

*Photo Credit - BeyondDC/Flickr

CHAPTER 5

FINANCIALLY CONSTRAINED ELEMENT

The financially constrained element of Visualize 2045 identifies all the regionally significant capital improvements to the region's highway and transit systems that transportation agencies expect to make and to be able to afford through 2045. It also outlines all anticipated spending on the current and future transportation system's operations and maintenance over the same timeframe. Any project that might affect future air quality by adding or removing highway or transit capacity is included in this portion of the plan.

The financially constrained element includes regionally significant projects and programs that seek to efficiently move people and goods using a variety of transportation modes. The investments spelled out in this element aim to meet the region's current mobility and accessibility needs, as well as those that will arise in the future.

There are three major types of projects and programs included in the financially constrained element. They are:

1. **System Expansion.** Projects that add new capacity by increasing the number of lane-miles of roadway or by building new transit lines or adding service to existing lines.
2. **State of Good Repair.** Major rehabilitation or complete replacement of aging infrastructure, including bridges, transit vehicles, and technology and communications systems, as they near the end of their useful lifespan.
3. **Operations and Maintenance.** Day-to-day activities like repaving roadways, inspecting and maintaining bridges, clearing snow and debris, servicing transit vehicles, maintaining and operating traffic signals, and paying train and bus operators.



Photo Credit - Aimee Custis/Flickr

System expansion investments are detailed as specific projects in the plan. Anticipated investments in state of good repair and operations and maintenance are discussed more generally. These investment details are included as part of the financial analysis of the plan (Appendix A).

This chapter includes lists and maps of the projects as well as an analysis of how they will help bring the region closer to fulfilling the concepts called for in the seven endorsed aspirational initiatives. This chapter includes summaries of the financial plan and the Air Quality Conformity analysis. It also includes an analysis which demonstrates the projected future performance of the transportation system in 2045.

FEDERAL REQUIREMENTS

Federal regulations require the TPB to develop a long-range transportation plan identifying the projects expected to be funded within a minimum planning horizon of 20 years. The TPB must demonstrate that there is funding available for those projects. The total expenditures cannot exceed the total anticipated funding. The TPB must also analyze the plan for its effect on the region's air quality.

Projects in the Financially Constrained Element

The following lists and maps highlight more than 100 of the major and regionally significant projects that provide for system expansion and changes in highway or transit capacity. To view an interactive version of the maps in this chapter and to access the project database (including full technical descriptions), please visit **visualize2045.org/financially-constrained-element**.

In all, the plan includes 1,388 new lane-miles of roadway and 124 new miles of high-capacity transit. Appendix B: Summary of Projects in the Financially Constrained Element includes a comprehensive listing of all projects in the financially constrained element beyond those highlighted in this chapter (numbering over 600) along with their costs, completion dates, and links to further project information.

Figure 5.1 Projects in the Financially Constrained Element

**Tolled Lanes are a subset of Freeways/Expressways*

	System	Existing	Added by Visualize 2045	Total 2045
Roadway (lane miles)	Freeways / Expressways	3,589	+975	4,564
	Arterials	13,459	+413	13,872
	Total	17,048	+1,388	18,436
Tolled Lanes* (lane miles)		436	+461	897
High-Capacity Transit (miles)	Metrorail	119	+12	131
	Light Rail / Streetcar	2	+21	23
	Bus Rapid Transit	4	+91	95
	Commuter Rail	167	0	167
	Total	292	+124	416



Photo Credit - Aimee Custis/Flickr

Major Highway Projects

DISTRICT OF COLUMBIA

MAJOR HIGHWAYS

1. I-295 - reconstruct interchange at Malcolm X Blvd, 2020 ($200M)
2. I-395 - remove 3rd St SB exit ramp, reconfigure 3rd St SB entrance and 2nd St NB exit ramps, reconnect F St between 2nd and 3rd St, 2019 ($27M)

LOCAL ROADS

3. South Capitol St - convert to 6 lane urban blvd, incl. Frederick Douglass Bridge Reconstruction, 2021 ($822M)
4. **Lane Reductions/Reconfigurations for Bicycle Lanes, 2018, 2019, 2020, 2024 (not mapped)**

MARYLAND

MAJOR HIGHWAYS

5. I-70 - widen to 6 lanes with interchange at Meadow Rd, 2025, 2035 ($143M)
6. I-95/I-495 - interchange at Greenbelt Metro Sta, 2030 ($196M)
7. **I-95/I-495 Traffic Relief Plan, construct 4 managed lanes, 2025 ($4.2B)**
8. **I-270 Traffic Relief Plan, construct 4 managed lanes, 2025 ($3.4B)**
9. **I-270 - "Innovative Congestion Management" project to includes auxiliary lanes & add'l improvements, 2019 ($114M)**
10. I-270 - interchange at Watkins Mill Rd Ext, 2021 ($120M)
11. Baltimore Washington Parkway (MD-295) at MD-193 (Greenbelt Rd) - intersection improvement, 2020 ($8.5M)
12. Suitland Pkwy - interchange at Rena/ Forestville Rd, 2025 ($2.8M)
13. US-1 (Baltimore Ave) - reconstruct 4 lanes, 2030 ($116M)
14. US-15 (Catoctin Mtn Hwy) - reconstruct intersection at Monocacy Blvd, 2018 ($61M)
15. **US-15 (Frederick Fwy and Catoctin Mtn Hwy) - widen to 6 lanes with interchange at Biggs Ford Rd, 2030, 2040, 2045 ($220M)**
16. **US-29 (Columbia Pke) - improve interchanges at Stewart Ln, Tech Rd/ Industrial Pkwy, Musgrove Rd/Fairland Rd, Greencastle Rd, and Blackburn Rd, 2045 ($646M)**
17. US-50 (John Hanson Hwy) - westbound ramp to Columbia Park Rd, 2025 ($64M)
18. **US-301 (Crain Hwy) - widen to 6 lanes, 2045 ($4.6B)**
19. US-301 - widen Governor Harry Nice Memorial Bridge, 2023 ($768M)

STATE ROUTES

20. MD-3 (Robert Crain Hwy) - widen to 6 lanes, 2035 ($1.8B)
21. MD-4 (Pennsylvania Ave) - widen to 6 lanes with interchanges at Dowerhouse Rd, Westphalia Rd, and Suitland Pkwy, 2040 ($533M)
22. MD-5 (Branch Ave) - upgrade, widen to 6 lanes including interchanges, 2035 ($790M)
23. MD-28 (Norbeck Rd) / MD-198 (Spencerville Rd) - widen to 4, 6 lanes, 2045 ($413M)
24. MD-85 (Buckeystown Pke) - widen to 4, 6 lanes, 2021, 2035 ($220)
25. **MD-97 (Georgia Ave) - widen to 7, 8 lanes, 2025 ($52M)**
26. MD-97 (Brookeville Bypass) - construct 2 lane bypass, 2021 ($52M)
27. MD-117 (Clopper Rd) - widen to 4 lanes, 2030 ($69M)
28. MD-118 (Germantown Rd) - widen to 4 lanes, 2020 ($4.0M)
29. MD-124 (Woodfield Rd) - widen to 6 lanes, 2035 ($129M)
30. MD-197 (Collington Rd) - widen to 4/5 lanes, 2025 ($94M)
31. MD-202 (Landover Rd) - Largo Town Center Metro Access Improvement, reconstruct 6 lanes, 2045 ($24M)
32. MD-210 (Indian Head Hwy) - upgrade to 6 lanes and interchange improvement, 2040 ($754M)
33. MD-223 (Woodyard Rd) - widen to 4 lanes, 2020 ($2.8M)
34. MD-450 (Annapolis Rd) - widen to 4 lanes, 2030 ($67M)

