of program elements between the four concepts so that there was not a concept with virtually no development, and no single concept that included all of the proposed program elements. In general, all of the concepts included some level of natural area restoration, enhanced gravel (walking) and mountain bike trails, a regional trail through the site, and paved access road and parking.

At this point in the process the primary objective was to test whether the various program elements fit within the vision for the park with specific location, amount (size) and relationship being of less importance. A brief summary description of the four concept plan options, the illustrated concept plans and a matrix comparing the key program elements of the four concepts is provided in Appendix D.

3.2 Two Concept Plan Options

Based on the input and ideas of the project team and the Terwillegar Park Citizen's Advisory Committee on the four concept options, the design team prepared two draft concept plans for further review and discussion. In preparing the two concepts, the design team pulled together the strongest ideas related to the characteristics and qualities for each of the program elements to ensure that they fit within the vision of a "unique natural park" while meeting the needs of current and future users.

In reviewing the two draft concepts, a decision was made that the program elements should be the same in both concepts. This would allow the public to be able to make a direct comparison between the size, location, and relationship of the various program elements. Based on the input from the project team and the Terwillegar Park Citizen's Advisory Committee, the two concept plan options were finalized and then presented to the public at two open house events. A description and illustrations of the two concept plan options, as well as a summary of the public input, are provided in Appendix D.

3.3 Final Concept Plan

Following the open houses where the two concept plan options were presented, the Terwillegar Park Citizen's Advisory Committee met with the design team and members of the City project team. The ideas, comments and suggestions received from the public during the open houses and through the project website were discussed and used as a foundation for developing the final concept. Based on the input received, the design team recommended that Concept Option 2 be used as the base for developing the final concept. During the meeting options for refining Concept Option 2 into the final concept were proposed and discussed, and a high level of consensus was achieved. The following key changes to Concept 2 were suggested as the framework for the final concept plan:

- Paddling Lake – since there was support for the larger lake that was illustrated in Concept 1, it was suggested that the lake be located roughly as per Concept Option 2, but enlarged to better meet the needs of paddlers.
- “Beach” Trail – to accommodate the larger lake, it was suggested that the main trail connecting the parking lot and the “beach” be shifted to the west to provide a more direct connection and clear line of sight. This trail would also provide a clear edge for the designated on-leash area.
- Pond Restoration Zone – a restoration/habitat zone surrounding the existing ponds to the west and south was suggested as a means to improve the water fowl habitat. This zone would include shoreline grading and riparian/upland planting of native species.
- Designated On-Leash Area – with the enlargement of the lake the designated on-leash area was also enlarged to include approximately 16% of the total Park area. It was agreed that the main parking lot should be designated as an on-leash area for the safety of dogs and people. Since the activity area was clearly defined it was suggested that the balance of the east part of the park as defined by the area east of the “Beach” trail and north of the park entrance road should also be included in the designated on-leash area. In addition, it was suggested that the pond restoration zone also be part of the designated on-leash area although this could be considered as a management item with the on-leash only being required during establishment and perhaps seasonally in support of bird nesting.
- Roof lines – it was agreed that with all of the sheltered viewpoints, group picnic sites and washrooms that there were going to be too many rooflines in the park. To reduce this potential impact on the visual environment only three sheltered viewpoints are proposed (down from 6) and only two group picnic sites are proposed.
- Group Picnic – it was suggested that only two group picnic sites be provided (rather than 3), and that the sites be a simple open shelter surrounded by 6 picnic tables.
- Picnic Sites – it was suggested that the picnic sites designated as a picnic table on a gravel or grass area, but that no concrete pads or firepits/barbeques be provided.

- Sledding Hill – it was suggested that a sledding hill should be included in the park and that it should be designed and located for use by families ie. a smaller hill located close to the parking lot, inside the on-leash area.
- Park Intersection – it was suggested that stop signs be included at the intersection of the park entrance road and the activity area access. This location is also where the regional trail is proposed to cross the road. The stop signs and a trail cross walk would improve safety for all users.
- Control Gates – to assist with the management of the park, control gates should be included at the entrance to the park (end of Rabbit Hill Road), at the secondary access road, off of the main and satellite parking lots (4 total). The control gate at the entrance to the park would be closed by park staff on a nightly basis. The other gates would be used by staff for maintenance or special program/event access.
- River Access – it was suggested that a popular location at the very west end of the park where people stop for access to the river's edge be maintained and improved (grading, surface treatments) to ensure that it is sustainable.

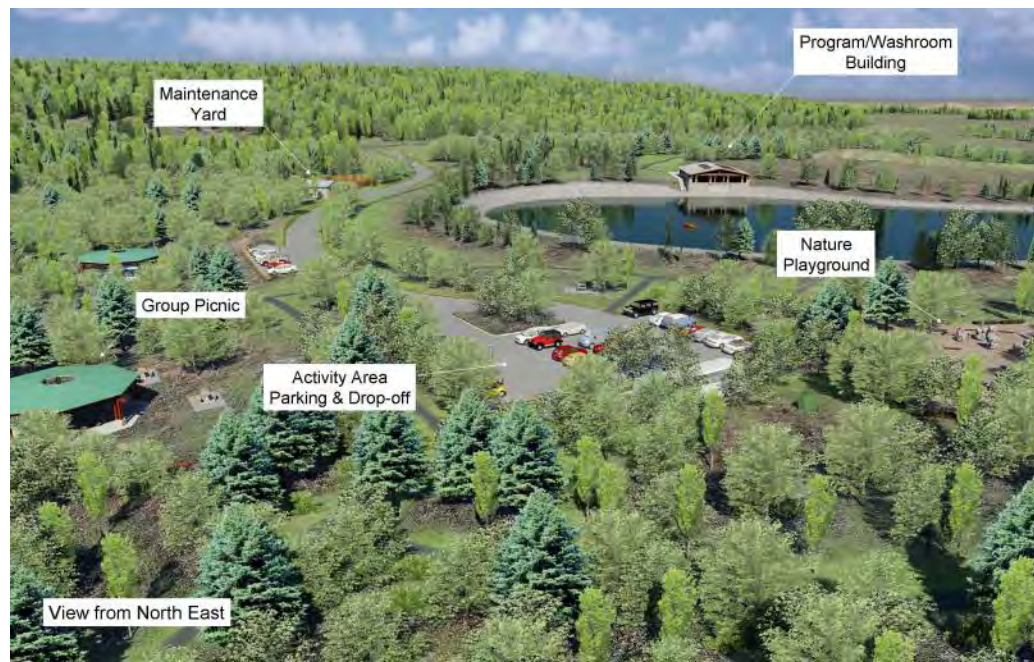
Following the meeting, the design team prepared a draft of the Final Concept Plan utilizing Concept Option 2 as the base and incorporating the suggested changes. The Final Concept Plan was then presented to the City project team and reviewed by the Terwillegar Park Citizen's Advisory Committee. Following refinement, the Final Concept Plan was presented to the public at an open house at the end of May 2008. Based on feedback from the public, the plan was finalized and included in this report.

A description of the final concept plan is provided below and illustrated on Figures 3.1-3.4. The numbers correspond to the numbers in the legend of the Figures. Program elements that are proposed but not numbered in the legend are described at the end of this section. Please note that for a detailed description of the program elements, the reader can refer to Section 2.4.

1. Regional Trail – from the west bridge along the base of the forest on an existing gravel trail, passing to the south of the parking lot through the edge of the forest, crossing the entrance road, along the old road and then through the forest to the north bridge.
2. Pedestrian Bridges – future pedestrian bridges providing access from the west (EL Smith/Cameron Heights/Anthony Henday) and providing access to the north (Country Club/Fort Edmonton Park). These bridges are not considered to be part of the Terwillegar Park development, but rather as part of the Capital Region River Valley Park (River Valley Alliance – www.rivervalley.ab.ca).
3. Paved Parking Lot Expansion – expansion of the existing parking lot to approximately 150 stalls. This expansion could be phased.
4. Paved Park Entrance Road – the park entrance road would be constructed to City standards for park roads.
5. Lighting – lights would be provided along the entrance road, at the parking lot and by the program building. Power service would be provided to meet event needs near the beach (Raft Race) and external to the program building.



6. Overflow Parking – a designated overflow parking area for approximately 300 vehicles.
7. Paved Activity Area Access – a paved park road with access off of the entrance road through the existing forest to a central location between the paddling lake, the picnic area and the canoe/kayak launch. The road would provide access to three satellite parking areas (with a total of 110 stalls) with turn-around's by the picnic area and by the program/washroom building.



8. Program / Washroom Building – located on edge of the lake, adjacent to the one of the satellite parking lots. Location and orientation towards the central open space makes it well suited as a venue for event coordination. The washrooms would be accessible from the outside and a location would be provide to leash a dog. A water fountain and a “doggy fountain” would also be provided on the outside of the building.
9. Remote Toilets – two are proposed – one at the west end of the park close to the future bridge on the main trail and one by the picnic area with proximity to the proposed canoe/kayak launch.

10. Entrance Node – one entrance node off of the main parking lot

11. Enhanced Walking Trails – approximately 8.5 km of existing informal trails will be enhanced by creating an even, compacted, fine granular surface and by eliminating drainage and erosion problems. One main trail loop around the outside of the park will be enhanced and maintained at 3.0m wide for service and emergency access. Generally, the other trails will be enhanced and will remain at their existing widths.



12. Universal Access Trail – approximately 1.2 km of paved, 1.5 m wide asphalt trail designed to universal standards and providing access from the program/washroom building, through the forest at the east end of the park and to viewpoints at the “beach”.

13. Enhanced Mountain Bike Trails – approximately 4.5 km of single track trail enhanced for sustainability of the trail surface (elimination of problem areas for erosion) and surrounding forest as well as for safety and user experience

14. Viewpoints – a total of 7 providing river and park views. Three of the viewpoints would also include a roof for shelter.



15. Group Picnic Site – 2 group picnic sites with a shelter (24’ dia.) and six tables will be developed and will be designed as ‘bookable’ facilities.

16. Interpretive Nodes – approximately 10 interpretive node locations and potential themes have been proposed and are illustrated on Figure 4.4. Additional locations and defined interpretive storylines would be developed during detailed design. Some of the proposed interpretive themes include:

- Succession – much of the park is becoming naturalized after the surface disturbance caused by gravel extraction activities in the 1970's
 - Wildlife movement – Terwillegar Park, being an “end destination” for large wildlife in south Edmonton, provides a venue for many visible species, particularly in the south end of the park
 - White spruce-dominated forest – the stand of spruce in the central part of the site is the only example of this type of habitat in all Terwillegar Park
 - Parkland forest and the habitats of the river valley
 - Old gravel pits – explaining how gravel extraction and its subsequent reclamation and regrading of the land has resulted in the series of open water ponds prevalent today
 - Grasslands – the uniqueness of the grasslands, its origin and range of species present
 - Valley overlook – the North Saskatchewan River valley is a cherished landmark for Edmontonians, and demonstrates a unique landform that relates to the geology of the region
17. Designated On-Leash Area – approximately 28.4 hectares (16% of the total park area. The recommended area includes around the paddling lake, the activity area, the main parking lot, and the balance of the east part of the park as defined by the area east of the “Beach” trail and north of the park entrance road.
18. Canoe / Kayak Teaching Area – a graded and seeded area (7:1 slope) on the edge of the lake designed for easy access into the water for teaching canoe/kayaks groups.
19. Picnic Area – 20 picnic sites – tables on gravel pads
20. Nature Playground – a designated playground area of approximately 450 square metres.
21. Sledding Hill – a small sledding hill designed for use by young families – located adjacent to the main parking lot, inside the designated on-leash area, and constructed from excavated material from the paddling lake.
22. Dock & Canoe / Kayak Launch – constructed by grading in an existing natural drainage channel in the forest, located approximately 75 m east of the proposed satellite parking area. A control gate would allow paddling groups (eg. Voyageur Canoes) to access the launch location for loading and unloading.
23. Maintenance Garage & Yard – a maintenance yard with garage tucked into the edge of the forest at the east end off of the activity area access road.
24. Stormwater Infiltration Dry Pond – adjacent to the parking lot to store and infiltrate stormwater coming off of the entrance road and the parking lot
25. Buffer Planting – locations throughout the park.



26. Control Gates – at the entrance to the park (end of Rabbit Hill Road), from the main parking lot to control access to the overflow parking, by the maintenance yard to control access to the activity area and by the canoe/kayak launch road to provide seasonal access control along this path.

27. Paddling Lake – a 2.0 hectare lake located east of the expanded parking lot on the edge of the existing forest. With the graded slopes and surrounding berms restored with native forest, the lake would blend into the park environment. The lake would be part of the designated on-leash area



The program elements that are included in the Final Concept Plan but are not numbered on Figures 3.1 to 3.4 are defined below:

- Mowed Open Space – central part of site to be mowed 1-2 times per year to maintain weed control and to provide for event use.
- Forest Restoration – areas of native tree and shrub planting to increase the amount of forest cover in the park and to improve habitat area.
- Buffer Planting – planting of native tree and shrub species in large beds in different areas of the park will be used to create visual or physical buffers between use areas and in the parking lot reduce the scale and improve the fit with the natural environment.
- Cross country ski trails – approximately 8.0 km of designated cross country ski trails are proposed originating from the program/washroom building which will be heated for dressing and warm-up. An 1.1 km loop is provided around the lake and to the east along the universal trails; a 2.4 km loop is provided out into the off-leash area, and a 4.0 km loop is provided around the entire park. A 1.7 km loop is also proposed in the upland area. The open space area adjacent to the program/washroom building and inside of the designated on-leash area is suitable for the development of a lit cross country ski teaching area
- Utility Servicing – as defined in the program statement (Section 2.3) and in the Access and Servicing Review (Appendix B), water, gas and power services will be provided into the Park.. Sustainable design alternatives should be considered and implemented where practical to reduce servicing requirements and to meet LEED objectives.
- Amenities – as identified in Section 2.4, there are a number of amenities proposed for the park as part of the program including benches, trash and recycling, drinking fountains, dog bag dispensers and bluphones. Key amenity locations have been proposed and are illustrated on Figure 4.4. Additional amenities may be required and can be specified at detailed design.

4.0 Concept Plan Implementation

The following section defines the recommended strategy for the implementation of the Terwillegar Park Concept Plan including park management guidelines, capital costs, development phasing, and specific recommendations related to approvals and next steps.

4.1 Park Management Guidelines

The following are recommended guidelines for the short and long term management of Terwillegar Park. The guidelines have been prepared with consideration of the site and environmental analysis, the defined opportunities and constraints, and the proposed development program. The need for good and consistent management of the Park, particularly with increased amenities and associated use, has been a well documented throughout the public consultation phases of the study. Insufficient management now and in the future is a significant concern of users. Throughout the study, various management requirements, issues and solutions have been identified by stakeholders and the public, and have been evaluated by the Project Team and the Terwillegar Park Citizen's Advisory Committee. The recommended management guidelines are designed to provide basic measures and strategies for managing the Parks natural resources, facilities, amenities, infrastructure and uses. The guidelines do not define specific operational practices or procedures as a majority of these would already be in place through existing approved City policies and documents such as the Urban Parks Management Plan. The management guidelines have been separated into three categories: Management Infrastructure, Resource Management, and Managing Use.

