



NOSE HILL DRIVE / STONEY TRAIL INTERCHANGE Functional Review

PRESENTATION To Scenic Acres Community Association

June 16, 2011

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STUDY MANDATE

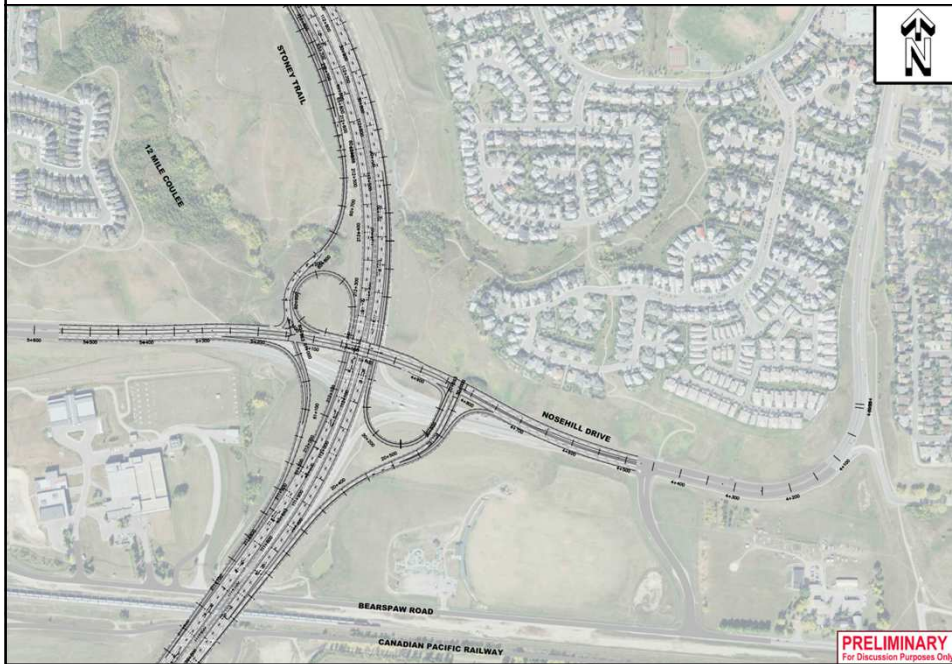
MH has been retained to:

- Perform a technical review/analysis of the existing 2010 interchange design,
- Examine potential design options, and
- Offer its conclusions to Alberta Transportation and SACA.

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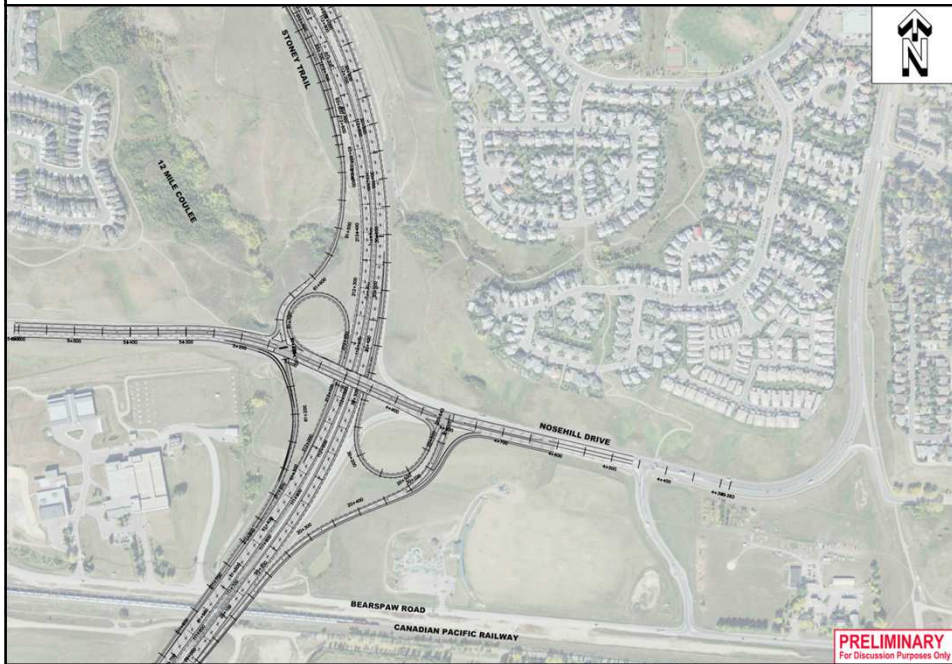
PROPOSED 2010 DESIGN



