338 Avenue Corridor
Functional Review

Prepared for:

Town of Okotoks

Prepared by:

Stantec Consulting Ltd.
on behalf of United Communities L.P.

August 2016

Figures

Contents

Authorization

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Prepared by: _____
Fraser McLeod (Signature)

Reviewed by: _____
Truper McBride (Signature)

01. Purpose

The purpose of this report is to provide a recommended concept for the 338 Avenue corridor as illustrated in **Figure 1: 338 Avenue Corridor Plan Area** by taking into account both the current planning context and implications of future build-out of lands to the south and north of the 338 Avenue corridor. The intent of the recommended concept is to create a distinct west-east urban multi-modal corridor that will achieve the following objectives:

- Create a distinct west-east corridor across Okotoks;
- Achieve an urban corridor in character and function;
- Promote safe and comfortable active transportation connections across and along 338 Avenue;
- Balance multiple modes of transportation within the corridor; and
- Accommodate anticipated traffic demand over a long-term 30 year horizon.

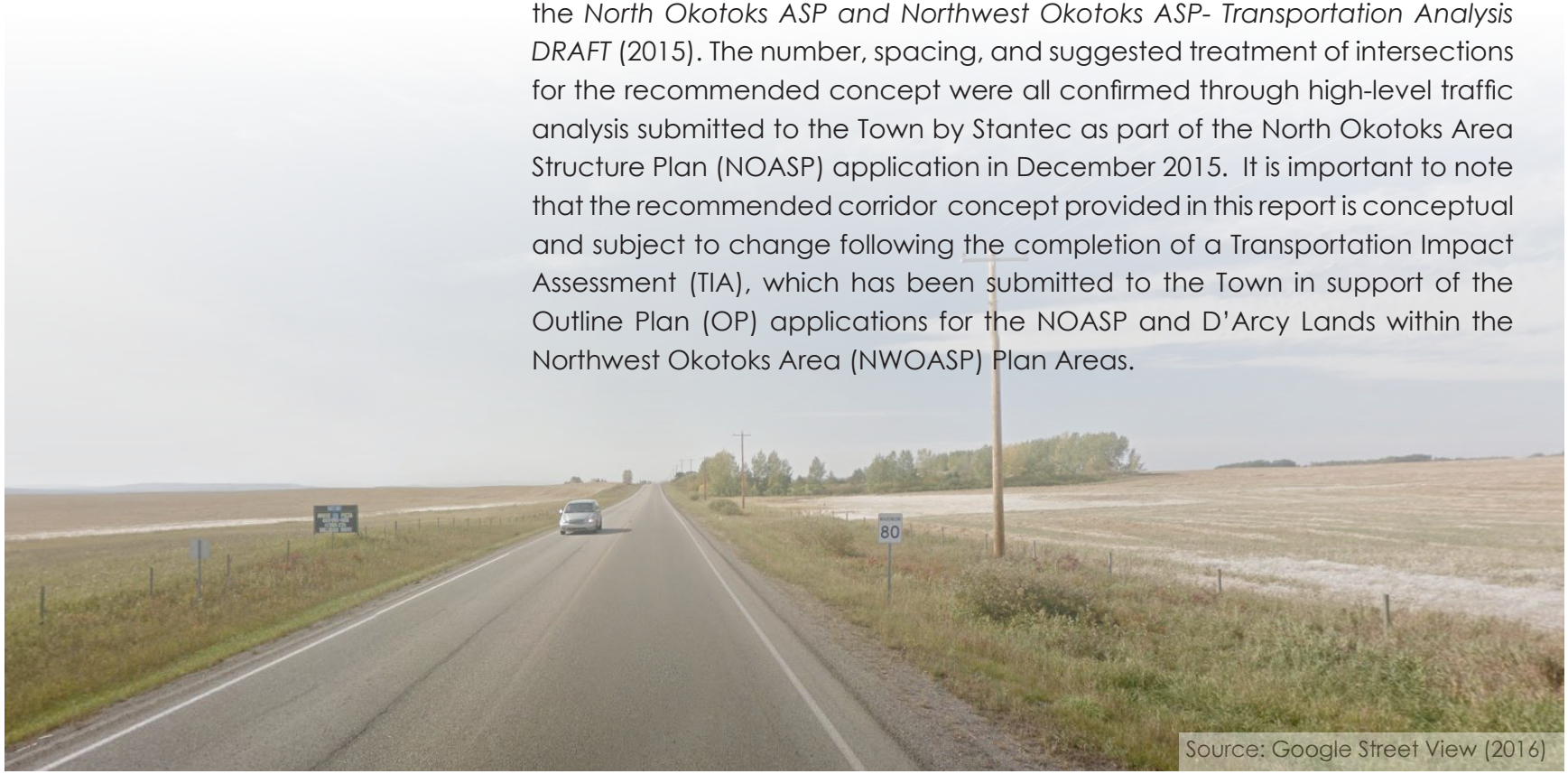
Consistent with the Northridge Drive Functional Study Draft (2006), these objectives will be achieved through a functional review of the 338 Avenue corridor from Northridge Drive to 32 Street E by:

- Establishing future intersection locations;
- Establishing the intended intersection laning and traffic control;
- Establishing conditions for future development access locations and control; and
- Establishing preliminary north gateway landscape design concepts.

Figure 1: 338 Avenue Corridor Plan Area

02. Background

The 338 Avenue corridor is envisioned to ultimately accommodate five signalized all-turn intersections in addition to the existing Northridge Drive and 32 Street E intersections that delineate the Plan Area's boundaries. The reference to these five future intersections (Access 5, Access 6, Access 7, Access 8, Access 9), beginning in **Figure 1: 338 Avenue Corridor Plan Area** and throughout this report, is consistent with the identified future accesses within the *North Okotoks ASP and Northwest Okotoks ASP- Transportation Analysis DRAFT* (2015). The number, spacing, and suggested treatment of intersections for the recommended concept were all confirmed through high-level traffic analysis submitted to the Town by Stantec as part of the North Okotoks Area Structure Plan (NOASP) application in December 2015. It is important to note that the recommended corridor concept provided in this report is conceptual and subject to change following the completion of a Transportation Impact Assessment (TIA), which has been submitted to the Town in support of the Outline Plan (OP) applications for the NOASP and D'Arcy Lands within the Northwest Okotoks Area (NWOASP) Plan Areas.



Source: Google Street View (2016)

Appendix A outlines an analysis of three concepts for the future Access 5 intersection along 338 Avenue and adjacent portions of the east-west corridor. The rationale for the selection of this specific future access intersection and adjacent areas was two-fold. First, this entry road into the NOASP Plan Area is intended to be a major collector with two travel lanes in each direction. Second, this intersection conceptually illustrates how each concept may best accommodate movement across and along the corridor for different modes of transportation, particularly for active modes.

Following facilitated discussions with Town administration at a workshop held in July 2015, and follow-up meetings with Town administration in August and October 2015, a recommended hybrid concept was developed in addition to the three existing concepts. Written comments received from the Town and feedback received at the North Okotoks Open House in December 2015 were reviewed, and assisted in the process of finalizing this recommended concept. The recommended concept was then expanded to encompass the entire 338 Avenue corridor.

03. Traffic Conditions

Existing Traffic Volumes

Existing traffic volumes were obtained on March 3, 2015 at intersections within the Study Area. The counts were conducted for the AM peak period (6:00-9:00 am) and the PM peak period (4:00-7:00 pm). The daily volumes along 338 Avenue were estimated by applying a factor of 10 to the PM peak hour volumes.

Section	Daily Two-way Traffic Volumes (vpd)
West of Northridge Drive	1,600
Northridge Drive to 32 Street E	5,900
East of 32 Street E	1,850

Existing Roadway Plan

The existing roadway, as illustrated in **Figure 2: Existing 338 Avenue**, is a rural township road consisting of two undivided lanes with one lane in each direction and a posted speed limit of 80 km/h. Although the majority of this road maintains the same rural character, there is a small stretch of the 338 Avenue just west of this report's Plan Area between the Northridge Drive intersection and the Northgate Circle intersection that takes a more urban form. Immediately east of Northgate Circle, 338 Avenue transitions into an urban roadway with curb and gutters, landscaped medians, and sidewalks along the south boundary. However, it then transitions back to the rural cross-section east of Northridge Drive that once again has two undivided lanes and is without curb and gutters. The posted speed limit along the entire corridor is 80 km/h.

Located immediately north of the current 2016 Town of Okotoks boundary, 338 Avenue offers few visual cues that travelers are adjacent to the Town, as it traverses rural lands fronting both sides.

The existing roadway does not have any paths or dedicated off-street cycle tracks running parallel to the two lane highway nor does it have marked and visible intersections for pedestrians. Further, in its current configuration it may neither accommodate potential transit stops nor accommodate increased traffic demand once lands south of the corridor are fully built-out. The road also has no curb and gutters or lighting.

