High Speed Inertial Profiler

Procedures to follow for the Inertial Profiler.

Caltrans Test Method 387 – METHOD OF TEST FOR OPERATION, CALIBRATION AND OPERATOR CERTIFICATION OF INERTIAL PROFILERS

References:

AASHTO R 56 – Certification of Inertial Profiling Systems

AASHTO R 57 – Operating Inertial Profiling Systems

AASHTO E2560 – Standard Specification for Data Format for Pavement Profile

Calibration steps prior to collecting data.

Accelerometer Calibration

Laser Height Verification

Calibration steps prior to collecting data.

Bounce Test Verification

Distance Measuring Instrument Calibration

Vehicle Tire Pressure

- Verify the tire air pressure on the wheels of the host vehicle daily and maintain according to the vehicle manufacturer's recommendations.
- Maintain a log with the inertial profiler in accordance with AASHTO R 56.

Repeatability Testing, required once Per Project.

Repeat Proval - PCM - Results.pdf (SECURED) - Adobe Reader

File Edit View Window Help

Open 1 / 4 100% Tools Fill & Sign Comment

Repeat Proval

Analysis: Profiler Certification

Inputs

Maximum Offset (ft): 3.00
Minimum Repeatability (%): 92
Minimum Accuracy (%): 90
Basis Filter: IRI (with 250mm Filter)
Comparison Filter: IRI (with 250mm Filter)

Selections

File	Profiles	Basis	Run	Sample Interval
20150924_10STA120_WB_1_B_4.10_0.00_EXIST_HMA_repeat01 T1 to T2	Left + Right	No	1	1.000000
20150924_10STA120_WB_1_B_4.10_0.00_EXIST_HMA_repeat04 T1 to T2	Left + Right	No	4	1.000000
20150924_10STA120_WB_1_B_4.10_0.00_EXIST_HMA_repeat05 T1 to T2	Left + Right	No	5	1.000000
20150924_10STA120_WB_1_B_4.10_0.00_EXIST_HMA_repeat06 T1 to T2	Left + Right	No	6	1.000000
20150924_10STA120_WB_1_B_4.10_0.00_EXIST_HMA_repeat02 T1 to T2	Left + Right	No	2	1.000000

Summary Results

Statistics

Statistic	Repeatability - Left	Repeatability - Right
Comparison Count	10	10
% Passing	100.00	100.00
Mean	96.61	97.86
Minimum	94.85	96.54
Maximum	99.15	98.99
Standard Deviation	1.3	0.7
Grade	Passed	Passed

