APPENDIX D

Existing Conditions

MEMORANDUM

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Seattle, WA 98101
(206) 735-7466

To: Stephen Power, Transportation Planning Lead, HDR

From: Steve Durrant, Principal, Alta Planning + Design

Date: April 11, 2018

Re: Rocky View Active Transportation Existing Conditions Technical Memo

Existing Active Transportation Conditions Inventory

Designated active transportation facilities in the Bow River Plains and Elbow River Ranch Lands of Rocky View County are predominantly meant to serve local recreational trips. Local pathways in Elbow River Ranch Lands include those near Springbank, Bragg Creek, and Elbow River. In the Bow River Plains, there is a much smaller collection of pathways and trails, with the bulk of existing pathways and trails located in the hamlets of Conrich and Langdon.

In addition to pathways and trails, there are a number of streets that support active transportation. Many major roadways-- such as Highways 1, 22, and 8, and Springbank Road in the west, and Highways 1, 9, 22X, and 560 in the east—have paved shoulders that support cycling. For pedestrians, sidewalks are present in areas such as Langdon.

There are also a number of pathways and trails either adopted or proposed for development in the area (see maps 1A and 1B). Pathways and trails with the *adopted* status are those included in statutory documents such as Area Structure Plans, Conceptual Schemes, and Master Plans. The *proposed* status, on the other hand, indicates that the pathway or trail has been identified through non-statutory processes and are used as a planning tool.

Table 1 provides a summary of the total distance for facilities evident in Bow River Plains and Elbow River Ranch Lands in Rocky View County.

Table 1: Length of Transportation Facilities in Bow River Plains and Elbow River Lands

Facility Type	Total Facility Distance (km)
Total length of roadways within study area	2,155 (approximately)
County Trails – Existing	114.9
County Trails - Adopted	126.2
County Trails – Proposed	250.5
County Sidewalks	34.3
Paved Shoulder (One Side of Street)	2.3
Paved Shoulder (Both Sides of Street)	236.5

The adopted pathway and trail network, when implemented, will enhance connectivity of the existing pathway and trail network to surrounding areas. For example, future connections in the west will link Springbank with Calgary to the east along Lower Springbank Rd. Springbank will also connect to Cochrane in the north along, Ridge Rd. 31, Township Rd. 250 and Highway 22. In the Bow River Plains, adopted pathways and trails will connect to Langdon to the south and Chestermere to the north.

However, the adopted pathways and trails will not provide a network of separated facilities to create continuous links through and between communities within the study area. In the Elbow River Ranch Lands, for instance, adopted pathways and trails connect Springbank to Calgary in the east but currently stop short of reaching Cochrane to the north. Bragg Creek in the south is completely separated from the rest of the active transportation (AT) network. In Bow River Plains, the issue is more pronounced. Adopted trails link Langdon to the south, but Conrich is completely self-contained.

Proposed trails, particularly in the west, help address the gaps in the adopted network; this is particularly evident along TWP RD 244/Springbank Road. When viewed at a county-wide scale, the lack of connections among communities within and adjacent to the study area is evident.

MAP 1A
INVENTORY
ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

ACTIVE TRANSPORTATION INFRASTRUCTURE
- County Trails - Existing
- County Trails - Adopted
- County Trails - Proposed
- County Sidewalks
- Calgary Bikeways
- Calgary Trails
- Redwood Meadows Trails
- Cochrane Pathways

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector
- Road
- Street

OTHER FEATURES
- School
- Community Facility
- Church
- Railway
- Hydrology

ROCKY VIEW COUNTY
Cultivating Communities

0 2.5 5 KILOMETRES

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D View County,
City of Calgary, Town of Cochrane and AltaLis.
Map produced January 2018.

