MD 355 South Corridor Advisory Committees (CAC) Meeting #3 Summary
August 31, 2015 | 6:00 PM – 9:00 PM
Bethesda Chevy Chase Regional Services Center
4805 Edgemoor Ln, Bethesda, Maryland

Attendees:

Members	
Nancy Abeles	Sasha Page
Peter Benjamin	Todd Pearson
Barbara Moir Condos	Chad Salganik
Kristi Cruzat	Ralph Schofer
Debbie Friese	David Sears
Jerry Garson	Ana Milena Sobalvarro
Celesta Jurkovich	Francine Waters
Richard O. Levine	Jan White
Todd Lewers	Steven P. Wilcox
Jeremy Martin	Paula Bienenfeld (MD355 North CAC)
Apologies	
Josh Arcurio	Philip Neuberg
Bill Carey	Andy Palanisamy
Francoise M. Carrier	Eric Siegel
Jay Corbalis	John Alex Staffier
Elizabeth Crane	Max Wilson
Ronit Dancis	Ryan Emery
Victoria (Tori) Hall	Miti Figueredo
Peter Katz	Greg Ford
Eleanor Kott	Roger Fox
Tony Kouneski	Gerard Stack
Damon C. Luciano	Emily Vaias
Patty Mason	Jon Weintraub
Deborah Michaels	
Project Team	
Facilitator – Yolanda Takesian	Facilitation Team – Mary Raulerson
Study Team – Alvaro Sifuentes	
Lead Facilitator -- Andrew Bing	
Staff	
Gary Erenrich, Montgomery County DOT	Tom Pogue, Montgomery County DOT
Drew Morrison, Councilman Berliner's Office	Kyle Nembhard, MTA
Tom Autrey, M-NCPPC	Darcy Buckley, MCDOT
Rafael Olarte, Montgomery County DOT	Scott Holcomb, SHA Gannet Flemming
Philip Shapiro, Montgomery County DOT	Aaron Zimmerman, M-NCPPC
Jacquelyn Seneschal, MTA	

Handouts

Handouts provided to CAC Members included:

- Summary from CAC Meeting #3
- Agenda for CAC Meeting # 4
- Presentation for CAC Meeting #4
- Frequently Asked Questions
- Technical handouts showing traffic operations information

Meeting materials and video will be posted on the project website: *www.montgomerycountymd.gov/rts*.

Introductions and Updates

Yolanda Takesian began the meeting with an overview of the agenda indicating that the meeting would include two hours of presentation and discussion, followed by an additional hour of discussion, questions and answers. The presentations will provide more detail on the technical subjects covered in previous meetings.

Background

Scott Holcomb opened with a review of topics covered at previous meetings, along with the purpose of the meeting, including:

- Review and explain detailed technical information associated with Travel Demand and Ridership Forecasting and Traffic Operations Analyses
- Provide specific information about how we collect and use existing data; describe the analysis tools and prediction models being used; and explain how the output information is used to as part of the planning process
- Respond to questions and concerns members may have about the study processes through direct interaction with project engineers and forecasting specialists

He also presented a summary of the feedback received from CAC members, which informed the content for this meeting, including:

- Provide more background of where data comes from and how it is processed
- Review the history of traffic volumes in the MD 355 corridor
- Discuss the data inputs to the modeling process, including land use and transportation network assumptions
- Explain the model processes, outputs, and analysis results in more detail
- Provide more understanding of data pertaining to trip patterns (i.e. thru trips, average trip lengths, etc.)

Question (Q): Why isn't the modeling looking at economic benefits and impacts?

Response (R): That will be part of later portions of the study. Right now we're looking specifically at existing and No Build traffic conditions.

Question (Q): What is the BMC [referenced on a slide]?

R: The Baltimore Metropolitan Council.

Q: Earlier you referenced NEPA, which includes a scoping process. What was this project's scoping process?