4.1.1 Management Infrastructure

There are a number of park infrastructure elements that must be provided and maintained in support of good park management:

- Trash receptacles – should be located throughout the Park and emptied on a weekly basis, year round. Larger in-ground receptacles near the parking lot and in the picnic area will reduce the requirement for weekly service. Metal receptacles with lids will still be required at intersections along the main walking trails to meet the requirements of dog walkers.
- Dog Bag Dispensers – should be provided at the Park entrance node and at key trail entries into the Park (Eg. Trail bridges, Rooney Crescent). Service check on a monthly basis to ensure that bags are available.
- Recycling Receptacles – should be provided by the main parking lot (2), the program washroom building and in the picnic area. Weekly service will likely be required.
- Access Control – control gates are proposed at the main entrance to the Park (closed nightly), by the maintenance yard to control access to the activity area, at the main parking lot (service, program and emergency access), and at the access to the canoe/kayak launch (seasonal control). These gates will be managed by Parks staff. Post and rail fences, wood bollards and concrete barriers should be provided to restrict vehicle access to roads and parking areas. A turn-around may be required on Rabbit Hill Road at the main entrance to the Park to facilitate the access control.

- Bluphones – to be provided at the main parking lot and at the proposed trail bridges over the North Saskatchewan. These should be checked monthly to ensure that they are in working order
- Trail Signs – small trail signs with maps should be provided at key trail intersections to inform trail users of their location within the Park. Specific locational information that could be used to describe the location to emergency response personnel could also be provided on the signs. Signs to be developed as per City standards.
- Maintenance Garage & Yard – this facility will provide a base for the equipment and personnel for onsite and district parks maintenance. This yard will also provide a location where Park users can report problem activities or resource management needs.
- River access infrastructure – the dock and canoe/kayak launch will provide a suitable location for emergency and service access to the river. This infrastructure will need annual maintenance in the spring as well as monthly checks to ensure that it is functioning in a safe manner and that any potential environmental impacts (eg. Erosion) are properly mitigated.
- Trails – the primary enhanced gravel trail and the regional asphalt trail will serve as an important management and emergency services access and will need to be maintained to ensure spring, summer and fall access. In the winter, the enhanced gravel trail will not be maintained (cleared) as it is part of the cross-country ski trail.

4.1.2 Resource Management

With additional and upgraded amenities in Terwillegar Park, adequate budget, staff and equipment resources will be required to ensure that defined service levels for extensive use (major parks) can be provided.

- Trails – as the key amenity in the Park, good trail maintenance will be important to all users. If the trails are designed and constructed to City standards there should not be significant maintenance requirements. Trails should be inspected once per year to determine the extent and location of required maintenance activities such as vegetation clearing, erosion controls, and surface repairs.
- Trash collection – as defined previously, trash will need to be collected on a weekly basis, year round, but can be reduced through the provision of larger in-ground receptacles at key locations.
- Built amenities – regular maintenance of built amenities such as viewpoints, signage, shelters, buildings, river access infrastructure, drinking fountains and washrooms will require dedicated resources to ensure that the amenities are maintained to a satisfactory standard. Views from viewpoints will be maintained by cutting back of adjacent vegetation on an ongoing basis by City Forestry staff.
- Mowing – as indicated, mowing in the Park will be limited to twice per year or to facilitate special events in the main open field area and along the enhanced walking trails.

- Informal River Access – as recommended in the Opportunities and Constraints Analysis (Appendix A), informal river access locations should be discouraged to prevent erosion and impacts to river's edge habitat. On an annual basis, Parks staff should identify informal access locations (trails) and then implement restoration measures (native planting) and temporary control measures (fence and signs).
- Weed and Pest Control – a major program for controlling nuisance and noxious weeds and restoring areas of the park to native prairie has been identified as part of the development program for the Park. Over the long term, a program for controlling weeds in restoration and landscaped areas of the Park through measures defined in the approved Integrated Pest Management Policy will be important. Since this could require significant resources, it is the type of program that may best be accomplished through organized volunteer activities on an annual basis (Eg. "Weed control Day"). In addition to weed control, wildlife management guidelines will be followed as necessary to manage wildlife pests.
- Restoration Planting/Landscaping – following the maintenance and warranty work of the contractors, maintenance (watering, fertilizing, weed control) of restoration planting and other Park landscaping will be required for up to five years to ensure establishment.
- Partnerships – an important resource for the ongoing management of Terwillegar Park is the user groups themselves. Volunteers from specific users groups such as the dog-walkers or mountain biking community, or an overall "Friends of Terwillegar Park" group could serve as a valuable resource for identifying, coordinating and completing specific aspects of Park maintenance. Through a partnership arrangement the City could provide liaison, equipment and budget resources to support the work of this group(s). If the City is interested in having a designated volunteer group to assist with management of Terwillegar Park, a Terms of Reference would need to be developed to define the structure, role, authority and reporting relationship of the partnership.

4.1.3 Managing Use

As indicated by the public input, Terwillegar Park users want a safe place to recreate while enjoying nature. They want suitable support amenities, and they recognize the importance of following the rules to ensure that the Park can be enjoyed by people (and dogs) doing a range of activities. Part of this expectation is that the Park and the activities of users will be properly managed but they don't want excessive controls or an overabundance of regulatory signage that will impact the natural values of the Park. This will be an important balance that can be achieved best by educating users, having a regular presence of Parks staff in the Park, and through consistent enforcement of the rules. To ensure that the increasing use is properly managed, the City has a number of measures in place that need to be implemented to adequate levels to ensure a safe and comfortable experience for users.

- Bylaws – there are two primary City bylaws which can be enforced to manage use in Terwillegar Park: (1) Parkland Bylaw (2202) which defines rules that apply to all users of parks including members of the public, and anyone controlling, renting or maintaining public park space and recreational facilities; (2) Animal Control Bylaw (13145) which regulates off-leash areas, stray animals etc.

- Local Rules - may be applied in the application of the City Parkland Bylaw to manage or facilitate specific uses in Terwillegar Park. One local rule that will be required is to allow on-leash dogs within the picnic area. Other local rules may be considered on an as needed basis as the use and number of users increases.
- Enforcement - Park Rangers monitor the river valley for safety and can enforce the fines if bylaws are not followed. Park Rangers work between the hours of 0700h-0100h everyday of the year, with additional resources applied to specific areas during special events. The application of bylaws for inappropriate and unsafe uses is limited to the resources of the Parks department and so an increase in the level of staffing related to operations in the Park in the future is recommended which will also assist with providing a presence in the Park that may help to reduce the incidence of unlawful behavior.
- Enforcement – Other agencies - The enforcement of provincial and federal regulations would require monitoring by other agencies such as the Wildlife Officers, or the Edmonton Police Service. Alberta Environment and Alberta Sustainable Resource Development (ASRD) are the primary provincial bodies that monitor, regulate and enforce both provincial and federal legislation with respect to the recreational use of water. Throughout the greater Edmonton area, ASRD has a strong presence and actively patrols the waters of the North Saskatchewan River. These officers are currently the only regulatory body that actively patrols this river segment within the study area.
- Education and Safety – it is recommended that a marketing and education campaign be designed and implemented to raise awareness about the Park and the proposed development and to encourage shared use and enjoyment. This can be an extension of the existing “Parks for Paws” program. From a safety perspective, Crime Prevention Through Environmental Design (CPTED) standards will be applied in the design of the parks facilities and amenities.
- Park Information Signs – primary Park information signs with maps and information on proper use of the park should be provided and maintained at the entrance node and at the regional trail bridges as they enter the Park. These signs will provide orientation and direction for new users and define the various types of use, local rules, specific “rules for use” and important environmental protection information. Signage should be developed based on City signage standards.
- Maintenance building and yard - as indicated, the provision of a staffed building in the Park will assist in managing use by providing a regular presence of Parks staff working in the Park (ie. ‘eyes in the park’).
- River Valley Event Guidelines – managing event use is clearly defined in the City’s River Valley Event Guidelines. Some local rules have already been established for the Park (Eg. Notification signs in neighborhoods)
- Programs – policies for managing City programs are in place and some local rules may need to be established to manage program use in the Park and within the Program/Washroom building. Active programming of the Park by the City will be important for providing access and recreation/environmental education opportunities for families and groups.

4.2 Estimated Capital Costs

The following table provides an estimate of capital costs for each of the recommended program elements. The table includes a description of the items included in the unit rate for each item. The total estimated capital cost of the project in 2008 dollars is \$14.7 million. Estimated capital costs by phase are provided in Section 4.3.

Item ¹	Description	Notes	Units	Quantity	Unit Price	Total
1.0	Regional Trail	Incl. clearing, grading, granular base, asphalt (3.0m wide), signage and edge restoration	Lin.m.	1450.0	\$230	\$333,500
3.0	Paved Parking Lot Expansion	Incl. grading, granular base, asphalt, line painting, curb stops, post and rail fence barriers, signage and edge restoration	Lump Sum	1.0	\$480,000	\$480,000
4.0	Paved Park Entrance Road	Incl. grading, drainage measures, granular base, asphalt (9.0m wide), line painting, jersey barriers, signage, restoration. New retaining walls not incl.	Lump Sum	1.0	\$930,000	\$930,000
5.0	Power and Lighting	Includes power service and transformer to the maintenance garage and program/washroom building and street lights (16 total) along entrance road, secondary road and parking lots	Lump Sum	1.0	\$240,000	\$240,000
6.0	Overflow Parking	Includes grading, compaction and seeding of overflow parking area	m ²	7600.0	\$14	\$106,400
7.0	Activity Area Access & Parking	Incl. grading, granular base, asphalt, post and rail fence barriers, signage and edge restoration	Lump Sum	1.0	\$830,000	\$830,000
8.0	Program / Washroom Building	Approx. 4500 sq. ft concrete building designed to LEED standards. Storage below (walk out to lake) multipurpose open space on main floor. Washrooms accessible to outside	m ²	420.0	\$3,400	\$1,428,000
9.0	Remote Toilets	Concrete block, vault-style toilets	Each	2.0	\$24,000	\$48,000
10.0	Entrance Node	Prefabricated, open gazebo-style shelter with signage and information boards	Lump Sum	1.0	\$22,000	\$22,000
11.0	Enhanced Walking Trail	Incl. grading, drainage/erosion control, granular surface and edge restoration. Trail width 3.0m	Lin.m.	8610.0	\$120	\$1,033,200
12.0	Universal Access Trail	Incl. minor clearing, grading, granular base, asphalt (2.0m wide), signage and edge restoration	Lin.m.	1255.0	\$170	\$213,350
13.0	Enhanced Mountain Bike Trail	Incl. specific clearing, grading, erosion controls, granular base, signage and edge restoration	Lin.m.	4660.0	\$60	\$279,600
14.0	Viewpoint	Incl. piles, substructure and prefabricated or custom designed viewpoint with benches. Average cost covers both open and sheltered viewpoints	Each	7.0	\$22,000	\$154,000
15.0	Group Picnic Site	Includes grading, concrete base and prefabricated gazebo plus 10 picnic tables on gravel pads.	Each	2.0	\$35,000	\$70,000
16.0	Interpretive Nodes	Includes grading, gravel node area and interpretive sign	Each	10.0	\$3,200	\$32,000
18.0	Canoe/Kayak Teaching Area	Includes grading, gravel slope, erosion control measures and boulder edge treatments	Lump Sum	1.0	\$44,000	\$44,000

19.0	Individual Picnic Site	Includes picnic table on gravel pad	Each	24.0	\$1,400	\$33,600
20.0	Nature Playground	Includes, excavation, grading, log edge treatments, natural play materials and equipment, landscaping	Lump Sum	1.0	\$155,000	\$155,000
21.0	Sledding Hill	Placement of excavated material from lake, grading, topsoil and seed.	Lump Sum	1.0	\$17,000	\$17,000
22.0	Dock and Canoe/Kayak Launch	Includes excavation, grading, erosion controls, granular base, boulders, prefab floating dock	Lump Sum	1.0	\$170,000	\$170,000
23.0	Maintenance Garage and Yard	Approx. 1000 sq. ft concrete building designed to LEED standards. Incl. fenced and graveled yard	Lump Sum	1.0	\$1,240,000	\$1,240,000
24.0	Stormwater Infiltration Pond	Includes excavation, hauling and placement of material on site, restoration	Lump Sum	1.0	\$44,000	\$44,000
26.0	Control Gates	Supply and installation of steel control gates	Each	4.0	\$2,400	\$9,600
27.0	Paddling Lake ²	Includes excavation below river level (approx 13.0m), hauling & placement of material on site, grading, rip rap edge treatments, landscape restoration around lake and on placed material	Lump Sum	1.0	\$1,350,000	\$1,350,000
	Buffer Planting	Allowance for native tree and shrub planting in large beds in parking lot and open areas	Lump Sum	1.0	\$450,000	\$450,000
	Forest Restoration	Allowance for planting of native tree and shrubs along edges to expand existing tree stands	Lump Sum	1.0	\$180,000	\$180,000
	Amenities	Allowance for supply & installation of amenities - Bench, trash, drinking fountain etc. (See Figure 4.4)	Lump Sum	1.0	\$140,000	\$140,000
	Meadow Restoration	Allowance for selective weed control and planting and seeding of native meadow species	Lump Sum	1.0	\$80,000	\$80,000
	Pond Restoration Zone	Allowance for excavation, grading (improve edge slopes) , topsoil, and installation of riparian species	Lump Sum	1.0	\$90,000	\$90,000
	Construction Restoration	Allowance for restoration and landscaping of areas disturbed during construction - topsoil, seed and tree and shrub planting. Split between phases	Lump Sum	1.0	\$180,000	\$180,000
	Signage	Allowance for information & regulatory signs in key locations in Park (Trail signs incl. in trail unit cost)	Lump Sum	1.0	\$90,000	\$90,000
	Trail Restoration	Restoration of trails that are being abandoned. Incl. excavation, topsoil, native plant material and seed	Lin.m.	2280.0	\$30	\$68,400
	Water Service	150mm waterline - Rooney Cr to maintenance garage and program/washroom building. Incl. all clearing, excavation, restoration and connections	Lin.m.	740.0	\$225	\$166,500
Notes: ¹ Item numbers correspond with Concept Plan legend Figure 3.1. Some items are not numbered or illustrated on the Concept Plan					Subtotal	\$10,708,150
					2.5% Operational Budget³	\$267,700
					35% Contingency & Fees	\$3,747,850
					PROJECT TOTAL	\$14,723,700
² Second option for lake construction is shallower excavation (Approx. 5.5 m) and use of 30mm pvc pond liner. Requires drilling of well to fill pond and discharge connection to river. Balance of scope of work the same as above. - Capital Cost \$890,000.						
³ An operational budget allowance of 2.5% of the base estimated capital budget (not incl. contingency or fees) has been added to reflect operational cost requirements as development occurs						

4.3 Development Phasing

Based on consultation with the City project team and the Terwillegar Park Citizen's Advisory Committee, it is recommended that the Terwillegar Park concept plan be implemented through three major phases of work over a three year period. If complete budget funding is not available, then the recommended phasing plan may require modification to ensure that some of the public's key priorities (Eg. Paved road and parking) are moved to the earlier phases. All program elements are included except the proposed pedestrian bridges which are identified as part of Alberta's Capital Region River Valley Park (www.rivervalley.ab.ca).

