
To:	Sabine Schweiger City of Whitehorse	From:	Michael Dartnell/Selby Thannikary Stantec Whitehorse
File:	McIntyre Drive Traffic Calming	Date:	August 24, 2020

Reference: McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results

This memo is to support the delivery of a conceptual traffic calming program for McIntyre Drive. It summarizes issues and opportunities identified through meetings with the City of Whitehorse, site visits conducted with the City and KFDN staff, and past letters by the City of Whitehorse summarizing key issues. The issues identified in this memo are addressed, where possible, through a temporary traffic calming program, outlined in this memo.

This memo includes updates from the previous April 13, 2020 memorandum that includes the preliminary results following the delivery of a conceptual traffic calming program for McIntyre Drive. It summarizes the findings from the implementation of the temporary measures over the summer of 2020. This includes pre- and post-installation travel speeds and traffic volumes along the McIntyre Drive corridor, collected between May and July 2020. For reference, the preliminary assessment memo is provided as an attachment, as well as an educational brochure that was published in the KFDN newsletter.

Speed and volume data were collected in two locations along the McIntyre Drive corridor. Location #1 is on McIntyre Drive between Macaulay Road and Johnston Road. Location #2 is on McIntyre Drive immediately south of O'Brien Road. A map illustrating both locations as well as the pre- and post-installation speed and volume data is provided as an attachment.

STUDY OBJECTIVES

In undertaking this study and recommendations, several high-level objectives were defined to guide the design elements of the corridor:

- 1) Provide safe travel environment for all modes of travel
- 2) Reduce vehicle travel speeds via infrastructure changes
- 3) Balance extent of infrastructure changes with overall projected project cost and ease of implementation
- 4) Prioritize designs that re-allocate roadway space and add medians rather than moving curbs/gutters
- 5) Prioritize infrastructure changes at key locations – monitor and adjust if required
- 6) Identify potential detailed design considerations such as centre-line and roadway crowning adjustments during surface overlay

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Reference: **McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results**

STUDY AREA

McIntyre Drive is a wide, two lane street that runs from Hamilton Boulevard to Hamilton Boulevard from Elijah Smith Elementary School to the Race Trac Gas station. The street has been identified for potential traffic calming based on perceived safety and operational issues along the entire street. Based on feedback from the site visit and through subsequent discussions with the City, traffic calming improvements could be staged starting with the section between Murphy Road and Murphy Road as the primary focal point.

PROJECT CONSIDERATIONS

In preparation of this plan, key factors for consideration consisted of the following:

- The posted speed limit is 30 km/h. It is our understanding that there have been internal discussions to change the neighbourhood speed limit to 40 km/hr, while maintaining 30 km/hr in playground zones. The City Wide Transportation Plan (2020-2021) may provide guidance on neighbourhood speed limits to provide consistency throughout Whitehorse neighbourhoods. However, it should be noted that the proposed infrastructure changes are appropriate for speed limits of 30 and 40 km/hr.
- McIntyre Drive has been identified as a potential non-AAA cycling facility in the City's *Bicycle Network Plan (2018)*. However, other considerations such as community concerns as identified below were not considered at the time of classification. With these considerations, an upgrade to the proposed cycling infrastructure for the corridor may be warranted if the proposed infrastructure can also support mitigation of other community concerns.
- Transit has expressed concerns with vertical deflection and will require a minimum 3.5m travel lane.
- The strategy will need to address the needs for all types of users, including the need for on-street parking.

ISSUES

SPEED

People travelling by motor vehicle through the study area can do so at a rate of speed that is not comfortable to those walking or cycling along the street, or trying to cross traffic. A speed study was completed in June of 2019 at the south end (between Hamilton Boulevard and McClennan Road). That study found that 98% of all vehicles were exceeding the posted speed limit of 30 km/h. The 85th Percentile Speed was 61.9km/h. A maximum speed was noted at 106.9 km/h. This measured data aligns with the perceived experience of users.

Factors that are contributing to these high speeds, based on observations from the City and consulting team include:

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- Channelization of right turn at the roundabout creates free flow movement with little conflict;
- Wide cross-section provides opportunity to travel fast by motor vehicle because of low perception of conflict and large sight distances;
- Wide cross-section also affords the opportunity to perform risky maneuvers (e.g passing in opposite lane);
- Operating speed does not match the posted speed limit or design speed; and
- Enforcement of speed through policing is perceived to not occur frequently. It can also function as an unsustainable solution, as drivers can often return to their previous habits in the absence of enforcement.

It was noted that the currently installed raised crosswalk was perceived to be an effective tool for slowing vehicles, though as noted previously, vertical deflection is not desired by Transit.

MISSING LINKS

Missing infrastructure links existed in the study area. These were particularly related to walking and cycling. Currently, only one side of the street has sidewalks installed and, unfortunately, the side missing sidewalks is the side where the transit stops are located. Near the roundabout, there is also a missing sidewalk linkage that creates indirect paths for people travelling to the transit stop located on Hamilton Boulevard.

VISIBILITY

Visibility of people walking along and across McIntyre Drive was noted as an issue in meetings with stakeholders and the City of Whitehorse. The specific issues noted are:

- Crosswalk signs missing when crosswalks have been painted. Pavement markings and signage are required to be installed together for crosswalks;
- There is a perception of inadequate lighting levels at conflict areas on McIntyre Drive, particularly near the portion adjacent to the roundabout; and
- Some areas have missing crosswalk opportunities, particularly where new developments are being constructed.

ORGANIZATION

Comments from the City, stakeholders and observations by the consulting team suggest that the organization of the streets is not currently similar to that of other community streets. In particular:

- Parking of private and public (service) vehicles occurs within the boulevards, making the boundary of the street unclear;
- Future developments may change the number and type of users on the street; and
- Landscaping opportunities within the street right-of-way have not been implemented or considered.

