

## Thomson Flats ASP Report

July 2020 | WSP Project #16M-02075



## wsp

### TABLE OF CONTENTS

1	PART I - ADMINISTRATION
1.0	Introduction
2	PART II - LOCAL CONTEXT AND BACKGROUND10
2.0	Area Description10
3.	PART III41
3.0	Land Use, Mobility, and Servicing41
4.0	Land Use Development Concept44
5.0	Conclusion91

#### **APPENDICES**

APPENDIX A – Public Consultation Summaries	92
APPENDIX B – Geotechnical Report	93
APPENDIX C1 – Environmental Assessment – Phase 1	94
APPENDIX C2 - Environmental Assessment – Phase 2	95
APPENDIX D – Traffic Impact Assessment	96
APPENDIX E – Transit Accommodation Plan	97
APPENDIX F- Servicing Brief	98
APPENDIX G – Hydrogeology Report	99

### **1 PART I - ADMINISTRATION**

#### **1.0 INTRODUCTION**

The Thomson Flats Area Structure Plan (ASP) sets out a general land use and servicing framework to facilitate and guide land development within the ASP area. The development proposals within this site have been designed to be innovative and complement the sites surrounding natural assets and neighbouring land development. Further, land development within the area is to support and build upon the City of Kelowna's existing policy documents while creating a distinctive neighbourhood. The Thomson Flats ASP emphasizes its dedication to enhance and strengthen Kelowna's existing neighbourhoods, notably the South Okanagan Mission neighbourhood.

The development of this ASP is the result of extensive communication with the City of Kelowna and the community at-large since it was authorized by the City in 2014. The ASP policies strive to enhance the parent neighbourhood by building upon its multiple strengths and features while looking to the future with the development of an amenity-rich neighbourhood that is home to a diverse population.

The Thomson Flats site is a 631.43-acre (255.53 ha) property located near Kelowna's southeast municipal boundary, south of Jack Smith Lake. Thomson Flats is within Kelowna's permanent growth boundary, and the land is designated as Future Urban Reserve. The site is a collection of parcels owned by Melcor Lakeside Inc., Canadian Horizons Land Investment Corporation, and the Schwerdtfeger Family.

This Area Structure Plan (ASP) document has been divided into three separate parts, each of which provides specific content that supplements the document as a whole:

**Part I:** Administration – provides brief statements and descriptions about the Thomson Flats ASP, the ASP purpose, authority, preparation process, interpretation, timeframe, and ASP amendment process, with reference to City policy documents that inform the ASP, such as the 2030 Official Community Plan.

**Part II: Background and Context** – provides sufficient background history of the area and its conditions, past and existing development, connectivity of lands within the ASP area and as it relates to the surrounding areas, land ownership details, and site context, including, but not limited to environmental and geotechnical conditions, and infrastructure information.

**Part III: Land Use, Transportation, and Servicing** – provides information related to the future of the area and how development will progress, including: the areas vision, goals and objectives, land use, transportation, and servicing policy, parkland and open space facilities, population and unit projections, and implementation measures.

#### 1.1. AREA STRUCTURE PLAN PURPOSE

The purpose of the Thomson Flats ASP is to provide a guiding policy document that assists land developers and the City of Kelowna in ensuring that the growth and development of the site progresses in a logical and integrated manner. The ASP will further ensure that development is set within the context of an adjacent neighborhood, as well as the broader community.

The limits of the Thomson Flats ASP boundary are illustrated within **Figure 1.1: Plan Area**, and fully described in Part II.

#### 1.2. PLAN AUTHORITY

The Thomson Flats ASP is authorized by the City of Kelowna as a formal policy document, which was guided by the policies within the City's Growth Management Strategy, and the Official Community Plan (OCP).

The City of Kelowna Growth Management Strategy and 2030 OCP provides a foundation for the development of policies established within the ASP. Using the direction provided by formal City policy documents as a foundational guide, the Thomson Flats ASP provides development principles and policy for land use, road and transportation, municipal servicing and utilities, parks and open space, and environment and ecology.

The policies within this ASP conform to, and seek to fulfill the objectives as outlined within the Kelowna 2030 OCP, which include;

- Develop sustainably,
- Focus development to designated growth areas,
- Ensure adherence to form and character, natural environment, hazardous condition, and conservation guidelines,
- Ensure appropriate and context-sensitive built form,
- Promote social wellbeing and quality of life by providing facilities that serve all community members,
- Achieve high quality urban design,
- Ensure opportunities are available for greater use of active transportation and transit to:
- Improve community health,
- Reduce greenhouse gas emissions, and
- Increase resilience in the face of higher energy prices,
- Provide parks for a diversity of people and a variety of uses,
- Ensure environmentally sustainable development, and
- Ensure efficient use of land.

#### 1.3. PLAN PREPARATION PROCESS

The City of Kelowna has established a hierarchy of Community Plans. **Figure 1.11: Plan Process** illustrates how the ASP relates to other City Planning documents.







LEGEND

PLAN AREA



EXISTING WATER BODY



## FIGURE 1.1 | PLAN AREA

The Thomson Flats ASP provides an intermediate link between the OCP and specific development applications. More specifically, an ASP provides policy and a generalized development concepts for future development within specific areas of the city. An ASP must adhere to the spirit and intent of the OCP and include the primary development elements as it relates to the site.

#### 1.3.1. COMMUNITY CONSULTATION

The Thomson Flats ASP was developed in consultation with a range of stakeholders, including various City of Kelowna departments and interested citizens from the Upper Mission and surrounding neighbourhoods. Two open houses were held during the ASP development process to seek input and comments from local area residents and the general public about the various elements of the ASP (i.e., land use, parks and open space, transportation, etc.) prior to final submission of the ASP to the City of Kelowna. The objectives of the open houses were to:

- Provide site background material to area residents and landowners,
- Seek input and comments from local area residents and landowners regarding the proposed ASP, prior to final submission,
- Collect completed comment forms from residents and landowners, and
- Answer any question residents and landowners may have regarding the proposed ASP.

Summary overviews of the open houses are included below, and **Section 2.12** summarizes the information gained through the community consultation process. Complete consultation information, the presented display materials, all the public feedback, raw data and analysis is included in **Appendix a – Public consultation summaries** 

#### **OPEN HOUSE #1**

The first open house took place on June 28, 2017 at the Okanagan Mission Community Hall, from 4pm – 7pm. The format of the open house was an informal drop-in style with twenty 34" x 40" large-format visual information panels. The panels provided an overview of the project, background study results, and an estimated ASP timeline. Project staff and facilitators were present at the open house to provide information and field questions by attendees. Select City of Kelowna staff and members of Council also attended the open house. Attendance was estimated at one hundred individuals based on a formal sign in sheet, however about 15% of attendees chose not to sign in.

The open house panels included feedback boards that asked attendees for their community values, hopes and fears, and comments regarding site design and development considerations. Many residents expressed concerns about conserving greenspace and ecological habitats, as well as traffic volumes. Good connectivity with trails and paths, as well as safety for walkability were also significant concerns.

#### OPEN HOUSE #2

Melcor Developments Ltd. and Canadian Horizons hosted the second Thomson Flats Area Structure Plan Community Open House on Wednesday February 19, 2020. The event was held at the Manteo Resort located at 3762 Lakeshore Road from 4pm-7pm. Open house attendance was between 60 and 100 individuals, which is based upon a formal sign-in record. It should be recognized, however, that some participants chose not to forego formal sign-in as it was 100% voluntary. The format of the open house was an informal 'drop-in' with the assistance of seventeen 34" x 40" large-format visual display panels. The display panels provided an overview of the project, background study results, and estimated timeline. The open house was represented by a total of eight individuals – five from WSP, one from Canadian Horizons, one from Melcor Developments Ltd., and one from Beckingham Environmental. Representatives spoke with open house participants and answered inquires, with the purpose of providing clear project goals and objectives.

#### OPEN HOUSE #3 ONLINE COVID 19 PUBLIC ENGAGEMENT

Melcor Developments Ltd. and Canadian Horizons hosted the third Thomson Flats Area Structure Plan Community Open House online from May 25<sup>th</sup>, 2020 – June 19<sup>th</sup>, 2020. Given the events surrounding COVID-19 it was not possible to host an in-person event.

The format for the Online Open House consisted of providing online display panels, a Traffic Impact Assessment summary and a Frequently Asked Questions (FAQ) document to assist participants with common questions about the Area Structure Plan. Attendees were asked to complete an online survey to provide feedback on the overall ASP. The material was hosted on <u>www.thomsonflats.ca</u> and a project facilitator was assigned to answer emails and questions of attendees throughout the online engagement process.

#### 1.4. INTERPRETATION

All mapping and figures within the Thomson Flats ASP, including boundaries, lot locations, and locations of any symbols or areas shown on a map or figure in the ASP, are approximate and conceptual only, and are not absolute and therefore should be interpreted as such.

Where a statement accompanies a policy or policies, it is provided for information purposes only to enhance the understanding of the policy. Should there be any inconsistency between general statements and the policies themselves, the policy shall take precedence. The purpose of the Plan is not to replace other City policy documents or bylaws, but to enhance and aid decision makers.

Where a policy requires submission of studies, analysis or information, the exact requirements and timing of the studies, analysis or information shall be determined at the rezoning, subdivision, or Development Application stages.

#### 1.5. TIMEFRAME

The Thomson Flats ASP is future-oriented and depicts a proposed land use and transportation pattern for the area. No specific timeframe is applied to the Plan as the timing of development will be influenced by a number of contributing factors such as, but not limited to market changes and the supply and demand of housing. It is, however, anticipated that under the existing development conditions, full build out of the Thomson Flats Area could take between 15-35 years from the start of construction.

#### 1.6. PLAN REVIEW AND REVISION

The text and illustrative figures within the Thomson Flats ASP are not intended to be static. Instead, their purpose is to help guide the future development of the area. While the Thomson Flats ASP describes and illustrates the best representation of how the development will process, designs are conceptual, and some modification and revision may occur as development progresses over time.

## 2 PART II - LOCAL CONTEXT AND BACKGROUND

The intent of Part II is to provide historical background and context to the Thomson Flats site. This section also provides information about surrounding neighbourhoods, site features, current infrastructure servicing conditions, and community open houses undertaken as part of the overall ASP process. This section forms the foundation for the established development concept and resulting guiding principles and land use policies within Part III.

#### 2.0 AREA DESCRIPTION

#### 2.1. LOCATION

The Thomson Flats ASP area is adjacent to Kelowna's Upper Mission neighbourhood. The ASP lands are generally bounded by the South Ridge area to the north, Jack Smith Lake and Bellevue Creek drainage area to the east, Lakeshore Drive/Upper Mission Drive to the west, and Gillard Forest Service Road/City of Kelowna municipal boundary to the south. The site's northern boundary consists of established urban residential, whereas the south is a rural resource area within the boundaries of the Central Okanagan Regional District. The ASP area encompasses a total of five parcels comprising an area of 255.53 ha (631.43 acres) within Kelowna's permanent growth boundary and is currently designated as Future Urban Reserve.

#### 2.2. BACKGROUND

The Thomson Flats area has been identified as having potential for residential development as early as 1985 in Kelowna's OCP. In addition to the previous OCP, the existing Transportation Plan shows a future grid road connection between Chute Lake Road, Crawford and Stuart Roads.

In anticipation of the Mission Village Concept Plan (now Kettle Valley), the City of Kelowna completed the Southwest Mission Sector Plan. Following that, the OCP was amended to include Neighbourhoods 1, 2, and 3. The future densities for these areas was projected at approximately 6700 units, based on a gross density of 10 units/ha for lands with slopes under 20% and 7 units/ha for lands with 20-30% slopes. Neighbourhood 1 of this sector plan is fully built out.

In 1995 City Council authorized the preparation of an ASP for Neighbourhood 2 which was subsequently adopted into the Official Community Plan in 1999. This plan included 3 nodes, 2a, 2b and 2c, providing a total potential unit count of 1230 units. At present, Neighbourhood 2 is close to meeting its projected 20-year build-out. January 2004 saw Council authorization for the preparation of an Area Structure Plan for Neighborhood 3 with the subsequent adoption of the plan into the Official Community Plan in 2007.

On March 3, 2014, the City of Kelowna authorized the preparation of the Thompson Flats ASP for a maximum of 1,400 housing units over two phases, and work on preliminary studies began. The ASP submission proposed the development of up to 800 dwelling units in Areas 1 and 2 (Melcor and Canadian Horizons parcels – see Section 2.3 below) and approximately 600 additional units in Area 3 (Schwerdtfegger parcels) at a later time. These units were

proposed to consist mainly of single dwelling housing, with the potential for some compact cluster housing, and other uses including parks, open space, and possibly educational or commercial amenities.

The ASP for Thompson Flats presents an opportunity to build on the vision of the Southwest Mission Sector Plan and realize the target population density in the neighbourhood necessary to support desired commercial and community amenities that are currently not supported. The phased development of the Thomson Flats area will provide critical transportation connections for the entire Mission neighbourhood and assist in helping the neighbourhood achieve the population density required to attract commercial and other community amenities. Development will be phased in a northwest-to-southeast manner with a sequenced focus on delivering critical infrastructure and transportation connections.

#### 2.3. LAND OWNERSHIP

Collectively, Melcor Lakeside Inc. (a subsidiary of Melcor Development Ltd.), Canadian Horizons Land Investment Corp, and the Schwerdtfegger Family own the lands comprising the Thomson Flats ASP area.

**Table 2.1: Land Ownership**, provides the legal and civic address for each of the five parcels corresponding to each of the three landowners and ASP planning areas. Error! Reference source not found. visually identifies the lands held by each of the landowners and the corresponding planning areas.

LANDOWNER	LEGAL ADDRESS	CIVIC ADDRESS	(HA)	ASP
Melcor Lakeside Inc.	SE¼, Sec. 24, Twp 28	5265 Upper Mission Dr.	62.90	1
0844053 BC Ltd.	W1/2 of SW1/4, Sec. 19, Twp 29	5300 South Ridge Dr.	32.37	2
0844053 BC Ltd.	E <sup>1</sup> / <sub>2</sub> of SE <sup>1</sup> / <sub>4</sub> , Sec. 19, Twp 29	(S of) Kuipers Cres.	32.37	2
Horst Immanuel Schwerdtfegger Ulrike Hannelor Schwerdtfegger	Lot 1, Plan 28237	(S of) Hewetson Ave.	40.47	3
Horst Immanuel Schwerdtfegger Ulrike Hannelor Schwerdtfegger	Lot 2, Plan 28237	(S of) Redstem St.	87.41	3

#### Table 2.1: Land Ownership

#### 2.3.1. MELCOR DEVELOPMENT LTD.

Melcor Development Ltd. (Melcor) is a family real estate business that spans four generations. They are a diversified real estate development and asset management company that transforms real estate from raw land through to high-quality finished product in both residential and commercial built form.

As a fully integrated real estate development and asset management company, Melcor has helped to shape much of Alberta's high-growth areas and also has developments spanning western Canada, Colorado and Arizona, including locally Kelowna's Blue Sky at Black Mountain and North Clifton Estates.

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. . .

Melcor is a participating ASP landowner.

#### 2.3.2. CANADIAN HORIZONS LAND INVESTMENT CORP.

Canadian Horizons Land Investment Corp. (Canadian Horizons) was formed in 2006 following several very successful land development partnerships and joint ventures amongst its founding members.

Based in Vancouver, CHLIC's multi-disciplinary team of professionals form an innovative approach to real estate development. CHLIC's extensive experience allows for residential, commercial, mixed-use, and industrial development ranging in size and complexity. A commitment to excellence allows CHLIC to continually deliver the highest quality developments with a specialization in medium to large scale master planned communities. CHLIC has major holdings throughout the Lower Mainland, Okanagan Valley, and southern Vancouver Island.

Canadian Horizons Land Investment Corp. is a participating ASP landowner.

#### 2.3.3. SCHWERDTFEGGER FAMILY

The Schwerdtfeggers are US-based residents who have land holdings throughout North America. The Schwerdtfeggers are a non-participating ASP landowner, but have granted consent to the ASP process

#### 2.4. SURROUNDING LAND USE

The Thomson Flats ASP area is located between the City of Kelowna and Regional District of Central Okanagan (RDCO) municipal boundaries. Surrounding land use (see Figure 2.2: Existing Land Use) is described as follows:

#### NORTH

Immediately north of the site is the South Ridge urban residential neighbourhood. While predominantly suburban-style development, the overall residential neighbourhood includes light commercial land uses (i.e. grocery stores, personal service establishments, restaurants, etc.), formal park space, passive open space areas, and institutional uses, such as schools and churches.

