

Blue Ribbon Panel



Final Report

August 27, 2014

BLUE RIBBON PANEL

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BLUE RIBBON PANEL

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BLUE RIBBON PANEL

EXECUTIVE SUMMARY

In August of 2013, Thomas F. Prendergast, the Chairman and Chief Executive Officer (CEO) of the MTA, assembled a Blue Ribbon Panel (BRP) of transportation safety officials and railroad industry leaders following mainline derailments at the Long Island Rail Road (LIRR), Metro-North Railroad (MNR) and New York City Transit (NYCT) that had track-related defects identified as either a potential cause or a contributing factor to these events. In addition, there was concern on the part of some stakeholders and elected officials that deferred maintenance and/or insufficient funding of critical infrastructure may have been a factor influencing these events. Furthermore, the occurrence of an employee fatality at MNR's West Haven Station raised concerns about the underlying safety culture within that organization. The Blue Ribbon Panel was tasked with reviewing the safety culture at all three organizations and identifying the causal and contributing factors that led to these incidents. The distinguished members of the Panel are Mortimer L. Downey, Jack Quinn, Conrad Ruppert, Jr., Rodney E. Slater, and William Van Trump (please see Appendix "A" for their biographies).

Select members of the BRP were tasked with reviewing non-technical aspects of the rail properties, such as their safety climate, organizational, funding and management issues and the overall policy setting and oversight. Additionally, the members of the BRP with technical expertise were asked to review each agency's existing track and track-related infrastructure inspection, maintenance and replacement programs with an eye toward using best industry practices and available technologies to guide the agencies toward implementing permanent and effective improvement in these areas.

On March 17, 2014, the BRP issued a series of interim recommendations. One specific concern focused on the need to modify the organizational structure that had existed between the safety function and the rail agency's leadership at LIRR and MNR. The Panel emphasized that this relationship must assure that a clear communication channel exists between these parties and send the message throughout the organization that safety is not subsidiary to other departments. Chairman/CEO Prendergast acted upon the finding by directing the Presidents of MNR and LIRR to designate a lead safety personnel at each respective agency to report directly to them and to ensure that the Chief Safety Officer had no job responsibilities other than safety. This reporting structure had already existed at NYCT.

In addition, at the suggestion by both the BRP and the Federal Railroad Administration (FRA), MTA Executive management directed MNR and LIRR to implement a Close Call Reporting system that is intended to improve the dialogue between hourly employees and management regarding safety related issues. Furthermore, MTA Executive management restored the MTA Board Safety Committee and created a Chief Safety Officer position that is a direct report to MTA Chairman/CEO to ensure that safety related matters are on the radar of the highest ranking individuals within the organization.

The BRP provided a series of key findings, the most significant of which are detailed as follows:

Overall Safety Culture:

The safety culture at LIRR and NYCT appears to be performing fairly well; however, in the case of MNR, there is strong evidence to suggest that this is not the case. The number of incidents that have occurred in recent months sends a clear message that fundamental rebuilding needs to occur to get to a level of safety achievement that would be acceptable to the rail agency's customers, employees and the communities they serve.

In addition, the BRP recommended that MNR engage with its customers to assure that the safety messages are understood and that customers know what they can expect in emergency situations. Whatever the form this engagement takes—advisory committees, town halls, media opportunities, direct customer communications—safety needs to be on the communications agenda.

Track Maintenance Program:

The level of effectiveness of the track programs had a large degree of variation across the three rail agencies; however, all of the organizations share commonalities where improvements can be made. Each agency would benefit from implementing improved computerized maintenance management systems to make their operations more effective and efficient. In the case of NYCT this would mean continued improvements in a system that has developed over the past 25+ years while in the other organizations a more fundamental change is required, where the transition from a paper-based system to a digital system will involve a larger investment and even a cultural change.

There are also new technologies available for track inspection purposes that can be employed more effectively or in some cases introduced for the first time. These include continued improvements to automated track geometry measurement systems, ride quality measurement system, automated visual inspection systems and rail flaw detection systems to name a few. Some of these technologies are already in service and have been performing effectively for years. Yet simply deploying more of these systems is not sufficient. It is important that the recorded data can be processed quickly to provide meaningful information that can be used to make informed maintenance decisions. In other words define a clear path from data to decisions. Further it is essential that this information be readily accessible to all levels of the organization, from the Track Inspector to the CEO.

In this regard, NYCT has made the furthest advances, with a system that began in the late 1970's and has continued to improve over the years. Yet even in their system a significant amount of manual input of data is required. With the sophistication of information technology available today, development must continue to the point where the digital data is sourced in the field using hand-held devices which not only feed the data into the system, but also guide the inspector to ensure that proper measurements are made and then provide immediate feedback on the severity of the conditions observed in the field.

Improvements in employee safety and productivity can also be achieved by a process review of each agency's track maintenance activities, which should lead to the adoption of industry best practices. These practices include, but are not limited to, greater use of mechanized equipment and the increased use of powered tools to reduce the manpower expended on processes that are currently being performed manually.

MNR's track maintenance activities are presently in a "fire-fighting" mode. This situation may be the result of MNR personnel demonstrating an excessive reliance on existing practices without performing a comprehensive review of its track maintenance program. Specific areas of concern and potential solutions to remedy them will be described in greater detail within the body of this report.

Track Access Issues: The BRP members identified that tension exists between operations personnel, and maintenance personnel for the allocation of track time. While this is a problem that is occurring to varying degrees at all three agencies, in the case of MNR it is magnified. The balance appears to have tipped too far, perhaps because on-time performance had always been the key measure of MNR improvement since the MTA takeover. This potentially adversarial relationship must be effectively managed; therefore, the BRP suggested that all agencies undertake a baseline review to assure that the proper balance between these opposing objectives is maintained and that the time for maintenance and inspection is built into the operating schedule to achieve this goal. On time performance cannot be the only measure applied by management.

In addition, new strategies may need to be implemented to assure adequate work can be performed. Approaches to address improved track access include, but are not limited to, adopting best practices such as FasTrack, which originated at NYCT, and reviewing/modifying collective bargaining agreements with labor units that apparently restrict work to times when train operations are more intense.

Capital Program:

There is no room for compromise where safety is at stake. The size and composition of MTA's next Capital Program must continue to be designed with a priority towards the state of good repair within the system.

LIRR and NYCT were able to articulate their policies on track replacement cycles, capital investment levels and similar issues. A common understanding of MTA policies is critical in achieving goals over a sustained period in all three organizations.

The new leadership team at MNR have reviewed their internal practices for establishing their Capital Program and found that there appeared to be an over-reliance on historical practices for this activity. MNR management is currently developing new strategies to implement their Capital Program; however, data analysis which leads to identifying and correcting the root cause of failures will be the driving force in identifying needs. This process is currently ongoing.

Succession Planning:

The BRP members expressed concerns regarding the current circumstances that are negatively impacting the succession planning activities at each organization. Presently, retirements and difficulties in filling vacated positions have left areas of the rail agencies to some degree “hollowed out.” The ability to implement an effective succession planning strategy is further hampered by competent hourly/wage workers staying in or even seeking voluntary demotions to retreat back to, often times more financially rewarding hourly work. This situation appears to be a manifestation of a lack of recent management increases, which is driving many key supervisory/managerial employees toward earlier retirements and private sector opportunities, thereby rapidly draining the agencies of valuable institutional knowledge.

In addition, without the sufficient ability to attract and retain qualified personnel with critical skills to backfill these leadership roles, the organizations are left struggling to attain key objectives. Speaking specifically to the track program, this circumstance is having unintended negative consequences on the caliber of safety critical track maintenance and inspection activities and the situation is lending itself to the inefficient use of human resources.

CONCLUSION

The BRP members have expressed that there is an obvious commitment to future improvement and the agency employees appeared to recognize the need to learn from current problems so that they do not recur. In addition, there is every reason to believe that the rail agencies are fully capable of change to assure that a process of continuous improvement in system safety will occur.

Finally, the report provides a total of twenty nine (29) recommendations to improve performance in the aforementioned areas. MTA Executive Management will direct the rail agency Presidents to provide a response detailing the corrective action plans that will be implemented to satisfy each one of the recommendations. In addition, the BRP members have requested to be supplied with the corrective action plans, when they are available and would like to revisit each of the rail agencies, in perhaps a year, to evaluate the effectiveness of the implemented corrective action plans. The following is a detailed report of the BRP Initiative.

FINAL REPORT

BLUE RIBBON PANEL'S OBJECTIVES

MTA Executive Management defined the following objectives at the onset of the BRP Initiative:

- to ensure that a safety culture exists in which agency leadership and all employees embrace the importance of safety and effectively communicate safety as a core value;
- to ensure that the identification of hazards is actively encouraged, and that hazards are investigated and appropriately resolved;
- to identify any commonalities among the four track related derailments and determine if there are any system-wide improvements that can be made to the agencies track and infrastructure programs that would help prevent future occurrences;
- to determine if each rail agency is complying with internal and external standards for maintaining and inspecting track and infrastructure system elements;
- to identify whether the current track and infrastructure programs and practices are effective in meeting the agencies' objectives and to assess the use of available technologies to improve the process;
- to identify latent conditions and/or active failures that have the potential to pose a safety hazard, including the prioritization and timely response to these conditions, and the implementation of appropriate corrective actions to address any such conditions in a meaningful, permanent and effective manner, in accordance with industry best practices;
- to ensure that the agencies have effective first line supervision that is empowered to manage safety concerns and understand the importance of open communication;
- to determine if a vibrant succession planning strategy is in place to ensure that each agency is capable of attaining key objectives, motivates employee performance, compensates employees in direct relation to their contributions to their respective organizations and reflects the compensation trends and practices in the surrounding area and industry.

On September 20, 2013, the BRP initiative commenced with a kick off meeting held at NYCT between the Panel members, MTA Executive management and key personnel from each of the rail agencies. During the course of the subsequent BRP members' activities, the Non-Technical members participated in four (4) visits (November 18, 2013, January 16, 2014, March 31-April 1, 2014 and May 7, 2014) to the rail agencies, where they engaged employees, ranging from the President of the organization, through to the Division of Track Hourly/wage workers for the purpose of gauging the overall safety culture across each respective organization. The Technical members of the Panel conducted five (5) field inspections (September 24-26, 2013, October 8-11, 2013, November 5-7, 2013, January 14-17, 2014 and March 25-28, 2014) across the different rail agencies and three (3) teleconferences focused on inspection practices (June 26, 27 and 30, 2014). The field inspections involved visits to work sites as track maintenance and construction activities were occurring, performing observations of a portion of each system's physical track and infrastructure elements, evaluating current track maintenance and inspection practices, examining training practices and reviewing the Capital Program. In addition, the Panel members participated in eight (8) conference calls (August 26, 2013, October 29, 2013, October 31, 2013, December 4, 2013, February 3, 2014, March 3, 2014, April 16, 2014 and April 25, 2014) for the purpose of accomplishing the objectives stated above. Please see Appendix "B" for a

chronological account of the BRP members' activities. In addition to visits and meetings at the MTA, panel members met with FRA, the National Transportation Safety Board (NTSB) and Amtrak.

OVERVIEW OF MASS TRANSIT'S IMPACT ON THE REGION

Mass transit has played a vital role in the development of New York City and its neighboring suburbs from its earliest days and it continues to be essential to the economic life of this region. It is the fuel that powers the \$1.4 trillion dollar New York regional economy, which makes up 11 percent of our nation's Gross Domestic Product (GDP), second in the world only to Tokyo. The intense concentration of commercial, financial, cultural, industrial and residential development that exists in the twenty-two (22) square miles comprising the Borough of Manhattan, particularly its central business district, would not be feasible without such an extensive system. Mass transit enables New York City to have approximately four times the job and population density of the next largest U.S. city and it also enables the most valuable real estate market in the country.

NYCT subway system alone carries nearly six million customers on an average weekday and that number climbs above 7.5 million daily customers when combining it with NYCT Bus and para-transit ridership. MNR's ridership—83 million in 2013—has almost doubled since it was founded in 1983. And the LIRR's ridership of nearly 83 million as well, makes MNR and LIRR the two most heavily-used railroads in the nation. By comparison, Amtrak—which serves 46 states—moves approximately 30 million people every year. MTA provides a combined 8.5 million transit rides a day, which is one third of all transit rides in the United States (U.S.), more than the next ten (10) U.S. transit systems combined and four times the amount of trips provided by the entire domestic airline industry.

