

## **CROWCHILD TRAIL STUDY – FINAL REPORT**

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### **EXECUTIVE SUMMARY**

This report details the outcomes of the six-phase study process to arrive at final recommendations of the Crowchild Trail Study for short-, medium-, and long-term changes and upgrades to Crowchild Trail, from 17 Avenue S.W. to 24 Avenue N.W., inclusive.

In 2014 July, Council approved a new Transportation Corridor Study Policy that established guiding principles and best practices that outlined how The City would undertake transportation corridor studies. A six-phase study process was developed for the Crowchild Trail Study that provided multiple opportunities for engagement throughout the entire study, tying engagement to the entire planning and design process. One of the most significant achievements of the study was the trust and environment created to foster constructive collaboration between the project team and stakeholders. Over the course of the study, the project team worked to earn Calgarians' trust. The study process demonstrated The City's openness and transparency in the decision making process, and provided report-back mechanisms and structures for Calgarians.

The final recommendations represent a culmination of the intensive and collaborative study process. The recommendations for changes and upgrades to Crowchild Trail are a well-balanced plan that meets key Transportation Corridor Study Policy objectives to maintain and enhance bordering communities, as well as improve travel along the corridor and improve mobility across the corridor. The recommendations represent a balance of many ideas, perspectives, thoughts, and concerns gathered throughout the study, addressing current issues and challenges and accommodating the continued growth of Calgary.

The short-term recommendations are expected to address the immediate needs of Crowchild Trail, and achieve a key stakeholder sentiment to "fix the bridge." The plan is expected to relieve several bottlenecks resulting from weaving, added and dropped lanes, and lack of continuous lanes from as far as Glenmore Trail S.W. to 16 Avenue N.W. Modest improvements to the pedestrian and active modes routes connecting to the Bow River pathway system, and improvements to transit bus stops along Crowchild Trail are also achieved through implementation of the short-term recommendations, as presented in report TT2016-0599.

The medium- and long-term recommendations are expected to accommodate for the continued growth and development of Calgary over the coming years and decades. The plans achieved a key goal of removing signals from Crowchild Trail and improving flow of people, goods, and services along the length of the corridor. The plan also improves mobility along and across the corridor for people who walk, bike, and take transit by creating a parallel route along Crowchild Trail for active modes for local and regional access. The plan adds or upgrades of crossings over Crowchild Trail to connect communities and provide improved access to several destinations, including recommendations for several enhanced land-bridge type crossings, and improves accessibility to transit bus service along and across Crowchild Trail.

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### ADMINISTRATION RECOMMENDATIONS

That the SPC of Transportation and Transit recommends that Council:

1. Approve the Crowchild Trail Study, including the short-, medium-, and long-term plans for Crowchild Trail, from 17 Avenue S.W. to 24 Avenue N.W., inclusive;
2. Direct Administration to acquire, on an opportunity basis, property required to accommodate the medium- and long-term plans for Crowchild Trail;
3. Direct Administration to bring updates to affected Area Redevelopment Plans (ARPs) to align with the Crowchild Trail Study; and
4. Direct Administration to document lessons learned from the Crowchild Trail Study, and develop an education strategy to sustain stakeholder awareness and knowledge of project decisions.

### RECOMMENDATION OF THE SPC ON TRANSPORTATION AND TRANSIT, DATED 2017 APRIL 19:

That Council:

1. Approve the Crowchild Trail Study, including the short-, medium-, and long-term plans for Crowchild Trail, from 17 Avenue SW to 24 Avenue NW, inclusive;
2. Direct Administration to acquire, on an opportunity basis, property required to accommodate the medium- and long-term plans for Crowchild Trail;
- 3. Direct Administration to acquire and redesignate, on an opportunity basis, adjacent property to replace lands which will be lost by the St. Pius X Parish as identified in the medium-term plans for Crowchild Trail.**
4. Direct Administration to bring updates to affected Area Redevelopment Plans (ARPs) to align with the Crowchild Trail Study; and
5. Direct Administration to document lessons learned from the Crowchild Trail Study, and develop an education strategy to sustain stakeholder awareness and knowledge of project decisions.

Excerpt from the Minutes of the Regular Meeting of the SPC on Transportation and Transit,  
Dated 2017 April 19:

AMENDMENT, Moved by Councillor Woolley, that the Administration Recommendations contained in Report TT2017-0329, be amended by adding a new Recommendation 3, as follows, and renumbering the remaining Recommendations accordingly:

“3. Direct Administration to acquire and redesignate, on an opportunity basis, adjacent property to replace lands which will be lost by the St. Pius X Parish as identified in the medium-term plans for Crowchild Trail.”

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Opposed: B. Pincott

CARRIED”

### **PREVIOUS COUNCIL DIRECTION / POLICY**

At the 2014 July 28 Regular Council meeting, Council adopted the Transportation Corridor Study Policy as presented in report TT2014-0400. Council further directed Administration to restart the Crowchild Trail Study in Q3, 2014.

At the 2015 September 14 Combined meeting of Council, Council accepted Administration’s recommendation to report back to Committee with an update on the Crowchild Trail Study no later than 2016 January, as presented in report TT2015-0409.

At the 2016 February 8 Combined meeting of Council, Council approved Administration’s recommendations to accept the process outlined in Phase 3 and 4 of this study to **develop** and **refine** short-, medium-, and long-term options for Crowchild Trail, in accordance with the Council approved Transportation Corridor Study Policy. Council further accepted Administration’s recommendation to report back to Committee with an update on the Crowchild Trail Study no later than 2016 July, as presented in report TT2016-0012.

At the 2016 July 25 Regular Council meeting, Council approved Administration’s recommendations to accept the process outlined in Phase 5 and 6 of this study to **refine** and **confirm** short-, medium-, and long-term plans for Crowchild Trail. Administration also proposed a plan for short-term improvements to Crowchild Trail, including several optimization projects along the corridor. The short-term improvements and optimization projects were developed to leverage and align with the ongoing Bow River and Memorial Drive bridges rehabilitation and life cycle work underway. Council accepted Administration’s recommendations to advance planning and design of the short-term plan, and finalize the project for funding consideration, as presented in report TT2016-0599.

