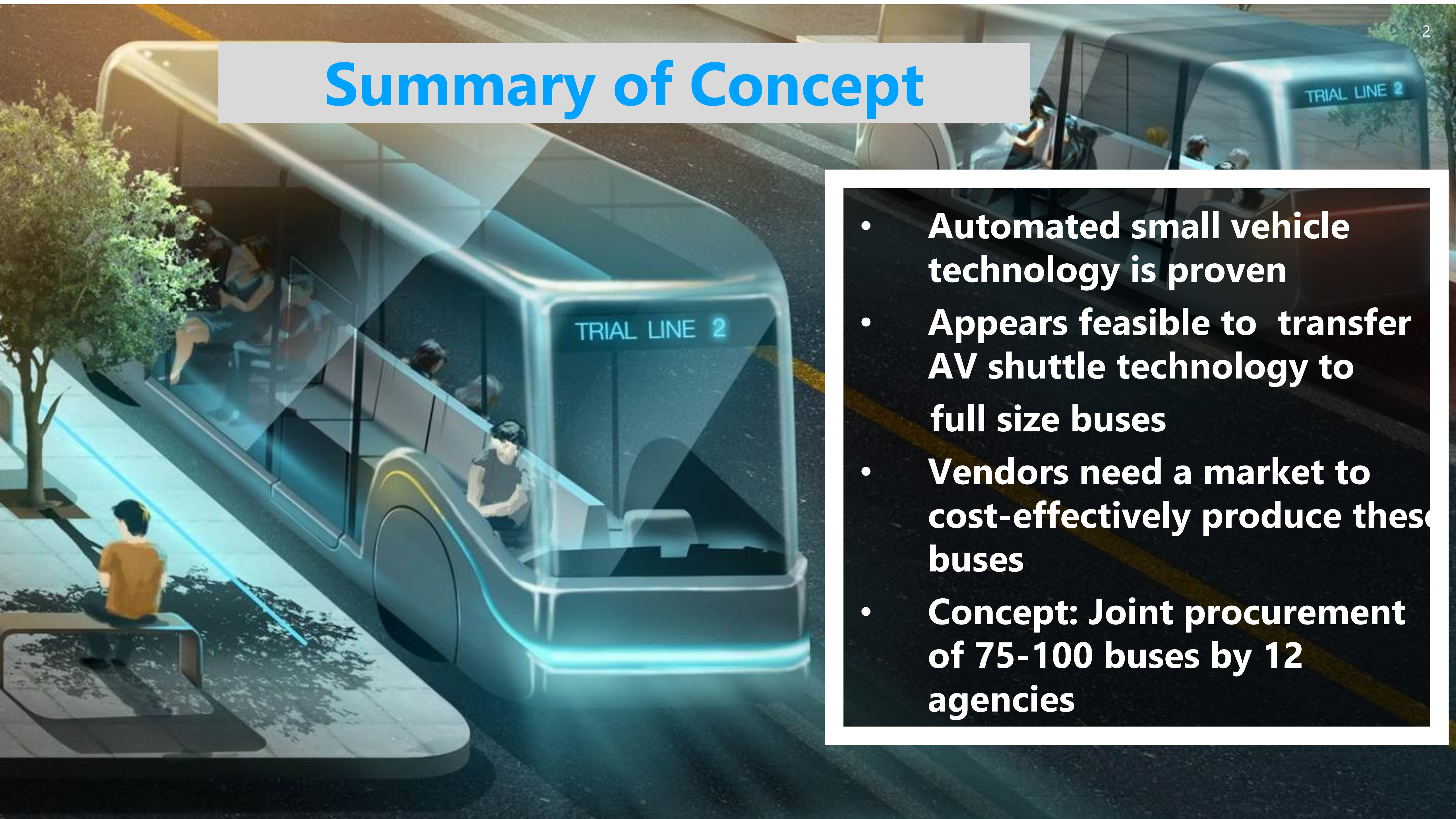


A futuristic, sleek, light-colored automated bus is shown in a city environment. The bus is partially obscured by a large, semi-transparent dark rectangle that serves as a background for the text. The bus has a digital display on its front that reads "TRIAL LINE 2". A person is seen boarding the bus at a station platform. The overall scene is rendered in a clean, modern, and slightly desaturated style, suggesting a high-tech, autonomous transportation system.

Automated Bus Consortium

Summary of Concept



- **Automated small vehicle technology is proven**
- **Appears feasible to transfer AV shuttle technology to full size buses**
- **Vendors need a market to cost-effectively produce these buses**
- **Concept: Joint procurement of 75-100 buses by 12 agencies**



Goal of Automated Bus Consortium Project

Deploy full size, full speed automated (Level 4) buses:

- in a variety of geographies and applications to advance the industry understanding of the technology
- leverage the technology to improve safety, reliability, operating efficiency and customer experience.