4.3.1 Phase 1: Enhancing Current Use

Phase 1 is designed to focus on enhancing current features of the site to meet the needs of current users. The estimated capital budget for Phase 1 is \$5.80 million. The program elements included in Phase 1 have been selected because they do not require extensive detailed design or significant approvals. The completion of these program elements will also ensure that majority of the construction in the central and west part of the Park can be completed to facilitate ongoing use during the balance of construction. Some of the selected elements also respond to expressed user priorities (eg. Toilets and parking expansion) as well as will put in place important management infrastructure. The following program elements are recommended for Phase 1 implementation:

Item	Description	Notes	Total
3.0	Paved Parking Lot Expansion	Grading, Gravel, barriers only in this phase	\$ 320,000
5.0	Power & Lighting	Power service only - for the buildings and site	\$ 80,000
6.0	Overflow Parking	Includes grading, compaction and seeding of parking area	\$ 106,400
7.0	Activity Area Access & Parking	Grading, granular and barriers to maintenance garage only	\$ 280,000
9.0	Remote Toilets	West end of site	\$ 24,000
10.0	Entrance Node	Gazebo-style shelter with signage and information boards	\$ 22,000
11.0	Enhanced Walking Trail	All enhanced walking trails	\$ 1,033,200
13.0	Enhanced Mountain Bike Trail	All enhanced mountain bike trails	\$ 279,600
14.0	Viewpoint	Viewpoints along enhanced trails only	\$ 88,000
23.0	Maintenance Garage and Yard	Construction of building and yard	\$ 1,240,000
24.0	Stormwater Infiltration Pond	Construction and restoration of stormwater dry pond	\$ 44,000
26.0	Control Gates	Supply and installation of three steel control gates	\$ 7,200
	Forest Restoration	all forest restoration in phase 1	\$ 180,000
	Amenities	Furnishings along enhanced trails only	\$ 70,000
	Meadow Restoration	Selective weed control and planting and seeding	\$ 80,000
	Pond Restoration Zone	All pond edge restoration	\$ 90,000
	Signage	Information & regulatory signs in key locations in Park	\$ 90,000
	Trail Restoration	Restoration of trails that are being abandoned in phase 1	\$ 68,400
	Water Service	150mm waterline - Rooney Cr to buildings	\$ 166,500
Phase 1 Subtotal			\$ 4,269,300
2.5% Operational Budget			\$ 106,790
35% Contingency & Fees			\$ 1,494,255
PHASE 1 TOTAL			\$ 5,870,345

4.3.2 Phase 2: Paddling Lake and Activity Area

Phase 2 is designed to focus on developing new recreational features in the Park to respond to needs of current and future users. The estimated capital budget for Phase 2 is \$3.84 million. The program elements included in Phase 2 are focused on the Central Activity Area which will be an easily defined and controlled construction area which will allow current uses to proceed with minimal impacts. The following program elements are recommended for Phase 2 implementation:

Item	Description	Notes	Total
7.0	Activity Area Access & Parking	Grading, Gravel & barriers - balance of Activity Area	\$ 275,000
9.0	Remote Toilets	In Activity Area	\$ 24,000
14.0	Viewpoint	In Activity Area	\$ 66,000
15.0	Group Picnic Site	Two group picnic sites and tables in Activity Area	\$ 70,000
16.0	Interpretive Nodes	Includes grading, gravel node area and interpretive sign	\$ 32,000
18.0	Canoe/Kayak Teaching Area	All grading, gravel, erosion control and edge treatments	\$ 44,000
19.0	Individual Picnic Site	Includes picnic table on gravel pad	\$ 33,600
20.0	Nature Playground	All construction and materials	\$ 155,000
21.0	Sledding Hill	Placement of excavated material and topsoil/seeding	\$ 17,000
22.0	Dock & Canoe / Kayak Launch	All grading, shore protection and dock	\$ 170,000
26.0	Control Gate	Supply & Install control gate at launch parking	\$ 2,400
27.0	Paddling Lake	Excavation, hauling and placement of material, restoration	\$ 1,350,000
	Buffer Planting	Native tree and shrub planting for buffers and screening	\$ 450,000
	Construction Restoration	Restoration of all disturbed area in Activity Area	\$ 90,000
	Amenities	In Activity Area	\$ 70,000
Phase 2 Subtotal			\$ 2,849,000
2.5% Operational Budget			\$ 71,160
35% Contingency & Fees			\$ 997,150
PHASE 2 TOTAL			\$ 3,917,310

(Phase 3 – see next page)

4.3.3 Phase 3: Entrance Road and Program Building

Phase 3 is designed to focus on completing the entrance road, constructing the program/washroom building and completing the final program features and landscaping. The estimated capital budget for Phase 2 is \$4.85 million. The most significant program elements to be completed in Phase 3 is the construction of the main entrance road. Due to the limited work space and the extent of grading and drainage work required, it is very likely that the entrance road will need to be completely closed during construction (approximately 2 months). This closure will have impacts on users and adjacent residents. All of the required paving in the Park has also been grouped in Phase 3 to ensure competitive pricing. It should be noted that the regional trail should not be constructed until the bridges are in place as it is not required for circulation within the Park. The following program elements are recommended for Phase 3 implementation:

Item	Description	Notes	Total
1.0	Regional Trail	All clearing, grading, granular, asphalt, signage, restoration	\$ 333,500
4.0	Paved Park Entrance Road	All required road construction	\$ 930,000
8.0	Program/Washroom Building	Approx. 4500 sq. ft concrete building	\$ 1,428,000
12.0	Universal Access Trail	All clearing, grading, granular, asphalt, signage, restoration	\$ 213,350
3.0	Paved Parking Lot Expansion	Paving - incl. line painting, curb stops, signage, restoration	\$ 160,000
5.0	Power & Lightng	Lighting - Street lights along all roads and parking	\$ 160,000
7.0	Activity Area Access & Parking	Paving of all Activity Area access and parking	\$ 275,000
	Construction Restoration	Allowance for restoration and landscaping of disturbed areas	\$ 90,000
Phase 3 Subtotal			\$ 3,589,850
2.5% Operational Budget			\$ 89,750
35% Contingency & Fees			\$ 1,256,445
PHASE 3 TOTAL			\$ 4,936,045
PHASE 1 TOTAL			\$ 5,870,345
PHASE 2 TOTAL			\$ 3,917,310
PHASE 3 TOTAL			\$ 4,936,045
PROJECT TOTAL			\$ 14,723,700

4.4 Summary and Recommendations

4.4.1 Project Summary

The **Terwillegar Park Concept Plan Study** defines an overall conceptual plan, management guidelines, and an implementation plan for the development and management of Terwillegar Park as a “**unique natural park**”. The following is a summary of the key aspects of the study:

- Key Players – the study was completed by a multidisciplinary design team that reported to the City project team. The design team was supported by the Terwillegar Park Citizen’s Advisory Committee who assisted by reviewing findings, suggesting program features, and helping to develop and refine concept options. Stakeholders and the public played a key role in the project by providing their feedback at key points throughout the study
- Study Phases – the study involved two major phases of work: Phase 1 involved analysis and preparation of concept plan options, and Phase 2 involved preparation of a final concept plan and the concept plan report. Public consultation was a key component of each phase plan.
- Site Analysis - the initial work by the design team included background review and field analysis leading to the preparation of three technical reports and the *Opportunities and Constraints Analysis Report* which provided an overview of site conditions, features, uses and issues as a framework for concept plan preparation.
- Program Statement - a facilitated workshop with invited stakeholders led to the preparation of the program statement that described the range of potential program elements that fit with the vision of a “*unique natural park*”.
- Concept Options - initially four concept plan options were prepared by the design team and then reviewed with the City project team and the Terwillegar Park Citizen’s Advisory Committee. The design team revised and refined the four concepts into two concept plan options which were then presented to the public at two open house events in March 2008.
- Draft Final Concept Plan - based on the input received from the public and the Terwillegar Park Citizen’s Advisory Committee, the design team prepared a draft of the Final Concept Plan which was presented to the public for feedback at an open house in May 2008.
- Final Concept Plan and Report - management guidelines and an implementation plan were prepared and refinements were made to the Concept Plan and the design team prepared this report to document the process, findings and recommendations of the Terwillegar Park Concept Plan Study.

4.4.2 Recommendations

The following are the main recommendations of the Study based on public feedback, stakeholder input, discussions with the Terwillegar Park Citizen's Advisory Committee and recommendations of the ISL design team. Overall, it is recommended that the concept plan defined in this report be used by the City of Edmonton to guide the short and long term development and management of Terwillegar Park as a ***“unique natural park”***. The following are the specific recommendations of the Terwillegar Park Concept Plan study:

- It is recommended that the detailed design and development of Terwillegar Park be implemented in a phased approach, with funding approved to facilitate three major phases of work completed over a three year period.
- It is recommended that the management guidelines for Terwillegar Park be implemented as part of the overall Urban Parks Management Plan as well as part of District Operations. Good and consistent management of the Park as it develops and use increases will be critical to the ultimate success of the Park.
- It is recommended that resources be allocated to increase management within the Park in the short term, with annual increases in resources allocated in support of operations and maintenance of the recommended capital improvements as they are implemented.
- It is recommended that the “do nothing” or “leave it alone” approach, not be considered as an acceptable option in the short or long term. With growing population and increased use, the existing infrastructure and the natural environment within the Park will deteriorate over time if a combination of infrastructure upgrades, additional amenities, environmental restoration and Park management are not implemented.
- It is recommended that a marketing and education campaign be designed and implemented to raise awareness about the Park and the proposed development and to encourage shared use and enjoyment.
- It is recommended that the City work to develop partnerships with users to support the implementation of the concept plan. This may involve consultation with individual users groups, and/or the development of an overall “Friends of Terwillegar Park” group the can be used to provide input into detailed plans, and solicit support and volunteers for construction and management.
- It is recommended that the City work with the River Queen ownership group to find a location outside of Terwillegar Park for dry docking.

The Terwillegar Park Concept Plan has been designed as a balanced plan that will ensure the protection and enhancement of the natural resources of the Park, while at the same time providing managed access for the recreation, nature appreciation and education of individuals, families and groups. The concept plan has been designed with careful consideration of the needs and desires of current users and the opportunities that exists for meeting the needs of a growing population in southwest and west Edmonton, as well as a diversity of outdoor enthusiasts from across the City. Finally, the concept plan supports the visions, values, principles and recommendations of previous planning documents such as “A Vision for Terwillegar Park”, the “Ribbon of Green Master Plan” and “A Plan of Action for The Capital Region River Valley Park”.

Appendix A

Opportunities and Constraints Analysis

1.0. INTRODUCTION

In 2005, The City of Edmonton began a study entitled “Vision for Terwillegar Park” which was approved by City Council later that year. In 2007, the City of Edmonton initiated a study focused on taking the vision plan to the next level – preparation of a concept plan to guide the future development and management of the Park. This **Opportunities and Constraints Analysis** is one of the first products of this study, and provides a summary of the background research and assessment work completed in the initial phase of the study, and outlines the identified opportunities and constraints which will be used as a framework for conceptual design.

The information provided in this report is based on information already compiled within the Vision Plan, a review of previous reports and plans for the Park, as well as field inventories and analysis completed by various members of the Design Team¹. The opportunities and constraints analysis has also been supplemented by input from City Project Team², other City staff from various departments, Advisory Committee³ members, and stakeholders who have offered their own individual knowledge, experience and expertise⁴. This analysis is program-based, and not site-specific – meaning that rather than depicting exactly *where* opportunities can be accommodated, it generalizes opportunities and constraints at a program or activity level with less specific reference to specific locations on the site.

Working with stakeholders in a workshop setting, this analysis will be used to develop a program (list of suitable features and activities) for the development and management of Terwillegar Park within the context of the vision of a “unique natural park”. Once the program is approved, the Design Team, again with input from the Advisory Committee, stakeholders and the public, will consider where on the site the program elements would be best located through the design of several alternative concept plans.

Throughout this document are excerpts within text boxes that summarize “Opportunities” or “Constraints” as they are introduced within the text. These boxes provide a quick summary of the various study area conditions that will be used to influence the next steps of this study. The document will also make numerous references to the “Vision for Terwillegar Park (2005)” report prepared by Randall Conrad & Associates Ltd., which will be referred to as the “Vision Plan” with no footnote.

Throughout the Concept Plan Study, the Terwillegar Park Advisory Committee (TPAC) will meet to review information and provide direct input into assessment, planning and concept plan development. The opportunities and constraints analysis involved the TPAC at four occasions, including: a preliminary meeting to review the complete study process wherein the opportunities and constraints model was outlined; two on-site tours to review field conditions; and a fourth meeting where the Design Team presented and discussed the findings contained in this report.

Opportunity – members of the Terwillegar Park Advisory Committee have intimate knowledge of the Park and will be asked throughout the study to provide input and test ideas on the uses, impacts, design, development and management of Terwillegar Park

¹ The Design Team is made up of the various consultants retained by the City and led by ISL Engineering and Land Services.

² The City Project Team is made up of senior City staff representing several departments

³ The Terwillegar Park Advisory Committee is made up of representatives of some of the key stakeholder groups for the Park as well as interested ‘public at large’ members

⁴ Note: the input of City staff, Advisory Committee and stakeholders into the opportunities and constraints analysis will be ongoing through the assessment and preliminary concept design stages of the study.

2.0. BACKGROUND REVIEW

2.1. Site Context

Site Area

Terwillegar Park is a 174 hectare (430 acre) parcel of land located near the southerly portion of the North Saskatchewan River Valley within the City of Edmonton. The Park is surrounded by the North Saskatchewan River on three sides and is accessible by vehicle from the west end of Rabbit Hill Road in the Riverbend community. There are approximately five informal (unimproved) trail connections into the park. Existing development within the park is limited to the access road, a 60-stall gravel parking lot, extensive informal trails and a few amenities such as benches, signs and trash receptacles.

Adjacent Lands

Adjacent lands to the north / northwest across the river include the Edmonton Golf and Country Club and Centennial Valley Lands. The EL Smith Water Treatment Facility lies to the southwest across the river from Terwillegar Park. Existing residential communities line the road leading into the park; while “newly established, growing and emerging residential communities surround this portion of Edmonton’s southwest river valley.” (Vision Plan)

Within the context of the ‘Capital Region River Valley Park’ prepared by the River Valley Alliance (RVA) in 2007, Terwillegar Park lies within the “Valley Attractions” zone that contains a number of Edmonton’s most well known parks. In this context, Terwillegar Park is seen as a nature-based park serving the surrounding neighborhoods while providing connections through the overall river valley network for all citizens of Edmonton.

Opportunity – Terwillegar Park is well positioned to service the needs of a growing number of residents in Edmonton’s south west and west end neighborhoods as well as to provide a unique destination within the ‘Capital Region River Valley Park’ for all citizens of Edmonton

Vision Plan

“A Vision for Terwillegar Park,” (referred to in this document as the Vision Plan), provides a vision for Terwillegar Park as “A Unique Natural Park within the City of Edmonton’s River Valley Park System”. The Vision Plan reflects a public desire to design and manage the Park as a natural park which retains and enhances natural, but accessible, landscapes while meeting of the needs of current and future users from across the City. The preparation of the **Terwillegar Park Concept Plan Study** as the next step in the planning and design of the Park was a recommendation of the Vision Plan. This study will build upon the input, work and recommendations approved in the Vision Plan.

