

SB1140 Performance Based Operating Funding Allocation Phase 3 – 2016 and Beyond

Working Group Meeting
January 28, 2014



Agenda

- Overview – Review of 1st Working Group Meeting
- Sizing of Transit Systems
- Data Collection Practices
- Other Possible Performance Measures & Grant Opportunities
 - Congestion Mitigation
 - Fulfillment of Transit Dependent Outcomes
- Exceptional Performance
- Next Steps

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Review of 1st Working Group Meeting

- Summarized work leading up to SB 1140
- Provided project overview, work plan, approach and schedule
 - Schedule of anticipated Working Group Meetings (monthly, through March)
- Explained the current operating allocation model
- Presented research on performance measures applicable to SB 1140
- Conducted Work Session: Phase 3 – 2016 and Beyond

Review of 1st Working Group Meeting

Working Session

- **Data Collection Practices**
 - Presented preliminary survey findings
- **Sizing of Transit Systems**
 - Discussed potential sizing measures, pros and cons
 - Working Group members provided recommendation
- **Other Possible Performance Measures & Grant Opportunities (Congestion Mitigation, Fulfillment of Transit Dependent Outcomes)**
 - Discussed literature review findings
 - Working Group members provided direction for further research

Review of 1st Working Group Meeting

Final Presentation

Materials on DRPT's Website:

[http://www.drpt.virginia.gov/activities/
TSDACTransitAgencyWorkingGroup.aspx](http://www.drpt.virginia.gov/activities/TSDACTransitAgencyWorkingGroup.aspx)

Since 1st Working Group Meeting

- Completed data collection practices survey
- Completed Virginia agency interviews
- Advanced nationwide peer interviews
- Completed and submitted Sizing Transit Systems technical memorandum
- Advanced research on Other Outcome measures
- Advanced research on Exceptional Performance measures

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Sizing of Transit Systems

Review: Need for Evaluation

- Stakeholders asked TSDAC review sizing metrics applied to distribute new operating funds

Consider:

- Output Measures: How much service *is actually* provided
 - Revenue hours, revenue miles)
- Input Measures: How much service *should be* provided based on the character of the service area
 - Population, population density, service area size, transit dependent population

Review: 1st Working Group Meeting

- Reviewed current Size-Weight formula:
 - Factors - Operating Cost and Unlinked Passenger Trips
 - Equal weighting of factors (50% each)
- Reviewed qualitative findings from literature
- Discussion questions posed to the Working Group
 - Does this incentivize a higher operating cost, regardless of system efficiency?
 - Are these the best two measures for determining relative size?
 - How might one or both measures be refined to improve the formula?
 - Should these factors have equal weight?

Review: 1st Working Group Meeting (continued)

- Discussed and rated potential sizing measures
 - Discussed pros and cons of measures relative to current size weight metrics – ridership and operating cost
 - Members provided input on issues specific to their systems
 - DRPT provided input and takeaways from SJR 297

Summary of Analysis: Sizing Transit Systems Technical Memorandum

Table: Qualitative Rating of Sizing Measures (Good, Average, Poor)

Category	Metric	Data source	Relevance to SB 1140 Goals	Ease of Data Collection	Consistency of Definition	Overall Score
Urban Area Characteristics	<i>Urban Area Population</i>	Census	A	G	G	A
	<i>Urban Area Size</i>	Census	A	G	G	A
	<i>Urban Area Population Density</i>	Census	A	G	G	A
	<i>Urban Area Population Growth Rate</i>	Census	A	G	G	A
Service Area Characteristics	<i>Service Area Population</i>	Agency	G	A	P	p
	<i>Service Area Size</i>	Agency	G	A	P	P
	<i>Service Area Type</i>	Agency	A	A	A	A
Transit Service Characteristics	<i>Annual Vehicle Revenue Miles Operated</i>	Agency	G	G	A	A
	<i>Annual Vehicle Revenue Hours Operated</i>	Agency	G	G	A	A
	<i>Miles of Track</i>	Agency	A	G	P	P
	<i>Number of Stations</i>	Agency	A	G	P	P
	<i>Percent of Service Operated as Fixed Route</i>	Agency	A	G	P	P
	<i>Peak Vehicles</i>	Agency	G	G	G	G
	<i>Peak Vehicle Seats</i>	Agency	A	P	P	P
	<i>Seat Miles</i>	Agency	A	P	P	P
Delivered Service Quality Measures	<i>Service Span</i>	Agency	A	A	P	P
	<i>Average System Peak Headway</i>	Agency	A	A	P	P
	<i>Revenue Miles per Urban Square Miles</i>	Agency	A	G	P	P
	<i>Revenue Miles (Hours) per Capita</i>	Agency	A	G	P	P

Findings and Recommendations summarized in Technical Memorandum

Findings and Recommendation

- No other measure(s) were better indicators of system size than current measures (ridership and cost)
- Working Group recommends to TSDAC that the current Size-Weight portion applied to allocate new operating formula funding remain unchanged
 - This shall not preclude DRPT from reconsidering sizing formula factors should future needs arise, particularly in response to changes in operating funding allocation goals
 - Formulas to be reconsidered every 3 years by law

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Data Collection

Data Collection Approach

- Survey sent to 41 agencies; 32 responses
- Follow-up interviews with 13 agencies
 - Issues related to data collection
 - Measures for transit dependent population, congestion mitigation, and exceptional performance
- Research industry practices and “lessons learned” among peers
 - States that use or have attempted to use performance-based funding
- Discuss key findings
 - Consider appropriate standards (data definition, QA/QC practices, accountability policy)

Local Agency Interviews

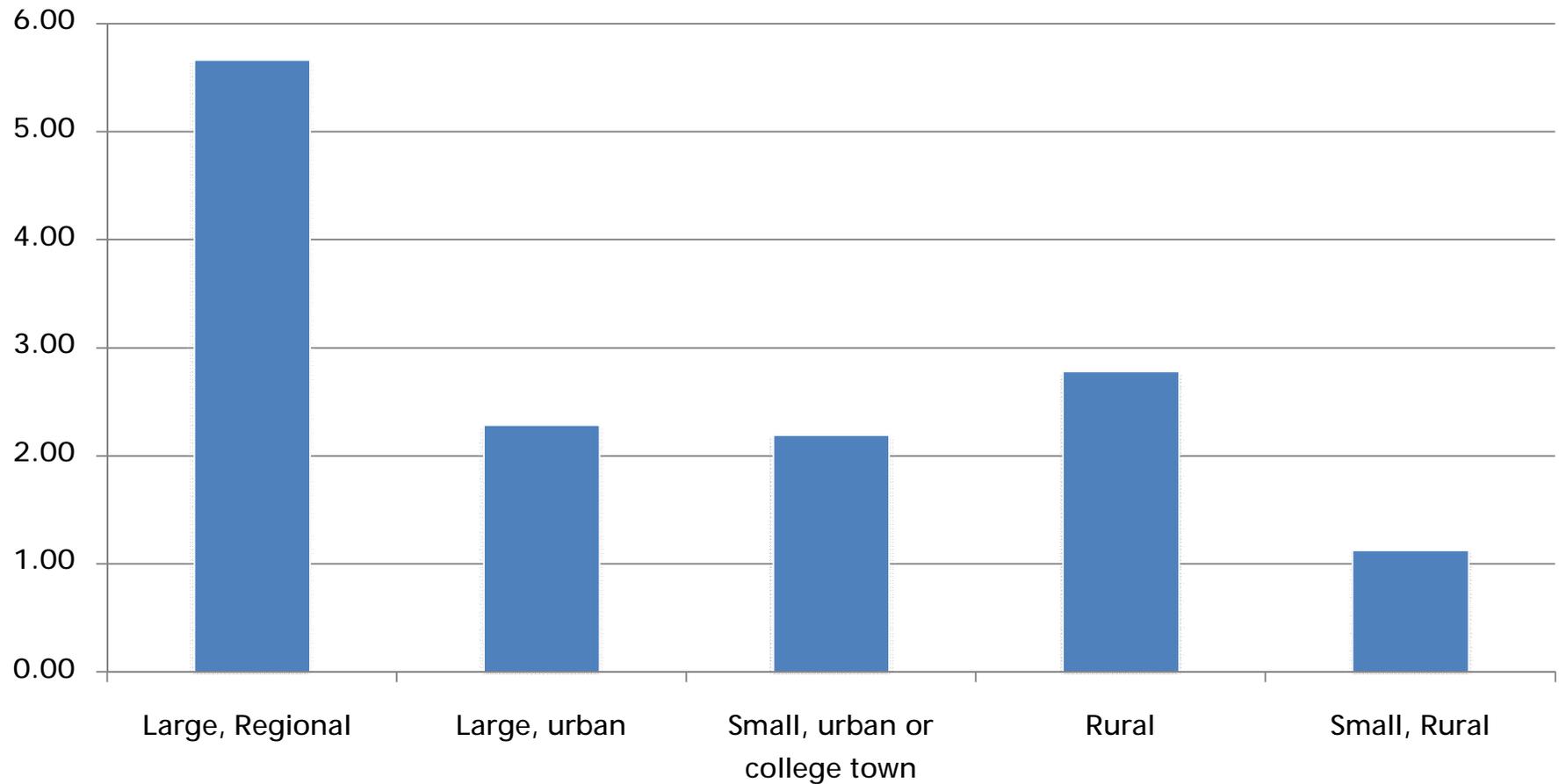
- 13 agencies selected based on:
 - Geographic location in the Commonwealth
 - Size of agency, ridership, geography
 - Type of service offered
 - Challenges and expertise across a range of issues surveyed
- Complete survey and interview results will be included in upcoming technical memo on data collection
 - February 2014 deliverable