Application of Transit Automation Technology (FTA Definitions)



Bus Advanced Driver Assist Systems

SAE/NHTSA Levels 0-3

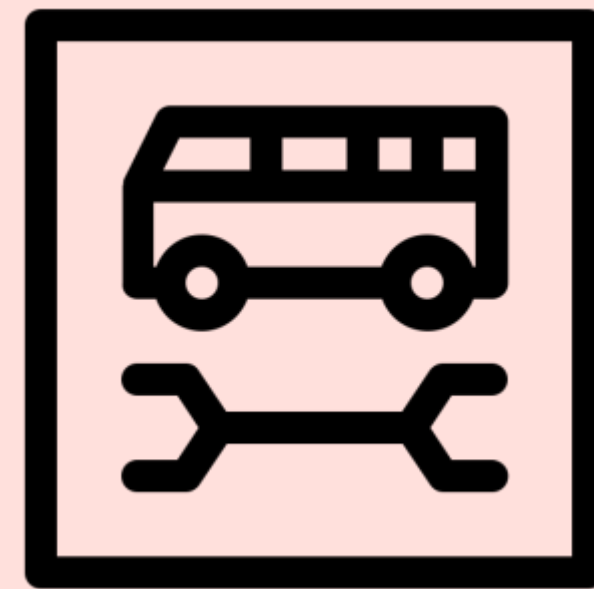
- Accel & Decel
- Automatic Emergency Braking and Pedestrian Collision Avoidance
- Curb Avoidance
- Precision Docking
- Narrow Lane/Shoulder Ops
- Platooning



Automated Shuttles

SAE/NHTSA Level 4

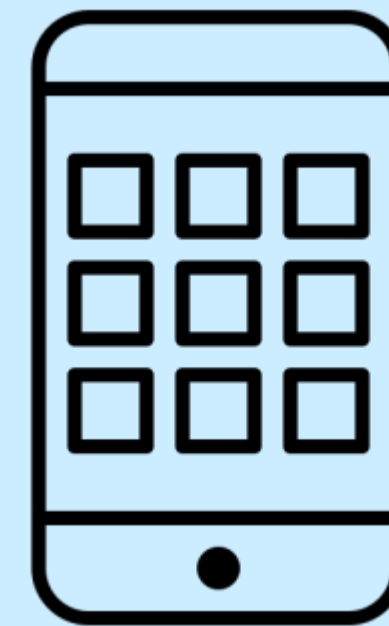
- Circulator Bus Service
- Feeder Bus Service



Maintenance, Yard, and Parking Ops

SAE/NHTSA Level 1-4

- Precision Movement for Fueling, Service Bays, and Bus Wash
- Automated Parking and Recall



Mobility-on-Demand

SAE/NHTSA Level 4-5

- Automated First/Last Mile
- Automated ADA Paratransit
- On-Demand Shared Ride



Automated ART/BRT

SAE/NHTSA Level 4

- Automated ART/BRT
- Shuttle Service
- Fixed & Express Route Service

Consortium Agencies

COMMITTED AGENCIES

- Dallas Area Rapid Transit (DART)
- Department Of Rail And Public Transportation (DRPT) / Hampton Roads Transit (HRT)
- Foothill Transit
- Long Beach Transit Authority (LBTA)
- Los Angeles County Metropolitan Transit Authority (LA METRO)
- Metrolink (Moline)
- Metropolitan Atlanta Rapid Transit Authority (MARTA)
- Michigan DOT/Planet M
- Minnesota DOT
- Pinellas Suncoast Transit Authority (PSTA)/FDOT)
- Washington Metropolitan Area Transit Agency (WMATA)



Foothill Transit



Conclusions on Technology Status

- Significant investment is being made in automation
- Industry appears able to produce an automated bus in the 2021/2022 time frame
- The technology needs a market
- Labor Partnerships important
- FTA has an interest in Automated Bus Deployment
- Federal, state, and local regulatory framework needs to be refined



One Program to Gain **Extensive Experience**



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
- Point-to-Point



Variety of Vehicle Options

- New Vehicles
- Retrofit Kits for Existing Vehicles
- Zero Emissions Vehicles
- Traditional Propulsion Vehicles

Phased Approach from Feasibility to Implementation

1

PRELIMINARY DEVELOPMENT AGREEMENT

- Service Visioning/Pilot Projects
- National & Local Outreach
- Vehicle and Infrastructure Technology
- Financial Planning
- Regulations
- Implementation Strategy