In addition, according to the New York Building Congress, MTA alone accounted for 25 percent of New York City's construction industry in 2012. According to one estimate, the current Capital Program will provide 350,000 jobs in New York City and an overall economic impact of \$44 billion dollars throughout New York State. Continuing capital investment is vital to ensuring the safe operation of these key regional assets.

BACKGROUND

History of Recent MTA Rail Related Incidents leading to the formation of the BRP:

- March 18, 2013, LIRR, Jamaica, New York: The east four cars of an eight car westbound non-passenger equipment train derailed on Track Main 1. The LIRR's internal investigation identified fractured rail joint bars of a bonded Insulated Joint and the subsequent track misalignment of the rails at this location to be the causal factor in this incident. Preliminary findings also suggest that track-bed support at this location likely contributed to a fatigue crack and subsequent low cycle fracture of the joint bars. There was extensive damage to car equipment, the roadbed and the contact rail; however, the track structure provided sufficient support to prevent the derailed train from fouling the adjacent tracks. There were no injuries reported as a result of this incident.

- May 17, 2013, MNR, Bridgeport, Connecticut: Mainline derailment of a revenue train, which was struck by another revenue train travelling in the opposite direction. The preliminary NTSB findings identified the track infrastructure at the point of derailment as an area of interest in the ongoing NTSB investigation. Seventy-three (73) people were injured, and approximately 300 people were evacuated as a result of this incident.
- May 28, 2013, a MNR employee fatality occurred at the West Haven Station due to a passenger train in revenue service being routed into a work area. This incident is also currently under investigation by the NTSB.
- May 29, 2013, NYCT, 125th Street, Manhattan, New York: The #1 truck of the lead car of a ten-car southbound revenue train experienced a mainline derailment due to a twenty-eight (28) inch section of rail experiencing a head and web separation and breaking out beneath the moving train. NYCT's internal findings identified a broken rail as the causal factor in this incident. There were no reported injuries during this incident; however, there was significant property damage to system elements during the event.
- July 18, 2013, MNR, north of Marble Hill Station, Manhattan, New York: Ten non-revenue rail cars of a twenty-four car CSX freight train consist derailed on mainline track as it traversed a curved segment of track. This incident is under investigation by the NTSB. Areas of interest include track maintenance, mechanical equipment and train operations. There were no injuries as a result of this incident; however, there was significant property damage to system elements during the event.

Note: After the formation of the BRP, two significant rail related incidents occurred at MNR. On December 1, 2013, there was a mainline derailment at the Spuyten Duyvil Station on the Hudson Line that resulted in four passenger fatalities and multiple injuries. There was also a MNR employee fatality that occurred on March 10, 2014, south of the 125th Street Station on the Hudson Line. These incidents are currently being investigated by the NTSB.

In addition, on May 2, 2014, a mainline derailment occurred at NYCT due to a broken rail, which resulted in 32 non-life threatening injuries to customers and crew members. The incident is currently under investigation by the New York State Public Transportation Safety Board (PTSB) and internal NYCT personnel.

BRP NON-TECHNICAL MEMBERS' DISCUSSION

As previously stated, the BRP panel members were given open access to employees at all levels of the MTA rail agencies for the purpose of performing their review. The BRP expressed that there is an obvious commitment to future improvement and the agency employees appeared to recognize the need to learn from current problems so that they do not recur.

The BRP discussions and reviews initially focused on LIRR and MNR. The Panel noted that each of these railroads has had substantial successes in the past, whether the significant service turnaround at MNR after being taken over by the MTA or smaller but important initiatives like LIRR's resolution of the platform gap issues. Therefore, there is every reason to believe that each is capable of change to assure a process of continuous improvement in system safety.

COMMENTARY ON MTA COMMUTER RAILROADS

Overall Safety Climate

A Panel member observed that both LIRR and MNR put appropriate attention to safety in their policy statements and reports; however, the outcomes in each case suggest that they have not achieved comparable results. Simply stating that safety is “our #1 priority” is not enough, since that leaves the impression that priorities are relative, could change or that they could be traded off in the future. Safety has to be recognized as a permanent core value that transcends priorities, providing a defense against any actions that would undermine results, even if those actions would be beneficial for the railroad’s bottom line.

The climate surveys done among employees at the two railroads show reasonably good results, but LIRR definitely scores better. In the case of MNR, the number of incidents that have occurred in recent months sends a clear message that fundamental rebuilding needs to occur to get to a level of safety achievement that would be acceptable to the railroad’s customers, employees and the communities that it serves.

The BRP interviews included a wide span of the management ranks of the two railroads, but in the case of hourly workers, the discussions were contained within the ranks of track maintenance personnel, as this area was recognized in the agreed scope of work as the most significant problem. Here again, there was clear differentiation in results. LIRR track workers do not see their situation as perfect, but expressed a clear understanding that conditions have improved significantly in recent years as the railroad professionalized and moved away from traditional practices. MNR track workers, by contrast, were less optimistic and felt that they were not given the support needed to accomplish their tasks (see discussion below regarding operational conflicts).

Safety Organization and Culture

The BRP members identified that both LIRR and MNR had an organizational structure in place to attend to safety issues, but each left questions as to how close they were coming to meeting the challenge. An effective safety department must be well focused, empowered within the organization, and capable of undertaking proactive efforts towards continuous improvement. The interim report identified that organizational changes were needed to assure that the safety groups are seen by all as clear and effective champions of safety with the tools and support needed to do their job well. This is an indispensable step in establishing a strong safety culture; however, there were issues in terms of reporting relationships between the safety function and the railroad’s leadership.

Specifically, at the time of the Panel members’ initial visit to LIRR, the lead safety person at the LIRR railroad was not a direct report to the agency head. A direct reporting relationship between the agency president and the head of safety is important both to assure a clear communications channel and to send the message throughout the organization that safety is not considered subsidiary to other departments. At LIRR, the Chief Safety Officer was the Vice President for Administration. This individual was on a scheduled leave at the time of the BRP members’ visit; however, they were informed that his duties include the management of the safety function and service on FRA safety panels. Since the BRP visit, the Chief Safety Officer

role has been assigned to the former director of safety and training. This individual, who formerly reported to the Vice President, now reports directly to the President.

In both railroads, MNR and LIRR, there was at the time of the BRP's visits, a mix of duties assigned to the safety management department. Arguments can be raised as to the linkages between safety and security (MNR) or safety and training (LIRR), but there are equally important issues about multiple responsibilities and how they affect the individual's focus. The BRP believes that a sole focus on safety will better achieve the result. The Panel did observe that LIRR has made good use of the linkage with training to make safety a leading element in all training, but asks whether this couldn't be done through cooperation rather than mixing focus. At present, based upon the BRP's interim recommendation, the lead safety person at both LIRR and MNR have had all other duties stripped away from them to ensure that their focus on safety is not diluted and their lines of communication to upper management are unimpeded.

Another key element in continuous safety improvement is a focus on innovation and proactive steps to avoid problems by being a learning organization. Both railroads seem more conventional and reactive in their approach. There did not seem to be as much attention as perhaps there should have been to adopting new methods and equipment, nor was there strong evidence of cooperation and knowledge sharing between the railroads; however, as a result of this initiative, there has been a notably increase in interagency dialogue.

A key tool in safety is the application of hazard analysis and proactive review for safety considerations as new operating or capital decisions are being made. Neither railroad had strong evidence to suggest that this has been the case. This is a concern, since hazard analysis is a key tool in focusing priority on the most significant issues that are found.

Recognizing that achieving superior safety performance goes beyond the safety department to all elements in the railroad, the Panel was pleased to note the LIRR's "Situational Awareness for Efficient Railroading" (SAFER) practice, holding each supervisor accountable for periodic evaluations and improvements of safety performance in his or her area of responsibility.

The use of climate surveys, as noted above, is one tool to measure attitudes among the work force and set priorities for further improvement. Another tool that can be used with the workforce is positive reinforcement of good performance. It is understood that within the framework of FRA and Occupational Safety and Health Administration (OSHA) safety oversight, it is inappropriate to reward individual employees for safety, because this action can potentially create an undesired incentive to cover up accidents. It is the case, however, that both railroads have solid programs for group recognition and the Chairman of MTA recognizes programmatic steps to enhance safety culture and performance.

Another element of employee participation is the creation of an environment where dialogue can occur about safety issues. As part of addressing this area of concern, MTA has committed to developing a confidential close-call reporting system. The Panel recognized that there are issues associated with implementing such a major change but urge that both railroads approach this positively and continue to work with FRA and with the employee organizations towards success in meeting the mutual objective of improved safety.

Finally, there needs to be engagement with your customers to assure that the safety messages are understood and that customers know what they can expect in emergency situations. Whatever the form this engagement takes—advisory committees, town halls, media opportunities, direct customer communications etc., safety needs to be on the communications agenda.

Track Conditions and Maintenance

While the technical members of the panel are reporting separately on their observations, the findings by the Transportation Technology Center, Inc. (TCCI) team and the recent review by FRA do cast doubt on the quality of work done by the MNR track maintenance division. The BRP member's discussions indicate lesser concern on LIRR, but there needs to be continuous attention to assure that conditions do not degrade. Some observations gleaned by the BRP members may be useful in assessing causes of the problems and suggest ways forward towards improvement.

In any railroad operation there is a continuing tension between operations and maintenance. The clear desire of train operations management, often supported by senior leadership, is to be customer focused; offering maximum achievable service levels in both directions with a high degree of on-time performance. Care must be taken to assure that appropriate opportunity is afforded to maintenance. In the case of MNR, this balance appears to have tipped too far, perhaps because on-time performance had always been the key measure of MNR improvement since the MTA takeover. Those charged with maintaining track, especially at the rank-and-file level, see themselves unable to get their job of inspection and maintenance done and almost view the operating side as their adversary. Rectifying this impression is critical if these workers are to exercise their best efforts towards a common task. At LIRR, the workers reflect some frustration, but more in the sense that lack of track time will mean more frequent repair needs. Both railroads should undertake a baseline review to assure that proper balance is maintained, and that the time for maintenance and inspection is built into the operating schedule. New strategies may be needed to assure adequate work is done, including review of collective bargaining agreements that apparently restrict work to times when the operations are more intense.

The Panel members asked each railroad to articulate their policies on track replacement cycles, capital investment levels and similar issues. A common understanding of policies is critical in achieving goals over a sustained period. LIRR provided a documentation of their policies and practices.

The new leadership team at MNR reviewed their internal practices for establishing their Capital Program and found that there appeared to be an over-reliance on historical practices for this activity. MNR management is currently developing strategies to implement their Capital Program; however, data analysis will be the driving force in identifying needs. This process is currently ongoing. For greater assurance, with respect to the change process at MNR, the panel scheduled a follow-up meeting with President Giulietti and were satisfied that improvements are underway that address their concerns.

Based on discussion with the technical experts on the panel, it appears that the track standards and manuals for each railroad are reasonably close to industry standards although possibly in need of more frequent update. If this is the case, there needs to be a basis for explaining the gap between standards and performance, particularly on MNR. This quality gap may be a problem of supervision. The track gangs are operating often on their own out on the Right of Way, but supervisors need to motivate their performance and assure its quality. On both railroads, the Panel members heard concerns about the supervisory levels. A combination of retirements and difficulties in filling positions seems to have left a “hollowed-out” organization. Lack of management pay increases will drive supervisors towards earlier retirement and private sector opportunities, while leading hourly workers to stay in or even retreat back to, more rewarding hourly work. A compensation review of the critical skills positions at both railroads should be undertaken.

COMMENTARY ON NYCT

NYCT Observations:

Of the three agencies reviewed by the panel, NYCT shows the greatest degree of maturity in its safety programs and accomplishments. There is much in NYCT’s program that could profitably be emulated by LIRR and MNR, but NYCT is also realistic in believing that there is much more they should be doing to protect and improve their performance. The recent derailment of an F train on the Queens Line, although still under investigation, reminds us that mishaps still can happen and the organization must remain vigilant. With respect to track conditions, it was noted that much of the Independent Subway System (IND), which is a generation younger than most of the original Inter-borough Rapid Transit Company (IRT) lines, is now at an age similar to that of IRT when it approached failure in the era before MTA’s capital rebuilding began. This is another reminder that there is no room for compromise where safety is at stake. The size and composition of MTA’s next Capital Program must be still designed with a priority towards the state of good repair within the system.