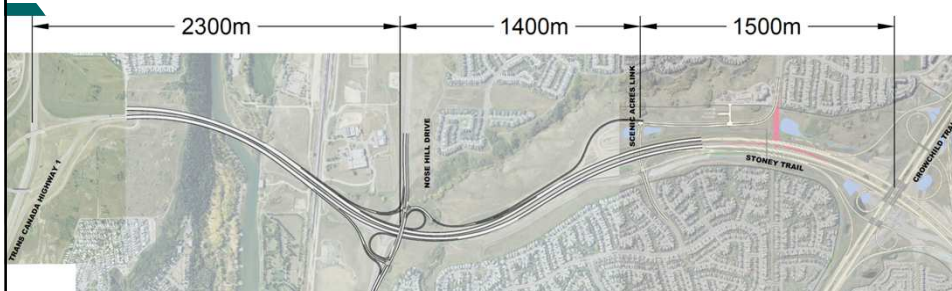
EXISTING ALIGNMENT – NOSE HILL UNDER



EXISTING ALIGNMENT – NOSE HILL OVER

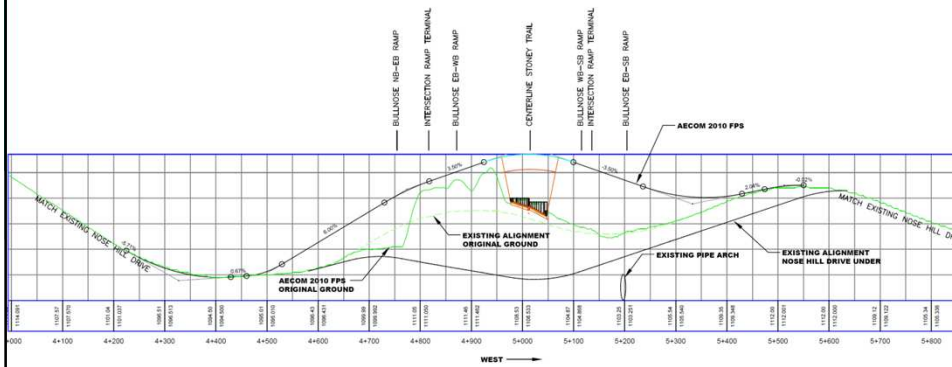


FREEWAY OPERATION



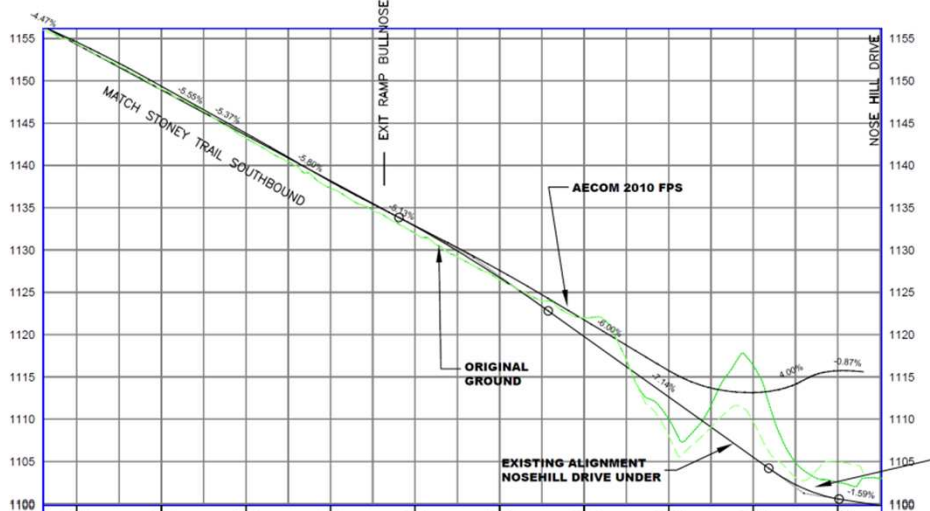
- Interchange Spacing – 3 km next to System interchange; 2 km between Service interchanges.
- Design Environment – 3 terrain domains: Level; Rolling (max. 3% grade); and Mountainous (max. 5% grade).
- Driver Expectations – Taking the local road over the freeway facility is a preferred outcome from an operational perspective.
- Safety Threshold – Majority of the decision points are already compressed, resulting in a sequence of minimums that would already almost challenge driver comprehension.

