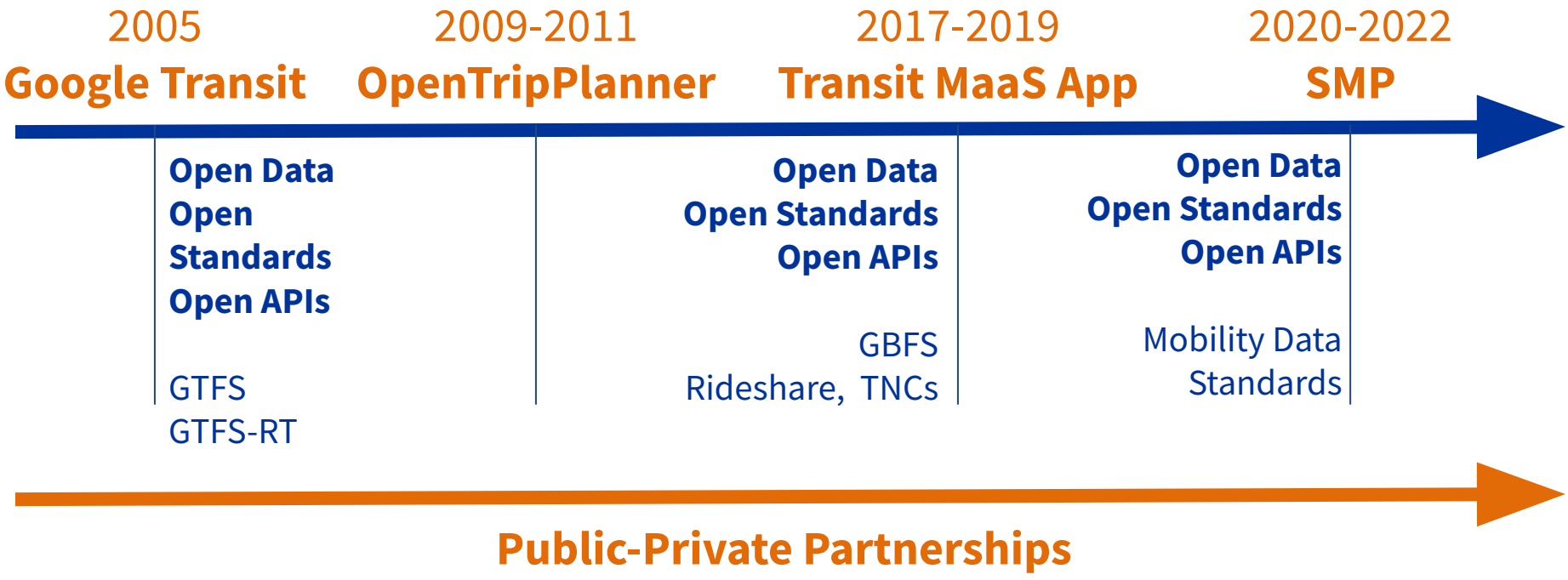
Mobility-as-a-Service in the US
Session 11: Data, Infrastructure, Sharing and Security
June 23, 2022

Augmenting TriMet's MaaS with a Smart Mobility Platform (SMP)

Bibiana McHugh, Mobility Manager

Background

TriMet Mobility Initiatives



Mobility Data Standards

1. GTFS
2. GTFS-RT
3. GBFS
4. GTFS-Fares vs 2.0
5. GTFS-Flex
6. GTFS-ride - fixed-route transit ridership
7. GTFS-stat – performance data
8. GTFS-trails
9. GTFS-plus – vehicle and capacity data suitable
10. Dyno-Demand
11. SUTI - for booking and brokering demand-response trips, including taxis