#### EAST

The east boundary of the ASP is Myra-Bellevue Provincial Park and Day Use Area. This dayuse area is used by picnickers and hikers but is more notably known as a mountain bike haven. It has a myriad of single and double-track trails that are used by thousands of hikers and mountain bikers each year.

#### SOUTH

Sharing a border with the south of the area is the RDCO's Gillard Forest Service Road. As the name suggest, it is a forest service road that extends south into the regional district. Despite this, Kelowna Mountain is also accessed off Gillard Forest Service Road. Kelowna Mountain can be seen from many points within the ASP area.

#### WEST

The western-most boundary of the ASP area is bordered by Chute Lake Road / Upper Mission Drive. This area is an extension of the Village of Kettle Valley and is home to hundreds of urban residential homes.

#### 2.5. SITE DESCRIPTION

The Thomson Flats site itself has various slopes, forming a valley bottom across the property. The area was devastated by the 2003 Okanagan Mountain Park fire which changed the site's environmental characteristics significantly. Many areas of the site have yet to recover from the fire, which has led to increased use by non-authorized users, both motorized and on foot.

The surrounding existing neighbourhoods all rely on municipal water, sanitary sewer, and storm servicing systems. Access to the Thomson Flats site is obtained from Upper Mission Drive at the west boundary, and South Ridge Drive at the north boundary. Future connections from Gordon Drive and South Perimeter Road will be provided in the future with development of this ASP.



## **THOMSON FLATS AREA STRUCTURE PLAN**

LEGEND

PLAN AREA

0	75m	150m	300m	Ν

## FIGURE 2.1 | LAND OWNERSHIP



## **THOMSON FLATS** AREA STRUCTURE PLAN

LEGEND

PLAN AREA



RURAL (RDCO) MAJOR PARK AND OPEN SPACE SINGLE/TWO UNIT RESIDENTIAL MULTIPLE UNIT RESIDENTIAL



EDUCATION/INSTITUTIONAL FUTURE URBAN RESERVE AGRICULTURAL COMMERCIAL

IN
R

## FIGURE 2.2 | EXISTING LAND USE

0 75m 150m

300m

#### 2.6. GEOTECHNICAL CONSIDERATIONS

WSP conducted a reconnaissance of Thomson Flats to identify geotechnical conditions and hazards, as well as hydrogeological features that may indicate potential hydrogeologically sensitive areas (HSAs). The site reconnaissance was conducted in May 2016 and a second site reconnaissance was conducted by geotechnical personnel and project team members in June 2016. The full report can be found in **Appendix B – Geotechnical Report** 

The reconnaissance focused on three key aspects: geotechnical hazards, geotechnical conditions, and HSAs. Specifically, the review was intended to identify evidence or indications of potential:

- Geotechnical surface conditions,
- Geotechnical hazards, and
- Hydrogeologically significant areas.

Pertinent features observed during the reconnaissance were documented with photographs, and the GPS coordinates of such features were identified with handheld equipment. HSAs and typical slope angles and distances were measured with handheld equipment to confirm the available mapping and survey information. The subsurface soil and groundwater conditions at the site were assessed by excavating a series of test pits using a tracked excavator equipped with a toothed digging bucket. A total of 49 test pits (TPs) were advanced to depths ranging from 1.9 to 5.0 m below existing surface grades. The locations of the TPs and the ground surface elevation at the TPs was determined in the field using handheld GPS equipment.

#### 2.6.1. GEOTECHNICAL HAZARDS AND ACCEPTABILITY OF DEVELOPMENT

Development of the site is not anticipated to have a negative impact or reduce the overall stability of the site or surrounding areas, provided the recommendations in this report are followed. It is the geotechnical engineer's opinion that there will not be significant new or increased risks of landslide, debris flows, snow avalanche or other geotechnical hazards as a result of development of the site, and that rock fall hazards from permanent rock cuts (if required for site grading purposes) can be avoided by use of appropriate cut inclinations, suitable offsets of buildings from the top and toe of rock cuts, or other mitigative measures.

It is the geotechnical engineer's opinion that the site is considered safe for the use intended (development of on-site roads, utilities, and homes) provided the recommendations provided in the geotechnical report are followed. We define "safe" based on the levels of safety adopted by the City of Kelowna, including a 10 percent probability of failure occurring in a 50 year period (i.e. 1 in 475 year event) for damaging events and a 2 percent probability of failure occurring in a 50 year period (1 in 2,475) when considering seismic events.

The Thomson Flats ASP area is not anticipated to have a negative impact or reduce the overall stability of the site or surrounding areas, provided the adherence to the recommendations of the Geotechnical Engineering and Hydrogeological Assessment.

#### 2.6.2. SUBSURFACE CONDITIONS

The site is lightly vegetated with wild grasses, trees, and brush. Bedrock is exposed on the south and north portions of the site at various locations. Granular soils are evident on the ground surface throughout the site. Soils are typically loose to a depth of 1 m below grade. Generally, the following was observed throughout the site at various locations following the test pit excavation:

- Boulders ranging from approximately 300 mm to 2.7 m in size were evident,
- Silty sands,

- Compact/stiff silty sand to sandy silt,
- Granular soils, and
- Bedrock.

#### 2.7. TERRESTRIAL & HYDROGEOLOGICAL CONDITIONS

The Thomson Flats ASP area is generally comprised of two valleys; the first of which is a deeply incised gulley of Bellevue Creek bisecting the eastern area in a south to north direction. The east portion of the ASP area presents variable topography with steep slopes toward Bellevue Creek. The second valley can be defined by Rembler Creek flowing east to west in a broader valley across most of the ASP area, resulting in sloping topography to the north and south.

The north portion of the site has benched slopes with localized slopes as steep as 2H:1V. The south portion of the ASP area has ground surface slopes moderately steeply upward towards Gillard Forest Service Road. Slopes in this area vary from approximately 2H:1V to 4H:1V, with various localized steeper areas. Through the mid-portion of the ASP area a drainage course runs in a general east to west direction.

An initial desktop assessment followed by site reconnaissance was undertaken as part of the hydrogeological assessment. The historical documents regarding hydrogeology in the area included published geographical, topographical, and soil mapping, detailed well records and aquifer mapping, two groundwater protection plans completed by Golder Associates, and a regional groundwater flow model completed by Simon Fraser University.

The hydrogeology report prepared by Western Water includes an outline of previous investigations completed for the Thomson Flats area, a detailed site description, an overview of their field program, and a hydrogeologic impact assessment. The full report can be found in **Appendix G – Hydrogeology Report.** 

The hydrogeological assessment resulted in the identification of two main hydrogeologically sensitive areas:

- 1. The southern hillside portion of the site south of Rembler Creek; and
- 2. The Rembler Creek Valley bottom between the flood control berm and Jack Smith Lake

During the site reconnaissance in May 2016, four slotted PVC standpipe piezometers were installed to depths ranging from 1.5 to 4.2m for monitoring the depth of ground water. In June 2016, groundwater depth ranged from at the surface to a depth of 3.39m.

Based on their assessment Western Water provides the following recommendations with respect to hydrogeology:

- Investigate who is responsible for maintaining culverts and drainage along the Gillard FSR. Advocate to have the damaged and poorly maintained culverts along the FSR addressed. Runoff from the hillside south of Thomson Flats is beyond the control of the developer, but ensuring that drainage infrastructure routing water onto Thomson Flats is well maintained and predictable will help with development.
- It can be expected that springs, shallow groundwater and surface runoff in the several gullies/ravines present on the southern hillside will occur each year in the spring.
   These gullies should be left in place as much as possible during the development to allow natural drainage patterns to continue. These features could also potentially be used to route storm water originating from hillside development to lower elevations for

management. Any road crossings of these features must consider seasonally resent water and drainage.

Thick sand and gravel deposits in Rembler Creek valley bottom make the valley bottom area an attractive location in for larger scale storm detention and infiltration facilities. Such a facility may best be located in the central part of the site south of Kuiper Creek. Other locations are also feasible, but the closer these facilities are to Frazer Lake, the quicker groundwater will report to Frazer Lake and potentially result in increased interception of groundwater in storm water infrastructure in the Southridge development and which could be detrimental. We understand the that City of Kelowna is looking into decommissioning the dam on Fraser Lake. This would likely result in a lowering of the groundwater table in the area, reduced issues with groundwater interception by storm water infrastructure in the Southridge development and storm water infrastructure in the area.

We recommend working with the ecological consultant on the project when planning and siting larger scale storm detention facilities adjacent to Rembler Creek, as there may be opportunities for habitat development/enhancement.

- Much of the area north of the Rembler Creek valley bottom appears suitable for inground storm infiltration. Drywells and perforated piping appear feasible in this area.
   Dispersed storm infiltration as opposed to centralized infiltration would be preferred in this area.
- Background information reviewing for this assessment indicates that Jack Smith Lake serves as a source of recharge to springs and sloughs in the Ponds development. There is potential for storm water infiltration south of the lake, and as long as it is not excessive, should not result in significant impact to downslope development. If centralized storm water infiltration is planned for this area or storm water will be directly discharged to the lake, volume calculations should be made to determine how much the level of the lake may increase as a result. This can be compared to cross-sections developed in the 2006 Golder Associates report to better determine the potential for down gradient impacts.

In addition, the current use of Jack Smith Lake for water storage should be confirmed. Based on online information, all water licences on Jack Smith Lake have apparently been abandoned or cancelled. The main implication of this is that if the lake were to be filled periodically, it could result in an elevated groundwater table in proximity to the lake and reduce the potential for storm water infiltration near the lake.

 We expect that storm runoff from extreme precipitation events will likely have to be routed to Rembler creek which is the natural drainage outlet for the area. Hydrometric data form two hydrometric stations installed on Rembler creek will likely prove useful in this regard, along with information contained in the South Mission Drainage Plan (RSB Engineering 2011).

There are no hydrogeologically sensitive areas within the Thomson Flats ASP area, however seepage may occur from the man-made pond located on Kelowna Mountain. The west area of the site and the man-made pond are roughly aligned with each other along a regional jointing pattern, and the migration of water along the jointing could be contributing to this area.

#### 2.8. LANDSCAPE + VISUALLY SIGNIFICANT FEATURES

The ASP area encompasses a diverse range of topography ranging from flat gentle grasslands, to prominent rocky outcrops and steep slopes. The site is subject to a spectrum of slope gradients from 0% to 30%+ (see **Figure 2.3**). As such, the site topography includes

natural features such as steep hillside, outcrops, kettles, and localized benches. The numerous benches within the site offer sweeping view corridors enabling excellent development potential. The various naturally occurring features of the Thomson Flats ASP area will be celebrated and incorporated into the overall planning and design. Although the site encompasses various landscape features boasting stunning views, the ASP area is very unique in that it will not contribute as a visual impact to existing and adjacent neighbourhoods.

A brief description of existing landscape, significant site features, and visually significant features follows and is visually illustrated on **Figure 2.4**.

#### LOCALIZED BENCHES

Several localized benches are present within the Thomson Flats ASP area. Many of the benches have been targeted as the most feasible areas for land development, including associated roads and infrastructure, residential homes, parks, and open space.

#### MATURE TREES AND GRASSLANDS

As identified within the Environmental Assessment, the area consists of large grassland areas and sparsely treed areas. Trees offer an array of benefits to neighbourhoods and existing ecosystems. Similarly, grasslands also provide ecosystems and climate change mitigation benefits. Of particular note, some grassland species have been identified as environmentally significant, within the Environmental Assessment. Recognizing that grasslands contribute to the economic and environmental character of the area, those areas within the ASP boundary will be preserved where possible.

#### **KETTLES**

The valley bottoms at several points throughout the ASP area are punctuated by depression features known as 'kettles'. Kettles are remnant glacial ice left during retreat as sediments built up only to leave depressions on the landscape once melted. These features are found to be common in this area.

#### **OUTCROPS**

While not immediately evident, rock outcroppings are present within the Thomson Flats ASP area. Rock outcrops are considered to be specialized habitats where vegetation cover can be sparse and usually interspersed within bedrock or blocks of rock. Many species use the steep slopes, cracks, pockets of soil vegetation as shelter. Given the importance of the rock outcrops, these areas will likely be preserved and in some cases, protected as passive open space and natural areas.

#### WATER FEATURES

A water feature, or watercourse, can be defined as a channel that a flowing body of water follows. Although the scope and role of water features is diverse and specific to its location and eco-scape, the function is based on several contributing factors. However, two broad perspectives can be distinguished: 1) aquatic interaction; and 2) landscape-ecological interaction. There are five water features within the Thomson Flats ASP area.

#### VIEW ANALYSIS

The Thomson Flats ASP area is composed of varying degrees of hillside areas ranging from gentle to steep. These ranges create an array of viewpoints, vistas, and corridors throughout the entire site. These areas will be ideal sites for future development and open space. While residential development upon localized benches presents opportunities for sweeping views from the property, the site is unique in that its visual impact on adjacent neighbourhoods will be negligible due to its "bowl shape" configuration.







## FIGURE 2.3 | SLOPE ANALYSIS



MATURE TREE STANDS

GRASSLAND

## **THOMSON FLATS AREA STRUCTURE PLAN**

# FIGURE 2.4 | EXISTING SITE FEATURES

#### 2.9. ENVIRONMENTAL ASSESSMENT

Beckingham Environmental Ltd. was retained in Spring 2016 to complete an environmental inventory and provide direction toward potential suitable development areas located within the Thomson Flats ASP. The purpose of the Environmental Assessment is to provide a complete environmental inventory, impact assessment and strategies with other disciplines to guide proposed development in a responsive environmental manner.

The foundational framework for the environmental guidelines of the Environmental Assessment are embodied in the current City of Kelowna OCP and outlined within the Termsof-Reference provided by City of Kelowna. Additional supporting legislative frameworks are also based on senior government requirements such as the Species at Risk Act (SARA), Fisheries Act, and Migratory Bird Act (Federal) and the Wildlife Act and Water Sustainability Act (Provincial).

The environmental reporting was prepared in consultation with the developer and communications with City of Kelowna and Province of British Columbia Ministry of Forests, Lands and Natural Resource Operations. Ecosystem mapping was undertaken in 2000 as part of the South Slopes Terrestrial Ecosystem Mapping (TEM) by the Regional District of Central Okanagan. This same mapping was later updated in 2007 as part of the City of Kelowna TEM project to describe baseline ecological conditions, which also included Sensitive Ecosystem Inventory (SEI) categories and Conservation Strategies. This mapping was completed at a 1:20,000 scale. A primary difference between the 2000 and 2007 mapping is that the 2007 mapping was based entirely in the 1999 terrain base, and no changes to the delineated polygons were noted. Both map products were designated as Okanagan hot-dry Interior Douglas-fir variant (IDFxh1) and ecosystems were mapped - classed accordingly to this classification. The ecosystem changed in 2007 to include a larger number of ecological units not readily accounted for in 1999 and provided a broader description of the landscape. The structural stages used in 1999 changed significantly due to the 2003 fire for much of the forested landscape that was accounted for in 2007.

The Thomson Flats ASP area parcels have been modified over the years by various degrees of farming, logging and more recently by fire and the encroachment of urban settings directly adjacent to its boundaries. The private properties comprising the Thomson Flats ASP area are used extensively by many residents for motorized and non-motorized recreational purposes (as observed through various field visits) and have contributed to significant habitat impacts and losses.

In 2009, the Okanagan Collaborative Conservation Program undertook Conservation Analysis for the Central Okanagan, including the City of Kelowna. This analysis took into account the smaller scale TEM and SEI inventories completed to develop the groundwork for habitat prioritization and protection. Using a step-wise process, the analysis results produced Sensitive Ecosystem Rankings and Conservation zones reflecting "Core Conservation Areas"; "Buffers"; and "Wildlife Corridors". Bellevue Creek was identified as a primary core conservation area, while the upper and lower segments of Rembler Creek were identified as "other", signifying several ecological values within. This was equally similar for both Jack Smith Lake and Frazer Lake areas. The majority of the Thomson Flats ASP area was ranked as "not applicable" in the larger regional context in this analysis. This broad view conservation analysis provides a template for the several objectives outlined for Phase Two when the Thomson Flats base information is overlaid and should form the backbone of natural areas within the Thomson Flats ASP area with Myra-Bellevue Provincial Park directly to the east.

From 2003 until present, several notable changes occurred in the Thomson Flats ASP area. The lack of trees due to forest fires led to habitat changes across the entire ASP area and surrounding areas. In addition, the construction of the 2003 Debris Fire Berm formed a wetland behind on Rembler Creek. Finally, urban development approached the borders of the

ASP area from the west and north. This use by residents has degraded the recovery via natural process post-fire and natural features throughout the ASP area, including Rembler Creek.

