Town of Coaldale

Transportation Master Plan

Contents

Appendices for functional studies can be found on the Town of Coaldale's website.

Introduction

Transportation Planning is not a point-in-time activity. Instead, it may be most appropriate to consider it an ongoing process that is underpinned by evidence-based decision making that balances community context with quantitative and qualitative analytical outcomes. Simply put, transportation planning is intended to provide direction as to how, where and why the Town's existing and future transportation network should grow and change over time in the safest and most effective ways possible.

Transportation Planning today is different than it may have been in the past. For instance, nowadays it is commonplace for transportation planning to recognize active modes users (walkers, cyclists, wheelchairing, skateboarding, etc.) as equal to vehicles in terms of who streets and roads should be designed for. The prevailing logic regarding how to safely and effectively manage all users in a transportation network is different than it once was. Decades ago, the thought of widening roads to provide as much comfort to drivers as possible, and thereby make drivers, and active modes users safer, was widely accepted. This logic has since been disproven and instead the current best practice is to design networks that result in all users being aware of and respecting one another's presence in the network. This is of course not the case for all aspects of a network, with consideration for major roadways that are wholly intended to move vehicular traffic. However, and especially in a community such as Coaldale, these types of roadways are not common other than in areas such as industrial parks.

This plan has been developed by the Town of Coaldale embraces the idea of planning as an ongoing process by breaking the document down into parts. Each part relies on the others to be used in the most effective way possible. However, each part is not mutually exclusive and can be updated as needed, without having to overhaul the entire document. The intention behind this is to create a document that has a great deal of longevity, as long as its parts are regularly reviewed and updated.

Parts of the Plan

1 Transportation Planning

This part of the Plan lays out how transportation planning is approached in Coaldale, including how community context can and should be considered when analyzing and designing changes and additions to the network.

2 Plan Goals, Policies, Strategies and Actions

This part of the Plan outlines strategic directions to achieve the desired outcomes of an enhanced transportation system in Coaldale.

3 Network Analysis and Cost Estimates

This part of the Plan is reliant on primarily quantitative data and a substantial amount of computer-based modeling. The outcomes of modeling help to inform where, when and why different parts of the network need to be changed or expanded. Specific options for how changes are made are based on a two step process that involves determining first which options are available, for example if traffic lights or a roundabout might work best, and then as a second step, designing the enhancement that has been chosen to fit the site it is being applied to.

4 Plan Implementation

This part of the Plan outlines a number of tools and mechanisms that should be developed and used in Coaldale, to achieve the goals of the Planning and Network Analysis parts of the Plan. In addition, suggested timelines are attached to each tool/mechanism along with the resources that are likely to be required to implement each one.

5 Appendices

Appendices hold the detailed quantitative information that is created when Part 2 (Network Analysis) is undertaken. This information is an important part of the Plan because it forms the basis of the engineering that is completed to understand the current and future network to the greatest extent possible, but it doesn't need to be right in the body of the Plan because summary tables and maps are provided instead.

Part 1

Transportation Planning

In this Section:

1.0 Transportation Planning

This Plan represents a progressive, practical, and effective path forward for the growth and change of the Town's transportation networks. The goals, strategies and actions contained in this Plan are largely based on the outcomes of the various community engagement activities and events that took place over the fall and winter of 2018/2019. Balancing current transportation planning, analysis and modeling, and design best practices with community context will ensure that this plan provides practical and effective guidance now and into the future.

1.1. Considerations

Transportation planning is a holistic and multidisciplinary exercise that is focused on balancing technical data, community context, and current best practices to create streets and roads that function well for all users. These elements should be considered and approached thoughtfully during the preparation and execution of a comprehensive planning exercise, such as a Transportation Master Plan.

1.2. Community Context

Between 2018 and 2019, a number of transportation focused community engagement events and activities were held and between the surveys, open houses and other events, more than 400 respondents representing a broad cross-section of the community provided feedback that has been invaluable to the shaping of this plan. These activities focused on capturing feedback from as diverse a cross section of the community as possible. School visits and open houses, evening events and other engagement activities helped to create a well rounded community perspective on transportation matters in Coaldale.

The outcomes of community dialogue can be summarized into a number of directives that have been incorporated into this Plan as goals, policies, strategies and actions. Generally, the results of community feedback indicated the following:

- Build-out and connect a functional active modes network throughout the community so that people can walk and cycle as a form of functional transportation, rather than just for recreation and leisure.
- Develop the goals and objectives of the Plan based on a broad set of considerations, rather than just cost or driver delay, for example.

- Smaller operational strategies and actions need to be included to achieve the goals and objectives of the Plan.
- Maintain Coaldale's character as the transportation network changes and grows.

In addition to the perspectives shared through the variety of community dialogue outcomes summarized above, the town can be organized into different contextual areas based on the variety of physical characteristics that make up Coaldale, such as predominant land uses, types of existing streets and roads, and likely future growth outcomes. This helps to ensure that network enhancements are designed and constructed in ways that are contextually sensitive.

For the purposes of this Plan, the town has been organized into six distinct areas, which can be described as follows:

Downtown

The downtown area is made up of Main Street (20th Avenue between 17th St. and 20th St.) and the blocks surrounding it. At just over 100 years old, this area is of particular significance as it represents Coaldale's history, and has been considered the heart of the community for many years. Changes to the transportation network in the Main Street area should be approached with great care so as to avoid negative impacts to the character of the area.

Established

The primarily residential areas that surround the downtown area to the east, west and south started to be developed as the Town was being settled, and major changes in this area concluded in the early 1980s with the development of the Eastview neighbourhood, which is situated around Jennie Emery Elementary School (JEES). Since the 1980s development in this area has been focused on smaller scale changes in the form of infill development and the renewal of housing stock near the end of its lifecycle. This area is home to five schools serving students at all grade levels. Changes to the network in this area should be approached with a particular focus on enhancing safety and creating more meaningful connections for active modes users.

Suburban

The Town's newer neighbourhoods have grown out around the edges of the established areas of the community, and include neighbourhoods such as Garden Grove, Parkside Acres, Cottonwood, Westgate and Waterfront Landing. These neighbourhoods are characterized by curvilinear street networks and fewer points of connection to the more

established parts of the community. Change to the network in these areas should be focused on creating more connections for active modes users, and ensuring a sufficient Level of Service for the main points of access to and from these neighbourhoods.

Transitional

Transitional areas include those parts of the community where development is either planned but has not yet occurred, or is partially completed but with a substantial amount of development left to occur. The neighbourhood sometimes referred to as “30th Avenue”, Fieldstone Meadows, and The Seasons Manufactured Home Community make up the transitional areas in the south of the community. The undeveloped parts of the West Coaldale ASP area, which are immediately west and south of Home Hardware, make up the transitional areas in the west of the community. Although these areas benefit from comprehensive plans in the form of adopted ASPs, it is likely that in at least some of the transitional areas there will need to be amendments and updates to these ASPs prior to further development occurring. With that being the case, changes to the network in these areas should be approached with a focus on enhancing network functionality for development has already occurred, while ensuring the tenets of this Plan are met with development that is planned but that has yet to occur.

Industrial

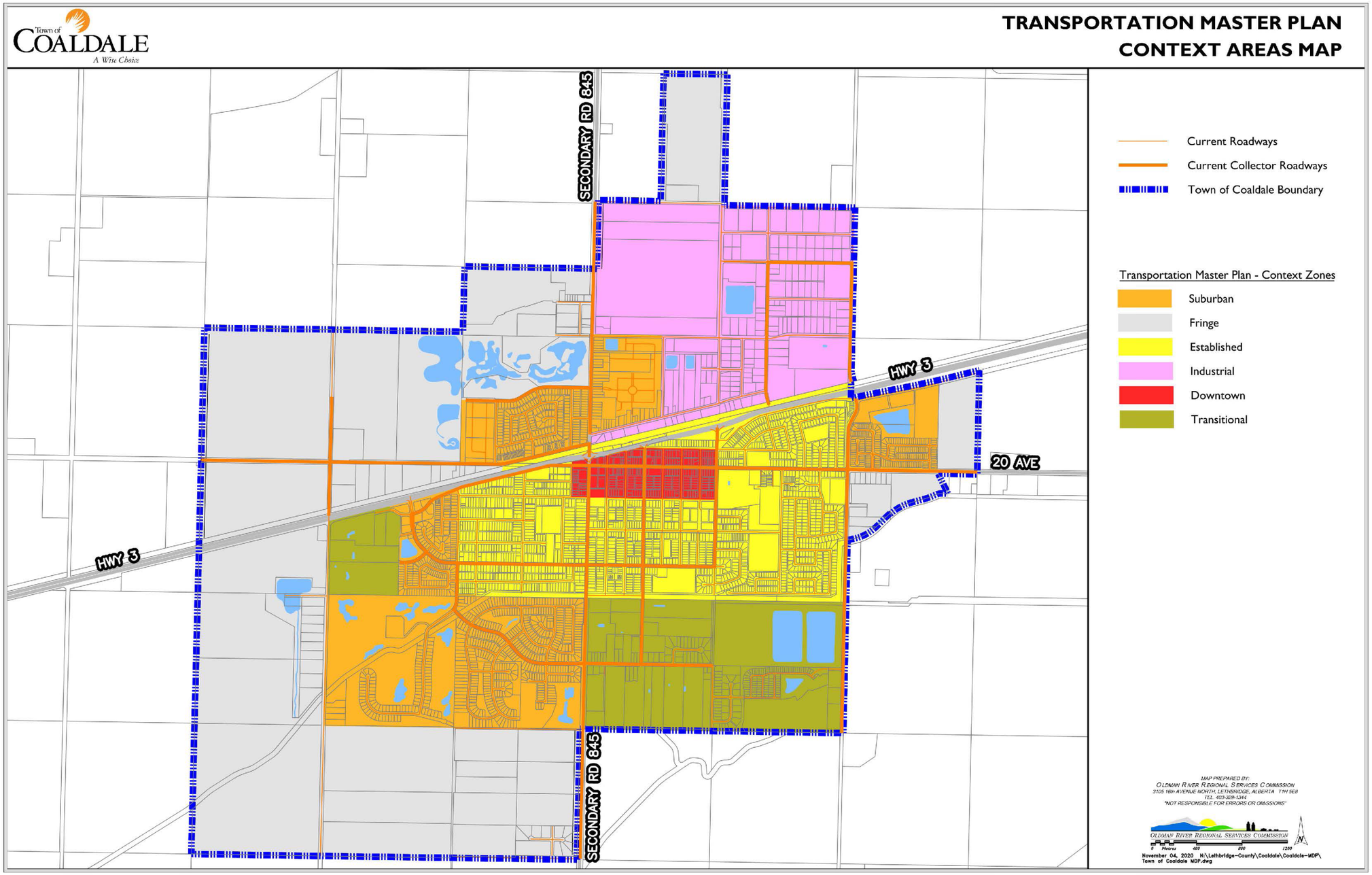
Coaldale’s industrial area has developed substantially over the past decade and continues to be seen as a desirable place to invest in. The industrial area is in the NE of the community and is well-served by Highway 3 and Highway 845. With consistent growth continuing to occur it will be of particular importance to ensure the enhancement and expansion of the network in the industrial area is focused on ease of access to and from Highways 845 and 3, and a layout and geometric design that promotes the efficient movement of commercial vehicles.

Fringe

In 2018 the Town successfully completed the annexation of almost 1500 acres of land in order to secure sufficient space for community growth that is projected to occur over the next 25+ years. Much of this area is currently being actively used for agricultural purposes, including cropping, and dairy operations. As development is planned for the lands making up the fringe area, it will be of particular importance to ensure the proposed networks intended to serve this area are designed to align fully with the core tenets of this plan.

Map 1 presents the context areas described above and can be found on page 9.

Map 1 - Context Areas



1.3. Past Plans and Studies

Coaldale's transportation network has benefitted from prior study and analysis. Being bisected north-south and east-west by the provincial highway network, a substantial amount of data and information has been gathered by Alberta Transportation, including studies focused on the intersection of Highway 845 and Highway 3. In addition, the ministry also undertakes traffic counts at regular intervals along the highways that run through Coaldale. This traffic count data is freely available and is used often by municipalities and consultants for transportation network analysis and planning purposes.

Following is a non-exhaustive list of past transportation-focused plans and studies that have been completed:

1998 - Town of Coaldale Transportation Study (Finn Transportation Consultants)

2004 - Highway 3 and 845 Functional Planning Study (McElhanney Consulting Services)

2004 - Pedestrian Crossing Control Assessment, Highway 845 at 21st and 23rd Avenue for the Town of Coaldale (Eagle Engineering Corp.)

2006 - Highway 3:10 Lethbridge to Coaldale Access Management Study, Report Number: R 946 (ISL Engineering and Land Services Ltd.)

2009 - Town of Coaldale Transportation Master Plan

2016 - Traffic Impact Assessment: Highway 3 and Land O' Lakes Drive (MPE Engineering Ltd.)

2017 - Traffic Impact Assessment: Solara Development (MPE Engineering Ltd.)

2017 - Impact of Development, the West end of Town North of Highway 3 - Network Study (WATT Consulting Group)

2017 - 2017 Traffic County Program report (WATT Consulting Group)

2019 - Cottonwood Estates Transportation Impact Assessment (WATT Consulting Group)

2020 - Highway 3/845 Functional Planning Study (WATT Consulting Group)

It should be noted that while not all plans and studies listed above have informed the development of this plan, the body of work they represent has had a positive impact on the management of the community's transportation network over time.

1.4. Integrating Land Use and Transportation Planning

Effective transportation planning demands consideration for what makes up a transportation network, and what has the potential to impact a network either positively or negatively. Land use, as in the variety of zonings and developments that occur based on what is allowed in each land use district, has a significant impact on a transportation network. The land use outcomes that have impact on a transportation network include how the network is designed, how it functions, and the principles of design the network is based on. To best plan for changes to a network, a holistic method in the practice of transportation planning is used. This method is referred to as Integrated Land Use and Transportation Planning, and is focused on the thoughtful consideration of all parts of a network and all aspects of a land use framework. Integrated Land Use and Transportation Planning often includes consideration for public transit. However, in Coaldale's current context this is not an element of the network that needs to be addressed. Instead, the other elements of the integrated planning method that do need to be included are population and dwelling unit density, trip generation volumes, peak times for specific uses, and consideration for all network users (vehicle traffic and active modes users). By making use of a more holistic methodology, the pitfalls of focusing exclusively on transportation or land use can be avoided, and both components, transportation and land use can be managed much more effectively.

1.5. Transportation Hierarchy

To know which users in a transportation network to prioritize, consideration must be given to the transportation hierarchy (see Figure 1). Figure 1 represents what may be considered a conventional transportation hierarchy based on best practices from the past.

