DISCOVERY

Outline Plan

July 2017

Associated Engineering

OLP00004 - Approved by the Municipal Planning Commission July 25, 2017 & September 5, 2017

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1. Introduction

1.1 Neighbourhood Theme

Discovery is a new neighbourhood proposed for Southeast Lethbridge. The neighbourhood has been designed to embrace Lethbridge's rich history related to its agricultural pioneers and indigenous people.

The construction of the St. Mary's irrigation canals in the early 1900s played an instrumental role in supporting the establishment of new communities in southwestern Alberta. Discovery represents the continuation of this community building influence. Much the same way that the irrigation canals linked early communities, Discovery has likewise been designed to link residents with employment, schools and other destinations that allow them to meet their daily needs on foot, bicycle, public transit, or in a car. Discovery features a comprehensive network of dedicated pathways and linear parks providing ample opportunity for existing and future residents to explore the area with minimal reliance on a vehicle.

The Blackfoot First Nation represents the original inhabitants of this area, taking advantage of the abundance of natural assets to meet their daily needs. Six-Mile Coulee represents one of the key community assets and is steeped in indigenous history and tradition. Discovery seeks to recognize and celebrate this rich indigenous history by incorporating features, signage and other design elements that recognize the Blackfoot culture.

> *"Discovery provides an opportunity for residents to experience and embrace Lethbridge's rich history while providing a place to build their future."*

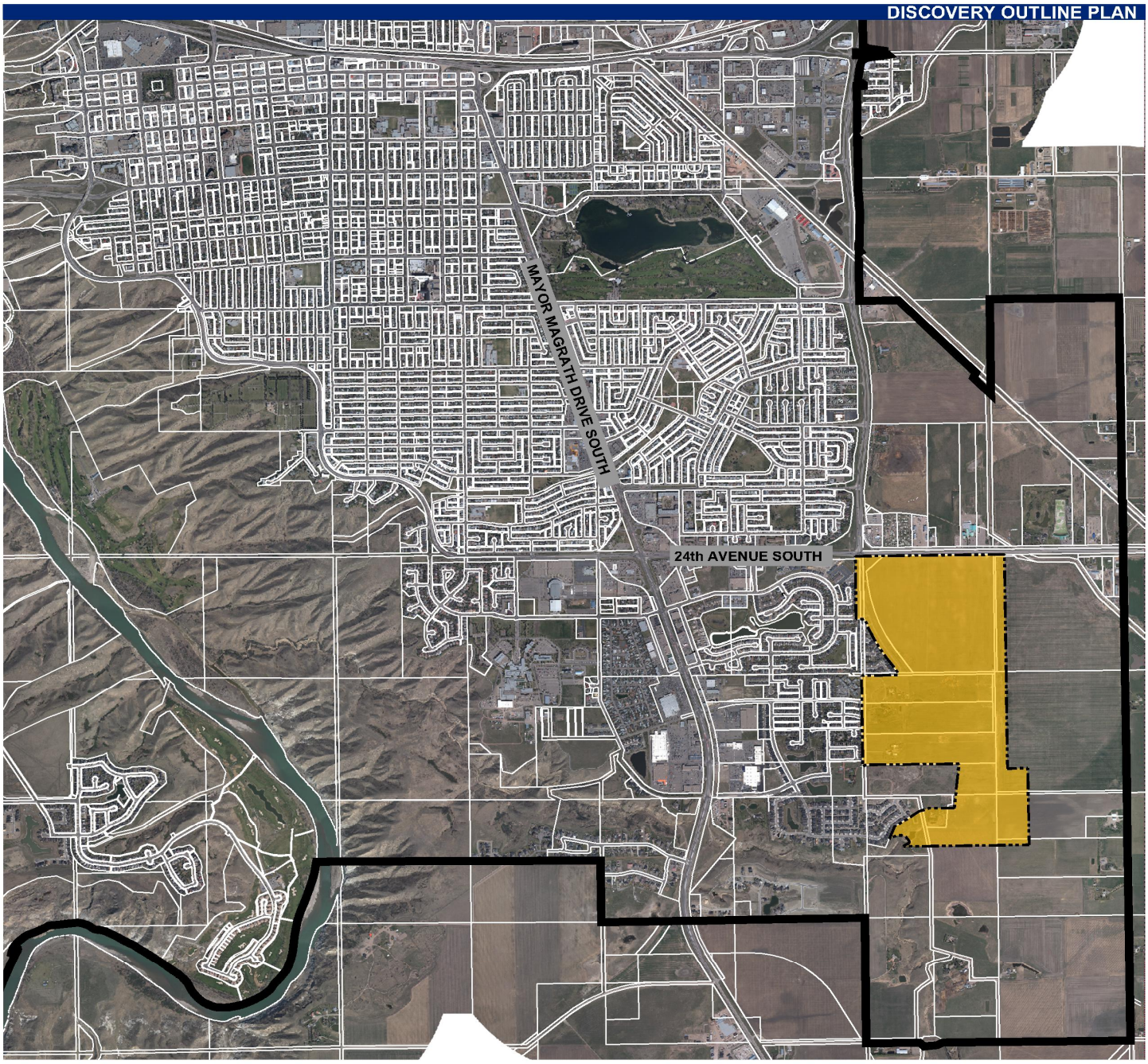
1.2 Plan Purpose

This outline plan has been prepared on behalf of the property owners within the R1a and R1b Outline Plan areas as defined in the South-East Area Structure Plan (SEASP). The plan is intended to provide a design basis for the future development of this area as illustrated in Map 1.

The plan provides information relating to:

- Land use types, distribution and intensity;
- Transportation networks;
- Core infrastructure layouts and development phasing; and
- Provision of public space and associated amenities.

This plan has been prepared in conformance with the City's higher level plans including the Integrated Community Sustainability Plan / Municipal Development Plan (ICSP/MDP) and the SEASP. In addition to considering the broader policy context, this plan also gives due consideration to the influence of natural and physical site conditions, existing and



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Map 1 - LOCATION PLAN

LEGEND

OUTLINE PLAN BOUNDARY

CITY OF LETHBRIDGE CORPORATE LIMITS

OUTLINE PLAN AREA

future land uses and municipal servicing capacities.

The plan area comprises 151.10 ha and is bounded by the existing 43rd Street to the west, 24th Avenue to the north, 51st Street to the east and extending south to the Six-Mile Coulee. A complete list of properties included within the plan area is attached as Appendix A.

2. Plan Context

2.1 Policy Context

South Saskatchewan Regional Plan

The South Saskatchewan Regional Plan (SSRP) is the primary tool for implementing the Provincial Land Use Framework prepared by the Government of Alberta. The SSRP takes a holistic approach to the management of land and natural resources, establishing broad based policies to guide responsible land management for 84,000 square kilometres of land within southern Alberta over the next 50-year period. The intention of the SSRP is to ensure that the many competing interests for limited land and natural resources is balanced and that communities continue to work towards a common vision. The following key strategies are established within the SSRP which apply to this outline plan:

Efficient Land Use

- Use the minimum amount of land necessary for new development and build higher density than current practice.
- Plan, design, and locate new development in a manner that makes the best use of existing and minimizes the need for new or expanded infrastructure.

Watershed Management

- Support healthy ecosystems and human needs through shared stewardships.

Quality of Life

- Preserve and promote the region's unique cultural and natural heritage resources.
- Promote active and healthy living.
- Provide recreation and nature-based tourism opportunities.
- Preserve and promote the regions unique cultural and natural heritage.

Aboriginal Engagement

- Invite Aboriginal people to share traditional knowledge to inform land and natural resource planning.

Community Needs

- Anticipate community development needs.
- Address challenges created by future growth.
- Collaborate throughout the land-use planning process with decision-makers and stakeholders.

Energy

- Ensure that opportunities for future routes and siting for pipeline gateways, transportation corridors and utility corridors are maintained in the region.
- Embrace opportunities for the responsible development of the region's renewable energy industry in support of Alberta's commitment to greener energy production and economic development.

Tourism

- Work with municipal government and other partners to identify, establish, and promote scenic byways in and around areas with high-quality attractions and recreation and tourism features including routes, trails, and waterways to create distinctive travel experiences and showcase the region's unique scenic resources and cultural landscape.

Integrated Community Sustainability Plan/Municipal Development Plan

The Integrated Community Sustainability Plan/Municipal Development Plan (ICSP/MDP) is the City's highest order local plan; establishing a policy basis to guide all forms of community development within the City of Lethbridge. The following key objectives were identified within the ICSP/MDP which influence decisions concerning the form and function of land use within the Discovery outline plan area:

Encourage urban design that promotes public safety and reduces opportunities for crime in parks, roadways and other public spaces.

- Apply Crime Prevention Through Environmental Design (CPTED) principles in neighbourhood design process considering natural surveillance, natural access control, and territorial reinforcement in the neighbourhood design process.

Provide for the integration of a diverse range of housing opportunities.

- Provide housing opportunities within the neighbourhood representing a broad range of income groups.

Encourage and provide opportunities for healthy living.

- Place a priority on creating a pedestrian friendly environment that maximizes neighbourhood permeability.
- Incorporate a range of active and passive recreational opportunities into the planned public open spaces and ensure that they are accessible to all residents.

Design the built environment to optimize opportunities for alternative energy and energy conservation and to consider the long-term impacts of climate change.

- Gradually increase residential densities in relation to existing built-up areas.
- Encourage and promote neighbourhood design and public spaces to mitigate the impact of climatic extremes.

Provide an efficient, effective and integrated multi-modal transportation network.

- Consider public transit within the neighbourhood design process to ensure easy access to public transportation.
- Design new neighbourhoods to improve pedestrian and cyclist access to destinations within and outside of neighbourhoods.
- Develop and maintain a sidewalk and pathway network that encourage safe, efficient, comfortable movement options for all residents.

Southeast Area Structure Plan

The Southeast Area Structure Plan (SEASP) builds upon the policies presented in the (ICSP/MDP) and provides a planning framework to guide the long term development and land use pattern in southeast Lethbridge. The following objectives within the SEASP influence decisions concerning the form and function of land use within the Discovery outline plan area:

Ensure sites of historic importance and traditional use are protected and effectively incorporated into the land use concept.

- Employ design features and interpretive signage within the Blackfoot Interpretive Park to reflect the rich history of the Blackfoot in this area.
- Commemorate the contributions of the Parry family through the dedication of a public park space in the immediate vicinity of the original family yard site.

Ensure that the SEASP area contains a range of housing that meets the needs of everyone.

- Provide housing opportunities within the neighbourhood representing a broad range of income groups.
- Maximize the provision of rear lanes to accommodate the development of secondary suites.

Establish a place for people to gather, build relationships and participate in civic life at Community Node 2.

- Establish a Village Centre as a key social, cultural and commercial centre for the area.
- Introduce a more urban landscape with a variety of amenities to attract and appeal to a broad segment of the public.
- Design the space as a higher intensity mixed use development.

Maintain a sufficient number of suitable schools to provide educational services to residents in the overall community and the SEASP area.

- Plan for a new elementary school in the area east of Fairmont and Southgate.

Utilize the Central Roadway as north-south parkway through the plan area that serves the needs of pedestrians, cyclists, public transit and private vehicles.

- Dedicate a linear parkway along 51st Street to accommodate multiple modes of transportation and to service as a corridor for major municipal infrastructure.

Establish a functional pathway and sidewalk network that serves residents, visitors and employees traveling for recreational and commercial purposes and as commuters.

- Provide a contiguous network of dedicated pathways and cycleways throughout the plan area to connect residents with community nodes and destinations.
- Utilize the ATCO high pressure gas line corridor as a key internal north-south pathway.
- Design the internal roadway system to provide a combination of dedicated pathways and cycleways to facilitate the efficient movement of users within the plan area.
- Provide a continuous network of sidewalks throughout the plan area.

Ensure that the internal roadway network is functional through strong integration with existing neighborhoods.

- Provide for the extension of Fairmont Gate, Southgate Boulevard and 40th Avenue into the plan area to provide existing residents with alternate points of access and egress from surrounding neighborhoods.

Parks Master Plan

The Parks Master Plan provides the following direction regarding the development of this outline plan:

Open spaces should be accessible to all age groups and physical abilities and should be barrier-free.

- Design open spaces to be accessible to all age groups and physical abilities.
- Design parks to attract and retain users.
- Provide a variety of amenities within the public open spaces ranging from basic shelter, shade and seating, to public washrooms and other conveniences as appropriate.

Parks should be connected to each other and to residential areas by the pathway system.

- Ensure that pathways and open space network are linked.
- Where appropriate, employ utility right of ways for recreation purposes. The design of the area shall complement park development and recreational use.

Parks can provide a dramatically diverse range of experiences; therefore, a variety of landscapes should be encouraged.

- Incorporate a range of landscapes to promote a variety of experiences within walking distance from residences including manicured turf and treed parks for passive and active recreation.
- Park design should recognize and take advantage of natural site features including sloping land, existing vegetation, and water bodies.
- Park design should promote low maintenance vegetation and materials.
- Bio retention and storm water facilities should be incorporated where possible to enhance the quality of storm water runoff.

Incorporating CPTED strategies in parks planning aims to reduce fear and the incidence of crime.

- Configure park boundaries to optimize visual access into the site with a compact, rectangular shape preferred.
- Locate planting and land forms to allow for visibility of play structures and walkways.

Bikeway and Pathway Master Plan

The Bikeway and Pathway Master Plan provides the following direction regarding the development of this outline plan:

The bikeway and pathway system should provide an interconnected hierarchy of routes which connect homes, neighbourhoods, communities, workplace and other destinations and recreational opportunities.

- Internal pathways should seek to connect residents to the planned community nodes, the proposed school site and to the existing commercial development along Mayor Magrath Drive.

Pathways should be classified and built per their function, volumes and the types of users. Each type of pathway in this hierarchy of functions will have differing characteristics such as width, design criteria and surfacing.

- Regional and local multi-use pathways shall be provided within the plan area.

Pathways and bikeways must be designed to be as safe as possible to encourage use by all ages and skill levels and reduce the potential for conflicts and accidents.

- Provide appropriate lighting along pathways.
- Consider incorporation of raised cross-walks in areas of high levels of vehicle and active transportation interactions.
- Where possible provide dedicated travel lanes.
- Consider pedestrians and cyclists in the overall streetscape design through the incorporation of on-street and shared bike lanes.

Transportation Master Plan

The Transportation Master Plan provides the following direction regarding the development of this outline plan:

Higher densities are necessary to support all modes of transportation.

- Promote complete neighbourhoods with a range of land uses, densities, and services.
- Employ a modified grid street pattern.
- Provide pedestrian and cycling connections to major activity centers and transit stops.
- Cluster higher density residential developments near public transit routes.

Focus development in targeted nodes and corridors serviced by transit and intensify uses and activities in these areas (transit-oriented developments).

- Link transit to community nodes, schools and commercial retail centres

Design streets to create better pedestrian, cycling and transit supportive environments

- Design streets to increase walking, cycling and public transit use and reduce potential conflicts with vehicles

that are related to traffic volume and speeds.
- Consider factors such as ease of street crossing, sidewalk continuity, street connectivity and topography in establishing street designs and layouts.

Consider traffic calming as an effective means of reducing the negative impacts of traffic on the quality of life for Lethbridge residents in the existing and future neighbourhoods and built-up areas.
- Incorporate traffic calming within the street design and layout to reduce vehicle speeds, to encourage positive interactions between vehicular and non-vehicular movements and to increase overall community livability.

Consider the life cycle benefits and costs when planning, maintaining and operating the transportation system.
- Use the City's roadway classification system to define the degree of access control applied to the roadway network.

2.2 Physical Context

The plan area is primarily undeveloped, cultivated farmland except for several rural residential dwellings situated in the southern half of the plan area. The area is relatively flat with geodetic elevations ranging between 910.9 and 919.8 metres. The topography of the area may be described as knob and kettle, featuring small localized low areas and high points. The lands in the north half of the plan area generally slope towards the northeast, whereas lands within the southern portion of the plan area generally slope towards Six-Mile Coulee to the southwest. Although the lack of overall grade provides some servicing challenges, it presents few physical constraints to development.

The St. Mary's irrigation canal extends to the northeast of the plan area with a minor tributary canal running along the eastern boundary supporting an existing pivot irrigation system to the east of the plan area.