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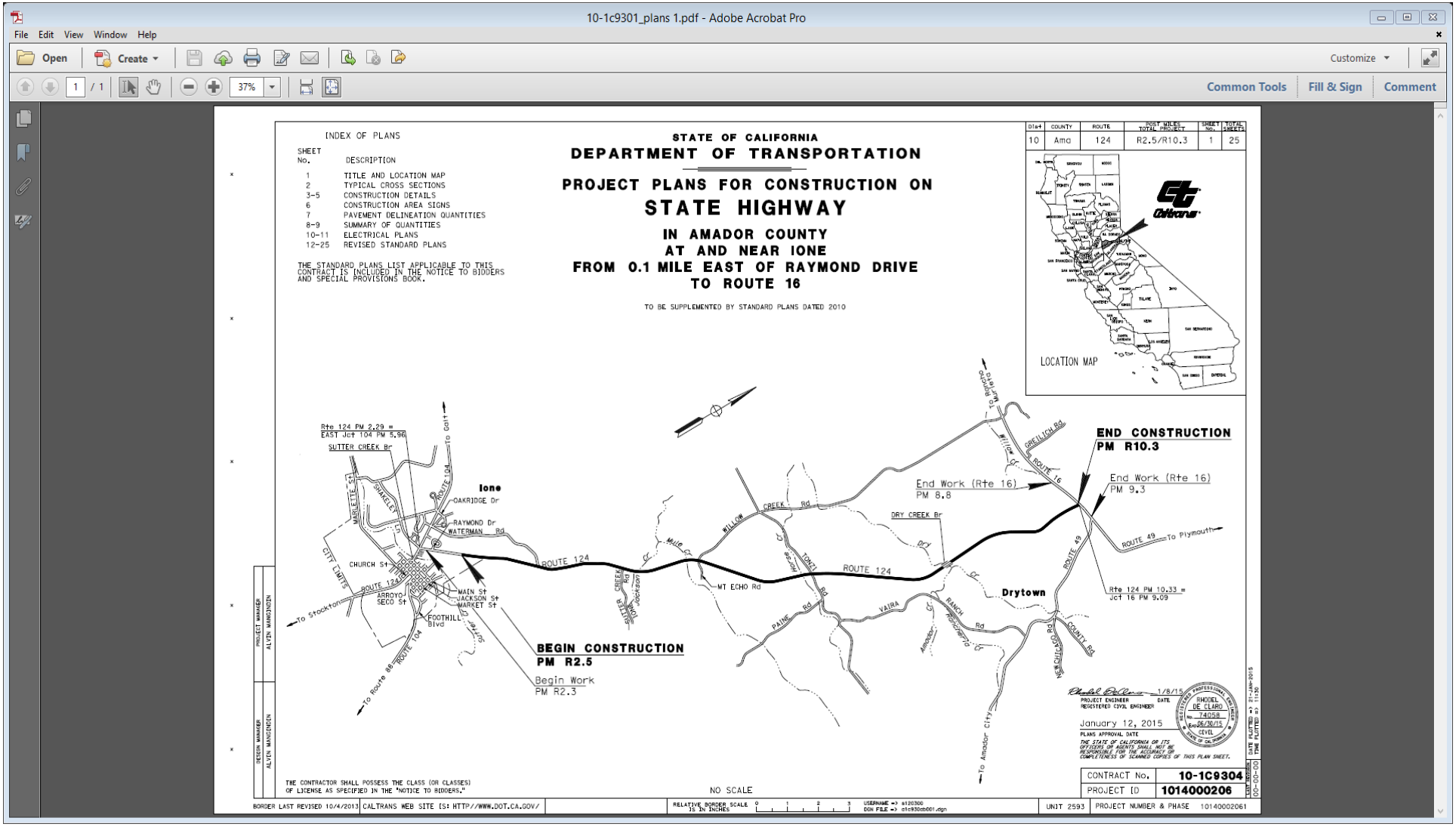


It is important to have the project plans and specifications available. The project plans offer start and end location for the project. It also identifies bridges, intersections, and additional information that may be needed. Contractors that can help prepare the profiler operator with these items will often times enhance the amount of information we can provide on the collection report.

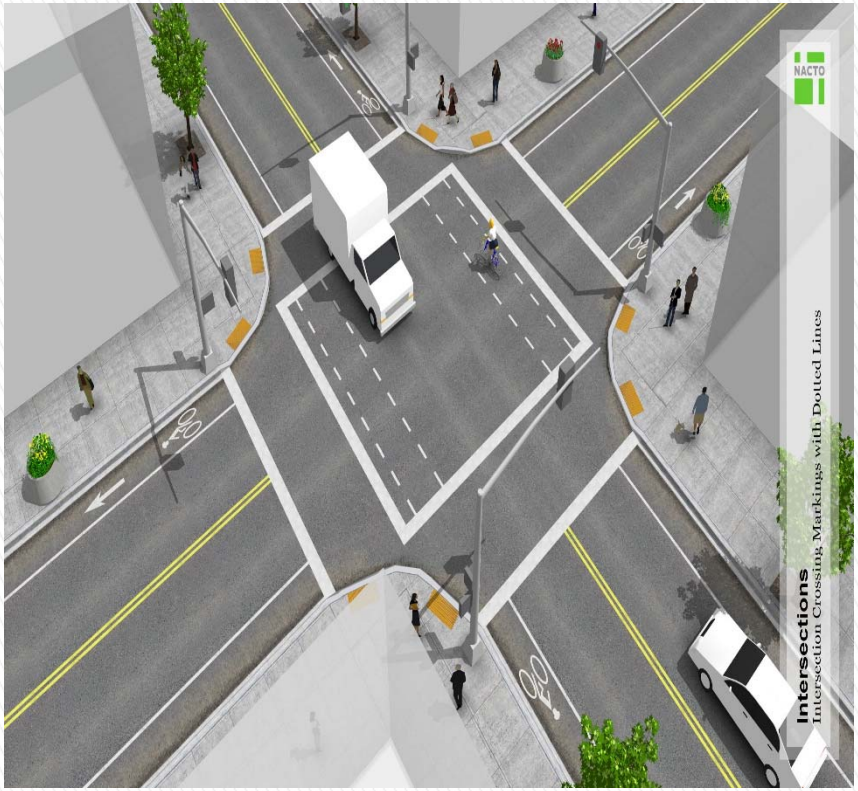
It is per the specification that the operator marks the start and end location on the pavement.