2

COMPREHENSIVE DEVELOPMENT AGREEMENT

- Procurement of Buses
- Infrastructure Design
- Technology Testing
- Deployment/Construction
- Evaluation
- Next Steps

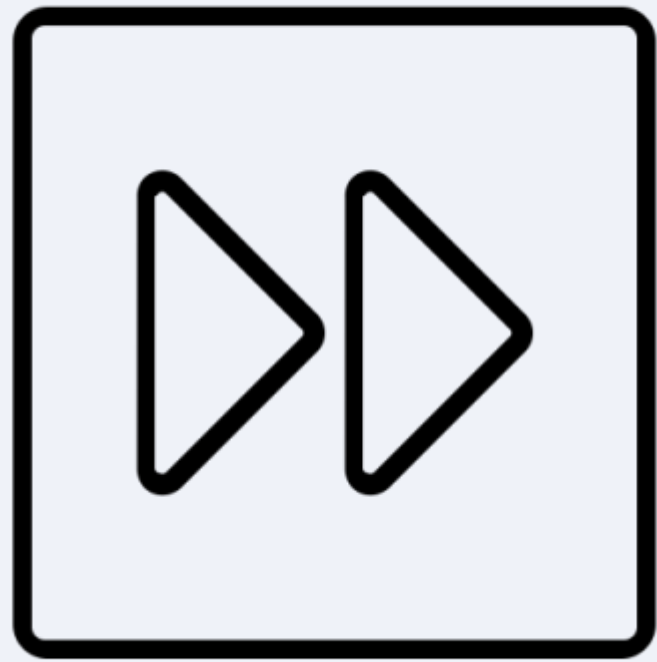
Potential Risks

- Passenger Acceptance/Security
- Labor Opposition
- Ability Of Technology Companies To Deliver
- Liability Insurance – Not Enough Experience With Automated Buses For Underwriting Risk
- Research And Development Program Costs
- Cybersecurity
- Other

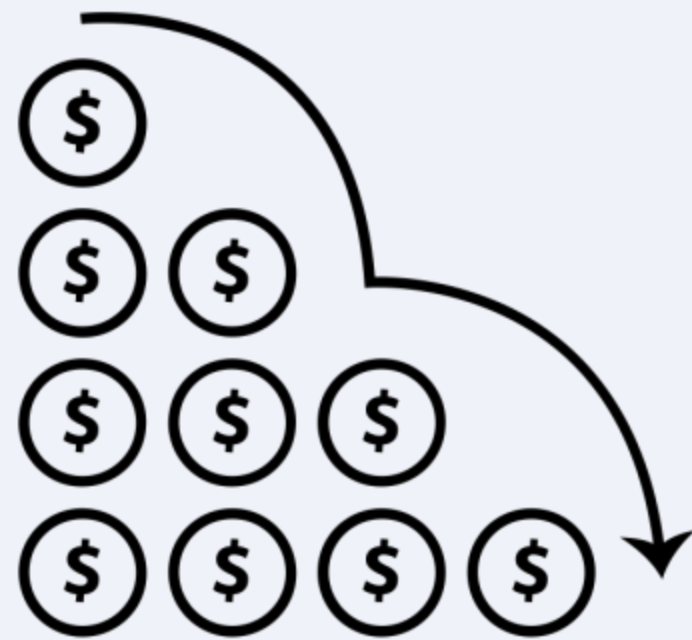
RISK REGISTER WILL BE DEVELOPED



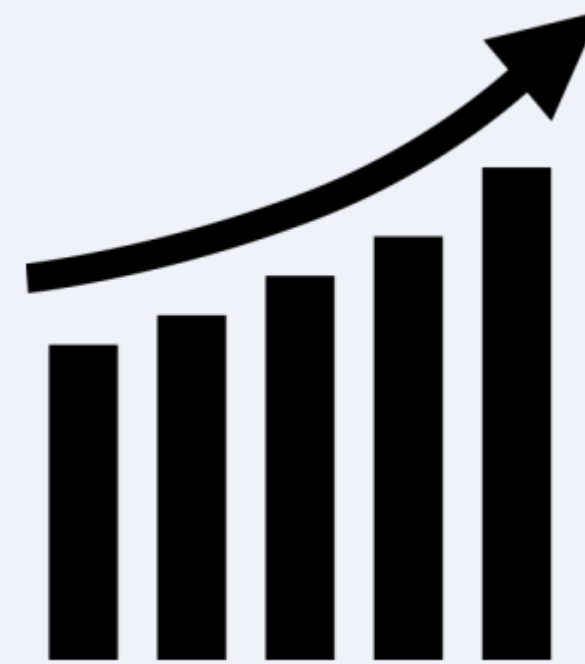
Potential Value of the Consortium



**Accelerate Technology
Development and
Deployment**



**Reduce Planning and
Procurement Costs**



**Stimulate Technology
Demand**



**Shared Lessons
Learned**

Preliminary Development Agreement Products

1

PRELIMINARY DEVELOPMENT AGREEMENT

- Service Visioning
- Vehicle and Infrastructure Technology
- Financial Planning
- Regulations
- Implementation Strategy
- Go/No-Go