Local Agencies Interviewed

- Arlington County (ART)
- Blacksburg Transit
- Town of Blackstone/Blackstone Area Bus
- Charlottesville Area (JAUNT)
- District Three Public Transit
- Hampton Roads Transit (HRT)
- Loudoun County
- Greater Lynchburg Transit Company (GLTC)
- Potomac and Rappahannock Transportation Commission (PRTC)
- Roanoke (RADAR)
- Washington Metro (WMATA)
- Williamsburg Area Transit Authority (WATA)
- Winchester Transit

Data Collection Methods

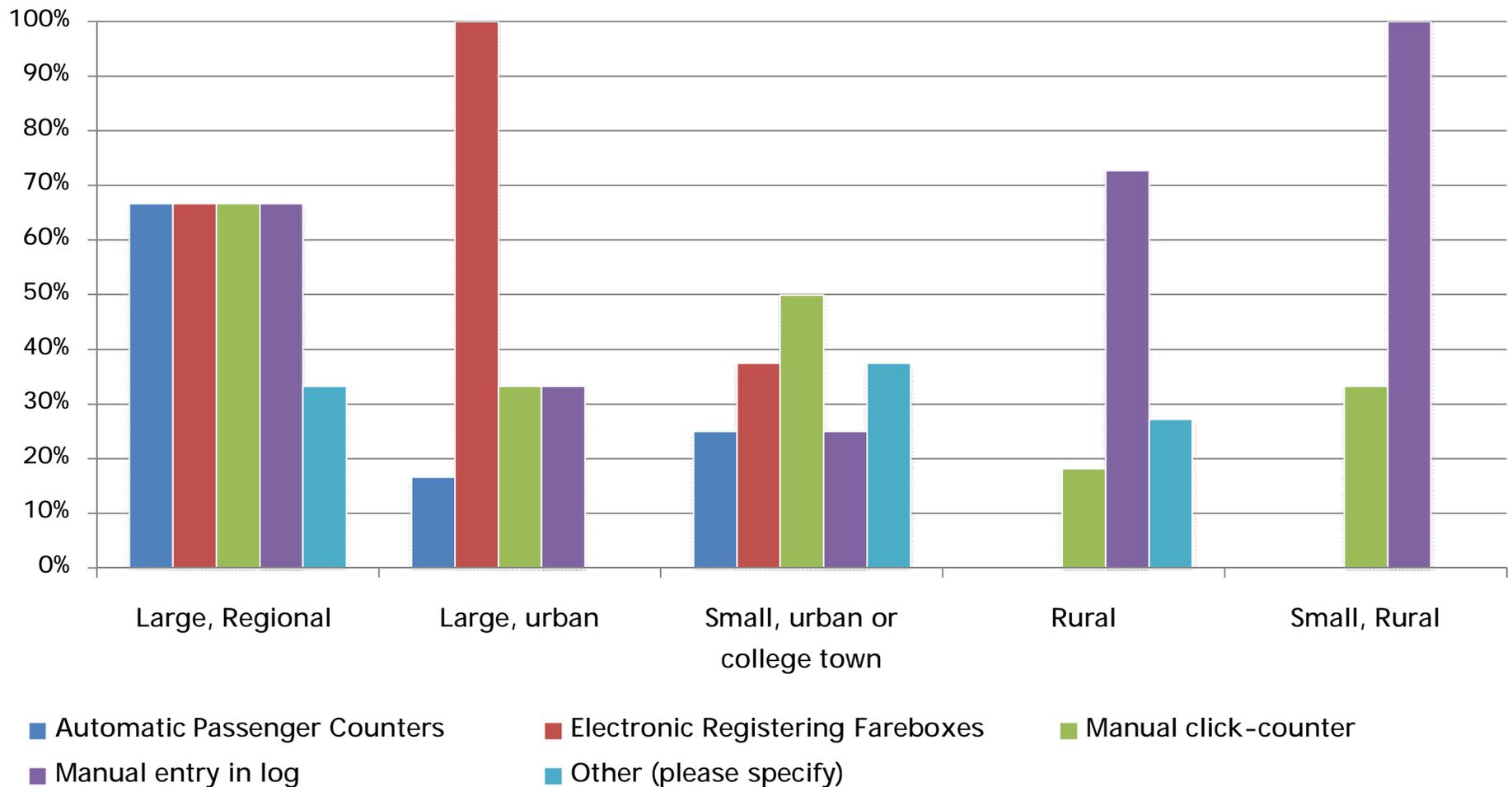
Survey Results: Staff Dedicated to Data Management



Data Collection

Data Collection Methods

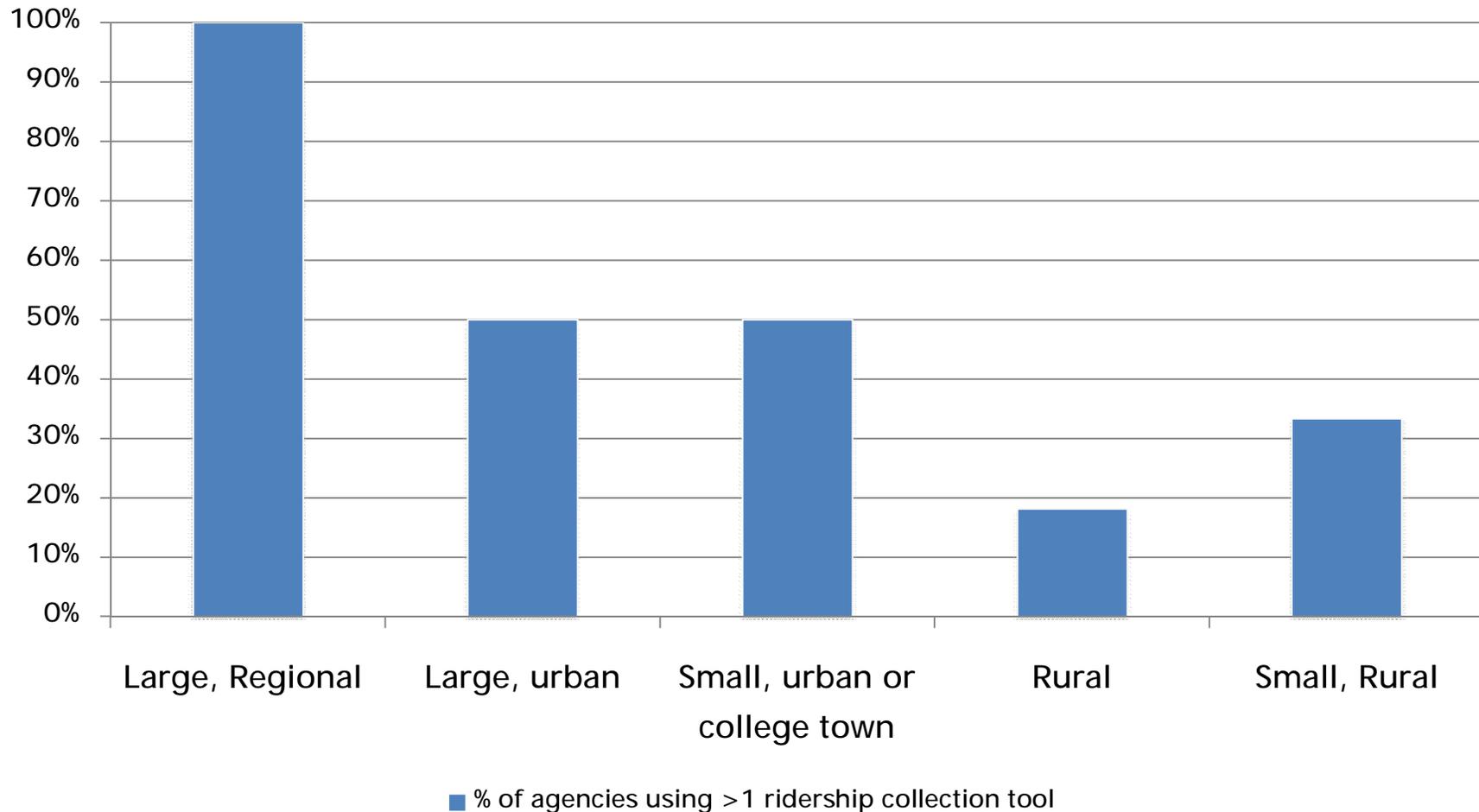
Survey Results: Ridership Data Collection Methods



