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September 6, 2013

The Honorable John McGlennon
Chairman
Transit Service Delivery Advisory Committee
c/o DRPT
600 East Main Street, Suite #2102
Richmond, Virginia 23219

Dear Chairman McGlennon:

At its last meeting on August 22, the Transit Service Delivery Advisory Committee (TSDAC) adopted a final white paper containing its recommendations on the Virginia Department of Rail and Public Transportation's (DRPT's) *Performance-Based Operating Assistance Allocation Implementation Plan* ("Operating Assistance Proposal"). It left one issue open and requested that DRPT, Northern Virginia Transportation Commission (NVTC) and WMATA staff meet again in an effort to work to reach consensus on the issue.

This group: 1) reviewed the formula that NVTC proposed for calculating unlinked passenger trips (for the purposes of the 50% ridership sizing component) for a system that serves a locality outside of Virginia; 2) analyzed whether alternative approaches suggested by DRPT reflect what TSDAC intended by using unlinked trips as a measure of ridership; and 3) considered whether DRPT's suggestion that unlinked trips equal 100% of total systemwide ridership could be accomplished consistent with TSDAC's intent. Unfortunately after two additional meetings, we were not able to reach a common view of how ridership data should be used to show the Virginia utilization of the system.

DRPT opted for a calculation which considers only those trips made by Virginia residents as attributable to Virginia for sizing purposes. NVTC complied with DRPT's request for this data on Thursday, September 5.

I appreciate the public comment opportunity, afforded by TSDAC, to explain why NVTC staff believes that its proposed approach best reflects TSDAC's intentions in including the industry standard of unlinked passenger trips as the measure of ridership for purposes of accounting for differences in the sizes of different systems. Before summarizing our principal concerns, I would like to describe how unlinked trips data is collected and reported to the Federal Transit Administration (FTA) and then describe the calculation for Virginia unlinked trips that NVTC, with WMATA's assistance, proposes.

In general, an unlinked trip is the boarding of any vehicle whether it is a bus or a railcar. So, for example, a bus rider boards the Fairfax Connecter and then transfers to another Fairfax Connector bus—each is an unlinked trip. Similarly, if a passenger boards an Orange Line train at the West Falls Church station, exits that train at the Rosslyn station and boards a Blue Line train, and exits at Franconia-Springfield station—each is an unlinked trip.

On Metrorail, the physical monitoring of trip-making occurs at the fare gate, both on entrance and exit. Because passengers may board multiple trains or vehicles within the system without fare gate access, WMATA has—in accordance with industry practice and with FTA's approval—calculated an average transfer rate.

The basis for the NVTC/WMATA approach is that any trip that either originates or ends in Virginia should be attributed to Virginia for purposes of sizing the level of system utilization. In non-technical terms this calculation would be based on:

All trips beginning in Virginia plus
All trips ending in Virginia minus
Trips beginning and ending in Virginia in order to avoid double-counting
Multiplied by a verified transfer rate
Equals unlinked trips attributed to Virginia

After considering several other options for how ridership data should be used to show the Virginia utilization of the system, DRPT selected an option that counts trips for Virginia residents irrespective of where they board or exit the system. Other approaches included counting only trips with Virginia entries or applying the subsidy allocation to systemwide Metrorail trips. The following summarizes NVTC's key concerns. (These are elaborated on in a policy memo that is attached with the percentages and numbers of trips different approaches yield shown.)

- TSDAC's recommended operating assistance formula includes two elements of how differences in relative system sizes are accounted: ridership and operating costs. The basis for determining ridership is a known, verified, universally-collected set of data called unlinked trips. Unlinked trips count each boarding of a vehicle as a trip and it is a measure of system utilization; it is not a measure of miles travelled or a number of passengers served. It is an output measure – a measure of what localities get from the system.

- How unlinked trips are used to measure any given system's utilization should be consistent across all systems whether it is other systems in Northern Virginia or other parts of the state. If trips beginning in DC and ending in Virginia are not credited to WMATA, similar trips from DC or Maryland or Tennessee or West Virginia or North Carolina should not be counted for other systems. If only trips by Virginia residents are counted for WMATA sizing, the same should be true for other systems. Using the subsidy allocation percentages as a proxy for Virginia's ridership share at best mixes apples and oranges. It uses a funding allocation formula to calculate utilization levels.

