Countywide Transit Corridors Functional Master Plan

Appendix 1
Decision Approaches

Travel Demand Forecasting Model

A travel demand forecasting model (TDFM) was used to develop the recommendations in this Plan. The transit model used for the BRT network is the Maryland Alternative Analysis II (MDAAII) model. The MDAAII model, originally developed by Maryland Transit Administration for the Purple Line and Corridor Cities Transitway (CCT) projects, uses a transit mode choice routine and complete four-step model process to develop ridership estimates for those transit modes.

An updated local bus network was developed to reflect assumed local bus service assumptions on the corridor. This network was developed after coordination with service providers in the area, including Ride On and WMATA staff. The intent of the development of this network was to reflect how service would be altered to support a fully implemented BRT network, to understand implications of this network at the level needed for decision-making.

Highway network and demographics data are based on a previous version of the the MWCOG model, which used the same 2191 zone structure as the MDAA II model. For this study, land use Round 8.1 was used for the forecasts, provided by MWCOG staff and summarized to the 2191 zone structure.
For the scenarios where the proposed BRT vehicles are running on dedicated guideway, the model's BRT mode was used and the speeds between stops/stations was adjusted to reflect actual operating conditions. For the scenarios where a route operates both on exclusive guideway for a portion on the roadway and with mixed traffic on other segments, the same BRT mode was used to maintain consistency in comparing the impacts of the scenario. Speeds were adjusted accordingly based on the operating characteristics of running in an exclusive guideway or mixed traffic. The local bus component of the model was re-calibrated in Summer 2012 to better reflect existing operating conditions. For each of the scenarios analyzed for this project, the background bus network was modified to provide connectivity with the proposed BRT routes as needed.

Additional details of the modeling process can be found in Appendix 9.