Data Collection

Data Collection Methods

Survey Results: Ridership Verification Methods



Data Collection Methods

Survey Results: Other Data Collection Methods

- Operating expenses
 - Internal and external (municipalities, counties, regional) financial software, invoices
 - Management systems such as Oracle
- Fare revenue
 - Electronic and “manual” fare boxes
- Other operating revenue
 - Financial software, invoices
- Revenue miles and Revenue hours
 - CAD/AVL systems
 - Mobile data terminals, demand response software, scheduling software
 - Driver logs
 - Maintenance logs (electronic or manual)

Data Collection Methods

Survey Results: Challenges

Accuracy Issues :

- Malfunctioning electronic equipment
- Lost data, software glitches
- Operator error
- Data Entry errors

Technical Resource Issues:

- Lack of funding for technical resources
- Lack of staff with experience and/or time to devote to data collection process
- “Hard to procure technical resources tailored to small agencies”

Data Collection Findings

Data Collection Process

- Data collection involves a system of techniques
 - Some manual, some electronic
 - Optimizing use of both
- Staffing is often a challenge; ideal is a team of individuals dedicated to data and maintenance of data tools
 - Ensuring consistency may require staff member dedicated to reviewing data daily
 - When staff have many hats to wear, they can't prioritize data collection and analysis, and process suffers

Data Collection Findings

Data Verification

- Requires checking one source against another
- The greater access one has to more data sources, the more robust the verification process
- Most agencies are comfortable that they are able to verify data by checking one source against another or by staff spotting anomalies in data

Data Collection Findings

Technology

- Technology improves data accuracy and verification
 - Creates ongoing responsibilities/expense (training, maintenance, upgrades)
- Positive cost-benefit to obtain electronic fare boxes or automatic passenger counters not a given for some agencies
- Some software systems work better than others based on agency goals, staff capabilities, and vehicles

Data Collection Findings

Technology (continued)

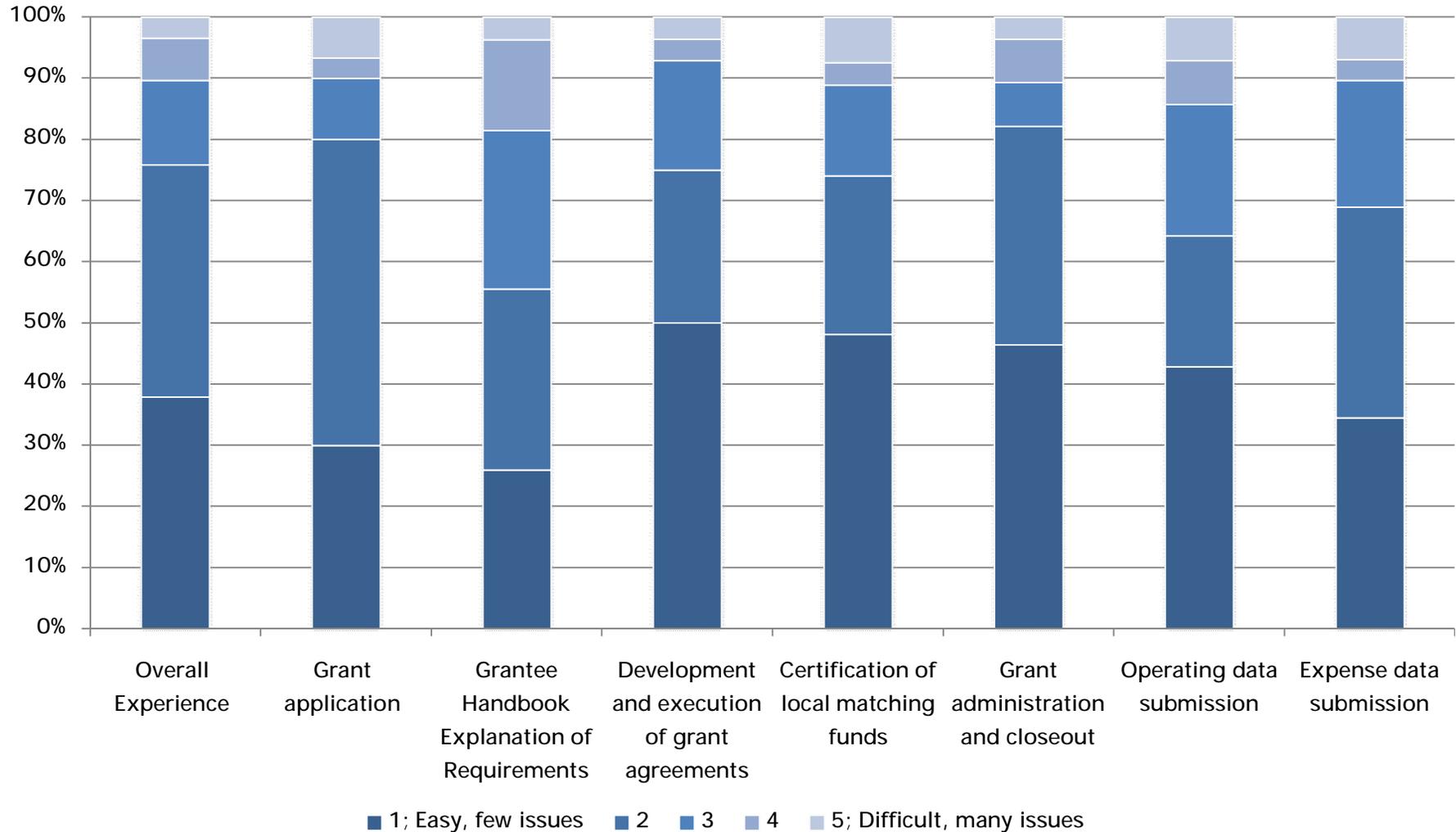
- Technologies that require additional interface/responsibility from drivers or passengers may not be suitable for some
- Some APCs work better than others
- Some agencies change tech providers to reduce costs
- Capital matching funds percentage may disadvantage technology improvements not tied to new vehicle purchases

Data Collection Findings

Data Definitions

- Large and small agencies report that current definitions lack detail
 - Cost, equipment, etc.
- Not clear that all agencies are capturing ‘full’ costs of their operations and services
- For reports to NTD and DRPT, data are the same except when DRPT explicitly requires to report unique number
 - Demand response is the major exception

OLGA Survey Results



Data Collection

OLGA Interview Findings

Reporting Process

- Several agencies remarked on OLGA improvements
 - Reporting process has been easier to understand
 - Data guidelines have been better defined than in the past
 - DRPT's recent simplification of what's excluded (now only depreciation) has helped
- Several agencies reported needing more than 90 days from fiscal year end to submit annual report to DRPT
 - Includes agencies able to submit data on time
 - Several agencies suggested 120 days
- Extra time needed to:
 - Process additional data reporting requirements
 - Obtain Board approval and/or receive final audited numbers from accounting process

OLGA Interview Findings

Reporting Process (continued)

- Several agencies unclear about OLGA annual deadlines
 - Reported receiving only a week to two week's notice at year-end
- Agencies described process of correcting issues with DRPT when anomalies/incorrect data are discovered
 - At least one agency reported that data entered and “accepted” by OLGA later disappeared from system
 - Data entered in OLGA by agency is different than what is received on back end by DRPT; issue is improving

OLGA Interview Findings

Software/Interface Improvements

- Some agencies suggested updating software and including more detailed definitions within OLGA
- Several agencies request improvements in OLGA
 - For example, allowing reimbursements to be submitted online
 - One suggested increasing character space in description boxes for grant applications
- Ability to access multiple years of previously entered OLGA data would be helpful
 - Perhaps as an Excel export
 - Use OLGA as a dashboard
 - Create comparative tool for agencies across the state (for agency use)