An 8" ATCO high pressure gas line extends from north to south near the eastern boundary of the plan area. This line is intended to remain in its current location and incorporated into the neighbourhood layout as a linear park. All dwellings or buildings intended for human occupancy shall maintain a minimum 15.25 m setback from this facility as required by the City's Land Use Bylaw. A power line right-of-way also extends along the northern boundary of the plan area and is intended to be incorporated into the neighbourhood design.

A privately-owned aerodrome was located in the plan area and has been decommissioned in anticipation of development in this area. A copy of the letter confirming the closure of this facility is attached as Appendix B.

A desktop geotechnical investigation was completed in conjunction with the preparation of the SEASP. This preliminary investigation was intended to comment on the general subsurface conditions within the plan area, to provide recommendations for the geotechnical aspects of design and construction and to provide high order recommendations concerning development adjacent to the Six-Mile Coulee. The safe development setback shown in the SEASP was established by the River Valley Area Redevelopment Plan as part of a safe development setback line for the entire City. The established safe development setback line forms a portion of the SEASP and Discovery Outline Plan boundaries.

A series of more detailed geotechnical evaluations were performed within the Discovery Outline plan area to build on the information presented in the above noted technical document that was completed for the SEASP. Soil testing within the north half of the plan area (R1a) confirmed that the soil stratigraphy comprises a surficial layer of topsoil extending up to 300 mm. A clay deposit was encountered at depths ranging between 0.5 m and 2.6 m. Underlying these layers is a glacial till deposit extending beyond the borehole termination depth of 12.7 m. Depth to groundwater ranged from 1-metre to dry with seasonal fluctuations expected.

Soil testing in the south half of the plan area (R1b) confirmed a similar soil stratigraphy with clay fill encountered at a depth of 0.5 m, extending to a depth of 4.6 m. Soils below depths of 4.6 m are described as clay fill with trace sand and gravel deposits. Depth to groundwater in the R1b area range between 0.6 m and 8.41 m. The report does not anticipate any groundwater related problems.

The report indicates that slopes approaching Six-Mile Coulee are moderate and generally covered with native grasses. The report acknowledges the existing safe development setback established during the SEASP and recommends that a separate site specific slope stability assessment is completed at a future date corresponding with detailed design for this area. Further detailed geotechnical investigation that includes a borehole drilling program and more accurately demarcates the safe development setback line will be completed prior to subdivision approval for lands adjacent to the

Six-Mile Coulee.

Subject to the further geotechnical investigation as described above, the geotechnical evaluation completed for the Discovery Outline Plan did not identify any subsurface conditions which would impede or significantly constrain development on the site. Local soil conditions are deemed to be appropriate for site grading and for use as landscaping and engineered fill material with minimal soil conditioning required. A copy of the geotechnical investigations is attached as Appendix C.

A Phase I Environmental Site Assessment was conducted for the north half of the Discovery Outline Plan area (R1a) to comment on past or present land use, either off site or on site, which may have a potential to cause environmental impairment to the site. This investigation noted the existence of an illegal dump site situated adjacent to Gateway Mews consisting of yard and construction waste and soil but concluded that no further intrusive environmental investigation is required now but that an environmental professional should be consulted if any suspicious materials or staining are observed during remediation of the dumping site. A copy of the Phase I Environmental Site Assessment is attached as Appendix D.

A Phase II Environmental Site Assessment (ESA) as conducted for the lands situated within R1b. This investigation confirmed the former existence of an irrigation canal extending in an east-west direction through legal subdivisions 5 and 6 in Section 22-08-21-W4M. This canal has been previously decommissioned and reclaimed. There is evidence of three decommissioned and five active dugouts within the area of study. The 2013 Phase I ESA completed by EBA Engineering Consultants Ltd. (EBA) identified the potential for methane generation in former canals and dugout areas from buried organic material (EBA 2013). Although methane generation is not an environmental risk, if construction plans require excavation/trenching (< 1 m) within former dugout or canal areas where buried, saturated organic sediments exist, a methane monitoring plan should be prepared by the contractor prior to commencement of excavation. Further desktop review of canals and dugouts within R1b by Associated Engineering does not indicate the presence of contamination; therefore, further assessment and remediation is not recommended. Historic dugouts and canals have been filled with unknown materials. It is assumed that local soil was used as fill; however, other materials may have been included and future excavation during construction activities in these areas should be observed for undesirable or potentially contaminated materials. Active dugouts should be pumped out and organic sediments removed and appropriately disposed prior to further development – approval or licensing may be required under the Water Act (i.e. Temporary Diversion License (TDL) for pumping out water) depending on volumes of existing dugouts.

The area of study also includes seven active private on-site wastewater disposal systems. Private on-site wastewater disposal systems inherently contain substances (pathogens, viruses, etc.) which require special handling procedures during decommissioning and should be completed by an experienced contractor; however, there are no municipal or provincial requirements for environmental testing of the surrounding soils or groundwater unless evidence is obtained that indicates the likelihood of potential widespread environmental degradation (EPEA Schedule of Activities 5(l)). During redevelopment activities, it is recommended that general procedures are followed to ensure proper septic system decommissioning to avoiding any potential environmental impacts or human health issues in the process (adapted from Manitoba Conservation):

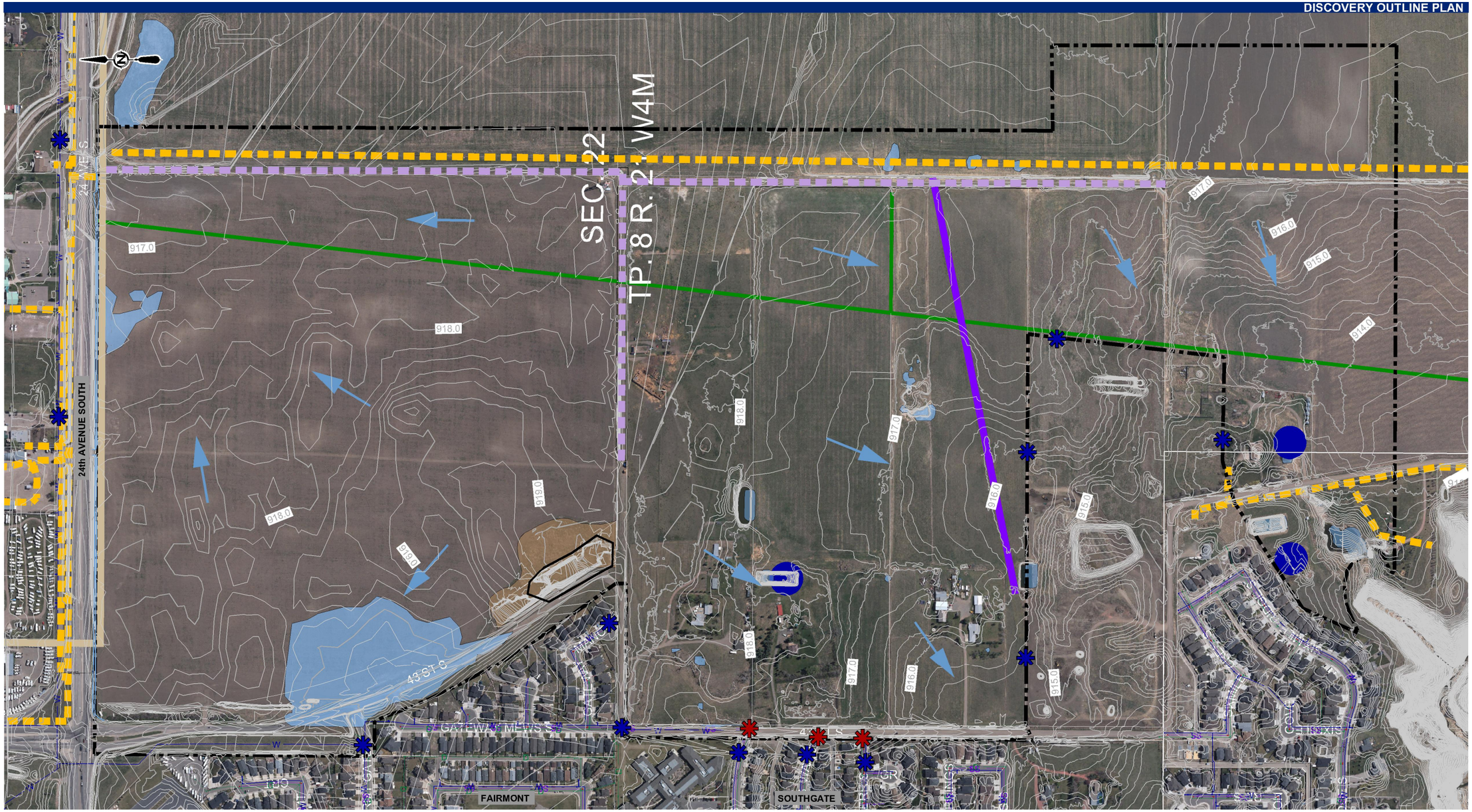
- All solids and liquids from septic tanks should be removed by an approved sewage hauler;
- All power is to be disconnected and lines, devices removed and disposed at the appropriate disposal facility;
- Tanks should be removed and disposed at an approved disposal facility;
- Septic fields (if present), should be allowed to dry for one year, if possible, for pathogens to die off; contents of

piping and other containment should be removed by an approved sewage hauler;
- All associated materials including piping and geotextiles should be disposed at an approved disposal facility;
- If septic fields must be removed within one year, excavated materials (aggregates and soils) should be disposed at an appropriate disposal facility or stockpiled on-site in such a way as to prevent surface run-off and to prevent contact with humans and animals;
- Excavated aggregates and soil may be reused on-site but should remain >30 m from any surface water body (including flood areas) and should be covered with >15 cm of clean soil; and
- Excavated aggregates and soils which have not been allowed to dry for one year prior to excavation may be re-used on-site if they are allowed to dry for one year following excavation.

Further investigation was completed for one of the existing country residences situated east of 43rd Street. The site exhibited evidence of automotive, heavy equipment and aviation related activities that could possibly result in soil contamination. The Phase II ESA consisted of a combination of desktop investigation and a field survey of the site to evaluate soil conditions in the immediate vicinity of the area of potential environmental concern. The report concluded that there are no impacts of environmental concerns with the soils tested and recommended diligent observation during decommissioning of the site to determine if there is potential sources of contamination within or below the buildings and/or structures on the site.

A follow-up biophysical survey was completed to supplement a biophysical impact assessment completed for the SEASP focusing on gaps in the initial assessment. The survey inventoried sensitive biological and physical features including existing water bodies, wildlife habitat and rare plants to determine potential development constraints. The report, attached as Appendix E, concluded that of the existing water bodies within the plan area only the wetland situated in the southwestern tip of the plan area near the Six-Mile Coulee will require Water Act approval as development proceeds. The survey indicated that although no amphibian habitat was observed in the plan area; the wetland and the dugout situated directly north should be re-surveyed prior to initiating construction to confirm that both waterbodies remain free of leopard frog habitat. The report also identified the need to complete a nest search during the spring and summer months in the locations where bird species were observed prior to development of the lands.

Within the context of the SEASP, Alberta Culture and Tourism granted clearance to the lands within the plan area situated above the banks of Six-Mile Coulee per Section 31 of the Historical Resource Act. Based upon this clearance, no formal Historical Resources Impact Assessment for either archaeological or paleontological resources is required in these areas. A copy of the clearance letter is attached as Appendix F. Development below the top of the bank of the coulee will likely require an additional archaeological investigation, depending upon the type of development undertaken in this area. This additional investigation will be completed following further consultation with the provincial ministry.



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Map 2 - Existing Conditions

LEGEND

- HYDROLOGY
- NATURAL LOW SPOTS
- SOIL / DEBRIS STOCKPILES
- OUTLINE PLAN BOUNDARY
- DECOMMISSIONED AIR STRIP
- APPROXIMATE GAS LINE LOCATION
- ACTIVE DUGOUT
- IRRIGATION CANAL
- 138 kV TRANSMISSION LINE
- FLOW DIRECTION
- 0.2 METRE CONTOURS
- EXISTING WATER DISTRIBUTION SYSTEM
- EXISTING WASTEWATER SYSTEM
- EXISTING STORMWATER SYSTEM
- APPROXIMATE LINE FOR TELECOMMUNICATION
- POTENTIAL WATER MAIN TIE-IN LOCATION
- LIMITED WASTEWATER SYSTEM CAPACITY AVAILABLE

2.3 Land Use Context

There are five existing rural residences situated near the western boundary of the plan area including the former Parry residence adjacent to Southgate. With the exception of the former Parry residence which has been incorporated into the land use concept so it may be retained following neighbourhood development, the balance of the existing rural residences are considered interim uses which will need to be relocated or removed as neighbourhood development proceeds in the future.

Various commercial businesses are situated along the northern boundary of 24th Avenue (Highway No. 4) including Skyline RV Center, The Craft Store, Enviro Smart, Green Acres Animal Hospital and the Evangelical Free Church. The lands to east and south of the site are currently undeveloped irrigated farm land.

Fairmont is situated directly west of the plan area and comprises predominantly low density residential development with pockets of medium and high density residential development situated along 24th Avenue. Higher density residential development in the area consists of semi-detached town-homes and three story apartment style condominiums. Fairmont includes large scale highway commercial developments situated along both 24th Avenue and Mayor Magrath Drive. Residential development densities in the Fairmont Park Area are estimated at an average of 15.9 units per net hectare.

Southgate is situated directly west of the plan area with development initiated in 2005. Like Fairmont, development within Southgate predominantly comprises low density residential development with pockets of medium and high density residential development backing the commercial development along Mayor Magrath Drive. Medium density residential development in this area includes row housing, triplexes, fourplexes and low rise apartments. The Southgate Outline Plan established a target gross population density of 22.6 units per net hectare excluding the commercial area. The internal roadway network of Fairmont and Southgate has been designed using a combination of through-roads, p-loops and cul-de-sacs with Fairmont Gate, Southgate Boulevard and 40th Avenue representing the primary road connections into Discovery.

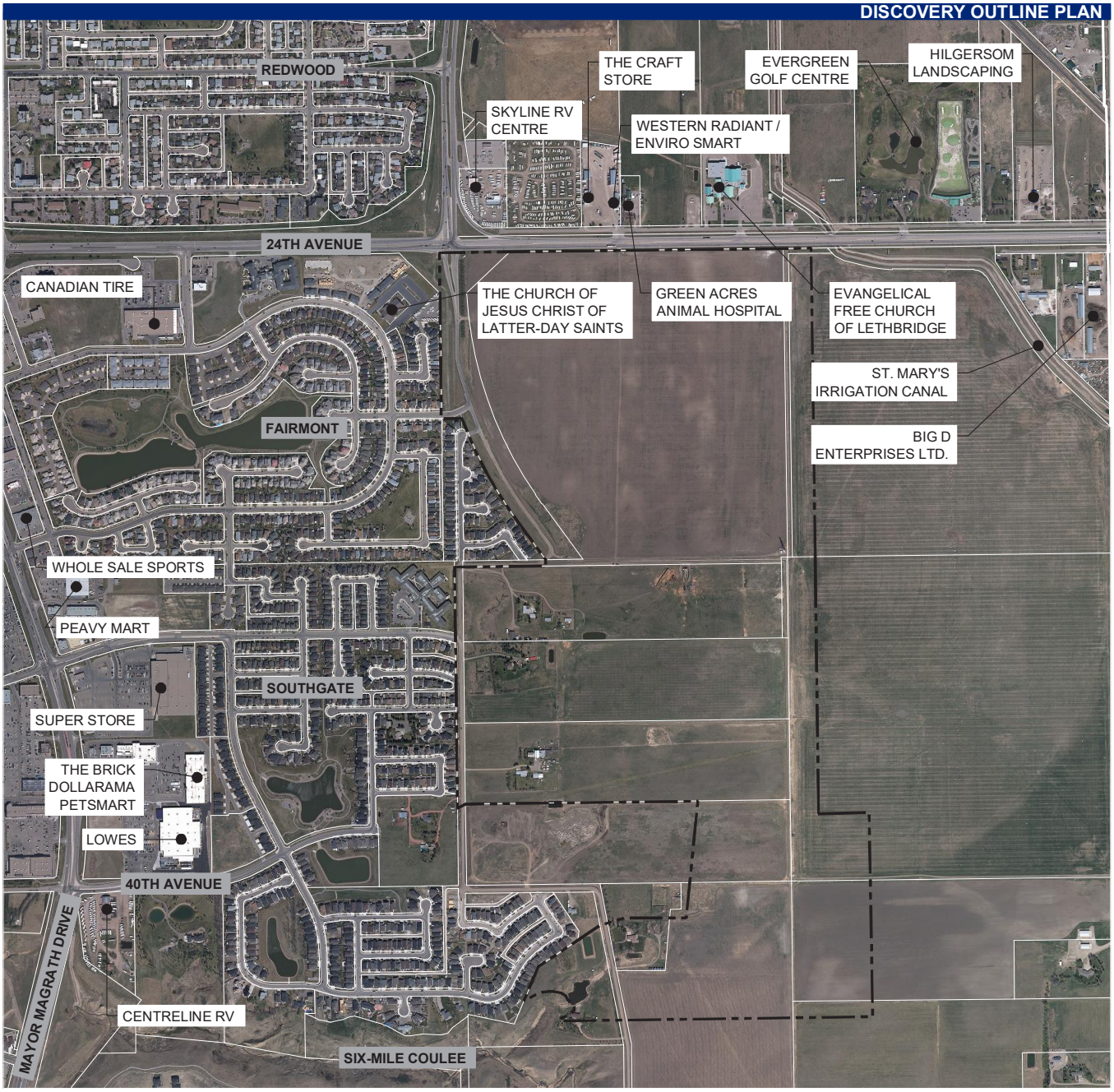
2.4 Servicing Context

Transportation

24th Avenue (Highway No. 4) defines the northern extent of the plan area and is a four-lane divided provincial highway, constructed as a semi-urban cross-section with a concrete median and open ditches. Based upon the application of the City's design standards, 47th Street and 51st Street are the only roads that will have direct access to 24th Avenue. Fairmont Gate , Southgate Boulevard and 40th Avenue represent the key vehicle connections between the plan area and the adjacent Fairmont and Southgate neighbourhoods to the west.