Approximately 1200 citizens participated in the visioning process. Community input was obtained through series of public focus group meetings, direct e-mail and telephone contact, public open houses, a stakeholder group questionnaire, and a City-wide telephone survey. Additionally, an academic forum was also held. During the process, focus groups identified value statements, program and activity preferences, and infrastructure required to support desired programs.

The most commonly identified key values included keeping the park as:

- a “natural” park;
- a shared resource;
- an outdoor classroom; and
- a connected resource.

The most commonly preferred activities identified were:

- all current activities (mountain biking, off-leash dog activities, canoe/kayak launching, walking, jogging);
- future activities that can be enjoyed by City-wide residents – not just current users (without compromising identified “values”); and
- opportunities to view wildlife and natural landscapes, and to learn about the natural attributes of the park’s environment.

Identified infrastructure requirements included:

- washrooms, improved access and improved parking that will not negatively affect the natural setting of the park; and
- linkages connecting the park to the rest of the river valley trail system while minimizing environmental impact.

Some of the key user concerns or issues that were identified in the Vision Plan include:

- Many current users feel that the park should be left as-is while other interest groups would like to see additional development (at least minimal infrastructure improvements) that better meet their needs;
- Current user groups have used this site for many years and some users are concerned that changes to the Park will impact their use and enjoyment of the Park;
- This park already has an estimated 200,000 visitors per year and with population growth in Edmonton's southwest and west, improved access (vehicle and trail), proposed enhancements and increased programming, an increase in the number of annual users can be expected. There is a fear among some that the park cannot accommodate increased use or events, while others feel the size is more than adequate to accommodate more visitors.

Opportunity – the Concept Plan Study will build upon the input, work and recommendations approved in the Vision Plan, providing a strong foundation of values, activities, needs and issues related to the development and management of Terwillegar Park

2.2. Biophysical Review of Sensitivities and Opportunities

Spencer Environmental Management Services Ltd. was retained as part of the Design Team to provide background research and field investigations of the environment within Terwillegar Park. The complete process and findings of their work can be reviewed under separate cover in the: *“Terwillegar Park Concept Plan Study: Biophysical Review of Sensitivities and Opportunities” (September, 2007)*. The field surveys specific to this project were conducted by Spencer Environmental to determine the presence of any special status plant and wildlife species and, more generally, to refine the characterization of environmental features present within the study area beyond the detail of existing information. The following is a summary of the key findings of the report as they relate to opportunities and constraints for Park development and management.

Importance of Environmental Values

The City of Edmonton website notes that “Environmental concerns are important considerations for citizens and for the City of Edmonton regarding the river valley park system. Existing biophysical inventory information has been reviewed to identify the environmental opportunities and constraints of Terwillegar Park. The Vision Plan clearly indicates that the natural environment of Terwillegar Park is an attribute that is valued by a clear majority of park users, whether that be casual dog-walkers enjoying the natural surroundings or avid naturalists admiring the diversity of birds and plants inhabiting the park. Maintaining this natural character is an important part of the development strategy and requires an in-depth understanding of the landscape and the effects of development on its natural systems.

Existing Conditions

The geomorphology of the North Saskatchewan River Valley is one of the most prominent land forms found within the City of Edmonton. The bedrock formation of Terwillegar Park is comprised of sandstone, mudstone, shale, ironstone and coal deposits. The movement of water over time by this river has resulted in cutting through these various layers, exposing them in stratified horizons of differing materials. Above the bedrock layers are deposits of variable silty clay. Because both the silty clay and bedrock layers are composed of very soft materials, the North Saskatchewan River cuts relatively deep into these soils. As a result, the banks of the river surrounding Terwillegar Park are considerably steep and significantly high. Steep slopes of relatively loose soil and subsoil results in general bank instability and difficult conditions for top of bank trail development. The uniqueness of the North Saskatchewan River valley banks that surround Terwillegar Park are interesting natural features and provide an interpretive opportunity.

Opportunity – the uniqueness of the North Saskatchewan River valley banks that surround Terwillegar Park are interesting natural features and provide an interpretive opportunity

Constraint – steep slopes of relatively loose soil and subsoil results in general bank instability and difficult conditions for top of bank trail development

The North Saskatchewan River is the most prominent hydrological feature of Terwillegar Park. The confines of the park are very much defined by its existence within an inside bend of a large meander in the river, and as a result the park is bordered on three sides by the river. In a 100-year flood event, approximately 38 percent of Terwillegar Park would be covered by water, with this flooded area limited to the westerly region. As a result, approximately 885m onto the terrace from the west end of the park would fall within this flood limit. Development of permanent structures must be limited to areas outside the 100-year flood area, and consequently further surveys would be required in order to more precisely identify this limit. Other hydrological features include sixteen permanent open water ponds, three shallow marshes and a narrow ephemeral stream running along the southeastern slope of the park. The open water ponds and shallow marshes are a direct result of previous gravel extraction operations leaving behind low areas on this traditionally flat terrace that filled to the area's water table elevation. Flooding of the Park into the pond areas also occurs during the 1:25 year storm events.

Constraint – flooding of the Park will impact the potential location of structures, the integrity of the pond areas and the long term maintenance of trails and other amenities

Due to the fact that landscapes naturally change over time, it is not surprising that this Central Parkland Sub-region (of the parkland natural region) has evolved over the century. Much of this change in the Terwillegar Park area has been due to strip mining, gravel extraction and agriculture. Only 5% of the Central Parkland Natural Sub-region remains in native vegetation. The vegetation that remains varies from aspen groves to fescues including wheat grass, oat grass and a variety of perennial herbs on the uplands. In the wetlands (which account for about 2% of the area) cattail, sedge, bulrush and willow shrub lands are common but not extensive.

Terwillegar Park consists of 13 different plant community types ranging from open weedy fields to rich, mature deciduous forest. The entire site was once densely vegetated by trees and shrubs, and as a result of previous agricultural use and gravel extraction operations, much of the vegetation throughout the study area was removed. Due to poor reclamation practices, much of the site is now dominated by weedy species. Some of the weeds present in various areas of the park are considered noxious and nuisance as per the Alberta Weed Act. Undisturbed areas of the park, predominantly hilly and steep slopes areas that were not suitable for agricultural use, host a range of mature aspen-balsam poplar forest patches that support a variety of native plants. Other areas of sparse vegetation are dominated by various non-native species of trees and shrubs. The non-mowed open fields of Terwillegar Park are highly dominated by weeds, with over half of the area covered in noxious weeds. Shallow marsh areas which only contain surface water in springtime were also dominated by weeds. Three rare plant species were identified within the study area in 2007, with one additional species recorded in 1998.

This segment of the North Saskatchewan River Valley hosts a great range of migratory wildlife species, including a total of 226 vertebrate species reported.⁵ The park also hosts high species richness (high number of species) of songbirds, with the largest abundance of them in areas surrounding the various ponds near the west end of the site. This is a result of the range of ecosystem types in a relatively small area, including open water ponds, grasslands, mature forests, and the riverbank. Urban parks are usually dominated by those species that can easily adapt to the pressures of a developed landscape. Since Terwillegar Park is disconnected from urban development by topographical features and is part of a regional ecosystem presented by the river valley as a landform, species are less pressured by urbanism and therefore the park

⁵ Geowest Environmental Consultants Ltd. 1999. Natural Areas in the City of Edmonton: Assessment of conservation value and potential. Edmonton, Alberta.

can host a greater diversity of wildlife. Five species recorded during the 2007 site assessments are listed as Sensitive in the General Status of Wild Species.

Opportunity – although much of the study area was highly disturbed in previous years by agricultural practices and gravel extraction operations, high species richness demonstrates the significant ecological values of Terwillegar Park

Fish sampling was conducted within all of the open water ponds within this study area. Fish presence was verified through various methods of capture techniques. Two species of smaller fish (Brook stickleback and Fathead minnow) were found within the large pond system. White suckers were also found, although not as prevalent as the stickleback and minnow. The presence of white suckers is the result of flooding by the North Saskatchewan River when it overtopped the banks in 2004. Because the banks have not overtopped for at least two seasons, this indicates water in the ponds is of sufficient depth to allow overwintering. The population of white suckers would presumably be a non-breeding population given this species tends to favor moving water and the sample size of all fish was identical. Because of the presence of fish, any development with these ponds may require further fish studies.

Amphibian surveys were also conducted in various locations throughout the site, and species such as frogs and salamander were identified in areas near the existing pond systems. Reptile surveys found two species, both of which are found to be common within this type of habitat.

Neither past record nor current wildlife surveys found any special status wildlife species within the study area. Past records from the 1960's and 1970's note sightings of peregrine falcon along the north bank of the North Saskatchewan River opposite the north end of Terwillegar Park, however these were recorded prior to urban development of this area.

Terwillegar Park comprises many different plant communities and supports a great diversity of native wildlife. For these reasons, the park is ecologically unique within the City of Edmonton and is highly valued as a natural park by many residents of the City. Terwillegar Park does not, however, support any environmental features or species that are sensitive to the point that all development in the Park should be avoided. The location of sensitive species must be considered during concept planning and the protection of these species may limit the type and location of development that is proposed. Overall, the many features of the park combine to create an environment that is biologically diverse, while being able to accommodate a certain amount of recreational activity and development that is in balance with the ecology of the park.

Constraint – the location and protection of sensitive species must be considered during concept planning of the park

Opportunity – despite the presence of many species and significant ecological features, the park does not support any environmental features or species that are sensitive to the point that all development in the Park should be avoided

Environmental Sensitivities and Opportunities

The environmental review provides a summary of the environmental sensitivities and opportunities within the study area. A complete description and background information is included in the complete report provided by Spencer Environmental. Making program and design decisions with a focus on preservation and enhancement of the natural environment will result in a sustainable balance between recreational activities and natural values of the Park. Specifically, a number of environmental protection and restoration guidelines should be followed which will protect the natural values of the park.

- avoid the loss of large areas of habitat from any of the areas of existing mature forest
- limit the extent of development in key wildlife movement areas and in the locations of rare plant occurrences
- further investigate the potential impacts of weed control measures and incorporate the non-mowed fields in their current state within future concept plans

- maintain the existing diversity of habitat types in the west end of the park
- limit the extent of new trail development within areas of mature forest by locating formal trails on existing alignments. If additional trails are developed, consider decommissioning or restoring existing informal trails.
- avoid significant development in the area at the west end of the park dominated by ponds, shrubby slopes and young balsam poplar forest to maintain the great diversity of songbird species in that area

Constraint – environmental protection and restoration guidelines should be followed when developing conceptual plans for the park

Regulatory Considerations

In any development it is important to understand the regulatory implications and rules set forth that can strongly influence development and the process in which development is permitted. Regulatory considerations exist at three levels of government, including municipal (City of Edmonton), provincial (Province of Alberta) and federal (Government of Canada). The following is a summary of the legislation at the provincial and federal levels of government that will apply to this development.

Provincial Regulatory and Permitting Processes

- Alberta Water Act (Alberta Environment) – any surface water that is permanent is claimed by the Crown, and therefore any activity that involves any proposed use or alteration of this system requires permitting. In the case of alteration or loss of such areas, compensation may be required.
- Alberta Public Lands Act (Alberta Sustainable Resource Development) – applies to naturally occurring waterways of its bed and shore, in this case would only apply to the North Saskatchewan River given the upland ponds are not naturally occurring.
- Alberta Draft Wetland Policy (Alberta Sustainable Resource Development) – applies to naturally occurring wetland habitat, and would likely not be applicable to this area however should be confirmed with Alberta Environment
- Alberta Wildlife Act (Alberta Environment) – prohibits any disturbance to a nest or den of prescribed wildlife, including the alteration or removal of existing vegetation
- Alberta Weed Control Act (Alberta Environment) – specifies noxious and nuisance weeds which must be controlled within both publicly and privately owned lands
- Alberta Historical Resources Act (Alberta Community Development) – any fossil or other historical resource located prior to or during site development, as well as during ongoing operations, must be properly protected and reported to proper authorities
- Alberta Environmental Protection and Enhancement Act (Alberta Environment) - establishes a legislated process for environmental assessments, and ensures potential environmental impacts are identified early in the planning stages

Federal Regulatory and Permitting Processes

- Canadian Fisheries Act (Fisheries and Oceans Canada) – authorizations are required for any habitat that is or has the potential to be fish habitat; triggered when development leads to the harmful alteration, disruption or destruction of this habitat
- Navigable Waters Protection Act (Canadian Coast Guard) – in this case would only apply to any alteration to the waters or shoreline of the North Saskatchewan River, such as boat launches, bridges, etc.
- Canadian Environmental Assessment Act (Environment Canada) – would only apply to this development should any federal funding be obtained for development
- Migratory Birds Convention Act (Environment Canada) – prohibits any disturbance to bird species covered under the act, such as removal of vegetation or water from nesting areas
- Species At Risk Act (Environment Canada) – prohibits the disturbance to any species listed in the act that are deemed species-at-risk; and given species-at-risk have been identified in Terwillegar Park, this act would apply to any development
- Policy on Wetland Conservation (Environment Canada) – would only apply to this development should any federal funding be obtained for development

Constraint – Federal, Provincial and Municipal Regulations will define requirements for ensuring that development meets specific standards but may also pose restrictions on certain types of development in the Park

2.3. Historical Resources Assessment

As part of this study, The Archaeology Group conducted a Historical Resources Impact Assessment (HRIA) of Terwillegar Park. A historical air photo analysis was completed for the study area, with photos originating from the 1930's and leading to very recent years. This analysis found no buildings or other structures to indicate settlement or historic use of the site. As part of field investigations for the HRIA, this area was visually examined and a total of 30 shovel tests and eight backhoe tests were executed during the survey. During this new excavation, no diagnostic artifacts were found at the site. The presence of buried soils would have shown that longer term settlement or occupation took place on the site, however the excavations done as part of this study did not find any evidence of settlement in this area.

Constraint – artifacts and other historical occurrences found during a HRIA study can be used as inspiration for interpretive and education opportunities, and with a lack of historical resources, such opportunities are not present

In approximately 1978, buffalo bones were found approximately 3m below the ground's surface during gravel extraction operations. This site was revisited but since the site area is heavily overgrown, evidence of these bones was not reconfirmed. During the 2007 site investigation, a series of stone flakes were recovered which are believed to be remnants of a hand tool. This find, however, did not yield any diagnostic archaeological materials and is not considered a significant find. The lack of cultural or palaeontological materials, stratified layers, or significant buried soils in these study areas suggest the proposed development land does not require any further exploration. Within the excavation sites, the land did not contain any archeological, palaeontological or historic period sites that are of historical importance.

The supporting report authored by The Archaeology Group suggests that further historical resource investigations are not warranted and the proposed Terwillegar Park project should proceed as planned. However, should any fossils be discovered during the development, staff of the Royal Tyrrell Museum should be contacted immediately.

