Network-Wide Pavement Historical Comparison

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RPUG Road Profile Users' Group

Acknowledgements

- Xiaoyang Jia, Pavement Management Engineer
- Mark Woods, State Pavement Engineer
- Ulises Martinez, Pavement Evaluation Manager

TN TDOT Department of Transportation

Overview

- Background of Time-Series DQMP checks
- Time-Series Application Creation
- Initial Results
- Lessons Learned and Next Steps

Background

Picking DQMP Thresholds

- Based on historical trends and feedback from FHWA

Items	Expected Changes of Values
IRI	-10 to 30 in/mi
Rutting	<0.2 in

Source: Quality Improvement and Application of TDOT Pavement Management Systems (PMS) Data https://www.tn.gov/content/dam/tn/tdot/long-range-planning/research/final-reports/res2013-final-reports/RES2013-48%20Final%20report_Approved.pdf

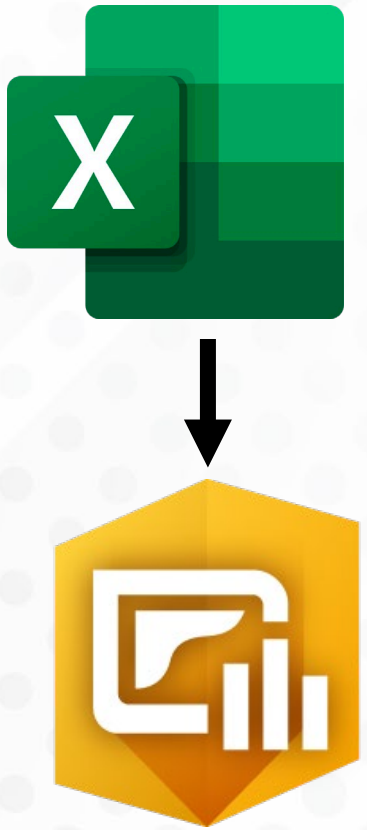
Use of Time-Series Data

- Identify road sections that have fast decline in pavement performance.
- To identify road sections that may be subject to data collection variability and potential issues of pavement condition data at network-level.

DQMP Report from Vendor

- Requested a time-series report from vendor
- Initial request didn’t specify delivery format and DOT previously used excel docs.

- Mandli wanted to:
  - Prevent lose files being the system of record
  - Provide a more user-friendly environment



Time-Series App Creation and Use

Application Requirements

- Widely used platform
- Security
- Web-based
- Dynamic (Drill down to results)
- Can be integrated with pavement data