Rembler Creek has been significantly impacted and continues to be impacted by residents. An objective of the Thomson Flats ASP is to restore Rembler Creek as part of the neighbourhood planning process. Doing so will provide a basic level of protection to the creek that is currently missing. Basic principles to be applied include a return stream to a channel and to create riparian habitat with connectivity from the Bellevue Creek corridor towards Okanagan Lake.

![](_page_22_Picture_2.jpeg)

#### 2.9.1. WILDLIFE

A wildlife survey and analysis was undertaken as a segment of the Environmental Assessment. Mark Piorecky, R.P.Bio, of Valhalla Environmental Consulting Ltd, was subcontracted to complete the wildlife surveys and analysis in conjunction with John Grods R.P.Bio.

The Thomson Flats Wildlife Assessment was conducted in 2016 and included the following scope:

- Key habitat feature inventory;
- Bat survey;
- Nocturnal owl survey;

- Pond breeding amphibian and painted turtle inventory; and
- Breeding bird survey.

Many habitat features important to wildlife occur at spatial scales that are often too small to map as distinct polygons. Typical Key Habitat Features include: sticknests, cavity trees, stand veteran trees, snags, mineral licks, small rock outcrops, cliffs, caves and/or hibernacula.

The Key Habitat Features were recorded on all site visits. This includes the location of an active red-tailed hawk sticknest and the general location of an active Coopers hawk sticknest. Cavity trees were reasonably abundant in all remaining forest stands and present as standing snags in many of the burnt over areas. The cavity and snag findings are reflected in the Wildlife ESA values. Due to the fine scale habitat mapping conducted, rock outcrops and cliffs were mapped as independent habitat polygons. No mineral licks, caves or hibernacula were identified.

During the identified site visits and surveys, a total of eight federally or provincially listed wildlife species were observed within the Thomson Flats ASP area. Barn swallows were observed on several occasions foraging over the Rembler Creek ephemeral wetlands. The common nighthawk was heard incidentally in an early morning site visit. All listed bats were recorded in either the Jack Smith lake area and adjacent offsite cliffs (to the west), Bellevue Creek area and cliffs, or associated disturbed grasslands between the two.

A western yellow-bellied racer was observed at two locations adjacent to the largest Rembler Creek ephemeral wetland. This species is generally associated with open grassland, shrubby thickets and associated wetlands. No suitable hibernacula sites were observed within the study area.

A more detailed discussion and overview of the wildlife discussion, including observed listed species, can be found within the Thomson Flats Area Structure Plan Environmental Assessment, located within **Appendix C1 – Environmental Assessment – Phase 1** 

#### 2.9.2. WATER COURSES AND FEATURES

The City of Kelowna Natural Environment Guidelines (2013) requires protection of fish habitat that includes the riparian areas adjacent to aquatic features. The Riparian Management Areas (RMAs) are measured perpendicular from the defined top-of-bank, or in poorly defined situations the natural boundary. However, the City of Kelowna OCP defines setbacks for all aquatic systems in the City of Kelowna. Two creeks exist in the Thomson Flats ASP area, including Bellevue Creek and Rembler Creek.

The City of Kelowna guidelines for RMAs support provincial and federal regulations in protection of fish and fish habitat. The City of Kelowna's OCP guidelines for RMA setbacks are well-defined and summarized within **Table 2.2: Water Course + Feature** Setbacks.

#### Table 2.2: Water Course + Feature Setbacks

WATER COURSE + FEATURE SETBACKS	MINIMUM SETBACK (M)
Bellevue Creek	15
Rembler Creek	15
Jack Smith Lake	30
Ephemeral streams, drainages and springs	15
Wetlands	15

#### 2.9.3. ENVIRONMENTALLY SIGNIFICANT AREAS

Beckingham Environmental employed the system that was adopted, in part, by RDCO as well as other systems, which differ slightly from the outline listed in the Terms of Reference in that our rankings amalgamates the "VERY-HIGH" and "HIGH" classes into one "HIGH" ranking. It is the opinion of Beckingham Environmental that both rankings are important and critical to maintain in ecological function and integrity and should be considered as one.

The system employed follows the ESA system used locally in the McKinley Landing ASP (2004) and North Clifton ASP (2013). Under this system, ESA-4 ranks as "NIL" habitat, as a nil or little to no value ranking has been left out of most other ESA systems employed. Per

Figure 2.5: Environmentally Sensitive Areas, the following is the basis ranking for Thomson Flats ESA's:

- ESA-1: High (and Very High)
- ESA-2: Moderate
- ESA-3: Low
- ESA-4: Little or No Value (i.e. Urban Area or Chute Lake FSR)

![](_page_26_Picture_0.jpeg)

# **AREA STRUCTURE PLAN**

![](_page_26_Figure_3.jpeg)

## FIGURE 2.5 | ENVIRONMENTALLY SIGNIFICANT AREAS

#### 2.10. HISTORICAL | CULTURAL | ARCHAEOLOGICAL

The Thomson Flats ASP area is an undeveloped greenfield area. With the exception of an old farm house and orchard in the early 1900s, no previous development has occurred on the lands as it was always used for agricultural purposes. To date, there are no known historical, cultural, or archaeological sites within the ASP boundary. However, this does not preclude potential for new information with construction and development of the site, and future developers must understand the possibility for new discoveries as development progresses.

Upon commencement of physical earthworks and land development, future developers must work with contractors to protect any new finds of archaeological remains that are found during site excavation, servicing, and development.

#### 2.11. INFRASTRUCTURE

The following sections provide a brief summary of the existing conditions for water, sanitary sewer, and storm water servicing. The existing water, sanitary sewer, and storm water services in the areas surrounding Thomson Flats (i.e., The Ponds and Kettle Valley) are relatively new and were designed with the expectation that the Thomson Flats area will ultimately be developed. Because of this, prior to completing the servicing analysis for the Thomson Flats area, it was expected that the surrounding and downstream infrastructure would either have available capacity for this development or, where necessary, have been designed with expansion in mind.

Our studies for site servicing have returned good results and clearly demonstrate, as expected, that infrastructure servicing methods are feasible with connections to the existing City systems; see the Thomson Flats Servicing Brief, completed by WSP, included in **Appendix F- Servicing Brief** for more information. Proposed servicing strategies are discussed in Section 4.9.

#### 2.11.1. EXISTING POTABLE WATER SUPPLY

North of Thomson Flats, the current water model and pipe sizes are illustrated in Figure 1.0 of the WSP Servicing Brief Report (see **Appendix F- Servicing Brief**). The existing system is separated into eight pressure zones and is supplied from Okanagan Lake through the Cedar Creek Water Supply System. The model of the existing system includes the following major components:

- Cedar Creek Pump Station
- KVR Pump Station
- Stellar Pump Station
- South Ridge Pump Station
- Stellar Reservoir
- KVR Reservoir
- Gillard Reservoir
- Frost Reservoir
- South Crest Reservoir

The existing 2015 pipe network with its current 2015 peak hour demand (PHD) can be seen in Figure 2.2 (in Appendix F). These conditions cause a few nodes to fail the minimum pressure criterion by a small margin at dead ends and on the intake side of two pump stations. The current pipe velocities satisfy the maximum pipe velocity criterion.

When the existing network runs using the projected 2030 Peak Hour Demand (PHD), a few additional nodes around the Northeast side fall below the minimum pressure criterion as seen in Figure 2.3. Along South Ridge Drive, one pipe's velocity rises above the maximum design criterion.

The fire flow model of the existing system at Maximum Day Demand (MDD) illustrated in Figure 2.4 (of the WSP Servicing Brief Report) shows that the current system delivers adequate residual pressure to most of the hydrants in the system except at a few dead-end nodes. Figure 2.5 (of the WSP Servicing Brief Report) shows the current system with the projected 2030 (maximum day demand) MDD fire flow demands. No additional nodes fall below the minimum residual pressure and available flow decreases slightly across the system as expected.

These findings indicate that the existing potable water system is conceptually able to provide service to the Thomson Flats area, with existing issues being easily accommodatable by providing pipe upgrades (seen in Figure 1.4. of the WSP Servicing Brief Report); these improvements should be implemented by the City independently of any future development of the Thomson Flats area.

#### 2.11.2. EXISTING SANITARY SEWER COLLECTION

The model of the existing system consists of a large gravity main along Lakeshore Rd, and a secondary main along Gordon Drive that ultimately collects at the Gyro Lift Station, which directs flows to the Kelowna Wastewater Treatment Facility.

The current 2015 network with 2015 demands is seen in Figure 2.1 (of the WSP Servicing Brief Report) while Figure 2.2 (of the WSP Servicing Brief Report) shows similar results for the existing network with projected 2030 demands.

The remainder of the existing sanitary system maintains acceptable d/D values under both the 2015 and 2030 demand scenarios, with the exception of the segment of the Lakeshore Trunk Main between the Bluebird and Gyro Lift Stations. It has been previously identified that these pipe capacity/backwater issues are due to lift station and wet well capacity issues at the Gyro Lift Station, which is planned for upgrades in the near future.

#### 2.11.3. STORM DRAINAGE

In 2011 the City of Kelowna prepared a comprehensive assessment of the South Mission Basin drainage catchments, which included analysis of the Rembler Creek and Bellevue Creek catchments and provides recommendations for drainage infrastructure downstream of Thomson Flats. For Rembler Creek, the recommendations are limited to obtaining right-ofways where the creek crosses private property. These right-of-ways will formalize the City's ability to access the creek to perform maintenance.

The majority of Thomson Flats drains west down the valley to Rembler Creek. The far eastern portion of Thomson Flats drains to Bellevue Creek. A number of studies were conducted to better understand the hydrological and hydrogeological characteristics of these areas and to identify sensitive areas. Western Water Associates Ltd. prepared a Hydrogeological Investigation and Assessment report in support of this ASP, which can be found in **Appendix G – Hydrogeology Report**; this report identifies two hydrogeologically sensitive areas and presents a number of recommendations that will be followed in the preparation future stormwater management plans (discussed further in Section 4.9.2.4).

#### 2.11.4. TRANSPORTATION + INTERNAL ROAD NETWORK

Traffic in the Upper Mission travels mostly to and from the business and commercial centres located north of the Upper Mission in downtown Kelowna and other destinations within and

beyond the city that are accessed via the provincial highway system that travels east-west just south of the downtown.

Currently, there are two principle north-south links in the area: (i) Lakeshore Road / Chute Lake Road; and (ii) Gordon Drive. As mentioned above, most traffic typically travels to and from the north and is heavily dependent on these two north-south roads. Both streets are two-lane arterial roads that also accommodate transit buses, cyclists and pedestrians. Lakeshore Road / Chute Lake Road carries approximately 1,250 vehicles per hour (vph) in the morning peak and 1,600 vph in the afternoon peak. Gordon Drive carries approximately 1,500 vph in the morning peak and 1,200 vph in the afternoon peak. The two existing principal east-west links, Frost Road and Barnaby Road, carry traffic across the Upper Mission and funnel traffic to and from the north through Lakeshore Road / Chute Lake Road and Gordon Drive. Frost Road carries approximately 530 vph in the morning peak and 350 vph in the afternoon peak.

Traffic congestion on the existing road network has been a concern as traffic typically travels either north (morning) or south (afternoon) during the peak periods as commuters travel to and from work. This is exacerbated by the limited number of alternate routes. However, in response to traffic congestion concerns on the existing network, the City of Kelowna completed a quantitative travel time analysis along Lakeshore and Gordon in early 2017. It was observed that between 7:30am and 8:30am travel times from the Upper Mission to Old Meadows Rd increased from five minutes to approximately 13 and 8 minutes on Lakeshore and Gordon, respectively. While this observed delay only persisted for 45 minutes, both roads operate below capacity over 23 hours per day. The analysis, followed by a formal City of Kelowna Council Report, further concluded that the "…*majority of delay between the Southwest Mission and the City Centre occurs at the Lower Mission schools.*" (*Appendix E – Transit Accommodation Plan*) (City of Kelowna, May1 2017 *Southwest Mission Sector Transportation Plan Report*)

Despite the foregoing, and in an effort to alleviate traffic conditions, the 2011 Official Community Plan (OCP) and the 20-Year Servicing Plan & Financial Strategy identified future plans to realign and upgrade Stewart Road West to become the third north-south link and to construct South Perimeter Road as a future east-west connection between Gordon Drive and Stewart Road West. Stewart Road West currently carries approximately 380 vph in the morning peak and 130 in the afternoon peak. The expanded network would help distribute traffic in the Upper Mission neighbourhood and relieve the traffic congestion on Lakeshore Road / Chute Lake Road and Gordon Drive. The proposed South Perimeter Road will be a two-lane arterial road incorporating on-street bike lanes. The plans for the South Perimeter Road include a multi-use trail along the north side of the arterial from Stewart Road West and connect to Bellevue Creek Linear Trail at the falls.

Within Thomson Flats, South Perimeter Road would run across the flats connecting between Chute Lake Road and the future intersection at Gordon Drive. South Ridge Drive would be extended southward to connect to South Perimeter Road in the flats.

#### 2.11.5. EXISTING UTILITY RIGHT OF WAYS + UTILITY CORRIDORS

Utilities, including electric, telephone, cable, and natural gas exist and are supplied to the Thomson Flats boundary. Existing electric, telephone, and cable service are supplied to the surrounding area via overhead lines and / or subgrade.

Extension of the power, communication and natural gas utilities will be relatively simple and at this stage will be limited to verifying that each utility will be able to accommodate the Thomson Flats development through sub-grade approaches.

#### 2.12.1 OPEN HOUSE #1 - PARTICIPANT FEEDBACK

Offering quality opportunities to open house participants to provide comments and feedback about the project was an important component of the event. In anticipation for a large crowd expressing various opinions and desires, the probability of receiving feedback was not only anticipated, it was encouraged. For this reason, the open house was intentionally programmed to solicit feedback from participants in multiple forms.

#### ENGAGEMENT PANELS

The purpose of the engagement panel activities was to solicit comment and feedback from open house participants at a personal level. In doing so, three different statements / questions were posed, followed by a request for an action:

There are compelling personal values (what is important to you) that attracted you to live in the area, choose to visit it, or decided to operate a business within the area. Please share your personal values with us to help us enhance our understanding of why this area is so special.

Share with us what types or styles of site design and development considerations you would like to see incorporated into a new residential development.

In consideration of a potential development occurring on the site, what are your hopes and fears?

Engagement panel participation rates were very high, resulting in an array of comments and feedback from open house participants.

Engagement panels in their raw, but completed form, can be found within *Appendix F* of the summary for Open House #1.

![](_page_30_Picture_10.jpeg)

#### VERBAL DISCUSSIONS

The Thomson Flats ASP open house was represented by eight project representatives. Each representative had fruitful conversations with various individuals that were appreciative of the discussion. Conversely, other participants chose to only peruse display panels and not engage in discussion or ask follow-up questions with open house representatives. Where discussion occurred, many inquired about potential increased traffic volumes, road access / connections, development style / density, and future open space areas and designs.

#### EXIT QUESTIONNAIRE

Each participant at the open house was provided an opportunity to complete a brief questionnaire (Appendix G of the Open House #1 summary). The questionnaire included a total five questions (two multiple-choice and three open-ended) and generally strived to achieve the participant's understanding of the open house material and its effectiveness. A summary of the multiple-choice questions is provided below.

#### Q1: WHICH ONE OF THE FOLLOWING BEST DESCRIBES YOUR ATTENDANCE TONIGHT?

I live and / or own land within the area of the subject site and have an interest in any potential land development	48
I'm part of a local group that has an interest in any potential land development on the subject site	2
Other	6
Total	56

#### Q2: WAS THE INFORMATION PROVIDED AT THIS OPEN HOUSE HELPFUL IN UNDERSTANDING THE DEVELOPER'S OBJECTIVES / INTENTIONS? WHY?

Yes	34
No	18
Total	52

It is noteworthy to highlight that nearly 35% of individuals indicated that the information provided at the open house was not helpful. However, the rationale for the "no" response was primarily attributed to the lack of full-build development details (i.e. "No exact planning for greenspaces/parks", "No plans of what structures will be. Only overhead views of what already exists", "No real info on actual development").

In addition to the two multiple choice questions, three open-ended questions were asked of participants.

Based on the information presented at the open house, do you have any concerns? If so, please list them?

- What should our project team know before we begin drafting a development design for Thomson Flats?
- What parts of the Open House did you enjoy most? What parts of the Open House could be improved?

Responses to the foregoing questions were predominantly isolated to concerns pertaining to increased traffic volumes, loss of (perceived) public open space / parkland, and the need for additional roads / access. Conversely, many individuals commented on their interest in the development coming to fruition, the assistance it may offer in terms of balancing housing affordability within the city, and the ability for the new development to add future road connections to the existing network. The raw comments have been combined into a table and has been included in *Appendix G* of the Open House #1 summary.