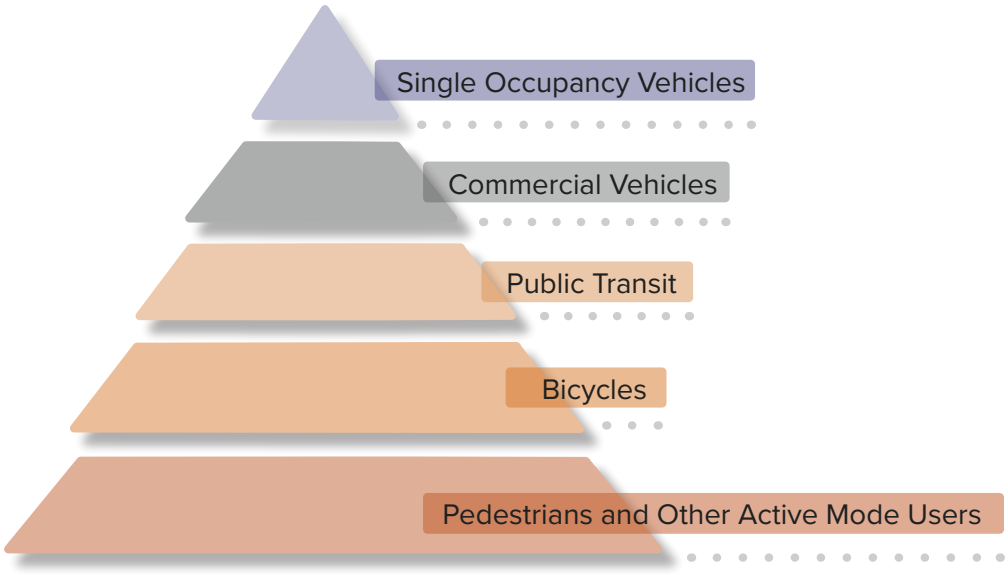


Figure 1. Transportation Hierarchy

However, more recently, transportation planning has focused on inverting the pyramid, placing the active modes user at the top and personal vehicles at the bottom.

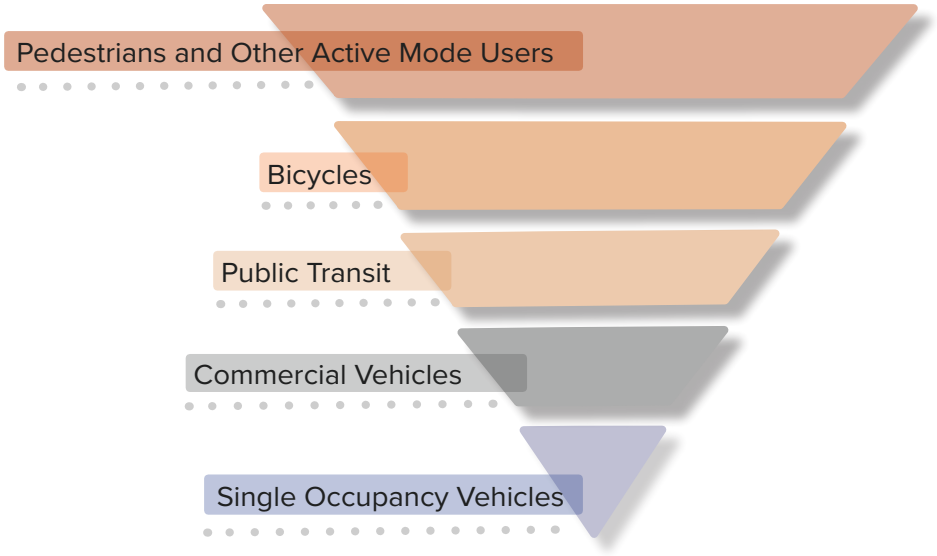


Figure 2. Inverted Transportation Hierarchy

Many Canadian communities are starting to embrace the inverted hierarchy, focusing on incorporationg the active modes user into our transportation networks in more meaningful ways than in the past. Where the active modes user, and in larger centres, the transit user, are higher up on the hierarchy. Based on the feedback received during transportation focused community dialogue, this is also true for Coaldale. One of the most common perspectives shared was the desire to have a more connected active modes network throughout the community. This is a healthy way to manage a community's transportation network as it allows for users to decide whether to drive, walk or cycle for daily transportation needs, rather than in the conventional hierarchy where walking and cycling are generally relegated to recreational pursuits. The expansion and increased connectedness of the active modes network in Coaldale should not be misunderstood as being the future of all travel in the community. Rather it may be considered an improvement to a network that is likely to continue to focus on vehicles as the primary users.

1.6. The Benefits of Network Analysis

Part 3 of this Plan contains the Network Analysis completed by the WATT Consulting Group. Network analysis is essential to this Plan as it provides a quantitative, technical basis for a benchmark understanding of the network's current condition, and where changes and enhancements are likely to be required in the short (0-5 year), and longer (5-10 year) terms. In

addition to providing a baseline understanding of network function and where changes are likely to be required, cost estimates have been developed for each recommended change. This is integral to prioritizing network changes from a functional and a budgetary perspective. Network analysis as it has been carried out in Part 3 is a powerful tool for transportation planning purposes. However, for complex and specific issues and proposals, it is often necessary to undertake additional, more detailed analysis to best inform proposed changes to specific parts of a network. An example of more detailed analysis for specific problem areas or proposed development areas includes tools such as Traffic Impact Assessments (TIAs), which are typically used for development proposals, or Functional Studies, which are typically applied to a specific, existing part of a network such as an intersection. These more focused forms of analysis are informed by broader network analysis and make up a part of the body of knowledge referred to for transportation network planning purposes.

1.7. Summary

Part 1 of this plan provides a snapshot of community context and presents the value and importance of considering the transportation network holistically and as a key part of Coaldale's built environment.

By considering the transportation network in the context of the desires of the community, and with the best available quantitative outcomes found in the network analysis, the Goals, Policies, Strategies and Actions presented in the next part of the plan can be applied with confidence, to ensure the Town's transportation network remains functional and resilient over time.

Part 2

Plan Goals, Policies, Strategies and Actions

In this Section:

2.0 Plan Goals, Policies, Strategies and Actions

Part 1 outlined the variety of influences and inputs that have helped to shape this Plan. The goals, strategies and actions presented in this part of the plan is based on a pragmatic and actionable approach to managing the Town's transportations networks and have been informed by the feedback collected through community dialogue.

2.1. Goals

1. An effective and efficient network
2. Prioritize active modes
3. Comfort and safety for all users
4. Create memorable streets and places
5. Proactive community involvement

2.2. Policies, Strategies, and Actions

An Effective and Efficient Network

Policies

1. Ensure the road network hierarchy is based on network analysis outcomes and adjust the classification of roadways where necessary to maintain optimal functionality of the network, with consideration for community context.

2. Develop and implement a method of analyzing the options available for a change or expansion to the network that makes use of asset management principles, and that reflects the choices that most closely align with this Plan.

   Strategies

   a. Develop a decision-making matrix based on asset management principles, among other things.

Actions

i. Apply the matrix to proposed network changes and present the outcomes in associated reports to Council, to help inform the decision-making process to the greatest degree. possible.

3. For new developments that are of a size or level of intensity that triggers a need for a Traffic Impact Assessment (TIA), ensure the potential impacts to the existing network are analyzed and understood prior to any final decisions being made regarding the approval of the development.

Strategies

a. Develop and implement a Traffic Impact Analysis (TIA) guideline and policy.

Actions

i. Develop and implement a TIA policy that is suitable for Coaldale's context, including a development impact threshold that clearly outlines when a TIA should be required.

ii. For areas that may not require a full TIA, identify alternative forms of analysis that may be considered suitable to require, at the discretion of the Town.

4. Ensure the functionality of roadways is upheld by proactively addressing potential challenges in the network.

Strategies

a. Private driveways should be discouraged along collectors and arterials in residential areas both as a way of minimizing the reduction in functionality for vehicle traffic and to enhance safety for active modes users. Parking in the rear of lots fronting collectors and arterials should be encouraged.

b. Local roadways should be designed in such a way as to promote the lower vehicle speeds that are desired for a given area, rather than overreliance on posted speed limits.

c. Service roads parallel to higher order roadways (such as provincial highways) should be discouraged and instead network design that allows for lots to front onto higher order roadways while being accessed from a part of the lot that is not directly adjacent to the higher order roadway, should be encouraged.

Actions

i. Reinforce the policy directives above by unifying them with the Town Plan policies.

5. Ensure the Town's transportation network model is kept up-to-date to ensure it remains functional and relevant over time.

Strategies

a. Develop and maintain a traffic counting program at key parts of the network throughout the community.

Actions

i. Taking guidance from the Network Analysis found in Part 2 of this Plan, identify those locations around the community that would benefit most from regular traffic counts.

ii. Identify the frequency with which these regular traffic counts should be undertaken.

iii. Identify budget impact for the program year over year and include in annual operating budget requests.

iv. Execute the traffic counting program.

6. Regularly review and update this Plan to ensure it remains relevant and useful for as long as possible, with a key part of more substantial reviews being community dialogue focused on ensuring the goals, policies, strategies and actions of the Plan developed in 2020 remain relevant, or can be adjusted to remain relevant, over time.

Strategies

a. Undertake an annual review of this Plan, including network analysis and cost estimates, and implementation, with the assistance of consulting transportation engineering expertise.

b. To ensure annual reviews consider community perspectives, prepare and provide an annual 'Transportation Matters' survey.

Actions

i. Identify budget impact for the program year over year and include in annual operating budget requests.

ii. Schedule a review to be conducted at the same or similar time each year.

iii. Ensure that the results of each annual update are shared with the community.

Strategies

c. Execute a major review of this Plan every 4 years, coinciding the review with the start of each Council term, and include opportunities for community dialogue within this review.

Actions

i. Include discussion and scheduling of a major review with the new Council orientation process required by the Municipal Government Act (MGA).

ii. Prior to each major review, prepare a public participation plan that ensures the incorporation of meaningful community dialogue in the review process.

7. Ensure the street signs and speed limits throughout the community function in a way that is logical and reflective of community perspectives.

   Strategies

   a. Undertake a street sign and speed limit rationalization study to determine if and where any changes to the current signage and/or speed limits throughout the community may be beneficial.

   Actions

   i. Confirm the scope of the study and identify budget impact.

   ii. Prepare a Public Participation Plan that allows for the incorporation of community feedback in the study and the outcomes that are actioned from the study.

8. Enhance network connectivity for all modes and users.

   Strategies

   a. Undertake a network connectivity analysis for the Town's vehicle network and active modes network.

   Action

   i. Using the outcomes of Strategy a, identify priority connections that can be reasonably made in the network, prepare estimates for this work, and present a connectivity enhancement project plan to Council for consideration.

   Strategies

   b. Make new connections within the existing network where reasonably achievable, to enhance network connectivity.

   Action

   i. Identify an evidence-based minimum measurable level of connectivity that must be provided within new developments, and between new and existing developments and require that new development meets this minimum.

Growth Areas (all goals should be realized in the implementation of these policies)

Policies

9. Ensure that as the areas annexed in 2018 are developed the tenets of this Plan are upheld in the design, construction and operation of network expansions made to serve these areas.

   Strategies

   a. Identify the most likely scenarios for community growth over the next 5, 10 and 20 years,

and proactively plan major components of network expansion to serve the growth areas based on those scenarios.

Actions

i. Identify transportation network designs that most closely align with the goals and policies of the Town Plan and apply them to each growth area identified in the Town Plan and the Network Analysis in Part 3 of this Plan.

Prioritize Active Modes

Policies

10. Enhance the active modes network.

Strategies

a. Improve safety for active modes users by continuing to implement infrastructure such as, but not limited to, Rectangular Rapid Flashing Beacons (RRFBs) at key intersections throughout the community.

Actions

i. Taking outcomes from Policy 8, identify solutions for each part of the active modes network that is identified as requiring one or more functional enhancements.

ii. Prioritize the solutions identified in Action i above and present a multi-year funding request to Council for consideration.

iii. In the process of prioritizing the solutions identified in Action i, provide opportunities for community dialogue in order that priorities can be set based not only on network analysis outcomes but also on community perspectives and preferences.

Strategies

b. Develop pathways design standards based on a hierarchy of pathways that is similar to roads hierarchies (local, collector, arterial).

Actions

i. Identify pathways design standards for each type of pathway including but not limited to widths, surface and subsurface materials, signage, and lighting.

ii. Include the standards developed in Action i in the Town's general design standards.

Strategies

c. Undertake an accessibility analysis and identify and retrofit those parts of the network

that do not provide adequate access to the active modes network as measured by universal access standards and as informbed by community feedback.

Actions

i. Taking outcomes from Strategy c above, identify solutions for each part of the active modes network that is identified as requiring retrofits to be universally accessible.

ii. Prioritize the solutions identified in Strategy c above and present a multi-year funding request to Council for consideration.

iii. In the process of prioritizing the solutions identified in Strategy c, provide opportunities for community dialogue in order that priorities can be set based not only on network analysis outcomes but also on community perspectives and preferences.

11. Account for active modes users in the existing and future transportation network by requiring new neighbourhoods to tie into the active modes network in meaningful and measurable ways.

Strategies

a. Require a minimum level of connectivity for new neighbourhoods both internally, and in how these neighbourhoods will tie into existing adjacent developments, and where possible by way of analysis and retrofits, in existing neighbourhoods as well.

Actions

i. Identify a minimum distance each dwelling should be from a pathway connection and require that distance to be met in new neighbourhoods.

ii. Make connections where reasonably achievable to ensure existing neighbourhoods meet the same standard as noted in Strategy a above.

Comfort and Safety for All

Policies

12. Complete streets, that is, streets that are designed to accommodate active modes and vehicle users in an equitable manner and in a way that encourages active modes travel and improves accessibility and safety for all users, should be designed and constructed throughout the community.

Strategies

a. Develop a Complete Streets Strategy for Coaldale.

b. Prepare and implement a Public Participation Plan for this strategy to ensure it reflects community perspectives.

13. Provide a clear and consistent method of identifying, deploying and monitoring traffic calming measures throughout the community, with a particular focus on ensuring a focused and purposeful way of dialoguing with community members that are most likely to be affected.

Strategies

a. Develop a traffic calming strategy and supportive policy that allows for the Town to implement traffic calming measures in areas known to have issues and in areas where issues may be identified by one or more members of the community.

b. Ensure that the strategy and policy provides a clear and effective process for community members to request traffic calming measures in a specific location, and that the same process requires meaningful dialogue with stakeholders near the location in question prior to final decisions on if, what, where, when and how measures may be implemented.

Actions

i. Identify an annual budget for implementation of the Traffic Calming Policy that will be developed as a part of Strategies a and b above, and include in annual operation/capital budget requests.

14. Identify and implement programs that focus on enhancing the comfort and safety of all users of the network, and of specific user groups within the network, such as but not limited to K-12 students, the elderly, and those with cognitive, mobility or other physical disabilities.

Strategies

a. Continue with the implementation of the Active and Safe Routes to School program in Coaldale.

b. Continue to seek out proactive, meaningful ways to include students and community members in the ongoing processes involved with this program.

Strategies

a. Identify and implement other similar programs focused on serving those who may find navigating and using the transportation network challenging in one or more ways.

15. Parking infrastructure, whether in the public road r-o-w or within a lot that is separate from public road r-o-w, should be designed with consideration for area context, accessibility, visual appeal, and the impacts parking can have on public space and nearby properties.

Strategies

a. With recognition for the fact that drivers and passengers become pedestrians and active modes users once they leave a vehicle, public and private parking lots should include design elements that provide safe and comfortable access to and from vehicles and the lot such as but not limited to marked pedestrian crossings internal to the lot, adequate lighting, and compliance with universal design guidance.

b. In areas where parking is primarily off-street and parkings lots for different properties are likely to be adjacent to one another, parking should be shared amongst multiple lots and uses to avoid the over-dedication of lot area for the purposes of parking.

c. In the areas of the community that have primarily shared on-street parking, or a substantial amount of private parking lots, a parking inventory should be completed at regular intervals and the results reviewed against measured usership rates to identify whether there is an over-dedication of parking, sufficient parking or a parking shortage.

