The What & Why of Pilot Projects: *Focus on Mobility Technologies*

Summary Pilot Project Design

Examples

Success Factors in Designing & Scaling Pilots

Emerging Issues

**Exercise:** Outlining an Autonomous Shuttle Pilot
A small scale ... preliminary study .... conducted to evaluate:

- Feasibility
- Time
- Cost
- Adverse events

... and improve upon the design prior to full implementation
JOB #1: GOALS AND DEFINITION OF SUCCESS

- Better serve dispersed transit deserts
- Build jobs through fleet electrification
- Build Treasure Valley’s reputation as a mobility innovator
- Enhance community engagement through pilot projects
- Use mobility pilots to improve safety
PILOT SCOPE

MICRO TRANSIT PILOT PROJECT ON WESTSIDE

Length of Time

Geographic Area(s)

Budget

Staffing

March 28, 2018
**MARKETING & BRANDING THE PILOT**

How to Promote the Service?

- **Community**: schools, Walmart, social services, senior residences, extended stays, management offices, library, rec center
- **Commuters**: reverse commute; TMO; residential; station
- **Competitive/Complementary Services**: employer or government shuttles
- **Direct marketing**: mail, flyers, direct contact, associations, municipalities, transit vehicles

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On-demand flexible shuttles in specified geographies

Target Eventual Service Users

Design & Test for Clarity

Design & Test Seamless Journeys

Stories of How Service is Life-Changing
PARKING DESIGN

SEAMLESS SERVICE: ON-BOARDING CUSTOMERS

Customer Journey Map

Persona Details
Bio of key attitudes and behaviors

Scope Summary
Detail the scope of the journey being detailed below

Goals
List the motivations driving this particular persona within the scope detailed

Develop User Journey Maps

The First Use

Customer Service

Design in Feedback

Opportunities
Improve information on website and customer service.
Streamline process. Reduce steps and take online.
Reduce wait time by optimizing internal processes. Improve call communications.
Accelerates time to get to first successful goal.
Improve the contextual help and cues for taking next steps.

Competitive tools

Visit XYZ.com
"There are too many options, I don't know where to start"

Complements and submits application
"Excited to get started and be more productive"

Completes in-person requirements, speaking with customer support once per week.
Long wait of one month in this process.

Watches tutorials, reads boards and speaks to existing customers/colleagues.

Uses product for 2 weeks steadily then slowly falls off.

"The facts support these were very helpful"

"They finally contacted me"

"The application is too long. I don't think I'd ever complete it. Relieved that's done!"

Approval Received

First Success

"Excited to get started and be more productive!"

App Started

Automated Response

Wait for approval, 1 month

Troubleshooting Call

Competitive tools

Treasure Data Blog
DATA FOR PILOTS

Goals -> Metrics (KPIs) -> Data Needs

Best Way to Collect & Analyze?

Data Ownership, Access, Reporting

Communicating Security & Privacy

NACTO Bike Share
Intercept Survey Toolkit

SharedStreets
Data for Pilots: A Role for MPOS?

General Bikeshare/Transit Feed Specifications -> Mobility Data Specifications

Ability to aggregate standard data on all shared modes versus privacy considerations & ability to scale

Third party data stewards: Universities, private companies (Remix, SharedStreets, Ride Report)

Path Forward: Data Standards

GBFS is the present. An MDS-like standard is the future. How should TransLink navigate this evolving landscape?

1. Require one GBFS feed for all of Metro Vancouver
As new municipalities adopt micromobility services, require one aggregate GBFS feed for all of Metro Vancouver rather than individual municipal feeds. This will also set the precedent for future data sharing activities. While not technologically challenging, this mandate will require municipal cooperation. However, this feed does not support ridehailing.

2. Gauge technical feasibility/cost of MDS adoption
Review TransLink’s in-house Information Technology and Analytics capabilities. Determine if there are sufficient resources/expertise and cooperation with area municipalities to create an aggregate Metro Vancouver MDS feed. Explore the options of using third-party transportation data companies (such as Remix, Populus, or Ride Report) to determine cost of using their platforms for any analysis needed.

