Highlights from the
TPB Bus On Shoulders (BOS) Task Force – Meeting #3
April 17, 2013
Place: COG Meeting Rooms 4&5

ELECTED OFFICIALS
Carol Krimm, Alderman for the City of Frederick, Co-Chair
Tawanna Gaines, Maryland State Delegate
Emmett Jordan, City Council of Greenbelt
Chris Zimmerman, Arlington County Council, Co-Chair

ATTENDEES:
Ari Ashe, WTOP
Ron Burns, Frederick County
Eulois Cleckley, District DOT
Tim Davis, City of Frederick
Bridget Donnell , City of Rockville
Gary Erenrich, Montgomery County
Lyn Erickson, Maryland DOT
Claire Gron, NVTC
Jason Groth, Charles County (phone)
Renée Hamilton, Virginia DOT
Barry Kiedrowski, Maryland SHA
Mike Lake, Fairfax County
Kenya Lucas, Maryland SHA
Dan Malouff, Arlington County
Nicole Macon, Capital News Service
Mark Rawlings, District DOT
Tina Slater, TPB Citizens Advisory Committee
Kanti Srikanth, Virginia DOT
Rahul Trivedi, Virginia DOT
Vic Weissberg, Prince George's County
Randall White, Fairfax County

TPB Staff:
Ron Kirby
Eric Randall
Jerry Miller
Andy Meese

All meeting and other task force documents are available at: http://www.mwcog.org//bostf

1. Welcome and Introductions

Ms. Krimm welcomed the participants and asked them to introduce themselves.

2. Review of task force work plan, overview of Tech Memo #1, and initial data for select corridors in Maryland.

Mr. Randall reviewed the progress of the task force to date. This included a review of the task force's objectives and work plan, and previous accomplishments. He noted that the focus of the meeting would be on the selected corridors for preliminary analysis: the MD 5/US 301 corridor in Prince George's and Charles Counties and the I-270 corridor from City of Frederick to the Capital Beltway, both in Maryland; and the I-66 Inside the Beltway Pilot Project taking place in

Virginia. Mr. Randall closed with a list of potential next steps for the task force, including the final technical memorandum to be published and a draft report for June.

Mr. Zimmerman asked how staff envisioned formulating a set of recommendations to take to the TPB. Ms. Krimm agreed, and asked what recommendations were likely to have regional applicability.

Mr. Erenrich responded that the work of the task force to date was a great start, and that further analysis is need before recommendations can be made. The initial analysis of I-270 is very broad, and there would need to be further work to identify more promising segments of the corridor that might be worthwhile for a pilot BOS project in Maryland. It appears unlikely that the whole I-270 corridor could have BOS operations, but some smaller sections appear more feasible.

Ms. Krimm agreed that further consideration of I-270 should focus on the potential for short segments, similar to queue jumps or VDOT's proposal for I-66. However, additional analysis of what areas have the most congestion, an assessment of shoulder widths, and the potential for lane restriping, should be considered in a pilot project.

Ms. Erickson stated that the task force has been a place to start the conversation on BOS feasibility. However, further analysis must compete for limited resources with other work. SHA has supported the work to date on I-270 and MD-5 as an internal exercise, but funding would have to be identified for further assessment. She emphasized that the work done focused on the limited information available. She also noted that most of the work was looking at infrastructure, but that more analysis from the transit operations point of view is also needed. Any task force recommendations could suggest where future study may take place, but again would need to go through the project planning process.

Mr. Zimmerman responded that some segments are likely to be low-cost and more feasible, and that SHA concentrate on these as the first goal. There should be regional action on assessing the potential for BOS, as well as specific steps.

Mr. Erenrich agreed that a pilot project in Maryland is critical.

Ms. Krimm said her reaction is that which the public often has, that transportation planners spend their time producing long studies that end up sitting on a shelf. BOS is an alternative that has worked in other areas, and is working now on some sections in the region. It should be looked at as an immediate, cost-effective, and efficient way to provide better transportation. The perception is that study and analysis only leads to inaction; what is the purpose of further study, and how does it take the region to implementation?

Mr. Kirby responded by noting that there are many concerns with BOS operations, especially when it comes to safety. These things need to be considered, including permitted speed differentials, necessary driver training, and so forth. There is lots of planning and preparation that must be very deliberative. Yes, in some locations, BOS should be feasible. The work

VDOT has conducted on I-66 is an example of what needs to be done, the necessary involvement of many agencies and the total effort required.