Opportunity – the recent HRIA study was unable to identify any historical resource that would hinder site development

2.4. Phase One Environmental Site Assessment

The purpose of the Phase 1 Environmental Site Assessment in Terwillegar Park was to identify potential and actual contamination of the area. Thurber Engineering was retained as part of the Design Team to provide their expertise related to this work, including both desktop research and field investigations. A supplementary report entitled '*Terwillegar Park: Phase 1 Environmental Site Assessment*' supports the summary provided in this document.

Historically, the Park site was undeveloped agricultural land for the first 50 years of the 20th century. In two specific areas of the park, gravel extraction was dominant from 1949 until 1986; while surrounding land remained virtually unchanged. Air photos show that gravel operations appear to have concluded after 1986, with vegetation beginning to encroach on the original pit site, but not yet present on the newer pit site. By the 1990's, significant development in surrounding areas was present, and the site continued to thrive as an ecosystem in succession. By 2001, land appears unchanged other than the addition of a gravel parking lot.

Since there has been practically no development in Terwillegar Park, studies conclude that there has been little to no contamination of the site. Reports filed by the City of Edmonton reveal no contamination or remediation of the site as there is no knowledge or observation of any landfills, waste sites or contamination. It is possible that some fuel storage may have taken place on site and observations indicate some non-native fill on site, however no hazardous materials were found. Soil tests proved negative for PCB's, (Polychlorinated Biphenyls) asbestos, lead paint, and CFC's (Chlorinated fluorocarbons). Due to previous agricultural practices, pesticides and herbicides may have been used on the site. In general, no historical or visual evidence of contamination was found on the site.

Opportunity – the recent Phase 1 Site Assessment findings did not result in any evidence of contamination that would require further remediation or hinder site development

3.0. SITE ANALYSIS

The analysis of the existing site features has been completed by the Design Team through a review of previous reports and plans for the Park, as well as field inventories and discussions with City staff, Advisory Committee members, and stakeholders.

3.1. Existing Use & Infrastructure

Park Uses

As identified in the Vision Plan, walking, dog walking, mountain biking/cycling and jogging are the top four activities occurring in the Park. Other current uses include canoe/kayak launching, picnicking, attending programmed events, and casual summer activities. Many of these uses are also combined with nature viewing and appreciation lending to the natural attributes of the Park and the River Valley.

Opportunity – to provide for improved nature appreciation and interpretation opportunities to benefit all park users

The input during the Vision Plan indicated that in the future, all current activities would continue but be designed and managed to ensure that all city-wide residents could access Terwillegar Park. Additional activities that were identified as potentially suitable for the Park included playgrounds with an emphasis on natural design, natural picnic areas, boat launch, interpretive areas and kiosks, and city-wide events and festivals (See Section 3.3). (Note: See Section 3.2 for a discussion on trails). Some of the proposed activities that were not well supported included a whitewater facility, groomed sports fields, water spray park, art displays and food services.

Based on the size of the Park, the mix of large open space and natural areas, reasonable vehicle access and trail linkages Terwillegar Park is physically well suited to support a wide range of parks activities and uses. As clearly defined in the Vision Plan, proposed uses must fit within the context of the vision of a "unique natural park", and be guided by the four key values that were used to shape the Vision Plan.

Opportunity – based on the size of the Park, the mix of large open space and natural areas, reasonable vehicle access and trail linkages Terwillegar Park is physically well suited to support a wide range of parks activities and uses

Winter Use

Off-leash dog walking and pedestrian trail use occurs year round. Although snow on trails is rarely cleared, several prominent paths of packed snow develop through the winter as a result of extensive use. Cross country skiing is another wintertime use of Terwillegar Park, with primary trails maintained by the City. When trails are groomed, they tend to become trampled down by walkers. Since Terwillegar Park is lower priority

for ski trail maintenance, programmed cross country skiing is not prevalent. Given its size, extensive trail system and the relatively shallow slopes in much of this park, Terwillegar Park's landscape is well-suited for cross country skiing.

Conflicts and Site Impacts

Despite the size of the Park there are a number of minor conflicts and impacts on the site that can be attributed to the mix of uses, trail width, poor sightlines in some locations, irresponsible use and the lack of definition between various zones of use. In addition, the lack of a formal management program and the limited extent of controls and signage can contribute to conflicts in use and impacts to the site and environment. Conflicting uses and impacts observed within the park include:

- Off-leash dogs which are not under direct control of their owners can approach either humans or other pets, even in a non-threatening manner, and create uncomfortable encounters;
- The open-water pond area showed a surprisingly low population of nesting waterfowl birds – which has been attributed to disturbance by humans and off-leash dogs, and to pond characteristics such as steeper slopes and lack of shoreline vegetation;
- Some dog walkers neglect to clean up after their pets, which results in a significant amount of waste left on site;
- Use of narrow trails is often shared between pedestrians and bicyclists, creating possible interface conflicts – especially where sight lines are limited in more densely treed or hilly areas;
- Use of shoreline areas for accessing the water's edge is not controlled, leading to disturbance of shoreline vegetation and soil conditions that lead to erosion and the destruction of prime habitat.

Constraints – a number of user conflicts and site impacts can be attributed to the mix of uses, layout of the Park and lack of a formal management program

Motorized Use

Motorized vehicle use within the park is limited to maintenance equipment such as lawn mowers and light weight vehicles, quads used for Ranger patrolling, authorized vehicles used to deliver large boats, and also authorized access for specific events for which vehicles are required. Vehicular access into the park is currently controlled by a series of moveable concrete mini-barriers surrounding the parking lot, with a lockable gate at one location. Unregulated use of motorized vehicles in the Park is not as prevalent as in the past due to better controls on the site and the high level of everyday use.

Water-Based Uses

The fact that Terwillegar Park is bound by the North Saskatchewan River provides a unique opportunity for water-based uses that is currently not developed. The Park is used by the City for launching of Voyageur Canoes for scheduled group outings and by other individuals for launching of canoes and kayaks. It is within the Grade Four school curriculum to take a day trip by canoe from Terwillegar Park to Fort Edmonton Park, which is a short paddle downstream of this study area. Although Terwillegar Park provides good access to the river, there are currently no docking facilities to park boats and securely fasten them on a temporary basis. There is also no formal road or parking provisions or other amenities to facilitate water access. Throughout the RVA study there was considerable discussion about improving water-based access to various open spaces and key nodes along the North Saskatchewan River.

Opportunity - the North Saskatchewan River surrounding Terwillegar Park provides excellent opportunities for a range of water-based activities during summer and winter

In the winter of 2006 / 2007, Terwillegar Park was home to the River Queen for maintenance. The area of the river bank known to users as 'the beach', was cut back in order to house the ship for maintenance. In the spring of 2007, the area was reclaimed with an improved slope condition more compatible with water access for canoe/kayak launching. One of the constraints related to using this location for launching boats is that 'the beach' is the most popular location in the park for water access for dog walkers and for parents with kids for a place to see the river and throw stones. This high level of activity can make launching more difficult.

Opportunity – the restoration work following maintenance to the River Queen has improved the access to the river for all users in the Park

Constraint – the River Queen currently has no other location for maintenance and dry docking. This will need to be considered in concept and management planning for the Park

Constraint – access to the river for canoe/kayak launching and for docking of boats visiting the park is constrained by a lack of permanent dock facilities and infrastructure such as access road and parking and support amenities such as washrooms and shelters

Besides the 'Beach' area of the Park, there are only a limited number of locations for easy access to the river's edge in the park. It is important from an environmental standpoint to minimize intrusion of the shoreline and removal of existing vegetation. Riparian areas provide vegetative filters that help improve the condition of water prior to release into the river while protecting the shorelines and bank surfaces from problems such as loss of habitat, introduction of noxious weed, and erosion. In proposing any additional access to the river's edge for recreational or even nature appreciation purposes it will be important to consider the impacts and design with the highest sensitivity. During concept design it will be important to find a balance between restoration of some existing river edge areas that have previously been disturbed with the sensitive development of new access locations (eg. Viewpoints).

Opportunity – it will be important to find a balance between restoration of some existing river edge areas that have previously been disturbed with the sensitive development of new access locations (i.e. Viewpoints)

Although water quality of the North Saskatchewan River system adjacent to Terwillegar Park is considered "Excellent to Good" according to the Alberta Environment Index, there are still concerns related to the long term impacts of using the river for direct contact activities. As part of communicating useful information to users of Terwillegar Park, signage providing information related to water quality and cautioning against the consumption of fish should be made available. Testing of the water quality should occur regularly with results posted along the river to advise park users of possible dangers and precautions. All water-based activities are associated with risks of accidents such as drowning or falling through thin ice. The Park should be well-signed with appropriate notifications during winter conditions to promote unsafe ice surfaces, especially near structures and those other features which create thin ice conditions.

Constraint – river use activities can be associated with health and safety risks related to water quality and accidents resulting in drowning

The existing series of ponds in Terwillegar Park are a result of gravel operations over past years. During approximately each 25-year flood condition, the North Saskatchewan River breaches the banks of Terwillegar Park and will flood the west portion of the study area wherein these ponds exist. As a result, the ponds are recharged to their top of banks, providing not only the addition of water but also the potential for fish migration. Given such a flood event has not occurred for at least two spring floods and white sucker fish had been identified in the ponds during the 2007 survey, it is assumed that the pond depths are sufficient enough (greater than approximately 3m) as to allow over-wintering of large fish. Most large fish species, including white sucker, require flowing water in order to spawn. As a result, the population of white suckers found in these ponds is assumed to be a non-breeding population.

Currently the ponds are enjoyed as a natural feature of the park and are used as part of the off leash activities of dogs. As indicated previously, the fact that the ponds are not used extensively by waterfowl can

be attributed to the use be dogs as well as the relatively poor edge condition (steeper slopes, limited wetland vegetation). Both of these conditions could be altered through design and management changes if improvements to the ponds as waterfowl habitat are important to users.

Opportunity – the value of the ponds as waterfowl habitat could be improved though design and management changes

Opportunity – there is an opportunity for recreational fishing and paddling in the ponds. These activities should be explored during concept planning

Infrastructure

Existing infrastructure in the park is limited to a graveled parking lot, a portable washroom facility, a few benches, trash receptacles and a public notification board. The parking lot accommodates approximately 60 vehicles, with some overflow parking occasionally occurring on the access road. Typical peak use times for the parking lot are evenings and weekend afternoons. During programmed special events, parking for up to 500 cars can be accommodated by setting up temporary overflow parking area in the open park space immediately adjacent to the parking lot.

Constraint – the current parking lot size is limited and often fills to capacity even on days with no programmed event

The parking lot limits vehicle access to the site through the use of concrete barricades. A locked gate allows controlled access to the rest of the Park for City operations and program staff as well as for event use. Typical peak use times for the A detailed evaluation of parking requirements will be required as the program and design concepts are developed. At the parking lot, a receptacle containing plastic grocery bags provides a supply of bags to collect solid pet waste. Trash receptacles are located throughout the site. (Note: see section 3.2 for information on Trail and Road infrastructure).

Terwillegar Park currently has a single portable toilet on site, located immediately adjacent to the parking lot. As indicated in the Vision Plan the construction of an indoor washroom was expressed as the highest need in the public survey. The washroom should be designed to accommodate the needs of everyday users, and be safe, accessible and vandal resistant. For larger programmed events, event coordinators would still be required to bring in additional washroom facilities. If a permanent washroom facility is developed water and sanitary infrastructure will be required (Note: ISL is currently evaluating the provision of services into the park).

Constraint – overall there is a lack of infrastructure to adequately support the level of use and to meet the needs of current and future users. During the Vision Plan process citizens identified a range of infrastructure needs to improve use and enjoyment of the Park

3.2. Site Access and Trails

Access Road

Vehicle access to Terwillegar Park is limited to the single access road leading from the west end of Rabbit Hill Road. Based on a transportation study performed as part of this analysis, upgrading the access road to asphalt is feasible.

Opportunity – based on a transportation study performed as part of this analysis, upgrading the access road to asphalt is feasible

Aside from asphalt paving, a recent geotechnical assessment completed by ISL recommends that the following be incorporated into the upgrading of the access road:

- The posted speed (30km/hr) is adequate for the radii of the road, with the exception of one curve. A review of this curve and the retaining wall beside it should be performed if the posted speed is to remain the same.
- The grade of the road is acceptable, but superelevation should be added to ensure it is drivable in all weather conditions.
- Sightline requirements for stopping sight distances seem adequate, but a detailed analysis is recommended and lighting near the end of the roadway should be considered.
- Either modest widening of the road or the development of a new typical cross section is required to accommodate minimum City of Edmonton standards.
- Side slopes should be reviewed for safety and erosion. Existing barriers should be replaced with a higher standard for increased safety.
- The road's turning radii are adequate for buses, but the current parking lot plan does not properly accommodate bus and truck turning movements.

Traffic congestion, specifically movement into and out of the Park, is generally not a problem on typical days at full parking lot capacity and, according to the City of Edmonton's Transportation Department, the access road into the park should comfortably handle a traffic volume of 500 cars during special events, with an estimated exit time of 30 minutes or less.

Opportunity – traffic congestion is generally not a problem on typical days at full parking lot capacity. During the occasional special event, the access road should comfortably handle traffic volumes of 500 cars, with an estimated exit time of 30 minutes or less

Currently there is no designated pedestrian zone adjacent to the road which leads to an uncomfortable interface between pedestrians and vehicles. The design of the road upgrading should evaluate the feasibility of providing an adjacent sidewalk or trail.

Constraint – the existing access road does not include a designated pedestrian walk which causes an uncomfortable interface with pedestrians and vehicles

Public Transit

Public transit does not lead directly into Terwillegar Park, however busing to the park should be considered. In particular, higher-use special events should encourage the use of off-site parking in combination with busing. The nearest transit stop is currently located at the top of the hill at the west extent of Rabbit Hill Road, uphill from the park's parking lot. The current parking lot does not have adequate size or configuration to allow for a typical bus turnaround. The implementation of an on-site public transit stop would require either smaller busses to be able to directly access to the existing parking lot, or a reconfiguration which incorporates a full-sized bus turnaround without obstruction of parked cars. Consideration should also be given to providing proper turnaround and parking for event related vehicles (trucks, delivery vans) and recreational vehicles.

Constraint – access for public transit directly into Terwillegar Park is limited given the inability for typical buses to turn around at the parking lot; either smaller buses or a reconfiguration of the parking lot would be required to promote accessibility of buses

Wildlife Access

As part of the environmental analysis for this study area, it was found that wildlife movement into, through and out of Terwillegar Park was well-defined. There is a strong wildlife corridor leading from the south west corner of the study area, allowing terrestrial wildlife to enter into the park. Due to the river and steep slopes at the far north east corner, there is not easy passage of wildlife beyond Terwillegar Park toward Fort

Edmonton Park. As a result, Terwillegar Park is an “end destination” for wildlife in south Edmonton. Consequently, the south west end of the site, being a prime entrance point for wildlife, must take into consideration species needs should any proposed development (including trails) be designated for this area.

