Urban Transit Implementation

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Presentation Overview

- **APMs and BRTs - Technology Overview**

- **Urban Applications**

- **Keys to Implementation Success**
  - Thorough Technical Analysis
  - Proper Density & Passenger Volumes
  - Project Champion
  - Multiple Funding Sources
    - Public
    - Private
  - Small First Phase
  - Preserving Corridors for Expansion

Lea+Elliott Technology Experience

- **Focus on Transit and APMs Since 1973**
- **Core Business – Technology Evaluations**
  - Over 400 Technology Studies
  - Over Thirty APM or Bus Implementations
  - Original BRT Evaluation for Dulles Corridor 1988
- **Many Employees Formerly with Suppliers**
- **Technology Overview**
  - Automated People Movers (APMs)
  - Bus Rapid Transit (BRT)
  - Personal Rapid Transit (PRT)

Types of APM Systems

- Cable
- Monorail
- Automated Guideway Transit (AGT)
- Maglev
- Personal Rapid Transit & Emerging Technologies

Cable-Propelled

- **Doppelmayr and Poma**
  - Test Track - Austria
  - <u>Las Vegas-Mandalay Bay</u>
  - <u>Birmingham (UK) Airport</u>
    - Replaced Maglev
  - Toronto Airport (1.5 km)
  - Mexico City Airport
  - Las Vegas Resort
  - Narita, CVG
  - MSP, ZUR and others

Medium Monorails

- **Bombardier**
  - Tampa Int'l Garage
  - Jacksonville Urban
  - Newark Int'l
  - Las Vegas Urban

Large Rubber-Tired AGTs

- **Bombardier / Mitsubishi / Siemens-Matra**
  - Miami Urban
  - Detroit Urban
  - Mult. French Urban
  - Frankfurt
  - Kuala Lumpur
  - Dallas / Ft Worth
  - Houston
  - Changi
  - Chicago
  - others

Low-Speed Maglev

- **Magnetbahn**
  - Berlin (removed)
- **HSST / Chubu HSST**
  - Expos
  - Test Track
  - Aichi Prefecture – Tobu Kyuryo Line

Bus Rapid Transit or BRT

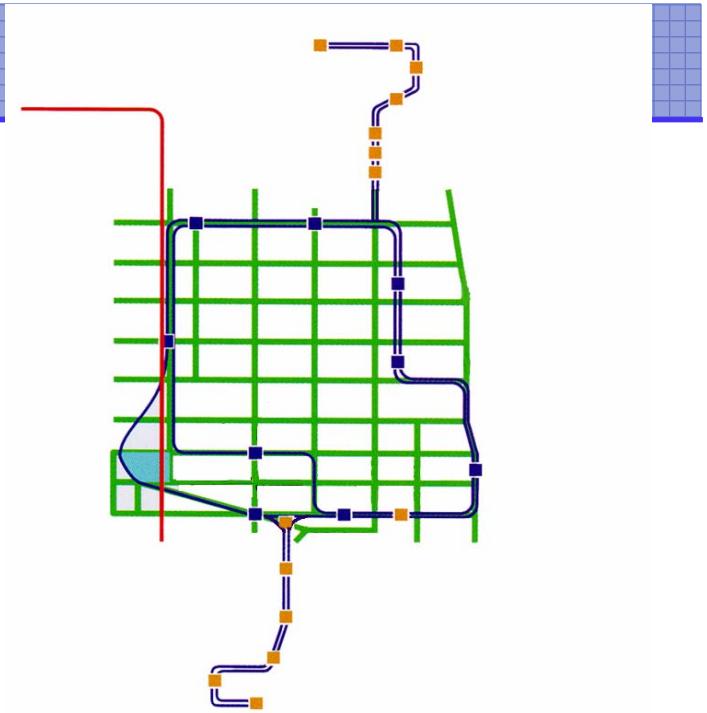
- **"BRT is a flexible, high performance rapid transit mode that combines a variety of physical, operating and system elements into a permanently integrated system with a quality image and unique identity."**

- **Not your typical bus ride – think "rapid transit"**
- **BRT can be applied to activity center circulators and line haul systems**
- **No two BRT systems are the same**