LOCAL ROADS

35. Mid county Hwy Extension (M-83) - construct 4, 6 lanes, 2025 ($202M)
36. Middlebrook Rd Extended - widen to 4 lanes, 2025 ($16M)
37. Montrose Pkwy East - construct 4 lanes, 2025 ($140M)

VIRGINIA

MAJOR HIGHWAYS

38. I-66 HOT (Inside Beltway), revise operations from HOV 2+ to HOT during peak hours and bus service, 2017, 2021, 2040 ($375M)
39. I-66 HOT (Outside Beltway) - widen to 6 lanes (3 general purpose, 2 HOT, and 1 auxiliary) and bus service, 2021, 2040 ($4.4B)
40. I-66 - Extend existing westbound acceleration/ deceleration lane, 2020, 2022 ($59M)
41. I-95/Fairfax County Parkway - enhanced interchanges for BRAC, 2025 ($57M)
42. **I-95 - add southbound auxiliary lane, 2028 ($27M)**
43. I-95/I-495 - reconstruct interchange at Van Dorn St, 2030 ($40M)
44. I-395 HOT - additional lane and revise operation from HOV 3+ during peak to HOT 3+, 2019 ($220M)
45. I-395 - construct new south bound lane, 2018, 2020 ($58M)
46. **I-495 - construct 4 HOT lanes, 2025 ($500M)**
47. I-495 Auxiliary Lanes - construct 2 auxiliary lanes in both directions, 2030
48. I-495 - interchange at VA 267, 2030 ($70M)
49. Dulles Toll Rd (VA-267) - Collector-Distributor Road west-bound, 2037 ($62M)
50. Dulles Toll Rd (VA-267) - Collector-Distributor Road east-bound, 2036 ($124M)
51. Dulles Toll Rd (VA-267) - interchange at New Boone Blvd Extension, 2037 ($79M)
52. Dulles Toll Rd (VA-267) - interchange at Greensboro Drive/Tyco Rd, 2036 ($28M)
53. Dulles Access Rd (VA 267) - widen to 6 lanes including interchange reconstruct at I-495, 2030 ($40M)
54. US-1 (Jefferson Davis Hwy) - widen to 6 lanes, 2040 ($58M)
55. US-1 (Richmond Hwy) - widen to 6 lanes, 2025, 2035 ($37M)
56. US-1 (Richmond Hwy) - widen to 6 lanes, 2024, 2030 ($127M)
57. US-1 (Richmond Hwy) - widen to 6 lanes, 2035 ($125M)
58. US-15 (James Madison Hwy) - widen to 4 lanes, 2024, 2030 ($45M)
59. **US-15 (James Madison Hwy) - widen to 4 lanes, 2022, 2025 ($33M)**
60. US-15 (James Madison Hwy) - widen to 4 lanes, 2030, 2040 ($54M)
61. US-29 (Lee Hwy) - widen to 5 lanes and improve I-66 interchange, 2030 ($255M)
62. US-29 (Lee Hwy) - widen to 3, 6 lanes, 2017, 2025 ($130M)
63. US-50 (Lee Jackson Memorial Hwy) - widen to 6 lanes, 2025 ($100M)
64. US-50 (Arlington Blvd) - widen/reconstruct 6 lanes including interchanges, 2020, 2025 ($249M)

STATE ROUTES

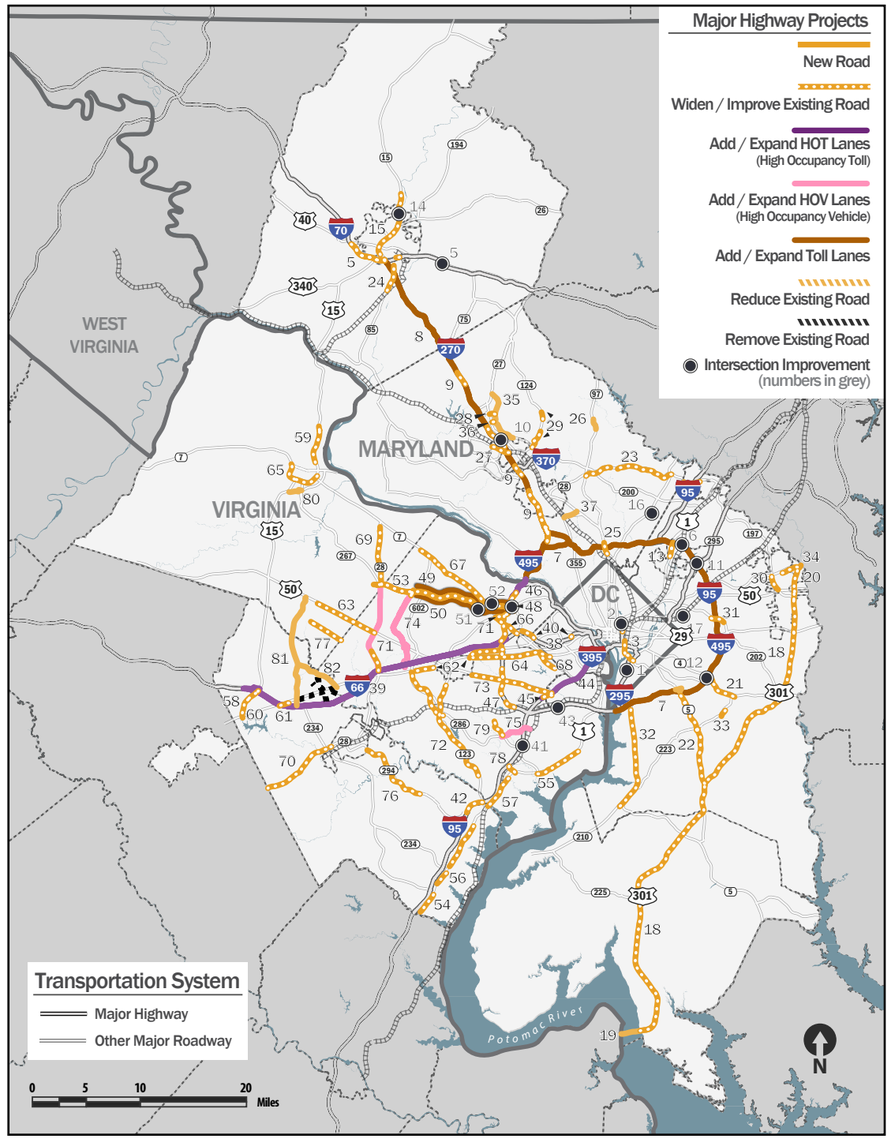
65. VA-7/US-15 Bypass (Harry Byrd Hwy) - widen to 6 lanes, 2035, 2040 ($55M)
66. VA-7 (Leesburg Pke) - widen to 6 lanes, 2021 ($71M)
67. VA-7 (Leesburg Pke) - widen to 6, 8 lanes, 2021, 2025, 2030 ($49M)
68. VA-7 (Leesburg Pke) - widen to 6 lanes, 2020, 2025 ($34M)
69. VA 28 (Sully Rd) HOV, widen to 8-10 lanes, HOV in additional lanes during peak, 2016, 2025, 2040 ($100M)
70. VA-28 (Nokesville Rd) - widen to 4 or 6 lanes, 2019, 2025, 2022, 2040 ($71M)
71. VA-123 (Chain Bridge Rd) - widen to 8 lanes, 2021 ($22M)
72. VA-123 (Ox Road) - widen to 4, 6 lanes, 2020, 2025 ($69.9M)
73. VA-236 (Little River Tpke) - widen to 6 lanes, 2030 ($58M)
74. VA-286 (Fairfax County Pkwy) HOV - widen to 6 lanes, HOV in additional lanes during Peak, 2025, 2035 ($295M)
75. VA-289 (Franconia/ Springfield Parkway), HOV lanes with interchange at Neuman St, 2025 ($16M)
76. VA-294 (Prince William Pkwy) - widen to 6 lanes, 2040 ($263M)
77. **VA-620 (Braddock Rd) - widen to 4 lanes, 2025, 2027 ($165M)**
78. VA-638 (Pohick Rd) - widen to 4 lanes, 2020 ($12M)
79. VA-638 (Rolling Rd) - widen to 4 Lanes, 2025 ($31M)

