

STAFF REPORT

TTC Special-Called Meeting January 5, 2021

SUBJ: Continued Development of the Update to the Roanoke Valley Transportation Plan

Supplemental Information

For TTC member review and discussion at the meeting, included in this packet are the following items:

- Summaries of work done since November 2021 TTC meeting
- Needs Prioritization Methodology Report outlining the process for prioritizing various transportation needs throughout the Roanoke Valley region.
 - *Descriptions updated under each group of prioritization criteria, p. 5-8.*
- Revised Objectives and Performance Measures
- Overview summary of the next plan phase: Solutions Development

Items still being updated to be shared separately:

- Needs Prioritization Spreadsheet including each individual need and the associated prioritization result for each criteria outlined in the methodology report.
- Needs Prioritization Map enabling a spatial understanding of the needs that were prioritized and the outcomes of the methodology.

Summary Update on Priority Needs

The priority needs process uses available data to assess the importance of around 1,000 specific needs identified through the Regional Transportation Needs Assessment by aligning each need with data that represents aspects of the Roanoke Valley Transportation Plan goals. The outcome of the process **is a prioritized list of needs, organized by need type and jurisdiction**. RVTPO staff and the TTC will use this information, as well as insights from the VTrans needs assessment and other ongoing planning and project development efforts, as a **means to explore solutions to address priority needs** for possible inclusion in the Plan.

During the November 2021 TTC meeting, the TTC expressed concerns on inconsistencies between the RVTPO priority needs weighting by criteria compared to VTrans and SMART SCALE approaches. While there were multiple concerns regarding the inconsistency and how it could lead to regional priorities that may conflict with priorities in VTrans and SMART SCALE, the environmental justice criteria received the most attention.

EJ criteria response: The EJ factor utilizes the VTrans Equity Emphasis Areas (EEAs) which goes beyond traditional EJ to include seniors, disabled populations, etc. There are EEAs in the rural / suburban and urbanized portions of the RVTPO study area. The priority needs process for RVTPO focuses on how important each individual need is relative to different regional socioeconomic, land use, and transportation factors that represent the Plan goals. The RVTPO approach is different from VTrans and SMART SCALE as follows:

- The VTrans approach evaluates needs on each segment of VDOT's linear referencing system (LRS) through a scoring process on a scale of 1 to 7 across all applicable need types (only one EJ specific need type for transit access) to come up with an aggregate needs rating. The VTrans approach is solutions-based and is applied statewide consistent with the VTrans travel markets (corridors of statewide significance, regional networks, urban development areas) and only on higher classification roadways.
- SMART SCALE includes one measure that directly accounts for EJ populations within the accessibility factor, which is 25% of the weighted project score in the RVTPO region. The individual EJ measure represents up to 5% of a total project score in Round 4.

Action: Update weights to align closer with the level of importance assigned to similar (but not the same) factors used to represent equity topics in VTrans and SMART SCALE. The new weights are still higher than similar weights in VTrans and SMART SCALE, representing the importance of this goal to the Plan. A comparison between the prior and updated weighting matrices are provided on the next page.

When reviewing priority needs and reviewing options for solutions, RVTPO staff and the consultant team will compare regional priority needs to the results from VTrans and other needs assessments and project development activities. Where there are overlaps and differences, the team will document and brief the TTC on the approach to address as part of the Plan.



Prior Weighting Matrix:

Criteria & Measures	Multimodal		Activity Density		Throughput		Safety		Environmental Justice	Economics	
	Centers	District	2019	2045	Priority Corridor	VMT Change	VTrans Needs (PSI)	PSAP	Equity Emphasis Areas	Development Priority Locations	Urban Development Areas
Vehicle Safety			5	5		20	50		10	5	5
Pedestrian Safety	5	5		10				50	20	5	5
Bicycle Safety	5	5		10				50	20	5	5
Transit Safety	5	5		10				50	20	5	5
Congestion			15	15		15			25	15	15
System Management			12.5	12.5	12.5	12.5			25	12.5	12.5
System Management (Transit)	10	10		20		20			20	10	10
Access Criteria	Population Affected				Severity			Environmental Justice			
Transit and Non-Transit	Points Available		5		5			2			

Updated Weighting Matrix:

Criteria & Measures	Multimodal		Activity Density		Throughput		Safety		Environmental Justice	Economics	
	Centers	District	2019	2045	Priority Corridor	VMT Change	VTrans Needs (PSI)	PSAP	Equity Emphasis Areas	Development Priority Locations	Urban Development Areas
Vehicle Safety			5	5		22	53		5	5	5
Pedestrian Safety	6	6		13				51	10	7	7
Bicycle Safety	6	6		13				51	10	7	7
Transit Safety	6	6		13				51	10	7	7
Congestion			17.5	17.5		17.5			12.5	17.5	17.5
System Management			15	15	15	15.5			12.5	13.5	13.5
System Management (Transit)	11	11		21.5		20			12.5	12	12
Access Criteria	Population Affected				Severity			Environmental Justice			
Transit and Non-Transit	Points Available		5		5			2			

Summary Update on Objectives and Performance Measures

Prior to initiating the process of identifying and reviewing solutions, RVTPO staff and the Plan consultant team developed a Draft set of plan objectives carrying out the process outlined by the OIPI GAP consultant team. During the October 2021 TTC meeting and through a survey, input on the Draft objectives was solicited from TTC members. Further input was received from the TTC on updated Draft objectives and existing and candidate performance measures at the November 2021 TTC meeting.

During the November 2021 TTC meeting, the TTC discussed the approach to establishing objectives consistent with the goals of the region's transportation plan, and identified existing Draft objectives that should be reworded to more closely align with the goals.

RVTPO staff and the consultant team revised three objectives to address the TTC input:

Previous:

- 1a-Reduce fatalities and injuries on the multimodal transportation system.
- 7c-Reduce fatalities and serious traffic injuries in Equity Emphasis Areas.
- 7b-Ensure at least 40% of new nonvehicle roadway investments primarily benefit Equity Emphasis Areas.