STONEY INDIAN RESERVES #142, #143, #144

COCHRANE

MUNICIPAL DISTRICT OF BIGHORN NO. 8

HWY 68

HWY 1

TWP RD 252

TOWERS TR

HWY 22

RGE RD 41

RGE RD 40

JUMPINGPOUND RD

TWP RD 250

HWY 1

RGE RD 33

TWP RD 245

HUGGARD RD

TWP RD 244

SPRINGBANK RD

RGE RD 35

RGE RD 32

RGE RD 31

HORIZON VIEW RD

CALGARY

STONEY INDIAN RESERVES #142, #143, #144

HERMITAGE RD

TWP RD 242

RGE RD 43

HWY 22

HWY 8

SPRINGBANK

LOWER SPRINGBANK RD

LOTT CREEK DR

REDWOOD MEADOWS

KANANASKIS IMPROVEMENT DISTRICT

BRAGG CREEK

TWP RD 232

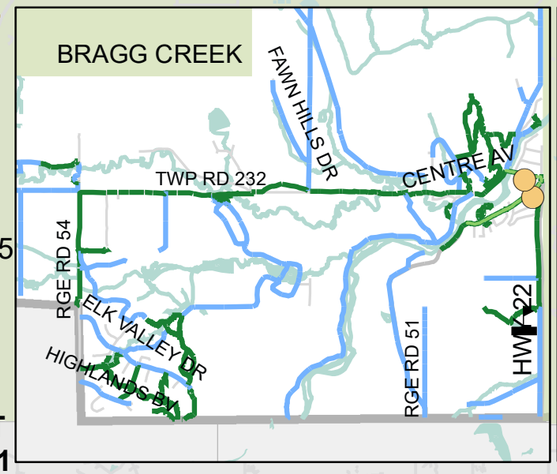
CENTRE AV

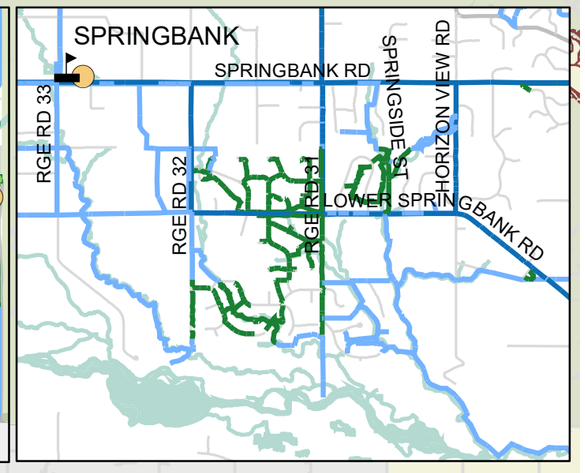
RGE RD 52

HWY 22

TSU U TINA INDIAN RESERVE #145

MUNICIPAL DISTRICT OF FOOTHILLS NO. 31





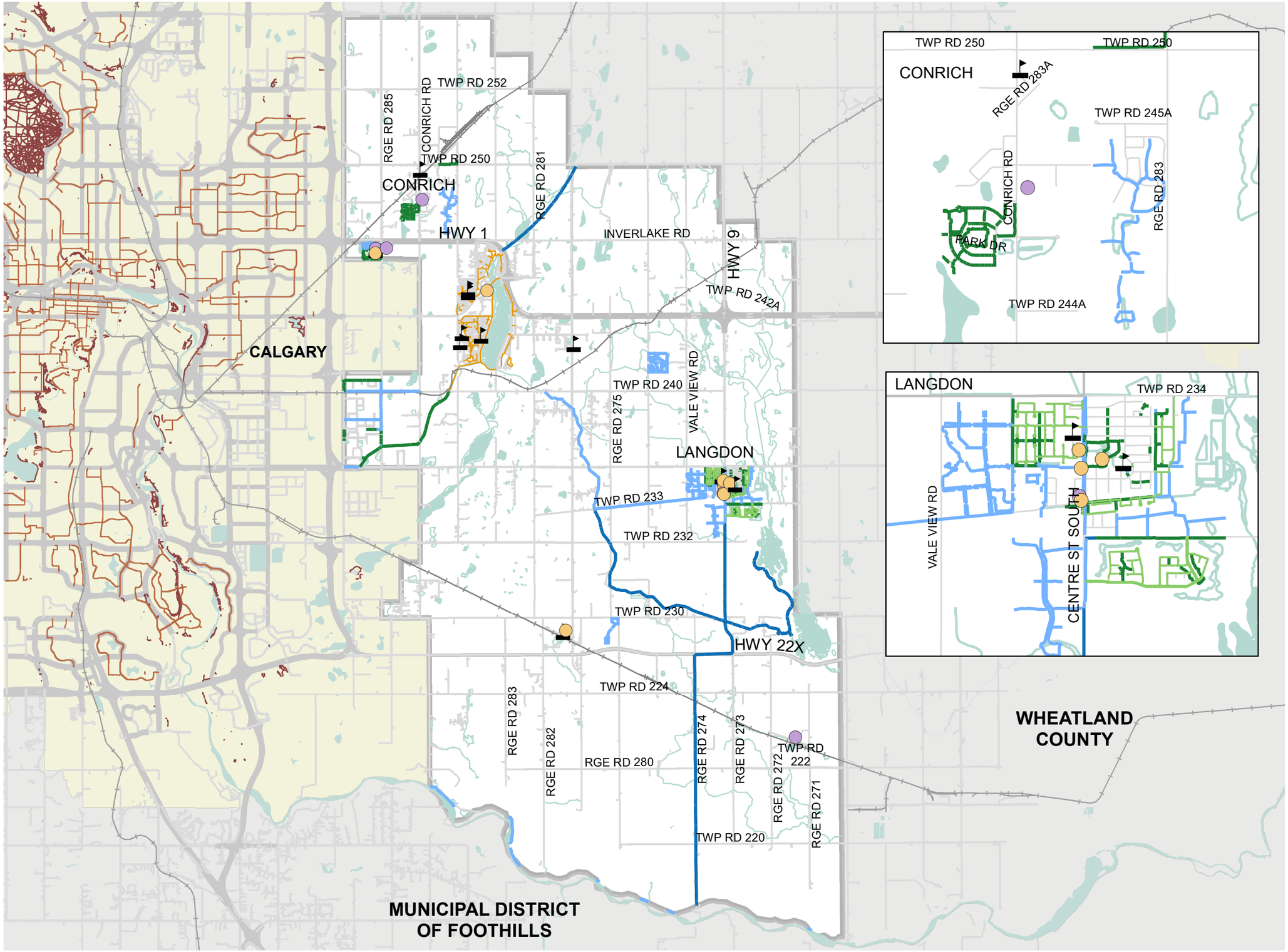
MAP 1B
INVENTORY

ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

ACTIVE TRANSPORTATION INFRASTRUCTURE
- County Trails - Existing
- County Trails - Adopted
- County Trails - Proposed
- County Sidewalks
- Calgary Bikeways
- Calgary Trails
- Chestermere Paths

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector
- Road
- Street

OTHER FEATURES
- School
- Community Facility
- Church
- Railway
- Hydrology



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[illegible]y View County,
City of Calgary, Town of Cochrane and AltaLis.
Map produced January 2018.

Systematic Safety Analysis

A detailed review of pedestrian- and cyclist-involved collisions between 2011 and 2015 was conducted; this is the most-recent five-year period of data available for the Elbow River Ranch Lands and Bow River Pains areas. The data is derived from police reports, where location of the collision was described primarily in text form and often include estimated distances. As a result, specific locations may not be precise.

In addition to the frequency of collisions, the review included consideration of the characteristics of the roadway where the collision occurred. The roadway characteristics included as part of the analysis include: location (midblock or at intersection), speed limit, number of lanes, and presence of an existing active transportation facility, such as a paved shoulder, pathway, trail, or sidewalk.

In the data provided, 18 reported collisions within the study area involved pedestrians or cyclists. Of the 18 collisions, the location of 17 could be identified. Of those 17 collisions:

- There were 16 injuries, and one fatality
- 15 collisions occurred in the Elbow River Ranch Lands, and 2 occurred in the Bow River Plains area
- 9 collisions occurred at intersections, 7 occurred midblock, and 1 occurred in a parking lot
- More collisions occurred on roads with speeds greater than 50 km/h, which is in proportion to the total length of roads with posted speeds greater than 50 km/h
- All collisions occurred on paved roads
- 47% of collisions occurred on roads with paved shoulders.
    - Paved shoulders are present on only 18% of roads within the study area.
    - It is important to note that this analysis does not consider exposure (i.e., the number of bicyclists and pedestrians traveling on the roadway). A greater concentration of collisions along roadways with paved shoulders may reflect that more are using this roadway, increasing the potential for a collision.
    - Strava data suggests that these roadways receive greater use.

In the data provided, information was available regarding the characteristics of the collisions; based on the available data, the following is known about the 17 collisions where locations could be identified:

- 4 collisions involved pedestrians, and 13 involved people on bicycles
- 14 collisions occurred between May and September
- 12 occurred during daylight hours
- 16 occurred on dry surfaces, the surface conditions for other collisions were reported as unknown
- 15 occurred in clear conditions, with the visibility conditions for the other 2 collisions reported as unknown

Maps 1A and 1B show the reported collisions in relation to the existing, planned, and proposed pathways and trails.

MAP 2A
COLLISION ANALYSIS
ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

- Collision with Fatality
- Collision with Injury

ACTIVE TRANSPORTATION INFRASTRUCTURE
- County Trails - Existing
- County Trails - Adopted
- County Trails - Proposed
- County Sidewalks
- Calgary Bikeways
- Calgary Trails
- Redwood Meadows Trails
- Cochrane Pathways

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector
- Road
- Street

OTHER FEATURES
- Railway
- Hydrology

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Cultivating Communities

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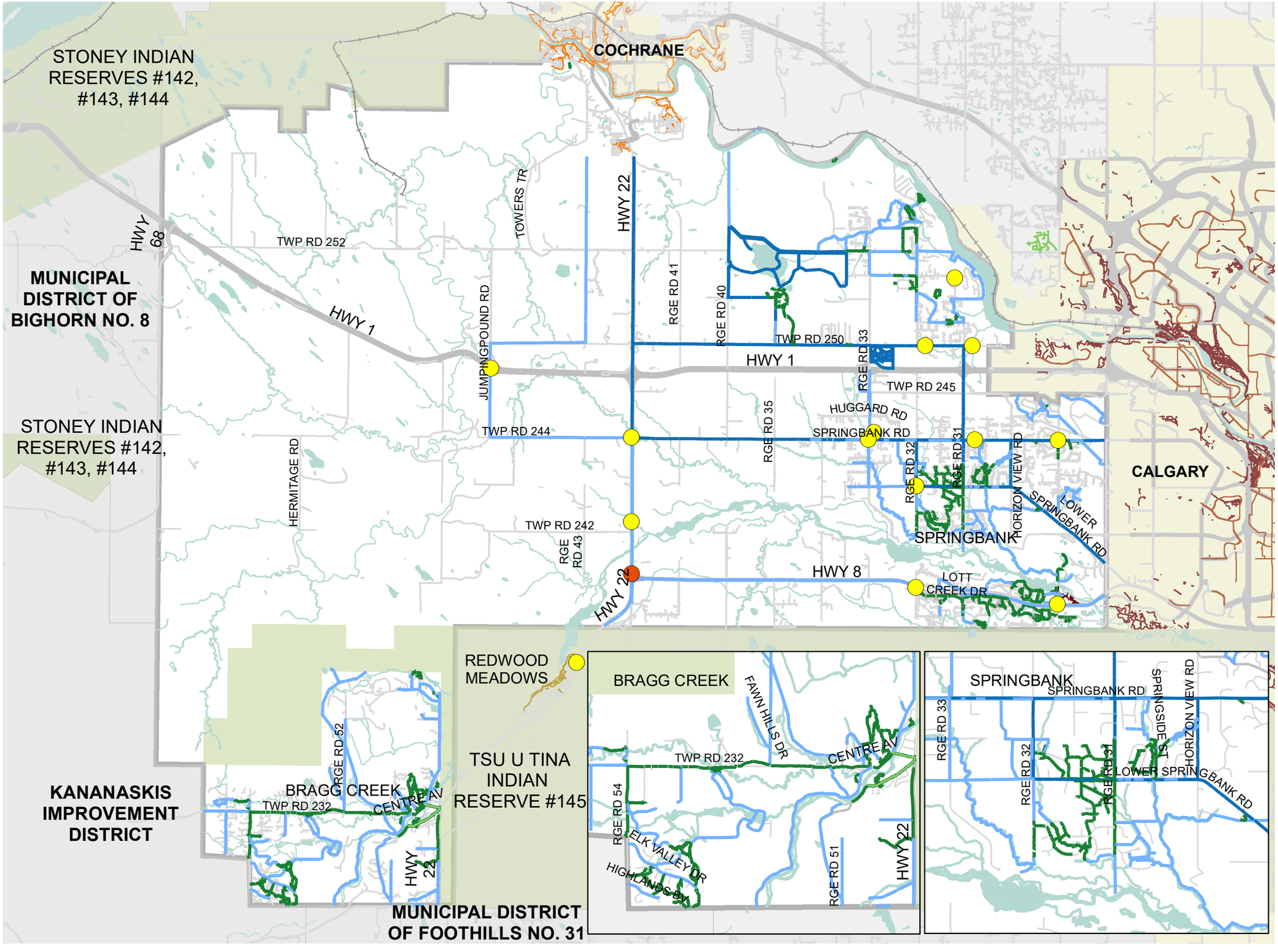


