Choosing the right technology for your transit system

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Office of Transit and Active Transportation

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Greater Minnesota Transit Technology Plan

Chuck Morris, Data and Technology Coordinator

http://www.dot.state.mn.us/transit/reports/transittechplan.html
• Statewide Technology Plan Finalized June 2021

• **Introduction** – Purpose and process

• **Context for Transit Technology - resources**
  
  Transit Technology Survey

  Review MnDOT Regional Transit Plans

  National Peer Review
5 Keys to a Successful Project

Understand the asset, take care of its components, support it with training, and make plans to replace or upgrade it.

• Key 1: Defining clear goals is a critical first step, and champions must communicate and advance those goals.
• Key 2: After setting goals, regularly monitor performance measures and update work plans.
• Key 3: Watch for coordination opportunities that align with agency/provider goals
• Key 4: Technology is evolving quickly but, getting fundamental building blocks in place – maintaining them is an ongoing activity
• Key 5: The technology program must have a plan for sustaining data and covering ongoing costs.
Technology Plan

• **Goals and Strategies**
  • Input from OTAT, Transit Systems and RTCC

• **Technology and Management Solutions**
  • Scheduling /Dispatch and related Management
  • Customer Facing Trip Planning
  • Communication with Riders and Public
  • Asset Management
  • In-Vehicle Technology
  • Fare Payment
  • Service Planning
### Technology Plan

#### Figure 5.2 Baseline Transit Technology Reference Chart

- Scheduling /Dispatch and related Management
- Customer Facing Trip Planning
- Communication with Riders and Public
- Asset Management
- In-Vehicle Technology
- Fare Payment
- Service Planning

<table>
<thead>
<tr>
<th>FLEET SIZE OR TRIP COUNT</th>
<th>1 to 9 vehicles OR &lt;100 trips per day</th>
<th>10 to 29 vehicles OR &gt;100 trips per day</th>
<th>30+ vehicles OR &gt;250 trips per day</th>
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<tr>
<td>DR</td>
<td>FR</td>
<td>DR</td>
<td>FR</td>
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<td>---</td>
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<td>Scheduling Software/Dispatch and Related Management Systems</td>
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<td>Client mgmt and scheduling DR trips</td>
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<td>Vehicle maintenance</td>
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<td>In-Vehicle Technology</td>
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<td>Automated voice announcements</td>
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<td>Cameras</td>
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<tr>
<td>Mobile data terminal/computer</td>
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</table>
Technology Plan

• Transit Technology Flow Chart

• Primary Technologies

• Scheduling/Dispatch and related Management

• Customer Facing Trip Planning

• Communication with Riders and Public

• Asset Management

• In-Vehicle Technology

• Fare Payment

• Service Planning
Developing Transit Agency Assessments and Growth Plans

**Part 1 – Assessment**
- Step 1: Agency Context and Goals
- Step 2: Review Supports
- Step 3: Identify & Analyze Tech Systems
- Step 4: SWOT Analysis & Recommendations

**Part 2 – Growth Plan**
- Include perspectives of decision makers, stakeholders, and from other plans
- Prioritize and select among options
- Identify details for actionable plan
Collaborative Decision Making

• Create a Technology Committee
  • Committee met last Thursday- in process of prioritizing tasks creating a work plan and defining goals

• Refine investment process
  • Maintain five-year vision for planning / budgeting purposes. Assess current funding criteria.

• Develop New Approach to Technology Innovation
  • Jointly identify areas innovation may offer critical benefits.
  • Identify funding and partnership opportunities.

• Establish ongoing Communication-
  • Build knowledge sharing, incentivize coordination,
  • Increase understanding of technology issues.
Organizational Support

• Provide Comprehensive Technology Training
  • Training program for current technologies, and partner with national training opportunities

• Increase Access to Technology Domain Experts
  • Develop a list of experts to resource for current problems and future growth

• Create a Resource Library
  • A library to house technology procurements, rfp’s, cost estimates, procedural information

• Technology and Cyber Security Assessments
  • clarifies expectations for technology and cybersecurity assessments to advance statewide strategic technology priorities.

• Leverage State Procurement role- Procurement assistance streamlined and/or centralized.
Technology Plan

Specifications, Acquisitions, and Integration

- Establish Functional Requirements for Key Systems
  - Rigorous specifications do not yet exist for all technology systems.

- Support Integrated Technology Systems
  - Identify specific scenarios where APIs can serve to streamline data.

- Support Specifications Development
  - Standardize data flows between vendors/systems. Reduces risk of vendor lock-in.

