BACK TO THE FUTURE ™

Choosing the right technology for your transit system

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Office of Transit and Active Transportation

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mn DEPARTMENT OF TRANSPORTATION

Greater Minnesota Transit Technology Plan

http://www.dot.state.mn.us/transit/reports/transittechplan.html

Chuck Morris, Data and Technology Coordinator

Technology Plan

- 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.**

- **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
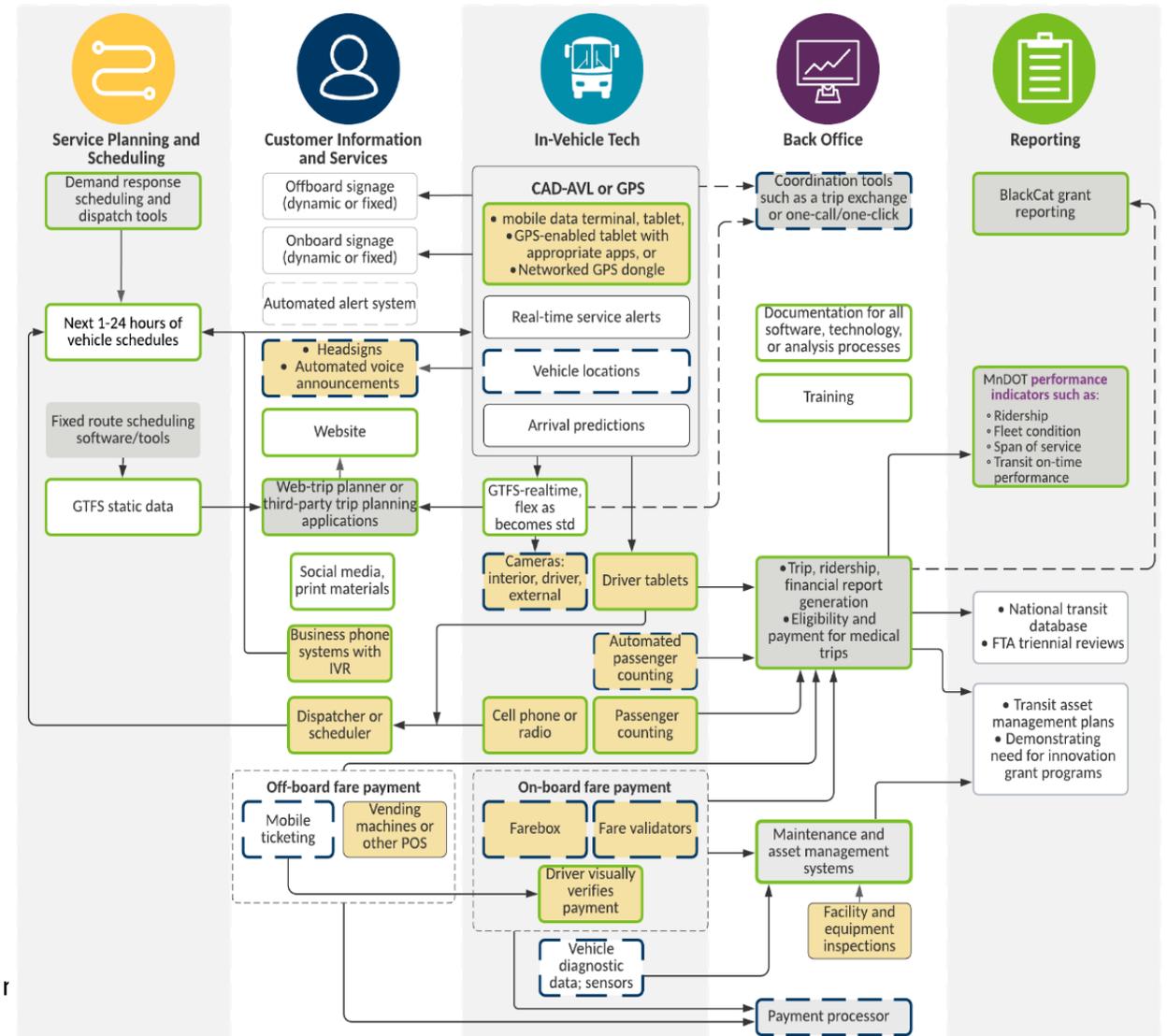 - In-Vehicle Technology
  - Fare Payment
  - Service Planning

