

16 Avenue N. and 19 Street E. Interchange Functional Planning Study

Phase 2 Stakeholder Input Summary



Background

The City of Calgary is conducting a functional planning study to determine plans for a future interchange at the intersection of 16 Avenue and 19 Street N.E. A public engagement process is being implemented as part of the study to gather stakeholder and community input so feedback can be reflected in any future plans to the greatest extent possible.

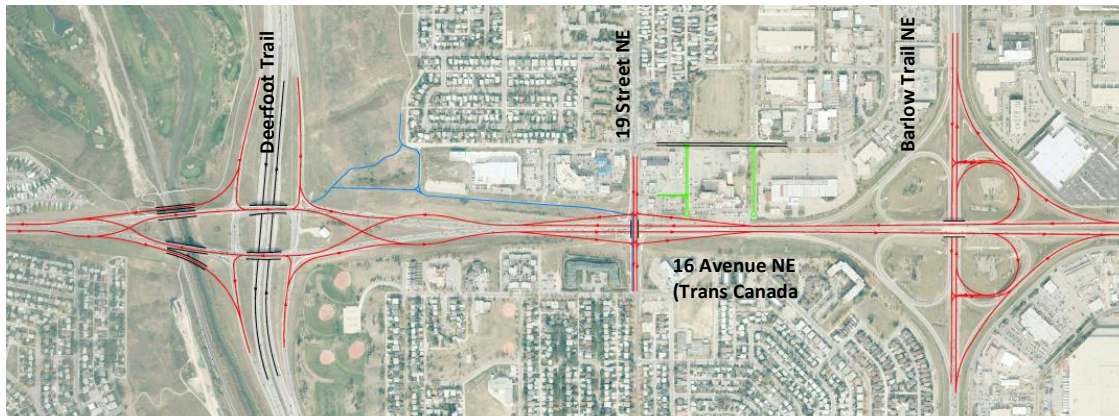
Stakeholder Workshop

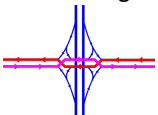
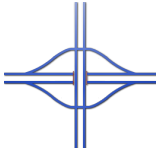
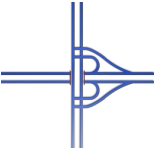
During Phase 1 of the public engagement process, stakeholders and the community were asked to identify issues and concerns with the current intersection. The project team used that feedback to develop numerous preliminary interchange options. After a high-level screening process, six options were presented to stakeholders at a workshop held on Wednesday, September 11, 2013 from 6:30 to 8:30 p.m. at the Crossroads Community Association (1803 14 Avenue N.E.). A total of 59 stakeholders were invited to the meeting and 10 attended.

The purpose of the workshop was to gather input from stakeholders to be used to refine and select concepts for further development. Following a presentation, stakeholders divided into three small groups to discuss the options and identify strengths, weaknesses and proposed changes for each option. Each group had a facilitator and a technical expert to record the discussion and answer questions. The following paragraphs summarize the comments provided for each option during the small group conversations, as well as from the feedback forms handed out at the event. The feedback forms asked participants for comments about the workshop itself, as well as any additional information they wanted to provide about the options. A total of three feedback forms were received.

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Option A: Diamond Interchange at 19 Street NE



