Roanoke Valley Transportation
PLANNING ORGANIZATION
Staffed by the REGIONAL commission

Vision 2040: Roanoke Valley Transportation

FINAL DRAFT

November 17, 2016

Roanoke Valley Transportation PLANNING ORGANIZATION
Staffed by the REGIONAL commission

RVTPO POLICY BOARD

Jane Johnson, Chair	*Salem City Council*
Ray Ferris, Vice Chair	*Roanoke City Council*
George Assaid, AIA	Roanoke County Board of Supervisors
Todd Dodson	Botetourt County Board of Supervisors
John Garland, PE, LEED AP	Roanoke City Council
Ken King, PE	Virginia Department of Transportation – Salem District
Diana Lewis, AAE	Roanoke-Blacksburg Regional Airport
Keith Liles	Vinton Town Council
Billy Martin, Sr.	Botetourt County Board of Supervisors
Carl Palmer	Greater Roanoke Transit Company
Annette S. Perkins	Montgomery County Board of Supervisors
Jason Peters	Roanoke County Board of Supervisors
Janet Scheid	Vinton Town Council
Jitender Ramchandani	Virginia Department of Rail and Public Transportation
Bill Thomasson	Bedford County Board of Supervisors

Non-Voting Members:

Kevin Jones	Federal Highway Administration
Melissa McGill	Federal Transit Administration
J. Lee E. Osborne	Roanoke Valley-Alleghany Regional Commission

Roanoke Valley Transportation PLANNING ORGANIZATION
Staffed by the REGIONAL commission

TRANSPORTATION TECHNCIAL COMMITTEE

Cody Sexton, Chair	*Botetourt County*
Benjamin W. Tripp, Vice Chair	*City of Salem*

Curtis Andrews	Unified Human Services Transportation Systems, Inc.
Liz Belcher	Roanoke Valley Greenway Commission
Nick Britton, AICP	Virginia Department of Rail and Public Transportation
Dan Brugh	New River Valley Metropolitan Planning Organization
Chris Chittum, AICP	City of Roanoke
Michael Gray	Virginia Department of Transportation
Joey Hiner	Town of Vinton
David Holladay	Roanoke County
Mark Jamison, PE	City of Roanoke
Diana Lewis, AAE	Roanoke-Blacksburg Regional Airport
Jerod Myers	Botetourt County
Melinda Payne	City of Salem
Kevin Price	Greater Roanoke Transit Company
Karla Turman	Town of Vinton
Tori Williams	Roanoke County
Greg Zody, AICP	Bedford County

Roanoke Valley Transportation PLANNING ORGANIZATION
Staffed by the REGIONAL commission

CITIZENS ADVISORY COMMITTEE

Amar Bhattarai	Refugee and Immigration Services
Angela Conroy	Department of Environmental Quality
Angela Penn	TAP
Ann Rogers	Consultant and Transportation Advocate
Antwyne Calloway	Blue Ridge Independent Living Center
Barbara Duerk	Blue Ridge Bicycle Club
Brittany Deknight	United Way of the Roanoke Valley
Dee King	Citizen
Elda Stanco Downey	Roanoke Spanish
Freeda Cathcart	Citizen
Jake Gilmer	Western Virginia Workforce Development Board
Josh Baumgartner	Roanoke Regional Chamber of Commerce
Paul Anderson	AECOM
Robert Jeffery	Colors Magazine
Susan Jennings	City of Roanoke Arts Commission
Tim Cerebe	Freedom First
William Roberts	Blue Ridge Independent Living Center

Introduction

All urban areas within the United States are required by federal regulations to maintain and update a regional long-range transportation plan with a minimum of a 20-year planning horizon. The constrained long-range multimodal transportation plan (CLRMTP) for the Roanoke Valley Transportation Planning Organization (RVTPO) includes the urbanized areas in Bedford County, Botetourt County, the City of Roanoke, Roanoke County, the City of Salem, and the Town of Vinton. The CLRMTP will be published in two stages:

1. The first stage: titled "Vision 2040: Roanoke Valley Transportation" (this document, herein after referred to as the Vision 2040 plan) is a summary plan that is geared toward the average citizen. It will meet the minimum federal requirements for a regional long-range transportation plan, and stand as the RVTPO's regional transportation plan.

2. The second stage, which is anticipated for the summer of 2017, will be a technical report containing documentation of the full technical detail, data and travel demand model that federal and state stakeholders require. The CLRMTP 2040 - Technical Report will be a major amendment to the Vision 2040 plan and go through the full public process. This second stage will provide an opportunity to:

    - Fully analyze and document the current state of transportation in the Roanoke Valley as well as future considerations.
    - Make any corrections or changes that have been discovered between the adoption of the Vision 2040 plan and the adoption of the CLRMTP 2040 - Technical Report.
    - Update, improve and refine the performance measures which are the heart of performance-based planning.
    - Update the financially constrained list of transportation projects.

Vision 2040 is a plan for federal surface transportation funds. The most recent federal law pertaining to federal transportation funding and policy is the Fixing America's Surface Transportation Act ("FAST Act") that was signed into law on December 4, 2015. The FAST Act has several major frameworks, concepts or initiatives that apply to the Vision 2040 plan:

- The Federal Planning Factors
- Ladders of Opportunity
- Performance Measures Based Planning
- Freight Planning

Federal Planning Factors:
According to the Metropolitan Transportation Planning Final Rule (dated May 27, 2016) there are 10 Planning Factors in 23 CFR Part 450.206:

1. Support the economic vitality of the United States, the States, metropolitan areas, and nonmetropolitan areas, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users;
3. Increase the security of the transportation system for motorized and non-motorized users;
4. Increase accessibility and mobility of people and freight;
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight;
7. Promote efficient system management and operation;
8. Emphasize the preservation of the existing transportation system;
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
10. Enhance travel and tourism.

Ladders of Opportunity:
The following summary of the Ladders of Opportunity Concept is from the US Department of Transportation (USDOT) website:

> *America's highways, railways, airports, ports and transit systems help drive our economy. There is a regrettable legacy of aligning and designing transportation projects that separated Americans along economic and even racial lines. At a time when our nation has so much infrastructure to repair and replace, we have a chance to do so in a much more inclusive way that will simultaneously expand economic opportunity and socioeconomic mobility throughout America. The choices we make about future transportation projects, the people they touch and places they connect, will play a role in determining how widely opportunity expands throughout America. Together, we can build a stronger and more connected nation, a healthier economy, and more vibrant communities.*

This concept can be further expressed in three contexts:

- **Work** - Infrastructure investment creates jobs and paves the way for business, particularly small and disadvantaged business enterprises.
- **Connect** - A multimodal transportation system provides Americans with safe, reliable,

and affordable connections to employment, education, healthcare, and other essential services.

- **Revitalize** - Transportation infrastructure can lift up neighborhoods and regions by attracting new opportunities, jobs, and housing. (https://www.transportation.gov/opportunity accessed 06/08/2016).

Clearly the concept of aligning transportation planning and workforce development efforts are an important part of the ladders of opportunity concept. Sometimes what appears at first glance to be a transportation issue is actually a workforce issue and vice-versa.

Performance-Based Planning:
The Metropolitan Transportation Planning Final Rule (dated May 27, 2016) greatly increases the importance of Performance-Based planning for Metropolitan Transportation Plans (MTPs) which is their terminology for long-range transportation plans such as the Vision 2040 plan. RVTPO has participated in the Virginia Department of Transportation's (VDOT's) Performance Measures Reporting System in which we have produced an RVTPO Regional Performance Measures Report annually since 2012. However, this state level performance measurement reporting system in not completely in alignment with the new Metropolitan Transportation Planning Final Rule (dated May 27, 2016); therefore, a transition in performance measures and performance based planning will be needed. This Vision 2040 plan is the first step in that transition. This document will set the stage for the RVTPO Performance Based planning to align with the new federal rule. RVTPO's performance based planning system will be enhanced and completed in the aforementioned CLRMTP 2040 - Technical Report amendment to this plan which is anticipated in the fall of 2017. In many ways performance based planning will constitute a feedback loop whereby the system is constantly updated and improved.

Freight Planning:
The FAST Act includes a renewed interest in Freight Planning at the Transportation Planning Organization and the State Levels. The idea is to ensure adequate planning support to the vital logistics and supply chain system that benefits economic competitiveness and economic development. The RVTPO has a history of including freight in our planning effort and products including a 2012 Freight Generation Study and a 2014-15 "Western Virginia Intermodal Study." In addition, a Commercial Vehicle Model was added to the 2016 update of RVTPO Travel Demand Model. RVTPO will continue to expand freight planning activities over the coming years. Reliability of the logistics and supply chain is of utmost importance to many businesses who have business models that rely on low levels of inventory and timely availability of inputs.