43rd Street borders the western boundary of the plan area and is intended to be closed in conjunction with the development of this area with portions of the roadway being redeveloped as a linear park corridor or local roads.

The internal roadway network within Fairmont and Southgate is predominantly curvilinear. The intention within Discovery is to transition from this type of a roadway network to a modified grid which has shown to increase



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Map 3 - Existing Land Use

LEGEND

OUTLINE PLAN BOUNDARY

connectivity and walkability within and between neighbourhoods by maximizing the number of routing options; dispersing traffic and decreasing vehicle and pedestrian interactions.

Stormwater Management

Management of storm water flows within the plan area and throughout the SEASP will require the construction of new infrastructure to connect to a planned outfall in Six-Mile Coulee. A future gravity storm sewer trunk is intended to be constructed within the 51st Street right-of-way situated along the eastern boundary of the plan area. The neighbourhood layout will utilize natural low areas to collect and temporarily store run-off prior to discharging to the future trunk sewer. The SEASP estimates that there is approximately 200 L/s of existing capacity in the current storm sewer system situated within Southgate. It is expected that this existing storm sewer capacity will be apportioned equally between the southern and northern areas of the neighbourhood. Development of lands in the northern area of the neighbourhood will necessitate the extension of a new sewer trunk to connect with the existing connection near Southgate Boulevard S.

Sanitary Sewer Collection

The SEASP identifies limitations in the current capacity of existing sanitary sewer infrastructure in south Lethbridge. An assessment of the downstream capacity of the sanitary sewer collection system indicates that the current system is operating at capacity and that development within Discovery will require the construction of a new sanitary sewer trunk extending to the City's wastewater treatment plant situated in north Lethbridge in the future. Site specific storage solutions are being investigated for the area surrounding the proposed new elementary school site to bridge the capacity shortfall and to meet the timing requirements for school development. Any additional development beyond this amount of land will require the construction of the new sanitary trunk.

Water Distribution

Potable water is intended to be extended into the plan area from existing municipal supply lines located at Fairmont Gate , 47th Street, Southgate Boulevard and at 43rd Street. The expansion of the water distribution network is supported by an existing reservoir located within Southgate. Water distribution capacity is not anticipated to represent any constraints to development in the plan area.

3. Design Basis Objectives

The SEASP identifies the area situated south of 24th Avenue as best suited for the continued extension of residential development as represented in neighboring Fairmont and Southgate.

The core planning principals used to inform the preparation of the SEASP have been used as a basis for defining the overall vision and design objectives for the plan area. The vision for Discovery is best described by the application of the following design objectives:

4. Development Concept

4.1 Land Use Distribution

The neighbourhood will contain a full range of housing forms including single-unit detached with no lanes, single unit detached with lanes, street orientated townhouses, comprehensively planned dwelling group townhouses, medium density apartments and housing situated above neighbourhood commercial uses within the Village Centre. As represented in the SEASP, development within the plan area is intended to generate residential populations to support existing commercial development along Mayor Magrath Drive and within planned community nodes including the Village Centre.

Low density residential development consisting of single detached dwellings is the predominate form of planned residential development within the plan area representing approximately 58% of the planned units. A variety of lot widths are to be provided to satisfy market demands, promote a compact form and to support housing accessibility for a broad population. The range of housing forms within the neighbourhood is intended to support a sustainable neighbourhood life cycle that can meet the basic housing requirements of individuals and families at different stages in their lives, including varying income levels and household size.

Medium density residential development in the plan area represents approximately 42% of the planned residential housing units in Discovery. This calculation assumes that the swing sites within the plan area are developed as medium density. This form of development will predominantly comprise street orientated and comprehensively planned town housing which is consistent with other new neighbourhoods in the city. The SEASP estimates that up to 40% of the housing may represent multi-unit dwellings. Medium density development within the plan area is intended to be situated along the key transportation corridors to enable full utilization of the City's public transit system, near the planned elementary school and within and adjacent to the Village Centre as a transition between more intensive commercial uses and surrounding low density residential. Comprehensively planned medium density areas will be developed with privately owned internal roadways to minimize driveway access along the municipal roadways.

Residential development within the immediate vicinity of the planned Village Centre is intended to present a more vertically orientated form of development represented by developments of two or more stories. This increased density will provide sufficient local population to assist in supporting the shops and services along the planned commercial corridor. Medium density residential surrounding the proposed main street corridor will be designed to accommodate live work units which depending upon the market conditions, are capable of being converted to standalone commercial uses in the future. The legal separation of residence and business would be accommodated by employing flexible zoning and designing the residences so they can provide separate entrances and independent services to the two uses within the unit, creating a similar mixed use form of development as is anticipated to be provided along the proposed main street corridor

The internal road and block layout follows a modified grid pattern wherever possible to facilitate convenient pedestrian access to key destinations within the broader plan area including the Village Centre, other planned community nodes and

the proposed new elementary school site. Block lengths have been designed to promote walkability by maximizing the pedestrian and vehicle routes available. This results in shorter trips and less frequent vehicle and pedestrian interactions. Effective pedestrian navigation is also supported through the provision of sidewalks and multi-use trails.

To further ensure that pedestrian safety is maintained, traffic calming measures are intended to be incorporated at strategic locations within the plan area where more frequent pedestrian and vehicle interactions are anticipated and where the active transportation component is intended to preside. Traffic calming measures to be utilized within the plan area will be designed to suit the location and circumstances and may include any or a combination of curb extensions, pedestrian islands, raised and ground level cross walks, signage and flashing pedestrian crosswalk beacons.

The location of the high-pressure gas line along the eastern boundary of the plan area provides a challenge in maintaining the modified grid pattern due to the need to limit road crossings. Although this corridor represents a significant physical barrier, it does present an opportunity to develop an attractive linear park space for the use and enjoyment of residents. The corridor also enables efficient north/south navigation within the plan area.

Where practical, rear laneways have been provided to reduce pedestrian and vehicle interactions along the site frontage by eliminating the need for front driveways. Laneways facilitate rear property access allowing for a continuous and uniform sidewalk and street frontage. Laneways also enable the placement of trees along a grassed boulevard as is found in other areas of the city. This vegetated corridor along the street frontage improves the overall appearance of the community by creating a continuous canopy while also providing a contiguous pervious surface to increase local run-off infiltration. Rear laneways also offer opportunities for the development of laneway housing, secondary suites and garden suites. Secondary suites may be permitted provided they are located only in areas with lane access, preferably on corner parcels and not on cul-de-sac bulbs or roundabouts where parking will not be an issue.

Every attempt has been made to promote blocks maintaining an east/west orientation within the plan area to enable homeowners to take advantage of passive solar gains as part of a localized alternative energy scheme including heating, lighting or electrical generation.

Several swing sites have been introduced into the plan area to accommodate changing community demographics and to respond to changing local market conditions. The intention of providing swing sites within the plan area is to provide the developer and the City with the flexibility to consider either low or medium density development in a location where the road network has sufficient capacity to accommodate either intensity of development. Where these areas are to be developed for medium density, it is expected that the development will be comprehensively planned with privately owned internal roadways to minimize driveway access along the municipal roadways.

4.2 Summary Development Statistics

Project Land Use Statistics Discovery Outline Plan Area			SEASP Projections	Discovery OLP Projections
Gross Development Area (GDA)			148.5	151.1
Rail Right-of-Way			0	0
Existing Highway 4 / 24 Ave R/W			0	0
Future Arterial Roadways			0	0
Irrigation R/W			0	0
Gas Transmission Pipeline R/W			1	1
Undevelopable Area			0	0
Gross Development Area			147.5	150.1
Local Roadways (Est. 20% GDA of non-semi-urban land)			29.5	27.59
Collector Roadways			16	14.79
Stormwater Management Facilities			11	10.72
Park/School/Open Space (10% of GDA)			15	17.11
			71.5	70.21
Semi-Rural			0	0
Retail Commercial			2	4.08
Public Use (Religious Assembly, Recreation Facility, etc.)			2	0
Residential			72	76.81
Business/Light Industrial/Office			0	0
Net Developable Area			76	80.89
Residential Units and Population				
Low Density Area (ha)			62.5	62.84
Low Density Dwelling Units	Units/Net Hectare	22.0	1375	1382
Low Density Population	People per Dwelling Unit	2.9	3988	4007
Medium/High Density Area (ha)			9.5	13.97
Medium/High Density Dwelling Units	Units/Net Hectare	70.0	665	978
Medium/High Density Population	People per Dwelling Unit	1.9	1264	1858
Total Area (ha)			72	76.79
Total Dwelling Units	Units/Net Hectare	30.0	2040	2360
Total Population	People per Dwelling Unit	2.5	5252	5865
School Generation				
Total	Elementary Age (5-10) % of total pop	6.7%	349	392
	Middle School Age (11-13) of total pop	3.0%	155	175
	High School Age (14-17) of total pop	4.1%	215	240
Public District	Elementary Age	66.0%	231	258
	Middle School Age	66.0%	103	115
	High School Age	66.0%	142	158
Separate District	Elementary Age	29.0%	67	114
	Middle Age	29.0%	30	51
	High School Age	29.0%	41	70
Alternative (Private School/Home Schooled)	Elementary Age	5.0%	3	20
	Middle School Age	5.0%	1	9
	High School Age	5.0%	2	12

4.3 Village Centre

Discovery includes a Village Centre concept intended to function as a central public gathering point containing a wide range of neighbourhood amenities and conveniences. The Village Center will contribute to creating a sense of place and promoting a sense of community within the neighbourhood. The Village Centre has been designed to include a commercial main street corridor to host a variety of ground level, street orientated boutique style retail shops and services such as café's, bookstores, clothing stores, bakeries, dentist and doctor's offices. This will provide an opportunity to provide integrated residential development above the ground level commercial development.

The main street is intended to be pedestrian focused featuring a 30-metre right-of-way with a single lane of traffic in each direction, angled on-street and rear off-street parking and wide sidewalks with a vegetated boulevard separating parking from pedestrian movements. To maintain a pedestrian focus, as per the SEASP, parking shall be provided in accordance to section 9.22.5.1 of Land Use Bylaw 5700.

As a major community destination, the Village Centre will be accessible by public transit with bus stop(s) provided along the external municipal roadways outside of the main street. It is expected that raised crosswalks will be provided at regular intervals along main street to assist in the safe navigation of the area by pedestrians. Curb extensions are to be constructed at either road entrance to calm traffic. On-site bike parking shall be provided throughout the Village Centre. Bike parking areas shall be provided in accordance to section 9.22.10 of the Land Use Bylaw 5700. Further details regarding the type and location of these facilities will be completed at the detailed design stage.

Commercial development will be allowed to front directly onto the sidewalk with the option to set the building back to accommodate a front patio as required. The rear yard of the commercial properties along the west side of the main street will back onto a pedestrian corridor extending along the perimeter of the surrounding greenspace and planned water feature to the west. This will allow businesses to take advantage of this proximate amenity. Additional off-street parking and screened loading and waste disposal areas will be provided within the rear yards. Further details regarding off-street parking and loading facilities will be completed at the detailed design stage.

Conceptual Rendering Only

The Village Plaza is intended to feature a larger percentage of hard landscaped areas such as paving stones, concrete and fixed planters than is typically found in public park spaces. The plaza will act as the primary public meeting space for the neighbourhood. It will support a variety of formal and informal events including, but not limited to, public meetings, children, adult, or family activities, or simply as a place to sit and enjoy a cup of coffee on a nice day.

The park space connecting the Village Square and the Village Plaza is designed to serve multiple purposes. These include storm water management, providing passive and active recreational space, acting as an active transportation hub linking the Central Parkway with the Blackfoot Interpretative Park and as a utility corridor for the extension of a future storm sewer trunk.

Conceptual Rendering Only

4.4 Public Parks

Public parks within Discovery include a combination of neighbourhood scale, pocket and linear parks situated to provide residents with convenient access to a variety of open space areas and to provide diverse recreational opportunities. The proposed new elementary school will include an integrated neighbourhood scale park with amenities capable of hosting programmed events which may include softball or field sports. A second neighbourhood scale park is planned along the community interface with Southgate. It is expected that this park space will be designed to accommodate complementary field sports within a dry pond area.

A series of pocket parks have been distributed throughout the plan area to provide an opportunity to host spontaneous and informal recreational activities including but not limited to football, soccer and ultimate Frisbee. These spaces will also enable the development of unique and innovative naturalized children's play areas. These multi-use areas are intended to support year-round pursuits including the potential for tobogganing along the gradual side slopes of the dry ponding areas.

In addition to supporting active recreational pursuits, areas surrounding the dry and wet ponding areas will be developed to support a variety of passive recreational activities, combining both naturalized and manicured areas. This variety of park treatments provides a diverse backdrop for recreational activities in the area, promotes environmental sustainability and local biodiversity as well as serving as an educational venue for citizens to better understand and enjoy nature.