KEY: ○ = NO ● = YES ◐ = MAYBE NA = Not applicable

Scheduling Software/Dispatch and Related Management Systems	1 to 9 vehicles or <100 trips per day		10 to 29 vehicles OR >100 trips per day		30+ vehicles OR >250 trips per day	
	DR	FR	DR	FR	DR	FR
Client mgmt and scheduling DR trips	◐	NA	●	NA	●	NA
Scheduling FR vehicle runs	NA	●	NA	●	NA	●
Algorithm to optimize schedule	●	NA	●	NA	●	NA
Driver and vehicle scheduling and mgmt	●	●	●	●	●	●
Reporting	●	●	●	●	●	●
Interfaces and export/import ability	◐	◐	◐	◐	●	●
Driver manifests on tablets or MDTs	◐	NA	◐	NA	●	NA
Reminder calls	◐	NA	●	NA	●	NA
Customer-Facing Trip Planning						
Trip planning for riders	◐	◐	◐	●	◐	●
GTFS	NA	●	NA	●	NA	●
GTFS-Realtime	NA	◐	NA	◐	NA	●
GTFS-Flex	◐	NA	●	NA	●	NA
Communications with Riders and Public						
Web page	●	●	●	●	◐	◐
Social media	◐	◐	◐	◐	◐	◐
Business telephone systems	◐	◐	●	●	●	●
Asset Management						
Vehicle maintenance	●	●	●	●	●	●
Facility maintenance/other (e.g., passenger shelters)	◐	◐	◐	◐	◐	◐
Pre-trip inspections	●	●	●	●	●	●
In-Vehicle Technology						
Automated voice announcements	NA	◐	NA	◐	NA	●
Cameras	◐	◐	●	●	●	●
Automatic vehicle location or GPS	◐	◐	◐	●	●	●
Automated passenger counters	NA	○	NA	◐	NA	◐
Collision avoidance systems	◐	◐	◐	◐	◐	◐
Mobile data terminal/computer	◐	◐	●	◐	●	●

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

- **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. mndot.gov/

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.

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 1st 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

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- 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

Greater Minnesota Shared Mobility Assessment

- 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
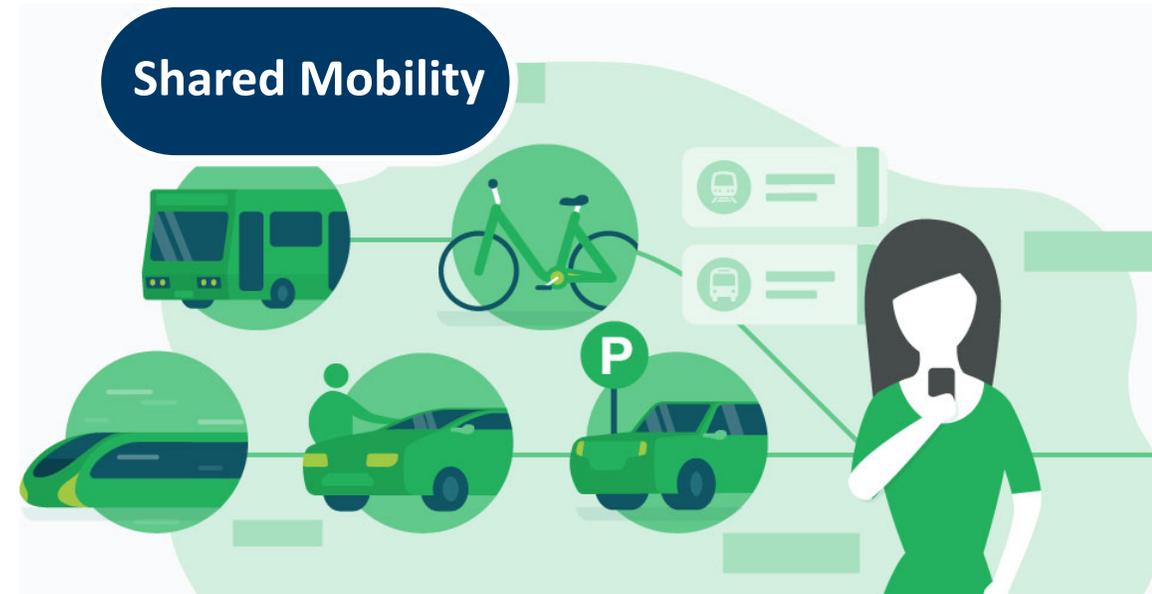
Shared Mobility

- 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!
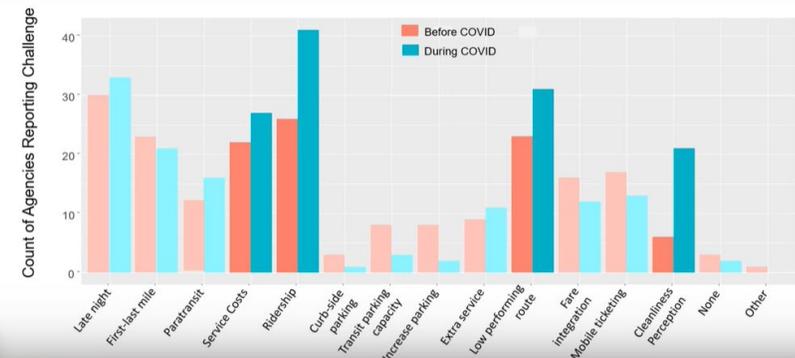
- Develop a parking product that will help reduce SOV trips by removing sunk cost of parking contract

