AMERICAN PUBLIC TRANSPORTATION ASSOCIATION

PEER REVIEW

FOR

DISTRICT DEPARTMENT OF TRANSPORTATION

Washington, DC

FINAL REPORT JUNE 2015

A Service of the American Public Transportation Association
performed by the
North American Transit Services Association
a wholly owned subsidiary of APTA

REPORT

OF THE

NORTH AMERICAN TRANSIT SERVICES ASSOCIATION

PEER REVIEW PANEL

ON THE

STREETCAR SERVICE READINESS

PROVIDED AT

THE CITY OF WASHINGTON, DC

PANEL MEMBERS:

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Published by the
North American Transit Services Association
1666 K Street, NW, 11th Floor
Washington, DC 20006

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INTRODUCTION

In February 2015, Mr. Leif Dormsjo, Acting Director at the District of Columbia Department of Transportation (DDOT) contacted the American Public Transportation Association (APTA) to request a Service Readiness peer review of the agency's H Street Benning Road Corridor Streetcar Project, the initial phase of a program to provide a modern streetcar network for the City of Washington DC (See Appendix A for Letter of Request). This peer review was structured to provide open access to the project principles, consisting of the DDOT staff, and the primary contractors in the design, build and operations of the project along with the State Oversight Agency following the project for the Federal Transit Administration.

APTA, through its wholly owned subsidiary the North American Transit Services Association (NATSA) and through discussions between NATSA and Agency staff, it was determined the review would be conducted March 9 – 13, 2015 (See Appendix B for Peer Review Agenda).

A panel of industry peers was assembled comprised of individuals with senior and executive industry leadership skills from within the public transit sector to provide advice, guidance, benchmarking and best practices. The onsite peer review panel consisted of the following individuals and the transit agencies from which they were selected:

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The panel convened onsite in Washington on March 8, 2015 to complete the detailed task set forth in the scope of the DDOT request for the peer review. Panel coordination and logistical support was provided by NATSA Staff Advisor Mr. Charles Joseph who coordinated panel member input in the drafting of this peer review report. Mr. Ralph Burns, Deputy Associate Director for DDOT, directed overall Agency participation and support for the Panel's work.

BACKGROUND

The District of Columbia Department of Transportation (DDOT), an agency of the government of the District of Columbia, manages and maintains publicly owned transportation infrastructure and is the lead agency with authority over the planning, design, construction, and maintenance of bridges, sidewalks, streets, street lights, and traffic signals in the District of Columbia. DDOT's mission, in part, is to "develop and maintain a cohesive sustainable transportation system that delivers safe, affordable, and convenient ways to move people and goods – while protecting and enhancing the natural, environmental, and cultural resources of the District." DDOT is currently engaged in a number of critical transportation initiatives. One such initiative is the DC Streetcar Program, a planned surface streetcar network in Washington, D.C. DDOT is finalizing plans to complete the H Street/Benning Road line Project. This initial line, will be the first of a larger system for the District. With the responsibility to use prudent practices in its operations and maintenance activities, the procurement and delivery of those services is a high priority for the agency. (See Appendix D for DDOT Organization Chart.)

The scope of this review was conducted to make recommendations as to DDOT's preparations to launch and operate the H Street/Benning Road Streetcar segment safely and reliably. This report provides a summary of the issues identified in the exit conference held on Friday, March 13, 2015 with senior DDOT staff. Just over 50 years after streetcars last operated in the District, their return is now within sight.

METHODOLOGY

The NATSA peer review process is well established as a valuable resource to the industry for assessing all aspects of transit operations and functions. The process begins much like a structured formal audit activity, but unlike a formal audit, peer review teams are comprised of highly experienced transit professionals who are selected on the basis of their subject matter knowledge. The purpose of using experienced subject matter professionals is to share methods, insight and experiences interactively with the requesting property. Through the utilization of on-site interviews of staff, review of relevant documents, and field inspections the review team engages the requesting property in an informal process of introspective examination and dialog on the areas of their concern.

It is through this exchange of ideas and experiences that the synergic process of the peer review earns value as each of the participants, on the review team and at the property, gain a better understanding of the complexities of transit functions and opportunities for improvement. It is truly an industry self-improvement process where all parties benefit.

The peer review concludes with a caucus among the peer review team to draw out the opinions of the team members and define a consensus summation of observations taken and their

professional judgment as to where areas of improvement could be attained. This information is then presented to the requesting property in an exit conference and followed by a report, if so desired by the requesting property. There are no expectations expressed or implied that the requesting property take any action to satisfy the opinions of the peer review team or to engage any members of the team in any follow up activities as the requesting property may want to undertake as a result of the review. The information provided by the peer review team is consensus based and transferred to the requesting property as a "Pro Bono" work product which the transit property holds all rights to under the terms of the peer review agreement.

SCOPE OF THE REPORT

The scope of this review focused on an assessment of DDOT's streetcar project to help determine if the system is revenue-ready. In summary, the scope of work requested:

- A document review to gauge DDOT's and the Operations and Maintenance Contractor's technical capacity and operational readiness.
- Interviews with key personnel involved in the safety and operations of the Project, including key staff from DDOT and the operations and maintenance contractor.
- Field observations focusing on infrastructure, equipment and operations.

For each of these three areas of the scope, DDOT provided a detailed task list to examine technical capacity, positions, contracts, procedures, organizational charts, operating plans, safety plans, and maintenance procedures. The task list also provided a list of organizational functions or titles that were selected as being key personnel for interviewing, along with making observations and inspections of the systems and infrastructure for real or potential issues affecting safety and reliability.
The peer review panel performed the following work:

- Interviewed 22 personnel from DDOT, primary contractors and State Safety Oversight
- Approximately 2,000 pages of documents were provided to the peer review team
- (See Appendix C for a List of Documents)
- Conducted field observations during both day light hours and at night
- Toured the line
- Visited the temporary O&M Facility at 2550 Benning Road NE, Washington, DC 20002
- Inspected a segment of the streetcar infrastructure and rolling stock

At the end of the onsite visit, an Exit Conference was conducted on Friday, March 13, 2015, where the peer review panel presented its findings in the following three areas: Critical Issues, which we define as a component or element of the project plan that may prevent the streetcar system from entering revenue service; Recommendations for Implementation Prior to Entering Revenue Service; and Other Observations. Observations reflect both commendations and opportunities to strengthen or enhance the project safety and/or operations. While the peer review panel did perform a cursory review of the DC Streetcar Program to ensure they understood how the H Street/Benning Road Project related to and fit within it, the panel did not examine the Program at any length or detail. Observations and recommendations for the tasks outlined in the scope of work and detailed task list are provided in the report. Areas where observations were noted on Program-wide issues by the peer review panel are found in the last section of the report under "Other Observations".

OBSERVATIONS AND RECOMMENDATIONS

OPENING COMMENTS

The panel found a number of elements in its review of the Project that call for commendations. The new DDOT director, in office only since January 2015, has taken proactive steps and continues to take corrective actions for the Project. Despite delays and previous issues, the DC Streetcar system is nonetheless close to entering revenue service. The Operations and Maintenance service contractor has fostered a positive team environment for all their employees and is adequately prepared and staffed to perform service, once item #3 under Other Observations are addressed.

In the course of our review, we found all the staff we interviewed to be cooperative. In addition, we determined that other DC departments are willing to provide assistance to this Project. Within DDOT, we concluded that there is a need for more fully trained personnel and a clearer organizational structure. Some staff, while holding a strong background in rail transit, often have multiple roles, which results in diminishing their effectiveness in key areas.

Currently, there is no one DDOT individual in charge who holds ultimate responsibility for the Project. The senior manager, while well intentioned and focused on the job to be done, could be much more effective if supported with additional staff with rail transit experience to lead the Project. DDOT will particularly benefit by hiring staff with direct light rail or streetcar operating, maintenance, or regulatory experience. Without direct operational experience, it is difficult for DDOT staff to effectively analyze recommendations from contractors. This results in blurred lines of command and delays in decision making.

