MCPB
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Worksession: Countywide Transit Corridors Functional Master Plan

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Description

This worksession is a follow-up to the Planning Board's review of the Network and Methodology Report on December 15, 2011 and the January 12, 2012 roundtable. (The staff memo and report for the December 15, 2011 and January 12, 2012 meetings may be found on the following links: http://www.montgomeryplanningboard.org/agenda/2011/documents/20111215_NetworkMethodologyReportBRT_md_final_000.pdf and http://www.montgomeryplanningboard.org/agenda/2012/documents/20120112_Roundtable_BRT.pdf.

At this worksession, we would like to discuss the functions of the proposed BRT corridors, repurposing travel lanes as bus lanes, and the impacts of various levels of treatment on a sampling of corridors. Planning Board members are requested their copies of the staff memos from the above previous two meetings for reference.

Functions of the proposed BRT corridors

As noted in the Network and Methodology Report on pages 8 and 9, the corridors in the proposed BRT network would be classified as having one of three functions: commuter/express, activity center connector, or link. The attributes of these corridor functions are described in greater detail in Appendix D. The key attributes of these corridor types are summarized on page D-1, and will be used as working criteria to determine whether a one-lane or two-lane transitway is recommended. The initial assessments of each corridor are shown on page D-3. The Board had questions at the 12/15/11 meeting as to how these corridors were classified; we can discuss the issue of corridor function classification in greater detail at this meeting.

Methods for achieving dedicated bus lanes

The methodology in the report includes a tiered approach to determining a desired level of treatment based on the corridor function and on the forecast ridership. The corridors that are forecast to operate with the highest ridership merit having dedicated bus lanes: those having a two-way travel pattern all-day merit having a dedicated bus lane in each direction; those with a distinct peak direction would merit

one reversible dedicated lane. How we achieve those lanes is one of the central decision points for the Board.

Below, we discuss four alternatives for determining when we should repurpose an existing travel lane to achieve the desired bus lanes.

Alternative1: General purpose lanes with v/c less than 1.0

Once dedicated lanes are determined to be merited, the proposed methodology would repurpose existing travel lanes only where there is sufficient capacity in the remaining lanes to maintain a Level of Service (LOS) E. The Board asked why LOS E was the goal for these lanes when the County Council has stated that our goal is that our roads should operate at LOS D or better. The answer is that while these general purpose lanes would operate at a maximum volume/capacity (v/c) ratio of 1.0 (LOS E), the bus lane would operate at a much higher LOS, so the whole roadway would operate at an acceptable LOS.

The capacity of the general purpose lanes for a suburban condition is assumed to be 1,200 vehicles per hour (vph) with an average of 1.15 persons per vehicle, or which results in about 1,400 persons per hour (pph).

Capacity of General Purpose Lane = 1,200 vph X 1.15 ppv = 1,400 pph

Per the Transit Capacity and Quality of Service Manual (page 4-39), the capacity of a dedicated bus lane in an interrupted flow facility on an arterial street is approximately 135 vph with a load factor (total passengers/seating capacity) of 1.2 times a seating capacity of 43 for an articulated bus, equivalent to 7,000 pph..

Capacity of Dedicated Bus Lane = 135 vph X 52 ppv (43 X 1.2) = 7,000 pph

The capacity of a bus lane is therefore far higher than a general purpose lane.

If we assume that 1,400 people are being carried in the bus lane in the peak hour, the v/c ratio for that lane would be 0.2 (LOS A).

Volume to Capacity for Bus Lane= 1,400 pph / 7,000 pph = 0.2

If the v/c ratio for the remaining two lanes of the road is 1.0, then the average v/c ratio for all three lanes would be 0.73 (LOS C).

Alternative 2: General purpose lanes with v/c less than 1.25

A much higher v/c ratio would be allowable in the general purpose lanes and still let us meet the Council's criterion of an overall LOS D for the road, a maximum v/c ratio of 0.9, as an average for the whole roadway: (3x0.9-0.2) /2=1.25).

At the December 15, 2011 Planning Board meeting, staff noted that using a v/c threshold of 1.0 would not result in many lanes being repurposed. A threshold of 1.25 would result in a greater number, but the

diversion of traffic to other area roadways would need to be modeled to confirm any v/c ratio of greater than 1.0, as we have recommended. The language in the General Plan however (summarized below) might provide a stronger guide in that the importance of the transportation facility serving land use and the need to minimize impacts to already urbanized areas are given greater weight than accommodating travel demand.