At the 2017 March 6 Strategic Council meeting, Council accepted Administration’s recommendations to advance the Crowchild Trail short-term plan, as presented in report C2017-0214 and directed Administration to return with implementation plans to the Priorities and Finance Committee or a Standing Policy Committee. The implementation plan will be presented to the SPC on Transportation and Transit 2017 April 19, report TT2017-0379.

### **BACKGROUND**

Crowchild Trail was identified as a skeletal road as early as the 1959 Calgary Metropolitan Area Transportation Study. Since that time, its role in Calgary’s transportation network as a key corridor has been confirmed through a number of transportation plans, including the 2009 Calgary Transportation Plan (CTP). Today, Crowchild Trail is one of the busiest corridors in Calgary, with more than 100,000 trips per day crossing the Bow River. It plays an important role in the movement of goods and services in a reliable and efficient way to key destinations, and serves as a vital link for the delivery of health and emergency services throughout Calgary and southern Alberta.

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Crowchild Trail is expected to accommodate Calgary's continued growth as the population expects to more than double over the next 30 to 60 years, by facilitating future redevelopment of the inner-city and established communities, supporting the development of vibrant activity and neighbourhood corridors through key planning initiatives such as the Main Streets program, as well as continued growth around the city and region.

The primary objective of this study was to develop short-, medium-, and long-term plans for Crowchild Trail, from 17 Avenue S.W. to 24 Avenue N.W., inclusive. The short-term plan is generally characterized as recommendations that can be implemented within a five year planning horizon, providing immediate benefit and improvements to the corridor. Medium-term plans are recommendations that should be implemented beyond a ten year planning horizon. Segments of the plan can be implemented in stages over the course of time, as funding becomes available. Long-term plans are recommendations that would be considered beyond a 30 year planning horizon, typically staged at a time where replacement or upgrades of existing infrastructure is required.

A six-phase study process was developed to deliver a recommended plan for changes and upgrades to Crowchild Trail, and is outlined in Figure 1, below:



Figure 1: Crowchild Trail Study Phases

A Project Steering Committee was also formed to review and verify the recommendations forwarded by the Project Team. The Project Steering Committee is a committee of senior leaders in Transportation and Community Planning.

### THE CROWCHILD TRAIL STUDY PROCESS

A foundational element of the Crowchild Trail Study process was to tie engagement to the entire planning and design process, whereby discussion with Calgarians drove the course of the study. Phase 1 employed a collaborative process, whereby an engagement design team (EDT) of volunteers worked with the project team to develop the engagement process for the corridor study. Phases 2 through 6 employed an iterative engagement process, whereby stakeholders and the public were provided opportunities for both **gathering** ideas, and then **refining** those ideas into final **confirmed** output.

A comprehensive Engagement and Communications report detailing the engagement and communications strategies and implementation is included as **Attachment 1** of this report.

### OUTCOMES OF THE SIX PHASE STUDY PROCESS

#### Phase 1: Engagement Process Design

The outcome of **Phase 1** was an engagement and communications plan that provided Calgarians with multiple opportunities to participate throughout the entire study. The plan maximized outreach and awareness of the study, and confirmed report-back processes and

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methodology. Planning of each subsequent phase of the study by the project team looped back to the recommendations developed in Phase 1 to ensure that engagement tools, tactics, and outreach plans were selected to best achieve the phase outcomes. A summary of Phase 1 is included in **Attachment 2** of this report.

### Phase 2: Confirm Project Goals

**Phase 2** established the project goals of the Crowchild Trail Study. The project goals, included in **Attachment 2** of this report, are based on three key principles of the 2014 Transportation Corridor Study Policy, as follows:

1. Maintain and enhance bordering communities;
2. Improve travel along the corridor; and
3. Improve mobility across the corridor.

The project goals were developed with Calgarians through multiple rounds of stakeholder and citizen engagement, **gathering** ideas and **refining** those ideas into 11 Project Goals. Two project goals were added by the project team to align the outcomes of the study with applicable policy, standards, and guidelines. The project's key principles and goals were used to guide and evaluate ideas and concepts in Phases 3 and 4, and as criteria against which study recommendations were measured through Phases 5 and 6.

The project goals were **confirmed** by the project team, and endorsed by the Project Steering Committee 2015 9 October.

### Phase 3: Concept Identification

In **Phase 3**, the project team invited Calgarians to share their ideas and explore possible benefits, constraints, impacts, and trade-offs of those ideas. Over 500 unique ideas for possible changes and upgrades to Crowchild Trail were shared by Calgarians, ranging from short-term, "quick-fix" optimization and local improvement ideas, through to ideas that could support continued growth and development of the City for the years and decades to come.

The ideas **gathered** by the project team from Calgarians were consolidated into 25 idea sets, and were further themed into three general categories:

1. Ideas and concepts that will move directly to Phase 4: Concept Evaluation;
2. Ideas not moving forward for further consideration beyond Phase 3; and
3. 17 ideas for further review and evaluation in Phase 3.

Calgarians were asked to help the project team **refine** ideas that would move forward to Phase 4 of the study by evaluating how well the group of 17 ideas for further review and evaluation met the project's three key principles. Combined with the results of the project team's technical review a short-list of 12 well-rated ideas was **confirmed** to move forward to Phase 4 of the study. The benefits or intent of ideas not moving forward beyond Phase 3 were captured by the project team, and incorporated into the preliminary concepts developed in Phase 4, where possible.

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The short-list of ideas and concepts were prepared by the project team, and endorsed by the Project Steering Committee 2016 April 13. A summary of Phase 3 outcomes is included in **Attachment 2** of this report.

### Phase 4: Concept Evaluation

The project team engaged Calgarians to **gather** feedback and evaluate the preliminary concepts against the project goals developed in Phase 2. Seven preliminary concepts were developed by the project team, and shared with Calgarians throughout **Phase 4** of the study, as follows:

1. Bow River Crossing (Short-term planning horizon);
2. Optimization between 16 Avenue N.W. and 24 Avenue N.W. (Short-term planning horizon);
3. 17 Avenue S.W. Optimization (Short- to Medium-term planning horizon);
4. 16 Avenue N.W. and 24 Avenue N.W. Interchanges (Medium-term planning horizon);
5. Kensington Road N.W. Interchange (Medium-term planning horizon);
6. Central Tunnel (Medium-term planning horizon); and
7. Rebuild Crowchild Trail Bridges (Long-term planning horizon).