MAP 2B
COLLISION ANALYSIS

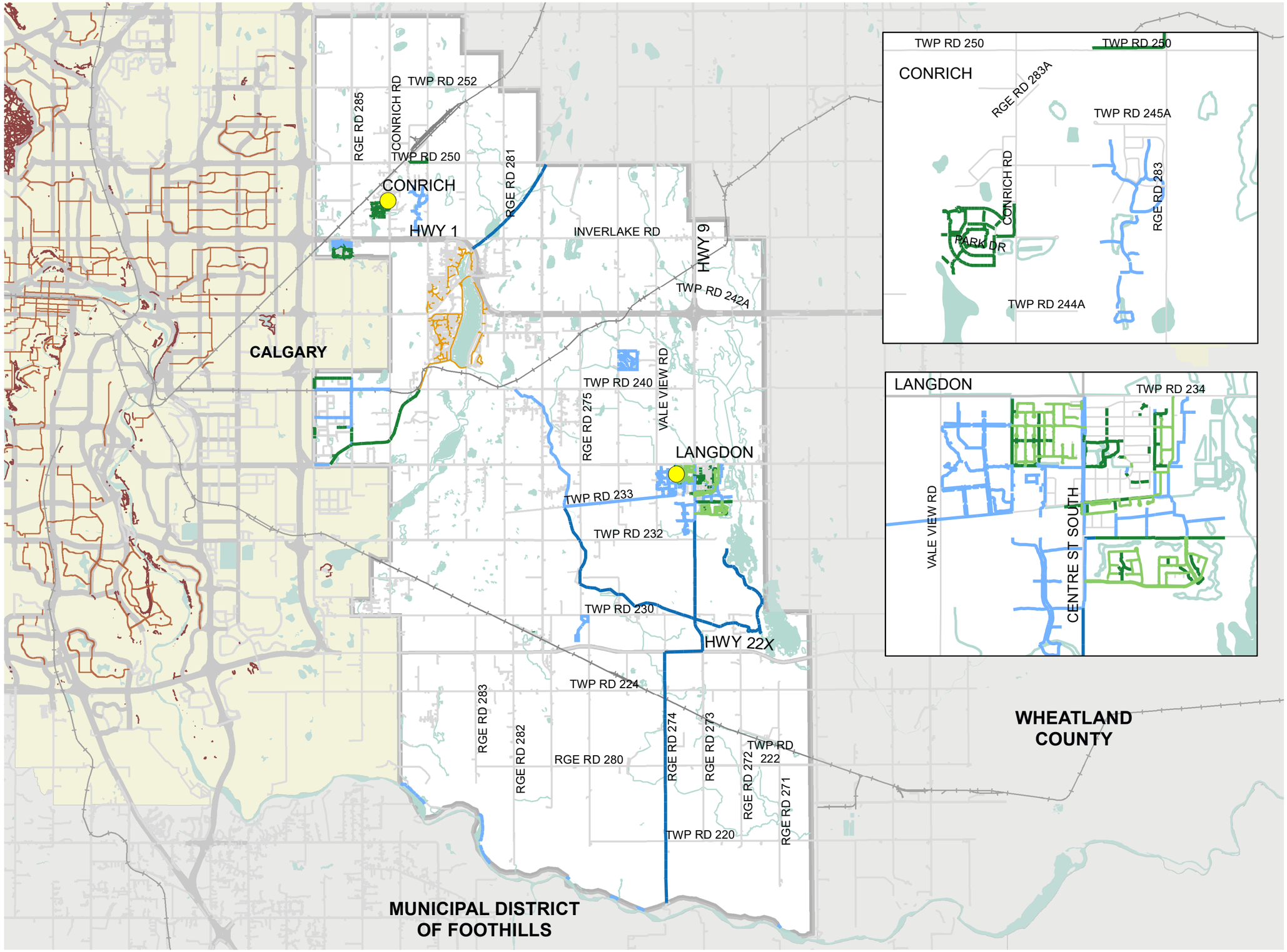
ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

- Collision with Fatality
- Collision with Injury

ACTIVE TRANSPORTATION INFRASTRUCTURE
- County Trails - Existing
- County Trails - Adopted
- County Trails - Proposed
- County Sidewalks
- Calgary Bikeways
- Calgary Trails
- Chestermere Paths

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector
- Road
- Street

OTHER FEATURES
- Railway
- Hydrology



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Level of Traffic Stress (LTS) Analysis

The Level of Traffic Stress (LTS) Analysis was originally presented in the 2012 Mineta Transportation Institute Report 11-19: Low-*Stress Bicycling and Network Connectivity* and has been adapted for rural application by the Oregon Department of Transportation, and further refined by Alta Planning + Design. The results of this analysis identify a perceived level of comfort for bicyclists determined on factors, such as posted speed limit, roadway width or number of traffic lanes, and the presence and character of bicycle lanes or other bicycle infrastructure. The combination of this criteria separates the bicycle network into one of four scores:

- LTS 1: Low-stress roadway suitable for all ages and abilities
- LTS 2: Roadway comfortably ridden by the mainstream adult population
- LTS 3: Roadway ridden by "enthused and confident" cyclists
- LTS 4: Roadway ridden by the "strong and fearless" cyclists

In general, a separated bicycle facility, such as a trail or a cycle track, would qualify as a low-stress (LTS 1) bikeway, while a roadway shared with motor vehicle traffic operating at speeds greater than 40kph would receive a higher-stress score. The results of the LTS analysis helps identify existing areas where people can cycle more comfortably, as well as focus areas for improvement. LTS provides a framework to describe the benefits of bicycle infrastructure and demonstrates that some roadways need more intervention than others to provide a truly comfortable experience.

For this analysis, roadways without paved shoulders were evaluated using the original methodology presented in the 2012 Mineta Transportation Institute Report 11-19; for roadways with paved shoulders, the rural methodology defined in the Oregon Department of Transportation (ODOT) Analysis Procedures Manual was used. ODOT's manual includes methodology for calculating LTS for roadways in a rural context, specifically considering roads with paved shoulders. The guidance assumes a speed limit of 70 km/h or greater and assigns a score based on the width of the paved shoulder and the Annual Daily Traffic (ADT). Additional details regarding the methodology are found in the following section.

Level of Traffic Stress Methodology

The Level of Traffic Stress analysis is completed through an assessment of street segments, intersections, and approaches using spatial data and aerial imagery. Broadly, every street link (a section of roadway) receives *up to* three scores based on its characteristics (Figure 1):

- Segment – area of roadway between intersecting streets
- Approach – area of roadway segment with turn lanes, where present
- Intersection – area where one road crosses another, where present

All roadways receive a segment score. However, not all roadways receive an intersection or an approach score. For example, a midblock portion of a street link receives a segment score, but no intersection or approach score because it doesn't intersect another street, nor does it have turn lane. Figure 1 helps illustrate the three possible sections of a roadway that are scored.

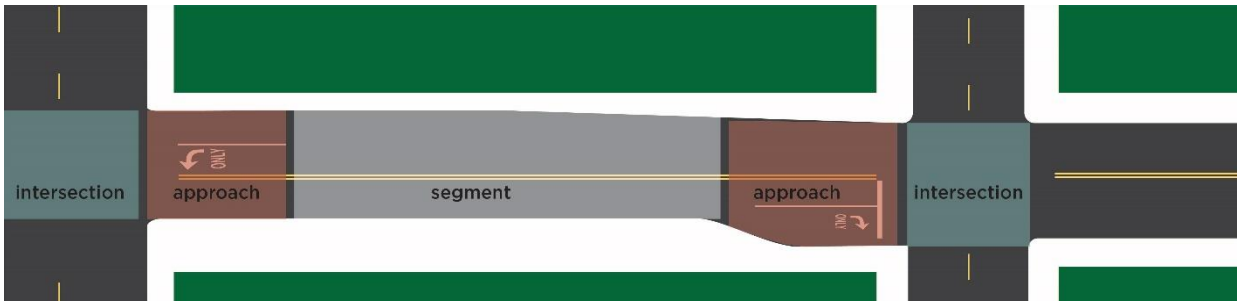


Figure 1. A street link showing the three possible scores it could receive. Because not all links have these three sections, some links may instead receive one or two scores.

The three scores assigned are based on a link's characteristics that affect a bicyclist's perception of safety and comfort. These three scores are combined to determine the overall LTS score; the weakest link principle is used, meaning that the highest stress score is used. For example, a segment may provide a low stress pathway but due to a high stress intersection, the link will receive a high stress score.

LTS Analysis Results and Considerations

It is important to note that the LTS model is reflective of the roadway network data available. While aerial imagery was utilized to provide additional information about roadways with paved shoulders, certain characteristics—such as posted speed—are more difficult to verify using aerial imagery. For this reason, it is understood that there are limitations due to the available data; these are noted in more detail in the results below.