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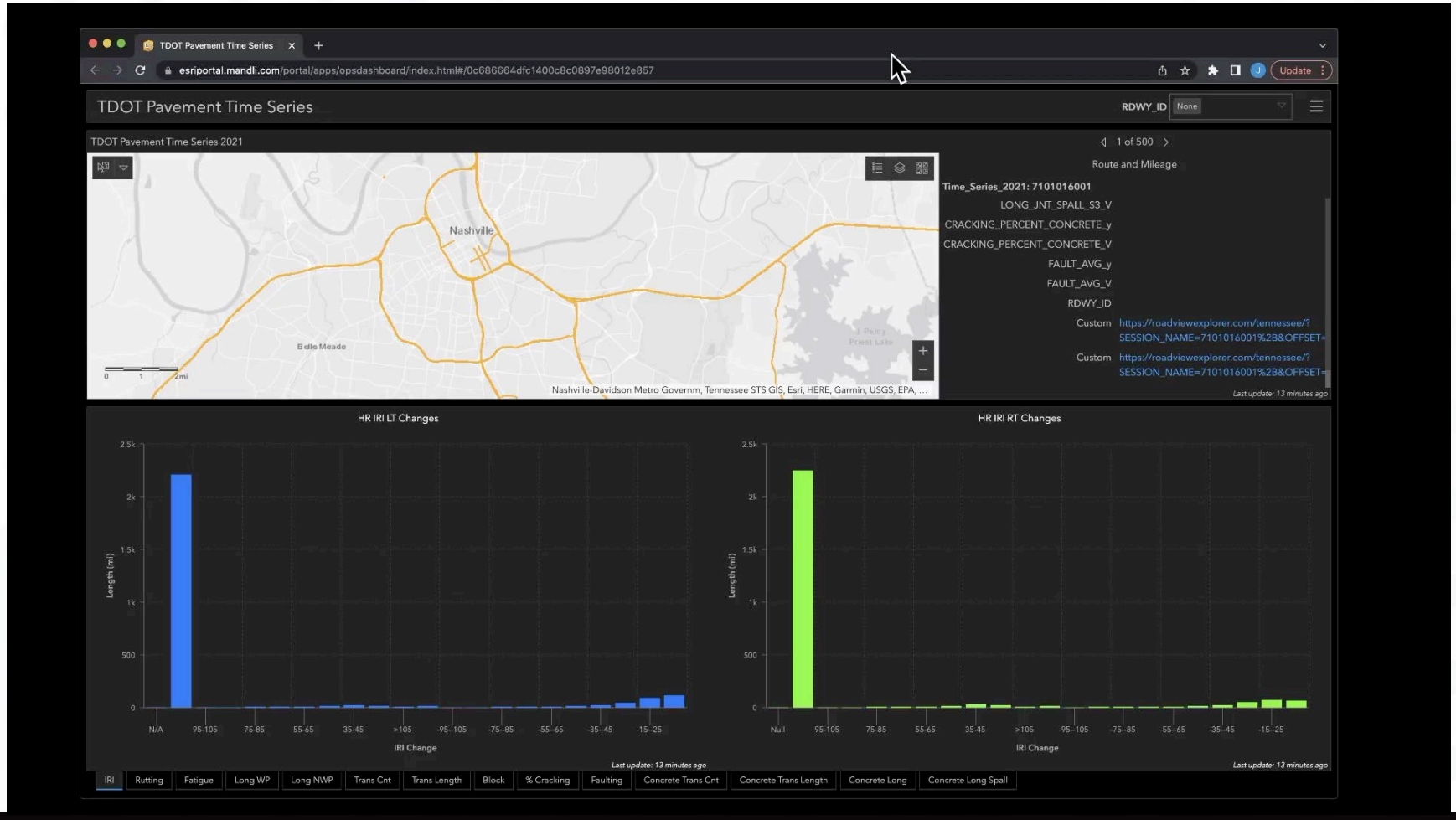
ROADVIEW EXPLORER 5

TDOT Time-Series Application



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Review Procedure

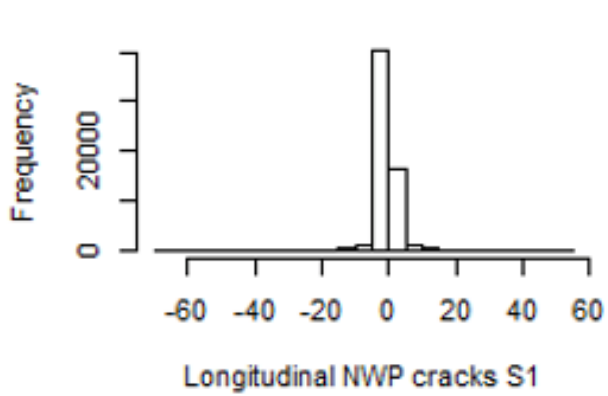
- Identify data out of expected ranges
- Determine cause:
  - Pavement surface change
  - Rapid deterioration
  - Data Error
- Review the DQMP annually and adjust as needed