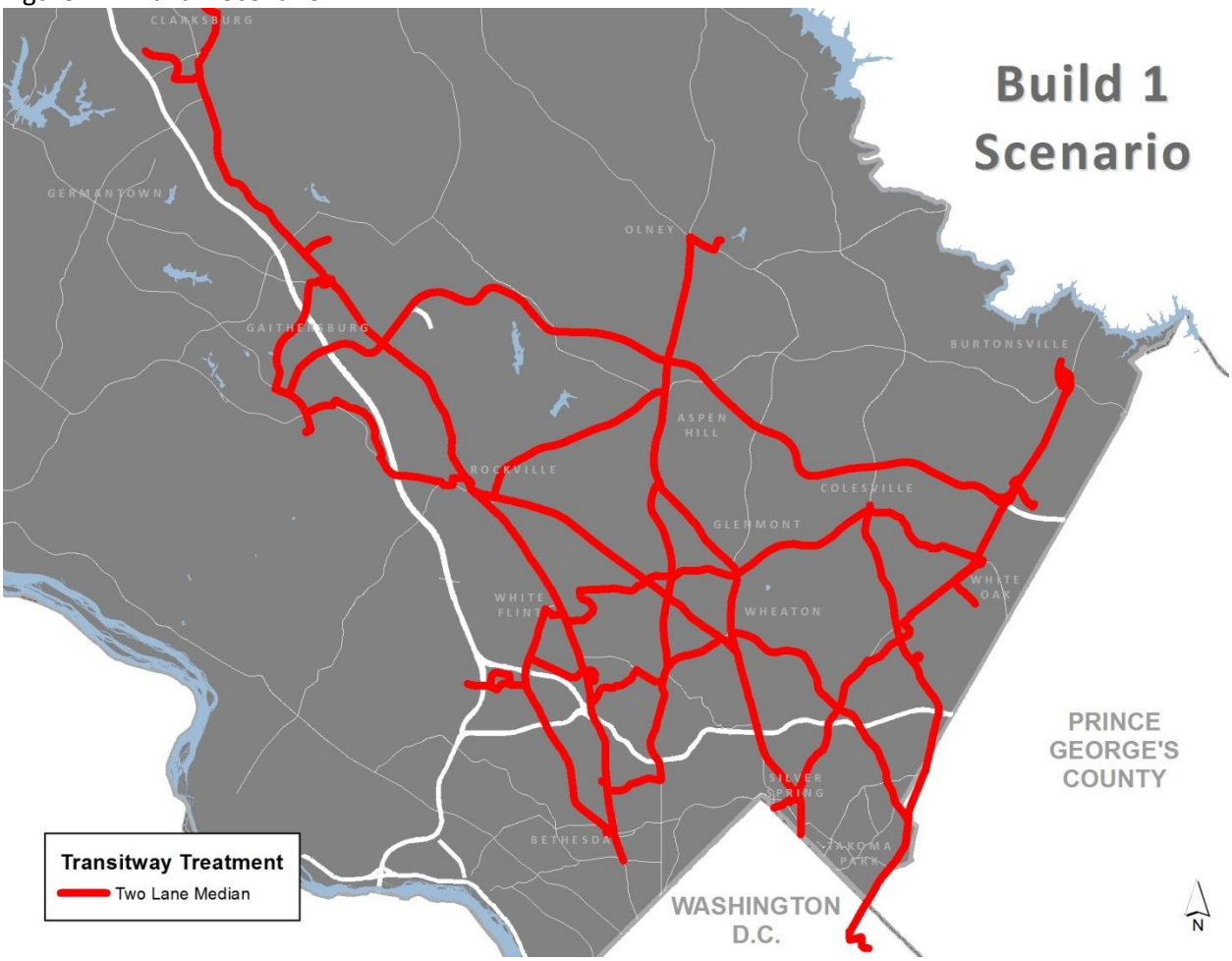
Ridership Assessment

The ridership forecasting was approached as an iterative process, in which the ridership results from each scenario would inform subsequent rounds of evaluation. The process started by evaluating a network based on the best ridership that could be achieved (Build 1 and to a lesser extent Build 2), and then adjusting the network by removing corridors that achieve low ridership even under the most favorable conditions, and/or where there are major impacts to private property and traffic (Build 2A). Of course every time the network is adjusted to (1) remove inefficient corridors and/or (2) reduce the busway treatments to avoid impacts the ridership on the entire network is affected. If carried through multiple iterations, this could result in a severely degraded network. Therefore, the key is to find the optimal network where a balance is reached between a viable network of corridors, transit speeds, private property impacts, and traffic impacts. In practice this is difficult to achieve, but staff believes that the final recommendations approach this goal. Ultimately, the recommendations are likely to result in ridership forecasts that are between those of the Build 2 and Build 2A scenarios.

As part of the Build 1 scenario (Figure 1-1), staff evaluated a highly ambitious scenario using speeds associated with a median busway, in which transit vehicles benefit from unimpeded flow between