- Limiting trips to only those taken by Virginia residents excludes workers travelling to Virginia-based jobs, excludes many trips to and from National Airport, and bases the calculation on stale data. Residency data is collected through a survey undertaken every three to five years. As a result, it may be three to five years before Virginia residents' trips on Phase I of the Silver Line are accounted for and the data will lag actual performance. For Phase II of the Silver Line, this would mean that Virginia residence ridership would not be accounted for until at least 2021. Fare gate data is available monthly in a raw form; WMATA produces adjusted data annually for submission to NTD, and the FTA produces an audited number for inclusion in the National Transit Data Base.

- We take exception to DRPT's contention that the number of unlinked trips assigned to Virginia for sizing purposes plus the number of DC unlinked linked trips plus the number of Maryland unlinked trips should sum to 100 percent of the total WMATA trips. DRPT suggests that whatever approach that is applied to a calculation of the number of trips attributed to Virginia should be applied to DC and to Maryland and that the sum of those numbers should equal the sum of trips for the entire WMATA system. A calculation for sizing should be the same as a calculation for the subsidy. The calculation of the subsidy for Maryland and Virginia and DC is a result of a negotiated agreement that does not turn on utilization. A trip that originates in DC or Maryland but which continues into Virginia represents a utilization of the service in both DC or Maryland *and* Virginia. To disallow an unlinked trip that originates in Maryland or DC and ends in Virginia results in discounting the very performance that should be encouraged, namely increased use of transit.

- Assigning trips for Metrorail that begin or end in the Commonwealth for the purpose of the 50% sizing factor does not have a bearing on the subsidy allocation formula. The NVTC jurisdiction's share of the subsidy subject to agreement between parties to the WMATA compact. At issue is what portion of that operating assistance should be provided by the Commonwealth. The total subsidy is remains constant

Thank you once again for the opportunity to submit comments. Please feel free to contact me if you have any questions.

Sincerely,

Kelley Coyner

Kelley Coyner

Enclosure

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TSDAC Adopted Unlinked Passenger Trips as the Metric for Ridership

TSDAC chose a sizing factor split equally (50-50) between two elements: ridership and operating costs. Ridership measures the utilization of the service while operating costs measure the costs of the service. In considering different alternative approaches to calculating ridership for WMATA, the focus should be on the utilization of the service in Virginia, and not on its cost. Cost is reflected in the second part of the sizing factor. Unlinked trips measures utilization; transit systems collect the data routinely using standardized methodologies, and the data are consistently verified.

In practical terms we tend to think of ridership as "the number of passengers transported,"[1] in other words, how many people are being moved. The output sought is more than just the number of passengers—it is the number of trips taken. To put it another way, the output is the measure of utilization, not the number of passengers. The industry standard for measuring this output in the United States the Unlinked Passenger Trip (UPT).[2]

Unlinked passenger trips are defined as, "the number of passengers who board public transportation vehicles. Passengers are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination."[3] The definition of unlinked trips does not speak to the geographic location of boarding or transfer, jurisdictional boundaries, or length of the trip.

Unlinked trips differ from linked trips as follows: a one-way trip from point A to point B is counted as one linked trip. If the one-way trip requires a transfer between vehicles, it is counted as two unlinked trips. As noted by the Transit Research Cooperative Program, ridership is an economic measure of resource utilization.[4] In July, when TSDAC was considering possible sizing factors, DRPT acknowledged that all possible sizing factor options measure "outputs, not inputs" and "agencies with higher ridership per operating unit have potential for higher funding."[5]

To calculate the unlinked trips WMATA trips appropriately attributed to Virginia for purposes of the sizing factor, NVTC/WMATA's approach is that any trip that either originates or ends in Virginia should be attributed to Virginia for purposes of sizing the level of system utilization. In non-technical terms this calculation would be based on:

All trips beginning in Virginia **plus**

All trips ending in Virginia **minus**

Trips beginning and ending in Virginia in order to avoid double-counting

Multiplied by a verified transfer rate

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[1] TCRP Report 88: A Guidebook for Developing a Transit Performance-Measurement System, p. 301.
[2] TCRP Report 88: A Guidebook for Developing a Transit Performance-Measurement System, p.126-7, 167, and 301.
[3] NTD Glossary, available at http://www.ntdprogram.gov. DRPT/TSDAC has adopted the FTA's definition of Unlinked Passenger Trips in the *Performance-Based Operating Assistance Allocation Implementation Plan*.
[4] TCRP Report 88: A Guidebook for Developing a Transit Performance-Measurement System, p.126-7, 167, and 301.
[5] DRPT July 1, 2013 presentation to TSDAC, "Funding allocation concepts and items."