PROFILE COMPARISON NOSE HILL UNDER



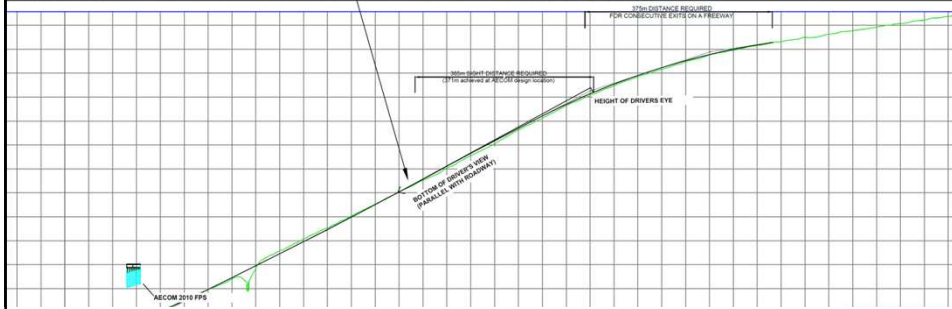
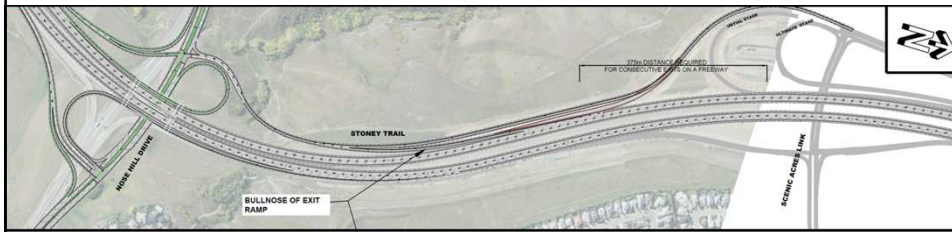
- Nose Hill Over along proposed 2010 alignment.
 compared with
- Nose Hill Under along existing roadway alignment.

PROFILE COMPARISON SOUTHBOUND OFF-RAMP



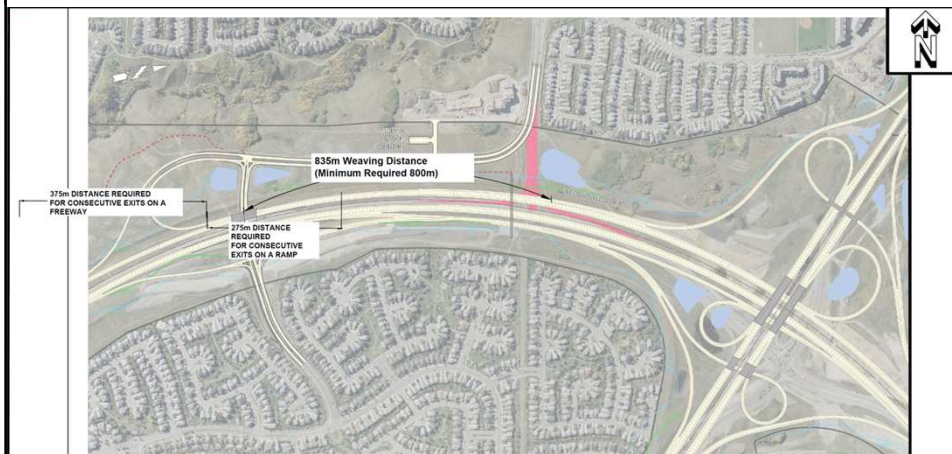
- The steeper grade (7.1%) and no sag approaching Nose Hill Drive ramp terminal intersection is a safety issue compared with proposed 2010 design.