#### 2.12.2 OPEN HOUSE #2 - PARTICIPANT FEEDBACK

A total of two comment and feedback mediums were available to participants: 1) Verbal Discussions; and 2) Exit Questionnaire.

The Thomson Flats ASP open house was represented by eight project representatives. Each of the eight open house representatives were visually identified with name badges and consistently approached participants throughout the evening, with the purpose of offering information, engaging in discussions, and responding to questions.

#### VERBAL DISCUSSIONS

Each representative had conversations with various individuals that were appreciative of the discussion. Conversely, other participants chose to only peruse display panels and not engage in discussion or ask follow-up questions with open house representatives. Where discussion occurred, many inquired about potential increased traffic volumes, road access / connections, development style / density, and future open space areas and designs. Where possible, open house representatives attempted to answer all questions. However, where an answer could not be provided, the project team made a offer to follow-up with that individual.

#### EXIT QUESTIONNAIRE

Each participant at the open house was provided an opportunity to complete a brief questionnaire (*Appendix E* of the summary for Open House #2). The questionnaire included a total five questions (two multiple-choice and three open-ended). A summary of the multiple-choice questions is provided below. The goal of the survey was to gauge participants understanding of the Open House Panels and to solicit feedback on the document.

#### Q1: WHICH ONE OF THE FOLLOWING BEST DESCRIBES YOUR ATTENDANCE TONIGHT?

I live and / or own land within the area of the subject site and have an interest in any potential land development	26
I'm part of a local group that has an interest in any potential land development on the subject site	3
Other	6
Total	35

#### Q2: WAS THE INFORMATION PROVIDED AT THIS OPEN HOUSE HELPFUL IN UNDERSTANDING THE DEVELOPER'S OBJECTIVES / INTENTIONS? WHY?

Yes	31
No	2
Total	33

It is noteworthy to highlight that nearly 94% of individuals indicated that the information provided at the open house was helpful.

In addition to the two multiple choice questions, two open-ended questions were asked of participants.

Based on the information presented at the open house, do you have any concerns or feel there was any information that wasn't addressed? If so, please list them.

What Transportation issues should we be prepared to address in preparation for the next Open House Event

Responses to the foregoing questions were predominantly isolated to concerns pertaining to increased traffic volumes, loss of (perceived) public open space / parkland, and the need for additional roads / access. For question 2, items such as traffic volume, traffic calming, construction timing, public transit, road design and travel times were all mentioned. Conversely, many individuals commented on their interest in the development coming to fruition, the assistance it may offer in terms of balancing housing affordability within the city, and the ability for the new development to add future road connections to the existing network. The raw comments have been combined into a table and has been included in *Appendix E* of the Open House #2 summary.

#### 2.12.2 ONLINE OPEN HOUSE #3 - PARTICIPANT FEEDBACK

Melcor Developments Ltd. and Canadian Horizons hosted the third Thomson Flats Area Structure Plan Community Open House online from May 25<sup>th</sup>, 2020 – June 19<sup>th</sup>, 2020. Given the events surrounding COVID-19 it was not possible to host an in-person event.

The format for the Online Open House consisted of providing online display panels, a Traffic Impact Assessment summary and a Frequently Asked Questions (FAQ) document to assist participants with common questions about the Area Structure Plan. Attendees were asked to complete an online survey to provide feedback on the overall ASP. The material was hosted on <u>www.thomsonflats.ca</u> and a project facilitator was assigned to answer emails and questions of attendees throughout the online engagement process.

Following are the statistics regarding the online engagement:

- More than 3,300 mail outs to the adjacent neighbourhoods were issued
- 253 survey responses were provided, this is 7.7% of the mail outs.
- Of the 253 responses, 163 provided comments through the open-ended Questions 12 and 13 in the survey

In hindsight, following the completion of the online public engagement there were advantages and disadvantages for this approach. Some of the advantages turned out to be:

- There was likely a higher response level than if an in-person open house was conducted
- The survey provides a documented response

Some of the disadvantages turned out to be:

- The online format also provided challenges in answering direct questions of participants who viewed the materials. While a project facilitator hotline was setup answer questions of the materials, participants rarely reached out with direct questions. This is the opposite of an in person open house event where comments and questions are addressed on the spot, live, and in real time.
- It is possible people responded to the survey without reviewing the display panels, Traffic Impact Assessment summary and Frequently Asked Question information.
- Some of the survey respondents, about 30, did not provide complete contact information

#### ISSUE RANKING

The analysis involved ranking the responses as provided in Question 3 which asked participants to rank critical issues associated with development of the Thomson Flats ASP. GIS was used to produce a series of heat maps applicable to each category of the question. The goal here was to understand where each category was viewed as most critical within the context of the ASP boundary and surrounding neighbourhoods. These maps are attached as **(Appendix P** of the online open house summary**)**.

The question asked in the survey was:

- 1. ON A SCALE OF 1 TO 8, WHERE 1 MEANS MOST CRITICAL AND 8 MEANS LEAST CRITICAL PLEASE RANK THESE ISSUES ASSOCIATED WITH THE OVERALL DEVELOPMENT OF THOMSON FLATS:
  - Completing the long-term plan for the Upper Mission area

- Providing a range of family oriented single detached, duplex, and/or townhome housing
- Providing alternate travel routes
- Providing parks and trails
- The development of the possible commercial centre at Frost Road and Gordon Drive
- Travel times from the Upper Mission to destinations within the city
- Protecting the environment
- Economic activity associated with development

Analysis of the responses yields the following trends:

- Residents in direct proximity (the immediate surrounding neighbourhood) place a higher importance than residents further away of these key issues:
- Providing parks and trails
- Environmental protection
- Providing alternate travel routes
- Travel times to destinations (though this had a broader reach in the surrounding areas)
- Completing the long-term plan for the Upper Mission area
- Residents further out from Thomson Flats placed a higher importance on these key issues:
- Providing a range of housing options
- The possibility of a commercial development at Frost and Gordon Drive
- Economic activity associated with development

#### OPEN ENDED QUESTION OR COMMENT ANALYSIS

To analyze Questions 12 & 13 (the open-ended questions from the survey), we felt it prudent to divide the responses into several categories. Figure 2.6 provides a summary of the created categories using GIS.

The mapping exercise was completed combining the comment categories with the ASP support/no support responses. The categories are shown below:

Support - Category No Development under any circumstances No - No Comment Provided No - Commercial Concerns No - Density Concerns No - Environmental Concerns No - Access to Parks, Trails, and Open Space Concerns No - Transportation Concerns Yes - No Comment Provided Yes - Commercial Conerns Xes - Density Concerns Yes - Environmental Conerns Yes - Access to Parks, Trails, and Open Space Concerns Yes - Transportation Concerns


#### ASP SUPPORT ANALYSIS

General support for the Area Structure Plan (Question 11 of the survey) was cross referenced with comments provided in open-ended questions 12 & 13 to produce categories of support or no support for the Area Structure Plan. Figure 2.7 provides a summary using GIS.

The following categories were created.

Do you support council adoption of the Thomson Flats Area Structure Plan?

No development under any circumstances

No, without comment

No, but with conditions

Yes, but with conditions

Yes, without comment

A summary of the support/no support analysis is as follows:

Of the 253 responses, 85 (or 34.0%) indicated support and 163 (or 66%) indicated no support, for the Area Structure Plan

Of the responses in support with comments, there is this breakdown:

- Just over half of this component did not provide comments
- Just under half of this component provided suggestions for improvements to the Area Structure Plan
- Of the responses not in support with comments, there this breakdown:
- Just over half would not support the Area Structure Plan under any circumstances
- Just over 1/8 of this component did not provide comments
- About 1/3 of this component provided comments to explain their reasons for not supporting the Area Structure Plan.
- Of the 3300 mailouts, the 85 in support represent 2.6% of this total, and the 163 not in support represent 4.9% of this total

A key take away is the "No development under any circumstances category" response to questions 12 or 13 e.g. no development at all, don't develop, or sell it as parkland. By ruling out those respondents who would not support the Thomson Flats ASP in any regard, general support for the ASP or support for the ASP with conditions / technical comments becomes more apparent and can serve as a basis to weigh overall support for the Area Structure Plan.



#### Total questionaire responses: 253

Support Analysis:

Of the 66% of respondents who indicated they would not support the adoption of the Area Structure Plan:

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35.2% said they would not suport development under any circumstances.

8.3% said they did not support the adoption of the Area Structure Plan, but did not provide comments.

22.5% said they did not support the adoption of the Area Structure Plan, but would be supportive if their concerns were addressed.

Of the 34% of respondents who indicated they would support the adoption of the Area Structure Plan:

18.5% said they did support the adoption of the Area Structure Plan and did not provide comments.

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15.0% said they did support the adoption of the Area Structure Plan and included suggestions for improvements to the Plan.

#### Respondent Identification:

77% of respondents provided complete identification

9% of respondents provided partial identification

14% of respondents did not provide adequate identification



<insert client logo here>

#### Thomson Flats Area Structure Plan

#### OPEN HOUSE 3 SUPPORT ANALYSIS

project no. 16M-02075-01

date: 2020-07-06



#### SUMMARY

The community consultation process has confirmed these key issues for the Area Structure Plan

- Parks and trails
- Environmental protection
- Providing alternative travel routes
- Transportation/traffic impact
- Completing the long-term plan for the Upper Mission area

One issue identified through the comments provided in response to the open-ended Questions 12 and 13 were concerns regarding density or the extent of development. This issue will be mitigated by the current and future development horizon approach presented in Section 4 of the Area Structure Plan. Essentially, this approach will result in OCP Amendment approval for 55% of the development in the Area Structure Plan at this time.

When critically looking at the response regarding support of the Area Structure Plan (Question 11), if you remove the respondents who would not support the ASP in any regard, general support is slightly lower than general opposition of the Area Structure Plan.

#### 2.13. DEVELOPMENT POTENTIAL

#### 2.13.1. MUNICIPAL PLANNING POLICY

The proposed ASP area has long been identified in the City of Kelowna Official Community Plan (past and present) as having future development potential subject to the completion of an ASP that demonstrates that there are viable development opportunities concurrent with the appropriate level of infrastructure services. This, compounded with Council's March 2014 resolution to grant the Developer authorization to proceed with the preparation of an ASP, should satisfy the City's criteria from a policy level.

#### 2.13.2. LAND USE POTENTIAL

While development potential of Thomson Flats is satisfactorily addressed at the policy level, it is critical the site can withstand physical development and associated density referred to within the November 2013 request to undertake an area structure plan.

In support of this, an environmental assessment, geotechnical study, infrastructure analysis, transportation, and neighbourhood planning review was undertaken. The site presents various development challenges such as hillside topography, environmental sensitivities, and geotechnical constraints. However, the challenges and constraints are deemed minor and can be mitigated through industry-accepted approaches. In some cases, such as where environmental sensitivities are presented, there are opportunities to improve and enhance existing site conditions through site development. From an off-site perspective, there are few existing infrastructure servicing improvements that will be required. Conversely, transportation impacts will require various improvements, which will be identified within the Transportation Impact Assessment (TIA) in the coming months.

In consideration of the foregoing, the Thomson Flats project team has confidently concluded that urban development within Thomson Flats is highly feasible. The site offers significant land development opportunities, where development will be predominantly focussed on lands sustaining minimal development challenges. A range of single-family residential development, supplemented by supporting infrastructure, attractive active transportation, parks, and opens space areas are all possible to seamlessly coexist. Where possible, key site features and environmentally sensitive areas within the ASP area will be protected.

### 3. PART III

### 3.0LAND USE, MOBILITY, AND SERVICING

Part 3 discusses the generalized land use concept, type, style, location and proposed density of land use, mobility and servicing elements and establishes policies that facilitate land development implementation.

From inception, the objective is to create a high quality and comprehensively designed neighbourhood that is, first and foremost, complimentary to the natural environment. In an effort to fully understand the area, multiple site walkabouts were completed with the project planning team, property owners, and interdisciplinary professionals. Identification of the site's opportunities and constraints quickly resulted in an organic and fluid planning approach centred on the premise of achieving a practical balance of developed land use while respecting the site's ecology.

#### 3.1. SW MISSION COMMUNITY CONTEXT

The Thomson Flats ASP is a guiding document that will effectively inform the development of the Thomson Flats area. However, the design and development of the Thomson Flats neighbourhood acquired inspiration through the City of Kelowna's SW Mission Sector Plan (2007). Within the SW Mission Sector Plan, the Thomson Flats area (see Figure 3.1: SW Mission Sector Plan, 2007 below) is identified within 'Neighbourhood 2 and 3'.

The SW Mission community has experienced considerable development over the last 25 years. This is likely attributed to proximity to various city features and amenities, including Kelowna's downtown core, Okanagan Lake, schools, and other recreational amenities. Robust growth combined with rising land prices continue to provide incentives for businesses and individuals to locate within this desirable community.

The area is expected to continue to experience strong growth rates as people continue to seek home options within this community. Development of the Thomson Flats neighbourhood would introduce additional forms of housing stock to the market and potentially ease demand. This is especially critical as Kelowna's housing market continues to change and evolve. Further, additional housing produced within the Thomson Flats neighbourhood would significantly boost support and success of the Ponds commercial development, which is estimated at 300,000 sq.ft.

The Thomson Flats site is also an active recreational area for the Southwest Mission Community, both for motorized and non-motorized outdoor activities. As discussed in Sections 2.5 to 2.10 above, this has compromised some of the unique site features and environmental habitat of the area. The planned development of Thomson Flats provides opportunities to restore and protect valuable habitat and environmentally sensitive areas while accommodating recreational opportunities for residents in the area. As detailed in the sections below, the creation of parks, trails, and pathways is an important priority in cooperation with the preservation and enhancement of naturalized areas and open space, as well as the restoration of Rembler Creek.

Development of the Thompson Flats ASP also provides the City and residents the resources and the opportunity for critical transportation infrastructure in the form of the south Perimeter Road link. This connection will provide residents with a third arterial link out of the Southwest Mission through to the City centre and would be funded and constructed through the Thomson Flats lands as a part of the development. This link, in addition to the proposed density in support of additional neighbourhood amenities anticipated to reduce trips out of the area, is expected to provide relief to Gordon Drive and Chute Lake Road / Lakeshore Road for an overall improvement to the Southwest Mission Neighbourhood transportation network.



Figure 3.1: SW Mission Sector Plan, 2007

#### 3.2. VISION

Inspired by its natural landscape, recreational features, and existing surrounding neighbourhoods, the vision for the Thomson Flats Area Structure Plan is predicated on the natural progression of SW Mission neighbourhood. The hillside residential neighbourhood will grow through the application of principles, goals, objectives, and effective policy statements outlined below.

Thomson Flats will provide for a phased, single-family development neighbourhood supplemented by small multiple family housing pockets for a range of appropriate housing densities. The neighbourhood will be structured around a network of trails, pathways, parks, and rehabilitated natural landscape. The ASP establishes a guide for growth of land use, environmental, servicing, transportation, and economic considerations that reflects its historical context and the existing state of surrounding neighbourhoods. The development of the planned additional residential units will complete the original vision of the Southwest Mission Sector Plan and improve the viability of the commercial and institutional land uses in Neighbourhood 3.

#### 3.3. GUIDING PRINCIPLES

Thomson Flats will be an attractive neighbourhood that integrates and respects existing built form within SW Mission. Both residents and neighbourhood visitors will have the opportunity to travel through the pedestrian-oriented neighbourhood network and experience the unique recreation options and outdoor spaces. Residents will reside in single-family and multi-family (i.e. townhousing) dwellings and be in close proximity to neighbourhood and community destinations. There is a strong commitment to minimize impacts on the environment, yet provide ample places for outdoor activity and connections to the collective SW Mission community. Thomson Flats is fostered on the following guiding principles:

- Built Form + Character: promote high quality neighbourhood design, and character, and high quality urban design.
- Active Neighbourhood Living: promote Thomson Flats as a neighbourhood that encourages active and physical living through its ability to offer an array of fourseason formal and informal active transportation pursuits, formal parks, and open space areas.
- Connectivity + Mobility: provide a well-connected neighbourhood that is easy to navigate by foot, bike or car allowing for alternative access options and routes through the extension of streets, sidewalks and pathways in a pedestrian friendly environment; The South Perimeter road network is a focal point of this connectivity.
- Social Connectedness: promote a quality neighbourhood design that encourages social activation within the public realm (parks, streetscape, trails, etc.) and built environment.
- Fiscal Responsibility: embrace design and neighbourhood maintenance program that is cost effective to build, service, and maintain, while also ensuring that quality of life and livability is not sacrificed.
- Environmental Stewardship & Restoration: promote environmentally responsible development practices such as protection and preservation of environmentally sensitive areas, sensitive land development approaches, mitigation of light pollution, water efficient landscaping, water use reduction measures within buildings, and energy efficient buildings.
- Complete Community: the addition of the Thomson Flats neighbourhood will enhance and strengthen the SW Mission community, enabling residents to live a full lifestyle supported through existing and future community amenities, including schools, recreational pursuits, and commercial retail and personal services.