LOCAL ROADS

80. Battlefield Pkwy - construct 4 lanes, 2020 ($45M)
81. Manassas Bypass (VA-234 Bypass) - construct 4 lanes, 2040 ($96M)
82. Manassas Battlefield Bypass - construct 4 lanes and close portions of US-29 (Lee Hwy) and VA-234 (Sudley Rd), 2035, 2040 ($28M)

Note: New or significantly changed projects are identified with **bold text**. Costs identified include total project costs which may include additional elements presented in another list(s).

Figure 5.2 Major Highway Projects



Major HOT, HOV, and Toll Lane Projects

Note: New or significantly changed projects are identified with **bold text**. Costs identified include total project costs which may include additional elements presented in another list(s).

*HOT = High-Occupancy Toll Lanes
HOV = High-Occupancy Vehicle Lanes

MARYLAND

MAJOR HIGHWAYS

1. **I-95/I-495 Traffic Relief Plan, construct 4 managed lanes, 2025 ($4.2B)**
2. **I-270 Traffic Relief Plan, construct 4 managed lanes, 2025 ($3.4B)**

VIRGINIA

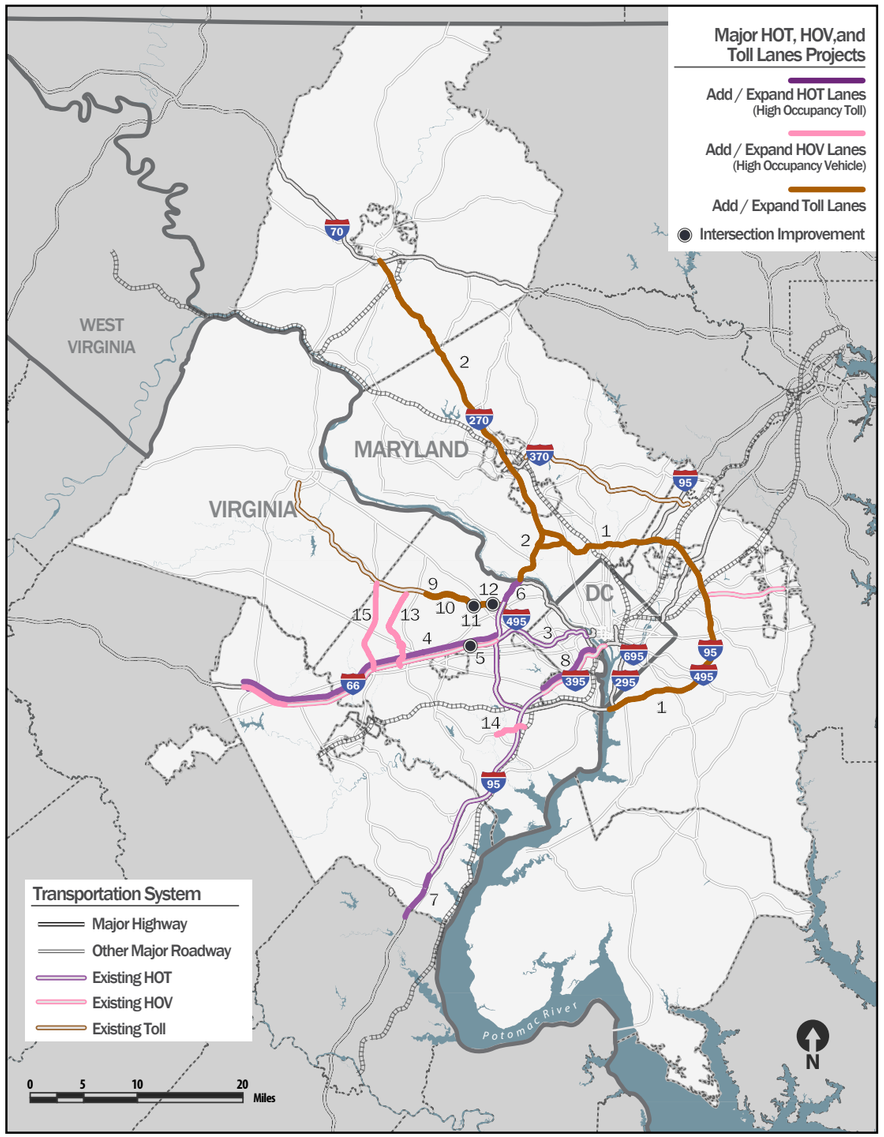
MAJOR HIGHWAYS

3. I-66 HOT (Inside Beltway), revise operations from HOV 2+ to HOT during peak hours and bus service, 2017, 2021, 2040 ($375M)
4. I-66 HOT (Outside Beltway) - widen to 6 lanes (3 general purpose, 2 HOT, and 1 auxiliary) and bus service, 2021, 2040 ($4.4B)
5. I-66 - construct HOV ramps to access Vienna Metro Sta, 2021 ($41M)
6. **I-495 - construct 4 HOT lanes, 2025 ($500M)**
7. I-95 - convert to managed lanes ($254M)
8. I-395 HOT - additional lane and revise operation from HOV 3+ during peak to HOT 3+, 2019 ($220M)
9. Dulles Toll Rd (VA-267) - Collector-Distributor Road west-bound, 2037 ($62M)
10. Dulles Toll Rd (VA-267) - Collector-Distributor Road east-bound, 2036 ($124M)
11. Dulles Toll Rd (VA-267) - interchange at New Boone Blvd Extension, 2037 ($79M)
12. Dulles Toll Rd (VA-267) - interchange at Greensboro Drive/Tyco Rd, 2036 ($28M)