It was apparent during the Panel members’ discussions that safety values begin at the top of NYCT’s organization and work their way down to the front lines. There is an integrated approach to safety and operations, with the clear value that safe performance is a matter of commitment, not simply compliance. Bringing this concept throughout the organization is a conscious effort, beginning with President Bianco and cascading through the ranks of management in a systematic way. As discussed below, there is probably more that can be done to extend all the way to the front line worker, but the beginnings of this approach are present with the charge for all management and supervisory personnel to spend less time in meetings and more time in the work place.

The formal safety organization at NYCT fits the model, not just on paper but in its performance. There is a strong professionalism and some good accomplishments that mirror its independent status and its single focus on safety. They showed real command of the data and good follow-up on such issues as responses to NTSB recommendations. Their use of standard hazard analysis was particularly evident in the work done to support the decision to close the Montague Tunnel for post-SuperStorm Sandy repairs. While no particular hazard was such as to drive the decision, the sum total of high-risk issues contributed to an outcome where the work could be done more quickly and effectively, but also with confidence that this was the safer way to proceed.

The tunnel closing is one example of balancing the issues of service levels and system integrity, an issue also reflected in the Panel members' comments on the other railroads. In this regard, NYCT is similarly showing the way. The design of the FasTrack maintenance program is an approach intended to provide the time for efficient and safe rebuilding. The physical nature of NYCT with its parallel services makes it easier to contemplate such initiatives, but the principle is the correct one. Another similar policy direction is the MTA's decision to undertake protective shutdowns, as in the case of Hurricane Irene and SuperStorm Sandy. There may have been some inconveniences imposed on customers, but these could be mitigated with good public information and the shutdowns may well have prevented long-term damage with much more service consequence. All the agencies should review their decision-making process to assure that the long-term interests of the system and its customers are given appropriate balance.

NYCT is cognizant that technology and a sound workforce are key ingredients in safety performance. In the technology area, NYCT has made great strides in the use of its Track Geometry Car (TGC) with augmented capabilities to diagnose conditions and establish effective responses. They have also taken important steps to design new methods and materials for renewing the system effectively and quickly. With a greater ability to focus track renewal in a cost effective way, NYCT has put itself on a sound cycle for maintaining its track in a constant state of good repair.

On the workforce side, there is a recognition that the organization is at risk to a wave of retirements, with many of the staff who came on to carry out the expanded work under the MTA Capital Program soon to reach retirement age. Continued efforts are needed towards talent acquisition, and there needs to be a review of the impact of the continued failure to give management increases on the supervisory and management ranks.

There also is opportunity for more efforts to extend safety accomplishments throughout the work force. While there are strong institutional programs in place with organized labor representatives, there is room for greater outreach to rank and file workers to identify barriers to good performance, some as simple as higher quality gloves and boots but also extending to consideration of worker views on how to make the workplace safer. NYCT does pay good attention to "close calls" and "near misses," but has not extended to an approach that encourages confidential reporting of such incidents through a neutral third party. There may be lessons learned and potential opportunities for improvement as the MTA railroads move in this direction. There also has not been an explicit "safety climate" survey done in recent years, leaving the earlier survey in place showing mixed results. There has been some good work on "culture change" analysis, but it may be time to re-visit the specifics of safety climate to assure that progress is being made.

In the BRP interim report, the Panel had recommended a more systematic safety presence at MTA Headquarters and at the level of the MTA Board. While NYCT has made good progress without such oversight, the Panel members continue to support this observation and note that identifying how well each agency has done can help spread practices that are working to support that progress, which will be discussed in greater detail below.

COMMENTARY ON MTA HEADQUARTERS

MTA Role

While management of each railroad needs to be accountable for results, a greater degree of oversight from MTA would add greater discipline to the process. Greater attention from executive management and from the Board on a sustained basis will not only shed light on performance but will send the message that the safety culture truly runs top to bottom. Further discussion is needed as to how best this can be achieved, but without such a balance, the message can be taken that safety is not a primary goal.

In the earlier BRP interim report, it was identified that at the MTA staff level, a more disciplined process could include more rigorous reporting of issues, strategies and outcomes. Each railroad has its own practices for investigation, creation of corrective action plans and effective implementation of safety related improvements, and the responsibility for getting these things done rests with railroad top management. But there is a lot to be said for outside review to assure that good results are achieved, that important actions don't go on the shelf, an appropriate sharing of technical and operational knowledge goes on among the MTA agencies and that key findings from outside agencies like the NTSB are being implemented.

This review among the operating agencies could be supplemented by a process of benchmarking, not only within MTA but among comparable operations around the country and the world. A central function that provides for follow-up on safety recommendations and development of dashboards to identify progress is an important element in spurring change.

In response to this finding, MTA Chairman/CEO Thomas F. Prendergast restored the MTA Board Safety Committee and created a Chief Safety Officer position reporting to him directly to ensure that safety related matters are on the radar of the highest ranking individuals within the organization.

BRP TECHNICAL MEMBERS' DISCUSSION

COMMONALITIES AMONGST THE LIRR, MNR AND NYCT

The BRP technical experts identified that all railroads would benefit from the development of more integrated maintenance management systems. In some instances the current manual systems, including timekeeping, track inspection reports (both internal and external), and geometry car reports that have to be categorized and prioritized, can diminish the value of the data, as managers oftentimes have to sort through lengthy reports to identify key action items. In addition, performing these manual processes drains a significant amount of time, which would be better spent by having front line supervisors working with personnel in the field.

The foundation of a maintenance management system is the asset database or registry. Each the three organization stores asset information in a variety of ways, often digitally but in some instances still on paper records. Further, much of the digitally stored information is on "local" computers and not integrated into a cohesive system, nor can it be accessed directly by people in the field. It is understood that work is already underway to develop an integrated system using

commercially available software and this is a worthy task. It is important to keep a few things in mind as this development progresses.

- First, define a clear path from data to decisions. Over the past several decades the railroad industry has developed techniques to quickly measure and record vast quantities of data about the condition of the fixed infrastructure, so much so that this store of data can be cumbersome to manage. An effective maintenance management system should not only record and store data, but should transform it into meaningful information that is used to make informed decisions by all users of the system. This should be a fundamental concept that is a driving force behind system design and development.
- Make sure that the design and development of the system is a joint effort between the Engineering department and the Information Technology department with the Engineering department having the lead role. It is important that those tasked with managing maintenance activities, and who will be the end users of the system, play the principal role in defining its functional requirements.
- Make the time and effort to thoroughly define the functional requirements of the system at all levels of the organization, before hardware and software decisions are made. Also have a clear understanding how the maintenance management system will integrate with other corporate systems.
- Take advantage of the economies of scale and consider an MTA-wide development with some tailoring to account for the unique aspects of each organization. This is particularly important to ensure an integrated reporting system that is sourced at the local level but which is visible and accessible up to the highest level in the MTA.
- Involve field personnel in the development process and encourage their feedback. This is particularly important with the development of mobile devices and applications to be used by inspectors and front line supervisors. The value of the information contained in a maintenance management system is only as good as the quality of that information. As the inspectors and supervisors are the source of much of this information, their “buy-in” of the system and knowledge of the conditions in the field where it will be used will help ensure success. This can be as simple as field testing a device to see if it functions in the work environment to obtaining feedback from the inspectors as to how best to capture and record inspection findings.
- Understand the unique nature of the railroad’s fixed infrastructure assets and how they relate to asset, maintenance and work management systems. Many of the commercially available software systems employ a purely hierarchical data structure for the assets which they manage. This works well with some assets which are hierarchical in nature (e.g. signal installations, building systems, etc.) and are located at a specific point on the Right of Way. Yet several key assets are linear in nature (e.g. track, catenary, signal cables) and are located along the entire length of the Right of Way. For these assets it is not sufficient to just know “what” the condition is but “where” the condition is as well. The data structure of the asset database must take the linear nature of these assets into account.
- Establish a process to keep the data current. The configuration and makeup of fixed infrastructure assets changes over time and such changes must be reflected in the asset database. It is far easier to have a process in place to maintain the currency of the data than it is to allow it to get out of date and then correct it.

Track inspections are a vital part of the maintenance cycle as well as being a core component of the regulatory framework of the FRA Track Safety Standards. To that end it is important to manage compliance with regulations and standards. Compliance management has two parts. First is to understand the inspection requirements (i.e. type of inspections, frequency, etc.) and to make sure that they are conducted in compliance with the regulations. In short, managing the inspection process. The second and perhaps more important part of compliance management is to evaluate the condition of the assets being inspected to ensure that they are in compliance with the standards to ensure safety and minimize failure. And also to determine that inspectors are making accurate reports. In short, managing the inspection results.

Both of these parts of compliance management are an integral part of an effective inspection program. It is clear through discussion with engineering managers in the field and through a review of engineering practices that all three organizations place a high priority on inspections. With that said, it was not clear that a formal audit process was in place on a system or organizational level to monitor and evaluate compliance. Division and subdivision forces were tasked with completing inspections on time, doing them in a proper manner and self-auditing to ensure compliance. Yet oversight at a higher level would be helpful to ensure consistency of reports and overall compliance with regulations. This is most easily accomplished at NYCT through their electronic reporting process but is more cumbersome at MNR and LIRR where paper inspection records still prevail. This should also be an integral part of the maintenance management systems being developed.

The Panel identified that acquiring track time for maintenance is an issue, to varying degrees, with all three railroads. Track forces should establish production plans and be held accountable for meeting planned goals; however, to meet these objectives, adequate and predictable track access time for maintenance activities needs to be established and measured. When larger blocks of track time can be established, the maintenance forces should be marshalled to take optimum advantage of the time. A good model of this activity is the "Fastrack" program that NYCT is using; however, these types of projects can be more productive if the work forces' plan is based on an assembly line type of operation, as opposed to the spot repair type of work that is taking place today. This will require each work group to adequately gear up to a higher level of productivity, which can be achieved by adding more personnel into the work effort that is the slowest in the chain, or by developing/acquiring small machinery that makes tasks more efficient than manual labor. It will also involve constant and close coordination with the Operations department. In addition to regular track outage and planning meetings with Engineering and Operations that are already taking place, field visits by operating personnel to work sites can be an effective way for them to understand the nature of the work and the constraints that can affect productivity.

All three railroads are very dependent on basic labor with hand tools to perform the maintenance on the track. There is significant opportunity to increase productivity by investing in more power equipment to replace some of the hand labor that is currently utilized. The benefits of more mechanization include the potential to reduce employee injuries, lower unit costs for work performed and improve the quality of the work product.

There is opportunity on all three railroads to enhance safety by cleaning up scrap material and debris on the Right of Way to eliminate stumbling and tripping hazards. This is particularly an issue in the underground operations and in tunnels, where walking areas are limited and lighting is sometimes dim.

With the lighter wheel loads of the rolling stock over most of these railroads, (particularly when compared to typical North American freight rolling stock), rail fatigue occurs at a slow rate. But it does happen. Further, while the wheel loads are light, the number of load cycles is high, particularly on certain NYCT routes. This can also have an effect on fatigue. Given the significant amount of older rail still in service, the technical experts suggest that each organization develop a policy to periodically perform a “whole rail inventory.” This review would consist of a mile by mile look at all of the older rail that is in main line service. By watching for signs of fatigue, the rail agencies can avoid the logistical problems of having an abnormally large amount of rail simultaneously reaching the end of its reliable life. This is an example where an integrated maintenance management system can be used to evaluate rail condition and failure information and facilitate an effective rail replacement plan.

Similar to the non-technical members on the Panel, the technical experts also identified that there is a desire among the field people on all three railroads to have more interaction with upper management. Some employees feel that they have useful suggestions that would benefit the railroads, but do not have the opportunity to contribute. Many of them believe that suggestions they make to their immediate supervisor do not get past that level of management. A Panel member noted that many advancements in railroad construction and maintenance practices have started with a suggestion made by the people performing the work on the ground. This is a resource that is being underutilized today and which will require a cultural change led by front line management. While not prevalent today, historically railroads have fostered a culture where the “boss” is always right and knows it all. Some vestiges of this culture remain and can only be eliminated by the actions of management at all levels, where not only are ideas and advice from the workers in the field accepted, but are encouraged.