3. Update on the Virginia Department of Transportation's I-66 (Inside the Beltway) BOS Pilot Program Evaluation

Mr. Srikanth opened his presentation with a recapitulation of what was presented in January, to provide the complete context and highlight the work accomplished since then. In regard to the type of resources needed to assess BOS feasibility, he noted that VDOT had the advantage of an extensive aerial survey for the I-66 corridor, already completed for other purposes, a two to three million dollar expense that they were then able to take off the shelf and use for the BOS evaluation. This expedited advanced planning required and is helping them move more quickly to implementation. Since January, the VDOT working group has refined locations and developed operations protocols for the pilot project.

Mr. Zimmerman asked about the lateral obstruction limits presented. Mr. Srikanth noted such obstruction limits are legally required, and are specified per the guidelines set by AASHTO. Close to the end of the lane, obstructions can be structures like guard rails or unpaved sections.

Mr. Srikanth emphasized that one major change was the decision to limited BOS speeds to no more than 25 mph by the buses. This is due to the limits of the infrastructure, including grates with limited strength and drop-offs from pavement grade. He also noted the limited strength of shoulders and some awkwardly-placed junction boxes located near the lateral limits. Per AASHTO design requirements, there must be a shy distance, typically 2-1/2 to 3 feet, or a design exception is required from FHWA. Therefore, it was decided to keep BOS speeds low for the pilot project, for safety and driver comfort.

Mr. Erenrich asked for more explanation on what buses would use shoulders at 25 mph, if VDOT has also specified that shoulders can be used when general traffic speeds fall below 35 mph. He noted that 35 mph is a common standard in other BOS projects and asked why VDOT felt they had to more restrictive. Mr. Srikanth reiterated that as a pilot, VDOT want to accumulate some initial experience before moving to a higher shoulder speed limit. He acknowledged that they will lose out on some of the advantage offered by BOS operations, but want to see what happens first. VDOT would then consider re-examining the shoulder along the corridor.

Mr. Zimmerman asked whether VDOT tried to match the pilot segments to the general traffic hot spots. Mr. Srikanth responded that doing exactly that was VDOT's initial approach to the issue: comparing transit needs with highway traffic speeds.

Mr. Srikanth noted that the speed profile graphs do not show where speeds are unreliable, such as where traffic was bad today. A speed limit of 25 mph for BOS operations is for safety and structural purposes. There are too few spots with a shoulder with of 12 feet, which was VDOT's initial horizontal clearance goal. Permissible shoulder width was thus reduced to eleven feet, or eleven and a half where lateral obstructions such as sound walls, in order to open more locations for BOS operations. He emphasized that the protocols shown have yet to be approved by

FHWA. The next step for VDOT is for the project to enter the design phase to engineer the project.

Mr. Srikanth then reviewed the specific characteristics of the five initial pilot locations. In particular, looking at the eastbound segments, segment one will be the continuation of the current Dulles Access Road shoulder access to West Falls Church, across the bridge over I-66. However, this shoulder cannot continue to the full merge to the Interstate due to the lack of a shoulder. Also, segment three, from Spout Run to the Rosslyn tunnel, will need minimal engineering work as there is sufficient shoulder width. This segment coincides with recurring congestion, so it should provide relief for the transit operators.

Mr. Srikanth concluded by noting that all five initial segments are approximately a mile long, totaling about 5.5 miles. They will be usable throughout the day, whenever general traffic speeds drop below 35 mph. This experience should provide VDOT the information it needs to potentially apply this concept to other Virginia locations.

Mr. Burns asked if all shoulders for bus use would be on the outside, and if all the I-66 shoulders were at least ten feet in width. Mr. Srikanth responded that all shoulders were outside, but that there were locations where shoulders were less than ten feet, let alone VDOT's minimum of eleven feet for the pilot project.

Mr. Burns then asked if there was any consideration of looking at re-striping lane widths to get the needed foot or foot-and-a-half. If shoulders are typically only ten feet, is there a way to get the extra width needed? He also added if narrow general purpose lanes were covered by federal design codes. He stated that there had been some precedents, and no fatal flaws had been found with such lane narrowing. Finally, he also asked about shoulder thicknesses and strength along I-66.

Mr. Srikanth responded that VDOT is using previous survey work on the I-66 shoulders to determine their strength, which included materials tests. VDOT's calculation is that the current shoulders could support use by up to 150 buses a day for a period of up to two years. Beyond that, more intense monitoring of the shoulders would be needed. He added that the cost estimates for some of the long-term shoulder improvements proposed would be about $2 million, including signage and some resurfacing and restriping to meet federal highways guidelines. There would also be improvements around the grates, junction boxes, and some shoulder strengthening.