RELOCATE SOUTHBOUND EXIT POINT



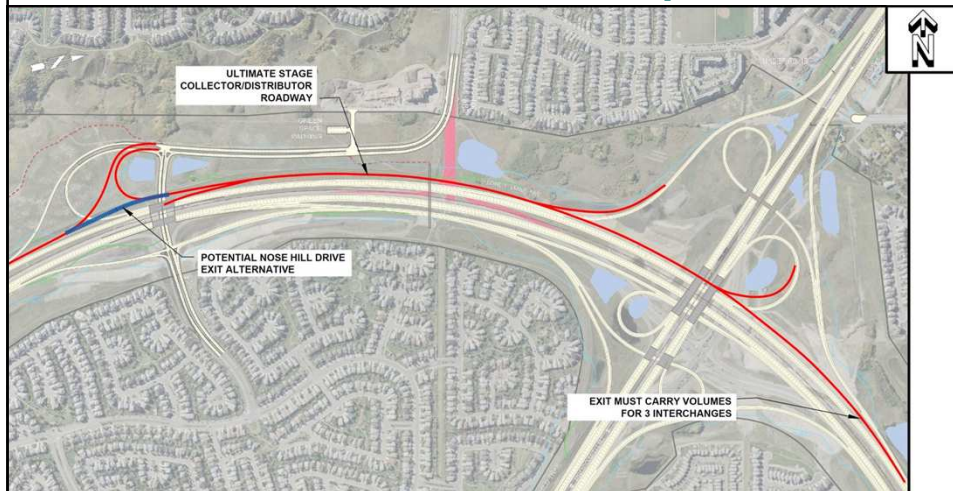
- Current exit point provides the required sight distance for driver.
- Minimum 375m spacing between consecutive exits prevents relocating crest near the Scenic Acres first stage - exit to loop ramp.

RELOCATE SOUTHBOUND EXIT POINT



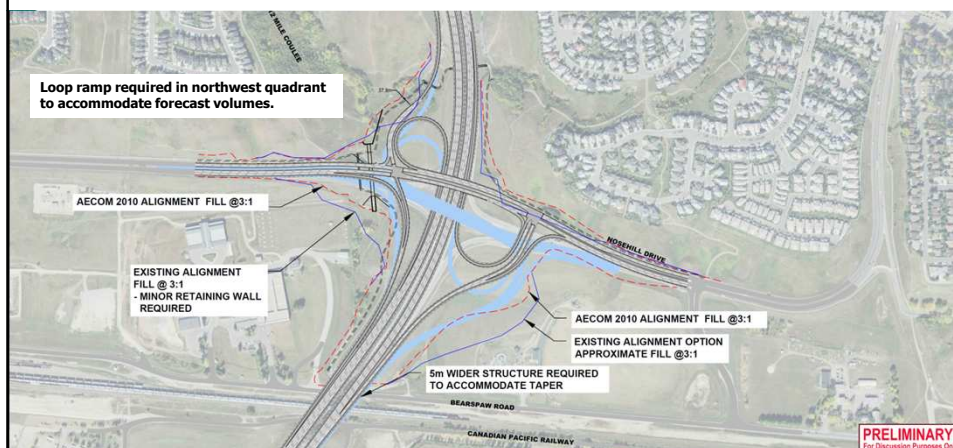
- Minimum 375m spacing between consecutive exits prevents relocating beyond crest near the Scenic Acres first stage - exit to loop ramp.
- Minimum 800m weaving distance between Crowchild and Scenic Acres prevents moving Scenic Acres exit 275m north along Stoney Trail for single exit point serving both NHD and Scenic Acres interchanges.