Updated:

- **1a-Eliminate fatalities and reduce injuries on the multimodal transportation system.**
- **7c-Eliminate fatalities and reduce serious injuries in Equity Emphasis Areas.**
- **7b-Ensure that non-drive alone mobility investments create opportunities for people in Equity Emphasis Areas.**

Objectives help describe how the RVTPO will attain the Plan vision and goals that the TTC reviewed in May and June 2021. Objectives also create the framework for other steps of the Plan development process, including:

- Objectives inform how we reach agreement on preferred solutions
- Objectives can guide the development of criteria to prioritize projects for inclusion in the Plan
- Objectives help create performance measures to assess how the region's transportation system performs today and into the future, consistent with the Plan goals and objectives.

Included with this staff report is an updated summary document presenting a table of Final Draft objectives for TTC review, considerations supporting development of those objectives, and existing and candidate performance measures.

TTC Action:

None

Needs Prioritization Methodology

January 3, 2022

Table of Contents

1. Introduction	1
2. Methodology Overview	1
3. Need Prioritization Criteria	4

List of Tables

Table 1	Scoring Weighting by Need Type.....	3
Table 2	Needs Criteria, Metrics, and Rationale.....	4
Table 3	Access Needs Criteria and Rationale.....	9

List of Figures

Figure 1	Overall Needs Prioritization Process.....	2
Figure 2	Proportional Overlap Calculation Example.....	5

1. Introduction

This methodology documentation outlines the process for prioritizing various transportation needs throughout the Roanoke Valley region. Included is the overall process for completing the prioritization and an overview of the needs prioritization criteria and individual metrics within each criteria.

Currently, the described process and associated files only represent the quantitative / geospatial performance. Other considerations will be applied to these quantitative results, such as alignment with regional goals, geographic equity, comparison to VTrans mid-term needs, and other factors. All results serve as a tool to inform priority need decisions but should not be treated as a definitive or absolute list or ranking.

2. Methodology Overview

The overall process for scoring and prioritizing the list of transportation needs involves a few steps. A generalized flowchart of this process is shown in **Figure 1**.

- **Needs List:** First, a comprehensive needs list is cleaned and organized. This includes placing the identified need in the correct geospatial location, removing any duplicates, and assigning each need to one of seven categories: **Automobile Safety, Pedestrian Safety, Bicycle Safety, Transit Safety, Congestion, System Management (Non-Transit), System Management (Transit)**.
Note: Access Needs were considered separately and are discussed in detail on page 8.
- **Spatial Calculations:** After the needs list is organized, the needs list is then spatial analyzed, calculating whether the need applies to a series of six criteria: **Multimodal, Activity Density, Throughput, Safety, Environmental Justice, Economics**. See **Section 3** for more information on each criterion and **Table 2** for a full list of the criteria and associated metrics.
- **Combine Results:** All the criteria results are then combined in Excel. Users can define more specific thresholds and conditions for each criteria (e.g., what constitutes a need being located in a multimodal center).
- **Apply Scoring and Weights:** Scoring and weights are then applied. Weighting varies depending on the needs category. An overview of the weighting by need type / metric is shown in **Table 1**.
- **Prioritized List:** The scoring and weighting creates the final prioritized needs list. This displays the total points received for each individual need by its associated needs type. Scores can receive a maximum of 100 points.

The criteria align with the seven goals developed for the Roanoke Valley Transportation Plan by considering related metrics associated with different goals across every need type. However, every need, and its ultimate solutions, are not intended to address every goal as indicated in **Table 1**.