MobilityData accelerates the development and adoption of mobility specs

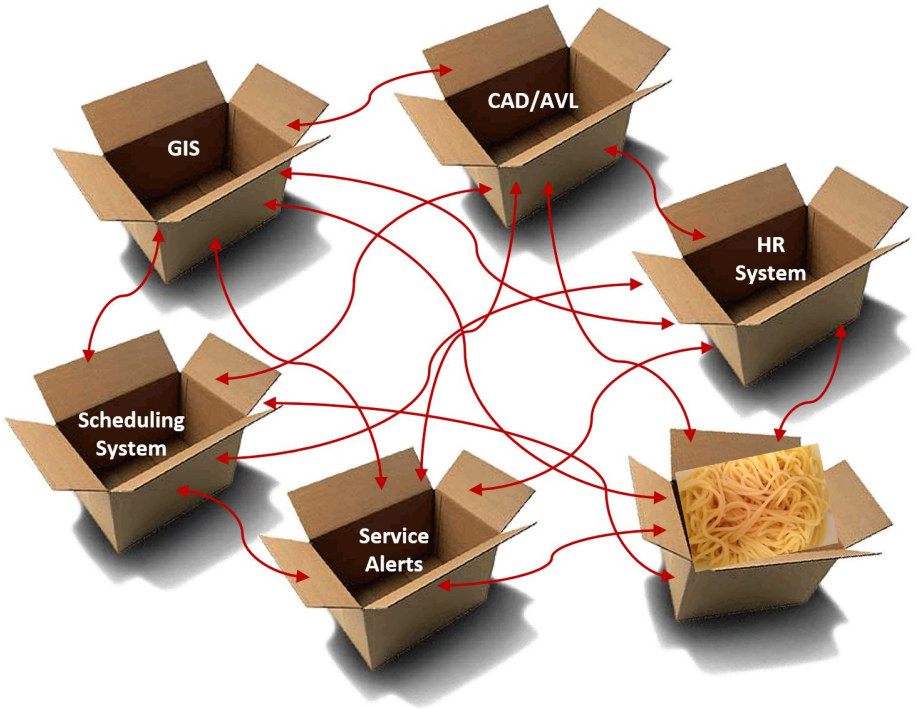
GTFS

voluntary

worldwide adopted standard

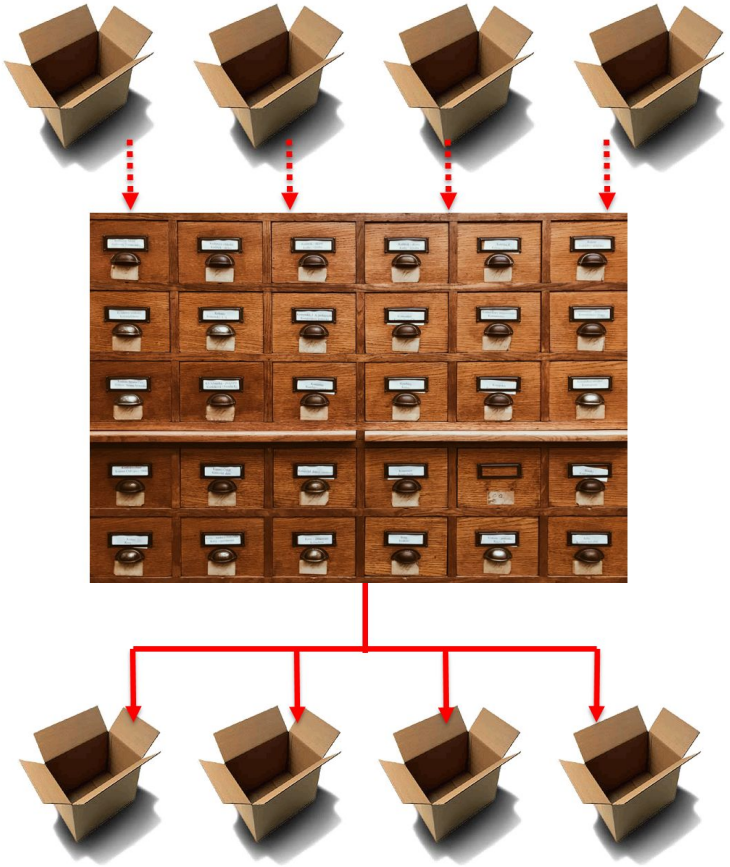
application
centric approach

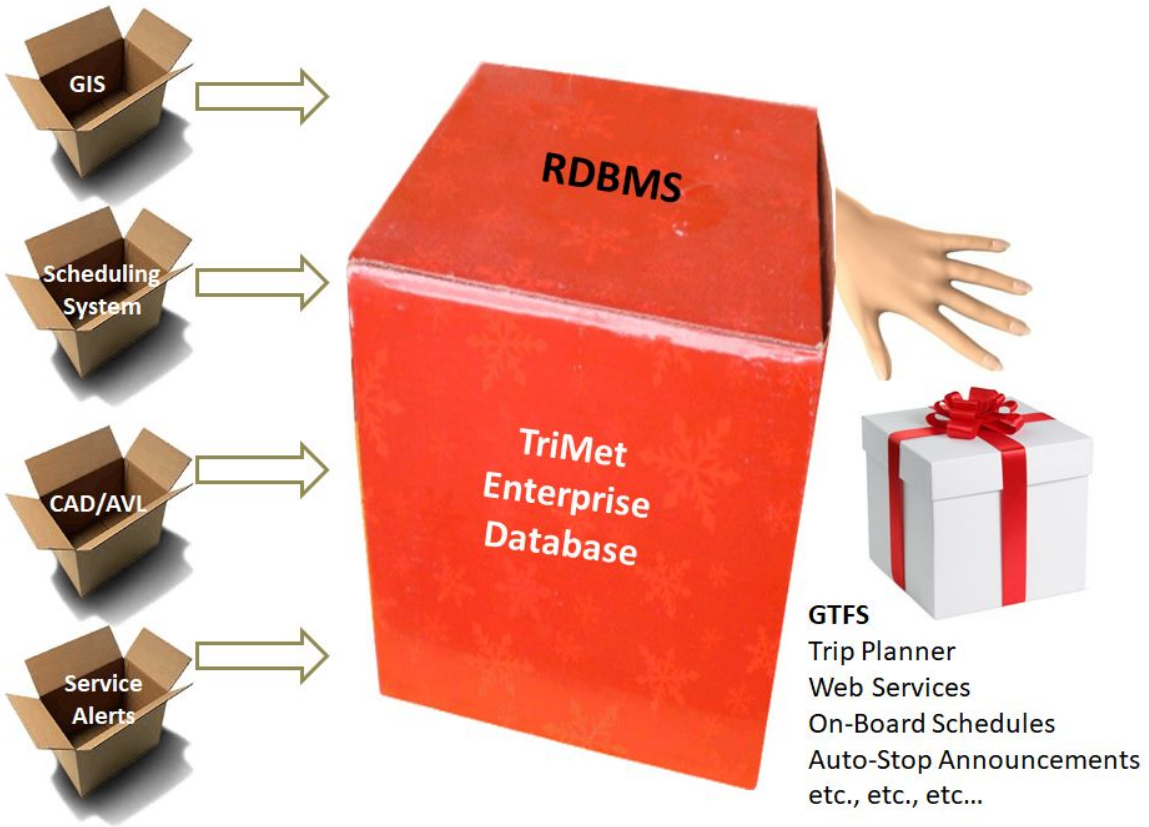
Unorganized Data



data
centric approach

Organized Data




GIS
Scheduling System
CAD/AVL
Service Alerts
RDBMS
TriMet Enterprise Database
GTFS
Trip Planner
Web Services
On-Board Schedules
Auto-Stop Announcements
etc., etc., etc...

OpenTripPlanner (OTP)

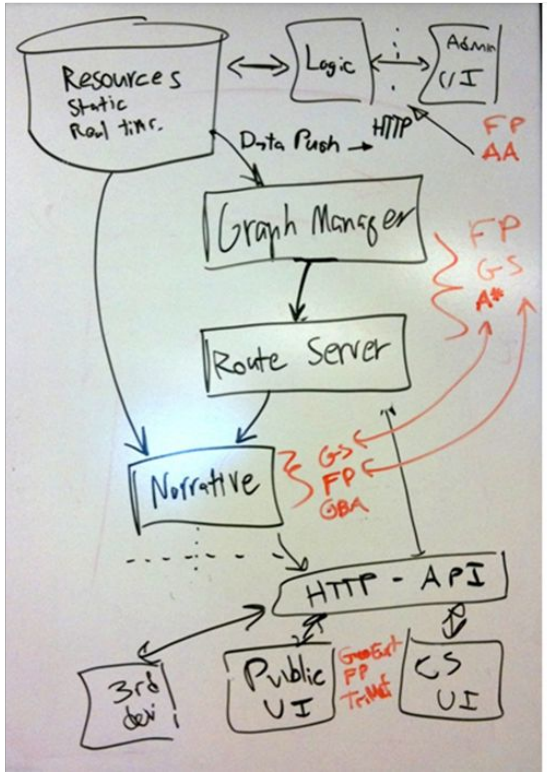
Metro RTO Grant 2009-2011

Connected Transit with

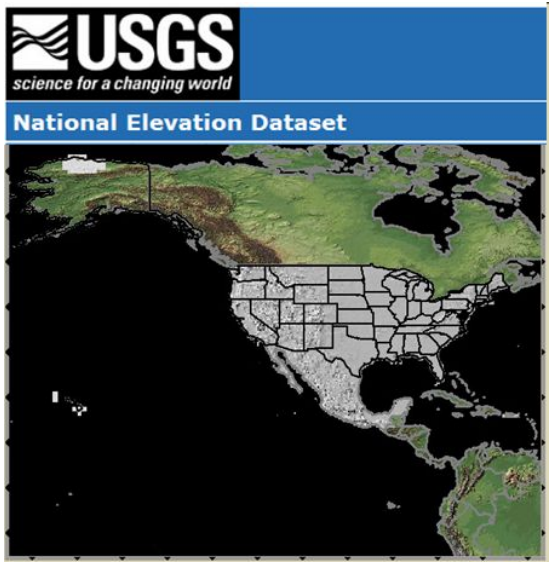
Biking and Walking

OpenTripPlanner (OTP) – First Multimodal Trip Planner

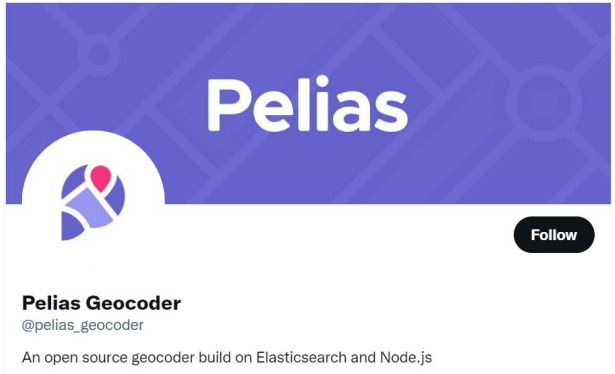
- Public-private collaboration
- Fulfilled requirement not met with private sector alone (did not exist but was emerging requirement)



Wide Adoption Facilitated with Open Data, Open Data, OSS



GTFS



OTP Implementations in North America

Agency Name	Vendor or Self-Managed	Vendor/Consultant Name
AC Transit	Self-managed	N/A
ATL (Atlanta, GA)	Vendor Managed	
MBTA (Boston)	Self-managed	
Florida DOT, District 5	Vendor Managed	
LA Metro (Los Angeles, CA)	Self-managed	
MBTA (Boston, MA)	Self-managed	
METRO (Houston, TX)	Vendor Managed	
MTA NYCT (New York, NY)	Consultant Supported	
New York State DOT (NY)	Consultant Supported	
RTD (Denver, RTD)	Consultant Supported	
SEPTA (Philadelphia, PA)	Vendor Managed	
Smart Columbus (Ohio)	Self-managed	
Sound Transit (Seattle, WA)	Consultant Supported	
TriMet (Portland, OR)	Consultant Supported	
Hillsborough Area Regional Transit (Tampa)	University Supported	CUTR, University of South Florida
USF Maps App (Tampa)	University Supported	CUTR
VTrans (Vermont)	Consultant Supported	Trillium Transit

Worldwide OTP Agency Users

Norway (nationwide)
- National Journey Planner
- Oslo Region

Finland (nationwide)
- Helsinki Regional Transpo
- Finnish Transport Agency
- Finnish intercity coach ser

Netherlands (nationwide)

Germany
- Leipzig Move

Italy
- Piemonte Region
- City of Torino
- Trento Province
- ViviBus Bologna

Spain
- Municipal Transport Comp

Spain
- Municipal Transport Company of Valencia S.A.U.

