

## MEMORANDUM

To: Anne Corbett  
Vision McMillan Partners

From: Robert B. Schiesel, P.E.  
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Date: June 18, 2014

Subject: McMillan Sand Filtration Site PUD - Response to MCV Associates Testimony & Reports

This memorandum contains Gorove/Slade's responses to MCV Associates' testimony presented by Joe Mehra, P.E., PTOE to the Zoning Commission on May 8<sup>th</sup> and 13<sup>th</sup>, 2014 regarding the McMillan Transportation Impact Study (TIS) prepared by Gorove/Slade. Gorove/Slade disagrees with this testimony and demonstrates in this memorandum that:

- Many of Mr. Mehra's findings are misrepresentative, incorrect, and do not follow industry standard methodologies or analysis techniques;
- All of the findings and conclusions in Gorove/Slade's report and subsequent documentation remain valid; and
- Revising and resubmitting the Transportation Impact Study (TIS) is not necessary, as any revisions would not alter findings or the resulting recommended set of mitigation measures.

The following sections, organized by topic, refute Mr. Mehra's testimony and provide additional detail on our analyses and methodology.

### ***Capacity Analysis Assumptions & Methodologies***

- In his testimony before the Zoning Commission, Mr. Mehra claimed there are errors in Gorove/Slade's capacity analyses, which includes the existing, background and future scenarios. These claims included the use of default values of heavy vehicles in the network, incorrect lane widths, assuming the default right-turn-on-red assumptions, missing details on bus blockages, adjacent parking lanes, and conflicting bicycle volumes. Gorove/Slade does not agree with Mr. Mehra's conclusion, as follows:
  - Gorove/Slade followed District Department of Transportation (DDOT) guidelines, which state that capacity analyses should be based on methodologies outlined in the *Highway Capacity Manual (HCM)*<sup>1</sup>. This was confirmed during Gorove/Slade's scoping process with DDOT.
  - The *HCM* outlines varying levels of analysis, in which a TIS for the PUD review process would fall under '*Planning and Preliminary Engineering Analysis*'<sup>2</sup>, and states that,

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<sup>1</sup> DDOT Design and Engineering Manual, Chapter 44. DDOT.

<sup>2</sup> Highway Capacity Manual – Chapter 8. Transportation Research Board. 2010

*“In planning and preliminary engineering analyses, and analyst applies an HCM methodology by using default values for some to nearly all of the model inputs.”*

- Gorove/Slade’s application of HCM methodologies was appropriate in this study, as it used a mixture of default values and information collected in the field. The resulting capacity analysis findings are appropriate for this type of study and resulted in the necessary information needed to adjudicate potential mitigation measures. DDOT affirmed this in their staff report from April 21, 2014, which states, *“The Applicant utilized sound techniques to perform the Analysis.”*
- Mr. Mehra claimed there are discrepancies in the existing traffic counts on North Capitol Street, where some intersections show balanced counts, and some do not.
  - Some intersections have balanced counts because they are closely spaced and counts of just side street traffic are combined with mainline traffic from another count.
  - Other intersections do not balance. As a general practice, Gorove/Slade does not balance traffic volumes unless the analysis methodology requires it, believing that altering field data should be kept to a minimum. The HCM methodologies used by Gorove/Slade in the TIS do not require balancing of traffic volumes, thus they were not balanced.
- Mr. Mehra asserts the Armed Forces Retirement Home traffic study has an existing Level of Service (LOS) grade at the intersection of North Capitol Street and Michigan Avenue that differs from Gorove/Slade’s TIS (LOS E versus LOS D).
  - LOS grades at intersections often change in the District through slight changes in traffic volumes, DDOT’s regular signal timing updates or other variables. Having a change in one letter grade in LOS between reports several years apart is not atypical.

### ***Background Traffic Assumptions***

- Mr. Mehra objected to Gorove/Slade’s background traffic assumptions. First, Mr. Mehra stated the Gorove/Slade TIS underestimated the growth of traffic from developments outside of the study area because the Metropolitan Washington Council of Governments (MWCOC) regional model was used as a basis for determining growth from developments outside of the study area. Second, Mr. Mehra noted that Gorove/Slade did not include trips from future Washington Hospital Center projects.
  - Gorove/Slade followed industry and local DDOT standards in developing the background traffic assumptions. All of these assumptions were discussed and vetted with DDOT before the TIS analyses were assembled.
  - Regional growth (traffic generated by developments outside of the study area) was accounted for in the Gorove/Slade TIS through information derived from the (MWCOC) regional traffic model. This approach was selected because the regional model accounts for all planned development, estimates growth in the peak hours and provides roadway direction specific growth rates. The alternative approach is to compare historical traffic volumes on nearby roadways. While using historical growth rates is a common approach in traffic studies, it was not considered appropriate for this study since growth rates are not stable, which is

recommended in industry practice<sup>3</sup>. In addition, historical volumes are provided in total daily trips and do not provide specific information on peak hours, nor are broken down by roadway direction.

