Automated Pavement Condition Survey (APCS)

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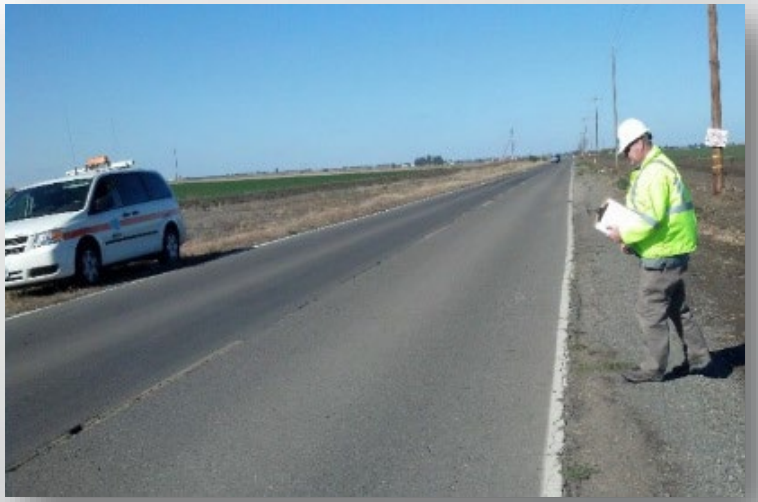
California Transportation Commission (CTC)

Evolution of Pavement Condition Surveys

1. Manual
   a. Sampling, single outside lane and first 100 foot for each mile
   b. Every 3 years to complete one cycle
   c. Pavement Raters exposed to live traffic for visual survey and IRI measurement.
   d. Took teams of two to run the pavement survey vans.



2. Automated Pavement Condition Survey (APCS)
   a. Lane by lane full coverage
   b. ROW images feeding other programs
   c. One collection cycle takes about 6 months to
   d. collect and process.
   e. Reduces workers' exposure to open traffic during data collection.
3. 2012 APCS as a trial
4. 2015/16 APCS, fully automated
5. 2018/19 APCS, semi-automated

What Is APCS?

1. A statewide program, supporting both CT programs and the Local NHS system
2. Collects pavement surface data
   a. Imagery data that shows surface distress data for asphalt and concrete pavements and a various assets along the roadway.
   b. Surface Profile data that includes international roughness index (IRI), rutting, fault height, cracking, and Mean Profile Depth (MPD)
3. Asset extraction and legal support
   a. Highway Performance Monitoring System (HPMS)
   b. Photolog
   c. Imagery based asset data collection and monitoring
4. TSN and LRS improvement
   a. TSN verification
   b. LRS linework improvement

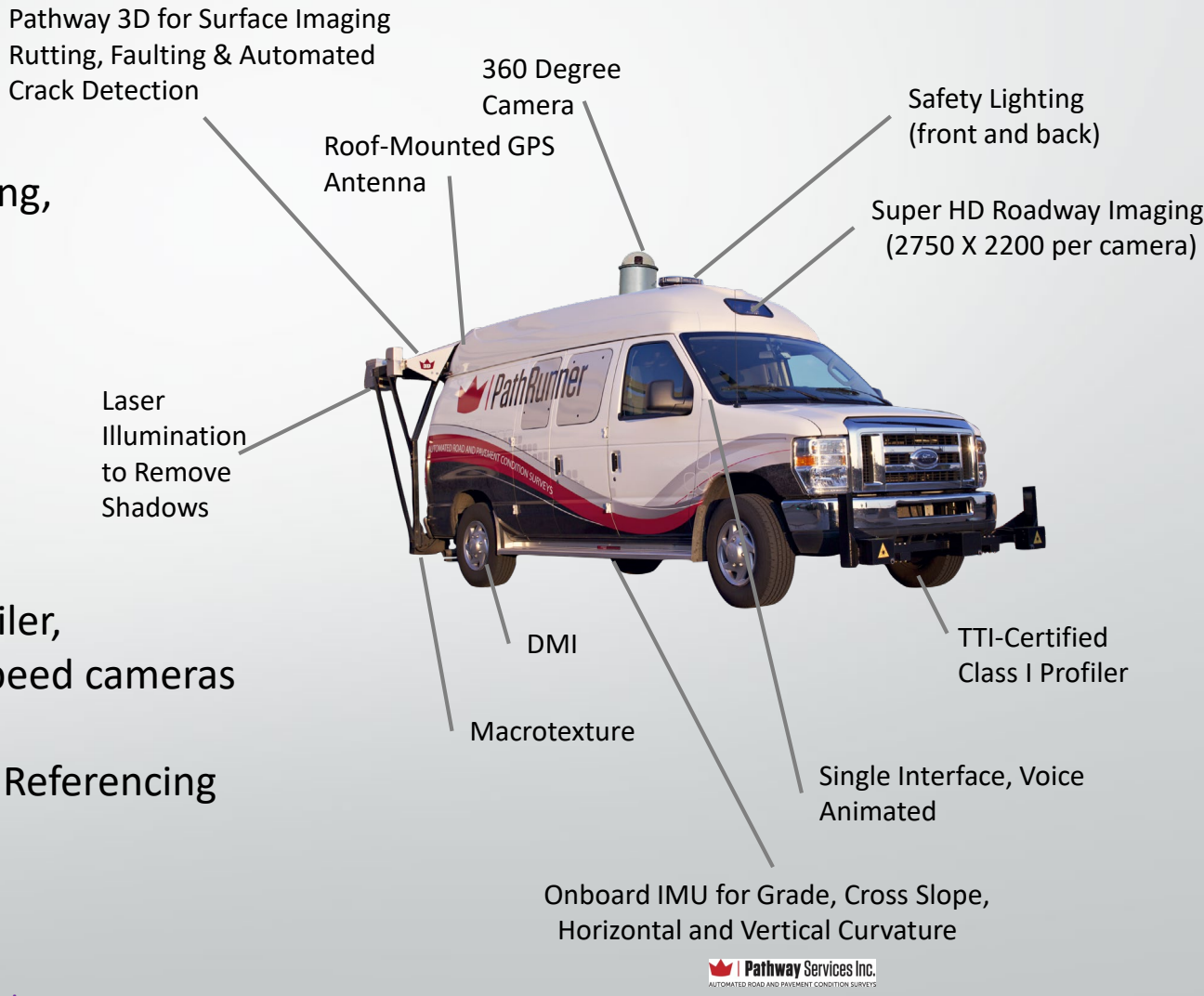
APCS – Automated Pavement Condition Survey