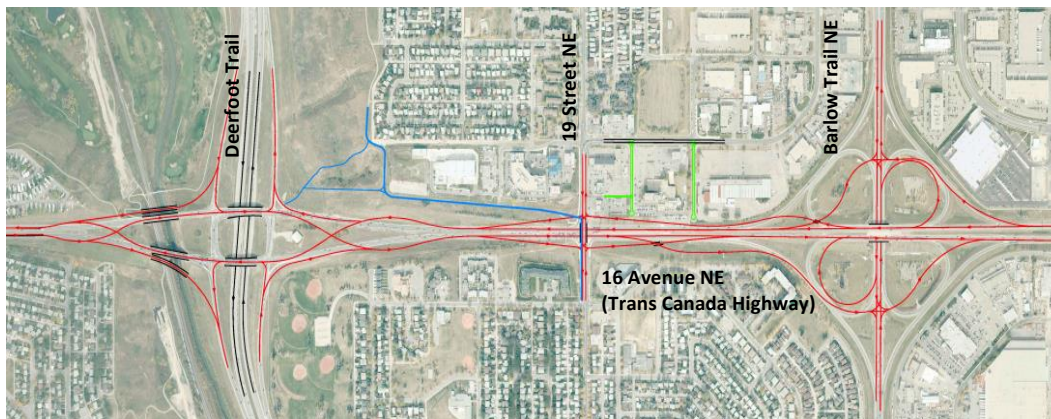
Deerfoot Trail	19 Street	Barlow Trail	Key Points
Diverging Diamond Interchange 	Diamond Interchange 	Folded Partial Cloverleaf 	<ul style="list-style-type: none"> - Reduces weaving between Barlow Trail and 19 Street - Reduces conflicts at Deerfoot Trail

Strengths	Weaknesses	Proposed Changes
<ul style="list-style-type: none"> - Ramps at Barlow Trail will improve weaving distance (3) - Increases traffic flow on Deerfoot Trail (2) - May reduce noise for adjacent residents and businesses (2) - Adequate time to make connector change off 16 Avenue - Accommodates cyclists - Good for unfamiliar motorists - Reduces traffic on Barlow Trail - Economical - Free-flow traffic on 16 Avenue deters motorists from shortcutting through Mayland Heights - The Diamond Interchange at 19 Street provides all movements - Eliminates weaving at 19 Street - Reduces traffic on 19 Street - Folded Partial Cloverleaf at Barlow Trail - Turning flyovers northbound/southbound on 16 Avenue 	<ul style="list-style-type: none"> - Diverging Diamond Interchange is complex (3) and unfamiliar to Calgary drivers (3) - Disconcerting to see headlights from oncoming traffic when driving eastbound on 16 Avenue (from Diverging Diamond Interchange) - Does not improve shortcutting traffic on 19 Street to 8 Avenue and through Mayland Heights - Excessive Traffic on 19 Street - Shell gas station will need to be removed - Overpass connects to pathway and access must be updated and maintained - Diamond Interchange at 19 Street is very tight - Folded Partial Cloverleaf at Barlow Trail will have capacity problems with conflicting traffic movements - Merging lanes on Barlow Trail are very tight - Not enough space between interchanges on 19 Street and Barlow Trail 	<ul style="list-style-type: none"> - Add roundabouts on 19 Street - Improve traffic on Deerfoot Trail to remedy 8 Avenue shortcutting - Add signals after the Diverging Diamond Interchange at Deerfoot Trail - Consider replacing the "Folded Parclo" at Barlow with a "Split Diamond"

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Option C: Diamond Interchange at 19 Street NE