General Suggestions

- Knowledge sharing among state and local agencies
 - Help work through common issues and provide recommendations for implementing new systems
 - Provide annual forums for agency executives, data managers to share lessons learned in ITS and data management
- Support pooling of resources for small agencies to procure electronic tools and/or technical resources
 - Two agencies remarked that state taking the lead by creating a state contracts list for ordering would be more cost effective

Peer Agency Research Interviews

- Chair of Transportation Research Board (TRB) Performance Measurement Committee
- Ohio DOT
- New York State DOT
- Kansas DOT
- Still to come: Pennsylvania, North Carolina

Peer Agency Research

Preliminary Findings

- These states have attempted to create and/or implement a performance measurement system
 - Process difficult, or can be stalled due to decreased funding or complexity in creating an “equitable” system
- Year-to-year comparison is too short a time frame for some performance measures
 - A longer time frame (5 or more years) will provide a more representative trend line

Peer Agency Research

Preliminary Findings (continued)

- States provide technical and/or data collection training, tailored state staff assistance, consultant and/or other resources to local agencies:
 - States provide assistance through annual or triennial audits or submit NTD data on agencies' behalf
 - Ohio DOT is developing a Training 101 series to help transit agencies learn transit operations
 - NYSDOT and KDOT have held data summits in the past, bringing in agency representatives for day-long training, peer exchange
 - KDOT program managers meet with rural agencies 4-6 times a year to provide training, tailored assistance, technical resources.

Peer Agency Research

Preliminary Findings (continued)

- KDOT is implementing a regionalization process for rural agencies
 - Help pool resources
 - Integrate service and provide centralized dispatching for multiple agencies
 - Facilitate other technology procurements to improve efficiency

Data Collection Discussion Questions

- How do we create data standards?
 - Via data definitions?
 - Takeaway: Clear definitions from DRPT of data type such as cost would be helpful
 - Via best practices guidance for collecting and processing data?
 - Takeaway: Documentation and dissemination of best practices (particularly in manual collection) could be useful
 - Should standards be tied to agency type?
- How can current verification methods improve?
- What elements would strengthen a DRPT accountability policy?
- Can OLGA be useful in disseminating standards?
 - Takeaway: Helpful for DRPT to share OLGA reporting and agency-specific updates to agencies via email

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Congestion Mitigation

Congestion Mitigation in Virginia

“Congestion, simply put, is a condition caused when the demand for use of a given transportation facility is great than the available capacity”

- Virginia Long-Range Multimodal Transportation Plan 2007-2035

Congestion Mitigation Goals

- Review key issues
- Summarize findings of literature review
 - Data sources available in Virginia
- Discuss implementation strategy
 - Discuss performance measures used in four largest Metropolitan Planning Organizations (MPOs), over 200,000 population
 - Provide short list of common performance measures and others to consider
- Discuss strategy implementation and questions to consider

Congestion Mitigation

Issues to Consider

- Congestion mitigation in context of transit operating funding
 - Transit system congestion
 - Improving transit service on congested corridors
 - Additional transit service in congested areas
- Quantification requires significant, reliable data and may require complex tools (e.g., travel demand models)
 - Data availability in both rural and urban areas
 - Roadway and transit network congestion
 - Data collection burden
- Correlation with population density
- “Dividing slices of the pie into slivers”

Congestion Mitigation

Interview Responses

- Congestion is not an issue in rural areas
- Some agencies rely on the Transportation Management Areas (TMAs) Congestion Management Process (CMP) but it has been underreported overall in the region
- Varied level of measurement across agencies
- Performance measures typically take into account roadway congestion and not specifically transit

Congestion Mitigation

Interview Responses (continued)

- One agency uses average trip length on each route and passenger trips on each route to calculate “VMT saved”
 - Air quality measure for all transit data in the region for the SIP
 - Congestion measure for elected officials and the public
 - Tracking fuel saved by transit in the county
- Suggestion to weight riders in congested corridors more heavily than those in non-congested corridors

Data Available Regionally

- VDOT Traffic Data
- FHWA's Transportation Technology Innovation and Demonstration (TTID) Program
- I-95 Corridor Coalition's Vehicle Probe Project
- Skycomp Aerial Survey
- Google Traffic
- INRIX National Traffic Scorecard
- Texas Transportation Institute (TTI) Annual Urban Mobility Report

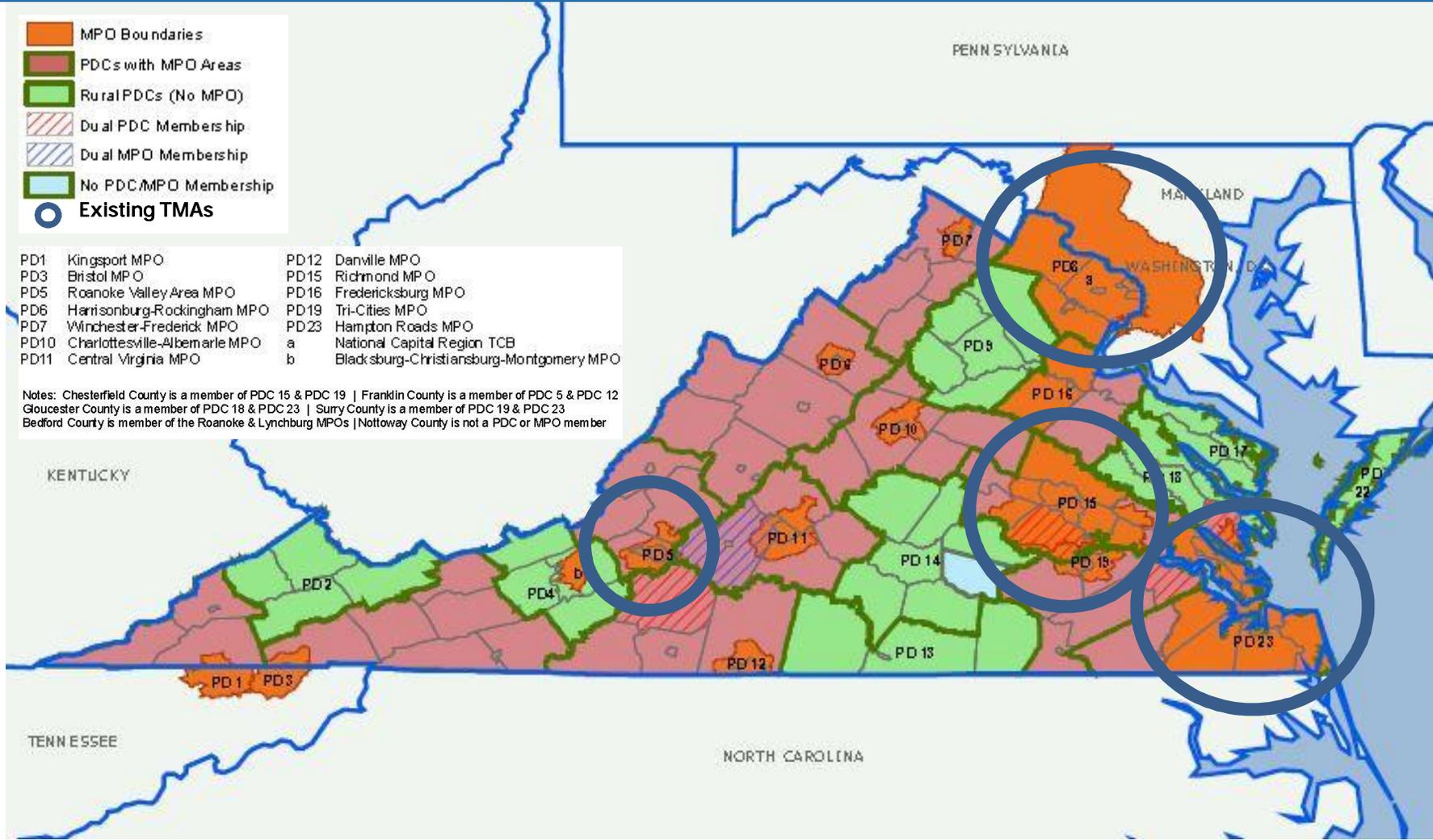
Data Available Statewide

- American Community Survey (ACS)
 - Census tract level
- National Transit Database (NTD)
 - Transit agencies who receive FTA funding