Actions

i. Develop and implement a Parking Strategy and Policy that captures the intent of the above policies.

16. Community wayfinding signage should be developed and designed for all users in the transportation network, and implemented across the community to ensure consistency and ease-of-navigation for all users.

Strategies

a. Wayfinding signage should be sized and designed in a manner that is appropriate to the context within which it is being implemented, with consideration for design elements such as but not limited to the primary intended audience (active modes users or drivers), and whether supportive infrastructure such as lighting may be beneficial.

Memorable Streets and Places

Policies

17. With consideration for the contextual areas of the community identified in Part 1 of this Plan, when changes to or expansions of the network in each area are required, the design of such a change or expansion should include elements focused on maintaining or enhancing the character of that area.

Strategies

a. Features such as but not limited to lighting, street furniture, street signage and the landscaping on and adjacent to public rights-of-way should be designed in such a way as

to uphold and enhance the character and/or primary purpose of the network for each of the context areas identified in Part 1, Section 1.2.

Actions

i. Include guidance on the types of features desired for each area of the community in the appropriate document(s) for each area, such as neighbourhood Area Structure Plans, the Land Use Bylaw, and Downtown Design Guidelines.

Proactive Community Involvement

Policies

18. In all policies, strategies and actions that recommend or require community dialogue, ensure this is practicesd proactively by preparing and providing opportunities for dialogue as early as possible for processes that involve changes to the transportation network.

19. All Public Participation Plans and related tools, events, and activities shall align with the Town's Public Participation Policy, as amended from time to time.

Part 3

Network Analysis and Cost Estimates

In this Section:

3.1. Recommended Changes to the Network

Priority items identified in the 2019-2020 Network Analysis (see Part 2 of this Plan)

The network analysis has identified the following as priority items for Coaldale's transportation network:

Recommended to be completed in the next 5 years:

- signalization of the intersection of Highway 3/30 Street
- addition of a NB left turn lane or Right-in/Right-out at the intersection of Highway 3/20 Street
- upgrade of 21 Avenue/Land O'Lakes Drive to a roundabout, or signalization.

Recommended to be completed in the next 10 years:

- signalization of the intersection of 18 Avenue/20 Street or improvement of the 18 Avenue/20 Street intersection to roundabout.
- A traffic monitoring program should be introduced to ensure that the schedule of improvements reflects actual traffic conditions and the actual development progression in the area.

Recommendations based on community and stakeholder feedback and/or previous studies:

- Pedestrian overpass

  (as recommended through work completed in association with the Joint Multi-use School and Recreation Study project that has been ongoing since 2018)

- John Davidson extension of 21st Avenue

  (as recommended by the Finn Transportation study completed in 1998 and as related to the recommendation to extend the n/s median as outlined in the Highway 3/845 Functional Planning Study completed in 2020)

- 13th Street to 17th Street extension

  (as identified on page 72 of this plan (page 41 of the Network Analysis document)

- 8th Street connection at Seasons

  (as suggested by WATT representatives informally during neighbourhood transportation planning discussions in 2017, as a way of completing an e/w route from Highway 845 to 8th Street)

Please note that the recommendations listed above require additional study prior to a final decision being made regarding the exact design and location of the recommendations. In the case of the John Davidson and 8th Street connection items, additional discussion with affected stakeholders (the school division, developer,and area stakeholders, respectively) regarding whether either of these recommendations is achievable based on additional complexities such as land acquisition and a change in traffic patterns.

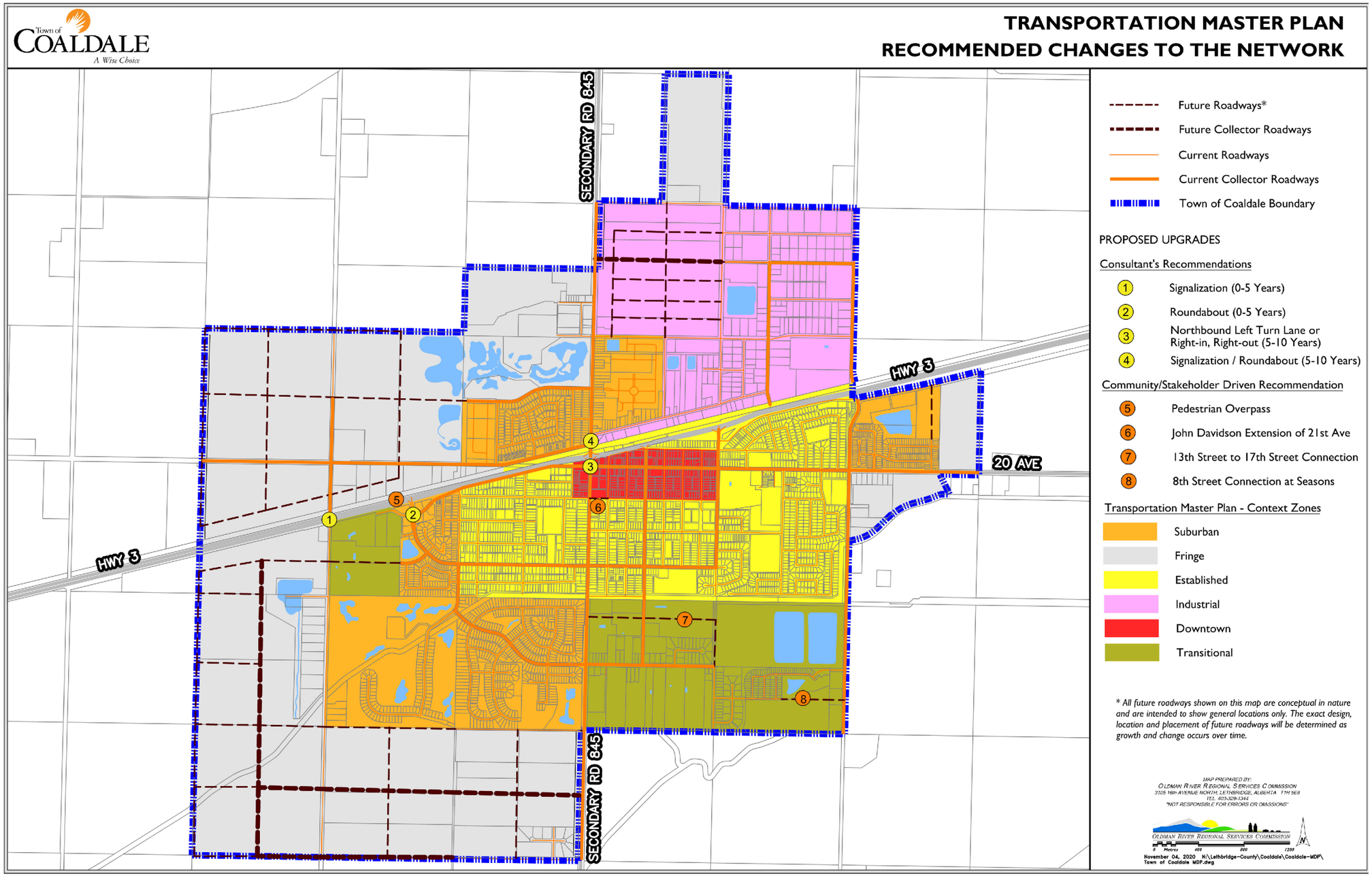
Priority items identified in future analysis

As time passes, network analysis will be updated and from time to time completely redone to ensure ongoing accuracy and usability of the information for both the Town and for developers. Refer to the proper appendix will maintain all versions of network analysis from the 2019-2020 version onward.

In addition to the changes as noted above, the outcomes of network analysis can help guide, at a conceptual level, where the current network should be expanded to accommodate growth in new areas of the community.

Map 2 provides a conceptual view of the future network, identifying major points of connection to service new areas and ensure they are well-connected to the existing built-up areas of the community.

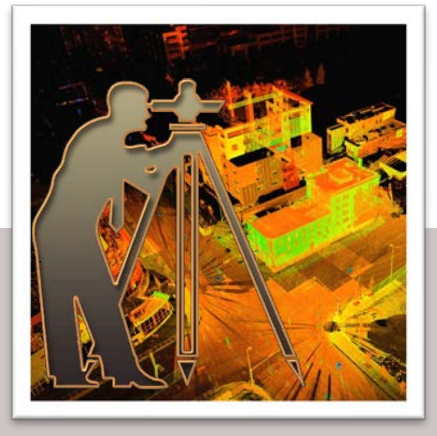
Map 2 - Recommended Changes to the Network



Town of Coaldale TMP

Network Analysis

November 19, 2020



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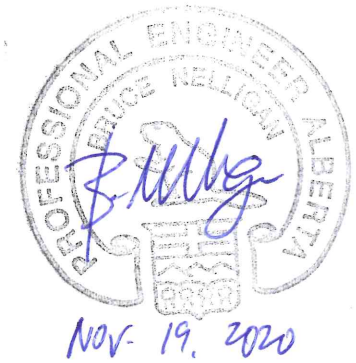
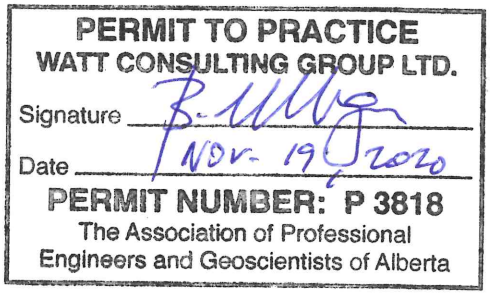
TOWN OF COALDALE TMP

Network Analysis





Author: E. Hill

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Prepared for: The Town of Coaldale

Our File: 3691.T01

Date: November 19, 2020

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1.0 INTRODUCTION

1.1 BACKGROUND TO THIS STUDY

Watt Consulting Group (WATT) was retained by the Town of Coaldale (Town) to carry out the transportation network analysis related to the Town's Transportation Master Plan (TMP). The results of the study will be utilized by the Town to review in detail the impact of the proposed development expected to be realized within the 10-year horizon on the existing transportation network.

The Town of Coaldale is located in Southern Alberta east of Lethbridge and has a population of 8691 according to census data from 2019. The study area is shown in **Figure 1**.

Figure 1: Study Area

1.2 SCOPE OF WORK

The scope of work for this network analysis was discussed and confirmed with the Town and includes the following main points:

- Identification, in co-operation with the Town staff, of the expected development within the Town's boundaries at the analyzed horizon years including population and employment,
- Traffic forecast for the analyzed horizon years,
- Operational and capacity analysis of the Town's key intersections and links to determine improvements required by the 5- and 10-year horizons;
    - we will include a specific evaluation of the extension of the 13 Avenue irrigational canal crossing as well as the extension of 12 Avenue to Secondary Highway (SH) 845.
    - We will also include an analysis of an extension of 16 Avenue, to determine the impacts of extending this road from 23 Street to 30 Street.
- Alternative modes; as alternative modes were reviewed extensively and are covered in detail in the Draft TMP report, we propose to include modifications to the original alternative mode network as per comments provided by Alberta Transportation.
- Preparation of a Type A construction cost estimate for identified improvements.

1.3 REFERENCED DOCUMENTS

In the preparation of the Draft TMP report, the following documents were reviewed and considered as part of the analysis:

- Town of Coaldale Land Use Bylaw – Bylaw No. 677-P-04-13 July 2013 (Consolidated to Bylaw 750-P-11-18 October 2018) & Land Use District Map
- "Town of Coaldale Growth Study" (Oldman River Regional Services Commission, Approved by Resolution of Council on May 25, 2015)
- "Town of Coaldale / Lethbridge County Annexation Areas" map (Oldman River Regional Services Commission, January 2017)
- "Accommodating Growth – Town of Coaldale Annexation Application" presentation to the Municipal Government Board (June 2017)

- Spruce Woods Country Estates Issued for Approval drawing set (Martin Geomatic Consultants, December 2018)
- “Proposed Palliser High School and Recreation Facility – Future Growth Map” (January 2019)
- “Coaldale Transportation Master Plan – draft report” (Peter A. Truch, February 2019)
- “Town of Coaldale – Highway 3 and 30 Street Traffic Impact Assessment” (MPE Engineering Ltd., June 2019)
- “Cottonwood Estates Transportation Impact Assessment” (WATT, December 2019)

2.0 EXISTING CONDITIONS

2.1 EXISTING ROAD NETWORK

Coaldale is located in on Highway 3 approximately 18 km east of the City of Lethbridge. The Town's network includes transportation facilities located under management and control of the two different road authorities namely; the Town of Coaldale and Alberta Transportation (AT).

The roads under the jurisdiction, management and control of AT include;

- Highway 3: a four-lane east/west provincial divided highway. It is posted as follows:
  - at 100 km/h to the west of Town boundary with speed limit transition to 70 km/h approximately 120 m east of 30th Street,
  - 70 km/h approximately 120 m east of 30th Street to approximately 650 m east of Highway 3/Land O'Lakes Drive intersection and
  - 50 km/h from approximately 650 m east of Highway 3/Land O'Lakes Drive intersection to the eastern Town boundaries.
- Highway 845 (20 Street): a two-lane north/south provincial highway posted at 50 km/h within the Town boundaries.

The Town's main street network, with all roads constructed to an urban standard and operating as two-lane streets with a posted speed limit of 50 km/h includes;

- 12 Avenue
- 18 Avenue
- 20 Avenue
- 23 Avenue
- 30 Avenue
- 8 Street
- 11 Street
- 13 Street
- Land O' Lakes Drive
- 30 Street

Figure 2 shows the existing road network within the Town.

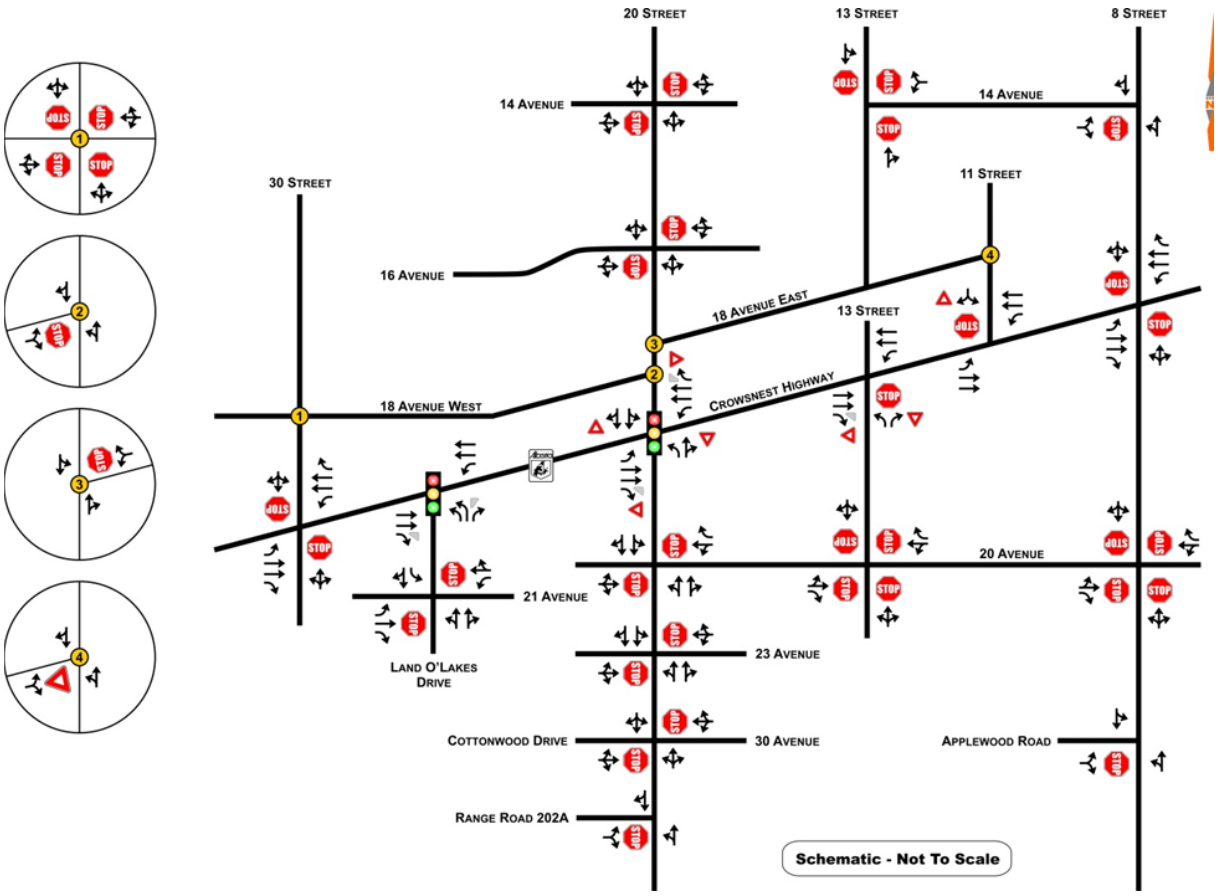

Figure 2: Existing Road Network

2.2 EXISTING TRAFFIC VOLUMES

The County of Lethbridge VISUM traffic forecasting model was utilized to derive the existing volumes at the key intersections within the Town. The model was calibrated using the County of Lethbridge and AT traffic counts and turning movements at the key intersections. Available traffic volumes included 2017 traffic counts at key Town intersections, 2019 link traffic counts provided by the County of Lethbridge and 2019 traffic counts on provincial highways obtained from the AT database. This information has been used to calibrate the traffic model and determine turning movements at the key intersections.