R: This project is following a process that will support NEPA requirements, but the project is currently pre-NEPA.

Q: The COG uses travel surveys to capture travel patterns, but how are we filling in what we don't know?

R: We used the traffic data from the COG model; we'll share more about how that model works later in the presentation.

Existing and Historical Traffic Volumes

Traffic data presented at CAC meeting #3 prompted a desire for more detailed information, and this presentation provided more detail, focusing on the following topics:

- Sources of traffic data and Maryland State Highway Administration (SHA) methodology
- Existing traffic volumes on MD 355
- Comparisons to historic traffic volumes on MD 355

Sources of traffic count data:

- SHA's Traffic Monitoring System
- Manual traffic counts at select intersections conducted for 13 hours (6 AM to 7 PM)
- Automated (tube) counts conducted for 48 hours
- SHA's Traffic Trends publication is used to convert 13 and 48 hour counts into Average Annual Daily Traffic (AADT) estimates

Maps presented used weighted lines to compare traffic volumes along the corridor. The heaviest volumes in the North corridor were near Rockville. The directionality of the traffic increases toward the north end of the corridor, the direction of the traffic is more equally split in the area of the Beltway.

Traffic volumes on the corridor appear to have remained relatively stagnant over time. There was a decrease in traffic volumes during 2007-2008, but that is beginning to reverse. This trend can also be seen in other parts of the state and nationwide. The official volumes developed for this study will be the traffic volumes used for all further analysis in the study.

Q: Why do we limit traffic data to weekdays before 7 PM when we know there's traffic on weekends and past the data collection period?

R: We also have machine counts that are done over a 24 hour period, though those do exclude weekends. Typically for corridor studies, when developing purpose and need, we start out by looking at the weekday peak hours.

Comment (C): Show weekend traffic data in the future.

C: Two-thirds of the beltway traffic is turning on and off, but these maps make it look like they're through traffic on MD 355.

R: We can share more detailed traffic data at the beltway ramps.

Q: How did you get to the average daily volume shown on the map? Please take a deeper dive into making these maps.

R: We used the Traffic Trends publication described above to extrapolate from our 13 hour counts to 24 hour counts, using factors that have been developed across the state.

C: Peak traffic on MD 355 is shopping traffic.

C: We need manual counts on Rockville Pike for two weeks at every intersection, especially on the southern end. Any BRT layout that uses the median will limit left turns, so we need complete and current turning data.

Q: The Rockville Pike is unique, is it possible to create a more specific model?

R: We can take these comments back and see if we need to collect more data, or make other changes.

Q: Can we get traffic projections for other years than 2040, such as 2020, 2025, 2030?

R: For purposes of establishing No-build traffic for the Purpose and Need we utilized 2040 as our forecast year. We will discuss if other traffic projection years can be developed.

Q: Is reconfiguration of Rockville Pike built into the model?

R: When we do operational comparisons of alternatives we put in new lane configurations.

Q: There have been studies conducted in conjunction with the Bethesda sector plan. Do these use the same data?

R: We coordinated with staff leading these projects and looked at the information, but our analysis years are different.

C: The other study showed, as a best case scenario, traffic not getting worse.

C: We want to see current traffic data in both directions.