IP Start Location

IP End Location

Additional efforts marking events such as manholes, inlet drains, bridge/approaches, intersections, are good practices for the operator to use in the field. Marking these events help off-site personnel better understand areas of work that often show high IRI values.

Bridge, Approach & Departures



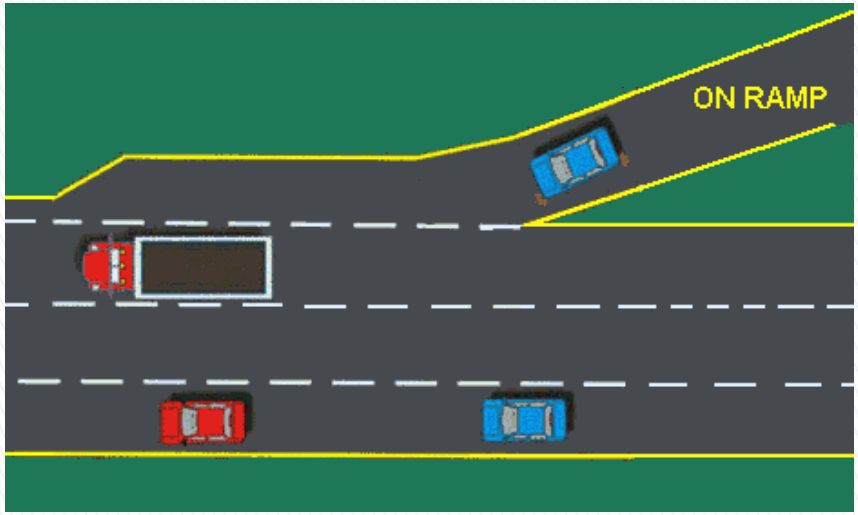
Intersection

Identifying these items allows the operator to set up cones with 3M strip tape to trigger the "EE" Electric Eye or a flag system so the operator can apply the event during the collection process. Also having these events marked on the pavement allows the operator to perform repeat collections as the project advances and the data can be layered through the construction process for review.

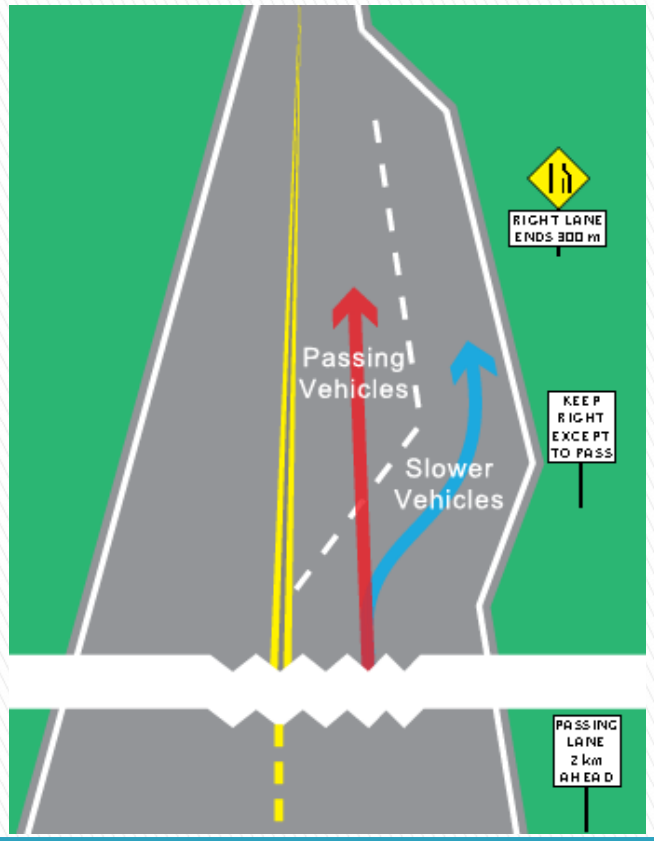
Electric Eye, reads 3M

Traffic Cone with 3M

Accelerator lanes, on-off ramps, and passing lanes less than 1000' feet are exempt from the inertial profiler system. If these lanes exceed the 1000' feet in length, it is good practice to start the collection once the vehicle's collection system is completely in the lane of travel. Ending the data collection is done when the lane is either starting to end or taper from mainline.