While some of the procedures still need to be created, procedures reviewed showed inconsistent in both work and result, and some of the paperwork we examined was incomplete. Further, we noted inconsistencies in practice (where what was done differed from what the manual said to do), and we cite Lock/Out and Tag/Out as an examples later in this report.

The panel also came across an issue about installing switch heaters and spring switches on the track. We noted the difficulty in resolving the issue as the authority for reviewing and making a decision was not clearly established, therefore, the need to find and apply a remedy to resolve this issue was not being adequately addressed in a timely manner.

The following sections of the report expand on each of the recommendations and observations made by the peer review panel by providing specific examples (where available) and narratives that form the basis for the remarks.

CRITICAL ISSUES

While there are areas that need improvement, based on interviews conducted, review of documents, and our own observations, we have concluded that there appear to be no critical issues in the Project that would prevent it from beginning passenger or revenue service. We have, however, identified 18 items that the panel recommends should be completed satisfactorily prior to entering revenue service. A discussion of each of these 18 items follows in this report.

RECOMMENTIONS FOR IMPLEMENTATION PRIOR TO ENTERING INTO REVENUE SERVICE

The following 18 items were identified that the panel recommends in preparation for revenue service. While we recognize that it may not be possible for these items to be fully completed by Revenue Operating Day (ROD), they do need to be addressed and resolved by developing adequate work-arounds. Using the industry standard, we define work-around as the development and use of other solutions that provide an alternative means of achieving an equivalent level of safety or operational effectiveness to allow for the commencement or continuation of revenue service.

1. The DC Fire & Emergency Management Services is providing the critical function of serving as the State Safety Oversight Agency (SSOA), which is designated with the responsibility of overseeing the safety and security of the streetcar system.

   This key team member is solely responsible for administering FTA's oversight program and is entirely independent from other operational activities of DC FEMS.

   While DDOT should resolve the safety, engineering, operations, and maintenance issues listed in this report prior to initiating passenger service, we stress that adequate work-arounds are acceptable industry practice to achieve the needed level of safety. We believe, however, that SSOA may not be completely knowledgeable that such work-arounds are acceptable as temporary fixes. That is why, if certain items cannot be resolved, DDOT can, as stated in its Safety and Security Certification Verification Report (SSCVR), identify them as "exceptions," and implement alternative temporary solutions as described in the *FTA Resource Toolkit for State Oversight Agencies Implementing 49 CFR 659* (issued January 2006). Per the FTA Resource Toolkit such "exceptions" must provide an equivalent level of safety as the permanent measure would have had it been implemented and must be approved by the DDOT Director and the SSOA, and must identify target dates for implementing the permanent solutions.

2. MAKE HIRING A QUALIFIED STREETCAR DDOT CHIEF SAFETY OFFICER (CSO) A PRIORITY.
   Acceptance and approval of the project by the SSOA is important. To more fully understand the requirements and help achieve this important milestone, DDOT should expedite hiring a qualified Chief Safety Officer (CSO) with relevant safety experience in all aspects of implementing the requirements of 49 CFR 659.

3. MAKE HIRING QUALIFIED TECHNICALLY PROJECT STAFF A PRIORITY
   It is recognized that the current Project Manager, while passionate about the project, does not have the necessary rail experience to serve as a technical expert. However, there should be a member of the DDOT project staff, either the Project Manager or a direct hire report to the Project Manager, with strong light rail or streetcar experience to serve as technical support. Furthermore, the Project Manager should have clear authority to oversee both DDOT staff and their contractors.

3. REPAIR RAIL BREAKS**.**

(**Figure 1** – Rail break on mainline track)

Three rail breaks (two on the mainline and one in the yard) were identified more than three months ago. The time lag in repairing these breaks, however, is understandable, because some of the materials needed for the repairs had to be procured from a third party design builder, shipped from overseas, and then go through U.S. Customs. In addition, the rail repair at one break required the use of a pre-bent fiberglass reinforcement that has a very long procurement lead time. Now that all the necessary materials have been procured, however, the breaks should be repaired quickly.

5. PERFORM NECESSARY WORK ON ALL SIX STREETCARS TO ACHIEVE A STATE OF GOOD REPAIR SUITABLE FOR REVENUE SERVICE.

DDOT owns six streetcar vehicles from two different suppliers. Car numbers 101, 102 and 103 were built by the Inekon Group in Prague, Czech Republic. The other three cars numbered 201, 202 and 203 were built in the United States by United Streetcar LLC in Clackamas, OR. While these cars look similar, there are many differences, and that has exacerbated the distinct training requirements from the two vendors and the need to store a separate inventory of spare parts. It is therefore critical that DDOT compel the vendors to provide the necessary training and other support required to ensure these cars are ready for revenue service. For example, there was a fire in February 2015 that damaged components on the pantograph on car 202 and requires repair. At the time the panel inspected the car (nearly three weeks after the fire) it was still out of service. (See Figures 2 and 3 for the damaged components on the pantograph.)

(Figure 2 - Pantograph component damaged in the fire on car #202 on February 21, 2015.)

(**Figure 3** - Fire damage on car 202 showing the burnt cable on the pantograph.)

6. INVESTIGATE WHY STREETCAR DOORS SCRAPE; PROVIDE SOLUTION(S) TO ELIMINATE SCRAPING.

An issue exists where the train doors scrape against the side of the station platform edge when opening and closing. This seems to be a result of inadequate platform/train door clearance interface. While this occurs intermittently, it nevertheless damages the train door and platform edges. We understand that there have been discussions for some time among DDOT, RDMT, the vehicle supplier, and PMC staff about possible solutions. Based on our review, however, we found that no decision has been made as to which solution to implement to resolve this problem, nor is there a schedule for a resolution. (See Figure 4 for scape marks on doors.)

(**Figure 4** – Inadequate clearance between platform edge and door opening.)

7. INSTALL ADEQUATE MARKERS FOR STATION BERTHING, FOULING POINTS, AND OTHER OPERATIONAL REQUIREMENTS**.**

Currently, there is a small orange circle approximately 4 inches in diameter (See Figure 5 for the current car stopping marks) on the edge of the platform that serves as an indication for operators as to the stopping location of streetcars that is not easily distinguishable to the train operator. There needs to be more prominent signage/indicators to assist the train operator to stop more precisely and consistently. One suggestion is to make this signage/indicator similar to delineators installed on Hopscotch Bridge (to prevent motorists from entering the right-of-way).

Also, to prevent sideswipe accidents, we suggest that fouling point markers be installed at switch points where a stopped streetcar could foul and interfere with the movement of another streetcar on an adjacent track.

(**Figure 5** – Train berthing marker on station platforms.)

8. ENSURE THAT ALL ONBOARD STREETCAR RADIOS ARE WORKING.

During a field visit to the O&M Facility, we found the onboard radio system on one of the cars was not working, but we could not determine if this was so for all other cars. While all train operators have hand held/mobile radios, those are generally used as a backup, with the onboard radio being the primary means of communication with the control center. It is therefore necessary to ensure that any defective onboard radio systems be repaired. Further, staff should verify under operating conditions the radios' functionality and intelligibility at various locations along the alignment and at various locations within the O&M Facility.

9. CONDUCT LIGHTING REVIEW ON PLATFORMS TO ENSURE ADEQUACY.

The peer review panel visited several stations at night and found the light levels to be either low or primarily dependent on ambient lighting from the street lights or lights from illuminated advertisement cases (dioramas). Illumination from some of these dioramas, however, were not functioning at the time of the panel's observations. Similarly, panel lights on curb side stations were functioning and supplementing the lighting being shed on the platform from the street lights. It recommended that an independent assessment be made of the lighting levels to be in compliance with code requirements. (See Figures 6 and 7 for illustrations of lighting scenarios.)