All railroads should continue to eliminate joints in track. By eliminating joints they will eliminate the broken rails associated with joints, which is a significant portion of all rail failures. They should also phase out the use of compromise welds in main line tracks where the differential in rail size is significant. Compromise welds are inherently weaker than conventional welds of like rail weights. Taper rails can be used to join differing rail weight ends together and the use of a weld eliminates the need for a joint. The transition to taper rails should be scheduled to accommodate the highest risk areas first (bridge approaches, higher speed locations, turnout and special trackwork and other more safety sensitive locations). Where joints need be installed, the bolt holes should be chamfered to clean up any burrs left from the drilling process that can start stress risers in the rail.

The concern regarding joining different size rails is most pronounced at MNR, where seven (7) different sizes of rail are present throughout their system on mainline track. In response to this finding, MNR, as with most of the industry, has banned the use of compromise welds between 115/119 lb. rail to 131 lb. or greater sized rail on their property. A welding program is being developed, which will target the replacement of these welds with bridge abutments being the

highest priority. In addition, MNR has ordered 75 pair of 115 to 119 transition rails as well as 136 transition rails to account for varying wear. When the rails are received, MNR will begin installing them and continue this practice as opposed to the previous practice of making a single weld joining two dissimilar rails or similar rails with varying wear conditions.

ISSUES SPECIFIC TO MNR

Drainage and Water Intrusion Issues:

MNR had multiple locations where existing concrete ties were cracking and failing due to subgrade problems created by water saturation, which in turn was the result of inadequate track drainage. Prior to the heightened focus on their track maintenance program, MNR track management's plan to address this circumstance was to replace the concrete ties with wood ties, which deteriorate at a slower rate. However, this approach is only treating the symptom of a deeper problem. Efforts should continue to be made to determine the "root cause" of the failure and in the case of the track, it is often the result of poor drainage. While it is acknowledged by most track engineers that providing adequate drainage is recognized as first in importance in maintaining a track structure that provides adequate support for the movement of trains and prolongs life of track components, it is sometimes ignored. Work to build and restore functional track drainage systems must take a prominent role in the Track Capital Program.

TTCI is addressing drainage issues and has since retained Hy-Ground Engineering LLC to conduct Ground Penetrating Radar (GPR) surveys of the MNR mainline routes (approximately 775 miles of track). The GPR survey will provide detailed information of the condition of the ballast and sub-grade, including identifying locations where water is retained in the track, thus reducing the stability and bearing capacity of the track structure. GPR is also an important tool in identifying fouled ballast conditions and can provide valuable input to programmed drainage restoration activities (e.g. shoulder ballast cleaning, undercutting, etc.)

In numerous locations there are no ditches to intercept water runoff from the adjoining property and channel it away from the track structure. This is exacerbated by the fact that the original Right of Way drainage system was designed when the surrounding environment was less urbanized and much of the rainfall percolated into the ground rather than running off onto the railroad property. With a significantly larger area of paved surfaces, the surrounding land speeds the runoff and in areas where the track structure was the lowest terrain, results in water standing in the track structure. Each of these locations needs to have a plan developed to remove all of the material built up from past undercutting projects, fugitive trash from neighbors, and water runoff from city streets. There is room for drainage ditches, which will have to be established, once all of the overburden is removed. MNR's Hydrologist has been working with local municipalities to address the fugitive water issues.

Drainage plans should be developed to move the water off the property, or into holding ponds away from the track structure. MNR will need to acquire the appropriate equipment to construct drainage systems, and maintain them. They currently have Vac-Trucks that are used to remove mud from small areas within the track structure. While these machines work well in a confined area, they are not productive enough to keep up with the need. Small undercutters, gradalls and badger ditchers are much more productive, where they can be utilized.

Signal Cable Trays potentially impacting drainage:

Signal cable trays were installed in the ditch section of the grade as part of a Signal modernization project on the Danbury line. The presence of the Signal cable trays raised questions as to whether they could be potentially inhibiting drainage on the Right of Way. TTCI was asked to review this finding. Their review found that Signal cable trays alone are not a problem and alone do not cause drainage issues. The problem arises when the Signal cable tray installations are not properly designed and integrated into the existing drainage systems.

TTCI also noted that in the past, not only Signal cable trays, but also other capital projects, such as station construction and new interlocking installations did not integrate drainage into their design. Therefore, TTCI felt an appropriate recommendation would be that any new construction, installations or improvements, led by any discipline, should have the designs reviewed and approved by an employee competent in drainage engineering to ensure that the installations do not impede existing drainage or interfere with MNR's ability to maintain drainage systems in the future.

In response to these findings, the MNR Hydrologist has inspected the Signal cable tray locations on the Danbury branch and agrees that in some locations these trays were installed in a manner which may contribute to drainage issues and is investigating possible drainage solutions (such as swales, pipes, etc.) in these areas to alleviate existing and potential problems. One of the biggest contributors to some of these poor drainage areas is uncontrolled runoff from neighboring properties, either private or municipal. The MNR Hydrologist has been working with the local municipalities, who have the legal responsibility and enforcement capability to address this issue.

In the future, designs and installations such as those noted in TTCI's comments, MNR will require all new construction to have the approval of the MNR Hydrologist and/or the MNR Engineering department. Any new installations which have the potential of compromising the existing drainage will be required to implement drainage solutions as a part of the design and construction of the project. An additional Drainage Engineer is being hired to support this effort.

Flexible Tie Splices (a/k/a Dog-bone connectors):

A field inspection of a track switch layout revealed numerous failures of Flexible Tie Splices (a/k/a "Dog Bones"). Flexible Tie Splices are used to connect ties in track switch layouts and eliminates the need for extremely long ties within close track center crossovers, where switch tie lengths of more than 18 feet would otherwise be required. The primary purpose of these devices is to provide gauge holding capacity between the rails of the crossover, where tie separation occurs.

The Panel member identified that the MNR track maintenance personnel had some confusion regarding the standards for maintaining and identifying wear on these components. At the Panel's request, TTCI reviewed the issue and determined that a defective or degraded component that is impacting the gauge holding capability should cause that particular tie to be treated as a "defective tie"; therefore, the devices were specifically covered under FRA and MNR standards; §213.133(a) "In turnouts and track crossings, the fastenings shall be intact and maintained so as

to keep the components securely in place. . . "; and, §213.109(b) "Each 39-foot segment of track shall have at a minimum - (1) A sufficient number of crossties that in combination provide effective support that will - (i) Hold gauge within the limits prescribed in §213.53(b);"

TTCI recommended, and MNR management concurred, that a failure in any of the Flexible Tie Splice components will be treated in accordance with the FRA regulations and MNR standards. The forthcoming update to MNR's MW-4 Track Standards manual will include inspection requirements, as well as defined tolerances to formalize maintenance and replacement of components. Inspectors will also be required to note that these components were checked during their inspections. In addition, as also recommended by TTCI, MNR will provide Manufacturer drawings to Track Supervisors, which include the allowable tolerances of these components. Spares parts for these components have also been ordered.

Track Evaluation Car:

All three railroads have a reasonable amount of large rail bound maintenance equipment, either owned or leased. With the exception of MNR, this includes automated track measurement or track evaluation cars. This is a very important tool in diagnosing and identifying trouble spots in the track structure, and prioritizing the work effort to eliminate unsafe or deteriorating conditions and to avoid slow speed orders due to identified significant track conditions.

As a result of MNR's collaboration with TTCI, a comprehensive automated track inspection plan was developed. This plan includes the use of track geometry measurements, machine vision track inspection, and rail internal defect testing. These efforts will augment the visual inspections conducted by track inspectors. MNR is also seeking to purchase a track monitoring system. This system would be mounted on passenger rail cars and will provide continuous information about the condition of the Right of Way. In addition, although MNR currently contracts with others to provide this service, it intends to purchase its own track geometry vehicle. As noted previously, simply deploying an automated track measuring system is not sufficient without providing a means for the recorded data to be processed quickly to provide meaningful information that can be used to make informed maintenance decisions. In other words, define a clear path from data to decisions. Further, it is essential that this information be readily accessible to all levels of the organization, from the Track Inspector to the CEO.

Consideration needs to be given to the frequency that the track evaluation cars will run. These cars serve multiple purposes. First and foremost is to provide an "early warning system" to avoid track failures and unsafe conditions. In this regard, the track evaluation cars will supplement the role of the Track Inspector as well as help direct the Track Inspector's attention to problem areas. The cars are also used to determine deterioration trends, which in turn will provide input to the development of the Track Capital Plan. With this in mind, the frequency should be sufficient to determine deterioration over time with consideration given to seasonal variations and to lines that are in worse condition. Once deterioration trends are established over the course of several years, changes in the frequency of inspection may be considered.

Finally, the technical members recommend that consideration be given to developing and deploying an autonomous ride quality measuring system. Such a system would provide

continuous measures of lateral and vertical vehicle accelerations over the entire network, which are a good indicator of poor track conditions. Based on a route's frequency of service, an evaluation would need to be made as to the number of trains to be equipped with these systems to ensure reporting on a daily basis at a minimum. The system would also provide for automated notification to maintenance personnel when acceleration thresholds are exceeded. It is suggested that MNR contact Amtrak for details on the system, which has been in use on the Acela for the past fifteen years.

Use of Sacrificial Beams:

The BRP identified the benefit of installing "sacrificial beams" to protect overhead rail bridges from over height motor vehicles and discussed this issue with MNR. In response to this finding, MNR will explore the use of sacrificial beams in each one of their bridge replacements and refurbishments; however, depending on bridge physical characteristics, and Town, City and State requirements, the use of these beams may be somewhat limited. In the interim, MNR is targeting the bridges at greatest risk of being struck by motor vehicles and are making vast improvements to the existing signage.

Further along these lines is research being conducted to develop autonomous bridge monitoring systems that can detect impacts from vehicle strikes and provide feedback as to the effect the impact had on the structural integrity of the bridge. While this work is still in the development stages, it should be considered for future deployment at bridges with a high incidents of vehicle impacts.

MW-4 Track Standards Manual:

Both TTCI and Panel members noted that MNR's MW-4 Track Standards manual appeared to be two revisions behind the current FRA regulations. MNR has established a Track Engineering function within the Track and Structures Design division to bring these standards up to date and to maintain them from this point forward. It is also suggested that MNR consider retaining additional help to get the standards manual current as this will require a larger effort than maintaining its relevance in the future as standards change. It is also recommended that MNR (and LIRR) take an active role in FRA's Railway Safety Advisory Committee (RSAC) Working Group on Track Safety Standards. This will give them a voice at the table as changes to standards or new standards are considered, as well as promoting a dialogue with other track standards engineers throughout the rail industry. Similar benefits can also be attained through active involvement in AREMA committee activities. Lastly, MNR should look to LIRR's MW-2000 as a model for the update of their MW-4.

Succession Planning:

During a Panel member's field visits to MNR, he identified that most of the track forces were operating in "fire-fighting" mode. The experienced track managers were aware of this and frustrated by their inability to get ahead of the curve in order to develop a productive maintenance plan. The ability to have field forces working in various locations was hampered by the need to double up work forces, due to the lack of qualified front line supervisors to lead each work group. This resulted in locations that were overstaffed for the work they were performing. There has been a significant number of qualified front line supervisors retire recently and

insufficient people in training to replace them. The learning curve for these new front line supervisory candidates will take some time, further hampering the maintenance effort.

A succession plan needs to be established to identify candidates for front line supervisors and management positions so they can be trained and ready when they are needed. MNR has the daunting task of re-establishing good maintenance practices, while training a significant number of new track front line supervisors and inspectors. The succession plan need also consider the federal regulatory requirements governing the promotion of track employees to front line supervisor or inspector positions.

