Richmond Regional

Transportation Planning Organization

SUPPORTED BY PlanRVA

THE REGIONAL COMMISSION

Connect RVA 2045

Advisory Committee Meeting

January 28, 2021

Richmond Regional Transportation Planning Organization

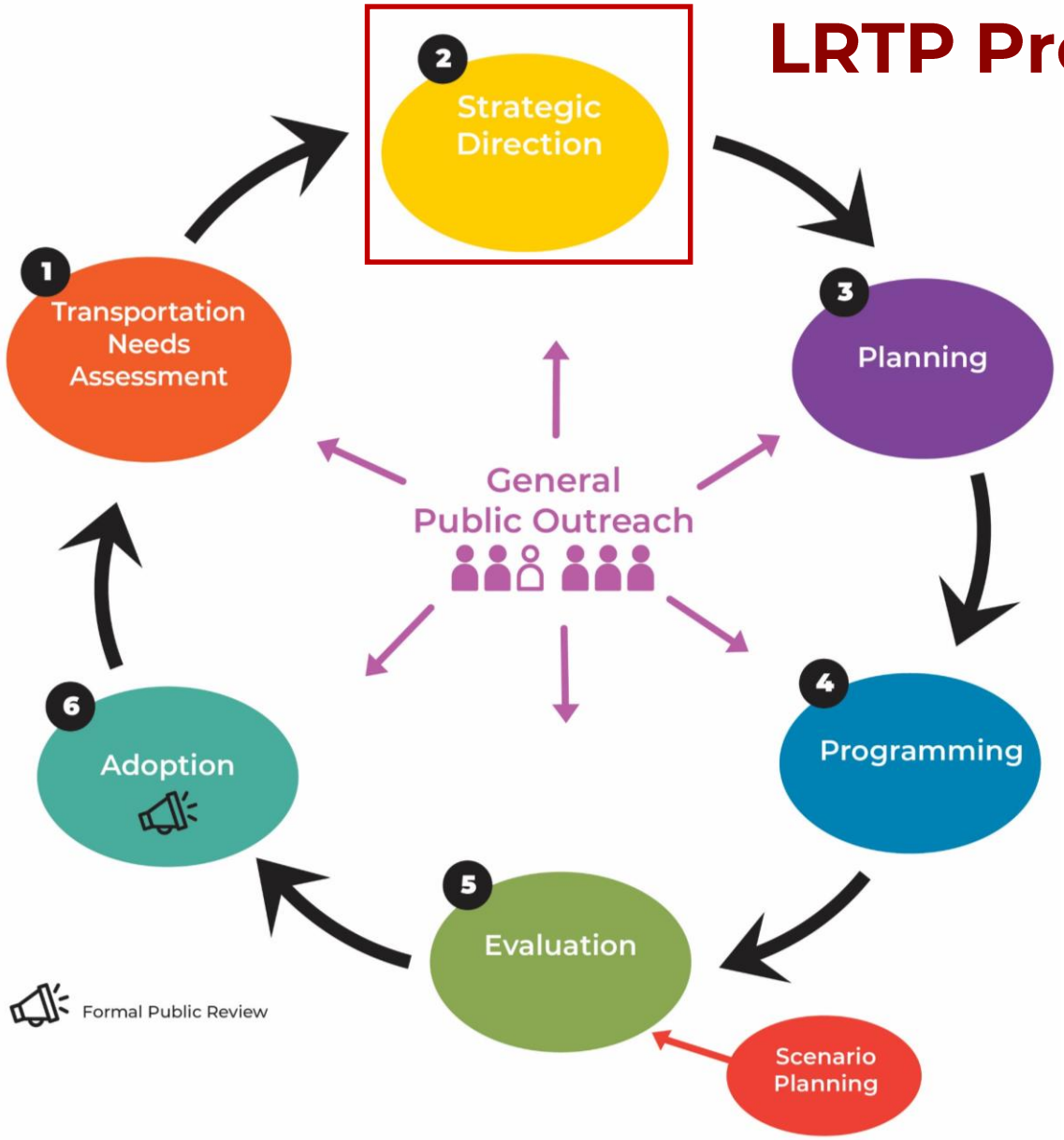
SUPPORTED BY PlanRVA

4.LRTP Process Update Task 2

Strategic Direction
Vision Goals and Objectives

Richmond Regional Transportation Planning Organization
SUPPORTED BY PlanRVA

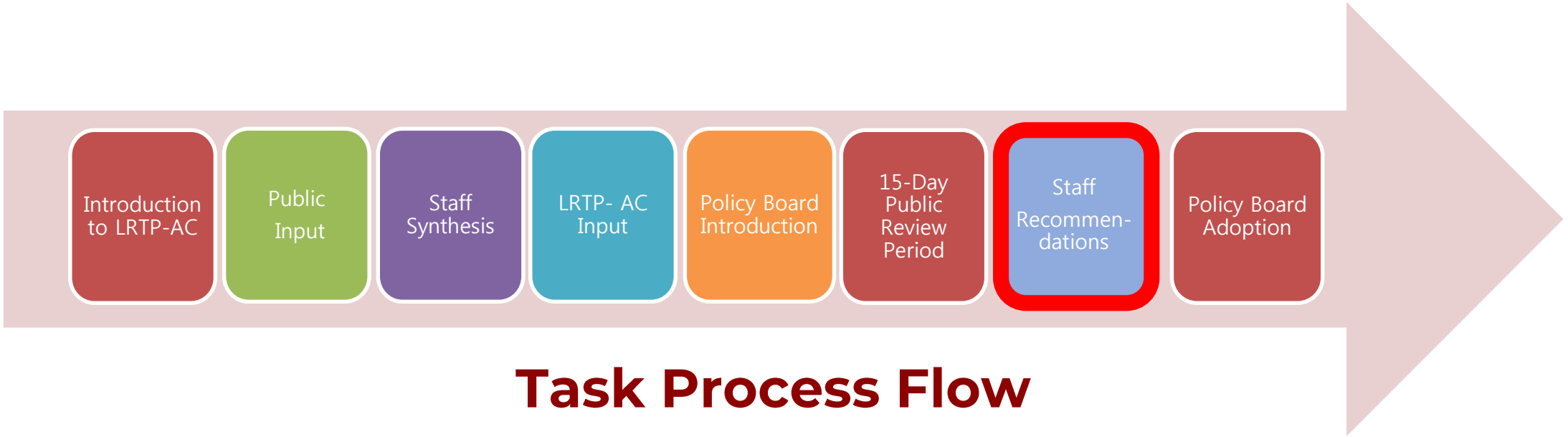
LRTP Process Flow



Richmond Regional Transportation Planning Organization
SUPPORTED BY PlanRVA

Strategic Direction

Task Objective: Develop Vision and Goals for the LRTP. Also develop Objectives and performance measure within each goal which could measure the achievement towards the goal



Task Process Flow

Staff Recommendations

Vision

The transportation system in the Richmond Region will reliably connect people, prioritize more equitable opportunities for all to thrive and live healthy lives, promote a strong economy, and respect environmental stewardship.

Guiding Principles

GP1 Create a safe system for all users committed to the proven strategies in planning, design, operations and maintenance as well as advances in technology to eliminate fatal and serious injury crashes.

GP2 Choice among all travel modes regionwide.

GP3 Prioritize completion of regional bicycle and pedestrian networks to provide active travel alternatives to driving for better individual and community health.

GP4 A robust transit network which delivers comprehensive, effective, and convenient service, particularly in areas of greatest need and to key destinations.