BRT Features

- **Unguided in Mixed Traffic, Express or Reserved Lanes**
  - Mixed or Reserved Lanes
    - 0.5 to 1-mile Stop Spacing
  - Express Service
- **Guided on Dedicated Lane**
  - Express Service with Types of Guidance
    - Mechanical, Optical, Magnetic
- **Raised Platforms at Stops, or Low-floor Buses**
- **Multiple-door Boarding**
- **Signal Priority**
- **Advanced Public Information Systems**

Urban APM and BRT Applications



- **APM Applications**
  - Miami, Los Angeles (Getty)
  - Jacksonville, Detroit, Las Colinas
  - Las Vegas
  - BART-Oakland Airport
  - Europe & Asia implementations

- **BRT Applications**
  - Boston Silver Line
  - Cleveland Euclid Corridor
  - Las Vegas
  - Many other cities

Successful Transport Applications

- **Thorough Technical Analysis**

- **Incorporating Client's Goals & Objectives into Evaluation**

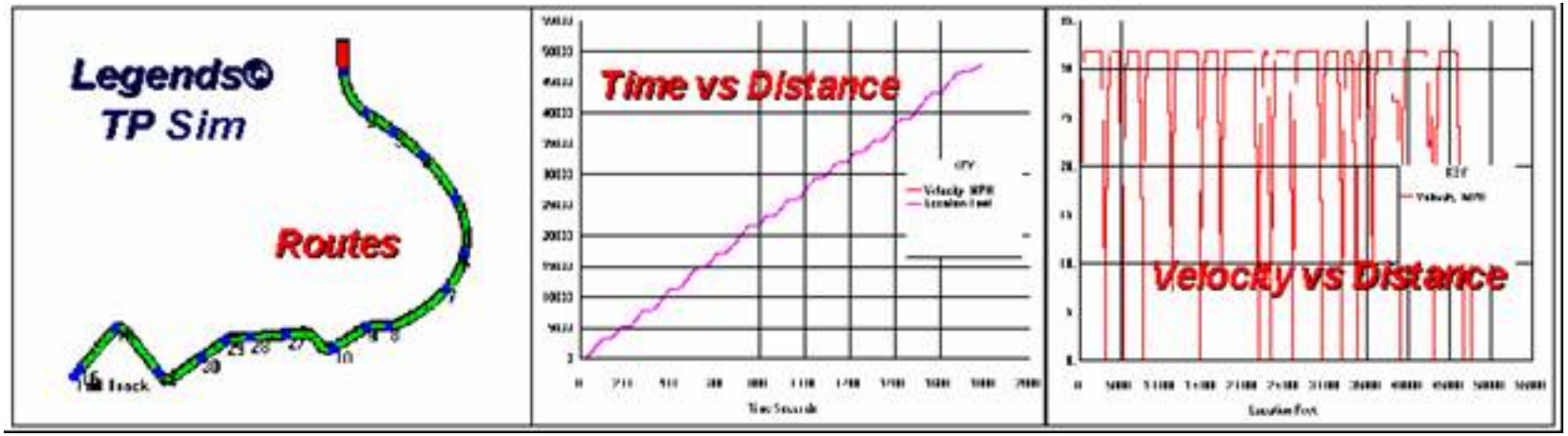
- **System Planning that Accommodates**
  - multiple technologies
  - achievable 1st phase
  - flexibility/expansion

Goals & Objectives => Evaluation Criteria

EVALUATION CRITERIA	Criteria Weight	BUS		APM		
		Std. Bus	Adv. Bus	PRT	Cable	Self Prop.
Demand / Capacity						
Trip Time						
Frequency						
Walk Distance						
Climate Control						
Ride Comfort						
Convenience						
Automobile Reduction						
Capital Costs						
O&M Costs						
Funding						
Environmental						

Technology Evaluation

- **Passenger Level of Service**
  - Station to Station Trip Time;
    - ⇨ APM Vehicle Motor Curves for all APM Suppliers
  - APM advantage
    - ⇨ More direct routes = shorter distance
    - ⇨ No traffic congestion = higher speed



