**Motivation**

This project was initiated due to the high occurrence of right-angle collisions at rural divided intersections with larger than normal median widths. It is believed that extended medians give the impression of right-of-way to drivers on the minor approaches. The objective of this study is to confirm this relationship and determine the width at which new standards are required.

**Collision Model**

Deriving a generalized linear model for expected collisions at unsignalized rural divided intersections yielded:

\[
C = -6.1 + 1.4 \times 10^{-4} (AADT_{max}) + 3.8 \times 10^{-3} (AADT_{min}) + 8.8 \times 10^{-1} (\text{Length}_{m^2})
\]

Plotting the raw residuals against the expected collisions from the model shows little drift but increasing variance towards the boundary values. Removal of outliers had only a nominal impact on the performance of the model.

**Results**

- There is a strong relationship between median width and collision rates.
- Median width is much less significant than the square of the median width.
- Square of median length contributory with \( p=0.023 \).
- Average collisions per MEV increases sharply after approximately 45m.

**Discussion / Recommendations**

- Median widths are positively related with segmental safety but negatively related with intersection safety.
- The MORECOAR [1] report suggests compatibility, consistency, and affordability in collision mitigation strategies.
- NCHRP 650 [2] suggests double yellow pavement markings in wide medians as well as yield bars. This is also recommended by Ontario’s MTO [3] and the Federal Highway Administration [4].
- Given the definitive point at which positive guidance is lost, a new design standard consistent with MTO, FHWA, and TRB suggestions is recommended for intersections with medians >45m.

**Methodology**

- 171 rural unsignalized divided intersections for which turning movement counts were available were selected for analysis.
- Digital video logs were reviewed to ensure that no contributory factors were involved.
- Median widths were calculated in GeoMedia as the length of an intersecting segment through outside lane markings on major highways.
- Generalized linear model was developed to illustrate the relationship between median width and collisions.
- One-way ANOVA test of average collisions per million entering vehicles across binned median width groupings was carried out.

**Sample wide-median intersection, Highway 43 at Range Road 82, Wembly, Alberta. [2006 ESRD Aerial Imagery]**

**The sample sites are primarily between 20-40m. The Alberta Geometric Design Guide (1999) currently encourages medians of 55m or wider to accommodate trucks and to allow for future multi-laning.**

**References**