Trails

Terwillegar Park currently hosts an extensive system of formal and informal trails made up of a hierarchy of trail types throughout the entire park area (Figure 9). These trails can be classified as follows:

- Informal “Goat Paths” – well used areas of packed ground with little to no vegetation growing, ranging from 350-500mm wide, which are created by repetitive off-trail use of the park along desire lines and on generally flat ground; non-maintained
- Single track terrain trails – narrow trails, approximately 350-500mm wide, with some native grass cover material leading up, down and perpendicular to slopes, most commonly used by mountain bikes and less often used by walkers; non-maintained
- Double track terrain trails –approximately 1.5m wide with only native surface material, leading in various directions parallel to a slope with slight undulations up and down in elevation; non-maintained
- Double track surface trails – approximately 3.0m wide with modified ground surface material which follow generally flat ground; maintained by parks staff
- Multi-use major trails – greater than 3.0m wide with modified ground surface material providing a maintained route for multi-use; maintained by parks staff

While all of the trails in the Park are extensively used there are a number of constraints to trail use related to accessibility, management and signage. Consideration must also be given to the impacts of informal trail use and the development of more informal trails on the environment of the Park.

There are no trails in Terwillegar Park that are universally accessible which limits access to the park for the elderly, people with disabilities, and people pushing strollers while trying to enjoy these areas. During the Vision Plan the importance of providing accessible, all-weather trails (not always paved) was identified as a priority.

One of the other trail use constraints is the lack of trail signage to provide users with information related to trail route, surface, length and level of difficulty (ie. steepness of slope, surfacing, etc.) Proper signage would help promote a safer and more comfortable trail experience. This information could be available along the trail at access points, nearby parks, and the City of Edmonton website. Communicating the variety of trails would not only promote the range of trails in Terwillegar Park, but also provide comfort to users that their trail walking abilities meet the difficulty of a specific trail.

Management issues related to trails include poor drainage, erosion, vegetation clearing (sightlines), and steep slopes. If trails are developed/improved to meet City standards then there will also be corresponding improvements in maintenance standards.

Opportunity – the current configuration and range of trail types provides a high potential for a managed trail system in Terwillegar Park

Constraints – trail use by a broader range of users is impacted by issues related to accessibility, signage and management

Regional Trails

As part of the Ribbon of Green Master Plan and more recent work conducted by the RVA, two bridges have been proposed to lead from Terwillegar Park to adjacent areas of the city and to provide continuity within the ‘Capital Region River Valley Park’. This trail would provide a regional linkage from outside communities and provide good access to the Park for more City residents without corresponding increases in vehicle access. As indicated in the Vision Plan, 85% of survey respondents regarded development of a continuous paved multi-use trail and river footbridges as important to the river valley park system. However, the Vision Plan also identified the importance of investigating alternate trail alignments within Terwillegar Park. The concept

plan process will include discussions with stakeholders and the public on proposed alignments and the potential benefits and impacts on current and future use.

Opportunity – a regional trail through Terwillegar Park provides an important link within the context of the ‘Capital Region River Valley Park’

3.3. Events

The Edmonton Sourdough Raft Race is the most prominent large scale event which takes place in Terwillegar Park. This event, which is annually scheduled for the end of July, brings hundreds of people to Terwillegar Park. In 2007, this event was cancelled only the day before the scheduled event date as a result of poor bank stability resulting from wet conditions. While this event has been held in the Park for many years, the number of rafters in this year's race has dwindled to around 25 boats, about 10 per cent of the total boats participating in the festival during its heydays in the late 1960s and 1970s.⁶

Another large event that has been held in Terwillegar Park the Edmonton Corporate Challenge, which has been known to bring between 200-500 participants and about 300 vehicles⁷ into the park. Specifically, orienteering and mountain biking are the events held at this location. Terwillegar Park is well suited for these events.

In 2007, the Edmonton Overlanders Orienteering club hosted two of its events in Terwillegar Park, having taken place in late May and mid-September. Mountain biking continues to be a prominent activity in Terwillegar Park, given the available terrain and trail types which are well-suited for naturally occurring and variable topography. The City of Edmonton Grade 4 curriculum also takes advantage of this park, by involving students in traveling from Terwillegar Park by voyageur canoe downstream to Fort Edmonton Park.

Although the size of the park, the large amount of open space and the extensive trail network make the Park suitable to host a number of additional events held annually within the City of Edmonton, event organizers tend to discount Terwillegar Park as a viable event site due to a combination of its lack of available amenities (i.e. inadequate parking, lack of washroom facilities, absence of water and power hook-ups) and its non-central location.

Constraint – although its size is appealing, event organizers tend to discount Terwillegar Park as a viable event site due to a combination of its lack of amenities and its non-central location

3.4. Signage

Wayfinding

The Park currently does not provide on-site wayfinding signage to locate and explain the various features within the Park. Wayfinding signage would be advantageous in providing such information as trail distances, linkages to external locations, mountain bike trails, Blufone locations, etc. Signs could be placed at the various park entrances, and potentially provide paper maps for visitors to take with them. In the future, wayfinding signs could provide digital connections for downloading GPS coordinates or interpretive information. Wayfinding signage helps to improve the perceived safety of a site, allows users to more comfortably explore all mapped areas of the site without concern of getting lost, and allows people in distress to more easily identify their exact location to emergency responders.

Safety Signage

Throughout the North Saskatchewan River valley, there are numerous signs posted along the shoreline which help indicate boater safety hazards such as outfall locations and areas to generally avoid. These signs are highly visible and are a great asset to promote boating safety. Based on a river tour in 2006, the

⁶ <http://www.connect2edmonton.ca/forum/viewtopic.php?p=56114>

⁷ Meeting with City Program Staff, Sept. 10, 2007

shoreline of Terwillegar Park does not host any such information signage for boaters. Also absent from the river valley and unavailable to boaters are regular landmark posts or wayfinding devices indicating exact locations. For example, if boaters were to launch a boat in Devon and move downstream toward Terwillegar Park, they would likely pass by the park given the absence of any location or wayfinding signage. Furthermore, without location markers clearly visible to boaters in distress, conveying information on exact location to emergency services responders is extremely difficult. Water depth can be a concern on the North Saskatchewan River, and with extremely variable water depths throughout the year and also year to year, conditions are known to be very unpredictable. Charts which indicate water depths and the various waterway hazards along the river are not readily available to boaters. In combination with a lack of literature, devices used to indicate overall water levels (high vs. low conditions) have not been implemented.

Public Notification

Prior to any scheduled event in Terwillegar Park, public notifications are placed at all trail and roadway entrances into the park. These notifications provide information on the date and time of the event, type of use, as well as a contact for further information. This practice helps to minimize conflict between regular park users and event participants.⁸

Interpretation and Education

The site does not contain interpretive signage, which would provide an added element of education and site exploration for users. Terwillegar Park, as a unique natural feature in the City of Edmonton, presents many interpretive opportunities that are currently not available:

- Succession – much of the park is becoming naturalized after the surface disturbance caused by gravel extraction activities in the 1970's
- Wildlife movement – Terwillegar Park, being an “end destination” for large wildlife in south Edmonton, provides a venue for many visible species, particularly in the south end of the park
- White spruce-dominated forest – the stand of spruce in the north east corner of the site is the only example of this type of habitat in all Terwillegar Park
- Old gravel pits – explaining how gravel extraction and its subsequent reclamation and regrading of the land has resulted in the series of open water ponds prevalent today
- Grasslands – the uniqueness of the grasslands, its origin and range of species present
- Valley overlook – the North Saskatchewan River valley is a cherished landmark for Edmontonians, and demonstrates a unique landform that relates to the geology of the region

Opportunity – implementation of City of Edmonton signage standards within the Park will improve user enjoyment of the park by providing critical wayfinding, safety, and management information as well as educational and site exploration experiences

3.5 Public Safety

In October 2004, the City of Edmonton Community Services Department retained Criterion Research Corp. to coordinate a public survey on river valley trails and parks satisfaction. This report entitled “City of Edmonton Community Services Department River Valley Trails and Parks Satisfaction Survey” states that approximately 74% of respondents agree or strongly agree that the river valley and its amenities provide a safe and secure place to recreate.⁹ The river valley is indeed a safe place to recreate, as a result of strategic planning and the implementation of key safety features and best management practices. During preparation of the program and the design concepts for Terwillegar Park, consideration will be given to user safety and security.

In consideration of hazards and/or safety concerns in river valley parks, the City of Edmonton has developed general guidelines that seek to assess hazards and manage them in an appropriate manner. The City has also amended the current Parks and Recreation bylaw to actively “protect City property, address health and safety issues, and allow for the enjoyment and preservation of natural areas”¹⁰ The City of Edmonton Parkland Bylaw will apply to all users of the parks including members of the public, anyone owning, controlling, renting or maintaining public park space and recreational facilities.

⁸ Meeting with City Program Staff, Sept. 10, 2007

⁹ City of Edmonton Community Services Department River Valley Trails and Parks Satisfaction Survey – Criterion, 2004

¹⁰ City of Edmonton Parkland Bylaw 2202

The Parkland Bylaw 2202 provides the majority of safety recommendations for the City of Edmonton. The following list identifies the related section wherein areas of interest are found within the Parkland Bylaw:

- Structures – Section 6 of Bylaw 2202
- Trails – Section 12 of Bylaw 2202
- Dumping of Waste – Section 9 of Bylaw 2202
- Hunting / Angling – Section 13 of Bylaw 2202
- Fire Safety – Section 7 of Bylaw 2202
- Water Safety – Section 14 of Bylaw 2202
- Motor Vehicles – Section 18 of Bylaw 2202
- Restricted Areas – Section 10 of Bylaw 2202
- Water Quality – addressed in drainage bylaw

The City of Edmonton has several other municipal policies related to management and safety that set controls on activities in Terwillegar Park and other river valley areas, including:

Document	Description
River Valley Redevelopment Plan Bylaw No. 7188	Provides direction on permitted uses, delineation of river valley boundary, and development requirements
Noise Bylaw No. 7255	Limits the amount of noise permitted, and allowable operating hours.
Animal Control Bylaw No. 13145	Regulates off-leash areas, stray animals etc.
Fire and Ambulance Bylaw No. 10801	Outlines the roles and responsibilities (including coverage area) for fire and emergency services
Public Places Bylaw No. 7608	Regulates public places including fines for littering, access, golf courses etc.
Unauthorized Use Bylaw NO. 12308	Regulates unauthorized uses (such as driveways, patios etc.), and provide a means to remove unauthorized uses
Erosion and Sedimentation Control Guidelines	Provides best management practices for erosion and sediment control in a variety of applications

Enforcement

Park Rangers monitor the river valley for safety and can enforce the fines if bylaws are not followed. The enforcement of provincial and federal regulations would require monitoring by an elected body such as the Wildlife Officers, or the Edmonton Police Service. Park Rangers work between the hours of 0700h-0100h everyday of the year, with additional resources applied to specific areas during special events. The primary vehicle used for patrolling is a quad and snowmobile, both of which have unlimited access throughout Terwillegar Park on a year-round basis. The application of bylaws for inappropriate and unsafe uses is limited to the resources of the Parks department and other agencies to patrol and monitor activities in the Park. An increase in the level of staffing related to operations in the Park in the future will also assist with providing a presence in the Park that may help to reduce the incidence of unlawful behavior.

Alberta Environment and Alberta Sustainable Resource Development (ASRD) are the primary provincial bodies that monitor, regulate and enforce both provincial and federal legislation with respect to the recreational use of water. For example, a provincial officer enforces fishing and hunting regulations, and is also empowered to monitor and enforce legislation under the Navigable Waters Act for boating regulations. Throughout the greater Edmonton area, ARSD has a strong presence and actively patrols the waters of the North Saskatchewan River. These officers are currently the only regulatory body that actively patrols this river segment within the study area. Although Fisheries and Oceans Canada has a district office in Edmonton, they do not have the equipment (ie. boats, all-terrain vehicles) readily available to access the water within the greater Edmonton area.

Constraint - the application of bylaws for inappropriate and unsafe uses is limited to the resources of the Parks department and other agencies to patrol and monitor activities in the Park

Emergency Response

Terwillegar Park falls within the response jurisdiction of The City of Edmonton Emergency Medical Services (EMS). Although the parking lot is accessible by vehicle, much of the study area is not and as a result can pose a problem for ambulance access to the various potential distress locations. A 3m wide cleared path is the minimum width for ambulance access. On occasion, helicopters have been used to rescue people in distress due to limited site access.¹¹ In winter months, vehicular access is even more limited in areas that are not plowed. Direct access for ambulances is always best, given the limited terrain that a stretcher can travel over and the need to have access to large equipment carried by an ambulance. Typical EMS responses within Terwillegar Park include heart problems, heat stroke and allergic reactions - with no prominent type of occurrence. Few to no sporting injuries are responded to by EMS in Terwillegar Park as most people seem to be able to transport themselves to medical help without an ambulance.¹² There may be a requirement for a secondary access/egress route into the Park for extreme circumstances for emergency response.

The City of Edmonton Fire Department has equipment for water-based rescue, as well as equipment required for high angle rescue. High angle rescue would be more common of a potential response given the location of some informal trails adjacent to the steep slopes in some areas of Terwillegar Park interfacing with the North Saskatchewan River. The Fire Department does not have a significant role in the Park at present but would have in the future if there are buildings, other structures or fire pit areas developed. Any future building would have to meet all Building Code requirements related to materials and internal fire suppression systems.

Alberta Sustainable Resource Development (ASRD) also provides assistance with respect to water-based rescue given their familiarity with the water, active patrolling and availability of equipment. Due to limited availability of manpower and equipment, ASRD is available – just not as readily available as other emergency services teams.¹³ ASRD works closely with local municipal emergency services and the RCMP, and also has the ability to consult with the Canadian Military to provide emergency response as required in the North Saskatchewan River Valley.

Blufones

As a means of improving public safety of trail users within city limits, the City of Edmonton offers “Blufones” at approximately 19 locations throughout the river valley along trails and in parks. These facilities are equipped with an overhead light and a pedestal-mounted electronic calling system that links callers directly with City of Edmonton 911 service operators. These phones are based on a live-voice exchange system that allows users to speak directly with 911 operators by simply pushing a button and speaking in the general area of the pedestal. Each phone indicates an individualized number which helps identify the exact location of the person in distress. The City of Edmonton has a mandate to add additional Blufone facilities throughout the river and ravine parkland system as development continues.

Providing added communication between recreational users and emergency services, such as an extension of the Blufone network, will greatly improve safety in more remote areas, and further imply that these areas are in fact under the care and watch of City emergency and bylaw services. Additional call stations covering the more remote areas of Terwillegar Park would result in improved safety throughout. Future installations of Blufones in Terwillegar Park would also be desirable at water access locations, trail intersections, and pedestrian bridges.¹⁴

Recently there has been discussion related to the usefulness of the Blufones given the assumption of a widespread and common availability of cell phones carried by trail and park users. However, increased use does not necessarily equate to increase public safety especially in parks and recreation areas as many people do not carry cell phones while recreating. The other benefit of Blufones over cell phones is that the Blufone locations are automatically known by emergency personnel whereas an individual with a cell phone may not be capable of identifying their location within the Park. This issue also speaks to the need to have a good system of signs so that trail users have a better sense of their location.