Implementation Strategy

- Congestion measure threshold:
Urbanized Area population > 200,000
 - Governs whether the agency is required to submit congestion-mitigation related data
 - Excludes agencies that are not focused on congestion mitigation as a goal
 - MAP-21 requires a Congestion Management Process (CMP) for all Transportation Management Areas (TMAs)
 - Possibly exclude or require additional data collection from Roanoke Valley Area
- If no threshold applied, only ACS and NTD data is available at the rural (non-highway) level in Virginia

Map of Virginia MPOs, PDCs



VIRGINIA | PUBLIC TRANSPORTATION

LEGEND

Public Transportation

- Fixed-Route Transit Area
- Demand-Response Transit Area
- Passenger Rail Network
- Passenger Train Station
- VRE Station
- Greyhound Station
- Park & Ride Lot
- Metro Station

Highway Transportation

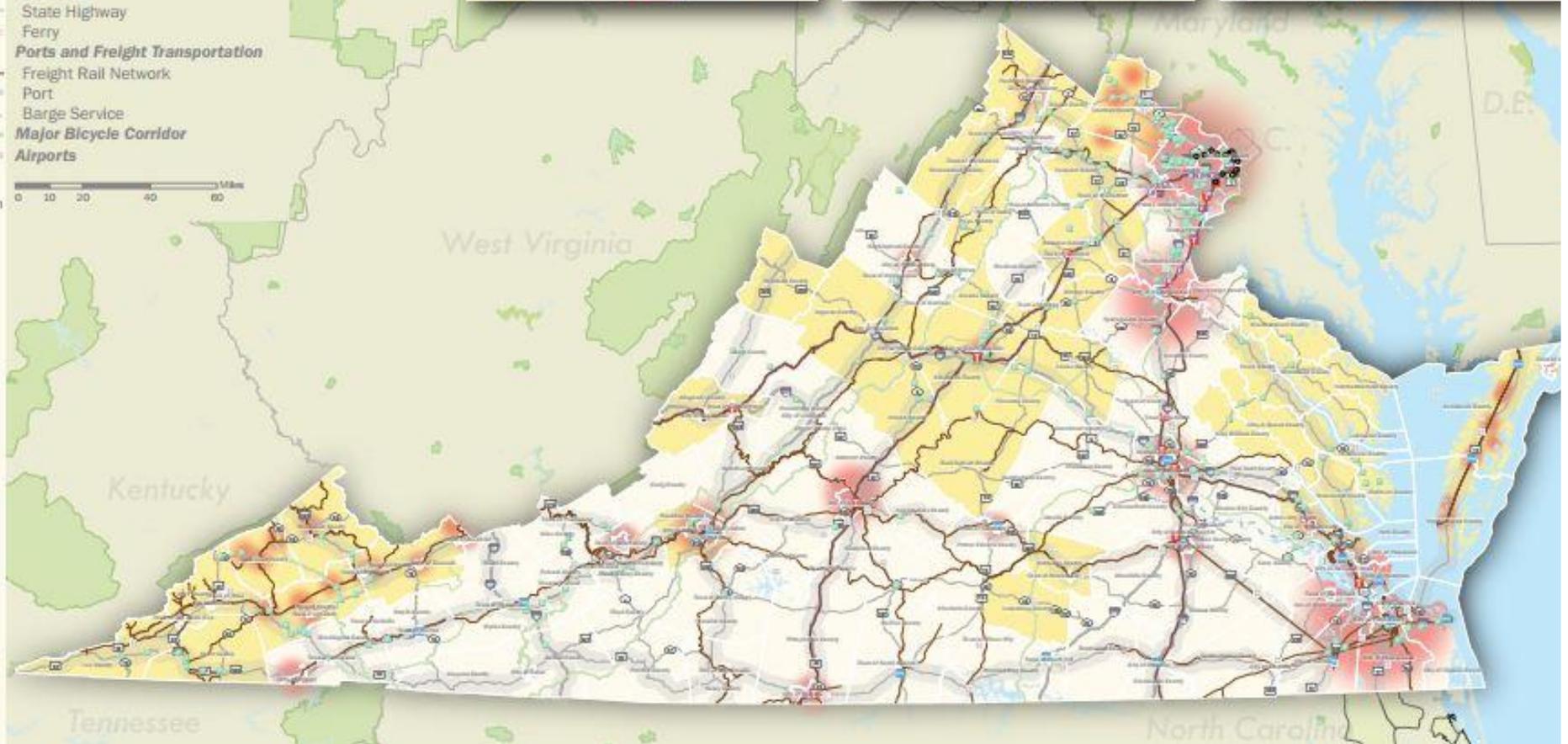
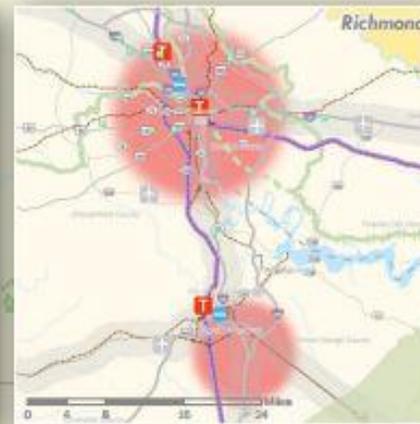
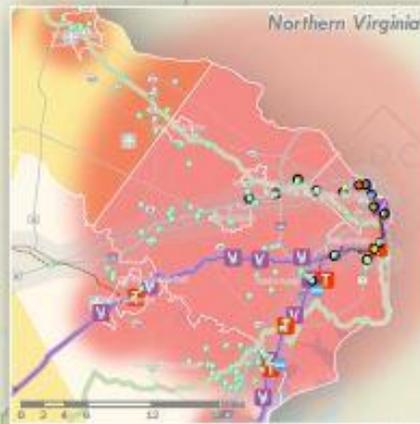
- Corridor of Statewide Significance
- Interstate
- US Route
- State Highway
- Ferry

Ports and Freight Transportation

- Freight Rail Network
- Port
- Barge Service

Major Bicycle Corridor

Airports



Congestion Mitigation Measures

National Capital Congestion Management Process

Area	Metric	Data Source	Relevance to SB1140 goals (G/A/P)	Ease of data collection/update (G/A/P)	Consistency of definition (G/A/P)	Comments/ Issues
Freeway and Arterials	Freeway Lane-Miles Under LOS F Conditions	Skycomp 1999-2011	A	P	A	Collected every three years
	Travel Time Index	TTI/INRIX 2000-2010	A	G	G	Good if only considering freeways and arterials (not specifically transit) INRIX does not provide complete coverage of all roads; TTI does not include Roanoke
	Annual Hours Of Delay Per Traveler Per Month	I-95 Vehicle Probe Project/ TTID Program/ INRIX/ TTI 2008-2011	A	A	A	Good if only considering freeways and arterials (not specifically transit); TTI does not include Roanoke Continuous monitoring Segment data is more accurate than speed estimates from location-fixed detectors
	Extra Time for On-Time Arrival (Planning Time Index)	I-95 Vehicle Probe Project/ TTID Program/ INRIX/ TTI 2008-2011	A	A	A	More rural areas will be excluded from analysis given a limited number of road miles covered by procured INRIX data (for example MWCOG excludes Falls Church, Manassas, and Manassas Park are excluded from National Capital CMP)
	24-Hour % of Congested Arterial Route Miles	INRIX 2010	P	A	P	Does not take into account freeway and rural areas
	Level Of Service (LOS)	VDOT 2010	A	G	A	Volume to capacity ratio from VDOT GIS road layer Difficult to distinguish between levels of congestion once congested

Congestion Mitigation Measures

Hampton Roads Congestion Management Process

Area	Metric	Data Source	Relevance to SB1140 goals (G/A/P)	Ease of data collection/update (G/A/P)	Consistency of definition (G/A/P)	Comments/ Issues
Freeway and Arterials	Travel Time Index	TTI/INRIX 2000-2010	A	G	G	Good if only considering freeways and arterials (not specifically transit) INRIX does not provide complete coverage of all roads TTI does not include Roanoke
	Level Of Service (LOS)	VDOT 2010	A	G	A	Volume to capacity ratio from VDOT GIS road layer Difficult to distinguish between levels of congestion once congested conditions are reached
	Congestion Level	INRIX and VDOT 2009	G	P	A	Calculated using both INRIX data and LOS methods for roadways without speed data from the Highway Capacity Manual (HCM)
	Buffer Index	INRIX 2010	P	A	A	More suitable for public because addresses individual vehicle travel time and can be used for trip planning. Less useful for transportation professionals than total delay
	Planning Time Index	IINRIX/TTI 2010	A	A	A	More rural areas will be excluded from analysis given a limited number of road miles covered by procured INRIX data
Public Transit Trends	Annual Delay Increase if Public Transportation Service were Discontinued	TTI 2010	G	P	A	Hypothetical scenario with a number of assumptions Is available for Richmond, Hampton Roads, and National Capital