Figure 1 Overall Needs Prioritization Process

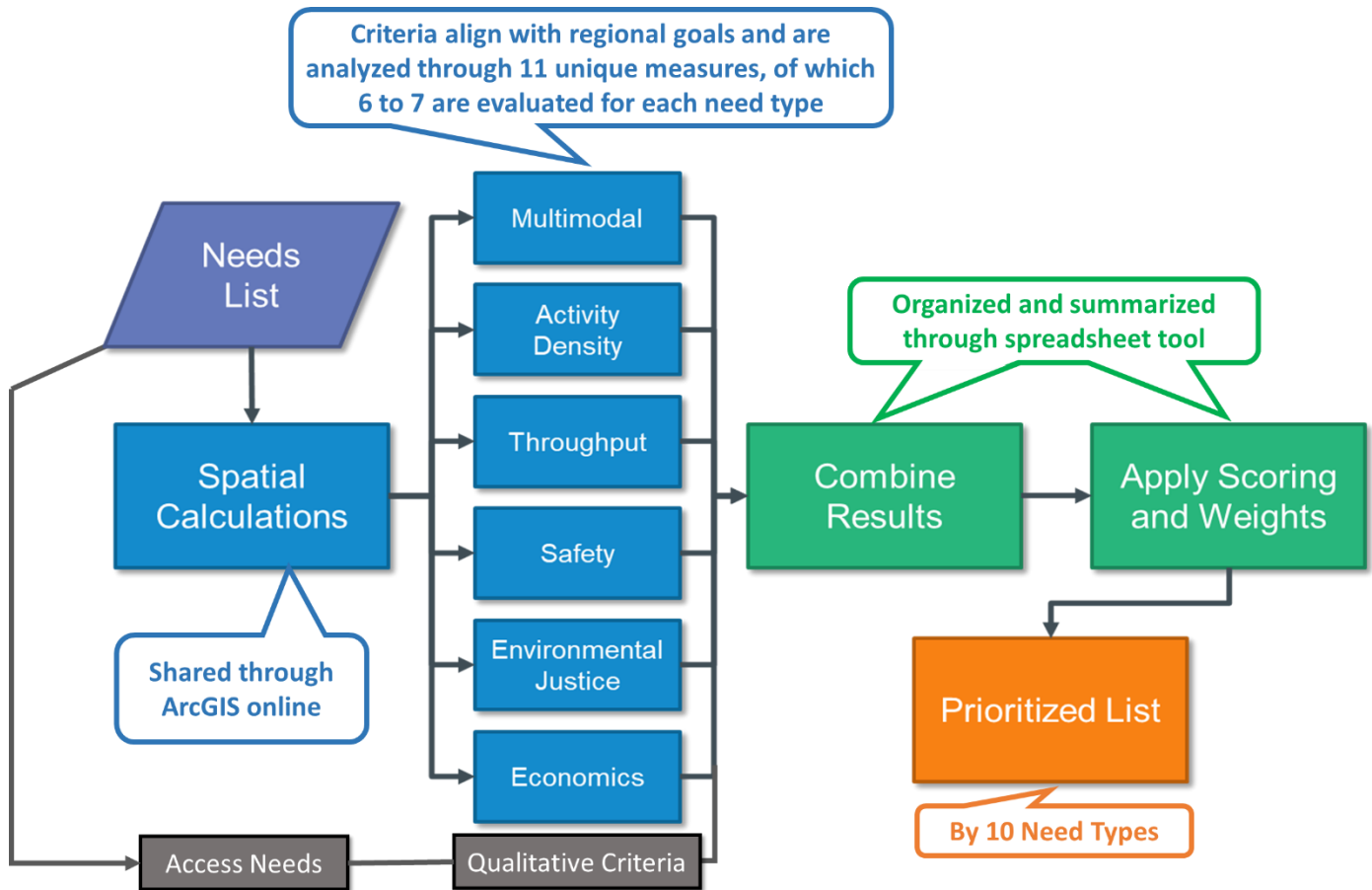


Table 1 Scoring Weighting by Need Type

Alignment with Plan Goals	3, 6		3, 6		2, 3, 5, 6		1, 5, 7		4, 7		3, 6, 7	
	Multimodal		Activity Density		Throughput		Safety		Environmental Justice		Economics	
Need Type	Centers	District	2019	2045	Priority Corridor	VMT Change	VTrans Needs (PSI)	PSAP	Equity Emphasis Areas	Development Priority Locations	Urban Development Areas	
Automobile Safety			5	5		22	53		5	5	5	
Pedestrian Safety	6	6		13				51	10	7	7	
Bicycle Safety	6	6		13				51	10	7	7	
Transit Safety	6	6		13				51	10	7	7	
Congestion			17.5	17.5		17.5			12.5	17.5	17.5	
System Management (Non-Transit)			15	15	15	15.5			12.5	13.5	13.5	
System Management (Transit)	11	11		21.5		20			12.5	12	12	
Access Criteria	Population Affected				Severity				Environmental Justice			
Transit and Non-transit	5				5				2			

Roanoke Valley Transportation Plan Goals:

1. Provide a safe and secure transportation system
2. Enable reliable mobility
3. Ensure convenient and affordable access to destinations
4. Foster environmental sustainability
5. Maintain and operate an efficient and resilient transportation system
6. Support economic vitality
7. Promote equitable transportation investments

3. Need Prioritization Criteria

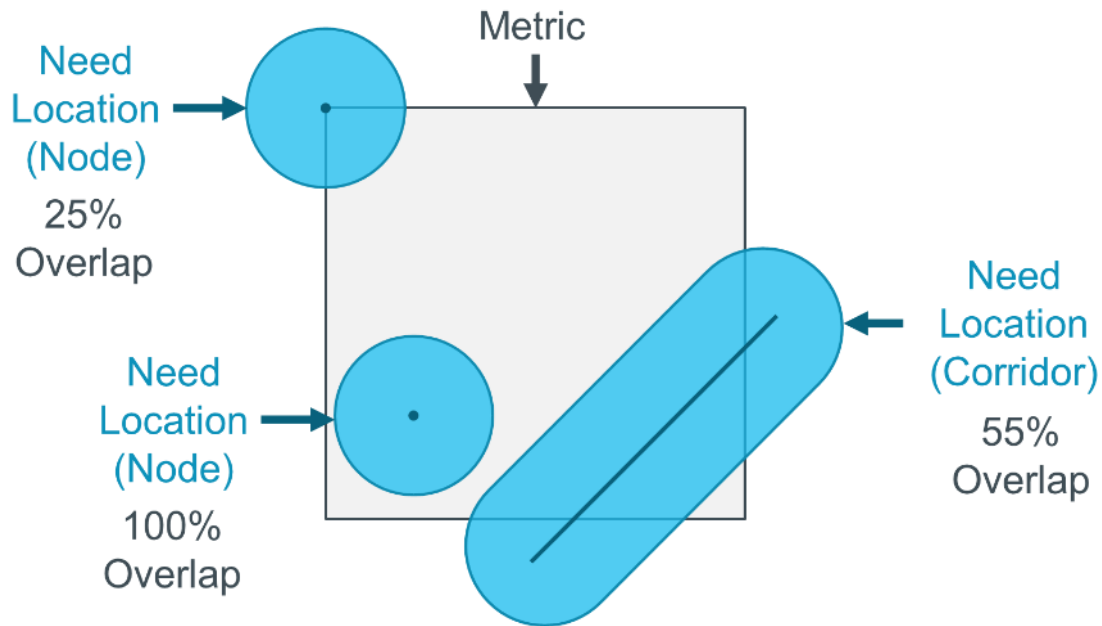
Needs are assessed within the following criteria categories, comprised of individual metrics (**Table 2**). This section provides an overview of each individual criteria and metric, including definition, sources, and how it is calculated for the analysis.

Table 2 Needs Criteria, Metrics, and Rationale

Needs Criteria	Needs Metrics	Criteria Rationale
Multimodal	Multimodal Centers	Places importance on needs that support access and mobility in designated multimodal areas within the region
	Multimodal Districts	
Activity Density	2019 Activity Density	Places importance on needs that address population and employment centers within the region today and in the future
	2045 Activity Density	
Throughput	Priority Corridor	Places importance on needs within congested corridors identified in the Congestion Management Process and high travel-growth corridors
	VMT Change	
Safety	VTrans Safety Needs (based on Potential for Safety Improvement (PSI))	Places importance on needs in areas with observed high crash frequency and severity for both vehicles and non-motorized users
	Pedestrian Safety Action Plan (PSAP) Priority Needs	
Environmental Justice	Equity Emphasis Areas	Places importance on needs supporting communities in designated equity emphasis areas
Economics	Development Priority Locations	Places importance on needs adjacent to economic development priority locations and serving designated urban development areas
	Urban Development Areas	
Transit and Non-transit Access	Population Affected	Places importance on needs by relative number of people impacted by lack of access and how significant the inability to access the destination is to daily life particularly for EJ populations.
	Severity	
	Environmental Justice	

For all metrics, a 1/8th mile buffer was applied to each individual need to represent the catchment area. The only exception are needs covering a specific area, such as a neighborhood. In these cases, the area was left as-is. Many of the metrics used a proportional overlap to estimate whether the metric impacted each individual need. An example of this process is shown in **Figure 2**, where the grey box is the metric, and the blue shapes are individual needs. This was also completed the opposite way to account for metrics impacting a smaller area. For example, if a needs corridor fully extends from A to C but the metric only extends from A to B. All metrics, besides Activity Density and VMT, assumed a metric impacts a need if it overlaps by at least 50 percent.