This Vision 2040 plan is organized around the following eight questions that are also the titles to the sections of this document.

1. Where are we today with transportation in the Roanoke Valley?
2. What other plans have been done related to transportation, and how has the public been involved?
3. What do these plans say to guide transportation and land use decisions going forward?
4. What are the possibilities for the future?
5. What do these possibilities mean for transportation?
6. What funding is available to our region to make necessary investments in our transportation system?
7. What projects will best meet the needs identified for today; and, as best we can tell, for the future?
8. Do these projects have any anticipated benefits or burdens from an Environmental Justice perspective?

Section 1 - Where are we today with transportation?

In many ways we are near a tipping point in transportation. Unfortunately, it is difficult to see which way the tipping point is headed. The Baby Boomers have started to retire and will all retire by 2040. The Millennials, currently in their teens and early twenties, are more numerous than the Baby Boomers. Early indications are that the Millennials get their driver's license later, drive less and prefer more compact urban environments more than recent generations. But, will this pattern hold when Millennials form families and have children? Prototypes of self-driving vehicles from Google and others have already proven feasible. But, how long will it take before most vehicles are at least partially automated? And, will this let us get enough extra capacity out of the buses and roads that we already have to not have to build so many new roads in the future? Or, is this just hope in "gee whiz" technology and reality will be similar to today?

The purpose of the Vision 2040 plan is not to predict the future exactly. Instead, the purpose of the plan is to anticipate plausible possibilities for the future, and to help elected officials, citizens and other stakeholders to wisely think through the investments in transportation infrastructure that should be made to make the most of future opportunities. In a very real and tangible way, transportation is our physical connection to economic development, community development and livability.

A more down-to-earth answer of "Where we are today with transportation?" is that we have a mixed bag of bottlenecks and spot congestion. Also, we have some accessibility to jobs and goods/services issues. However, we don't generally have the stark congestion and delay issues that other larger metropolitan areas experience. **Part of the goal of Vision 2040 is to help guide transportation investment decisions so that the debilitating congestion that plagues other regions does not become a reality in the Roanoke Valley.**

The Citizens Advisory Committee (CAC) provides a citizen's perspective on the impact of transportation plans in the region and advises the TPO Policy Board on the public participation plan. At their May 23, 2014 meeting the CAC and staff, developed a vision and six goals and objectives for the Vision 2040 plan. The goals were subsequently shared with stakeholders and the public for review and are listed on the following table as they relate to *FAST Act* Planning Factors and Performance Measures.

The vision of the RVTPO Vision 2040 plan is to communicate a clear and consistent plan for a seamless regional multimodal transportation system that is safe, cost-effective, environmentally conscious, maintainable, inclusive of all users, and conducive to the economic vitality of the community.

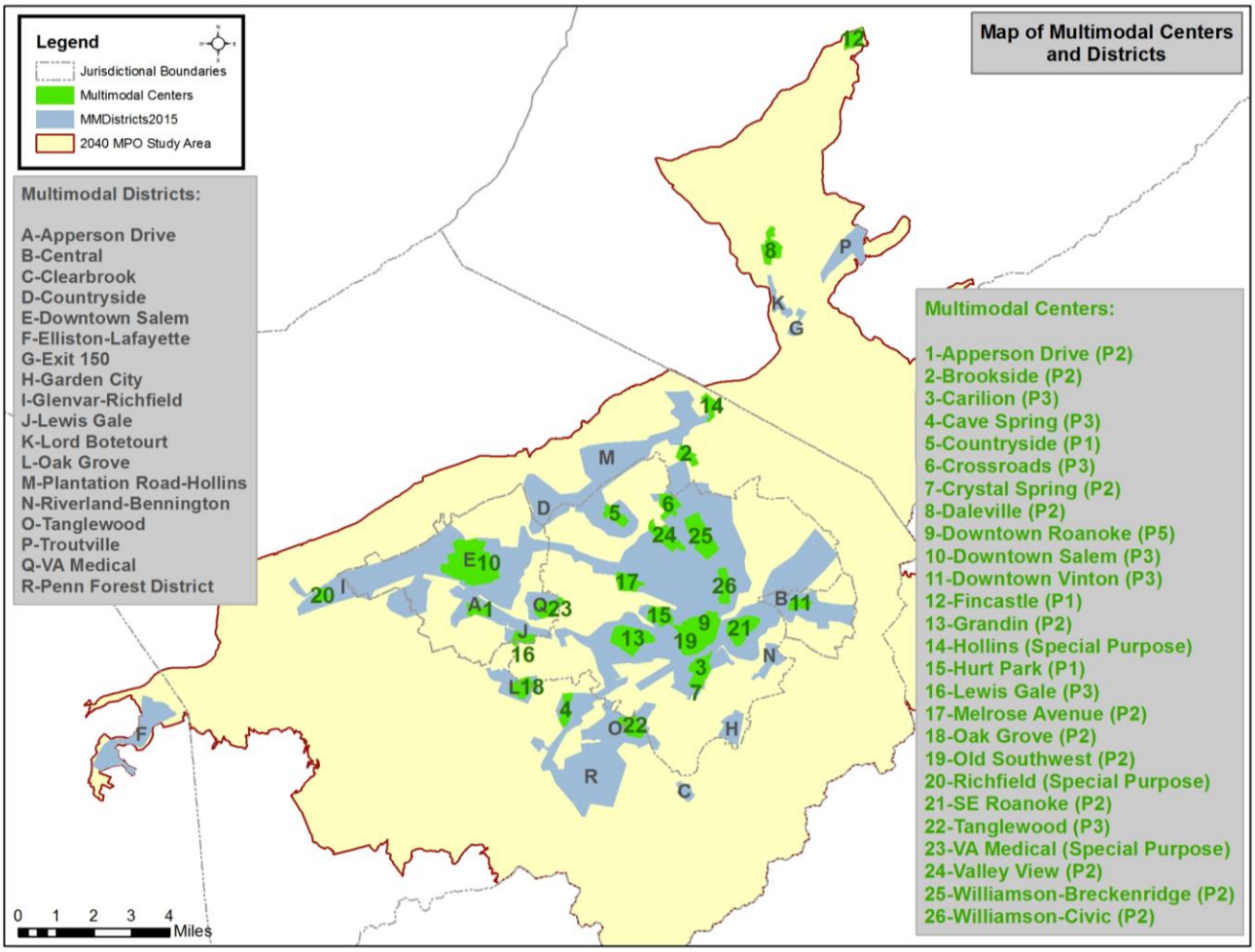
The Roanoke Valley's 2040 transportation goals include the previous goals from the 2035 plan (See Appendix A) as well as six additional goals that were developed with the Citizen's Advisory Committee (CAC).

Roanoke Valley Transportation Goals as developed with the Citizen's Advisory Committee:

#	Goals	Applicable ***FAST Act*** Planning Factors	Applicable Performance Measures
1	Focus on transportation connectivity gaps in access to employment and essential services and help address those gaps through multimodal transportation solutions. The concept behind this goal is labeled "Ladders of Opportunity."	#1, 4, 6	• Annual Unlinked Passenger Trips Per Capita • % of Population in TAZs served by Transit • % of Employment in TAZs served by Transit • Number of Members in RIDE Solutions Program • Number of Bicycle Friendly Businesses
2	Build on our strengths by investing in multimodal transportation infrastructure improvements in predefined areas where citizens already live and work and where dense increases in jobs and housing are planned. The TPO Policy Board has defined these areas as Multimodal Districts and Multimodal Centers (see following map).	#1, 5, 8	• % of Population in TAZs served by Transit • % of Employment in TAZs served by Transit • # and % of Residents who Walk to Work • Number of Pedestrians or Bicyclists by Location • Number of Greenway Users by Location
3	Invest in a seamless multimodal transportation system by developing operations management, intelligent transportation systems and similar technical and managerial best management practices to get the most out	#1, 2, 3, 7, 8, 10	• Mean Travel Time to Work • Annual # of Days When Ozone Levels were Above 8-Hour Standard • Annual Unlinked Passenger Transit Trips per Capita • Annual Passenger Miles Traveled

	of the transportation infrastructure and assets that already exist.		per Capita • Truck and Rail Mode Share by Value • Truck and Rail Mode Share by Tons
4	Facilitate greater regional planning cooperation by advancing transportation projects that benefit the citizens of more than one TPO member locality, and/or that are sponsored by more than one TPO local government.	#1, 4, 5	• Ratio of $ value of RVTPO submitted SMART SCALE applications to local government submitted applications over successive SMART SCALE application cycles.
5	Continually advance towards greater levels of performance-based planning and programming by using and incorporating feedback from the RVTPO Performance Measures report toward the planning and programming of future projects. This goal describes a continually advancing and mutually supportive feedback loop in which performance measures help define and select future projects as well as annual updates to the performance measures themselves.	All planning factors are addressed by performance -based planning.	• Percentage of financially constrained list projects in future long-range transportation plans that were generated based on trends in performance measures in addition to other sources.
6	Align the RVTPO Vision 2040 prioritization process, described later in this document, as much as feasible*, to the SMART SCALE project prioritization and scoring factors in the development of Vision 2040 plan financially constrained project lists. The five state project priorities that apply statewide and to the VDOT Salem District are: economic development, safety, accessibility, environmental quality and congestion management. The goal is that RVTPO priorities stand a greater chance of being	#1, 2, 3, 5, 6, 8, 10	• Percentage of Vision 2040 plan constrained list projects that get recommended for funding in the SMART SCALE system over time. **Target:** ***100% for full alignment of Vision 2040 plan, SMART SCALE and RVTPO Transportation Improvement Program (TIP).***

	included in statewide planning and programming documents due to their consistency with the state and federally mandated prioritization process (Code of Virginia §33.1-23.5:5).		