This report evaluates three different concepts and concludes that a fourth hybrid concept as shown in **Figure 5: Recommended Concept (Hybrid)** on page 11 provides the greatest opportunity to create a balanced corridor that meets the needs of pedestrians, cyclists, future transit, and motorists.


338 AVENUE
NORTHRIDGE DRIVE
1


Source: Google Street View (2016)

1

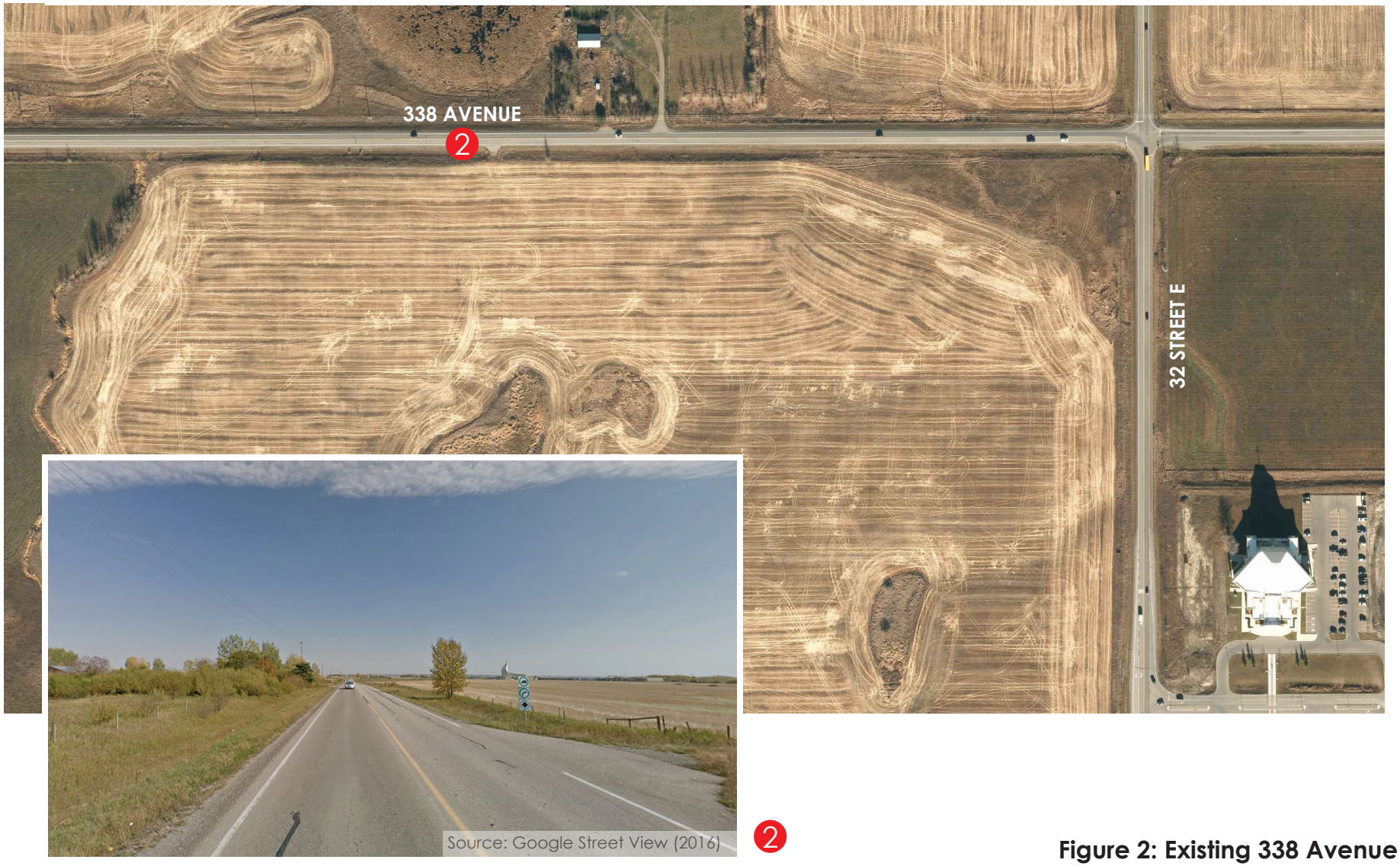


Figure 2: Existing 338 Avenue

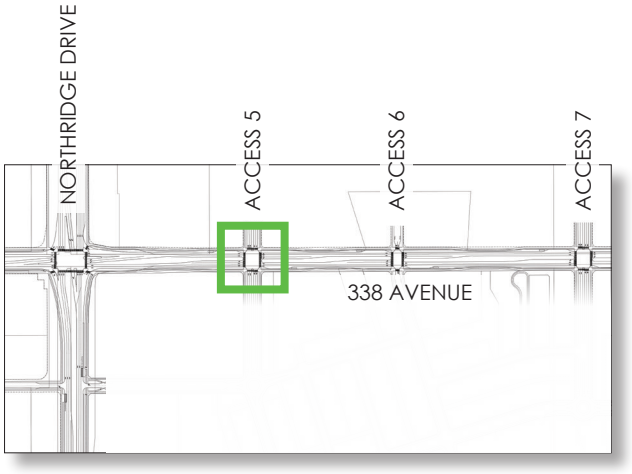
04. Recommended Corridor Concept

Based on high-level traffic analysis, discussions with Town administration and feedback received at the North Okotoks Open House, a fourth hybrid concept was developed and selected as the recommended corridor concept, as shown in **Figure 3: Recommended Concept (Hyrbrid)** and outlined in **Table 1: Recommended Corridor Concept Key Features**. Further, **Figure 4: Recommended Concept Cross-Section** conceptually illustrate the corridor.

Table 1: Recommended Corridor Concept Key Features

Key Elements	Description
Right-of-Way	40 m
Number of Travel Lanes	Two travel lanes in each direction with designated bus bays.
Intersection Treatment	Marked Cycling and Pedestrian Crossings
Dedicated Left Turn Bays	Dedicated left turn slot bays at each intersection and raised right turn islands at 32 Street E Intersection and Northridge Drive Intersection.
Centre median	Raised Centre Median
Speed Limit	60 km/h
Pedestrian + Active Modes Circulation	This concept includes a meandering sidewalk on both sides of the corridor and a two-way protected cycle track along the southern edge of the corridor. The cycle track and sidewalk are separated from each other by a mountable curb and separated from traffic by a boulevard. Pedestrian and cyclist crossings are appropriately marked to accommodate safe movement across the corridor.
Sidewalks	Sidewalks are provided on both sides of the corridor and adjacent to the cycle tracks along the south side of the corridor (illustrated in grey).
Additional Conceptual Design Treatment	Curb and gutters along the entire corridor.
Public Transit Readiness	This concept includes transit bays after each intersection to allow buses to safely pull over to pick up and drop off passengers.