France
- Grenoble Alpes métropole, l'État Français, the Rhône-alpes region, the Isère council and the City of Grenoble.
- STAR Rennes, France
- Réunir Alençon integrated urban and school bus network planner

Poland
- Urban Transport Authority of Poznań (ZTM Poznan)
- ZTM Lublin

Estonia
- Maanteeamet

Australia
- Adelaide Metro
- Canberra

Singapore
- Singapore Mass Rapid Transit (SMRT)
- Nextride

Unofficial (third party) Implementations:
Tel Aviv, South Africa, Athens, Budapest, Portugal, London

Benefits of Open Source Software

- Shared responsibility for ongoing support and maintenance
- More control over features and data
- Active development community and aggressive development pipeline
- Less risky
- Competitive implementation and support options
- Note: OSS should be treated same as propriety with regard to procurement and budget (it is NOT free)

MaaS Application

FTA MOD Sandbox Grant

2019-2022

Connected Transit with all Shared-Use Mobility Modes

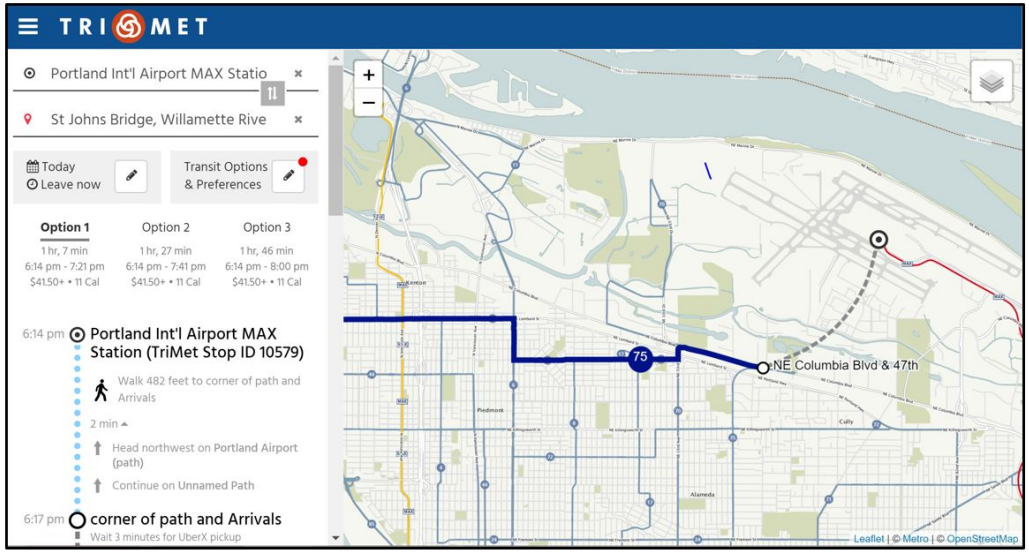
Plan-Book-Pay via Deep Linking

- Multimodal Trip Planner and Geocoder (Address Locator)
- Full Integration of All Mobility Service Providers in Real-Time
- Open Source and Data (OSM) Facilitates Shared Resources
- Replicable White Label App

trimet.org/MOD

Benefits of Multimodal Trip Planning

- Solution to the historic ***"last mile"*** public transit problem
- Offer faster and cheaper options for our customers - important for equitable and accessible service
- Encourages public transit, thus reducing SOVs and CO2 emissions
- Is an inherent requirement for ***Mobility Initiatives***



Integration with Transit

Faster than transit alone

Cheaper than Uber alone

trimet.org/MOD

FTA IMI Sandbox Grant

2020-2023

1. Hop Fastpass™ Expansion
2. Real-Time Improvements
3. Smart Mobility Platform (SMP)

Focus Area 3:

Using mobility data to better assess and improve mobility management performance

Process

Phase 1 - Exploration

Fehr & Peers developed Mobility Performance Metrics and Use Cases. UrbanLogiq was selected partner (RFP).

Phase 2 - Demonstration

Development of data pipelines, data management, dashboards, and use case interfaces for data drill-down

trimet.org/IMI

Primary Metric Categories:

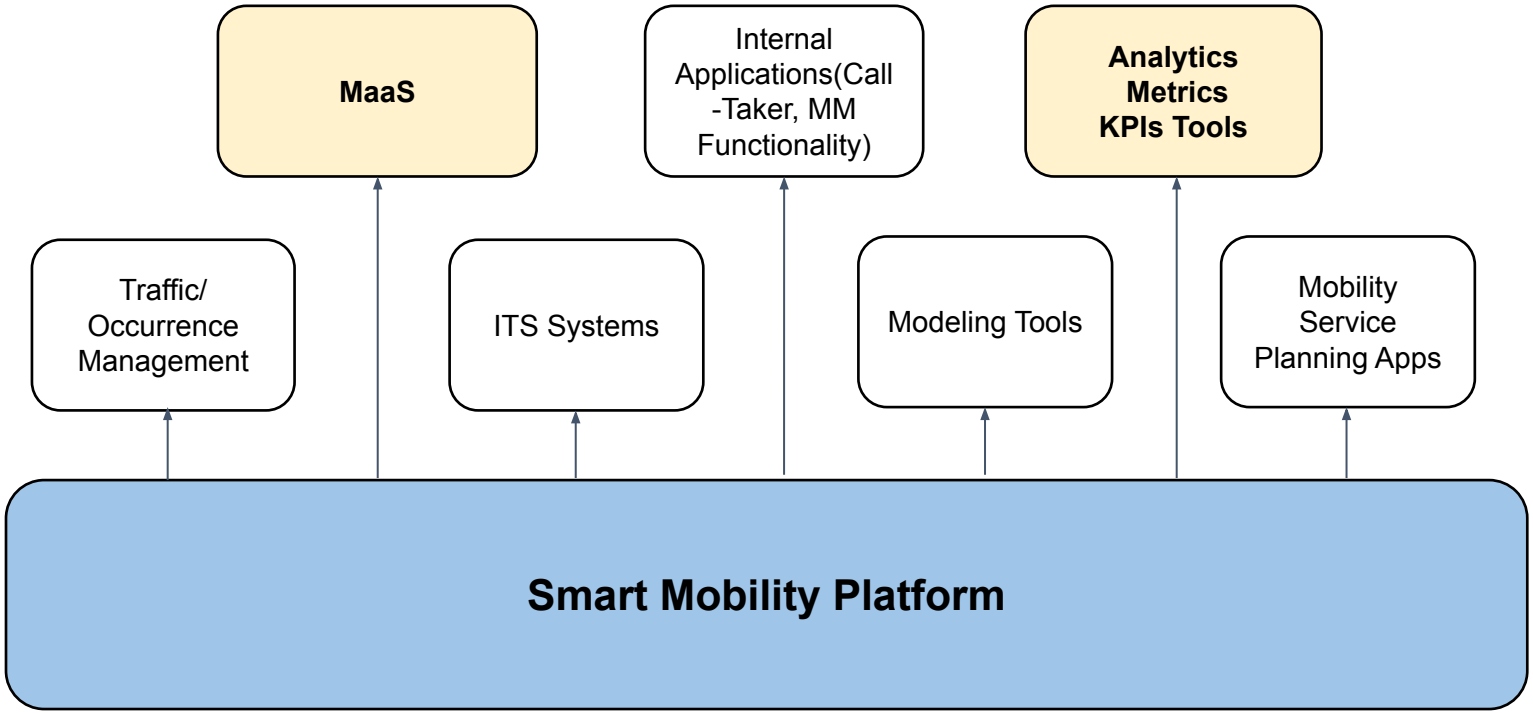
1. Accessibility
2. Availability
3. Cost
4. Customer Satisfaction
5. Demand for MOD
6. Knowledge Transfer
7. Reliability
8. Time

The Smart Mobility Platform (SMP)

Foundation for all Mobility Initiatives and Technologies beyond MaaS

Smart Mobility Platform

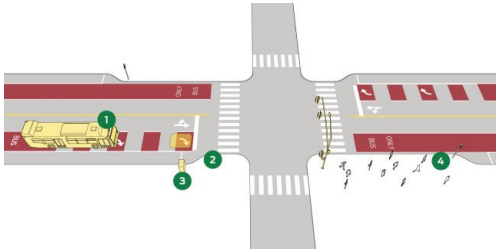
Open Architecture, Open Data, Open Standards