GP5 Equity and inclusion in all transportation spending and planning decisions in the region with a focus on historically under-represented and under-served communities.

GP6 Efficient movement of people and goods across the transportation network.

GP7 Alignment of transportation investment and planning with land use, community health, and environmental stewardship.

Goals & Objectives

A. Safety

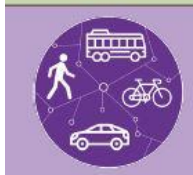
Improve the safety of the transportation system for all people.

A1. Enhance safety and comforts of bicycle and pedestrian facilities.
A2. Work to eliminate all serious injuries and fatalities resulting from vehicular accidents.

B. Environment/Land Use

Reduce the negative impact the transportation system has on the natural and built environment.

B1. Address roadways prone to flooding and consider climate impacts in transportation planning prioritization and funding decisions.
B2. Reduce transportation related pollutants, including decarbonizing transportation.
B3. Reduce VMT (vehicle miles travelled) per capita.
B4. Increase number and share of trips taken by shared and active transportation modes.
B5. Tie land use planning to transportation investments through encouragement of walkable and transit-oriented communities.
B6. Minimize impacts of transportation system on natural resources and communities with a particular emphasis on Environmental Justice (EJ) populations.



C. Equity/Accessibility

Improve equitable access through greater availability of mode choices that are affordable and efficient.

C1. Reduce trip lengths for all people with a focus on Environmental Justice (EJ) populations.
C2. Increase access to jobs and community services via transit, walking, and biking for all people with a focus on EJ populations.