ISSUES SPECIFIC TO LIRR

Arcing Damaging Insulated Rail Joints:

Although the “arcing” problem affects both MNR and LIRR, this discussion is being presented under the LIRR section of the report, as it appears to be more prevalent at this property. The arcing occurs in Direct Current (DC) electrified territory at the trailing end of the end post of an insulated joint (IJ) as a train is exiting a track circuit. The arcing literally melts small pockets of the rail head at the end post. The wheels of the rolling stock then starts battering the rail running surface, resulting in the need to prematurely replace the IJs. Two welds are required to install each IJ; these are welds that could be utilized in joint elimination if the arcing issue were resolved. It should be noted that both properties have used third party consultants to help understand the issues and potential solutions to minimize the arcing and subsequent reduction in the useful life of the IJ; however, this a persisting problem that needs to be rectified.

Because no definitive solution has yet to be identified, including the relationship between new Car Equipment and this condition, LIRR is currently taking several different approaches to address premature IJ failures. One approach is the creation of an IJ database to catalog the location and conditions of IJs, as well to capture IJ failure and replacement information for statistical analysis purposes. Additionally, an IJ committee was established to review all IJ failures in an attempt to further identify the root cause of the failures.

LIRR has also revised its IJ Specification standards. All IJs installed in electrified territory will be an 8-bolt premium (Kevlar) type. This will result in thirty percent greater strength, stronger longitudinal sections, elimination of batter between rail ends, and improved service life. In addition, LIRR has partnered with MNR in retaining Systra to investigate the excessive destructive arcing. Although Systra has provided multiple mitigation recommendations, LIRR found their implementation to be unfeasible. However, one mitigation effort that LIRR is investigating is the installation of IJs in parallel, rather than the current staggered orientation. Systra will also investigate the capacity of a typical LIRR Impedance Bond location, and 54 inch negative lead (500 MCM cable) across rail joints with respect to M7 traction power return loads.

The BRP technical expert also suggested that the rail replacement plan for LIRR needs to include some consideration to the locations (generally around switches), where many of the joints were signal bonded in the past utilizing cad welding on the ball of the rail. This welding process can create enough heat, without control cooling, to develop martincite in the rail head. This condition can eventually cause the rail to break under traffic. On a side note, there is also a

continuing problem of signal cable being stolen and sold as scrap copper. This is a problem that can compromise safety and needs the full support of law enforcement. MNR and NYCT need to evaluate both of these issues as well.

The Panel member noted that LIRR appears to have kept up with the attrition rate of employees. Most of the track maintenance crews that the Panel member interacted with had a significant number of employees with ten (10) or fewer years of experience. In addition, there were several employees who have been hired within the last five (5) years. The newer employees are intermingled amongst the more seasoned personnel, who act as a resource by sharing their occupational experience.

The Panel member also remarked that the MW-2000 Recommended Practice for the Inspection, Maintenance, and Construction of Track, developed by the LIRR is “one of the best field guide books I have seen.” Therefore, this guide book can be a very helpful tool for field forces to ensure the use of and understanding of the recommended practices. In addition, it can be used as part of morning job briefings. LIRR has a designated person responsible for keeping the guide book up to date, thereby, ensuring that it will continue to be useful and pertinent. It would be appropriate for MNR to review this book for its applicability and use in its operations. MTA might also consider establishing a joint track standards committee, comprised of track engineers from the three organizations to meet periodically to review and update standards and to maintain consistency of standards across the MTA system.

The Panel member made other key observations. The process of repairing and rebuilding frogs in a shop environment by LIRR is a good process that ensures quality of repair and reduced track time for repair, as it is much quicker to replace the frog, rather than rebuild it while on the Right of Way. In addition, while LIRR track structure is in generally good condition, there are areas where tie condition is getting close to marginal. Therefore, LIRR management should carefully examine cross tie conditions on a mile by mile basis to ensure the annual tie replacement program is sufficient, particularly in the lower speed territories, and in the vicinity of track switches. This should include an analysis of the gauge restraint measurements taken as part of the TTCI work to establish the structural strength of the tie and fastening system.

ISSUES SPECIFIC TO NEW YORK CITY TRANSIT

The Panel member found that NYCT is in generally good condition. The “FasTrack” process mentioned above is allowing them to get good track access time to address problems in some of their more difficult locations. Additionally, by utilizing work trains during FasTrack, they are also able to clean up some of the legacy scrap and debris by loading it onto flat cars for removal. The Panel member further encouraged NYCT to work more toward an “assembly line” type of work during the FasTrack process, which will require identifying the slowest task being performed and devising methods to speed up the process. When this task is no longer bogging down the “assembly line,” NYCT should find the next bottleneck and speed it up as well. The goal is to have all operations simultaneously working full time for the duration of the track outage. In addition, the presence of a single “Field General” orchestrating and coordinating all of the activities would improve productivity.

The Panels members agreed that NYCT is effectively utilizing their TGC data to help drive prioritization of work locations. They are also working on enhancing video software that will automatically scan video files to detect potential rail anomalies, making a video inspection process much more manageable and efficient. As noted previously, while the system in place at NYCT is effective, it still requires unnecessary manual input of data and the dissemination of inspection results should be expanded and improved as part of the maintenance management system development.

It is important to note that the maintenance and inspection management system currently in use at NYCT is a mature system that is well designed and based on sound processes and principles. It should be used as an example throughout the MTA. With this solid foundation, future development work should focus on [a] integrating data sources with the location based asset database as the foundation, [b] streamlining the data entry process through the use of hand-held mobile devices and [c] improving the accessibility and dissemination of the information. As an example, a Track Inspector should not have to make a request through the Supervisor's office to obtain track geometry defect information from recent measuring runs. That information should be immediately accessible either through a network connected computer or a hand-held mobile device. Similarly, when an inspector finds a defect in track, it should be entered into the system immediately with feedback provided to the inspector as to the severity of the defect. This is particularly important as the older, more experienced inspectors retire and the younger, less experienced take over.

The Panel member observed that most of the track structure that he visited was in good or excellent condition; however, there were a few locations that were marginal, and he believes that it would be beneficial for track inspectors to occasionally be accompanied on inspections by management to ensure the inspectors know where the threshold for acceptable track is drawn.

The Panel member also attended the one day, NYCT Track Safety course and felt the required safety training is an excellent program. The Panel member commented that the Training Instructor was dedicated and very effective in demonstrating how the rules are pertinent to the work environment. The class includes a field visit, where the safety rules are applied. This aspect of the training was an excellent way to reinforce the value and criticality of the rules presented in the classroom.

Linden Shop, where switch panels are assembled and transported to the field, was found to be very well managed and an efficient operation. The individuals that work at this location are innovative and dedicated to making a good product. The Panel member was impressed with the work flow through the shop with regard to the pre-assembly and delivery of turnouts, pre-plating of ties, and reconditioning of frogs. He noted that the RF Resilient Fasteners appear to be a good step forward in technology. In addition, both the rail welding plant and the shop area were very well organized and clean, which is an indication that this facility is a place where people are proud to go to work.

While the Panel member did find a few locations that needed minor improvement, NYCT is in general a fairly well maintained transit agency. Of the three rail agencies visited, he believes that NYCT is in the best position to drive more technology and better productivity within this group,

which can be shared amongst the organizations. Benchmarking with other similar railroads and transit agencies might help get the creative juices flowing; however, he felt most of the innovations in railroad engineering still tend to come from Europe.

BRP NON-TECHNICAL & TECHNICAL MEMBERS' COMBINED KEY FINDINGS

Safety Organization and Culture:

- The BRP expressed that there is an obvious commitment to future improvement and the agency employees appeared to recognize the need to learn from current problems so that they do not recur;
- The BRP expressed that there is every reason to believe that the rail agencies are fully capable of change to assure that a process of continuous improvement in system safety will occur;
- The BRP members reinforced that one key tool in safety is the application of hazard analysis and the proactive review for safety considerations as new operating capital decisions are being made;
- There was not strong evidence of cooperation and knowledge sharing between the rail agencies; however, as a result of this initiative, there has been a notably increase in interagency dialogue;
- The safety climate at NYCT and LIRR appear to be performing fairly well; however, in the case of MNR, there is strong evidence to suggest that this is not the case.
- The number of incidents that have occurred at MNR in recent months, sends a clear message that fundamental rebuilding needs to occur to get to a level of safety achievement that would be acceptable to the rail agency's customers, employees and the communities they serve;
- LIRR and MNR would benefit from a non-punitive Close Call Reporting System and the reporting of such incidents through a neutral third party;
- NYCT does pay good attention to "close calls" and "near misses," but has not extended to an approach that encourages confidential reporting of such incidents through a neutral third party. There may be lessons learned and potential opportunities for improvement as the MTA railroads move in this direction.
- Receiving input from hourly/wage workers on methods to improve safety and productivity is currently an underutilized resource at the rail agencies;
- NYCT safety values begin at the top of the organization and work their way down to the front lines;
- At NYCT, there is an integrated approach to safety and operations, with the clear value that safe performance is a matter of commitment, not simply compliance;
- The formal safety organization at NYCT fits the model, not just on paper but in its performance;
- Within NYCT's formal safety organization, there is a strong professionalism and some good accomplishments that mirror its independent status and its single focus on safety;
- NYCT safety personnel showed a real command of their data and good follow-up on such issues as responses to NTSB recommendations;
- NYCT's use of standard hazard analysis was particularly evident in the work done to support the decision to close the Montague Tunnel for post-SuperStorm Sandy repairs;
- The best practices utilized at NYCT should be emulated at LIRR and MNR.

- MTA’s decision to undertake protective shutdowns, as in the case of Hurricane Irene and SuperStorm Sandy may have imposed inconveniences on customers, but these could be mitigated with good public information and the shutdowns may well have prevented long-term damage with much more service consequences.
- A systematic safety presence at MTA Headquarters and at the level of the MTA Board can help spread practices that are working to support progress toward improving each rail agencies safety culture.
- Greater attention from the MTA Board and executive management on a sustained basis will not only shed light on performance, but will send the message that the safety culture truly runs top to bottom.
- Participation at the MTA staff level can lead to a more disciplined process that could include more rigorous reporting of issues, strategies and outcomes.
- MTA involvement should promote appropriate sharing of technical and operational knowledge among the MTA agencies and ensure that key findings from outside agencies like the NTSB are being implemented.
- The BRP review among the operating agencies could be supplemented by a process of benchmarking, not only within MTA, but among comparable operations around the country and the world.

Track Maintenance Program:

- Each agency would benefit from implementing improved computerized maintenance management systems to make their operations more effective and efficient;
- The level of effectiveness of the track programs had a large degree of variation across the three rail agencies;
- There are new technologies available for track inspection purposes that are not being utilized or are being under-utilized by the agencies;
- Improvements can be achieved by a process review of each agency’s track maintenance activities, leading to greater use of mechanized equipment and the increased use of powered tools to reduce the manpower expended on processes that are currently being performed manually;
- Benefits to more mechanization include reducing employee injuries and lowering unit costs for work performed;
- FasTrack can be more productive if the work force’s plan is based on an assembly line type of operation, as opposed to the spot project type of work in place today;
- FasTrack could be improved by identifying tasks that are bogging down processes and devising methods of addressing them to reach full production levels;
- FasTrack would benefit from a single “Field General” at the worksite orchestrating and coordinating all of the activities in the area to improve productivity;
- MNR track maintenance activities are presently in a “fire-fighting” mode;
- This situation may be the result of MNR personnel demonstrating an excessive reliance on existing practices without performing a comprehensive review of its track maintenance practices;
- All railroads should continue to eliminate joints in track. By eliminating joints they will eliminate the broken rails associated with joints, which is a significant portion of all rail failures;

- The joint elimination programs at LIRR and MNR are being hindered by the number of insulated joints that are failing prematurely and require replacement due to destructive arcing;
- The arcing issue is a persisting problem that needs to be rectified;
- There is opportunity on all three railroads to enhance safety by cleaning up scrap material and debris on the Right of Way to eliminate stumbling and tripping hazards;
- LIRR track structure is in generally good condition, however, there are areas where tie condition is getting close to marginal; therefore, the condition of cross ties should be elevated to ensure the annual tie replacement program is sufficient;
- NYCT has made great strides in the use of its TGC with augmented capabilities to diagnose conditions and establish effective responses;
- NYCT has also taken important steps to design new methods and materials for renewing the system effectively and quickly. With a greater ability to focus track renewal in a cost effective way, NYCT has put itself on a sound cycle for maintaining its track in a constant state of good repair;
- LIRR and MNR can emulate the best practices utilized at NYCT as one approach to improving their operations.