Integrated Data for Comprehensive Processing and

Historic, Scheduled, RT, Predicted, AI, Inferrerence, Data Blending

hop fastpass

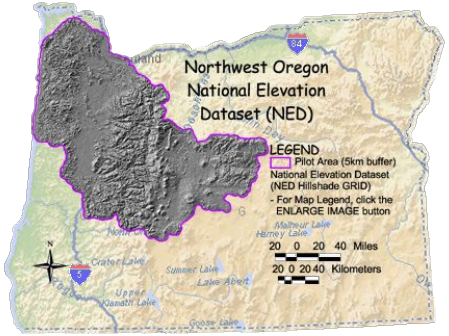


OpenStreetMap
The Free Wiki World Map

United States® Census Bureau

INRIX

OpenWeather



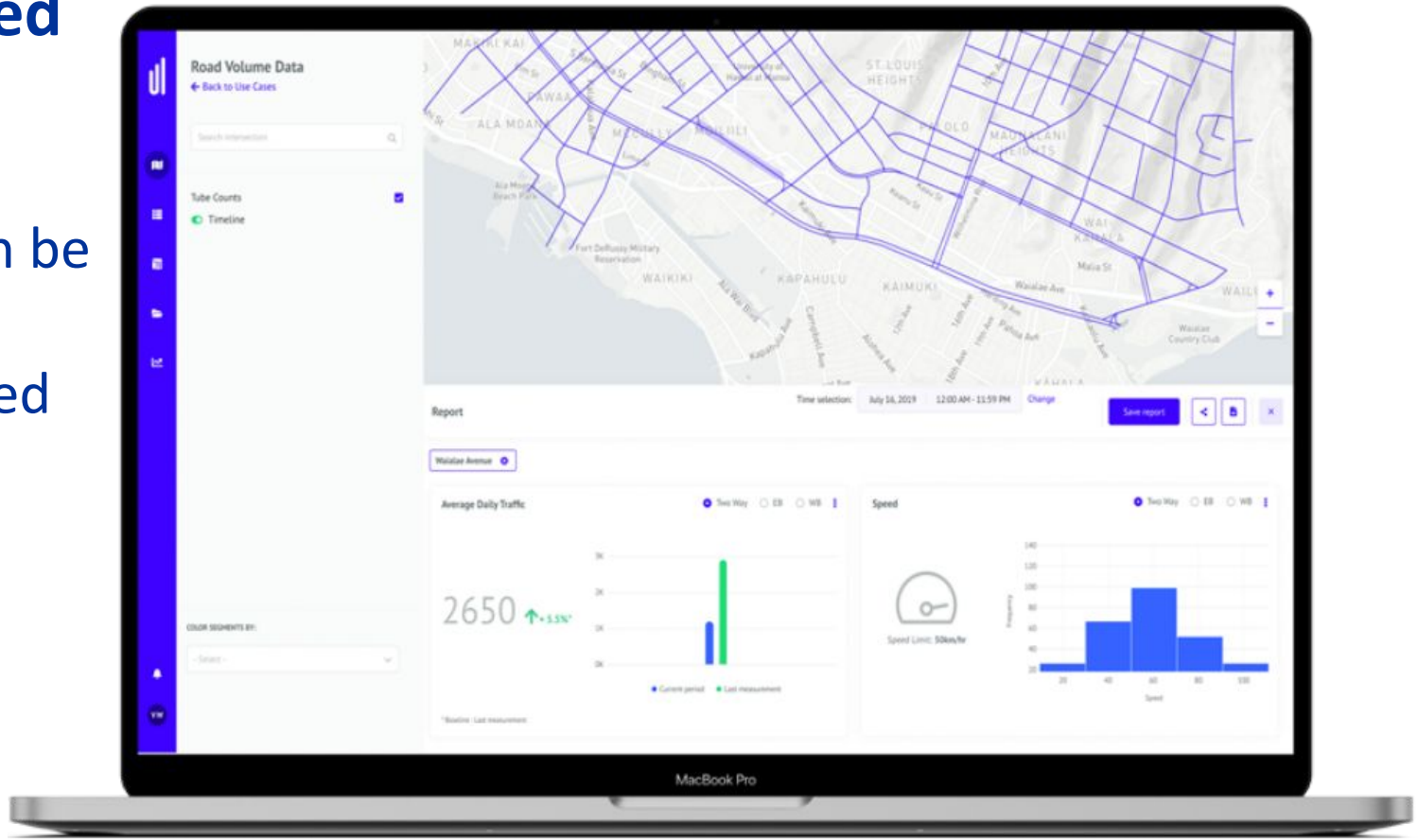
Metro

Uber

Lime

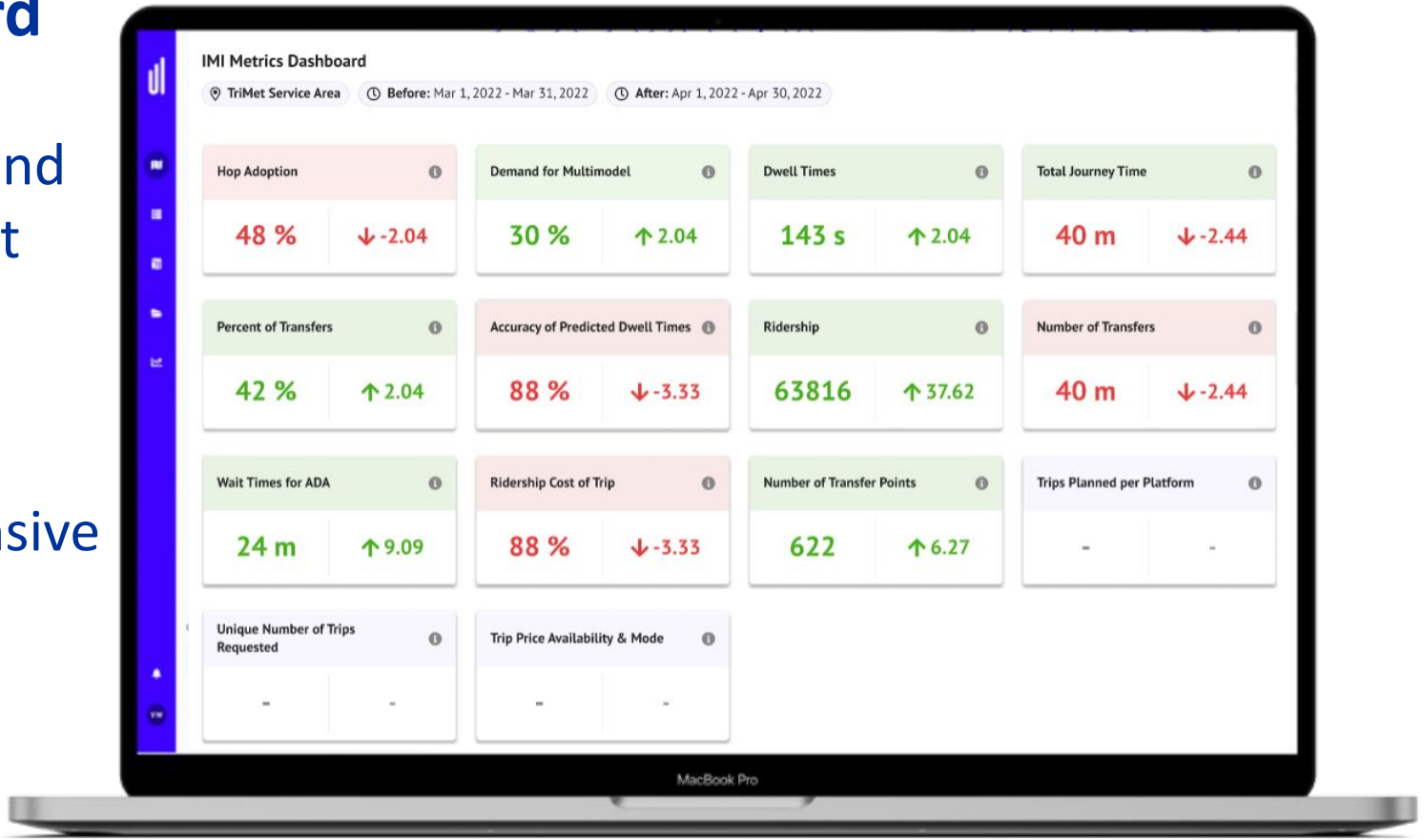
Web-Based Tool

Metrics can be visualized and explored through space and time.