(**Figure 6** – Station platform with the benefit of street lighting and an illuminated advertisement case (diorama)

(Figure 7 – Station platform which has very little street lighting and no illumination from an advertising case (diorama)

10. COMPLETE A SAFETY ASSESSMENT.

Since the streetcar system has experienced a number of accidents during the initial testing phase, it is prudent to complete a safety assessment under operating conditions that may recommend additional safety warning signage or devices and improved traffic signal coordination (e.g., pavement marking or blank out signs).

This safety assessment can be combined with the scope of the SSO's planned Safety & Security Readiness Review under current operating conditions to determine if additional safety interventions – such as passive signs, active warning signs (similar to the ones installed at the pedestrian crossing near the O&M Facility), improved traffic signal coordination at intersections where streetcars are governed by such elements as "bar" signals, pavement markings, and median fence to deter mid-block jaywalking across tracks – are warranted.

11. CONTRACT WITH AN INDEPENDENT PARTY TO ENSURE AMERICANS WITH DISABILITY ACT (ADA) COMPLIANCE.

Retain an independent ADA compliance expert to verify compliance with the requirements, particularly as they relate to the design of the truncated domes on the station platforms. While none of the panel members are ADA experts, their collective experience informs them that there should be a color contrast between the truncated dome edge and the rest of the platform surface and that the truncated domes should extend all the way up to the edge of the platform. (See Figure 8 for contract in platform edges.)

(Figure 8 – Platform edge showing the truncated domes and edge paving)

12. PROVIDE ADDITIONAL TRAINING FOR ALL MAINTENANCE STAFF ENSURING IT IS RELEVANT TO ROLLING STOCK AND INFRASTRUCTURE IN USE.

    Based on our field tours, observations, and interviews with RDMT staff, we suggest that maintenance staff should receive additional training for conducting track inspections and switch maintenance and for maintaining the various sub-systems on the streetcars. DDOT should ensure that sub-system vendors on each of the two types of rolling stock enhance the training they provide.

13. DEVELOP A PRE-REVENUE OPERATIONS PLAN.

    Develop and implement the planned Pre-Revenue Operations Plan after resolution of ROW and vehicle issues described to verify that planned service levels can be achieved.

14. RESOLVE INSULATED JOINT (IJ) AND SWITCH HEATER ISSUES.

    Determine whether the resolution to the insulated joint (IJ) issue is to simply repair it or remove it and install a spring switch – and then implement the final decision. The report on the IJ incident provided to the panel was inconclusive on the cause of the incident and indicated it being an isolated event.

    The installation of switch heaters is critical to minimize or eliminate disruption to the service during adverse weather conditions, especially when it snows. The snow can fall in between track switches that prevents them from functioning correctly. Installing them will minimize labor hours that otherwise will have to be expended to clear snow/ice from switch areas.

    We understand that switch heaters were part of the original design but then subsequently deleted. The Project team should revisit the issue and consider installing them.

15. RESOLVE SAFETY & SECURITY CERTIFICATION VERIFICATION REPORT (SSCVR) AND THE FTA SAFETY & SECURITY READINESS REVIEW (SSRR) OPEN ITEMS.

Several open items were identified in the SSCVR submitted in December 2014 and also in the FTA's SSRR report. It is imperative that these open items be addressed, resolved, and accepted by all stakeholders.

16. DEVELOP A MASTER TRACKING MATRIX INCLUDING A SCHEDULE, DATES, AND PERSONS RESPONSIBLE.

One extremely critical issue was the lack of a master matrix to track all identified issues. While we reviewed several matrices – and noted the focus and resolve of the individuals in charge of those matrices – there was no consolidated matrix, so that one individual, for instance, would know which issues were being worked on, which had been resolved, and which needed further attention. This approach, unfortunately, can let some issues slip through the cracks.

We found tracking matrices of open items that had been developed and held by various individuals from various disciplines. While this certainly has merit, because it is indicative of Project individuals being aware of and working diligently on open items, distinct tracking matrices are just not as efficient or effective as a single master tracking matrix that works across all disciplines. The Project should have one Master Tracking Matrix that is held by the Project Manager. This matrix should identify a single person responsible for completing each task/issue with target dates for completion, all leading to a Revenue Operations Date.

17. REVIEW O&M PROCEDURES AND DOCUMENTS TO IMPROVE AND ELIMINATE INCONSISTENCIES AND INCOMPLETENESS.

There are inconsistencies and incompleteness in the O&M procedures. For example, some of the SOPs state they will be updated annually, but had 2013 dates listed.

Another example: the SOP for Lockout/Tagout (LOTO) states that combination locks are provided to employees for this program and the combination is not to be shared with any other employee. This prudent practice, however, is not being followed. Our interviews with front line maintenance staff found that a keyed lock is used for LOTO and the key is kept in a drawer in the Traction Power Substation (TPSS).

There are also areas of instruction that are incomplete. The SOP for conducting pre-departure inspections states safety critical items are listed on the pre-departure inspection form and streetcars with defective safety critical items shall not be released into service, unless authorized by the control center. Upon reviewing the pre-departure form, however, we found that those safety critical items were not identified. Further, the panel could not ascertain how the control center staff would decide when to release a streetcar into service despite it having defective/non-functioning safety critical items.

18. DEVELOP AN ESTIMATED REVENUE OPERATING DAY SCHEDULE.

    The Operations and Maintenance Contractor needs to develop a revenue operating schedule, with agreed upon headways, and submit it to DDOT for approval.

OTHER OBSERVATIONS

1. The general organization of the project and the support to DDOT from the contractors, appears to be uneven. Many areas of support may be buried deeper in the organization than need be. As stated previously, there needs to be one person in charge who takes responsibility for the Project. DDOT should ensure that its Project Manager (supported by staff with relevant rail transit experience) is the person through whom all project decisions are made. Further, this individual should only have to elevate decisions when a set financial threshold exceeds that person's authority or when it requires a policy decision. In keeping with this concept, DDOT should establish levels of authority (budgetary and programmable) at lower levels to keep decisions from being stagnant. The peer review panel noted that all decisions appeared to have to be elevated to the executive/director level for resolution. Driving decisions to the lowest level, and empowering committees and section chiefs to take decisions facilitates a more cohesive team and smoother project.

2. Existing Program Manager Consultant (PMC) safety staff should report directly to the DDOT Chief Safety Officer (CSO). Our understanding is that this is not the current reporting relationship, a circumstance that leads to some confusion with both parties giving direction on safety matters.

3. The O&M contractor should augment its Operations Director position now. Because the O&M contractor employee currently serving as the Operations Director does not have rail transit operational experience to make rail safety decisions, it is crucial either that this individual receive additional training, or be replaced. This position is vital in the operations of the DC Streetcar system to ensure the maximum degree of success.

4. Review organizational staffing for this project and their functionalities. DDOT should review the overall level of support currently provided by the project team. The peer review panel was told that monthly invoices were reviewed; however, no overall task list, support requirement list, or support objectives were provided or made available, indicating no recent review of the project's objectives at this phase. While the organizational charts identify many consultants and sub-consultants, it was not clear to the panel which of them worked on the Project in a dedicated capacity and which were working at the Program level on the rest of the streetcar system expansion beyond the H Street Benning Rd Corridor. Further, at this phase of the Project, someone must be in control of the work needed, and there should also be a working plan for demobilization upon start of review service, which we did not find.

5. Co-Locate Project Contractors and DDOT staff members. From when the panel observed staffing to the current time, it is our understanding that this co-location has taken place. We made this suggestion because having project personnel in the same area facilitates hallway conversations and decisions, which, although sometimes informal, can save significant time. This co-location should include dedicated offices/cubicles for the O&M contractors and important non-staff agencies, including SSO and FTA. Facilitating a tone of a "special/unique/important project" within the department will help build the camaraderie needed to effectively transition and operate the Project.