#### 3.4. GUIDING ARCHITECTURE + DESIGN

Architectural housing controls and guidelines remain an evolving process for Thomson Flats. However, such controls will be established in advance of detailed subdivision and development stages. Despite this, all architectural controls and guidelines for Thomson Flats are intended to reflect the diverse SW Mission community context. Guidelines will provide for a compatible variety of massing, colours and housing styles that will assist in achieving the overall vision for Thomson Flats. Accordingly, it is anticipated that a mixed 'vernacular' of west coast contemporary and the SW Mission's classic 'craftsman' architectural designs will be applied to achieve aesthetic building styles, forms, and massing.

### 4.0 LAND USE DEVELOPMENT CONCEPT

Thomson Flats will be an active neighbourhood touting its parks, open space, recreation, and restored natural landscapes network as focal features. An interconnected formal and informal trail and pathway network will seamlessly transition residential development areas with established neighbourhood areas, the existing and future school site, and the off-site commercial node located within the adjacent Ponds neighbourhood. The viability of proposed and existing neighbouring institutional and commercial amenities will be enhanced with the development of additional residential units.

The development concept is divided into current development horizon and future development horizon areas. The goal is to immediately proceed to the Official Community Plan amendment step for the current development horizon area. In the future, as key issues for the future development horizon area resolve themselves (for example, completion of the South Perimeter Road and its affect on traffic patterns, secondary access to the area through development to the west, buffer requirements for the transition at the City/Regional District boundary, the Forest Service Road relocation or closure) the next stages of the development proceed.

Architectural style, detailing of streetscapes, design of streetscape elements and landscaping are some of the components which will be used to establish a unique identity within the land use concept. See **Figure 4.1A:** Proposed Development Nodes**Current Development Horizon and Figure 4.1B Future Development Horizon** for developable areas.

The generalized land use concept (see **Figure 4.2: Generalized Land Use**) incorporates the primary goals and objectives identified within this section, while responding to the sensitive characteristics of the neighbourhood area. Low and medium density residential areas on the north and west of the site will be prioritized for development first (the current development horizon), with areas at the south end being held as future urban reserve (the future development horizon).

Hillside landscapes, and natural sensitive attributes are largely preserved (see **Figure 4.3: Slope Analysis with Development Nodes**).

The current development horizon is limited to an estimated 668 residential units resulting in a project population of about 1,577 residents. At its full build out, Thomson Flats is anticipated to produce an estimated 1200 residential units supporting an estimated population of approximately 2854 residents. The Generalized Land Use concept identifies the types and approximate locations of the anticipated land uses that form the neighbourhood. The land use concept divides the site into broad land use categories, namely residential, schools, parks and open space. These land uses are discussed further in the following sections.

#### 4.1. RESIDENTIAL

Thomson Flats will provide primarily single-family housing with the opportunity to accommodate a diversity of single-family housing choices including large lot, medium lot, and small lot options. Further opportunities exist for the area to be supplemented with the potential of up to 10-15% of the development area as multi-family housing (as the market may dictate). Thomson Flats' single family and multiple family housing typologies are offered in the following forms:

- Single / Two unit residential;
- Single / Two unit residential Hillside; and
- Multiple unit residential (low density).

The various types of housing products within the different development pockets are anticipated to evolve through development horizons and phasing (See Section 4.17 for additional development phasing details). Each housing pocket will be situated on either hillside benches of land that best lend itself to the site's natural topography or within the Thomson Flats valley bottom. Access to each development pocket

will be achieved through the broader transportation network. To the fullest extent possible, all housing forms, building heights, scale, and general massing will be designed to seamlessly transition with hillside landscapes and vegetation.

Given the site's topography, residential housing nodes present development challenges typical of hillside development. However, diligent planning and consultation with City staff were factored into the planning and design process to ensure that residential development nodes have practical mobility and transportation network access. Additionally, development will adopt a site sensitive approach and endeavor to minimize physical and visual hillside impact, further enhancing the neighbourhoods' visual appeal and aesthetics while reducing physical and environmental impact.



# **THOMSON FLATS AREA STRUCTURE PLAN**

### LEGEND

PLAN AREA

PROPOSED ROAD



CURRENT DEVELOPMENT NODE FUTURE DEVELOPMENT NODE DEVELOPMENT NODE AREA

## FIGURE 4.1A CURRENT DEVELOPMENT HORIZON

300m

75m 150m



# THOMSON FLATS AREA STRUCTURE PLAN

### LEGEND

PLAN AREA

PROPOSED ROAD



CURRENT DEVELOPMENT NODE FUTURE DEVELOPMENT NODE DEVELOPMENT NODE AREA

## FIGURE 4.1B | FUTURE DEVELOPMENT HORIZON

300m

75m 150m



NEIGHBOURHOOD PARK

MEDIUM DENSITY RESIDENTIAL



## FIGURE 4.2 | GENERALIZED LAND USE



# **THOMSON FLATS AREA STRUCTURE PLAN**





PLAN AREA DEVELOPMENT NODE AREA



0% - 15% SLOPE



## FIGURE 4.3 | SLOPE ANALYSIS WITH **DEVELOPMENT NODES**

DEVELOPMENT NODE

#### 4.2. PROJECTED DENSITY

Based on the land uses as illustrated within the concept plan, it is anticipated that the full build-out of the Thomson Flats neighbourhood could accommodate approximately 1200 units consisting of single family and multi-family residential homes. Development yield is a direct result of the planning process that identified non-development areas, such as parks, open space, hazardous areas (30%+ slopes), and environmentally sensitive areas.

Based on the proposed land use types and applying Statistics Canada's average household sizes to the corresponding housing types the Thomson Flats' estimated neighbourhood population is 2854. However, this estimated projection excludes any potential for secondary suites and carriage homes.

DEVELOPMENT AREA	ESTIMATED UNITS	AVERAGE / HOUSEHOLD	TOTAL POP. / AREA	POP. DENSITY PPL / HA)
А	35	2.4	84	31
В	94	2.4	226	31
С	71	2.4	170	30
D	48	2.4	115	30
Е	29	1.8	52	32
F	126	2.4	302	24
G	14	1.8	25	22
Н	20	2.4	48	39
L	34	2.4	82	15
М	20	2.4	48	22
N	10	2.4	24	22
0	9	2.4	22	9
Р	93	2.4	223	19
Q	22	2.4	53	25
R	23	2.4	55	23
V	20	2.4	48	19
Total	668	-	1577	-

#### Table 4.1A: Density Projections Current Development Horizon

Development	Estimated	Average	Total Pop.	Pop. Density
Area	Units	/ Household	/ Area	Ppl / ha)
I	38	2.4	91	24
J	84	2.4	202	22
К	136	2.4	324	39
S	15	2.4	36	26
Т	13	2.4	31	19
U	167	2.4	401	21
Total	472	-	1277	-

#### Table 4.2B: Density Projections Future Development Horizon

#### Table 4.3: Land Use Statistics

	Residential	Area	Area	Percent
Land Use	Units	(ac)	(ha)	
Single / Two Unit	1157	286.2	115.8	45%
Multiple Unit Low Density	43	6.7	2.7	1%
Dedicated Park	-	4.4	1.8	1%
Open Space	-	290.2	117.4	46%
Road Network	-	43.9	17.8	7%
Total	1200	631.4	255.5	100%

#### 4.3. FUTURE SCHOOL SITE

School District 23 advises they project 650 new students by 2030, with an additional 600 new students by 2040. Consequently, they expect a new school will be required in the Thomson Flats area to accommodate another middle, or small secondary school. The District advises their preference is to set aside a 3.25 to 4.0-hectare area for a school site. They also suggest the school site be adjacent to park land to maximize the potential for sport fields.

With this in mind, a school site is provided on Figure 4.2, Generalized Land Use.

#### 4.4. *MOBILITY* + *TRANSPORTATION*

The Thomson Flats mobility and transportation road network was designed to provide easy connectivity throughout the neighbourhood. Further, the road network was specifically designed to integrate with adjacent neighbourhoods, such as South Ridge, Kettle Valley, and the Ponds. Road connectivity with established neighbourhoods will occur as follows:

- Kettle Valley Chute Lake / South Perimeter Way / Upper Mission Drive
- South Ridge South Ridge Drive
- The Ponds Gordon Drive

Pedestrian accessibility is a high priority and encouraged through the extensive use of sidewalks and connecting trails and pathways offered throughout the neighbourhood. **Figure 4.4A: Mobility and Transportation** shows the roads and trails.

#### 4.4.1. MOBILITY CLASSIFICATIONS

The Thomson Flats mobility and transportation network will conform to the City of Kelowna's required road right-of-way widths for hillside collector roads, local roads, and public lanes, as identified by current policy and bylaws. Further, and in keeping with the City's goals and objectives in achieving great streets, design and construction of streets will be undertaken in close communication with the City to achieve best-practices.

The following is a description of the various mobility classifications that will be included within the neighbourhood.

#### ARTERIAL ROAD

Arterial roads are high-capacity urban roads, designed to deliver traffic from collector roads to freeways and between urban centers. Arterial roads prioritize free-flowing traffic and typically do not have driveway accesses or other impediments to free-flowing traffic such as frequent intersections, and traffic calming.

#### COLLECTOR ROAD

Collector roads perform the dual function of land access and traffic movement between arterial and local roads. However, this more localized type of road plays a social role, as well as a functional role in the neighbourhood. Specifically, collector roads offer the potential to include public shared-use pathways, providing for pedestrian and cycling connections through the Thomson Flats neighbourhood *and* surrounding neighbourhoods. Street design of collector roads must balance all of the objectives carefully.

#### LOCAL ROAD

Local roads serve a multitude of functions that are important in the day-to-day lives of residents, including passive recreation pursuits, and social interaction. Physical play by children occurs as a natural extension of the local neighbourhood park system, thus local roads must recognize the importance of the non-vehicle and vehicle landscape interface and corresponding design sensitivities.

#### PUBLIC LANE

Public lanes are utilized in areas of gentle terrain to support more compact housing forms, provide vehicular access along specific streets and to create a more pedestrian-friendly public realm. Lanes contribute greatly to the community fabric, and often they are used by the residents of a community as a venue for social interaction and play. It is anticipated that public lanes will be predominantly applied to multi-family residential development areas.

#### MULTI-USE TRAILS

Multi-use trails are non-motorized hard or soft-surfaced trails for the purpose of walking, jogging, hiking, cycling and wheelchair use (where possible) within open space areas that provide residents with access to viewpoints and nature areas. Integrating multi-use trails within the neighbourhood is restricted to those areas with less aggressive slopes and terrain. Although limited to the northeast and northwest fringe areas of the neighbourhood, they will provide access to adjacent neighbourhoods and include potential viewing areas.

#### NATURE TRAILS

Nature trails within Thomson Flats are located within dedicated natural and open space park areas. Although areas with more aggressive slopes and terrain, they help form an important component of the pedestrian network. Nearly five kilometres of trails fore use by residents for walking, mountain biking, and hiking surround the Thomson Flats Neighbourhood. However, depending on the level of environmental sensitivity that the trails may hold, specific passive activities (i.e. mountain biking) could be limited.



**AREA STRUCTURE PLAN** 

FUTURE ARTERIAL EXISTING COLLECTOR



EXISTING MINOR COLLECTOR FUTURE MINOR COLLECTOR

EXISTING TRAIL - – FUTURE TRAIL PLAN AREA

## FIGURE 4.4A | MOBILITY AND TRANSPORTATION

#### 4.5. TRAFFIC IMPACT ASSESSMENT

A comprehensive Traffic Impact Assessment has been completed for full build out (ie for the ultimate development which includes both the current and future development horizons) for Thomson Flats. This section is a summary of the assessment and **Appendix D** contains the full report.

The Traffic Impact Assessment study area is bounded by Stewart Road West to the east, Quilchena Drive to the west, Benvoulin Road to the north and the RDCO's Gillard Forest Service Road to the south. This figure illustrates the site location in the context of the transportation network and the study intersections.

**Background traffic** for the study is traffic growth related to population growth (0.5% per annum) plus full build out of the Kettle Valley, South Ridge and the Ponds areas. This build out assumes and additional 1000 single family and 300 multi-family residences.

**Total traffic** for the study adds potential development in Thomson Flats to the background traffic. This adds another 1110 single family residences.

While the City of Kelowna has been thoroughly involved in the completion of the traffic impact assessment, the results presented in the assessment and summary do not necessarily represent the final conclusions of the City of Kelowna. The City's conclusions and requirements associated with Thomson Flats will be finalized upon the completion of the next stage of the Traffic Impact Assessment and during subsequent stages of development, which include:

- The Official Community Plan amendment
- Rezoning
- Subdivision

The next stage of the Traffic Impact Assessment will include these components:

 Resolution and agreement on the approach for the remaining analysis for the key items that are relevant to the outcome

 Analysis for interim horizons, which include projections for traffic generated for the current development horizon development, projected traffic in 2024 and projected traffic in 2030

 An implementation, or staging, strategy for the improvements needed for the combination of projected background traffic and total (ie Thomson Flats) traffic

 Agreement regarding the proportion of financial responsibility for the City and developers for the improvements needed.

#### ROAD NETWORK IMPROVEMENTS

City of Kelowna 2019-2028 10 Year Capital Plan projects are partially funded by Development Cost Charges (DCC Roads). The timing indicated is based on this 2019 Capital Plan. Thomson Flats development will extend the South Perimeter Road from Chute Lake Road to Gordon Road and provide a direct, alternative access for the Upper Mission and Kettle Valley Neighbourhood area. Thomson Flats development will provide alternatives and flexibility for Upper Mission residents to reach destinations at Casorso Road and beyond.

**Figure 4.4B – Road Network Improvements**, on the following page, summarize the road network improvements.





N.T.S.

### FIGURE 4.4B | MOBILITY AND TRANSPORTATION

The recommendations for the background and total traffic horizons assume the road improvements in the City of Kelowna's current Capital Plan are implemented. The following summarizes all the suggested road improvements (Capital Plan, background traffic and total traffic).

2040 BACKGROUND HORIZON (BUILDOUT OF KETTLE VALLEY, SOUTH RIDGE AND THE PONDS)

- The following additional network improvements were identified as required in the background horizon to improve intersection operations:
  - Chute Lake Road & Quilchena Drive: Convert to 4-way stop;
  - Chute Lake Road & Barnaby Road: Construct a southbound right-turn lane;
  - Gordon Drive & McClure Road: Install Traffic Signals;
  - Casorso Road & Benvoulin Road: Construct northbound to eastbound right-turn slip lane; and,
- The Gordon Drive and Hazell Road intersection and the Gordon Drive and Okanagan Mission School Exit intersection should be monitored, and traffic signals implemented if required.
- The City should review the applicability of implementing traffic calming measures on South Crest Drive to reduce neighbourhood short cutting.

#### 2040 TOTAL HORIZON (BACKGROUND BUILDOUT PLUS THOMSON FLATS BUILDOUT)

- The following network improvements were identified as required in the total horizon to improve intersection operations:
  - Chute Lake Road & Upper Mission Drive: Construct a single-lane roundabout
  - Gordon Drive & Frost Road: Install Traffic Signals
  - Gordon Drive & South Perimeter Road: Construct a single-lane roundabout
  - Bedford Road & Saucier Road: Convert to single-lane roundabout
  - Bedford Road / Casorso Road / DeHart Road: Realign as a stop-controlled Tintersection
  - Casorso Road & Swamp Road: Further capacity improvements will be required.
  - Casorso Road & Benvoulin Road: Further capacity improvements, over and above those required above for 2040 Background, will be required.

#### LEVEL OF SERVICE - INTERSECTION CAPACITY

The Level of Service (LOS) for an intersection provides an indication of the quality of traffic operations. Intersection LOS denoted by letter grades 'A' through 'D' indicates a satisfactory level of operations, with 'A' being free flow and level 'D' representing conditions approaching congestion. Levels designated 'E' and 'F' represent increasingly congested traffic conditions. The LOS criteria for signalized and unsignalized (stop-controlled) intersections is presented in the table below.