- Traffic from future Washington Hospital Center projects was not included because no plans are approved for the Center. Industry guidelines recommend only including local developments that have approvals<sup>4</sup>. In addition, DDOT guidelines for preparing traffic studies state that only developments with approvals/entitlements should be considered<sup>5</sup>.
- The combination of two types of background trips leads to an overestimation of traffic volumes, not an underestimation as Mr. Mehra states because the MWCOG model includes developments such as the Armed Forces Retirement Home and the McMillan Sand Filtration Site as sources of new traffic data. Thus, by assuming these developments as part of the regional growth and also assigning trips directly generated by these developments onto the network, the Gorove/Slade TIS is double-counting trips from some developments.

### **Mode Split**

- Based on information documented in WMATA's *Ridership Survey*, Mr. Mehra objected to Gorove/Slade's assumption that the Medical Office Building can achieve a 30% transit mode split.
  - Gorove/Slade's mode split assumptions and trip generation methodologies are described in detail in the Technical Appendix to the TIS and were vetted over a several month period with DDOT during the TIS scoping process. As described in the Appendix, Gorove/Slade used several sources of information, in addition to WMATA's *Ridership Survey: Commuter Connections' 2010 State of the Commute Survey Report* and results from the U.S. Census American Community Survey.
  - Looking at additional sources of information provides insight into the limitations of the *Ridership Survey*. First, *Ridership Survey* suggests distance from a Metrorail station is the key variable in estimating transit mode share. However, other sources of information demonstrate how additional variables are also major factors in mode splits. For example:
    - First, the general location of a project in the Washington Metropolitan region plays a role in mode split, as transit use increases as sites get closer to the District Central Business District. Table 1 shows the mode share by state of employment, as presented by the *State of the Commute Survey Report*. As indicated in Table 1, there is a strong correlation between the location of employment and office mode split, as well as primary mode of travel by state of residence and state of employment.

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<sup>3</sup> *Transportation Impact Analyses for Site Development*. Institute of Transportation Engineers. 2010

<sup>4</sup> *Transportation Impact Analyses for Site Development*. Institute of Transportation Engineers. 2010

<sup>5</sup> *DDOT Guidelines for Comprehensive Transportation Review (CTR) Requirements*. DDOT. 2012

**Table 1: Mode Split Difference Based on Free Parking (Entire DC Area)<sup>6</sup>**

State of Employment	Primary Mode of Travel				
	Drive Alone	Carpool/ Vanpool	Bus	Train	Bike/Walk
District of Columbia	42%	11%	10%	33%	4%
Maryland	84%	5%	5%	4%	2%
Virginia	82%	6%	3%	7%	2%

- Second, the amount of parking and its pricing characteristics also play a large role in determining transit mode split. The Transportation Demand Management (TDM) plan for the McMillan site contains measures that will ensure the parking garage will be priced at market rate for the majority of users, including office workers. Information contained within the *2010 State of the Commute* report shows how offering only market rate pricing has a large influence mode split. This is shown in Table 2.

**Table 2: Mode Split Difference Based on Free Parking (Entire DC Area)<sup>7</sup>**

Parking Benefit	Mode				
	Drive Alone	Carpool	Bus	Train	Walk/Bike
Free Parking Offered	82%	6%	3%	5%	4%
No Free Parking	41%	10%	11%	32%	6%

Thus, basing mode split assumptions solely on the information contained in a single report and one variable may lead to incorrect assumptions.

- Furthermore, the office buildings included in the WMATA *Ridership Survey* do not share similar characteristics to the McMillan project. *Ridership Survey* included information from 17 sites, of which only 4 were located in the District. Since the majority of these sites were located outside of the District, they do not have similar characteristics to the McMillan site; therefore, mode split information from *Ridership Survey* should be used with caution. For example, the *Ridership Survey* notes that 72% of the office commuters that responded to the survey were offered subsidized or free parking by their employers<sup>8</sup>, which as shown above has a significant impact on transit mode share.
- Mr. Mehra objects to Gorove/Slade’s residential mode split and suggests a maximum of 25% transit mode split for residents.
  - Gorove/Slade disagrees with Mr. Mehra and believes he is grossly underestimating the potential vehicle mode split of future residents. In addition to the same arguments made above concerning office worker mode split, Gorove/Slade bases our findings on Census derived information regarding the mode split of residents that live adjacent to the McMillan site.
  - The following table shows data from the *2007-2011 American Community Survey (ACS)* obtained from the U.S. Census Bureau online American Fact Finder. Data was collected for Census Tract 33.01, which contains the site, as well as Census Tracts 23.02, 34, and 92.03, which directly border the site. These additional Census

<sup>6</sup> *2010 State of the Commute Survey Report*. “Table 34: Primary Mode by State of Residence and State of Employment”, Page 61. Commuter Connections, 2011.