D. Economic Development

Improve connectivity and mobility for strong economic vitality.

D1. Reduce peak period travel times.
D2. Increase transportation investment which focuses on economic vitality.
D3. Improve reliability and accessibility of travel to and within the regional activity centers.
D4. Reduce freight bottlenecks.
D5. Increase multimodal access to tourist destinations.

E. Mobility

Increase travel efficiency and mode choices by maintaining the transportation system in a state of good repair.

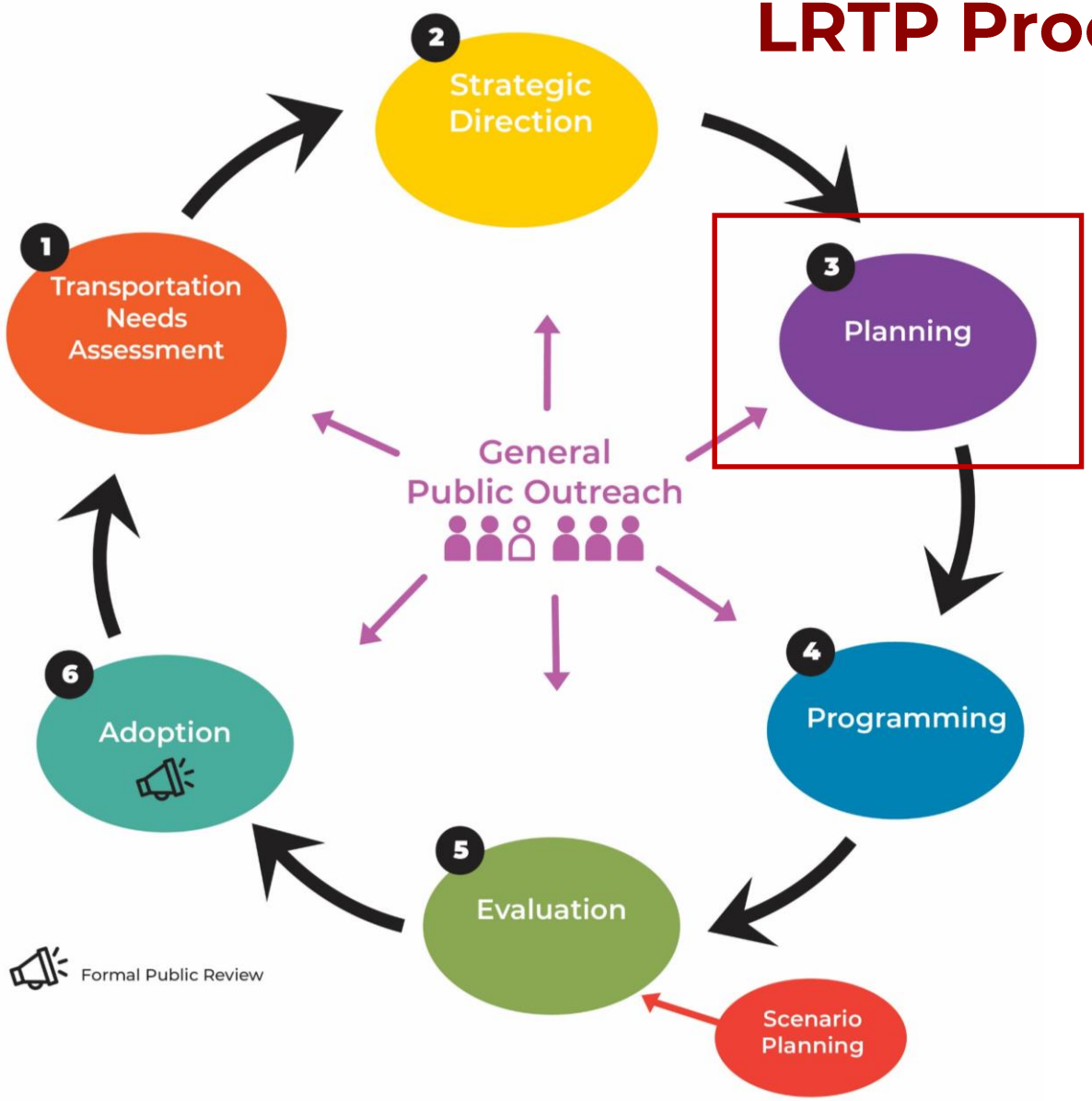
E1. Increase the percent of complete streets across the highway network to maximize use of available capacity.
E2. Increase system efficiency through operational, transportation demand management (TDM), and technology-based solutions.
E3. Improve system reliability across all modes.