Mr. Zimmerman asked what the number two spot improvement on I-66 cost? Mr. Srikanth responded that spot improvement number one cost about $10 million, while improvement number two work has not yet started; he would have to look up the latest estimate. That cost includes replacing some soundwalls and other costs to mitigate the impacts of traffic. For the bus on shoulders pilot, VDOT is not expecting any additional impacts.

Mr. Lucas asked if VDOT did any noise forecast. Mr. Srikanth responded that the focus has been on weight impacts of bus operations. As BOS is only a pilot project, a full conformity analysis is not required. If the pilot program is continued, there would have to be some study of

whether buses were closer to residences and if existing soundwalls were sufficiently mitigating the noise impacts of buses using shoulders. However, it is likely that existing soundwalls handle any impacts. Mr. Zimmerman asked how much the City of Fairfax soundwalls cost, to which the answer was approximately $20 million.

Mr. Srikanth then summarized the next steps for the BOS pilot project, including determining the source of funding for engineering and also further coordination with the Virginia State Police. Some of the engineering funding will be found by leveraging some currently planned work, including planned repaving. In addition, the final engineering plan will be submitted to FHWA for approval.

Mr. Kirby noted that the cited costs do not include the extensive planning work that has been accomplished to date. There are significant planning requirements to meet before any implementation costs are incurred, and that VDOT was fortunate in being able to use existing survey data and other resources.

Mr. Malouff reported that I-66 spot improvement two is budgeted at $24 million, number three at $18 million. Mr. Zimmerman noted that the costs of BOS engineering were therefore comparatively smaller by an order of magnitude. He believes that making improvements for BOS operations is therefore relatively economical, and should be a higher priority in VDOT's project prioritization and budgeting.

Mr. Srikanth noted that costs increase for more technical challenging projects, and that rehabilitation work is costly. In future planning, VDOT may be able to plan for stronger shoulders where right-of-way is available. However, many current shoulders may not be able to support BOS, making improvements cost prohibitive. Mr. Zimmerman agreed that it would be more economic if shoulder improvements to make them sustainable for BOS operations could be built in ahead of time.

Mr. Srikanth noted some other actions in the I-66 project, including reaching a memorandum of understanding with the state police, and finalizing the bus operations protocols with the bus operators. In particular, the protocol for buses cutting across intersections with ramps is challenging and has yet to be fully agreed on. The planners' final report will have the full protocols and recommended actions, before it goes to engineering. He noted that the normal project process of design, federal review, and budgeting normally takes 2 or 2-1/2 years, and that VDOT is trying to accomplish the I-66 BOS pilot within 16-18 months, five of which have past. With ten more months to complete requirements, VDOT anticipates that the pilot will be operational early next year.

Mr. Zimmerman thanked VDOT for the work completed and their rapid mobilization around this effort. However, he noted his concerns that an assessment after only twelve months of the project was a bare minimum to assess results. He also expressed his opinion that the extent of the project is so limited that it will be very difficult to determine any benefit. Real benefits would be much more likely with a full implementation of BOS operations. The ultimate value would be achieved by continuing to add segments until a full network of shoulders would be useable by buses. Then, a marketing effort and outreach to potential bus customers could

significantly improve bus use. In addition, there are end-to-end circulation issues at town centers that need to be addressed to exploit the full potential of rapid bus service. It may be necessary to take lanes from general traffic on town streets to get the full benefit, which would require a lot of coordination across multiple agencies, but should be the long-term goal for transit in the region.

Mr. Erenrich asked if VDOT had determined the applicability of the I-66 segments of future transit guideway funds from the FTA. Mr. Srikanth responded that such would be an issue for DRPT to take up.

4. Maryland State Highway Administration's evaluation of BOS feasibility on select corridors in Maryland

Ms. Krimm introduced the topic by noting that Maryland is at a more preliminary stage in looking at BOS operations, but that she hopes the efforts in Virginia will provide an example for Maryland, just as Virginia looked at experiences in other states.

Mr. Kiedrowski spoke to SHA's contribution to the task force's work. He stated that SHA has focused on developing the specific needs that would have to be addressed in order to evaluate BOS feasibility on some long corridors.