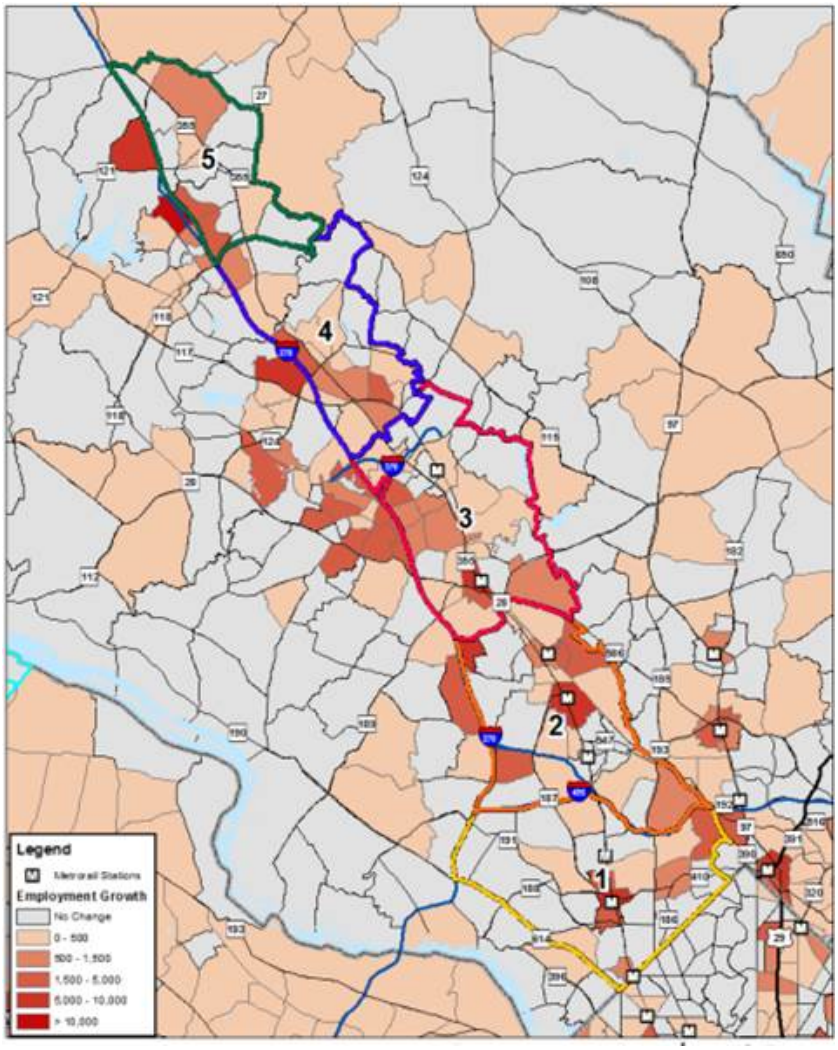
R: We will provide that.

Regional Travel Demand Model and Forecasts

Amir Shahpar's travel demand forecasting presentation focused on:

- Travel demand forecasting overview
- Explanation of the four step model
- Overview of the Metropolitan Washington Council of Governments Regional Travel Demand Model
- The model's input and assumptions
- The model's outputs

Travel demand forecasting for the MD 355 project is computer modeling that predicts travel patterns, traffic volumes, and transit ridership based on changes to land use and the transportation network. Actual data has been used to determine if the model is producing valid results that are consistent with the actual data. The study area for the MD 355 project includes 127 of Montgomery County's 375 Transportation Analysis Zones (TAZs), which are the smallest area for which the model will report results. The MD 355 Study Area TAZs have been organized into five different project areas and are shown in the Employment Growth diagram.



The industry standard (for the Washington region) Four Step Model uses its inputs to predict:

- Trip generation: The number of trips that will occur in the study area
- Trip distribution: Where the trips begin and end
- Mode Choice: Which travel mode will be used to complete each trip
- Trip Assignment: Which route will be used to complete each trip

The model inputs used to make these predictions are:

- Definitions of TAZs
- Population growth predictions for 2040
- Employment growth predictions for 2040
- Anticipated Future Transportation networks
    - Highways
    - Transit system

The job amounts and growth rates within the study area are:

District	2014	2040	Growth	Percent Growth
1	94,500	114,100	17,600	20.1%
2	84,600	122,100	37,500	46.7%
3	61,300	78,700	17,400	36.3%
4	30,600	39,500	8,900	13.4%
5	9,800	14,800	5,000	19.4%
Study Area Total	282,800	369,200	86,300	28.0%
County Total	528,000	738,800	210,000	39.8%

The population amounts and growth rates within the study area are:

District	2014	2040	Growth	Percent Growth
1	87,900	101,800	13,900	15.9%
2	80,200	122,700	42,500	53.0%
3	48,000	68,000	20,000	41.5%
4	66,000	76,200	10,200	15.5%
5	26,000	40,600	14,600	56.2%
Study Area Total	308,100	409,300	101,200	32.9%
County Total	1,011,000	1,213,000	202,000	20.0%

The model output predictions will include:

- Trip production and attractions
- Trip origins and destinations
- Number of trips taken by each mode
- Roadway volumes for each time of day
- Total daily ridership on the BRT Alternative
    - Boardings and Alightings by Stop
    - Mode of Access at Stations
    - Park-and-Ride Use
- Passenger loads on transit lines
- New Transit Trips/Change in transit mode share

Different kinds of trips occur in the study area. Trips that either begin OR end in the study area, trips that do not begin or end in the study area, but simply pass through the study area, and trips that occur entirely within the study area. In order to understand trips that both begin and end in the study area, the study area was divided into five districts. Trips were then analyzed according to which districts they began and ended in. This analysis revealed the prevalence of shorter trips using the MD 355 corridor (though longer trips are predicted to grow by 2040). The model also predicted that non-commute trips are a major market for future trips along the corridor, and that most trips are associated with District 2 (from the beltway to Rockville).

Trips to/from the study area from areas outside of the study area in 2040 are predicted to predominantly have their opposite end in either DC (178,900 trips, 38% accomplished by transit), Frederick County (59,900 daily trips, 4% accomplished by transit), West Montgomery County (437,700 trips, 7% accomplished by transit), and East Montgomery County (390,900, 8% accomplished by transit).

Trips that pass through the study area come from many different areas, and pass through the study area in each direction. The method used to study the origins/destinations of these trips was designating screen lines or cut lines, where the model will output the origin, destination, etc. for every trip predicted to pass the screen line. One important takeaway from this analysis is that MD 355 and I-270 serve different travel markets; longer trips are better served by I-270 than MD 355. For example, travel from Clarksburg to Bethesda takes 66% longer on MD 355 during the morning peak.

Q: What distribution model do you use?

R: It's a gravity model. This has its pros and cons. In the last ten years, we've begun to incorporate census data.

C: This data is not useful because it only asks about commute mode in a single question and doesn't capture if people use different modes on different days, or commute fewer than five days a week.

Q: How many zones are there in the study area?

R: There are 127 TAZs, of Montgomery County's total of 325.

Q: How do you calibrate the gravity model?

R: We look at other data (further discussion of this subject deferred to after presentation).

Q: Why does Montgomery County only have 10% of the region's traffic analysis zones?

Q: What percent of the jobs shown in the model's employment growth will be restaurant jobs? These jobs don't typically commute during peak hours.

C: With respect to the No Build scenario: For fiscal year 2019, WMATA has approved a plan to stop the rush hour turnaround on the Red Line at Grosvenor, so that the frequency of trains running from Shady Grove to Grosvenor will double, during rush hour. Additionally, they plan to add train cars so that each train has eight cars in the next ten years.

R: The eight car trains are reflected in the assumptions of the model.

Q: Will the Ride-On Plus service from Lakeforest to Grosvenor be included in the No Build Scenario?

R: The No-Build Model reflects the proposed improvements in the Constrained Long Range Plan for the Washington region. Ride-On Plus service is not currently part of the adopted transportation network therefore is not included in the model. If MWCOG adopts any changes to the No-Build network we can include those in our model.

Q: Does the model reflect changes to the transit network, especially the reduction in Ride On service?

R: If something is in an approved plan, it is included. We will follow up with Ride On to ensure we have the current service plans.

Q: What about Bridj and more flexible transit services? Are these included in your network? What about autonomous vehicles?

R: Autonomous vehicles are not included. Bridj is also not included.

Q: How does the model determine which travel mode a trip uses?