Richmond Regional Transportation Planning Organization
SUPPORTED BY PlanRVA

5. LRTP Process Update Task 3

Planning

LRTP Process Flow



Richmond Regional Transportation Planning Organization
SUPPORTED BY PlanRVA

Universe of Project Screening and Development Update

Update

- List of projects form all the Champions
- Staff screening based on Project Inclusion Guidelines
- Working with Champions on required missing Information.

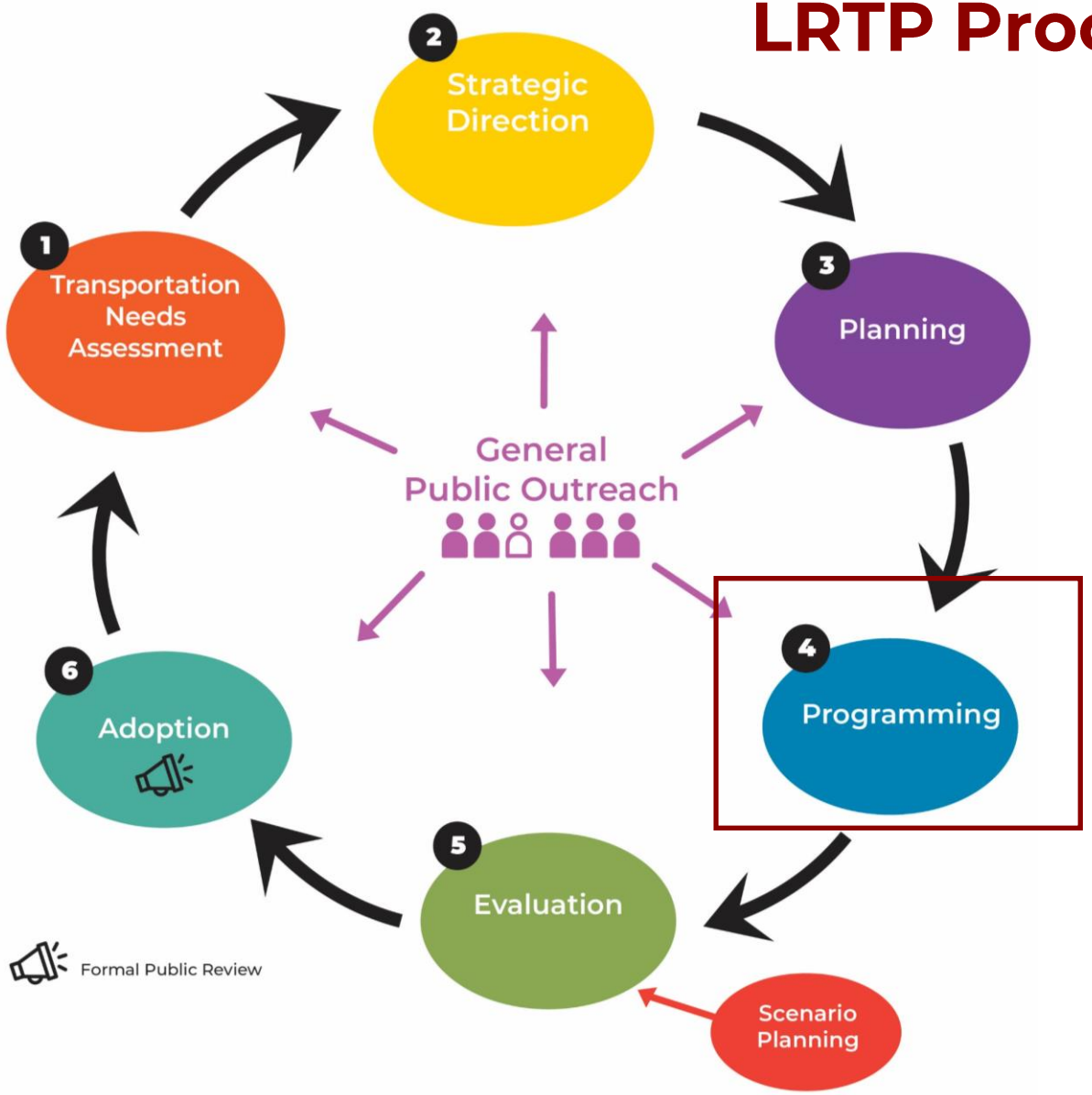
Timeline

- Staff & VDOT Compilation – February 14
- LRTP –AC Review and Comments – February 15 to March 1
- Staff presentations and Discussion on Findings – February 25 LRTP–AC Meeting
- Formal Public Review – March 3 to March 17
- Final Universe of Projects sent to LRTP–AC - March 18
- LRTP-AC Endorsement - March 25 LRTP-AC Meeting

6.LRTP Process Update Task 4

Programming

LRTP Process Flow



Richmond Regional Transportation Planning Organization
SUPPORTED BY PlanRVA

Project Evaluation and Scoring Methodology Review

Work Scope

Development of project scoring, ranking and prioritization methodology/guidelines based on established performance measures.