Section 2 - What other plans have been done related to transportation and how has the public been involved?

The long-range transportation planning process is a continuous process with new "long-range transportation plans" being approved every five years. This continuous work often manifests itself through specific plans and studies such as corridor and area studies or vision plans. These plans often have their own public involvement process that allow for continuous public involvement in the planning process in between long-range plans. Several new and significant planning initiatives have taken place since the adoption of the 2035 long-range transportation plan in June 2012. Highlights of major public involvement successes follow:

- **Livable Roanoke Valley**
  http://rvarc.org/livableroanoke/
  The Livable Roanoke Valley public involvement process took place over three years during which a Livable Roanoke Valley Summary Summary Plan was produced. Livable Roanoke Valley Actively Engaged over 1,500 citizens in the Roanoke Valley during the development of the plan. Many of these citizens were engaged through a statistically significant randomized telephone survey.

- **Congestion Management Process (CMP) Plan**
  http://rvarc.org/transportation
  The region's first ever CMP plan was produced in 2013-14. The main citizen outreach was an online congestion sentiment survey where citizens were asked where they experienced traffic congestion, where bottlenecks occur and other similar questions. Hundreds of citizens participated in these surveys.

- **Roanoke Valley Transit Vision Plan**
  http://rvarc.org/transportation/transit/
  The region's first ever Transit Vision Plan was adopted by the TPO Policy Board in September 2016. The plan was guided by a steering committee made up of people representing local governments, non-profit organizations, health and business interests. An extensive public outreach process spanned three years and involved people throughout the multiple phases of the plan's development. Citizens were engaged via traditional public meetings, focus groups, online discussion forums, and public surveys administered online, on transit vehicles, and in person. In total, over 4,000 responses guided the region's vision for transit.

- **Regional Pedestrian Vision Plan**
  http://rvarc.org/transportation/bicycle-pedestrian-greenways/regional-pedestrian-vision-plan/
  The region's first ever Pedestrian Vision Plan was adopted by the TPO Policy Board in January 2015. As part of this planning effort, over 450 citizens responded to a public survey about the importance of walking for transportation in the Roanoke Valley and where improvements to walking infrastructure are most needed. Staff participated in local events to promote the plan and solicit input, and the TPO's Transportation Technical Committee served as the plan's steering committee.

- **Bikeway Plan for the Roanoke Valley Area MPO - 2012 Update**
  http://rvarc.org/wp-content/uploads/2013/12/RVAMPO-BikewayPlan-2012Update-web.pdf
  In March 2012, the TPO Policy Board adopted an update to its 2005 Bikeway Plan. A bicycle user survey guided the plan's recommendations with over 300 people responding to the survey. The Bikeway Plan addresses on-street accommodations whereas the Greenway Plan addresses off-street bike accommodations.

- **Roanoke Valley Conceptual Greenway Plan - 2007 Update**
  http://greenways.org/wp-content/uploads/2014/12/2007greenwayplan.pdf
  In 2007, the Greenway Plan was updated from its original 1995 plan. In developing the 2007 Update, over 200 people participated in the public input meetings. Input was also sought from local government staff and elected officials as well as corporations.

- **Roanoke Centre for Industry and Technology/Blue Hills Transportation Survey Analysis Report** (February 2014)
  http://rvarc.org/wp-content/uploads/2014/11/RCIT-Blue-Hills-Survey-Analysis-Report.pdf
  A special purpose transportation survey was carried out in a major economic development park in the City of Roanoke in order to estimate potential public transit demand. A total of 528 employees responded to the survey and a demonstration transit service project (Route 31X) began operating in January 2016.

- **Bonsack Area Public Transit Survey Analysis Report** (December 2014) http://rvarc.org/wp-content/uploads/2016/08/Bonsack-Area-Public-Transit-Survey-Analysis-Report.pdf
  As a follow-up to the previous survey conducted for RCIT/Blue Hills, a survey of businesses further east along Route 460 in the the Bonsack/EastPark area took place to identify the need and interest of employers of transit service. Of the 28 businesses surveyed, eight in Botetourt County and 16 in Roanoke County provided input.

For the purpose of this long-range planning effort, RVARC staff conducted a transportation priorities survey to gauge where citizens see the need for investments. The survey asked citizens to prioritize categories of projects that receive transportation funding and rank them from 1 (most important) to 6 (least important) indicating where limited transportation funding should be spent. A total of 494 people participated in the survey between September 1 – November 7, 2016 either through focus groups, interviews in-person at community events, or online. These initial survey results are provided below.

1 - I-81 Improvements
2 - Pedestrians/Bicycles/Access to Transit (on-road)
3 - Other Roads/Highways
4 - Greenways (off-road)
5 - Transit (Buses and Transfer Facilities)
6 - Intelligent Transportation Solutions

Roanoke Valley Transportation PLANNING ORGANIZATION
A Program of the REGIONALcommission

Transportation Priorities Survey

Please rank the following categories where limited transportation funding should be spent.

1 = most important, 6 = least important	
	I-81 Improvements
	Other Roads/Highways
	Intelligent Transportation Solutions
	Greenways (off-road)
	Pedestrians/Bicycles/Access to Transit (on-road)
	Transit (Buses and Transfer Facilities)

RVARC staff will continue to promote this survey and obtain further public input through FY2016.

Section 3 - What do these plans say to guide transportation and land use decisions going forward?

The general theme that stands out from the plans listed in the previous section is one of access to jobs and access to goods/services via an interconnected easy and convenient multimodal transportation system that provides people multiple options for moving around the Roanoke Valley.

There are situations in which people who are in the market for particular jobs live in a different part of the region from where employers are offering these jobs. This is often referred to as "spatial mismatch." These plans also highlight the potential for infill development and redevelopment, which is critical for reducing longer distance travel demands. One approach to "spatial mismatch" is to get people from where they live to where they work which is a transportation approach. Another approach is to encourage employers to locate close to where potential employees live via redevelopment which is a community development approach. Sometimes a situation that gets labeled as a transportation issue is really a community development opportunity.

In short, these regional plans encourage investment in transportation infrastructure (pedestrian, bicycle, transit and roadway) and investment in community development, housing and economic development initiatives in areas that are planned or already well-developed activity centers.

Going forward, the vision for the Roanoke Valley is one that generally discourages sprawl (i.e. development that is designed and built at low densities with the automobile as the only realistic means of access); infrastructure is too expensive for the public sector to continue building and maintaining in a low-density sprawling environment.

Infrastructure usually has high fixed construction costs with low incremental costs for each additional individual user up to the point of congestion. For this reason, it is much more efficient to spread the fixed costs out over a concentration of users, rather than a dispersed set of users.

Section 4 - What are the possibilities for the future?

We are likely at a tipping point of technological and societal change that could profoundly impact future transportation demand, infrastructure and services. The interplay between these demographic, cultural and technological trends are complex; so, there is no one simple answer for what the future holds. In order to make sense of this complexity scenario planning is used. Transportation projects can be compared and contrasted across a variety of possible future conditions, and the relative merits and tradeoffs can be intelligently discussed.

It may often appear that big changes are on the way, yet the changes do not always materialize. Though there are more that warrant discussion, below are three very good reasons to think that big change could be around the corner. The first two reasons have to do with transportation demand and the other with transportation supply.

Baby Boomer Retirement AND Millenials (Gen Y) Entering their Prime Working Years
The Baby Boom Generation (born 1945-64) will be in full retirement between now and 2040. As such their transportation demand is likely to change in both kind (fewer work trips) and degree (fewer trips in general). However, accessibility to destinations and timing of trips (i.e. to keep appointments or attend social activities) may be of increased importance.