Drainage and Water Intrusion Issues:

- TTCI is evaluating the water intrusion problems occurring at MNR and is working with management to develop strategies to combat these concerns;
- MNR should develop drainage plans to move water off the property, or into holding ponds away from the track structure;
- MNR will need to acquire the appropriate equipment to construct drainage systems, and maintain them;
- MNR currently has Vac-Trucks that are used to remove mud from small areas within the track structure. While these machines work well in a confined area, they are not productive enough to keep up with the need. Small under cutters and back hoe type equipment are much more productive, where they can be utilized;
- MNR Hydrologist has been working with local municipalities to address the fugitive water issues;
- MNR has added an additional Drainage Engineer to support this effort.

Track Access Issues:

- Tension exists between operations personnel and maintenance personnel for the allocation of track time. This potentially adversarial relationship must be effectively managed;
- All agencies should undertake a baseline review to assure that the proper balance between these opposing objectives is maintained and that the time for maintenance and inspection is built into the operating schedule to achieve this goal.
- Collective bargaining agreements with labor units that apparently restrict work to times when operations are more intense should be reviewed/modified to improve track access;
- New strategies may need to be implemented to assure adequate work can be performed. One such example is NYCT “FasTrack” program that is geared toward improving track access to perform work.

Succession Planning

- There are obstacles in developing an effective succession planning model primarily due to a lack of management pay increases that is driving supervisors/managers towards earlier retirement and private sector opportunities;
- The ability to implement an effective succession planning strategy is further hampered by competent hourly/wage workers staying in or even seeking voluntary demotions to retreat back to often times, more financially rewarding hourly work;
- This circumstance is rapidly draining the agencies of valuable institutional knowledge;
- Without the sufficient ability to attract and retain qualified personnel with critical skills to backfill these leadership roles, the organizations are left struggling to attain key objectives;
- Speaking specifically to the track program, this circumstance is having unintended negative consequences on the caliber of safety critical track maintenance and inspection activities and the situation is lending itself to the inefficient use of human resources;
- MNR has the daunting task of re-establishing good track maintenance practices, while training a significant number of new track front line supervisors and inspectors;
- NYCT is at risk due to a wave of pending retirements, with many of the staff who came on to carry out the expanded work under the MTA Capital Program soon to reach the retirement age.
- Continued efforts by all agencies is needed towards talent acquisition;
- There needs to be a review of the impact of continued failure to give management raises on the supervisory and management ranks.

Capital Program:

- There is no room for compromise where safety is at stake. The size and composition of MTA's next Capital Program must be still designed with a priority towards the state of good repair within the system;
- LIRR and NYCT were capable of articulating their policies on track replacement cycles, capital investment levels and similar issues, which is critical in achieving goals over a sustained period.
- MNR reviewed their internal practices for establishing their Capital Program and found that there appeared to be an over-reliance on historical practices for this activity.

Communication:

- There needs to be engagement with your customers to assure that the safety messages are understood and that customers know what they can expect in emergency situations. Whatever the form this engagement takes—advisory committees, town halls, media opportunities, direct customer communications—safety needs to be on the communications agenda.

BEST PRACTICES

A desired outcome of the BRP initiative was to identify the best practices occurring within transit industry in general, as well as at the rail agencies being reviewed, for the purpose of emulating these activities in the future to improve performance. The following items are best practices that were identified during the review:

MTA Rail Agencies' Best Practices:

- LIRR's "Situational Awareness for Efficient Railroading" (SAFER) program, which holds each supervisor accountable for periodic evaluations and improvements of safety performance in his or her area of responsibility.
- LIRR's process of repairing and rebuilding frogs in a shop environment is a good process that ensures quality of repair, and reduced track time for repair.
- LIRR's MW-2000 Recommended Practice for the Inspection, Maintenance, and Construction of Track is a very helpful tool for field forces.
- NYCT's FasTrack program has improved track access to perform track maintenance activities; additionally, by utilizing work trains during FasTrack, NYCT is also able to clean up some of the legacy scrap and debris by loading it onto flat cars for removal.
- NYCT use of standard hazard analysis is an effective method of driving decision making processes.
- NYCT is cognizant that technology and a sound workforce are key ingredients in safety performance. In the technology area, NYCT has made great strides in the use of its TGC with augmented capabilities to diagnose conditions and establish effective responses.
- NYCT have also taken important steps to design new methods and materials for renewing the system effectively and quickly. With a greater ability to focus track renewal in a cost effective way, NYCT has put itself on a sound cycle for maintaining its track in a constant state of good repair.
- NYCT is also working on enhancing video software that will automatically scan video files to detect potential rail anomalies, making a video inspection process much more manageable and efficient.
- NYCT's Track Safety course is an excellent program for emphasizing and reinforcing the safety rules to individuals that require access to the Right of Way.

External Best Practices:

- Non-punitive Close Call Reporting System and the reporting of such incidents through a neutral third party.
- Benchmarking, not only within MTA, but among comparable operations around the country and the world.
- The development of dashboards to identify progress is an important element in spurring change.
- The implementation of Computerized Maintenance Management Systems to make operations more effective and to enable the timely dissemination of information to all levels of the organization.

ACTIONS TAKEN

As part of MTA's commitment to keep the BRP members advised on the status of their recommendations, the following is a comprehensive list of actions taken by MTA, as well as the rail agencies, to remedy problematic areas of concern that were identified in the BRP members interim report, as well as the activities that were taken subsequent to their final submission:

Overall Safety Culture:

- MTA Chairman/CEO created a Chief Safety Officer position that is a direct report to him to ensure that safety related matters are on the radar of the highest ranking individuals within the organization.
- MTA's Chairman/CEO restored the MTA Board Safety Committee to reflect the organization's commitment to safety.
- MTA has committed to developing a confidential close-call reporting system at MNR and LIRR.
- MNR has experienced significant changes in its senior management team since the inception of the BRP. Recent appointments include a new agency President and new Vice Presidents in multiple areas; Engineering, Labor Relations, Capital Programs, Human Resources, as well as the appointment of a new Chief Engineer, Chief Transportation Officer, Chief Mechanical Officer and General Counsel.
- The President of MNR stripped away all other non-safety related duties from the lead safety person at the agency to ensure that their focus on safety is not diluted. This individual has been a direct report to the agency President in past practice.
- The President of LIRR selected and elevated a lead safety person to be a direct report and has also stripped away all other non-safety related duties from this individual to ensure that their focus on safety is not diluted.

In addition, both MNR and LIRR have established a quarterly Safety Stand-Down program. The Safety Stand-Downs are intended to act as a venue for the employees and supervision to have an open and honest conversation regarding safety concerns and to provide a forum for questions that the employees may have on any topic. Typically, there are general guidelines provided to supervision with specific Safety topics to be discussed, as well as informational content to facilitate a constructive conversation for all involved.

On December 5, 2013, LIRR's leadership team held a Safety Stand-Down, which discussed awareness of hazards at the agency, hazards specific to tasks performed by individual employees, situational awareness, etc. Over five thousand employees participated in approximately two hundred different sessions that were held over a consecutive three day period. The critical message presented during the Safety Stand-Down is that Safety is of prime importance over on-time performance or any other considerations. A subsequent session was held on March 27, 2014, where seasonal specific topics such as dehydration, sun burn, lightning strikes, toxic plants and insect-borne illnesses were discussed. The most recent Safety Stand-Down occurred on June 24, 2014. Additionally, LIRR has held two Corporate Safety, Health and Wellness Fairs at key employee locations to further promote safety as a core value. The Fair included presentations on Back Health, Lifting and Preventing Back injuries. The next Corporate Safety Health and Wellness Fair is scheduled to occur in the Fall of 2014.

Similarly, MNR also established a quarterly Safety Stand-Down program. On December 5, 2013, a Safety Stand-Down was held throughout all locations, crafts and tours of duty. More than 4,000 employees, including senior management, managers, supervisors and front-line employees participated in the various sessions. The Safety Stand-Down focused on Key Safety Messages (Safety is Priority One in all that we do, NO EXCEPTION) and Safety Essentials, which focused on the following topics: the task at hand, take all precautions necessary to ensure safety, conducting a Job Safety Briefing at the start of each job, be alert and attentive at all times, look out for yourself and your coworkers. Additional Safety Stand-Downs were held on March 11, 2014, April 10, 2014 and June 19, 2014. The discussion topics included the recent MNR Employee Fatality that occurred on the Hudson Line, Fatigue Awareness to coincide with the new Fatigue Awareness campaign that includes posters, pins, pamphlets and electronic slides in rotation on the employee information display, and the Enhanced Employee Protection System (EEPS)

On May 15, 2014, MNR provided a response to the FRA's "Operation Deep Dive" report. One aspect of the response specifically deals with addressing the balance between on-time performance and providing a sufficient window for track maintenance activities to be performed. MNR has mounted an intense communication effort to its employees to reinforce that nothing is more important than working safely and operating the railroad to the safest standards.

- Safety messages that emphasize safety statistics and safe work practices – in both static and video formats – have been posted to all employee monitors (screens on display in high-traffic areas at each employee facility). These messages are replicated in other formats to reach the largest number of employees possible. For example, daily messages are delivered via company computers every day when employees log in. Printed material is available to employees who work in the field and are away from computer terminals for most of their work week.
- Further, the daily monitoring of on-time performance and consist compliance statistics has been removed from these same communication vehicles. It will also be removed from monthly communication pieces, such as employee newsletters.
- In addition, President Giulietti has directed that the overall 2014 on-time performance goal – which had stood at 97% – would be reduced to 93%. This action was an important signal to the workforce: The railroad will not seek to achieve its former high on-time performance numbers until there is a high degree of confidence that safe operation and safe work practices are of paramount importance.
- Critical to the perception that safety is paramount is allowing employees who inspect and maintain the Right of Way sufficient time to do their work. MNR continues to reinforce this requirement to all employees – particularly those in the Maintenance of Way/Engineering and Transportation departments, who must work together every day to achieve this goal. The railroad has also completed a review of its train schedules to ensure that sufficient work windows exist to perform necessary maintenance.

Track Maintenance Program:

- TTCI is aiding MNR in addressing water intrusion issues and has since retained Hy-Ground Engineering LLC to conduct GPR surveys of the MNR mainline routes (approximately 775 miles of track).
- The MNR Hydrologist has been working with the local municipalities, who have the legal responsibility and enforcement capability to address uncontrolled runoff from neighboring properties, either private or municipal.
- MNR will require all new construction to have the approval of the MNR Hydrologist and/or the MNR Engineering department. Any new installations which have the potential of compromising the existing drainage will be required to implement drainage solutions as a part of the design and construction of the project.
- MNR is hiring an additional Drainage Engineer to support this effort.
- MNR, in collaboration with TTCI, developed a comprehensive automated track inspection plan.
- MNR is pursuing the purchase of a track monitoring system that would be mounted on passenger rail cars and will provide continuous information about the condition of the Right of Way.
- MNR is pursuing the purchase of a track geometry vehicle.
- MNR is addressing concerns pertaining to the inspection of Flexible Tie Splices (a/k/a “Dog Bones”) by providing manufacturer drawings to field Supervisors that include the specifications for maintenance of these components.
- The standards for inspecting this component will be included in the next MNR MW-4 Track Standards revision.
- MNR is exploring installing “sacrificial beams” to protect overhead bridges from over height vehicles. In the interim they are targeting the bridges at greatest risk of being struck and improving the existing warning signage.
- MNR established a Track Engineering function within the Track and Structures Design division to ensure the MW-4 Track Standards are updated and maintained going forward.

NYCT Addressing the Frequency of Broken Rails:

The key goal of NYCT’s Division of Track is to continue to maintain mainline tracks in a state of good repair. The overall objective is to eliminate safety hazards (such as derailments, broken rails, etc.), maximize throughput by the elimination of slow speed orders due to track conditions, increase passenger comfort and the ride quality of the tracks and enhance the reliability of system.

Keeping mainline tracks in a state of good repair is achieved through Division of Track maintenance forces and staff from the Track Engineering group working both independently and cooperatively to evaluate, inspect and maintain mainline track. NYCT Track inspectors are required to regularly inspect track to identify conditions that deviate from the standards established in the MW-1 Track Standards Manual and are tasked with the inspection of main line tracks within a defined geographic area twice during a seven day period. Supervisors must inspect main line track twice a month on average, which is referred to as the 14 day Supervisory inspection. In addition, Superintendents make a general inspection of their assigned Zone every three months, including a detailed inspection of all guarded curves, with a radius of less than 500 feet, on all mainline tracks and yard leads in approach to mainline track.