Work Task

Task 4.0 Project Prioritization & Scoring

Timeline

- LRTP-AC Introduction : October 22
- Guidelines First Draft sent to LRTP-AC: December 7
- LRTP-AC Presentation: December 14
- LRTP-AC Comments: December 15-January 10
- Staff Tweaks and Project Testing: Ongoing
- Guidelines Final Draft: January 18
- LRTP-AC Endorsement: January 28

Overview of Today's Discussion

- LRTP – AC Members Review/Comments
- Staff Considerations - changes made to the to the Draft Project Evaluation and Scoring Process
- Accessibility Measures: Testing & Results
- Test Projects Scoring & Ranking
- Beyond Project Scoring – Project Benefit Cost Analysis (BCA)
- Action requested: Endorsement of ConnectRVA 2045 Project Evaluation and Scoring Process

LRTP – AC Members Review/Comments

1. **Goal and PM Weights**
   - Consistent to Smart Scale Factor Weights
   - Mobility goal should carry more weight than 10%
   - Equity
     - 10 % is high.
     - Should be 15%
   - Sensitive features should be at least 5% (3.75 % currently)
   - In economic Development Goal 50% of PM weight for Trucks (Highway Projects) not fair.

2. **Methodology**
   - Environmental Sensitive Feature – ¼ mile buffer for all projects type does not capture the actual likelihood of impacts.
   - Job Growth measure - depreciation should be applied evenly across the 3 tiers
   - For Safety Measure Split crash info by Car with Pedestrian, Car with Bike, and Car with Car.

LRTP – AC Review/Comments

3. New Suggested Performance Measures

- Proximity to Tourist Centers
- Located in the Health Impact Area/Environmental Justice Area

4. General Comments

- Metrics are predominantly focused on vehicular movement.
- Integrate health with transportation (Good example: Nashville MPO LRTP)
- Project tiering is biased towards highway projects
- Automatic Bonus of 15% to transit projects. Negative 15% to projects in highway corridors with no transit.
- Additional equity points to transit and active transportation projects
- Project destroying EJ Communities/health harm – counter for such impact
- Cost benefit calculation rounding to 10 million hampers small projects

Methodology Changes

1. Goal Weights

LRTP Goal	Goal Weight 12/14	Goal Weight 1/21
Safety	25%	25%
Mobility	10%	15%
Equity and Accessibility	25%	25%
Economic Development	15%	15%
Environment/Land Use	25%	20%
Total	100%	100%

2. PM Weights

Enviroment/ Land Use Performance Measure (PM)	PM Weight 12/14	PM Weight 1/21
EL1. Sensitive Features	15%	25%
EL2. Air Pollution	30%	25%
EL3. VMT per Capita	30%	25%
EL4. Connection to Activity Center	25%	25%
Total	100%	100%

Methodology Changes

3. Sensitive Features

1. Geographical Features considered Sensitive
    a. National Wetlands Inventory
    b. Department of Game and Inland Fisheries (DGIF) Species Habitats
    c. DGIF Conservation Lands
    d. Department of Conservation and Recreation (DCR) Easements
    e. Department of Forestry (DOF) Agricultural/Forestry Lands
    f. Department of Historic Resources (DHR) National Register Listed Sites
    g. Storm Surge from Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model -Category 2
    h. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) (100-Year Floodplain)
    i. National Oceanic and Atmospheric Administration (NOAA) sea level rise (2-ft)
2. Adjustment Factor added for the calculation of Impacted area. Overlap Area * Adjustment Factor = Impact Area

Project Tier	Adjustment Factor
Tier 1	10%
Tier 2	30%
Tier 3	50%

Methodology Changes

4. Air Pollution

- For highway emissions calculations use Emission factors for NOx and VOC by Speed Bins based on EPA Motor Vehicle Emission Simulator (MOVES2014a) Emission Factors for Richmond Area CMAQ Analyses (2016 Update).