Based on the outcome of these findings, there are three primary options:

a. Adopt MDS in-house (Portland model)
   - Create internal systems for MDS data storage and analysis.
   - Contribute to the MDS Github to ensure TL’s requirements and interests, such as standards for ridehailing, are met.
   - Ambitious project; likely will require labor of at least one skilled employee full-time

b. Adopt MDS with third-party (LA model)
   - Use third-party’s systems for MDS data storage and analysis.
   - Contribute to the MDS Github to ensure TL’s requirements are met.
   - Large project; likely will require at least 50% of one skilled employee’s time

Translink

c. Wait to adopt MDS (DC model)
   - Wait for technology to improve and ease of adoption to increase.
   - Require GBFS feed and regular static reports.
   - Determine if a third-party’s dashboard/tools is viable for static report analysis
KPIs: A ROLE FOR MPOS?

Micro-Transit Pilot Program

Productivity - The key metric for ridership will be boardings per revenue hour. This is consistent with how productivity is measured on the bus and rail services. Data to calculate this measure will come from reports in the TransLoc software. The target at the end of the first year of service will be six or more boardings per revenue hour.

Cost-Effectiveness - The key metric for cost-effectiveness will be subsidy per boarding. This will be measured using actual costs and revenues received. The target at the end of the first year of service will be $9.00 or less subsidy per boarding.

Shared Rides - The key metric for vehicle occupancy will be percent shared rides. Data to calculate this measure will come from reports in the TransLoc software. The target at the end of the first year of service will be 25 percent shared rides.

Connecting transit trips - The key metric for connecting transit trips will be percentage of trips to/from transit hubs. Data to calculate this measure will come from reports in the TransLoc software. The target at the end of the first year of service will be more than 25 percent of trips to/from transit hubs.

Customer satisfaction - The key metric for customer satisfaction will be the percent of passengers satisfied with the service. Data will be collected using a statistically valid survey conducted by the driver. The target at the end of the first year of service will be more than 85 percent of passengers will indicate that they are very or somewhat satisfied with the micro-transit service.
PILOT IMPLEMENTATION DESIGN

Anticipatory Scenarios

Santa Monica CA
WHAT IS ANTICIPATORY SCENARIO PLANNING?

Existing
- private & public

Trending
- on-demand pilot projects

Emerging
- driverless - operator
  - segregated lane
  - assigned routes/stops

Future
- driverless without operator

Driving forces for on-demand
- bus network redesign
- first-last mile demonstration
  - grant for P3

Tipping Points for limited AV transit
- successful pilot - private lanes
- successful pilot - public streets
- safety protocol
- pedestrian interaction
- ridership goals
- service efficacy

Tipping Points for full scale AV transit
- pilot - scaled, on-demand
- safety protocol
- cybersecurity
- congestion metrics
- equitable service metrics
- financial projections
- supportive land use/mobility hubs

Edge Cases & Contingencies
### External Forces

<table>
<thead>
<tr>
<th>Future Name</th>
<th>Immigration and Trade</th>
<th>National Taxes and Funding</th>
<th>National Growth</th>
<th>Land Use Preferences</th>
<th>National Environmental Policy</th>
<th>New Technologies</th>
<th>Natural Disasters</th>
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<tr>
<td>Rising Tides, Falling Fortunes</td>
<td>Reduced</td>
<td>Lower funding due to tax cuts</td>
<td>Limited</td>
<td>Housing: more urban</td>
<td>Relaxed regulations (3' SLR)</td>
<td>More limited</td>
<td>Magnitude 7.0 Hayward Fault earthquake</td>
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<tr>
<td>Clean and Green</td>
<td>Similar to today</td>
<td>Higher funding via carbon tax</td>
<td>Similar to today</td>
<td>Housing: more urban</td>
<td>Stricter regulations (1' SLR)</td>
<td>Widespread</td>
<td>Magnitude 7.0 Hayward Fault earthquake</td>
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<tr>
<td>Back to the Future</td>
<td>Increased</td>
<td>Similar to today</td>
<td>Rapid</td>
<td>Housing: more dispersed</td>
<td>Similar to today (2' SLR)</td>
<td>Widespread</td>
<td>Magnitude 7.0 Hayward Fault earthquake</td>
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*Source: MTC*
PILOT IMPLEMENTATION DESIGN

Impact Assessments on Plausible Scenarios

Fees & Bonding Requirements

Workplan by Week & Training Plan

Santa Monica CA
Midpoint Evaluation For Powered Scooter Share Pilot

Tuesday, April 16, 2019

SFMTA
ROOT FACTORS: THE WHOLE PRODUCT WHEEL

Shared Scooters:
- Short trips
- First/Last Mile
- Safety

Mobility Integration

Infrastructure & Parking

Legal Requirements & Enforcement

Recharging & Maintenance

Rider Training & Support

Ubiquity
PILOT CLOSE OUT

Lime Real Estate Partners Program
UPGRADE YOUR PROPERTY WITH SMART, SHARED MOBILITY

