

# DOCUMENTATION:

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## Transportation networks used as inputs to the TPB's Travel Model (Ver. 2.3.75) for the 2018 Air Quality Conformity Analysis of Visualize 2045

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# Overview

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Staff has recently completed a draft report describing the transportation networks used as inputs for the 2018 Air Quality Conformity Analysis of Visualize 2045 and the FY 2019-2024 TIP

- Purpose of this report
  - Review the network development process
  - Explain network elements & coding conventions
  - Provide summary statistics
- This AQC analysis included
  - Years: 2019, 2021, 2025, 2030, 2040 and 2045
  - Travel Model: Version 2.3.75
- Last report: VDOT and MDOT Off-Cycle Amendment to the 2016 CLRP Network Report (6/15/18)



# Network report compliments current documents

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- Version 2.3.75 Travel Model User's Guide (December 5, 2018)  
<httpwww.mwcog.org/transportation/data-and-tools/modeling//>
- Visualize 2045, A Long-Range Transportation Plan for the National Capital Region, Air Quality Conformity Analysis Report (October 17, 2018)  
<https://www.mwcog.org/documents/2018/10/17/visualize-2045-air-quality-conformity-analysis/>
- Travel model transmittal memorandum (December 6, 2018)  
<https://www.mwcog.org/transportation/data-and-tools/modeling/data-requests/>



# Network report outline

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1. Introduction
  - Conformity schedule
  - Network development process
2. Network Elements and Conventions
  - Study area, zone system
  - Time periods, node numbering, network elements
3. Network Inputs (Cube Voyager format)
  - Inputs
  - Procedures
4. TPB Multi-year, Multi-modal Geodatabase



# What's New?

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- Networks reflect transit and highway projects analyzed in the Visualize 2045 LRTP and FY 2019-2024 TIP air quality conformity analysis
- Transit service was updated to reflect Fall 2017 schedules
- Cost deflation factor was updated to reflect most recently published BLS CPI data
- Transit fare parameters reflect the most recent policy (WMATA Tariff Number 37, effective June 25, 2017).
- Non-WMATA service providers fares are also updated
- Highway tolls/toll rates coded in the network were updated to reflect 2018 conditions



# Modified managed lane facility operations

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- I-66 HOT lanes inside the Beltway
  - HOV lanes converted to HOT lanes in 2017
  - Extent: from US Route 29 near Rosslyn to I-495
  - **Express lane facility during the morning and evening peak periods in the peak direction ONLY**
  - **HOT 2+ until I-66 outside the Beltway express lanes open (currently scheduled for 2021)**
  - In 2040 facility will be HOT3+ during the morning and evening peak periods in **both** directions
- I-395 HOT lanes
  - HOV lanes convert to HOT lanes in 2019
  - Extent: from Turkeycock Run to Eads Street



# Major HOT/ETL Projects included in Visualize 2045

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- I-66 HOT lanes outside the Beltway

**Extent:**

- From the Beltway to University Boulevard starting in 2021
  - From University Boulevard to 1.2 miles west of US 15 in 2040
  - In 2021 facility will have 3 general-purpose lanes (plus auxiliary lanes in some segments) and 2 HOT lanes in each direction, with tolling 24/7
- Expansion of I-95 HOT lanes
- Extent:**
- From VA 610 (Garrisonville Rd, Stafford County ) to VA 17 (Warrenton Rd, Exit 133) in 2022
- Expansion of I-495 in Virginia HOT lanes
- Extent:**
- From south of Old Dominion Drive to the American Legion Bridge in 2025



# Major HOT/ETL Projects included in the Visualize 2045 Plan

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- Electronic Toll Lanes (ETLs) starting 2025:  
**Extent:**
  - On the entire Beltway in Maryland
  - I-270 from the Beltway to Frederick





# Toll-Lane Facilities: Existing and Planned (Visualize 2045)

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# End-to-end tolls and toll rates on managed lane facilities by year, time period and direction