STATE ROUTES

13. VA-286 (Fairfax County Pkwy) HOV - widen to 6 lanes, HOV in additional lanes during peak, 2025, 2035 ($296M)
14. VA-289 (Franconia/Springfield Parkway), HOV lanes with interchange at Neuman St, 2025 ($16M)
15. VA-28 (Sully Rd) HOV, widen to 8-10 lanes, HOV in additional lanes during peak, 2016, 2025, 2040 ($100M)

Figure 5.3 Major HOT, HOV, and Toll Lane Projects



Major Transit Projects

Note: New or significantly changed projects are identified with **bold text**. Costs identified include total project costs which may include additional elements presented in another list(s).

DISTRICT OF COLUMBIA

1. DC Streetcar, 2023, 2026 ($348M)
2. DC Dedicated Bicycle Lane Network, 2019, 2024 (not mapped) ($800k)
3. 16th Street Bus Priority Improvements, 2021 ($15M)

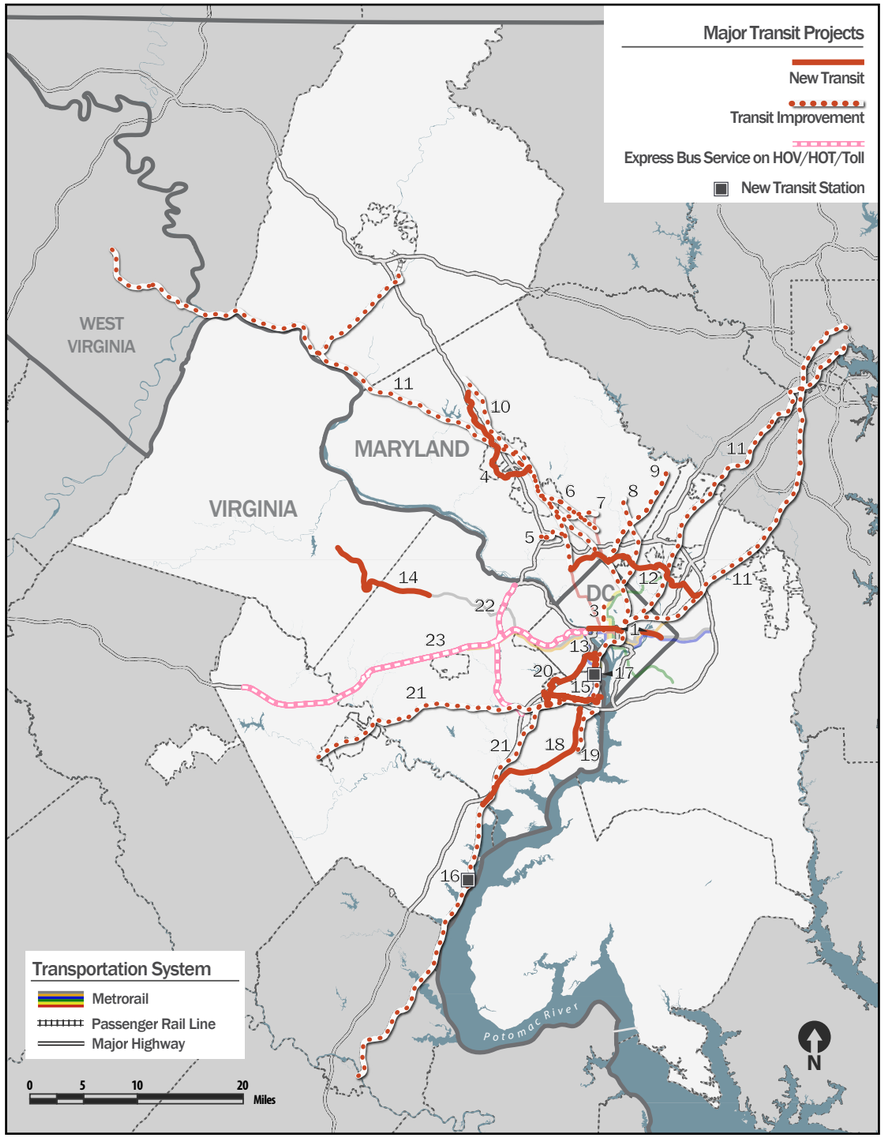
MARYLAND

4. Corridor Cities Transitway BRT - from Shady Grove to COMSAT, 2020 ($545M)
5. **North Bethesda Transitway BRT - from Montgomery Mall to White Flint Metro, 2040 ($115M)**
6. **Veirs Mill Rd BRT - from Wheaton Metro to Rockville Metro, 2030 ($6M)**
7. **Randolph Rd BRT - from US-29 to MD-355, 2040 ($102M)**
8. **New Hampshire Ave. BRT - from Takoma Metro to Colesville P&R, 2045 ($285M)**
9. US-29 BRT - from Silver Spring Metro to Burtonsville P&R, 2020 ($39M)
10. **MD-355 BRT - from Bethesda Metro to Clarksburg, 2040 ($1B)**
11. MARC - Increase trip capacity and frequency along all commuter rail lines, 2029 ($1B)
12. Purple Line - Bethesda to New Carrollton, 2020 ($2.4B)

VIRGINIA

13. Crystal City Transitway: Northern Extension BRT, 2023 ($24M)
14. Metro Silver Line (Dulles Corridor Metrorail Project) - Phase 2, 2020 ($2.9B)
15. Duke St Transitway - King St Metro to Fairfax County line, 2024 ($19M)
16. Potomac Shores VRE Station, 2019 ($26M)
17. Potomac Yard Metro Station, 2021 ($268M)
18. US-1 BRT from Huntington Metro Station to Woodbridge, 2030 ($504M)
19. US-1 bus lanes and improved intersections, 2035 ($37M)
20. West End Transitway - Van Dorn St Metro to Pentagon Metro, 2024 ($140M)
21. VRE - Reduce headways along the Manassas and Fredericksburg Lines, 2020 ($105M)
22. I-495 HOT Lane Express Bus Service, 2030 ($254M)
23. I-66 HOT Lane Enhanced Bus Service, 2025, 2040

Figure 5.4 Major Transit Projects



Financially Constrained Element and Aspirational Initiatives

Visualize 2045 calls upon local jurisdictions and funding agencies to implement projects, programs, and policies in line with the seven aspirational initiatives described in Chapter 4. These initiatives represent regionally agreed-upon concepts to pursue to help the region attain its goals for the transportation system in the future.