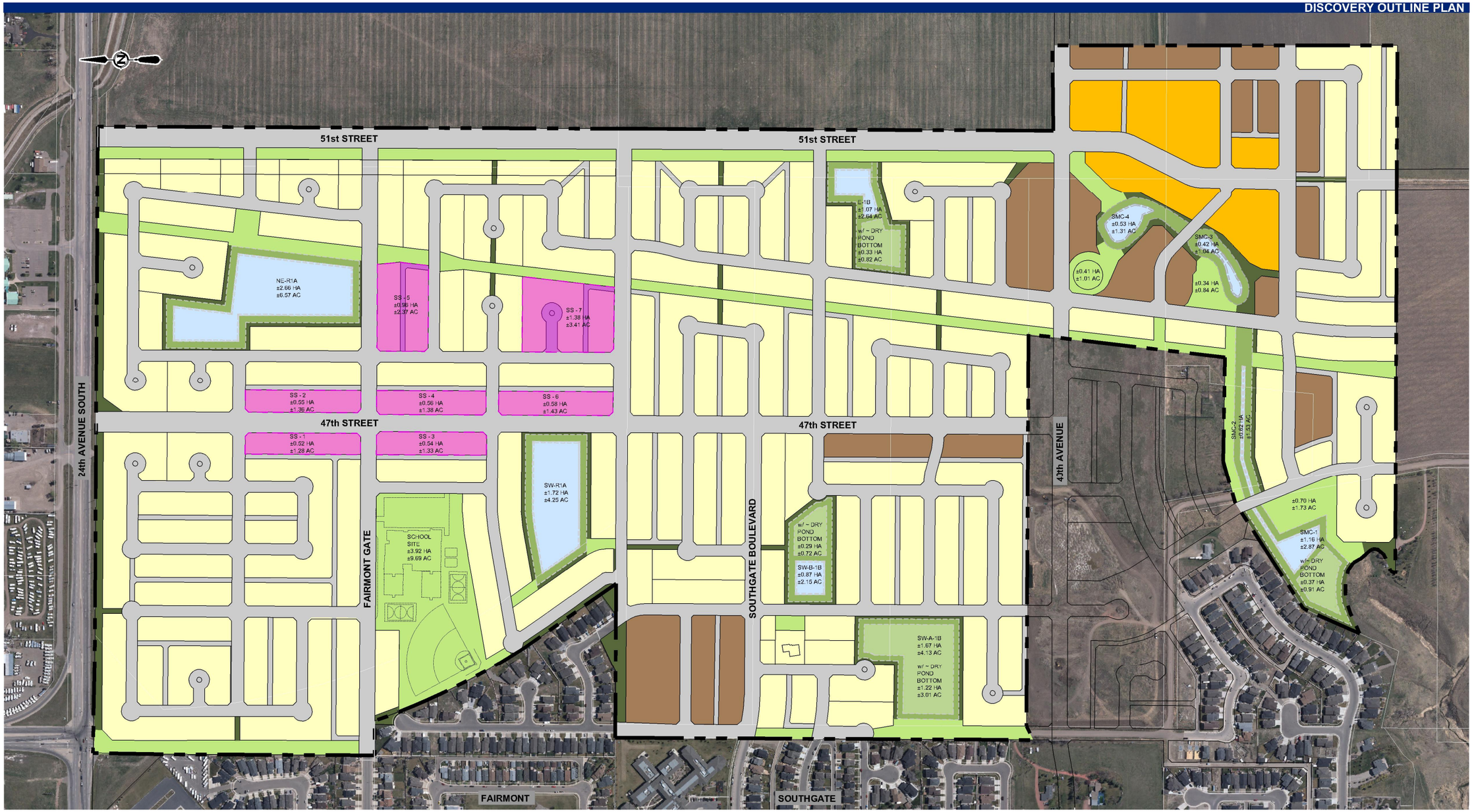
True to the theme of celebrating the history of the area, the local park system includes a small pocket park situated along the Southgate Boulevard extension dedicated to commemorate the Parry family who were early Lethbridge pioneer ranchers well renowned as stewards of the land. This park is situated in an area which generally corresponds with the location of the original family farm yard. Plantings within the park are intended to reflect the original character of the site by maintaining existing vegetation where possible. This will provide a mix of new and mature vegetation. The park will include a small public gathering area with a commemorative monument celebrating the contributions of the family in influencing Lethbridge history. Further details of the design of the Parry Park will be completed at the detailed design stage.

The Blackfoot Interpretive Park is a major park destination within the plan area. This park is intended to act as a gateway to a future linear corridor along the Six-Mile Coulee. This park, situated in the southwest corner of the plan area will provide public access to the coulee and act as a buffer between the coulee slope and nearby residential development. The park will include interpretive signage referencing the historical importance of the area in relation to the Blackfoot First Nations. Other amenities within this park will include paved pathways, art installations, benches, look out points and native plantings which are consistent with the biophysical conditions of the past. Further details of the design of the interpretive park will be completed at the detailed design stage in consultation with Blackfoot Elders. A survey of native vegetation within Six-Mile Coulee will also be conducted during detailed design. A mitigation plan to reduce the impact on native plant species shall inform the design and maintenance of the Interpretive Park.

4.5 Crime Prevention Through Environmental Design

Promoting a safe neighbourhood has been a major consideration within the design process. CPTED principles were considered and incorporated into the design of this neighbourhood. These considerations include but are not limited to the following:

- The modified grid street layout provides for shorter street blocks, open sight lines, easier way finding and a street layout that is less confining.
- Local park spaces are designed to enable good visibility of the site interior from the surrounding streets.
- Fencing around public park areas and along internal linear pathways will utilize "see through" fencing to distinguish between private and public properties and to increase natural surveillance in public areas.
- All street corners with sidewalks will have wheelchair accessible ramps and all multi-use trails will be graded to ensure cohesion.
- Traffic calming measures will be employed in areas of frequent pedestrian and vehicle interactions.
- Permanent transit stops should be positioned adjacent to planned street lighting.



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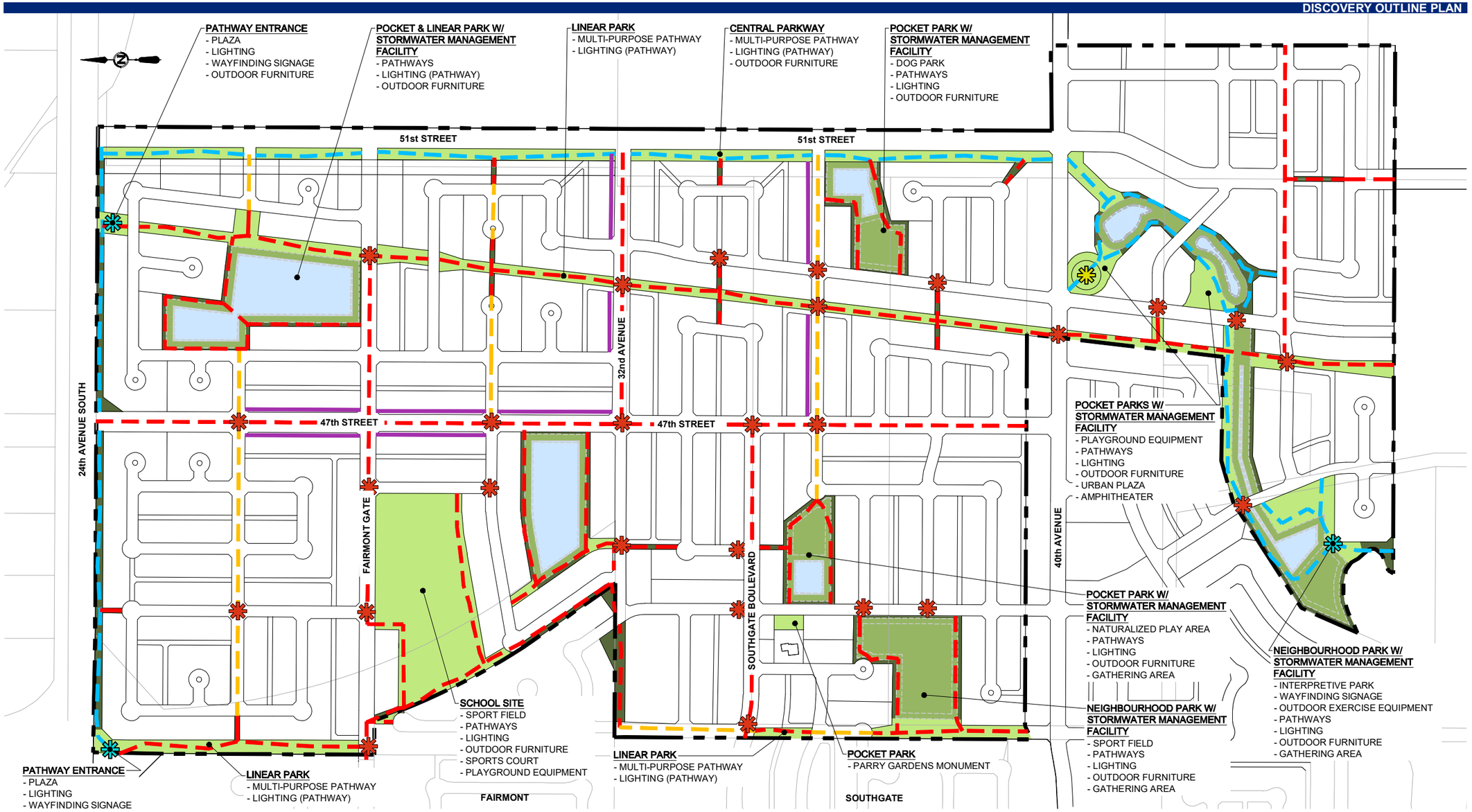
Map 4 - Land Use Development Concept

LEGEND	HECTARES	PERCENT			
LOW DENSITY RESIDENTIAL	± 62.84 ha	41.6 %	PARKS AND RECREATION*	± 27.83 ha	18.4 %
MEDIUM DENSITY RESIDENTIAL	± 8.88 ha	5.9 %	NON-CREDIT OPEN SPACE		
RESIDENTIAL SWING SITE	± 5.09 ha	3.4 %	STORM AREA		
COMMERCIAL	± 4.08 ha	2.7 %	NWL STORM AREA		
			RIGHT-OF-WAY	± 42.38 ha	28.0 %



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Map 5 - Open Space and Active Transportation Concept

LEGEND

PARKS AND RECREATION		REGIONAL PATHWAY	TRAIL HEAD
NON-CREDIT OPEN SPACE		MULTI-PURPOSE PATHWAY	URBAN PLAZA
STORM AREA		SHARED BIKE LANE	TRAFFIC CALMING CONSIDERATIONS (TO BE CONFIRMED AT DESIGN STAGE)
NWL STORM AREA		FRONT DRIVEWAY RESTRICTION	

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5. Servicing Concept

5.1 Transportation

The transportation network within Discovery is designed to operate as an integrated system; considering multiple modes of travel including pedestrians, cyclists, public transit and private vehicles. The basis for this network was established within the SEASP and refined following the establishment of the land use concept and preparation of a subsequent Traffic Impact Assessment which is attached as Appendix G. The transportation network recognizes the need to integrate Discovery with Fairmont and Southgate as well as maximizing the connections to future development to the east and south by providing multiple roadways and active transportation links.

The internal road network has been designed in a modified grid pattern which combines elements of a traditional grid with a curvilinear road network. The modified grid features a network of collector streets orientated in a traditional grid designed to accommodate moderate levels of traffic, enhancing navigability and improving overall connectivity in the neighbourhood. Cul-de-sacs and crescents are integrated into the quadrants created by the grid to provide local access to homes and to discourage shortcutting through the neighbourhood.

24th Avenue, Fairmont Gate, Southgate Boulevard and 40th Avenue represent the key east-west roadway connections within Discovery while 47th Street and 51st Street act as the primary north-south roadways.

24th Avenue (Highway No. 4) extends along the northern boundary of the plan area and currently operates as a four-lane divided provincial highway. It is anticipated that the segment of highway situated along the northern boundary will have a reduced posted speed limit; providing the ability to enable the construction of intersections at 47th Street and 51st Street respectively. As a major gateway, the City intends to employ a overlay zone within this corridor to promote and celebrate Lethbridge's historical landscapes. Development within and directly interfacing with this corridor will be cohesive in regards to its aesthetic and functional elements including landscaping and architectural styles.

A multi-use pathway is planned to extend along the south side of the 24th Avenue right-of -way connecting residents with existing and future commercial developments and providing a link to the City's Regional Trail system. A small fully landscaped berm is intended to be constructed to separate the northern interface of Discovery with the planned multi-use pathway. It is anticipated that a solid community fence will be constructed along 24th Avenue interface to provide additional privacy to residents.

Community Entrances

47th Street represents one of two northern road entrances into the community from 24th Avenue. The initial segment of 47th Street extending south to Fairmont Gate is designed as a super collector constructed within a 30-metre right-of-way. The initial segment of 47th Street extending south to the first internal intersection will feature a four lane facility with a vegetated median and no on-street parking as represented in the road cross section illustrated in Figure 5.1. From this intersection south to Fairmont Gate, the centre median is intended to transition from a width of 5.1 -metres to 1.8-metres to accommodate the introduction of on-street parking lanes on either side of the roadway (see Figure 5.2).