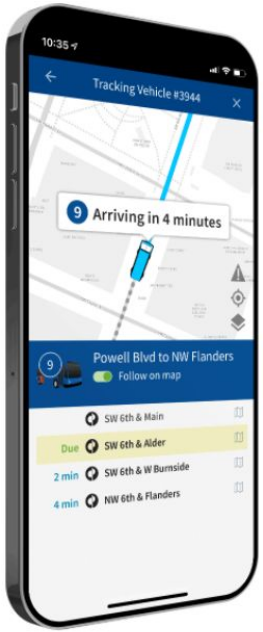
Dashboard

Going beyond basic transit operations metrics to analyze comprehensive mobility ecosystem



AI Machine Learning

Improving Next Arrival Information Based on TransLink Model



TransitTracker™

Arrivals by web

trimet.org

Arrivals by text

Send Stop ID # to 27299

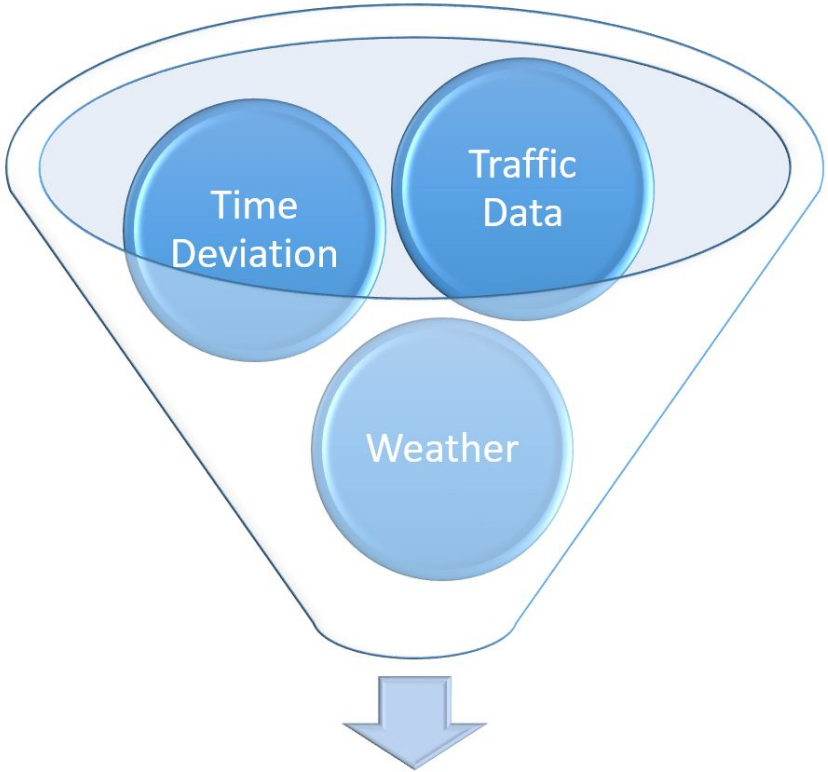
Standard text messaging and data rates apply

Learn more

Arrivals by phone

503-238-RIDE

Select option 1 and enter your Stop ID Number



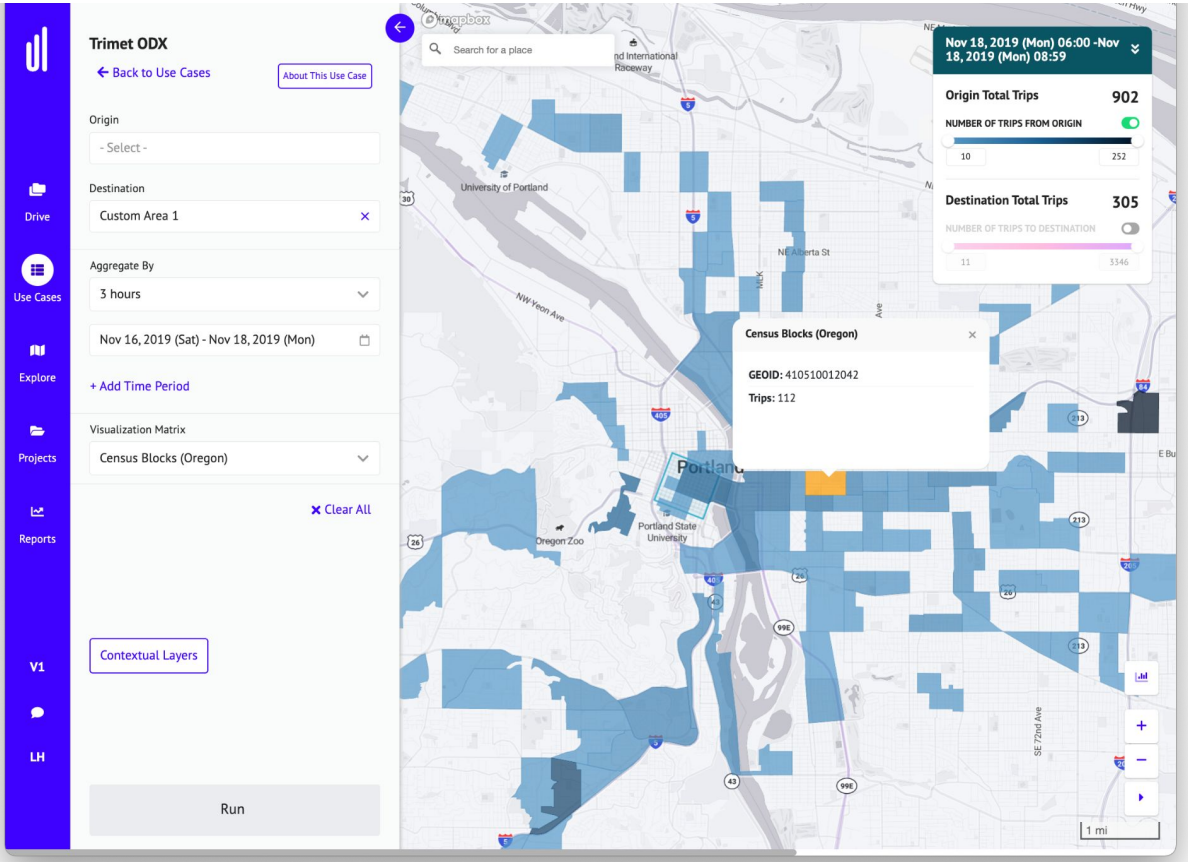
Use Cases
ODX Analysis

Hop Fastpass™

- Tap on only
- Open architecture for interoperability
- Account based
- Cash moved to retail outlets
- Fare Capping - guaranteed best fair
- Mobile Wallet - tap to ride, phone is your card

UrbanLogiq ODX Model

Provides TriMet with new insights into travel patterns and trends.