In some cases, TPB member jurisdictions are already planning and implementing parts of these initiatives. Others have yet to be planned and funded. This section summarizes how the financially constrained element includes projects that support the initiatives. The TPB believes that the anticipated growth in travel demand calls for increasing investment in projects, programs, and policies in line with the aspirational initiatives, meaning more of these should be folded into the constrained element. In future long-range transportation plans, the TPB would like to see more projects, programs, and policies that support the seven endorsed initiatives incorporated into the financially constrained elements.

This high-level summary is not a fully exhaustive analysis of all the projects in the constrained element and their connection to the endorsed initiatives – rather, a few examples of projects are mentioned.

Bring Jobs and Housing Closer Together

This initiative is focused on achieving a balanced distribution of jobs and housing throughout the region and adding more housing to the region to meet the forecast growth in jobs, rather than focusing on transportation infrastructure projects. Some projects in the financially constrained element do address future land-use assumptions, such as Embark Richmond Highway, which includes plans for complementary new development and rapid transit. While projects in the constrained element do reflect current locally adopted land-use plans, they may not fully complement the balanced distribution of jobs and housing throughout the region envisioned under this initiative.

COG's Cooperative Forecasts of Population, Households, and Employment projects that much of the new housing and jobs in the region will be located in regional Activity Centers. While the strategy of growing in Activity Centers has proven to be effective and holds promise for the future, this initiative calls for more to be done in terms of optimizing the distribution of jobs and housing across jurisdictions and to also bring more housing into the region.

TPB and COG leaders are working together to harness the expertise of COG's Planning Directors Technical Advisory Committee and COG's Housing Directors Advisory Committee for their advice on how to more fully implement this initiative.



Photo Credit - Dan Reed/Flickr

Expand Bus Rapid Transit Regionwide

The financially constrained element includes five new bus rapid transit (BRT) routes in Montgomery County. The endorsed initiative encourages BRT systems to operate fully in dedicated rights-of-way, which these four BRT routes do not entirely do. The constrained element also includes the Crystal City Transitway BRT expansion. This project expands upon the existing Metroway system and results in a route which will run partially on an exclusive right-of-way. Other BRT in the plan includes the Corridor Cities Transitway BRT in Maryland and the Richmond Highway BRT in Virginia, both of which will run in exclusive rights-of-way.

TPB's Regional Public Transportation Subcommittee will advise the TPB on how the region's BRT network can be further expanded in the years to come.



Photo Credit - Aimee Custis/Flickr

Move More People on Metrorail

The financially constrained element includes plans for expanding capacity on Metrorail by running all 8-car trains during peak hours and making capacity improvements to stations in the system core. These improvements directly support the endorsed initiative. The initiative calls for other core capacity improvements to Metrorail including a new Rosslyn tunnel and station, which are not yet included in the financially constrained element of the plan.



Photo Credit - BeyondDC/Flickr

Provide More Telecommuting and Other Options for Commuting

The financially constrained element of Visualize 2045 includes funding for travel demand management programs such as CMAQ (Congestion Mitigation and Air Quality) and TPB's Commuter Connections program. Programs like these encourage and incentivize telework and transit use through employer-provided subsidies, among other actions. They help push our region to more rapidly adopt alternative transportation strategies to reduce vehicle miles traveled and relieve congestion.

The Commuter Connections Subcommittee will advise the TPB on how to further enhance and grow the transportation demand management programs and policies called for in this initiative.



Photo Credit - Lea Latumahina/Flickr

Expand Express Highway Network

Visualize 2045's financially constrained element includes one major project that fully supports this initiative: High-Occupancy Toll (HOT) lanes on the northern portion of I-495 in Virginia. This project includes express toll lanes with toll-free travel for high-occupancy vehicles. Express bus service will also run on the express lanes.

The financially constrained element also includes adding dynamically-priced toll lanes along I-495 in Maryland and I-270. These projects, otherwise known as the "Traffic Relief Plan," support the endorsed initiative by adding express tolling but fall short of fulfilling the calls in the endorsed initiative to add express bus service to connect Activity Centers and to allow for HOVs to travel for free in the express lanes.

Improve Walk and Bike Access to Transit

The financially constrained element includes expanding the network of dedicated bicycle lanes in the District of Columbia which will allow more people to bicycle for their daily trips and connect to Metro and other transit options. This project supports bicycle movement but does not explicitly address the pedestrian experience.

For the most part, bicycle and pedestrian improvements are not included in the financially constrained portion of the region's long-range transportation plan because they are typically not large enough to be considered "regionally significant" to impact Air Quality Conformity. Such improvements may also be incorporated into highway or transit projects but not explicitly mentioned in the constrained element. However, Visualize 2045 calls attention to other ways that the TPB promotes and supports improvement of walk and bike access to transit: see the Bicycle and Pedestrian Element in Chapter 7 as well as more information about this endorsed initiative in Chapter 4.

TPB's Bicycle and Pedestrian Subcommittee advises the TPB on ways to create more safe and efficient opportunities for walking and bicycling to transit stations.

Complete the National Capital Trail

The National Capital Trail will circle the region's inner jurisdictions with a fully connected bicycle and pedestrian path separated from motor vehicle traffic. Most of the upgrades to existing trails and new trails that need to be built in order to complete the National Capital Trail will not fall within the purview of the constrained element of Visualize 2045 because the trails will typically not impact Air Quality Conformity. However, some pieces of the National Capital Trail are related to other projects in the financially constrained element of the plan – once the Purple Line is completed, the portion of the National Capital Trail between Bethesda and Silver Spring, which is currently closed for construction, will be reopened and vastly improved compared to the previous conditions of the trail.

Visualize 2045 calls attention to other ways that the TPB promotes and supports bicycle and pedestrian trails: see the Bicycle and Pedestrian Element in Chapter 7 as well as more information about this endorsed initiative in Chapter 4.

TPB's Bicycle and Pedestrian Subcommittee advises the TPB on the National Capital Trail and other bicycle and pedestrian trail improvements.



Photo Credit - Maryland GovPics/Flickr

Financial Plan Summary

The financial analysis is meant to demonstrate that the region has forecast revenues which are reasonably expected to be available to cover the estimated costs of adequately maintaining, operating, and expanding the highway and transit system. This analysis is a required element of the TPB's long-range transportation plan. Appendix A: Financial Plan of Visualize 2045 contains the full financial analysis, while this section provides a summary.

The financially constrained element of Visualize 2045 is fiscally realistic, balancing all proposed new project investments and system maintenance and operating costs with reasonable revenue expectations, as agreed upon by TPB and its implementation agency partners in the metropolitan transportation planning process.

A total of $291.1 billion[1] in transportation revenues and expenditures is projected for the National Capital Region for the 27-year period of 2019 to 2045. WMATA's expenditures will constitute 48%, local public transportation 18%, and highways 34% of the total through 2045.