Who: State hired contractor
What: Pavement condition: IRI, Cracking, Faulting, Rutting

Images: Downward, forward and ROW

Frequency: Annual

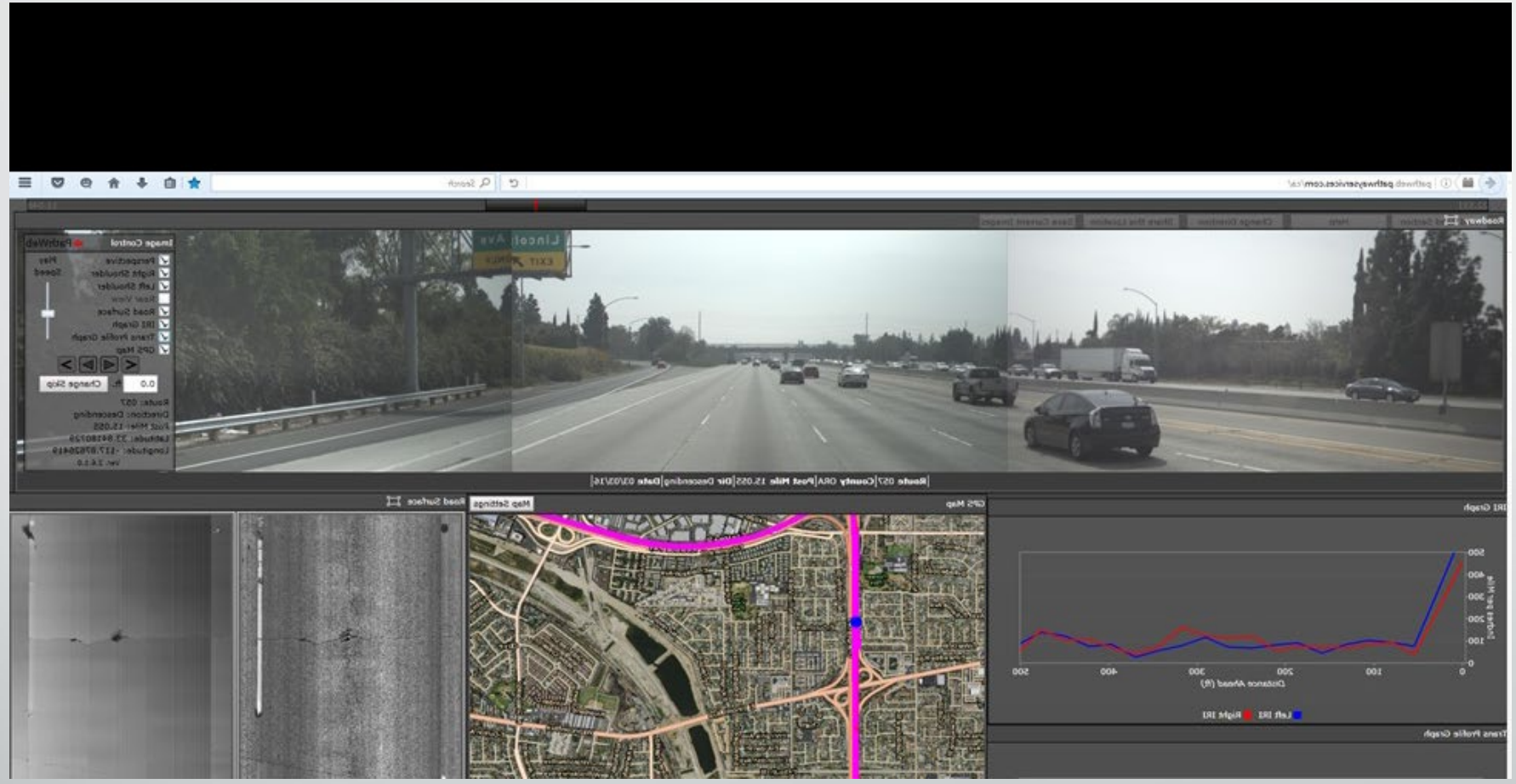
How:
Collection: Vehicles equipped with inertial profiler, transverse laser system, and high speed cameras
Processing: Automated (algorithms)
Referencing: Data aligned with Caltrans' Linear Referencing System (LRS)