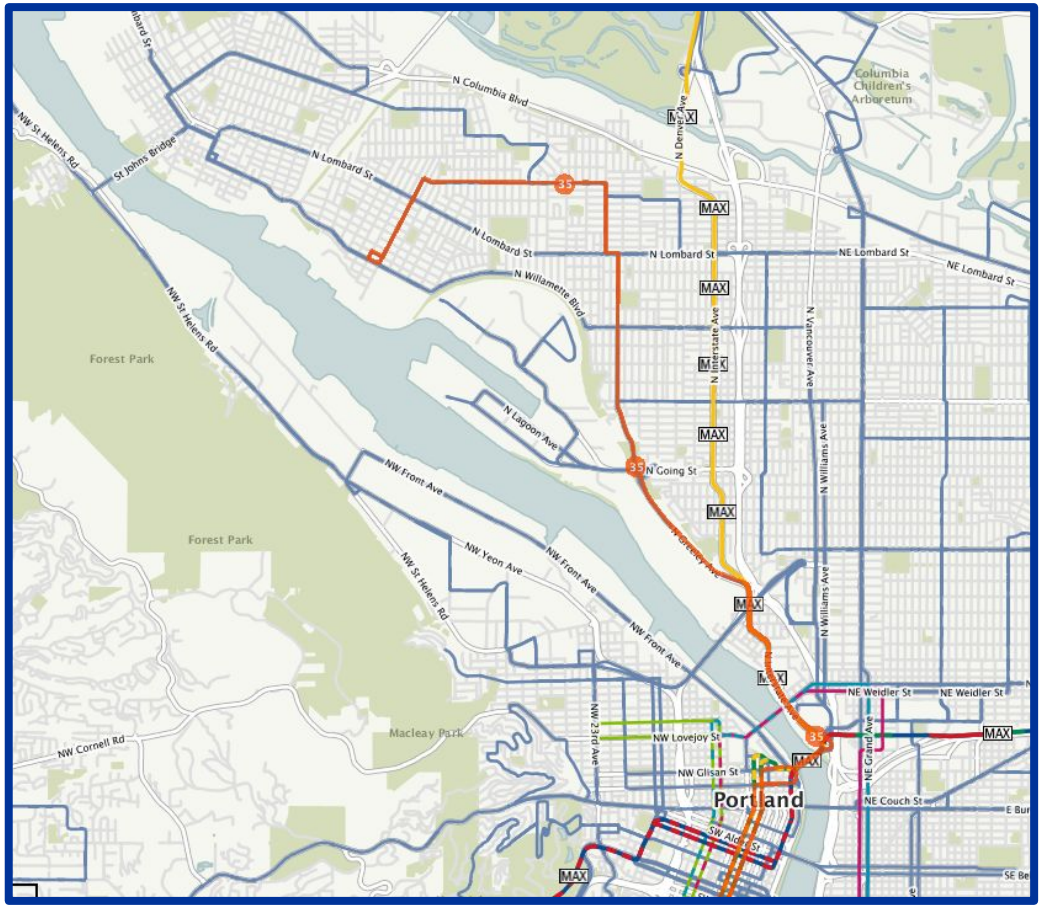


ODX Analysis
Service Planning

Used for development of TriMet's Comprehensive Service Plan

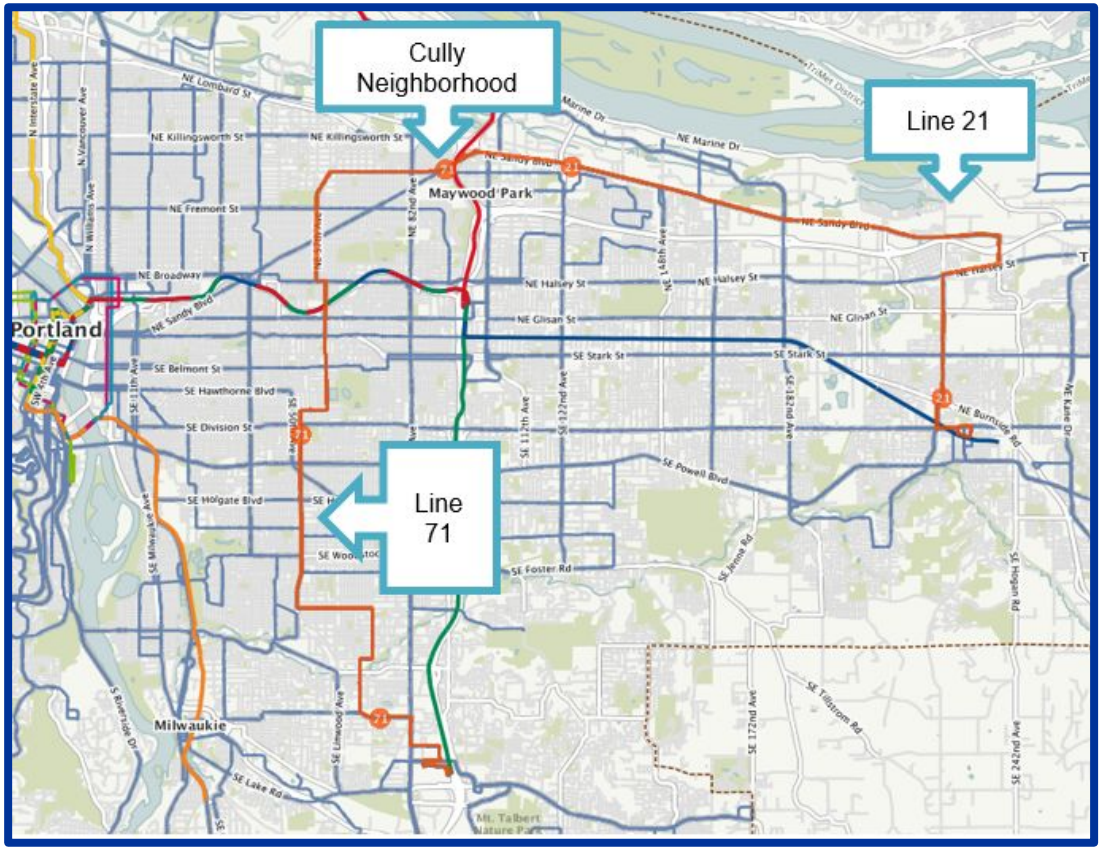
Transfer Analysis
Line 35

Line 35 deviates to create transfer opportunities in St. Johns, but Hop ODX data showed only 1% of Line 35's transfers were happening here. Resulted in proposed redesign that could speed up trips and save hundreds of thousands of dollars annually in service cost.



O&D Analysis
Lines 71 & 21

Based on O/D patterns and poverty data, we are now proposing to combine Lines 71 and 21 into a single route. This will give people in the underprivileged Cully Neighborhood a one-seat ride to jobs along the Columbia Corridor.