The VISUM modelling outputs and volume diagrams for the existing traffic volumes, and all subsequent VISUM modelling outputs for this report, can be found in **Appendix A**.

2.3 INTERSECTION PERFORMANCE AND EVALUATION CRITERIA

The operating conditions during the peak hours at the studied intersections were evaluated using the Synchro/SimTraffic and SIDRA software packages, which are based on the Highway Capacity Manual (HCM 2010) evaluation methodology.

For un-signalized (stop-controlled) intersections, the Level-of-Service (LOS) is based on the computed delays on each of the critical movements. LOS 'A' represents minimal delays for minor-street traffic movements, and LOS 'F' represents a scenario with an insufficient number of gaps on the major street for minor street motorists to complete their movements without significant delays.

For signalized intersections, the methodology considers the intersection geometry, traffic volumes, traffic signal phasing/timing plan, and also pedestrian volumes. The average delay for each lane group is calculated, as well as the delay for the overall intersection. The operating conditions can also be expressed in terms of volume to capacity (v/c) ratios. LOS criteria for both unsignalized and signalized intersections, as summarized in the Highway Capacity Manual, are illustrated in **Table 1**.

TABLE 1: LEVEL OF SERVICE CRITERIA

Level of Service (LOS)	Average Delay for Unsignalized Intersection Movements	Average Delay for signalized Intersection Movements
A	0 – 10 seconds per vehicle	0 – 10 seconds per vehicle
B	> 10 – 15 seconds per vehicle	> 10 – 20 seconds per vehicle
C	> 15 – 25 seconds per vehicle	> 20 – 35 seconds per vehicle
D	> 25 – 35 seconds per vehicle	> 35 – 55 seconds per vehicle
E	> 35 – 50 seconds per vehicle	> 55 – 80 seconds per vehicle
F	> 50 seconds per vehicle	> 80 seconds per vehicle

As Highway 3 and Highway 845 are highways under the jurisdiction, management and control of Alberta Transportation (AT), AT standards and criteria for acceptable LOS operations were followed in the analysis as summarized below for the Highway:

1. A maximum v/c ratio of 0.9 with a minimum LOS of C is acceptable for developments within rural areas.
2. A maximum v/c ratio of 0.9 with a minimum LOS of D is acceptable for developments within urban areas.

For the Town's internal street system, the City of Lethbridge criteria were used, namely, for developments that are adjacent to existing arterial and collector roadways, the City of Lethbridge considers a minimum LOS of D to be acceptable.

2.4 EXISTING OPERATING CONDITIONS

The existing traffic volumes, derived as described in Section 2.2, were evaluated on the existing road network as shown in **Figure 2**. The results of the analysis are summarized in **Table 2**. All Synchro and Sidra microsimulation modelling outputs for this analysis, and all subsequent analysis, can be found in **Appendix B** of this report.

TABLE 2: EXISTING OPERATING CONDITIONS

EXISTING CONDITIONS ON EXISTING NETWORK

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
18 Avenue / 30 Street (Stop-Controlled)	EB	Left	0.00	A	0.0	0.0
		Through	0.07	A	7.5	0.2
		Right	0.07	A	7.5	0.2
	WB	Left	0.14	A	8.1	0.5
		Through	0.14	A	8.1	0.5
		Right	0.14	A	8.1	0.5
	NB	Left	0.10	A	7.3	0.3
		Through	0.10	A	7.3	0.3
		Right	0.10	A	7.3	0.3
	SB	Left	0.01	A	7.5	0.0
		Through	0.01	A	7.5	0.0
		Right	0.00	A	0.0	0.0
	Intersection Summary		-	**A**	**7.7**	-
HWY 3 / 30 Street (Stop-Controlled)	EB	Left	0.08	A	8.9	1.9
		Through	0.18	A	0.0	0.0
		Right	0.00	A	0.0	0.0
	WB	Left	0.00	A	9.0	0.0
		Through	0.14	A	0.0	0.0
		Right	0.01	A	0.0	0.0
	NB	Left	0.02	C	21.9	0.4
		Through	0.02	C	21.9	0.4
		Right	0.02	C	21.9	0.4
	SB	Left	0.23	C	16.6	6.8
		Through	0.23	C	16.6	6.8
		Right	0.23	C	16.6	6.8
	Intersection Summary		-	**A**	**1.8**	-
HWY 3 / Land O' Lakes Drive (Signalized)	EB	Through	0.29	A	9.9	18.1
		Right	0.30	A	3.0	8.9
	WB	Left	0.03	A	8.6	2.7
		Through	0.28	A	9.8	17.1
	NB	Left	0.09	A	8.7	6.4
		Right	0.02	A	4.9	2.2
	Intersection Summary		-	**A**	**8.3**	-
21 Avenue / Land O' Lakes Drive (Stop-Controlled)	EB	Left	0.00	B	12.1	0.1
		Through	0.00	A	0.0	0.0
		Right	0.00	A	9.3	0.0
	WB	Left	0.01	B	12.0	0.3
		Through	0.00	A	0.0	0.0
		Right	0.04	A	8.7	1.0
	NB	Left	0.00	A	0.0	0.0
		Through	0.03	A	0.0	0.0
		Right	0.03	A	0.0	0.0
	SB	Left	0.04	A	7.5	1.0
		Through	0.10	A	0.0	0.0
		Right	0.10	A	0.0	0.0
	Intersection Summary		-	**A**	**2.4**	-

EXISTING CONDITIONS ON EXISTING NETWORK

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
18 Avenue East / 20 Street (Stop-Controlled)	WB	Left	0.24	B	13.4	7.2
		Right	0.24	B	13.4	7.2
	NB	Through	0.16	A	0.0	0.0
		Right	0.16	A	0.0	0.0
	SB	Left	0.01	A	0.1	0.2
		Through	0.01	A	0.5	0.2
	Intersection Summary		-	**A**	**3.1**	-
18 Avenue West / 20 Street (Stop-Controlled)	EB	Left	0.19	B	11.7	5.2
		Right	0.19	B	11.7	5.2
	NB	Left	0.10	A	0.9	2.4
		Through	0.10	A	3.5	2.4
	SB	Through	0.17	A	0.0	0.0
		Right	0.17	A	0.0	0.0
	Intersection Summary		-	**A**	**3.5**	-
HWY 3 / 20 Street (Signalized)	EB	Left	0.23	A	10.0	14.2
		Through	0.09	A	8.1	7.0
		Right	0.22	A	2.6	7.3
	WB	Left	0.02	A	7.9	2.7
		Through / Right	0.11	A	6.9	7.3
	NB	Left	0.36	B	15.0	19.2
		Through / Right	0.28	B	12.1	22.4
	SB	Left / Through / Right	0.30	A	7.7	14.2
	Intersection Summary		-	**A**	**8.6**	-
20 Avenue / 20 Street (Stop-Controlled)	EB	Left	0.23	D	30.8	6.4
		Through	0.23	D	30.8	6.4
		Right	0.23	D	30.8	6.4
	WB	Left	0.16	C	20.1	4.4
		Through	0.16	C	20.1	4.4
		Right	0.23	A	9.6	6.9
	NB	Left	0.00	A	0.0	0.0
		Through	0.03	A	0.2	0.0
		Right	0.03	A	0.0	0.0
	SB	Left	0.17	A	1.4	4.7
		Through	0.17	A	3.3	4.7
		Right	0.05	A	0.0	0.0
	Intersection Summary		-	**A**	**8.0**	-

EXISTING CONDITIONS ON EXISTING NETWORK

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
23 Avenue / 20 Street (Stop-Controlled)	EB	Left	0.11	B	10.2	2.8
		Through	0.11	B	10.2	2.8
		Right	0.11	B	10.2	2.8
	WB	Left	0.10	B	10.9	2.5
		Through	0.10	B	10.9	2.5
		Right	0.10	B	10.9	2.5
	NB	Left	0.02	A	0.2	0.6
		Through	0.02	A	2.2	0.6
		Right	0.02	A	0.0	0.0
	SB	Left	0.00	A	0.0	0.1
		Through	0.03	A	0.7	0.1
		Right	0.03	A	0.0	0.0
	Intersection Summary		-	**A**	**5.6**	-
30 Avenue / 20 Street (Stop-Controlled)	EB	Left	0.04	B	10.4	1.0
		Through	0.04	B	10.4	1.0
		Right	0.04	B	10.4	1.0
	WB	Left	0.06	A	9.1	1.5
		Through	0.06	A	9.1	1.5
		Right	0.06	A	9.1	1.5
	NB	Left	0.00	A	0.0	0.1
		Through	0.00	A	1.2	0.1
		Right	0.00	A	1.2	0.1
	SB	Left	0.03	A	0.2	0.7
		Through	0.03	A	3.3	0.7
		Right	0.03	A	3.3	0.7
	Intersection Summary		-	**A**	**5.2**	-
HWY 845 / RR 202A (Stop-Controlled)	EB	Left	0.00	A	0.0	0.0
		Right	0.00	A	8.4	0.0
	NB	Left	0.00	A	0.0	0.0
		Through	0.00	A	0.2	0.0
	SB	Through	0.02	A	0.0	0.0
		Right	0.00	A	0.0	0.0
	Intersection Summary		-	**A**	**0.2**	-
14 Avenue / 13 Street (Stop-Controlled)	WB	Left	0.00	A	6.8	0.0
		Right	0.00	A	6.8	0.0
	NB	Through	0.00	A	6.6	0.0
		Right	0.00	A	6.6	0.0
	SB	Left	0.00	A	7.0	0.0
		Through	0.00	A	7.0	0.0
	Intersection Summary		-	**A**	**6.8**	-

EXISTING CONDITIONS ON EXISTING NETWORK

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
HWY 3 / 13 Street (Stop-Controlled)	EB	Through	0.03	A	0.0	0.0
		Right	0.02	A	0.0	0.0
	WB	Left	0.02	A	7.6	0.5
		Through	0.04	A	0.0	0.0
	NB	Left	0.05	A	9.8	1.1
		Right	0.05	A	9.8	1.1
	Intersection Summary		-	**A**	**1.9**	-
20 Avenue / 13 Street (Stop-Controlled)	EB	Left	0.25	A	8.3	1.0
		Through	0.25	A	8.3	1.0
		Right	0.04	A	6.1	0.1
	WB	Left	0.19	A	7.9	0.7
		Through	0.19	A	7.9	0.7
		Right	0.01	A	6.0	0.0
	NB	Left	0.05	A	8.1	0.1
		Through	0.05	A	8.1	0.1
		Right	0.05	A	8.1	0.1
	SB	Left	0.05	A	7.8	0.2
		Through	0.05	A	7.8	0.2
		Right	0.05	A	7.8	0.2
	Intersection Summary		-	**A**	**7.9**	-
18 Avenue / 11 Street (Stop-Controlled)	EB	Left	0.03	A	8.7	0.8
		Right	0.03	A	8.7	0.8
	NB	Left	0.01	A	0.1	0.2
		Through	0.01	A	5.6	0.2
	SB	Through	0.02	A	0.0	0.0
		Right	0.02	A	0.0	0.0
	Intersection Summary		-	**A**	**5.1**	-
HWY 3 / 11 Street (Stop-Controlled)	EB	Left	0.01	A	7.6	0.2
		Through	0.03	A	0.0	0.0
	WB	Through	0.04	A	0.0	0.0
		Right	0.01	A	0.0	0.0
	SB	Left	0.04	A	9.4	1.0
		Right	0.04	A	9.4	1.0
	Intersection Summary		-	**A**	**1.5**	-
14 Avenue / 8 Street (Stop-Controlled)	EB	Left	0.00	A	0.0	0.0
		Right	0.01	A	8.4	0.2
	NB	Left	0.00	A	0.0	0.0
		Through	0.00	A	0.1	0.0
	SB	Through	0.01	A	0.0	0.0
		Right	0.00	A	0.0	0.0
	Intersection Summary		-	**A**	**1.7**	-

EXISTING CONDITIONS ON EXISTING NETWORK

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
HWY 3 / 8 Street (Stop-Controlled)	EB	Left	0.00	A	7.6	1.0
		Through	0.03	A	0.0	1.0
		Right	0.00	A	0.0	0.1
	WB	Left	0.02	A	7.6	0.7
		Through	0.04	A	0.0	0.7
		Right	0.01	A	0.0	0.0
	NB	Left	0.04	A	9.2	0.1
		Through	0.04	A	9.2	0.1
		Right	0.04	A	9.2	0.1
	SB	Left	0.05	B	11.0	0.2
		Through	0.05	B	11.0	0.2
		Right	0.05	B	11.0	0.2
	Intersection Summary		-	**A**	**2.6**	-
20 Avenue / 8 Street (Stop-Controlled)	EB	Left	0.08	A	7.5	0.3
		Through	0.08	A	7.5	0.3
		Right	0.08	A	7.5	0.3
	WB	Left	0.05	A	7.4	0.2
		Through	0.05	A	7.4	0.2
		Right	0.05	A	7.4	0.2
	NB	Left	0.05	A	7.5	0.2
		Through	0.05	A	7.5	0.2
		Right	0.05	A	7.5	0.2
	SB	Left	0.06	A	7.4	0.2
		Through	0.06	A	7.4	0.2
		Right	0.06	A	7.4	0.2
	Intersection Summary		-	**A**	**7.4**	-
Applewood Road / 8 Street (Stop-Controlled)	EB	Left	0.01	A	8.8	0.3
		Right	0.01	A	8.8	0.3
	NB	Left	0.00	A	0.0	0.1
		Through	0.00	A	1.0	0.1
	SB	Through	0.02	A	0.0	0.0
		Right	0.02	A	0.0	0.0
	Intersection Summary		-	**A**	**1.9**	-

Results of the analysis indicate that all intersections are currently operating at LOS A with v/c ratios not exceeding 0.3.