CONNECT NHD EXIT TO C/D ROAD



- No acceptable first stage solution.
- Would require building the ultimate C/D road immediately.
- Single exit point upstream of Crowchild Trail would require the C/D road to carry the exiting volumes for 3 interchanges. Significant cost increment.

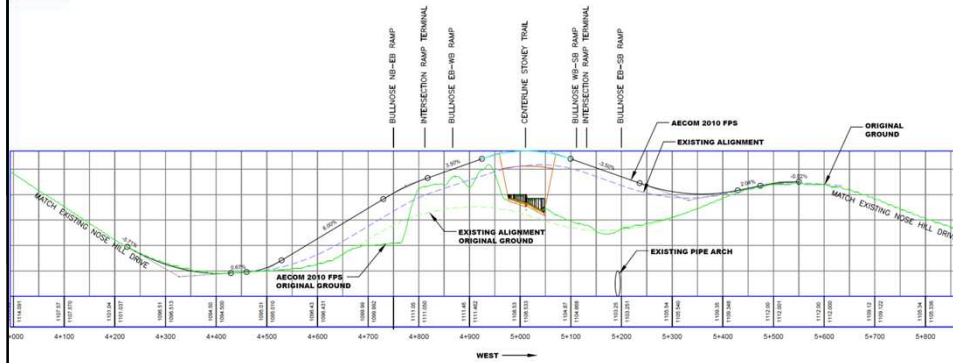
NOSE HILL OVER - EXISTING ALIGNMENT



Existing Alignment requires:

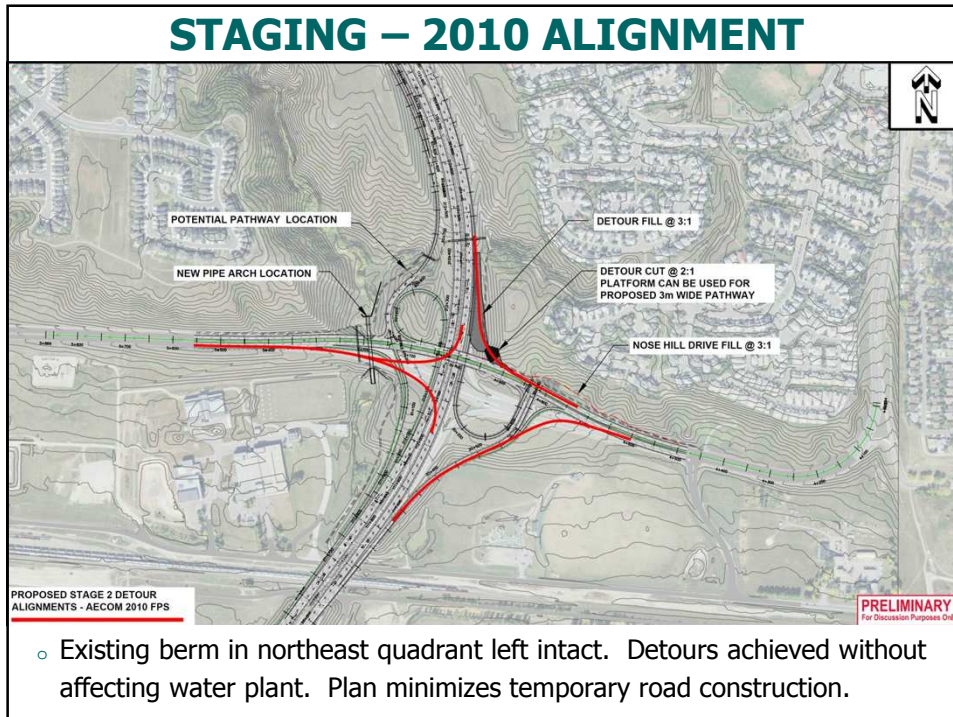
- Minor retaining wall around water treatment plant.
- 5m additional widening of CP Rail structure.
- Less desirable geometry along NHD with poor integration of horizontal and vertical alignment; less utilization of existing terrain; higher grading costs.