Millennials (born Early 80s through 2000s), who as a group are a little bigger than the Baby Boomers, will enter their prime career and family forming years between now and 2040. So, will the Millennials just “smooth out” the transportation demand changes brought on by the Baby Boomers? There are early indications that Millennial tastes and preferences for urban amenities and transportation modes are different than past generations. In some cases, Baby Boomer and Millennials may amplify transportation demand in a similar direction, rather than cancel each other out. It has often been observed that both young professionals and active empty nester retirees want to live downtown or in other urban settings with social activities and amenities nearby.

Internet Shopping (“The Amazon Effect”)
People are increasingly comfortable with shopping online. Traditional retail will likely continue to play a role in the foreseeable future due to the sociability and experiential aspects of retail that are hard to replicate online. Nevertheless, it is reasonable to assume that an increasing percentage, compared with current levels, of items will be purchased online from now until 2040. In traditional retail large trucks deliver thousands of items to a retail location, and individual consumers typically purchase multiple items in one shopping trip. Each online purchase potentially represents a separate package shipped through services such as UPS, Federal Express or the US Postal Service, thus increasing small package freight transportation demand.

- **Automation and Intelligent Transportation Systems** - The prospect of automated vehicles is not an all-or-nothing situation. There are a spectrum of possibilities. The various possibilities of automation are typically grouped into five levels. The National Highway Traffic Safety Administration (NHTSA) has proposed a formal classification system for the levels of vehicular automation.

Level 0	The driver completely controls the vehicle at all times
Level 1	Individual vehicle controls are automated, such as electronic stability control or automatic braking.
Level 2	At least two controls can be automated in unison, such as adaptive cruise control in combination with lane keeping.
Level 3	The driver can fully cede control of all safety-critical functions in certain conditions.
Level 4	The vehicle performs all safety-critical functions for the entire trip, with the driver not expected to control the vehicle at any time.

Source: https://en.wikipedia.org/wiki/Autonomous_car#cite_note-10

Timeframe	Technology and Market Trends	Possible Effects	Rules of Thumb for Prioritization Process
2016 to 2020	Early Adopters have "Super Cruise Control" and similar technologies.	Safety enhancements are anticipated but few traffic flow improvements are anticipated.	None – technology won't materially increase capacity on existing facilities.
2020 to 2030	Level 2 Technologies for Majority and Level 3 Technologies for Early Majority.	Increase in capacity of existing transportation network (collector and above) by 10% due to better traffic flow and fewer accidents.	If existing facilities are forecasted within 10% of transitioning from LOS E to D then technology improvements may avoid the need for roadway widening.
2030 to 2040	Level 3 for Majority and Level 4 "full automation" for Early Adopters.	Increase in capacity of existing transportation network by 20% due to better traffic flow and much better safety.	If existing facilities are forecasted within 20% of transitioning from LOS E to D then technology improvements may avoid the need for roadway widening.

Section 5 - What do these possibilities mean for transportation?

It would be undesirable to look naive or unimaginative to future generations for failing to have foreseen possible impacts of demographic changes, technology and automation on transportation. It would also be detrimental to the community to build unnecessary roads because technology, enhanced public transit or demographic trends sufficiently reduce traffic congestion. Great uncertainty surrounds the extent to which new technology will improve mobility and reduce traffic congestion in the future.

What is known is that citizens in the Roanoke Valley have spoken loud and clear through many public input opportunities that more and improved multimodal transportation options are greatly desired and needed. Plans such as the Roanoke Valley Transit Vision Plan, the Roanoke Valley Pedestrian Vision Plan, the 2012 Update to the Bikeway Plan for the RVAMPO, and the 2007 Update to the Conceptual Greenway Plan for the Roanoke Valley, for example, all provide recommendations for improving the multimodal characteristics of the Roanoke Valley's transportation network, and their successful implementation will be evident in the ease with which people can transfer easily between any combination of a car, a bus, a train, walking, and biking. The same needs exist for freight and goods movement.

The interconnectedness and ease of mobility between one mode of transportation with another is essential to the region's evolving transportation network and growing economy.

Section 6 - What funding is available to our region to make necessary investments in our transportation system?

Funding systems have changed since the 2035 long-range transportation plan. There are no longer financially constrained categories such as "City of Roanoke Urban System", "Roanoke County Secondary System", "Interstate System", "Primary System," etc. for every locality in the Study Area. The financial constraint is now done on a regional basis reflecting recent statewide prioritization and project selection procedures through Virginia's "System for the Management and Allocation of Resources for Transportation" which will hereafter be referred to by its acronym SMART SCALE. This is better for regional decision making and should strengthen the role of the RVTPO's Vision 2040 plan over time. The Vision 2040 plan's role will also change in response to a combination of SMART SCALE and the fact that the vast majority of anticipated future funding will be used for maintenance rather than new construction. This will likely mean that very few large-scale new terrain transportation projects will be built in the future. Rather, many transportation projects will be smaller incremental improvements.

The new financially constrained categories are as follows along with the total amount constrained from 2016 until 2040; the amounts reflect projections determined by VDOT.

Funding Program	**Total Funds Available**
Administrative	$88,272,296
SMART SCALE District Grant Program	$91,151,525
SMART SCALE High Priority Projects	$91,151,525
Maintenance - Localities	$411,870,834
Maintenance - VDOT	$1,698,097,653
Other Discretionary Construction	$196,149,537
Regional Surface Transportation Program (RSTP)	$79,443,881
RSTP-Match	$20,960,436
State of Good Repair	$133,520,967
Transportation Alternatives (TA Set-Aside)	$6,617,752
FY16 Constrained Long-Range Multimodal Transportation Plan TOTALS	**$2,817,236,406**

Funding categories from the preceding table such as administrative, maintenance and state of good repair are not available for adding capacity or new construction. They are included in the Vision 2040 plan because federal surface transportation funds are being used and federal regulations require their disclosure. The funding categories available for additional capacity or new equipment are depicted in the following table. It is especially noteworthy that this total is much smaller than the preceding total that includes both maintenance and state of good repair. In fact, maintenance alone (VDOT and Localities) makes up almost 75% of the financial constraint. This is a clear indication that lifecycle costs of transportation infrastructure are a very important consideration.

Maintaining existing infrastructure before constructing new infrastructure is the first priority. A key project for the Roanoke Valley that will require long-term maintenance though a sustainable funding source for its maintenance has not been identified is the Roanoke-Blacksburg Regional Airport tunnel over State Route 118/Airport Road NW. The airport provides a vital connection to the Roanoke Valley for people and freight and finding a sustainable way to fund tunnel maintenance is essential.

Only 25% of the total funds available are for "new construction"; thus, the number of large-scale transportation projects in RVTPO are limited.

Funding Sources available for New Construction	Total Funds Available
SMART SCALE District Grant Program	$91,151,525
SMART SCALE High Priority Projects	$91,151,525
Other Discretionary Construction	$196,149,537
Regional Surface Transportation Program (RSTP)	$79,443,881
RSTP-Match	$20,960,436
Transportation Alternatives (TA Set-Aside)	$6,617,752
TOTAL	**$485,474,656**

The amounts depicted above are sum totals from Fiscal Year 2016 through Fiscal Year 2040. These funding categories already account for inflation on the revenue side because each year that makes up the total is already in future dollars (Year of Expenditure Dollars - YOE) for that year.

A 3% annual inflation rate for project costs has been assumed in consultation with VDOT using their standard assumptions for planning level project cost inflation. The 3% annual inflation for project costs is higher than the growth rate of revenue using state level revenue collection assumptions. This means that the "purchasing power" will erode over time with respect to new transportation projects. In other words, the money available to the region will buy fewer projects in the out years of this long-range plan solely due to inflation.

The situation is even more striking with regards to public transit. Revenues for the maintenance and operation of existing public transit services is expected to remain flat. Therefore, inflation will take a larger toll on the purchasing power of future year transit dollars than on the transportation construction side. A one-year snapshot (FY 2016) of public transit specific funding for the Roanoke Valley is shown in the following table; estimated revenue projections were provided by the Virginia Department of Rail and Public Transportation.

FISCAL CONSTRAINT DEMONSTRATION - RVTPO Region

	FY 2016[2]			
	Estimated Federal Revenue	Non-Federal Revenue		Total Estimated Revenue
		Estimated State Revenue	Estimated local Revenue	
Section 5303[3]	$ 125,542	$ 15,693	$ 15,693	$ 156,928
Section 5307[4]	$ 2,449,772	$ 306,222	$ 306,222	$ 3,062,215
Section 5311[5]	$ 694,958	$ -	$ 334,958	$ 1,029,916
Section 5339 [4]	$ 268,621	$ 53,724	$ 13,431	$ 335,776
Section 5310	$ 221,013	$ -	$ 55,253	$ 276,266
TOTAL	**$ 3,759,906**	**$ 375,639**	**$ 725,557**	**$ 4,861,102**

[1] Calculations in this spreadsheet are based on FTA apportionments only and do not include CMAQ or STP funds that have been flexed into 5307. We have opted for a conservative approach and are showing FY2016-19 allocations at the level of FY2016 funding, without an inflation factor.