- Due to posted speed limits of 60 km/h or greater on many of the roadways in Rocky View County, most roads received an LTS score of 3 or 4
- Some local roads received a higher LTS score than the through-roads they branch off of due to the speed limit of the roadway
    - This could be a result of 60 km/h being used as a default speed limit in the road network data provided and may not reflect the operating speeds given the geometry of many of these roadways
- Roadways with paved shoulders were identified through a survey using satellite imagery
    - Paved shoulders found in the survey had an estimated clear width of 1.5 m or greater based on aerial imagery
- Pathways and trails were not considered as part of the LTS analysis. The analysis only considers the roadway

    - In general, physically separated facilities are considered an LTS 1, except where they intersect a higher stress road, especially if no crossing treatment currently exists
    - Consideration should be given where pathways cross roadways
    - In the maps included in this memo, existing pathways and trail facilities are shown on top of roadways
- Currently, many existing pathways and trails are located between lower stress roads (within subdivisions) and not along higher stress through streets

The results of this analysis are shown on Maps 3A and 3B.

MAP 3A
LTS ANALYSIS

ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

LEVEL OF TRAFFIC STRESS ANALYSIS

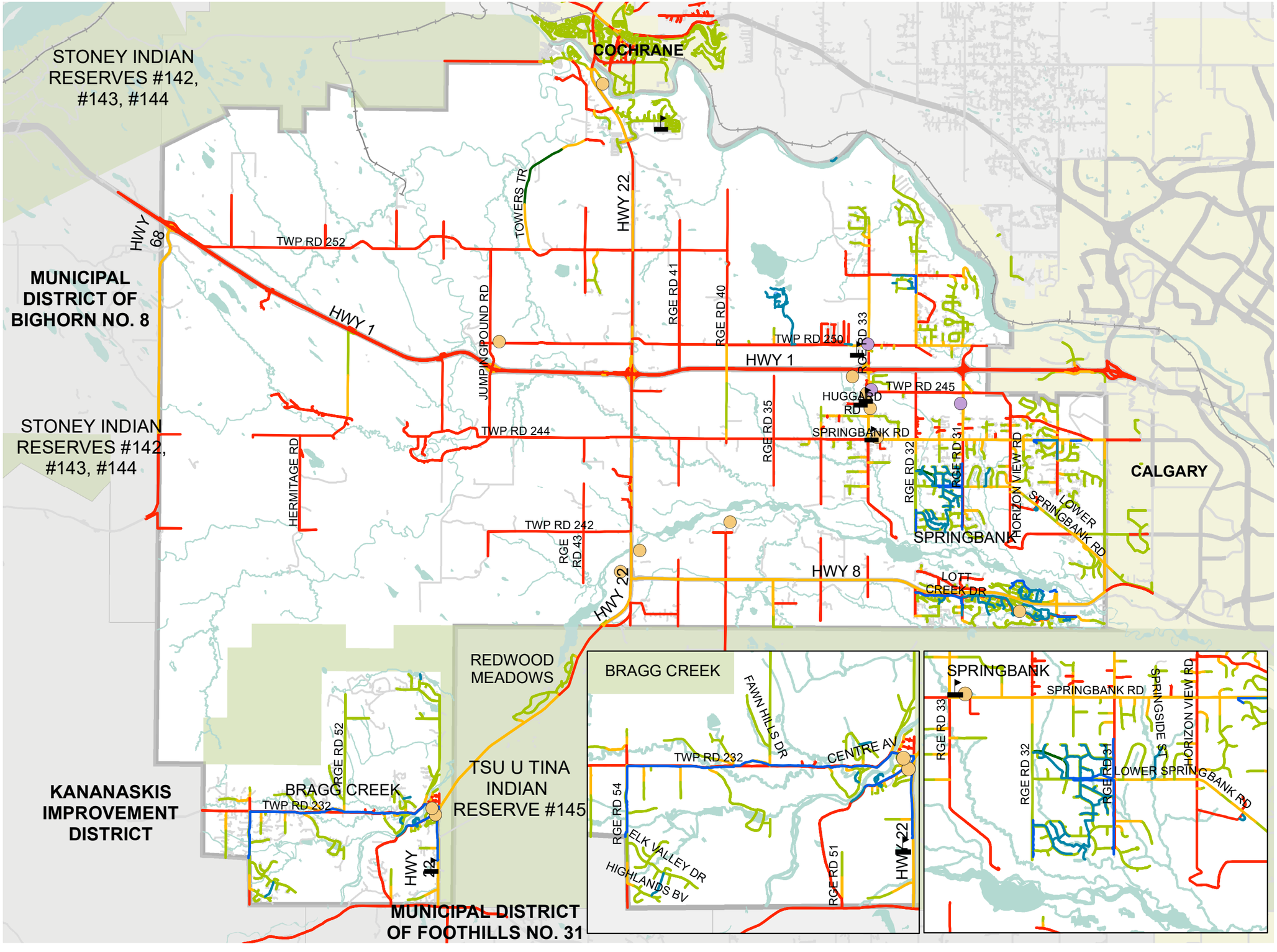
- 1 - Low Stress Roadway
- 2
- 3
- 4 - High Stress Roadway

ACTIVE TRANSPORTATION INFRASTRUCTURE

- Existing Regional Pathway
- Existing Local Pathway or Trail
- Existing Sidewalk

OTHER FEATURES

- School
- Community Facility
- Church
- Railway
- Hydrology



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MAP 3B
LTS ANALYSIS

ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

LEVEL OF TRAFFIC STRESS ANALYSIS

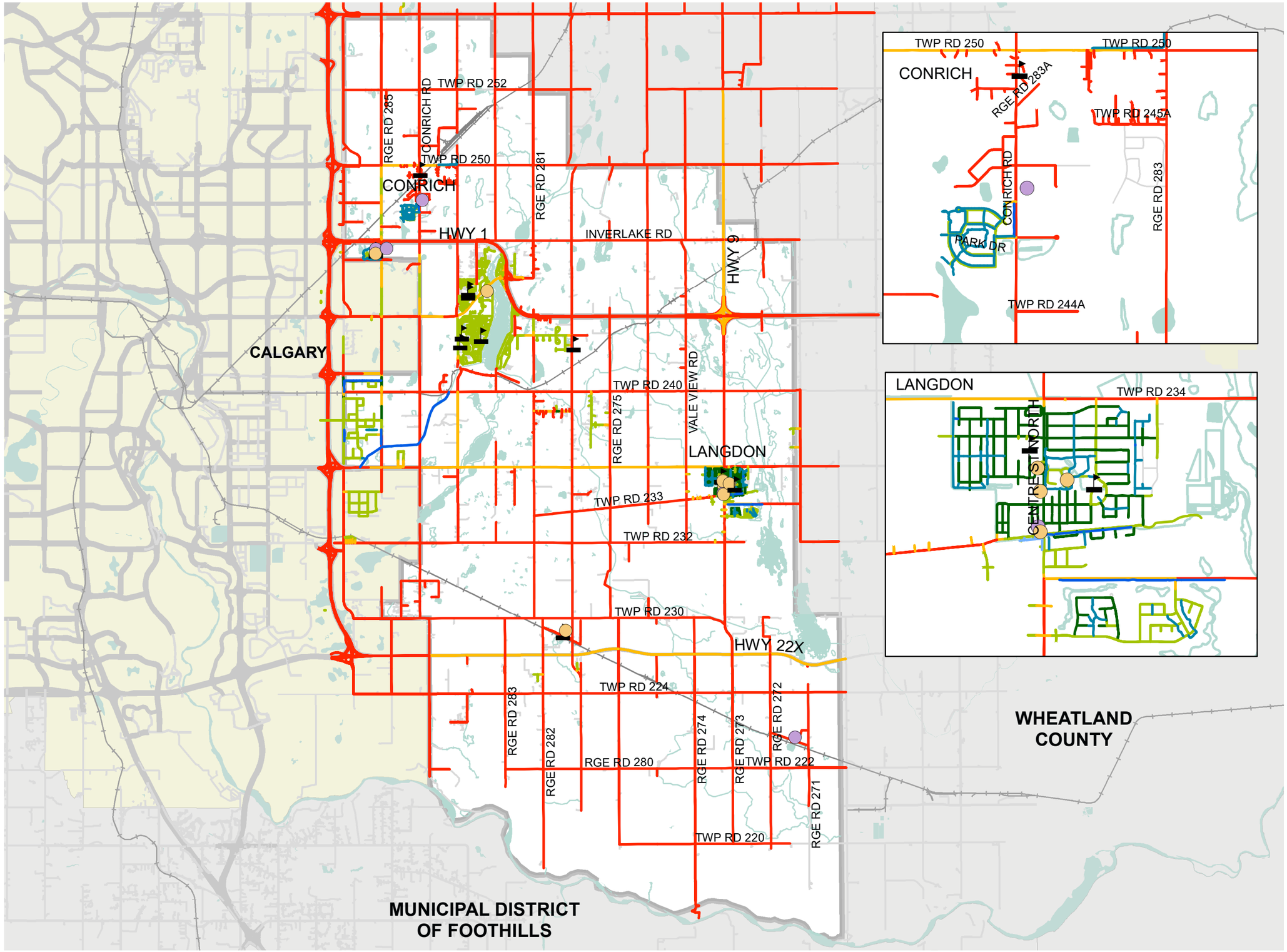
- 1 - Low Stress Roadway
- 2
- 3
- 4 - High Stress Roadway

ACTIVE TRANSPORTATION INFRASTRUCTURE

- Existing Regional Pathway
- Existing Local Pathway or Trail
- Existing Sidewalk

OTHER FEATURES

- School
- Community Facility
- Church
- Railway
- Hydrology



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Map produced February 2018.