TSDAC Adopted Unlinked Passenger Trips as the Metric for Ridership

In order to identify the number of Virginia unlinked trips for WMATA Metrorail, NVTC and WMATA updated a long-standing NVTC formula for estimating Virginia's share of unlinked trips. The formula in more technical terms is summarized as follows:

	VA station entries
+	VA station exits[6]
-	(Systemwide entries * 0.0789) (VA-VA)
=	Total Linked Trips taken w/ Virginia origin or destination
X	1.33
=	Total Unlinked Trips taken w/ Virginia origin or destination

The formula includes both Virginia station entries and Virginia station exits, because in both instances, a trip is being provided in Virginia. On Metrorail, the physical monitoring of boarding occurs at the fare gate. Riders are "captured" taking a trip in Virginia by means of Virginia station entries/exits. For example, the formula takes into account trips that start at Foggy Bottom station in DC and end at Vienna station in Virginia and trips that start at Vienna station and end at Foggy Bottom station.

The formula also addresses trips that both start and end in Virginia. An examination of WMATA origin/destination data (see chart, below), reveals that 23.2% of the total number of systemwide Metrorail trips originate and 23.3% end in Virginia. The intersection of these trips, 7.89%, represents the total number of trips with a Virginia origin and destination; the formula subtracts 7.89% of system wide trips in order to avoid double-counting.

Finally, the WMATA system wide transfer rate is 1.33. Because passengers may board multiple trains (vehicles), WMATA calculated an average transfer rate. The transfer rate represents the percentage of transfers in the system per linked trip; it is used to identify the total number of unlinked trips for WMATA Metrorail. This ratio is derived annually by WMATA, and has been approved by the Federal Transit Administration (FTA) for the purposes of calculating and reporting unlinked trips to the FTA through the National Transit Database (NTD) in order to meet federal requirements.

[6] Virginia station entries are being used as a proxy for station exits. WMATA data indicate that entry and exit data are almost identical, although entry data are more accurate.

TSDAC Adopted Unlinked Passenger Trips as the Metric for Ridership

		Destination			
		District of Columbia	Maryland	Virginia	TOTAL
Origin	District of Columbia	29.4%	14.0%	13.7%	57.2%
	Maryland	14.0%	4.0%	1.6%	19.6%
	Virginia	13.6%	1.7%	7.89%	23.2%
	TOTAL	57.0%	19.7%	23.3%	100.0%

FY2011 Linked Trips	
17,414,434	51,050,703
50,463,226	220,715,259

As discussed above, an examination of WMATA origin/destination data reveals that 23.2% of the total number of system wide Metrorail linked trips originate and 23.3% end in Virginia. After removing the intersection of these trips to avoid double-counting 7.89% and applying the transfer rate, we find that 38.6% of the total number of systemwide Metrorail trips originates or concludes in Virginia. This methodology measures the utilization of Metrorail in Virginia. The NVTC formula measures outputs from Metrorail. Using the formula described above, NVTC calculates the delivery of 112,633,672 unlinked trips in Virginia for FY11.[7]

NVTC should be credited with Virginia entries and exits; to fail to include trips originating in DC or Maryland would underestimate utilization in Virginia. To provide a concrete example, trips by an employee of a local business or government located in Virginia who lives in the DC are not counted unless entries and exits are considered.

Further, this approach would result in inconsistencies across systems. PRTC, LCT and VRE trips that originate in DC but which occur, in part, in Virginia, are credited 100% to Virginia in terms of the system sizing. According to DRPT, a VRE trip that originates at Union Station in DC and which concludes in Fredericksburg is counted as a Virginia trip. In fact, 30.5% of all VRE trips originate in DC[8]; these trips originate outside Virginia, but end in Virginia, and VRE is able to count every trip. Using this logic, Metrorail should rightly be permitted to count trips that originate outside of Virginia, but end in Virginia. Similarly, reverse commutes on PRTCs system (presumably not trips with Virginia residents as passengers) should not be counted in order to achieve a consistent application across systems. Applying NVTC's formula to calculate trips in Maryland and DC results in more than 100% of the unlinked trips for the total Metrorail system.

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[7] NVTC utilized monthly fare gate data to calculate this figure, and well as ridership for Options #1 and #2, later in this paper. These calculations differ slightly than if they are calculated based on annual data. WMATA produces adjusted data annually for submission to NTD, and the FTA produces an audited number for inclusion in the National Transit Database.

[8] See Virginia Railway Express 2012 Customer Opinion Survey Results. Sixty-one percent of VRE riders commute to/from DC.