<sup>7</sup> *2010 State of the Commute Survey Report*. “Figure 41: Primary Commute Mode by Free Parking Available at Work”, Page 46. Commuter Connections, 2011.

<sup>8</sup> *2005 Development-Related Ridership Survey, Final Report*. Page 23. Washington Metropolitan Area Transit Authority (WMATA), 2006.

Tracts are included because the surrounding Tracts contain a mix of residential uses that may more accurately predict the future behavior of the residents of the McMillan Redevelopment.

**Table 3: Summary of ACS Mode Split Data for Residents Living Adjacent to McMillan Site<sup>9</sup>**

Means of Transportation to Work	Census Tract									
	33.01		23.02		34		92.03		Average	
	Data	%	Data	%	Data	%	Data	%	Data	%
Total:	1,724	--	658	--	1,918	--	1,430	--	1,433	--
Car, truck, or van:	891	51.7%	426	64.7%	574	29.9%	679	47.5%	643	44.9%
Drove alone	754	43.7%	365	55.5%	501	26.1%	653	45.7%	568	39.7%
Carpooled:	137	7.9%	61	9.3%	73	3.8%	26	1.8%	74	5.2%
2-person carpool	69	4.0%	50	7.6%	53	2.8%	17	1.2%	47	3.3%
3-person carpool	68	3.9%	11	1.7%	0	0	0	0	20	1.4%
4-person carpool	0	0	0	0	20	1.0%	9	0.6%	7	0.5%
Public transportation:	479	27.8%	232	0	847	44.2%	670	46.9%	557	<b>38.9%</b>
Bus or trolley bus	249	14.4%	97	35.3%	440	22.9%	364	25.5%	288	20.1%
Street car or trolley car	0	0	0	14.7%	13	0.7%	0	0	3	0.2%
Subway or elevated	193	11.2%	135	0	381	19.9%	306	21.4%	254	17.7%
Railroad	37	2.1%	0	20.5%	13	0.7%	0	0	13	0.9%
Bicycle	75	4.4%	0	0	72	3.8%	35	2.4%	46	3.2%
Walked	96	5.6%	0	0	290	15.1%	28	2.0%	104	7.2%
Other means	15	0.9%	0	0	26	1.4%	18	1.3%	15	1.0%
Worked at home	168	9.7%	0	0	109	5.7%	0	0	69	4.8%

The data in the table shows a residential transit use of approximately 39%, which is far greater than Mr. Mehra’s proposed maximum of 25%.

**Transit Capacity Needed to Serve Demand**

- Mr. Mehra made several statements that the amount of new transit demand generated by the McMillan development will create the need for an unfeasibly high amount of bus service.
  - Gorove/Slade agrees that a significant increase in transit capacity is necessary to serve the project’s transit demand needs, but disagrees with the characterization of how difficult it will be to provide new transit demand.
  - As described in the TIS, not all new transit riders will use bus service that directly serves the site, as some will walk or bike to Metrorail stations. Thus, Mr. Mehra overestimates the amount of buses needed to serve future demand.
  - The amount of new service required for the full build-out of the PUD, 1,100 trips during peak hours (as recommended by Gorove/Slade as a Zoning Order commitment), is based on estimates of future PUD transit demand that will use public or private buses.
  - To place the 1,100 rider/hour demand in perspective, the following is Gorove/Slade’s estimates of ridership capacity for three proposed bus routes (described in the TIS).

<sup>9</sup> Information obtained via “American Fact Finder” online. (<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>)

- New Circulator Route – 500 riders/hour
- Metrobus80x – 325 riders/hour
- Proposed Neighborhood Connector – 325 riders/hour
- Thus, if all proposed bus service is provided before full build-out of the PUD, capacity will exceed the 1,100 rider/hour requirement and the McMillan development will not have to provide private shuttles. If only one or two of the new routes are in place, then the required amount of private shuttle service to fill the transit capacity gap will be at a reasonable level of cost and effort.