¹¹ Meeting with City Operations Staff, Sept. 10, 2007

¹² Meeting with City Operations Staff, Sept. 10, 2007

¹³ Interview with Mr. Steve Carlson, Alberta Sustainable Resource Development, Sept. 22/06

¹⁴ Meeting with City Operations Staff, Sept. 10, 2007

Opportunity - providing added communication between recreational users and emergency services, such as an extension of the Blufone network, will greatly boost the perceived safety of more remote areas, and further imply that these areas are in fact under the care and watch of municipal emergency services

Representatives from the City of Edmonton have noted problems with Blufone facilities, including high incidences of false alarms, vandalism and a lack of understanding that they are meant specifically for “emergency use only” (some callers press the button to ask for directions). Every call is considered a 911, high priority call. In the event that a person presses the button and walks away, police are still dispatched to respond to the area. Since these phones can be at a considerable distance from areas with vehicular access, such high incidences of prank calls and misuse results in a waste of valuable security resources. Although the infrastructure is paid for by the City of Edmonton, Telus is currently responsible to ensure service is provided. In the past, there have also been criticisms that many of these phones are found to be “out of service” and the delays in rectifying this problem are often extensive, although the City has recently begun employing a new model of phone that seems to have significantly less down-time than the previous model.

CPTED Principles

CPTED (Crime Prevention Through Environmental Design) is an important initiative to recognize while studying safety concerns within Terwillegar Park and along the North Saskatchewan River. In order to create a design that is functional, safe and beautiful CPTED has outlined some basic principles to reduce the opportunities of crime. Maintenance, surveillance and access control are just a few of the main principles that may require focus as concept plan for the Park are prepared. A CPTED audit has never been done for Terwillegar Park or any part of the study area.¹⁵ During detailed design of future development in this park, a thorough CPTED evaluation will help address principles of site safety.

Opportunity - CPTED evaluations and development principles should continue to be an integral part of future development projects and should be implemented as part of the ongoing maintenance and operations of Terwillegar Park

Maintenance will address issues related to trail surfaces, sightlines, and removal of hazards which will make the trails safer for use. Trail use (ie. level of activity) is also a key factor in creating a safer trail network. Surveillance related to views from adjacent areas and sightlines within the Park can also play a large role in minimizing crime. In Terwillegar Park there is only minimal natural surveillance from adjacent residents (Donsdale) due to the considerable distance from the park, existing forest and topography. Access control is the third important principle in crime prevention through environmental design. Making main access points predominant and limiting the number of smaller, unmarked access areas will help control crime and give Park users the perception of improved safety by notifying them of exit and entrance points. (Note: City policy on lighting in parks to be discussed.)

3.6. Environmental Restoration

Topsoil and Growing Conditions

As noted in the historical and environmental summaries, much of the site was once used as a gravel pit that was reclaimed to the existing state. Although best management practices were used and the site was restored to an acceptable condition at the time of decommissioning gravel extraction, the resulting environment does not provide current values of restoration. For example, some pond slopes are excessively steep and ponds lack aquatic vegetation which can help provide improved water quality and enhanced wildlife habitat. There is also very little topsoil in some areas of the site with a large proportion of the natural area having exposed subsoil without proper growing medium to native grasses and encourage succession.

¹⁵ Meeting with City Operations Staff, Sept. 10, 2007

There are a number of restoration and management techniques that could be implemented to assist in enhancing the extent of grasslands and successional aspen forest throughout the Park. These measures may include importing of topsoil, weed control/removal, seeding and planting. Restoring exposed clay soils will aid in reducing the amount of natural erosion prevalent in many areas. Reclamation and management of some of the most highly disturbed areas of the Park system could be one of the key program features in support of the vision of a “unique natural park”.

Opportunity – reclamation and management of some of the most highly disturbed areas of the Park system could be one of the key program features in support of the vision of a “unique natural park”

Weeds

There are significantly large patches of noxious weeds throughout the site. These weeds present through various areas of the park are considered noxious and nuisance as per the Alberta Weed Act. The City of Edmonton currently does not endorse the use of chemical means of weed eradication.¹⁶ Mechanical measures are taken to remove weeds in limited areas, including annual mowing and hand pulling of weeds immediately adjacent to maintained trails only. Because these weeds are well established, eradicating them completely would be extremely difficult. One technique to eradicate weeds that are this established would be to strip the active rooting layer of topsoil and all surface vegetation, then importing clean topsoil free of weeds or weed seed and applying an aggressive naturalization seed mix. Because weed growth is extremely extensive and covers the majority of the site, this practice would not be feasible due to the large site area as well as the potential for drift of seeds from weedy areas outside the re-seeded area. The need to eliminate these weeds is based on a few factors:

- aesthetics – many noxious weeds are easily recognized and become an unattractive feature of the park
- function – some noxious weeds, such as thistle, are difficult to walk through for humans and pets thereby reducing the functionality of many open areas
- habitat – although the site currently has a high species diversity of wildlife in and amongst weedy areas, a more natural regime of species may thrive if the vegetative regime was composed of only native plants

Constraint – much of this site is overwhelmed with noxious and nuisance weeds that are well established; removing these weeds completely would be extremely difficult

3.7. Operations and Management

Current Operations

The access road leading into Terwillegar Park from the west end of Terwillegar Drive is maintained and under the jurisdiction of the City of Edmonton Parkland Services, not Transportation. During winter months, the road and parking lot are cleared of snow only after large snow events. During summer months, the gravel surface is graded as to reduce potholes and irregular surfacing, and also to minimize surface erosion caused by water flowing down this relatively steep grade. Because the road bed is composed of a gravel aggregate, dust is inevitable during dry conditions when passed over by vehicles. As a result, maintenance crews have applied dust abatement agents to the gravel as a direct response to regular complaints from adjacent homeowners nearby to the roadway.

Terwillegar Park has trash receptacles located at the parking lot. Trash is collected each week on Wednesdays, year-round. The current maintenance schedule and trash receptacles seems adequate for the current use of the park, and additional waste receptacles are brought to the site for special events on an as-needed basis by the event coordinators.¹⁷

¹⁶ Meeting with City Operations Staff, Sept. 10, 2007

¹⁷ Meeting with City Operations Staff, Sept. 10, 2007

Consistent with the Vision Plan statement of keeping the natural characteristics of Terwillegar Park, grass is not mowed regularly. According to maintenance staff, only a small area of grass is mowed twice per year¹⁸ Tree and shrub pruning is limited to the removal of hazard branches that overgrow the edges of the maintained trails. These hazards are assessed on an annual basis by the trail maintenance team and cared for approximately once each spring. The City of Edmonton maintains a public telephone line which allows the public to report fallen or damaged trees (780.496.TREE), and several calls are received each year for trees that lie within the Terwillegar Park study area.¹⁹

Since most of the trails in Terwillegar Park are informal/unimproved trails, there is limited trail maintenance. Current maintenance activities are focused on safety issues resulting from slope failures and erosion. In the winter City staff set ski tracks but do not clear any of the trails.

Maintenance equipment for Terwillegar Park is currently mobilized from Hermitage Park, with a one-way period of loading and driving of approximately 1.5 hours.²⁰ As various proposed enhancements to Terwillegar Park are implemented, additional maintenance objectives and practices will be required. These measures will be dependent upon the type and use-specific requirements.

Constraint – current maintenance operations in the Park are limited and challenging due to a lack of on site maintenance storage and mobilization issues

¹⁸ Meeting with City Operations Staff, Sept. 10, 2007

¹⁹ Meeting with City Operations Staff, Sept. 10, 2007

²⁰ Meeting with City Operations Staff, Sept. 10, 2007

4.0. SUMMARY OF OPPORTUNITIES & CONSTRAINTS

As noted in the introduction, the discussion throughout this document is program based, and not site specific, as to not prescribe exact locations for the various opportunities and constraints. The **opportunities and constraints analysis** has been based on the recommendations and descriptions provided in the Vision Plan, input from City staff and a the background and field reviews completed by ISL Engineering and Land Services design team. This report will not be completed until input is gathered from the Project Team, the Advisory Committee and stakeholders through a workshop process. Following input from these groups a program statement will be prepared and the Design Team will begin working on alternative concept plans for consideration and input from the public. This report and the subsequent program statement will serve as the foundation for conceptual design.

Throughout the document, several opportunities and constraints were summarized in excerpt boxes. The following provides a recapture of these excerpts as a summary to this document:

Opportunities

- Members of the Terwillegar Park Advisory Committee have intimate knowledge of the Park and will be asked throughout the study to provide input and test ideas on the uses, impacts, design, development and management of Terwillegar Park.
- Terwillegar Park is well positioned to service the needs of a growing number of residents in Edmonton's south west and west end neighborhoods as well as to provide a unique destination within the 'Capital Region River Valley Park' for all citizens of Edmonton.
- The Concept Plan Study will build upon the input, work and recommendations approved in the Vision Plan, providing a strong foundation of values, activities, needs and issues related to the development and management of Terwillegar Park.
- The uniqueness of the North Saskatchewan River valley banks that surround Terwillegar Park are interesting natural features and provide an interpretive opportunity.
- Although much of the study area was highly disturbed in previous years by agricultural practices and gravel extraction operations, high species richness demonstrates the significant ecological values of Terwillegar Park.
- Despite the presence of many species and significant ecological features, the park does not support any environmental features or species that are sensitive to the point that all development in the park should be avoided.
- The recent HRIA study was unable to identify any historical resource that would hinder site development.
- The recent Phase 1 Site Assessment findings did not result in any evidence of contamination that would require further remediation or hinder site development.
- To provide for improved nature appreciation and interpretation opportunities to benefit all park users.
- Based on the size of the Park, the mix of large open space and natural areas, reasonable vehicle access and trail linkages Terwillegar Park is physically well suited to support a wide range of parks activities and uses.
- The North Saskatchewan River surrounding Terwillegar Park provides excellent opportunities for a range of water-based activities during summer and winter.
- The restoration work following maintenance to the River Queen has improved the access to the river for all users.
- It will be important to find a balance between restoration of some existing river edge areas that have previously disturbed with the sensitive development of new access locations (eg. Viewpoints).
- The value of the ponds as waterfowl habitat could be improved though design and management changes.

- There is an opportunity for recreational fishing and paddling in the ponds. These activities should be explored during concept planning.
- Based on a transportation study performed as part of this analysis, upgrading the access road to asphalt is feasible.
- Traffic congestion is generally not a problem on typical days at full parking lot capacity. During the occasional special event, the access road should comfortably handle traffic volumes of 500 cars, with an estimated exit time of 30 minutes or less.
- The current configuration and range of trail types provides a high potential for a managed trail system in Terwillegar Park.
- A regional trail through Terwillegar Park provides an important link within the context of the 'Capital Region River Valley Park'.
- Implementation of City of Edmonton signage standards within the Park will improve user enjoyment of the park by providing critical wayfinding, safety, and management information as well as educational and site exploration experiences.
- Providing added communication between recreational users and emergency services, such as an extension of the Blufone network, will greatly boost the perceived safety of more remote areas, and further imply that these areas are in fact under the care and watch of municipal emergency services.
- CPTED evaluations and development principles should continue to be an integral part of future development projects and should be implemented as part of the ongoing maintenance and operations of Terwillegar Park.
- Reclamation and management of some of the most highly disturbed areas of the Park system could be one of the key program features in support of the vision of a "unique natural park".

Constraints

- Steep slopes of relatively loose soil and subsoil results in general bank instability and difficult conditions for top of bank trail development.
- Flooding of the Park will impact the potential location of structures, the integrity of the pond areas and the long term maintenance of trails and other amenities.
- The location and protection of sensitive species must be considered during concept planning of the Park.
- Environmental protection and restoration guidelines should be followed when developing conceptual plans for the Park.
- Federal, Provincial and Municipal Regulations will define requirements for ensuring that development meets specific standards but may also pose restrictions on certain types of development in the Park.
- Artifacts and other historical occurrences found during a HRIA study can be used as inspiration for interpretive and education opportunities, and with a lack of historical resources, such opportunities are not present.
- A number of user conflicts and site impacts can be attributed to the mix of uses, the layout of the Park and the lack of a formal management program.
- The River Queen currently has no other location for maintenance and dry docking. This will need to be considered in concept and management planning for the Park.
- Access to the river for canoe/kayak launching and for docking of boats visiting the park is constrained by a lack of permanent dock facilities and launch infrastructure such as access road and parking and support amenities such as washrooms and shelters.
- River use activities can be associated with health and safety risks related to water quality and accidents resulting in drowning.

- The current parking lot size is limited and often fills to capacity even on days with no programmed event.
- Overall there is a lack of infrastructure to adequately support the level of use and to meet the needs of users. During the Vision Plan process users identified a range of infrastructure needs to improve use and enjoyment of the Park.
- The existing roadway into the park does not provide a designated pedestrian walking surface which causes an uncomfortable interface with pedestrians and vehicles.
- Access for public transit directly into Terwillegar Park is limited given the inability for typical busses to turn around at the parking lot; either smaller busses or a reconfiguration of the parking lot would be required to promote accessibility of busses.
- Trail use by a broader range of users is impacted by issues related to accessibility, signage and management.
- Although its size is appealing, event organizers tend to discount Terwillegar Park as a viable event site due to a combination of its lack of amenities and its non-central location.
- The application of bylaws for inappropriate and unsafe uses is limited to the resources of the Parks department and other agencies to patrol and monitor activities in the Park
- Much of this site is overwhelmed with noxious and nuisance weeds that are well established; removing these weeds completely would be extremely difficult.
- Current maintenance operations in the Park are limited and challenging due to a lack of on site maintenance storage and mobilization issues.

Appendix B

Access and Servicing Review

1.0 Terwillegar Park Access

The following is a review of the existing conditions of the access road to Terwillegar Park and recommendations on proposed modifications to the road which should be completed to help ensure that it meets TAC (Transportation Association of Canada) Geometric Design Guidelines. The proposed improvements are designed to ensure that the access road can be improved to meet the long term needs of the City and Park users. ISL Engineering and Land Services completed a review of the horizontal and vertical alignments, cross section, turning movements of vehicles and drainage. A separate geotechnical report by Thurber Engineering completed in October 2005 was also reviewed as part of this access review.

1.1 Horizontal and Vertical Alignment

The existing road is approximately 550m long and has a posted speed of 30 km/hr. It drops in elevation from approximately 665m to 633m from the top of the North Saskatchewan River Valley to the bottom and follows a curvilinear path. There are four horizontal curves along the road which were assessed from an air photo of the area. The first curve is at the top of the bank, located at the end of Rabbit Hill Rd and has a radius of approximately 79m. Continuing down the access road there is a double s curve turn with radii of 37m and 61m respectively. The lowermost curve is a larger radius curve of 160m.

Table 2.1.4.4: Minimum Radii for Urban Designs from TAC, provides the minimum radii for roadways in urban areas and 40 km/hr design speed (30km/hr posted speed) as 40m (with a 0.06 (m/m) superelevation). All but one of the radii meet this criteria. For a 30 km/hr design speed the minimum radius is 20m. The curve with the 37m radius may be considered to be acceptable because a retaining wall is located to the north of this curve which is most likely limiting the radius allowed. During detailed design this curve should again be reviewed and the radius verified. The calculated 37m radius meets the minimum radius for a 30km/hr design speed. A review of the retaining wall should also be complete to determine the condition of the wall and how any adjustments to the curve may affect its location.

In assessing the vertical alignment of the road, there appears to be a consistent grade of approximately 9% for the entire length of the access road. According to Table 2.1.3.1 Maximum Gradients from TAC for a ULU road (Urban Local Undivided) the maximum grade for rolling topography is 6% and for mountainous topography it is 12%. 9% is still between these two extremes and would be an acceptable grade for an access road of this nature.