TSDAC Adopted Unlinked Passenger Trips as the Metric for Ridership

As previously mentioned, 38.6% of systemwide trips occurs in Virginia, 84.8% occurs in DC, and 35.3% occurs in Maryland. Taken together, these figures add up to over 100%. Assigning trips for Metrorail that begin or end in the Commonwealth for the purpose of the 50% sizing factor does not have a bearing on the subsidy allocation formula. The NVTC jurisdiction's share of the subsidy subject to agreement between parties to the WMATA compact. At issue is what portion of that operating assistance should be provided by the Commonwealth. The total subsidy is remains constant

It is appropriate to "credit" trips to more than one jurisdiction. Transit trips cross jurisdictional boundaries and can occur in more than one place. A trip that originates in DC or Maryland but which continues into Virginia represents a utilization of the service in both DC or Maryland *and* Virginia; it is appropriate to include that trip as part of the ridership data for the WMATA sizing factor. Transit trips that cross jurisdictional boundaries cannot be "assigned" to a single jurisdiction. In fact, a trip can be attributed to more than one jurisdiction.

DRPT Options

DRPT asked that NVTC and WMATA examine two methods of assigning unlinked trips to VA/DC/MD such that the sum of all unlinked trips is 100%. There are two possible options and DRPT has selected Option #1.

Option #1:	Multiply systemwide unlinked trips by the percentage of Metrorail riders who reside in Virginia (30.9%); or
Option #2:	Multiply systemwide unlinked trips by Virginia's Metrorail subsidy percentage (31.17%).

DRPT's Option #1 measures the percentage of unlinked trips that are taken by Virginia residents. Unlinked trips that are taken in Virginia by DC and Maryland residents (or others) are not counted. Where residency is the basis for the determination, the formula generates 90,707,350 "unlinked trips" in Virginia for FY11. Assume that a trip is taken by a DC resident to work in Falls Church, Virginia. The DC resident travels between East Capital station and East Falls Church station to and from work. Under the option selected by DRPT, neither of these trips would count toward the ridership portion of the sizing factor for Virginia. Another troubling concern is that using the Virginia residency constraint excludes trips made to and from Ronald Reagan Washington National Airport station if the traveler is not a resident. This is a problematic for counts to and from the airport; we understand that the undercount would be much more severe if ridership to and from Dulles Airport were also excluded in the future when the Silver Line Phase II opens. In addition, Residency data is collected through a survey undertaken every three to five years. This has particular consequence of undercounting with respect to the Silver Line trips.

DRPT's Option #2 measures the number of unlinked trips for which Virginia's jurisdictions are "paying;" it measures how much Virginia is paying for Metrorail service in Virginia, DC, and Maryland. Option #2 is not an appropriate measure of unlinked trips in Virginia. As discussed above, ridership measures the utilization of the service while operating costs measure the costs of the service. The other half of the sizing factor—operating costs—addresses how much Virginia is paying for Metrorail service in Virginia. This methodology is flawed because it measures inputs and not outputs and is not an accurate measure of Metrorail utilization in Virginia. Option #2 formula generates 91,499,938 "unlinked trips" in Virginia for FY11.

TSDAC Adopted Unlinked Passenger Trips as the Metric for Ridership

Note with respect to Metrobus: The bulk of the discussion concerning WMATA ridership data to date has focused on WMATA Metrorail; however, the calculation of WMATA Metrobus ridership data is also not finalized. WMATA tracks ridership for Virginia routes (unlike Metrorail, Metrobus routes, with few exceptions, are specific to jurisdiction). Approximately 16.6% of total WMATA Metrobus systemwide ridership is on Virginia routes. Based on ridership for Virginia routes, there were 20,810,422 unlinked trips in Virginia for FY11.

If we were to calculate WMATA Metrobus ridership based on Option #1 using the percentage of Metrobus riders who reside in Virginia (16.0%), there were 20,014,240 unlinked trips in Virginia for FY11. If we were to calculate WMATA Metrobus ridership based on Option #2 using Virginia's Metrobus subsidy percentage (25.7% in FY11), there were 32,151,552 unlinked trips in Virginia for FY11. As with WMATA Metrorail, the calculation of WMATA Metrobus ridership based on a jurisdiction of residence or subsidy percentage measures inputs, not outputs. The accurate measure of Metrobus utilization in Virginia is actual ridership for Virginia routes. For consistency, were this calculation applied throughout the Commonwealth, ridership as a sizing factor for other systems would also only include trips by Virginia residents. Out-of-towners using Hampton Roads Transit (HRT) would not be included; DC residents travelling to work in Fairfax County would not be counted; West Virginians on commuter buses or Virginia Regional Transit (VRT) would not be included in the calculation for ridership of those systems.