Recommended Concept



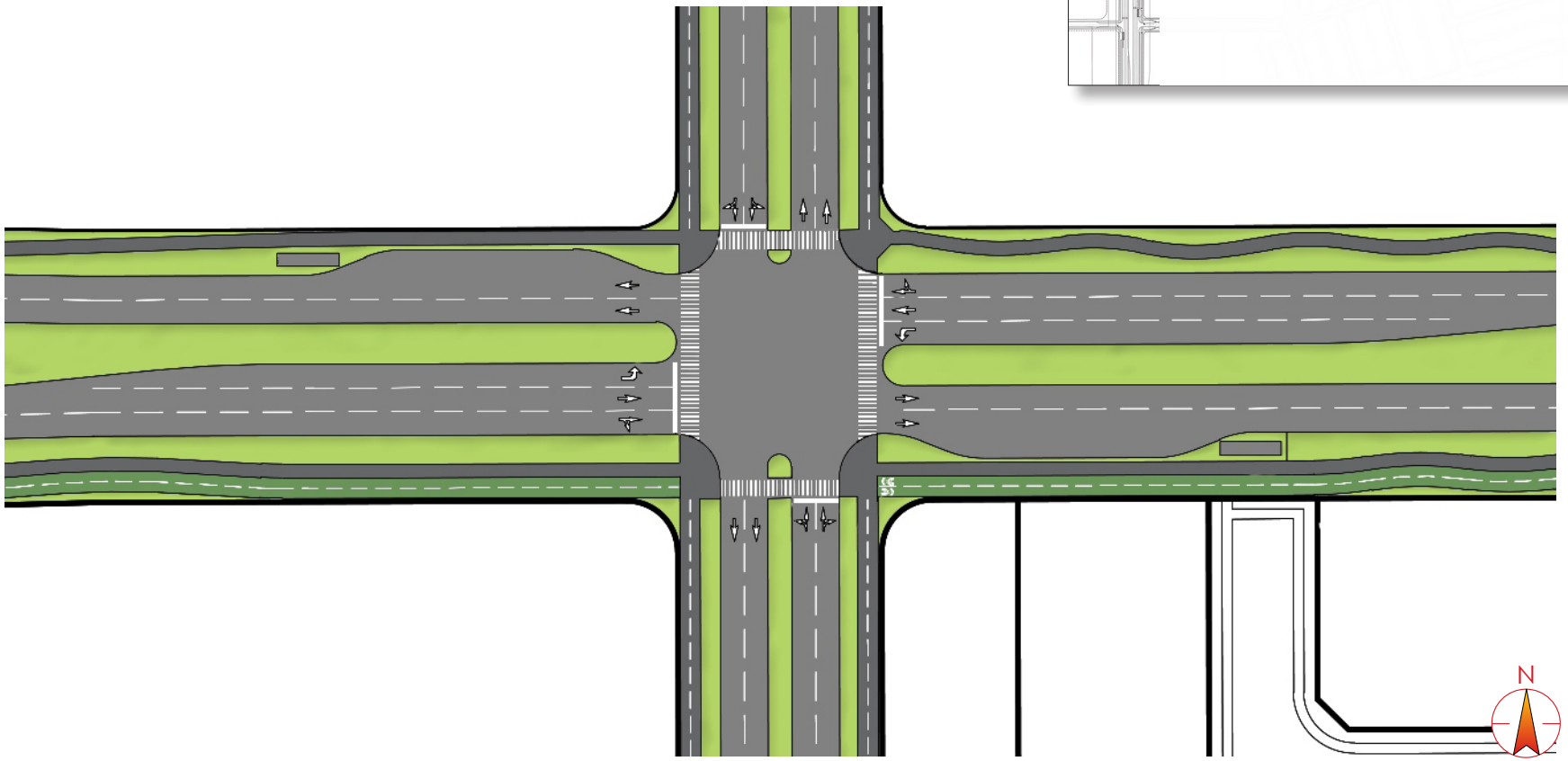
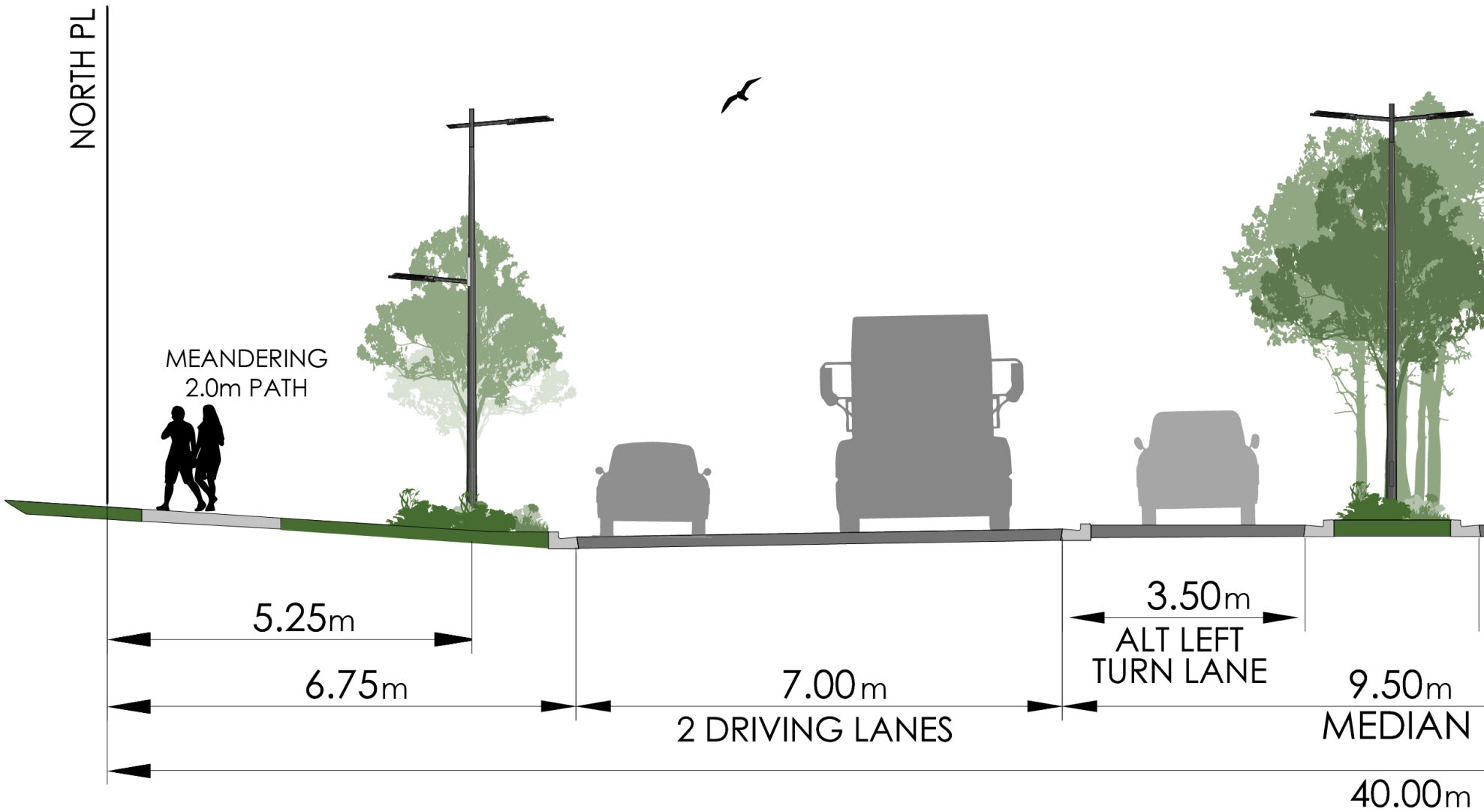


Figure 3: Recommended Concept (Hybrid)


