



Getting you there. Smarter.

Jon Newhard – *General Manager*

September 25th, 2019

CUBIC™ | Transportation Systems



Company Overview: Cubic & Trafficware

- Cubic (NYSE: CUB) billion dollar player in global transportation systems.
- Cubic ITS is the largest ITS player in North America incorporating Trafficware, GRIDSMART and Cubic brands.
- Trafficware designs, engineers, and manufactures every major component used to control an intersection, all in the USA.
- Reputation for technological innovation and high levels of quality and customer service.
- Most advanced software in the industry. Leaders in adaptive and connected vehicle.
- Large deployments at marque customers in the US and around the world.
- We do not create “technology orphans”



Coast to Coast Innovation



Technology Overview

Trafficware Cloud

Synchro® 10
plus **SimTraffic®**
Signal Timing & Analysis Software



Connected Vehicle	SPM	Synchro Green	WEB.now	TSP	Emergency .now	TEAMS
CCTV	DMS	Parking Guidance	StreetSync	BlueTOAD	Alpha UPS	Disaster Recovery

ATMS.now
Central Management Platform



Cabinets & Controllers



CUBIC Transportation Systems

Dashboards



Data Warehouse



Database



Experience

- Houston, Texas
- Santa Clara County, California
- Seminole County, Florida
- Baltimore, Maryland
- New Jersey Transit
- Oklahoma City
- Palo Alto, California
- Broward County, Florida
- Sugar Land, Texas





2

Overview of Rail and Traffic Signal Operations

Safety First

- Ensure Clearances
- Ensure No Conflicts
- Ensure Efficient Recovery



Rail and Traffic Operations

- Preemption Inputs
 - *Some are Very Simple*
 - *Some or More Complex with Confirmation Circuits*
- Clearance (Track) Phases
- Dwell Phases
- Exit Phases



Example

- Rail Crossing and Preemption at Rush Hour
- Signal Performs Clearance Routine
- Limited Service Operations During Train Crossing
- Signal Recovery
 - *Priority Movements*
 - *Resume Standard Signal Coordination*
 - *“Transition Period”*
- And Then Another Train



Traditional Traffic Signals

- Between 20,000-30,000 Settings in a Standard Traffic Controller
- Why Do Traditional Traffic Signals Struggle?
 - *Programming is Relatively Static*
 - *Optimization is Local, Instead of Global*
 - *Infrastructure is Outdated*



3

Solutions to Improve Traffic Operations Due to Rail Events



Goals

- Safety First and Foremost
- Optimize Traffic During Dwell and Exit Phases
 - *Maximize Available Time and Space*
 - *Make Signals More Dynamic*
- Quicker Recovery
- Better Reporting



Rail-Centric Traffic Signals

- Trafficware SCOUT Local Controller Software
- Features
 - *More Phases, More Detectors, More Preempt Inputs*
 - *Custom Logic Lines*
 - *Peer to Peer Logic*
 - *Dynamic Exit Routines*
 - *Dynamic Recovery Modes*
- What does this mean?
 - *Faster Traffic Signal Synchronization After a Train Exits*
 - *Traffic Returns to Normal Faster*
 - *More Features and Options for Improving Traffic*

Adaptive Signal Control Technology

- Automatically Adjusts Signal Timing in Real Time
- Able to Vary Green Times, Coordination Patterns and Sequences
- Technology has Gained Momentum in the Past Decade
- Applications in Various Traffic and Operational Scenarios
- Designed to Maximize Available Time and Space