PROFILE COMPARISON NOSE HILL OVER



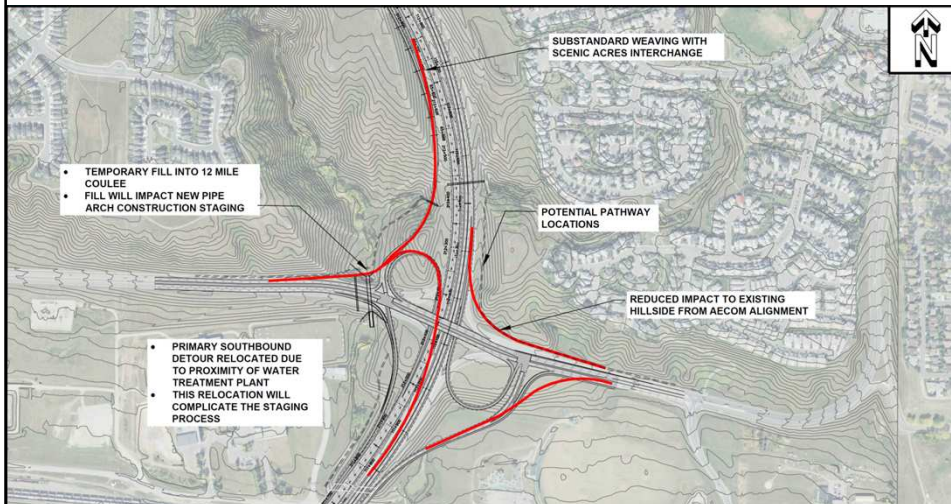
- o Nose Hill Over along proposed 2010 alignment compared with
- o Nose Hill Over along existing roadway alignment.

STAGING – 2010 ALIGNMENT



- o Existing berm in northeast quadrant left intact. Detours achieved without affecting water plant. Plan minimizes temporary road construction.

STAGING – EXISTING ALIGNMENT

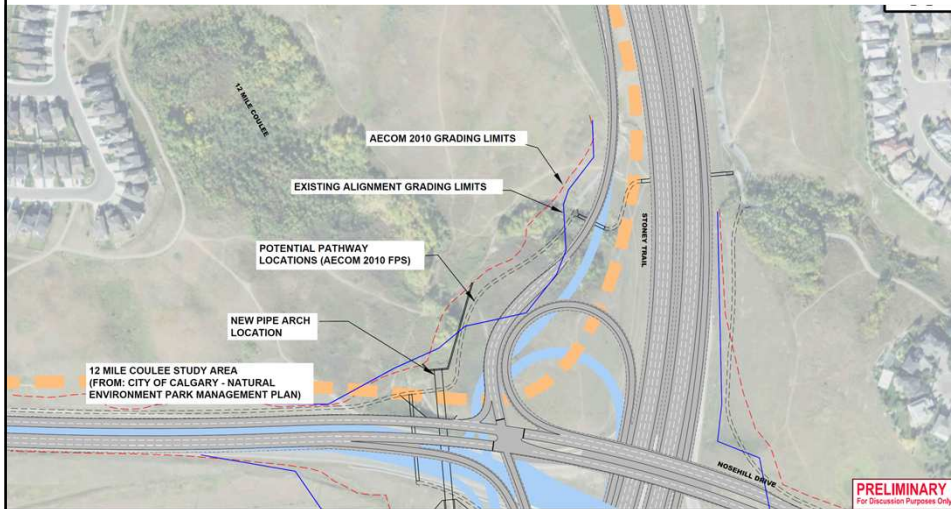


- Proximity to water plant relocates eastbound to southbound detour; results in more complex staging requirements.
- Temporary fill into 12 Mile Coulee; complicates pipe arch underpass.
- Compromises weaving with Scenic Acres interchange.