LimeHub Network
Host Lime Scooters and Bikes at Your Small Business

Lime Corporate Partners Program
FASTER, HEALTHIER MOBILITY FOR YOUR EMPLOYEES

Decision to Proceed
Pilot Project Pivot
Close Out
TIPS

LONG RANGE TRANSPORTATION PLANNING

PILOT PROJECTS & PROGRAMS

Infrastructure

Services

Congestion Management

Freight

Sustainable Funding

System Efficiency

Safety

System Preservation

Land Use

Public Involvement

Economic Development

Environment

Transit

Compass WGI
PARKING & CURBSIDES: TRENDS

Dynamic Parking

TNC Pick-up & Drop-off

Curbside Management for Deliveries
PARKDC EXPANSION: DESIGNATED TNC ZONES

Replace parking with TNC pick-up & drop-off

Goals: (1) Reduce congestion in entertainment zone, (2) Reduce drunk driving, (3) increase pedestrian safety

Results: (1) Positive reviews from businesses and enforcement, (2) Unofficially been advised of increase in customer uptake, reduction in dwell times

Pivot: Continued issues with wayfinding and signage to prevent parking.
MICROMOBILITY: TRENDS

- Increased Concerns over Safety
- Move to Fleets
- Sustainable Business Models

- Lime
- Bird
- Charge
MICROMOBILITY EXAMPLE: AUSTIN TEXAS PERMIT PROGRAM

How Austin E-Scoots

Guidelines: (1) Pedestrians First, (2) Park Responsibly, (3) Stay on Right of Way, (4) Know What You’re Sharing, (5) Right and Report

Details: Nov 2018 re-launch: 8 licensed operators with maximum of 500 vehicles. Additional units allowed for higher performance

Results: Tracking (1) reduction in auto trips, (2) activity locations, (3) access to transit, (4) costs, (5) safety

Pivots: Expanded from Dockless to Micromobility Program, Hired CDC to conduct crash study

AustinTexas.gov/Micromobility
# Dockless Mobility Overview

**April 2019**

<table>
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<th>All Modes</th>
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<td>Average Miles</td>
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<td>Average Minutes</td>
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<tr>
<td>Total Devices</td>
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<tr>
<td>Service Requests</td>
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### Dockless Scooters

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<th>Scooter Trips</th>
<th>391,581</th>
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<tr>
<td>Total Devices</td>
<td>15,516</td>
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MICROTAXIS & RIDEHAIL: TRENDS

TNCS under scrutiny for negative impacts

Microtransit popular, but success mixed

Moving to Mobility-as-a-Service model
**Example: Summit New Jersey TNC Partnerships**

Parking congestion downtown/train station

Goals: (1) Alternatives to inadequate parking, (2) Avoid cost of new parking structure

Results: Waitlist for service

Pivot: (1) Switched vendors to allow riders to pre-schedule rides up to a week in advance, (2) Extended hours, (3) Extended area serving downtown workers
EXAMPLE: KING COUNTY WASHINGTON

First/Last 1-3 miles to transit stations

Goals: (1) Alternatives to inadequate parking, (2) Increase transit ridership, (3) streamline service with pick up points

Results: Several microtransit routes connecting riders to outlying transit stations.

Pivots: Ford discontinued its Chariot microtransit business, so service now through Via. Added mobile app. Continuing to expand service to all transit hubs.
Are Uber and Lyft the Future of Transit? Not So Fast

By Aaron Short | Jul 22, 2019

60% of them took fewer than five rides during that time. By comparison, the top ten most frequent users had each taken at least 40 rides, as many as 75 times for two riders, and alone represented 40% of all rides. Trips through United Taxi followed a similar trend through the last point of analysis.
EXAMPLE: RTA, LYFT AND BANNOCKBURN LAKES - CHICAGO

Microtransit for reverse commuters – 2 year pilot

Goals: (1) fill vacant suburban office space, (2) eliminate cost of corporate shuttle, (3) connect office parks, (4) Access to transit
VEHICLE SHARE: TRENDS

ROUND TRIP, POINT TO POINT, PEER TO PEER, AMENITY FLEETS

Amenity fleets for individual buildings

Moped share

TaaS: Turnkey vehicle share platforms

Envoy Technologies/IONEX/Ridecell
Example: Victor Valley Transit Authority Carshare Pilot