Figure 2 Proportional Overlap Calculation Example



Multimodal

Pedestrian Safety, Bicycle Safety, Transit Safety, and Transit System Management needs prioritization utilizes two multimodal metrics:

- **Multimodal Districts**
 - **Description:** Any portion of a city or region with land use characteristics that support multimodal travel, such as higher densities and mixed uses, and where it is relatively easy to make trips without needing a car as gauged by the number of bus routes available, and safe walking or biking paths – either currently or proposed in the future.
 - **Source:** RVARC Staff (Approved by the RVTPO Policy Board in 2015)
- **Multimodal Centers**
 - **Description:** A smaller area of even higher multimodal connectivity and more intense activity, roughly equivalent to a 10-minute walk or a one-mile area.
 - **Source:** RVARC Staff (Approved by the RVTPO Policy Board in 2015)

Methodology: Multimodal Needs use a proportional overlap to estimate whether a need is within a Multimodal District or Center.

Activity Density

Safety, Congestion, and System Management needs are prioritized using two activity density metrics:

- **2019 Activity Density**
 - **Description:** The current activity density in the region. This metric sums the existing population and employment then divides by the area to estimate current activity density.
 - **Source:** Traffic Analysis Zone (TAZ) within the Travel Demand Model (TDM)
- **2045 Activity Density**
 - **Description:** The activity density in the region in 2045. This metric sums the future population and employment then divides by the area to estimate future activity density.
 - **Source:** Traffic Analysis Zone (TAZ) within the Travel Demand Model (TDM)

Methodology: Both 2019 and 2045 Activity Density metrics use a slightly different methodology when compared to other metrics. Instead, a weighted proportional overlap is used, considering not only the overlap area but also the underlying density. Essentially the calculation estimates the area overlap then multiplies by the TAZ's total activity. So, if a TAZ has 120 residents and employees and the need overlaps by 25 percent, this method estimates the need covers 30 residents and employees. This is completed for every TAZ the need intersects with, sums all of the proportional overlapping residents and employees, then divides by the total need area to reach an estimated activity density.

Throughput

Automobile safety, congestion, and system management needs are prioritized using two throughput metrics:

- **Priority Corridors**
 - **Description:** Identified corridor for congestion management activities, as defined in the 2020 Congestion Management Process. These corridors were identified from the Top 10 Areas of Emphasis and had a Planning Time Index (PTI) greater than three
 - **Source:** RVARC Staff, Traffic Congestion Management Process 2020
- **Vehicle Miles Traveled (VMT) Growth**
 - **Description:** The estimated growth in VMT between 2019 and 2045
 - **Source:** Travel Demand Model (TDM)

Methodology: Priority Corridors use a proportional overlap to estimate whether a need is within a one of the identified priority corridors in the 2020 Congestion Management Process.

VMT Growth was estimated slightly different. Here, the change between 2019 and 2045 VMT was calculated for each segment. All segments were then placed into a percentile, equally distributing the segments with the highest to lowest (or no) estimated growth. A proportional overlap was then completed for each individual need, identifying which percentile overlapped the most. A need was considered along a high-growth VMT corridor if it overlapped with 75th or higher percentile corridors.

Safety

Two safety metrics contribute to the prioritization of safety needs.

- **VTrans Safety Needs (PSI)**

- **Description:** Identified segments with the highest Potential for Safety Improvement (PSI), including Corridors of Statewide Significance (CoSS), and non-Corridors of Statewide Significance.
- **Source:** 2019 VTrans Mid-Term Needs for Roadway Safety

- **PSAP Needs**

- **Description:** The top crash clusters and priority corridors (Top 5%) identified through the VDOT Pedestrian Safety Action Plan.
- **Source:** VDOT Pedestrian Safety Action Plan (PSAP) 2.0

Methodology: VTrans Safety and PSAP Needs use a proportional overlap to estimate whether a need is within a one of these identified corridors.

Environmental Justice

The impact of the need on historically disadvantaged people is considered in the needs prioritization using the following metric:

- **Equity Emphasis Areas (EEA)**

- **Description:** Identified areas as defined by the Office of Intermodal Planning and Investment (OIPI) for the purposes of the VTrans mid-term needs identification and prioritization process. Areas are identified based on resident's income, age, race and ethnicity, English proficiency, and disability.
- **Source:** 2019 VTrans Mid-Term Needs and Priority

Methodology: Equity Emphasis Areas use a proportional overlap to estimate whether a need is within a one of these identified areas.

Economics

Safety, congestion, and system management needs are prioritized using two economic metrics:

- **Development Priority Locations**
 - **Description:** Future development priority locations as identified through the 2021 Regional Study on Transportation Project Prioritization for and Economic Development and Growth
 - **Source:** RVARC Staff, (Study completed in August 2021)
- **Urban Development Areas (UDA)**
 - **Description:** Areas designated by locality that may be sufficient to meet projected residential and commercial growth within the next 10 to 20 years
 - **Source:** VTrans

Methodology: Development Priority Locations and UDA use a proportional overlap to estimate whether a need is within one of these identified locations.

Access Needs Methodology

It was quickly apparent that the methodology to prioritize other needs wasn't applicable to access needs. For example, transit riders have overwhelmingly cited the Department of Motor Vehicles as a place they need to access but currently cannot. Applying a methodology similar to that described for the other needs yields the Department of Motor Vehicles as a low priority because its location doesn't overlap any of the desired criteria. But it is *because* its location doesn't overlap those criteria that it is so inaccessible. A different method was needed to prioritize access needs.

Transit access needs seemed distinct from non-transit access needs, so access needs were divided into Access (Transit) and Access (Non-transit). Most access needs were location-based, but three systemic access needs were also reviewed: transit frequency, hours of transit, and ADA accessibility. Staff identified what the access need was at each location. If no access need could be discerned, the location was not scored. Motor vehicle access needs were often actually congestion concerns or system management issues, for example, and bicycle and pedestrian needs were often actually safety needs. Motor vehicle access needs were typically regarding resiliency or having more than one way to access a destination.

