

3.13 Need Category: Transportation Demand Management (TDM)

Measure: TDM Needs utilizing VTrans Travel Markets, Roadway Functional Classification, and Roadway Access Management.

What it means: Locations where Transportation Demand Management (TDM) strategies can be beneficial to reduce vehicle miles traveled.

Applicable VTrans Travel Market: CoSS, RN

Identification of Needs

- Data Sources:
 - VDOT, LRS Geospatial database of Virginia’s roadway system
- Year of analysis: 2019
- Period of Analysis: n/a
- Calculations:
 1. Identify roadway segments by VTrans Travel Markets and facility type
 - ~~on a limited access or non-limited access facility~~
 - ~~within Regional Networks or along CoSS~~
 2. Categorize the following roads as qualifying for designation as a TDM Need:
 - ~~Limited access facilities on CoSS: These roads have a Need whose solution may be new or expanded park and ride facilities, rail and public transportation services and passenger facilities, bicycle and pedestrian facilities where permitted, and expansion and coordination of commuter assistance programs services.~~
 - ~~Non-limited access facilities on CoSS: These roads have a Need whose solution may be new or expanded park and ride facilities, rail and public transportation services and facilities, bicycle and pedestrian facilities, and expansion and coordination of commuter assistance programs services.~~
 - ~~Limited access facilities within Regional Networks: These roads have a Need whose solution may be new or expanded park and ride facilities, rail and public transportation services and facilities, bicycle and pedestrian facilities, and expansion and coordination of commuter assistance programs services.~~
 - Non-limited access and non-local roads within MPO Areas: These roads have a Need whose solution may be new or expanded public transportation services and facilities, bicycle and pedestrian facilities, expansion and coordination of commuter assistance programs, and Shared Mobility solutions.
 3. **Threshold for VTrans Mid-term Need for Transportation Demand Management:**
 - Roadway segments ~~along limited access facilities~~ along CoSS are identified as those with a VTrans Mid-term Need for Transportation Demand Management for new or expanded park and ride facilities, rail and public transportation services and passenger facilities, bicycle and pedestrian facilities where permitted, and expansion and coordination of commuter assistance programs services.
 - ~~Roadway segments along non-limited access facilities along CoSS are identified as those with a VTrans Mid-term Need for Transportation Demand Management for new or expanded park and ride facilities, rail and public transportation services and facilities, bicycle and pedestrian facilities, and expansion and coordination of commuter assistance programs services.~~
 - ~~Roadway segments along limited access facilities within Regional Networks are identified as those with a VTrans Mid-term Need for Transportation Demand Management for new or expanded park and ride facilities, rail and public transportation services and passenger facilities, bicycle and pedestrian facilities where permitted, and expansion and coordination of commuter assistance programs services.~~
 - Roadway segments along non-limited access facilities within Regional Networks (but not also along CoSS) are identified as those with a VTrans Mid-term Need for Transportation Demand Management for ~~new or expanded public transportation services and facilities, bicycle and pedestrian facilities, coordination of commuter assistance programs, and~~ Shared Mobility.





4.2.12 Prioritization within Transportation Demand Management Need Category

Applicable VTrans Travel Market: CoSS, RN

Utilized for: Establishing Statewide and Construction District Priority Locations

Severity of VTrans Mid-term Need for Transportation Demand Management

- Source data:
 - StreetLight Data, CoSS Severity: Total number of inter-RN trips during a typical three weekdays.
 - RN Severity: PECC and TTI values developed for Need for Congestion Mitigation
- Calculations
 - CoSS Severity:
 - Total number of inter-RN trips during a typical three weekday period were assigned to Primary CoSS facilities and, if required, CoSS Major Component facilities (Appendix A) that provide connection between CoSS Primary Facilities. Trips were assigned from the centroid of the RN and adjusted as needed to match the RN's urban core. In most cases, this corresponded with a roadway junction on the CoSS near the downtown of the largest city in the RN.
 - Trips were assigned to the network to achieve the fastest travel times.
 - RN Severity:
 - Normalize PECC scores within each VDOT Construction District using the following equations. Use District-normalized PECC for limited access facilities or those without a TTI score, and District-normalized TTI_AADT for non-limited access roads or roads without a PECC value.
 - $PECC\ District\ Normalized = \frac{PECC-minimum\ district\ PECC}{maximum\ district\ PECC-minimum\ district\ PECC}$
 - Set a ceiling of 100% for PECC.
 - $TTI_AADT\ District\ Normalized = \frac{TTI_AADT-minimum\ district\ TTI_AADT}{maximum\ district\ TTI_AADT-minimum\ district\ TTI_AADT}$

Magnitude of VTrans Mid-term Need for Transportation Demand Management

- Source data:
 - StreetLight Data, CoSS Magnitude: total number of inter-RN trips during a typical three weekdays (captures Severity as well as Magnitude)
 - RN Magnitude: VDOT Traffic Engineering Division: Annual Average Daily Traffic (AADT) data
 - Calculations:
 - CoSS Magnitude: No additional calculations are performed.
 - RN Magnitude: If AADT for a segment is null or 0, populate AADT with default values based on the roadway segment's functional classification (see Appendix E)

Consideration of Severity and Magnitude Criteria

- RN
 - Assign the *PECC District Normalized* score¹ to limited access facilities and the *TTI_VMT District Normalized* score to non-limited access roadway segments. If a road was not given a value using this method, the maximum normalized score of the two is used.

Prioritizing within CoSS and RN Transportation Demand Management Need Category

Prioritization within this VTrans Mid-term Needs Category occurs in the following manner:

- Sort CoSS severity in descending order for CoSS primary facilities or key secondary CoSS facilities that fill in gaps in the primary facility network, and assign the following scores based on mileage to develop statewide Very High, High, Medium, and Low categorizations for VTrans Mid-term Need for Transportation Demand Management. Other CoSS roads with transportation demand management needs are categorized as Low (Score 1).
 - *Very High* (Score 7): Top 5% of the total mileage
 - *High* (Score 6): 5.001%–10%
 - *High* (Score 5): 10.001%–15%
 - *Medium* (Score 4): 15.001%–20%
 - *Medium* (Score 3): 20.001%–25%
 - *Low* (Score 2): 25.001%–50%
 - *Low* (Score 1): Bottom 50.001%–100%
- For limited access roads or non-limited access roads with no TTI value, retain PECC District Normalized. For non-limited access roads or roads where PECC scores are not available, retain TTI_AADT District Normalized. Sort by the retained score in descending order and assign the following scores based on mileage² to develop VDOT Construction District-specific *Very High*, *High*, *Medium*, and *Low* categorizations for VTrans Mid-term Need for Capacity Preservation.
 - *Very High* (Score 7): Top 5% of the total mileage
 - *High* (Score 6): 5.001%–10%
 - *High* (Score 5): 10.001%–15%
 - *Medium* (Score 4): 15.001%–20%
 - *Medium* (Score 3): 20.001%–25%
 - *Low* (Score 2): 25.001%–50%
 - *Low* (Score 1): Bottom 50.001%–100%

¹ See Needs Category: Congestion Mitigation (PECC) for details on this normalized score.

² Where prioritization values do not break exactly at the percentile categories, assign all values to the higher category until there is a new prioritization value. For example, if the top 7% of roadway miles all have the same score, then 7% of miles would be classified as *Very High*.