3.0 FUTURE CONDITIONS

3.1 FUTURE GROWTH AND DEVELOPMENT TRIP GENERATION

Development plans were provided by The Town as part of their Transportation Master Plan, and included anticipated residential, commercial and industrial growth areas. The plans also indicate future institutional uses, such as a school, as well. The planned development within the Town is shown in the "**Future Growth Map**" on the following page.

This planned development was input into the Lethbridge County traffic forecasting model as a series of development cells, as shown in **Figure 3** to be used to derive future traffic volumes from. For the future volumes, it was also assumed that a background traffic growth of 2% would occur, on top of the projected volumes from the proposed development.

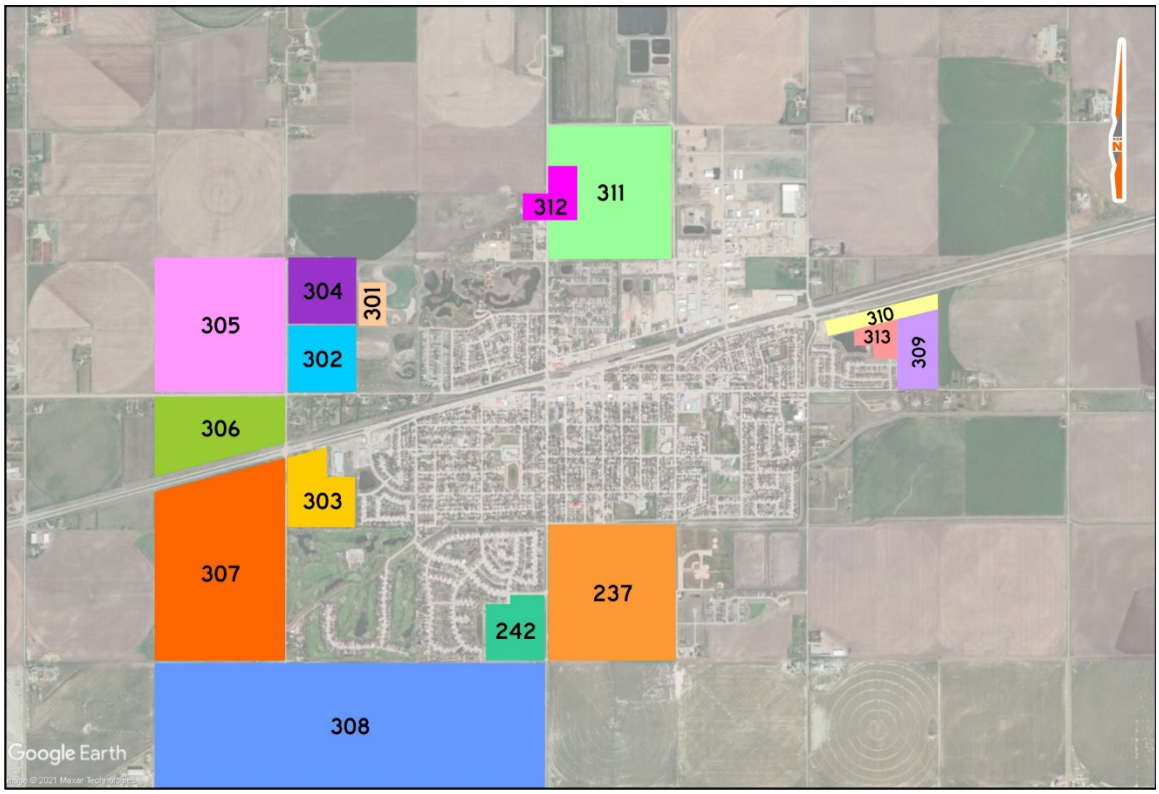

Figure 3: Development Cells for Analysis

Table 3 contains the land use information and expected progression of development for each cell up to a 20-year horizon.

TABLE 3: LAND USE AND PROGRESSION INFORMATION

Zone	Land Use	Horizon Year		
		2024	2029	2039
237	Residential Infill	50%	75%	100%
242	Residential Infill	100%	100%	100%
301	School and Recreation Centre	100%	100%	100%
302	Residential	50%	100%	100%
303	Residential and Commercial	50%	100%	100%
304	Residential	25%	100%	100%
305	Residential	0%	50%	100%
306	Residential and Commercial	25%	50%	100%
307	Residential and Commercial	25%	50%	100%
308	Residential	0%	0%	50%
309	Residential	25%	50%	100%
310	RCMP	100%	100%	100%
311	Industrial Infill	25%	50%	100%
312	Commercial Infill	25%	50%	100%
313	Residential	0%	100%	100%

Trip generation for the proposed land uses within the development cells was based on the Institute of Transportation Engineers (ITE) trip generation manual (10th Edition), with trip generation rates for different commercial, residential and light industrial land uses as follows:

- **Residential** - 0.9 vehicle trips per dwelling unit with a split of 66% inbound and 34% outbound in the PM peak.
- **Office** - 0.45 vehicle trips per employee with a split of 17% inbound and 83% outbound in the PM peak.
- **Industrial** - 0.39 vehicle trips per employee with a split of 21% inbound and 79% outbound in the PM peak.

- **Retail** - 3.00 vehicle trips per employee with a split of 50% inbound and 50% outbound in the PM peak.
- **School** - 0.1 vehicle trips per student with a split of 47% inbound and 53% outbound in the PM peak.
- **Agriculture** - 0.5 vehicle trips per employee with a split of 21% inbound and 79% outbound in the PM peak.

The traffic generated by the development cells within the study area was assigned to the adjacent road network for each analyzed horizon. Traffic forecasts were carried out using the County of Lethbridge traffic forecasting model for the PM peak hour for the 2024 and 2029 horizon years.

It should be noted that the County of Lethbridge model does not account for alternative modes of transportation and therefore its results should be considered conservative as they do not reflect reductions associated with bicycle and pedestrian only trips.

3.2 2024 OPERATING CONDITIONS

3.2.1 EXISTING ROAD NETWORK

The 2024 horizon year traffic volumes, as derived per Section 3.1, can be found in **Appendix A**. These volumes were analyzed on the existing road network, as shown in **Figure 2**. The results of the analysis are summarized in **Table 4**, with the detailed model outputs included in **Appendix B**.

TABLE 4: 2024 OPERATING CONDITIONS, EXISTING ROAD NETWORK

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
18 Avenue / 30 Street (Stop-Controlled)	EB	Left	0.16	A	8.3	0.6
		Through	0.16	A	8.3	0.6
		Right	0.16	A	8.3	0.6
	WB	Left	0.17	A	8.5	0.6
		Through	0.17	A	8.5	0.6
		Right	0.00	A	0.0	0.6
	NB	Left	0.15	A	8.2	0.5
		Through	0.15	A	8.2	0.5
		Right	0.15	A	8.2	0.5
	SB	Left	0.00	A	0.0	0.2
		Through	0.07	A	7.7	0.2
		Right	0.07	A	7.7	0.2
	Intersection Summary		-	**A**	**8.2**	-
HWY 3 / 30 Street (Stop-Controlled)	EB	Left	0.08	A	9.5	1.9
		Through	0.20	A	0.0	0.0
		Right	0.03	A	0.0	0.0
	WB	Left	0.18	B	10.5	5.0
		Through	0.19	A	0.0	0.0
		Right	0.02	A	0.0	0.0
	NB	Left	4.03	F	Error*	Error*
		Through	4.03	F	Error*	Error*
		Right	4.03	F	Error*	Error*
	SB	Left	2.95	F	Error*	Error*
		Through	2.95	F	Error*	Error*
		Right	2.95	F	Error*	Error*
	Intersection Summary		-	**F**	**1283.0**	-
HWY 3 / Land O' Lakes Drive (Signalized)	EB	Through	0.39	B	10.6	24.2
		Right	0.42	A	3.2	11.0
	WB	Left	0.13	A	9.9	6.3
		Through	0.41	B	10.8	24.9
	NB	Left	0.19	A	9.2	12.0
		Right	0.07	A	3.7	4.1
	Intersection Summary		-	**A**	**8.8**	-
21 Avenue / Land O' Lakes Drive (Stop-Controlled)	EB	Left	0.22	C	17.6	6.2
		Through	0.04	B	11.7	1.0
		Right	0.04	B	11.7	1.0
	WB	Left	0.03	C	15.3	0.6
		Through	0.01	C	15.1	0.3
		Right	0.05	A	9.0	1.2
	NB	Left	0.01	A	0.1	0.2
		Through	0.06	A	0.5	0.2
		Right	0.06	A	0.0	0.0
	SB	Left	0.04	A	7.7	1.0
		Through	0.19	A	0.0	0.0
		Right	0.19	A	0.0	0.0
	Intersection Summary		-	**A**	**3.8**	-

* - Denotes values beyond criteria/software limits. Intersection requires improvements.

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
18 Avenue East / 20 Street (Stop-Controlled)	WB	Left	0.56	D	28.5	24.8
		Right	0.56	D	28.5	24.8
	NB	Through	0.23	A	0.0	0.0
		Right	0.23	A	0.0	0.0
	SB	Left	0.03	A	0.4	0.7
		Through	0.03	A	0.9	0.7
	Intersection Summary		-	**A**	**5.4**	-
18 Avenue West / 20 Street (Stop-Controlled)	EB	Left	0.35	C	18.8	11.9
		Right	0.35	C	18.8	11.9
	NB	Left	0.14	A	1.6	3.8
		Through	0.14	A	4.0	3.8
	SB	Through	0.32	A	0.0	0.0
		Right	0.32	A	0.0	0.0
	Intersection Summary		-	**A**	**4.0**	-
HWY 3 / 20 Street (Signalized)	EB	Left	0.41	B	12.9	24.7
		Through	0.13	A	8.7	9.5
		Right	0.25	A	2.7	8.1
	WB	Left	0.04	A	8.3	3.4
		Through / Right	0.13	A	7.5	8.7
	NB	Left	0.62	C	25.7	35.2
		Through / Right	0.35	B	12.6	28.2
	SB	Left / Through / Right	0.45	A	7.4	19.3
	Intersection Summary		-	**B**	**10.1**	-
20 Avenue / 20 Street (Stop-Controlled)	EB	Left	0.33	E	46.7	10.0
		Through	0.33	E	46.7	10.0
		Right	0.33	E	46.7	10.0
	WB	Left	0.19	C	24.4	5.2
		Through	0.19	C	24.4	5.2
		Right	0.28	B	10.1	8.9
	NB	Left	0.00	A	0.0	0.0
		Through	0.04	A	0.1	0.0
		Right	0.04	A	0.0	0.0
	SB	Left	0.19	A	1.6	5.3
		Through	0.19	A	3.2	5.3
		Right	0.08	A	0.0	0.0
	Intersection Summary		-	**A**	**8.2**	-

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
23 Avenue / 20 Street (Stop-Controlled)	EB	Left	0.14	B	10.9	3.7
		Through	0.14	B	10.9	3.7
		Right	0.14	B	10.9	3.7
	WB	Left	0.15	B	12.4	4.0
		Through	0.15	B	12.4	4.0
		Right	0.15	B	12.4	4.0
	NB	Left	0.03	A	0.3	0.8
		Through	0.03	A	2.3	0.8
		Right	0.03	A	0.0	0.0
	SB	Left	0.01	A	0.1	0.2
		Through	0.05	A	0.7	0.2
		Right	0.05	A	0.0	0.0
	Intersection Summary		-	**A**	**5.5**	-
30 Avenue / 20 Street (Stop-Controlled)	EB	Left	0.07	B	11.4	1.6
		Through	0.07	B	11.4	1.6
		Right	0.07	B	11.4	1.6
	WB	Left	0.09	A	9.8	2.3
		Through	0.09	A	9.8	2.3
		Right	0.09	A	9.8	2.3
	NB	Left	0.01	A	0.1	0.3
		Through	0.01	A	1.6	0.3
		Right	0.01	A	1.6	0.3
	SB	Left	0.05	A	0.4	1.1
		Through	0.05	A	3.2	1.1
		Right	0.05	A	3.2	1.1
	Intersection Summary		-	**A**	**5.0**	-
HWY 845 / RR 202A (Stop-Controlled)	EB	Left	0.00	A	8.6	0.0
		Right	0.00	A	8.6	0.0
	NB	Left	0.00	A	0.0	0.0
		Through	0.00	A	0.0	0.0
	SB	Through	0.04	A	0.0	0.0
		Right	0.00	A	0.0	0.0
	Intersection Summary		-	**A**	**0.2**	-
14 Avenue / 13 Street (Stop-Controlled)	WB	Left	0.00	A	6.7	0.0
		Right	0.00	A	6.7	0.0
	NB	Through	0.01	A	7.0	0.0
		Right	0.01	A	7.0	0.0
	SB	Left	0.05	A	7.2	0.2
		Through	0.05	A	7.2	0.2
	Intersection Summary		-	**A**	**7.1**	-

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
HWY 3 / 13 Street (Stop-Controlled)	EB	Through	0.03	A	0.0	0.0
		Right	0.03	A	0.0	0.0
	WB	Left	0.02	A	7.6	0.5
		Through	0.05	A	0.0	0.0
	NB	Left	0.06	B	10.1	1.5
		Right	0.06	B	10.1	1.5
	Intersection Summary		-	**A**	**1.9**	-
20 Avenue / 13 Street (Stop-Controlled)	EB	Left	0.27	A	8.6	1.1
		Through	0.27	A	8.6	0.2
		Right	0.05	A	6.2	0.2
	WB	Left	0.22	A	8.2	0.8
		Through	0.22	A	8.2	0.0
		Right	0.01	A	6.1	0.0
	NB	Left	0.07	A	8.1	0.2
		Through	0.07	A	8.1	0.2
		Right	0.07	A	8.1	0.2
	SB	Left	0.06	A	7.9	0.2
		Through	0.06	A	7.9	0.2
		Right	0.06	A	7.9	0.2
	Intersection Summary		-	**A**	**8.1**	-
18 Avenue / 11 Street (Stop-Controlled)	EB	Left	0.04	A	8.8	1.0
		Right	0.04	A	8.8	1.0
	NB	Left	0.01	A	0.1	0.2
		Through	0.01	A	5.7	0.2
	SB	Through	0.02	A	0.0	0.0
		Right	0.02	A	0.0	0.0
	Intersection Summary		-	**A**	**5.0**	-
HWY 3 / 11 Street (Stop-Controlled)	EB	Left	0.01	A	7.7	0.2
		Through	0.03	A	0.0	0.0
	WB	Through	0.05	A	0.0	0.0
		Right	0.01	A	0.0	0.0
	SB	Left	0.07	A	9.6	1.7
		Right	0.07	A	9.6	1.7
	Intersection Summary		-	**A**	**1.9**	-
14 Avenue / 8 Street (Stop-Controlled)	EB	Left	0.01	A	8.5	0.3
		Right	0.01	A	8.5	0.3
	NB	Left	0.00	A	0.0	0.1
		Through	0.00	A	1.2	0.1
	SB	Through	0.01	A	0.0	0.0
		Right	0.01	A	0.0	0.0
	Intersection Summary		-	**A**	**2.3**	-