6. Evaluate the leadership and effectiveness of Program vs. Project management. There is a diverse, and significant number of project support staff, which during the review raised the possibility of gaps in effectiveness and process control. We understand that the contract staff provided represents decades of rail experience, but the organizational charts provided for the Program did not clarify which of these experienced individuals and to what extent, if any, was working solely on the H Street/Benning Road Project.

   The peer review panel noted some elements of conflict between program and project contractors. It appeared that the PMC – working on behalf of DDOT – did not resolve some requests for items to be repaired or fixed – in some cases expeditiously, in other cases not at all. However, the APTA peer review panel understands that the PMC is the vessel in which the work is coordinated but that the other contractors are contractually responsible for resolving quality and failure issues on the project dependent upon the phase of the project.

7. Convene partnering and team-building events. DDOT should consider conducting partnering and team-building events to improve team effectiveness. The panel observed some elements of tension between key team members that have clearly developed over time, and believes that such events will provide the best way to achieve staff working together in a more harmonious way before the Project enters into the operational phase. We suggest such simple efforts as off-site sessions focused on team dynamics outside of DCS, community service projects, and nature outings. For a team to focus on a project, they need to be able to communicate effectively and work towards a common goal. We suggest that any one or combination of these events will foster that collective goal.

8. Consider using rear-facing cameras on streetcars instead of mirrors. DDOT should consider replacing rear view mirrors on the streetcars with backward-facing exterior cameras. This will both reduce the extended "width" of the streetcar in this narrow corridor and avoid potential conflicts, especially with adjacent parked vehicles along H Street.

9. Develop a committee structure chart and identify who makes strategic decisions. Similar to an organizational chart, DDOT should establish a meeting and committee structure chart that illustrates the relationship and hierarchy of committees and the purposes of meetings. Based on the peer review panel's understanding, a Safety and Security Review Committee and Executive Safety and Security Committee have been established with similar, but overlapping, membership and purposes. A list of meetings with required

attendees, therefore, will help clarify the purpose and authority of each of these gatherings and provide an opportunity to remove or reduce redundant meetings.

10. Develop a meeting schedule and identify who is required to attend. Similar to the committee structure recommendation above, DDOT should establish a list of meetings needed for the Project. The peer review panel observed few regularly scheduled meetings to resolve issues, with most problems being dealt with through ad hoc meetings. Regular meetings, with a hierarchy of decision making, would standardize and streamline the decision process. Again, like the meeting and committee structure chart, any meetings placed on this schedule should have a list of required or regular attendees, with the level of decision making explicitly defined and known to all attendees.

(**Figure 9** – Easy pedestrian access to the alignment at Union Station.)

11. Resolve pedestrian safety concerns at Union Station. There are potential problems with pedestrians walking down the alignment from Union Station. This is a result of construction work between Union Station and 3rd Street along the south side of H Street.

12. Resolve pedestrian protection at stairs at Operations & Maintenance Facility (OMF). Pedestrians use the stairway on the north side of Benning Road at the entrance to the streetcar O&M Facility/CBTC. This stairway terminates immediately north of the streetcar tracks, with a piece of tactile tile as the only warning device. These stairs are one of the entry/exit points for a housing complex where there is a steady flow of foot traffic – particularly school children. (See Figure 10.)

(**Figure 10** – Stairs to/from a housing complex)

13. Resolve pedestrian protection issues along the corridor (fence). Pedestrians frequently jay walk across H Street and Benning Road along the entire alignment, which is why it is critical to encourage them to use existing, marked, and signalized crossings. Pedestrian safety along the corridor requires additional evaluation, so the panel suggests using deterrents to this practice, such as enhanced landscaping, fencing, and enforcement. Several current and potential conflict areas with pedestrians need to be improved.

    While some communities welcome the prospect of increased safety in their neighborhoods by directing jaywalkers to crosswalks, others interpret any kind of fencing as a means of "dividing" a neighborhood. Should DDOT decide to use fencing as a deterrent, it will be important to work collaboratively with local stakeholders to convey that safety is the motivating factor behind this suggested deterrence.

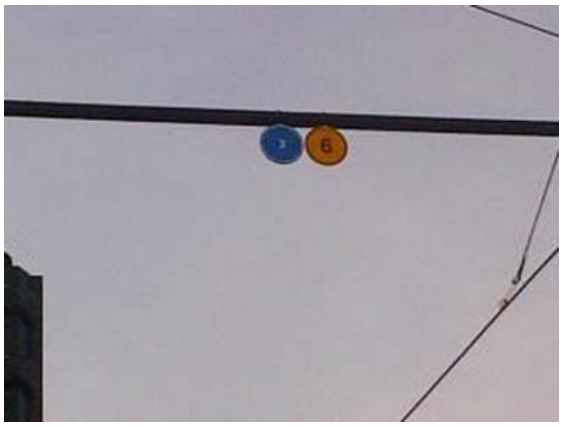
(**Figure 11**- Jay-walking across H Street)

14. Traffic Clearance Conditions. Similarly to the pedestrian safety issue, there were conflicts with parked vehicles along H Street. A solid white line is painted on the inside of the parking lanes (between vehicles and the streetcar track) for the entire length of H Street. While there are signs explaining the need for drivers to park inside the white line, with no tires on the line, these signs are small and posted only sporadically along H Street. Further, there is a profusion of other signs on that route – including "Tow Away Zone," "Emergency Snow Route," "Pay to Park," and "No Parking" – so that the major message is essentially hidden.

DOT should therefore consider enlarging the "park inside white line" signs and graphics to make them more evident to drivers, and adding such elements as stenciling "STREETCAR" on the road next to the white line – to better inform the public of the reason for the white parking line.

(**Figure 12** – Issues of automobiles infringing on the dynamic envelope of the streetcar)

15. In addition, the panel also suggests that DDOT make the streetcar speed limit and signal identification signs larger. Currently, the signs are a small circle, hung on the OCS arm high above the streetcar operator. Distinguishing the number in the sign is difficult, so larger signs – installed on OCS poles at a height just above signals and other signage – would be more effective.



(**Figure 13** – Small signs installed high on OCS arms are difficult to see)

CLOSING COMMENTS

Further, there appears to be insufficient understanding of such processes as the requirement for a Rail Activation Committee and the requirement for a system hazard analysis as well as a lack of an understanding of regulations and oversight roles. These are fundamental program processes that directly affect the project delivery.

Based on the panel's examination of resumes provided, we concluded that not all PM contractor staff assigned to this project have enough relevant light rail or streetcar experience. Likewise, the O & M contractor resumes reviewed found only one individual with a light rail or streetcar experience. As was found with DDOT, some individuals have multiple duties, may be overtasking them. The result is that the engineering analysis is not always proactive, and there are delays in evaluation and response time, which extends schedules. We did find a lack of co-location with DDOT offices, but that has now been remedied, and key team members are now more effective in working collaboratively with DDOT staff. (See Appendix D)

The panel discerned, however, that there may be insufficient technical capacity on the part of the DDOT staff to perform their duties in a satisfactory manner. It is our concern that this may be adversely affecting the ability of those directing the project to make timely and appropriate decisions.

One option the peer review panel suggests is for DDOT to establish and operate the DC Streetcar according to the organizational chart shown in Appendix G. This chart establishes DDOT as the project leader, with support from the PMC. The areas of PMC support and assigned staff should report directly to their DDOT counterpart, rather than taking direction from the PMC Program Manager as is currently the case. This structure will aid in making safety in the Project the paramount concern. For example, the Safety sub-consultants to each contractor should report to, take direction from, and directly support the DDOT Chief Safety Officer. Currently, these important positions are found four levels down in the organizational charts, reporting through three managers who do not have safety in their titles or have safety listed as their primary responsibility.