Small car share program

Goals: (1) Increase mobility in low income, rural district, (2) Access to fresh food, (3) use existing partnerships for financial sustainability

Results: (1) High utilization rates, (2) Nissan Altima and Dodge Caravan: $5/hour including insurance and fuel, (3) Revenues cover 70% of program costs

Pivot: None - the program is permanent
EXAMPLE: BlueLA CAR SHARE

Electric car share – affordable housing

Goals: (1) Increase mobility in low income, residents, (2) Lower impact cars, (3) scalability

Results: (1) 68 vehicles circulating among 110 charge points at 22 stations, (2) 1,367 BlueLA members, (3) Mix Standard & Community memberships

Pivot: Phase 2: increase fleet number of charging points, new payment & service model
Conventional car-parks

Autonomous vehicle car-parks

Mehdi Nourinejada, Sina Bahramib, Matthew J. Roordab
NOW
TECHNOLOGY
- Payment apps
- Navigation, sensors & apps
- Smart parking meters
- Carshare

PARKING
- Designated carshare parking
- Guide drivers to spots
- Payment-by-app

PLANNING
- TDM
- Valets
- Dynamic pricing
- Parklets, Streateries, Corrals

TRENDING
TECHNOLOGY
- Autonomous Parking
- Shared Use Mobility
- Microtransit
- Electric charging

PARKING
- Pickup/Drop off zones
  (passengers & deliveries)
- Smart garages

PLANNING
- Queuing
- On-street space reallocation
- Parking districts
- Flexible garage design
- Ubiquitous charging stations

EMERGING
TECHNOLOGY
- Autonomous Shuttles
  (1st fixed route, then demand-response)
- Mobility-as-a-Service (MaaS)

PARKING
- Off-site parking
- Shared, automated, district parking

PLANNING
- Shuttle route planning
- Transition (driver-driverless)
- Coordination with transit
- Repurposed garage spaces

FUTURE?
TECHNOLOGY
- Individual cars - % of fleet?
- Owned or shared? Publicly or privately operated?

PARKING
- What are the best parking locations to balance demand-response with lower congestion & VMT?

PLANNING
- How should parking be priced?
- How should cities retool parking revenue?
Rise in e-commerce changing logistics

Real estate responding: warehouses & lockers

Automated delivery at all scales

Amazon says drone deliveries coming 'within months'

Visit Addison/ Daimler
Kohl’s is going to accept Amazon returns in all of its stores across the country, starting in July

PUBLISHED TUE, APR 23 2019 • 9:09 AM EDT | UPDATED TUE, APR 23 2019 • 12:54 PM EDT
Autonomous trucks will likely roll out in four waves.

**Constrained platooning of trucks**
- **2018–20**: Driver in each truck
- **2018–20**: 2 drivers platoon 2 trucks on interstate highway
- **2018–20**: Drivers drive individually on noninterstate highway

**Constrained autonomy**
- **2022–25**: Driver in leading truck
- **2022–25**: Platooning only on interstate highway between dedicated truck stops with 2 trucks, with single driver in leading vehicle
- **2022–25**: Drivers drive individually on noninterstate highway

**Full autonomy**
- **2025–27**: Driver for pickup and drop-off
- **2025–27**: Autonomous trucks ride on interstate highway without drivers (platooning 2 or more trucks when possible)
- **2025–27**: Drivers drop off trucks at dedicated truck stops

- **2027+**: Driverless
- **2027+**: Autonomous trucks drive individually on all highways and in Platoons of 2 or more trucks
- **2027+**: Driver involvement eliminated throughout the journey

McKinsey
Automated shuttles & trucks seem to have traction

Automated cars in ridehail or car share model

Automated deliverybots (air & ground)
Service types that could be used for various use cases:

- Educational Campuses
- Service to Hubs (e.g., transit, downtown)
- Health Care Services
- Employment
- Entertainment & Recreation
- Retail and Restaurants/Downtown Business Centers
- Parking Shuttles
- Residential developments & Retirement Communities
Service types that could be used for various use cases:

- Exclusive Off-street Guideway
- Off-street, Multi-use Pathway
- On-Street Pathway with Dedicated, Low Speed Lane
- On-Street Pathway with Dedicated Transit Lane
- On-Street, Mixed Traffic
Pilot Readiness: Automated Shuttle Pilot