R: The model looks at all of the available options to complete a trip. Factors such as travel time and cost are built into a utility function that predicts which mode will be chosen.

Q: What happens if a trip passes through the TAZs in the study area, but it doesn't begin or end in the study area?

R: That trip is still counted in our analysis. The model looks at pass through trips.

Q: If someone is beginning a trip north of the study area, and ending south of the study area, how does the model determine if the trip uses I270, vs. MD 355?

R: The model knows the origin and destination of the trip and the transportation network. It uses this information to predict which route would be the fastest and least costly for a trip and assigns it to that route.

Q: How does the model account for trips that have multiple stops?

R: The model has five trip types; trips with multiple stops are "tours." This is a trip based model.

Q: How does the model determine that if a trip with many stops starts in a car, it will probably stay in a car even if transit might be less costly for some portions?

R: The model makes assumptions, including that it's unlikely that the trip will shift from car to transit in the middle. The perceived cost is a combination of factors that includes the actual fare, time spent on the train, the time waiting, the number of transfers.

Q: How does the fare structure influence the model?

R: The fare structure is an item that remains constant.

C: There is data that supports the fact that how one pays for the trip also influences the perception of cost.

C: *WMATA is going to introduce a no-charge ride from Wheaton to Silver Spring for people transferring from buses. Something like this could be introduced for the BRT or the Purple Line which could make a trip cost effective, but that pricing plan wouldn't show up in the model.*

C: If the assumptions that underlie the model are wrong, the conclusions will be wrong.

R: At this level of study, the model is a good way to compare alternatives against one another.

Gary Erinrich reminded the group that the task at this stage of the study is to use the models to compare the alternatives systematically, to understand how speed, convenience, access are different across alternatives. Underlying assumptions are generally the same across all scenarios; the network, travel speed, time, and costs will be different for each alternative. Median running vs. a curb running vs. mixed traffic BRT conditions will scored according to a range of objectives and the model is one tool that will help to measure the differences.

C:If the service causes congestion on Rockville Pike people will choose to stay away and businesses will suffer.

2040 No Build Traffic Volumes

The outputs from the 2040 MWCOG traffic model outputs are analyzed/post processed and used in the operational analyses for the study. The post processing is conducted according to the methodology found in NCHRP Report 765 to convert model outputs to more detailed intersection counts that can be used in traffic operations analysis to compare Build Alternatives to No Build conditions.

Q: How is the model validated?

R: We validate the model using a screenline model that compares snapshot measurements to the model's predictions and adjusts other areas based on a factor derived from these comparisons.

Q: Does SHA use ongoing studies for comparison?

R: No.

Q: Is Smart Signalization incorporated into the model?

R: The model does evaluate the impact of optimized traffic signals.

Q: Do you include the impact of crashes into your model?

R: The model is designed to look into a typical day. Crash probabilities can be looked at when considering alternatives.

Traffic Operations Analysis

Daniel Worke presented the traffic operations analysis information. The data sources that are used for traffic analysis are as recent as possible and include:

- Existing traffic volumes from counts and model
- Signal timings
- Transit travel time
- Transit boarding and alighting
- Field observations to calibrate models

Traffic operations analysis for the MD 355 project uses Synchro/Sim Traffic 9.0 and VISSIM 7.0. Synchro is used for macro-scale analyses, and VISSIM is used for micro-scale simulation. Synchro reports intersection level operations in terms of delay, queuing and volume to capacity ratios.

VISSIM is able to predict complex situations such as the introduction of BRT. It can model effects upstream and downstream from a study intersection, as well as model the dynamic interaction of cars and trucks with bicyclists, pedestrians, and transit. VISSIM's advantages include its ability to deliver a more refined analysis of Build alternatives that includes operating predictions for all modes including transit and pedestrians.