#### LEVEL-OF-SERVICE CRITERIA

LEVEL-OF-SERVICE	SIGNALIZED INTERSECTION (SEC UNSIGNALIZED INTERSECT	
A	≤ 10	≤ 10
В	>10 – 20	>10 – 15
С	> 20 – 35	> 15 – 25
D	> 35 – 55	> 25 – 35
E	> 55 – 80	> 35 – 50
F	> 80	> 50

As a target or design parameter, the following was provided by the City of Kelowna for the study area:

- Unsignalized Intersection
  - Individual movement LOS is not to exceed LOS D, unless movement is very low compared to the other movements;
  - Individual movement v/c ratios not to exceed 0.90;
  - 95<sup>th</sup> percentile queue lengths do not exceed the available storage length;
- Signalized Intersection
  - Overall intersection LOS is not to exceed LOS D;
  - Individual movement LOS is not to exceed LOS E;
  - Individual movement v/c ratios not to exceed 0.90; and,
  - 95<sup>th</sup> Percentile queue lengths do not exceed the available storage length.

The target or design parameter determine if an improvement needs to be considered at that location.

#### LEVEL OF SERVICE - INTERSECTION CAPACITY

The following tables summarize the overall level-of-service at the study intersections for the morning and afternoon peak hours, respectively, for the 2016 traffic conditions, the 2040 final background traffic conditions and the 2040 final total traffic conditions (assuming the road system improvements are complete and increase in congestion/delay on Lakeshore and Gordon result in trip redistribution to other corridors as assumed by this analysis).

INTERSECTION	2016	2040 BACKGROUND (2040-B3)	2040 Total (2040-T3)
Chute Lake Road & Quilchena Drive	•	•	•
Chute Lake Road & Upper Mission Drive	•	•	•
Chute Lake Road & South Crest Drive	•	•	•
Chute Lake Road & Chute Lake Crescent / Frost Road	•	•	•
Chute Lake Road & Lakeshore Road & Barnaby Road	•	•	•
Lakeshore Road & Collett Road	•	•	•
Lakeshore Road & Eldorado Road	•	•	•
Lakeshore Road & Sarsons Road/DeHart Road	•	•	•
Gordon Drive & DeHart Road	•	•	•
Frost Road & South Ridge Road	•	•	•
Gordon Drive & Frost Road	•	•	•
Gordon Drive & McClure Road	•	•	•
Stewart Road W & Saucier Road	•	•	•
Bedford Road/Casorso Road & DeHart Road	•	•	•
Bedford Road & Saucier Road	•	•	•
Casorso Road & Swamp Road	•		•
Casorso Road & Benvoulin Road	•	•	•
Gordon Drive & South Perimeter Road	•	•	•

#### OVERALL INTERSECTION OPERATIONS COMPARISON - (MORNING PEAK HOUR)

No movements exceed the design parameters

One movement exceeds the design parameters

Intersection		2040 Background (2040-B3)	2040 Total (2040-T3)	
Chute Lake Road & Quilchena Drive	•	•	•	
Chute Lake Road & Upper Mission Drive	•	•	•	
Chute Lake Road & South Crest Drive	•	•	•	
Chute Lake Road & Chute Lake Crescent / Frost Road	•	•	•	
Chute Lake Road & Lakeshore Road & Barnaby Road	•	•	•	
Lakeshore Road & Collett Road	•	•	•	
Lakeshore Road & Eldorado Road	•	•	•	
Lakeshore Road & Sarsons Road/DeHart Road	•	•	•	
Gordon Drive & DeHart Road	•	•	•	
Frost Road & South Ridge Road	•	•	•	
Gordon Drive & Frost Road	•	•	•	
Gordon Drive & McClure Road	•	•	•	
Stewart Road W & Saucier Road	•	•	•	
Bedford Road/Casorso Road & DeHart Road	•	•	•	
Bedford Road & Saucier Road	•	•	•	
Casorso Road & Swamp Road	•	•	•	
Casorso Road & Benvoulin Road	•	•	•	
Gordon Drive & South Perimeter Road	•	•	•	

#### OVERALL INTERSECTION OPERATIONS COMPARISON - (AFTERNOON PEAK HOUR)

No movements exceed the design parameters

One movement exceeds the design parameters

#### CRITICAL MOVEMENTS AT INTERSECTIONS

The following tables summarize the critical movements at the study intersections for the morning and afternoon peak hours, respectively, for the 2016 traffic conditions, the 2040 final background traffic conditions and the 2040 final total traffic conditions (assuming the road system improvements are complete and increase in congestion/delay on Lakeshore and Gordon result in trip redistribution to other corridors as assumed by this analysis).

Intersection	2016	2040 Background (2040-B3)	2040 Total (2040-T3)
Chute Lake Road & Quilchena Drive	•	•	•
Chute Lake Road & Upper Mission Drive	•	•	•
Chute Lake Road & South Crest Drive	•	•	•
Chute Lake Road & Chute Lake Crescent / Fro	•	•	•
Chute Lake Road & Lakeshore Road & Barnab	•	•	•
Lakeshore Road & Collett Road	•	•	•
Lakeshore Road & Eldorado Road		•	•
Lakeshore Road & Sarsons Road/DeHart Road		•	•
Gordon Drive & DeHart Road	•	•	•
Frost Road & South Ridge Road	•	•	•
Gordon Drive & Frost Road	•	•	•
Gordon Drive & McClure Road	•	•	•
Stewart Road W & Saucier Road	•	•	•
Bedford Road/Casorso Road & DeHart Road	•	•	•
Bedford Road & Saucier Road	٠	•	•
Casorso Road & Swamp Road	•	•	•
Casorso Road & Benvoulin Road	•	•	•
Gordon Drive & South Perimeter Road	•		•

#### OVERALL CRITICAL MOVEMENTS COMPARISON – (MORNING PEAK HOUR)

No movements exceed the design parameters

One movement exceeds the design parameters

Intersection	2016	2040 Background	2040 Total
		(2040-B3)	(2040-T3)
Chute Lake Road & Quilchena Drive	•	•	•
Chute Lake Road & Upper Mission Drive	•	•	•
Chute Lake Road & South Crest Drive	•	•	•
Chute Lake Road & Chute Lake Crescent / Frost Road	•	•	•
Chute Lake Road & Lakeshore Road & Barnaby Road	•	•	•
Lakeshore Road & Collett Road	•	•	•
Lakeshore Road & Eldorado Road	•	•	•
Lakeshore Road & Sarsons Road/DeHart Road	•	•	•
Gordon Drive & DeHart Road	•	•	•
Frost Road & South Ridge Road	٠	•	•
Gordon Drive & Frost Road	•	•	•
Gordon Drive & McClure Road	•	•	•
Stewart Road W & Saucier Road	•	•	•
Bedford Road/Casorso Road & DeHart Road	•	•	•
Bedford Road & Saucier Road	•	•	•
Casorso Road & Swamp Road	•	•	•
Casorso Road & Benvoulin Road	•	•	•
Gordon Drive & South Perimeter Road	•	•	•

#### OVERALL CRITICAL MOVEMENTS COMPARISON - (AFTERNOON PEAK HOUR)

No movements exceed the design parameters

One movement exceeds the design parameters



#### TRAVEL TIME

Traffic delays and congestion are already experienced on Lakeshore Road and Gordon Drive under today's conditions. Currently, Lakeshore Road, at Eldorado Road, is over capacity in the northbound direction during the morning peak hour. As development proceeds (from Kettle Valley, South Ridge, The Ponds, and Thomson Flats), this delay will worsen over time and the afternoon peak hour will also become over capacity resulting in delays in the southbound direction. In other words, as the background development in the area proceeds, travel times for all existing residents will be longer in the future.

Due to this, residents will look for alternative routes to save time during their morning and afternoon commutes. With the development of Thomson Flats, South Perimeter Road will connect Chute Lake Road to Gordon Drive and this connection will offer alternative travel routes for residents. These alternative travel routes may offer time savings for residents depending on their origin and destination.

Six corridors were selected for travel time assessment:

- Lakeshore Road Point A to Lakeshore Road Point B (6.5 km): Upper Mission Drive to Barrera Road, utilizing Lakeshore Road only;
- Lakeshore Road Point A to Gordon Drive Point B (7.0 km): Upper Mission Drive to Barrera Road, utilizing Lakeshore Road, Dehart Road and Gordon Drive;
- Lakeshore Road Point A to Benvoulin Road Point B (7.6 km): Upper Mission Drive to 500 m north of the Benvoulin Road Roundabout, utilizing Lakeshore Road, Dehart Road, Swamp Road, Casorso Road, and Benvoulin Road;
- Gordon Drive Point A to Gordon Drive Point B (7.9 km): South Perimeter Road to Barrera Road, utilizing Gordon Drive only; and,
- Gordon Drive Point A to Benvoulin Road Point B (8.5 km): Future South Perimeter Road to 500 m north of the Benvoulin Road Roundabout, utilizing Gordon Drive, Swamp Road, Casorso Road, and Benvoulin Road.
- Stewart Road West Point A to Benvoulin Road B (5.9 km): Southern terminal of Stewart Road West to 500 m north of Benvoulin Road roundabout, utilizing Stewart Road West, Saucier Road, Bedford Road, Casorso Road, and Benvoulin Road. Once South Perimeter Road connects between Gordon Drive and Stewart Road West, an additional 2.4 km distance is added to this route.

The travel time analysis like a Google Directions Map below, which shows three route options and the travel times for each route traveling between an origin and the destination.



Sample Google Direction Map

#### 2040 TRAFFIC CONDITIONS

The traffic operations analysis for the 2040 horizon indicated that traffic delays and congestion are anticipated to occur on Lakeshore Road and Gordon Drive in the future. This will result in additional travel time and congestion and trips shifting to other corridors. With the final connection of South Perimeter Road, between Chute Lake Road and Gordon Drive, alternative north-south travel routes, such as Stewart Road West, are available to achieve similar or slightly longer travel times for residents on Lakeshore Road and Gordon Drive for background and total projections.

To develop the final background (i.e. development without Thomson Flats) and final total (i.e. development with Thomson Flats) traffic projections, an iterative process was undertaken that considered motorists existing travel patterns, travel times between origins and destinations for the six key routes, and the reassignment of traffic if an alternative travel route offered a shorter travel time. In both the background and total traffic scenarios, it was found that traffic will shift from their existing routes and look for a route that offers a shorter travel time.

The following table summarizes the anticipated travel times along the key routes in the Mission Area for 2016 traffic conditions, the 2040 final background traffic conditions and the 2040 final total traffic conditions. As expected, travel times for all existing residents will be longer in the future.

#### TRAVEL TIME COMPARISON

		AM PEAK HOUR			PWI PEAK HOUR		
ROUTE	2016	Background (2040-B3)	Тотаl (2040-Т3)	2016	Background (2040-B3)	Total (2040-T3)	
Lakeshore A – Lakeshore B	13	15	15	9	15	15	
Lakeshore A – Gordon B	13	16	16	14	16	17	
Lakeshore A – Benvoulin B	13	14	14	14	14	15	
Gordon A – Gordon B	12	15	15	11	14	15	
Gordon A – Benvoulin B	11	11	12	10	11	12	
Stewart Road West – Benvoulin B <sup>1</sup>		10	10		11	11	

<sup>1</sup> No travel time available for 2016 as South Perimeter Road is not constructed between Gordon Drive and Stewart Road West.

Despite adding an additional 1,100 vehicle trips in the PM peak hour to the network, the Thomson Flats development does not have a significant negative affect on the travel times in the Mission Area in the 2040 horizon when compared to the 2040 background travel. The projected travel times are either the same, or one minute longer. The connection of South Perimeter Road between Chute Lake Road and Gordon Drive provides a more equitable balance of traffic across the transportation network.

#### TRANSPORTATION SYSTEM UPGRADES AND ECONOMIC IMPACT

Upon Council support for the Area Structure Plan, the next stage of the Traffic Impact Assessment will be completed, which will include these components:

- Resolution and agreement on the approach for the remaining analysis for the key items that are relevant to the outcome
- Analysis for interim horizons, which include projections for traffic generated for the current development horizon development, projected traffic in 2024 and projected traffic in 2030
- An implementation, or staging, strategy for the improvements needed for the combination of projected background traffic and total (ie Thomson Flats) traffic
- Agreement regarding the proportion of financial responsibility for the City and developers for the improvements needed at each stage.

As part of the ASP, any problems anticipated in the orderly staging of development or off-site development impacts generated by the proposed development (e.g. additional funding requirements or costs to City, downstream servicing impacts, traffic) are to be identified. This will be completed in detail following the interim horizon analysis discussed above.

To start this process, we have reviewed the information available and provided by the City for the current capital plan and current development cost charge calculations. From this review, we expect:

- Thomson Flats development will be responsible for:
  - Completion of the South Perimeter Road from Chute Lake Road to Gordon Drive
  - Incremental cost of construction increases associated with the improvements required at the key intersections along the Stewart Road/Casorso Road/Benvoulin Road corridor. One example of an incremental cost is the provision of traffic lights at intersections where background development indicated that traffic lights are not required.
  - Improvements at the Maclure/Gordon and Frost/Chute Lake Road interesections
- Thomson Flats will contribute development cost charges and as a consequence more fully fund the Common and South Mission Roads DCC projects which include the improvements associated with the remainder of the South Perimeter Road, Stewart Road, Saucier Road, Casorso Road and Benvoulin Road.

#### 4.6. TRANSIT ACCOMMODATION PLAN

Transit service expansions are ultimately based on Central Okanagan Transit Service Guidelines.

For the Thomson Flats Neighbourhood to be serviced by transit in the future, WSP reviewed rerouting Routes 15, 16 or Route 17. The result is Route 17 is the best candidate as it would require the least amount of re-routing and can easily be extended into the study area to serve the community.

Further details are provided in the Traffic Impact Assessment in Appendix D.

#### 4.7. PARKS | OPEN SPACE | RECREATION

Thomson Flats is designed to provide both active and passive recreation opportunities, that enhance pedestrian connectivity as well as to serve a visual and social function. A comprehensive system of neighbourhood parks and pathways will provide connectivity within the immediate and surrounding neighbourhoods. The Thomson Flats open space areas will become a logical extension of the existing and open space network within the area.

Neighbourhood parks will be located in a manner that enhance social interaction as well as make a visual statement. All formal parks and integrated pathway and trail networks achieve a balanced distribution of open space within the broader neighbourhood. Rembler Creek will also be restored from its dilapidated state and integrated into the design as a linear park and trail and will be a noteworthy neighbourhood feature.

Figure 4.5A: Parks and Open Space illustrates the overall location of public parks, open space, trails and active and passive recreation areas.

#### 4.7.1. NEIGHBOURHOOD PARKS

Quality parks and open space areas define neighbourhoods, offer recreational opportunities, and in many cases provide measurable health benefits. Parks should provide important neighbourhood gathering areas and strengthen the well-being of a connected neighbourhood. The design and interface between residential use and parks and open space areas strongly determines the character and livability of neighbourhoods. It is an important criterion in the development of this ASP that parks and open space areas balance with developed areas and provide the elements necessary to meet the anticipated recreational demands of the neighbourhood residents.

The Thomson Flats ASP area will contain at least 3 neighbourhood parks as illustrated in **Figure 4.5A**: **Parks and Open Space** and will dedicated to the City of Kelowna by a combination of Development Cost Charge (DCC) credits and acquisition. Each neighbourhood park area will be at least 0.6 hectares in size and will have these characteristics:

- They will be adjacent to a road
- They will be rectangular or square in shape
- They will be on land that has slope less than 15%
- They will avoid ESA-1 and ESA-2 areas

The identified park sites are conceptual only and will be "fine tuned" at subsequent stages of development. As discussed in Section 4.3, it is expected that one of the neighbourhood parks will be adjacent to the new school site. At this stage, we expect the implementation of the parks will be:

- For the current development horizon:
  - For the western park in Area 1, once a threshold of 300 units is achieved
  - For the central park in Area 2, land dedication, grading and seeding with the construction of the South Perimeter Road and relocation of Rembler Creek. Further development of park infrastructure will be determined by the City.
  - For the eastern park in Area 3, upon development of the adjacent school site, or once a threshold of 900 units is achieved, whichever comes first.
- For the future development horizon, park dedication may be required, but this will be determined when development of this area proceeds.

#### 4.7.2. LINEAR PARKS AND TRAILS

As indicated on **Figure 4.5A**, there will be considerable development of approximately 20 km of trails along Rembler Creek and through the natural + passive recreation areas. **Figure 4.5B** provides a conceptual cross-section of Rembler Creek.

The conceptual western and central neighbourhood park locations can be integrated with the Rembler Creek trail network to provide a significant trail head opportunity.