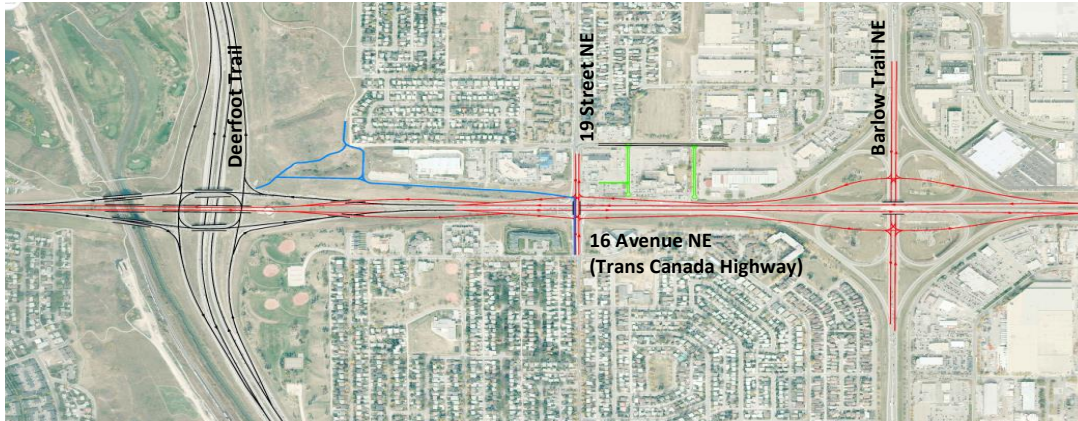


Deerfoot Trail	19th Street	Barlow Trail	Key Points
<p>Diverging Diamond</p>	<p>Diamond</p>	<p>Partial Cloverleaf "A"</p>	<ul style="list-style-type: none"> - Reduces conflicting traffic operations on 16 Avenue and at Deerfoot Trail - Reduces interaction between Barlow Trail and 19 Street

Strengths	Weaknesses	Proposed Changes
<ul style="list-style-type: none"> - Free-flow traffic on 16 Avenue - Accommodates cyclists - Surplus land at Barlow Trail (NW and SE quadrants) - Reduces shortcutting traffic on 19 Street - Limited movements reduce traffic on 19 Street - Weaving traffic works well - Diverging Diamond Interchange at Deerfoot Trail improves traffic - Basket weave structures at Barlow Trail improve weaving 	<ul style="list-style-type: none"> - Restricted access between Barlow Trail and 19 Street (3) - Motorists need to select destinations early - Not using existing infrastructure at Barlow Trail - Infrastructure costs associated with basket weave structures for Partial Cloverleaf "A" at Barlow Trail - Potential impact to green space and businesses - Diverging Diamond Interchange at Deerfoot Trail may be confusing to motorists and cyclists - Diamond Interchange at 19 Street is very tight - Not all movements provided 	<ul style="list-style-type: none"> - Need safe cyclist crossings - A lower "around the block" residential loop in the NW quadrant of 19 Street and 16 Avenue to eliminate weaving - Consider 3rd level at Deerfoot (D) instead of the diverging diamond

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Option D: Split Diamond Interchanges at 19 Street and Barlow Trail



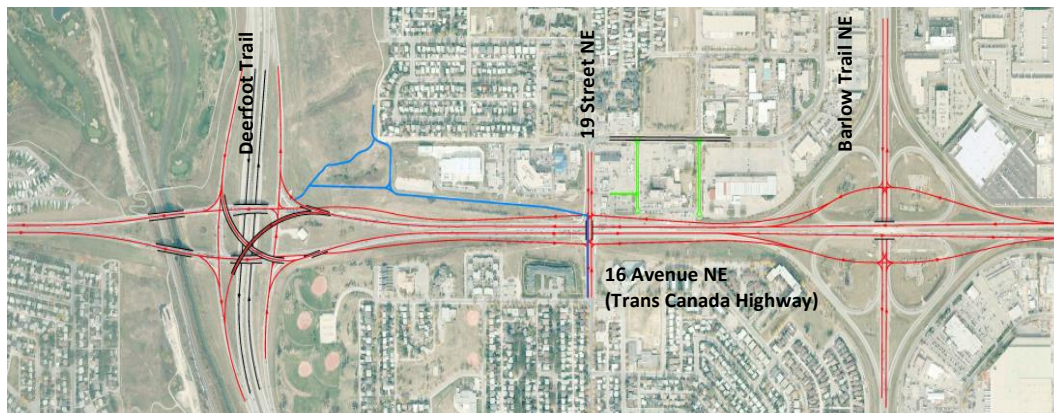
Deerfoot Trail	19th Street	Barlow Trail	Key Points
<p>Third Level</p>	<p>Split Diamond</p>	<p>Split Diamond</p>	<ul style="list-style-type: none"> - Reduces conflicting traffic operations on 16 Ave - Third level at Deerfoot Trail provides free-flow traffic on 16 Avenue - Split Diamond Interchanges at 19 Street and Barlow Trail link the cross streets with connecting roads / ramps