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
HWY 3 / 8 Street (Stop-Controlled)	EB	Left	0.00	A	7.6	0.1
		Through	0.03	A	0.0	0.0
		Right	0.01	A	0.0	0.0
	WB	Left	0.02	A	7.6	0.5
		Through	0.05	A	0.0	0.0
		Right	0.01	A	0.0	0.0
	NB	Left	0.06	A	9.7	1.4
		Through	0.06	A	9.7	1.4
		Right	0.06	A	9.7	1.4
	SB	Left	0.07	B	11.4	1.7
		Through	0.07	B	11.4	1.7
		Right	0.07	B	11.4	1.7
	Intersection Summary		-	**A**	**2.9**	-
20 Avenue / 8 Street (Stop-Controlled)	EB	Left	0.11	A	7.6	0.4
		Through	0.11	A	7.6	0.4
		Right	0.11	A	7.6	0.4
	WB	Left	0.06	A	7.5	0.2
		Through	0.06	A	7.5	0.2
		Right	0.06	A	7.5	0.2
	NB	Left	0.06	A	7.6	0.2
		Through	0.06	A	7.6	0.2
		Right	0.06	A	7.6	0.2
	SB	Left	0.07	A	7.6	0.2
		Through	0.07	A	7.6	0.2
		Right	0.07	A	7.6	0.2
	Intersection Summary		-	**A**	**7.6**	-
Applewood Road / 8 Street (Stop-Controlled)	EB	Left	0.02	A	8.9	0.4
		Right	0.02	A	8.9	0.4
	NB	Left	0.00	A	0.0	0.1
		Through	0.00	A	1.4	0.1
	SB	Through	0.02	A	0.0	0.0
		Right	0.02	A	0.0	0.0
	Intersection Summary		-	**A**	**2.0**	-

The results of the analysis indicate that all intersections are expected to operate at an acceptable LOS B or better with v/c ratios not exceeding 0.76, with the following exceptions:

- The intersection of Highway 3 and 30th Street operates at an overall LOS F, with the NB and SB movements experiencing significant delays and queues. This is due to the stop-controlled nature of the intersection, allowing for free flow movement on Highway 3. The large volume of traffic on Highway 3 means there are few gaps for traffic looking to access the highway and as a result, the intersection performance breaks down.
- The intersection of 20th Avenue and 20th Street, while operating with an overall performance of LOS A, experiences significant delays for the EB movements, resulting in a LOS F for that direction. The WB movements also experience delays, though not as severe, resulting in a LOS D. This is due to the NB queues for the intersection of 20th Street and Highway 3 as they are projected to be 39m, which may result in blockages at the intersection of 20th Street and 20th Avenue.

Town staff had expressed concerns about the future operation of the Land O'Lakes Drive and 21st Avenue intersection, with it being potentially blocked by the left turns and queues on the northbound (NB) approach to the intersection of Highway 3 and Land O' Lakes Drive. Results in **Table 4** show that the NB queue for movements at the Highway 3 and Land O' Lakes Drive intersection only reaches a length of 12m, which is less than the approximately 55m of storage space, so no such blockage should occur.

3.2.2 PROPOSED IMPROVEMENTS

To address the operational issues outlined in Section 3.2.1, the following adjustments to the road network were made:

- Signalize the intersection of Highway 3 and 30th Street
- Introduction of an additional northbound left turn lane and adjusted signal timing to include protected phases for left turn movements at the intersection of

Highway 3 and 20th Street, to prevent the queues from blocking the intersection of 20th Street and 20th Avenue[1].

- Create a single lane roundabout for the intersection of Land O' Lakes Drive and 21st Avenue.

Town staff indicated that there are plans to signalize the intersection of 18th Avenue and 30th Street by the year 2024 to increase pedestrian safety for a future school development. However, as indicated in **Table 4**, this intersection still operates as a LOS A, with excellent performance for all directions, as a stop-controlled intersection. Therefore, for the analysis, it was left as a stop-controlled intersection.

The three intersections noted above were re-analyzed with the recommended improvements, and the results are summarized in **Table 5**.

The results indicate the intersection of Highway 3 and 30th Street has a dramatic increase in performance, with all movements experiencing a LOS B or better, and the overall intersection operating at a LOS A.

The NB queues for the intersection of Highway 3 and 20th Street have been reduced from 39m to 27m, removing the potential blockage of the intersection of 20th Avenue and 20th Street.

The single lane roundabout for the intersection of Land O' Lakes Drive and 21st Avenue is expected to operate at LOS A, with minimal delays and queues. Similar to the existing condition, no blocking or interference is expected between this intersection and the intersection of Highway 3 and Land O' Lakes Drive.

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[1] *Following the initial draft submission of this study in March 2020, the "Highway 3 / Highway 845 Functional Planning Study" has been initiated to further explore this and other options to address operational issues at the intersection, as well as issues at the intersection of Highway 845 (20 Street) / 20 Avenue related to the northbound queue at Highway 3 / Highway 845.*

TABLE 5: 2024 OPERATING CONDITIONS, IMPROVED ROAD NETWORK

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
HWY 3 / 30 Street (Signalized)	EB	Left	0.22	A	8.2	8.4
		Through	0.48	A	7.9	27.6
		Right	0.08	A	2.7	3.7
	WB	Left	0.50	B	14.0	19.3
		Through	0.44	A	7.6	24.8
		Right	0.04	A	2.9	2.5
	NB	Left / Through / Right	0.52	B	10.1	19.2
	SB	Left / Through / Right	0.30	A	9.8	13.7
	Intersection Summary		-	**A**	**8.5**	-
HWY 3 / 20 Street (Signalized)	EB	Left	0.55	C	22.0	33.5
		Through	0.17	B	13.7	12.9
		Right	0.31	A	4.2	10.7
	WB	Left	0.05	B	13.2	4.5
		Through / Right	0.18	B	11.9	11.9
	NB	Left	0.54	C	30.8	16.3
		Through / Right	0.26	A	8.4	23.0
	SB	Left / Through / Right	0.50	A	9.5	23.5
	Intersection Summary		-	**B**	**12.9**	-
21 Avenue / Land O' Lakes Drive (ROUNDABOUT)	EB	Left	0.10	A	4.6	3.4
		Through	0.10	A	4.6	3.4
		Right	0.10	A	4.6	3.4
	WB	Left	0.06	A	4.1	1.9
		Through	0.06	A	4.1	1.9
		Right	0.06	A	4.1	1.9
	NB	Left	0.17	A	4.6	6.3
		Through	0.17	A	4.6	6.3
		Right	0.17	A	4.6	6.3
	SB	Left	0.29	A	5.3	12.9
		Through	0.29	A	5.3	12.9
		Right	0.29	A	5.3	12.9
	Intersection Summary		-	**A**	**4.9**	-

3.3 2029 OPERATING CONDITIONS

3.3.1 2024 IMPROVED ROAD NETWORK

The 2029 horizon year traffic volumes, as derived per Section 3.1, can be found in **Appendix A**. These volumes were analyzed on the existing road network, as shown in **Figure 2**, but with the following modifications:

- The improvements suggested in Section 3.2.2, apart from the single lane roundabout at Land O' Lakes Drive and 21st Avenue, as that intersection already performed well as a stop-controlled intersection in the 2024 horizon.
- An extension of 12th Avenue from 8th Street to 20th Street, per plans shared by the Town.
- The reconfiguration of the intersection of 18th Avenue and 20th Street, per plans shared by the Town, to remove the two off-set T-intersections and combine them into one single intersection.

The 12th Avenue will function as a collector road through an industrial area. A typical cross-section for this extension is shown **Figure 4** below. Building 12th Avenue to this standard should provide for future development on the north side of 12th Avenue.

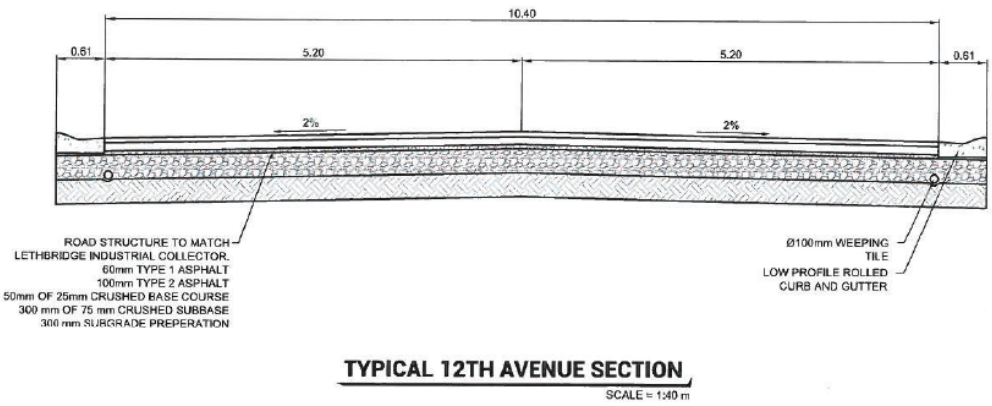

Figure 4: 12th Avenue Extension Cross-Section

The results of the analysis are summarized in **Table 6**, with the detailed model outputs included in **Appendix B**.

TABLE 6: 2029 OPERATING CONDITIONS, 2024 IMPROVED ROAD NETWORK

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
18 Avenue / 30 Street (Stop-Controlled)	EB	Left	0.15	A	7.9	0.5
		Through	0.15	A	7.9	0.5
		Right	0.15	A	7.9	0.5
	WB	Left	0.12	A	8.2	0.4
		Through	0.12	A	8.2	0.4
		Right	0.00	A	0.0	0.0
	NB	Left	0.17	A	8.3	0.6
		Through	0.17	A	8.3	0.6
		Right	0.17	A	8.3	0.6
	SB	Left	0.00	A	0.0	0.0
		Through	0.06	A	7.6	0.2
		Right	0.06	A	7.6	0.2
	Intersection Summary		-	**A**	**8.1**	-
HWY 3 / 30 Street (Signalized)	EB	Left	0.35	B	17.1	10.0
		Through	0.78	B	16.4	59.1
		Right	0.13	A	2.9	5.3
	WB	Left	0.01	A	8.0	1.0
		Through	0.73	B	14.9	53.3
		Right	0.08	A	3.3	4.1
	NB	Left / Through / Right	0.26	B	12.9	17.3
	SB	Left / Through / Right	0.26	A	9.3	16.0
	Intersection Summary		-	**B**	**14.5**	-
HWY 3 / Land O' Lakes Drive (Signalized)	EB	Through	0.50	B	11.7	31.6
		Right	0.51	A	3.6	12.5
	WB	Left	0.18	B	11.4	6.6
		Through	0.03	A	8.3	3.0
	NB	Left	0.24	A	9.5	14.7
		Right	0.22	A	4.6	10.1
	Intersection Summary		-	**A**	**8.4**	-
21 Avenue / Land O' Lakes Drive (Stop-Controlled)	EB	Left	0.93	F	72.0	69.9
		Through	0.16	B	14.7	4.1
		Right	0.16	B	14.7	4.1
	WB	Left	0.04	B	14.7	0.9
		Through	0.25	C	19.2	7.4
		Right	0.02	A	8.9	0.5
	NB	Left	0.01	A	0.1	0.3
		Through	0.06	A	0.6	0.3
		Right	0.06	A	0.0	0.0
	SB	Left	0.02	A	7.7	0.5
		Through	0.27	A	0.0	0.0
		Right	0.27	A	0.0	0.0
	Intersection Summary		-	**C**	**20.8**	-

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
12 Avenue / 20 Street (Stop-Controlled)	WB	Left	0.21	A	9.5	0.8
		Right	0.21	A	9.5	0.8
	NB	Through	0.29	A	9.5	1.2
		Right	0.29	A	9.5	1.2
	SB	Left	0.44	B	11.2	2.3
		Through	0.44	B	11.2	2.3
	Intersection Summary		-	**B**	**10.3**	-
18 Avenue / 20 Street (Stop-Controlled)	EB	Left	1.28	F	216.4	96.4
		Through	1.28	F	216.4	96.4
		Right	1.28	F	216.4	96.4
	WB	Left	8.96	F	Error	Error
		Through	8.96	F	Error	Error
		Right	8.96	F	Error	Error
	NB	Left	0.24	A	3.5	7.1
		Through	0.24	A	3.5	7.1
		Right	0.24	A	3.5	7.1
	SB	Left	0.04	A	0.4	0.9
		Through	0.19	A	0.6	0.9
		Right	0.19	A	0.0	0.0
	Intersection Summary		-	**F**	**1237.9**	-
	***Note: Error denotes value beyond software limits**					
HWY 3 / 20 Street (Signalized)	EB	Left	0.85	D	36.2	68.5
		Through	0.20	A	10.0	13.9
		Right	0.28	A	3.0	9.0
	WB	Left	0.17	B	10.7	10.0
		Through / Right	0.19	A	9.5	12.8
	NB	Left	0.52	B	17.3	14.4
		Through / Right	0.43	B	12.2	34.7
	SB	Left / Through / Right	0.57	A	7.8	27.1
	Intersection Summary		-	**B**	**13.3**	-
20 Avenue / 20 Street (Stop-Controlled)	EB	Left	1.13	F	245.9	47.3
		Through	1.13	F	245.9	47.3
		Right	1.13	F	245.9	47.3
	WB	Left	0.45	E	49.5	15.4
		Through	0.45	E	49.5	15.4
		Right	0.29	B	10.7	9.4
	NB	Left	0.00	A	0.0	0.0
		Through	0.08	A	0.1	0.0
		Right	0.08	A	0.0	0.0
	SB	Left	0.19	A	1.8	5.3
		Through	0.19	A	2.7	5.3
		Right	0.18	A	0.0	0.0
	Intersection Summary		-	**C**	**20.1**	-

* - Denotes values beyond criteria/software limits. Intersection requires improvements.