#### 4.7.3. NATURAL + PASSIVE RECREATION AREAS

Protection and enhancement of natural areas was identified as a strong concern during the development of this ASP. It is important to protect the fragile balance between the realms of development and naturalized areas. The concept for the neighbourhood open space areas places high value on the integration of natural areas, trails, parks, and passive recreation areas. The current development plan has set aside approximately 117 ha or 46% of the site area for naturalized area, which excludes formalized park and trail areas.



**AREA STRUCTURE PLAN** 





FUTURE MINOR COLLECTOR

PLAN AREA

FIGURE 4.5A | PARKS AND OPEN SPACE



**AREA STRUCTURE PLAN** 

FIGURE 4.5B | REMBLER CREEK SECTION

#### 4.8. ENVIRONMENT + ECOLOGY

The goal in Phase Two of the Thomson Flats ASP Environmental Assessment, completed in the Spring of 2019, was to review the impact of the proposed ASP concept-layout in order to negate any further impact and loss of habitat; restore and reverse site conditions induced by historical use; and to create, enhance and protect habitat conditions. A comparison summary of the ASP concept layout to the Phase One ecosystem inventory is included in the Phase 2 Report, found in **Appendix C2 - Environmental Assessment – Phase 2**. The Phase 2 assessment of the ASP concept layout acknowledges the protection of 55% of existing green space across an array of ecosystems and habitat types, were biodiversity can be maintained, and provides a number of recommendations to help guide future development within the ASP based on the concept layout.

#### 4.8.1. FRAMEWORK

One of the primary focuses of this ASP to guide development that is consistent with the City of Kelowna, Provincial, and Federal environmental policies and regulations. It is also to help ensure that future development will protect the interfaces between future communities and natural and sensitive ecosystems that species rely on. Along with the City of Kelowna's core value of "No Net Loss", several fundamental conservation aspects were reviewed:

- Avoid Hydrological changes
- Avoid habitat destruction, fragmentation, and islandization and/or reduced biodiversity by:
  - Providing Linkages
  - Connect smaller habitats via linkages
  - Retain refuges
- Reduce wildlife conflicts

#### 4.8.2. ASP CONCEPT REVIEW

Although there is no single determining factor of how much environmental interface area should be left intact, environmentally relevant natural green spaces, parks, and corridors was reviewed. The results of this analysis are summarized in Table One of the Phase 2 Report, found in **Appendix C2** - **Environmental Assessment – Phase 2**. This review considered Terrestrial and Aquatic habitat impacts and Wildlife impacts. Of particular note is the accommodations made for the Great Basin Spadefoot Toad.

#### GREAT BASIN SPADEFOOT TOAD

A significant part of the environmental assessment was focused to wildlife species found within the ASP, of which the Great Basin Spadefoot Toad was found to breed in the wetlands along Rembler Creek; they were also detected in the Fraser Lake basin, to the north in the Ponds Development areas, and further north across Bellevue Creek. Key accommodations in this ASP are to maintain population and breeding connections from the north Fraser Lake and Ponds areas, as well as general terrestrial habitat throughout the ASP. Maintaining suitable migration corridors and habitat connectivity among road crossings and development nodes was a specific consideration of this ASP and will be adapted through detail design.

#### 4.8.3. ENVIRONMENT AND ECOLOGY RECOMMENDATIONS

As the neighbourhood develops the following environmental recommendations will be implemented;

- Designate no disturb areas prior to construction with flagging or temporary fencing;
- Minimize cut a fill slopes where possible utilize natural topography in the development design;
- Ensure construction activities are conducted during appropriate times of the year to avoid potential impacts to nesting and breeding wildlife;

- Hydro-seed disturbed sites shortly after construction, during appropriate times of the year to limit the potential of erosion and introduction of invasive weeds;
- Trails and recreational areas should be designed and constructed to avoid Environmentally Sensitive Areas (ESAs) and sensitive features where possible;
- Habitat corridors should be incorporated into the development to provide access between ESAs and avoid fragmentation and alienation of habitat and species. These features also provide higher aesthetic values within the development;
- Retain Habitat Trees where possible as part of the overall development design;
- Road crossings occurring on natural drainage or seepage sites will integrate measures to ensure the hydrogeological patterns are not altered to avoid impacts on riparian and wetland communities downslope;
- Aquatic Mitigation
  - At the DP level, complete assessment of condition and functioning of wetlands so that neither are impaired significantly by proposed development.
  - Restoration of Rembler Creek will require Provincial Authorization an City of Kelowna Approvals requiring further detail design and planning to occur.
  - Construction activities will require to be coordinated for Great Basin Spadefoot breeding rearing timing as not to impact species and the lifecycles.

Refer to Appendix C2 - Environmental Assessment - Phase 2 and


#### 4.9. INFRASTRUCTURE + SITE SERVICING

The ASP area is not currently serviced with any existing municipal infrastructure. As such, new infrastructure will be required to connect and service the area by extending infrastructure lines, connections, and road networks. WSP has reviewed and evaluated the preliminary servicing needs to provide Thomson Flats with potable water distribution and sanitary sewer collection and found that the existing systems can service the site with minor improvements and upgrades. Preliminary stormwater management strategies and transportation servicing options have also been developed.

#### 4.9.1. WATER SUPPLY

Water demands for the Thomson Flats development were calculated based on the projected neighbourhood populations and the estimates from the City of Kelowna Design Standards Schedule 4 of Bylaw 7900 (2012) as follows:

- Average Daily Flow (ADD): 900 L/capita/day
- Maximum Daily Flow (MDD): 1800 L/capita/day
- Peak Hour Flow (PHD): 4000 L/capita/day

The calculated demands for the ultimate development (current and future horizons) are summarized below in **Table 4.4A: Water Demands** Summary – **Ultimate Development.** 

#### Table 4.4A: Water Demands Summary – Ultimate Development

	AVERAGE DAILY [L/S]	PEAK DAILY [L/S]	PEAK HOUR [L/S]
Area 1	11.87	23.74	52.76
Area 2	10.76	21.53	47.83
Area 3	17.79	35.58	79.07
SUM	40.43	80.85	179.67

These ultimate demands were then applied to the more conservative 2030 scenario for evaluation.

The calculated demands for the current development horizon are summarized below in Table 4.4A: Water Demands Summary- Current Development Horizon.

Table 4.4B Water Demands Summary – Current Development Horizon

	AVERAGE DAILY [L/S]	PEAK DAILY [L/S]	PEAK HOUR [L/S]
Area 1	7.44	14.88	33.07
Area 2	5.54	11.08	24.63
Area 3	6.50	13.00	28.89
SUM	19.48	38.96	86.09

#### 4.9.1.1. PROPOSED DISTRIBUTION NETWORK

The Thomson Flats system is planned to include a piped distribution network that follows the proposed road layout. The proposed network was modelled, and results indicated that the majority (18.8km) of the proposed servicing network should be 200 mm in diameter with a small number of segments (0.9km) requiring 250mm diameter. All pipes were modelled with a Hazen-Williams coefficient of 100 to reflect a future "aged-condition" DI pipe. Due to the large variations in elevations across the development, three pressure zones are anticipated to be required to service Thomson Flats: 613m, 665m/666m, and 725m.

#### Figure 4.7: Preliminary Water Service Plan illustrates the system features.

#### 613 METRE ZONE

The 613m zone is required for the current development horizon, which is limited to property owned by Melcor and Canadian Horizons.

The 613m zone will be an extension of the existing 613m zone which is fed from Frost Reservoir via an existing PRV on Kuipers Crescent as well as three new PRVs. These new PRVs will be located near the 575 m contour line, two predominantly supplying water from the Frost Reservoir, and one supplying water predominantly from Gillard Reservoir.

The 613m zone will also be connected to the 552m zone via a normally closed valve. While this could be used to backfeed the 552m zone in an emergency, this would be causing a "pump-up, PRV-down" situation and therefore is not recommended for common practice.

Initial servicing will likely be via a connection at the current termination of South Ridge Drive with the additional PRV connections added as development progresses.

#### 665 METRE / 666 METRE ZONE

The 665m zone is required for the current development horizon, which includes a portion owned by Canadian Horizons and a portion owned by Schwerzfergers.

The 665m/666m zone will be gravity supplied directly by the Frost and Gillard reservoirs. The connection of these two reservoirs will also allow for an increase in operational flexibility as there is the potential to take one of the reservoirs temporarily out of service and maintain a level of service to customers in the zone by utilizing the other reservoir.

Initial servicing will likely be from the west side via a connection to the Gillard Reservoir at Gillard Forest Service Road. As development progresses a key piece of infrastructure will be the construction of the new main from the Frost Reservoir and 250mm main from Hewetson Ave to Area 3 in order to connect the zone to the Frost Reservoir.

#### 725 METRE ZONE

The 725m zone is required for the future development horizon, which includes all of the properties.

The 725m zone will service the highest areas of the Thomson Flats development which run along the south edge of the property. This will require a new booster station and should be complimented with a reservoir in the heights south of Area 3 in order to provide storage for PHD and MDD+FF service. The location of this reservoir has not yet been determined but should be at a sufficient elevation to provide a TWL of 725m.

A summary of all additional water infrastructure for Thomson Flats is described within **Table 4.5**: **Thomson Flats Summary Network**.

	QUANTITY	COMMENTS
NEW COMPONENT		
Pump Station	1	- At southwest Thomson Flats to provide sufficient pressure for the high elevation area along the south in the future development horizon area.
Reservoir	1	<ul> <li>Location on the property to achieve a top water level at 725 m</li> <li>For the future development horizon area.</li> </ul>
PRV	3	<ul> <li>Located near the 575 m contour to reduce the HGL as water travels from the 666 m pressure zone into the 613 m pressure zone</li> <li>Required for the current development areas.</li> </ul>
Pipes	~18.8 km	- 200 mm I.D. Pipes
	~0.9 km	- 250 mm I.D. Pipes

#### Table 4.5: Thomson Flats Summary Network

#### 4.9.1.2. DISTRIBUTION SYSTEM DESIGN CONSIDERATIONS

Watermains will be included in all roadways and lanes in accordance with the City's bylaws. Looping of the watermains for maintaining water quality will require careful, flexible design and coordination with other infrastructure, road alignments, walkway inter-connections between neighbourhoods and trail systems In particular, for the future development horizon area there is potential for a dead end at the east end of Node U, unless a loop can be provided in the road/lane system.

Development of the current development horizon will require extension of a watermain down the slope from near the Gillard Reservoir to the Node F area. It is inevitable that a temporary access road, and coordination with the trail system, will be required for this portion of the water supply.

#### 4.9.1.3. REQUIRED UPGRADES TO EXISTING SYSTEM

No upgrades are required to the existing network in order to service Thomson Flats; however, the City could consider upgrading portions of South Ridge Drive from 200<sup>ø</sup> to 250<sup>ø</sup> and portions of Frost Road and Steele Road from 250<sup>ø</sup> to 300<sup>ø</sup>, however this is an existing issue and not related to Thomson Flats.

#### CEDAR CREEK WATER SUPPLY SYSTEM

The Cedar Creek Water Supply System consists of an intake in Okanagan Lake, a supply line from the intake to the Cedar Creek Pump Station, a transmission main along Stellar Drive, a booster pump station on Stellar Drive and a transmission main to the Adams Reservoir. At the Adams Reservoir there is a treatment facility (for UV disinfection, filtration, and chlorination) and storage reservoir. The completed Stage 1 of this system's improvements achieved a design capacity of 275L/s. Stage 2 of this supply system's improvements will achieve a capacity of 825L/s.

The peak daily demand for 2030 provided in the model is 303L/s. The projected peak daily demand for Thomson Flats Neighbourhood is 81L/s, resulting in a total projected peak daily demand of 384L/s. This is well within the Stage 2 capacity for the Cedar Creek Water Supply System of 825L/s.

#### **PUMP STATIONS**

For the current development horizon, the readily expandable capacity at KVR (or Randhawa) and South Ridge pump stations will have available capacity. The first stage of expansion at the South Ridge Pump Station, or the expansion of the KVR (Randhawa) pump station may be necessary toward the end of the current development horizon for Area 1 and Area 2.

For the ultimate development horizon, the existing pump stations in Southridge and KVR have available capacity for Thomson Flats with one pump out of service. For the ultimate Thomson Flats development maximum day demand of 80.6 L/s, the readily expandable capacity at KVR (or Randhawa) and South Ridge pump stations will have available capacity.

The Stellar and Cedar Creek pump stations have available capacity for their total design flow, with a capacity of 400 L/s exceeding the project demand of 384 L/s. It is noted that the Kelowna Integrated Water Project is to increase the capacity of the Stellar Pump Station to 480 L/s.

#### RESERVOIRS

The combination of the Frost and Gillard reservoirs provide a total available storage of 4,500 m<sup>3</sup> that is readily expandable to 6,600 m<sup>3</sup> and will have available capacity for the initial phases of the Thomson Flats development. The existing reservoirs have adequate capacity for the current development horizon. For development of the future horizon areas expansion of one, or both, of these reservoirs will be required at some point.

The KVR (Adams) and Southcrest reservoirs at the 551m HGL have a total expandable storage of 6,700 m<sup>3</sup>.

Combined with proposed improvements associated with the Kelowna Integrated Water project, there may be sufficient storage at KVR (Adams) for the ultimate build-out of the Thomson Flats development, but this will need to be verified as area improvements and development progresses.

#### 20 YEAR SERVICING PLAN AND FINANCING STRATEGY

In the 20-year servicing plan and financial strategy the Stage 2 Cedar Creek Transmission System Improvements are identified as projects. Consequently, the City is collecting development cost charges for these improvements and the introduction of the Thomson Flats demands does not create an unexpected burden on the City's water supply system.

The City's 20 Year Servicing Plan also includes a water main improvement within the Upper Mission. Specifically, the water main improvement proposes to connect to the Adams and South Crest reservoir. If, and when this occurs, the overall improvement may enhance the Thomson Flats water supply system.

Based on the results of the study, the City of Kelowna water system does not require unexpected upgrades when the Thomson Flats water demands are introduced in the future.



#### 4.9.2. SANITARY SYSTEM

#### 4.9.2.1. THOMSON FLATS SANITARY DEMANDS

Sanitary demands for the Thomson Flats development were calculated based on the neighbourhood population projections found in Section 1.1 and the estimates from the City of Kelowna Design Standards Schedule 4 of Bylaw 7900 (2012) as shown below:

- Domestic Flow Rate = 300 litres/capita/day
- A reduction factor of 0.75 was used to calculate the Harmon Peaking Factor
- It was assumed that all additional pipes from Thomson Flats are above the water table, and therefore infiltration & intake rates (I&I) would be 5000 L/ha/day.

The calculated demands for the ultimate development (both current and future horizons) are summarized in *Table 4.6: Sanitary Demands Summary – Ultimate Development*.

	AVERAGE DAILY [L/S]	PEAK DAILY FLC	1&1	PWWF [L/S]
Area 1	3.96	11.17	3.70	14.87
Area 2	3.59	10.20	3.77	13.97
Area 3	5.93	16.18	5.71	21.89
Area 4	0.00	0.00	0.00	0.00
Area 5	0.00	0.00	0.00	0.00
SUM	13.48	37.55	13.18	50.73

#### **Table 4.6: Sanitary Demands Summary- Ultimate Development**

These demands were then applied to the more conservative 2030 scenario for evaluation.

#### 4.9.2.2. PROPOSED NETWORK

The Thomson Flats system includes a pipe network that follows the proposed road layout. Pipe alignments have been placed in road right-of-way for practical reasons such as cost and obtaining easements. New pipes within the development area were modelled as 200mm diameter PVC.

The proposed Thomson Flats network was modelled with connections to the existing system include tieins at:

- Lakeshore Road Servicing Area 1, portions of Area 2 and 3 via a twinned section with the existing sanitary main along Chute Lake Rd.
- South Ridge Drive servicing portions of Area 2
- Gordon Drive servicing portions of Area 3

For phasing purposes, the elimination of the Gordon Drive connection was also modelled to provide more conservative demands on the Chute Lake Road section. This will be a less expensive option, however will limit the development of Area 3 until after the development of Area 1 & 2.

Figure 4.8 shows the key features of the sanitary system.

A summary of all additional water infrastructure is seen in Table 4.7: Thomson Flats Sanitary Network Summary.

#### Table 4.7: Thomson Flats Sanitary Network Summary

NEW COMPONENT	QUANTITY	COMMENTS
Pipes	18.8 km	200 mm I.D. Pipes

#### 4.9.2.3. COLLECTION SYSTEM DESIGN CONSIDERATIONS

Sanitary sewers will be included in all roadways and lanes in accordance with the City's bylaws. In some areas, the sanitary collection system will require careful, flexible design and coordination with other infrastructure, road alignments, walkway inter-connections between neighbourhoods and trail systems to achieve suitable access for maintenance and perhaps to avoid shallow grades.