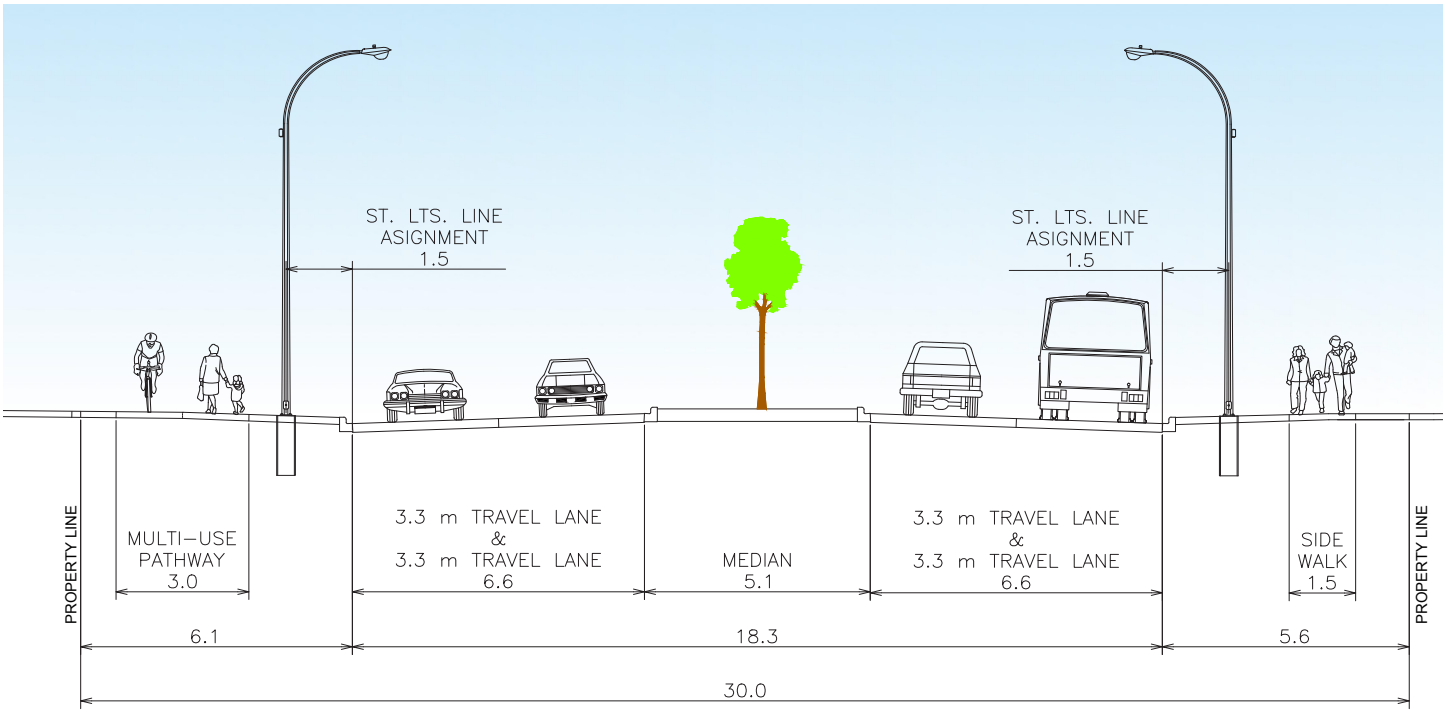


Figure 5-1: Conceptual Road Cross Section 47th Street at 24th Avenue

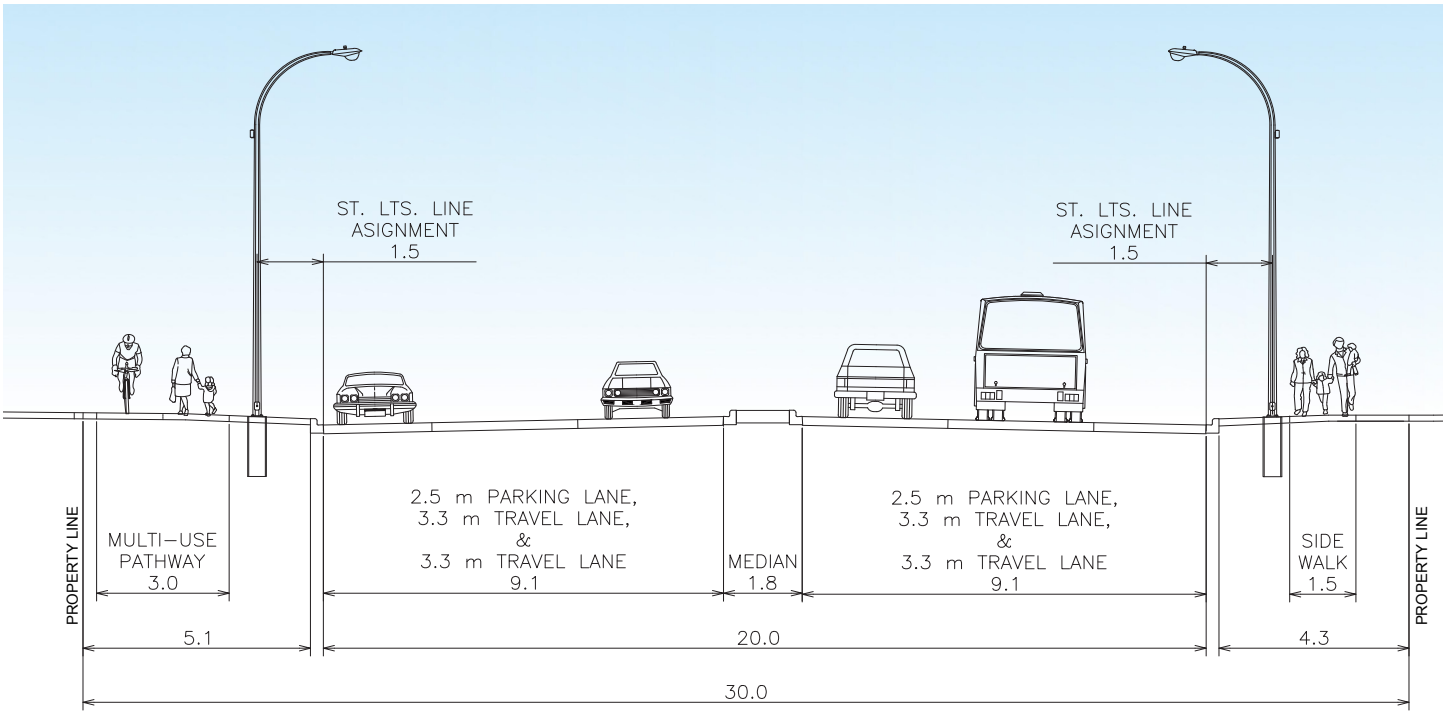


Figure 5-2: Conceptual Road Cross Section 47th Street at Fairmont Gate

South of its intersection with Fairmont Gate, 47th Street is anticipated to further transition to a two-lane major collector with a parking lane on either side constructed within a 25-metre right-of-way. Although direct property access is capable along the southern portions of 47th Street, the neighbourhood has been designed with perpendicular block orientations to minimize the number of homes fronting along this roadway. Where residences front 47th Street, rear lanes have been included to enable rear property access to minimize the number of driveways along this route. A 3-metre multi-use pathway will be constructed along the west side of the 47th Street extending to 40th Avenue while a sidewalk with separated boulevard will extend along the east side of the street.

51st Street represents the second major vehicle entrance to Discovery from 24th Avenue. This roadway was identified in the SEASP as a central parkway serving a critical role as a year-round multi-modal link between 24th Avenue and the southern extents of the plan area. 51st Street is designed as a median divided four-lane super collector from its intersection at 24th Avenue to a planned intersection at 32nd Avenue. As with 47th Street, this initial segment of 51st Street will feature a fully landscaped median equipped with pedestrian islands at key pedestrian crossings. As a super collector, no direct property access is available. Reflecting the higher traffic volumes, it is expected that a solid developer's fence will be constructed along the northern boundary of the plan area and along 51st Street to provide a visual and noise buffer for adjacent residences. From the 32nd Avenue intersection south to the entrance to the Village Centre, the parkway transitions to a two-lane facility. A 42-metre right-of-way is intended to be maintained along the entire length of 51st Street to accommodate the construction of a vegetated parkway along its western boundary including a physically separated regional multi-use pathway. The additional right-of-way also provides a corridor for the construction of future storm and sanitary trunk sewer infrastructure.

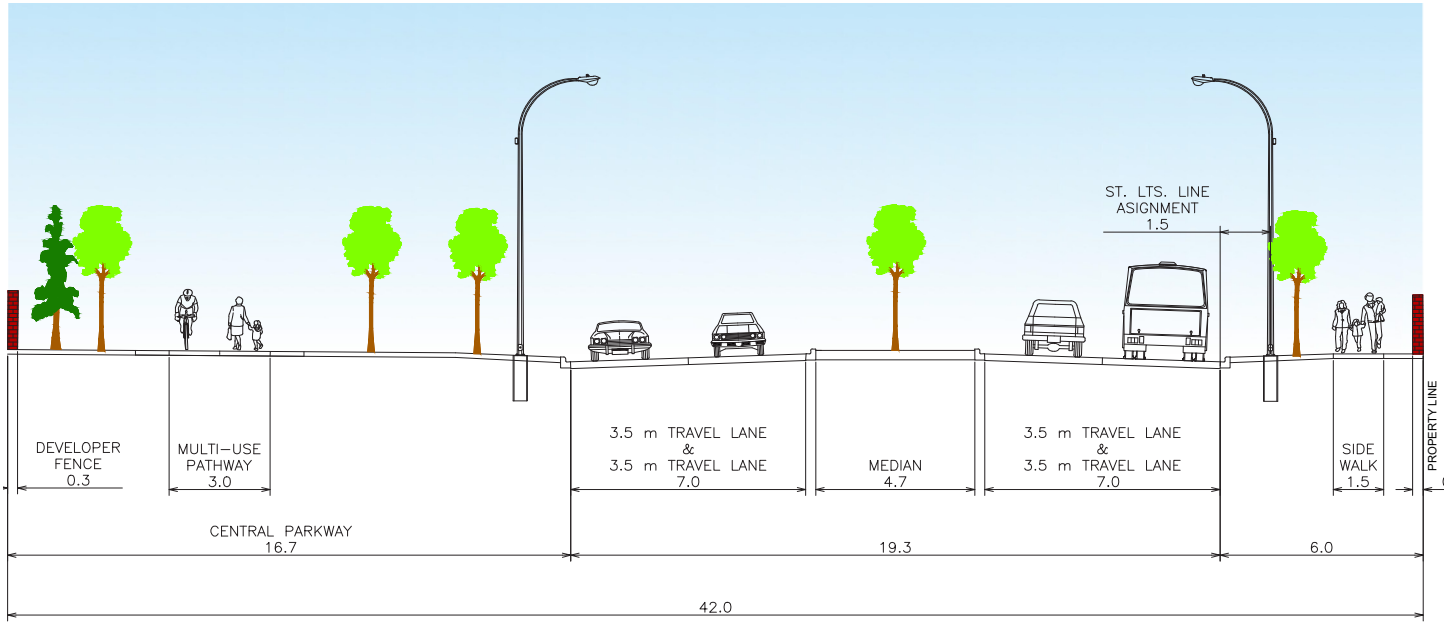


Figure 5-3: Conceptual Road Cross Section 51st Street

Fairmont Gate, Southgate Boulevard and 40th Avenue represent the key connections between Discovery and the neighboring communities of Fairmont and Southgate. Fairmont Gate is designed as a two-lane minor collector featuring a paved width of 13 metres constructed within a 23-metre right-of-way with on-street parking supported

on either side of the street. Although Fairmont Gate is capable of accommodating front driveway access, rear lanes have been provided along this route to encourage rear site access thus reducing the need for front driveways and potential conflicts between vehicles. Fairmont Gate provides secondary access and egress from Fairmont and hosts the drop off point for school buses associated with the planned elementary school. As a host to future bus traffic, Fairmont Gate will be constructed to a minimum 12-metre paved width.

A multi-use pathway is proposed along the south side of Fairmont Gate to connect the 43rd Street parkway (former 43rd Street roadway) and the proposed school site. Where this pathway is proposed, houses fronting onto the street will be restricted to rear access only, to prevent conflicts with pathway users.

Southgate Boulevard is planned to extend to 47th Street, providing a connection between Discovery and neighboring Southgate. Southgate Boulevard is designed as a major collector featuring an existing paved width of 13 metres constructed within a 23-metre right-of-way. As a major collector, direct property access is generally permitted with exception to residences situated along the north side of the street. A 3-metre multi-use pathway is planned along the north side of the right-of-way, necessitating the prohibition of front driveways. An integrated and continuous sidewalk is intended to be provided on the south side of the street.

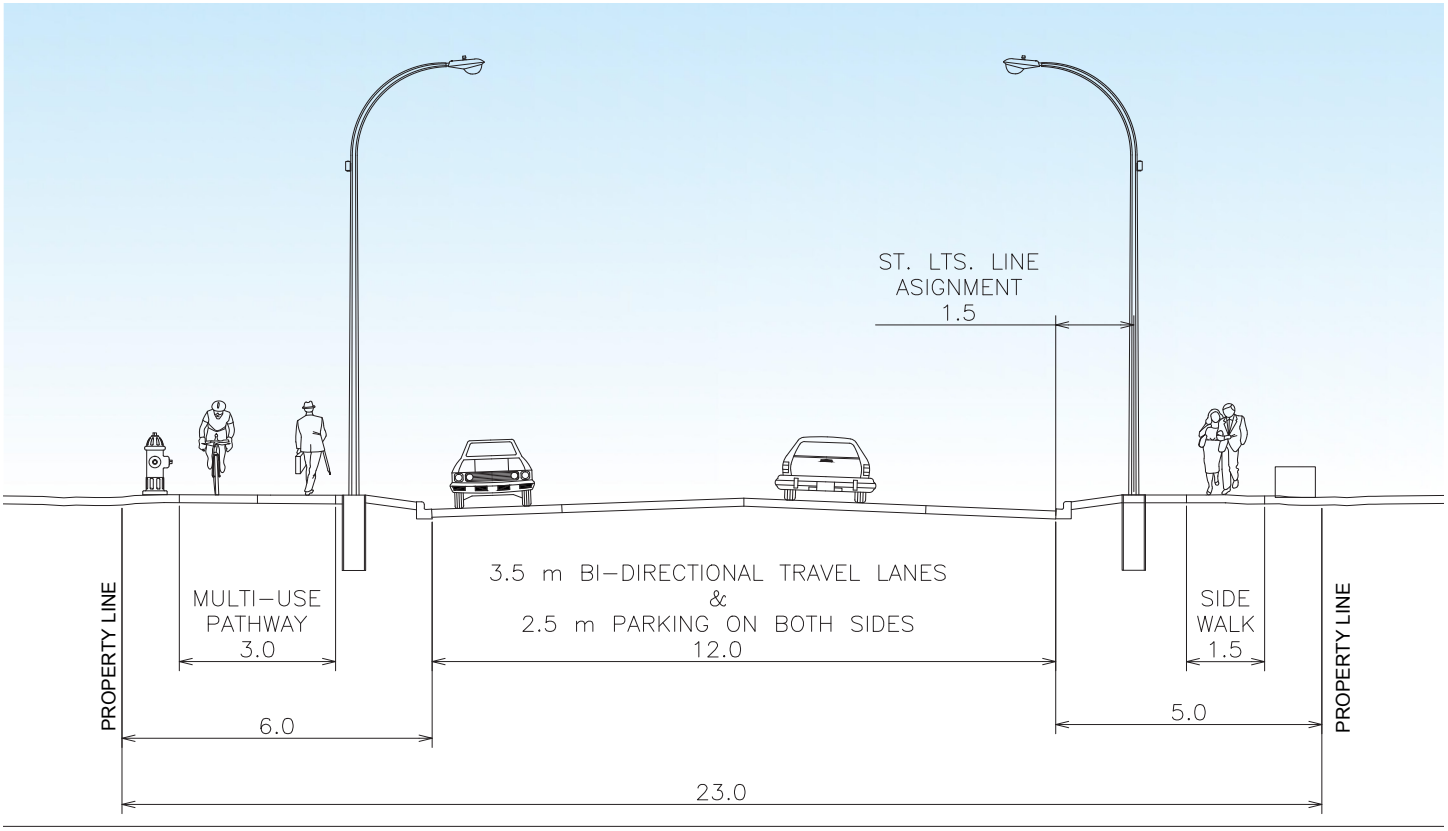


Figure 5-4: Conceptual Road Cross Section Southgate Boulevard and Fairmont Gate

40th Avenue represents a second major connector within the plan area. 40th Avenue extending east from Southgate

is anticipated to function as a major collector constructed on a 23-metre right-of-way. The current roadway is constructed with a 11-metre paved width. Only the portion of 40th Avenue lying east of the ATCO high pressure gas line and extending east of 51st Street is situated in the Discovery plan area. It is anticipated that as a major collector, the paved width will transition to a similar profile as Southgate Boulevard.

Local Roads

Local roads within Discovery include both 16.5-metre and 18.5-metre right-of-ways based upon anticipated traffic and the function of the roadways within the over-all transportation strategy for the area. A 9-metre paved surface is intended for most local roadways except for those constructed within the wider right-of-way which will feature a 11-metre paved surface. The wider local roadways are intended to provide a wider carriageway, particularly at the collector road intersections, to collect and distribute local traffic within the various internal neighbourhood quadrants. Cul-de-sacs will feature a 9-metre paved surface constructed in a 15.5-metre radius and with a 31-metre right-of-way provided within the bulb. All local roadways will have an urban curb and gutter cross section with integrated storm water drainage and continuous sidewalks.

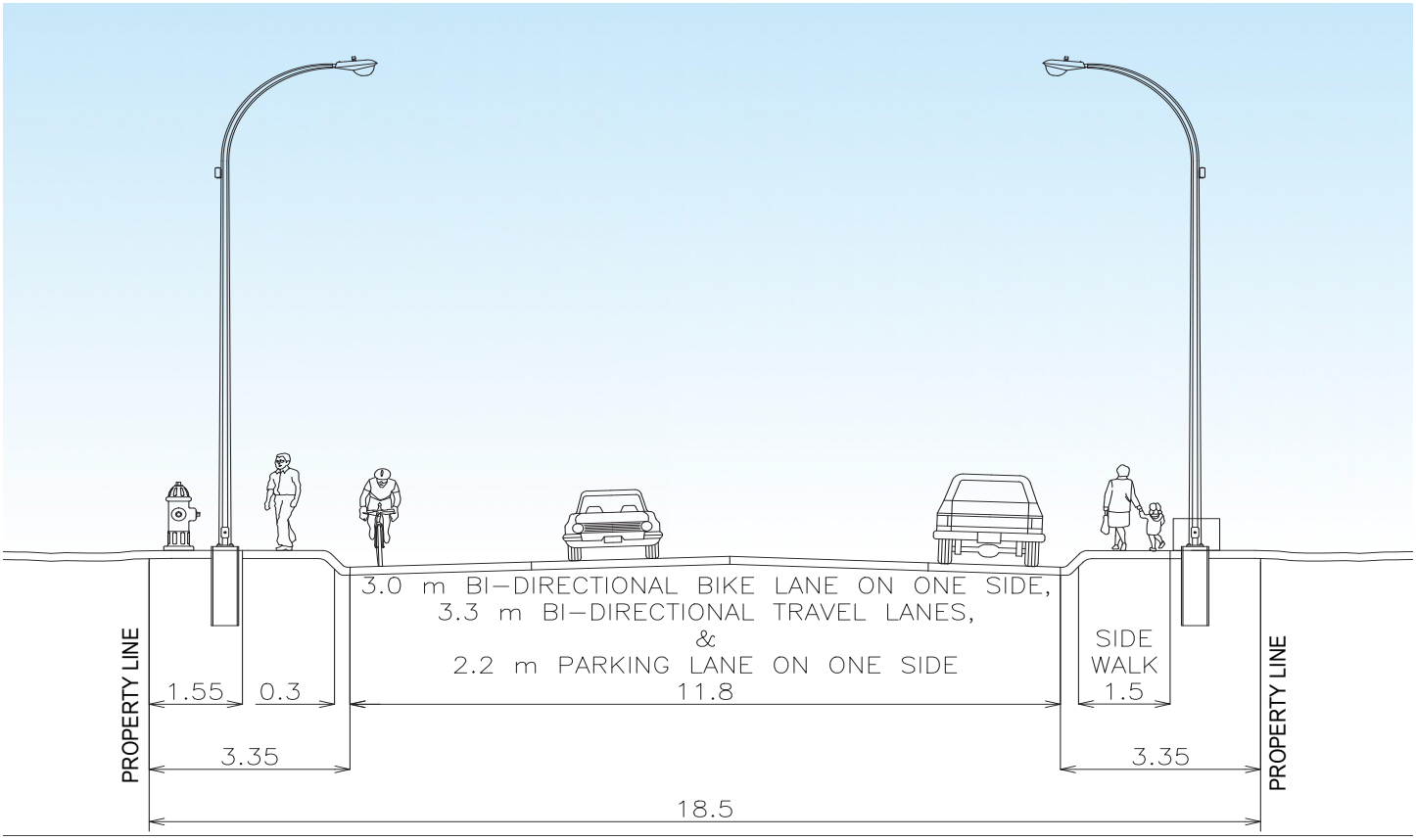


Figure 5-5: Conceptual Road Cross Section 18.5 m Local Street with Cycle Lane

Several of the planned local roadways are intended to include a shared bike lane to provide bike commuting opportunities in areas where a dedicated multi-use pathway is not present. In these areas, posted speed limits should

be reduced to 30 km/h where warranted and consideration should be made to incorporate traffic calming measures. Anticipated locations where traffic calming measures should be considered have been identified on Map 6, but the details concerning the type and configuration of these calming measures will be determined during the detailed design phase.