NOISE ANALYSIS

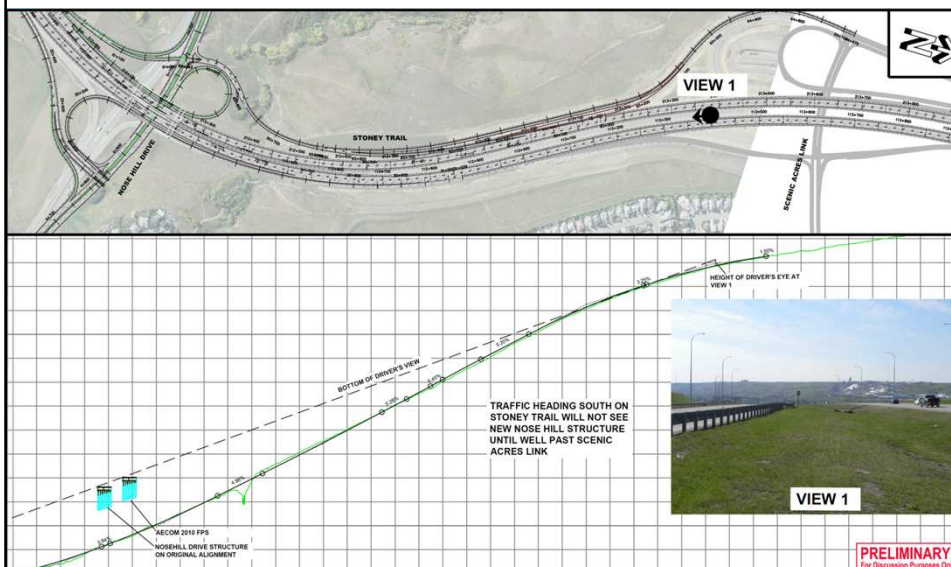
- ACI was retained to conduct a noise assessment comparing the two NHD alignments.
- NHD evaluated with 8% (existing) and 12% heavy trucks (typically 5%) to test sensitivity.
- Increase due to truck percentage ranged between 0 and 0.7 dBA, subjectively imperceptible.
- Largest difference between the two alignments was 2.1 dBA, (at the lower range of being subjectively perceptible) occurring along NHD away from Stoney Trail.
- All results projected to be well below Alberta Transportation's warrant for noise attenuation; 65 dBA $L_{eq}24$.
- Results for 12% trucks reached 60 dBA for 2010 alignment and 58 dBA for existing alignment.

INCREMENTAL ENVIRONMENTAL FOOTPRINT



- o Grading limits in northwest quadrant are shown for both interchange plans.
- o 2010 NHD alignment requires approximately 0.45 additional ha.
- o It is noted that the 2010 plan was determined in consultation with the City of Calgary and has required regulatory approvals.

SIGHTLINES – STONEY TRAIL - 1



- o Traffic heading south along Stoney Trail will not see the Nose Hill Drive structure until well past Scenic Acres Link.

SIGHTLINES – STONEY TRAIL - 2

FOR TRAFFIC HEADING SOUTH ON STONEY TRAIL STRUCTURE FIRST COMES INTO VIEW AROUND EMBANKMENT TO THE WEST

VIEW 2

PRELIMINARY
For Discussion Purposes Only

VIEW 2

VIEW 2: AECOM 2010 FPS STRUCTURE

- Southbound along Stoney Trail, driver first sees the Nose Hill Drive structure around existing embankment on the west.