[2] Designates State fiscal year. Includes FTA apportionments from the Federal Register dated August 27, 2015.

[3] Section 5303 for FY 2016 based on approved FY 2016 Six Year Improvement Plan, FY2017-19 based on FTA apportionments from the Federal Register dated August 27, 2015.

[4] State and local match ratios depend on DRPT's current year match rate.

[5] Secion 5311 capital allocations are discretionary, therefore this forecast only includes 5311 operating assistance based on the approved 2016 Six Year Improvement Plan.

Summing up the fiscal years from FY 2016 through FY 2040 (25 years) gives us the following aggregate financial constraint for public transit specific funding sources (Note: due to rounding cents to the dollar, the totals below may be slightly different than a simple calculation of FY 2016 * 25.).

FISCAL CONSTRAINT DEMONSTRATION - RVTPO Region

	Total from FY 2016 through FY 2040			
		Non-Federal Revenue		
	Estimated Federal Revenue	Estimated State Revenue	Estimated local Revenue	Total Estimated Revenue
Section 5303[3]	$ 3,138,550	$ 392,325	$ 392,325	$ 3,923,200
Section 5307[4]	$ 61,244,300	$ 7,655,538	$ 7,655,538	$ 76,555,375
Section 5311[5]	$ 17,373,950	$ -	$ 8,373,950	$ 25,747,900
Section 5339 [4]	$ 6,715,525	$ 1,343,105	$ 335,776	$ 8,394,406
Section 5310	$ 5,525,325	$ -	$ 1,381,331	$ 6,906,656
TOTAL	**$ 93,997,650**	**$ 9,390,968**	**$ 18,138,920**	**$ 121,527,538**

Many projects associated with public transit such as service expansion buses, bus replacement, bus stop improvements, accessibility improvements, transfer centers and multimodal centers can be funded through the SMART SCALE District Grant Program or High Priority Program, RSTP, TAP and/or other construction and new project related funding sources. The FTA 5303,07,10,11, and 39 family of funding can be reserved for service maintenance and provision purposes. Other non 53** funding can and should be used for public transit supportive projects.

Section 7 - What projects will best meet the needs identified for today; and, as best we can tell, for the future?

There are two basic frameworks to keep in mind in identifying which projects will best meet our current and future needs: 1) Project selection and prioritization; and 2) Performance Based Planning over successive long-range transportation plans.

Project Selection and Prioritization

Transportation project ideas may come from a variety of sources including but not limited to:

- The Regional Travel Demand Model (TDM);
- Other regional transportation plans: the Regional Transit Vision Plan, the Regional Pedestrian Vision Plan and the Congestion Management Process Plan; and,
- Local government comprehensive, neighborhood, community and strategic plans.

There are typically more candidate projects than there are funds to consider for the financially constrained list of projects. Worthy projects that are not selected for the financially constrained list are placed on the vision list of projects. The purpose of the vision list is to provide ready to go projects should unanticipated additional funding be made available in the future to enlarge the financially constrained list.

Should projects receive funding that are not included in the Vision 2040 plan, they will need to be amended into the plan and the financially constrained list modified accordingly. *A project selection process and a Vision 2040 plan amendment process are currently under development.*

The initial project selection process used for this financially constrained list considered the projects that have already received funding in the Commonwealth Transportation Board's Six-Year Improvement Program as well as the projects for which funding has been applied through 2016. The project selection process for the vision list considered how well the projects meet the goals of the Vision 2040 plan, public input received from the previously mentioned planning process as well as additional input received specific to this CLRMTP, and the six factors found in Virginia's SMART SCALE system (see: http://vasmartscale.org/) which are: **Safety, Congestion Mitigation, Accessibility, Environmental Quality, Economic Development and Land Use**.

The financial constraint, for both public transit and transportation facility construction, functions at two levels. Some transportation projects are regionally significant and need to be listed individually in the financially constrained list of projects. Other projects such as spot improvements, adding bicycle and pedestrian accommodations to existing corridors, signal timings and various similar projects are to-be-determined based on applications in future funding cycles. Many smaller projects are financially constrained by virtue of being grouped in a financially constrained category with project selection to be determined by the appropriate

funding program's own selection and scoring procedures.

Determining which projects are "regionally significant" for the purposes of being listed individually in the Vision 2040 plan and which are grouped into a category involves the participation of Federal and State partners in the continuing, cooperative and comprehensive "3-C" process. The key distinction is between transportation projects that fall in either Category A or Category B:

- **Category A: "specifically referenced in"** the Vision 2040 plan (i.e identified individually such as but not limited to new road construction, interchange projects, fixed guideway transit projects, etc.); and,
- **Category B:** Projects that are **"consistent with"** the Vision 2040 plan. These projects are **not** the type that must be identified individually, *"i.e. specifically referenced in,"* (i.e including but not limited to: typical intersection improvements, signal timing, pedestrian and biking projects, bus shelters or other transit access enhancements, etc.), then the project should be compatible with the vision, strategies and goals of the Vision 2040 plan.

Performance-Based Planning

RVTPO constrained long-range multimodal transportation plans have at least a 20-year horizon. However, these plans are updated at least every five (5) years with each successive plan potentially moving the 20-year planning horizon out an additional five years. As such, an initial selection of constrained list projects in any given CLRMTP needs to be linked to subsequent decisions in future CLRMTPs. The best way to do this is to use performance measures in Performance-Based Planning.

This Vision 2040 plan will establish the initial list of performance measures (as referenced in the RVTPO's Annual Performance Measures Report) and targets that will measure the success of the long-range transportation planning process. Future CLRMTPs may amend or expand these measures. Annual updates on the performance measures should inform choices in future CLRMTPs in conjunction with the six SMART SCALE project selection factors. With this information, more informed and robust choices can be made regarding transportation.

The RVTPO has been reporting performance measures annually since 2012. Annual performance measures reports can be found on the Roanoke Valley-Alleghany Regional Commission's website (http://rvarc.org/transportation/mpo_urban_transportation/performace_measures). The goal of the Vision 2040 plan and other regional plans is to propose new relevant performance measures and otherwise advance performance-based planning. This will develop a positive feedback loop with regional transportation plans and the annual performance measures reports, so that the annual reports serve to integrate and track the measures developed in the planning process.

The financially constrained list of projects and the vision list of projects are provided in Appendix B.

Section 8 - Do these projects have any anticipated benefits or burdens from an Environmental Justice perspective?

Environmental Justice (EJ) has a slightly misleading name. It is more of a social justice and fairness concept. It does have a connection to the physical environment through emphasizing that traditionally underrepresented communities, low-income and minority communities, should not be adversely affected by disproportionate exposure to pollution, or other adverse impacts, from transportation projects. However, the central meaning behind EJ is more about not disrupting the social fabric, cohesion and development of traditionally underrepresented communities. Disruption could occur by separating communities with large thoroughfare transportation projects that don't directly serve the communities and may serve as barriers.

At its core EJ seeks to learn from the mistakes of the "Urban Renewal" era of the 1960s and 70s in which vibrant and successful urban neighborhoods were divided by freeways and highways subsequently harming the economic health and social fabric of the neighborhoods. More information about the official history of the EJ concept with its origins in Title VI of the Civil Rights Act of 1964 and Executive Orders 12898 and 13166 in the late 90s and early 2000s can be found in the RVTPO Title VI, Environmental Justice and Limited English Proficiency (LEP) Plan.

EJ concepts extend beyond the planning phase through the project development, engineering and construction phases. EJ concepts will primarily be implemented at two separate levels:

- In the CLRMTP, at the planning level, with the development of the financially constrained list of projects (and related amendments); and,
- When the RVTPO implements the CLRMTP by endorsing or approving projects for federal funding through the available federal funding programs, as reflected in the Transportation Improvement Program (TIP) and the Annual Obligations Report.

These two levels enable the continuous evaluation of projects and their EJ impacts. The EJ Framework will primarily identify red flags and screen out any potentially inappropriate projects from the long-range plan. Before projects are endorsed for federal funding programs, the TPO Policy Board can evaluate the projects again, in a more robust manner, and modify the scope of the project to address any additional EJ concerns that arise. The projects listed will be evaluated for EJ concerns as part of the technical report to the CLRMTP to be completed by Summer 2017.