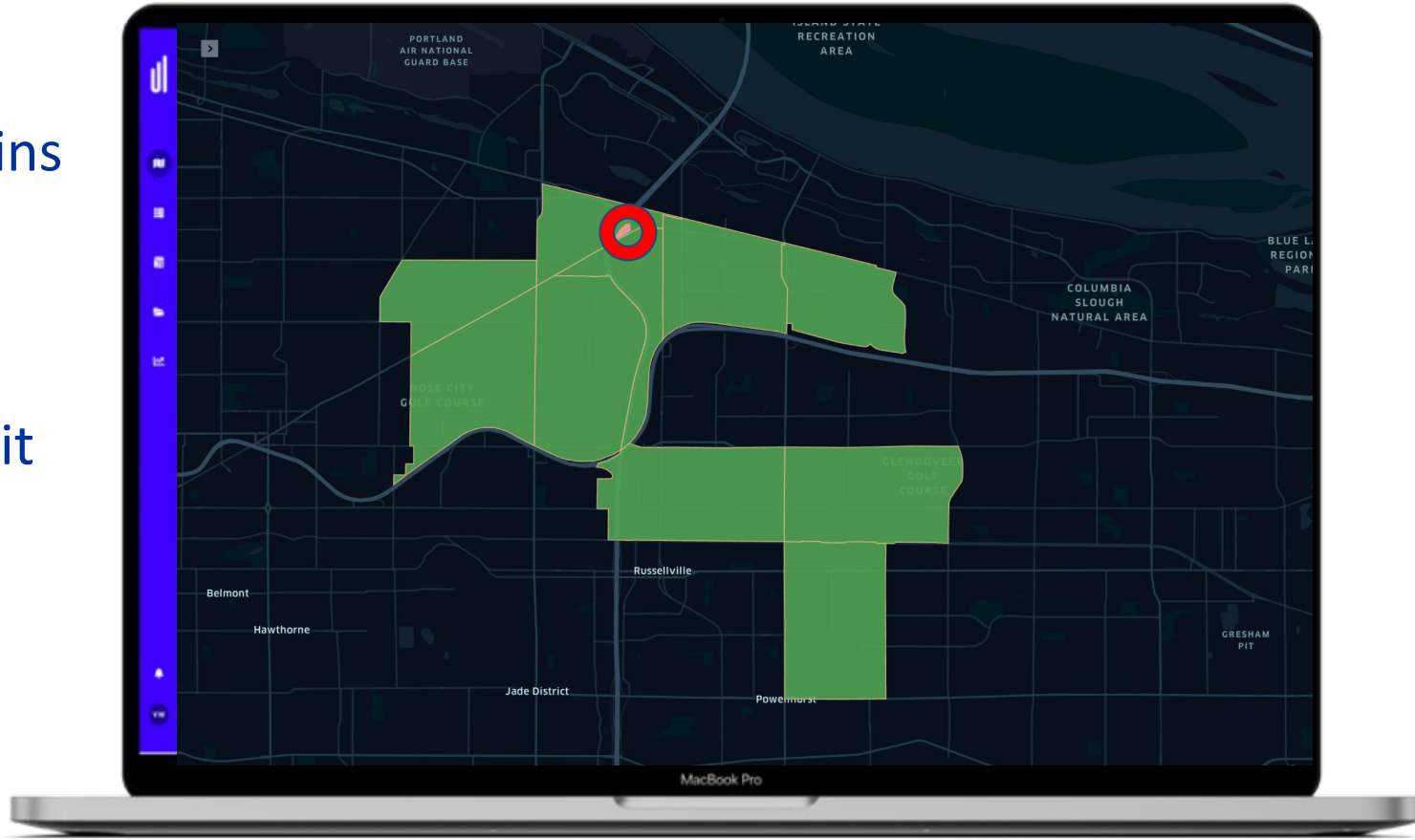


Mode Comparisons

Study of O&D to/from same transit station comparing Lyft, Uber and Transit data

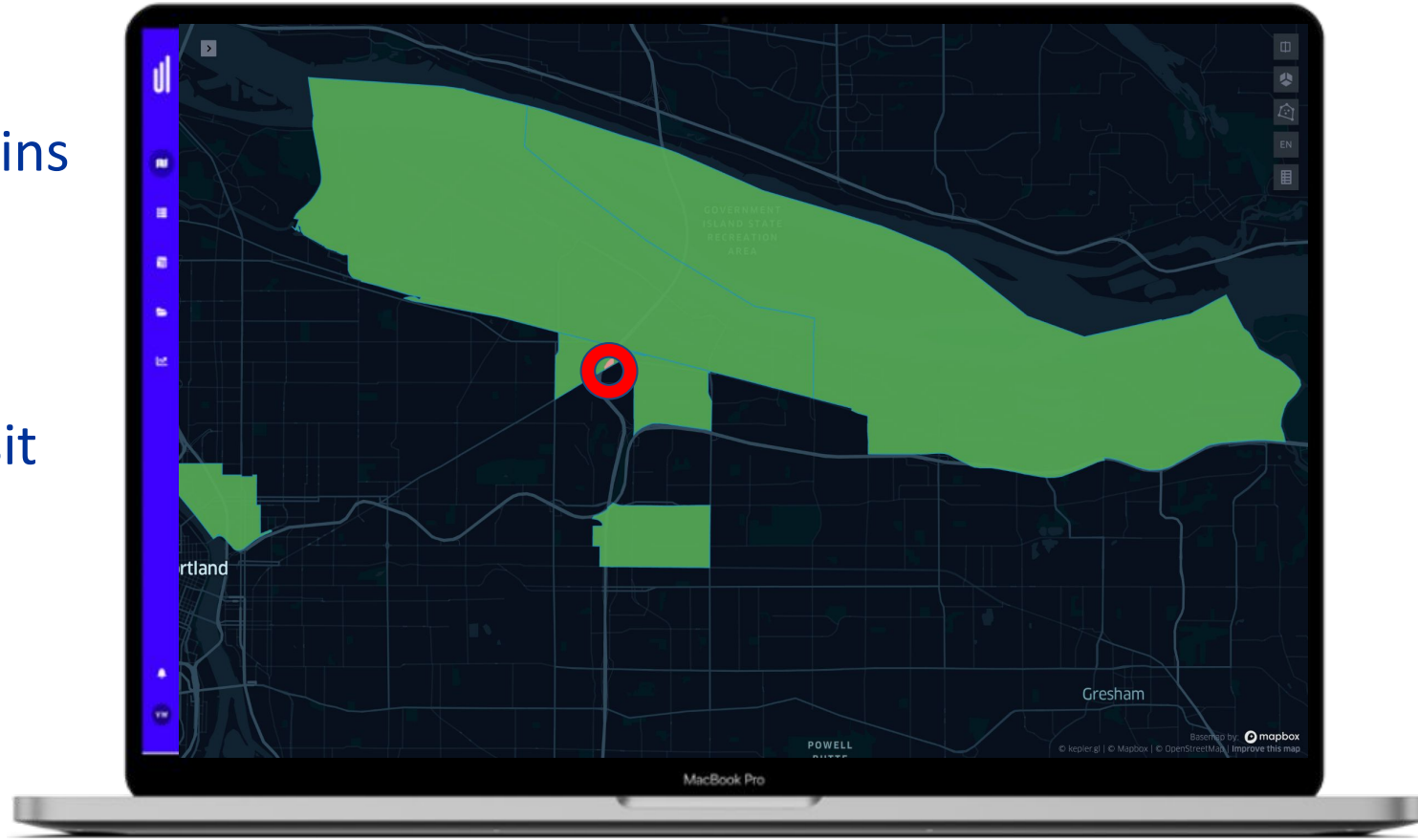
Lime Data

Lime trip origins (green area) arriving at Parkrose/ Sumner Transit Stop



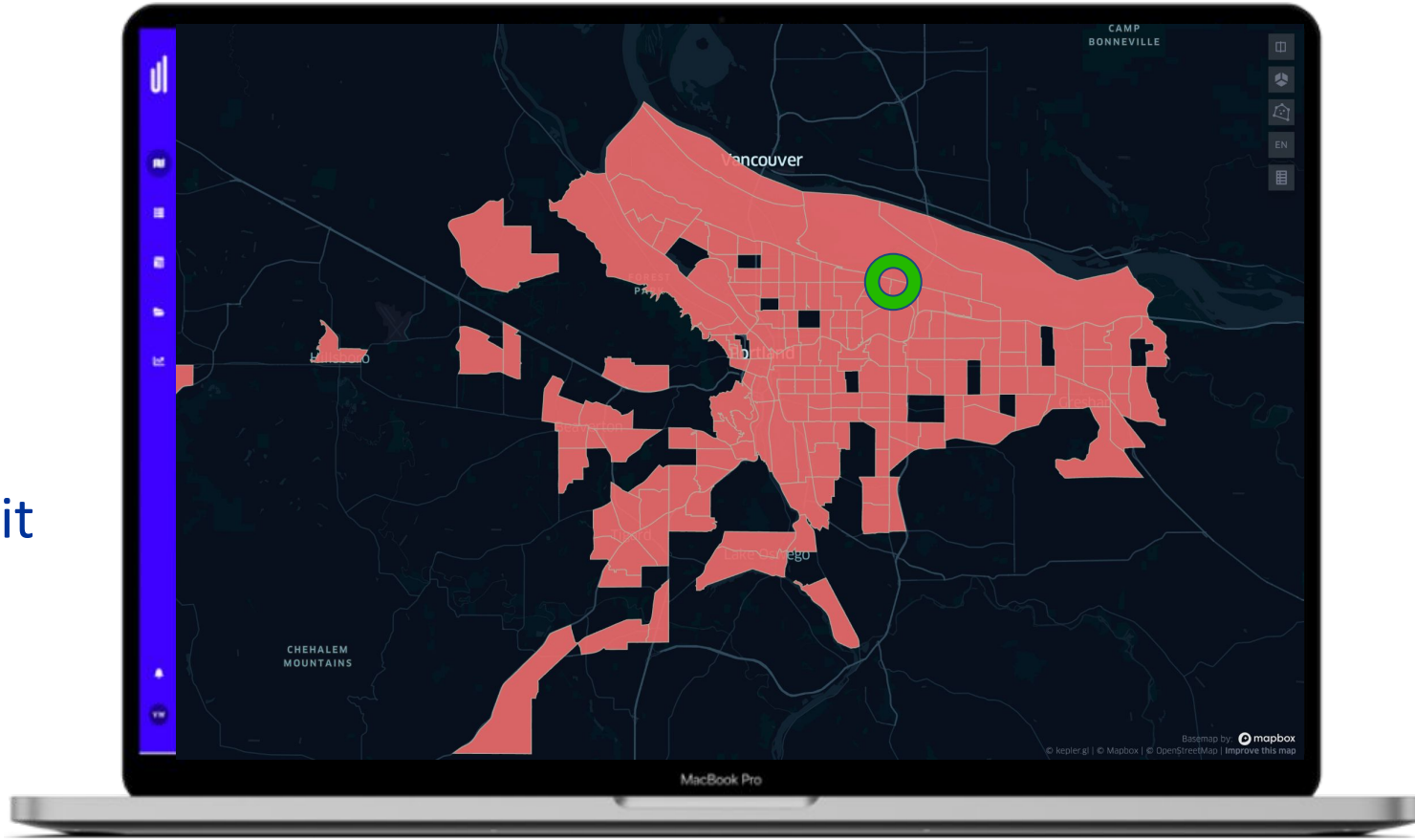
Uber Data

Uber trip origins (green area) arriving at Parkrose/ Sumner Transit Stop



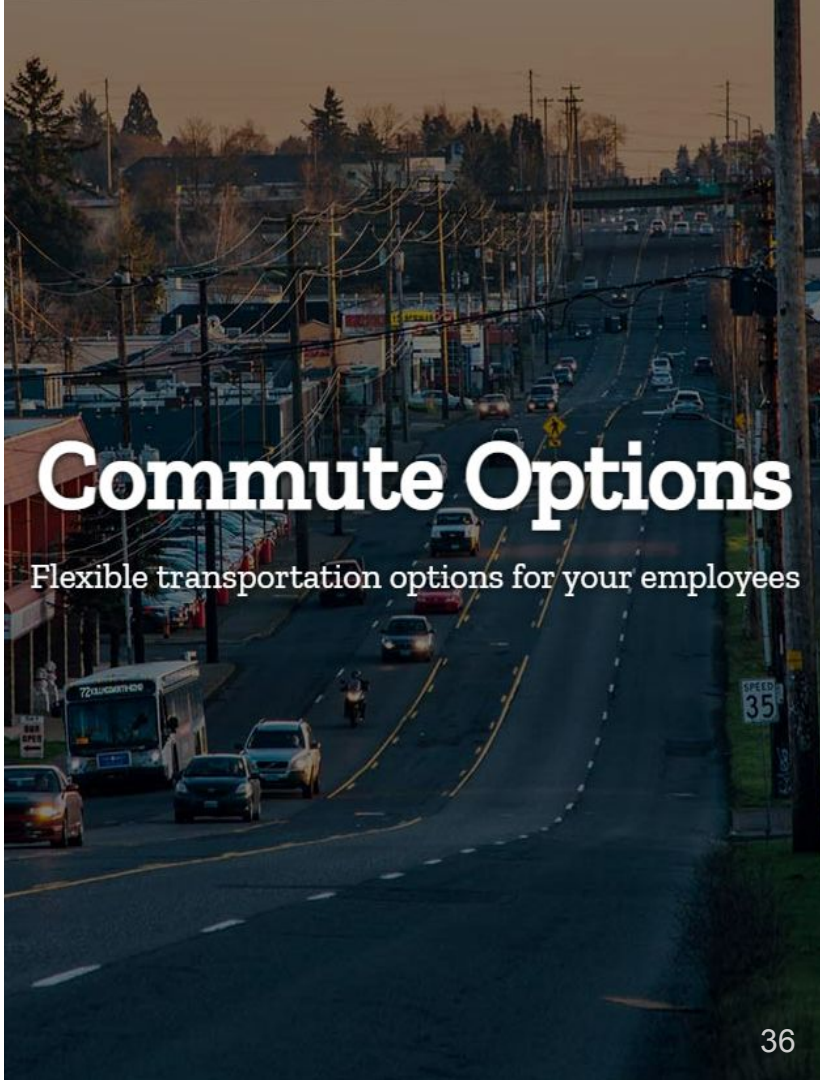
Transit Data

Transit trip origins (red area) arriving at Parkrose/ Sumner Transit Stop



ODX Analysis
Marketing and Business Development

- Insight into Employer plans (universal, annual passes, self-serve)
- Insight into Honored Citizen Fares (low income, seniors, disabilities)
- Data on overall Hop Purchases