Reference: **McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results**

OPERATIONS AND MAINTENANCE

The final theme considered was around the operations and maintenance of the street. As per the Snow and Ice clearing Policy, the City maintains the driving surface of McIntyre Drive; adjacent property owners are responsible for the sidewalks. KDFN may choose to clear sidewalks within the community. At present, the City does not have the equipment to remove snow directly from an on-street cycling facility, and typically relies on snow storage at the edges of the roadway. With narrower travel lanes, this may reduce the space for on-street storage. The future operation and maintenance of a new street cross section must be considered.

Reference: **McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results**

OPPORTUNITIES

Based on the site observations and conversations with stakeholders, a need for an effective, multi-stage traffic calming program was identified as needed for the core area of McIntyre Drive between Murphy Road and Murphy Road. The intention of the traffic calming pilot should be to:

- Provide improved pedestrian infrastructure, including a safe place to walk on both sides of the street and cross;
- Slow traffic;
- Discourage short-cutting through the area; and
- Improve visibility for pedestrians at crossings.

Based on those opportunities, traffic calming will focus on these components:

- A separated sidewalk to provide safe pedestrian refuge and pedestrian connectivity on the side of the street with Transit;
- Medians in select locations to narrow the street, provide pedestrian refuge mid crossing, and slow traffic;
- Additional measures to narrow lane widths such as wider centre yellow lines and shifting curb lines;
- Horizontal deflection to reduce speeds along the corridor while still accommodating the movement of transit vehicles and other vehicles with larger turning radii;
- Painted crosswalks; and
- Temporary curb extensions to slow traffic through intersections.

This study also recommends a construction of a temporary curb along the front of the First Nation Office to eliminate the elongated access and allow for construction of a separated sidewalk. For all measures deployed, an education program should be considered with the community to raise awareness of the plan and intended use. Additional public awareness should be considered through other outreach plans such as the KDFN website and newsletter, media outlets and advance signage alerting vehicles to the changed conditions along the roadways. Material to support the education plan will be provided once the concept has been reviewed and approved.

Additional details on these proposed traffic calming measures is outlined in the following section.

Reference: McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results

TRAFFIC CALMING TOOLS

CURB EXTENSIONS (TEMPORARY OR PERMANENT)

- Speed reduction
- Decrease crossing distance for pedestrians
- Can decrease speeds by making it less comfortable to drive above the design speed
- Can be used on local and collector streets
- Low cost
- Can be deployed as both permanent or temporary measures and can easily be relocated if necessary
- May want to use advance warning signs
- Cyclists on street may have to merge with traffic
- Need to confirm turning radius to support minimum design vehicle
- Potential drainage impacts with cast-in-place concrete curbs
- Have been applied in winter conditions



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MEDIANS

- Low to medium cost depending on length
- Can reduce comfortable driving speed
- Provide pedestrian refuge to make two stage crossing
- Can be constructed with permanent or temporary measures
- Preferable for collector streets
- Potential drainage impacts where median is not aligned with the existing roadway crown
- Consider access impacts
- Consider snow removal and emergency services impacts



PAINTED CROSSWALKS

- Alerts drivers of the potential for pedestrian activity
- Low cost implementation
- Can support speed limit of 30km/h
- Should be paired with advanced warning signs and pavement markings
- No impacts to drainage, transit and emergency services



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Reference: McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results

TRAFFIC CALMING OPTIONS

Using the information noted previously, Stantec has prepared a conceptual plan for the McIntyre Drive corridor along with a staging strategy for implementation. **Drawing 1** illustrates the plan view for the medium-term/temporary to long-term/permanent plan; **Drawing 2** illustrates the plan view for the short-term/immediate plan for the entire corridor to build towards the future stages illustrated in Drawing 1. **Drawing 3** illustrates cross-sections of different areas within the corridor with dimensions to illustrate the ground level view. **Drawing 4** illustrates a sample roadway between two intersections.

Overall Plan

The overall plan is shown for two conditions:

Medium-Term/Temporary to Long-Term/Permanent Plan (Drawing 1)

This plan consists of the long-term vision for the corridor with more permanent physical measures in place for the long-term. The temporary phase may involve the placement of precast concrete elements rather than cast-in place infrastructure.

Along the corridor, a sidewalk is proposed along the west side of the roadway, as illustrated in both Drawing 1 and Drawing 3. The existing rolled curb and a landscaped boulevard is proposed to differentiate the separated walk from the travel/parking lane. The sidewalk on the west side of the roadway will terminate at the McCaulay Road intersection. Future development to the east may support extending this sidewalk further.

In the areas where the travel lanes are narrowed, a minimum 3.5m travel lane in each direction is maintained where there is no dividing median. It is assumed that transit vehicles traveling south will stop in the travel lane to load / unload passengers with the curb extensions provided at the existing bus stop locations. The travel lanes will widen to 4.5m where there is a dividing median present between Hamilton Boulevard and north of McCandless Crescent (S); and between Hamilton Boulevard and west of Boyd Crescent. Wider travel lanes are required where a single travel lane is between two curb lines to assist with turns at intersections and to support larger vehicles including maintenance and emergency services which may have issues with narrow lanes between curb lines.

In the longer term, a two-way cycle track facility is proposed along the corridor on the east side of the roadway. This will further reduce the travel lane width of the roadway, leading to reduced vehicle speeds. With concerns raised by the City's Maintenance department on a barrier separation between the cycle track and the travel lane, a painted 0.6m buffer can be provided in lieu of the physical separation. Once the cycle track is implemented, 3m long dividing islands are provided at the intersections within the buffer space. In order to maintain cyclist connectivity to the multi-use pathways on Hamilton Boulevard, the cycle track transitions to an off-street Type 1 Trail (multi-use) between Hamilton Boulevard and north of McCandless Crescent (S); and between Hamilton Boulevard and west of Boyd Crescent.