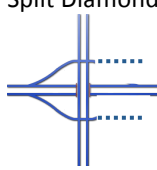
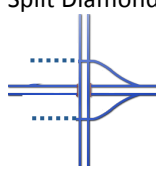
Strengths	Weaknesses	Proposed Changes
<ul style="list-style-type: none"> - Easier to navigate and less weaving (2) - Third level over Deerfoot Trail Interchange makes 16 Avenue from the west free-flow (2) and eliminates that traffic from the turning movements - Collector roads at 19 Street keep 16 Avenue traffic separated (2) - All movements are provided at 19 Street and at Barlow Trail (2) - Collector road reduces speed on 16 Ave (2) - Free-flow traffic on 16 Avenue (2) and Deerfoot Trail - Separation for cyclists - More access to 19 Street from Barlow Trail - Less traffic at 16 Avenue and Deerfoot Trail interchange - Through movements at Deerfoot Trail (northbound/southbound and eastbound/westbound) are physically separated 	<ul style="list-style-type: none"> - Large and costly infrastructure (3) - Connected/Split Diamond Interchanges at 19 Street and Barlow Trail require motorists to choose destinations very early; may be confusing (3) - Lacks free-flow on 16 Avenue at Deerfoot Trail from the east - Increases congestion at Barlow Trail because of motorists trying to access 19 Street - Third level interchange at Deerfoot Trail creates short weaving section for motorists between 19 Street and Deerfoot Trail - Increases travel time between Deerfoot Trail and 19 Street - Split Diamond Interchange at 19 Street is very tight and does not reduce short cutting - Split Diamond Interchange at Barlow Trail does not provide easy access between 16 Ave and Barlow Trail - Heavy eastbound left turn traffic demand at Barlow Trail will cause capacity issues at south intersection 	<ul style="list-style-type: none"> - Consider adding a directional loop ramp for eastbound to northbound traffic at Barlow Trail

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Option H: Split Diamond Interchange / Couplet System

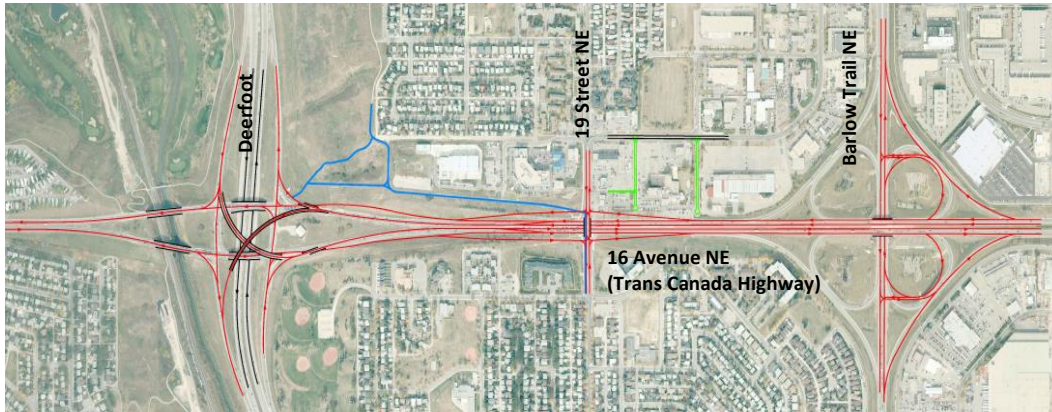


Deerfoot Trail	19th Street	Barlow Trail	Key Points
<p>Directional Ramps</p> 	<p>Split Diamond</p> 	<p>Split Diamond</p> 	<ul style="list-style-type: none"> - Reduces conflicting traffic operations on 16 Ave - Free-flow traffic at Deerfoot Trail - Couplet system provides connectivity between Barlow Trail, 19 Street and 16 Ave - Recognizes 16 Ave as an Urban Boulevard west of Deerfoot Trail - Split Diamond Interchanges at 19 Street and Barlow Trail link the cross streets with connecting roads / ramps