- 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

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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
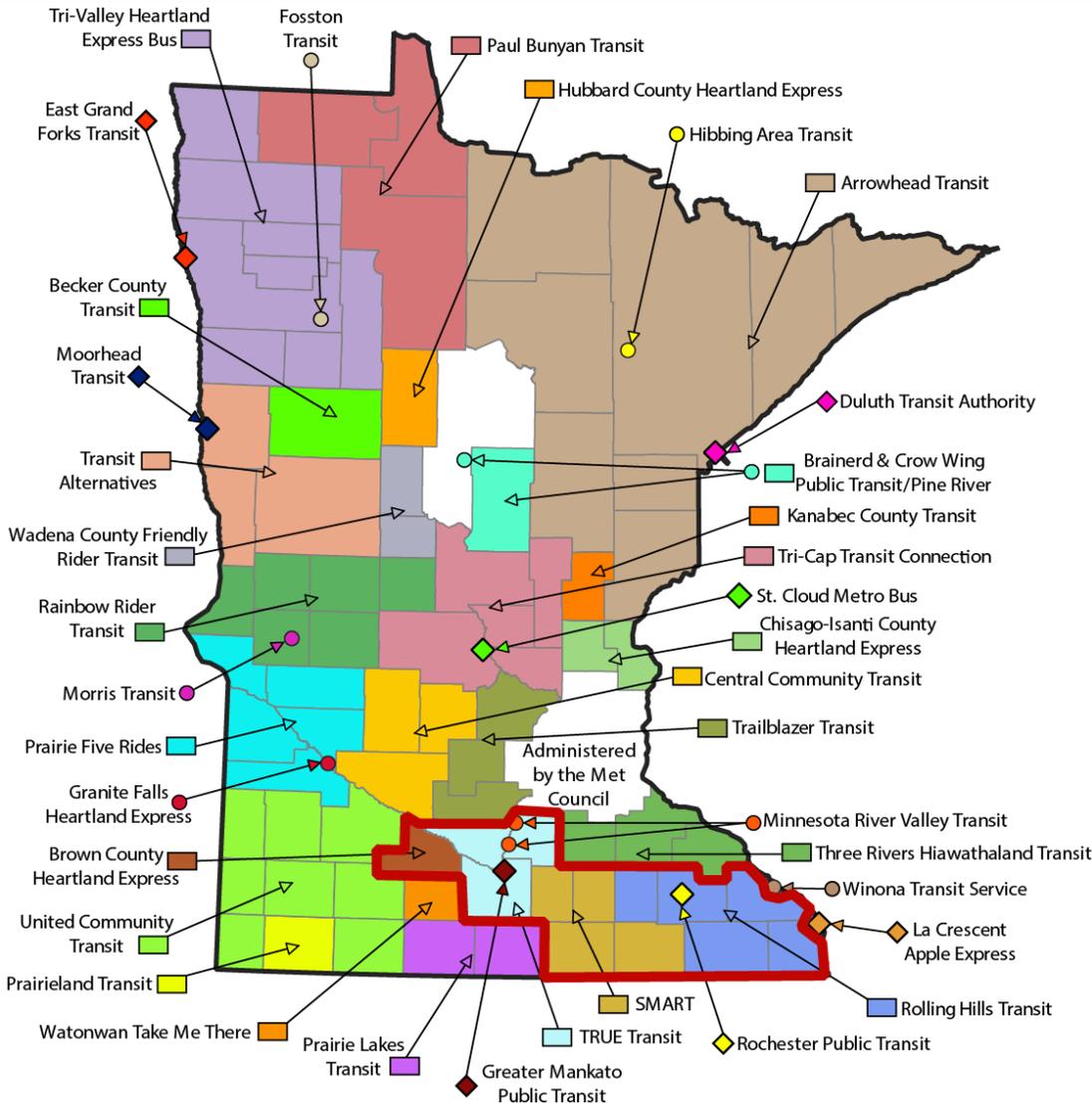
7 Greater Minnesota Transit Systems
- Rochester Public Transit
- Greater Mankato Public Transit
- Brown County Heartland Express
- Minnesota River Valley Transit
- Rolling Hills Transit
- SMART
- TRUE Transit