Equity Mapping Analysis

Equity mapping is the process of visually depicting the general areas where historically vulnerable or disadvantaged groups of people reside according to the census. In the simplest of terms, equity recognizes that different people experience different barriers to securing their needs, and working toward equity may mean prioritizing active transportation funding in areas with a greater concentration of disadvantaged populations as opposed to equally based on geography.

Mapping selected indicators such as income, education, and Aboriginal Identity, identifies where vulnerable populations predominantly reside, which can then be used for community and stakeholder selection and engagement, project prioritization, and design implementation decisions.

Using the 2016 Canadian Census, data was retrieved for census tracts in Rocky View County that fall predominantly within the study area. For purposes of analysis, the following socio-economic indicators define the potential underserved populations, as shown on maps 4 through 9:

- Percentage of population aged 19 or younger
- Percentage of population aged 65 or older
- Prevalence of low income population (LIM_AT %)
- Percentage of population with recognized Aboriginal Identity
- Percentage of population without a high school diploma (or equivalency)

The analysis used the Alberta mean average as a threshold for each of the above indicators, so that census tracts that had a greater value than the Alberta statistical mean was given a score of one (1). For example, if a census tract had an above average number of adults aged 65 and older, and above average population without a high-school diploma, then the census tract was given a score of two (2). The highest equity score possible was a five and the lowest possible score was zero. This total equity score combined with further review of the component parts will be used to identify areas where making active transportation investment can make the most impact.

Age: Children and Seniors (Map 4 and 5)

The percentage of children in the study area is generally above the Alberta mean, with only the census tract in the northeast section of the study area below the Alberta mean. The percentage of seniors is more evenly split, with above-average populations in both the Elbow River Ranch Lands and Bow River Plains areas. Children under the age of 19 and seniors are more likely to depend on modes of transportation other than private vehicles, due to age and reduced physical capacity relative to healthy adult populations.

In using active transportation infrastructure, children and seniors need specialized safety considerations such as strategic use of curb ramps, shorter crossing lengths, and additional shade and resting areas.

Income: Prevalence of Low Income (Map 6)

To identify people with low income, the Statistics Canada (2016) definition of the Low-Income Measure - After Tax (LIM-AT) was used. This measure considers low income to be less than 50% of the mean Canadian income (after adjustments for taxes and household size). All census tracts within the study area have fewer low income persons relative to the Alberta mean.

Income effects health in multiple ways, including generally, the ability to live in safer, more active transportation-friendly communities, with a variety of options to obtain healthy food within walking or cycling distances. Additionally, one's income can permit or inhibit the ability to access medical or mental health services.

Educational Attainment (Map 7)

Those with more education typically obtain higher earnings, which in turn provides greater access to employment opportunities, safe living and working environments, healthier environments and generally better health outcomes. Within the study area only one census tract, which includes the northern part of the Bow River Plains area is above the Alberta mean.

Aboriginal People (Map 8)

The population of Aboriginal people within the study area is below the Alberta mean. Although the health of Aboriginal population has been increasing in recent years, Aboriginal populations continue to show a disproportionate burden of disease or health disparities[1].

Total Equity (Map 9)

The total equity score across the entire study area is two out of five, with exception of the census tract that is predominantly within Cochrane. Areas of inequality are spread throughout the study area, rather than focused in a particular location. Generally, the study area has above average populations of children and seniors, and population without a high-school degree. An active transportation plan for Rocky View County should focus on the needs of seniors and children and making connections to schools and community facilities such as libraries, community centres and recreation centres.

[1] Adelson, N. (2005). The embodiment of inequality: Health disparities in Aboriginal Canada. Canadian Journal of Public Health, 96(2): S45-S61.

Latent Demand: Commuting Time (Map 10)

After the completion of the equity analysis, the concept of latent demand was examined through the lens of commuting time. Travel time can be the determining factor for modal choice, with automobiles more attractive as a mode for longer trips. As shown on Map 10, all census tracts within the study area are below the Alberta mean for people with a commute time of 15 minutes or less. This means that on average people in the study area are commuting further for work, which infers that active transportation options less attractive than the automobile.

MAP 4
POPULATION AGED 19 AND BELOW

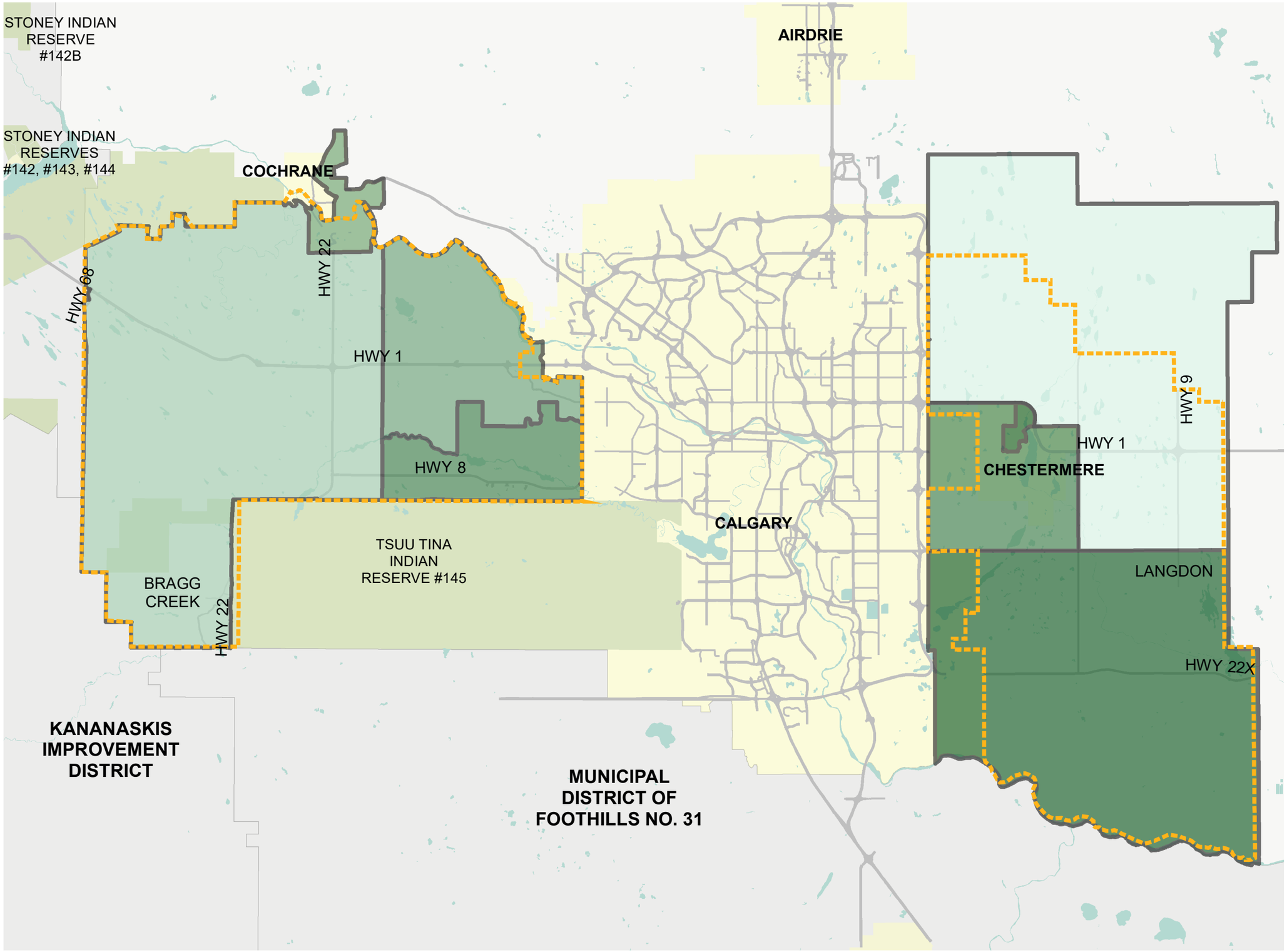
ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

Alberta Mean: 25%

Population aged 19 and below
- 23%
- 24-25%
- 26-27%
- 28-29%
- 30-32%

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector

OTHER FEATURES
- Hydrology
- Study Area



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Map produced February 2018.