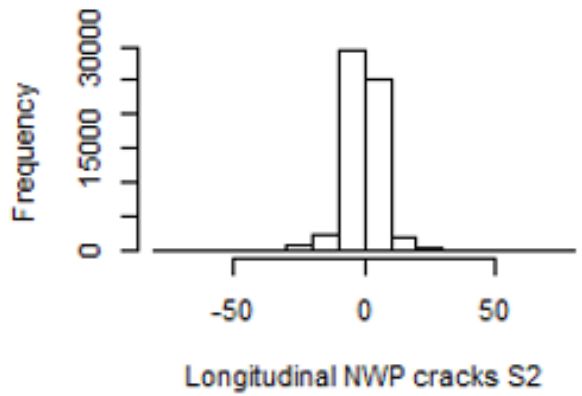
Results

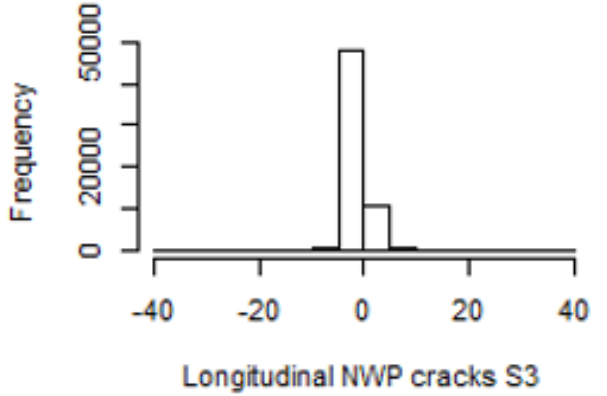
2020 vs 2021 Comparison

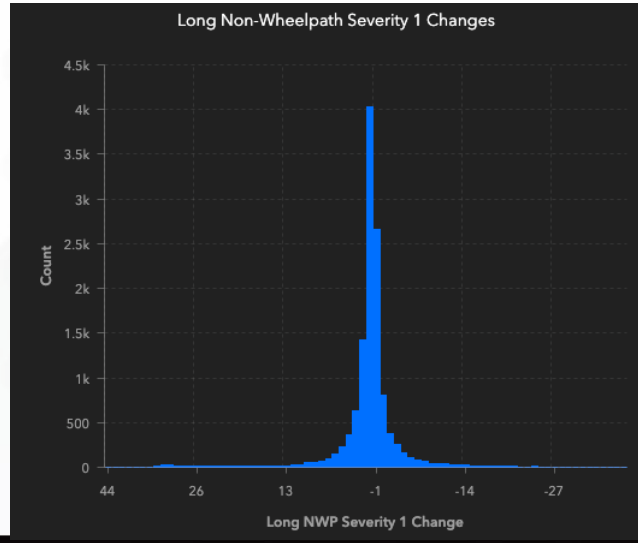
- Over 85% of the segments are within the expected range of time-series thresholds for IRI (difference of IRI between current cycle and previous cycle: -10 to 30 in./mi.
- Over 99% of segments have a change of rut depth between two data collection cycles less than 0.2 inches

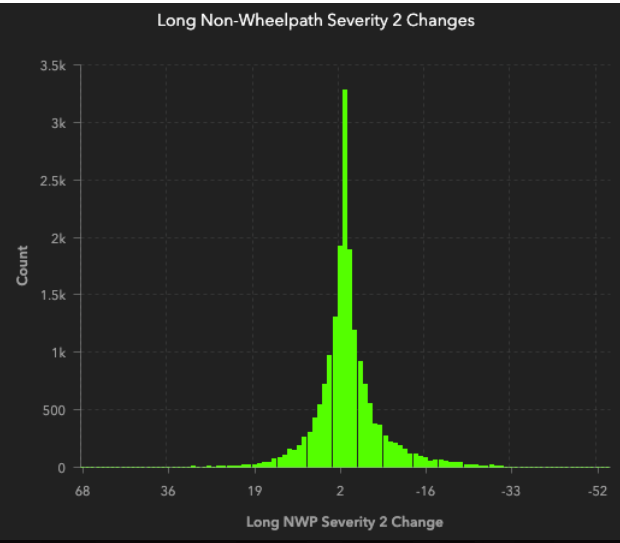
Sample Charts

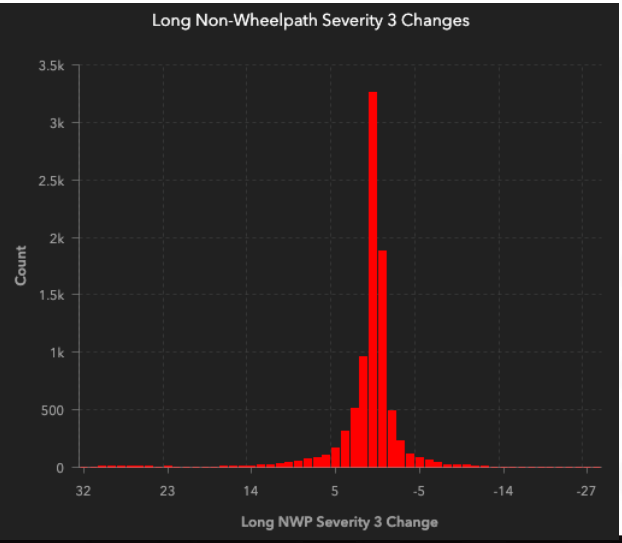












Lessons Learned & Next Steps

Lessons Learned

- Cost of app performance with large datasets
- Time required to review large datasets

Next Steps

- Continue data review and feedback
- Increase the functionality of the dashboard
- Classification of outliers
- Develop expected value trends for additional attributes

Thank You

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