- Ensure High Quality Streaming Data and Management
  - Assess the current data collection requirements, processes, frequency to streamline effort.
Questions??
Greater Minnesota Shared Mobility Program Update

Elliott McFadden, Greater Minnesota Shared Mobility Coordinator
About Elliott McFadden

• 15-year veteran of shared mobility industry
• Launched 1\textsuperscript{st} carsharing system in Texas
• Founding CEO of Austin B-cycle
• Co-founder of North American Bike Share Association
• Leader on dozens of product development and innovation projects using Lean Startup principles
• Started as state rideshare program, expanded to all shared mobility technologies in 2020

• Work focus
  • Building understanding of shared mobility options
  • Identify opportunities for shared mobility pilots in Greater Minnesota
  • Build network of organizations in shared mobility space and host Greater Minnesota Symposium
• 28 of 35 systems currently have some form of existing shared mobility in their market

• 10 have had a shared mobility service that had ceased operating in their market

• Generally, a high level of interest in shared mobility to address unmet community need

• 14 potential shared mobility pilots identified for further research and exploration
• Monthly programming from November 2020 to June 2021

• Increase familiarity with shared mobility technology and services

• Platform for knowledge share

• Topics included GTFS, microtransit, mobility hubs, and Mobility-as-a-Service

• Previous webinars on MnDOT Transit page and more to come!
• Develop a parking product that will help reduce SOV trips by removing sunk cost of parking contract

• Testing 2 products: 14-day monthly contract and similar pass with parking bundled

• 20% discount off of similar pay-as-you-go product

• Uses Metro Transit Go-To card as media
Southern Minnesota MaaS Platform Pilot

• Mobility as a Service vision: a single platform that provides access to all shared mobility options, allows trip planning, fare payment, and real time updates on trip information

• Integration of transit planning and ticketing with private shuttles and buses, taxis, TNCs, bike and scooter share, van pool, carshare, shared CAV, and new emerging shared mobility technologies

• Pilot will focus on 7 transit systems plus private providers in Southern Minnesota
Coverage area

7 Greater Minnesota Transit Systems
• Rochester Public Transit
• Greater Mankato Public Transit
• Brown County Heartland Express
• Minnesota River Valley Transit
• Rolling Hills Transit
• SMART
• TRUE Transit
Parts of Mobility as a Service (MaaS) system

- MaaS Consumer App
  - API/SDK Management
  - Data Feeds (GTFS, GBFS, and Service Provider API)
  - Data Analysis and Planning Software
    - E-ticketing
      - 3rd Party Planners, Public Transit & Service Provider Apps

Dispatching & Routing/Operations Software

Data Feeds

- GTFS, GBFS, and Service Provider API

API/SDK Management

Data Analysis and Planning Software

E-ticketing

3rd Party Planners, Public Transit & Service Provider Apps
Planned data spec implementation

• GTFS/GTFS-Flex data feeds for all participating transit

• Development and testing of Demand Response Transactional Data Spec (TDS) in partnership with SUMC/AARP workgroup

• General OnDemand Feed Specification (GOFS) in partnership with MobilityData workgroup

• Adaptation of General Bike Share Feed Spec (GBFS) to carsharing application
Western Minnesota Contactless Payment Pilot

• University of Minnesota is researching how transit and shared mobility can address COVID safety concerns to accelerate return of ridership

• FTA research grant will help add contactless payment options and trip planning to determine impact

• Will compare mobile app ticketing versus card-based system
Project Partners

8 Rural (5311) Greater Minnesota Transit Systems
Mobile Ticketing
• Morris Transit
• Rainbow Rider
• Transit Alternatives
• Tri-cap Transit Connection
• Wadena County Friendly Rider

Fare Card
• Central Community Transit
• Prairie Five Riders
• United Community Transit

Research
University of Minnesota led by Prof. Yingling Fan

Dispatching and Routing Software
• CTS Software, Routematch by Uber, Tripspark
Future Improvements

2023 and Beyond

• MnDOT and MNIT evaluate for statewide deployment

• Develop standard for billing transactions including non-emergency medical

• Longer term: tolling and parking, curb management, distance-based fees
Challenges of implementing new tech

• Risk can be high (as can be the reward!)

• It’s not “set it and forget it”

• It can be hard to determine cost/benefit and when to keep going or pivot
How to reduce risk

• Make sure it’s a problem worth solving

• Get out of the building and talk to customers first

• Figure out a way to build an MVP to test your hypothesis

• Don’t scale until you get success
A model for continuous improvement

• Build your MVP to test your hypothesis

• Measure how your customers react

• Learn what customers like and don’t like, what is a requirement versus a nice to have

• Improve and repeat until you have something to scale with
When to keep going or throw in the towel

• Before you start, envision the result of your technology you’d like to see

• Determine what are the key metrics to tell you if you are successful (avoiding vanity metrics!)

• Keep running the Lean Startup Cycle until you find success (then scale) or run out of time, money or ideas (then pivot)
Recommended reading

[Image of "The Lean Startup" by Eric Ries]

[Image of "Running Lean" by Ash Maurya]

[Image of "Scaling Lean" by Ash Maurya]

“A battle-tested approach to building companies that matter.”
—Eric Ries, author of The Lean Startup

Author of Running Lean and creator of Lean Canvas

Mastering the Key Metrics for Startup Growth
Thank you!

Greater Minnesota
Transit Technology Plan