Strengths	Weaknesses	Proposed Changes
<ul style="list-style-type: none"> - Collector roads keep 16 Avenue traffic separated from 19 Street (2) - All movements provided at 19 Street and Barlow Trail (2) - Decreases congestion at 19 Street signals (2) and between Deerfoot Trail and 19 Street (1) - Northbound and southbound access to 16 Avenue improved - Through traffic improved on 16 Avenue - Removes heavy left turn movements from 16 Avenue and Deerfoot Trail interchange - Directional ramps at Deerfoot Trail provide good connectivity between skeletal roads 	<ul style="list-style-type: none"> - Connected/Split Diamond Interchanges at 19 Street and Barlow Trail requires motorists to choose destinations very early; may be confusing (3) - Too many signals on 16 Avenue - Will not eliminate traffic on 16 Avenue - Not ideal for transport trucks - Increases congestion - Bottleneck at north and south Deerfoot Trail does not solve current traffic issues and could cause increased shortcutting - Deerfoot Trail directional ramps are costly - Split Diamond Interchange at 19 Street is tight - Heavy eastbound left turn demand will cause capacity problems at south intersection on Barlow Trail 	<ul style="list-style-type: none"> - Consider a hybrid of Options A & H (replacing the directional ramps at Deerfoot with a diverging diamond interchange)

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Option J: Diamond Interchange with Collector-Distributor System



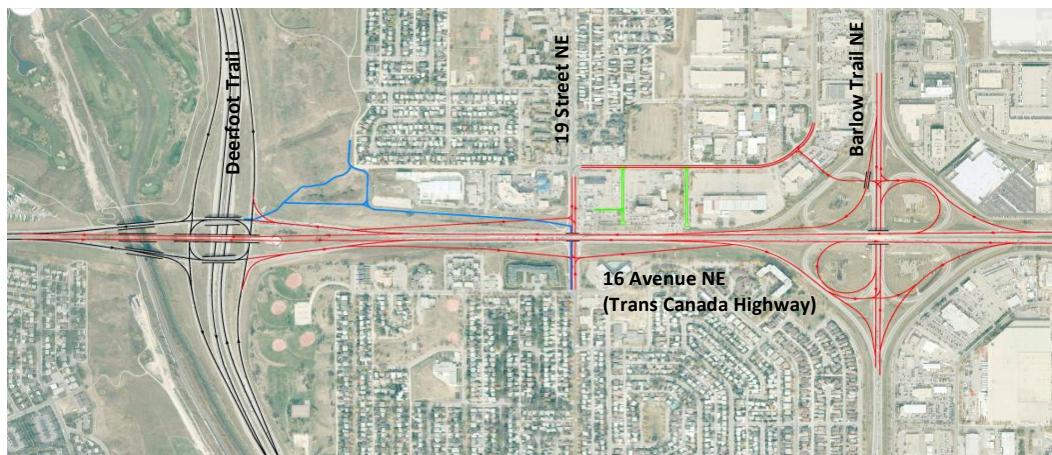
Deerfoot Trail	19th Street	Barlow Trail	Key Points
<p>Directional Ramps</p>	<p>Diamond</p>	<p>Folded Partial Cloverleaf</p>	<ul style="list-style-type: none"> - Reduces conflicts between merging traffic entering / exiting 16 Ave at 19 Street and Deerfoot Trail - Collector-Distributor System provides connectivity between Barlow Trail, 19 Street and the 16 Avenue Urban Boulevard west of Deerfoot Trail

Strengths	Weaknesses	Proposed Changes
<ul style="list-style-type: none"> - Removes heavy left turn movements from 16 Avenue and Deerfoot Trail interchange (2) - Folded Partial Cloverleaf at Barlow Trail increases weaving distances (2) - Could solve weaving at Deerfoot Trail - Collector roads are forgiving – way finding? - New structure at Deerfoot Trail allows for pedestrian facilities - Directional ramps at Deerfoot Trail provide good connectivity between skeletal roads - Diamond Interchange at 19 Street provides all movements - Reduces congestion between Deerfoot Trail and 19 Street 	<ul style="list-style-type: none"> - Confusing (3) - Infrastructure cost (2) - Property impacts at 19 Street (2) - Large cross-section - Deerfoot Trail traffic will need to exit prior to directional ramps to access collector roads - Diamond Interchange at 19 Street is very tight - Folded Partial Cloverleaf at Barlow Trail will have capacity problems with all the conflicting traffic movements 	<ul style="list-style-type: none"> - Consider adding a third level over 16 Avenue if it would maintain through movement on 19 Street

