



CAMBRIDGE  
SYSTEMATICS

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# Prioritization Process and Measures

*presented to*

*Transit Capital Project Revenue  
Advisory Board*

*presented by*

*Cambridge Systematics, Inc.  
Tom Harrington*

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# HB 1359 - Transit Capital Prioritization

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- Project-specific prioritization for both state-of-good repair and expansion transit asset needs based on an objective and quantifiable analysis
- For new or expansion transit projects, the following factors should be considered relative to the cost of the project:
  - » congestion mitigation
  - » economic development
  - » accessibility
  - » safety
  - » environmental quality
  - » land use



# Project Type Categories

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## State of Good Repair

- Rehabilitation and replacement projects such as purchase of replacement vehicles, facilities, shelters, fare payment, etc.

## Capacity Expansion/Enhancement

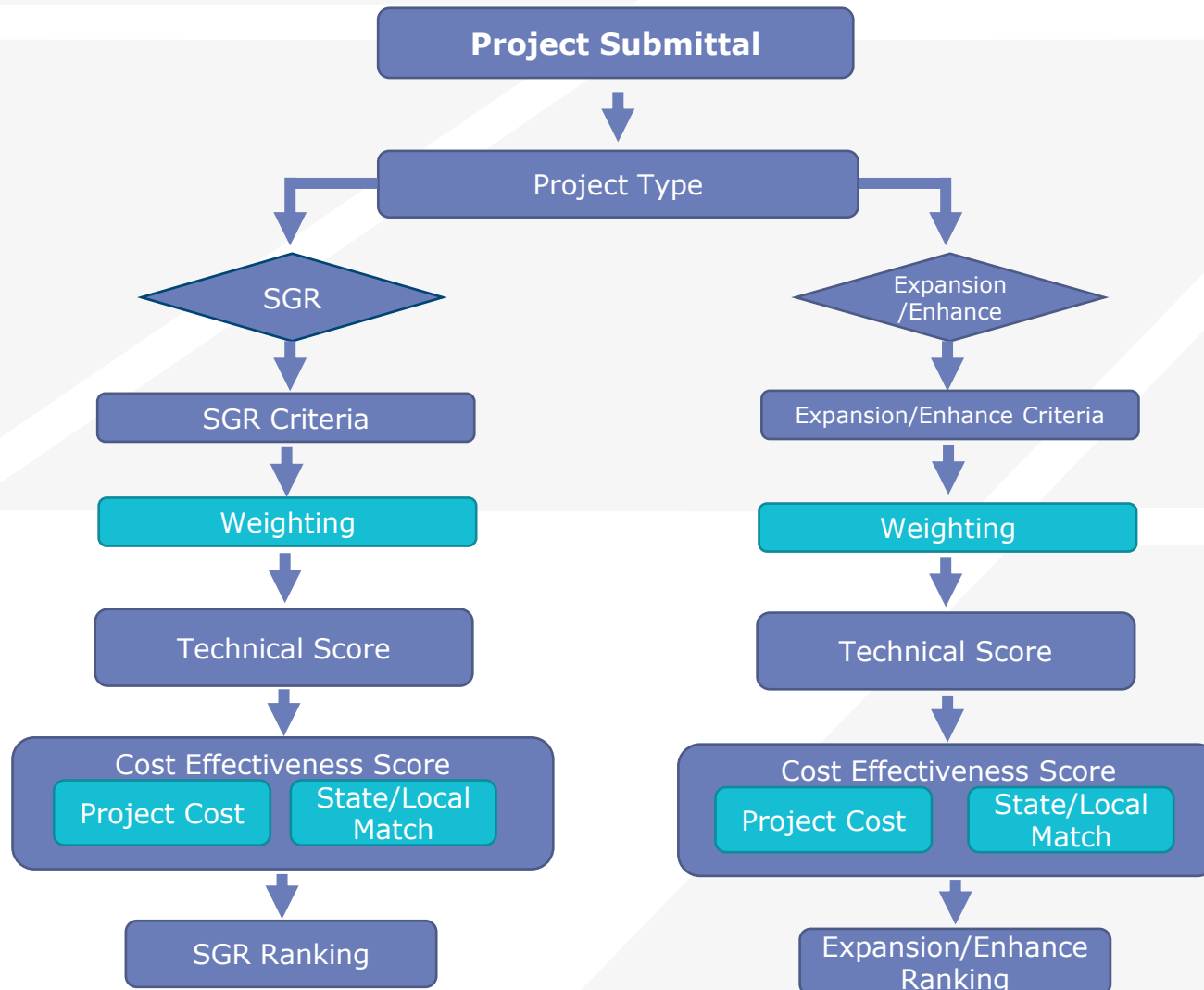
- Expansion vehicles (bus, vans, and service vehicles)
- Significant new facilities and upgrades such as construction of second elevators, station entrances, and parking garages

