



# Pavement Deterioration Modeling

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VERMONT AGENCY OF TRANSPORTATION  
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## Acknowledgements

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- Emily Parkany & Ashlie Mercado, Research Office



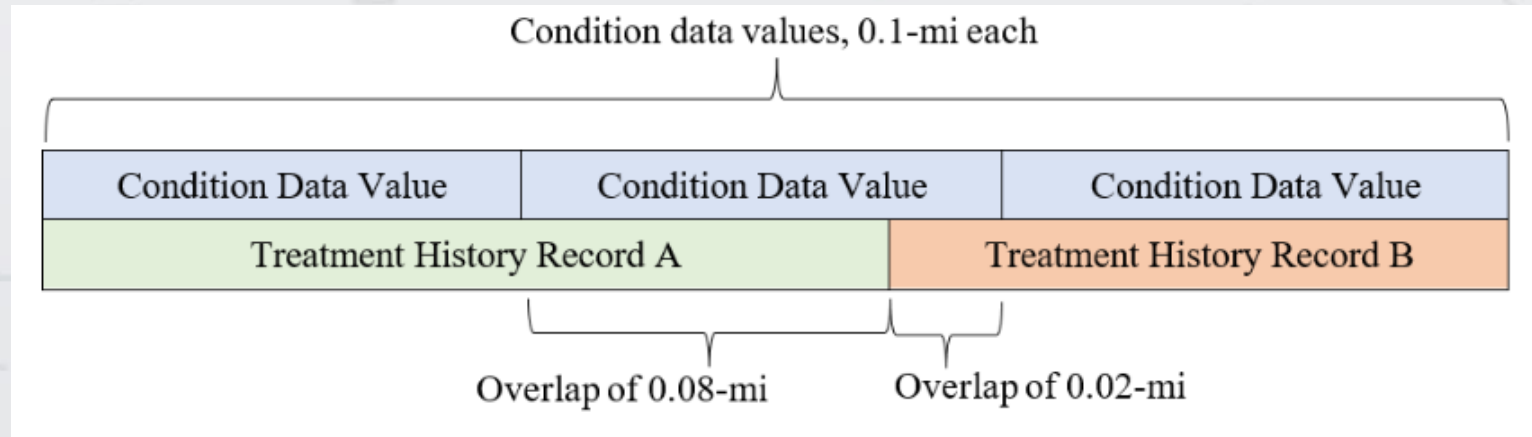
# Background

- VTrans annually collects pavement condition data such as smoothness, rutting, and cracking for 3,100 centerline miles of paved public roads.
- Current models had not been updated since 2004.
- Models had not been established for thin overlays or the National Performance Measure (NPM) for cracking.



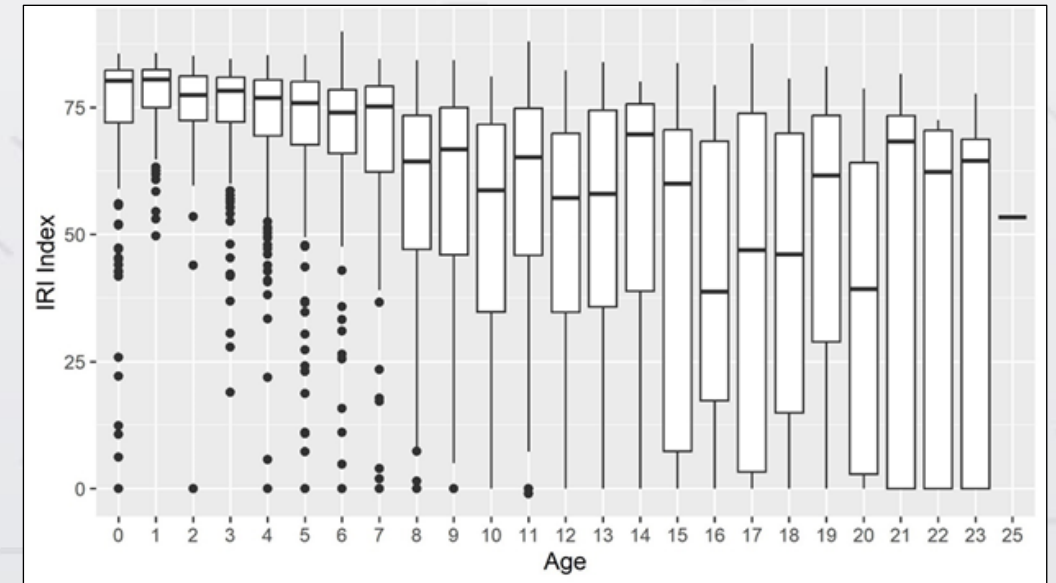
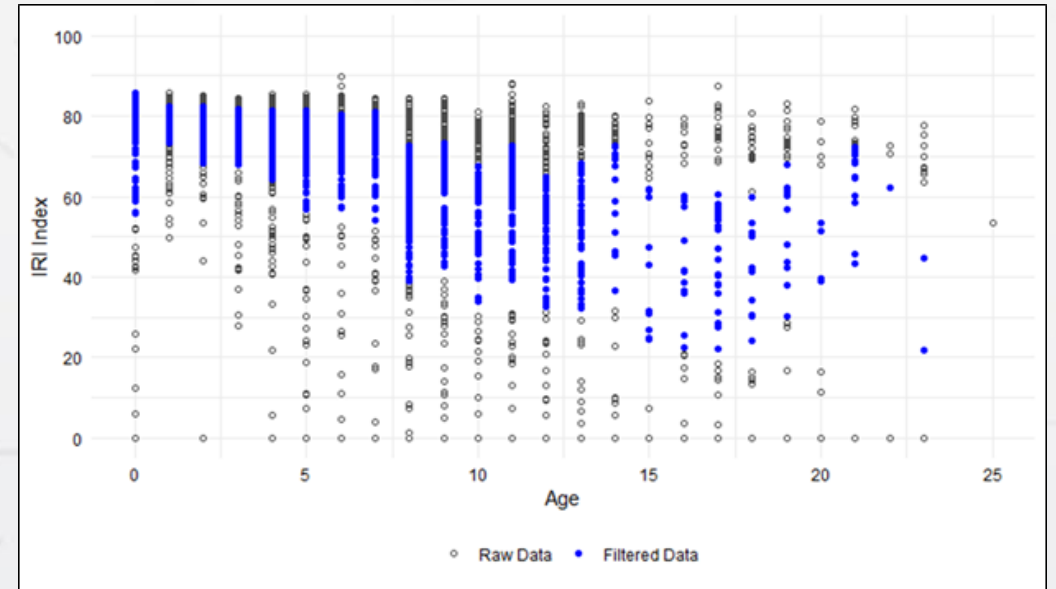
# Data Preparation