Intersection Treatments

The majority of the intersections within the plan area will consist of two-way stop control, with priority given to the more major route. For instance, the primary north-south collectors at 47th Street and 51st Street, will be given priority over the other collector or local roads that intersect them. Similarly, where local roads intersect collector roads, priority will be given to the more major, or higher volume roadway.

Traffic signals are proposed at the following key intersections:

- 24th Avenue and 47th Street – traffic signals will be required at the initial construction of the intersection, due to the volume of through traffic on 24th Avenue. Signals will be designed for all four legs of the intersection, but the north leg is expected to have low volumes in the interim with access provided only to the adjacent service road.
- In the future, when development extends to the north side of 24th Avenue, 47th Street will be extended to the north as a collector roadway.
- 24th Avenue and 51st Street - traffic signals will be required at the initial construction of the intersection, due to the volume of through traffic on 24th Avenue.
- 47th Street and Fairmont Gate – initially, this intersection will be constructed as a two-way stop control intersection in the first phase. As the development expands and volumes increase on 47th Street, signals will be required. Our analysis indicates that signals are not warranted at the 10 year planning horizon, but are warranted at full-build out. We recommend that the volumes be monitored at this intersection as future phases are constructed, and the signals be installed when warranted. Due to the proximity of the school, interim traffic calming or increased pedestrian crossing facilities may need to be considered until such a time as the signals are installed.

Through our analysis, we determined some intersections where two-way stop control would not provide an acceptable level of service at the 10 year planning horizon. At these intersections, roundabouts are proposed to provide the acceptable level of service. These intersections include:

- 40th Avenue and 51st Street
- 40th Avenue and Local Road (west of 51st Street)

At these intersections, single lane, urban compact roundabouts are proposed with sufficient size to accommodate the commercial design vehicles that would need to access the shops within the Village Centre. These roundabouts will also incorporate pedestrian crossing facilities to connect with the sidewalks and pathways that are proposed at these intersections. The roundabouts provide a unique opportunity for landscaping features within the central island, and provide a gateway treatment at the entrances to the Village Centre area of the development. The proposed road classifications and planned intersection treatments are illustrated in Map 6.

Active Transportation

Active open spaces, including pedestrian and bike routes that link to jobs, homes and community destinations, play a key role in the creation of sustainable, healthy places. Discovery features a continuous network of interconnected

linear parks and multi-use trails linking the residents to various key internal and external destinations. The active transportation network offers the following sustainable advantages:

- The pedestrian trail network and links to external trail systems offer attractive alternatives to vehicular use;
- Dark-sky compliant, LED street lighting will be provided along all streets and in all parks to enhance visibility;
- Some lot drainage can be absorbed into the ground and plantings during normal precipitation, rather than conveying it out of the neighbourhood;
- Provides an efficient route for the extension of major linear infrastructure; and
- Areas of potential pedestrian and vehicle conflicts have been avoided, thus encouraging pedestrian movement.

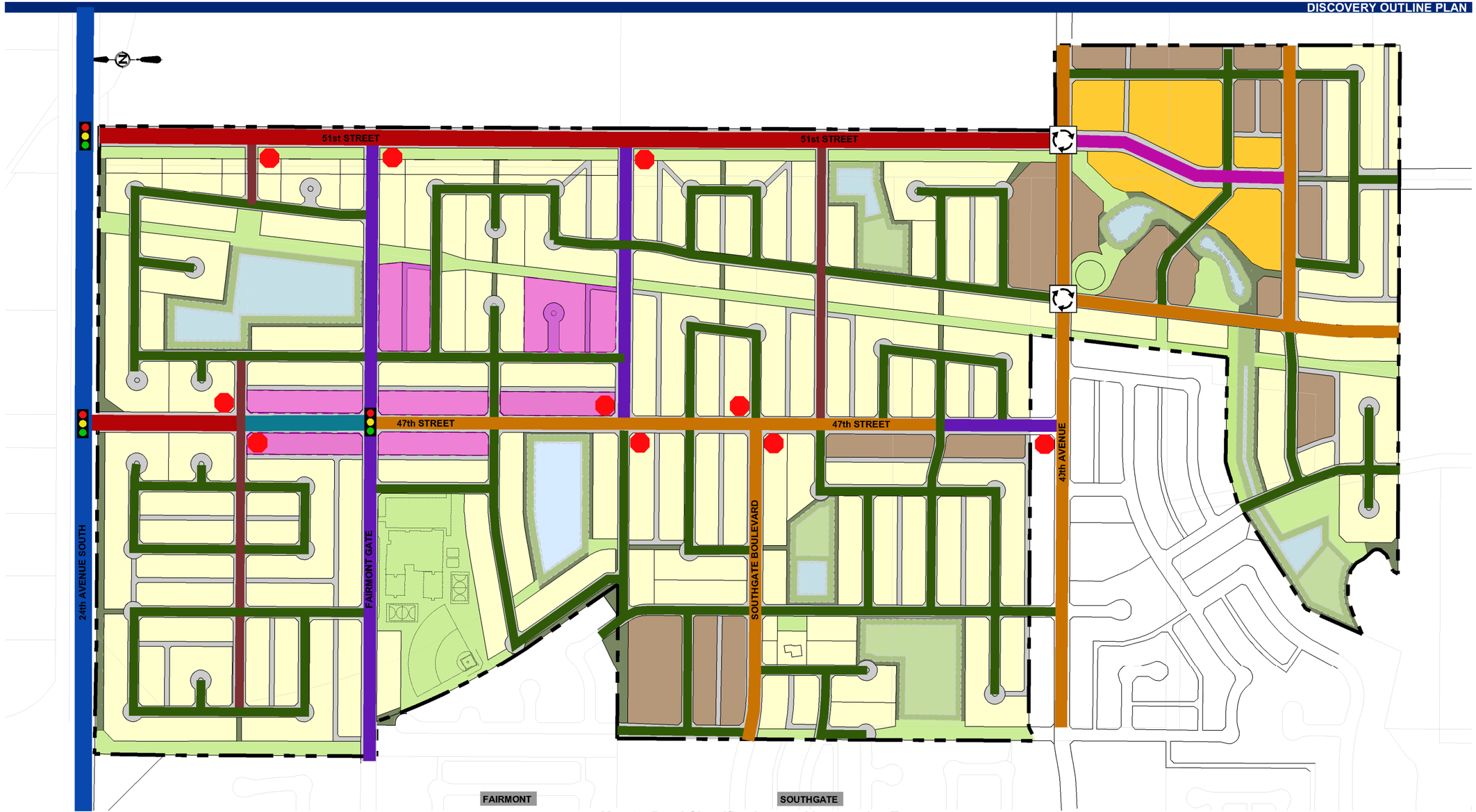
The active transportation network is illustrated within Map 5. Decisions concerning the location and type of traffic calming measures or enhanced crossing treatments will be made at detailed design.

The 3-metre-wide, asphalt surfaced multi-use trails including the planned extension of the City's Regional Trail system within the 51st Street parkway are to be equipped with lighting and enhanced pedestrian crossings at points of intersection with higher volume roadways to ensure pedestrian safety. Where these trails are proposed along major or minor collector roadways, front driveways will be eliminated and rear access is provided to those lots adjacent to the pathways as illustrated on Map 5. This will minimize potential conflicts with pathway users from vehicles crossing the pathway.

The orientation and routing of the ATCO high pressure gas line through the plan area creates unavoidable multiple mid-block crossings; necessitating the employment of enhanced crossings which may include any or a combination of curb extensions, pedestrian islands, raised and ground level cross walks, signage and flashing pedestrian crosswalk beacons. The proposed school site also generates the need for employment of a pedestrian activated crossing beacon to facilitate safe navigation to and from the school site. The exact configurations for these enhanced crossings will be determined during the detailed design phase.

Public Transit

Employment of a modified grid internal road network will facilitate the provision of efficient public transit along the major collectors. The various community destinations and medium density developments have been situated along internal roadways which can accommodate public transit. The location of bus stops and transit routes will be located in compliance with the Transit Master Plan and transit standards of the day following consultation with the City Administration as part of the detailed design phase.



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Map 6 - Road Classifications and Intersection Treatments

- ARTERIAL ROAD
- SUPER COLLECTOR (4-LANE, NO ON-STREET PARKING)
- SUPER COLLECTOR (4-LANE, ON-STREET PARKING, NO DRIVEWAYS)
- MAJOR COLLECTOR
- MINOR COLLECTOR
- LOCAL ROAD (18.5 m)
- LOCAL ROAD (16.5 m)
- TRAFFIC-CALMED PEDESTRIAN ORIENTED ROADWAY

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5.2 Water Distribution

Potable water service to the outline plan area will be provided from the existing infrastructure in the Fairmont and Southgate neighbourhoods, including the existing Southeast Reservoir and Pump Station. The two key connection points to the 350mm distribution mains are located at 40th Avenue and Southgate Boulevard. Other connections will be made to the existing system in 24th Avenue, and at Fairmont Gate.

Design Criteria

Design requirements outlined in the City of Lethbridge Design Standards include:

- No less than 310 kPa (45 psi) during peak hour demand
- No less than 345 kPa (50 psi) at maximum day demand
- Maximum delivery pressure should not exceed 620 kPa (90 psi)
- Average Day Demand (ADD) = 415 l/p/d
- Maximum Day Demand = 2.2 x ADD
- Peak Hour Demand = 3.5 x ADD

The water distribution network within Discovery will follow the proposed roadway network. Distribution pipe sizes will range from 200mm to 400mm in diameter. Proposed pipe sizes and connection points are shown on Map 7. The total estimated water demand for the plan area is provided in Table 5-1 below.

Table 5-1 Water Demand

Scenario		
Design Population	5,792	
Average Day Demand (415 l/p/d)	2.40 MLD	27.8 l/s
Maximum Day Demand (2.2 x ADD)	5.29 MLD	61.2 l/s
Peak Hour Demand (3.5 x ADD)	8.41 MLD	97.4 l/s

ADD - Average Day Demand
MLD - Million Litres per Day

5.3 Sanitary Collection

The SEASP has identified significant constraints within the existing sanitary sewer system. An assessment of the City's downstream sanitary sewer collection system indicated that it is currently operating at full capacity and is unable to support the projected flows from Discovery.

Collection System

The sanitary sewer collection system within Discovery will follow the proposed roadway network. The collection system pipe sizes will range from 200mm to 375mm in diameter. Proposed pipe sizes and connection points are shown on Map 8.

The ultimate servicing strategy for sanitary sewer for Discovery is to connect at 24th Avenue to the planned regional sanitary sewer system. There may be a small amount of capacity available in the Southgate system that could be used

strategically to facilitate orderly development. The trunk sanitary sewer will be located along 51st Street and will ultimately service the area south of 24th Avenue by gravity and areas south of 40th Avenue that will be serviced by lift stations that pump into the trunk.

Development within Discovery will connect to the proposed Southeast Sanitary sewer trunk and downstream improvements. The servicing concept for the plan area proposes five primary connections to the trunk.

- Catchment A (47 Street and 24 Avenue)
- Catchment B (32 Avenue and 51 Street)
- Catchment C (36 Avenue and 51 Street)
- Catchment D (40 Avenue)
- Catchment E (40 Avenue and 51 Street)
- Catchment F (South East Lift Station)

The total estimated sewer generation rates for the outline plan area is provided in Table 5-2 below.

Table 5-2 Sanitary Sewer Generation

Connection Point	Design Population	Average Day Weather Flow (m^3)	Peak Wet Weather Flow (m^3)	Peak Wet Weather Flow (l/s)
A	2,440	1,055	5,692	65.9
B	1,162	465	2,501	28.9
C	817	327	1,791	20.7
D	545	218	1,217	14.1
E	98	39	230	2.7
F	730	412	2,760	31.9

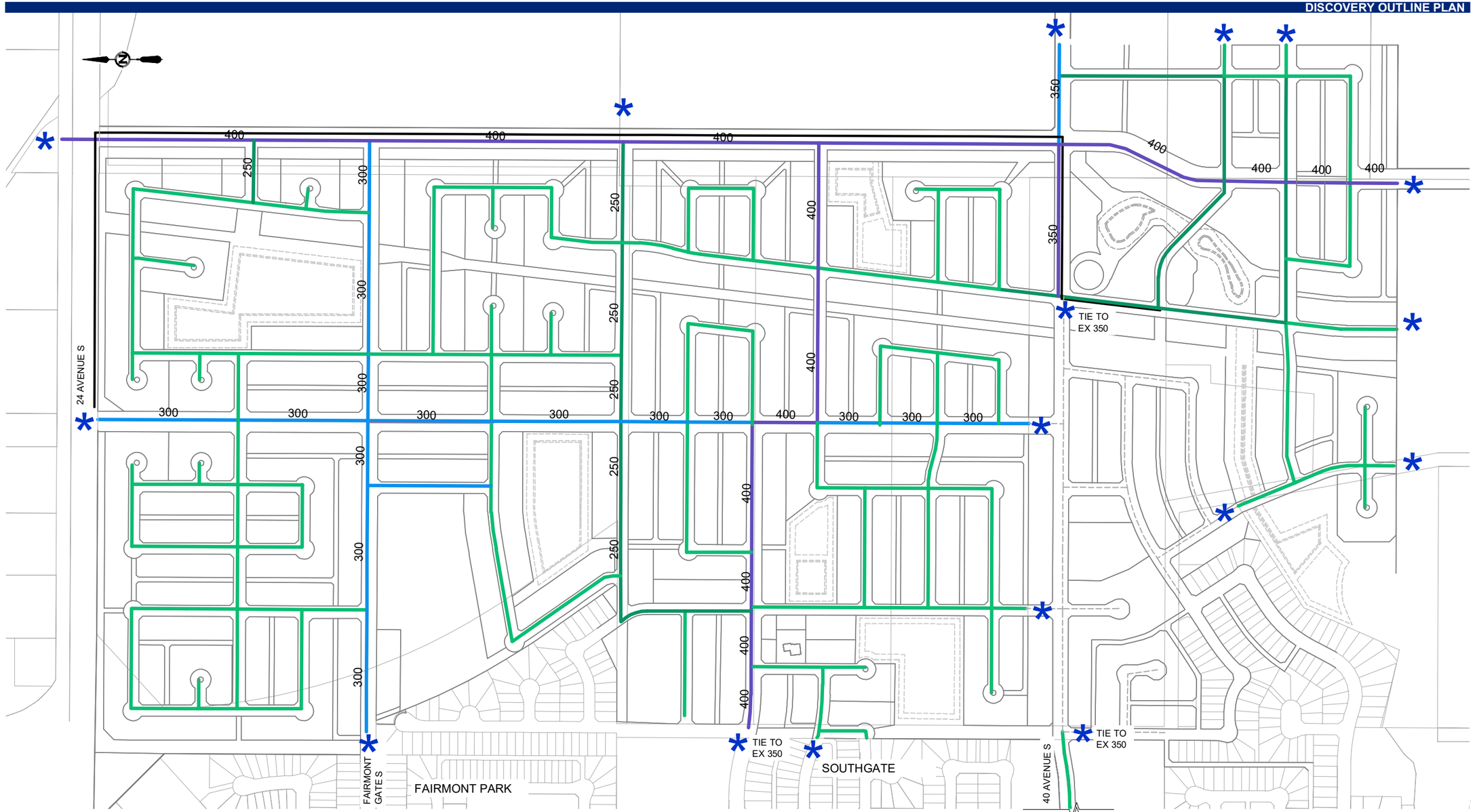
Off-site Infrastructure Requirements

The ultimate sanitary sewer collection system for the plan area will require the development of the complete South East Sanitary Sewer Trunk System. The timing for the regional solution is currently projected for 2029, however uncertainties in the availability of off-site funding for the project make the actual construction date uncertain.