The majority of future transportation revenues will be devoted to the operation and maintenance of the current public transportation and highway systems. However, funding is identified for significant capital projects, including the South Capitol Street Corridor project and the DC Streetcar East-West line in the District of Columbia; the I-270 and I-495 Traffic Relief Plan, the replacement of the Nice Bridge and construction of the Purple Line, and the MARC Growth and Investment Plan for commuter rail in Maryland; and the I-66 HOT Lanes, completion of phase two of the Metrorail Silver Line, and the VRE System Expansion Plan in Virginia, among other projects.

Most importantly, the plan also demonstrates full funding for WMATA's forecast operational and state of good repair needs through 2045. The increasing need for state of good repair funding to renew and rehabilitate the 40-year old Metrorail system and to operate and maintain the region's largest bus and paratransit fleet requires considerable financial resources. Over the past few years, the need for additional funding for Metro has been a subject of agreement by the region's leaders, and the District, Maryland, and Virginia have all identified additional funding for Metro this year.

The inputs to the financial plan were prepared by the TPB member jurisdiction and agency staffs, working with the TPB staff. The forecasts and assumptions were reviewed by a working group and subsequently reported to and reviewed by the TPB's Technical Committee. The expenditure and revenue estimates for the WMATA transit system were developed, reviewed and agreed upon jointly between WMATA and its member jurisdictions.

[1] *Because federal planning regulations require that the financial analysis show reasonably anticipated revenues and expenditures in year of expenditure (YOE) dollars, this report provides estimates in year of expenditure dollars. Year of expenditure dollars include inflation rates in the future years.*

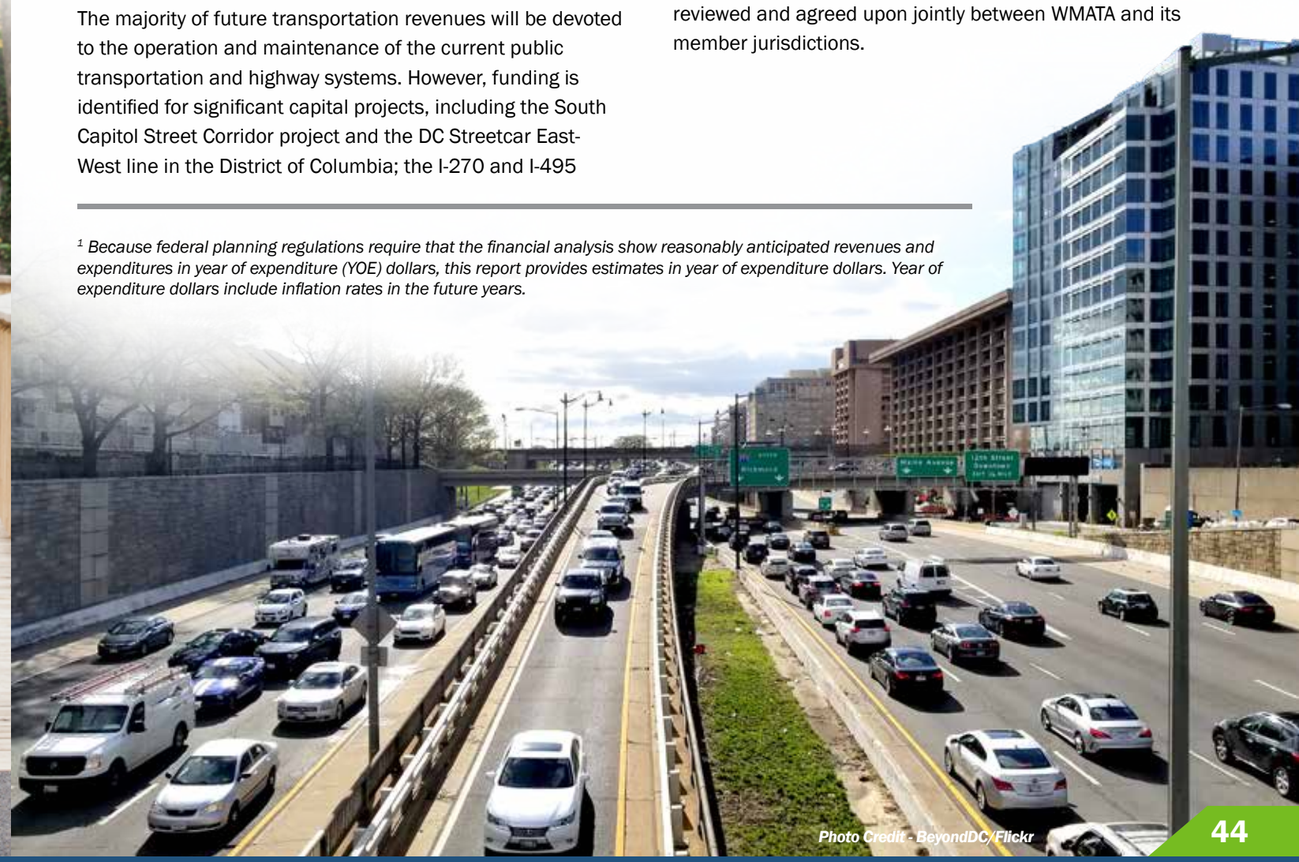


Photo Credit - BeyondDC/Flickr

Forecast Revenues

State DOTs, public transportation providers, other transportation agencies and jurisdictions, and the TPB cooperatively developed reasonable estimates of funds that will be available to support the implementation of the constrained element of Visualize 2045. More details can be found in Appendix A regarding the assumptions agencies made in developing the forecast revenues.

The financial analysis summarizes the revenues (Figure 5.5) for the constrained element of the long-range transportation plan for the period 2019 through 2045. There are five sources of revenue: federal, state, regional/local, private/other, and fares/tolls.

Overall, federal revenue as a proportion of total revenue is 13%, while state (including the District of Columbia) sources are the largest single source at 44%. Local funds, which include funds collected across Northern Virginia, represent 24% of revenue. User fees from fares and tolls are 16% of the total revenues, while bonds, private, or other sources account for 4% of total revenues.

Forecast Expenditures

The financial analysis forecasts the costs of operating, maintaining and expanding the transportation system (Figure 5.6). Notably, only a fraction of the funds is for expansion of the region's highway and transit systems; most expenditures are to operate and maintain the system and fund state of good repair projects to repair or replace infrastructure including highway bridges, transit vehicles, and other assets. There are three categories of expenditure: operations & maintenance, capital - state of good repair, and capital - expansion.

The financial analysis demonstrates that the region has reasonably expected funds for the projects in the constrained element of Visualize 2045.

Sixty-six percent of expenditures are slated for public transportation and 34% is slated for highways. Within the expenditures, operating the transportation system is forecast to take up 44%, maintaining the system in a state-of-good-repair is forecasted to take up 34%, and expansion is the smallest portion, with 22%. While operating the system constitutes the largest portion of all transit expenditures it constitutes the smallest portion of all highway expenditures.