- Condition data: RUT index, STRC index, TRAN index, IRI index, NPM cracking
- Pavement type data: Asphalt on Concrete, Thick on Strong, Thin on Strong, Thin on Weak
- Pavement Treatments: Reconstruction, Mill and Fill, Overlay, Pulverize and Overlay, Cold Recycle and Overlay, Hot Recycle and Overlay, Unknown



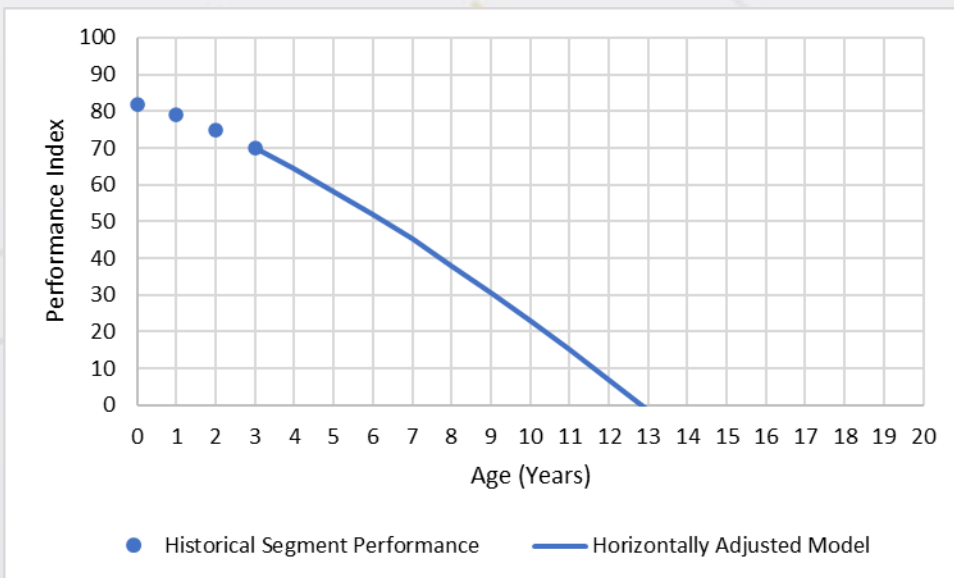
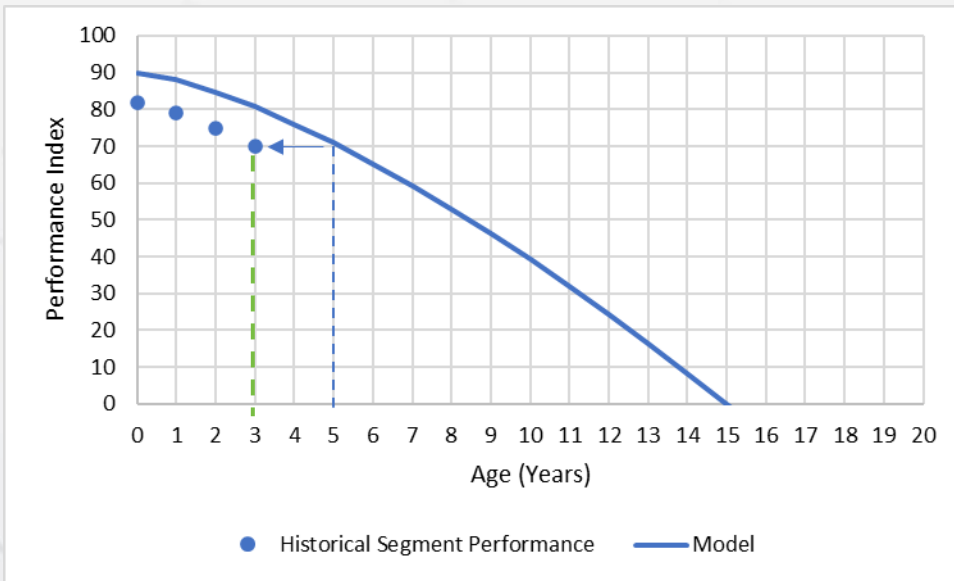
# Data Preparation

- Uniform segment data is organized by performance indicator, pavement type, and treatment type and checked for consistency and outliers.

