



May 31, 2018

Network Operations

Tom Haley
Vice President – Network Planning & Operations

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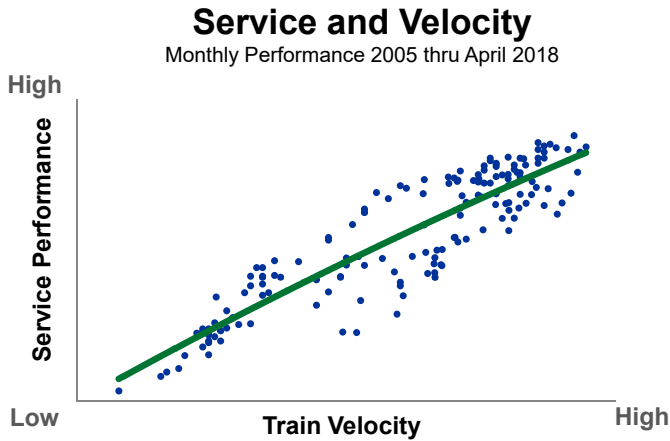
Tom Haley is vice president network planning & operations, a position he has held since May 2014. The Network Planning team designs UP's service product, and leads the planning and analysis of the critical operating resources, including workforce, locomotives, and infrastructure capacity. The team also includes Joint Facilities and Network Development.

Tom has been with Union Pacific almost 30 years, working in both the Operating and Finance functions. He began his railroad career as a college intern with CSX in 1983, followed by field operations and locomotive management assignments. After earning his Master of Business Administration from Indiana University, Haley joined the Union Pacific Finance Department in 1989. He moved to the Operating Department in 1993, and has held several positions leading to his current role. In his career with Union Pacific, Tom has directed infrastructure and resource investments, network design, operating strategies, and development of UP's rail network.



Velocity Drives Service Performance

Significant Progress



- Proven relationship between Velocity, Service, and Productivity
- Reducing “Variability” improves both Velocity and Service

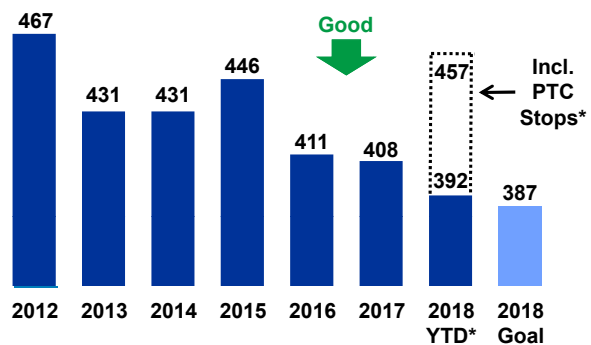
Reducing Variability

Improves Velocity and Service



- Variability Harms Velocity and Service Reliability
- Steps To Reduce Variability:
 - Visualization Tools
 - Pin-Point Largest Opportunities
 - Root-Cause Problem Solving
 - Continuous Improvement

Daily Variability Events



* 2018 YTD through 4/30

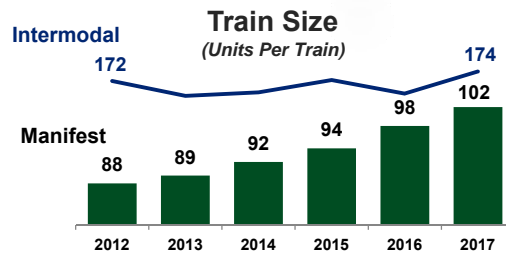
Blend and Balance

Improving Train Network Productivity



- **Significant Progress**
 - Record Train Size
 - 70% of Auto Network is Blended
- **Significant Opportunity**
 - Leverage Intermodal Network
 - Blending Manifest and Bulk
 - Balance Fewer Unproductive Starts
- **People, Process, Technology**
 - Corridor Wave Process
 - Design and Decision Support Tools

Train Category	2017 Train Size
Manifest	✓ Record
Intermodal (Boxes)	✓ Record
Coal	✓ Record
Auto	✓ Record
Grain & Ethanol	✓ Record
Rock, Sand & Cement	✓ Record



Fuel Conservation Initiatives

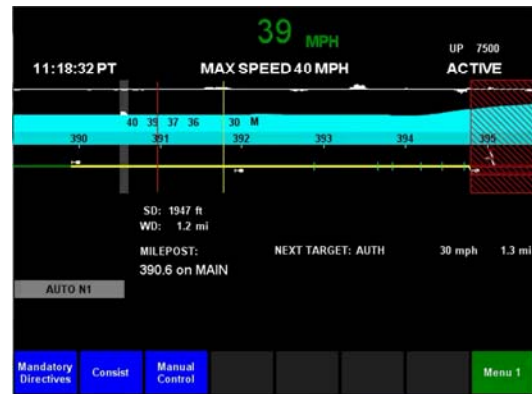
- Automatic Locomotive Shutdown
- Distributed Power
- Energy Management Systems

PTC Productivity Initiatives

PTC Opportunities



- Improved Safety
- Advanced Energy Management Systems
- Harness Data for Customers and Operations
- Advanced Train Control
- Capacity and Velocity Gains
- Greater Automation



Integrated PTC and Energy Management Display