The seven preliminary concepts shared with Calgarians in Phase 4 are included as **Attachment 3** of this report.

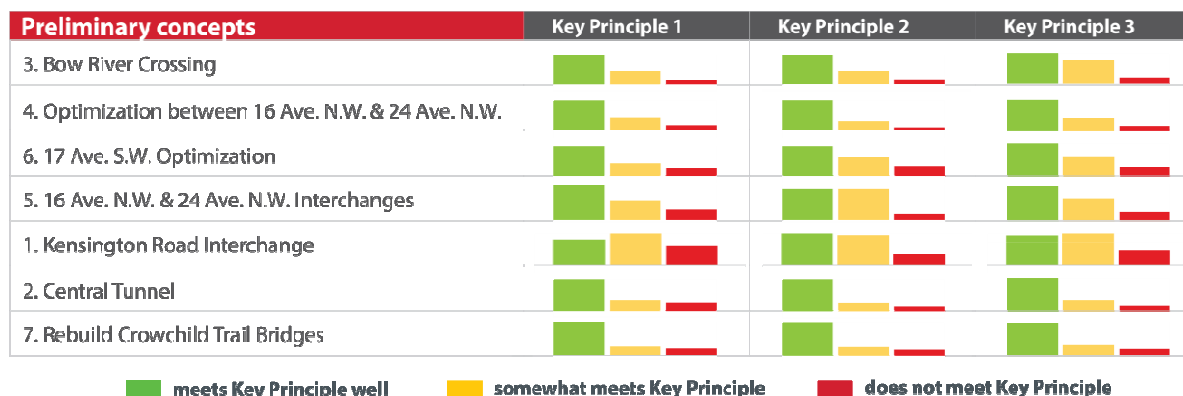
In developing the short-term concepts, the project team sought to align with the concurrent lifecycle and rehabilitation work on several bridges along Crowchild Trail that began March 2016. Lifecycle work is anticipated to add approximately 35 years of service life to the existing bridge structures. The project team worked in close consultation and coordination with Roads on the structural review, assessment, and design of the Bow River bridge, as well as the bridges at Memorial Drive and Bow Trail S.W.. Together, it was determined that the lifecycle and rehabilitation work could be aligned with possible outcomes of the Crowchild Trail Study.

The medium-term preliminary concepts identified possible impact to private properties along Crowchild Trail. Impact to private residential properties or businesses varied along the length of Crowchild Trail, from potential changes to property access, to impact of parcels that may not affect the physical structures or access to property, to impact of the entire property. Out of respect to the impacted residents and businesses, the project team engaged the affected property owners prior to release of the preliminary concept plans to the bordering communities and the general public. The project team met with many of the property owners one-on-one and in small group settings to explain how the preliminary concepts were developed, as well as to define the extent of the possible impacts shown in the concept plans.

The long-term preliminary concept plan identified upgrades to Crowchild Trail generally focused on the need to replace infrastructure upon it reaching its end of its lifecycle. No additional private property impacts were identified as an outcome of the long-term plan.

The results of the evaluation of the preliminary concepts completed by Calgarians are summarized in Figure 2, below:

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**Figure 2: Phase 4 preliminary concepts evaluation**

The results of participants’ evaluations for the short-term concepts indicated that the plan aligned well with the project’s key principles, reflected the feedback received from Calgarians, and would provide Calgarians immediate benefit and investment value for the coming years. The short-term plan is expected to improve traffic flow and operations along the corridor, provide some modest active modes and transit improvements to mobility and access along and across the corridor, and provide some improvements to bordering communities with some modest additions or improvements to noise attenuation walls and visual screening at select locations in the near term.

Evaluation of the medium-term preliminary concepts by Calgarians suggested that the plans aligned well or somewhat well with the key principles and project goals. The concepts improved travel along the corridor by:

- Removing signals and intersections along Crowchild Trail to create free-flow travel along the entire length of the corridor;
- Reduced bottleneck areas and removed many of the forced lane changes and weaving sections by providing three continuous lanes from Glenmore Trail S.W. through to Stoney Trail N.W.; and
- Adding and upgrading parallel local and regional pedestrian and active modes routes along and across the corridor.

The concepts improved mobility across the corridor with additions of new or upgraded crossings over Crowchild Trail at about 300 meter spacing, as well as changes and upgrades to Transit accessibility to bus stops along Crowchild Trail. The plans included buffer areas and green spaces along the corridor, and improved noise attenuation walls and features to enhance communities bordering Crowchild Trail.

The long-term concept met the key principles and study goals well, by creating opportunities for future extension of transit or high occupancy vehicle (HOV) lanes along Crowchild Trail, and allowing for improvements to pedestrian and active modes crossings of the Bow River.

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### Advancing the short-term plan

The project team brought forward recommendations to the Project Steering Committee to advance planning and design of the short-term plan ahead of concluding the study, and to bring forward funding options for Council's consideration as part of Action Plan, and as a candidate project with Infrastructure Calgary. The recommendations were endorsed by the Project Steering Committee 2016 July 12 and were subsequently approved by Council 2016 July 25 as detailed in report TT2016-0599.

### Phase 5: Concept Selection and Recommendation

In **Phase 5** of the study, the project team presented draft recommendations for short-, medium-, and long-term changes and upgrades to Crowchild Trail. Calgarians were invited to see how their input was used to develop the draft recommendations. Participants were asked to provide feedback on the strengths and weaknesses of the plans, and help the project team **refine** and **confirm** the plans to move forward to Phase 6: Reporting and Completion.

Recommendations for short-term and long-term plans for Crowchild Trail were consistent with the preliminary concepts developed in Phase 4. Medium-term plans for the north segment of Crowchild Trail, from 16 Avenue N.W. to 24 Avenue N.W., inclusive were also consistent with the Phase 4 concepts plans.