One consideration in making the decision as to whether we should repurpose an existing lane as a bus lane or build a new lane is to look at the incremental benefit compared to the potential cost. For example an existing six-lane roadway with the three lanes in the peak direction:

	Capacity in persons per hour (pph)	Increase in roadway capacity in peak direction over existing
Existing condition: 3 general purpose lanes	3 lanes x 1,400pph = 4,200pph	0%
Repurpose lane: 2 general purpose lanes plus dedicated bus lane	2 lanes x 1,400 pph + 1 bus lane x 7,000 pph = 9,800pph	133%
Add lane: 3 general purpose lanes plus dedicated bus lane	4,200pph + 7,000pph = 11,200pph	166%

Converting an existing lane to a bus lane more than doubles the roadway's capacity to move people. The capacity of the bus lane is so much greater than the general purpose lane, so the incremental increase in total roadway capacity achieved by building a new lane over just repurposing a lane would be fairly small. But the cost for the new lane would be much higher – in construction, right-of-way, and moving utilities. (A better estimate of the relative dollar costs should be available shortly from the task force's consultant.) In addition, adding two lanes for each corridor in the whole proposed BRT network would require the addition of more than 400 acres of pavement whose stormwater treatment would have to be managed at an additional cost and which would likely require still more right-of-way.

The highest ridership for a BRT facility and the greatest mode shift to transit would be achieved by repurposing an existing lane rather than building a new lane. This is because the travel time for travel by automobile compared to BRT would increase, making BRT a more competitive option

<u>Alternative 3: Repurpose existing lanes in urbanized areas as a general policy</u>

Our interpretation of the 1969 Updated General Plan's guidance on this issue (restated from our memo for the 1/12/12 meeting) is:

- Transportation facilities are intended first to serve planned land use rather than just meeting travel demand
- Planning for a BRT network must consider the impacts on adjacent properties
- Transit is given a higher priority over automobiles in urbanized areas

Repurposing travel lanes to achieve dedicated bus lanes is therefore the preferred choice in our urbanized areas. Coincidentally, these areas are where the highest BRT ridership is forecast. So this alternative would repurpose an existing travel lane unless additional modeling determined that the area transportation network would not perform adequately.

Alternative 4: Rapid Transit Task Force – dual lanes on entire network

This alternative reflects the Rapid Transit Task Force's recommendation to construct dual bus lanes on all corridors regardless of demonstrated need (forecast ridership).

Method for Achieving Dedicated Bus Lanes

	LOS D or better achieved for entire roadway?	Consistent with General Plan?	Staff assessment
Alternative 1 (general purpose lanes have v/c less than 1.0)	yes	yes	This alternative would result in some transit benefits but few repurposed lanes. With the removal of buses from the general purpose lanes, additional road capacity would be freed up and vehicle-miles-traveled (VMT) would likely increase. Impacts on adjacent properties would be moderate.
Alternative 2 (general purpose lanes have v/c less than 1.25)	yes	yes	This alternative would result in greater transit benefits with more repurposed lanes; congestion would increase in the general purpose lanes. Lesser additional road capacity would be freed up than the above alternative, but VMT would likely increase on the remaining roads. Impacts on adjacent properties would be moderate to low.
Alternative 3 (repurpose existing lanes in urbanized areas as a general policy)	no, in most cases	yes	This alternative would result in the highest transit benefits and ridership; congestion would increase in the general purpose lanes and drivers would seek alternative routes. Impacts on adjacent properties would be low.
Alternative 4 (Rapid Transit Task Force – dual lanes on entire network)	yes	no	This alternative would result in the highest transit benefits but ridership would be the most adversely affected by the freeing up of additional road capacity in the general purpose lanes. Impacts on adjacent properties would be very high. **Staff does not recommend this alternative.**

Sample impacts on existing development

To give the Board an idea of what the impacts of various levels of treatment would be, particularly in regard to repurposing a travel lane vs. adding new lanes, we have examined two corridor segments – Old Georgetown Road in front of NIH and Georgia Avenue between Forest Glen and Wheaton. We will display the results of this examination at the Board's meeting.

Summary

The proposed BRT network has the ability to act as a transformational tool in supporting and encouraging denser development along these corridors and at the stations and converting these corridors to boulevards, in line with the County's efforts over the past few years, including the adoption of the White Flint Master Plan. The designation of the corridors to be included in the network must be based on forecast ridership and travel patterns, but just as important, the treatment for these corridors must consider the impacts on existing development.

Next Steps

We have just received the Rapid Transit Task Force consultant's report on a preliminary design for an interim BRT network with a cost estimate. We will include a review of this report in our memos for subsequent Functional Plan worksessions in February at which we will request the Board's recommendations on the BRT network and methodology.