NORTH PL
MEANDERING
2.0m PATH
5.25m
6.75m
7.00m
2 DRIVING LANES
3.50m
ALT LEFT
TURN LANE
9.50m
MEDIAN
40.00m

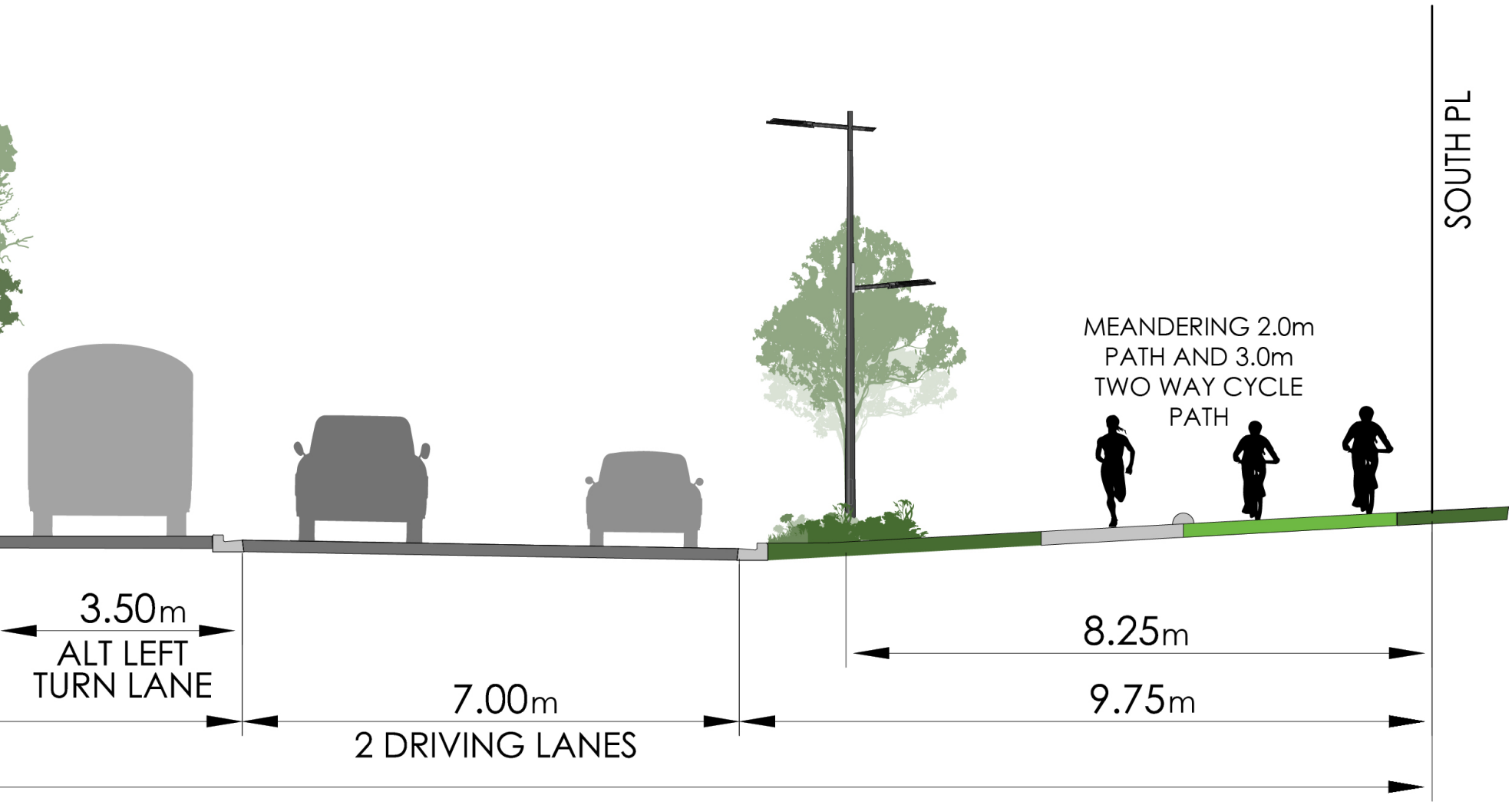
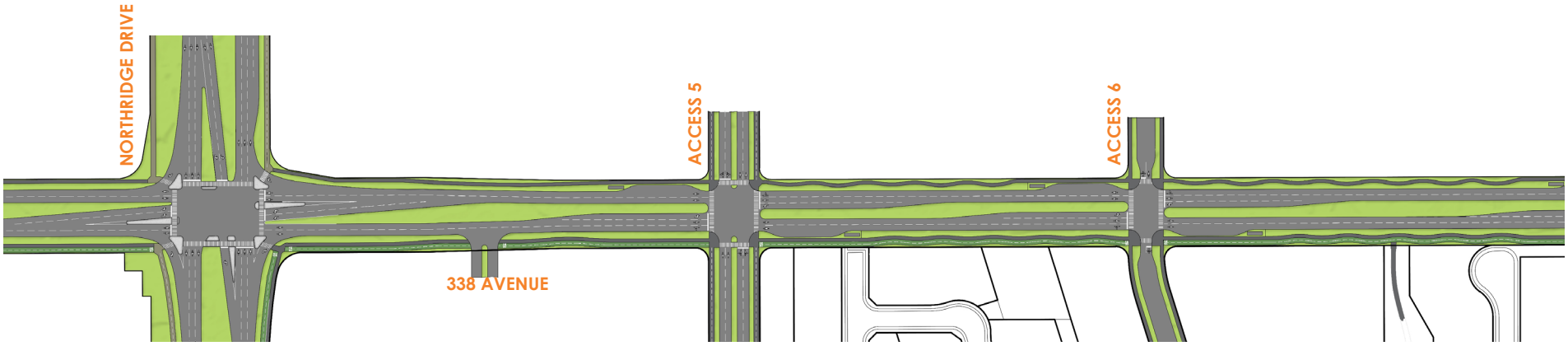


Figure 4: Recommended Concept Cross-Section

The hybrid concept, as shown in **Figure 5: 338 Avenue Corridor Recommended Concept** for the entire Plan Area is the recommended concept as it achieves the following planning and design outcomes.

Achieving A Multi-Modal Boulevard

Town administration has identified a desire for 338 Avenue to be designed as an urban multi-modal boulevard that can provide safe and efficient transportation for pedestrians, cyclists, transit and motorists. The recommended corridor concept achieves this vision by establishing a suitable balance of all modes in the conceptual design. A sidewalks are located on both sides of the corridor and two-way cycle track can be found on the south side of 338 Avenue. This will help minimize conflicts between pedestrians, leisure cyclists, commuting cyclists, and vehicles who all have different needs when utilizing the corridor. In addition to the pedestrian and cycle infrastructure, the recommended concept also includes bus bays to ensure that future transit is accommodated and connected to pedestrian infrastructure.



Providing Opportunities for Urban Promenades

The July 2015 workshop with Town administration resulted in a common vision for 338 Avenue to become a safe and urban multi-modal boulevard. The recommended concept achieves this vision by developing a type of Urban Promenade that will enhance the experience of pedestrians, cyclists, and vehicles through integrated design elements. These elements include raised medians, tree lined boulevards, a meandering multi-use pedestrian promenade, and a two-way cycle track on the south side of the corridor. The meandering pathways use differing materials and colours to clearly separate cyclists and pedestrians to ensure safety and minimize conflict. The route also allows landscaping opportunities and a variety of planting that will add visual interest to the corridor. Lastly, a wide landscaped boulevard separates all active modes from vehicle traffic to further ensure safety and enhance the experience for all use.

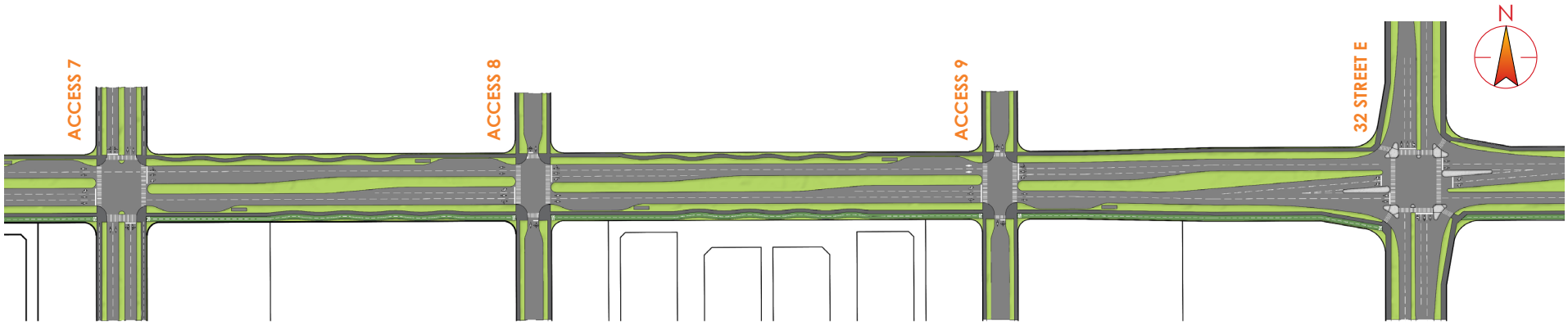


Figure 5: 338 Avenue Corridor Recommended Concept

Focusing on Crossings for People, Not Just Vehicles

Town administration identified a need to balance all modes of transportation and placed particular emphasis on active modes. Since the 338 corridor and the northsouth arterials that cross it, carry collector vehicle volumes daily, the ROW for these streets require a standard width that results in significant crossing distances. In response to this, the recommended concept includes several design features that will help ensure that these corridors do not become intimidating for pedestrians and cyclists. For example, pedestrians crossing 338 Avenue along Northridge Drive have the opportunity to stop within the wide medians and refuge islands if they are not able to cross the entire 40m right-of-way during one light cycle. Additionally, the inclusion of marked and well-lit crossings will assist in the safe movement of pedestrians and cyclists by raising awareness to potential conflict areas. **Figure 6: Intersection Concepts** on pages 18 and 19 illustrates how this interaction between different modes of transportation may function at key intersections.

Where possible, in order to reinforce pedestrian safety and priority, intersections will not include right turn bays and raised right turn islands in order to slow in order to slow traffic, and reduce pedestrian crossing distances. At key intersections, such as the 32 Street E and Northridge Drive intersections, where traffic volumes are expected to be higher, these typical arterial road standards will likely still be utilized.

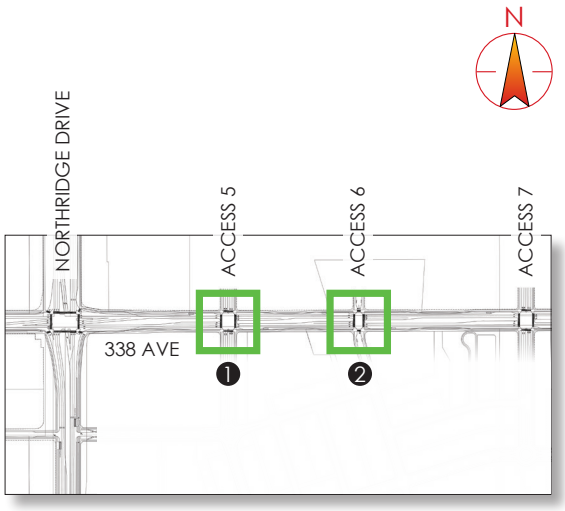
Accounting for the Phasing of Future Public Transit

The recommended concept will accommodate future public transit, whether regional or local, by introducing bus bays after each intersection to enable buses to safely pull over to pick up and drop off passengers without impeding traffic. As seen in Appendix A, a transitway was considered in Concept 3; however, given that the details of public transit require further analysis by the Town to determine exact routes and details and that transitways are typically utilized in more urban, high volume situations, the recommended concept provides the most appropriate function and greatest amount of flexibility.