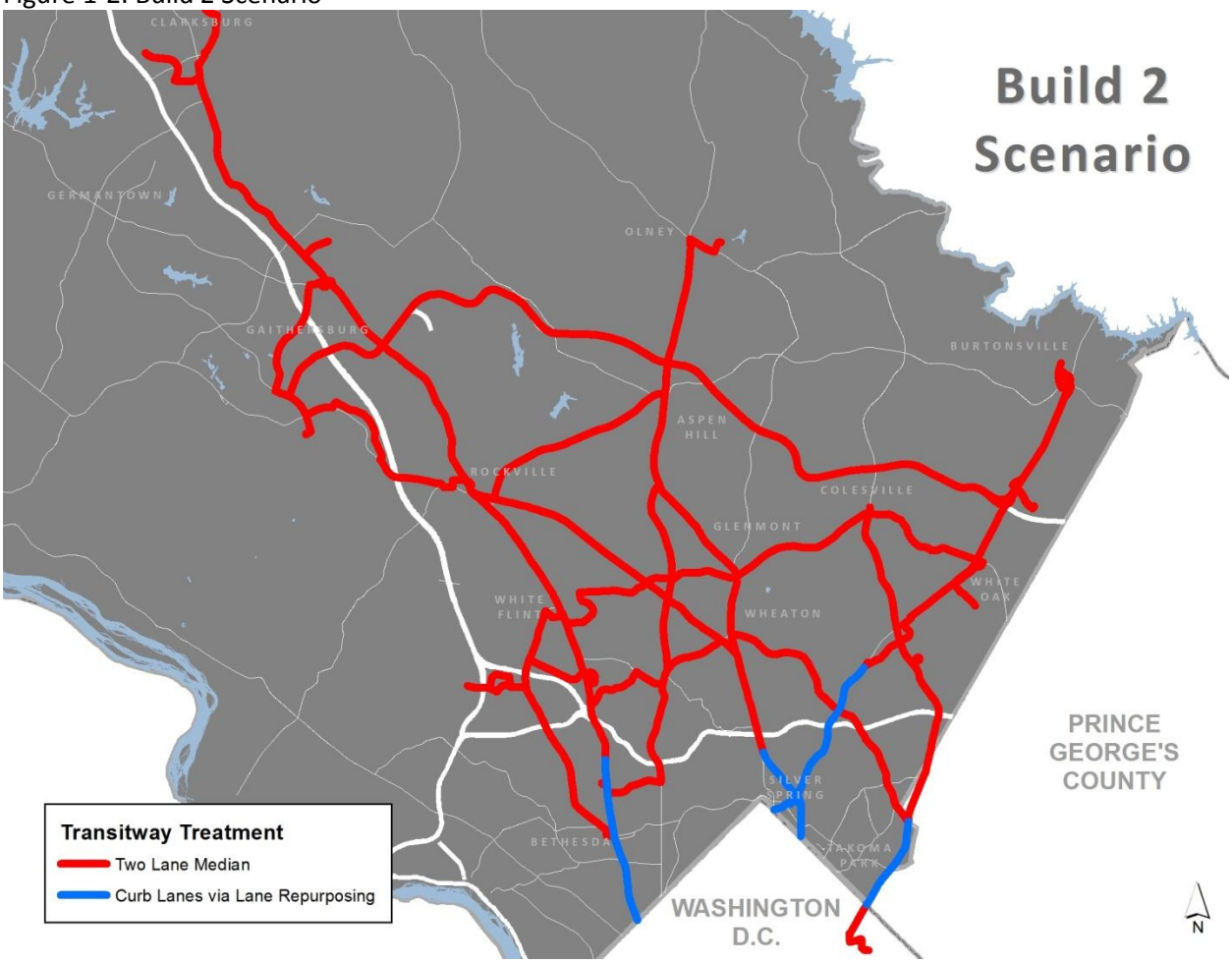
intersections, transit signal priority/queue jumps provided at intersections, and station spacing is roughly between 0.5 and 1.0 mile.