MAP 5
POPULATION AGED 65 AND ABOVE

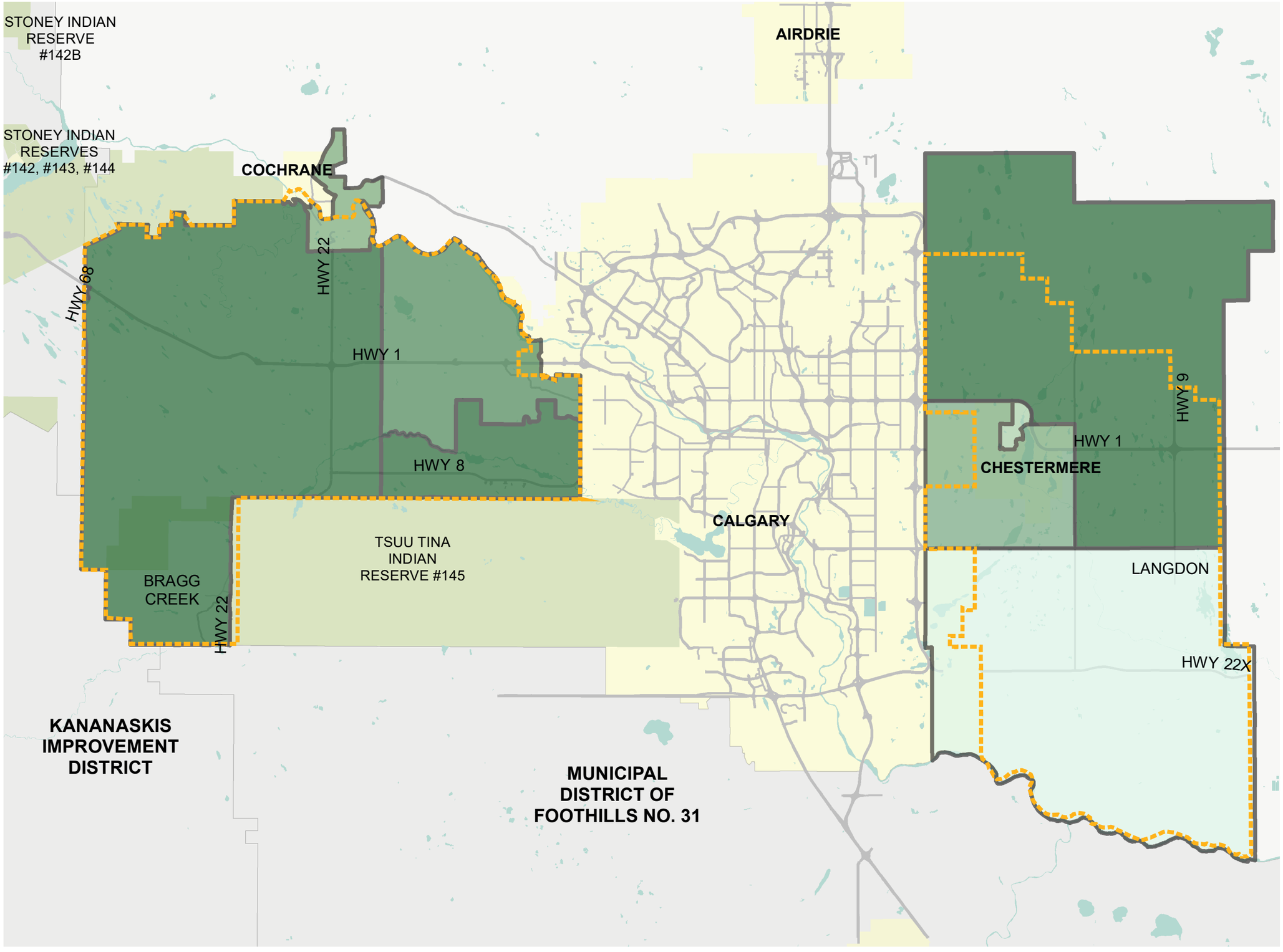
ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

Alberta Mean: 12%

Population aged 65 and above
- 6%
- 7%
- 8-11%
- 12%
- 13%

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector

OTHER FEATURES
- Hydrology
- Study Area



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Cultivating Communities

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Map produced February 2018.

MAP 6
POPULATION
LOW INCOME STATUS

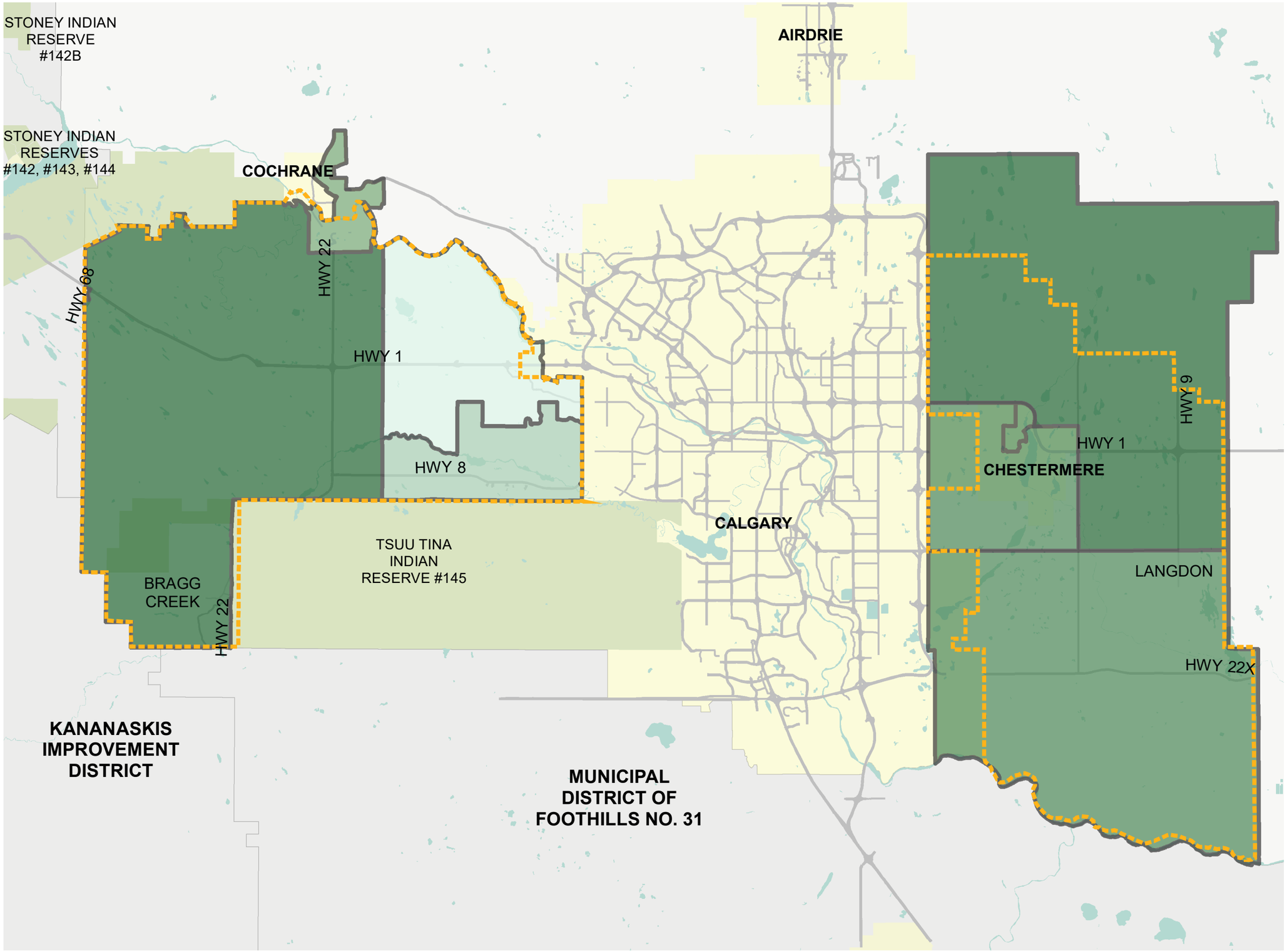
ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

Alberta Mean: 9.3%

Population Low Income Status
- 3.5%
- 3.6-4.9%
- 5.0-5.5%
- 5.6-5.9%
- 6.0-7.5%

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector

OTHER FEATURES
- Hydrology
- Study Area



ROCKY VIEW COUNTY
Cultivating Communities

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Map produced February 2018.