Reference: McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results

Short-Term/Immediate Plan (Drawing 2)

This plan aims to set the intent of the temporary to long-term plan but allows the application of traffic calming measures immediately for a lower cost in 2020. The measures may be less effective than the temporary to long-term plan with physical infrastructure applications but allows for the implementation of the traffic calming strategy sooner. The short-term plan consists primarily of minimal revisions or additions to existing infrastructure and involves elements such as signage and pavement marking additions.

At both entrances to the corridor, a painted median is proposed to distinguish this portion of the roadway from the travel lane portion and to reduce the perceived travel lane width. The professionally painted median would include a mountable rubberized curb or barrier to hold supporting traffic signage. During winter months, this painted median area can be used for roadway snow storage to more clearly define a median space.

At the existing raised crosswalk, it is recommended that pedestrian crossing signage and speed hump signage including advance warning signage be provided on both approaches to enhance visibility of the crosswalk to traffic along the corridor.

An important design element of the cycle track are the concrete temporary curbs to provide physical separation for cyclists. As the capital expenditures for the concrete temporary curbs are not part of the 2020 budget, it is recommended that a capital budget request should be considered for 2021 prior to the submission for the entire project. As a temporary measure, the physical width of the roadway could be narrowed during the winter months by using the space for snow storage and the summer months with pavement markings. Once funding becomes available in 2021, the temporary to long-term plan may be considered.

The following is a description of the temporary to long-term plan as shown in Drawing 1 and Drawing 3. The intent for the 2020 short-term plan in Drawing 2 is similar but with signage and pavement markings applied only without other new infrastructure.

McIntyre Drive from Hamilton Boulevard to north of McCandless Crescent (S); and McIntyre Drive from Hamilton Boulevard to west of Boyd Crescent:

Beginning at the south of the corridor, from the Hamilton Boulevard roundabout, a raised median is proposed as an extension of the roundabout's splitter island. The island will extend to the McCandless Crescent / Hanna Crescent south intersection, with a short section on the next block north to orient travel lanes and minimize travel lane offsets. Opportunities to create a pedestrian refuge with these islands can further be evaluated at detailed design.

South of the McCandless Crescent (N) intersection, curb extensions are proposed to further narrow the pavement width and develop the on-street cycle track.

See Cross Section A for further details of how the pavement width is proposed to be managed.

Reference: McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results

McIntyre Drive from north of McCandless Crescent (S) to west of Boyd Crescent:

Through this section of the corridor, on-street parking has also been added to the cross-section (see Cross-Section B), and cyclists will be transitioning between the off-street Type 1 Trail (multi-use) to an on-street two-way cycle track. Curb extensions are proposed to further narrow the travel lanes, introduce/end the two-way cycle track within existing roadway pavement and support shorter pedestrian crossings. Painted crosswalks are also introduced as illustrated in the plan.

STAGING STRATEGY

The implementation strategy is expected to consist of temporary measures first, to allow residents and users to become accustomed to the plan and as the City's budget allows for full implementation of the overall strategy. The introduction of the measures with temporary infrastructure first may also provide a pilot-program for transit, maintenance staff and emergency services to become accustomed to the new measures and provide feedback prior to full implementation. Over time, these measures will be replaced with permanent infrastructure, and other elements to the overall plan will be added. Staging of the plan may consist of:

1. Short-Term/Immediate: Providing soft measures that may be implemented immediately in 2020 with lower costs (such as signage and pavement markings) prior to implementing temporary infrastructure such as precast concrete elements. In addition to the short-term/immediate elements described previously, the following may be considered:
 - An additional measure discussed is a widened painted yellow centre line. A widened centre line can have the effect of further reducing travel lanes along the corridor and may be contingent on available funding and the City's painting schedule. However, a widened centre line would be a deviation from the standard paint line width guidelines set out in the Transportation Association of Canada *Manual for Uniform Traffic Control Devices for Canada (MUTCDC)* which identifies typical pavement marking dimensions. In lieu of deviating from the MUTCDC, measures such as application of medians and/or painted lines where the future cycle track is located are recommended as they would accomplish the same objectives of a narrowed travel lane.
 - Further temporary measures for reducing lane widths could include shifting curb lines where possible along the corridor. Limitations to this option may include the condition of the existing curb lines and the turning radii required at intersections.
2. Medium-Term /Temporary: Providing physical temporary infrastructure (such as precast concrete barriers at intersections and precast concrete traffic calming blocks) prior to implementing hard surface treatments such as cast-in place concrete median islands or curbs. These temporary traffic calming devices can be implemented for:
 - Curb extensions can be provided as shown in the figure on page 5 with precast concrete traffic calming blocks.

Reference: **McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results**

- The two-way cycle track can be delineated with precast concrete barriers at the intersections in the interim until more permanent measures may be implemented.
 - Median islands can also be brought in as a temporary or interim measure with precast concrete barriers or traffic calming blocks depending on the desired width of the median.
2. Long-Term/Permanent: Providing permanent hard surfaced infrastructure. This stage of the implementation will involve higher cost and more permanent infrastructure for completing the traffic calming plan. Detailed engineering review will also be required prior to the implementation of the permanent measures to ensure that drainage is not negatively impacted. The permanent hard surface devices include the use of:
- Cast-in place concrete median islands/curbs.
 - Developing the curb extensions with curb and gutter along with supporting landscaped areas.
 - Installation of new sidewalk separated from the roadway by a boulevard.

The Medium-Term/Temporary and Long-Term/Permanent implementation identified above can further be divided through an introduction by geographical area, such as focusing first on the area between Murphy Road (S) and Murphy Road (N), in lieu of temporary measures for the entire corridor. A more refined plan can be developed following further discussions with the City to also ensure that pedestrian and cyclist connectivity is not negatively impacted with a staged geographical implementation.

Therefore, in the Medium-Term/Temporary, temporary measures could be introduced along the entire corridor or only between Murphy Road and Murphy Road.

In the Medium-Term/Temporary, the temporary measures between Murphy Road and Murphy Road could be converted to be permanent infrastructure. Temporary measures could remain between Hamilton Boulevard (S) and Murphy Road (S) and between Hamilton Boulevard (N) and Murphy Road (N) or introduced if not provided during the Short-Term.