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Option O: Partial Diamond Interchange at 19 Street NE (1986 Option)



Deerfoot Trail	19th Street	Barlow Trail	Key Points
Third Level 	Partial Diamond 	Partial Cloverleaf "A" 	<ul style="list-style-type: none"> - Missing ramp at 19 Street (indirect access to NE quadrant via Barlow Trail to 20 Avenue). - Third level at Deerfoot Trail provides free-flow traffic on 16 Avenue

Strengths	Weaknesses	Proposed Changes
<ul style="list-style-type: none"> - Indirect routes and Partial Diamond Interchange at 19 Street could reduce short cutting through Mayland Heights (2) - Free flow traffic on Deerfoot Trail reduces traffic and is easy to understand - All through movements are separated, and Partial Cloverleaf "A" at Barlow Trail provides most movements 	<ul style="list-style-type: none"> - Increases traffic in school zone on 18 Avenue (3) - Third level at Deerfoot Trail creates weaving for eastbound traffic to 19 Street (2) - Confusing - Signing for cyclists to connect to existing pathway difficult - Difficult to go south on 19 Street from westbound 20 Ave - Tunnel or underpass between communities is not desired - Concerned with 16 Avenue bridge icing during the winter months - Shortcutting through Mayland Heights from Deerfoot Trail - No access from 16 Avenue for businesses on 19 Street - Infrastructure cost - Partial Diamond at 19 Street is tight and restricts movements and accessibility - Partial Cloverleaf "A" at Barlow Trail will impact businesses 	<ul style="list-style-type: none"> - Requires a pedestrian crossing - Remove businesses to build ramp from Barlow Trail to 18 Avenue to improve connectivity to 19 Street - Create a separate design for 19 Street that separates overpass from pedestrians and cyclists

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Stakeholder workshop evaluation

The feedback forms handed out at the workshop asked participants to evaluate the event. Specifically:

- What did you like about tonight's workshop?
- Do you have any suggestions about how we can improve future workshops?
- Additional comments about tonight's workshop.

Just one workshop attendee provided comments about the workshop; they said it was well facilitated and provided a thorough, open discussion and examination of all issues, and a safe and respectful environment. To improve future workshops, they suggested distributing literature about transportation best practices and terminology in advance so that attendees could prepare.

Additional comments

The technical experts at each table noted the following additional comments as part of the small group discussions:

- Some key components were strong in some options and not addressed in others:
 - Separating 16 Avenue traffic accessing Deerfoot Trail
 - Directional ramps at Deerfoot Trail
 - Folded Partial Cloverleaf at Barlow Trail
- Stakeholders requested the refined options be presented as 3D renderings at the next open house
- The final option should accommodate pedestrians and cyclists by:
 - Make them feel safe and creating a pathway connection so cyclists can avoid Renfrew Hill
 - Implementing an east/west pathway on north side of 16 Avenue that connects to existing pathways
 - Including bike lanes on 19 Street

Conclusions

- Overall, stakeholders rated options D, A and H or J as their top choices, in that order.
- Some stakeholders felt the Diverging Diamond interchange was confusing for motorists, and counter-intuitive.
- Stakeholders prefer options that provide free-flow traffic on 16 Avenue.
- The Split Diamond interchange at 19 Street and Barlow Trail requires motorists to choose destinations very early and may be confusing for motorists.
- Stakeholders liked options that provided all movements at all intersections.

Next steps

Based on the feedback received at the workshop, the project team combined and/or added the elements stakeholders felt were the most important from the options to develop four concepts to present at a public open house. Specifically, the "hybrid" options are:

- Option A1: Hybrid of options A (Deerfoot Trail) & H (Barlow Trail)
- Option D1: Hybrid of options D (Deerfoot Trail) & H (Barlow Trail modified)
- Option D2: Hybrid of options D (Deerfoot Trail) & C (Barlow Trail)
- Option H1: Hybrid of options H (Deerfoot Trail) & H (Barlow Trail modified)