Bibliography

AECOM. *Western Virginia Intermodal Facility: Economic and Transportation Impacts Study.* Virginia Office of Intermodal Planning and Investment and Roanoke Valley-Alleghany Regional Commission, June 2015. Print

Executive Order 12898. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Federal Register, Vol. 59, No. 32, Feb. 16, 1994

Forkenbrock, David J., and Sheeley, Jason (2004). Effective Methods for Environmental Justice Assessment. *NCHRP Report 532.* Transportation Research Board. Washington D.C.

Hill, Bryan. "Bonsack Area Public Transit Survey Analysis Report." (2015). *Roanoke Valley-Alleghany Regional Commission*.

Hill, Bryan. "RCIT/Blue Hills Transportation Survey Analysis Report." (2014). *Roanoke Valley-Alleghany Regional Commission*.

Kanter, Rosabeth Moss. *Move: Putting America's Infrastructure Back in the Lead*. N.p.: W.W. Norton, 2015. Print.

Multimodal System Design Guidelines. Virginia Department of Rail and Public Transportation, Oct. 2013. Web. Dec. 2014. <http://www.drpt.virginia.gov/media/1055/drpt_mmsdg_final_full.pdf>.

Regional Pedestrian Vision Plan: A Coordinated Approach to a Walkable Roanoke Valley. 22 Jan. 2015. Web. Accessed Feb. 2015. <http://rvarc.org/wp-content/uploads/2014/08/REGIONAL-PEDESTRIAN-VISION-PLAN-2015.pdf>.

Roanoke Valley Area Metropolitan Planning Organization Congestion Management Process Plan 2013/14. Jan. 2014. Roanoke Valley-Alleghany Regional Commission. Web. http://rvarc.org/wp-content/uploads/2014/01/CMP-Plan_Final-Draft.pdf.

Roanoke Valley Transportation Planning Organization Regional Performance Measures Report. Oct 2015. Roanoke Valley-Alleghany Regional Commission. Web. http://rvarc.org/transportation/mpo_urban_transportation/performance_measures

Smith, Scott. "Soon American Highways Could Be Overrun with Self-driving Trucks." Quartz. Atlantic Media Company, 25 Feb. 2015. Web. 04 Mar. 2015. <http://qz.com/349051/soon-american-highways-could-be-overrun-with-self-driving-trucks/>.

APPENDIX A: GOALS FROM THE CONSTRAINED LONG-RANGE TRANSPORTATION PLAN 2035

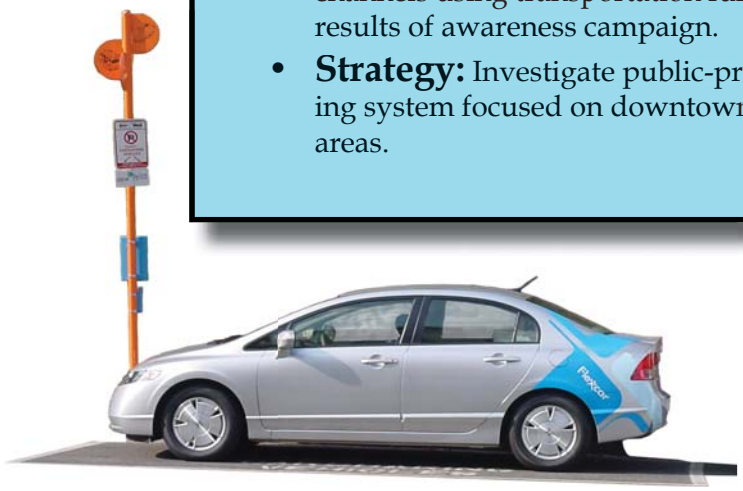
Goals and Objectives

The RVAMPO CLRTP 2035 establishes a set of goals, objectives, and strategies to help guide the planning process. For the purposes of this plan the following definitions are used for goal, objective, and strategy:

Goal - A long-term end toward which efforts are directed.
Objective - A specific, intermediate program or activity that marks progress toward a goal.
Strategy - A measurable plan of action or way in which programs and activities are coordinated to achieve an identified goal and objective.

Goal One: Improve transportation system performance and air quality *and* reduce growth in transportation-related energy use by reducing the growth rate of Vehicle Miles Traveled (VMT)

- **Objective:** Plan for non-interstate park and ride lots by including construction costs or private sector partnership costs in the Financially Constrained List of Transportation Projects (FCLTP).
  - **Strategy:** Develop a program, focused on key regional arterial corridors, to encourage businesses, churches, and other organizations with pre-existing excess parking capacity, to officially section off portions of their existing parking lots as park and ride sections. Progress on this objective can be measured by the number of such partnerships by a certain date.
  - **Strategy:** Add the estimated construction cost of one non-interstate 20-space park and ride lot to the project costs of major arterial construction projects over one mile in length in the FCLTP.
- **Objective:** Increase performance and awareness of Travel Demand Management (TDM) Program.
  - **Strategy:** Conduct professional target market analysis and create campaign for commuters near major regional corridors using transportation funds from construction revenues.
  - **Strategy:** Develop VMT reduction awareness campaign using a wide variety of communication products, possibly including: public service announcements, advertising, social networking, and other appropriate channels using transportation funds from construction revenues. Measure results of awareness campaign.
  - **Strategy:** Investigate public-private partnerships to implement a car sharing system focused on downtown, village centers, and mixed use residential areas.



Goal Two: Increase percentage of "complete streets" by adding elements that adapt existing right-of-way (ROW) and travel corridors for safe use by multiple transportation modes.

- **Objective:** Provide bicycle accommodations on key commute corridors.
  - **Strategy:** Apply at least 2% of total FCLTP funds to bicycle enhancements.
  - **Strategy:** Install or provide installation incentives for an additional 50 bicycle racks by the time horizon of this plan.
- **Objective:** Increase pedestrian access and safety on collector and arterial roads.
  - **Strategy:** Include sidewalk costs in FCLTP project cost estimates for roadways that function at the collector or arterial level and currently lack sidewalks.
  - **Strategy:** Include costs for crosswalks and pedestrian crossing signals to connect sidewalks already present or to be constructed in FCLTP project cost estimates.
- **Objective:** Reconfigure, restripe, and/or resurface urban collectors and arterials to include bicycle lanes, sidewalks, or pedestrian paths in accordance with local comprehensive plans and local design guidelines.
  - **Strategy:** Include "stand alone" bicycle or pedestrian accommodations that are attached to existing collectors or arterials in FCLTP where appropriate.

Goal Three: Assure that transportation improvements are compatible with local comprehensive plans and regional economic development activities.

- **Objective:** Consult local government design guidelines and neighborhood plans to more accurately develop project cost estimates for candidate LRTP 2035 projects.
- **Objective:** Construct "Roanoke River Greenway" as defined in "2007 Update to the Roanoke Valley Conceptual Greenway Plan" by the end of CLRTP 2035 time horizon.
  - **Strategy:** Periodically monitor "Roanoke River Greenway" implementation and schedule.
  - **Strategy:** Apply surface transportation funds, as appropriate, to "Roanoke River Greenway" construction.

Goal Three - continued:

- **Objective:** Assure adequate transportation connectivity between Downtown Roanoke and Biomedical Center Complex on Reserve Avenue.
- **Objective:** Plan for freight needs on applicable corridors.
  - **Strategy:** Review candidate CLRTP 2035 projects for inclusion in the 2002-03 "Roanoke Valley – Alleghany Regional Freight Study" and give special consideration to included projects.
  - **Strategy:** Consider extra costs needed to accommodate vehicles with long wheel bases in appropriate candidate CLRTP 2035 projects.
- **Objective:** Develop telework as a complement to existing commuting patterns and as an inter-regional transportation option for those living in the RVAMPO area and teleworking to larger metropolitan areas.
  - **Strategy:** Continue to work with City of Roanoke Economic Development and Telework VA program to expand telework options both inter- and intra–regionally. Report number of registered telework participants on an annual basis.
- **Objective:** Continue to investigate an increased role for rail, both intermodal freight and a possible re-establishment of passenger rail service.
  - **Strategy:** Investigate under-analyzed niche markets for passenger rail service and cross reference with existing economic development and tourism planning initiatives.
  - **Strategy:** Assess intermodal freight aspect of candidate CLRTP 2035 projects.

Goal Four: Maximize benefits from limited transportation funds by focusing on bottleneck improvements, spot improvements, and/or technology improvements to be applied to the transportation system at a lower cost than traditional construction costs.

- **Objective:** Provide funds for signal timing coordination and synchronization plans and studies on key regional corridors.
- **Objective:** Consider corridor improvements as a combination of a series of intersection or bottleneck improvements coupled with appropriate safety and accessibility.
  - **Strategy:** Program costs for roundabouts where feasible and track number of roundabouts implemented.
  - **Strategy:** Program costs for signal timing, reversible lane or other operations systems designed to get extra capacity out of existing infrastructure.