Additionally, Track Engineering personnel perform a variety of functions and automated inspections intended to support the track maintenance program. One specific activity performed by Track Engineering personnel is the Quadrennial Track and Switch Condition survey. Key objectives of these periodic surveys are to establish a definitive system of track devices, updating the Track Device System with actual measured data and categorizing each track device by its remaining useful track life. This data is coupled with information collected through automated inspections such as the TGC and UT inspection runs, thus providing the means of planning future Capital track rehabilitation and maintenance investments.

Although NYCT has robust multi-layered track maintenance program, a significant concern at the agency is the previously identified five subway corridors, where the ratio of rails breaks per mile is noticeably higher than the average based upon historical rail break data. These five corridors are:

- Queens Blvd. Line between 5 Avenue and Continental Avenue;
- 8 Avenue Line between 168 Street and Jay Street;
- 6 Avenue Line between 59 Street and Broadway-Lafayette Street;
- Broadway-7 Avenue Line between Dyckman Street and Chambers Street;
- 60 Street under river tunnel on the Astoria Line.

Track Engineering personnel performed an analysis of the broken rail data collected, and formulated the “CWR and Resilient Fastener Initiative” intended to significantly reduce the number of broken rails and improve track conditions in the aforementioned five critical corridors. In addition, on October 3, 2013, NYCT retained the services of John Zuspan from “Track Guy” Consultants (separate from the BRP Technical experts) to ensure that there is no condition or technical approach to this issue that has not been examined in depth and to assess that the proposed actions and steps taken by NYCT are the correct ones with regard to the CWR and Resilient Fastener Initiative. The primary actions being performed under this initiative are as follows:

- Installing new CWR, either 115RE or 100-8 rail (at locations where clearances may be an issue);
- Eliminate as many bolted joints as possible and replace deteriorated tie blocks in those corridors;
- Install new resilient fasteners in the 5 corridors.

The “Track Guy” Consultant summarized their findings by stating in part, “Controlling water and removing mud should greatly reduce the number of rail breaks along with a major program for replacing rail with new CWR and installing resilient type fasteners. NYCT continues to perform excellent testing and inspections of track and all materials used within the system.”

Additionally, Track Engineering has submitted a budget proposal to upgrade the TGC4 with additional Field Side View and Power Rail View Video Systems (cameras, lights and computers) to have complete detailed coverage of the track and rail elements. In addition, Track Engineering personnel are pursuing software that will automatically detect potential rail and fastener defects using the Rail View and Side View Video Systems, which will aid in accurately

and objectively flagging MW-1 Priority Defects and require a dedicated team to review and verify the data. The TGC3 will have a video car equipped with the latest technology added to it in the early years of the next Capital Program.

BRP RECOMMENDATIONS

BRP Recommendations to all three Rail Agencies:

- 1) Implement a Computerized Maintenance Management System to improve operational effectiveness and to enable the timely dissemination of information to all levels of the organization.
- 2) Perform a process review of track maintenance activities to identify methods of improving employee safety and productivity, such as the use of greater mechanization to perform work traditionally done by manual means.
- 3) Identify and adopt new technologies to improve the track inspection process and integrate it into the maintenance management system.
- 4) Develop a policy to periodically perform a “whole rail inventory” evaluation.
- 5) Evaluate emerging autonomous bridge monitoring systems that can detect impacts from vehicle strikes and provide feedback as to the effect the impact had on the structural integrity of the bridge.
- 6) Engage technical experts to analyze rail fatigue defects and failures with modification to rail specifications and maintenance practices as needed.
- 7) Enhance safety by implementing programs to remove scrap material and debris on the Right of Way; thereby reducing tripping hazards.
- 8) Develop strategies to reduce joint rail to reduce the likelihood of bolt-hole fractures occurring in rails.
- 9) Develop alternatives to the use of cad welding bonds across the head of a rail to reduce the likelihood of in-service rail breaks.
- 10) Periodically have management walk with track inspectors to reinforce the thresholds for acceptable track.
- 11) Perform a baseline review to assure that the time for maintenance and inspection activities is built into the operating schedule to achieve this goal.
- 12) Pursue new strategies to assure adequate track maintenance activities can be performed. One such example is the “FasTrack” program originated at NYCT.
- 13) Review/modify existing collective bargaining agreements with labor units to facilitate work at times when the operating schedule is less intense.
- 14) Review current Capital Programs to ensure that they are designed with a priority toward the state of good repair within the system.
- 15) Each agency review its decision-making process to assure that the long-term interests of the system and its customers are given appropriate balance.
- 16) Conduct a climate survey to measure attitudes among the workforce and to set priorities for further improvement.
- 17) Improve outreach to employees to elicit suggestions on how to improve the workplace.
- 18) Ensure customer engagement on the topic of safety is occurring, which can be communicated via advisory committees, town halls, media opportunities, and direct customer communications.

- 19) Continue to work closely with Law Enforcement to aid in the reducing signal cable theft, seeking additional assistance as necessary.

BRP Recommendations specific to LIRR and MNR:

- 1) Make every effort to resolve the persistent arcing problem that is causing IJs to prematurely fail.
- 2) Take an active role in the FRA's RSAC Working Group on Track Safety Standards, as well as have active involvement in AREMA committee activities.
- 3) Use NYCT's quadrennial evaluation process as a model with adjustments to account for the differences in operating environments.

BRP Recommendations specific to LIRR:

- 1) Incorporate excerpts from the MW-2000 Recommended Practice for the Inspection, Maintenance, and Construction of Track into job briefings for track maintenance personnel.
- 2) Perform a holistic look (mile by mile) of cross tie conditions to ensure the annual tie replacement program is sufficient, particularly in the lower speed territories, and around switch layouts.

BRP Recommendations specific to MNR:

- 1) Update the MW-4 manual using the LIRR's MW-2000 as a model.

BRP Recommendations specific to MTA:

- 1) Perform benchmarking activities within MTA, as well as among comparable operations around the country, and the world to supplement existing track maintenance and construction activities.
- 2) Evaluate establishing a joint track standards committee, comprised of track engineers from the three rail organizations, to meet periodically to review and update standards and to maintain consistency of standards across the MTA system.
- 3) Develop "Dashboards" for follow-up on safety recommendations and to identify progress, which is an important element in spurring change.
- 4) Perform a compensation review of the critical skills positions to address the identified concerns with regard to succession planning.

CONCLUSION

The BRP members have expressed that there is an obvious commitment to future improvement and the agency employees appeared to recognize the need to learn from current problems so that they do not recur. In addition, there is every reason to believe that the rail agencies are fully capable of change to assure that a process of continuous improvement in system safety will occur.

The Panel members understand that MTA Executive Management will direct the rail agency Presidents to provide a response detailing the corrective action plans that will be implemented to satisfy each one of the recommendations. In addition, the BRP members have requested to revisit each of the rail agencies, in perhaps a year, to evaluate the effectiveness of the implemented corrective action plans.

APPENDIX “A”

MORTIMER L. DOWNEY III

Senior Advisor, Parsons Brinckerhoff

Mortimer L. Downey, III serves as a Senior Advisor to Parsons Brinckerhoff, providing advisory and management consulting services to the firm and to its client base, including public and private owners, developers, financiers and builders of infrastructure projects worldwide. He also operates his own consulting firm, Mort Downey Consulting, LLC.

Mr. Downey served on the Transportation Policy Committee for the Obama Presidential campaign, and during the transition was appointed as leader of the Department of Transportation Agency Review Team. He was appointed in 2010 as the first Federal member of the Washington Metropolitan Area Transit Authority Board, now serving as First Vice Chairman. He was also recently appointed as Vice Chairman of USDOT's new Freight Transportation Advisory Committee, which will be working with the Department on the implementation of new freight-related provisions in federal surface transportation legislation (MAP-21 and its successors.)

Mr. Downey held the position of U.S. Deputy Secretary of Transportation for eight years, the longest serving individual in that post. As the Department's chief operating officer, Mr. Downey developed the agency's strategic plans and had program responsibilities for operations, regulation and investments in land, sea, air and space transportation. He also served on the President's Management Council, as Chairman of the National Science and Technology Council's Committee on Technology, as a member of the Trade Promotion Coordinating Council and as a member of the Board of Directors of the National Railroad Passenger Corporation (Amtrak). In a prior Administration he had served as an Assistant Secretary of the Department.

Previously, Mr. Downey was for 12 years the executive director and chief financial officer of the New York Metropolitan Transportation Authority (MTA), the nation's largest independent public authority, directing capital programs totaling over \$20 billion, including development of new public and private financing techniques, and responsibility for oversight of capital project designs, budgets, schedules and performance. He has also worked at the U.S. House of Representatives Committee on the Budget, and at the Port Authority of New York and New Jersey.

Mr. Downey has received numerous professional awards, including election to the National Academy of Public Administration, where he has served as Chairman of the Board of Directors. He has been honored with the Frank Turner Lifetime Achievement award from the Transportation Research Board, the American Society of Public Administration's Truitt Award for transportation management, the W. Graham Claytor Award for contributions to intercity passenger rail, lifetime achievement awards from the American Public Transportation Association and the Council of University Transportation Centers, the Leadership Award from the Intelligent Transportation Society of America and the National Member of the Year Award from the Women's Transportation Seminar.

He is a member of the Board of Directors of the Eno Transportation Foundation and has served on the National Academy of Science's Committee on Science & Technology Countermeasures to Terrorism. He is the Founding Chairman of the Coalition for America's Gateways and Trade Corridors, an advocacy group for freight investment. He was a member of the Office of Management and Budget's Performance Measurement Advisory Council, served on a DOT special panel to report on safety impacts of Mexican truck operations in the United States, and currently serves on the Industry Leaders Council of the American Society of Civil Engineers, the Comptroller General's Advisory Council and New York Governor Cuomo's NYS2100 Post-Sandy Recovery Panel.

A 1958 graduate of Yale University with a B.A. in Political Science, Mr. Downey earned his masters degree in Public Administration from New York University, completed the Advanced Management Program at the Harvard Business School and served as an officer in the United States Coast Guard Reserve. He resides in Oakton, Virginia. He and his late wife, Joyce Downey, have two children and five grandchildren.

The Honorable Jack Quinn

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SUMMARY

Over 34 years of experience as an Educator, Congressman and Government Relations Consultant with an excellent track record that includes securing over \$100m in grants and funding for educational clients that include: Alfred University, American University, Boston College, Boston University, D'Youville College, Elmira College, Rhode Island School of Design, St. Leo University, Villanova University, Worcester Polytechnic Institute and other clients. A frequent lecturer on government and public policy at Georgetown University, American University, Colgate University, State University of New York at Buffalo Law School and other organizations. Congressional experience includes serving as Chairman of Transportation and Infrastructure Subcommittee on Railroads; member of the Transportation Committees on Aviation and Highways, Veteran's Affairs Committee and other committees and caucuses; and as government liaison for international efforts in France (Nuclear Energy Institute), Ireland (Good Friday Peace Accord), Norway (NGO's), and South Africa (AIDS relief). Additional elected offices include serving as Councilman and Supervisor for the Town of Hamburg, responsible for a municipality with \$25m budget and over 300 employees. Educational experience includes time as an instructor at Orchard Park High School, New York Central School District and Erie County Summer Youth Employment Program, as well as time in his current position as President of Erie Community College. Over his multi-faceted career, Mr. Quinn has been the recipient of countless service-related awards, including the Flax Trust Award for Service to the Irish Peace Process (2003), Compeer's Western New York Vision Award (2011), and the prestigious Community Leadership Medal from State University of New York (SUNY) at Buffalo (2007).