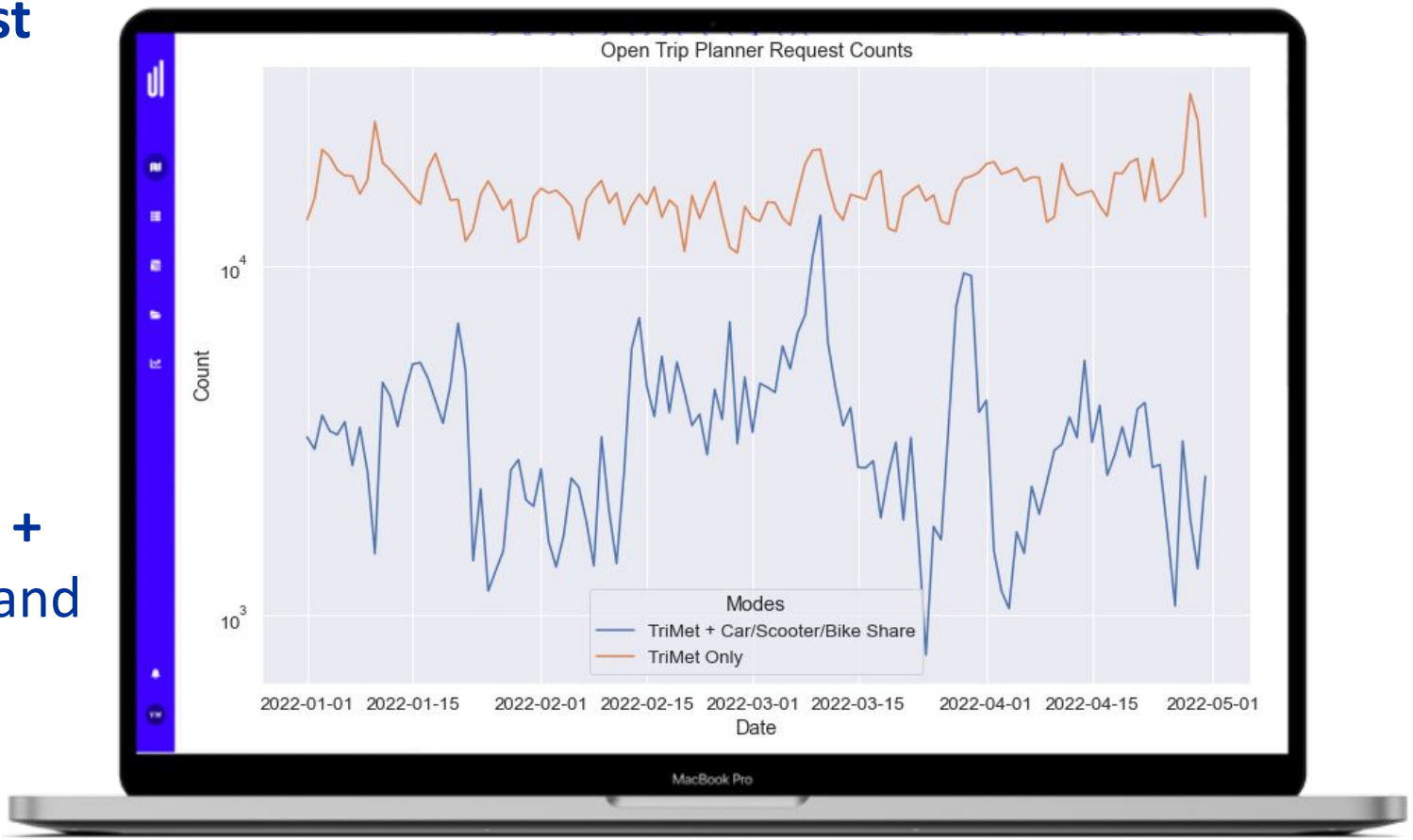


Use Cases
Trends in Multimodal Use

Study of mode usage, transfers, travel patterns, rider incentives

OTP Request Counts

Five month time period comparing Transit only with TriMet + Uber, Lime and Bikeshare Requests



SMP Impacts and Benefits

- Better customer information
- Better decision making
- Better, seamless, affordable, safe, door-to-door trip options
- Better Mobility Management
- Stronger Public/Private Partnerships (& data sharing)
- Improved collaboration between business units

Managing a comprehensive transportation ecosystem beyond just public transit

Urban Platform, developed by Ubiwhere, demonstrated using open data and third-party data about the city of Barcelona