Accommodating Increased Traffic Demand

Upon full build out of the lands south of 338 Avenue, the corridor design will be required to accommodate a greater volume of vehicular traffic. The recommended concept accommodates increased traffic demand without compromising active modes along the corridor. By maintaining two travel lanes in each direction and including dedicated right and left turn bays at specific intersections, the recommended concept will assist with reducing congestion at peak travel times.

❶ *Access 5 and 338 Avenue*



❷ *Access 6 and 338 Avenue*

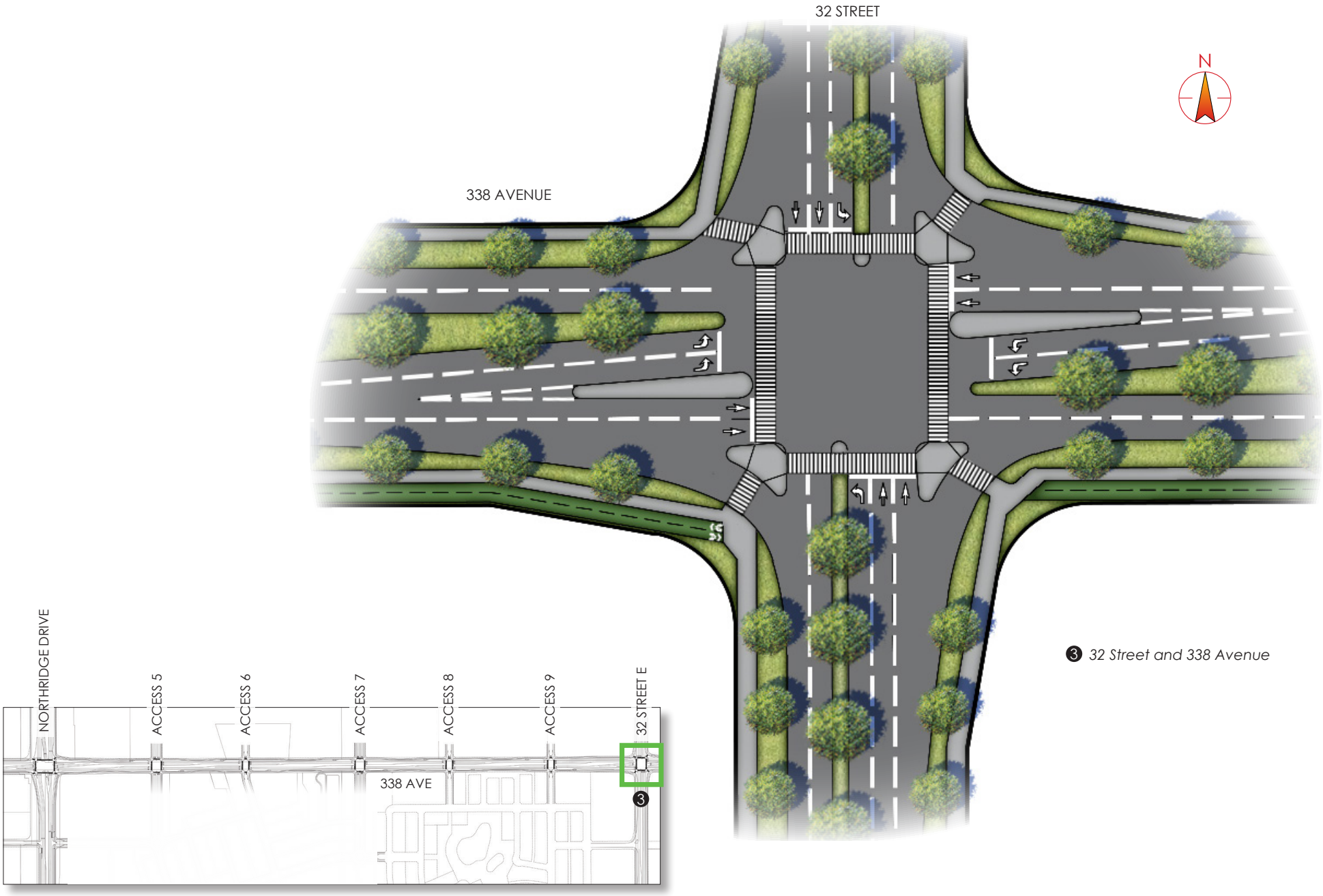
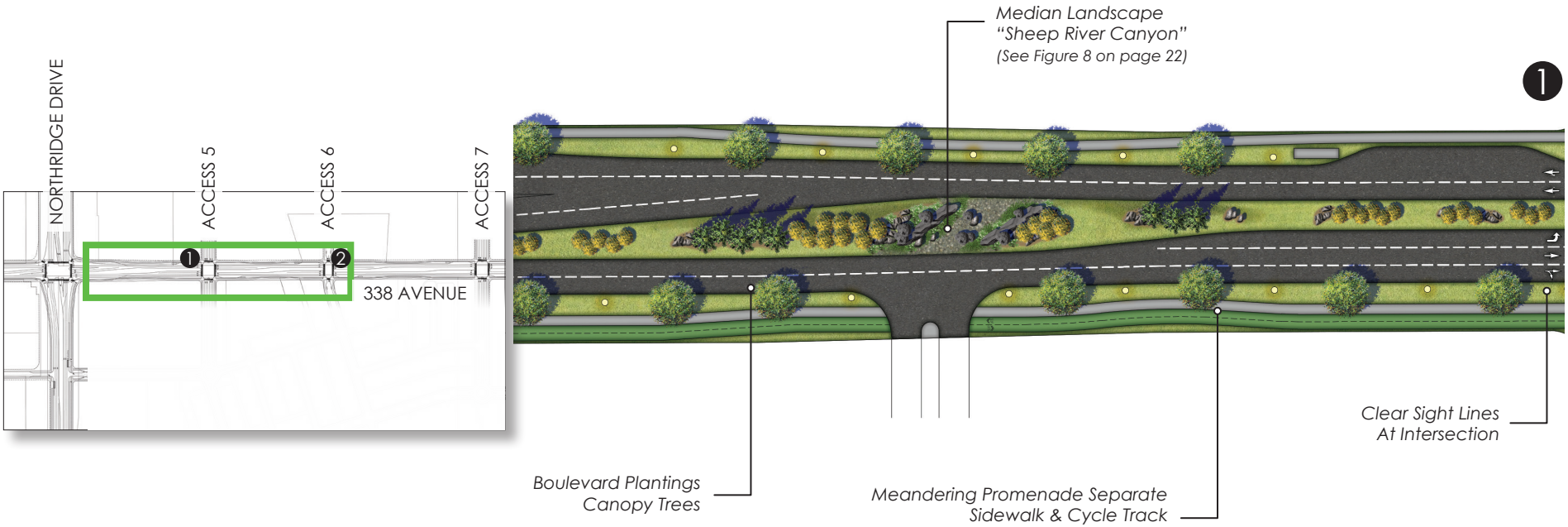


Figure 6: Intersection Concepts

05. Landscape Concept

Okotoks is situated at the foot of the Rockies, alongside the Sheep River with remarkable natural features and beautiful vistas. Inspiration is drawn from the natural features of Okotoks' setting in a metaphoric way. It focuses on the east west connections from the mountains to the foothills and the gradient in concentration of landscape feature shifting from to urban to rural as illustrated in **Figure 7: Landscape Concept**.

- Evoke a sense of community;
- Allow for connections and views into new communities;
- Provide a transition from urban to rural;
- Give a sense of character and identity unique from other transportation corridors in Okotoks;
- Compliment the overall vision for the Town of Okotoks;
- Increase intensity to slow traffic approaching Northridge Drive gateway intersection; and
- Encourage safe active mode uses and buffer from vehicle traffic.



Central Median

At the west end of the 338 Avenue corridor as it approaches the Northridge Drive gateway intersection, the central median features landform elements that reference the canyons of the Sheep River, alongside creative soft landscaping and river rock as shown conceptually in **Figure 8: 338 Avenue Central Median Feature Idea "Sheep River Canyon"**. The berms may be planted with aspen, pine and spruce creating a backdrop for the dramatic berms. The features both enhance the intensity of landscaping drawing interest as you approach Northridge Drive, and frame a view as you head east toward the outskirts of the Town. The landforms and landscape elements decrease in intensity and become less dramatic moving eastward.