Goals

Regulatory Readiness

Technical Partnerships

Technical Requirements

Infrastructure Partnerships

Feasibility

Financial & Funding

Geographic Boundaries

Pilot Length
EXAMPLE: MILO SHUTTLE ARLINGTON TEXAS

Early automated shuttle

Goals: (1) Reduce fuel costs and increase safety, (2) increase public awareness, (3) collect data, (4) enhance Arlington’s reputation for innovation, (5) attract research and development funds, (6) connect remote parking

Results: (1) Able to move from private roads to public rights of way, (2) Attract CMAQ grants, (3) 99% riders satisfied, (4) 97% reported they support AV technology.
TREND: AUTONOMOUS BUS RAPID TRANSIT

Variety of Geographies
Cold Weather
Desert
Hot and Humid
Rainy

Variety of Applications
Bus Rapid Transit
Shuttle Service
Arterial Rapid Transit
Express Service
Fixed-Route Service

Variety of Vehicle Options
New Vehicles
Retrofit Kits for Existing Vehicles
Zero Emissions Vehicles
Traditional Propulsion
EXAMPLE: POPUP MANGO IN SANTA MONICA CA

“Living Preview” of Traffic Calming Options for a Michigan Avenue Neighborhood Greenway (MANGO) 2013

Goals: (1) Gain Public Feedback, (2) Improved visuals of possible techniques, (3) Create a festival to attract more people, (4) Collect data on preferences.

Results: (1) Positive Feedback, (2) Improvements over earlier efforts that were not as attractive and not part of an event, (3) more support for a roundabout, (4) Santa Monica adopted Phase 1 improvements 2015.
TREND: MOBILITY HUBS

Tesla claims it can deploy an emissions-free 250 MW, 1 GWh power plant in less than three months.
EXAMPLE: RETROFITTING CORRIDORS
EXERCISE: PLANNING FOR AUTONOMOUS SHUTTLES

- Service to Hubs (e.g., transit, downtown)
- Educational Campuses
- Health Care Services
- Employment
- Entertainment & Recreation
- Retail and Restaurants/Downtown Business Centers
- Parking Shuttles
- Residential developments/Retirement Communities
Solves Problems... & Creates Problems

- Expanded mobility
  - The Elderly
  - Youth
  - Travelers with Disabilities
- Ability to Lower Tailpipe Emissions
- Feeders to Transit
- Automated Transit
- Economic Catalyst
- Potential to Lower Costs

- Privatization of Personal Data
- Cybersecurity
- Lack of Consumer Trust
- Preference for Vehicle Ownership
  - Subjugated Walk/Bike Modes
- Biased Algorithms
- Federal/State Preemption
- Cost of Mass Electrification
NEW MOBILITY: NEXT GENERATION PROCESS

Normative Scenario Planning
Growth/4 Futures
What is preferred scenario?

Exploratory Scenario Planning
What are change drivers?
Alone & combinations?
What’s possible/probable/likely?
Impacts: positive/negative/mixed?

Predictive or Anticipatory Scenarios
What are the phases?
What levers do we have?
To what degree do we control levers?

Strategic Planning
What are priority activities for moving forward?
Which policies &/or bundles are most effective & deliver multiple benefits?

Performance-Based & Pilots
How do we test?
When do we approve pilot expansion?
How do we master a program for multiple pilots & multiple technologies?

Contingency Planning
How do we plan for low probability/high risk events?
Data: Supply data to determine where pilots would serve a need

Funding: Provide funding or a cost matching pool of funds for pilots.

One Stop Resource and Single Point of Contact: Host a one-stop resource to track multiple pilot projects, including permitting, MOUs, data collection, reporting, and pilot analysis

Coordinate Public-Private Partnerships: Most pilots involve assets and resources from multiple sources. Coordinating roles, responsibilities and resources is a critical aspect in pilots.

Plans: Include pilot activities in Long Range Transportation Planning

Pursuing Pilots: MPOs can themselves pursue pilots with widely applicable outcomes, products and services

Analysis: Use Pilots to stress test and enhance forecasting and planning models

Next Generation Planning Support: provide training in Exploratory Scenario Planning, Performance-Based Planning and Pilot Project Design

Monitoring: Start data collection initiatives to monitor emergent trends in technology/services adoption and shifts in travel behavior patterns

Planning “Triggers:” Establish potential “dates of decision” for making policy changes to planning/forecasting procedures once technologies reach a certain point of adoption or if there is a noted trigger event.