- For non-Highway Project VMT reduction attributed to the Project used to calculate NOx and VOC based on National average criteria pollutant emissions rates.

Speed1	Speed2	Nox Factor	VOC Factor
0	2.5	0.6108	0.6967
2.5	7.5	0.2552	0.1659
7.5	12.5	0.1699	0.0908
12.5	17.5	0.1424	0.0652
17.5	22.5	0.1271	0.0521
22.5	27.5	0.1166	0.0434
27.5	32.5	0.1118	0.0382
32.5	37.5	0.1051	0.0341
37.5	42.5	0.1038	0.031
42.5	47.5	0.1033	0.0287
47.5	52.5	0.1038	0.0272
52.5	57.5	0.1055	0.0263
57.5	62.5	0.1091	0.0259
62.5	67.5	0.119	0.0266
67.5	72.5	0.1373	0.0296

Pollutant	Average Emission Rates	Emission Calculation
NOx	0.9018 grams/mile	VMT (miles) * NOx Emission Rate (grams/mile)
VOC	0.686 grams/mile	VMT (miles)* VOC Emission Rate (grams/mile)

Methodology Changes

Project Performance Measure (PM)	Weight For Project Scoring	Combined Weights	Comments
Crash Frequency	17.50%		
Crash Rate	7.50%		
Person Throughput	7.50%		
Person Hours of Delay	7.50%		
Access to Jobs	7.50%		
Access to Destinations	7.50%		
Access to Jobs (EJ)	5.00%	10.00%	Overall Equity Component
Access to Destinations (EJ)	5.00%		
Job Growth	7.50%		
Connection to Truck Intensive Areas	3.75%	7.50%	Beneficial To Highway Projects Only
Truck Throughput	3.75%		
Sensitive Features	5.00%		
Air Pollution	5.00%	10.00%	More Beneficial to Active Transportation and Transit projects compared to Highway Projects
VMT per Capita	5.00%		
Connection to Activity Center	5.00%		
Total	100.00%		

Accessibility Measures: Testing & Results

Performance Measure (PM)	PM Weight
EA1.Access to Jobs	30%
EA2. Access to Jobs (EJ Area)	20%
EA3. Access to Destinations	30%
EA4. Access to Destinations (EJ Area)	20%
Total	100%

Id	Project Name	Accessibility to Jobs		Accessibility to Jobs (EJ)		Accessibility to Destinations		Accessibility to Destinations (EJ)	
		Raw Value	Normalized Value	Raw Value	Normalized Value	Raw Value	Normalized Value	Raw Value	Normalized Value
1	N Gayton Interchange at I-64	3.46	9.84	1.86	1.76	57	27.99	37.65	9.14
2	Pole Green Rd Widening	1.52	0.44	4.96	8.08	16.57	0.00	6.6	0.95
3	Route 1 New Transit Line	22.05	100.00	50	100.00	161	100.00	382	100.00
4	ATP Trail – Chickahominy Crossing	1.5	0.34	1	0.00	24	5.14	3	0.00
5	Route 60/Route 522 Intersection Improvement	1.43	0.00	1.14	0.29	48	21.76	36.5	8.84

Accessibility Measures: Testing & Results

TAZ	Pop_45	SuperMarke	Health	Schools	Colleges	Parks	Library	Gov_Center	A_Score	TOT_EMP
1	16	0.03870974	-0.01418	0.03004	-0.00115	0.018502	0.002861	-0.002158892	0.08489	-3.1749649
3	3211	0.00042865	0.000361	0.000274	2.13E-06	-0.00011	3.09E-05	-7.53647E-06	0.00137	-0.2223006
4	1028	0.000374141	-0.00022	0.000329	-6.3E-06	9.41E-05	2.44E-05	-2.99239E-05	0.000641	-0.1557138
5	1786	0.000258179	-4.9E-05	0.000227	-3E-06	8.07E-05	1.68E-05	-1.72345E-05	0.000618	-0.0790103
6	2239	0.000553768	0.000213	0.000374	2.11E-06	4.31E-05	1.62E-05	-1.02604E-05	0.001575	-0.0471083
7	1367	-0.000338458	-0.0012	-2.6E-05	-1.8E-05	-0.00129	-6.8E-06	-3.01929E-05	-0.00369	-1.08099
8	1892	-0.000192737	-0.00073	2.24E-06	-1.5E-05	-0.00014	-4.8E-06	-2.20893E-05	-0.00156	-0.2535005
9	2409	-0.000338725	-0.00086	-7E-05	-2.1E-05	-0.00052	-4.9E-06	-1.74372E-05	-0.00244	-0.6264705
10	1365	-4.79056E-05	-0.00046	9.2E-05	-7.3E-06	-0.00011	8.39E-06	-2.29395E-05	-0.00079	-0.2213535
11	1614	-0.00166531	-0.0033	-0.00106	-8.2E-05	-0.00094	-5.3E-05	-4.03483E-05	-0.00962	-0.7834511