MAP 7
POPULATION WITH NO HIGH SCHOOL DIPLOMA

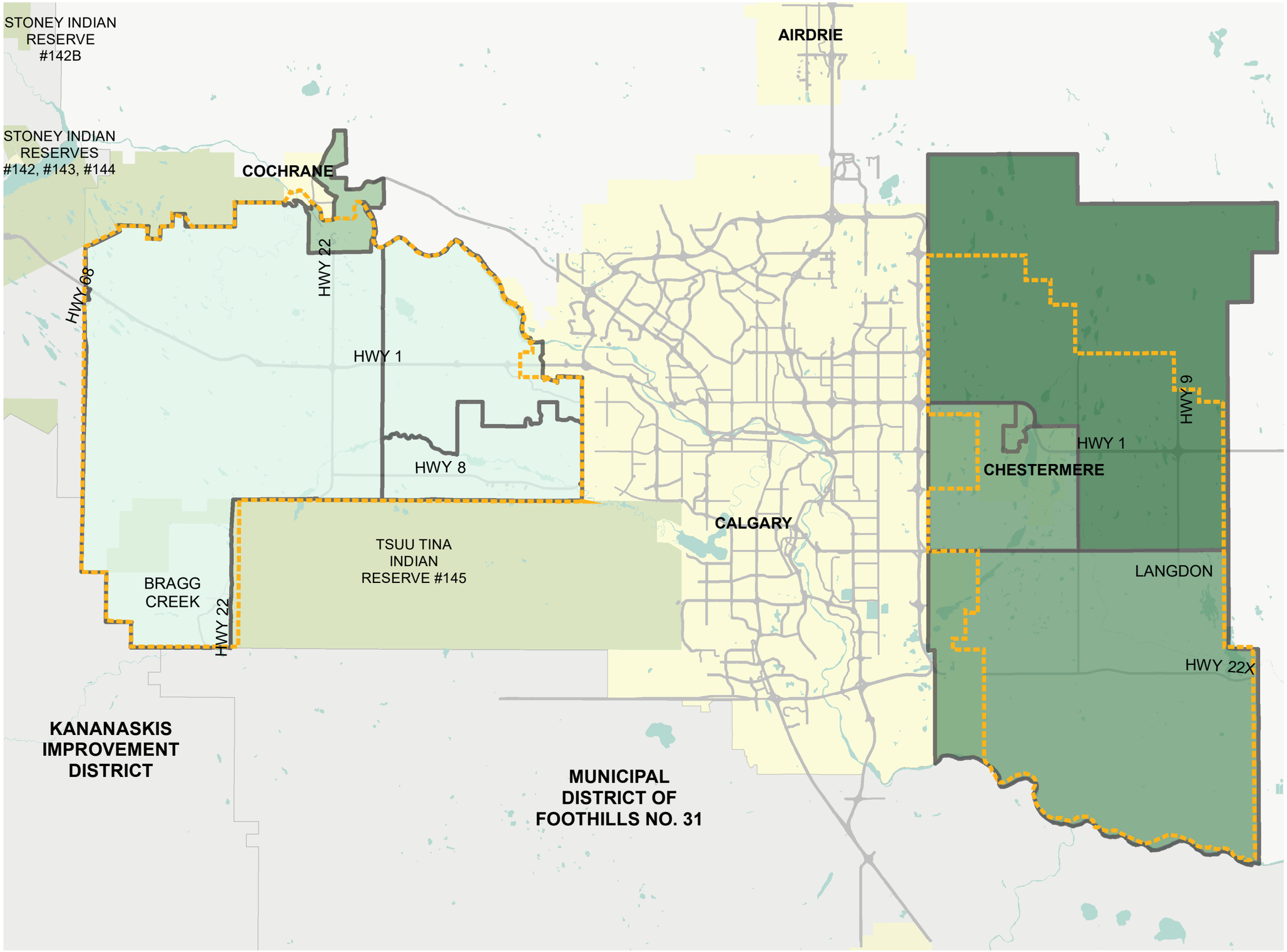
ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

Alberta Mean: 17%

No high school diploma
- 9%
- 10%
- 11-17%
- 18-23%

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector

OTHER FEATURES
- Hydrology
- Study Area



ROCKY VIEW COUNTY
Cultivating Communities

0 4 8 KILOMETRES

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Map produced February 2018.

MAP 8
POPULATION WITH ABORIGINAL IDENTITY

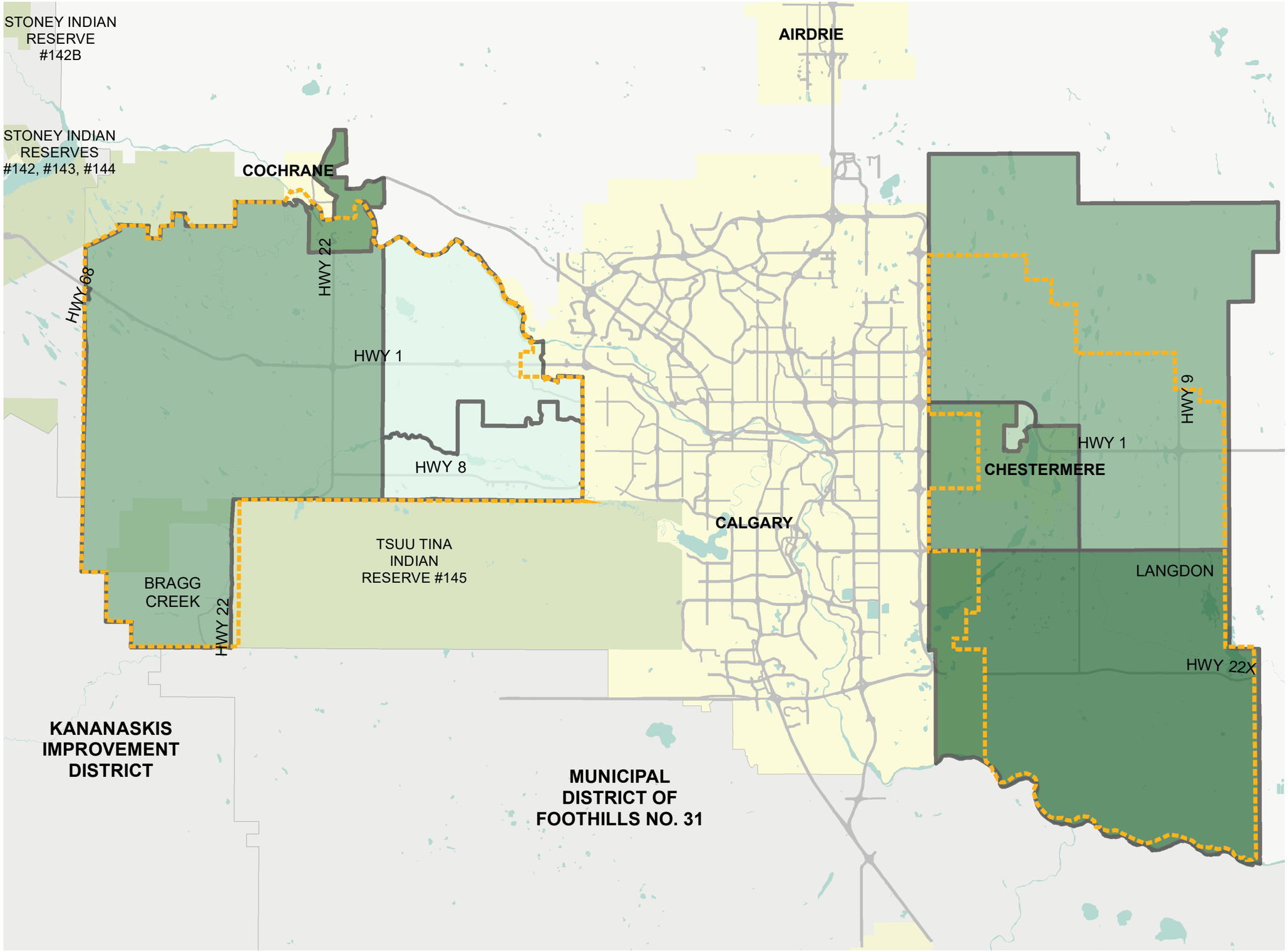
ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

Alberta Mean: 6.5%

Population Aboriginal Identity
- 1%
- 2%
- 3%
- 4%
- 5%

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector

OTHER FEATURES
- Hydrology
- Study Area



ROCKY VIEW COUNTY
Cultivating Communities

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Map produced February 2018.