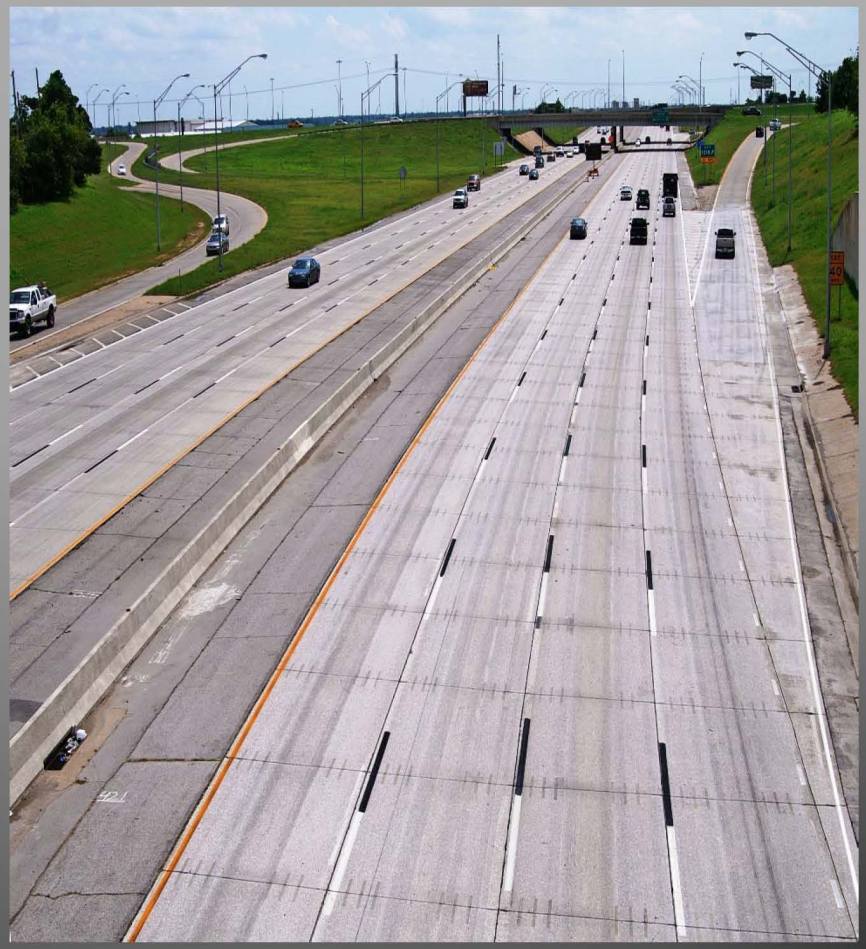


On Ramp and Accelerator Lane

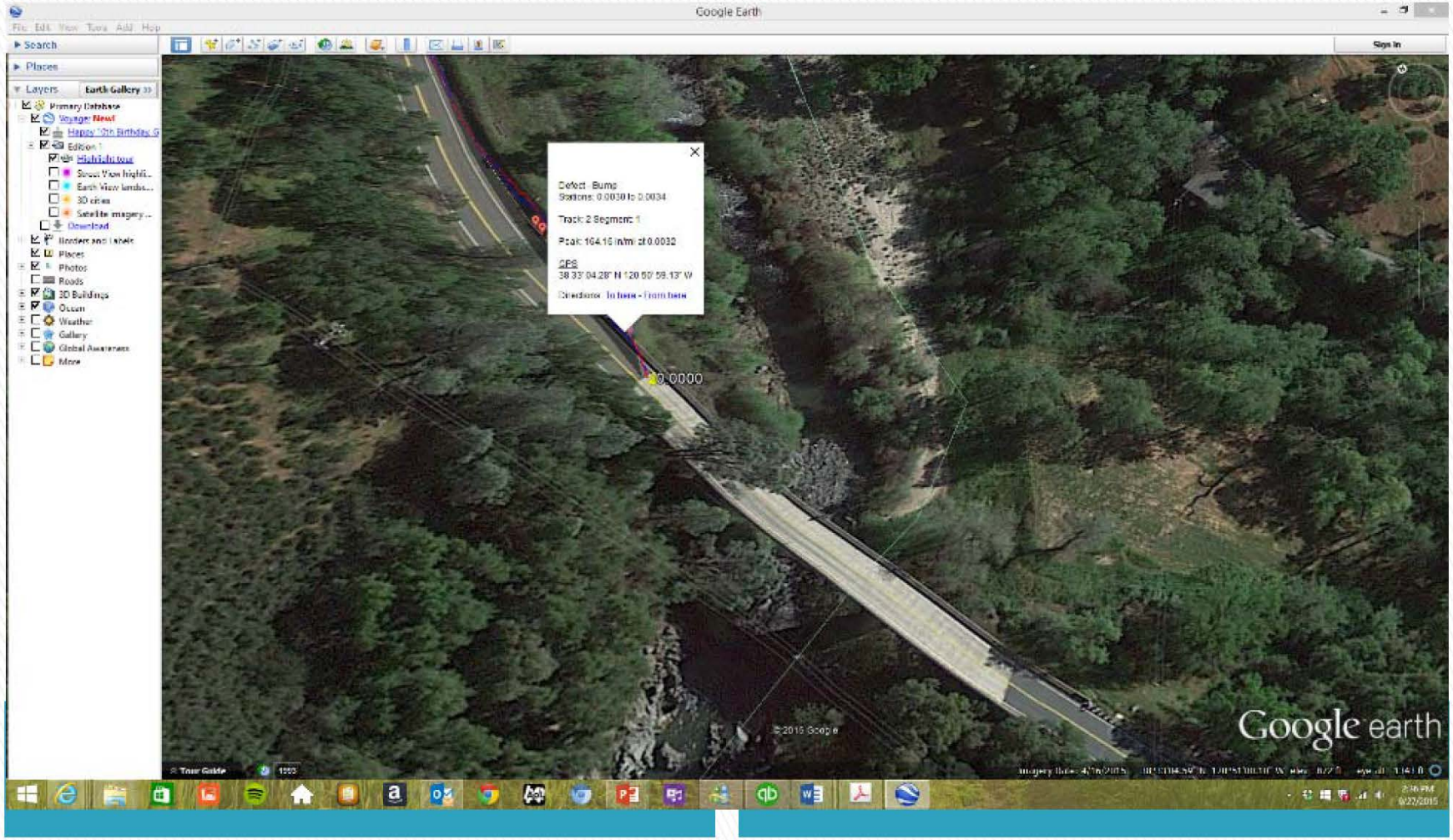


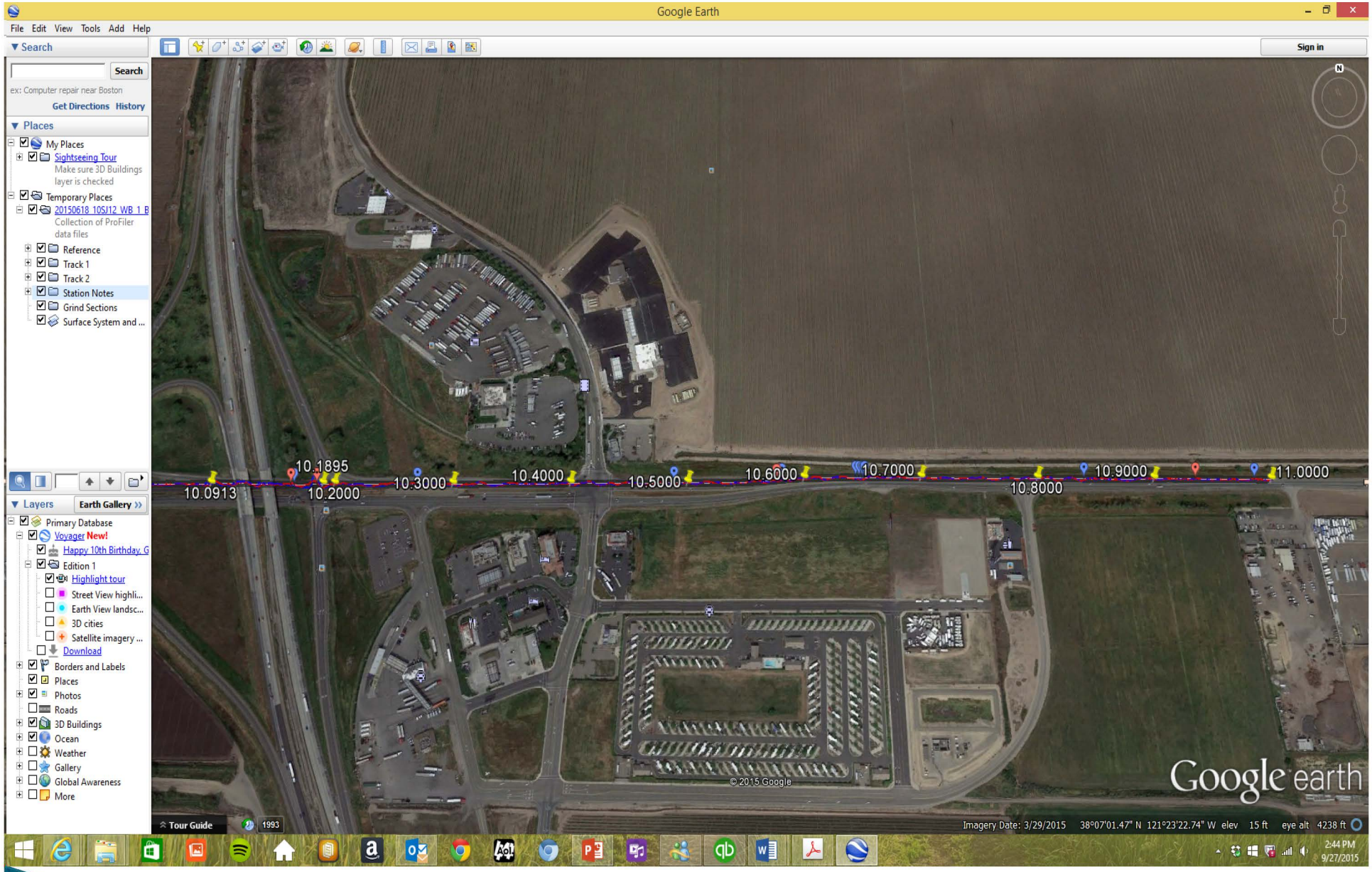
Passing Lanes

Challenges with the inertial profiling system include collecting data with longitudinal construction joints. Lasers enter the construction joint line and provide erroneous data of the pavements profile.



Issues not having traffic control: Some highways are difficult to work on due to extreme volume of traffic, small shoulders, or even blind corners not allowing the operator to identify the start and end location of the project. SSI's system provides additional tools to work with scenarios like this and also any discrepancies with distance using the high accuracy GPS system. The data collected can be viewed on a map application to determine start, end, and event locations. The data can then be cropped to correct start and end sections of the project.

