



## Features

- **A powerful and flexible tool that provides detailed customer travel pattern analysis**
- **Allows agencies to plan services that meet and exceed customer expectations**
- **Removes excess transit supply, reducing operating costs**
- **Intuitive design to perform flexible and reproducible analysis, conceptualize results, and visualize impacts**
- **State-of-the art passenger-centric metrics built into reports**
- **Standardized data pipeline reduces time, complexity, and cost of data analysis**
- **Quickly performs complex analysis in-house**

# Passenger Movement Analysis (PMA) Module

A robust approach to predicting destinations and full multi-modal passenger journeys

**Cubic PMA module, part of Cubic's Data Management and Analytics Platform (DMAP), leverages the power of data to provide unparalleled insights into complete customer journeys, refining route and schedule alignment, improving fare product optimization, and reducing operating costs.**

### Enhanced Customer Experience

The Cubic PMA module provides agencies with unparalleled insights into full passenger journeys including origin and destination pairs, transfer points, stop and platform waiting times, and crowding. In doing so it helps reduce congestion, improve service quality, better align route and schedule services, minimize waiting times, and reduce overcrowding on transit vehicles, allowing agencies to enhance the overall customer experience on the transit network.

### Reduced Operating Costs and Better Service Utilization

By applying a robust approach to predicting destinations and full multi-modal passenger journeys, Cubic PMA module creates a framework for benchmarking and measuring the impact of strategic decisions and trade-offs between schedules, performance, and ridership to help agencies reduce operating costs, improve service utilization, enable better resource allocation, and, over time, compare their performance to other cities and agencies.

## Specifications

### Data Analytics Engine

- End-to-end, multi-modal journey linkage
- Passenger-centric performance metrics and insights, including wait times and crowdedness
- Destination & Transfer inference engine
- Passenger Behavior inference engine

### PMA Domain Model

- Multiple-source data integration
- Industry standard performance metrics
- Cubic-developed passenger level metrics
- Data Exploration Visualizer
- Pre-packaged visualizations

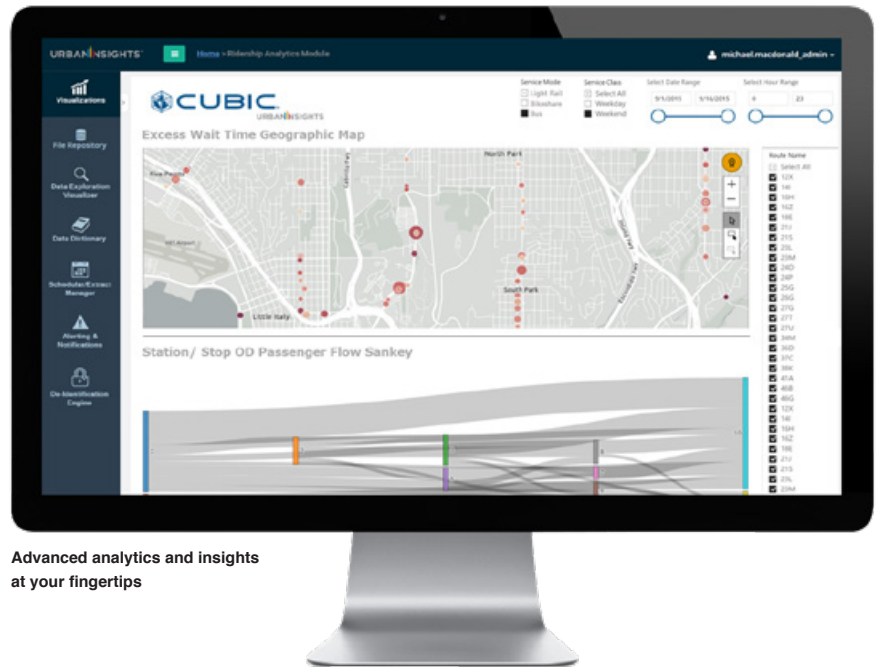
### Modern Modeling Techniques

- Aggregated Learner Approach
- Predictions weighted across multiple models
- Continual learning based on agency-specific data and needs
- Increased flexibility over strictly rule-based approaches

### Integration with Cubic Product Lines

- Urban Mobility Back Office
- Road User Charging Back Office
- NextBus
- Mobile
- Analytics
- Non-Cubic AVL, AFC, and APC solutions

*In the interests of product improvement Cubic reserves the right to change the above specifications without notice.*



Advanced analytics and insights at your fingertips

### Operational Readiness and Foresight

The detailed visibility into the movement of travelers and transit vehicles through the network combined with full insight into transit service utilization offered by Cubic PMA module allows agencies to better plan services that meet customer journeys, remove excess transit supply, and effectively plan for any disruptions. It also gives transit agencies the ability to anticipate and successfully manage any potential service outages and provide bridge services quickly and efficiently, reducing customer burden.

### Industry-Leading Continual Learning

The Cubic PMA module uses aggregated machine learning to correlate various data sources, including vehicle location, schedule, passenger count, and fare collection information from both Cubic and third-party systems. Utilizing a number of modern modeling techniques, Cubic PMA module weights predictions across multiple continually learning analytic methods in order to provide robust passenger movement predictions whose accuracy improves over time and far surpasses rule-based approaches.

### Reproducible Analysis with Dynamic Visualizations

The Cubic PMA module comes with an integrated data portal which allows users to tap into the power of all DMAP features, perform flexible, reproducible, contextualized analysis, and easily share results across multiple users. Standardized data pipeline automates the process of data extraction, loading and transformation, reducing time, complexity, and cost of data analysis and eliminating user-based errors. Pre-configured interactive filtering on key transit dimension, including citywide geovisuals, allows users to create their own dynamic visualizations.