Staff identified criteria about each location that indicated the number of people affected, the severity of lack of access, and the effect of a lack of access on environmental justice populations (such as poverty, minority, and disability). Staff used these criteria to subjectively assign a score for environmental justice (0-2 points), number of people affected (0-5 points), and severity of the lack of access (0-5 points).

Table 3 Access Needs Criteria and Rationale

Mode	What is here?	Does this affect number of people, the severity of lack of access, or environmental justice?
All modes	Government services	Severity – many government services are essential and available in only one place (i.e., a courthouse), lack of access is high severity
All modes	Essential services	Severity – necessary but may be available in multiple locations (i.e., a grocery store or health clinic), lack of access is moderate severity
All modes	Retail, services	Severity – may not be necessary and may be available in multiple locations, lack of access is low severity Number of people Environmental justice (low wage jobs)
All modes	Recreation	Severity – Access to recreation and outdoor spaces improves quality of life, lack of access is low severity
All modes	Residential density	Number of people
All modes	EJ Index	Environmental justice
All modes	Special residence (assisted living, affordable housing)	Environmental justice
Transit	Bus service	Severity – No existing bus service is high severity, existing bus service without sidewalks is moderate severity, existing bus service without other amenities is low severity
Transit	Bus stop activity	Number of people
Transit	Traffic congestion (Priority corridor for congestion management, corridor of concern for congestion, VTrans congestion need)	Number of people (people driving could use transit, people driving benefit if other drivers switch to transit)
Motor vehicle	Average Annual Daily Traffic	Number of people
Motor vehicle	Alternative routes	Motor vehicle access needs are typically resilience issues, if alternative routes are available the severity is low.

Systemic (non-mappable) access needs were similarly subjectively scored based on the number of people affected, the severity of lack of access, and the effect of lack of access on environmental justice populations.

Objectives & Performance Measures in the Roanoke Valley Transportation Plan Update

Objectives Definition: Describe how the RVTPO will attain the Plan vision and goals. Objectives represent specific desired Plan outcomes.

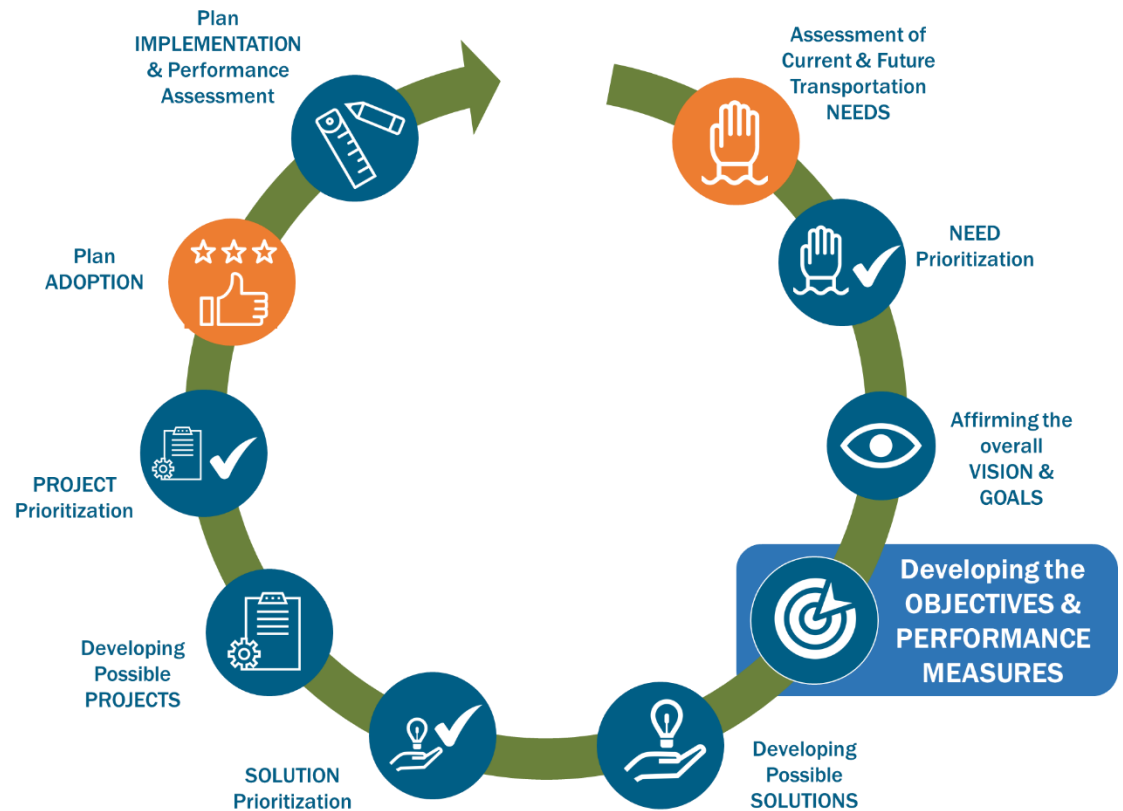
Objectives Purpose: Objectives inform how to develop solutions to respond to needs, how to prioritize projects within the Plan, and how to track the Plan and overall system performance.

Performance Measures Definition: The quantitative link to objectives, performance measures assess the degree to which investments address transportation needs and meet acceptable thresholds.

