

**Title: Hwy 43:20/22, Highway Rehabilitation and Intersection Improvements**

Design Exception Request Date: February 15, 2017

Region: North Central

Approval Status: Approved

Date of Approval: February 24, 2017

| Project Location |                 |       |         |        |               |
|------------------|-----------------|-------|---------|--------|---------------|
| Highway          | Control Section | At km | From km | To km  | Existing AADT |
| 43               | 20/22           |       | 23.483  | 12.007 | 11320         |

| Project Type (Mark all that apply with an X) |                   |                 |                            |
|--|-------------------|-----------------|----------------------------|
| Functional Planning:                         | New Construction: | Reconstruction: | Paving/Surfacing: <b>X</b> |
| Bridge:                                      | Operations:       | Geotechnical:   | Environmental:             |
| Other:                                       |                   |                 |                            |

**Summary**

A southbound median acceleration lane (MAL) is proposed at the intersection of Hwy 43:22 and Twp Rd 544. Based on the current standards in the Alberta Transportation Highway Geometric Design Guide D-8.4, a median acceleration lane is not recommended as drivers must accelerate to highway speed and attempt to merge to the right, which does not meet driver's expectation. However, a gravel operation is located at the quadrant which uses Hwy 43 & Twp Rd 544 intersection to access Hwy 43. There are approximately 360 Tandem -Trailer Dump trucks coming in and out of the gravel pit site daily and the vast majority of the trucks from site make westbound (WB) and southbound (SB) movement onto SB Hwy 43.

**Rationale for Approval/Rejection**

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.

MAL allows vehicles to merge at higher speeds and reduce median delay and delay time at intersections

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 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 2.5% annual traffic increase, the level of service (LOS) for the southbound lanes (two SB lanes) in the design year (2036) will be "A". There are sufficient gaps for the westbound left turn vehicles merging to the southbound Hwy 43 from the southbound median acceleration lane.

The intersection of Hwy 43 and Twp Rd 544 meets condition (1) and (5) stated in NCHRP Report 375.

**Additional Mitigation Required**

Appropriate signage, pavement markings and illumination will be applied in detailed design and construction

**Key Words**

Median acceleration lane, four-lane divided highway, median width

**Photograph/Diagram**