In the Long-Term, all temporary measures along the entire corridor could be converted to permanent infrastructure.

COST ESTIMATES

Class D cost estimates have been prepared for the proposed traffic calming plan, and are provided as an attachment. It should be noted that any probable cost cannot consist of all contractor mobilization & demobilization and front-end costs, overhead and profit, as well as detailed schedule of values, which would require the review of drawings, specifications, and material schedules. Stantec does not guarantee the accuracy of these costs and shall incur no liability where actual construction costs are exceeded.

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Reference: **McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results**

In preparation of costing we have assumed:

- Contractor unit rates for projects being completed within the City of Whitehorse in 2020
- All work is done under a single contract.
- The project is tendered publicly with a minimum of three bidder
- Summer/fall construction

FUTURE CONSIDERATIONS

Vertical separation of the bicycle facility is a possible long-term option but would require rebuilding the roadway and would narrow the curb-to-curb width of the roadway permanently. As part of this, the on-street two-way cycle track could be converted in the future but is not currently illustrated in this design.

The extension of the sidewalk on the north side of McIntyre Drive could be staged to occur as the neighbourhood is built out.

The existing transit stop on Hamilton Boulevard could be moved south of the roundabout or the pedestrian access in this area could be improved via a new Type I Trail from the roundabout to the current transit stop location. Further discussions with the City are required to determine the benefits of either option.

If speed issues continue to persist following implementation of the proposed mitigation strategy that cannot be addressed through enforcement and education, modifications should be considered to additional intersections along the corridor. These modifications may include reducing turning radii, installing curb extensions and consideration for mini-roundabouts.

Consideration should be given to curb extensions on the parking-lane side at intersections to bring pedestrians out to the edge of the parking lane, further improving their visibility to vehicles traveling along the roadways.

Consideration should also be given to pavement treatments such as green-painted cross-rides in high conflict locations to further improve visibility to pedestrians and cyclists.

PRELIMINARY SUMMARY AND RECOMMENDATIONS

Stantec has identified a range of traffic calming interventions for McIntyre Drive which aim to address the key issues identified through site investigation, data review, and stakeholder discussions. These traffic calming interventions can be developed in a staged approach with temporary infrastructure such as precast concrete elements implemented prior to the introduction of hard surfaced cast-in place elements. There is also a potential to implement the plan based on geographical area, focusing first on the core area between Murphy Road and Murphy Road, which can be discussed further upon review of this memo.

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INSTALLATION OF TEMPORARY MEASURES

As noted previously, temporary traffic calming measures have been installed along the McIntyre Drive corridor as a precursor to future stages of the traffic calming plan. These temporary measures consist of painted medians on McIntyre Drive at the corridor's entry / exit points and advance warning signage associated with the existing crosswalk located approximately midpoint on the corridor. These measures were installed in June 2020.

SPEED DATA COMPARISONS

Pre-installation speed data was collected at Location #1 on October 9, 2018. At Location #1, the 85th Percentile Speed was documented at 60 km/hr, averaging 6 days of data collection. An average speed of approximately 51 km/hr was recorded, as well as a maximum speed of 107 km/hr. Following installation of the temporary measures, speed data was once again collected over a 6-day period beginning on July 20, 2020. Measurements indicate a slight drop in the 85th Percentile Speed to 58 km/hr (3% reduction), as well as the average speed, recorded at approximately 50 km/hr (2% reduction). A maximum speed of 97 km/hr (9% reduction) was documented.

Pre-installation speed data was collected at Location #2 more recently on May 12, 2020. At Location #2, the 85th Percentile Speed was documented at 41 km/hr, averaging 4 days of data collection. An average speed of 33 km/hr was recorded, as well as a maximum speed of 62 km/hr. Following installation of the temporary measures, speed data was once again collected over a 6-day period beginning on July 14, 2020. Measurements indicate no change to the 85th Percentile Speed, recorded at 41 km/hr nor to the average speed, recorded at approximately 33 km/hr. A maximum speed of 65 km/hr (5% increase) was documented.

VOLUME DATA COMPARISONS

Traffic volumes were also collected at Location #1 at the same time period as the speed data. Prior to the implementation of measures, over a 6-day period, a total of 5,674 vehicles were observed, for an average daily volume of 946 vehicles. Following installation of the temporary measures, 2,909 vehicles were observed over a 6-day period, for an average daily volume of 485 vehicles. This change in average daily traffic volumes represents approximately a 49% decline.

Similarly, traffic volumes were collected at Location #2 most recently on May 12, 2020 over a 4-day period. Prior to the implementation of measures, a total of 1,711 vehicles were observed, for an average daily volume of 428 vehicles. Following installation of the temporary measures, a total of 2,447 vehicles were observed over a 6-day period, for an average daily volume of 408 vehicles. This change in average daily traffic volumes represents approximately a 5% decline.

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Reference: **McIntyre Drive Traffic Calming: Traffic Calming Concepts and Post Temporary Measures Installation Results**

POST TEMPORARY MEASURE INSTALLATION FINDINGS

A review of the pre- and post-temporary measures installation indicates minimal impacts to speeds along the corridor. However, the temporary measures were only focused on the two end points of the corridor, using paint only (no physical barriers or construction). It is unclear how effective the education campaign has been to-date, however the limited changes in speeds along the corridor suggests the education campaign should continue.

A review of the volumes along the corridor does indicate a significant decline in volumes at Location #1, with a more modest reduction at Location #2. However it should be noted that the pre-installation volumes at Location #1 were documented in 2019, while Location #2 was documented in 2020. It is unclear if traffic volumes along the corridor have been impacted as a result of the COVID-19 pandemic. In addition, it should be noted that as roadway volumes decrease, speeds can inversely increase. As drivers perceive fewer vehicles on a roadway and fewer conflicts, a driver's comfort level traveling at a higher speed can increase.