One area where the outcomes of Phase 4 yielded two distinct options was for the central segment of the study area between Memorial Drive N.W. and 16 Avenue N.W.:

1. **Kensington Interchange**, generally described as Crowchild Trail travelling at-grade from Memorial Drive N.W. to University Drive N.W., with an all-movement interchange connection at Kensington Road N.W., and partial access at 5 Avenue N.W. with movements limited to right-in right-out turns only; and
2. **Central Tunnel**, generally described as Crowchild Trail running about one level below existing grade, with a four-lane urban boulevard standard road on the surface of the tunnel extending from Kensington Road N.W., directly through to University Drive N.W. (no connection to Crowchild Trail). Access to Crowchild Trail was provided by an all-movement interchange at Kensington Road N.W., and at 16 Avenue N.W. only.

The evaluation of the Kensington Interchange and Central Tunnel medium-term concepts demonstrated common and unique benefits as well as impacts or trade-offs required to implement either concept. By way of example, the tunnel concept reduced noise impacts to bordering communities by lowering and covering Crowchild Trail, however access to Crowchild Trail for bordering communities was limited to 16 Avenue N.W. and Kensington Road N.W., and resulted in increased traffic cutting through bordering communities. In contrast, the Kensington Road Interchange concept was generally at existing grade and would require noise walls and other ancillary features to mitigate noise and visual impacts, whereas access to Crowchild Trail is provided at University Drive N.W. and 5 Avenue N.W., as well as 16 Avenue N.W. and Kensington Road N.W. and traffic cutting through bordering communities was reduced.



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Two additional technical evaluations were completed to help the project team arrive at a draft recommended plan for the central segment of Crowchild Trail.

Multiple Accounts Evaluation (MAE)

The project team completed a Multiple Accounts Evaluation (MAE) based on Alberta Transportation guidelines. Five accounts (categories) were used in the evaluation: Community sustainability; customer service; economy; environment; and finance. Each category aligned well with the project’s key principles and project goals, but also includes several additional technical and non-technical considerations.

The Kensington Road Interchange concepts and the Central Tunnel concept yielded similar ratings in a number of factors, summarized in Figure 3, below:

<b>Community Sustainability</b>	Green space and pathway enhancement Business impacts Opportunities for redevelopment	Both concepts affect existing businesses along Crowchild Tr. at 7 Ave. N.W. and 9 Ave. N.W.
<b>Customer Service</b>	Connections for people who walk and bike along Crowchild Tr. Connections for people who walk and bike across Crowchild Tr. Delivery of emergency response and health services Community access Access to major destinations (University, hospitals, etc.) Potential for accident frequency Consistency with City transportation plans	The interchange concept does not provide all-turns access at 9 Ave. N.W., while the tunnel has limited access north on Crowchild Tr.
<b>Economy</b>	Travel time to work	Average travel times along Crowchild Tr. are only about 2 seconds faster for the tunnel concept.
<b>Environment</b>	Impact to existing natural environment Impact to Historic Resources	Both concepts avoid impacts to the Bow River and shoreline areas.

**Figure 3: Kensington Interchange and Central Tunnel - Similarities**

In comparing the Kensington Interchange concepts and the Central Tunnel concept, the MAE helped identify several differences between the concepts for consideration.

The Kensington Interchange concept rated more favourably by several factors, shown in Figure 4, below:

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<b>Community Sustainability</b>	Adjacent property impacts	.....	The interchange concept impacts 25 properties while the tunnel impacts 56 properties.
	Construction impacts	.....	The tunnel concept removes community access north on Crowchild Tr., which diverts more traffic to local streets to reach northern destinations.
	Community traffic patterns	.....	
<b>Customer Service</b>	Flexibility to add capacity for all modes in the future	.....	The interchange concept does not pose additional accident risk, for example in the case of a fire or spill in the tunnel.
	Accident risk and severity	.....	
	Constructibility	.....	
<b>Economy</b>	Travel time reliability	.....	The interchange concept allows for localized detours on the ramps in the event of a major accident on Crowchild Tr. without routing traffic onto local streets.
	Environmental soil conditions and contamination	.....	While a depressed interchange still does pose some flood risk, it is less severe than in an enclosed tunnel.
<b>Environment</b>	Flood risk and rehabilitation	.....	
<b>Finance</b>	Capital construction costs	.....	The interchange concept can be constructed for about 4x less than of the cost of the tunnel.
	Operating and maintenance costs	.....	

**Figure 4: Kensington Interchange concept: Benefits**

The Central Tunnel concept rated more favourably by several factors, shown in Figure 5, below:

<b>Community Sustainability</b>	Noise impacts	.....	The tunnel concept would put approximately 80% of Crowchild Tr. traffic underground, reducing noise and visual impacts to bordering communities.
	Aesthetics	.....	
	Transit stop safety and accessibility	.....	
	Community cohesion	.....	
<b>Customer Service</b>	Transit service along Crowchild Tr.	.....	The tunnel concept reduces the size of the roadway adjacent to bordering communities.
	Transit service across Crowchild Tr.	.....	The tunnel concept can allow for transit service along and across an Urban Boulevard, above the Crowchild Tr. tunnel.
<b>Economy</b>	Value of newly accessible land	.....	The tunnel concept provides redevelopment opportunities along Crowchild Tr.
	Number of jobs from construction spending	.....	

**Figure 5: Central Tunnel concept: Benefits**

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### Expert Panel – Peer Review

To assist the project team in arriving at a recommended plan for the central segment of Crowchild Trail, the project team assembled an expert-panel, peer review group to review and offer input in forming a draft recommendation for the central section in light of the study's objectives and engagement process. The panel included two Transportation Planning and Design Engineers regarded as experts in their field in North America, two experts in the field of Urban Planning, and an expert in the field of public relations and communications. A list of the peer review participants as well as a summary of the review is included as **Attachment 4** of this report.