Parts of Mobility as a Service (MaaS) system

MaaS Consumer App

API/SDK Management

3rd Party Planners, Public Transit & Service Provider Apps

Dispatching & Routing/Operations Software

Data Feeds
GTFS, GBFS, and Service Provider API

E-ticketing

Data Analysis and Planning Software
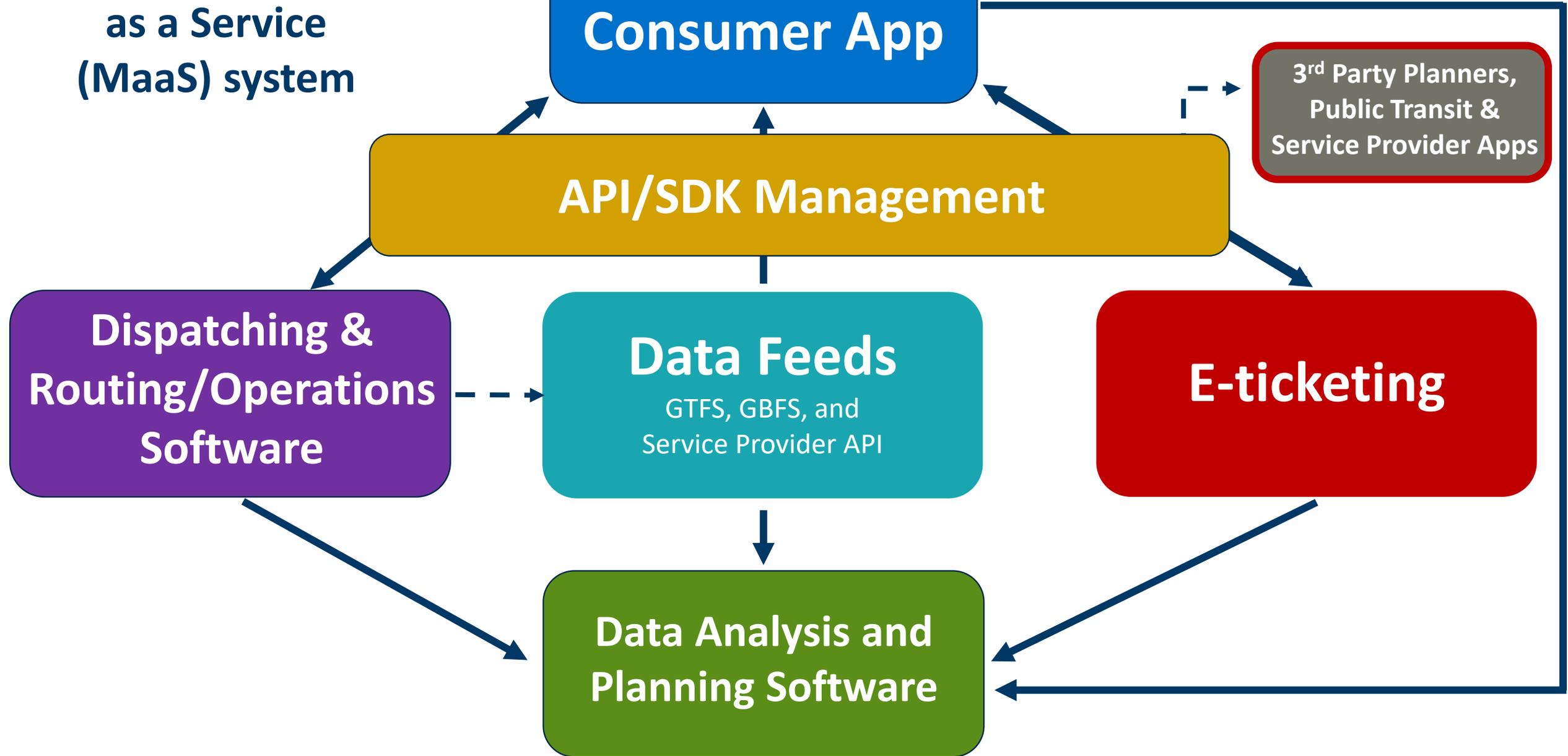