Together, balancing revenues and expenditures demonstrates fiscal constraint and the region's ability to pay for the long-range transportation plan.

Figure 5.5 Revenues by Funding Source

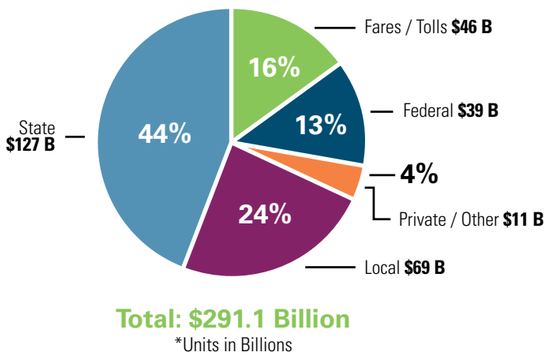
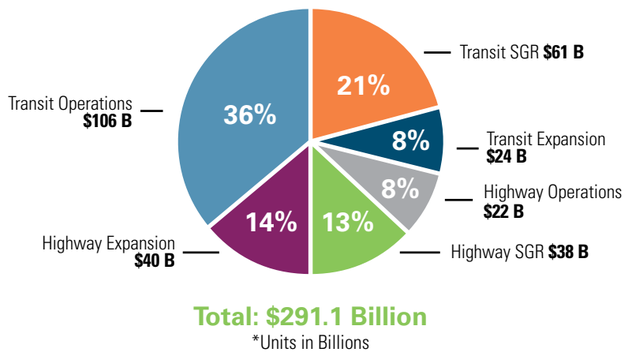


Figure 5.6 Expenditures by Type and Mode



Performance Analysis Summary

What does our transportation future hold? How will it compare to today? For the past few major updates of the long-range transportation plan TPB has conducted "performance analyses" on the projects in the financially constrained long-range plan, which help regional leaders and the public envision what the future holds based on the projects and funding that are expected to be in place by the end of the plan period.

The performance analysis for the constrained element of Visualize 2045 "visualizes" the differences between three scenarios:

Conditions today

- Existing land-use patterns (population and employment)
- Existing transportation system

2045 "No-Build" scenario

- 2045 projected land-use patterns (population and employment)
- Existing transportation system – hence the "No-Build" – we grow but don't build any additional transportation capacity

2045 "Planned-Build" scenario

- 2045 projected land-use patterns (population and employment)
- 2045 transportation system based on the transportation improvements specified in the constrained element list of projects

PLACEHOLDER

The draft performance analysis results for public comment are available for review at visualize2045.org

PLACEHOLDER
The draft performance analysis results for public comment are available for review at visualize2045.org

PLACEHOLDER
The draft performance analysis results for public comment are available for review at visualize2045.org

PLACEHOLDER
The draft performance analysis results for public comment are available for review at visualize2045.org

PLACEHOLDER
The draft performance analysis results for public comment are available for review at visualize2045.org

PLACEHOLDER
The draft performance analysis results for public comment are available for review at visualize2045.org

PLACEHOLDER
The draft performance analysis results for public comment are available for review at visualize2045.org

Air Quality Conformity Analysis Summary

The air quality analysis demonstrates how the region is working towards its environmental goals. One of these goals comes from the Regional Transportation Priorities Plan (RTPP), which states the TPB's work should "enhance environmental quality and protect natural and cultural resources."

The financially constrained element of Visualize 2045 must demonstrate that future emissions under the plan are consistent—"in conformity"—with emissions levels set forth in air quality plans adopted by the states. Federal law requires "conformity findings" in all metropolitan regions that are currently not in attainment of certain federal air quality standards. Since the Washington region does not currently meet federal standards for ground-level ozone, the TPB must demonstrate that future vehicle-related emissions of ozone-forming pollutants will, under the proposed constrained element plan, remain below the approved limits. This section summarizes the air quality conformity analysis, and the full document can be found in Appendix C: Air Quality Conformity Report.

Pollutants Analyzed

The Washington metropolitan area currently does not meet federal air quality standards for ground-level ozone, meaning that the amount of ozone present in the air exceeds the maximum allowed. Ozone pollution is harmful to people and the environment. Therefore, the region must show through a detailed technical analysis that future vehicle-related emissions of the two key ingredients in the formation of ozone—nitrogen oxides (NOx) and volatile organic compounds (VOCs)—are expected to remain below approved regional limits. The Metropolitan Washington Air Quality Committee (MWAQC) facilitates the establishment of the regional limits for on-road mobile emissions of VOCs and NOx, which combine in sunlight on hot summer days to form ground-level ozone. Motor vehicles are one of several sources responsible for VOC and NOx emissions in the region. A few examples of others include: power plants, residential heating and air conditioning, dry cleaners, gas stations, boats, airplanes, construction vehicles, and lawn equipment.

FEDERAL REQUIREMENTS

The Clean Air Act requires that transportation and air quality planning be integrated in regions like this one that are designated by the U.S. Environmental Protection Agency (EPA) as air quality "nonattainment" areas. In such areas, as well as in areas designated as "maintenance", federal funding and approval for transportation projects is only available if transportation activities are consistent with the region's air quality goals.

Before Visualize 2045 can be adopted, the TPB must approve a "conformity determination" showing that anticipated future vehicle-related emissions will remain below regional limits (known formally as "motor vehicle emissions budgets") that have been set by the region's air quality improvement plan (known as the "State Implementation Plan" or "SIP") and approved by the EPA. The Metropolitan Washington Air Quality Committee (MWAQC) is the body responsible for developing the regional air quality plan. The conformity determination will demonstrate that the constrained element of Visualize 2045 is consistent – "in conformity" – with the regional limits.



Photo Credit - Ted Eytan/Flickr

Air Quality Conformity Analysis Results

Under the constrained element of Visualize 2045, mobile emissions are expected to drop steadily (Figures 5.7 and 5.8) mainly due to tougher fuel and vehicle efficiency standards.[2] In spite of increased travel, mobile emissions are expected to steadily decrease through the 2045 horizon year of the plan, mainly as cars and trucks meeting tougher new federal fuel and vehicle efficiency standards enter the region's vehicle fleet and as changes are made to the formulation of vehicle fuel. Changes in development patterns, investments in transit and other travel options, and improved operational efficiency of area roadways will also contribute to reductions in vehicle-related emissions.

The plan's air quality conformity assessment included comparing forecasted mobile source emissions to the region's mobile emissions budgets for volatile organic compounds (VOC) and nitrogen oxides (NOx). The conformity analysis found that forecasts of mobile emissions for VOC and NOx are within required budgets for all analysis years of the plan.