The panel's key recommendation was to combine the benefits of both concepts, and develop a hybrid concept. The hybrid idea, coined the "interchunnel" by the panel, lowered Crowchild Trail between Kensington Road N.W. to University Drive N.W., with an all-movement interchange connection at Kensington Road N.W., and a partial interchange connection at 5 Avenue N.W., providing access to Crowchild Trail to and from the north. Lowering Crowchild Trail extracted the benefit of noise attenuation that the Central Tunnel concepts provided, and allowed for an additional connection at 5 Avenue N.W.

The draft recommendations for changes and upgrades to Crowchild Trail were endorsed by the Project Steering Committee 2016 September 30.

### Phase 6: Reporting and Completion

The Crowchild Trail Study concluded with the presentation of the final **confirmed** recommendations for short-, medium-, and long-term changes and upgrades to Crowchild Trail throughout November and December 2016. As part of **Phase 6**, Calgarians were asked to evaluate the engagement process, and to provide feedback on whether it was clear how public input was used to develop the study recommendations, to share positive outcomes, and to share thoughts or concerns not addressed by the study. The input received will be used to improve future studies undertaken by Administration.

The final recommendations for changes and upgrades to Crowchild Trail were endorsed by the Project Steering Committee 2016 December 14.

### **Study Recommendations**

The final recommendations for changes and upgrades to Crowchild Trail represent a culmination of work completed with Calgarians over two years of the study. The recommendations represent a balance of many ideas, perspectives, thoughts, and concerns gathered throughout the study process, addressing current issues and challenges and accommodating the continued growth of Calgary. The final recommendations align with the study's key principles and project goals, balancing technical needs and requirements with competing priorities.

### **Short-term plan: Five year planning horizon**

A key theme repeated throughout the course of the study was "fix the bridge." The Bow River crossing is contributing to several functional and operational challenges, with a significant bottlenecks resulting from weaving, added and dropped lanes, and lack of continuous lanes

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from as far as Glenmore Trail S.W. to 16 Avenue N.W. By leveraging resources across Administration, the short-term plan was developed to improve operations and function of Crowchild Trail at this key location. Modest improvements to the pedestrian and active modes routes connecting to the Bow River pathway system, and improvements to transit bus stops along Crowchild Trail can be achieved through implementation of the short-term recommendations.

Council approved Administration's recommendations for the Crowchild Trail Study's short-term plan 2016 July 25, detailed in report TT2016-0599 and is included as **Attachment 5** of this report. The short-term plan is described as follows:

### Improve travel along the corridor:

- Widen and complete life cycle rehabilitation for the northbound Crowchild Trail bridge over Bow Trail by one lane, for a total of three northbound lanes;
- Realign the westbound to northbound Bow Trail and 10 Avenue S.W. ramps that enter Crowchild Trail from the median (inside) lane, to the outside lane across the Bow River;
- Widen the Bow River Bridge by one additional lane in each direction, for a total of four lanes in each direction. Life cycle rehabilitation of this bridge structure is also required and is planned and designed to align with the short-term plan recommendations;
- Shift the northbound to eastbound exit ramp to Memorial Drive N.W. approximately 100 meters to the north;
- Widen and complete life cycle rehabilitation for the Crowchild Trail bridge over eastbound Memorial Drive by one additional lane in each direction, for a total of three lanes in each direction;
- Add one northbound lane along Crowchild Trail from Memorial Drive to 5 Avenue N.W.;
- Upgrade the intersection along Crowchild Trail at Kensington Road N.W. for vehicular traffic, pedestrian and active modes crossings;
- Add a new interchange ramp, connecting westbound 16 Avenue N.W. (Trans-Canada Highway) to northbound Crowchild Trail;
- Left-turn restrictions along Crowchild Trail during peak traffic hours at Kensington Road N.W. and 24 Avenue N.W. (implemented October 2016); and
- Closing of several unsignalized all-movement intersections between 16 Avenue N.W. and 24 Avenue N.W. to right-in right-out movements only (CPS controlled all-movement access allowed for events at McMahon Stadium).

### Improve mobility across the corridor:

- Improvements to Transit access and bus stops at select locations along the corridor;
- Addition of pedestrian crossing signal along Parkdale Boulevard N.W. at Memorial Drive N.W.; and
- Improvements to intersection alignment and configuration to better accommodate pedestrian and active modes crossing of Crowchild Trail at Kensington Road N.W., 5 Avenue N.W., and Richmond Road S.W. (at 17 Avenue S.W.).

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### Maintain and Enhance Bordering Communities:

- Improvements to noise attenuation at select locations (south of 16 Avenue N.W. and between Bow Trail and 17 Avenue S.W.), subject to outcomes of a noise study; and
- Some visual screening enhancements at Oliver Quarry Park through planting of trees and shrubs.

### **Medium-term plan: Ten+ year planning horizon**

A key achievement of this study was to confirm that the Bow River bridge, and bridges at Memorial Drive and Bow Trail could be widened to accommodate an additional lane in each direction, and that the entrance ramps from 10 Avenue S.W. and Bow Trail S.W. to northbound Crowchild Trail could be moved to the outside lane.

South of the Bow River crossing, increasing the number of northbound continuous lanes from a single lane to three continuous lanes was accomplished without impacting private properties within bordering communities. This allowed the project team to work with bordering communities and Calgarians to further develop recommendations to improve mobility across the corridor, and to advance additional technical studies.

North of the Bow River, three northbound and three southbound continuous lanes extend through to Stoney Trail N.W. Signals and intersections were removed along Crowchild Trail creating free-flow conditions along the entire length of the corridor, with interchanges at Kensington Road N.W., 5 Avenue N.W., 16 Avenue N.W. and University Drive N.W., and at 24 Avenue N.W. providing access to Crowchild Trail and connecting communities and Calgarians to key destinations along the corridor. Crowchild Trail was lowered below Kensington Road N.W. and 5 Avenue N.W., reducing noise and visual impacts for bordering communities. Local and regional pedestrian and active modes pathways and routes are located along the length of the corridor, providing continuous and uninterrupted flow of pedestrians and active modes users along most of Crowchild Trail. Several new crossings over Crowchild Trail are recommended providing improved mobility across Crowchild Trail and access to Transit.