Technology Evaluation

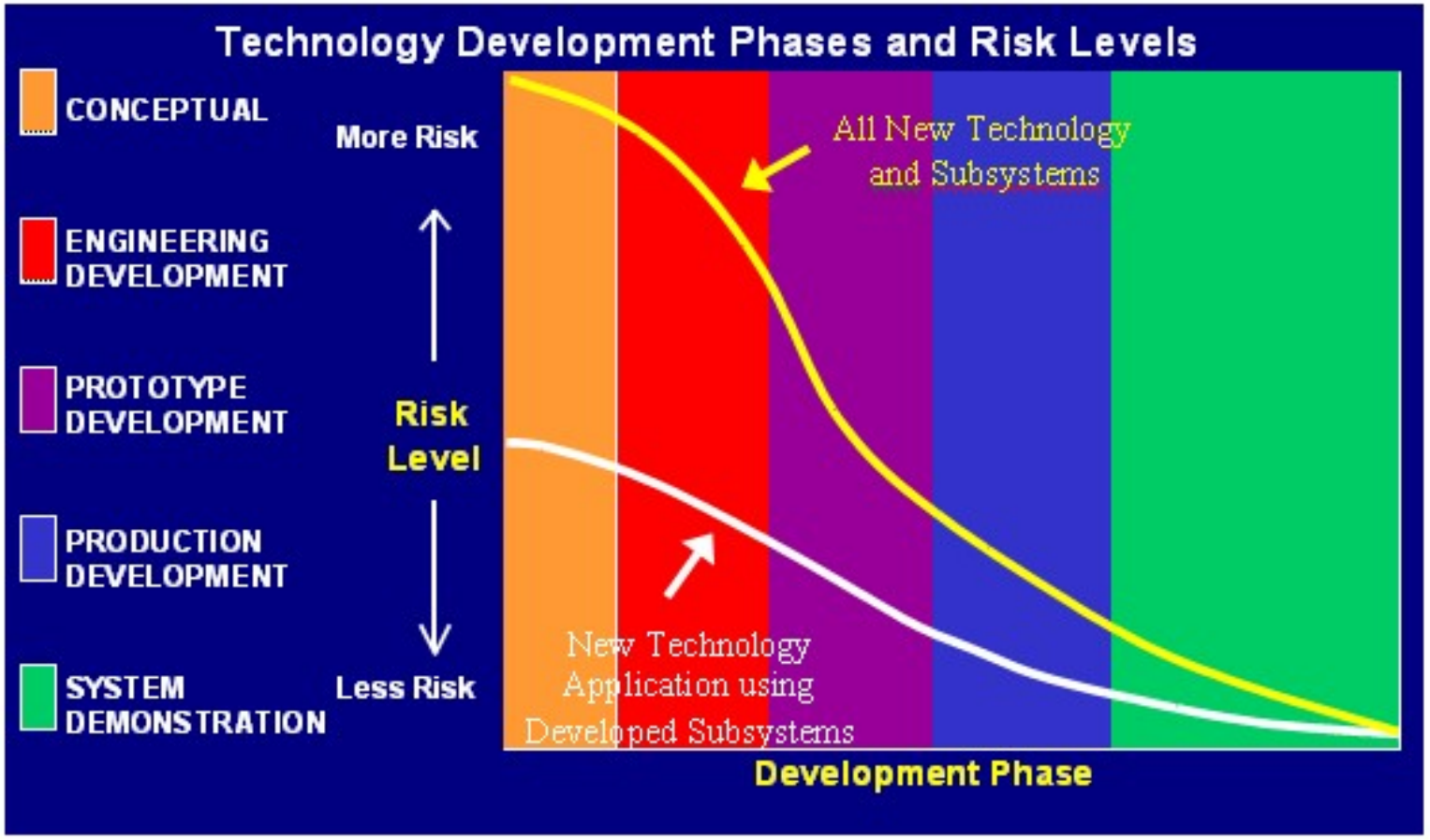
Passenger Level of Service

- Walk Distance
- Weather Protection