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
23 Avenue / 20 Street (Stop-Controlled)	EB	Left	0.51	C	22.7	21.5
		Through	0.51	C	22.7	21.5
		Right	0.51	C	22.7	21.5
	WB	Left	0.35	C	15.6	11.7
		Through	0.35	C	15.6	11.7
		Right	0.35	C	15.6	11.7
	NB	Left	0.00	A	0.0	0.0
		Through	0.03	A	0.2	0.0
		Right	0.03	A	0.0	0.0
	SB	Left	0.05	A	0.4	1.2
		Through	0.14	A	2.0	1.2
		Right	0.14	A	0.0	0.0
	Intersection Summary		-	**A**	**9.3**	-
30 Avenue / 20 Street (Stop-Controlled)	EB	Left	0.07	B	10.7	1.6
		Through	0.07	B	10.7	1.6
		Right	0.07	B	10.7	1.6
	WB	Left	0.05	B	10.6	1.3
		Through	0.05	B	10.6	1.3
		Right	0.05	B	10.6	1.3
	NB	Left	0.01	A	0.1	0.3
		Through	0.01	A	1.9	0.3
		Right	0.01	A	1.9	0.3
	SB	Left	0.02	A	0.2	0.6
		Through	0.02	A	1.7	0.6
		Right	0.02	A	1.7	0.6
	Intersection Summary		-	**A**	**3.9**	-
HWY 845 / RR 202A (Stop-Controlled)	EB	Left	0.00	A	8.7	0.0
		Right	0.00	A	8.7	0.0
	NB	Left	0.00	A	0.0	0.0
		Through	0.00	A	0.1	0.0
	SB	Through	0.05	A	0.0	0.0
		Right	0.00	A	0.0	0.0
	Intersection Summary		-	**A**	**0.1**	-
12 Avenue / 13 Street (Stop-Controlled)	EB	Left	0.08	A	7.5	0.3
		Through	0.08	A	7.5	0.3
		Right	0.08	A	7.5	0.3
	WB	Left	0.00	A	0.0	0.1
		Through	0.04	A	7.4	0.1
		Right	0.04	A	7.4	0.1
	NB	Left	0.03	A	7.5	0.1
		Through	0.03	A	7.5	0.1
		Right	0.00	A	0.0	0.1
	SB	Left	0.10	A	7.5	0.3
		Through	0.10	A	7.5	0.3
		Right	0.10	A	7.5	0.3
	Intersection Summary		-	**A**	**7.5**	-

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
14 Avenue / 13 Street (Stop-Controlled)	WB	Left	0.01	A	6.6	0.0
		Right	0.01	A	6.6	0.0
	NB	Through	0.02	A	7.1	0.1
		Right	0.02	A	7.1	0.1
	SB	Left	0.07	A	7.3	0.2
		Through	0.07	A	7.3	0.2
	Intersection Summary		-	**A**	**7.2**	-
HWY 3 / 13 Street (Stop-Controlled)	EB	Through	0.07	A	0.0	0.0
		Right	0.03	A	0.0	0.0
	WB	Left	0.04	A	7.9	1.1
		Through	0.09	A	0.0	0.0
	NB	Left	0.10	B	11.7	2.4
		Right	0.10	B	11.7	2.4
	Intersection Summary		-	**A**	**1.9**	-
20 Avenue / 13 Street (Stop-Controlled)	EB	Left	0.27	A	8.7	1.1
		Through	0.27	A	8.7	1.1
		Right	0.05	A	6.3	0.1
	WB	Left	0.23	A	8.5	0.9
		Through	0.23	A	8.5	0.9
		Right	0.01	A	6.2	0.0
	NB	Left	0.09	A	8.3	0.3
		Through	0.09	A	8.3	0.3
		Right	0.09	A	8.3	0.3
	SB	Left	0.08	A	8.2	0.3
		Through	0.08	A	8.2	0.3
		Right	0.08	A	8.2	0.3
	Intersection Summary		-	**A**	**8.3**	-
18 Avenue / 11 Street (Stop-Controlled)	EB	Left	0.07	A	8.8	1.7
		Right	0.07	A	8.8	1.7
	NB	Left	0.03	A	0.3	0.8
		Through	0.03	A	5.8	0.8
	SB	Through	0.02	A	0.0	0.0
		Right	0.02	A	0.0	0.0
	Intersection Summary		-	**A**	**5.6**	-
HWY 3 / 11 Street (Stop-Controlled)	EB	Left	0.02	A	8.0	0.5
		Through	0.07	A	0.0	0.0
	WB	Through	0.09	A	0.0	0.0
		Right	0.03	A	0.0	0.0
	SB	Left	0.18	B	11.9	4.8
		Right	0.18	B	11.9	4.8
	Intersection Summary		-	**A**	**2.2**	-

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
12 Avenue / 8 Street (Stop-Controlled)	EB	Left	0.06	A	8.6	1.5
		Right	0.06	A	8.6	1.5
	NB	Left	0.02	A	0.2	0.5
		Through	0.02	A	5.5	0.5
	SB	Through	0.01	A	0.0	0.0
		Right	0.00	A	0.0	0.0
	Intersection Summary		-	**A**	**6.5**	-
14 Avenue / 8 Street (Stop-Controlled)	EB	Left	0.00	A	0.0	0.0
		Right	0.01	A	8.7	0.2
	NB	Left	0.00	A	0.0	0.1
		Through	0.00	A	0.6	0.1
	SB	Through	0.05	A	0.0	0.0
		Right	0.00	A	0.0	0.0
	Intersection Summary		-	**A**	**0.9**	-
HWY 3 / 8 Street (Stop-Controlled)	EB	Left	0.00	A	7.8	0.1
		Through	0.05	A	0.0	0.0
		Right	0.07	A	0.0	0.0
	WB	Left	0.03	A	7.7	0.7
		Through	0.07	A	0.0	0.0
		Right	0.02	A	0.0	0.0
	NB	Left	0.29	B	14.3	8.9
		Through	0.29	B	14.3	8.9
		Right	0.29	B	14.3	8.9
	SB	Left	0.21	B	14.8	5.8
		Through	0.21	B	14.8	5.8
		Right	0.21	B	14.8	5.8
	Intersection Summary		-	**A**	**4.7**	-
20 Avenue / 8 Street (Stop-Controlled)	EB	Left	0.11	A	7.9	0.4
		Through	0.11	A	7.9	0.4
		Right	0.11	A	7.9	0.4
	WB	Left	0.08	A	7.7	0.3
		Through	0.08	A	7.7	0.3
		Right	0.08	A	7.7	0.3
	NB	Left	0.07	A	7.7	0.2
		Through	0.07	A	7.7	0.2
		Right	0.07	A	7.7	0.2
	SB	Left	0.14	A	7.9	0.5
		Through	0.14	A	7.9	0.5
		Right	0.14	A	7.9	0.5
	Intersection Summary		-	**A**	**7.8**	-

Applewood Road / 8 Street (Stop-Controlled)	EB	Left	0.02	A	8.9	0.4
		Right	0.02	A	8.9	0.4
	NB	Left	0.00	A	0.0	0.1
		Through	0.00	A	0.9	0.1
	SB	Through	0.03	A	0.0	0.0
		Right	0.03	A	0.0	0.0
	Intersection Summary		-	**A**	**1.9**	-

The results of the analysis indicate that all intersections are expected to operate at an acceptable LOS B or better with the following exceptions:

- The intersection of Land O' Lakes Drive and 21st Avenue experiences a LOS F for the EBLT movement. While overall the intersection operates at a LOS C, this movement experiences a significant queue and delay, resulting in the LOS F performance, due to the through movements on Land O' Lakes Drive not allowing many gaps in traffic.
- The newly aligned intersection of 20th Street and 18th Avenue, which was modelled as a stop-controlled intersection, experiences significant delays for the WB movements, resulting in a LOS F. While not as significant as the WB movements, the EB movements also experience some delays, resulting in a LOS D for that leg of the intersection. This is likely due to the higher volumes of traffic on 20th Street, meaning there are few gaps for traffic from 18th Avenue to take advantage of to access the intersection.
- The intersection of 20th Avenue and 20th Street operates with an overall LOS D, with substantial delays again being experienced by the EB movements, which operate with a LOS F. The WB movements also experience significant delays, causing a LOS E for that leg of the intersection. Even with the improvements implemented from 2024, the NB queues for the intersection of 20th Street and Highway 3 again appear to be encroaching on the intersection of 20th Avenue and 20th Street due to the growth in traffic volume, resulting in the significant delays and poor performance for the 20th Avenue legs of the intersection.

The queuing concern between the Highway 3 and 21st Avenue intersections with Land O'Lakes Drive was again looked at for the 2029 horizon. No queue was present for the SB movement at 21st Avenue due to the stop-controlled configuration, and only a 16m queue was shown for the NB movements at Highway 3, which is less than the distance between the two intersections, so no impact from queuing on the two intersections is anticipated.

3.3.2 PROPOSED IMPROVEMENTS

To address the operational issues outlined in Section 3.3.1, the following adjustments to the road network were made:

- Create a single lane roundabout for the intersection of Land O' Lakes Drive and 21st Avenue.
- Signalize the intersection of 20th Street and 18th Avenue
- Create a roundabout for the intersection of 20th Street and 18th Avenue

To rectify the LOS F performance for the EB movements at the intersection of Land O' Lakes Drive and 21st Avenue, a single lane roundabout was again modelled for the 2029 horizon, similar to the 2024 horizon.

The intersection of 20th Street and 18th Avenue was modelled as two different scenarios; a fully signalized intersection, and a roundabout.

And while the intersection of 20th Street and 20th Avenue was experiencing poor operational performance in the 2029 horizon, the proximity to Highway 3 and the queues created at the intersection of Highway 3 and 20th Street limit the potential solutions available to resolve the issue, more analysis may be required at this location to develop a solution. The Town should give consideration to the modification of the EB and WB approaches at this intersection to 'in/out' only.

The improvements listed above were re-analyzed, and the results are summarized in **Table 7**. As can be seen, the recommended improvements resolve all issues at the subject intersections.

Queuing issues will not be a problem with Land O' Lakes Drive and 21st Avenue, as the SB queues with the roundabout only grow to 21m, less than the distance from the intersection with Highway 3.

For 20th Street and 18th Avenue, both solutions provide a good level of service, with the roundabout offering slightly better performance than the traffic signal. However, it is noted that 18th Avenue is located very close to and the existing rail line that runs parallel to the roadway – it is approximately 20m from the 18th Avenue centerline to the southbound stop bar approaching the rail crossing. Due to the minimal space between 18th Avenue and the rail line, traffic signals would be the preferred alternative. Traffic signals would also provide the opportunity to provide preempted operations when trains are approaching. Preemption serves to ensure that the actions of these separate traffic control devices complement, rather than conflict with, each other.

TABLE 7: 2029 OPERATING CONDITIONS, IMPROVED ROAD NETWORK

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
21 Avenue / Land O' Lakes Drive (ROUNDABOUT)	NB	Left	0.22	A	6.1	7.6
		Through	0.22	A	6.1	7.6
		Right	0.22	A	6.1	7.6
	WB	Left	0.14	A	5.8	4.6
		Through	0.14	A	5.8	4.6
		Right	0.14	A	5.8	4.6
	SB	Left	0.41	A	7.1	19.9
		Through	0.41	A	7.1	19.9
		Right	0.41	A	7.1	19.9
	EB	Left	0.34	A	6.9	14.3
		Through	0.34	A	6.9	14.3
		Right	0.34	A	6.9	14.3
	Intersection Summary		-	**A**	**6.7**	-
18 Avenue / 20 Street (Signalized)	EB	Left / Through	0.17	C	22.2	10.9
		Right	0.45	A	8.5	13.2
	WB	Left	0.53	C	22.1	18.0
		Through / Right	0.15	A	9.2	10.2
	NB	Left	0.52	B	13.0	25.4
		Through / Right	0.55	B	11.7	47.5
	SB	Left / Through / Right	0.65	B	18.6	37.9
	Intersection Summary		-	**B**	**15.0**	-
18 Avenue / 20 Street (ROUNDABOUT)	NB	Left	0.52	A	8.5	30.8
		Through	0.52	A	8.5	30.8
		Right	0.52	A	8.5	30.8
	WB	Left	0.26	A	7.9	8.9
		Through	0.26	A	7.9	8.9
		Right	0.26	A	7.9	8.9
	SB	Left	0.62	B	13.2	50.0
		Through	0.62	B	13.2	50.0
		Right	0.62	B	13.2	50.0
	EB	Left	0.33	A	9.6	11.5
		Through	0.33	A	9.6	11.5
		Right	0.33	A	9.6	11.5
	Intersection Summary		-	**B**	**10.2**	-

4.0 PROPOSED NETWORK CHANGES

4.1 16TH AVENUE EXTENSION

4.1.1 PROPOSED SCENARIOS

The Town requested that WATT analyze two scenarios for a possible extension of 16th Avenue, west to connect with 30th Street. 16th Avenue currently terminates at 23rd Street, but planned development will likely lead to its extension west to 30th Street.

Two scenarios were considered. The first scenario assumed 16th Avenue would continue as a straight road, and connect with 30th Street in a single intersection. The second scenario assumed 16th Avenue would have a more curvilinear design to loop through a future community, and connect with 30th Street at two separate intersections. Both scenarios are shown in **Figure 5**.

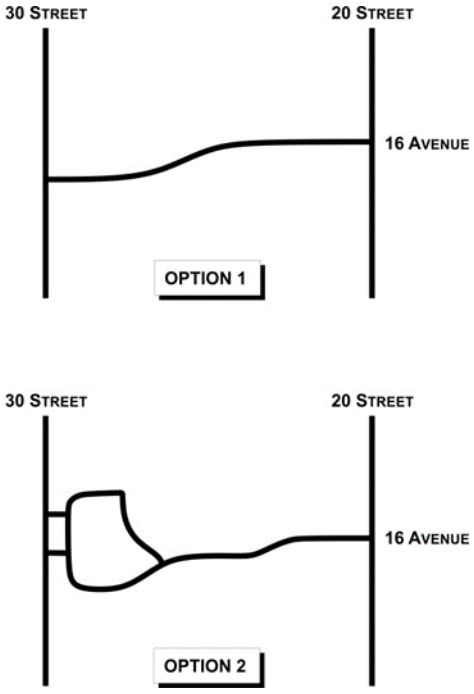

Figure 5: 16th Avenue Extension Options

4.1.2 16TH AVENUE OPTIONS ANALYSIS

The 16th Avenue connection options outlined in **Figure 5** were built into the County of Lethbridge traffic forecasting model and traffic forecasts were carried out for the PM peak hour for the 2024 and 2029 horizon years. The traffic volumes for the subject intersections for each scenario, for both horizons, can be found in **Appendix A**.

Option 1, with 16th Avenue providing a direct connection to 30th Street, was the first to be analyzed for the 2024 and 2029 horizons. Both intersections with 16th Avenue, 30th Street and 20th Street, were modelled as stop-controlled intersections, with both 30th Street and 20th Street being free-flow for the North-South movements. The results of the analysis for Option 1 are summarized in **Table 8**.

TABLE 8: 16TH AVENUE OPTION 1 OPERATING CONDITIONS

2024 Horizon, Option 1

INTERSECTION / MOVEMENT			PM PEAK HOUR v/c Ratio	LOS	Delay (s)	Queue (m)
16 Avenue / 20 Street (Stop-Controlled)	EB	Left/Through/Right	0.06	B	13.7	1.4
	WB	Left/Through/Right	0.03	C	15.1	0.7
	NB	Left/Through/Right	0.02	A	0.9	0.5
	SB	Left/Through/Right	0.00	A	0.1	0.1
	Intersection Summary		-	**A**	**1.1**	-
16 Avenue / 30 Street (Stop-Controlled)	WB	Left/Through/Right	0.05	A	9.0	1.2
	NB	Left/Through/Right	0.04	A	0.0	0.0
	SB	Left/Through/Right	0.00	A	0.5	0.0
	Intersection Summary		-	**A**	**3.5**	-

2029 Horizon, Option 1

INTERSECTION / MOVEMENT			PM PEAK HOUR v/c Ratio	LOS	Delay (s)	Queue (m)
16 Avenue / 20 Street (Stop-Controlled)	EB	Left/Through/Right	0.16	C	19.9	4.4
	WB	Left/Through/Right	0.05	C	22.4	1.3
	NB	Left/Through/Right	0.08	A	2.5	1.9
	SB	Left/Through/Right	0.01	A	0.2	0.1
	Intersection Summary		-	**A**	**2.2**	-
16 Avenue / 30 Street (Stop-Controlled)	EB	Left/Through/Right	0.06	B	11.0	1.4
	WB	Left/Through/Right	0.13	B	11.2	3.5
	NB	Left/Through/Right	0.03	A	4.6	0.7
	SB	Left/Through/Right	0.03	A	3.3	0.7
	Intersection Summary		-	**A**	**6.8**	-

The results indicate that both intersections with 16th Avenue will operate at good level of service with both intersections being stop controlled, for both future horizons.

Option 2 was then analyzed, to look at the impacts of changing the alignment of the western portion of 16th Avenue, and the number of connections with 30th Street. The intersection of 20th Street and 16th Avenue was not re-analyzed, as its performance would be similar to what is shown in **Table 8** for Option 1. The results of the analysis for Option 2 are summarized in **Table 9**.