All Population

TAZ	EJ_Index_45	EJ_S2	SuperMarker	Health	Schools	Colleges	Parks	Library	Gov_Center	A_Score	TOT_EMP
5	1	302	0.001526845	-0.000292	0.0013436	-1.75E-05	0.0004774	9.939E-05	-0.00010192	0.0036528	-0.467259
6	1	1120	0.001107042	0.0004256	0.0007476	4.223E-06	8.626E-05	3.241E-05	-2.0512E-05	0.0031489	-0.094175
7	1	1007	-0.00045946	-0.001634	-3.49E-05	-2.47E-05	-0.001758	-9.2E-06	-4.0987E-05	-0.005007	-1.467441
8	1	1748	-0.00020861	-0.000786	2.423E-06	-1.59E-05	-0.000153	-5.24E-06	-2.3909E-05	-0.001687	-0.274384
9	1	1774	-0.00045997	-0.001171	-9.49E-05	-2.88E-05	-0.000712	-6.65E-06	-2.3679E-05	-0.003313	-0.850714
10	1	1245	-5.2523E-05	-0.000499	0.0001009	-8.04E-06	-0.000117	9.194E-06	-2.5151E-05	-0.000868	-0.242689
11	1	1369	-0.00196334	-0.00389	-0.001255	-9.71E-05	-0.001104	-6.21E-05	-4.7569E-05	-0.011345	-0.92366
12	1	161	0.022711149	0.0175663	0.0158792	-7.35E-05	0.0095159	0.0017309	-0.00010912	0.0873596	2.5057275
16	1	84	0.030865743	0.0447392	0.0144342	0.0010419	0.0092148	0.0017386	7.40355E-05	0.1399111	6.9076568

EJ Population in EJ Areas

Test Projects Scoring & Ranking

Safety

Id	Project Name	Crash Frequency				Crash Rate			
		Raw Value	Normalized Value	Weight	Score Value	Raw Value	Normalized Value	Weight	Score Value
1	N Gayton Interchange at I-64	$ 965,000.00	57.47	17.50%	10.06	$ 22,031.96	45.80	7.50%	3.44
2	Pole Green Rd Widening	$ 1,550,000.00	92.32	17.50%	16.16	$ 48,100.17	100.00	7.50%	7.50
3	Route 1 New Transit Line	$ 1,679,000.00	100.00	25.00%	25.00	N/A	N/A	0.00%	0.00
4	ATP Trail – Chickahominy Crossing	$ -	0.00	17.50%	0.00	$ -	0.00	7.50%	0.00
5	Route 60/Route 522 Intersection Improvement	$ 210,000.00	12.51	17.50%	2.19	$ 21,468.00	44.63	7.50%	3.35

Mobility

Id	Project Name	Person Throughput				Person Hours of Delay			
		Raw Value	Normalized Value	Weight	Score Value	Raw Value	Normalized Value	Weight	Score Value
1	N Gayton Interchange at I-64	2533	100	7.50%	7.50	683	100	7.50%	7.50
2	Pole Green Rd Widening	1380	54	7.50%	4.05	372	53	7.50%	3.96
3	Route 1 New Transit Line	88	3	7.50%	0.19	24	0	7.50%	0.00
4	ATP Trail – Chickahominy Crossing	25	0	7.50%	0.00	75	8	7.50%	0.58
5	Route 60/Route 522 Intersection Improvement	1780	70	7.50%	5.25	440	63	7.50%	4.73

Test Projects Scoring & Ranking

ID	LRTP Goals	Safety		Mobility		Equity and Accessibility				Economic Development		
	Project Name	Crash Frequency	Crash Rate	Person Throughput	Person Hours of Delay	Access to Jobs	Access to Jobs (EJ)	Access to Destinations	Access to Destinations (EJ)	Job Growth	Connection to Truck Intensive Areas	Truck Throughput
3	Route 1 New Transit Line	25.00	0.00	0.19	0.00	7.50	5.00	7.50	5.00	2.19	0.00	0.00
2	Pole Green Rd Widening	16.16	7.50	4.05	3.96	0.03	0.40	0.00	0.05	0.60	0.00	3.75
4	ATP Trail – Chickahominy Crossing	0.00	0.00	0.00	0.58	0.03	0.00	0.39	0.00	0.10	1.02	0.00
5	Route 60/Route 522 Intersection Improvement	2.19	3.35	5.25	4.73	0.00	0.01	1.63	0.44	0.00	0.00	1.09
1	N Gayton Interchange at I-64	10.06	3.44	7.50	7.50	0.74	0.09	2.10	0.46	7.50	5.00	1.54