Lastly, at the existing or proposed new Operations and Maintenance Facility (OMF), we did not see a paint or body repair capability and considered this to be an informational item for consideration and to forward on to those that are developing the rest of the streetcar system to be aware of.

CONCLUDING REMARKS

Once again, the peer review panel wishes it to be known and sincerely appreciates the professional support, assistance, and courtesy extended throughout the peer review process by staff – particularly the DDOT Project Manager Ralph Burns.

The observations and findings provided through this peer review are offered as an industry resource to be considered by DDOT in support of strengthening the organization's strategic goals and enhancing practices in the operation and safety of the streetcar system for the H Street/Benning Road Corridor Project and as could be applied in the future to the rest of the planned streetcar program as future lines are developed.

The findings provided through this review are intended to assist DDOT in its strategies for enhancing and strengthening its Streetcar Program and the H Street/Benning Road Project Corridor.

APPENDIX

Appendix A

Government of the District of Columbia

Department of Transportation

d. **Office of the Director**

February 4, 2015

Michael Melaniphy
President and CEO
American Public Transit Association
1666 K St NW, Suite 1100
Washington, DC 20006

SUB: APTA Peer Review Request

Dear Mr. Melaniphy:

The District Department of Transportation (DDOT) requests that the American Public Transit Association (APTA) conduct a Peer Review of our first modern streetcar segment, currently undergoing its safety certification process, along with some capital improvements and warranty work. We invite APTA to visit us in February or March, to examine the forthcoming DC Streetcar H/Benning streetcar line as we gear up for operations, and to help us determine whether the system is revenue-ready.

We suggest that the Peer Review include:

- A document review that will gauge DDOT and the Operations & Maintenance Contractor (RDMT's) technical capacity and operational readiness.
- Interviews with key personnel involved in the safety and operation of the system, including key staff from DDOT and RDMT.
- Field observations focusing on infrastructure, equipment, and operations.

A more detailed scope is attached for your consideration.

We understand that APTA is able to conduct its peer review while capital improvements to the system are underway, but would require a day of simulated service for observations. We believe that the best time for APTA to conduct its review would be the week of February 23 or March 2, allowing time for many capital improvements to be completed before the review.

District Department of Transportation | 55 M Street, SE, Suite 400, Washington, DC 20003 | 202.671.2800 | ddot.dc.gov

Letter regarding APTA Peer Review Request

Additionally, DDOT would like to invite the APTA review team back for a second peer review after DC Streetcar passenger service begins in order to review our operations in action. We can discuss this in further detail at a later date.

Thank you for your consideration and we look forward to a constructive exchange with our industry peers. We look forward to hearing back from you soon.

Sincerely,

Leif Dormsjo
Acting Director

cc: Greg Hull, APTA

Government of the District of Columbia

Department of Transportation

d. Office of the Director

APTA Peer Review – Suggested Scope of Work
DC Streetcar Operational Readiness Review

INTRODUCTION

The following outline scope of work was developed to assist the DDOT Streetcar Leadership in determining if DDOT and RDMT can launch and operate the H/Benning Streetcar segment safely and reliably. The scope of work for the subject peer review assumes that APTA staff will lead the effort, supported by transit agency safety and operational professionals who have experience operating in-street rail projects such as streetcars or light rail systems, and is performed in accordance with APTA's Peer Review Guidelines. The suggested scope of work includes three activities and results in a report summarizing review findings and offering re

TASK LIST

- **Conduct Document Review** – It is important to note that many of the documents suggested for review were drafted by multiple consultants with many years of safety and operational experience in the transit industry. In addition, the Federal Transit Administration (FTA) and State Safety Office (SSO) have reviewed these documents and provided comments. Further, the documents have been updated to include their comments.
    - DDOT / Program Management Consultant (HDR) – Technical Capability and Positions
        - Contracts, Agreements, MOUs
        - Internal Procedures and SOPs
        - Organizational Charts
        - Operations and Safety Plans
    - O&M Contractor (RDMT)
        - Standard Operating Procedures
        - Operating Rules
        - Maintenance Documentation and Checklists

APTA Peer Review – Suggested Scope of Work

- **Interview Key Personnel** – The following key personnel were identified as those most responsible for safety and operation of the system.
  - DDOT / PMC
    - Deputy Associate Director / Streetcar Project Manager
    - Chief Safety and Security Officer
    - Public Outreach / Communications Manager
  - OMC (RDMT)
    - General Manager
    - Director of Safety and Training
    - Director of Operations
    - Director of Maintenance

- **Conduct Field Observations** – This exercise would focus on visual/interview/documentation observations for a couple of days.
  - **Infrastructure and Equipment** – Inspect the built infrastructure, systems, and equipment to identify real or potential issues that may compromise system safety and reliability.
  - **Operations** – Observe day-to-day operations of management, operators, maintenance staff, and other support staff to identify real or potential issues that may compromise system safety and reliability. The activity could also include the observation of scheduled exercises.

APTA Peer Review for the Government of the District of Columbia Washington, DC Streetcars

Appendix B

Agenda

Sunday March 8, 2015

6:00 PM Peer review panel members meet and get acquainted dinner – meet in hotel lobby.

Monday March 9, 2015

7:30 AM **Breakfast in hotel**

8:15 AM Peer review members to meet DDOT and RDMT management staff, introductions, etc.
Welcome remarks by DDOT Director Leif Dormsjo
Briefing by DDOT of the streetcar project/program
Scope and expectations of the peer review
Review agenda

9:00 AM DDOT interface organization with RDMT Streetcar O&M contractor

a) How does DDOT staff operate and function in overseeing the project
b) How and where are their respective roles and responsibilities defined
c) Technical capacity and qualifications of the staff
d) Periodic meetings where project status are discussed
e) Who attends these meetings, and are there minutes with defined action items, assigned persons and reporting deadlines
f) If DDOT was to start this process all over again:
    - Is the team configured correctly
    - What additional support would be required
    - What would be the lessons learned

10:15 AM Tour of the system to include:

a) Maintenance facility
b) Maintenance training facility
c) Operator training facility
d) TPSS
    - Demonstrate or walk through
        - Lock out/tag out procedure
        - Normal ON/OFF procedure
        - Emergency OFF procedure
e) Track work
    - Describe the track inspection procedure
    - Describe how reporting of faults/defects are done
f) Observation of streetcar day-today operations, maintenance and management
    - Replicate a start-up of revenue service
        - Energization of traction power to the line
        - Train operators reporting for duty
        - Preparation of streetcar for service
        - Entering service
    - Replicate a close-down of revenue service

- Procedure for returning to the O&M Facility
- Shutting the car down
- Sign-off
- Paper work (defects card) regarding defects
- De-energization of traction power to the line

- Ride on train and replicate a derailment and have staff tell us how they would deal with the incident
- Ride on train and replicate a 'fender bender' and have staff tell us how they would deal with this incident
- Show paper work involved in mechanics dealing with a reported LRV fault and how these are documented

g) Other – TBD

NOTE: DEPENDING ON HOW MUCH THERE IS TO SEE, THE TOUR OF THE SYSTEM MAY CONTINUE INTO THE AFTERNOON.