Goal Five: Enhance transportation safety for all users and bystanders.

- **Objective:** Develop at least 10 active or completed Safe Routes to Schools (SRTS) plans or projects by the end of the CLRTP 2035 time horizon.
  - **Strategy:** Develop at least one SRTS plan in each RVAMPO locality within the next 10 years.
- **Objective:** Use data analysis to identify top regional accident locations on a vehicle miles traveled, entering volume or other standard measure.
- **Objective:** Identify regionally significant right of way or human factors that have the potential to lead to accidents in anticipated projects listed in this plan.
  - **Strategy:** Investigate whether public policies such as limiting mobile phone use in operating vehicles can be implemented at the local or regional level.

Goal Six: Anticipate transportation needs of retiring Baby Boom population in projects selected for CLRTP 2035.

- **Objective:** Target future areas that are projected to have a concentration of "carless households" in retirement age ranges.
  - **Strategy:** Develop regional "non-commute trip" ridesharing system for non-emergency medical, shopping, and social trips. Have such a program in operation by 2012.

Goal six - continued:

- **Strategy:** Investigate a regional car sharing system designed to appeal to households who want to own one vehicle or less on a permanent basis. Report feasibility by 2012.
- **Strategy:** Investigate feeder system (e.g. taxi, jitney-style, or other para-transit feeder system) that targets concentrations of "future carless households" to the current fixed route transit system. Integrate concept into regional transit development plan by 2012.
- **Strategy:** Investigate bicycle sharing/renting systems that could serve as a transit feeder system. Integrate concept into regional bicycle plan by 2010.

- **Objective:** Investigate daily bus service between Roanoke Valley and Smith Mountain Lake to connect retired lake residents with regional airport and other transportation connections.

APPENDIX B: Financially Constrained and Vision Project Lists

The following table shows the operating budget projections needed to sustain current services for the Greater Roanoke Transit Company through 2040. The projections reflect a 3% annual inflation.

Fiscal Year	Amount
2017	$8,825,180.00*
2018	$9,089,935
2019	$9,362,633
2020	$9,643,512
2021	$9,932,818
2022	$10,230,802
2023	$10,537,726
2024	$10,853,858
2025	$11,179,474
2026	$11,514,858
2027	$11,860,304
2028	$12,216,113
2029	$12,582,596
2030	$12,960,074
2031	$13,348,877
2032	$13,749,343
2033	$14,161,823
2034	$14,586,678
2035	$15,024,278
2036	$15,475,007
2037	$15,939,257
2038	$16,417,434
2039	$16,909,957
2040	$17,417,256

* This number comes from the Virginia Commonwealth Transportation Board FY17 Rail and Public Transportation Improvement Program.

Roanoke Valley Transportation PLANNING ORGANIZATION
Staffed by the REGIONAL commission

Financially Constrained List of Projects

#	UPC	JURISDICTION	CONSTRAINED LIST: PROJECT NAME AND LIMITS	EST. COST IN YEAR OF EXPENDITURE
1	107053	Bedford Co.	Rte. 24 Bedford County - Safety Improvements (RVTPO portion is 0.4 mi. of 1.5 mi.)	$432,000
2	107521	Botetourt Co.	Daleville Greenway	$595,000
3	75910	Botetourt Co.	Rte. 11,220,220A Access Management Project at I-81 Exit 150	$18,038,000
4	N/A	Botetourt Co.	Exit 150 Park and Ride	$9,232,329
5	110101	City of Roanoke	Tinker Creek Trail Extension	$1,220,000
6	106265	City of Roanoke	Garden City Blvd. Bike/Ped - Transportation Alternatives	$246,000
7	108908	City of Roanoke	HB2 FY17 U.S. 220 Communications and Adaptive System Project	$422,500
8	11908	City of Roanoke	HB2 FY17 10TH Street - 2 Lane, Bike Lane, Curb & Gutter, Sidewalk	$12,451,245
9	N/A	City of Roanoke	Campbell Avenue Bike and Ped Improvements	$3,300,000
10	108896	City of Roanoke	HB2 FY17 Colonial Avenue Improvements	$2,545,000
11	N/A	City of Roanoke	Franklin Road sidewalk	$1,313,458
12	109288	City of Roanoke	HB2 FY17 Transit Accessibility Improvements on Edgewood Street	$350,811
13	N/A	City of Roanoke	Valley View Boulevard Extension from I-581 to Cove Road	$76,987,692
14	709	City of Roanoke	Tenth Street Improvements	$3,459,000
15	N/A	City of Roanoke	U.S. 220 Expressway Acceleration Lane Improvement	$2,646,129

#	UPC	JURISDICTION	CONSTRAINED LIST: PROJECT NAME AND LIMITS	EST. COST IN YEAR OF EXPENDITURE
16	N/A	City of Salem	Mason Creek Greenway from Route 460 to Roanoke River Greenway	$3,929,720
17	N/A	City of Salem	East Main Street/Downtown Salem Streetscape	$9,169,346
18	108853	City of Salem	East Main Street / College Avenue - Pedestrian Improvements	$1,001,000
19	108899	City of Salem	HB2 FY17 Multimodal Improvements along Boulevard	$884,881
20	N/A	City of Salem	East Main Street Phase II – Brand Ave. to Kessler Mill	$17,028,786
21	8753	City of Salem	HB2 FY17 U.S. 460 - Widen TO 3 Lanes w/ Bike Lane, Curb, Sidewalk	$2,912,984
22	N/A	Multi-Jurisdictional	Tinker Creek Pedestrian Bridge	$1,459,500
23	N/A	Multi-Jurisdictional	Tinker Creek Greenway Connectivity Study	$400,000
24	N/A	Multi-Jurisdictional	I-81 Auxiliary Lane Projects	$45,971,414
25	N/A	Multi-Jurisdictional	Bus Stop Accessibility	$1,000,000
26	N/A	Multi-Jurisdictional	Ongoing Bus Replacement and Rebuild Program	$44,298,755
27	T18675	Multi-Jurisdictional	Valley Metro Transit Vehicle Replacements	$15,002,535
28	N/A	Multi-Jurisdictional	Six (6) Additional Vehicles (short-term)	$3,667,738
29	N/A	Multi-Jurisdictional	Valley Metro Expanded Maintenance Facility	$2,626,915
30	N/A	Multi-Jurisdictional	Real Time Information System (short-term)	$238,810
31	97171	Roanoke Co.	HB2 FY17 Roanoke River Greenway, Green Hill Park to Riverside Park	$4,542,105

#	UPC	JURISDICTION	CONSTRAINED LIST: PROJECT NAME AND LIMITS	EST. COST IN YEAR OF EXPENDITURE
32	N/A	Roanoke Co.	Roanoke River Greenway Extension through Explore Park to Rutrough Rd.	$4,274,439
33	N/A	City of Salem	Roanoke River Greenway from Rotary Park to Roanoke City Corporate Limit	$3,929,720
34	N/A	Roanoke Co.	Roanoke River Greenway from Blue Ridge Parkway to Explore Park	$2,029,889
35	91191	Roanoke Co.	Roanoke River Greenway - City of Roanoke to Blue Ridge Parkway	$1,608,000
36	108906	Roanoke Co.	HB2 FY17 I-81 NB Auxiliary Lane from Exit 141 to 143	$29,830,716
37	N/A	Roanoke Co.	Adaptive Traffic Control Improvements: U.S. 221/ Brambleton Ave. (Colonial Ave. to Ranchcrest Dr.) and Rte. 419/Electric Rd. (Springwood Park Dr. to McVitty Rd.; Carriage Ln. to Valley Dr.)	$663,457
38	N/A	Roanoke Co.	Plantation Road Improvements Phase II Walrond Drive to Gander Way	$2,295,237
39	N/A	Roanoke Co.	West Main Street Pedestrian Improvements – Phase II	$1,182,451
40	107055	Roanoke Co.	U.S. 11/Williamson Rd. & Rte. 117/Peters Creek Rd. (from Peters Creek Rd. to Bike & Pedestrian Safety Improvements	$1,000,000
41	107054	Roanoke Co.	Rte. 311 (under I-81) Bike & Ped Safety Improvements	$700,000
42	N/A	City of Salem	Downtown Streetscape and Intersection Improvements	$358,216
43	103607	Roanoke Co.	Plantation Road Streetscae Improvements	$211,000
44	108882	Roanoke Co.	West Main Street Sidewalk Installation	$134,000