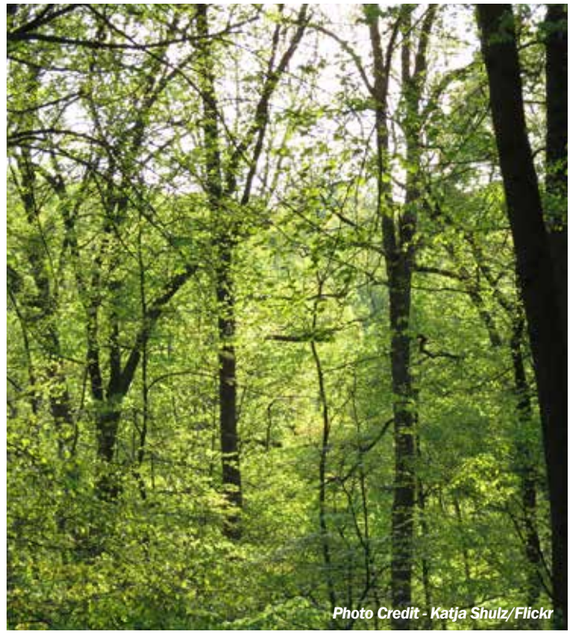
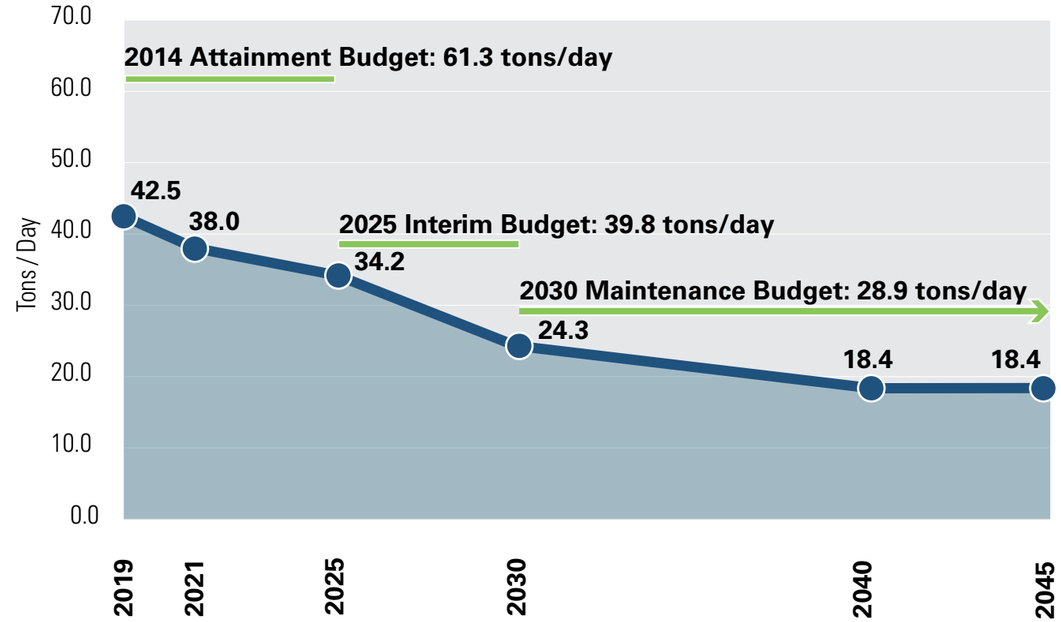


Photo Credit - Katja Shulz/Flickr

Figure 5.7 Volatile Organic Compound (VOC) Mobile Source Emissions and Budgets



[2] *NOTE: The mobile budgets shown were developed as part of the 2008 Ozone Standard Maintenance Plan. EPA found the budgets adequate for use in conformity. The adequacy finding was published in the Federal Register on August 6, 2018 with an effective date of August 21, 2018.*

Figure 5.8 Precursor Nitrogen Oxide (NOx) Mobile Source Emissions and Budgets

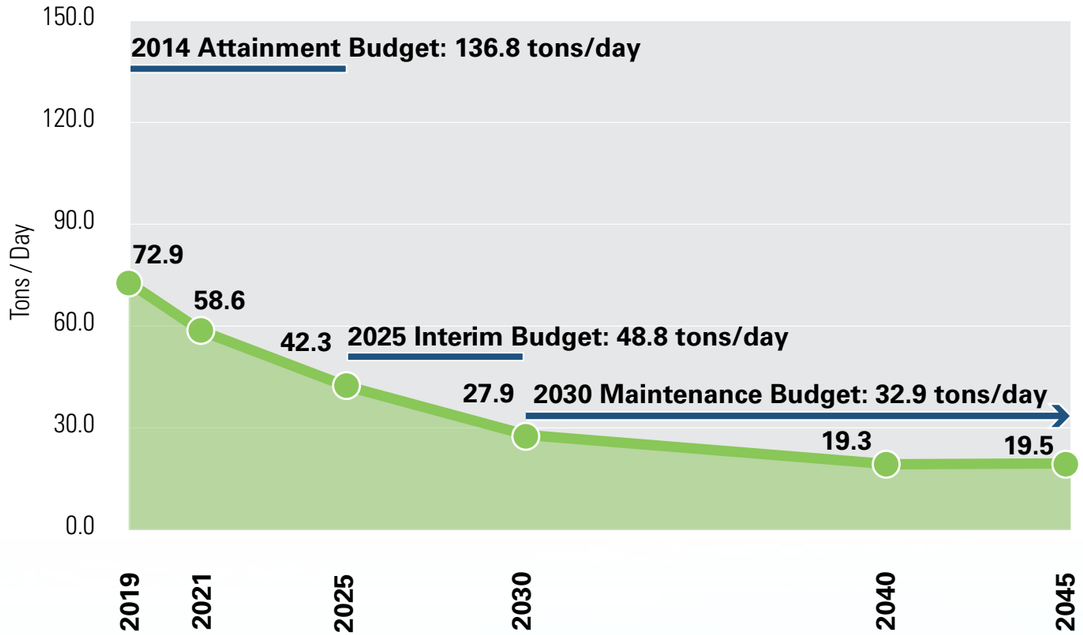




Photo Credit - BeyondDC/Flickr

Carbon Dioxide Emissions

Over the years, more attention is being paid to greenhouse gases like carbon dioxide (CO_2) and their contribution to global climate change. Unlike the two specific pollutants regulated by federal law in this region, CO_2 is not regulated by the federal government and it is not included in the Air Quality Conformity analysis. In 2010, the TPB proactively started estimating and reporting future CO_2 emissions in the regional long-range transportation plan.

The latest estimates show the absolute amount of CO_2e (carbon dioxide equivalent) emissions will decrease by 19% between now and 2040, with a slight uptick between 2040 and 2045, CO_2e emissions per-capita will decrease by 32% by 2045 (Figure 5.9). The emissions reductions are attributed to cleaner vehicles and fuel standards, but the uptick between 2040 and 2045 occurs as cleaner vehicles have saturated the fleet, and the benefits from vehicle and fuel standards can no longer keep pace with VMT increases.

Figure 5.9 Carbon Dioxide Equivalent (CO_2e) Mobile Source Emissions