POST TEMPORARY MEASURES INSTALLATION RECOMMENDATIONS AND NEXT STEPS

It was acknowledged during the development of the McIntyre Drive Traffic Calming Plan that full implementation of the strategy will be necessary to achieve the speed and volume reductions envisioned for the corridor. The temporary measures implemented along the corridor can provide an early indication to drivers that further changes will be coming to the corridor, improving drivers' expectations during future phases. It is recommended that the education campaign continue within the community to convey expectations that drivers adhere to the posted speed limits along McIntyre Drive. It is also recommended that the next steps within the Traffic Calming Plan be implemented when funding becomes available, with new speed and volume data collected both prior to and following installation / construction.

STANTEC CONSULTING LTD



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Associate, Transportation

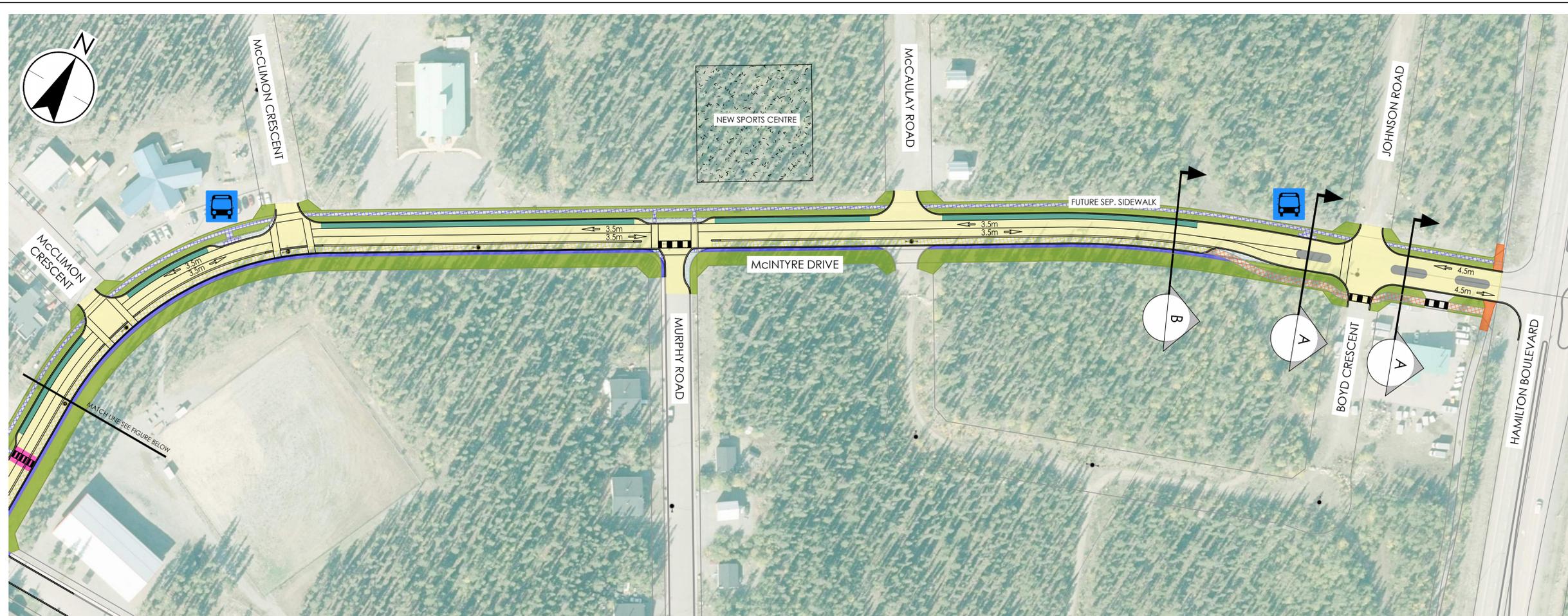
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Attachment: Drawing 1, Drawing 2 Drawing 3 and Drawing 4
 Class D Cost Estimates
 Education Materials
 Pre- and Post-Installation Speed and Volume Map

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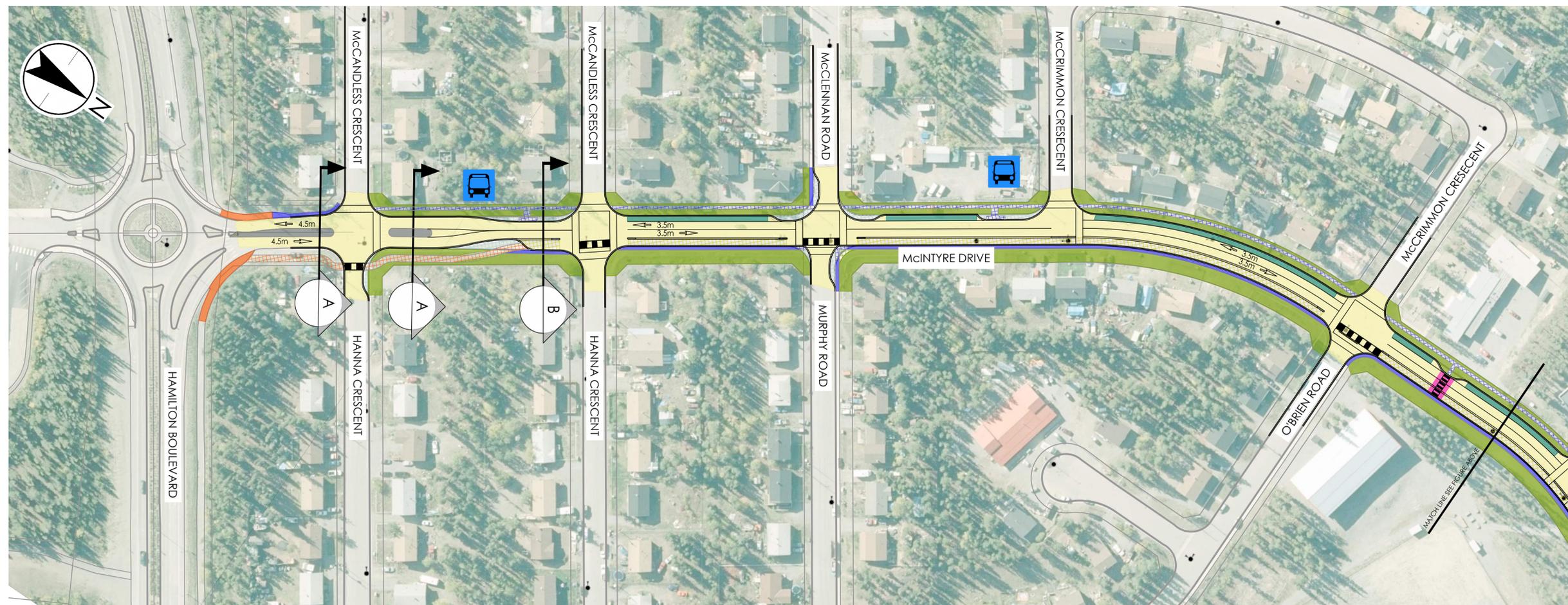