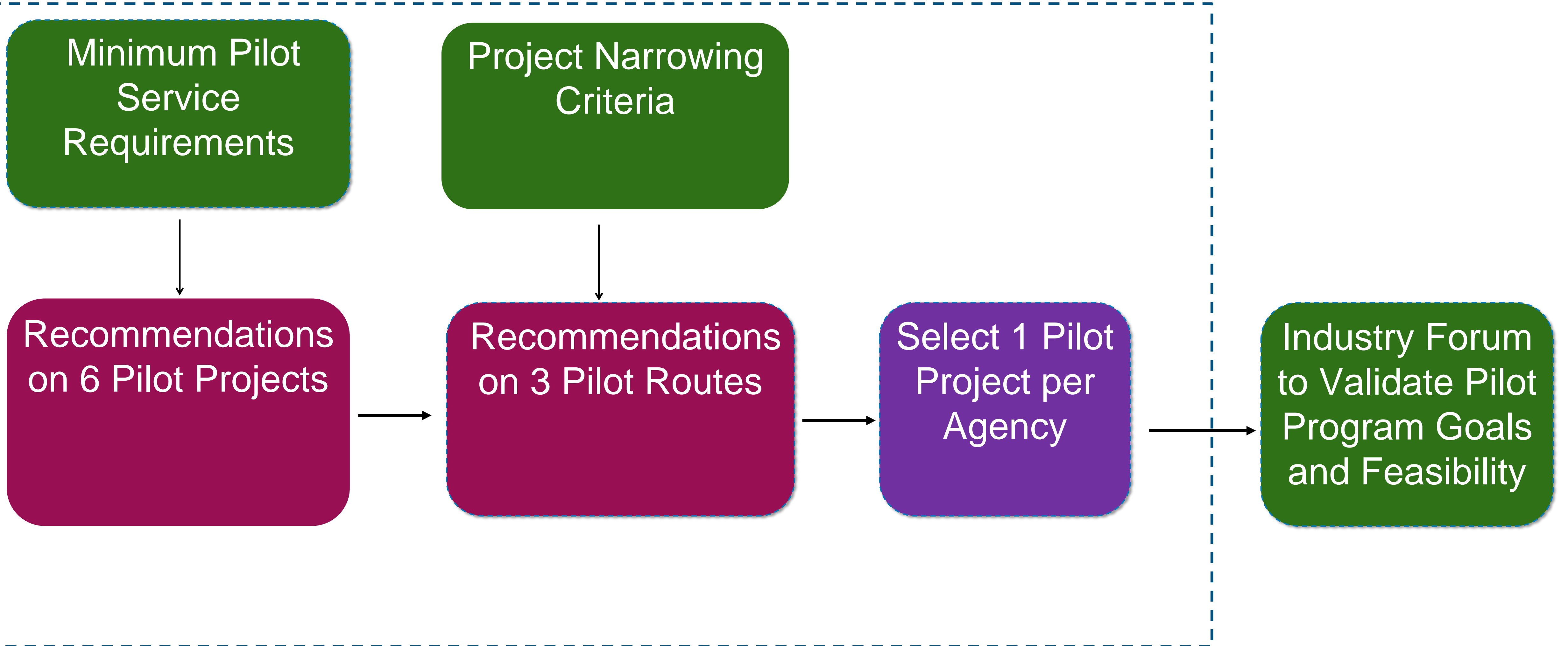
PHASE 1A (6 MONTHS):

Create A Pilot Program Plan Based On Consortium And Industry Needs And Input

PHASE 1B (6 MONTHS):

Develop The Program Details For Each Agency's Specific Pilot Route

Service Analysis Workshops



APPLICABILITY TO THE INTEGRATED HUB CONCEPT

- **Presents an Image of Contemporary Customer Service**
- **Cost of Transit Service Not Proportional to Frequency or Length of Service**
- **Enables Mobility on Demand**
- **Improves Safety of Systems through Enhanced Connectivity**
- **Improves Environmental Quality**





Thank You