12:30 PM **Lunch at DDOT**

1:30 PM DDOT to make available electronic version of the following documents in advance of the meeting and hard copies available at the meeting. Additionally, DDOT to make available electronic documents at the meeting on a laptop hooked to a projector.

a) DDOT organization chart for overseeing the O&M contractor
b) RDMT organization chart
c) Technical capacity:
   - DDOT staff who oversee the O&M Contractor
   - RDMT staff
   - Copies of resumes for both groups
d) Consultant deliverables
e) Configuration management process
f) Design criteria
g) Documents showing fire department involvement in the design phase
h) Documents showing fire department comments to DDOT and DDOTs responses
i) Reports from FTA/SSO
j) O&M contract between DDOT and RDMT
k) Standard Operating Procedures (SOP)
l) Standard Maintenance Procedures (SMP)
m) Emergency Operating Procedures (EOP)
n) Operating Management Plan
o) Maintenance Management Plan
p) Fleet Management Plan
q) Rule Book
r) SSPPs
s) Readiness drills plans and documentation of drills performed
t) Systems Integrated Test Plan
u) Systems Certification Plan
v) Hazard analysis
w) Training plans for operators and mechanics
x) Training programs and training records
y) Copy of accident reports and corrective actions taken
z) Signage plans
aa) Outreach work to schools, business, property owners, etc.
bb) Design, construction, testing, and revenue service schedule

cc) Copy of a plan, schedule and budget for public outreach

5:00 PM End of Day 1

Tuesday March 10, 2015

7:30 AM Breakfast in hotel

8:15 AM DDOT to arrange meetings with the following staff. All interviews will be at the DDOT offices.

THE CONTENTS OF THESE DISCUSSIONS WILL BE CONFIDENTIAL AND NOT AVAILABLE TO THOSE OUTSIDE THE APTA PEER REVIEW PANEL.

8:30 AM	a) DDOT Deputy Associate Director	- Ralph Burns	30 mins
	b) PMC Executive Leadership	- Steve Carroll	30 mins
	c) DDOT Chief Fire of Safety & Security	- Thomas Perry	60 mins
	d) State Safety Oversight Office	- Captain Kelton B. Ellerbe	30 mins
	e) PMC Safety Support	- Dennis Newman	30 mins
	f) PMC Operations Support	- Dan Nelson	30 mins
	g) DDOT Public Information Officer	- Reggie Sanders	30 mins
12:30 PM	**Lunch**		
	h) RDMT General Manager	- Louis Brusati	30 mins
	i) RDMT Director of Safety and Training	- Paul Mayfield	60 mins
	j) RDMT Director of Maintenance	- John Doherty	30 mins
	k) RDMT Director of Operations	- Ms. Mirchaye Kebede	30 mins
	l) RDMT Supervisor (Operations & Maintenance)	- Jerry Best	15 mins
	m) RDMT Supervisor (Operations & Maintenance)	- Stephanie Simms-Hector	15 mins
	n) RDMT ROW Maintenance	- Steven Bennett	15 mins
	o) RDMT ROW Maintenance	- Cornelius Page	15 mins
	p) RDMT Train Operator	- Saundra Harrison	15 mins
	q) RDMT Train Operator	- Ronald L. Lee	15 mins
	r) RDMT Train Operator	- De'Aundray Williams	15 mins

5:00 PM End of Day 3

Wednesday March 11, 2015

7:30 AM **Breakfast in hotel**

8:15 AM Peer review panel to spend the day at DDOT offices to caucus in private, formulate information gathered, and prepare summary findings and recommendations for exit conference on Friday.

DDOT will have a van on standby from 9:00 AM to 12:00 Noon should the peer review panel need to go back onto the alignment or the maintenance facility.

12:00 PM **Lunch at DDOT**

1:00 PM Peer review panel to continue with preparing findings and recommendations at DDOT offices

5:00 PM End of Day 3

Thursday March 12, 2015

7:30 AM **Breakfast in hotel**

8:15 AM Peer review panel to spend the day at DDOT offices to caucus in private, formulate information gathered, and prepare summary findings and recommendations for the exit conference on Friday

12:00 PM **Lunch at DDOT**

1:00 PM Peer review panel to continue with preparing findings and recommendations at DDOT offices

5:00 PM End of Day 4

Friday March 13, 2015

7:30 AM **Breakfast in hotel**

9:30 AM Peer review panel to prep for exit conference presentation

10:30 AM Exit conference with DDOT management staff and other DDOT invited guests

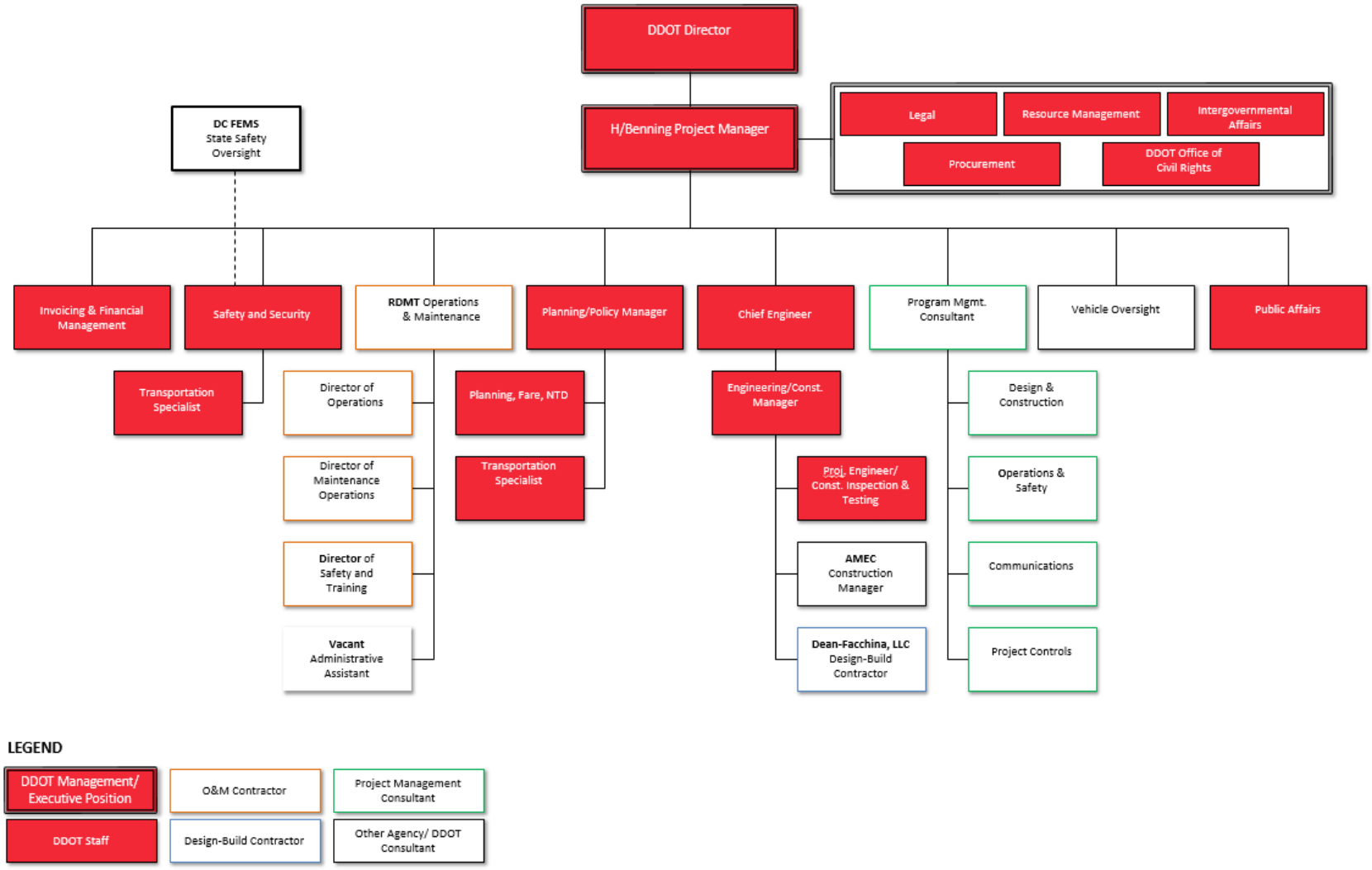
DEPENDING ON PROGRESS MADE BY THE PEER REVIEW PANEL, IT MAY BE POSSIBLE TO DO THE EXIT CONFERENCE ON THURSDAY AFTERNOON.