- Ride Comfort
- System Frequency

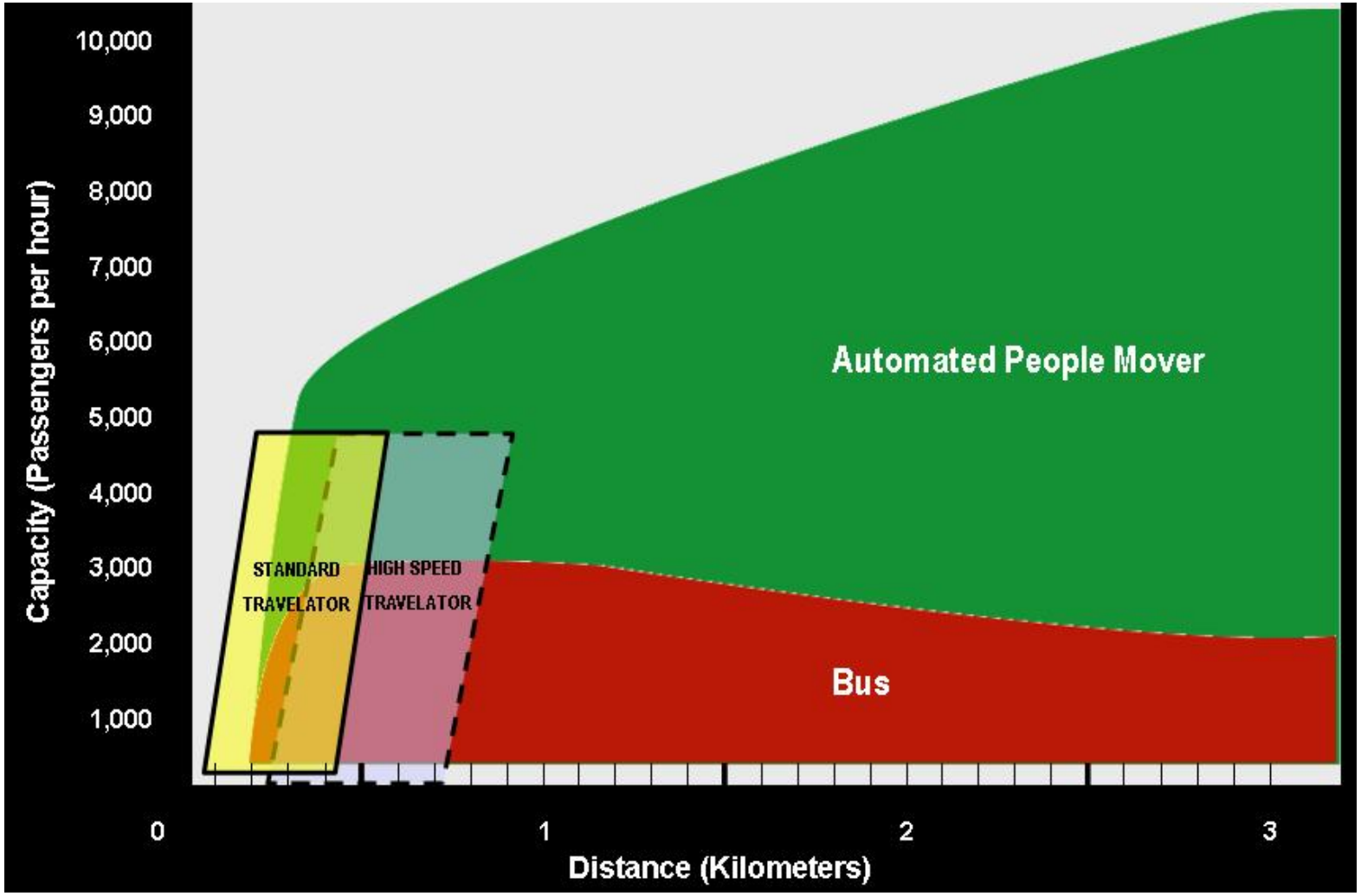
- System Most Be Convenient to Attract Ridership