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20150618_10SJ12_WB_1_B
Collection of ProFiler data files
Reference
Track 1
Track 2
Station Notes
Grind Sections
Surface System and ...
Layers
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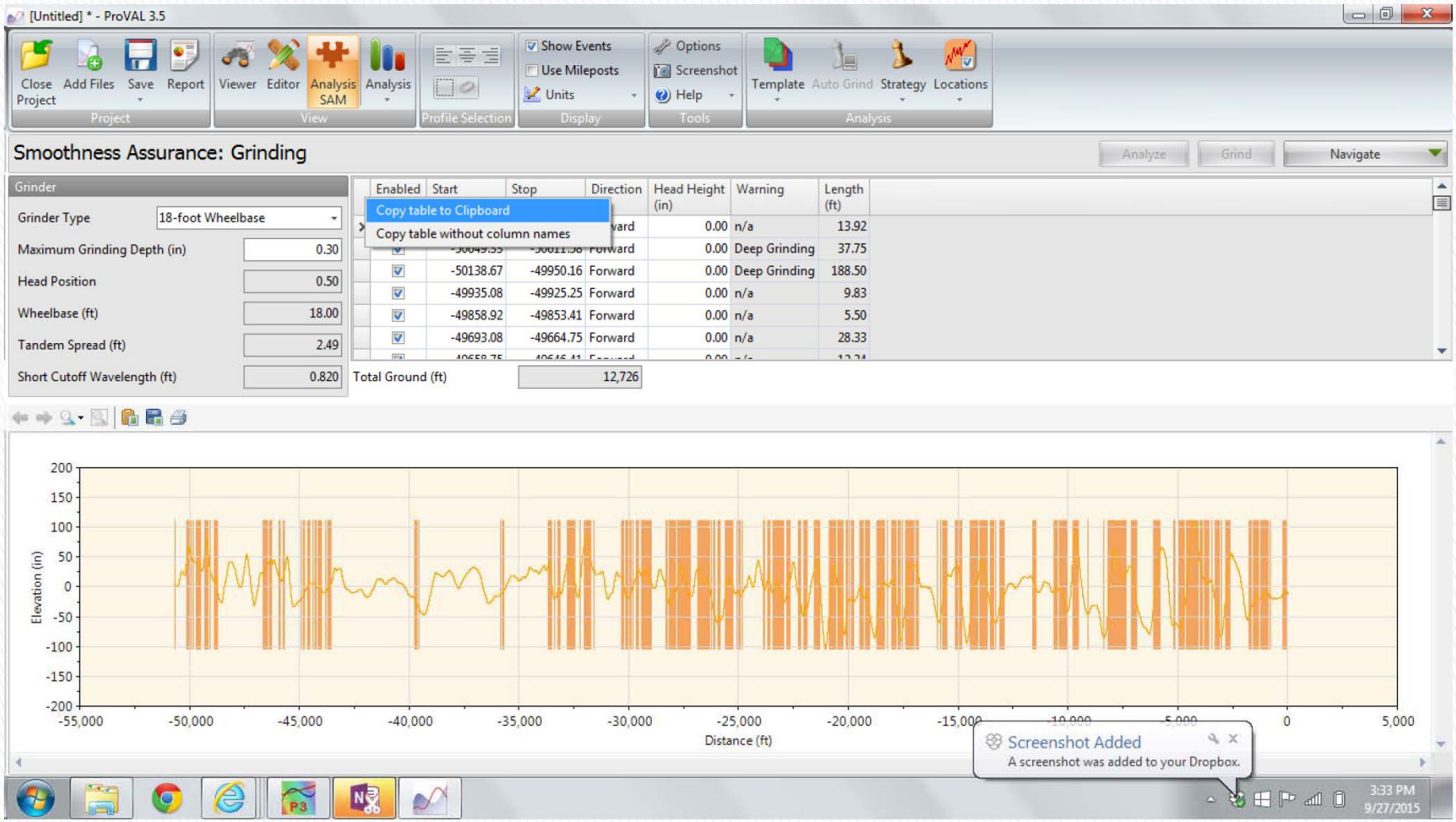
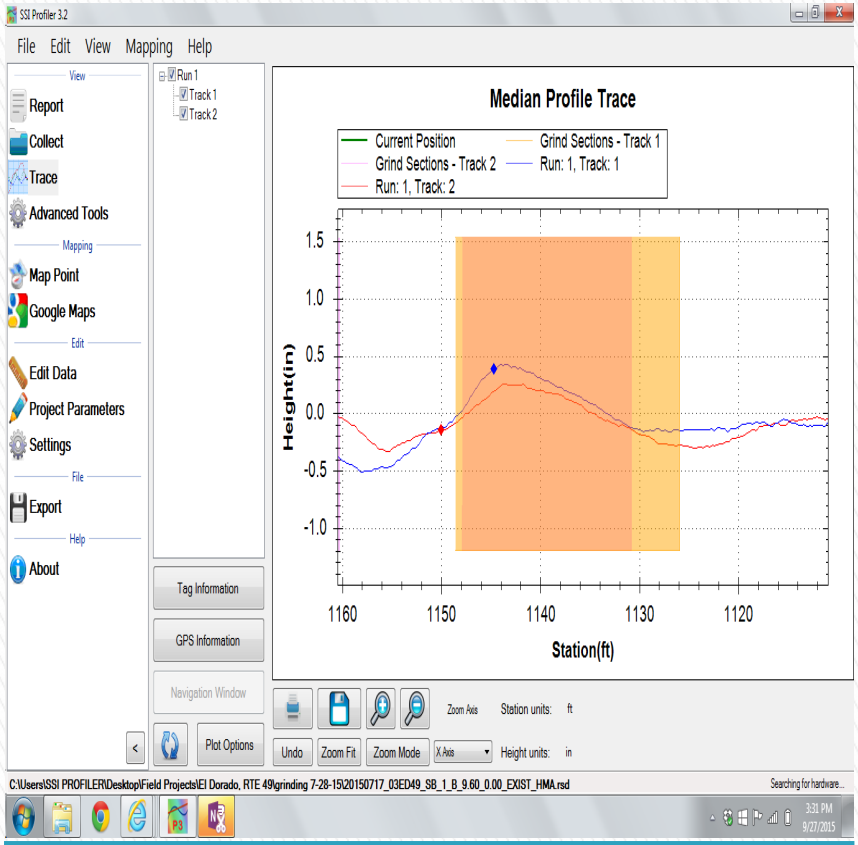
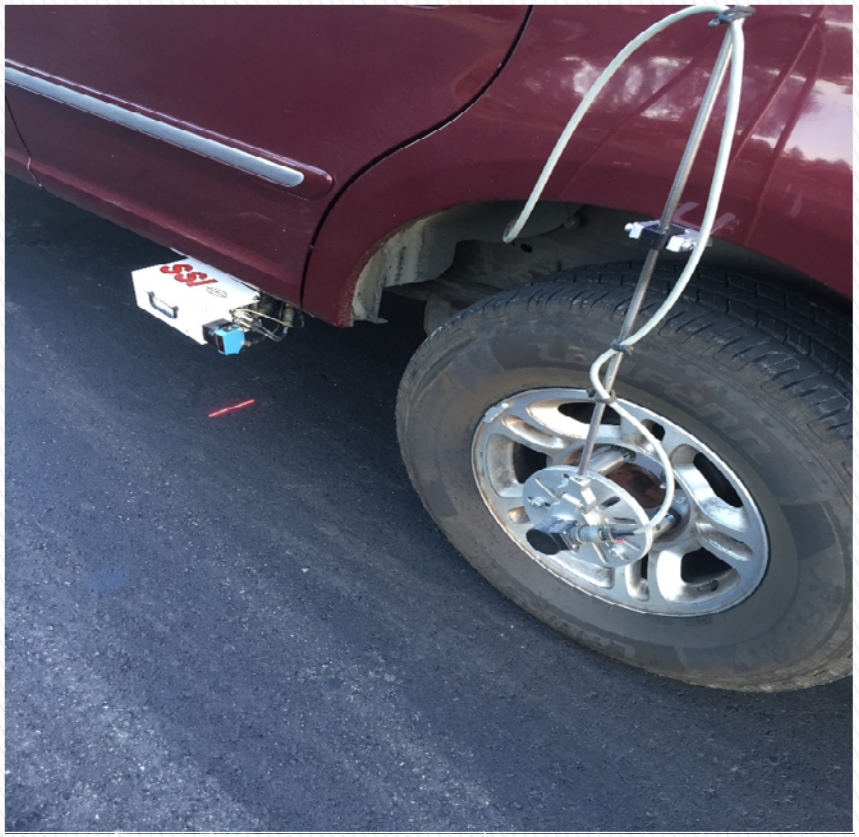
Identifying areas of localized roughness (ALR) for grinding. SSI's raw data is processed through ProVal's Smoothness Assurance Grind Simulator.



Smoothness Assurance Analyses data is copied/pasted back into SSI's profiler system. Areas of localized roughness are located on the project using the DMI (Distance Measuring Instrument) and High Accuracy GPS system.



SSI Profiler with High Accuracy GPS



Distance Measuring Instrument

Project Geography IRI Spec

- Interstate IRI specification vs Remote State Highways.
- * Design build method:
- * Paving over existing roadway conditions.
- * Dig-outs
- * Mill and Fill overlays

- Different methods of build design with the same IRI Specification.

Present Highways

Best Final Outcome

- Partnership Collaboration
- A unified approach with all involved parties

- Equals

The best final product for ALL.

Issues with grinding short ALR (feathering of grinds and the ability of pavers to remove small ALR defects).

- End of Presentation