Mr. Lucas then began a presentation on SHA's recent efforts, specifically focusing on collecting available shoulder data. SHA looked at pinch points (i.e., overpasses, other potential obstructions) and conflict points (i.e., intersections and lane merges) along the I-270 and MD-5 corridors.

Ms. Krimm asked if 10 foot shoulders were standard. Mr. Lucas responded that 10 foot shoulders were the AASHTO Interstate standard minimum, but that this width might not be enough in some cases for BOS operations.

Mr. Burns suggested that if ten feet is not available, narrowing of the general traffic lanes should be considered. Mr. Kiedrowski responded that SHA would be able to assess that once the inventory of shoulder widths is complete.

Mr. Lucas noted that from the MnDOT website he was able to get some information on how they handle merging at intersections where operations are tight. These are left to the driver's discretion. Mr. Erenrich noted that on US-29 in Maryland the bus yields to cars because of the bus driver's better line of sight. He then asked for clarification on SHA's definition of pinch points: are they minor, or significant?

Mr. Lucas reviewed the two corridors, noting that for MD-5 there are many urban segments where the shoulders are narrow, barely enough for ruble strips. He noted that the inventory displayed was simply with what data was available, and was not a suggested BOS start or end point. South of Surratts Road, there are driveways, a busy cinema by Brandywine, and safety concerns with any shoulder use. For I-270 there are other issues that would have to be considered, including the Monocacy Battlefield. Shoulder strength is also unknown for many

segments. The cost to reconstruct the shoulders along aside from any bridge pier or right-of-way issues is estimated at $3 to $6 million a mile.

Mr. Zimmerman noted that in comparison to other transportation projects, such a cost is relatively modest. Ms. Krimm added that the current budget for widening I-270 is $4 billion; making shoulders ready for bus use would be an interim measure for the near term.

Mr. Lucas noted that shoulder upgrades could be integrated with other projects, which would reduce the stand-alone costs.

Mr. Erenrich suggested that SHA focus on key segments, particularly between Germantown Road and the I-370 spur. The HOV lanes on the northbound side save buses 10 minutes a trip; it would be great if such savings could be realized in the southbound direction.

Mr. Lucas noted that SHA's study focused on the outside shoulders, and did not examine the feasibility of using center shoulders for BOS operations.

Mr. Saffran then provided comments on MTA commuter bus operations. The VDOT work for I-66 is very impressive, but he noted that MTA commuter buses include a substantial portion of contracted service, which raises a number of questions when the service is not owned, controlled, or branded as a public bus operations. The same buses are used for charter service, and cannot be easily identified. He noted that there are no controls over which buses use US-29. Going forward, he suggested looking at hot spots and priority locations for transit service.

Ms. Krimm noted that the VDOT figures included implementation costs, and asked if the SHA cost estimates include planning. Mr. Kiedrowski responded that the cost estimates are only high-level, preliminary estimates. If full shoulder reconstruction were needed, costs would increase sharply. If the shoulders are in satisfactory condition, costs could be lower. He emphasized that much of the data is unknown, SHA is working from a very limited amount of data; resources would be needed to collect more accurate information.

Ms. Erickson then reviewed the project planning process in Maryland. MDOT does not have funding assigned for the needed engineering survey of I-270 or MD-5. This funding would have to be identified and the survey conducted before a confident determination of the feasibility of BOS could be made.

Ms. Krimm asked if such funding would have to be system wide, or could jurisdictions submit in priority letters. Ms. Erickson responded that the need for BOS studies should be noted in the priority letters. The data gathered to date by SHA is just a first look for the purposes of the task force, and no further work is funded.

Mr. Weissberg asked if the MD-5 study now under way would provide relevant information. Mr. Kiedrowski responded that the study was a separate effort for other purposes, and they he did not know but did not believe so.

Ms. Erickson noted that Montgomery County is paying SHA to conduct an engineering assessment of two corridors for potential BRT service. This would be an option for other jurisdictions interested in having the feasibility of shoulders for bus operations on specific corridors assessed.

5. Roundtable / General Discussion

Mr. Jordan spoke to the challenges of airport access to BWI from Prince George's County, and noted that congestion on the Baltimore Washington Parkway is major issue for his constituents. He inquired as tot the potential for BOS operations on the parkway.

Mr. Erenrich noted that fifty buses per hour provide more transportation capacity than a general purpose lane. Mr. Zimmerman noted that there are other benefits as well, including environmental benefits and citizen cost savings from reduced auto use.

The task force meeting then concluded with thanks for staff work expressed by Mr. Zimmerman and Ms. Krimm.

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