

Title: Hwy 43:20 Intersection Improvements

Memorandum (or Approval) Date: June 16, 2017
 Design Exception Request Date: June 8, 2017
 Region: North Central
 Approval Status: Approved

Project Location				
Highway	Control Section	From km	To km	Existing AADT
43	20	14.60	15.80	7860

Project Type (Mark all that apply with an X)			
Functional Planning:	New Construction:	Reconstruction:	Paving/Surfacing:
Bridge:	Operations:	Geotechnical:	Environmental:
Shoulder Widening:	Preliminary Design:		Other: X (Intersection Improvements)

Summary
<p>This design exception is regarding the design of the proposed intersection improvements at the Hwy 43:20 Access between Rge Rd 40 and Twp Rd 554A (near km 15.00). A consultant proposes to adopt an eastbound (EB) median acceleration lane (MAL) at the intersection located on a tangent on Hwy 43. Based on Alberta Transportation Highway Geometric Design Guide 1995 (updated 1999) D-8.4, median acceleration lanes are considered undesirable, as drivers must accelerate to highway speed and attempt to merge to the right, which does not meet driver's expectations. A TIA report projected significant traffic turning movements at this intersection with regular use of Long Combination Vehicles (LCV). The TIA proposed a 3-legged intersection configuration with auxiliary and turning lanes for all the major traffic movements, including an EB MAL on Hwy 43 to accommodate high left turn movement from the southbound to eastbound.</p>

Rationale for Approval/Rejection
<p>MAL reduces delay time at intersections by allowing left – turning vehicles to make the turn once there is a gap in the lanes on the near side of the median instead of a gap in the passing lane on the far side of the median and in the lanes on the near side of the median, without stopping in the median.</p> <p>MAL allows vehicles to merge at higher speeds and reduce median delay and delay time at intersections</p> <p>According to studies in the USA, MALs benefit Two Way Stop controlled rural expressway intersections by reducing the potential for right angle collisions, side swipe collisions, and rear</p>

end collisions.

Based on 180g/W mass/power rating truck performance curve from HGDG, 510 m long acceleration lane is recommended with an additional 222m taper. The truck speed at the end of the acceleration lane would be approximately 66km/h which meets the required 60% of the posted speed limit of the through lanes.

Based on traffic projections in the TIA, the level of service (LOS) for the eastbound lanes (two EB lanes) in the design year (2026 and 2036) will be "A". There are sufficient gaps for the southbound left turn vehicles merging to the eastbound Hwy 43 from the eastbound median acceleration lane.

The projected southbound left turn volume at Highway 43:20 Access is 1300 vehicles per day in 2026. The intersection meets condition (1) and (5) stated in NCHRP Report 375.

Based on the projected traffic in the TIA, Major Road Intersection on Four-lane Divided Highway (Major intersection treatment with modifications) is warranted based on HGDG.

Additional Mitigation Required

In addition to geometric treatment, appropriate signage, pavement markings and illumination will be applied in detailed design and construction.

Key Words

Photograph/Diagram

Median Acceleration Lane, Four-lane divided highway, median width