## System Expansion/Extension

- Examples: Virginia Beach Light Rail Transit (LRT) Extension; Richmond Bus Rapid Transit (BRT); Norfolk Naval Station Transit Extension; Route 1 BRT in Fairfax County; and Bus Construction Admin/Maintenance Facility in Lynchburg



# Process Framework



# Potential Measures

# Criteria Objectives

## Asset Condition

- Maintain the state of good repair of transit assets

## Service Quality/Reliability

- Improve transit system reliability and perceived quality of service by minimizing asset failures and delays, and maximizing asset availability and use

## Congestion Mitigation

- Reduce delay, improve transportation system reliability, and encourage transit use

## Economic Development

- Support existing economies and enhance opportunity for economic development

## Accessibility

- Enhance worker and overall household access to jobs and other opportunities and provide multiple and connected modal choices

## Safety

- Address multimodal safety concerns and improve transit safety and security

## Environmental Quality

- Reduce emissions and energy consumption by providing modal choices, and minimize natural resource impacts

## Land Use

- Improve consistency of the connection between local comprehensive plans and land use policies with transit investments

# Criteria by Project Types

Criteria/Factor	SGR	Expansion/ Enhancement
Asset Condition	●	
Service Quality/ Reliability	●	
Congestion Mitigation		●
Economic Development		●
Accessibility		●
Safety	●	●
Environmental Quality		●
Land Use		●

# Selecting Appropriate Measures

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- Data availability
- Complexity
- Quantitative (vs. qualitative)
- Relevance to transit projects
- Consistency with FTA or Smart Scale evaluations
- Advantages
- Limitations



# Potential Measures by Factor Area

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## Asset Condition

- Asset age
- Condition rating

## Service Quality/Reliability

- Mean distance between failures
- Revenue hours per vehicle

## Congestion Mitigation

- New transit trips
- Project support for ridership/usage

## Economic Development

- Project support for economic development
- Benefit to economic/activity centers

## Accessibility

- Access to jobs
- Access to jobs by disadvantaged persons
- Transit travel time improvements and/or increased service frequencies

# Potential Measures by Factor Area

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## Safety

- Potential safety impact

## Environmental Quality

- Air quality and energy environmental effect
- Impact to natural and cultural resources

## Land Use

- Land use policy consistency



# Prioritization - Next Steps

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- September-November:
  - » Finalize list of potential prioritization criteria and measures
  - » Define evaluation methodology for measures
  - » Develop methodology for weighting and scoring of measures
- December: Update to CTB on draft concepts
- January-March: Demonstrate application of criteria to example implementation scenarios

# Appendices

# Asset Condition Measures

Measure	Data availability	Complexity	Quantitative?	Relevance to transit	Consistency with FTA/Smart Scale
<u>Age*</u>	H	L	Y	Y	FTA
<u>Condition rating*</u>	M	M	Y	Y	FTA
Asset availability	M	M	Y	Y	
Life cycle costs	L	H	Y	Y	

\* indicates measures recommended for further consideration

# FTA Transit Asset Management Requirements

Asset Class	Proposed TAM Performance Measures
Equipment- (non-revenue) service vehicles.	Percentage of non-revenue, support-service and maintenance vehicles that have met or exceeded their useful life benchmark (ULB). [§625.43 (a)]
Rolling Stock	Percentage of revenue vehicles within a particular asset class that have either met or exceeded their ULB. [§625.43 (b)]
Infrastructure-rail fixed-guideway track, signals, and systems	Percentage of track segments, signal, and systems with performance restrictions. [§625.43 (c)]
Facilities	Percentage of facilities within an asset class, rated below condition 3 on the TERM scale. [§625.43 (d)]