#	UPC	JURISDICTION	CONSTRAINED LIST: PROJECT NAME AND LIMITS	EST. COST IN YEAR OF EXPENDITURE
45	15187; 15188	Roanoke Co.	Rte. 1662/McVitty Rd. & Rte. 1663/Old Cave Spring Rd. Improvements	$29,473,906
46	107061	Roanoke Co.	HB2 FY17 Rte. 419 Safety Improvements at Tanglewood	$4,853,432
47	77305	Roanoke Co.	Rte. 116/Jae Valley Rd. over Back Creek - Bridge Replacement	$2,121,000
48	108904	Roanoke Co.	HB2 FY17 Rte. 311 / Rte. 419 Int. Safety & Congestion Improvements	$1,957,006
49	108905	Roanoke Co.	HB2 FY17 Lila Dr. / Rte. 115 Intersection Safety Improvements	$1,269,396
50	99542	Roanoke Co.	Exit 140 Park and Ride Reconstruction	$1,502,079
51	N/A	Town of Vinton	Glade Creek Greenway, Phase II	$597,026
52	N/A	Town of Vinton	Walnut Avenue Improvements Project	$3,663,585
53	93160	Town of Vinton	Rte. U000 - Walnut Ave. Int. Improvement at 8th Street	$2,767,813
			TOTAL:	**$383,796,021**

The total constrained amount for new construction ($383,796,021) is lower than the projected available funding as initially provided by VDOT of $485,474,656. The difference is the actual amount that has been allocated for the FY2016-2021 period is significantly less than the projected amount.

Vision List of Projects

DESIRED TIMEFRAME	JURISDICTION	VISION LIST: PROJECT NAME AND LIMITS	PROJECT COST (2016$)
M	City of Roanoke	Williamson Rd. – Orange to Angell (road diet)	$9,500,000
M	City of Roanoke	Memorial Ave. – Grandin to Denniston (streetscape impr.)	$1,500,000
M	City of Roanoke	Lick Run Greenway	$3,000,000
M	City of Roanoke	Liberty Rd. - Burrell to Hollins (add turn lanes, C&G, sidewalk, bike lanes, drainage, reconstruct signal)	$7,000,000
M	City of Roanoke	King St. – Gus Nicks to Orange (add turn lanes, C&G, sidewalk, bike lanes, drainage, reconstruct signal)	$7,500,000
M	City of Roanoke	Jefferson St. – Elm to McClanahan (road diet)	$13,000,000
M to L	City of Roanoke	Hollins Rd. (Orange Ave. to Liberty Rd) widening to 4 lanes w/bicycle ln.	$6,100,000
	City of Roanoke	Hershberger Rd. – Cove to Peters Creek (add turn lanes, C&G, sidewalk, bike lanes, drainage)	$6,900,000
L	City of Roanoke	Develop Orange Avenue to Urban 6 Lanes (13th St. to Gus Nicks Blvd.)	$49,519,000
M	City of Roanoke	Cove Rd. – Hershberger to Peters Creek (add turn lanes, C&G, sidewalk, bike lanes, drainage)	$7,500,000
M	City of Roanoke	Colonial Avenue Improvements – Brandon Ave. to Winding Way (streetscape, C&G, sidewalk, widen 1-ln., drainage)	$5,300,000
M	City of Roanoke	Church Ave. – Jefferson to 5th streetscape improvements	$2,800,000
M to L	City of Roanoke	9th St., SE (streetscape, pedestrian improvements, roundabouts, road diet & ped impr.)	$7,300,000

DESIRED TIMEFRAME	JURISDICTION	VISION LIST: PROJECT NAME AND LIMITS	PROJECT COST (2016$)
L	City of Roanoke	13th Street/Hollins Rd. Improvements	$63,266,000
S to M	City of Roanoke / GRTC	Downtown Roanoke Intermodal Station	$10,000,000
	City of Salem	Rte. 311/Thompson Memorial Improvements	$5,000,000
M	City of Salem	Braeburn Drive – Transit/Bike/Ped Improvements	$500,000
M	City of Salem	Apperson Drive Streetscape/Multimodal Improvements	$300,000
S to M	Multi-Jurisdictional	I-81 Auxiliary Lanes	$84,486,697
S to M	Roanoke Co.	U.S. 221/Brambleton Ave. Pedestrian Improvements (Roanoke City to Electric Rd.; SRTS - various)	$1,000,000
M to L	Roanoke Co.	U.S. 220 Improvements from Electric Rd./Rte. 419 to Franklin County	$136,000,000
M	Roanoke Co.	U.S. 11/Williamson Rd. (from Peters Creek Rd. to Roanoke City Limit) Urban 2 or 4-lanes & Bike/Ped Improvements	$24,000,000
M to L	Roanoke Co.	U.S. 11/U.S. 460 Corridor Study	
M to L	Roanoke Co.	Rte. 907/Starkey Rd. Improvements (Urban 2 or 4-lane, with bike/ped accommodations)	$12,000,000
M to L	Roanoke Co.	Rte. 687/Penn Forest Rd. - Bicycle and Pedestrian Improvements (From Colonial Ave. to Starkey Rd.)	$1,000,000
M	Roanoke Co.	Rte. 682/Garst Mill Rd. - Bicycle and Pedestrian Improvements (From Brambleton Ave. to Grandin Rd.)	$1,100,000
M to L	Roanoke Co.	Rte. 679/Buck Mountain Rd. - urban 2-lane with turn lanes, bicycle and pedestrian improvements (From Starkey Rd. to U.S. 220)	$1,500,000
M to L	Roanoke Co.	Rte. 634/Hardy Rd. - urban 4-lane or 2-lane with turn lanes, bicycle and pedestrian improvements (from Vinton to Bedford Co.)	$1,200,000

DESIRED TIMEFRAME	JURISDICTION	VISION LIST: PROJECT NAME AND LIMITS	PROJECT COST (2016$)
M	Roanoke Co.	Rte. 625/Hershberger Rd. - Urban 2-lane with turn lanes, bicycle and pedestrian accommodations (Roanoke City to Plantation Rd.)	$500,000
M to L	Roanoke Co.	Route 116/Jae Valley Rd. Improvements (rural 2-lane w/shoulder improvements)	$23,000,000
S to M	Roanoke Co.	Route 115/Plantation Road urban 2 or 4-lane with turn lanes, bike/ped accommodations (Williamson Road to Roanoke City)	
S to M	Roanoke Co.	Roanoke River Greenway West - West Main Street Pedestrian Connections	
S to M	Roanoke Co.	Roanoke River Greenway West - Green Hill Park to Montgomery County	$15,000,000
L	Roanoke Co.	I-73 - Roanoke County - Partial PE Only	$42,459,000
M	Roanoke Co.	I-581 & Peters Creek Rd. Interchange Improvements (enhancing access to Valleypointe Dr.)	$4,500,000
M to L	Roanoke Co.	Friendship Lane/Carvins Creek Bridge Replacement	$100,000
S to M	Roanoke Co.	Explore Park Access - Secondary Access Points from Rutrough Rd. and Road Circulation Improvements	$5,884,230
M to L	Roanoke Co.	Explore Park Access - Hardy Rd./Blue Ridge Parkway Connection	$4,885,000
M	Roanoke Co.	Electric Road/419 & Brambleton to Postal Multimodal Improvements	$100,000
M to L	Roanoke Co.	Develop U.S. 460/Challenger Ave. to Urban 6 lanes (continuation of Roanoke City project - from Roanoke City Limits to Botetourt Co.)	$36,000,000
M to L	Roanoke Co.	Rt. 419/Ogden Rd. to Rt. 221 – Urban 6 lane w/bike, pedestrian	
S to M	Roanoke Co.	Rt. 11, Peters Creek to Botetourt Co., Bike/Pedestrian Improvements	
M	Roanoke Co. / GRTC	Roanoke County Transfer Facilities (various)	$900,000
M	Multi-Jurisdictional	Brambleton Avenue – Multimodal Improvements	$3,600,000

DESIRED TIMEFRAME	JURISDICTION	VISION LIST: PROJECT NAME AND LIMITS	PROJECT COST (2016$)
M	Multi-Jurisdictional	Interchange Lighting at I-81 Exits 137-150	$8,400,000
	Multi-Jurisdictional	Tinker Creek Greenway from Masons Mill to Greenfield	$10,000,000
	Town of Vinton	Washington Avenue Pedestrian Crossing	
M	Town of Vinton	Walnut Avenue and 8th Street Intersection	$2,300,000
M	Town of Vinton	Virginia Ave./Rte. 24 bicycle improvements (from ECL City of Roanoke to Chestnut St.	
M	Town of Vinton	Hardy Road SRTS Project (to include new signalized intersection)	$300,000
ANY	Town of Vinton	Glade Creek Greenway, Phase III	$300,000
M	Town of Vinton	Comprehensive Traffic Intersection Improvements	$2,800,000