HOT lane Facilities	Dist (miles)	Tolls						Toll Rates					
		2019			2021			2019			2021		
		AM	PM	MD	AM	PM	MD	AM	PM	MD	AM	PM	MD
<b>Capital Beltway (I-495)</b>													
Old Dominion Dr to Springfield	10.22	\$2.04	\$2.70	\$1.53	\$2.04	\$3.61	\$1.53	\$0.20	\$0.26	\$0.15	\$0.20	\$0.35	\$0.15
Springfield to Old Dominion Dr	10.28	\$3.01	\$2.17	\$1.54	\$3.22	\$2.40	\$1.54	\$0.29	\$0.21	\$0.15	\$0.31	\$0.23	\$0.15
<b>I-95 &amp; I-395</b>													
Southern limit of I-95 to Edsall Rd.	28.35	\$20.27	N/A	\$4.25	\$20.89	N/A	\$4.25	\$0.71	N/A	\$0.15	\$0.74	N/A	\$0.15
Edsall Rd. to Southern limit of I-95	28.72	N/A	\$10.47	\$4.31	N/A	\$10.77	\$4.31	N/A	\$0.36	\$0.15	N/A	\$0.38	\$0.15
<b>I-66 Inside the Beltway (2017 and Beyond)</b>													
Roosevelt Bridge to Capital Beltway	9.08	N/A	\$8.42	N/A	N/A	\$7.62	N/A	N/A	\$0.93	N/A	N/A	\$0.84	N/A
Capital Beltway to Roosevelt Bridge	9.33	\$7.96	N/A	N/A	\$6.23	N/A	N/A	\$0.85	N/A	N/A	\$0.67	N/A	N/A
<b>I-66 Outside the Beltway (2025 and Beyond)</b>													
Capital Beltway to West Terminus	21.62	N/A			\$4.32	\$7.83	\$3.24	N/A			\$0.20	\$0.36	\$0.15
West Terminus to Capital Beltway	21.91	N/A			\$14.87	\$4.19	\$3.14	N/A			\$0.68	\$0.19	\$0.14

- ❖ Toll values range from \$1.53 to \$20.89
- ❖ Toll rates range from 14 cents to ~\$1.00 per mile



# End-to-end tolls on managed lane facilities by year, time period and direction

HOT lane Facilities	Dist. (miles)	2025			2030			2040			2045		
		AM	PM	MD	AM	PM	MD	AM	PM	MD	AM	PM	MD
<b>Beltway (VA)</b>													
American Legion Bridge to Springfield	12.31	\$3.23	\$5.64	\$1.85	\$2.90	\$5.78	\$1.85	\$4.29	\$7.03	\$1.85	\$5.22	\$7.98	\$1.85
Springfield to American Legion Bridge	12.36	\$4.38	\$3.10	\$1.85	\$5.73	\$3.55	\$1.85	\$7.67	\$4.42	\$1.85	\$9.05	\$4.84	\$1.85
<b>I-95 &amp; I-395</b>													
Southern limit of I-95 to 14th St. Bridge	44.64	\$34.79	N/A	\$6.70	\$46.81	N/A	\$6.70	\$60.97	N/A	\$6.70	\$67.24	N/A	\$6.70
14th St. Bridge to Southern limit of I-95	45.32	N/A	\$21.15	\$6.80	N/A	\$29.14	\$6.80	N/A	\$40.99	\$6.80	N/A	\$47.09	\$6.80
<b>I-66 Inside the Beltway (2017 and Beyond)</b>													
Roosevelt Bridge to Capital Beltway	9.08	N/A	\$7.45	N/A	N/A	\$7.50	N/A	\$1.82	\$7.63	N/A	\$1.82	\$8.31	N/A
Capital Beltway to Roosevelt Bridge	9.33	\$6.63	N/A	N/A	\$6.99	N/A	N/A	\$9.01	\$1.87	N/A	\$9.99	\$1.95	N/A
<b>I-66 Outside the Beltway (2025 and Beyond)</b>													
Capital Beltway to West Terminus	26.23	\$4.32	\$8.98	\$3.24	\$4.32	\$10.41	\$3.24	\$5.25	\$15.77	\$3.93	\$5.25	\$17.51	\$3.93
West Terminus to Capital Beltway	25.98	\$17.78	\$4.27	\$3.21	\$21.74	\$4.27	\$3.21	\$24.90	\$5.20	\$3.90	\$26.44	\$5.20	\$3.90
<b>Beltway (MD - ETL)</b>													
American Legion to Woodrow Wilson Bridge	41.52	\$8.30	\$12.60	\$6.23	\$8.30	\$14.47	\$6.23	\$8.30	\$17.80	\$6.23	\$8.30	\$20.44	\$6.23
Woodrow Wilson to American Legion Bridge	41.65	\$15.70	\$8.96	\$6.25	\$17.49	\$9.50	\$6.25	\$20.80	\$11.18	\$6.25	\$22.36	\$10.83	\$6.25
<b>I-270 (MD - ETL)</b>													
Frederick to Spur (VA side)	31.33	\$38.39	\$6.27	\$4.70	\$46.89	\$6.27	\$4.70	\$59.59	\$6.27	\$4.70	\$64.67	\$6.27	\$4.70
Frederick to Spur (MD side)	32.37	\$37.92	\$6.47	\$4.85	\$46.21	\$6.47	\$4.85	\$58.60	\$6.47	\$4.85	\$63.68	\$6.47	\$4.85
Spur (VA side) to Frederick	30.91	\$6.18	\$20.94	\$4.64	\$6.18	\$25.73	\$4.64	\$6.18	\$34.46	\$4.64	\$6.18	\$38.51	\$4.64
Spur (MD side) to Frederick	31.9	\$6.38	\$20.38	\$4.78	\$6.38	\$25.18	\$4.78	\$6.38	\$33.90	\$4.78	\$6.38	\$38.06	\$4.78