Transport System Risks

- **Technology Development Phases and risk**



Passenger Volumes

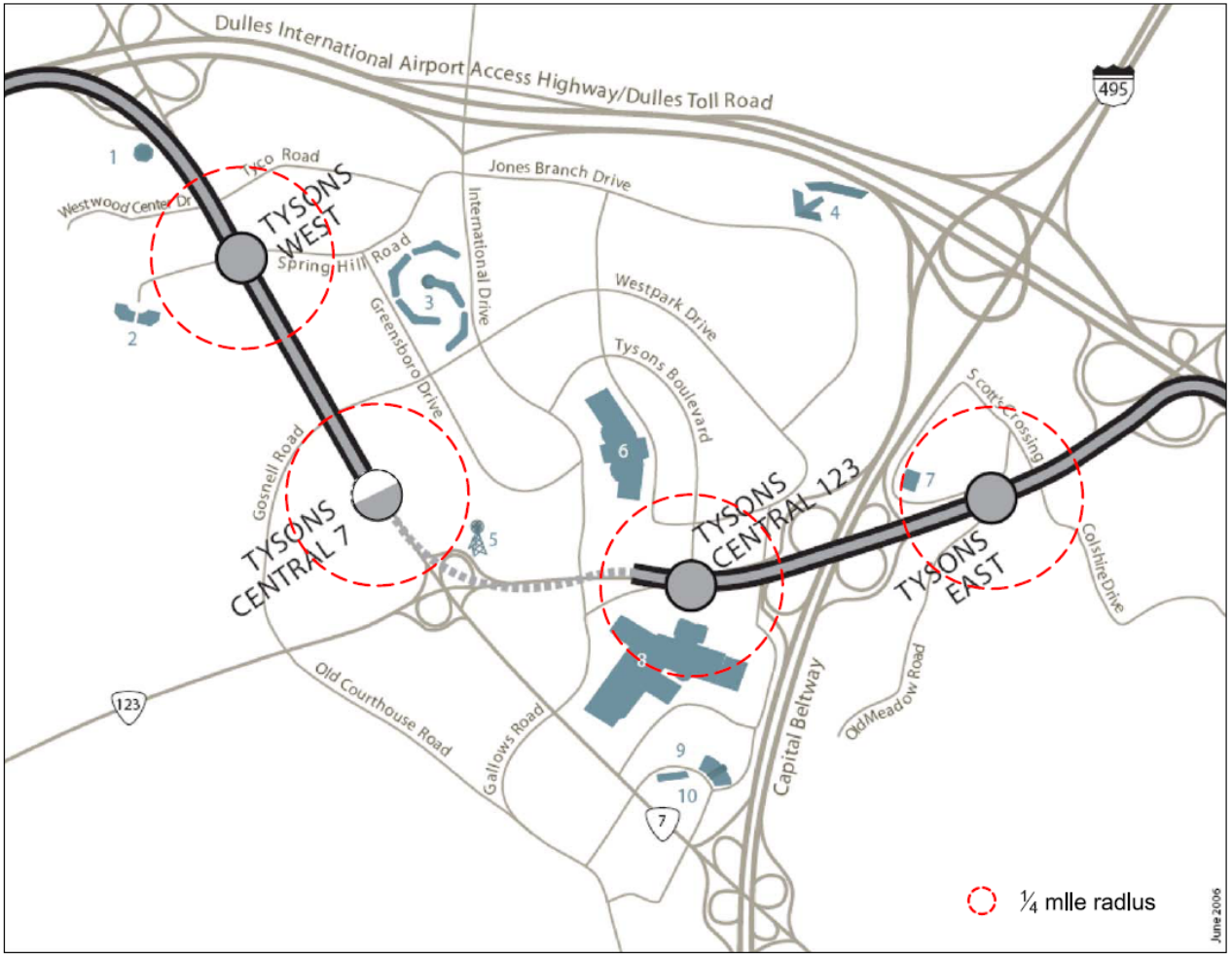


APM or BRT Implementation – Proper Density

- **Higher Density = Higher Passenger Volumes**
  - More Real Estate Value Enhancement
- **Metro stations provide high passenger volumes**
  - Federal Transit Funding Potential
- **¼-mile walk distance from Metro station**
- **Tyson's Corner**