To achieve these improvements, it is recognized that up to 40 properties are directly impacted by the plan, and is included as **Attachment 8** of this report. Every effort was made by the project team to limit the number of impacted properties; however impacts could not be avoided.

The medium-term plan is included as **Attachment 6** of this report, and is described as follows:

### Improve travel along the corridor:

- Crowchild Trail: Crowchild Trail is upgraded to provide three continuous lanes in each direction, from Glenmore Trail S.W. through to Stoney Trail N.W. Auxiliary lanes are provided in select locations to accommodate interchange connections and improve traffic flow;
- Crowchild Trail is lowered from Kensington Road N.W. through to University Drive N.W. Kensington Road N.W. and 5 Avenue N.W. cross over Crowchild Trail at existing grade;
- A new regional pathway system is proposed along the length of both sides of the Crowchild Trail corridor. Where possible, crossings of intersecting roadways are grade separated to accommodate continuous, uninterrupted flow for pedestrians and active modes users;

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- 17 Avenue S.W.: The northbound exit ramp to 17 Avenue S.W., via Richmond Road S.W., is widened to accommodate two left-turn lanes and a single right-turn lane. A new westbound left-turn bay is added along 17 Avenue S.W. at 24 Street S.W. (entrance to southbound Crowchild Trail) to improve intersection operations;
- Kensington Road N.W.: A new all-movement tight-diamond interchange will replace the existing intersection along Crowchild Trail. The westbound Memorial Drive exit ramp to northbound Crowchild Trail will connect through the intersection of the interchange. This configuration reduced the potential impacts to private properties along the east boundary of Crowchild Trail. Crowchild Trail will pass below Kensington Road N.W., and Kensington Road will remain at existing elevation.
- 5 Avenue N.W.: A new partial diamond interchange will replace the existing intersection along Crowchild Trail. Access to 5 Avenue N.W. is accommodated to and from the north only. Crowchild Trail will pass below 5 Avenue N.W., and 5 Avenue N.W. will remain at existing elevation.
- 16 Avenue N.W. and University Drive N.W.: A new single-point urban interchange (SPUI) at 16 Avenue N.W. provides connection to Crowchild Trail. Crowchild Trail will be lowered about one meter from existing grade north of 5 Avenue N.W. through to 16 Avenue N.W. The existing southbound Crowchild Trail overpass across University Drive N.W. is removed to match the grade of northbound Crowchild Trail. Access to University Drive N.W. from northbound Crowchild Trail is accommodated by a new underpass below Crowchild Trail. The interchange at University Drive is upgraded to provide connections to University Drive N.W. and Crowchild Trail.
- 24 Avenue N.W.: A new all-movement diamond interchange will replace the existing intersection along Crowchild Trail. The signalized intersection at 23 Avenue N.W. is removed, and access to Crowchild Trail is accommodated along new collector roads introduced between 16 Avenue N.W. and 24 Avenue N.W. Crowchild Trail is shifted to the west between 24 Avenue N.W. and 16 Avenue N.W. to accommodate the new interchange and collector roads at 24 Avenue N.W.

### Improve mobility across the corridor:

- Improvements to Transit access and bus stops along the corridor, ensuring bus stops meet accessibility guidelines and standards;
- Improved routing for pedestrian and active modes users connecting to regional transit service, including the southwest BRT, north cross-town BRT, and the Red Line LRT;
- New or upgraded pedestrian and active modes crossings are planned along the length of the corridor (inclusive of pedestrian and active modes facilities along new interchanges). Crossings are planned at about 300 meter intervals along the length of the corridor;
- New enhanced pedestrian crossings, or “land-bridge” type crossings, are proposed at several locations along the corridor. Enhanced crossings include features such as pathways, and naturalized features including plantings of trees and shrubs. Enhanced crossings are proposed between Bow Trail S.W. and 17 Avenue S.W., at 2 Avenue N.W., and at 12 Avenue N.W.;
- New pedestrian and active modes overpass or underpass crossings connecting the Bow River pathway system, located across Parkdale Boulevard at Kensington Road N.W., and across Memorial Drive N.W., east of Crowchild Trail; and

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- New east-west pedestrian facilities along 16 Avenue N.W., connecting the Banff Trail station area with adjacent communities and major destination, including the Foothills Medical Campus.

### Maintain and enhance bordering communities:

- Noise walls are recommended along all residential properties bordering Crowchild Trail along the length of the corridor. Opportunities to accommodate public art features can be considered at subsequent levels of study. The location, height, and type of walls to be used were not determined at this time. It is recommended that future stages of design and implementation to evaluate new and emerging technologies that may best suit the corridor and community needs;
- Surplus land areas along the east side of Crowchild Trail at 24 Avenue N.W., 16 Avenue N.W., University Drive N.W. near 13 Avenue N.W., along the east side of Crowchild Trail between Westmount Road and Memorial Drive N.W. to become green space following interchange construction to provide additional buffer to bordering communities.
- A 10 meter-wide green “buffer” area is provided along the east side of Crowchild Trail, from Memorial Drive N.W. to 16 Avenue N.W. behind the noise wall, and will include a 3 meter-wide regional pathway and additional plantings and green area.
- Additional green space is made available by the relocation of the northbound Crowchild Trail exit ramp to eastbound Memorial Drive. Lands to be rehabilitated and provide additional park or amenity space near the Bow River.

### **Long-term plan – 30+ year planning horizon**

Changes and upgrades to Crowchild Trail in the long-term plan largely focus on replacement or upgrades to key structural components, including the Crowchild Trail bridges across the Bow River, Memorial Drive, and Bow Trail S.W.. Completing the maintenance and lifecycle rehabilitation work as part of the short-term plan recommendations is expected to add at least 35 years of service life to the existing structures.

The long-term plan is included as **Attachment 7** of this report.

### **Planning and Implementation of Recommendations**

#### Short-term plan

Council approved the Crowchild Trail Study’s short-term recommendations 2017 March 6 as an Infrastructure Calgary candidate project. Administration continues to develop the implementation and construction sequencing strategy to deliver the short-term plan. Additional details will be developed and confirmed through the tendering and project implementation process.