To allow the development to proceed in advance of the regional solution, an interim solution that protects the downstream sanitary sewer system is required. This solution is likely to include the development of local storage that will limit flows to the existing system during wet weather, protecting the existing system and preventing further capacity limitations downstream. The details of the design of the interim facility will be determined in cooperation with the City of Lethbridge at the time of subdivision.

The opportunity for interim servicing to be considered shall apply equally to all lands within this Outline Plan. Servicing for the SW 1/4 Sec. 22 will allow for about 21 ha. to be serviced directly into the existing sanitary sewer in the Southgate and Fairmont areas. Servicing for the SW 1/4 Sec. 22 will be allowed based upon the approval by the City of Lethbridge of a detailed design for an interim storage strategy utilizing local storage.

The City acknowledges that the sanitary sewer concept for the SW 1/4 Sec. 22 will require changes to allow for flow into Fairmont and Southgate; to allow for any interim local storage, and to reflect the developer's phasing plans.



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Map 7 - Water Servicing Concept

LEGEND

PROPOSED 200 Ø

PROPOSED 250 Ø

PROPOSED 300 Ø

PROPOSED 400 Ø

CONNECTION TO EXISTING (OR FUTURE) WATERMAIN

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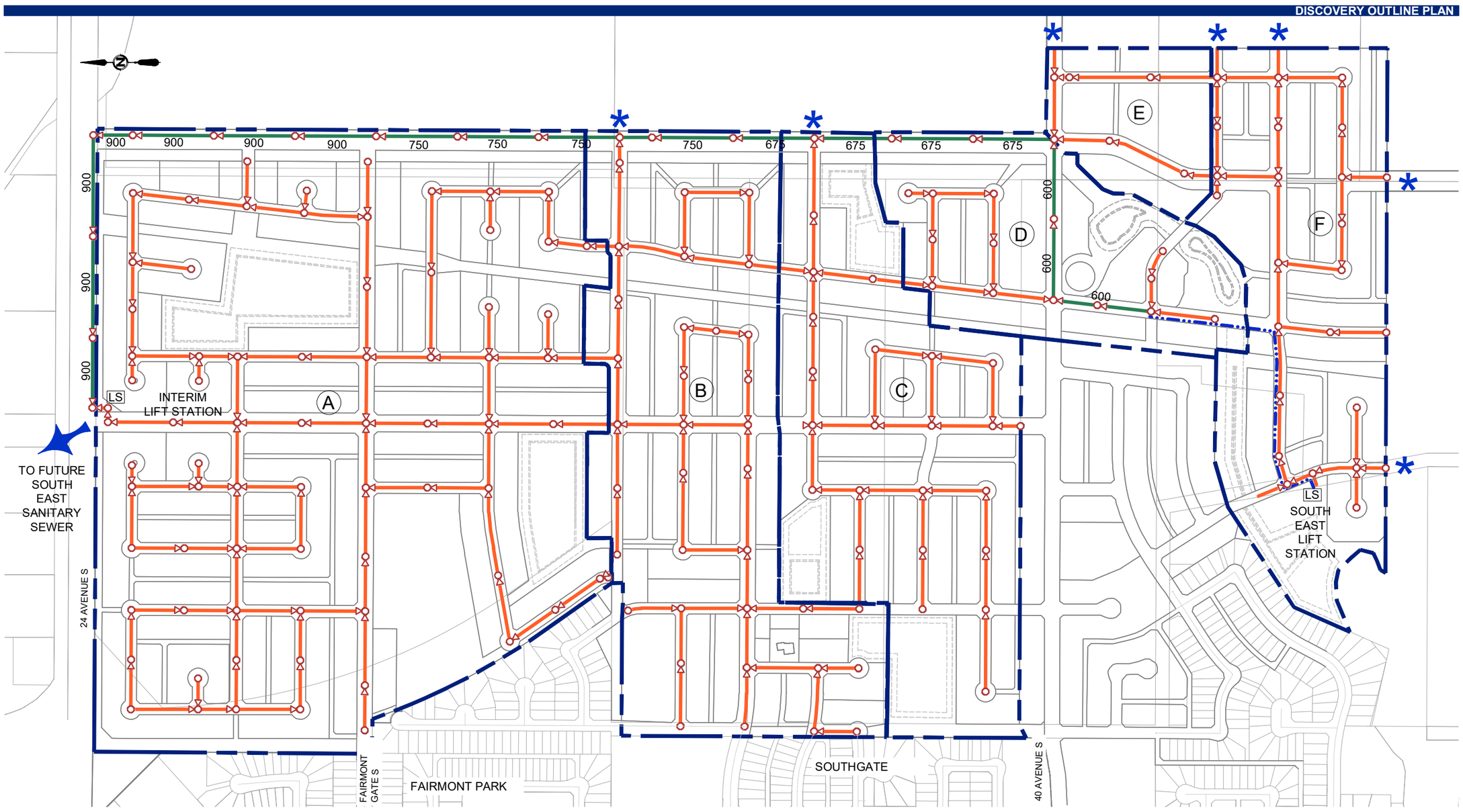

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Map 8 - Sanitary Servicing Concept

LEGEND

COLLECTION SYSTEM

SOUTH EAST SANITARY SEWER TRUNK

SANITARY FORCEMAIN

SANITARY CATCHMENT BOUNDARY

CONNECTION TO EXISTING (OR FUTURE) SANITARY

CATCHMENT LABEL (C)

5.4 Stormwater Management

Within the plan area the overall catchment boundaries have been defined to minimize overall earthworks, to take advantage of the natural topography and to facilitate logical development staging. Major and minor stormwater management systems have been divided into five catchment areas. Stormwater management facilities in each catchment will provide stormwater quality enhancement and storage for management of runoff during significant events. Stormwater runoff from the majority of the plan area will be conveyed to the Oldman River through the existing storm trunk located within the 40th Avenue right-of-way. The remainder of the runoff will be directed to a future storm trunk in the 51st Street right-of-way ultimately discharging to a new outfall in Six-Mile Coulee.

The following two storm sewer connection points are proposed

- A connection to the existing storm trunk located in 40th Avenue will provide 200 l/s of capacity through the existing Southgate stormwater management system. The 200 l/s capacity will be available with the completion of an extension of the existing stormwater management system through the undeveloped 40th Avenue right-of-way. The stormwater management strategy for the entire area apportions the available capacity between the landowners to maximize the land area that can be developed before the Six-Mile Coulee storm trunk is completed. Until the completion of the existing stormwater management system through the undeveloped 40th Avenue right of way; stormwater on an interim basis may be directed through other available storm pipes in Fairmont and Southgate subject to storm pond sizing and the City of Lethbridge's approval of detailed design.
- A new storm trunk and outfall will be constructed in Six-Mile Coulee to service the Southeast Area. The outfall will connect to the proposed stormwater trunk sewer in 51st Street.

Storm Pond Design

Stormwater Management facilities include a combination of wet, dry and hybrid style facilities. All wet ponds, including hybrid facilities will require irrigation make up water to maintain water quality. The water source will come from the St. Mary's River Irrigation District. Water rights will need to be acquired by the developer on behalf of the City of Lethbridge.

- Dry Ponds: Dry ponds will generally be designed to provide active park space within the active storage area of the pond. Typically, the active storage depth will be limited to 1.5m. This may require installation of sub-drains, or other sub-surface water controls to ensure that the dry pond area can service the stormwater management and recreational needs.
- Wet Ponds: Wet ponds within the discovery area will be designed as traditional wet / dry storage basins. Typically, the active storage depth will be limited to 2.0m. The ponds will incorporate measures to manage water quality within the permanent pool, including riparian plantings, aerators and other controls. A pathway will be constructed at the high water line of the pond to create a break between the storage basin and the fringe between the ponds and the lots backing onto the facility.
- Hybrid Ponds: The intention of the design of the hybrid facility is to incorporate a permanent wet portion of the pond that will provide water quality improvement. Typically, the active storage depth will be limited to 2.0m. As the area of permanent water is small, the design of the facility will require the development of a wetland area, with micro-pools and semi-marsh areas that will minimize the chance of water quality issues during extended dry periods. The dry portion of the pond will be designed to allow for more passive park uses, but could include natural play features.

As each stormwater management facility is developed, the ponds may be constructed as dry ponds, or include constructed wetland features to principally meet the stormwater management needs of the development, while

considering the site-specific needs for the neighbourhood and green space that incorporate the facility. This approach will allow the incorporation of appropriate park amenities within the footprint of the facility while still meeting the stormwater management requirements for the development.

Catchment Areas

Catchment areas are defined based on contributions to their corresponding stormwater management facility. Maps 9 and 10 show the major and minor systems, stormwater management facilities and corresponding catchment areas.

- **Catchment Area Pond SW-1A**

This catchment area includes approximately 22.2 ha of residential areas and the proposed elementary school site as well as the existing 43rd Street right-of-way that will ultimately be redeveloped and incorporated into the development. This catchment area will drain to the SW-1A pond. The pond will be designed with a release rate of 34 l/s. The emergency release route for the pond will direct flows to the NE-1A pond facility.

- **Catchment Area Pond NE-1A**

This catchment area includes approximately 42.3 ha of residential areas and the future 51st Street right of way. This catchment area will drain to the NE-1A pond. The pond will be designed with a release rate of 66 l/s. The pond volume provided provides sufficient storage to manage significant rainfall events and when combined with the designed emergency release route, will provide design resiliency and flood mitigation to future residents in the area.

- **Catchment Area Pond SW-1B**

This catchment area includes approximately 32.5 ha of residential development. The catchment area will drain to two ponds located within the development. The ponds (SW-A-1B and SW-B-1B) will be designed to balance storage volumes between them, allowing flexibility in staging of the service area. The two ponds will have a common high water level, and will be designed to minimize wet areas that limit active use of the dry portions of the ponds.

The ponds will drain to the existing 40th Avenue storm trunk connection at a release rate of 3.1 l/s/ha (100 l/s). The emergency release route for the pond will direct flows through the existing Southgate area, making use of the existing overland routes.

- **Catchment Area Pond E-1B**

This catchment area includes approximately 15.8 ha of residential areas and the future 51st Street right-of-way . This catchment area will drain to the E-1B pond. The pond will be designed with a release rate of 3.1 l/s/ha, and will connect to the future Six -Mile Coulee storm trunk. The emergency release route for the pond will direct flows to the SMC pond facility.

- **Catchment Area Pond SMC**

This catchment area includes approximately 36.9 ha of mixed commercial and residential areas.

The ponds are intended to function as linear storm water management facilities that will need to be designed with intermediate flow controls between individual cells of the pond. The concepts shown in the outline plan include traditional wet ponds, a linear detention facility and a 'hybrid' type storm pond.

This catchment area will ultimately expand to include some area east and south of the outline plan boundary. This may require that the proposed pond sizes be adjusted to accommodate the final catchment boundary. The ultimate catchment area for the SMC stormwater management facilities will be finalized with the completion of the adjacent outline plans. This catchment area will drain to the SMC stormwater management facilities. The ponds will be

designed with a release rate of 3.1 l/s/ha, and will connect to the future Six-Mile Coulee Storm Trunk. The emergency release route for the pond will direct flows overland to Six-Mile Coulee.

Characteristics for each of the seven catchment areas and associated detention ponds are summarized in Tables 5-3 and 5-4 below.

Table 5-3 Stormwater Management Facilities

Facility	Pond Type	Connection Point	Catchment Area (ha)	Permanent Pool [1]		Active Storage	
				Minimum Volume (m^3)	Depth (m)	Volume (m^3)	Depth (m)
SW-1A	Wet	40th Ave. S	22.2	5,600	2	24,400	2
NE-1A	Wet	40th Ave. S	42.3	10,600	2	46,500	2
SW-A-1B [2]	Dry		19.9			21,900	1.5
SW-B-1B [2]	Hybrid		12.6	3,200	2	13,900	2
SW 1B (Total)		40th Ave. S	32.5	81,000		35,800	
E-1B	Hybrid	Six-Mile Coulee	15.8	3,900	2	17,400	2
SMC-1B [3]	Hybrid	Six-Mile Coulee	36.9	9,200	2	40,600	2

[1] Based on storage required for 25mm of rainfall over entire catchment
[2] Ponds SW-A-1B and SW-B-1B will share a common high water level, ensuring that the dry facility will be wet less frequently than the planned hybrid facility.
[3] Pond SMC-1B is a general description of a series of pond facilities that will function together as a linear pond.

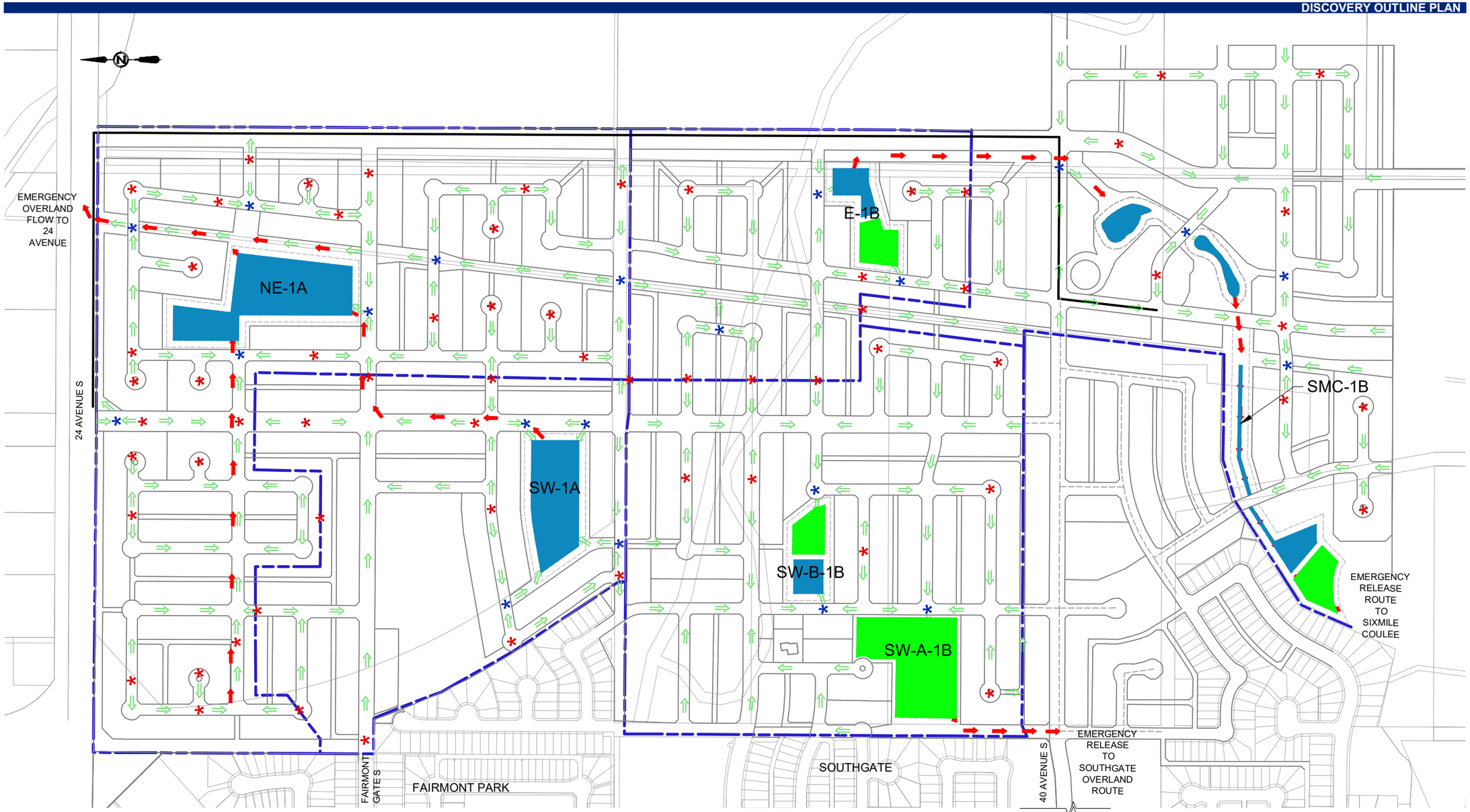
Table 5-4 Stormwater Flows

Facility	Unit Area Pond Release Rate (l/s)	Release Rate (l/s)	Minor (m^3/s) [1]	Major (m^3/s) [2]
SW-1A	1.6	34	2.00	4.44
NE-1A	1.6	66	3.81	8.46
40 Ave S Outlet (1A) [3]		100		
SW-A-1B	3.1	61	2.07	4.60
SW-B-1B	3.1	39	1.16	2.58
40 Ave S Outlet (1B) [3]		100		
E-1B	3.1	49	1.82	4.04
SMC-1B	3.1	114	2.18	1.84

[1] Minor system design basis flow: 90 l/s/ha
[2] Major system design basis flow: 200 l/s/ha
[3] Based on capacity available within the existing Southgate Stormwater Management System

Off-site Infrastructure Requirements

The ultimate storm water management system for the Discovery Outline Plan Area will require a connection to be constructed to the existing Southgate Stormwater Management system to provide an outfall for the SW-1A, NE-1A, SW-1B catchments. The final trunk will need to be constructed within the undeveloped portion of 40th Ave to the intersection of Couleesprings Road. The timing for the regional solution is currently projected for 2029, however uncertainties in the availability of off-site funding for the project make the actual construction date uncertain.