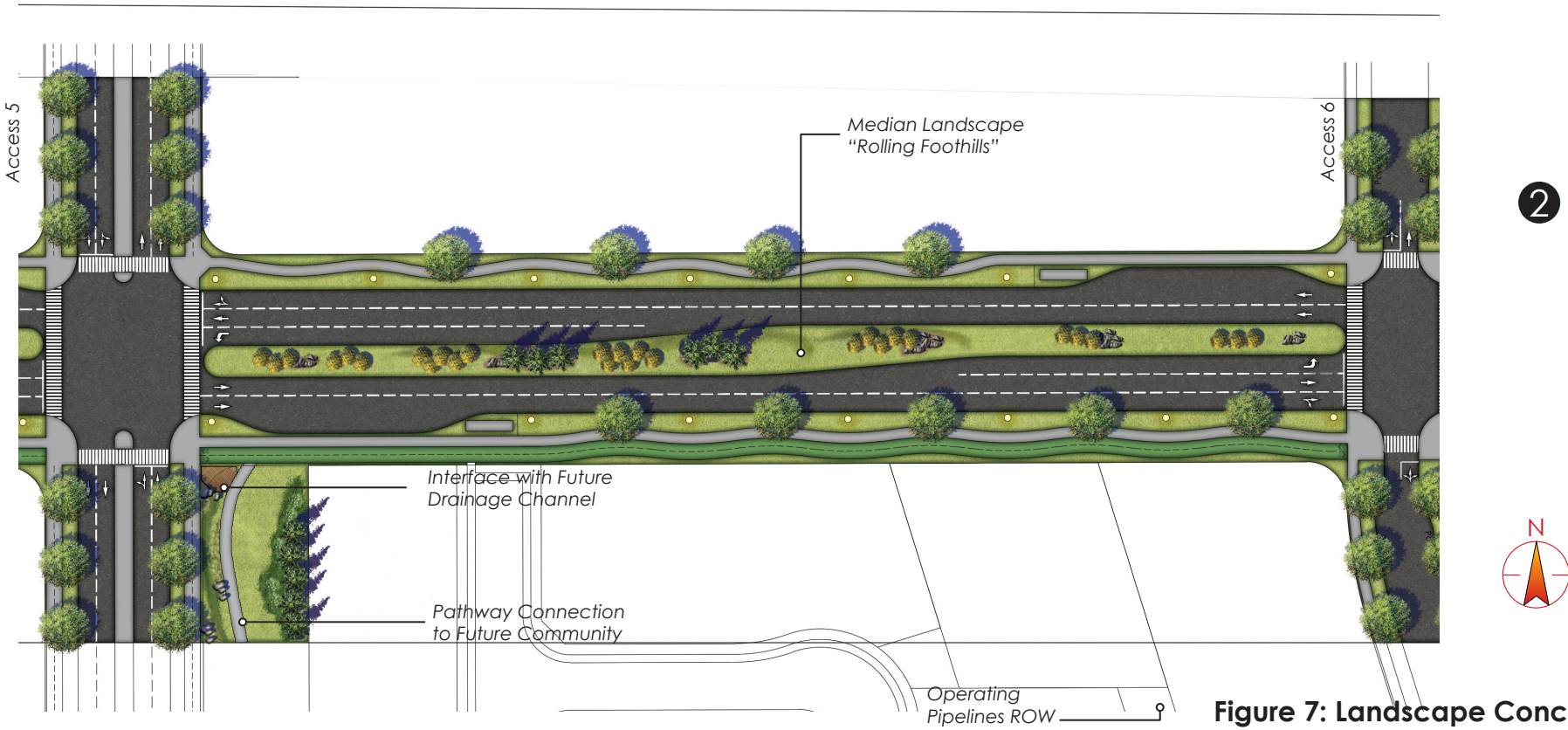


Figure 7: Landscape Concept

Figure 8: 338 Avenue Central Median Feature Idea
"Sheep River Canyon"

Boulevards

The north boulevard will provide a meandering sidewalk while the south boulevard will provide a meandering sidewalk as well as a two-way cycle track as conceptually shown in **Figure 9: 338 Avenue Boulevards**. The uses are clearly separated by material, colour and signage inlays to identify the direction of intended cyclist movement. Where feasible, the pathway should meander to break up the linear form of the road and provide opportunities plantings to enhance the corridor experience. The north and south boulevards should be tree lined to provide a buffer between pedestrians and vehicular traffic while creating a canopy to produce a perceived reduction in scale and inherently slow traffic. Intersections should have clear sight lines for pedestrian and cyclist crossings but low vibrant plantings may create visual cues to highlight potential areas of conflict.

Existing Natural Features

Existing natural features such as drainage courses provide opportunities to create views and links between existing / new communities and the 338 Avenue corridor. Building on the concept of natural systems, these drainage courses will connect open space from 338 Avenue into future adjacent communities. The drainage corridors also provide opportunities to create pathway entries and further increase pedestrian connectivity. Interfaces and crossings with the channels should be carefully studied and enhanced where possible to ensure safe access, low impact development, and vitality of the natural systems.

Possible Constraints

Constraints are important to note in the landscape design of the 338 Avenue corridor as they may be encountered and will impact the landscape intent for certain sections of the corridor. The most common constraints that affect landscape development are underground utilities and grading challenges. Utility right of ways and crossings may create conflicts that inhibit the ability to plant trees and provide landscape features. For instance, 338 Avenue has two operating pipelines by ATCO Gas and Pipelines Ltd. (South) crossing the corridor that requires a 15 m right-of-way (R/W) that may limit the opportunities to provide trees and landscape elements in that location. Crossing agreements and discussions with the utility companies must occur to determine what is feasible in those locations.

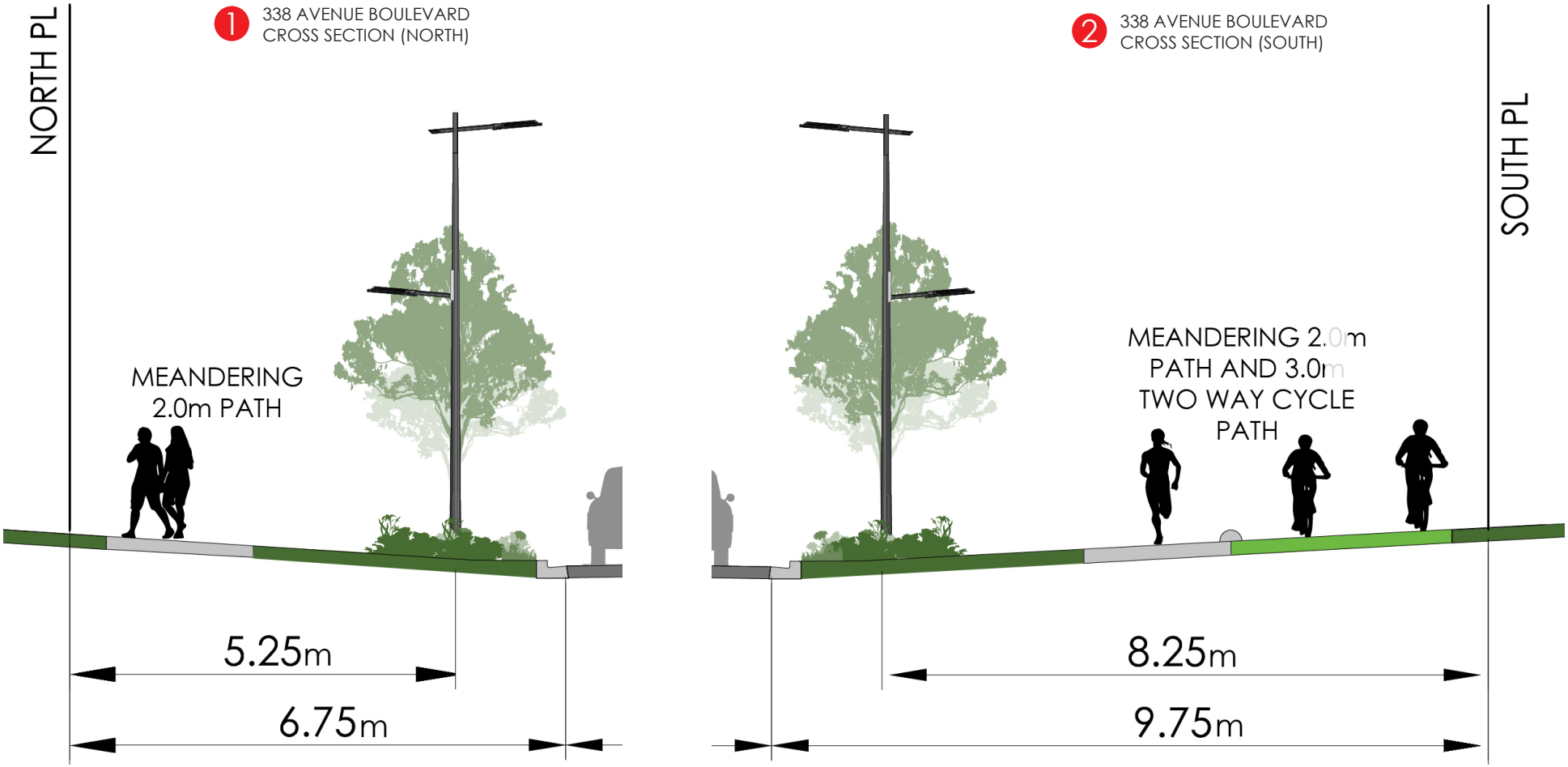


Figure 9: 338 Avenue Boulevards

06. Next steps

The following next steps should be considered to achieve the vision outlined in this report:

1. The recommended corridor concept option provided in this review has been refined further through additional traffic analysis and a formal TIA prepared by Stantec. This TIA, submitted to the Town in July 2016, examined in greater detail:

- Existing conditions;
- Full Build-out (30-Year Planning Horizon);
- Internal Road Network Assessment;
- External Intersection and Access Review; and
- Active Modes and Transit Assessment.