The short-term implementation plan is detailed in report TT2017-0379.

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### Medium- and long-term plan:

The medium-term plan was developed to allow flexibility to implement the recommendations in several segments of phases, to align with Council priorities and funding that may become available in the future. Staging options are included as **Attachment 9** of this report. In general terms, segments of the plan could be delivered as follows:

1. North section (two projects):
  - 24 Avenue N.W. interchange: interchange construction at 24 Avenue N.W., with removal of the at-grade signalized intersections at 24 Avenue N.W. and 23 Avenue N.W.; and
  - 16 Avenue N.W. and University Drive N.W. interchanges.
2. Central section (single project):
  - Lowering of Crowchild Trail from Memorial Drive N.W. to University Drive N.W., and construction of interchanges at Kensington Road N.W. and 5 Avenue N.W.
3. South section (two projects):
  - Construction of the westbound Memorial Drive N.W. loop ramp access to southbound Crowchild Trail, including a new bridge across the northbound Crowchild Trail ramp to eastbound Memorial Drive; and
  - Upgrades to 17 Avenues S.W.

As opportunities become available to implement segments of the plan, there may be opportunities to advance several of the pedestrian and active modes crossings over Crowchild Trail, including the proposed enhanced crossing between Bow Trail S.W. and 17 Avenue S.W., and several segment or pathway links along the corridor in advance of the projects noted, above. Additional review and design will be required to confirm that advancing these links can be staged to fit with the overall plan. Other infrastructure such as noise walls may also be advanced as separate projects.

### Land Use Planning – Integrated plan

As the Crowchild Trail recommendations are implemented over time, redevelopment opportunities that are integrated into adjacent communities may become available. For example, by lowering Crowchild Trail below Kensington Road, there is an opportunity to create a mixed used development node along Kensington Road at Crowchild Trail. This node could become an extension of the Main Streets initiative, whereby the Main Street is extended across Crowchild Trail, connecting to Parkdale Boulevard N.W.

Several Area Redevelopment Plans (ARP) will require an update to reflect the recommendations of the Crowchild Trail Study. These ARPs include:

- The Banff Trail – Capitol Hill ARP special study area;
- The Banff Trail Station ARP; and
- The Sunalta ARP.



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The ARP amendments will be brought forward by Administration through Calgary Planning Commission.

### **Stakeholder Engagement, Research and Communication**

#### Engagement Strategy

Throughout the study, engagement maintained a focus on building participants' and the Project Team's understanding of differing perspectives relating to Crowchild Trail, and how to balance those within the parameters of the study. The study sought to build this shared understanding by using techniques that encouraged participant-to-participant interaction and invited shared problem solving to balance those perspectives.

The engagement strategy was structured to include:

- A Collaborative engagement process design in Phase 1
- Iterative engagement in Phases 2 through 6
- Sharing results of engagement throughout the study

In each phase of the study, City expertise and stakeholder lived experience formed a combined input towards the subsequent study phase, as summarized in Table 1, below:

**Table 1: Engagement Approach**

Phase 1	<b>City</b> engagement plan straw model	+	<b>EDT</b> refined methods and approaches
Phase 2	<b>City</b> policy: 2 goals and 3 Key Principles	+	11 <b>Stakeholder</b> developed goals
Phase 3	<b>Stakeholder</b> provided ideas	+	<b>City</b> technical and effort-to-implement review
Phase 4	<b>City</b> developed concepts	+	<b>Stakeholder</b> evaluation
Phase 5	<b>City</b> recommendations	+	<b>Stakeholder</b> refinement
Phase 6	<b>City</b> report-back on process and outcomes	+	<b>Stakeholder</b> evaluation of process

One of the most significant achievements of the study was the trust and environment for constructive collaboration between the project team and stakeholders. Over the course of the study, comments from stakeholders moved away from skepticism and anger towards cautious optimism and, later, enthusiasm and appreciation for the study process. This achievement took significant time and effort, and the investment into the Crowchild Trail Study process is bearing fruit with other transportation studies underway.

The result of the intensive and collaborative study process for the Crowchild Trail Study was a well-balanced plan that met key Transportation Corridor Study Policy objectives to maintain and enhance bordering communities, as well as improve travel along the corridor and improve mobility across the corridor.

#### Communications Strategy

Early conversations about the study clearly illustrated the need to rebuild trust with stakeholders. The project team addressed this need by committing to and implementing an inclusive, iterative engagement process, with regular and transparent reporting on engagement results and outcomes as well as project decisions.

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Communications throughout the study focused on supporting the iterative engagement process, included a variety of grassroots marketing and paid advertising tactics to generate awareness and encourage participation in the study.

The communication strategy was designed to achieve the following goals:

- Provide stakeholders the information they need to participate meaningfully in the study process;
- Demonstrate openness throughout the study process; and
- Demonstrate responsiveness to stakeholder issues and concerns.

### **From Planning to Implementation**

The success of this study, and the process undertaken with Calgarians to arrive at a recommended plan, will likely be measured over time as recommendations are implemented. A knowledge transfer gap is often created or exposed as a result of the duration between corridor plan approval, which may be in the order of a few years, to several years or decades in advance of implementation.

In an effort to manage this risk over time, the project team developed a few recommendations for further consideration:

1. An **Executive Summary** (a prologue, of sorts) to share with the future project managers the contextual knowledge that shaped the corridor study process:
  - What decisions were made and why; and
  - The issues that were raised and how they were addressed through engagement, communication, and through project and technical decisions.

This is not an executive summary of the technical report, but rather a summary of lessons learned from the project experience.

2. An **Education Strategy** to help stakeholders understand the process that was undertaken to make the decisions to date:
  - The corridor study planning process;
  - What input stakeholders provided;
  - How input was used and how issues were addressed; and
  - Why decisions were made.

From our experience with recent projects, the absence of stakeholder knowledge of the planning and decision making process – sometimes several years before detailed design and construction takes place – can hinder construction and contribute to stakeholder apprehension and mistrust.

3. Maintain the **project website** at calgary.ca, inclusive of all materials, information, and plans developed throughout the study, for public use.