Planned data spec implementation

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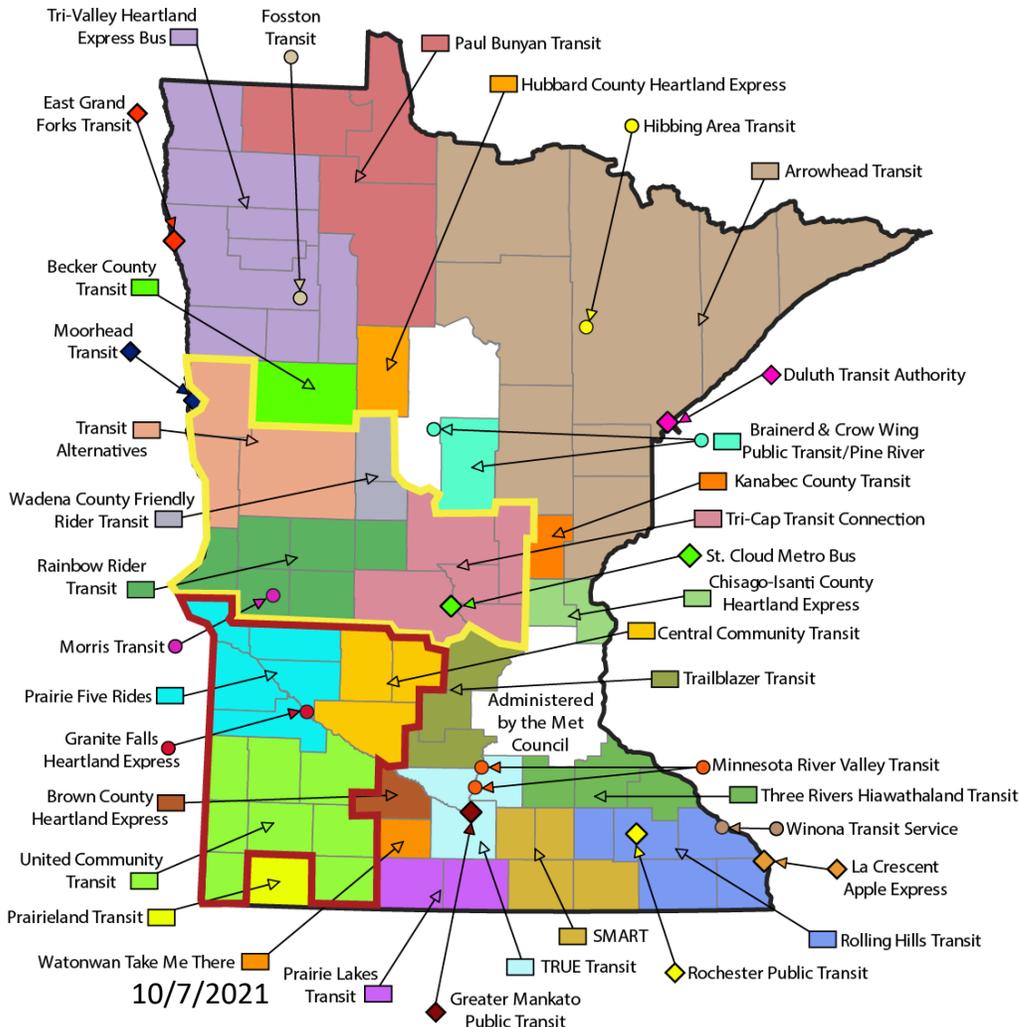
8 Rural (5311) Greater Minnesota Transit Systems
Mobile Ticketing
- Morris Transit
- Rainbow Rider
- Transit Alternatives
- Tri-cap Transit Connection
- Wadena County Friendly Rider