The outputs of these programs include:

- Vehicle delay by intersection or approach (Synchro/HCM)
- Car travel times from one study intersection to another (Sim Traffic and VISSIM)
- Transit travel times and reliability measures (VISSIM)

- Pedestrian delays (VISSIM – determined around station areas)

These outputs can show change over time, be used to compare the future alternative scenarios and identify potential issues with alternatives. All traffic analysis is validated against observed conditions.

Q: Have you used a VISSIM model?

R: Yes, we have experience using VISSIM on many projects. The level of detail within the VISSIM model makes it a more appropriate tool later in the evaluation process when infeasible options have been eliminated and more feasible options are being compared.

Q: Can we get projections and do analysis for interim years, such as five year increments?

R: We'll look into the possibility of an interim year evaluation.

Q: Does the County own the software package (VISSIM)?

R: Yes. County staff use it to review results of work prepared by consultants.

Q: Does it work for intersections, or the whole project corridor?

R: VISSIM does both; it can handle intersections, but also reports upstream and downstream conditions such as queuing and travel time. Synchro delivers results on an intersection basis.

Q*: At Cedar Lane, every lane has a different backup pattern, and if you make an assumption of where a bus will be, for example, it will change the results. You need results lane by lane, hour by hour, day of the week, etc.*

R: VISSIM makes a random assumption for assigning vehicles to different lanes. It can't be 100 percent accurate, but it will predict bus results under different conditions.

Q: What kind of expenses and labor does it take to run this model?

R: Developing a VISSIM model for a corridor like MD 355 is very labor intensive.

Q: How many intersections are you analyzing?

R: 80 intersections.

Crash History

The source for crash data for the MD 355 study is the Maryland State Police; a three year period (2011-2013) is reviewed for crash safety analysis, per federal requirements. In order to determine if a portion of the MD 355 corridor has a high crash rate, data are compared to State Highway crash rates. In addition to being a safety issue, crash rates negatively impact travel time reliability.

- Approximately 1900 crashes were recorded along the study corridor from 2011-2013, including five fatal crashes.
- Pedestrian crashes are of particular concern because transit stops are high pedestrian activity areas.
    - Four corridor sections had high pedestrian crash rates: Great Seneca Creek to I-370 (13 pedestrian crashes), I-370 to MD 28 (15 pedestrian crashes), Cedar Lane to Woodmont Avenue (8 pedestrian crashes), and Woodmont Avenue to MD 410 (8 pedestrian crashes).

Additional Q & A and Next Steps

Q: What are the major questions answered by these models? How do they fit into the study design? How do the models answer these questions?

R: The models provide a method for comparison of BRT alternatives. Assumptions about traffic and growth conditions are constant across alternatives. To narrow down the range of alternatives we need a way to compare them to one another using a set of assumptions that is the same across all scenarios. The study is iterative between traffic analysis and transit activity modelling. For example ridership at specific locations is factored into dwell times that will be fed to the traffic analysis to look at congestion impacts in terms of how they compare across alternatives; changes may be made within an alternative and the test is done again to look at ridership and traffic impacts. Results between the analyses are fed back into the models over several iterations. Ridership outputs will also be used to develop the various operating plan alternatives to establish BRT frequencies, the numbers of vehicles needed and the cost of operations at various service levels.

The County has been working on goals, objectives and evaluation criteria which are being discussed within the RTS committee. They will answer questions such as: Is travel time better or worse under each alternative? Is congestion better or worse? What are the variations between alternatives?

Q: Will the project team look for ways to improve the format of the meetings to be more effective?

R: Yes, future meetings will have more interactive formats. This meeting was meant to provide detailed responses to questions posed previously.

Q: Where do bus stop locations get factored into the analysis?

R: Bus stop locations will be part of future evaluations.

Q: Shouldn't the BRT line break at Shady Grove rather than at Rockville due to space, intermodal access and Red Line service influences?

R: Questions about where the line breaks will be answered as part of the build alternatives.

Future meetings have not been scheduled. Once they are members will be contacted by email.