This updated functional review is intended to be considered in conjunction with the TIA to help inform the Town in deciding the timing of long-term upgrades to the existing 338 Avenue corridor.

2. Further analysis and design is required for all landscaped elements prior to tender and construction. Adherence to all relevant construction standards is required, and should follow accepted tendering and detailed design protocols.

07. References

Stantec Consulting Ltd. ('Stantec') (2015) North Okotoks ASP and Northwest Okotoks ASP - Transportation Analysis DRAFT.

Appendix A:

Other Corridor Concepts Considered

Proposed Concepts for 338 Avenue Drive Corridor

The three concepts outlined in this appendix focus on potential concepts for the future Access 5 intersection as this entry road into the NOASP Plan Area is intended to be a major collector. It also illustrates conceptually how movement across and along the corridor may occur for different modes of transportation.

Concept One

Concept One, as shown in **Figure 11: Concept One** is modelled after Country Hills Boulevard in the City of Calgary. It consists of a 43 m ROW, a raised centre median and two travel lanes in each direction. Key features of Concept 2 are outlined in **Table 2: Concept One Key Features**.

Table 2: Concept One Key Features

Key Elements	Description
Right-of-Way	43 m
Number of Travel Lanes	Two travel lanes in each direction
Intersection Treatment	No Marked Cycling and Pedestrian Crossings
Dedicated Left Turn Bays	Dedicated Left Turn Slot Bays and Raised Right Turn Islands
Centre median	Raised Centre Median
Speed Limit	60 km/h
Pedestrian + Active Modes Circulation	No Cycle Tracks or Regional Pathway
Sidewalks	This concept includes a sidewalk along the southern edge of the corridor separated from the travel lanes by a grass median.
Additional Conceptual Design Treatment	Curb and gutters along the entire corridor. There are also raised right-turn islands for certain intersections as illustrated conceptually.
Public Transit Readiness	There is no dedicated transit infrastructure. Transit would be required to use the same travel lanes as other motorists.

Concept One

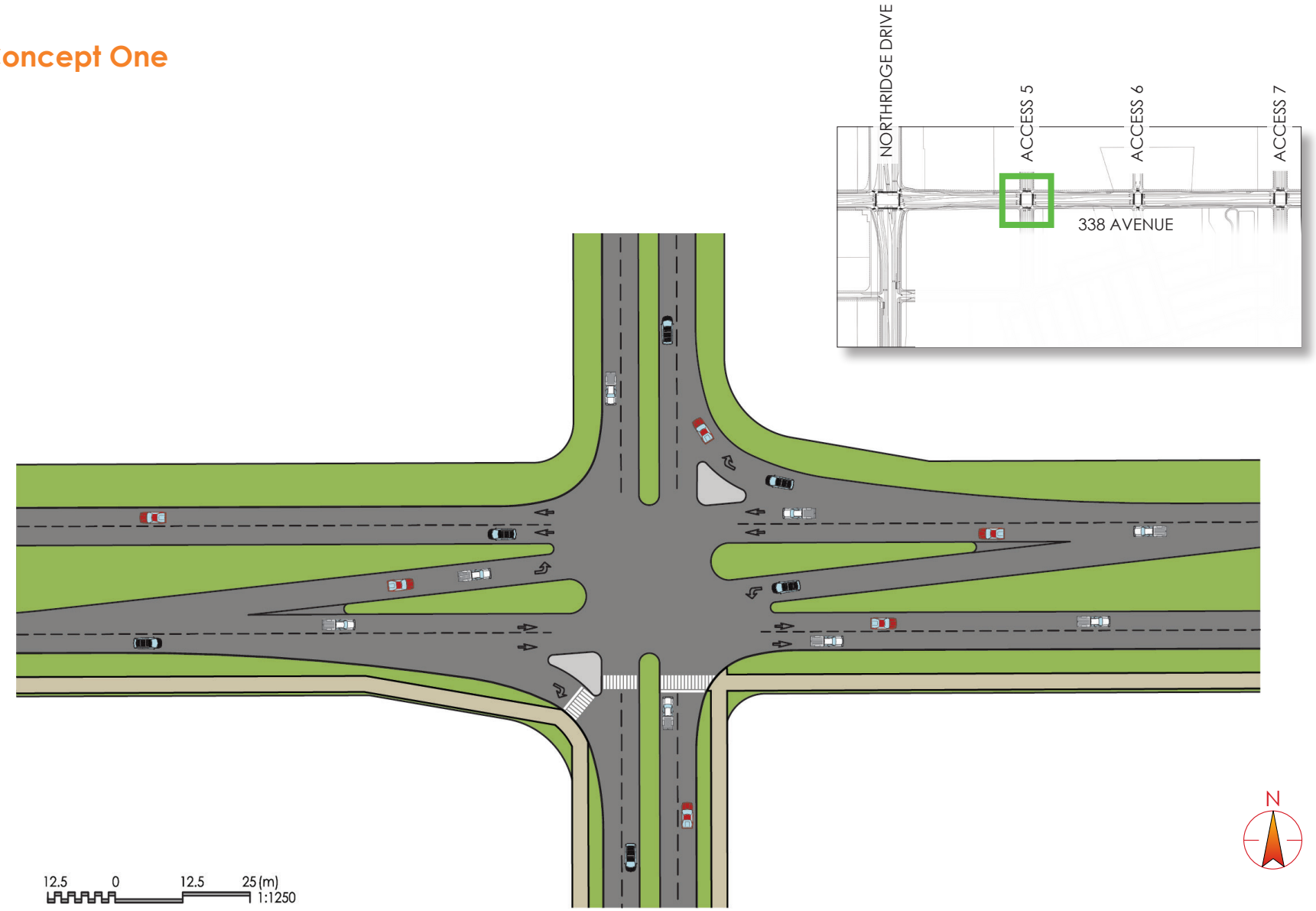


Figure 10: Concept One

Concept Two

Concept Two, as shown in **Figure 12: Concept Two** consists of a 38 m ROW, a raised and landscaped centre median and two travel lanes in each direction. Key features of Concept 2 are outlined in **Table 3: Concept Two Key Features**. This concept was modelled after direct comments from Town administration.

Table 3: Concept Two Key Features

Key Elements	Description
Right-of-Way	38 m
Number of Travel Lanes	Two travel lanes in each direction
Intersection Treatment	No Marked Cycling and Pedestrian Crossings
Dedicated Left Turn Bays	No Dedicated Left Turn Bays
Centre median	Raised Centre Landscaped Median
Speed Limit	60 km/h
Pedestrian + Active Modes Circulation	This concept includes a dedicated two-way cycle track along the northern edge of the corridor (illustrated in green) that is separated from the travel lanes by a mountable curb.
Sidewalks	This concept includes a sidewalk on both the north and south sides (illustrated in beige). The sidewalks are separated from the travel lanes and cycle track by grass medians.
Additional Conceptual Design Treatment	Curb and gutters along the entire corridor.
Public Transit Readiness	The outside lane of each set of two travel lanes is conceptually shown with designated bus bays to accommodate anticipated public transit.