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

10/7/2021

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2023 and Beyond

- MnDOT and MNIT evaluate for statewide deployment

- Develop standard for billing transactions including non-emergency medical

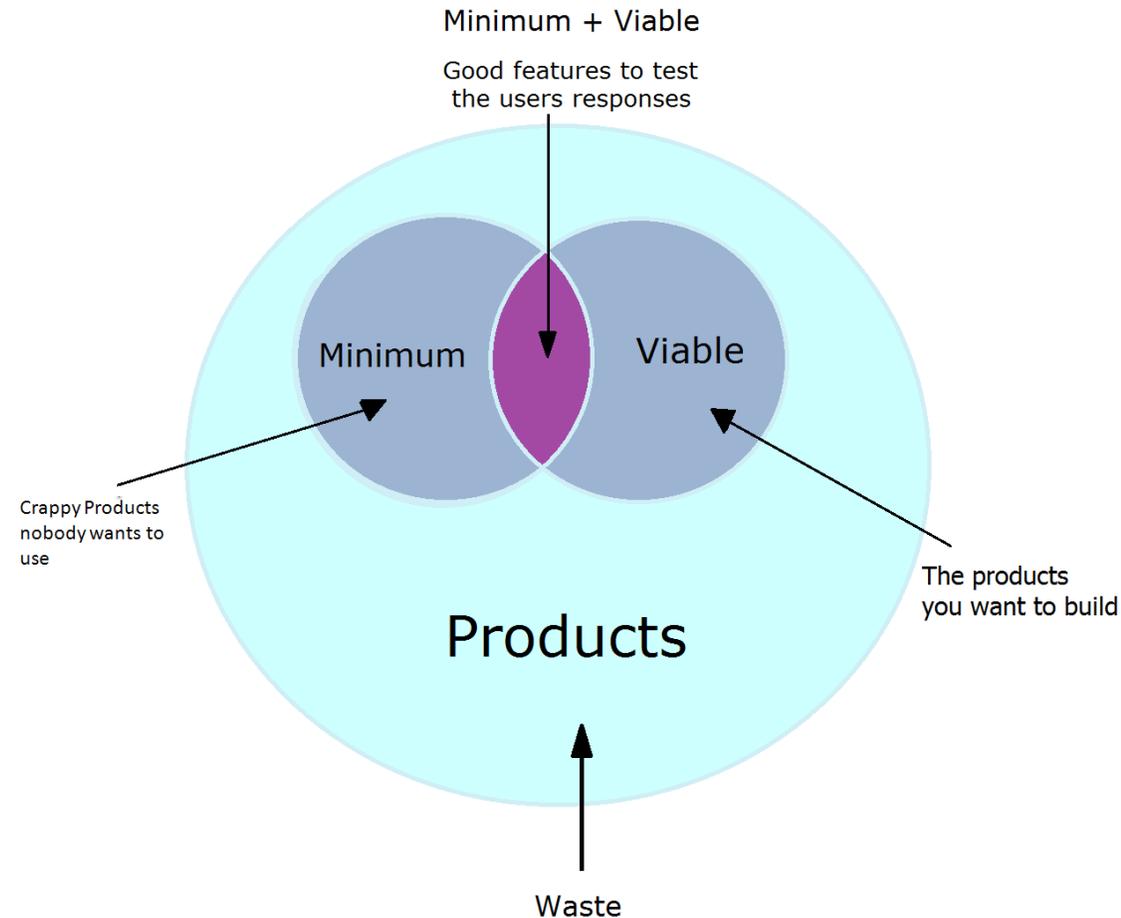- Longer term: tolling and parking, curb management, distance-based fees
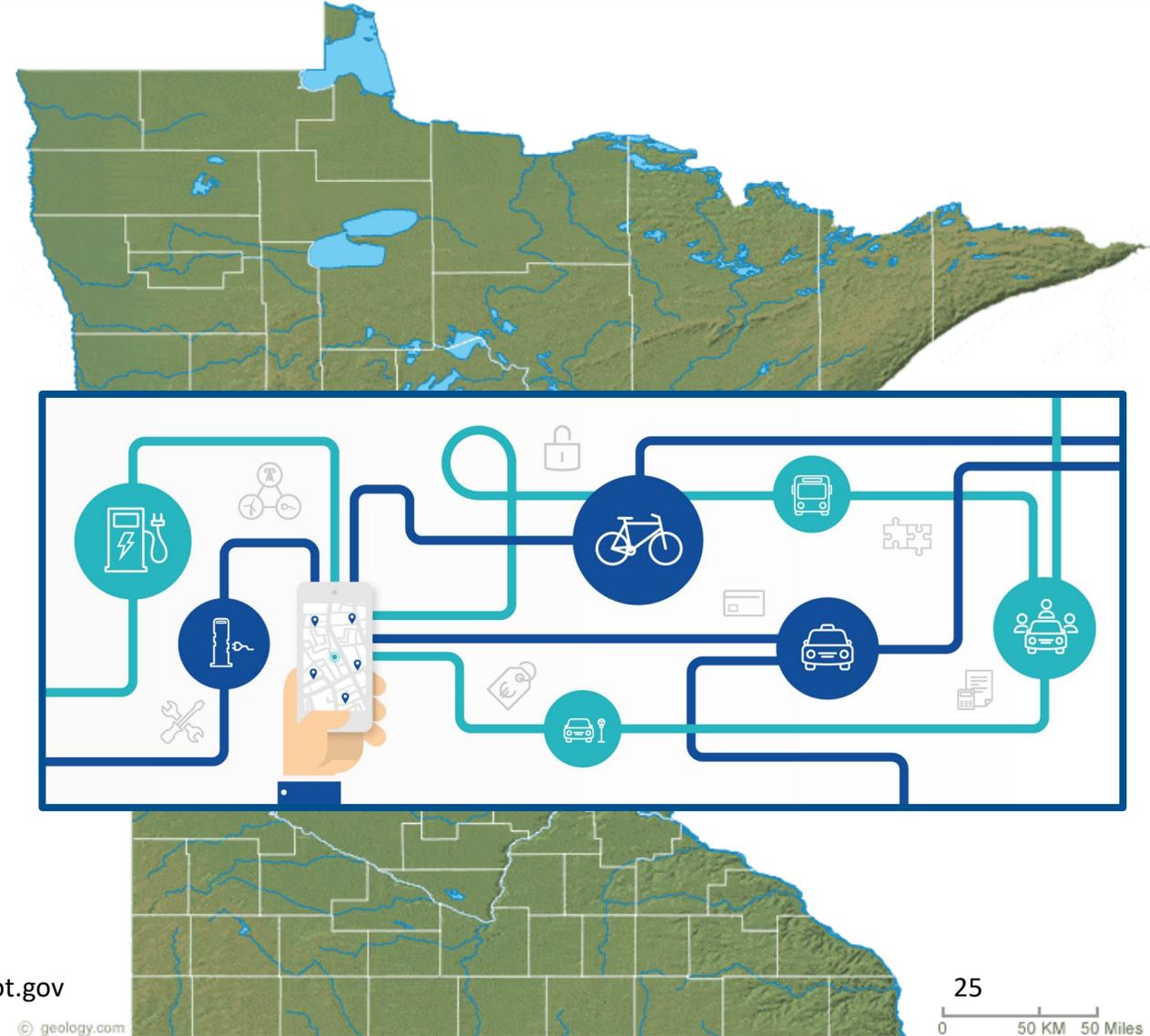
Challenges of implementing new tech