Legend

EXISTING	PROPOSED	
		ROADWAY
		CONCRETE MEDIAN
		SIDEWALK
		TYPE 1 TRAIL
		CYCLE TRACKS
		PARKING LANE
		CURB EXTENSION
		EXISTING RABED CROSSWALK
		LANDSCAPING
		BUS STOP

Notes

- MEDIUM-TERM/TEMPORARY ASSUMES FUNDING AVAILABILITY IN 2021.



Revision _____ By _____ Appd. _____ YY.MM.DD

Issued _____ By _____ Appd. _____ YY.MM.DD

File Name: _____ Dwn. _____ Chkd. _____ Dsgn. _____ YY.MM.DD

Permit-Seal _____

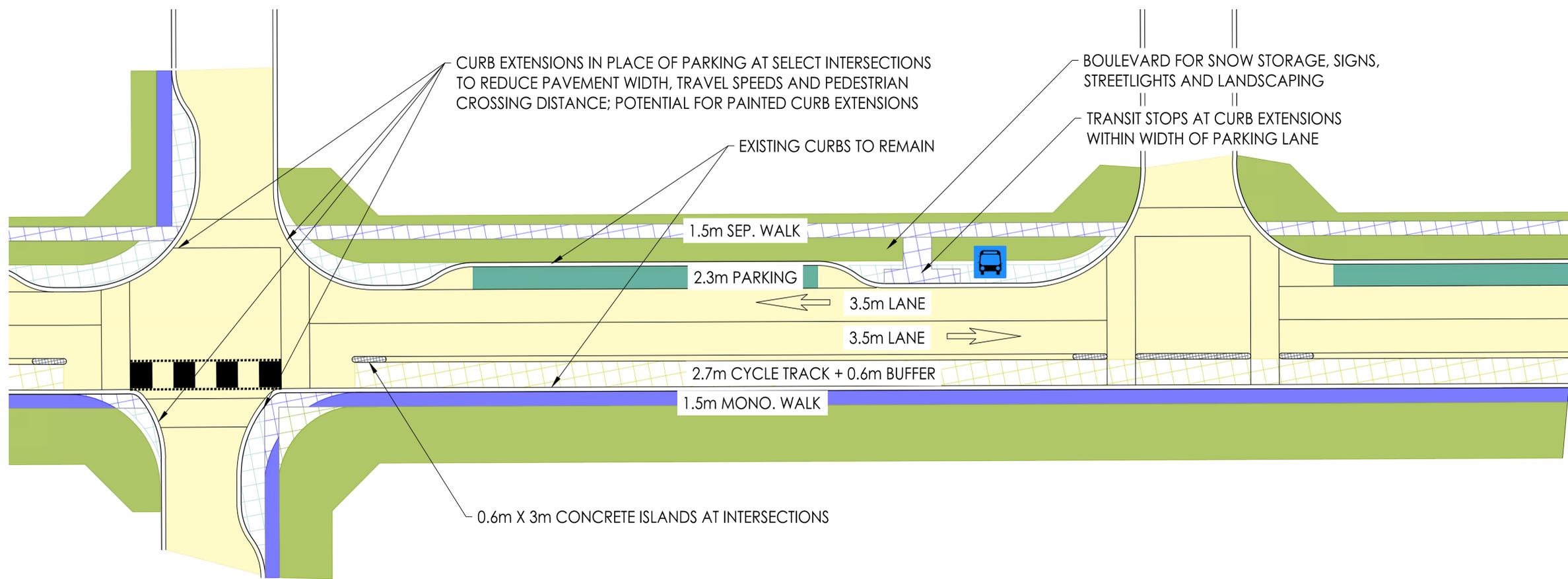
Client/Project
CITY OF WHITEHORSE

MCINTYRE DRIVE TRAFFIC CALMING

Title
PLAN
MEDIUM-TERM/TEMPORARY TO
LONG-TERM/PERMANENT

Project No. 113950026 Scale

Drawing No. _____ Sheet _____ Revision _____



Legend

EXISTING	PROPOSED	
[Pattern]	[Pattern]	ROADWAY
[Pattern]	[Pattern]	CONCRETE MEDIAN
[Pattern]	[Pattern]	SIDEWALK
[Pattern]	[Pattern]	TYPE 1 TRAIL
[Pattern]	[Pattern]	CYCLE TRACKS
[Pattern]	[Pattern]	PARKING LANE
[Pattern]	[Pattern]	CURB EXTENSION
[Pattern]	[Pattern]	LANDSCAPING
[Pattern]	[Pattern]	BUS STOP

Notes

NOTES:

- ROADWAY CROWN TO BE ADJUSTED DURING RESURFACING
- LOCATION AND RADII OF CURB EXTENSIONS AND MEDIANS TO BE CONFIRMED DURING DETAILED DESIGN ALONG WITH OPPORTUNITIES TO PROVIDE PEDESTRIAN REFUGE AT MEDIANS

Revision By Appd. YY.MM.DD

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File Name: Dwn. Chkd. Dsgn. YY.MM.DD

Permit-Seal

 Client/Project
 CITY OF WHITEHORSE

MCINTYRE DRIVE TRAFFIC CALMING

 Title
 DETAIL
 TYPICAL BLOCK LAYOUT

 Project No.
 113950026

 Scale


Drawing No. Sheet Revision

4

1 of 3

0

McIntyre Drive Traffic Long Term Solution - Class D Cost Estimate

Item	Description	Quantity	Units	Unit Price	Extension
1	General Requirements				
.1	Mobilization and Demobilization	1	LS	\$ 20,000.00	\$ 20,000
.2	Traffic Control	1	LS	\$ 25,000.00	\$ 25,000
.3	Utility Coordination	1	LS	\$ 15,000.00	\$ 15,000
.4	Survey & Layout	1	LS	\$ 75,000.00	\$ 75,000
				Subtotal	\$ 135,000
2	Roadway				
.1	Cutting & removal of asphaltic concrete	15,500	sq.m.	\$ 10.00	\$ 155,000
.2	Cutting & removal of concrete curb and gutter	500	sq.m.	\$ 10.00	\$ 5,000
.3	Subgrade Preparation	15,500	sq.m.	\$ 5.00	\$ 77,500
.4	20mm crush granular base course (150mm depth)	15,500	sq.m.	\$ 15.00	\$ 232,500
.5	Concrete curb & gutter - barrier curb	1,500	l.m.	\$ 110.00	\$ 165,000
.6	Warm mix asphaltic concrete (75mm depth)	15,500	sq.m.	\$ 45.00	\$ 697,500
.7	Line Painting	1,000	l.m.	\$ 20.00	\$ 20,000
.8	Permanent Pavement Markings Crosswalks	28	LS	\$ 500.00	\$ 14,000
				Subtotal	\$ 1,366,500
3	Concrete Meridian				
.1	Cutting & removal of asphaltic concrete	500	sq.m.	\$ 10.00	\$ 5,000
.2	Subgrade Preparation	500	sq.m.	\$ 4.00	\$ 2,000
.3	20mm crush granular base course (150mm depth)	500	sq.m.	\$ 15.00	\$ 7,500
.4	Concrete curb & gutter - barrier curb	300	l.m.	\$ 110.00	\$ 33,000
.5	Concrete Meridian	500	sq.m.	\$ 125.00	\$ 62,500
				Subtotal	\$ 110,000
4	Sidewalk				
.1	Subgrade Preparation	1,500	sq.m.	\$ 5.00	\$ 7,500
.2	20mm crush granular base course (150mm depth)	1,500	sq.m.	\$ 15.00	\$ 22,500
.3	Concrete sidewalk	1,500	sq.m.	\$ 125.00	\$ 187,500
				Subtotal	\$ 217,500
5	Type 1 Trail				
.1	20mm crush granular base course (150mm depth)	700	sq.m.	\$ 15.00	\$ 10,500
.2	Warm mix asphaltic concrete (75mm depth)	700	sq.m.	\$ 45.00	\$ 31,500
.3	Subgrate Preparation	700	sq.m.	\$ 5.00	\$ 3,500
				Subtotal	\$ 45,500
6	Cycling Tracks				
.1	Concrete Island	1,500	l.m.	\$ 110.00	\$ 165,000
				Subtotal	\$ 165,000
7	Parking Lane				
.1	Line Painting	500	l.m.	\$ 20.00	\$ 10,000
				Subtotal	\$ 10,000
8	Curb Extension				
.1	20mm crush granular base course (150mm depth)	500	sq.m.	\$ 15.00	\$ 7,500
.2	Concrete curb & gutter - barrier curb	500	l.m.	\$ 110.00	\$ 55,000
.3	20mm crush granular base course (150mm depth)	500	sq.m.	\$ 15.00	\$ 7,500
.4	Subgrade preparation	500	sq.m.	\$ 5.00	\$ 2,500
.5	Concrete sidewalk	500	sq.m.	\$ 125.00	\$ 62,500
				Subtotal	\$ 135,000
9	Landscaping				
.1	Topsoil & hydroseed	50	sq.m.	\$ 5.00	\$ 250
.2	Signage (Cycle Traci, Type 1 Trail, Parking, Crosswalks)		each	\$ 400.00	\$ -
				Subtotal	\$ 250
Summary of Costs					
Total of Subtotal cost					\$ 2,184,750
Design & Construction Contingency (40%)					\$ 873,900
Engineering (10%)					\$ 218,475
Total					\$ 3,277,125

June 2020 Road Safety Improvements



NEW PAINTED MEDIAN

Painted median to reduce width of driving lanes and slow down traffic.

CROSS WALK SIGNS



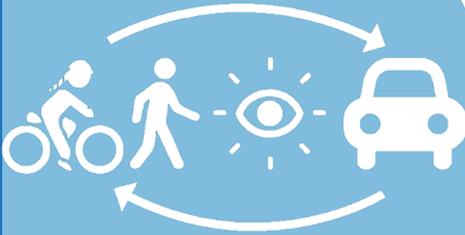
Watch and yield to pedestrians and cyclists.



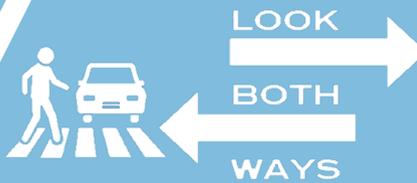
Safety starts with **YOU**.
Never exceed the posted **speed limit**.

WHAT CAN YOU DO?