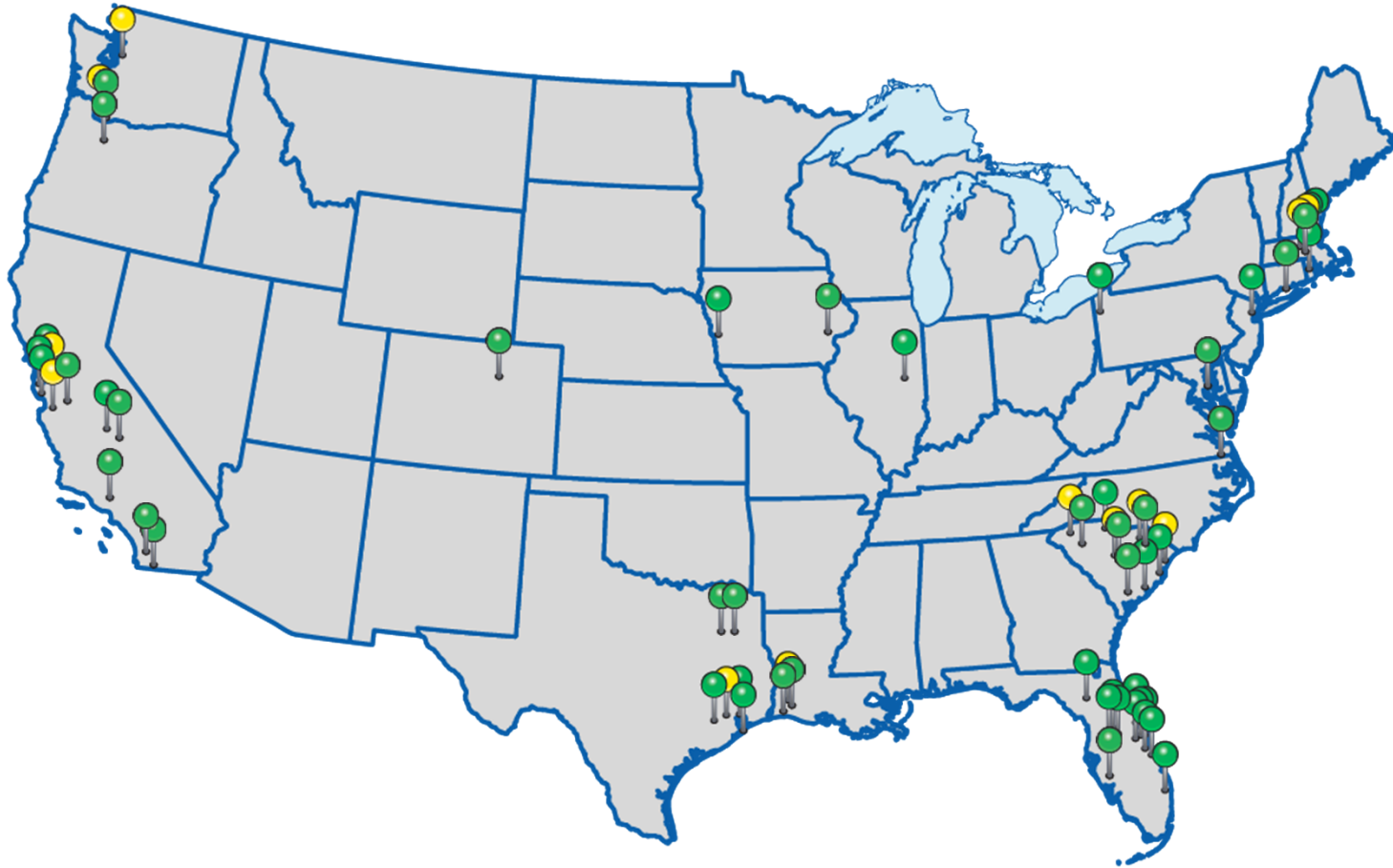


What you Need

- Accurate Detection Technology
- Reliable Communications
- Processing Power



Locations



Benefits

- Faster Recovery After a Rail Preempt Event
- Dynamically Serve Delayed Movements First
- Create Custom Logic to Handle Unique Situations
- Maintain Operations at Unimpacted Locations
- Added Benefits
 - *Lower Travel Time and Delay under Normal Conditions*
 - *Capacity to Handle Complex Operations*
 - *Reduced Emissions*

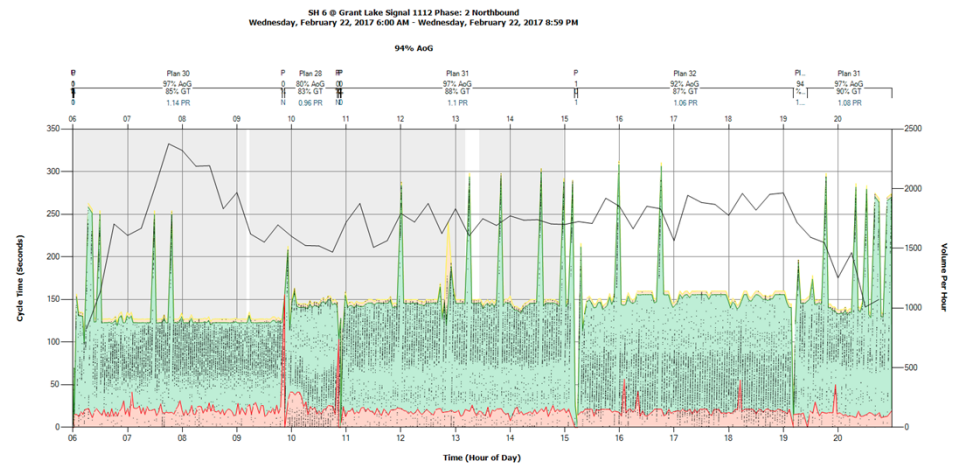
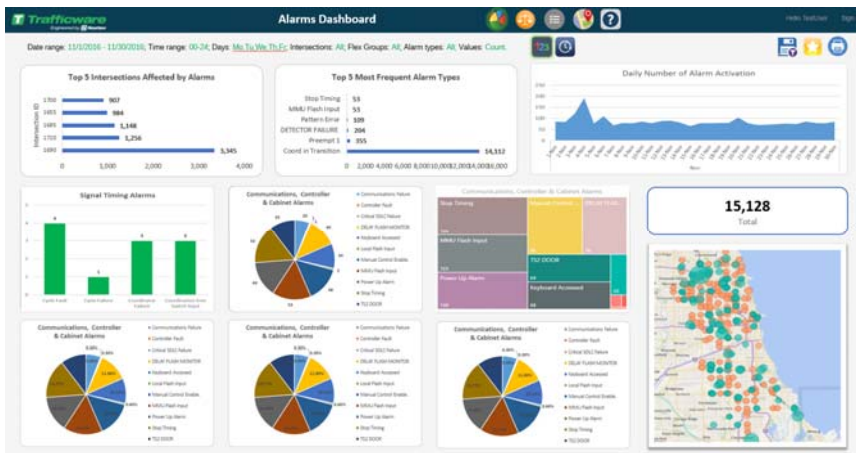


Performance Metrics

- Dashboard of Current Operations
- Quantitative Performance Metrics
- Reports and Graphics
- Real Time and Historical Measures
- Reports Designed for Various Disciplines



Reporting



4

Final Thoughts

Closing Thoughts

- Rail Crossing and Preemption Are Necessary to Ensure Safety
- Traffic Disruption Can Be Minimized with the Right Tools
- Solution is Likely a Combination of Solutions
- Most Traffic Issues will be Addressed Using a Holistic Approach
- Reporting Tools are Critical and Lead to Informed Decisions
- Agencies are Embracing New Technologies
- Be Creative and Think Differently



Getting you there. Smarter.



CUBIC™ | Transportation Systems

22CUBIC PROPRIETARY | Overview

CUB
LISTED
NYSE