\* indicates measures recommended for further consideration

# Service Quality/Reliability Measures

Measure	Data availability	Complexity	Quantitative?	Relevance to transit	Consistency with FTA/Smart Scale
Missed trips due to mechanical failure	M	H	Y	Y	
<u>Mean distance between failures*</u>	H	M	Y	Y	
Minutes of delay	L	H	Y	Y	
<u>Revenue hours per vehicle*</u>	H	L	Y	Y	

\* indicates measures recommended for further consideration

# Congestion Mitigation Measures

Measure	Data availability	Complexity	Quantitative?	Relevance to transit	Consistency with FTA/Smart Scale
<u>New Transit trips*</u>	M	H	Y	Y	FTA
Capacity increase	H	M	Y	Y	
Person throughput	M	H	Y	Y	SS
Person hours of delay	M	H	Y	N	SS
<u>Project support for ridership/usage*</u>	H	L	N	Y	
Demand management	H	L	N	N	
Existing congestion in corridor	M	M	Y	Y	

\* indicates measures recommended for further consideration



# Economic Development Measures

Measure	Data availability	Complexity	Quantitative?	Relevance to transit	Consistency with FTA/Smart Scale
Potential impact of transit project on regional development	M	M	N	Y	FTA
Changes in regional workforce access to transit	H	M	Y	Y	FTA
<u>Project support for economic development*</u>	M	M	N	Y	SS
Jobs created (TREDIS estimate)	L	H	Y	N	
<u>Benefit to economic/activity centers*</u>	H	L	N	Y	

\* indicates measures recommended for further consideration

# Accessibility Measures

Measure	Data availability	Complexity	Quantitative?	Scale Relevance to transit	Consistency with FTA/Smart
Access to jobs (Smart Scale approach)	M	H	Y	Y	SS
Access to jobs of disadvantaged persons (Smart Scale approach)	M	H	Y	Y	SS
<u>Access to jobs (simplified approach)*</u>	H	M	Y	Y	
<u>Access to job of disadvantaged persons (simplified approach)*</u>	H	M	Y	Y	
<u>Transit travel time improvements and/or increased service frequencies*</u>	M	H	Y	Y	
Annual trips (with credit applied for transit dependent trips)	M	M	Y	Y	FTA
Access to multimodal choices	H	L	N	Y	SS

\* indicates measures recommended for further consideration

# Safety Measures

Measure	Data availability	Complexity	Quantitative?	Relevance to transit	Consistency with FTA/Smart Scale
Accident and fatality rates (FTA approach)	M	H	Y	N	FTA
Number of fatal and injury crashes	M	H	Y	N	SS
Rate of fatal and injury crashes	M	H	Y	N	SS
<u>Potential safety impact*</u>	H	L	N	Y	

\* indicates measures recommended for further consideration

# Environmental Quality Measures

Measure	Data availability	Complexity	Quantitative?	Relevance to transit	Consistency with FTA/Smart Scale
Air quality impacts	L	H	Y	Y	FTA
Greenhouse gas emission impacts	L	H	Y	Y	FTA
Energy use impacts	L	H	Y	Y	FTA
<u>Air quality and energy environmental effect*</u>	H	L	N	Y	SS
Impact to natural and cultural resources	M	M	N	Y	SS
<u>Impact to natural and cultural resources (simplified)*</u>	H	L	N	Y	

\* indicates measures recommended for further consideration

# Land Use Measures

Measure	Data availability	Complexity	Quantitative?	Relevance to transit	Consistency with FTA/Smart Scale
<u>Land use policy consistency*</u>	M	M	N	Y	SS
Transit oriented development in the corridor	M	L	N	Y	
Station area development (employment and population density)	H	M	Y	Y	FTA
Parking supply (costs and spaces/employee in CBD)	M	M	Y	Y	FTA
Affordable housing	M	H	Y	Y	FTA
Activity density	M	M	Y	Y	SS
Project connection to activity centers/UDAs	H	L	N	Y	
FTA criteria for economic development	M	M	N	Y	FTA

\* indicates measures recommended for further consideration