❖ Toll values range from \$1.82 to \$67.24



# End-to-end toll rates on managed lane facilities by year, time period and direction

HOT lane Facilities	Dist. (miles)	2025			2030			2040			2045		
		AM	PM	MD	AM	PM	MD	AM	PM	MD	AM	PM	MD
<b>Beltway (VA)</b>													
American Legion Bridge to Springfield	12.31	\$0.26	\$0.46	\$0.15	\$0.24	\$0.47	\$0.15	\$0.35	\$0.57	\$0.15	\$0.42	\$0.65	\$0.15
Springfield to American Legion Bridge	12.36	\$0.35	\$0.25	\$0.15	\$0.46	\$0.29	\$0.15	\$0.62	\$0.36	\$0.15	\$0.73	\$0.39	\$0.15
<b>I-95 &amp; I-395</b>													
Southern limit of I-95 to 14th St. Bridge	44.64	\$0.78	N/A	\$0.15	\$1.05	N/A	\$0.15	\$1.37	N/A	\$0.15	\$1.51	N/A	\$0.15
14th St. Bridge to Southern limit of I-95	45.32	N/A	\$0.47	\$0.15	N/A	N/A	N/A	N/A	\$0.90	\$0.15	N/A	\$1.04	\$0.15
<b>I-66 Inside the Beltway (for 2017 and Beyond)</b>													
Roosevelt Bridge to Capital Beltway	9.08	N/A	\$0.82	N/A	N/A	N/A	N/A	\$0.20	\$0.84	N/A	\$0.20	\$0.92	N/A
Capital Beltway to Roosevelt Bridge	9.33	\$0.71	N/A	N/A	\$0.75	N/A	N/A	\$0.97	\$0.20	N/A	\$1.07	\$0.21	N/A
<b>I-66 Outside the Beltway (for 2025 and Beyond)</b>													
Capital Beltway to West Terminus	26.23	\$0.20	\$0.42	\$0.15	\$0.20	\$0.48	\$0.15	\$0.20	\$0.60	\$0.15	\$0.20	\$0.67	\$0.15
West Terminus to Capital Beltway	25.98	\$0.83	\$0.20	\$0.15	\$1.02	\$0.20	\$0.15	\$0.96	\$0.20	\$0.15	\$1.02	\$0.20	\$0.15
<b>Beltway (MD - ETL)</b>													
American Legion to Woodrow Wilson Bridge	41.52	\$0.20	\$0.30	\$0.15	\$0.20	\$0.35	\$0.15	\$0.20	\$0.43	\$0.15	\$0.20	\$0.49	\$0.15
Woodrow Wilson to American Legion Bridge	41.65	\$0.38	\$0.22	\$0.15	\$0.42	\$0.23	\$0.15	\$0.50	\$0.27	\$0.15	\$0.54	\$0.26	\$0.15
<b>I-270 (MD - ETL)</b>													
Frederick to Spur (VA side)	31.33	\$1.23	\$0.20	\$0.15	\$1.50	\$0.20	\$0.15	\$1.90	\$0.20	\$0.15	\$2.06	\$0.20	\$0.15
Frederick to Spur (MD side)	32.37	\$1.17	\$0.20	\$0.15	\$1.43	\$0.20	\$0.15	\$1.81	\$0.20	\$0.15	\$1.97	\$0.20	\$0.15
Spur (VA side) to Frederick	30.91	\$0.20	\$0.68	\$0.15	\$0.20	\$0.83	\$0.15	\$0.20	\$1.11	\$0.15	\$0.20	\$1.25	\$0.15
Spur (MD side) to Frederick	31.9	\$0.20	\$0.64	\$0.15	\$0.20	\$0.79	\$0.15	\$0.20	\$1.06	\$0.15	\$0.20	\$1.19	\$0.15

❖ Toll rates range from 15 cents to ~\$2.00 per mile



# Final comments

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- The report provides travel model users with a better understanding of the TPB networks, which are fundamental inputs to the travel model
- TPB staff welcomes feedback on the draft report (within 30 days)
- The report will be uploaded to the [TFS webpage](#) (under [Documents](#)) following this meeting



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