- 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

Minimum + Viable
Good features to test
the users responses

Minimum

Viable

Crappy Products
nobody wants to
use

The products
you want to build

Products

Waste

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

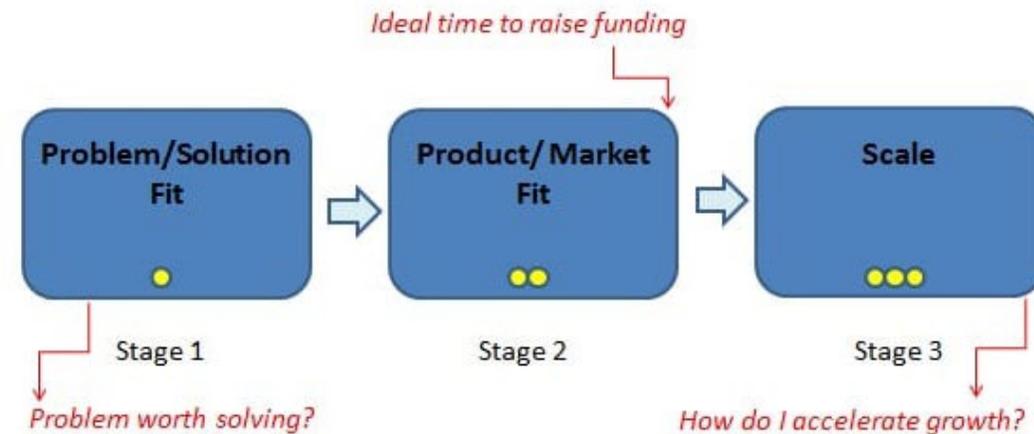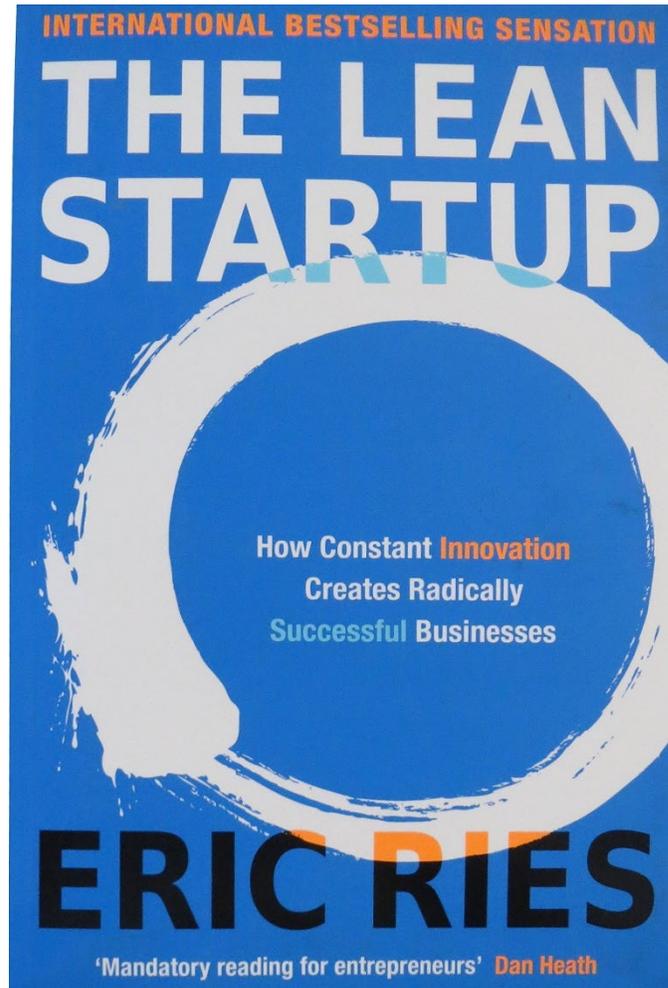- Improve and repeat until you have something to scale with
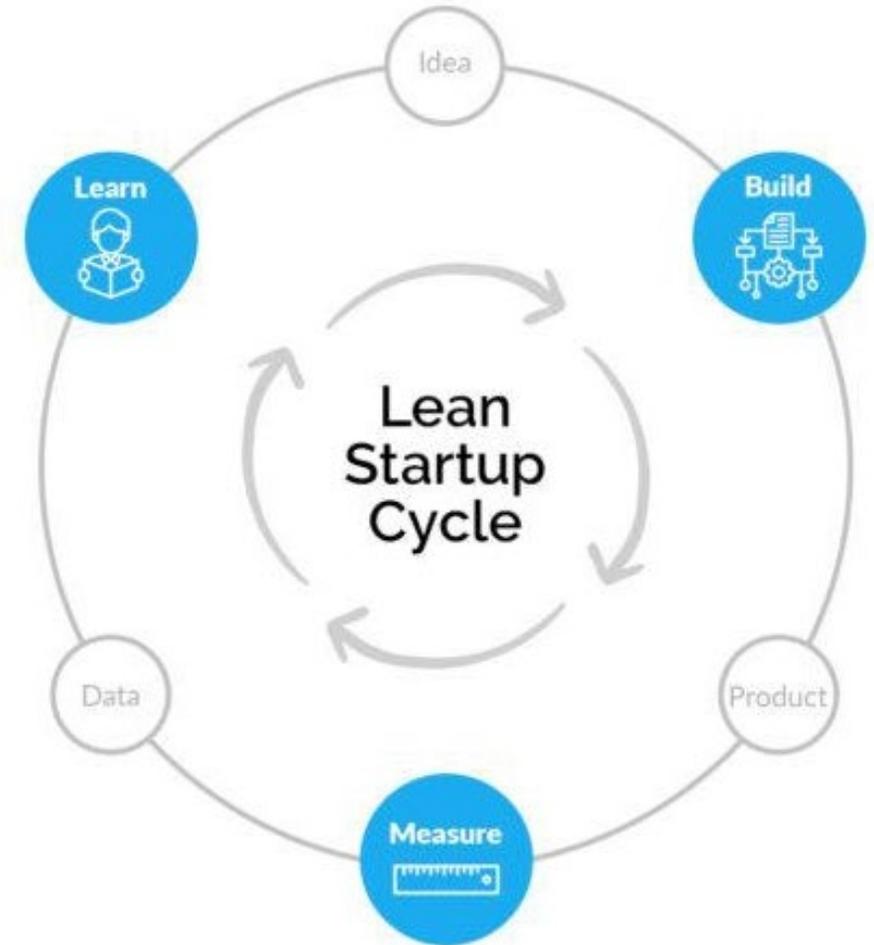
When to keep going or throw in the towel