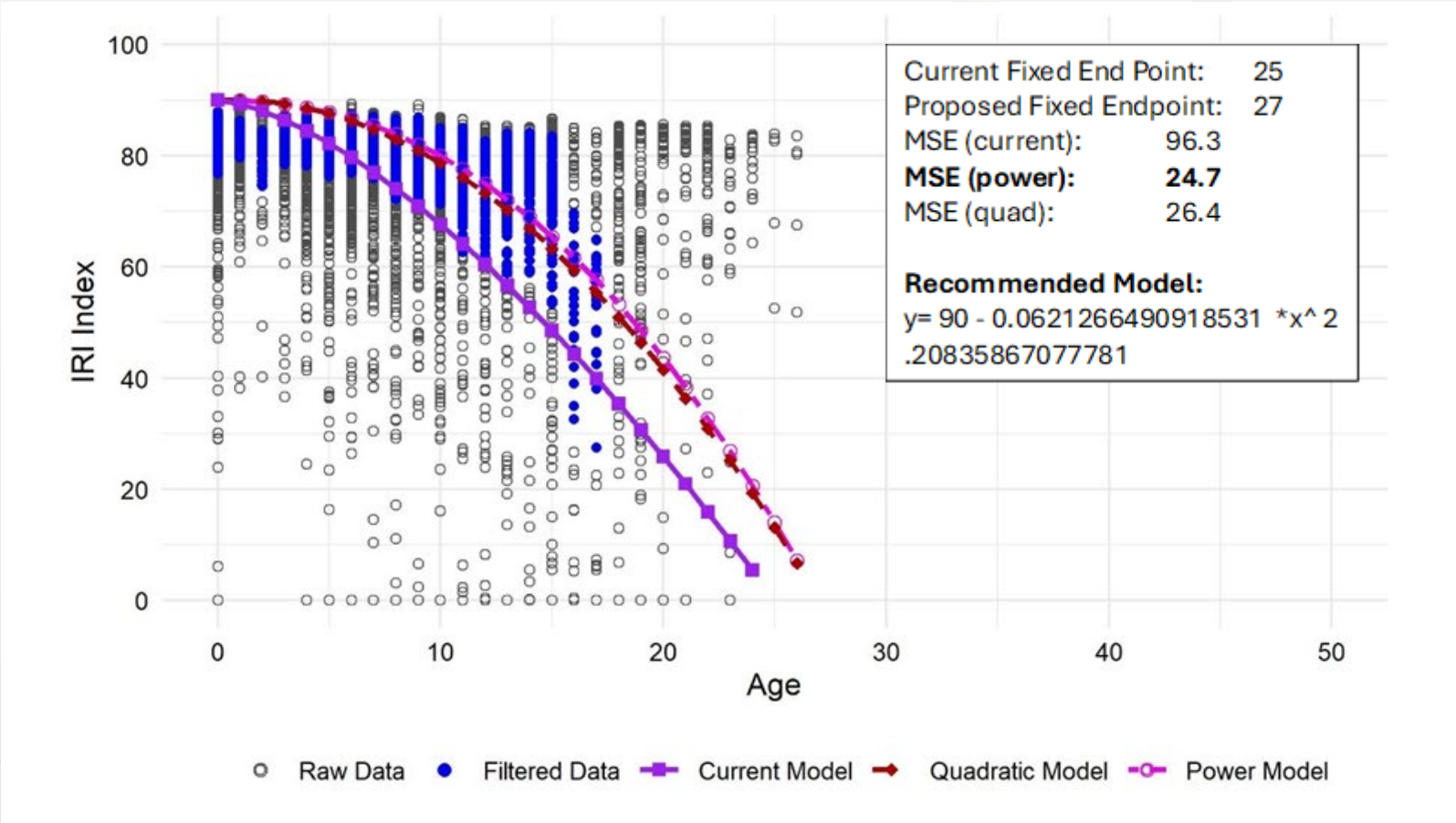


# Special Model Form Considerations

- Vtrans uses models with fixed endpoints to support model fitting.
- Fixed x-intercepts combined with nonlinear model forms required modified model fitting approaches.



# New and Updated Models



# Conclusions

- New or updated models were developed for 140 combinations of performance indicator, pavement type, and pavement treatment.
- For family combinations where insufficient data was available, surrogate models were recommended.
- The MSE was reduced for all combinations that had preexisting models, reducing prediction error for all cases.





# Thank You!

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