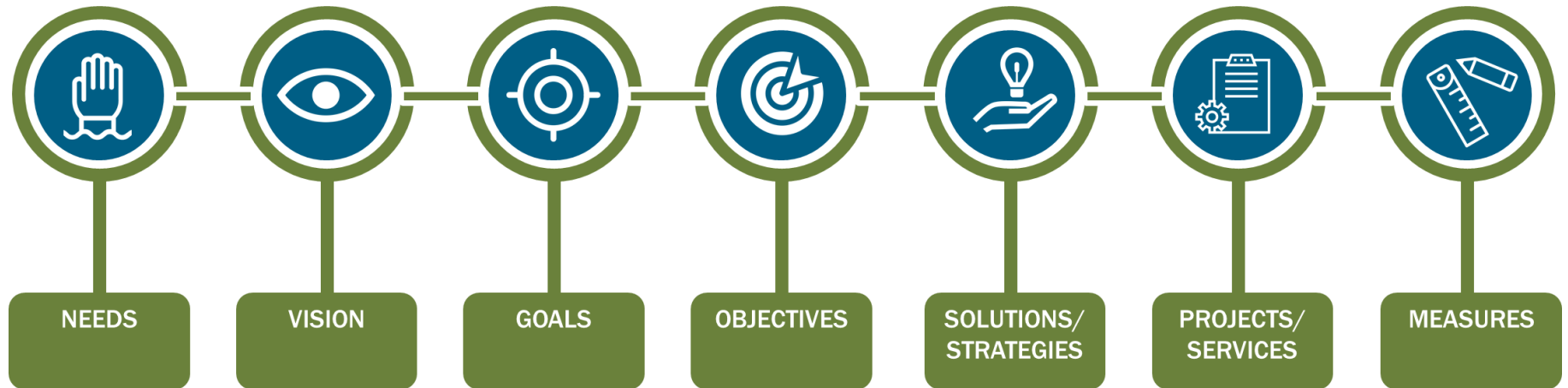
Performance Measures Purpose: Enables the RVTPO to assess the degree to which the transportation system is achieving objectives.

Considerations:

- Objectives and performance measures together meet the SMART framework and are readily measurable based on available data.
 - **S = Specific** **M = Measurable** **A = Agreeable**
R = Relevant **T = Time-Bound**
- **Federal Performance Measures** – Some objectives have existing and well-defined performance measures, including those established through USDOT rulemakings within performance areas managed by the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and Federal Railroad Administration (FRA). Targets have been established for these measures by RVTPO (through coordination with VDOT and OIPI), by transit providers (through coordination by DRPT), and by Amtrak (for the FRA measures).
- **Candidate Measures** – Some objectives represent emerging topics where performance measures, and the data to support them, are not yet well defined. For this Plan Update, RVTPO will adopt the objectives and note opportunities for RVTPO to research and develop candidate performance measures in the future. These measures are highlighted green in the matrix on the following pages.



Elements of the Transportation Planning Process



VISION:
 The Roanoke Valley’s seamless regional multimodal transportation system is safe, cost-effective, environmentally conscious, well maintained and reliable, accessible for all users, and promotes economic vitality of the community.

- GOALS:**
- Provide a safe and secure transportation system
 - Enable reliable mobility
 - Enable convenient and affordable access to destinations
 - Foster environmental sustainability
 - Maintain and operate an efficient and resilient transportation system
 - Support economic vitality
 - Promote equitable transportation investments

Recommended Objectives and Performance Measures

Recommended Objective	Considerations	Performance Measures (Federal Measure as noted) Note: Candidate measure to consider post Plan adoption
Goal 1: Provide a safe and secure transportation system		
a. Eliminate fatalities and reduce injuries on the multimodal transportation system.	<ul style="list-style-type: none"> The ultimate long-range goal is to push toward zero fatalities (consistent with Virginia’s current Strategic Highway Safety Plan)¹ Consistent with FHWA and FTA measures, data readily available Can segment by community to track safety impacts on specific populations (see Goal 7) Transit safety measures also include security related events (within the National Transit Database, NTD²) Transit safety measures are tracked by individual agency, including both fixed-route and on-demand (or paratransit) services 	<ul style="list-style-type: none"> Number and rate of motorized fatalities per 100 million vehicle miles traveled (VMT) (FHWA) Number and rate of motorized serious injuries per 100 million VMT (FHWA) Number of nonmotorized fatalities and serious injuries (FHWA) Number of reportable fatalities and rate per total vehicle revenue miles by transit agency per year (FTA) Number of reportable injuries and rate per total vehicle revenue miles by transit agency per year (FTA) Number of safety events and rate per total vehicle revenue miles by transit agency per year (FTA)
Goal 2: Enable reliable mobility		
a. Maintain vehicle travel time reliability on priority corridors.	<ul style="list-style-type: none"> Focus on Congestion Management Process priority corridors Consistent with FHWA required measures 	<ul style="list-style-type: none"> % of person miles traveled on the Interstate system and on the non-interstate National Highway System (NHS) that are reliable (FHWA)
b. Maintain transit and passenger rail on-time performance (OTP).	<ul style="list-style-type: none"> Reported by system – Amtrak, Valley Metro Data availability through DRPT and NTD (often at least 1 year behind) 	<ul style="list-style-type: none"> Amtrak on time performance (FRA, DRPT)³ Valley Metro on time performance Distance between transit system major mechanical failures (FTA)

¹ <https://tzdva.org/>

² <https://www.transit.dot.gov/ntd>

³ <http://drpt.virginia.gov/rail/amtrak-reports/>

Recommended Objective	Considerations	Performance Measures (Federal Measure as noted) Note: Candidate measure, developed post Plan adoption
Goal 3: Enable convenient and affordable access to destinations		
a. Provide motorized access to inaccessible properties identified for future development.	<ul style="list-style-type: none"> • New developments should be accessible by more than one direction to enable multi-directional vehicle connectivity to the roadway network 	<ul style="list-style-type: none"> • Number of localities with ordinances or policies that incentivize or require multiple access points in new developments
b. Increase accessibility to key destinations by transit.	<ul style="list-style-type: none"> • Could include types of destinations (e.g., essential services) • Transit level of service measure is an option (see ARC Rural Transit in Appalachia Study⁴) • Multiple statewide accessibility measures to consider, including VTrans • Accessibility measures are consistent with SMART SCALE approach 	<ul style="list-style-type: none"> • Number of destinations (government service, major grocery store, medical, school/higher education, business) within ¼ mile of a transit stop • Transit level of service (number of days per week and/or hours per day that service is available to key destinations)
c. Increase transportation connections to markets outside the region, including across Virginia and the U.S.	<ul style="list-style-type: none"> • Connections to Amtrak, intercity bus terminals, and airport 	<ul style="list-style-type: none"> • Number and frequency of daily or weekly inter-regional or interstate connections offered
d. Increase transit, bicycle and pedestrian connections for all users within multimodal centers and districts.	<ul style="list-style-type: none"> • Transit, on and off-road bicycle and pedestrian connections within centers and districts 	<ul style="list-style-type: none"> • Number and percent of transit stops with connecting sidewalks and ADA accommodations in multimodal centers and districts (walk – transit connection) • Number and percent of transit stops adjacent to a marked bicycle accommodation in multimodal centers and districts (transit – bike connection) • Number and percent of bike racks with connecting sidewalks in multimodal centers and districts (walk – bike connection)