Congestion Mitigation Measures

Richmond Congestion Management Process

Area	Metric	Data Source	Relevance to SB1140 goals (G/A/P)	Ease of data collection/update (G/A/P)	Consistency of definition (G/A/P)	Comments/ Issues
Freeway and Arterials	Travel Time Index	TTI/INRIX 2000-2010	A	G	G	Good if only considering freeways and arterials (not specifically transit) INRIX does not provide complete coverage of all roads TTI does not include Roanoke
	Annual Hours Of Delay Per Person (In Person-hours)	TTI 2000-2010	A	G	G	Good if only considering freeways and arterials (not specifically transit); TTI does not include Roanoke
	Level Of Service (LOS)	VDOT 2010	A	G	A	Volume to capacity ratio from VDOT GIS road layer Difficult to distinguish between levels of congestion once congested conditions are reached

Congestion Mitigation Measures

Roanoke Valley Congestion Management Process

Area	Metric	Data Source	Relevance to SB1140 goals (G/A/P)	Ease of data collection/update (G/A/P)	Consistency of definition (G/A/P)	Comments/ Issues
Area-wide	Average Travel Time	Census (ACS) 2007-2012	A	A	A	ACS data includes 5 years of data collection to maintain accuracy in rural service areas Measures one day, not annual data – congestion changes based on time of year
	Percent Of Respondents Being Satisfied Or Highly Satisfied With Travel Conditions	Public Input Surveys 2012	A	P	P	Not used by all TMAs
	Number Of Congestion Occurrences	Google Traffic 2012	A	P	P	Not used by all TMAs Google definition of congestion
Freeway and Arterials	Level Of Service (LOS)	VDOT 2010	A	G	A	Volume to capacity ratio from VDOT GIS road layer Difficult to distinguish between levels of congestion once congested conditions are reached

Common Congestion Mitigation Measures

- Annual Hours of Delay Per Traveler (TTI/INRIX)
- Travel Time Index (TTI/INRIX)
- Annual Delay Increase if Public Transportation Service were Discontinued (TTI)
- Level of Service (VDOT)
- Congested Hours Per Day (VDOT)
- Average Travel Time (ACS data)

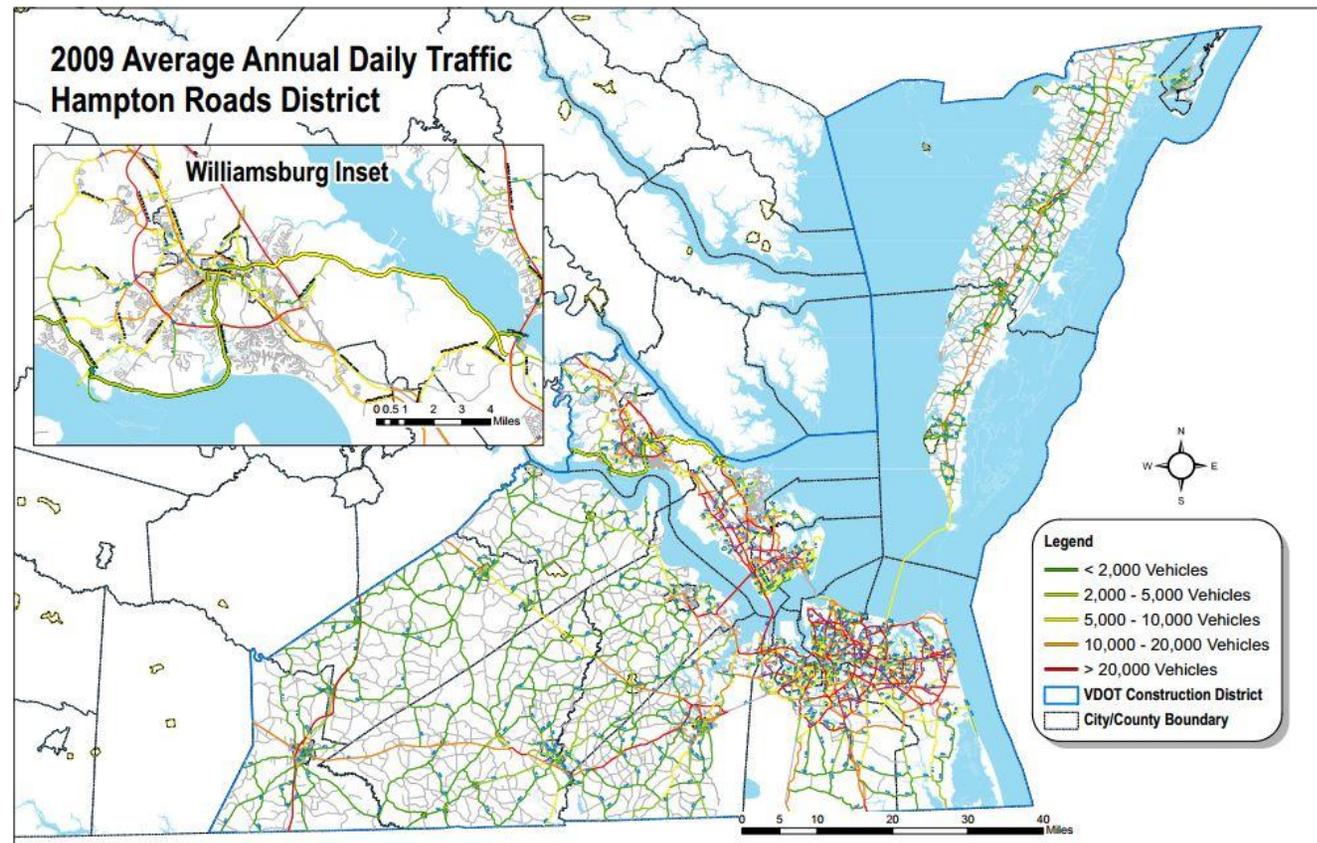
Congestion Mitigation Measures

2012 TTI Urban Mobility Study

Metric	Data Source	Roanoke Valley	Richmond	Hampton Roads	National Capital
Annual Hours of Delay Per Traveler	TTI 2012	-	29	43	67
Travel Time Index	TTI 2012	-	1.11	1.20	1.32
Annual Delay Increased if Public Transportation Service were Discontinued (1000)	TTI 2012	-	806	1,643	33,810
Population (000)		210	974	1,555	4,613

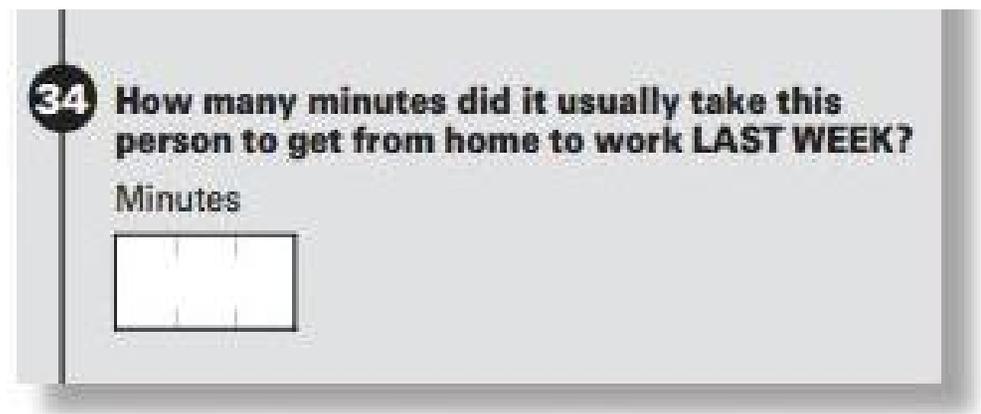
Congestion Mitigation VDOT Data

- VDOT data is available for all TMAs, but is limited in rural areas
 - Level of Service
 - Congested Hours Per Day



ACS Data

- ACS data is available on the census tract level across the commonwealth
 - Average Travel Time



34 How many minutes did it usually take this person to get from home to work LAST WEEK?
Minutes

Congestion Mitigation Discussion Questions

- What is the definition of congestion mitigation in the context of transit operating funding?
- Should we consider both rural and urban areas? Are data available on all levels?
- Is congestion reduction redundant with other measures?
- Should congestion mitigation funding come from existing formula funds or any new pots of money?
- What is the data collection burden for these measures?
- Are tools and data available to transit agencies? Do tools address both roadway and transit network congestion?