- 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)
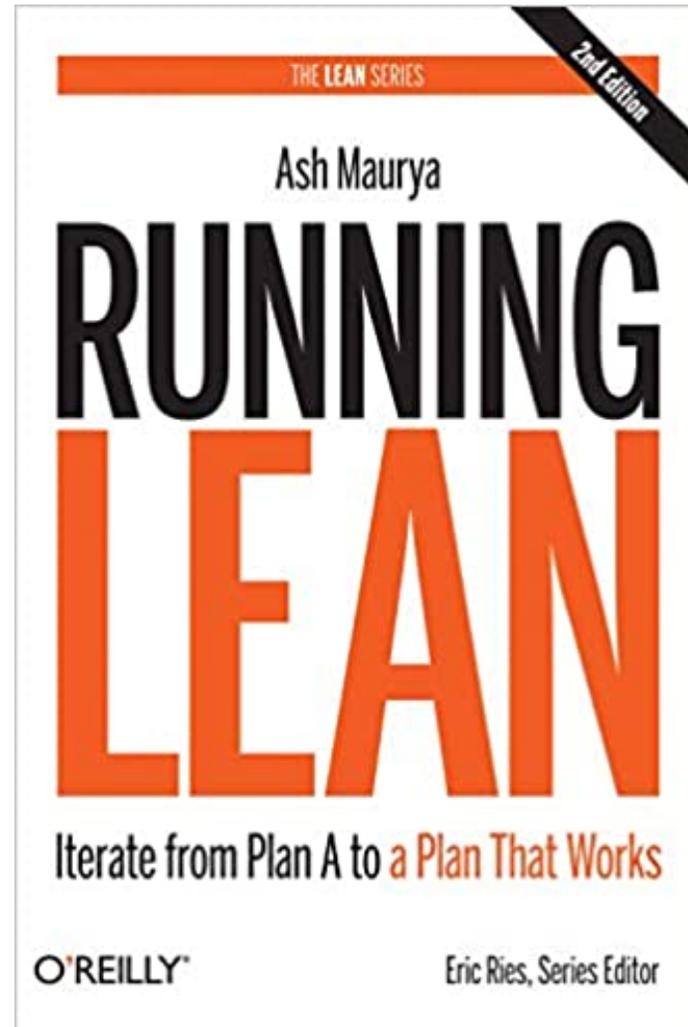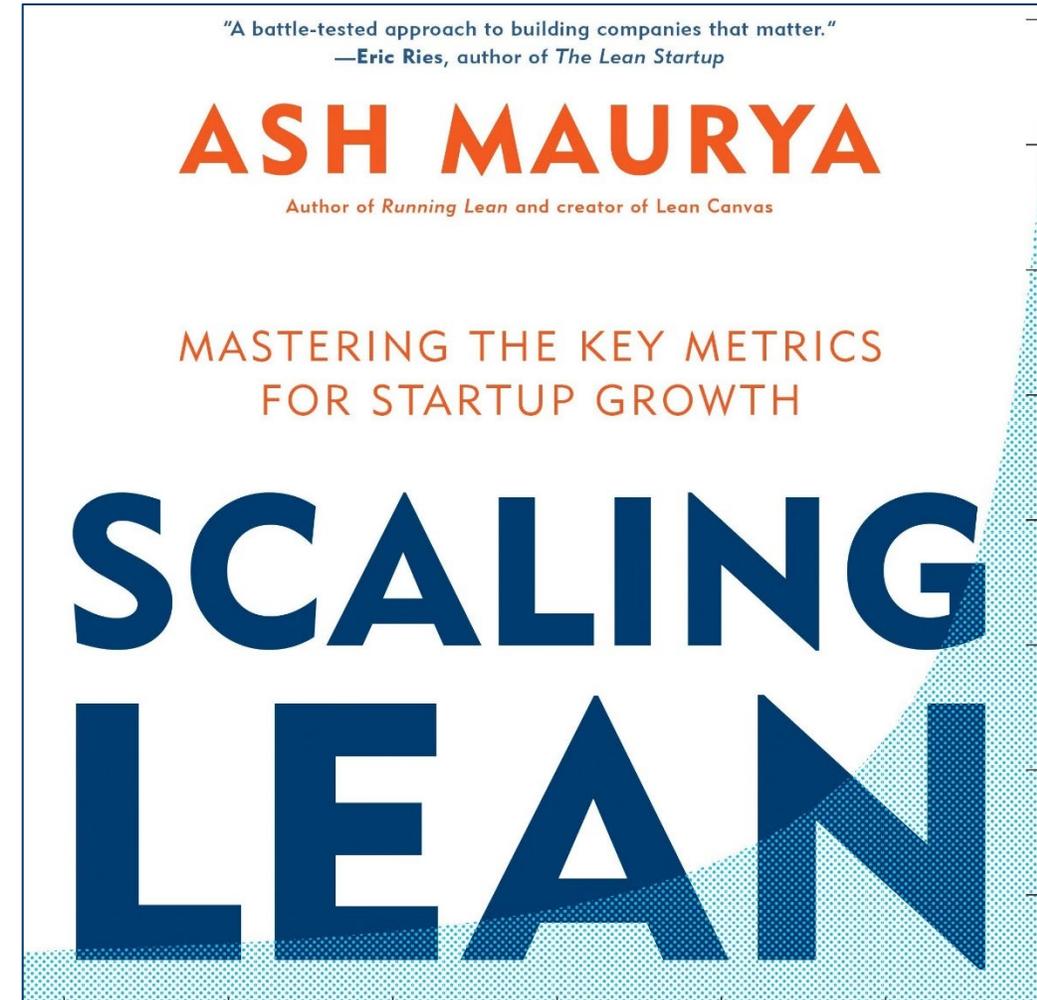
The three stages of a Startup

Ideal time to raise funding

Problem/Solution Fit	Product/Market Fit	Scale
Stage 1	Stage 2	Stage 3

Problem worth solving?

How do I accelerate growth?

Thank you!

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