⁴ <https://www.arc.gov/report/public-transportation-in-appalachia/>

Recommended Objective	Considerations	Performance Measures (Federal Measure as noted) Note: Candidate measure, developed post Plan adoption
Goal 4: Foster environmental sustainability		
a. Minimize emissions from motorized on-road transportation.	<ul style="list-style-type: none"> The RVTPO is in attainment of air quality standards per the Clean Air Act⁵ (existing standards may become more stringent) Greenhouse gases (GHG) are not part of the Clean Air Act, but many states (including Virginia⁶) are developing inventories GHG related measures likely will be included in the next Federal surface transportation bill 	<ul style="list-style-type: none"> Track investments and implementation of low and/or zero-emission technologies within the region (zero-emission buses, zero-emission fleets, charging stations, energy efficient infrastructure)
b. Minimize / mitigate new impervious surfaces created by transportation infrastructure.	<ul style="list-style-type: none"> Helps consider environmental risks associated with transportation system expansion, particularly in environmentally sensitive areas. 	<ul style="list-style-type: none"> Track new impervious surface area associated with transportation investments outside of designated growth areas Track new impervious surface area associated with transportation investments in floodplains
Goal 5: Maintain and operate an efficient and resilient transportation system		
a. Maintain state and national standards for infrastructure and asset condition.	<ul style="list-style-type: none"> Federal measures focus only on the National Highway System State measures⁷ expand to all VDOT owned/maintained bridges and pavement Valley Metro also tracks asset condition and sets targets through coordination with DRPT 	<ul style="list-style-type: none"> % good and poor NHS bridge deck area (FHWA) % good and poor NHS pavement lane miles (FHWA) % sufficient bridges and average weighted General Condition Rating (VDOT) % sufficient pavement lane miles on Interstate, Primary, and Secondary systems (VDOT) % of revenue and of non-revenue vehicles that have met or exceeded their useful life benchmark (FTA) % of facilities rated in poor condition (FTA)

⁵ <https://www.epa.gov/green-book>

⁶ <https://www.deq.virginia.gov/air/greenhouse-gases>

⁷ http://www.ctb.virginia.gov/resources/2021/sept/pres/2_september_presentation_09012021_1.pdf

Recommended Objective	Considerations	Performance Measures (Federal Measure as noted) Note: Candidate measure, developed post Plan adoption
Goal 6: Support economic vitality		
a. Ensure redevelopment and new developments in designated growth areas and multimodal centers/districts are supported by more than one mode of transportation infrastructure.	<ul style="list-style-type: none"> • Could also include access to regional economic development sites and VTrans industrial development areas outside of designated growth areas 	<ul style="list-style-type: none"> • Number of developments approved adjacent to more than one existing and/or planned transportation mode
b. Maintain truck travel time reliability	<ul style="list-style-type: none"> • Consistency with VTrans Freight Element⁸ (which tracks freight-related performance measures and truck bottleneck locations) • Truck travel time reliability measure helps characterize performance of the overall regional freight system • Baseline performance relative to 2019 (pre-pandemic levels) 	<ul style="list-style-type: none"> • Interstate truck travel time reliability (FHWA)
c. Maintain acceptable levels of congestion during peak travel periods on priority corridors	<ul style="list-style-type: none"> • Multiple possible measures to consider consistent with Congestion Management Process (CMP)⁹, VTrans, and Improve I-81 • Federal measures (peak hours of excessive delay) is not applicable to the RVTPO region currently (only to non-attainment areas over a certain population threshold) 	<ul style="list-style-type: none"> • Planning time index on Congestion Management Process Priority Corridors (RVTPO adopted via the CMP)

⁸ <https://www.vtrans.org/mid-term-planning/freight-plan>

⁹ <https://rvarc.org/wp-content/uploads/2020/10/Traffic-Congestion-Management-Process-2020.pdf>

Recommended Objective	Considerations	Performance Measures (Federal Measure as noted) Note: Candidate measure, developed post Plan adoption
Goal 7: Promote equitable transportation investments		
a. Assess planning-level benefits or disproportionate adverse effects of transportation projects included in this plan on Equity Emphasis Areas and identify mitigation strategies.	<ul style="list-style-type: none"> Assume that NEPA process protects communities from disproportionate impacts Within solution development and prioritization process, could consider benefits & burdens qualitatively for each project More details on VTrans Equity Emphasis Areas is available here¹⁰ 	<ul style="list-style-type: none"> Identify projects creating potential disadvantages for Equity Emphasis Areas and track mitigation strategies
b. Ensure that non-drive alone mobility investments create opportunities for people in Equity Emphasis Areas.	<ul style="list-style-type: none"> Consider unique benefits of each project on these communities Incorporate benefits to these communities within project prioritization Consistent with Justice40 initiative¹¹ builds on environmental justice outlined in Executive Order 12898¹² 	<ul style="list-style-type: none"> Track share of non-highway capacity or operational investments that provide documented benefits primarily for Equity Emphasis Areas compared to the Justice40 initiative goal “to deliver 40 percent of the overall benefits of relevant federal investments to disadvantaged communities”
c. Eliminate fatalities and reduce serious injuries in Equity Emphasis Areas.	<ul style="list-style-type: none"> Special attention to provide a safe and secure transportation system in these communities 	<ul style="list-style-type: none"> Decrease traffic fatalities in Equity Emphasis Areas Decrease traffic serious injuries in Equity Emphasis Areas Decrease nonmotorized fatalities and serious injuries in Equity Emphasis Areas
d. Maintain state and national standards for infrastructure condition in Equity Emphasis Areas.	<ul style="list-style-type: none"> Special attention to maintain and operate an efficient and resilient transportation system in Equity Emphasis Areas 	<ul style="list-style-type: none"> % good and poor pavement lane miles in Equity Emphasis Areas

¹⁰ https://vtrans.org/resources/Technical_Guide_for_the_Identification_and_Prioritization_of_VTrans_Mid-term_Needs.pdf