APCS Distresses Used for Condition Ratings

- **Asphalt pavements:**
  - IRI
  - Rutting
  - Cracking
- **Concrete pavements:**
  - IRI
  - Faulting
  - Cracking

Example of a Screen Shot from APCS



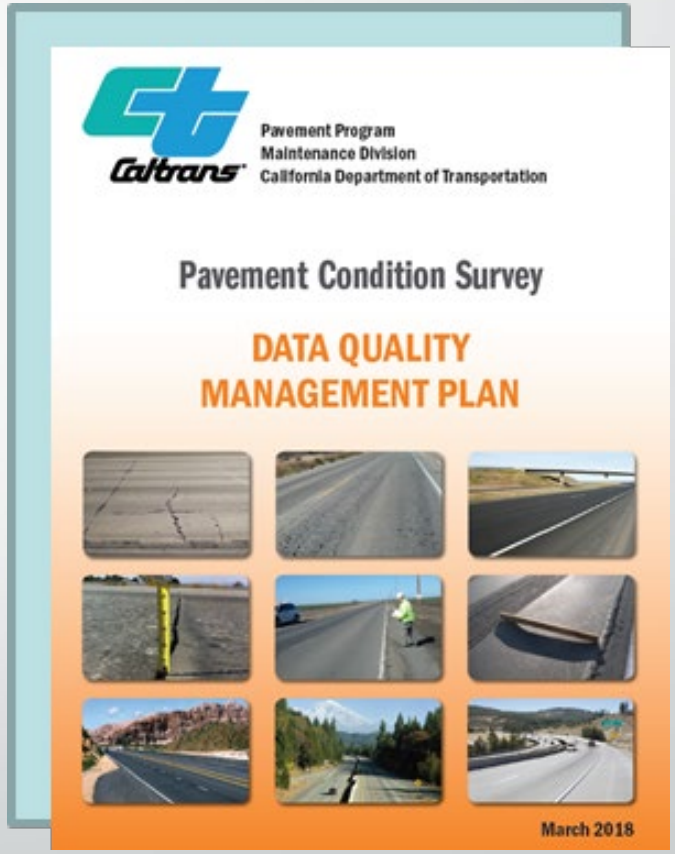
Screen shot illustrates ROW, downward surface image, GPS location and tabular summary.

How Does Caltrans Report Distress

- FHWA only requires states to report pavement condition for outside lane of the ascending roadway direction, or both direction outside lanes on a divided highway – North and East.
- Caltrans reports accordingly to FHWA through the HPMS.
- Caltrans internal reporting to California Transportation Commission and Legislature is the aggregated pavement condition for every lane-mile of roadway in both directions.

APCS Quality Assurance (QA)

- DQMP (Federal FAST Act req'd)
- Caltrans QA Process
  - Data completeness check ≥ 95%
  - Field verification at elemental & 0.1 mi (≥ 85%)
  - PA™ software Upload (100%)
  - Year to Year consistency
- Cracking Data Acceptance
  - 85% segments <u>within 10%</u> (of Caltrans value)



Continued Efforts to Enhance APCS

1. Minimize variability
   - Standardizing data format to avoid proprietary vendor data formats
   - Missing segments
   - Technology constraints
2. Continue to strengthen QA/QC, implement tighter tolerances
3. Make APCS easier to visualize, review, and accessible to all
4. Year to year data consistency

PaveM – Introduction

- Pavement Management System using proprietary Pavement Analyst software configured for Caltrans
- Complies with Moving Ahead for Progress in the 21st Century Act (MAP-21)
  - Utilizes automated pavement performance data
- Monitors and predicts pavement performance
- Recommends pavement treatments
- Helps achieve targeted performance goals
- Helps analyze pavement investment benefits

PaveM - Inputs

- APCS
- Statewide Approved Program project work plan
- Construction History
- Traffic
- Climate
- Linear Referencing System (LRS)

Office of Pavement Programming

- Assists districts in identifying, selecting, and programming quality SHOPP and HM projects by supplying the following services:
  - Providing reports that Forecast future pavement condition data.
  - Developing pavement targets and allocations (by class) that meet Map-21 goals.
  - Providing a “network level” Recommended Project list
  - Assists districts with identifying pavement strategies based on pavement condition and corridor history that ensure the department selects “the right project at the right time”.
  - Field reviewing project locations with districts.
  - Providing general pavement scope expertise to districts during the project planning and design phase.
  - Assisting districts with prioritizing projects based on pavement condition.
  - Communicate with districts any changes in pavement guidance, policies, and specifications that may affect project selection.

Thank You!

Improve Pavement Quality Across California