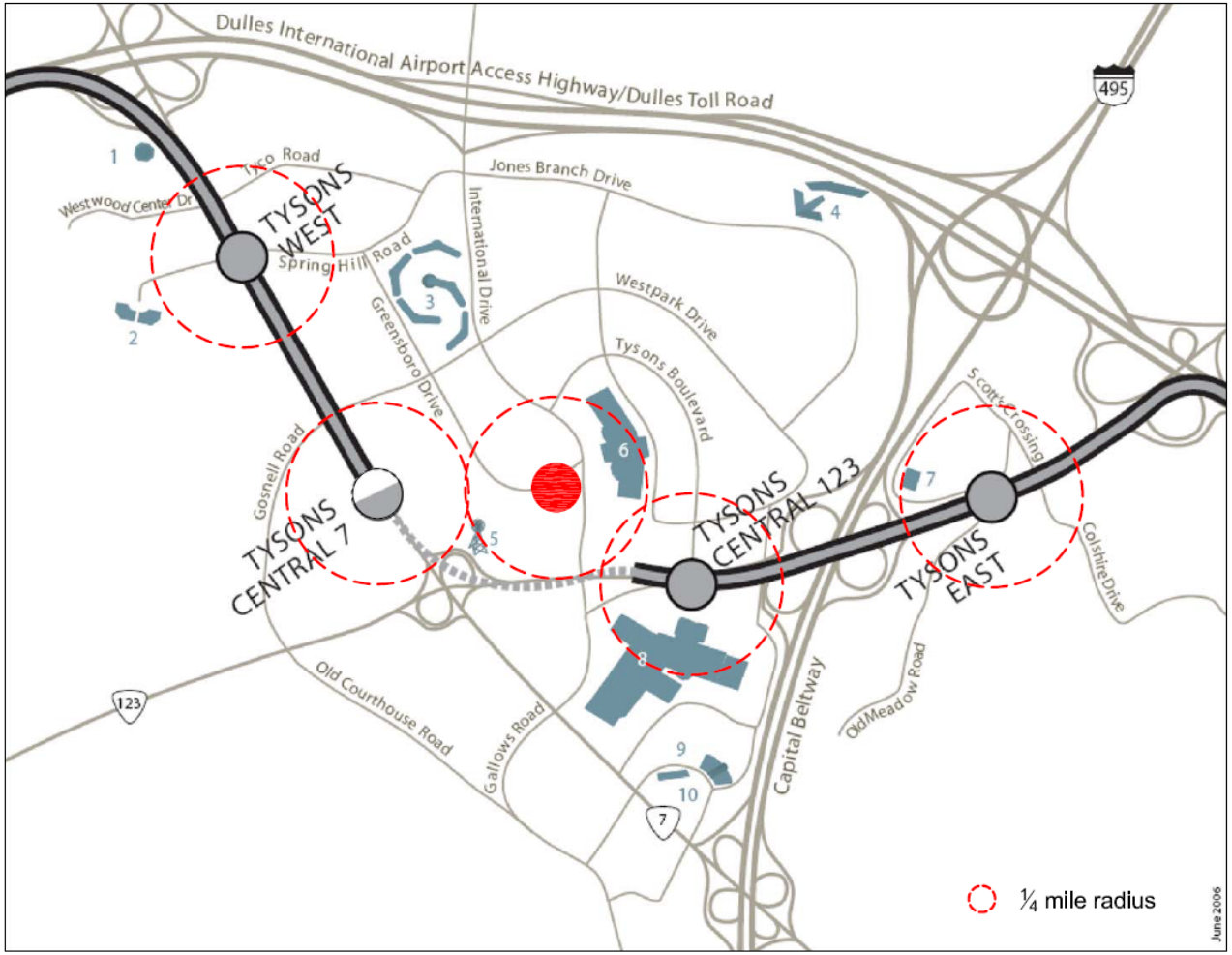
Technology Implementation – Tysons

- ¼ mile walk distances



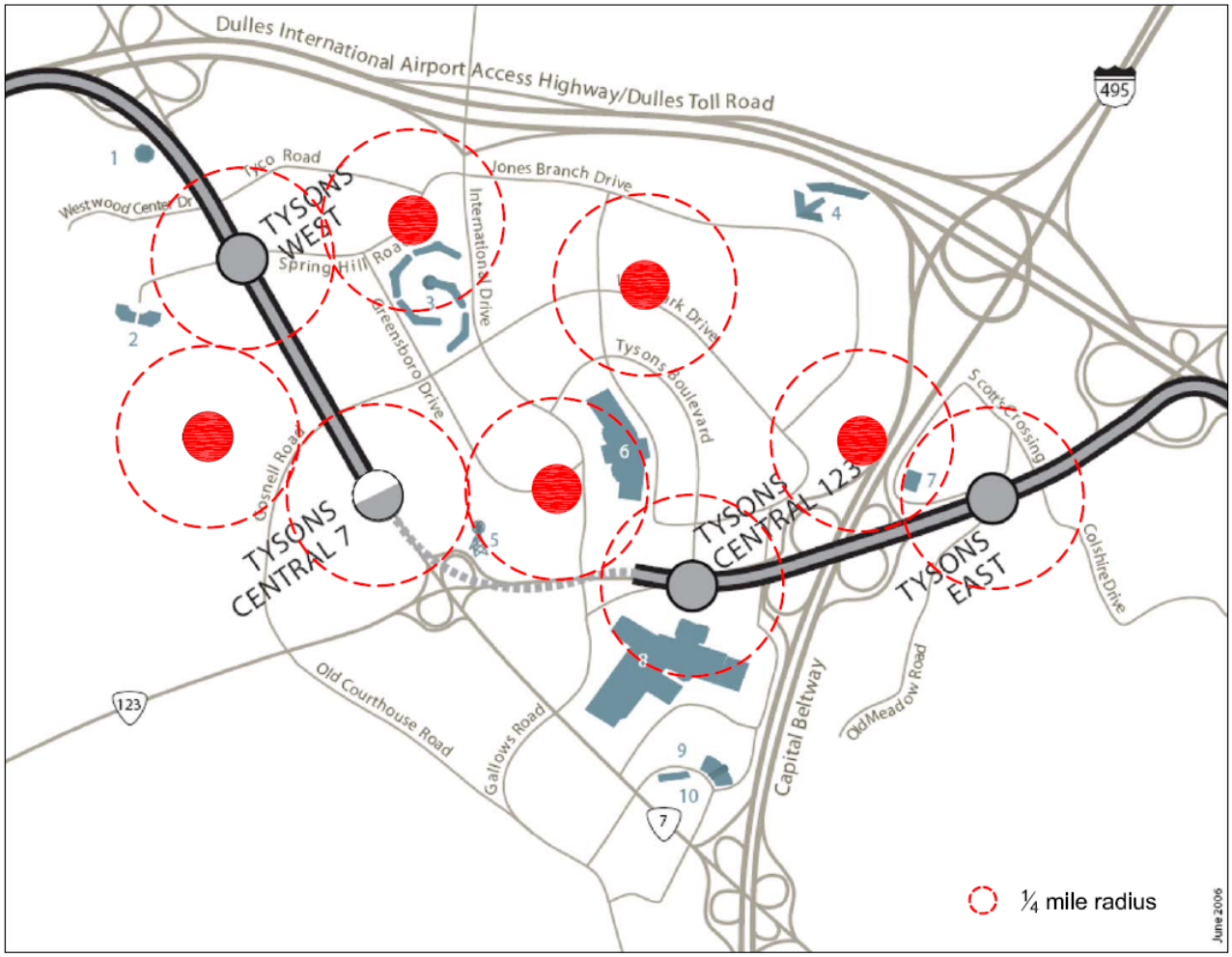
Technology Implementation – Tysons

- **Single half-mile shuttle increase's Metro coverage by at least 25%**



Technology Implementation – Tysons

- **Expandable 2nd Phase**



Other Keys to Implementation Success

- **Multiple Funding Sources**
  - Public Sources
    - Federal – Small Starts
    - State
    - Local
  - Private Sources
    - Capturing RE Value Enhancement

- **Small First Phase**
  - Affordable
  - Shorter Implementation Schedule
  - Expandable
- **Preserving Corridors for Future**
  - Columns for APMs
  - Roads for BRT

Summary - Keys to Success

- **Focus on Meeting Transport Demands**
- **Don't pick a Technology first**
- **Proper Density**
- **Benefit / Cost Equation**
  - Enhanced Value of Real Estate
  - Reduction in Congestion / Pollution
  - Funding Sources
    - Public (Local, State, Federal)
    - Private
  - Small/Affordable Initial Phase
- **Corridor Preservation for the Future**