Document List

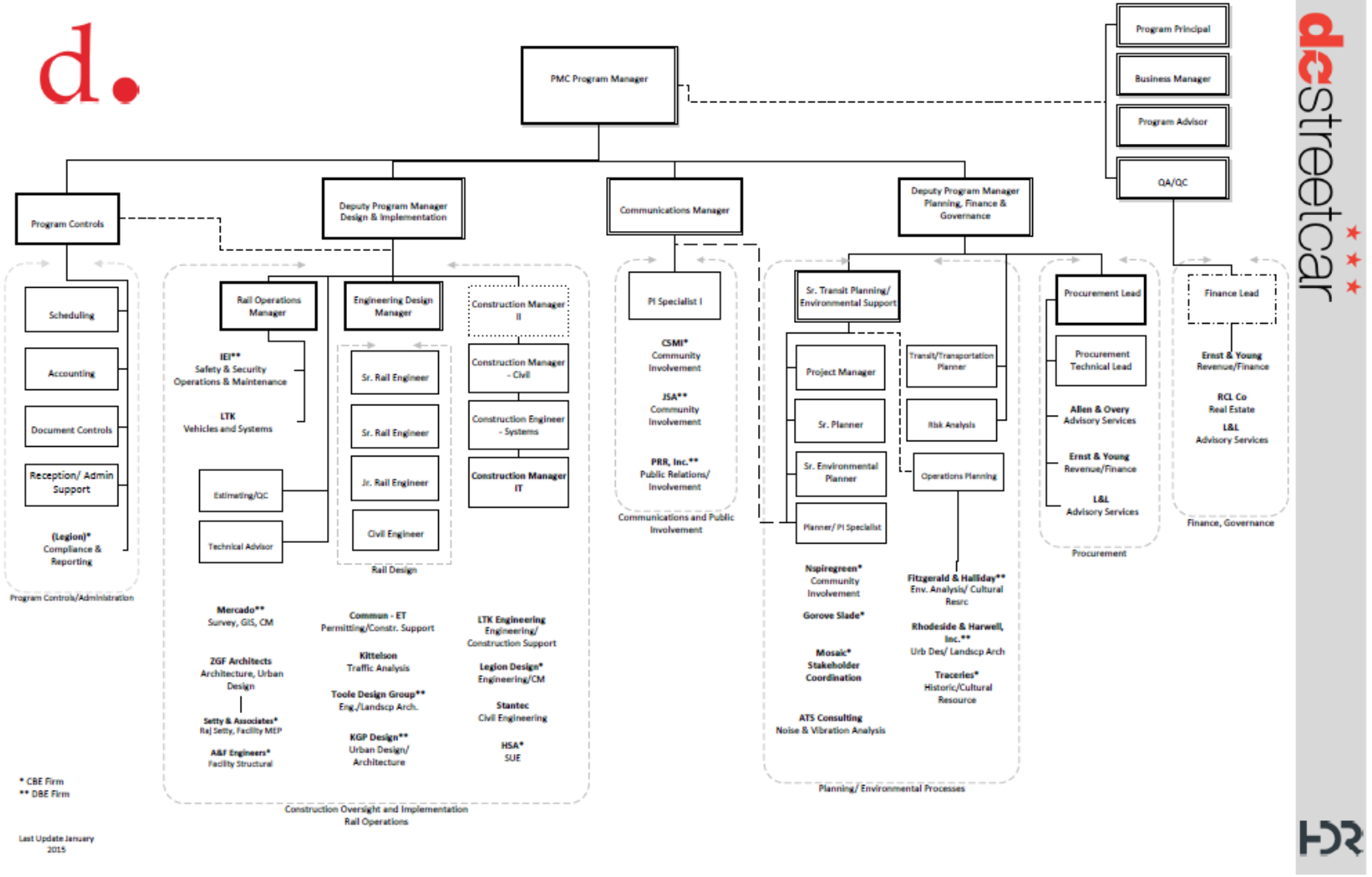
Appendix C

1. Organization Charts
2. Public Outreach
3. Project Schedules
4. Resumes
5. Configuration Management Process
6. Design Criteria
7. DCFEMS SSO Documentation
8. Reports from FTA and SSO
9. OMC Contract
10. Standard Operating Procedures
11. Operations and Maintenance Plan
12. Operating Rulebook
13. Safety and Security Plans
14. Readiness Drill Documentation
15. Systems Integration Test Plan
16. Safety and Security Certification
17. Hazard Analyses
18. OMC Training Plans
19. OMC Training Records
20. Incident Reports
21. Signage Plan