Figure 1-1: Build 1 Scenario



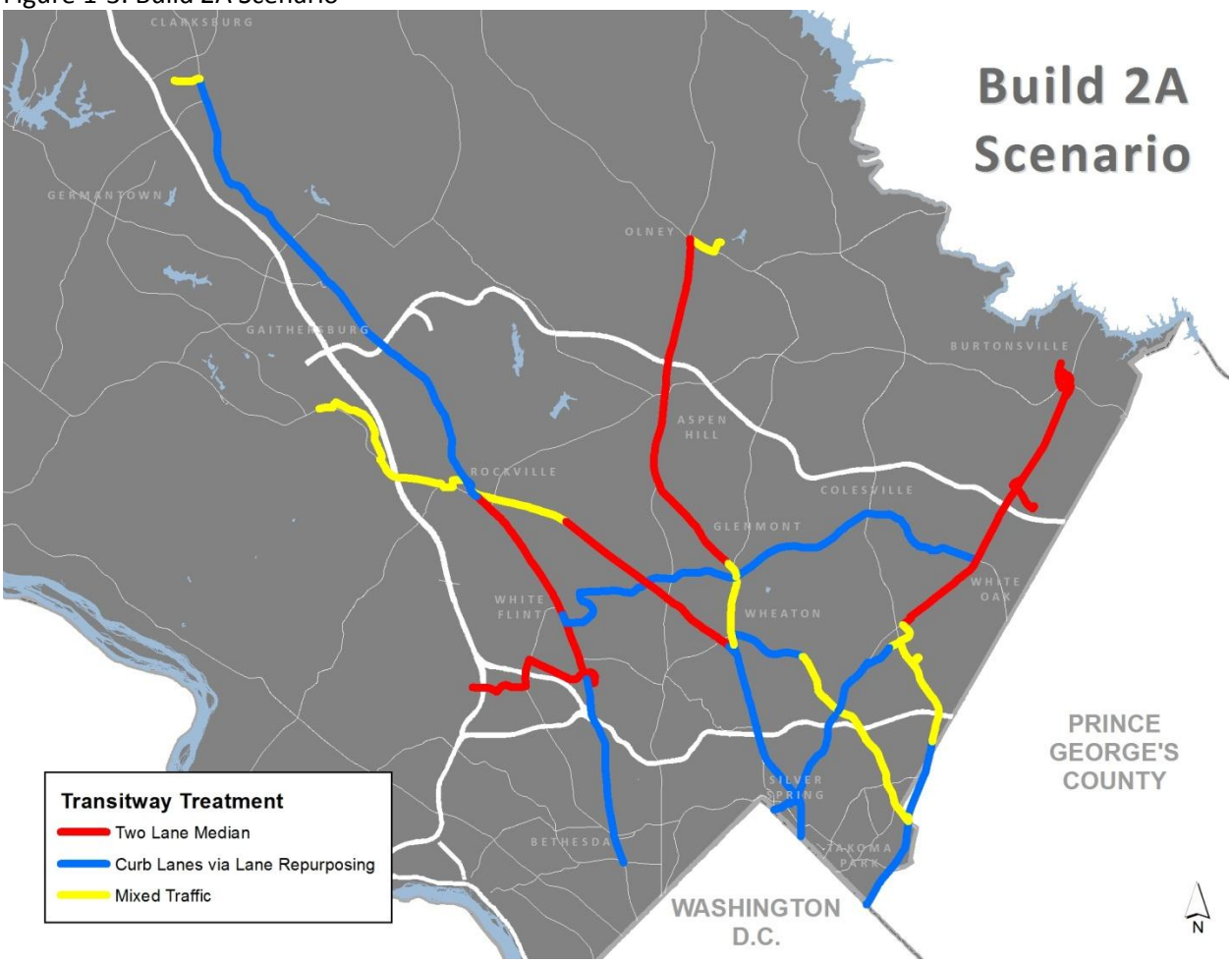
As a variation of the Build 1 scenario, Build 2 converted some existing curb lanes to bus lanes (Figure 1-2). This approach was considered on four corridors (MD 355, Georgia Avenue, US 29, and New Hampshire Avenue), where congestion is heavy and there is a need to achieve higher transit speeds, but where severe right-of-way constraints make adding new lanes for buses infeasible. Curbs lanes enable moderate transit speeds—slower than median lanes, but faster than operating in traffic. Transit vehicles benefit from some speed improvements between intersections, tempered by shared lane use with local buses and right-turning vehicles, as well as transit signal priority/queue jumps at intersections, and station spacing roughly between 0.5 miles and 1.0 miles.

Figure 1-2: Build 2 Scenario



The Build 2A (Figure 1-3) scenario scaled back the BRT network substantially, from a 152-mile system to an 87-mile system, and reduced some of the busway improvements on segments of the remaining corridors through the introduction of more curb lane or mixed traffic operation. In the end the Build 2A scenario reduced the speed of the network to such an extent that the ridership on some of the remaining corridors was not viable and the overall network integrity was reduced.

Figure 1-3: Build 2A Scenario



The network recommended in this plan ultimately seeks that balance between transit speeds, private property impacts, and traffic impacts. While we have not performed forecasting for the staff-recommended network, we believe that the recommended corridors and treatments are feasible.

Table 1-1 shows the number of miles of two-lane median, cub lanes, and mixed traffic that were tested for each scenario.

Table 1-1: Scenarios Tested (miles)

Treatment	**Build 1**	**Build 2**	**Build 2A**
Two Lane Median	152	140	29
Curb Lanes		12	41
Mixed Traffic			17
Total	152	152	87

It should also be noted that another variation of the Build 1 scenario—called Build 1A—looked at areas plans (*Glenmont Sector Plan* and *White Oak Science Gateway Master Plan*) under development concurrently with the *Countywide Transit Corridors Functional Master Plan*. The additional land use in these plan areas has not yet been approved but is being considered, and when adopted into the regional

land use, could result in additional ridership on some corridors. As expected, this analysis showed increases in ridership on US 29 and New Hampshire Avenue, and to a greater degree on Randolph Road. But because these area plans are not yet approved, the Build 1A scenario was not considered in the determination of the Phase 1 recommendations. The recommended Phase 2 transit treatments do provide direction for supporting additional development in the Glenmont and White Oak Science Gateway plan area.