Alberta Transportation’s Early Experience Using an IRI Based Smoothness Specification
Jim Gavin P.Eng.

Smoothness Testing in the Past

- Purchased first California Profilograph in 1978 – a first within Canada.
- Purchased several Cox CS8200 computerized profilographs in mid 1980’s.
- End Product Specifications for pavement smoothness developed in late 1980’s – another first within English Canada.
- Late 2000’s: Profilograph testing completed using different platforms – Cox computerized, Paveset and Inertial Profilers.

2013 Construction

- IRI smoothness specification first used on seven paving contracts in 2013.
- Tested over 530 km of rehabilitation including multi-lift, single lift and mill & inlay.
- Ride Quality assessed on a 100 m sublot basis using the Mean IRI (MIRI) – average of left and right wheel paths.
- Areas of Localized Roughness (ALR) measured using short continuous IRI (right wheel path) with a moving baseline of 7.62 m. Expressed as length of pavement with an IRI > 2.00 m/km.
- Separate bonus/penalty criteria based upon type of paving – multi-lift, single lift, etc.
- Contractor supplies the acceptance testing. Department may undertake verification testing.

Revisions for 2014

- All paving projects using the IRI based specification as of February 2014.
- Minor adjustments to the penalty schedule for Ride Quality on multi-lift paving.
- ALR trigger value increased from 2.00 m/km to 2.40 m/km.
- Penalty assessment for ALR revised to $40/m for multi-lift paving and $15/m for single lift and mill & inlay paving versus $12/m and $4/m in 2013.
- Criteria for “must repair” ALR is removed. Now a field decision by the project consultant.

Bumper Mounted Accelerators and Laser Sensors

Pre-Qualification Process

- Highway site profiled using a World Bank Class 1 reference profiler. Site chosen was considered to be smooth – MIRI of 1.10 to 1.30 m/km.
- Site is 500 m long with painted “profile” lines placed within the wheel paths.
- Hi-speed inertial units take five runs over the certification site.
- Hi-speed inertial units take five runs over the certification site.
- Accuracy and repeatability evaluated using two procedures.

Alberta Transportation Procedure

- Mean IRI to be within ±10% of reference profiler.
- IRI for each run is not to be > ± 5% of the mean value.

AASHTO R56 Procedure

- Cross-Correlation of the HSIP profiles to that of the reference profiler. Accuracy 90%, Repeatability 92%.