LOOK
Out for each other



Wear your helmet
Ride in the same direction as the traffic
Wear bright clothing



Only cross the street when vehicles have stopped for you

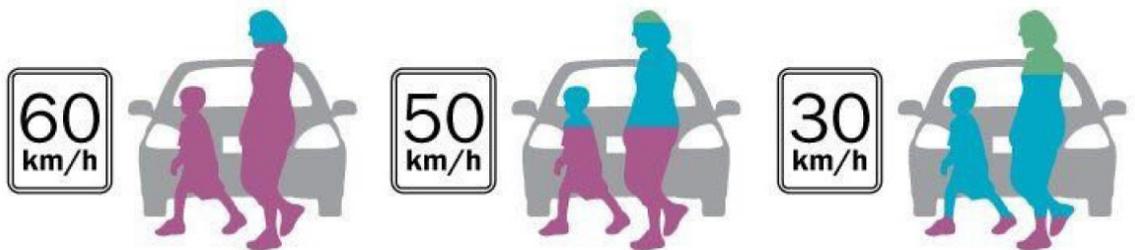
Roadway Safety is a Shared Responsibility

Project Contact
Sabine Schweiger
(867)-668-8652

Do not Speed – it's not worth the risk

Our children are the most vulnerable.

Even when you are driving at 30 km/hr, there is still a 10% chance of death, and children will most certainly be injured

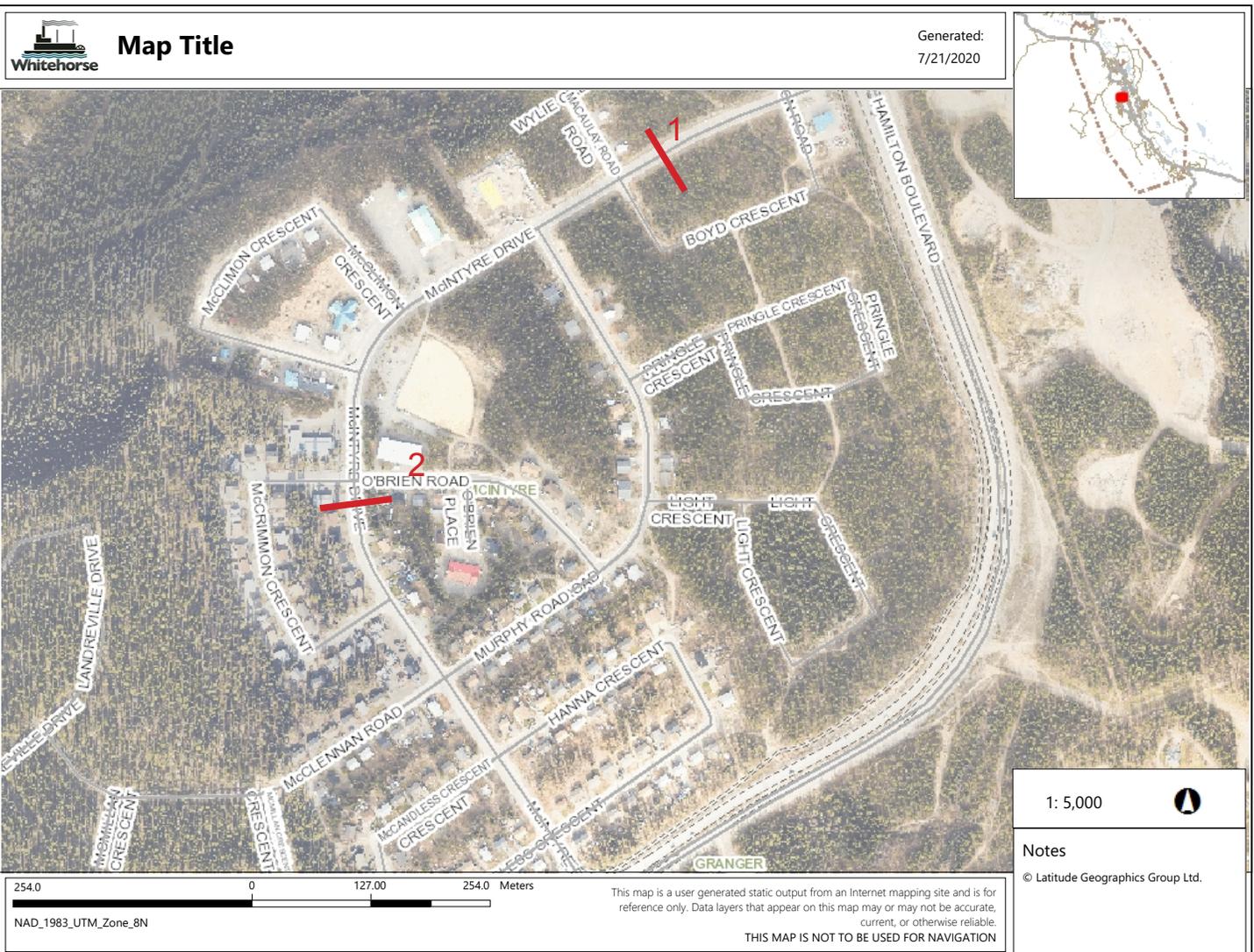


● Death

● Injured

● Uninjured

McIntyre Drive Speed Data by Location



Location	Date	Pre/Post	Speed in km/hr			# days of count	total vehicle-count
			85th percent-ile	Average	Max (time)		
1	2018-10-09	Pre	60	50.8	107 (02:11)	6	5674
1	2020-07-20	Post	58	49.74	97 (23:21)	6	2909
2	2019-06-17	Pre	34.6	27.1	51.3 (?)	4	963 (must be average)
2	2019-10-09	Pre	61.9	52	106.9	1	1406
2	2020-05-12	Pre	41	33.18	62 (22:29)	4	1711
2	2020-07-14	Post	41	33.2	65 (08:13)	6	2447

Speed Data collected by City of Whitehorse Engineering - Post refers to post-treatment traffic calming measurements (central medians painted at both entrances to the neighbourhood, and education distributed to residents via Community newsletter)

Posted speed limit is 30 km/h