Appendix D

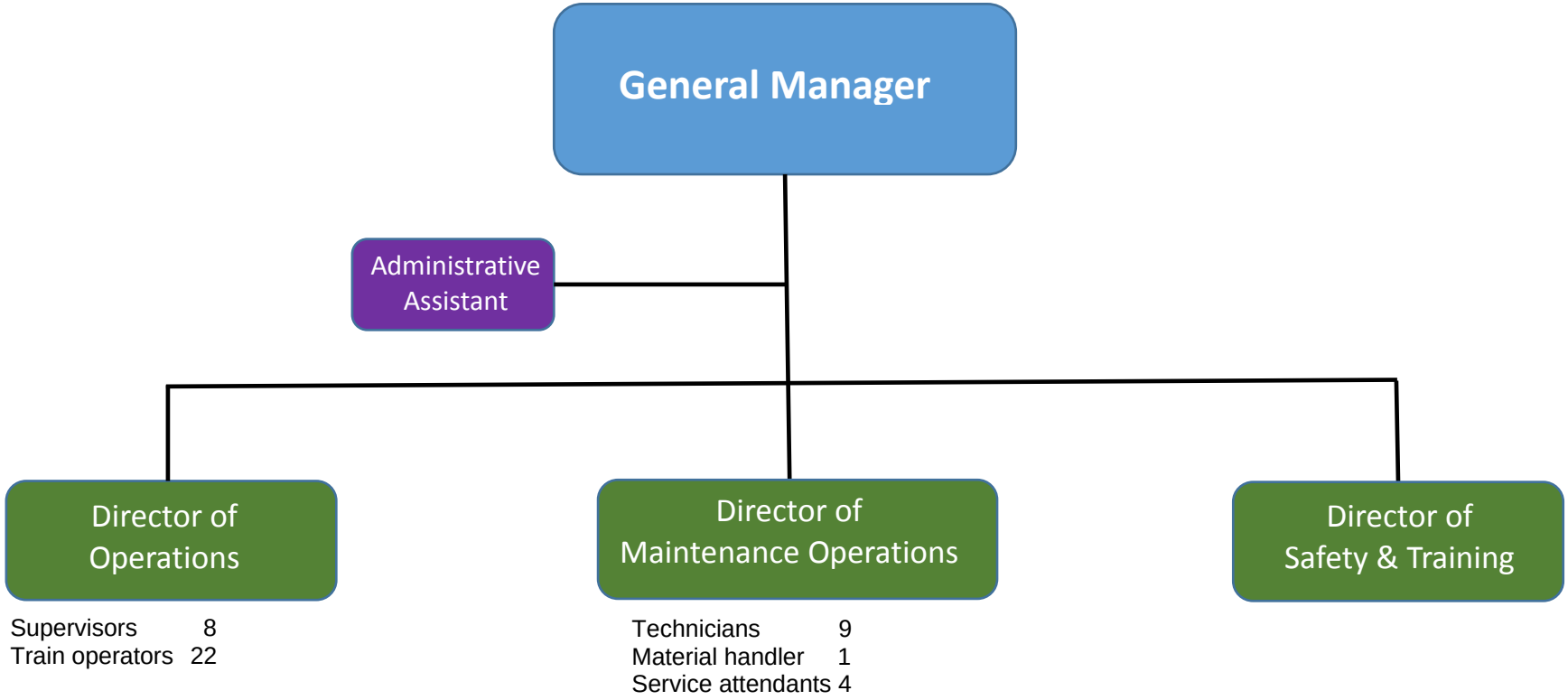

DDOT Director
H/Benning Project Manager
Legal
Resource Management
Intergovernmental Affairs
Procurement
DDOT Office of Civil Rights
DC FEMS State Safety Oversight
Invoicing & Financial Management
Safety and Security
RDMT Operations & Maintenance
Planning/Policy Manager
Chief Engineer
Program Mgmt. Consultant
Vehicle Oversight
Public Affairs
Transportation Specialist
Director of Operations
Director of Maintenance Operations
Director of Safety and Training
Vacant Administrative Assistant
Planning, Fare, NTD
Transportation Specialist
Engineering/Const. Manager
Proj. Engineer/ Const. Inspection & Testing
AMEC Construction Manager
Dean-Facchina, LLC Design-Build Contractor
Design & Construction
Operations & Safety
Communications
Project Controls
LEGEND
DDOT Management/ Executive Position
DDOT Staff
O&M Contractor
Design-Build Contractor
Project Management Consultant
Other Agency/ DDOT Consultant

Appendix E


PMC Program Manager
Program Principal
Business Manager
Program Advisor
QA/QC
Program Controls
Deputy Program Manager Design & Implementation
Communications Manager
Deputy Program Manager Planning, Finance & Governance
Scheduling
Accounting
Document Controls
Reception/ Admin Support
(Legion)* Compliance & Reporting
Program Controls/Administration
Rail Operations Manager
Engineering Design Manager
Construction Manager II
IEI** Safety & Security Operations & Maintenance
LTK Vehicles and Systems
Sr. Rail Engineer
Sr. Rail Engineer
Jr. Rail Engineer
Civil Engineer
Rail Design
Construction Manager - Civil
Construction Engineer - Systems
Construction Manager IT
Estimating/QC
Technical Advisor
Mercado** Survey, GIS, CM
ZGF Architects Architecture, Urban Design
Setty & Associates* Raj Setty, Facility MEP
A&F Engineers* Facility Structural
Commun - ET Permitting/Constr. Support
Kittelson Traffic Analysis
Toole Design Group** Eng./Landscp Arch.
KGP Design** Urban Design/ Architecture
LTK Engineering Engineering/ Construction Support
Legion Design* Engineering/CM
Stantec Civil Engineering
HSA* SUE
Construction Oversight and Implementation Rail Operations
PI Specialist I
CSMI* Community Involvement
JSA** Community Involvement
PRR, Inc.** Public Relations/ Involvement
Communications and Public Involvement
Sr. Transit Planning/ Environmental Support
Project Manager
Sr. Planner
Sr. Environmental Planner
Planner/ PI Specialist
Transit/Transportation Planner
Risk Analysis
Operations Planning
Nspiregreen* Community Involvement
Gorove Slade*
Mosaic* Stakeholder Coordination
ATS Consulting Noise & Vibration Analysis
Fitzgerald & Halliday** Env. Analysis/ Cultural Resrc
Rhodeside & Harwell, Inc.** Urb Des/ Landscp Arch
Traceries* Historic/Cultural Resource
Planning/ Environmental Processes
Procurement Lead
Procurement Technical Lead
Allen & Overy Advisory Services
Ernst & Young Revenue/Finance
L&L Advisory Services
Procurement
Finance Lead
Ernst & Young Revenue/Finance
RCL Co Real Estate
L&L Advisory Services
Finance, Governance
* CBE Firm
** DBE Firm
Last Update January 2015

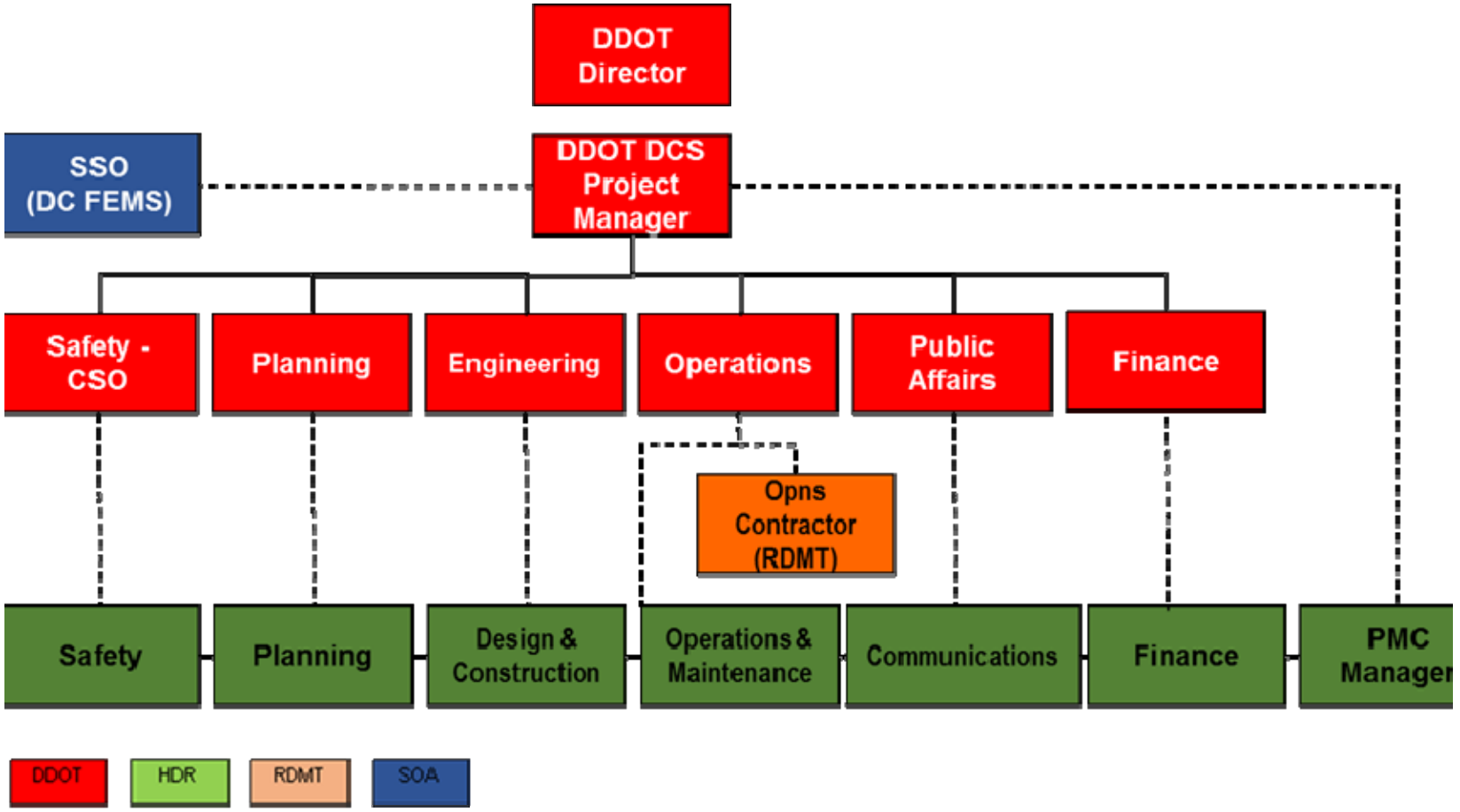
Appendix F

Ratp Dev McDonald Transit
Washington, DC



Appendix G

Recommended Organization Chart



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