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The education strategy should form an integral component of a future team's scope of work. This may be captured by the following:

- An education strategy should be included in a Project Charter;
- The planning and implementation of an Education Strategy should be built into the project timeline;
- The education strategy should be implemented prior to any engagement activities that may be required for future phases, or for subsequent levels of design and implementation, leading to construction;
- The education strategy needs to be a requirement of the RFP process. As part of the RFP process, proponents will need to submit proposals that include how they will educate the public to bridge the knowledge gap;
- Evaluation of the proposals should include people with backgrounds in communication, engagement, public consultation, education, and knowledge management; and
- Attach these recommendations to the Corridor Policy.

### **Strategic Alignment**

The Crowchild Trail Study aligns with the transportation goals identified in the 60-year Calgary Transportation Plan (CTP), the Calgary Municipal Development Plan (MDP), and the 2020 Sustainability Direction, including:

- CTP Goal No. 1: Align transportation planning and infrastructure investment with the city and regional land use directions and implementation strategies;
- CTP Goal No. 2: Promote safety for all transportation system users;
- CTP Goal No. 5: Promote economic development by ensuring the efficient movement of workers and goods;
- CTP Policy 3.1: Maintain automobile, commercial goods and emergency vehicle mobility in Calgary while placing increased emphasis on sustainable modes of transportation (walking, cycling, and transit);
- Sustainability Principle for Land Use and Mobility No. 4: Provide a variety of transportation options; and
- MDP Key Direction for Land Use and Mobility No. 5: Increase mobility choices.

### **Social, Environmental, Economic (External)**

This report was reviewed for alignment with The City of Calgary's Triple Bottom Line (TBL) Policy Framework. The following implications were identified to date:

Social: Recommendations of the study were measured against the three key principles and project goals of the study developed with Calgarians in Phase 2. A collaborative and iterative engagement process was undertaken to arrive at recommendations for the short-, medium-, and long-term plans for Crowchild Trail. Recommendations align with the MDP, CTP, and the Transportation Corridor Study Policy.

Environmental: Recommendations of the study were measured against the three key principles and project goals of the study developed with Calgarians in Phase 2. Opportunities to improve travel and mobility along and across the corridor were balanced for all travel modes. Improving traffic flow and operations along Crowchild Trail, as well as adding a parallel pedestrian and

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active modes corridor and improving transit access can have a correlative reduction in green house gas emissions. Recommendations were provided to improve spaces along bordering communities, as well as park and gathering spaces, and the Bow River environment by introducing buffer spaces along the corridor, or increasing usable park space at the Bow River.

Economic (external): The City worked with area businesses, stakeholders, and institutions along the corridor to arrive at the study recommendations. The recommendations support and improve the movement of people, goods, and services along and across Crowchild Trail, as well as supports local and regional economic vitality, while developing opportunities for land redevelopment and renewal.

### **Financial Capacity**

#### **Current and Future Operating Budget:**

Funding for the Crowchild Trail Study is contained within Transportation Planning's Functional Studies budget under program 617-OB1. No changes to current or future operating budgets will occur as a result of this report. However, future operating budgets would require incremental increases as a result of the additional infrastructure investments that were studied in this report should future capital be allocated to these projects. The additional operating costs of the proposed upgrades have not been quantified.

#### **Current and Future Capital Budget:**

Recommendations outlined in this report will require allocation of capital funding for short-term changes and upgrades to Crowchild Trail. Funding requirements to implement the short-term plan are documented in report TT2017-0397.

Recommendations outlined in this report will require allocation of capital funding in the future for implementation of the medium-term and long-term changes and upgrades to Crowchild Trail. The estimated cost to implement the medium-term recommendations is approximately \$1.3 billion, based on a Class 4 estimate in 2016 dollars. The estimated cost to implement the long-term recommendations is approximately \$250 million, based on a Class 4 estimate in 2016 dollars.

There are no future capital budget impacts associated with the medium- and long-term recommendations with this report. Administration will add the medium-term plan as a candidate project for evaluation with the next update of the ten year Investing in Mobility Capital Plan.

### **Risk Assessment**

The key risk to the success of the study was to address the legacy of a strong, negative perception from the 2012 study. A fundamental shift in The City's approach to corridor planning, guided by the Transportation Corridor Study Policy, and integration of an engagement and communications strategy focused on addressing the legacy issues on Crowchild Trail into the project process, has helped move the project forward.

Funding for the short-term plan would provide Calgarians immediate benefit in the near term, capitalizing on the Administration's ability to leverage shared efforts and resources that combines existing work required with the ability to adapt the plan to meet corridor needs today.

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A risk to future implementation of the recommendations is the time between approval of the corridor plan, and implementation of the plan in the future. Administration's recommendations to develop an internal executive summary for project managers and Administration, as well as a requirement for an education strategy should mitigate future risk to implementation of the plan.

### **REASONS FOR RECOMMENDATIONS:**

The final recommendations for short-, medium-, and long-term changes and upgrades to Crowchild Trail are a culmination of work completed with Calgarians following a new six-phase process. The process ties corridor planning and design directly to engagement, provides project information, and maintains clear, consistent and transparent communication.

The final recommendations align with the project's key principles, reflects the feedback received from Calgarians over the course of the study, and balances technical requirements with competing priorities.

The medium- and long-term plan sets the vision and needs for a critical component of the City's overall transportation network. It provides certainty to residents and businesses bordering Crowchild Trail, as well as the broader communities and the public.

### **ATTACHMENTS:**

1. Crowchild Trail Study – Engagement Summary Report;
2. Crowchild Trail Study – Six-Phase Study Process Summary;
3. Crowchild Trail Study – Phase 4 preliminary concepts;
4. Crowchild Trail Study – Expert Panel Peer Review Summary Report;
5. Crowchild Trail Study – Recommended Short-term Plan;
6. Crowchild Trail Study – Recommended Medium-term Plan;
7. Crowchild Trail Study – Recommended Long-term Plan;
8. Crowchild Trail Study – Property Impacts; and
9. Crowchild Trail Study – Implementation Staging Scenarios.