TABLE 9: 16TH AVENUE OPTION 2 OPERATING CONDITIONS

2024 Horizon, Option 2

INTERSECTION / MOVEMENT			PM PEAK HOUR v/c Ratio	LOS	Delay (s)	Queue (m)
Access 1 / 30 Street (Stop-Controlled)	WB	Left/Through/Right	0.01	A	8.7	0.0
	NB	Left/Through/Right	0.01	A	0.0	0.0
	SB	Left/Through/Right	0.00	A	0.5	0.0
	Intersection Summary		-	**A**	**1.9**	-
Access 2 / 30 Street (Stop-Controlled)	WB	Left/Through/Right	0.04	A	9.0	1.0
	NB	Left/Through/Right	0.04	A	0.0	0.0
	SB	Left/Through/Right	0.00	A	0.0	0.0
	Intersection Summary		-	**A**	**2.9**	-

2029 Horizon, Option 2

INTERSECTION / MOVEMENT			PM PEAK HOUR v/c Ratio	LOS	Delay (s)	Queue (m)
Access 1 / 30 Street (Stop-Controlled)	EB	Left/Through/Right	0.02	B	10.2	0.5
	WB	Left/Through/Right	0.03	B	10.1	0.7
	NB	Left/Through/Right	0.01	A	3.2	0.2
	SB	Left/Through/Right	0.02	A	1.9	0.4
	Intersection Summary		-	**A**	**3.9**	-
Access 2 / 30 Street (Stop-Controlled)	EB	Left/Through/Right	0.03	A	9.9	0.7
	WB	Left/Through/Right	0.08	A	9.9	2.0
	NB	Left/Through/Right	0.02	A	4.2	0.4
	SB	Left/Through/Right	0.01	A	2.9	0.3
	Intersection Summary		-	**A**	**6.3**	-

The results indicate that two accesses onto 30th Street would perform very well, however the performance though is not much different from what was seen in Option 1, as that option also indicated very good performance for just a single intersection onto 30th Street.

4.1.3 16TH AVENUE OPTION RECOMMENDATIONS

Given that the performance for both options is so similar, WATT recommends that Option 2 be pursued, as multiple points of connectivity will provide a more robust transportation network, giving users more options for a path of travel. The intersection spacing on 30th Street should be enough to maintain the 200m minimum of a Super Collector, taking into account the current location of the 30th Street and 18th Avenue intersection. Daily volumes on 30th Street are projected to be approximately 1,700, which is slightly below the threshold for a Super Collector; however the function of 30th Street as a connection to Highway 3, a major vehicle destination for Coaldale, indicates the Super Collector standard is appropriate.

16th Avenue itself is anticipated to have an approximate daily volume of 3,400 vehicles at its ultimate build-out horizon. While this is greater than 30th Street, due to the fact it collects traffic from adjacent development and distributes it to 20th Street and other destinations further east, the classification that best suits 16th Avenue would be a Minor Collector. Minor Collectors can serve up to 4,000 vehicles per day, and are intended to collect and distribute traffic within a residential community, provide direct access to adjacent properties, and serve secondary traffic generators such as schools. With this suitable classification of Minor Collector for 16th Avenue, WATT recommends maintaining 60m intersection spacing along 16th Avenue as part of any assessment of future communities accessing the roadway.

4.2 13TH STREET EXTENSION

4.2.1 PROPOSED SCENARIOS

An extension of 13th Street north from 30th Avenue is being considered by the Town; however, the presence of the irrigation canal means that two options were requested to determine if the challenges of a new canal crossing would be worth the benefit.

Two options were considered. The first option assumed a new east-west avenue would be constructed on the south side of the canal, connecting an extended 13th Street to 17th Street, to take advantage of the existing canal crossing. The second option assumed a new canal crossing would be constructed, and 13th Street would connect directly with itself, completing the missing link between 30th Avenue and 24th Avenue. Both options are illustrated in **Figure 6**.

Option 1 **Option 2**

Figure 6: 13th Street Extension Options

4.2.1 13TH STREET OPTIONS ANALYSIS

For both options, based upon growth projections, it was assumed the connection would not be in place for the 2024 horizon, and instead would be in place for the 2029 horizon year.

Option 1 had been modelled in as the assumed scenario in the overall future analysis contained in Section 3.0 of this report. As such, that scenario's planned route was built into the County of Lethbridge traffic forecasting model for the 2029 horizon analysis contained within Section 3.3, with the impacts on the overall network performance included in the results found in **Table 6**.

Option 2, with the direct connection over the canal, was then constructed into an alternate version of the 2029 horizon year and traffic forecasts were carried out for the PM peak hour. The traffic volumes for this scenario can be found in **Appendix A**.

The key intersections that would be impacted by Option 2 (Highway 3, 20th Avenue and 30th Avenue intersections with 13th Street) were then analyzed for the horizon year 2029. All intersections were modelled as stop-controlled intersections, similar to how they were modelled in Section 3.3 and exist today. The results of the analysis for Option 2 are summarized in **Table 10**.

TABLE 10: 13TH STREET OPTION 2 OPERATING CONDITIONS

INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
HWY 3 / 13 Street (Stop-Controlled)	EB	Through	0.07	A	0.0	0.0
		Right	0.03	A	0.0	0.0
	WB	Left	0.05	A	7.9	1.2
		Through	0.08	A	0.0	0.0
	NB	Left	0.12	B	12.0	3.2
		Right	0.12	B	12.0	3.2
	Intersection Summary		-	**A**	**2.2**	-
20 Avenue / 13 Street (Stop-Controlled)	EB	Left/Through	0.25	A	8.7	1.0
		Right	0.10	A	6.7	0.3
	WB	Left/Through	0.23	A	8.7	0.9
		Right	0.03	A	6.5	0.1
	NB	Left/Through/Right	0.14	A	8.7	0.5
	SB	Left/Through/Right	0.09	A	8.4	0.3
	Intersection Summary		-	**A**	**8.3**	-
30 Avenue / 13 Street (Stop-Controlled)	EB	Left/Through/Right	0.03	B	10.3	0.6
	WB	Left/Through/Right	0.08	A	9.1	2.1
	NB	Left/Through/Right	0.00	A	0.8	0.0
	SB	Left/Through/Right	0.04	A	4.7	0.9
	Intersection Summary		-	**A**	**6.5**	-

The results indicate that all intersections operate at a high level of performance, with an overall level of service A for all three intersections.

4.2.2 13TH STREET OPTION RECOMMENDATIONS

When comparing the results for Option 2 found in Table 10 with the Option 1 results found in Table 6, we see that the results are nearly identical. This indicates that the overall network operates in essentially the same manner, regardless of how the connection with 13th Street is made. The volume of traffic expected to travel across the canal with this new section of 13th Street is not significant enough to create an impact on the greater network. Therefore, WATT recommends that the lower cost option of the two presented as the preferred option, and given the likely additional complications involved with crossing the irrigation canal, as well as the grade difference on the north side of the canal with the existing 13th Street, it is likely that Option 1 is the most cost effective.

5.0 CONSTRUCTION COST ESTIMATES

Order of magnitude construction cost estimates were carried out for the improvements recommended in Section 3.2.2 and Section 3.3.2. As a reminder, these improvements included the following:

2024 Horizon:

- Signalize the intersection of Highway 3 and 30th Street
- A potential introduction of an additional northbound left turn lane and adjusted signal timing to include protected phases for left turn movements at the intersection of Highway 3 and 20th Street, to prevent the queues from blocking the intersection of 20th Street and 20th Avenue. However, additional analysis may be required at this location to determine the optimal solution.
- 16th Avenue extension

2029 Horizon:

- Create a single lane roundabout for the intersection of Land O' Lakes Drive and 21st Avenue.
- Signalize the intersection of 20th Street and 18th Avenue
- Extension of 12th Avenue from 8th Street to 20th Street
- Create a roundabout for the intersection of 20th Street and 18th Avenue
- Extension and connection of 13th Street.

A summary of the proposed improvements can be seen in **Figure 7**.

Figure 7: Proposed Improvements

An order of magnitude construction cost estimate was carried out for the recommended improvements and its results are summarized in **Table 11** below. It should be noted that this estimate includes construction costs and 25% contingencies but does not include engineering and additional right-of-way costs. Detailed estimate tables are included in **Appendix C**.

TABLE 11: RECOMMENDED IMPROVEMENT COST ESTIMATES

2024 Horizon (5-year) Improvements				
Location	Improvements	Constrcution cost	Contingencies	Total Cost
Highway 3 / 30 Street	Signal	$ 558,484	$ 139,621	$ 698,105
Highway 3 / 20 Street	NB Left Turn Lane	$ 92,416	$ 23,104	$ 115,520
16 Avenue Extention	Extension	$ 900,490	$ 225,122	$ 1,125,612
2029 Horizon (10-year) Improvements				
Location	Improvements	Constrcution cost	Contingencies	Total Cost
18 Avenue / 20 Street	Signal	$ 450,000	$ 112,500	$ 562,500
18 Avenue / 20 Street	Roundabout	$ 416,200	$ 104,050	$ 520,250
12 Avenue Extention	Extension	$ 824,163	$ 206,041	$ 1,030,204
21 Avenue / Land O'Lakes Drive	Roundabout	$ 391,900	$ 97,975	$ 489,875
13 Avenue Option 1	Extension	$ 826,740	$ 206,685	$ 1,033,425

6.0 ALTERNATIVE MODES OF TRAVEL

The Town is planning to develop a system of trails to accommodate alternative modes of transportation, such as walking and cycling. This system should be designed to provide connectivity between neighboring subdivisions and offer alternative safe routes for cyclists and pedestrians. Placement of trails or pathways along Highway 3 and Highway 845 should be avoided, per comments received from AT. Pathways that cross Highway 3 and Highway 845 should be located at an intersection with another public road and be equipped with the appropriate signage, road markings and signals, if warranted.

7.0 2039 HORIZON FULL BUILD-OUT SCENARIO

The Town requested additional analysis of a full build-out scenario of all planned development for the year 2039. Results of this analysis are included in **Appendix A** and **Appendix B**. These results are attached for information only and represent 20+ year horizon PM peak traffic volumes.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the analysis contained within this report, the following improvements are recommended for the general network at the noted time horizons:

2024 (5-year):

- Signalize the intersection of Highway 3 and 30th Street
- Introduction of an additional northbound left turn lane and adjusted signal timing to include protected phases for left turn movements at the intersection of Highway 3 and 20th Street, to prevent the queues from blocking the intersection of 20th Street and 20th Avenue.

2029 (10-year):

- Create a single lane roundabout for the intersection of Land O' Lakes Drive and 21st Avenue.
- Signalize the intersection of 20th Street and 18th Avenue.

For the proposed network change projects of the 16th Avenue 13th Street extensions, both options for each project performed well, and there were negligible differences in the overall network performance for each option.

For the 16th Avenue connection, WATT recommends that Option 2 be pursued, as multiple points of connectivity will provide a more robust transportation network, giving users more options for a path of travel. For the 13th Street connection, WATT recommends that the lower cost option of the two presented options be pursued, as the volume of traffic using this connection is relatively small and will not impact overall performance, so the most cost-effective scenario should be what governs. This is likely to be Option 1, the re-use of the existing 17th Street crossing, due to the complications of approval and engineering a new crossing of the irrigation canal.

A traffic monitoring program should be introduced to ensure that the schedule of improvements reflects actual traffic conditions and the actual development progression in the area.

Part 4

Plan Implementation

In this Section:

4.0 Plan Implementation

4.1. Implementation

The tools listed in the following table have been prioritized to allow for the purposes of budgeting and scheduling. It should be noted that the level of priority assigned to each tool is not absolute. Priority has been assigned relative to the impact a particular tool has on the ability for the Town to achieve the goals, policies and strategies of this plan.

For the purposes of this workplan the following priority levels are used:

Low Priority: 3+ years

Medium Priority: 2-3 years

High Priority: 1-2 years

**TMP Work Plan	Planning, Analysis , Strategies, Policy and Guidelines	2020 onward**			
Tool	**Purpose and Policy Alignment**	**Town or Consultant**	**Estimated Cost** *(Estimated costs are provided by WATT Consulting Group and are in 2020 dollars)*	**Status**
Network changes and expansions decision-making matrix *(High Priority)*	To provide Council with a decision-making matrix based on asset management principles, amongst other things, that identifies the costs, risks, and benefits of the options available to change or expand portions of the network over time. Aligns with Policy 2	Consultant	$5,500	Not started

Traffic Impact Assessment (TIA) Policy *(High Priority)*	To provide the Town's contracted service providers, and developers a consistent and predictable rationale for when TIA's are likely to be required and how they are to be carried out. Aligns with Policy 3	Consultant	$25,000 - $30,000	Not started
Traffic Counting Program and network model updates *(High Priority)*	To ensure the network model is kept up-to-date. Aligns with Policy 5	Consultant	$9,500	Traffic counting program initiated in 2017 to inform network analysis show in Part 3
Annual Plan review (minor) and 4-year review (major) *(High Priority)*	To ensure the document, beyond the network analysis, remains as up-to-date and relevant as possible Aligns with Policy 6	Both	$6,500	Not started
Accessibility Audit *(High Priority)*	To determine where in the network travel by those with cognitive, mobility, or other physical disabilities is challenging or not possible, and identify where it is reasonably achievable to enhance accessibility. Aligns with Policy 10	Town	$5000 - $7,500	Not started
Traffic Calming Guide *(High Priority)*	To provide a suite of calming measures that can be implemented either by direction from Council or on the request of one or more community members. Aligns with Policy 13	Town	TBD	Not started

Traffic Control Warrant Analysis *(High Priority)*	To take in and review requests from community members for traffic controls such as crosswalks and signage around Coaldale. This will be embedded in the Traffic Calming Policy. Aligns with Policy 13	Both	$1,500 per request	Not started
Safe and Active Routes to School Strategy and other similar strategies *(High Priority)*	To identify and enhance the routes to and from each of Coaldale's schools, with the focus being on making active modes trip choices safe and comfortable for students and parents. Aligns with Policy 14	Town	$2000 annually	In process since 2017
Community-wide Wayfinding Signage *(High Priority)*	To provide easily recognizable directional signage that lets people know where in the community they are, and where they can get to in as clear a format as possible. Aligns with Policy 16	Town	$5,500	In process
Traffic sign and speed limit rationalization study *(Medium Priority)*	To ensure street signs (stop, yield) and speed limits are placed and oriented in a manner that aligns with the desired functionality of the network and reflective of community perspectives. Aligns with Policy 7	Consultant	$10,500	Not started

Network Connectivity Analysis *(Medium Priority)*	To inform the level of connectivity the Town's network currently has, and identify locations in the network where it is reasonably achievable to enhance connectivity for active modes and/or vehicle users. Aligns with Policy 8	Both	$5,000	Not started
Complete Streets Strategy *(Medium Priority)*	To ensure new streets and existing streets that undergo major reconstruction are built and function in a way that is effective and comfortable for all users. Aligns with Policy 12	Both	TBD	TBD
Parking Analysis and Strategy *(Low Priority)*	To identify how much parking is needed for particular developments and/or areas of the Town in a more contextually appropriate manner than ITE standards provide. Aligns with Policy 15	Town	$35,000 - $50,000	Not started

Part 5

Appendices

In this Section:

These appendices are the same as referenced in the Network Analysis completed by the WATT Consulting Group