ID	LRTP Goals	Environment/Land Use				Project Benefit	Project Total Cost	Connect RVA 2045 Project Score	Connect RVA 2045 Project Rank
	Project Name	Sensitive Features	Air Pollution	VMT per Capita	Connection to Activity Centers				
3	Route 1 New Transit Line	4.59	5.00	5.00	0.00	66.97	$ 15,000,000	**44.65**	**1**
2	Pole Green Rd Widening	5.00	0.00	0.00	0.00	41.51	$ 20,000,000	**20.75**	**2**
4	ATP Trail – Chickahominy Crossing	1.77	3.84	1.25	1.02	9.98	$ 5,000,000	**19.95**	**3**
5	Route 60/Route 522 Intersection Improvement	0.00	2.75	0.00	0.00	21.45	$ 14,000,000	**15.32**	**4**
1	N Gayton Interchange at I-64	4.57	0.00	0.00	5.00	55.48	$ 80,000,000	**6.94**	**5**

Beyond Project Scoring: Benefit Cost Analysis (BCA)

- Net present value of benefit (Individual Project Level)
- Benefit could be positive or negative
- Absolute Benefit of the Project (Not relative to any other project)
- Only for Demonstration (ConnectRVA 2045)

Benefit	Explanation	Calculations & Monetization
Operational/Mobility Benefit	Reduction in hours of Delay (Auto delay and Truck delay for Highway Projects. Person delays for Active transportation and Transit Projects	Highway = D Truck Delay * Truck Value of Time + Auto Delay* Auto Value of Time Other Modes = D Person Delay* Person Value of Time
Safety Benefit	Reduction in Fatal and Injury Crashes	D Fatal* Fatal Cost+ D Injury* Injury Cost
Environmental Benefit	Reduction in VOC and NOx Emissions	D Reduction in VOC * Cost of VOC Emissions/ton + D Reduction in NOx Cost of NOx Emissions/ton
Access Benefit	Additional Jobs and Destinations reached by Auto, Transit Biking and Walking within 30 minutes (45 Minutes for Transit)	Additional Jobs and Destination * Person Value of Time (No. of Jobs = Person, Destinations to be converted into persons equivalent)
Quality of life Benefits	Any other user and not user benefit not captured in the first four categories (health, social etc.)	?
Total Benefit	Operation Benefit+ Safety Benefit + Environmental Benefit+ Access Benefit+ Quality of Life Benefit	
Total Cost	Construction Cost + PE Cost+ ROW Cost +(Maintenance Cost * # of years)	
Benefit /Cost Ratio (BCA)	Total Benefit/Total Cost	

Action requested

The Long-Range Transportation Plan (ConnectRVA 2045) Advisory Committee endorses the ConnectRVA 2045 Project Evaluation and Scoring Process as presented by RRTPO staff. This process will be used to score and rank all the projects listed in the ConnectRVA 2045 ‘Universe of Projects’.

7.ConnectRVA 2045 Report Documents

LRTP Report Documents

Main Document

- 50/60 pages targeted towards the general public and the RRTPO Policy Board
- Infographic heavy
- Following Federal Plain Language Guideline and USDOT Plain Language Checklist
- Outline in the Agenda

Technical Documentations

A series of reports presenting all technical analysis targeted towards the transportation community

1. Growth Forecast Analysis Report – Completed
2. Structures Inventory and Assessment Report- Completed
3. Public Participation and Outreach Report
4. Transportation Issues and Universe of Projects
5. RTC Model Use in ConnectRVA 2045
6. Project Prioritization Process Report (Methodology, Candidate Projects and Unfunded Needs, Scoring Sheets, Project Maps)
7. Environmental Justice and Accessibility Analysis Report
8. Congestion Management Process Report
9. Air Quality Conformity Report
10. Scenario Planning – TBD

Connect RVA 2045

Website
www.connectrva2045.org

Contact Information

ConnectRVA2045@planrva.org

Chet Parsons
cparsons@planrva.org

Sulabh Aryal
saryal@planrva.org

Richmond Regional Transportation Planning Organization
SUPPORTED BY PlanRVA