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Fulfillment of Transit Dependent Outcomes

Fulfillment of Transit Dependent Needs in the Commonwealth

“...those 1) without private transportation, 2) elderly (over age 65), 3) youths (under age 18), and 4) persons below poverty or median income levels defined by the U.S. Census Bureau”

- Federal Transit Administration Definition for Transit Dependent Persons

Fulfillment of Transit Dependent Needs Approach

- Review key issues
- Summarize findings of literature review
 - Data sources in Virginia
- Provide short list of transit dependent performance measures
- Discuss preferred transit dependent performance measures and mechanism for implementation

Fulfillment of Transit Dependent Needs

Issues to Consider

- Quantification requires significant, reliable data and may require complex tools (e.g., on-board surveys)
 - On-board surveys not conducted consistently across agencies
 - Requires data availability in both rural and urban areas
 - Need to quantify difference between demand-response and fixed-route service
 - Must determine additional data collection burden
- Huge benefit to systems who already receive benefit from sizing and possibly congestion mitigation (WMATA)
- “Dividing slices of the pie into slivers”
 - Formula funding versus new pot of money

Fulfillment of Transit Dependent Needs

Interview Responses

- Transit dependent data is usually collected from on-board survey (not frequent enough in Virginia agencies)
- Some agencies use MPO data that is not transit specific
- One uses origin/destination surveys (every 3 years)
- Simply measuring demographics of service area from ACS is not robust
 - One agency using ACS data to better service transit dependent populations (defined by age, population, income, and residence)
- Prefer targeted additional fund instead of formula-based
- Rural agencies have difficulty measuring transit dependent populations, no consistency between agencies

Fulfillment of Transit Dependent Needs

Data Available from Some Agencies

- On-Board Surveys
 - Various measurement periods

Fulfillment of Transit Dependent Needs

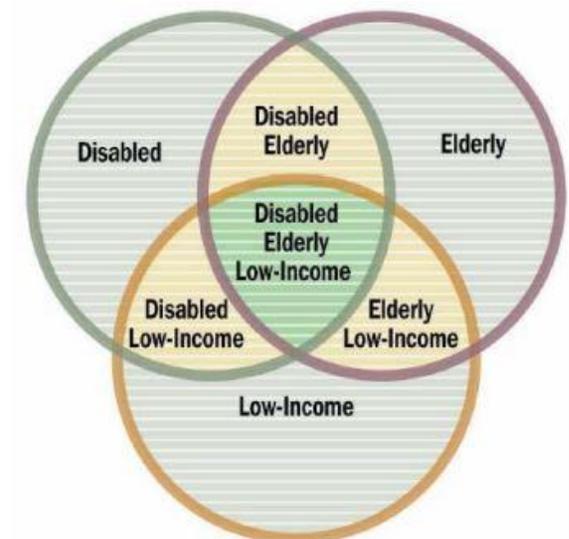
Data Available Statewide

- American Community Survey (ACS)
 - Census tract level
- National Transit Database (NTD)
 - Transit agencies who receive FTA funding

ACS Data

1. Those who do not have access to an automobile
ACS Data
2. Those who are under the age of 16 and over the age of 65
ACS Data
3. Those who identify as disabled
ACS Data
4. Those who report income below the poverty level
ACS Data

Coverage measure
NTD Data



ACS Data

Automobile(s) per Household

9 How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of this household?

- None
- 1
- 2
- 3
- 4
- 5
- 6 or more

Source: ACS-1(2009)KFI

ACS Data

Age

4

What is Person 1's age and what is Person 1's date of birth?
Please report babies as age 0 when the child is less than 1 year old.

Print numbers in boxes.

Age (in years)

Month

Day

Year of birth

Source: ACS-1(2009)KFI

ACS Data Disability

- 17** a. Is this person deaf or does he/she have serious difficulty hearing?
- Yes
 No
- b. Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?
- Yes
 No

- 19** Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?
- Yes
 No

- 18** a. Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?
- Yes
 No
- b. Does this person have serious difficulty walking or climbing stairs?
- Yes
 No
- c. Does this person have difficulty dressing or bathing?
- Yes
 No

Source: ACS-1 (2009)KFI

ACS Data

Other Commute Questions

30 At what location did this person work LAST WEEK? *If this person worked at more than one location, print where he or she worked most last week.*

a. Address (Number and street name)

If the exact address is not known, give a description of the location such as the building name or the nearest street or intersection.

b. Name of city, town, or post office

c. Is the work location inside the limits of that city or town?

Yes
 No, outside the city/town limits

d. Name of county

e. Name of U.S. state or foreign country

f. ZIP Code

31 How did this person usually get to work LAST WEEK? *If this person usually used more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.*

<input type="checkbox"/> Car, truck, or van	<input type="checkbox"/> Motorcycle
<input type="checkbox"/> Bus or trolley bus	<input type="checkbox"/> Bicycle
<input type="checkbox"/> Streetcar or trolley car	<input type="checkbox"/> Walked
<input type="checkbox"/> Subway or elevated	<input type="checkbox"/> Worked at home → SKIP to question 39a
<input type="checkbox"/> Railroad	<input type="checkbox"/> Other method
<input type="checkbox"/> Ferryboat	
<input type="checkbox"/> Taxicab	

32 How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?

Person(s)

33 What time did this person usually leave home to go to work LAST WEEK?

Hour Minute

 :

a.m.
 p.m.

34 How many minutes did it usually take this person to get from home to work LAST WEEK?

Minutes

Source: ACS-1(2009)KFI

Transit Dependent Population

Transit Service Coverage Measures

- Service area reported by transit agencies can be inconsistent
- Difference between demand-response and fixed-route service
 - Requires distance-based correlation to fixed-route service
 - Requires further analysis for demand-response service

Fulfillment of Transit Dependent Needs

Potential Measures

Category	Metric	Data Source	Relevance to SB1140 goals (G/A/P)	Ease of data collection/update (G/A/P)	Consistency of definition (G/A/P)	Comments/ Issues
Demographic Percent within Service Area	Percent Of Households In Service Area Without A Vehicle	Census (ACS)	Must be combined to cover transit dependent definition Single – P Combined – G	G	A	ACS data includes the past 5 years of collection to maintain accuracy in the rural service area. Data is accurate down to individual Census Tract
	Percent of Persons In Service Area Not Taking Car, Truck, Van, Or Motorcycle To Work Last Week (Bus Or Trolley, Bus, Streetcar, Or Trolley Car, Subway Or Elevated, Other Methods)	Census (ACS)		G	A	
	Percent Of Persons In Service Area Having Difficulty Doing Errands Alone Because Of A Physical, Mental, Or Emotional Condition	Census (ACS)		G	A	
	Percent Of Persons In Service Area Total Income In The Past 12 Months Being Under The Poverty Level	Census (ACS)		G	A	
	Percent Of Persons In Service Area Under Driving Age And Elderly	Census (ACS)		G	A	
Public Transit	Number of Passenger Trips For Transit Dependent	NTD and Census (ACS)	A	A	A	Requires further analysis and combination of demographics and NTD data Referenced in 2035 VTrans Update

Challenges with Incorporating Transit Dependent Measures

- Should service to transit dependents be addressed through transit operating funding? If so, how?
 - Is ACS data accurate enough? 5-year estimates are required for accuracy – is this current enough?
 - How to connect ACS data with service area? Are service areas reported similarly at each transit agency in Virginia?
 - Should each element of transit dependent demographic be equally weighted? If not, what should the percentages be?
 - What is the data collection burden for these measures?
 - Are certain agencies benefiting more than other agencies?
- Should congestion mitigation funding come from new or existing funds?

Agenda

- Overview – Review of 1st Working Group Meeting
- Sizing of Transit Systems
- Data Collection Practices
- Other Possible Performance Measures & Grant Opportunities
 - Congestion Mitigation
 - Fulfillment of Transit Dependent Outcomes
- **Exceptional Performance**
- Next Steps

STRATEGIC CONSULTING SERVICES

Exceptional Performance

Exceptional Performance Approach

- Qualitatively review approaches for rewarding exceptional performance
 - Short list of exceptional performance measures
 - Evaluate methods for implementation of incentive
- Assess quantitative impact of shortlisted measures and implementation methods
 - Run scenarios, variance analysis to inform final selection of metrics
- Recommend implementation of preferred exceptional transit performance incentive

Exceptional Performance

Issues to Consider

- Current formula rewards year-over-year improvement in performance within each agency, relative to statewide average trend
- High performing agencies have a relatively small window for improvement
- Year-over-year tracking of performance is shortsighted
- A longer time horizon weeds out temporary shocks from external factors and evaluates true agency performance
- Need to recognize and reward high performing agencies

Exceptional Performance

Key Questions

- How to measure exceptional performance?
- How to implement incentive?