¹¹ <https://www.transportation.gov/equity-Justice40>

¹² <https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice>

General Comments/Comment Themes and Responses

Theme	Survey Response / Comments	Response/Edits
Safety & Security	Strong agreement with the objective, preference to use stronger language than “reduce”	Focused on eliminating fatalities and reducing injuries. Eliminate is consistent with Virginia’s commitment in the Strategic Highway Safety Plan of “Towards Zero Deaths”.
Reliable Mobility	General agreement with objective, with some concern on data availability to monitor performance over time	Use of FHWA and FTA performance measures ensures confidence in data. Note, for highways this is focused only on the National Highway System.
Reliable Mobility	Concern over the use of “maintain” within the objective statements	Use of “maintain” is consistent with approach in the Congestion Management Process. Amtrak is already exceeding on-time performance targets.
Accessibility	Concern with focus on just motorized access (objective a.)	Objective 3a. retains focus on “motorized”, while Objective 6a. focuses on multimodal access.
Accessibility	Access is about more than the number of destinations, need to incorporate level of service (objective b.) and id the destinations	Reworded objective to speak to transit accessibility more broadly. Candidate measures will look at actual access and level of service.
Accessibility	Simplify terminology (objective c.)	Reworded to: “Increase transportation connections to markets outside the region, including across Virginia and the U.S.”
Accessibility	Expand definition to focus on access for all types of users (objective d.)	Reworded to include reference to “all users” and clarified candidate measures with reference to ADA accommodations.
Sustainability	For objective a. (manage growth in VMT), many other objectives already address this idea, this is duplicative	Removed objective.
Sustainability	Many prior objectives also help reduce emissions (by managing total SOV travel)	Reworded objective to: Minimize emissions from motorized on-road transportation. Candidate performance measures focus on technology deployment.
Sustainability	Objective c. should be clarified to focus exclusively on impervious surfaces associated with transportation investments	Clarified focus on transportation infrastructure impervious surfaces in candidate performance measures.
Efficient System	Strong agreement, clarify type of infrastructure and confirm terminology (e.g., maintain v. improve)	Retained use of “maintain” as VDOT and CTB regularly are reviewing performance, establishing appropriate performance targets given performance trends and programmed investments.
Economic Vitality	Concern over if “maintain” is the right message for truck travel time reliability and congestion objectives	Use of “maintain” is consistent with approach in the Congestion Management Process.
Equity	Streamline descriptions of objectives, too wordy/full of jargon, specify what we are measuring and how it is unique relative to other similar objectives	Streamlined definitions and added candidate performance measures. Created consistent focus on VTrans Equity Emphasis Areas through the candidate measures which capture the key communities within the region where performance will be tracked.
Equity	Remove reference to 40% goal within Justice40 initiative	Removed this reference but note that an ultimate measure for equitable multimodal investments may use the 40% goal as a target to compare to.

Task 4: OVERVIEW OF PROCESS FOR IDENTIFYING AND EVALUATING SOLUTIONS TO TRANSPORTATION NEEDS

Definitions of Terms

There are several terms that are important for understanding the proposed process. These terms are defined below.

Need – Transportation problem or issue identified in the community currently. As described in the Roanoke Valley Transportation Needs Assessment, a transportation need “states a problem, not a specific solution, and could be solved by multiple possible solutions.”¹

Gap Need – A need without a solution in progress.

Addressed Need – A need with a recently funded solution to be reviewed for performance outcomes prior to any further solutions identification, if needed.

Solution – An idea of how the region can achieve desired results. Solutions address specific transportation needs and contribute to the realization of a regional objective. Some transportation solutions may be simple enough to lead directly to a project whereas others may require further study/analysis.

Project – A specific scope of work describing how the solution will be implemented including start/end points, length, and cost.

Study/Analysis – Additional work required to derive a project from a solution.

Solutions Identification – The development of a universe of possible solutions (including non-transportation solutions) that can respond to a transportation need.

Solutions Evaluation – The prioritization and winnowing of solutions in response to a particular need. This evaluation may be a function of location-specific, organizational, and / or regional characteristics.

Common Solution – A solution deriving from sources that are not related to the context of a particular need, such as past projects, peers, and best practices. It contrasts with unique transportation solutions, which derive from a particular need’s context.

Unique Solution – A solution deriving from the context of a particular need, in contrast to a common solution, which derives from past projects, peers, or best practices before being applied to a particular need.

Solutions Development Process

The proposed process has three phases.

Phase I: Identifying Common Transportation Solutions

Step 1 – Develop List of Common Transportation Solutions:

Derive common solutions from past projects, peers, best practices, and other sources.

Step 2 – Check Alignment between Common Transportation Solutions, Goals, & Objectives:

Ensure that common transportation solutions promote the RVTP’s regional objectives.

Step 3 – TTC Reviews Common Transportation Solutions:

Edit and finalize based on TTC review.

Phase II: Identify Specific Needs Requiring Solutions and Update with Unique and Non-Transportation Solutions

Step 4 – Match Needs with Recently Completed, and Existing and Committed Projects to Identify Gap Needs:

Match projects to individual needs based on their ability to resolve that need in that location. Unresolved needs are “gap needs.”

Step 5 – Align Gap Needs with Possible Common Transportation Solutions:

Align gap needs with solutions and identify unique or non-transportation solutions.

Step 6 – Send List of Gap Needs with Possible Solutions to Member Organizations:

Gather member organization feedback about unique or non-transportation solutions for particular needs.

Step 7 – Generate Final List of Potential Solutions Aligned with Gap Needs:

Develop a single list of prioritized gap needs with a set of potential solutions assigned to each.

Phase III: Evaluate and Prioritize Solutions

Step 8 – Determine Evaluation Criteria, Prioritize, and Identify Preferred Solutions:

Draft solutions evaluation criteria and finalize with input from the TTC. Prioritize solutions using the evaluation criteria.

Step 9 – RVTPO Decision: The TTC considers the preferred solutions identified and recommends solution to the Policy Board.

Ongoing Activity

Step 10 – Ongoing Assessment and Feedback:

Record times when the TTC recommendation and Policy Board selection differs from the preferred solution recommended by the evaluation criteria. Use to calibrate process.

¹ RVTPO (2021). Roanoke Valley Transportation Needs Assessment. Approved April 22, 2021.