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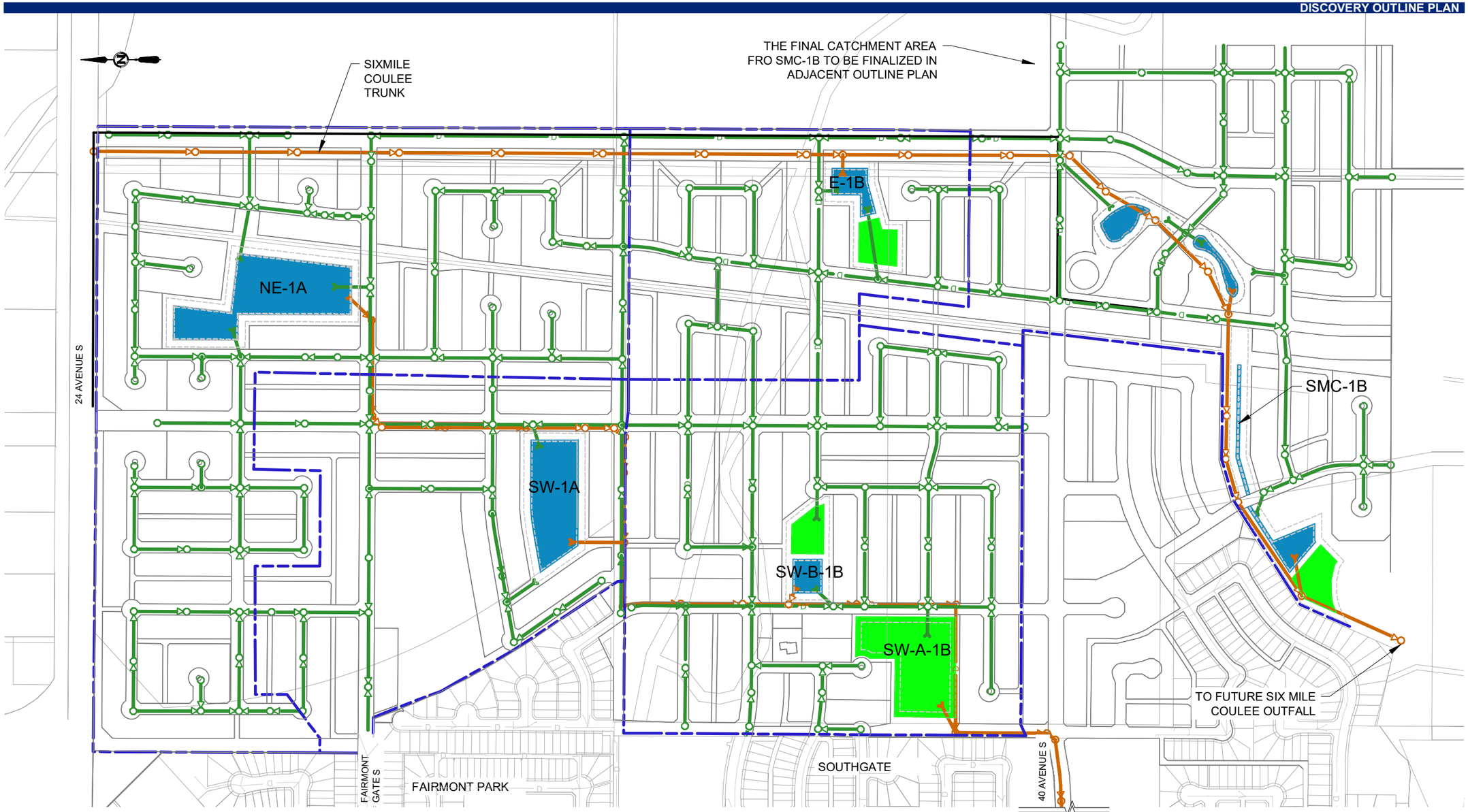
Map 9 - Major Stormwater Management Concept

LEGEND

HIGH POINT
LOW POINT
STORM CATCHMENT BOUNDARY
OVERLAND FLOW DIRECTION
EMERGENCY OVERLAND FLOW DIRECTION
STORM CATCHMENT AND POND IDENTIFICATION SW-B-1B



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Map 10 - Minor Stormwater Management Concept

LEGEND

STORM MAIN

STORM TRUNK

STORM CATCHMENT BOUNDARY

STORM CATCHMENT AND POND IDENTIFICATION SW-A-1B

6. Community Integration

Integration of Discovery with Fairmont and Southgate is a key design basis objective which was consistently communicated as a priority throughout the public consultation process.

A public open house event was hosted to present the preliminary outline plan. The event was well attended by residents from the neighboring communities. Public feedback received from the event included:

- Concern regarding the situation of residences directly adjacent to the existing homes within Gateway Mews.
- Concern regarding the plan to extend Gateway Mews South and Gateway Manor South to connect with the proposed new 32nd Avenue as this would significantly increase local traffic and the impact of closing the existing north access to the area along 43rd Street.
- Concern with the intention of designating Gateway Mews South as a bike lane as it does not have sufficient width to accommodate this activity.
- Concern with the accelerated timing for the decommissioning of 43rd Street and its impacts on accessibility into Fairmont and Southgate.
- Concern with the lack of greenspace along the back of lots north of 40th Avenue.
- People were pleased with the location and layout of the proposed elementary school.
- Concern with the number of mid-block crossings within the neighbourhood.

In response to the input received, the Land Use Development Concept was revised to provide a 10-metre wide dedicated linear parkway along the existing 43rd Street right-of-way adjacent to Gateway Mews. The proposed elementary school site and its associated school yard were relocated to the western boundary of the plan area to create an uninterrupted landscaped buffer between existing Gateway Mews residents and new development in Discovery. This corridor also eliminates the need to introduce a bike lane along Gateway Mews South.

Conceptual Rendering Only

The proposed new road network within Discovery results in the creation of three orphaned properties within the Gateways Mews area. The planned decommissioning of 43rd Street will result in the closure of the existing temporary northern access to Gateway Mews. With the closure, it is expected that the existing perimeter fence defining the eastern boundary of Gateway Mews will be extended to enclose this corridor, creating a small parcel of land inside the perimeter fence. It is anticipated that this small remnant parcel could be offered for purchase to existing adjacent residents or alternatively developed as a landscaped boulevard.

Discovery promotes inter-neighbourhood integration through the extension of Fairmont Gate, Southgate Boulevard and 40th Avenue as well as through the introduction of 32nd Avenue; providing an east-west connection to 47th and 51st Street to the east.

Pathways and linear parks have been situated to connect with existing pathways extending east from Fairmont and Southgate. The proposed new elementary school and proposed new outdoor amenity areas have been situated within walking distance of many of the residents within adjacent existing neighbourhoods. The proposed closure of a segment of the existing 43rd Street right-of-way situated along the southern boundary of Gateway Mews will result in the creation of two orphaned remnant properties. As illustrated in call-out 2 in Figure 5-6, these two remnant parcels are capable of being incorporated into the open space plan as fully landscaped parkettes. These properties are currently privately owned and any change in use will need to be negotiated with the City.

Wherever possible, fully landscaped parkways have been situated along the interface with existing neighbourhoods to act as a buffer and active transportation corridor linking the north and south areas of the plan.

The modified grid roadway network within Discovery provides multiple connections to the east of the outline plan area, increasing its overall permeability relative to future development. The proposed new road and pathway network adjacent to Southgate as illustrated in call-out 3 of Figure 5-6 will result in a slight reconfiguration of existing laneways and internal roads. Coulee Springs Way is intended to be extended into the Discovery Outline Plan area to connect with the proposed Southgate Boulevard extension. Likewise, Coulee Springs Terrace is intended to be extended to connect to Coulee Springs Way to the north.

The existing rear lanes situated between Southgate Boulevard and Coulee Springs Terrace along the interface with the Discovery plan area are intended to be retained and continue to function in their current capacity, utilizing the existing constructed bollards and cables to clearly define the eastern lane boundary and to create a physical separation between laneways and adjacent roads and park spaces.

Figure 5-6 Conceptual Rendering Community Interface

7. Plan Implementation

7.1 Plan Staging

It is anticipated that each land owner will develop their own phasing plan based upon the logical and orderly extension of municipal services into the area. In general, development is expected to be initiated in the immediate vicinity of the proposed elementary school site. As initial development in the area relies on the extension of existing infrastructure from Fairmont and Southgate, the staging of development is anticipated to proceed in an easterly direction from the interface with Southgate and Fairmont. The latter phases will occur east of the ATCO High Pressure Gas line corridor in conjunction with the installation of new major trunk infrastructure along the 51st Street right-of -way and based on market demand.

Development must consider City of Lethbridge Standards with respect to Infrastructure looping and access. Completion of individual phases of development will require careful consideration of the location and availability of services. Looping requirements for water services must ensure adequate level of service for users as areas are completed.

Tentative plan staging is shown in Map 11. This staging plan does not represent the order in which development may occur. It only reflects suggested phase boundaries. As noted above, development may occur concurrently along the boundaries of either Fairmont or Southgate and proceed in an easterly direction.

The details of boundary conditions for cost sharing of the collector roadways, stormwater management facilities and their appropriate recoveries will be negotiated and reflected in future Service Agreements. As the area transitions from existing to the future urban uses, no small remnant parcels are left that may impede the future utility servicing, transportation network or development of the area. Determination of this shall be made at the subdivision stage.

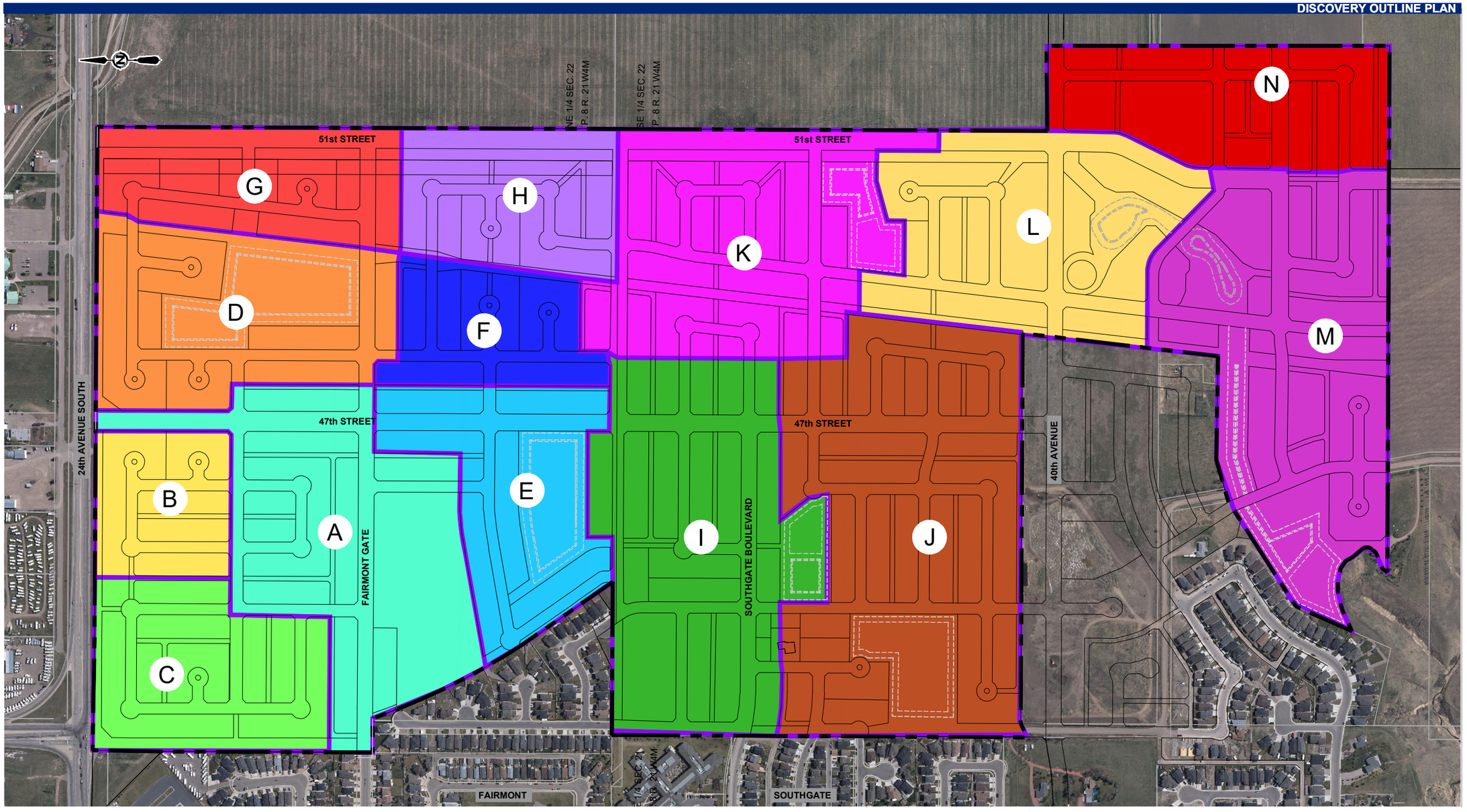
7.2 Rezoning and Subdivision

Following adoption of the Outline Plan, implementation of the plan will be on stage-by-stage basis achieved through the City's rezoning and subdivision process. Application for appropriate redistricting shall be consistent with the land use designations and descriptions provided within The Discovery Outline Plan and the SEASP, in addition to the City of Lethbridge Land Use Bylaw 5700. Rezoning and subdivision applications will be advanced for specific stages in response to market demand.

7.3 Plan Amendment

The Discovery Outline Plan is intended to provide a detailed description and illustration of development such as land use, circulation, parks, open space and pathways development. However, the plan remains conceptual and is subject to alterations and adjustments as a result of market conditions, new standards and consumer demand at the time of development. It is therefore important to create a flexible plan that still provides certainty to the City of Lethbridge, neighbourhoods and their residents.

Requirements for the adoption and amendment of an Outline Plan are the responsibility of a municipality. It is the City of Lethbridge Municipal Planning Commission that approves Outline Plans and this process would apply to any subsequent amendment applications to The Discovery Plan.



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Map 11 - Tentative Staging Plan

LEGEND

STAGE A	STAGE E	STAGE I	STAGE M
STAGE B	STAGE F	STAGE J	STAGE N
STAGE C	STAGE G	STAGE K	
STAGE D	STAGE H	STAGE L	

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Appendix A - Certificate of Title

Appendix B - Aerodrome Decommissioning

Appendix C - Geotechnical Reports

Appendix D - Environmental Site Assessment

Appendix E - Supplemental Biophysical Information

Appendix F - Heritage Resource Act Clearance

Appendix G - Traffic Impact Assessment

Appendix H - Correspondence