Within the current development horizon, Nodes H, Q, R and S a lift station may be needed due to grade considerations for crossing Rembler Creek. Alternative solutions to address this could be the installation of a heated gravity sewer on a pedestrian bridge over Rembler Creek as part of the Rembler Creek trail system or strata developments for these nodes.

#### 4.9.2.4. REQUIRED UPGRADES TO EXISTING SYSTEMS

The required off-site upgrades for Thomson Flats are the new sanitary sewer down Chute Lake Road, which is required for the development of the first area at the west end of the current development zone. Otherwise, with the City completing the Gyro force main project in 2020, the only other potential off-site sanitary sewer improvement at the Gyro Lift Station.

#### 2020 SERVICING PLAN

In the 20-year servicing plan and financing strategy, the Gyro Lift Station and Gyro Forcemain are identified as projects, consequently the City is collecting development cost charges for these improvements. This means that the Thomson Flats demands do not create an unexpected burden on the City's sanitary sewer system.





# **THOMSON FLATS AREA STRUCTURE PLAN**



EXISTING GRAVITY SANITARY LINE PROPOSED GRAVITY SANITARY LINE \_\_\_\_\_ ---- PROPOSED OFFSITE SANITARY LINE









































D







#### 4.9.3. STORMWATER MANAGEMENT

Assessment of the Rembler Creek catchment, as presented in the Thomson Flats Hydrogeological Assessment (see **Appendix G – Hydrogeology Report**) concluded that Rembler Creek is well suited to receive runoff flows from the Thomson Flats area, if adequate retention is in place to restrict flows to the pre-development conditions. It will be relatively straightforward to collect the storm water, direct it to a new drainage course (or storm sewer) and provide the detention/retention required to limit run-off to pre-development levels.

Careful coordination of road alignments, the new drainage system, detention systems, linear trails and park areas will result in amenities that create value for the Thomson Flats development and the future residents. In undertaking a comprehensive drainage plan for the area, standard City practices will be applied to ensure that pre-existing drainage flows do not exceed post drainage flow volumes.

With post-development flows being restricted to the pre-development rates, in accordance with a comprehensive stormwater management plan that follows best practices and the City of Kelowna development standards, no negative impact to downstream infrastructure is expected.

Figure 4.9: Preliminary Storm Servicing Plan shows the expected catchment areas, storm pond locations and outlets to Rembler Creek for the Thomson Flats drainage system. Figure 4.10: Predevelopment Storm Water Catchments shows the catchments for the entire watershed





# **THOMSON FLATS AREA STRUCTURE PLAN**



**BASIN BOUNDARY** PLAN AREA STORM POND



FLOW DIRECTION



300m

N

75m 150m





OVERLAND FLOW ESA 1



DETENTION POND DEVELOPMENT AREA

FIGURE 4.10 | STORM WATER CATCHMENTS

#### 4.9.4. SHALLOW UTILITIES

Shallow Utility servicing for electricity, communications, and gas will be provided by each respective utility, being designed and constructed in accordance with the most current applicable standards and in coordination with other utility servicing.

#### 4.10. DEVELOPMENT POLICY

Five principal land use policy areas have been identified within the Thomson Flats ASP. Requirements for land use, rezoning and subdivision plans will vary according to the location, context, and policy goals of each land use policy area. The following sections identify and provide policy statements to guide and inform future development of the area:

- General Land Use, Single + Medium Density Housing
- Mobility + Transportation
- Parks, Trails, + Open Space
- Environment + Ecology
- Neighbourhood Infrastructure + Servicing

#### 4.11. RESIDENTIAL LAND USE

Thomson Flats is an active neighbourhood touting its parks, open space, recreation, and restored sensitive environmental network as a focal feature. An interconnected formal and informal trail and pathway network will seamlessly transition residential development areas with established neighbourhood areas, the existing and future school site, and the commercial node located within the neighbouring Ponds neighbourhood.

#### 4.11.1. SINGLE-FAMILY HOUSING

- Single-family residential development shall address the Thomson Flats Area Structure Plan vision and generalized land use concept, which strongly encourages open and seamless connections throughout the neighbourhood with the intent to avoid neighbourhood divergence (i.e. gated communities).
- Development of residential nodes that provide for a variety of single / two-family housing forms and various lot sizes providing attainable housing choices that support of a range of income levels and age groups is encouraged.
- Single-family residential housing within Thomson Flats will be implemented in both the current and future development horizons.
- Modified or alternative land development approaches that complement the terrain and features and minimize unnecessary cuts / fills, hillside scaring, disturbance of wildlife and water courses, and visual impacts without compromising public safety are strongly encouraged.
- The retention of natural vegetation where feasible as well as the use of native and drought resistant vegetation for new development shall be strongly encouraged.
- The use of best practices in green building for all new construction is encouraged.
- Implementation of a comprehensive neighbourhood design control document (i.e. street furniture, trash receptacles, signage, street lamps, human-scaled lighting, landscaping, etc.) to provide consistent key unifying neighbourhood elements in accordance with City of Kelowna standards is encouraged.

#### 4.11.2. MULTI-FAMILY HOUSING

- Multi-family residential development shall address the Thomson Flats Area Structure Plan vision and generalized land use concept, which strongly encourages open and seamless connections throughout the neighbourhood with the intent to avoid neighbourhood divergence (i.e. gated communities).
- Development of low-density multi-family housing typologies in the form of town homes and row housing providing attainable housing choices that support a range of income levels and age groups is encouraged.
- Multi-family residential housing within Thomson Flats shall not exceed 15% of the total estimated housing yield.
- Multiple-family housing developments shall obtain a Development Permit to address form and character.
- Multiple-family housing developments shall be ground / street-oriented, where resident parking access via lanes, is encouraged.
- Encourage the provision of additional community amenities (such as pedestrian trails between buildings) as part of new development for public and semi-private open space and facilities at the time of rezoning / subdivision.
- Modified or alternative land development approaches that complement the terrain and features and minimize unnecessary cuts / fills, hillside scaring, disturbance of wildlife and water courses, and visual impacts without compromising public safety are strongly encouraged.
- The retention of natural vegetation where feasible as well as the use of native and drought resistant vegetation for new development shall be strongly encouraged.
- The use of best practices in green building for all new construction is encouraged.
- Implementation of a comprehensive neighbourhood design control document (i.e. street furniture, trash receptacles, signage, street lamps, human-scaled lighting, landscaping, etc.) to provide consistent key unifying neighbourhood elements in accordance with City of Kelowna standards is encouraged.

#### 4.12. *MOBILITY* + *TRANSPORTATION*

- Road design shall address multi-modal use where priority is given to pedestrians and cyclists.
- Minimize the number of direct access driveway connections along South Perimeter Road to effectively maximize vehicular safety and provide a continuous, uninterrupted shared-use pathway for non-vehicular traffic.
- Support a pedestrian-friendly mobility and transportation network through the development of street standards intended to reduce traffic speeds and establish safe pedestrian and cycling pathways.
- Transit-related improvements, such as right-of-way width for future bus pullouts and designated transit stop shelters for designated transit stops shall be provided in collaboration with BC Transit.
- Where necessary, the Developer shall design and construct a wildlife corridor, based the recommendations of the Environmental Report (attached hereto as Appendix C).
- Explore opportunities to reduce parking requirements for residential developments that promote car sharing co-operatives (i.e. Modo) or other forms of alternative transportation.
- Improvements to the existing road network as described in the Transportation Impact Assessment (attached hereto as Appendix D) shall be implemented according to a schedule and corresponding arrangement that is mutually agreed upon by the Developer and the City of Kelowna.

 Any necessary transit-related improvements per the Transit Accommodation Plan (attached hereto as Appendix E – Transit Accommodation Plan) shall be implemented according to a schedule and corresponding arrangement that is mutually agreed upon by the Developer and the City of Kelowna.

### 4.13. PARKS | OPEN SPACE | RECREATION

- Parks and open spaces shall be reasonably accessible for all forms of active transportation from each development area and incorporate a design that accommodates age-friendly needs and demands.
- Parks and open spaces will be designed to accommodate a wide variety of active and passive recreation opportunities.
- Parks, open space, and trail and pathway connections to facilitate access to new and existing features, including adjacent neighbourhood trails and the City of Kelowna's formal trail network will be encouraged, where possible
- Trails shall be designed to promote public safety, with appropriate buffers from major roadways while minimizing impact on sensitive areas.
- Pathways and pedestrian connectivity through the Thomson Flats ASP area should promote active transportation and accessibility, with different classes of trails designed to accommodate different abilities of residents in accordance with the City of Kelowna's Linear Parks Master Plan.
- Parkland will be designed to meet the needs of such users and patrons within the Thomson Flats neighbourhood.

#### 4.14. ENVIRONMENT + ECOLOGY

- Limit aggressive human use and activity within environmentally sensitive areas through the use of fencing and other measures as recommended by an environmental professional.
- Development areas will be "clustered" in areas that are not deemed environmentally significant wherever possible.
- Habitat areas shall be protected and enhanced as per the recommendations of the environmental consultant and their report.
- The Developer shall identify and preserve significant natural features.
- Where possible, the developer shall utilize innovative low-impact stormwater management solutions, such as bio-swales and permeable surfaces.
- Endorsement of environmentally responsible development practices such as light pollution mitigation, reduction of water use (buildings and landscaping), and energy efficiency measures is encouraged through comprehensive neighbourhood design control document.
- Disturbed ESA areas shall be remediated per recommendations within the Environmental Report (attached hereto as Appendix C1 – Environmental Assessment – Phase 1 and Appendix C2 - Environmental Assessment – Phase 2).

#### 4.15. NEIGHBOURHOOD SERVICING + INFRASTRUCTURE

#### SITE SERVICING

 The water distribution system shall be designed to adequately and efficiently service the development areas as per the proposed phasing plan.

- The wastewater collection system shall be designed to adequately and efficiently serve the development area.
- Where possible, collector roadways should incorporate low impact stormwater management principles.
- Land drainage and stormwater management facilities shall be designed to reduce the impact on the regional infrastructure system and shall be developed generally in conjunction with the mobility and transportation network that serves as a connection to off-site areas.
- A stormwater management plan shall be provided to ensure on-site drainage is maintained at pre-development flow rates and to mitigate environmental impacts from stormwater runoff, erosion, and sedimentation using a sustainable and low impact approach.
- Land and storm drainage systems should be designed to reflect a natural, rather than manufactured, appearance.
- Industry best-practices and environmentally responsible design approaches, such as low impact development, should be integrated in all servicing designs.
- Sharp cuts and fills and long linear slopes of uniform grade should be avoided, where possible.

#### SHALLOW SERVICES

- Utility rights-of-way shall be provided to accommodate utilities as determined necessary.
   Where possible, utilities will be located within the same right-of-way area.
- Utility rights-of-way and public utility lots shall be provided as required to accommodate the development or the extension of municipal utilities necessary for development.
- A developer may be required to provide, or enter into an agreement to provide when required, the utility rights-of-way necessary to accommodate the extension of municipal utilities through or adjacent to a site in advance of development in order to allow for the servicing of a site.

#### 4.16. DEVELOPMENT PERMIT AREAS

Pursuant to the Local Government Act Section 879 and 920, the City of Kelowna has included a number of Development Permit areas within the 2030 Kelowna Official Community Plan. The purpose of Development Permit Areas (DPA) is to provide protection to environmentally sensitive areas and hazard lands, wildfire interface protection, hillside development areas, and built form and character.

Thomson Flats development areas, or parts thereof, will be subject to the following 2030 Kelowna Official Community Plan DPA's:

- Natural Environment
- Hazardous Conditions
- Wildfire

The objectives and provisions for the guidelines are to be administered as a supplemental process to the 2030 Kelowna Official Community Plan. Further, development within Thomson Flats will be carried out in accordance with each of the applicable DPA guidelines, and guidelines set within the Thomson Flats ASP, while recognizing that the DPA guidelines take priority.

#### 4.17. IMPLEMENTATION + PHASING

The Thomson Flats ASP must be reviewed and formally accepted by City of Kelowna staff and Council prior to advancing through formal development processes. Upon acceptance of the document, the implementation of the ASP process will be initiated through a series of development processes, including,

but not limited to OCP amendment, rezoning, subdivision, and development permits. The proposed implementation, phasing, and development of Thomson Flats will specifically be achieved through a two-step process using: 1) the policy parameters set within the City's current OCP; and 2) policy parameters set within the City's future updated OCP. It is understood that the advancement of any development stage / phase is subject to the City's formal development approval process and adherence to current bylaws.

Upon Council support for the Area Structure Plan, the next stage of the Traffic Impact Assessment will be completed, which will include these components:

- Resolution and agreement on the approach for the remaining analysis for the key items that are relevant to the outcome
- Analysis for interim horizons, which include projections for traffic generated for the current development horizon development, projected traffic in 2024 and projected traffic in 2030
- An implementation, or staging, strategy for the improvements needed for the combination of projected background traffic and total (ie Thomson Flats) traffic
- Agreement regarding the proportion of financial responsibility for the City and developers for the improvements needed.

Following agreement regarding the Traffic Impact Assessment, the OCP amendment for the current development horizon areas will be conducted. The future development horizon areas will be designated as Future Urban Reserve.

In the future, as key issues for the future development horizon/future urban reserve area resolve themselves (for example, completion of the South Perimeter Road and its affect on traffic patterns, secondary access to the area through development to the west, buffer requirements for the transition at the City/Regional District boundary, the Forest Service Road relocation or closure) the next stages of the development process could proceed. When this occurs, another Official Community Plan amendment, supported by a comprehensive Neighbourhood Plan, will be required.

The current and future development phasing plan is illustrated below in **Figure 4.11 Development Phasing**.



## **THOMSON FLATS AREA STRUCTURE PLAN**

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PLAN AREA DEVELOPMENT NODE AREA

PHASE 2 DEVELOPMENT NODES - CURRENT DEVELOPMENT HORIZON PHASE 3 DEVELOPMENT NODES - FUTURE DEVELOPMENT HORIZON

## FIGURE 4.11 | DEVELOPMENT NODES BY PHASE

### 5.0 CONCLUSION

Thomson Flats is an undeveloped tract of land located within in Kelowna's Upper Mission neighbourhood at the east terminus of Chute Lake Road, south of Fraser Lake, traversing east to the City of Kelowna southeast municipal boundary, and south of Jack Smith Lake. The lands include five parcels, three landowners, and encompass a total of 255.53 hectares (631.43 acres).

Development of the site has been considered from as early as 1985 and has always been recognized by the City of Kelowna as a growth area. Accordingly, Thomson Flats is a location within the City's permanent growth boundary, where the Official Community Plan identifies the lands a future land use designation of 'Future Urban Reserve'. The Official Community Plan currently does not identify appropriate land use designations for Thomson Flats, nor does it provide a detailed planning framework for how the area should be developed. As such, the City of Kelowna requires that the lands be adequately planned through the City's established two-phase ASP process. In conjunction with the two-phase process, a comprehensive public consultation program has been undertaken and influenced this first plan.

This report encompasses the review, analysis, and results of background reconnaissance and technical studies, including an environmental assessment, geotechnical assessment, transportation and infrastructure servicing review, and a neighbourhood planning analysis. The results of the technical reports and analysis identified various site characteristics, features, potential development challenges, and site sensitivities. Technical study results have assisted in establishing a neighbourhood planning approach and identified the feasibility for site development. While the site presents development challenges, they are relatively minor in nature and can be mitigated through standard development applications. As such, urban development within Thomson Flats is highly feasible and presents various opportunities.

The development planning will be governed by the policy statements included in this ASP and by best practices. A range of single-family residential development, supplemented by supporting infrastructure, attractive active transportation, parks, and opens space areas are all possible to seamlessly coexist, while enhancing environmentally sensitive areas of the site.

Ultimately, a maximum of 1,200 residential units are proposed, but development will be implemented in stages. The first stage, the current development horizon is limited to an estimated 668 residential units resulting in a project population of about 1,577 residents. At its full build out, Thomson Flats is anticipated to produce an estimated 1200 residential units supporting an estimated population of approximately 2854 residents.

Upon Council support for the Area Structure Plan, the next stage of the Traffic Impact Assessment will be completed, Following agreement regarding the Traffic Impact Assessment, the OCP amendment for the current development horizon area will be conducted. The future development horizon areas will be designated as Future Urban Reserve.

In the future, as key issues for the future development horizon/future urban reserve area resolve themselves (for example, completion of the South Perimeter Road and its affect on traffic patterns, secondary access to the area through development to the west, buffer requirements for the transition at the City/Regional District boundary, the Forest Service Road relocation or closure) the next stages of the development process could proceed. When this occurs, another Official Community Plan amendment, supported by a comprehensive Neighbourhood Plan, will be required.