The minimum K value is also an important characteristic of the vertical alignment and is the measure of the flatness of the curve and it will affect the sight distance on a crest of a curve. According to Table 2.1.3.2 from TAC, for a 40 km/hr design speed a K of 4 is required which provides a stopping sight distance of 44.4m. Table 2.1.3.4 from TAC indicates that a sag vertical curve with a design speed of 40 km/hr also has a stopping sight distance of 44.4m. The K value when streetlights illuminate the roadway is 4 however if no streetlights are present then a K of 7 is used because of the reduced lighting. A profile of the existing road was created from contours and the approximate K value for the vertical curve at the top of the road is 25 and for the sag at the bottom is 6.2. During detailed design these values should be verified. The calculated K values are greater than the minimum K values from TAC however, lighting near the end of the roadway should be considered to meet this minimum criteria. All sightline requirements for stopping sight distance along the road appear to meet the adequate.

1.2 Cross Section and Drainage

The cross section of the road currently is not consistent for the length of the road. The width of the gravel portion of the roadway ranges from 6.6m to 8.5m. Where Rabbit Hill Road curves to the north the width of the road is 11.5m. According to the City of Edmonton Standards (Drawing 4024) a two lane rural road consists of two 3.5m lanes with 1.0m shoulders on each side for a total width of 9.0m and then 3:1 sideslopes down to a ditch. If this typical section does not meet the functional needs of the Park then a new typical section that may include pedestrian access and street lighting should be developed. To construct a different standard cross section along this access road will require the widening of the road and the need to remove vegetation within this area. A geotechnical review of the slope stability where the road widening occurs will be required.

During the site visit it was observed that W barriers had been located at three locations along the road. These W barriers have been placed due to steep side slopes down to the valley bottom. Depending on the side slopes of the natural ground from the access road, New Jersey or F shaped barriers may be considered as a better alternative as they will more likely prevent erroneous vehicles from leaving the road, rather than deflect like W barriers.

The road and parking lot may eventually be used for bus tours and maintenance vehicles, therefore a bus (B12) and a single unit vehicle (SU9) were used to test the turning radii and overhang characteristics, using AutoTURN software. Both of these vehicles were able to maneuver the road without any difficulties. Two passenger vehicles have no difficulty passing one another on this road and AutoTURN also shows that two buses or singles unit vehicles may also pass along the road.

Currently, poorly defined drainage ditches and channels exist along portions of the roadway. These ditches carry water down into the valley. There are three locations (at "W" barrier locations), where the natural ground slopes away from the road, and surface water runs off the road and down the slope into the trees. Proposed drainage should include proper ditch definition along the road with the recommendation for subdrains to be incorporated so that drainage is carried away in an engineered fashion and the erosion presently seen does not occur. The ditch slopes should also consist of some erosion control like rock rip rap to ensure the protection of not only the ditch but the road base. A drainage plan would also be required to be completed to determine how to handle the excess runoff from the paved surfaces of the road and parking lot.

A geotechnical investigation was completed by Thurber Engineering in October 2005 for the Terwillegar park access and parking lot. The report indicates that seepage at the subgrade level is occurring at the upper section of the road. To mitigate this problem the report suggests that lateral and transverse subdrains be installed. The report also recommends that portions of the road subgrade should be excavated and reconstructed. A non-woven geotextile may also be required in weaker areas. For the parking lot and other sections of the road, no subexcavation is required and the road structure may be constructed on top of the existing surface.

As Terwillegar Park is within the river valley, any work completed to this road and park will likely trigger an Environmental Impact Assessment according to the North Saskatchewan River Valley Bylaw (Bylaw #7188). The drainage and road works would have to be a part of that assessment.

1.3 Parking Lot

The existing parking lot for Terwillegar Park is approximately 60m by 40m and has a gravel surface. A review of the bus and truck turning movements was completed with the existing lot. The SU9 vehicle can maneuver through the lot with vehicles park perpendicular to the concrete barriers around the lot and vehicles parked north-south in the centre. A bus can maneuver through the lot if the concrete barriers on the north side of the entrance are moved. If interim measures are needed prior to the proposed expansion of the parking lot it is recommended that signs be placed in the lot indicating where vehicles may park to maintain the drive lanes for these larger turning vehicles. As part of the detailed design for the expanded parking lot, access and turning movements for buses and trucks should be accommodated.

1.4 Access Recommendations

The following recommendations should be incorporated into the upgrading of the Terwillegar Park Access Road:

- Posted speed should remain at 30 km/hr (design speed should be 40 km/hr).
- Review radius of second curve and the remaining wall.
- Add superelevation to horizontal curves along the road to ensure that the roadway is drivable in all weather conditions.
- Conduct a detailed analysis of the K values on the vertical curves and review the need for lighting at the end of the road.
- Develop a typical cross section for the road that will function for the needs of the Park.
- Widen the road to accommodate a minimum standard two lane City of Edmonton rural cross section (or a recommend cross section) to provide for consistent lane widths and shoulders on each side.
- Review side slopes along road for safety and erosion. Provide barriers along the roadway where side slopes provide a safety hazard. Ensure that entire slope is controlled for erosion to mitigate localized slumping and slipping of the roadway.
- Develop a parking lot plan that will accommodate bus and truck turning movements.
- Follow recommendations made with in the Terwillegar Park Access Roadway and Parking Lot Upgrading Geotechnical Investigation completed by Thurber Engineering.
- Account and accommodate for larger amounts of storm runoff from paved surfaces.
- Further investigate any Bylaw restrictions associated with the proximity to the North Saskatchewan River.

2.0 Site Servicing

2.1 Water Services

A water service into the Park will be required to provide water for sinks and water fountains. Depending on the type of building construction (ie. concrete block) and whether the proposed lake could be used as a water source, there may not be a need for water service for fire protection. This would need to be determined at detailed design. To meet basic water service needs for the maintenance building and the program/washroom building, a 100-150mm diameter water line would need to be extended into the Park. A larger line may be required if fire protection is required. Due to the elevation difference, a pressure reducing valve would likely be required. The creation of a public utility lot (PUL) to connect to water lines along Rooney Crescent down into the Park is the shortest distance but would require some forest clearing. Rainwater harvesting off of the buildings should be proposed as part of the LEED objectives to provide water for high-efficiency toilets and for cleaning of equipment in the maintenance building. Water fountains are proposed in the Amenity Area and on the outside of the program/washroom building. A looped water line from the building to the drinking fountain in the Amenity Area should be installed to ensure that acceptable water quality can be maintained.

2.2 Sanitary Services

Due to the significant elevation difference (33m) between existing sanitary services at Rabbit Hill Road and/or Rooney Crescent and the proposed locations of the Park buildings, providing a sanitary service connection into the Park is not recommended. To provide this service would require a sanitary lift station at significant cost to the project. As in many of the City's parks, the proposed buildings and remote toilets can be adequately serviced using septic tanks that are pumped out on a regular basis. Based on estimated annual visits in the 350,000 to 400,000 range, it would be anticipated that the washroom in the program/washroom building would need to be pumped out about 2-3 times per week throughout the year assuming tanks of 5-8000 gallons. The other remote toilets at the west end of the park and in the Amenity Area (1-3000 gallons) would be pumped on a call out basis. From an operational perspective, all of the washrooms will need to be checked daily by Parks staff to ensure that they are in clean, working order, and to check on the service requirements.

During detailed design, consideration should be given to the use of waterless urinals and composting toilets as part of the LEED objectives for the building and remote washroom designs. Currently none of the City's parks buildings are using this technology, but there are prefabricated, concrete washroom buildings that are designed and equipped to meet objectives for resource efficiency and sustainable construction (www.romtec.com). Composting toilets do require power to operate, but this can be provided through the use of photovoltaics.

2.3 Shallow Utilities

All shallow utilities (natural gas, power, telephone) are available to be extended into the Park by the individual franchise holders as required based on the proposed programming for the Park. As with the water service, shallow utilities could be provided in a public utility lot (PUL) connecting to Rooney Crescent.

Natural gas may be required to provide heating for the program/washroom and the maintenance garage. There are some City parks buildings that are heated with propane but over the long term this is not the most cost effective or sustainable approach. Both buildings should be designed for maximum solar gain to minimize heating requirements and with natural ventilation to minimize cooling requirements. At detailed design, the City may elect to provide the basic heating service for both of these buildings through the use of photovoltaic and electric or radiant floor space heating as part of the LEED objectives for the buildings. If natural gas is identified as the best option, then Atco Gas will be the service provider and will determine the best and most cost effective alignment for providing this service into the Park.

Epcor would be responsible for extending power services into Terwillegar Park. With upgrading of the access road, it is recommended that street lights extended from the end of Rabbit Hill road down the access road and into the main parking lot. The proposed secondary Park road (Activity Area Access) and the satellite parking lots should also have some street lighting since all-season programmed activities may occur in the program/washroom building and in the group picnic sites. At detailed design, the level and location of this lighting can be determined based on the type and extent of proposed programming as well as a discussion of requirements related to safety and security.

In addition to street lighting, power service into the Park may be required to service the program/washroom building and the maintenance garage. At detailed design, the City may elect to provide the basic power service for both of these buildings through the use of solar voltaics as part of the LEED objectives for the buildings. It is assumed that the basic power requirements for both of these buildings will be relatively low, consistent with other City parks buildings. However, since there may be additional power service required to facilitate staging of events and programs that can not be accommodated by greener energy options, it has been assumed that a power service and transformer will be required. There are two options in terms of alignment for providing this service: one is to utilize a common power service corridor with the street lighting and the second option is to a public utility lot (PUL) from Rooney Crescent down into the Park as proposed with the water and natural gas services.

Appendix C

Park Visitation Estimates

Park Visitation Estimates

In order to understand the current and projected level of use for Terwillegar Park, ISL reviewed historical traffic counts from 2004 and then developed a simplified and practical formula for extrapolating the traffic counts into the following use projections. Based on the formula, the total estimated number of visits to the site by individual users for 2007 was 240,000 and for 2012 it is projected to be 315,000.

It is important to note that there is not anything scientific about the approach that was taken and so the projected numbers are open to debate. There are many potential factors that can affect use such as weather, season, access, events, and overall provision of amenities and facilities. However, the formula and resulting projections were reviewed and refined through consultation with the City project team and the Terwillegar Park Citizen's Advisory Committee, and the consensus was that the visitation estimates represented a reasonable assessment of the level of current use (2007). Based on this estimate, future use could then be estimated by adding in projected use given the growth in population in the southwest, as well as the impacts of improved access, better management, and the additional amenities that were being proposed.

The basic formula for the visitation estimates involved extrapolating the average number of vehicles per day based on a 2004 traffic count into a total number of user visits per year. Estimated future use based on population growth (increased use by those arriving by vehicle and those arriving on foot and by bike) and growth due to the addition of new types of users (eg. paddlers) was then added to come up with a total estimated number of visits by all users. The estimates for 2004, 2007 and 2012 are provided below:

1. **2004 – Total Estimated visits – 190,000 arriving by vehicle only**
 - May 28–June 3/04. Ave temp. 18 Degrees C, Clear, Rained one day
 - Traffic Count – average of 350 Vehicles/day = 2450/week
 - Traffic projected for year = 127,400 vehicles/ year
 - Park Users arriving by Vehicle – assume 1.5 persons/vehicle = approx. **190,000 visits/year**. Assumes/includes multiple visits by many users.
 - Park Users Arriving on Bike/Foot – not estimated for 2004

2. **2007 – Total Estimated visits - 240,000 by all users**
 - Growth in use due to population in Southwest Edmonton (4% per year)
Vehicles – 127,400 vehicles/ year in 2004 = 143,000 in 2007
 - Parking – 143,000 vehicles/year = 390/day. With 80 parking spots (60 stalls, 20 on road) each stall turns over 4.9 times/day. *(Based on observations the design team believes this is higher than actual current use)*
 - Park Users arriving by Vehicle = 190,000 visits (2004) X 12% growth over 3 years) = approximately 215,000 visits in 2007 (90% of total visits)
 - Park Users Arriving on Bike/Foot – based on input from Advisory Committee members - estimated to average 50/day = 18,250 visits/year
 - Event Users – 12 events – average 400 people = 4800 visits/year and 3200 vehicles
 - Program Users – Voyageur Canoes – 1500 visits/year
 - Total Estimated Visits in 2007 – approximately 240,000 visits by all users

3. **2012 – Total Estimated visits - 315,000 by all users**
 - 2012 - 5 Years of Growth and Park Development
 - Total Visits - Growth due to population - Assume 4% growth per year = 240,000 visits in 2007 = 290,000 in 2012

- Visitors Arriving by Vehicle – 90% of 290,000 = **260,000 visits** – 1.5 persons per vehicle = 175,000 vehicles/year = 480/day
- Parking – with 150 parking stalls in the main parking lot - that means each stall turns over 3.2 times per day (*estimate for 2007 was each parking stall turned over 4.9 stalls per day*)
- Park Users Arriving on Bike/Foot – no additional access in five years so increase only due to population (4%/year) = 60/day = **22,200/year**
- Paddlers – projected paddler use¹ based on a boat house with 20 canoes, and 32 kayaks for booked programs and canoe clubs to use. Operation from early May through late September, approx. 20 weeks, with no commercial rentals on site. Estimated total use per year = **3000 visits** (rounded) based on:
 - Canoe Club - 2 clubs X 20 weeks X 12 persons per session = 480. Special programs 2 clubs X 3 programs X 3 days X 16 persons = 288
 - School & Youth Groups - 6 programs per week X 24 participants X 10 weeks = 1440
 - Casual Group Bookings - 1 program X 12 participants X 20 weeks = 240
 - Casual use - providing own/personal paddling gear - 6 paddlers per day X 4 days/wk X 20 wks = 480
- River Launch – total projected use of the river launch per year = **4200 visits** based on the following:
 - Casual landings mid-week: 2 groups X 6 paddlers X 4 days/week X 20 weeks = 960
 - Casual landings weekend: 4 groups X 8 paddlers X 2 days/week X 20 weeks = 1280
 - RVP Voyageur School, Summer Camp & Public Groups: 1 group/day X 24 participants X 4 days/week X 20 weeks = 1920
- Picnic Area: Total picnic user visits to the park each year = **13,500 visits** based on the following:
 - Individual Sites – 20 sites average 1 family (of 4) per day for 4 months = 9600 visits max.
 - Group sites - 2 group picnic sites, average 4 families (of 4) per site used an average of once per day for 4 months = 3840 visits (2 sites x 16 people x 1 use per day x 120 days).
- Programs: Total visits per for program participation = **5200 visits** based on the following (Note: Voyageur canoes included in river launch):
 - Day Camps: 2 concurrent camps of 50 participants running each day during the week for July and August (40 days) = 4000 visits/year
 - School & other Groups – one group of 30 every two days (40 days) during the week in May, June, September and October = 1200/year
- Events: Total event user visits per year = **6400 visits** based on growth from 12 to 16 events with an average of 400 people per event.

¹ Thanks To Mark Lund, Terwillegar Park Citizen's Advisory Committee for Paddling Lake and river launch use estimates