MAP 9
TOTAL EQUITY SCORE

ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

Total Equity Score
- 1
- 2

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector

OTHER FEATURES
- Hydrology
- Study Area

ROCKY VIEW COUNTY
Cultivating Communities

0 4 8 KILOMETRES

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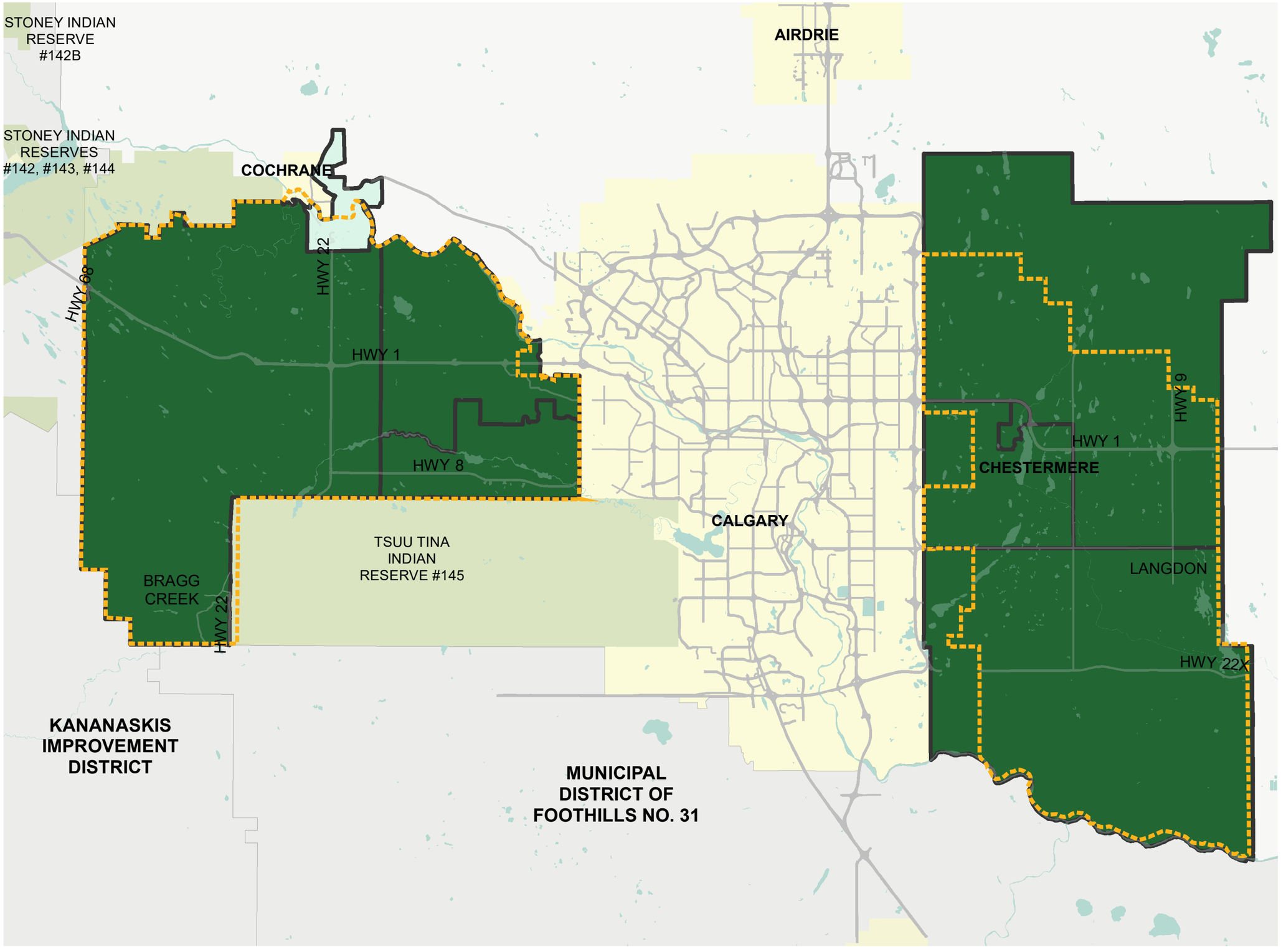
City of Calgary, Town of Cochrane and AltaLis.
Map produced February 2018.



MAP 10
POPULATION
COMMUTE TIME
15 MINS OR LESS

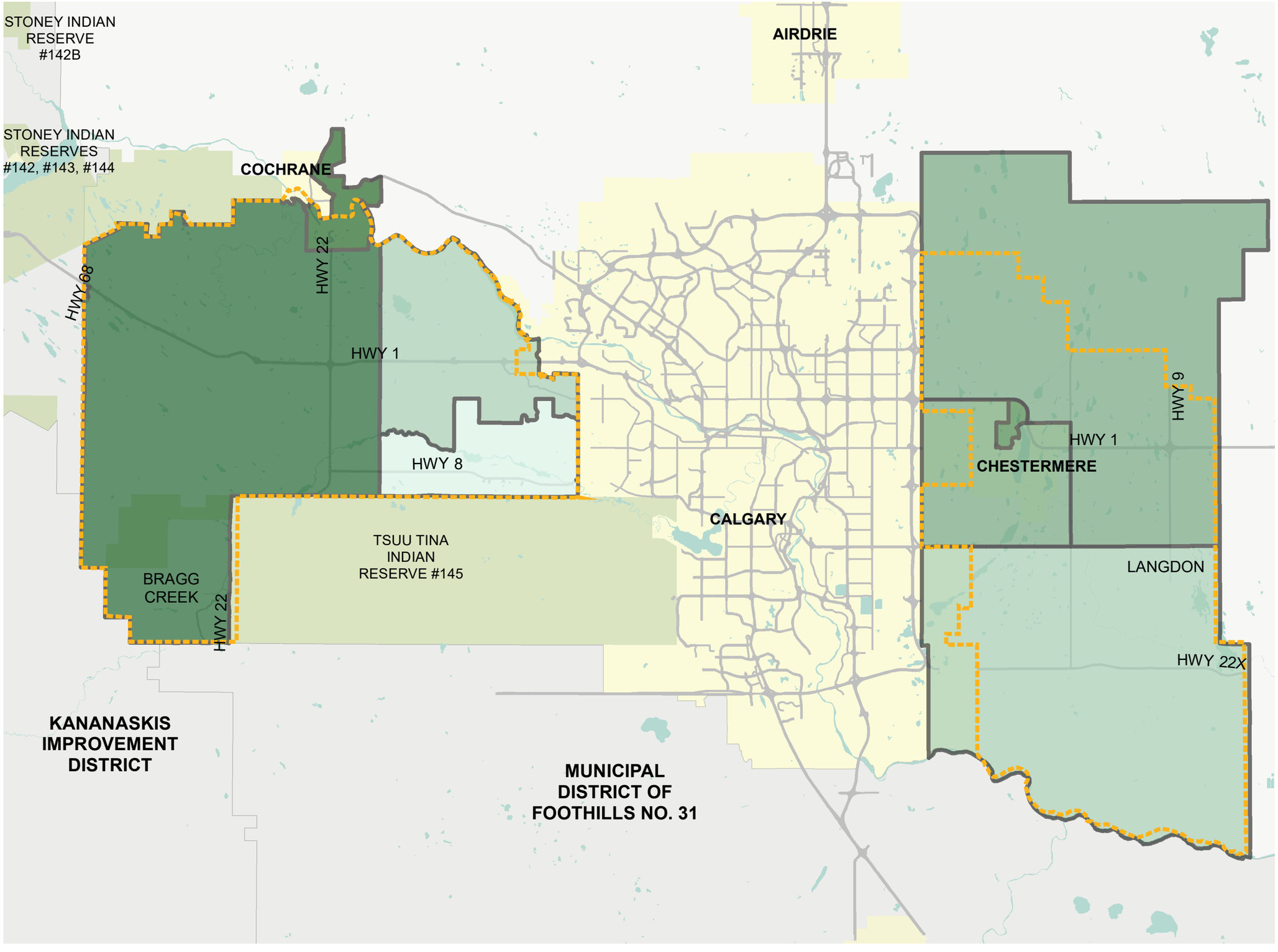
ROCKY VIEW COUNTY
ACTIVE TRANSPORTATION PLAN

Alberta Mean: 27%

Commute time 15 mins or less
- 9%
- 10-11%
- 12-14%
- 15-16%
- 17-24%

ROAD NETWORK
- Primary Hwy
- Secondary Hwy
- Major
- Collector

OTHER FEATURES
- Hydrology
- Study Area



ROCKY VIEW COUNTY
Cultivating Communities

0 4 8 KILOMETRES

N

HDR

alta PLANNING + DESIGN

Data provided by Rocky View County,
City of Calgary, Town of Cochrane and AltaLis.
Map produced February 2018.