Concept Two

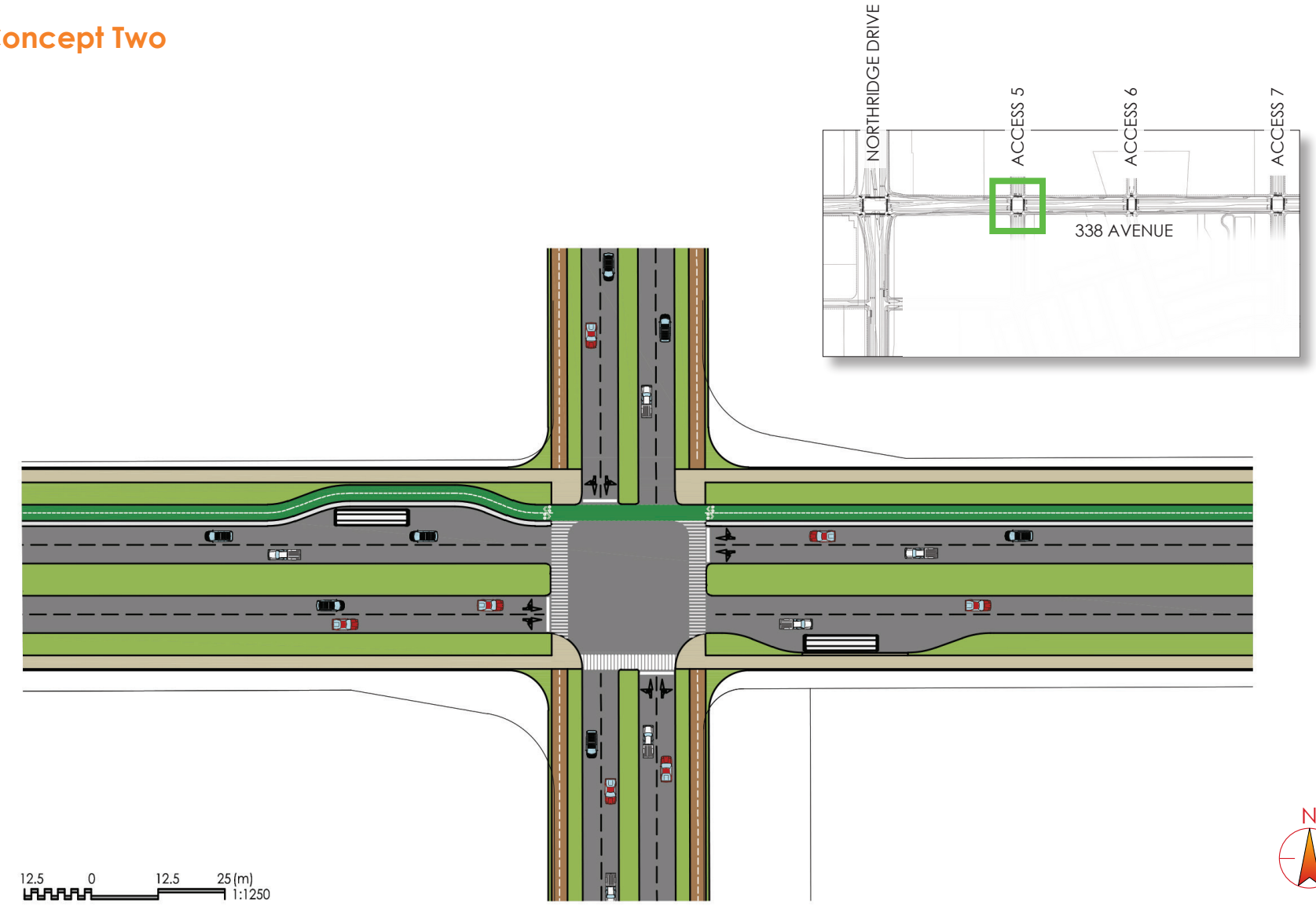


Figure 11: Concept Two

Concept Three

Concept Three as shown in **Figure 13: Concept Three** consists of a 45 m ROW, two raised medians to isolate the transitway and two travel lanes in each direction. Key features of Concept 3 are outlined in **Table 4: Concept Three Key Features**. This concept was modelled after conventional transit way designs.

Table 4: Concept Three Key Features

Key Elements	Description
Right-of-Way	45 m
Number of Travel Lanes	Two travel lanes in each direction for vehicles and one designated transit lane in each direction.
Intersection Treatment	Marked Cycling and Pedestrian Crossings
Dedicated Left Turn Bays	Dedicated Left Turn Bays
Centre median	Raised Centre Medians (which also accommodate transit station platforms)
Speed Limit	60 km/h
Pedestrian + Active Modes Circulation	This concept includes a raised one-way protected cycle track along both the northern and southern edges of the corridor (illustrated in green). The cycle track is separated from traffic by a mountable curb. Where the regional pathway crosses 338 Avenue (illustrated in brown), appropriate marked crossings are provided to accommodate safe movement across the corridor.
Sidewalks	Sidewalks separated from the cycle tracks by a grass median are located along both the north and south sides of the corridor (illustrated in beige).
Additional Conceptual Design Treatment	Curb and gutters along the entire corridor.
Public Transit Readiness	This concept includes a transitway to accommodate anticipated public transit. Protected by two medians, transit will have dedicated lanes and station platforms located in the median.

Concept Three

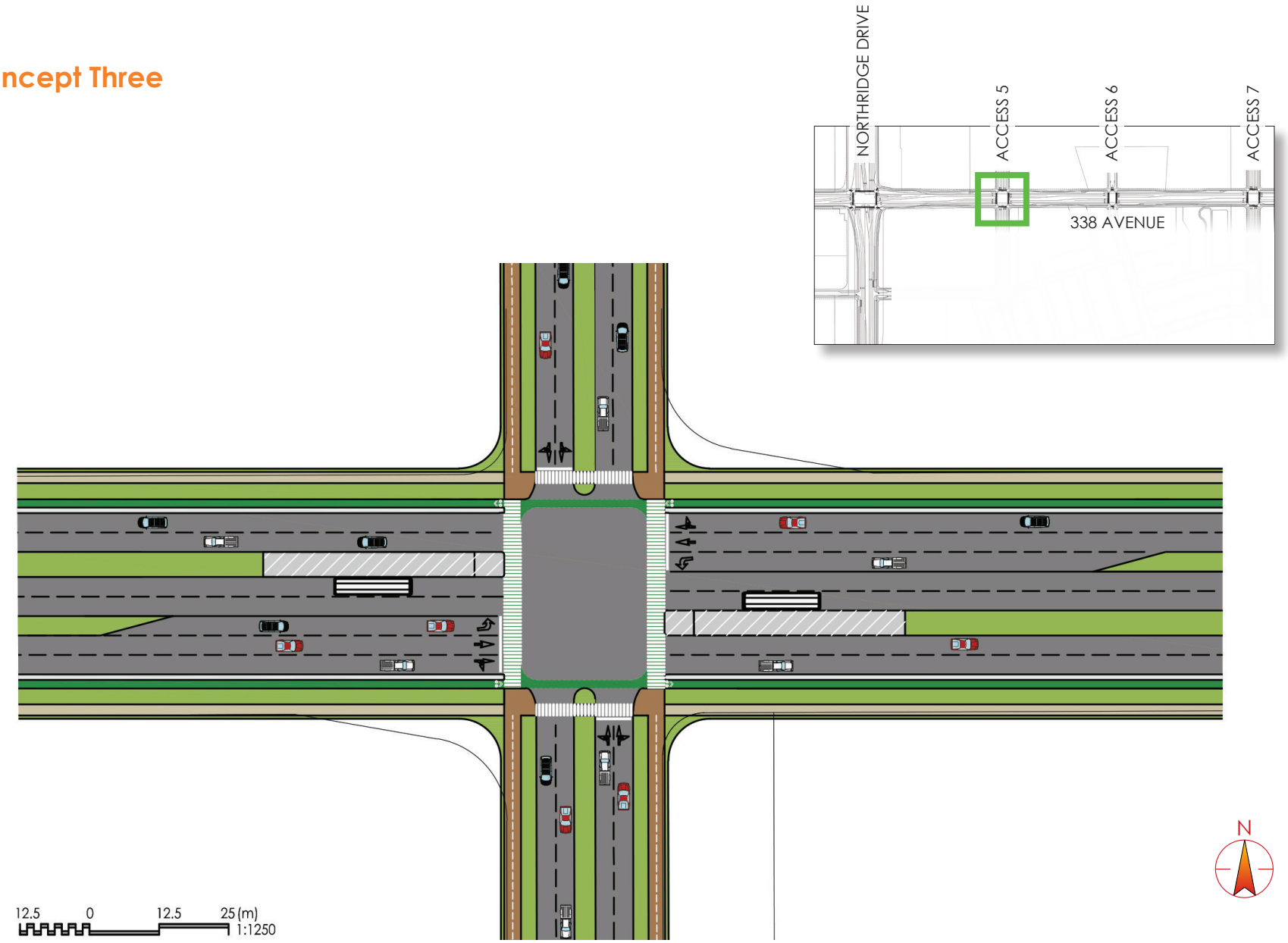


Figure 12: Concept Three

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August 2016