SIGHTLINES – STONEY TRAIL - 3

VIEW 3

PRELIMINARY
For Discussion Purposes Only

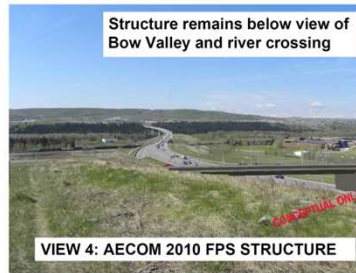
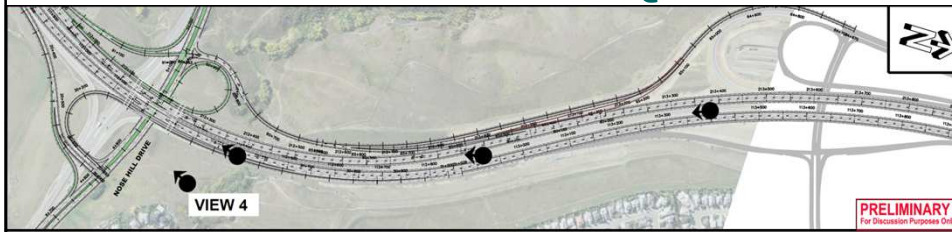
VIEW 3

VIEW 3: AECOM 2010 FPS STRUCTURE

Overpass structure is a preferred outcome for driver expectations.

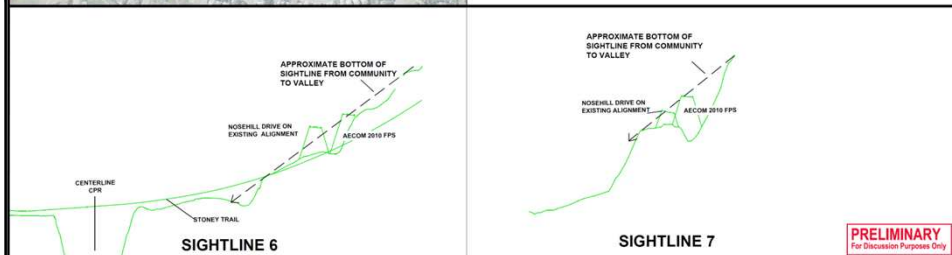
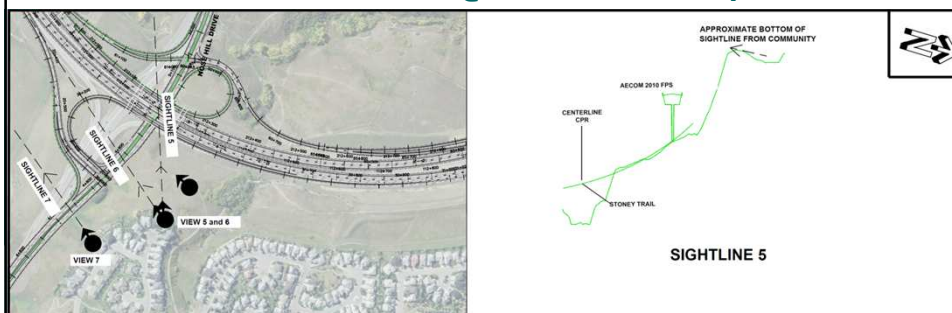
- The overpass structure is a preferred outcome for driver expectations, better alerting the driver to pending exit, entrance and weaving manoeuvres, particularly on a horizontal curve.

SIGHTLINES – NORTHEAST QUADRANT - 4



- From a vantage point below the Scenic Acres homes, the structure remains below the view of the Bow Valley and river crossing.

SIGHTLINES – NE QUADRANT 5, 6 and 7



- The three sightlines use vantage points in the backyards of adjacent Scenic Acres homes.

SUMMARY COMPARISON OF TWO ALIGNMENTS		
Attribute	2010 Alignment over Stoney Trail	Existing Alignment Over Stoney Trail
Visual	Marginally Preferred	Marginally more intrusive
Noise	2 dBA increase assuming 12% trucks	Marginally Preferred
Traffic Operations	No significant difference	
NHD Geometry	Preferred	Poorer combination of Hor. and Vert. curves
Incremental Environmental Footprint	0.45 ha. larger footprint	Preferred Option
Staging & Detours	Preferred Option	Substandard weave, more roadway, more complex
Construction Cost	Preferred Option	Potential incremental cost of \$6M
Summary	Preferred Alignment, i.e., technical & cost	Constructible, but less preferred

NOSE HILL DRIVE / STONEY TRAIL INTERCHANGE

Functional Review

END OF PRESENTATION

THANK YOU

QUESTIONS?

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