### ***Saturday Peak Hour***

- Mr. Mehra stated the Saturday Peak Hour analysis presented in the TIS is ‘meaningless’ since the times of field data collection do not coincide with the projected peak hour of Saturday traffic generated by the McMillan PUD.
  - Although Gorove/Slade acknowledges Mr. Mehra is technically correct, we disagree with his conclusion that the analysis is meaningless and should be revisited.
  - The Saturday data collection time of 4-7pm was selected during scoping because Gorove/Slade and DDOT agreed the grocery store related traffic would be the largest contributor to project traffic. After beginning the study, long after data collection was completed, Gorove/Slade projected a Saturday peak hour of site related traffic of 3-4pm. This is due to the Medical Office Buildings, when open on Saturdays, would lead to a significant amount of trip generation exceeding the grocery store.
  - Gorove/Slade decided to take the conservative approach and assume the Medical Office Building would be open on Saturday. This is considered highly conservative, because the resulting traffic volumes would only result from all 860,000 square feet of Parcel 1 being occupied by Medical Office uses (i.e. no general office, laboratory, or research space, which all have much lower trip generation rates), and that all 860,000 square feet was open on Saturday.
  - Thus, Gorove/Slade did not consider combining site generated peak hour volumes projected from 3-4pm with existing data collected from 4-5pm, which is an improper analysis technique, as it provided highly conservative results to make conclusions for Saturday traffic patterns. Furthermore, prior Saturday data collection performed in the District shows only a light variation between volumes collected from 3-4pm and 4-5pm.
  - Gorove/Slade does not recommend revisiting the Saturday analysis because we consider the analysis very conservative. Furthermore, none of the mitigation measures resulting from the capacity analyses were based on the Saturday scenarios, as all capacity analyses concerns were based on weekday commuter peak hour scenarios, which generate the highest trip rates.

### ***Traffic Simulation***

- Mr. Mehra presented two videos of traffic simulations during the May 13, 2014 Zoning Commission hearing. Gorove/Slade believes the Zoning Commission should entirely disregard these portions of Mr. Mehra’s testimony for the following reasons:

- As stated above, Gorove/Slade followed District Department of Transportation (DDOT) guidelines, which state that capacity analyses should be based on methodologies outlined in the *Highway Capacity Manual (HCM)*<sup>10</sup>. This was confirmed during Gorove/Slade's scoping process with DDOT. There are two main reasons simulations are not a standard for a TIS level study.
  - Simulations require additional work that is time consuming and does not usually lead to better capacity analysis results compared to HCM methodologies.
  - Simulations have limitations and are not designed to model the impact of driveway and side street access, on-street parking, commercial vehicle loading, double parking, interference between bicycles and pedestrians, and other aspects of an urban transportation network<sup>11</sup>.
  - Of note, Mr. Mehra testified that the SimTraffic software can analyze the impact of bus routes on a network, but it does not have that capability.
- Although Gorove/Slade provided analysis files to Mr. Mehra in the Synchro software package format, we did not perform the additional work necessary to prepare the files for simulation. The Synchro software can be used to produce capacity analysis results using HCM methodologies, which is how Gorove/Slade used the software. Synchro may also be used to set up traffic simulations through another software product, SimTraffic. However, Gorove/Slade did not use Synchro for this purpose, as setting up a simulation requires substantial secondary inputs, field work and data collection. It is important to note, Mr. Mehra testified that he did not perform this additional work to make the files simulation ready. Industry standards state:

*"Simulation tools, however, require a plethora of input data, considerable error checking of the data, and manipulation of a large amount of potential calibration parameters. Simulation models cannot be applied to a specific facility without calibration of those parameters to actual conditions in the field. Calibration can be a complex and time-consuming process."*<sup>11</sup>

Simply using the SimTraffic software on Synchro files does not produce a simulation that would pass DDOT or industry standards. Therefore, the simulations shown by Mr. Mehra are misrepresentative of actual results, are not up to the standards of the traffic engineering industry and should be dismissed by the Zoning Commission.

## **Conclusion**

Thus, based on the arguments presented above, GoroveSlade concludes that many of Mr. Mehra's findings are misrepresentative, incorrect, and do not follow industry standard methodologies or analysis techniques. All of the findings and conclusions in Gorove/Slade's report and subsequent documentation remain valid, and revising and resubmitting the Transportation Impact Study (TIS) is not necessary, as any revisions would not alter findings or the resulting recommended set of mitigation measures. GoroveSlade stands by the analyses techniques employees and notes DDOT's concurrence in their staff report from April 21, 2014.

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<sup>10</sup> DDOT Design and Engineering Manual, Chapter 44. DDOT.

<sup>11</sup> Traffic Analysis Toolbox Volume II: Decision Support Methodology for Selecting Traffic Analysis Tools. Federal Highway Administration. 2004