How to Measure Exceptional Performance?

- What measures to use?
 - What defines exceptional performance?
- How to compare?
 - National vs. Statewide benchmarking
 - Peer grouping?
 - Different measures for different peer groups?
 - Statistical modeling
- Over what time horizon to measure?
 - Year-over-year increment vs. average performance over multiple years

How to Implement Exceptional Performance Incentive?

- Incorporate within current operating formula
 - Would preclude peer grouping
- Carve out funds from within current allocation
 - Would reduce current formula allocation levels
- Pursue additional funding for rewarding exceptional performance
 - Is currently not identified

Exceptional Performance Interview Responses

- There are no true peers in case of transit systems
 - Different market, demographics, geographic area
- Year-to-year measurement of performance is too short sighted. Should have a longer time horizon (5 years)?
- Performance measurement shouldn't penalize those top performers
- Reward increase in passengers each year
- Difficult to measure exceptional performance for Demand Response systems
- Comparing nationally may be more appropriate
- Hard to measure performance without adequate data

Interview Responses

Suggested Metrics

- Customer complaints/satisfaction surveys, secret riders
 - Provide financial incentive to contractors for excellent ratings in customer surveys; Costly to implement
- Cost per Passenger, Cost per Passenger Mile
 - “You get what you pay for”
- Vehicle Passenger Hour
 - Ridership surges can throw this off
- Ridership/Incremental increase in ridership
 - Yearly fluctuation where serving unpredictable “captive” riders
- Load Factor during peak periods
- Farebox Recovery Ratio
- Park & Ride Lot Capacity and Bus Capacity/Occupancy

Exceptional Performance

How to Measure?

Discussion

- **What measures to use**
 - What defines exceptional performance?
- How to compare?
 - National vs. Statewide benchmarking
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What Measures to Use?

Performance Measures in Literature

- Cost Efficiency
- Cost Effectiveness
- Productivity
- Service Utilization
- Not consistently reported by NTD or other sources
 - Resource Utilization
 - Perceived Service Quality
 - Safety and Security

What Measures to Use?

Cost Efficiency

- Measures how efficiently a system is run irrespective of demand.
 - Operating cost/Revenue hour (mile)
 - Vehicle miles (hours)/Revenue miles (hours)
 - Operating cost/Peak vehicle in service
- Pros:
 - Commonly used measure to evaluate system-wide performance
- Cons:
 - Do not measure transit agency's ability to meet needs of passenger
 - Only measure system efficiency, regardless of where service is going or how it is being utilized

What Measures to Use?

Cost Effectiveness

- Compares the cost of providing service to outcomes resulting from service provision.
 - Farebox recovery ratio
 - Operating cost/Boarding (Passenger mile) (Service area pop.)
- Pros:
 - Commonly used by transit agencies
- Cons:
 - Only measures effectiveness by cost incurred/revenue generated, not how service is being utilized
 - Non-farebox sources of revenue make farebox recovery ratio an imperfect measure to use

What Measures to Use?

Productivity

- Measures how many passengers are served per unit of service
 - Boardings/Revenue hours (miles) (FTE employees)
- Cons
 - Not ideal measures for service for transit dependents
 - Does not answer “at what cost?”

What Measures to Use?

Service Utilization

- Examines how passengers use service
 - Annual unlinked trips
 - Annual passenger miles
 - Average trip length
 - Annual boardings (linked trips) per service area population
- Pros:
 - Commonly used/ reported measures
- Cons:
 - Cannot be used to measure performance between “unlike” systems/ service areas. Need to group agencies in like peers
 - Service area measures are reported inconsistently

What Measures to Use?

Other Measures

- **Resource Utilization**
 - Vehicle hours/ vehicle operated in peak service
 - Revenue hours per employee FTE
 - Vehicle miles per gallons of fuel consumed
- **Perceived Service Quality**
 - Average system speed
 - On-time performance
 - Excess wait time
- **Safety and Security**
 - Casualty and liability cost per vehicle mile

What Measures to Use?

Criteria for Evaluation of Measures

- Relevance to TSDAC goals:
 - *Does the measure serve the purpose of identifying exceptional performers towards the goal of improving mobility, effectively, efficiently and safely?*
- Consistency of definition
 - *Is there a consistent understanding of what the measure is and how to collect the data required for it across agencies?*
- Ease of data collection/ update
 - *Do agencies already collect the data required for the measure?*
 - *If not, what is the additional data collection burden?*
- Rate measures as Good, Average, or Poor based on how well they fare on the evaluation questions: higher relevance to TSDAC goals, greater consistency of definition and collection methods and lesser incremental data collection burden resulting in higher rating.

What Measures to Use?

Rating: Good/ Average / Poor

Category	Metric	Data Source	Relevance to TSDAC goals	Ease of Data Collection	Consistency of definition	Comments
Cost Efficiency	Operating cost/ revenue hour (mile)	NTD	A	G	A	Only measures cost efficiency not service provision and other transit goals. Operating Cost is defined differently by agencies of different sizes
	Operating cost/ peak vehicle in service	NTD	A	G	A	
	Vehicle miles (hour)/ revenue miles (hour)	NTD	A	G	A	Cannot compare across modes
Cost Effectiveness	Farebox recovery ratio	NTD	A	A	A	Non-farebox revenue sources make accounting complicated
	Operating cost/boarding	NTD	A	G	A	Operating Cost is defined differently by agencies of different sizes and structures. Effectiveness is only measured relative to cost and not to other transit goals.
	Operating cost/ passenger mile	NTD	A	G	A	
	Operating cost/ service area capita	NTD	A	A	P	
Boardings/ revenue hour	NTD	A	G	G		
Productivity	Boardings/ revenue mile	NTD	A	G	G	

Exceptional Performance

What Measures to Use?

Rating: Good/ Average / Poor (continued)

Category	Metric	Data Source	Relevance to TSDAC goals	Ease of Data Collection	Consistency of definition	Comments
Service Utilization	Annual Unlinked Trips	NTD	P	G	A	Already being used as a sizing measure
	Annual Passenger Miles	NTD	P	G	A	They are more scale/ sizing measures rather than exceptional performance measures
	Average Trip Length	NTD	P	G	A	
	Annual Boardings/Service Area Capita	NTD	P	P	P	
Resource Utilization	Vehicle hours/ vehicle operated in peak service	Agency	A	A	A	
	Revenue hours per employee FTE	Agency	A	A	A	
	Vehicle miles per gallons of fuel consumed	Agency	A	A	A	
Perceived Service Quality	Average System Speed	Agency	P	A	A	Not translate-able across modes
	On-Time Performance	Agency	A	P	P	Not defined consistently across agencies

Exceptional Performance

What Measures to Use?

Rating: Good/ Average / Poor (continued)

Category	Metric	Data Source	Relevance to TSDAC goals	Ease of Data Collection	Consistency of definition	Comments
Perceived Service Quality	Excess Wait time	Agency	A	P	A	Dependency upon archived AVL data
	Customer complaints/ Satisfaction Surveys/ Secret Rider surveys	Agency	A	A	P	Process of submitting complaints and conducting satisfaction surveys may differ at agencies
	Passenger load factor	Agency	A	A	A	Dependency on APC data
Safety and Security	Casualty or Liability cost / Vehicle Mile	Agency	A	A	A	
Other/ Agency Suggested	Park and Ride lot occupancy/ Bus Occupancy	Agency	A	A	A	
	Load Factor During Peak Periods	Agency	A	A	A	Dependency on APC data
	Vehicle Passenger Hour	Agency	A	A	A	
	Increase in Ridership	Agency	A	A	A	

Exceptional Performance

How to Measure?

Discussion

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Next Steps

- Data collection practices
 - Draft Report: Findings on data collection methods, standards, and technology: Feb. 28, 2014
 - Final Report: March 31, 2014
- Sizing of transit systems – **complete**
- Exceptional transit performance
 - Draft Report: Funding allocation scenarios: Feb. 28, 2014
 - Final Report: March 31, 2014
- Other Possible Performance Measures
 - Draft Report: Assessment of potential measures: Feb. 28, 2014
 - Final Report: March 31, 2014

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