PROFESSIONAL EXPERIENCE

Erie Community College, Erie County, NY President

2008-present

- Presides over three campuses, 16,000 students, 2000 employees, and a current annual budget of \$111m.
- Assisted NYS Gov. Andrew Cuomo's Hurricane Sandy Task Force to secure federal funds for repairs.
- Facilitates operation of college's English as a Second Language (ESL) Center, which provides training to international students and refugees from over 70 countries.
- Co-chairman, Legislative Committee for New York Community College Association of Presidents.
- Named one of 2012's Most Influential Business Leaders by *Buffalo Business First*.
- Awarded Compeer's Western New York Vision Award in 2011.
- Recipient of SUNY Buffalo's 2011 Graduate School of Education Distinguished Alumni Award in 2011.
- Invited by President Barack Obama and Dr. Jill Biden to participate in White House Summit on Community Colleges in Washington, D.C., 2010.
- Co-chair, New York's 2010 Empire State Summer Games

Cassidy & Associates, Washington, D.C. President

2005-2008

Responsible for directing the operations of a government relations firm with over 100 employees and providing services to 130+ clients.

- Duties include lobbying and promoting client policy and appropriations objectives with the Congress of the United States of America.
- Secured over \$100m in grants and funding for education clients.
- Led efforts, plans for rail component of Manhattan's Moynihan Station Redevelopment Project.
- Assisted clients achieve policy and appropriation objectives in the fields of education, transportation, housing, medical, hospital, local government and defense department-related programs.

United States House of Representatives, Washington, D.C. Congressman (R-NY)

1993-2004

Responsible for representing constituents of the 27th Congressional District.

- Served on Transportation & Infrastructure Committee; fought to improve safety and bring about passage of Railroad Retirement Survivor's Act, which was signed into law in 2001.
- Member, Aviation Subcommittee and Surface Transportation Subcommittee.

- Senior Member, Committee on Aviation & Highways & Mass Transit; played key role in passage of TEA-21 Reauthorization bill.
- Only NYS Member, Veteran's Affairs Committee
- Chairman, Benefits Subcommittee.
- Member, Hospital and Medical Subcommittee.
- Chairman, Executive Committee, Congressional Steel Caucus.
- Co-Chair, Northeast-Midwest Congressional Coalition
- Chairman, House Republican Working Group on Labor
- Co-Chair, Northern Border Caucus.

Town of Hamburg, Hamburg, NY 1982-1992

Town Supervisor, 1984-1992

Councilman, 1982-1983

Responsible for overseeing management of \$25m annual budget for a municipality with five labor unions and 300 employees.

- Served on various Boards, commissions and committees at the State, County and Town levels.

Erie County Summer Youth Employment Program, Buffalo, NY 1978-1982

Erie County Assistant Director, 1980-1982

Southtowns Director, 1978-1980

Responsible for developing and administering summer programs for high school students.

Orchard Park Central School District, Orchard Park, NY 1973-1983

English Teacher

Taught English to 7th and 8th grade students.

- Varsity Track & Field Coach
- Junior Varsity Basketball Coach
- Freshman Football Coach
- Intramural Advisor, Student Government Advisor, etc.

E D U C A T I O N

Siena College, Loudonville, NY

B.A., English

State University of New York at Fredonia

New York State Certificate, School District Administrator

State University of New York at Buffalo

Ph.D. Candidate, Education Administration

M.A., English – Education

C O M M U N I T Y I N V O L V E M E N T

Director, Buffalo Public Schools Foundation	2011-present
Director, Buffalo Arts and Technology Center	2011-present
Director, Catholic Health WNY	2008-present
Director, Read to Succeed Buffalo	2008-present
Director, ECC Foundation	2008-present
Kaiser Aluminum Corp., Director, Compensation & Governance Committees	2006-present
Georgetown University, Director, Program on Science in the Public Interest	2007-2010
So Others May Eat (S.O.M.E.), Corporate Advisory Board Member	2006-2010
Fox News, Panel Member, Political Issues & World Affairs	2006-2007
AFL – CIO Housing Investment Trust, Trustee	2005-present
American Ireland Fund, Director, Fundraising & Annual Dinner	2005-2010
Erie Canal Harbor Development Corporation (ECHSC), Board Director	2005-2010
Virginia Rail Advisory Board, Director, Rail Development & Transportation Grants	2005-2006

Curriculum Vitae

Conrad Ruppert, Jr.

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Education

Princeton University | Princeton, NJ

- BS Civil Engineering (June 1977)

University of Pennsylvania | Philadelphia, PA

- MS Engineering – Technology Management (June 1999)

Experience

National Railroad Passenger Corporation (Amtrak) | Philadelphia, PA

- Junior Engineer (Management Trainee) - New York, NY (1977 – 1978)
- Asst. Track Supervisor – New Brunswick, NJ (1978 – 1979)
- Project Engineer – New York, NY (1979 – 1981)
- Staff Engineer – New York, NY (1981 – 1983)
- Engineer Track – Philadelphia, PA (1983 – 1985)
- Sr. Engineer Capital Planning & Budgeting – Philadelphia, PA (1985 – 1988)
- Manager Field Engineering – Philadelphia, PA (1988 – 1991)
- Technical Director Track Engineering – Philadelphia, PA (1991 – 1995)
- Sr. Program Director Track Engineering – Philadelphia, PA (1995 – 2000)
- Division Engineer – Boston, MA (2000 – 2007)
- Asst. Deputy Chief Engineer Track – Philadelphia, PA (2007 – 2012)

University of Illinois | Urbana, IL

- Sr. Research Engineer / Associate Director for Research – Urbana, IL (2012 – Present)

Career Summary & Accomplishments

My railroad career began at Amtrak in 1977 as a Junior Engineer. Over the course of the next 35 years I accepted assignments covering most aspects of railway track engineering, track safety, maintenance operations, and track research. In my last assignment at Amtrak I was responsible to manage and direct all aspects of track design, surveying, track standards & specifications, and engineering systems development. Some key accomplishments of my career at Amtrak include the following:

- Supervised the Track Renewal Project in the tunnels into New York City under the Hudson River.
- Directed several engineering studies and track designs to increase speeds and improve ride quality over the Northeast Corridor from Washington to Boston.
- Managed the implementation of new track surfacing technologies using a computerized automated geometry guidance system.
- Managed track research efforts to improve the performance of track substructure and concrete ties.
- Shared leadership responsibilities for an aerial LiDAR survey of the Northeast Corridor which was the first application of this technology in the railroad industry.
- Acted as the technical project lead on the team testing high speed trainsets on the Northeast Corridor which included the Swedish X2000, the German ICE, and Amtrak's Acela. Work included developing test plans and monitoring quality of test data to ensure compliance with Amtrak standards.
- Directed a staff of 25 engineering managers and 450 craft employees responsible for the construction and maintenance of the high speed corridor on the New England Division between New Haven, CT and

Conrad Ruppert, Jr.

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- Boston, MA. This included the commissioning of the new electrification system and the introduction of the high speed Acela service in 2000.
- Led the development of Amtrak's Engineering Asset Management and Work Management Systems. Work involved developing functional requirements of the system and quality control plans required to maintain the integrity of the system development and implementation plans.
 - Have given numerous presentations at industry technical conferences both nationally and internationally covering a wide array of railway engineering topics.
 - Led the development of a Compliance Management System for track inspections on the Northeast Corridor involving the use of mobile electronic devices to capture inspection findings in the field. Work included oversight of quality control plans needed to ensure that the underlying logic of the software system was in complete compliance with Federal Railroad Administration regulations.
 - Mentored new track engineers entering Amtrak's Management Associate Program.
 - Led an applied research project to design and manufacture next generation turnouts with improved geometry and components. Responsibilities included providing technical direction to design team, managing contract compliance, and development of quality control plans.
 - Led preliminary engineering design efforts for two new tunnels under the Hudson River connecting to Amtrak's Penn Station in New York City. Responsibilities included providing technical direction to design team, managing contract compliance, and development of quality control plans.

In my current position at the University of Illinois I am part of the Rail Transportation and Engineering Center (RailTEC) and am responsible to direct research work, teach graduate level courses on railway engineering, and help mentor students who are pursuing railroad careers.

Industry Associations

Transportation Research Board (TRB)

- AR000 – Rail Group Executive Board - Member 2004 to 2010
- AR060 - Railway Maintenance - Committee Chair 2004 to 2010
- AR060 - Railway Maintenance - Member 1998 to Present
- Safety IDEA Committee - Member 2010 to Present
- AR050 – Railroad Track Structure System Design - Member 1998 to 2004

American Railway Engineering & Maintenance Association (AREMA)

- Director Passenger & Transit Functional Group – 2001 to 2004
- Vice President Passenger & Transit Functional Group – 2004 to 2006
- Committee 11 – Intercity & Commuter Rail - Member 1996 to 2007
- Committee 17 – High Speed Rail Systems – Member 1986 to Present
- Committee 30 – Ties – Member 2007 to Present

FRA Railroad Safety Advisory Committee (RSAC)

- Track Standards Working Group – 2007 to 2012

Presentations

- An Engineering Approach to Track Substructure Management, *AREA Conference, Chicago, IL – 1996*
- Using GPS and LiDAR Technology for Track Support Design & Construction
AREMA Symposium, Ypsilanti, MI - 1998
- Amtrak ACELA: A Track Engineer's Perspective, *AREMA Technical Conference, Chicago, IL – 1999*
- AMM_{TRACK} Information System: Keeping an Eye on the "I" in GIS
University of Illinois PTC Workshop, Champaign, IL - 1999
- AMM_{TRACK} Information System: Decision Support for the Management of Infrastructure Assets
UIC Track Technology Conference, Beijing, CH – 1999

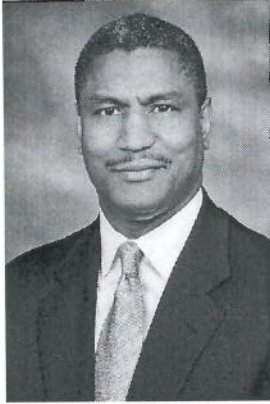
Conrad Ruppert, Jr.

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- Establishing an Infrastructure Asset Database and Maintenance Management System using GPS, LiDAR and Video Technologies, *OVG Conference, Salzburg, AU - 2000*
- A Decision Support System for the Management of Infrastructure Assets
TRB Workshop, Washington, DC – 2001
- Railway Infrastructure Maintenance Management - A Decision Support System for the Management of Infrastructure Assets, *IMECHE Conference, York, UK – 2002*
- Track Infrastructure Systems of Safety, *AREMA Technical Conference, Washington, DC – 2002*
- Track Inspection & Derailment Prevention on Amtrak's NEC, *ARM Conference, Chicago, IL – 2003*
- Track Upgrade for High-Speed and Heavy-Axle Load Trains, *TRB Workshop, Washington, DC – 2004*
- Interlockings: Why, Where & When to Move from Component Renewal of Switches to Reconstruction
TRB Session, Washington, DC – 2004
- Track & Vehicle Performance Data: Vital signs of the State of the Railroad
TRB Workshop, Washington, DC - 2006
- Research to Enhance Rail Network Performance: Efficiency Issues - A Passenger Rail Perspective
FRA/TRB Safety Research Workshop, Washington, DC – 2006
- Using Wayside & On-Board Measurement Data to Manage a Multi-Use Corridor
ARM Conference, Chicago, IL – 2009
- Switch Design and Maintenance: Improving the Performance of a Critical Track-Signal Interface
TRB Session, Washington, DC – 2009
- Using Track Geometry Car Data for Programmed Surfacing, *TRB Workshop, Washington, DC - 2009*
- The Use of FLI-MAP® Data at Amtrak
TRB Session, Washington, DC – 2010
- The Northeast Corridor Master Plan and High-Speed Intercity Passenger Rail Program Grants Northeast Projects, *ACEC Conference, Waltham, MA – 2010*
- The Northeast Corridor Master Plan and High-Speed Intercity Passenger Rail Program Grants Northeast Projects, *ASCE Meeting – Western Massachusetts Branch, Northampton, MA – 2011*
- Managing & Measuring Compliance: A Work Management System for Track Inspection
JRC Conference, Champaign, IL – 2010
- Railroad Infrastructure Improvements for High Speed Rail
University of Wisconsin Seminar, Madison, WI – 2010
- Managing & Measuring Compliance: A Structured Approach to Visual Track Inspections
AREMA Conference, Minneapolis, MN – 2011
- Putting People First: A Systems Perspective on Passenger Rail Safety
2nd International Conference on Mass Transit Rail Facilities Design & Management, Hong Kong, CN – 2012
- Research and Innovation to Improve Railway Infrastructure Safety, Efficiency & Sustainability
Korea Rail Research Institution International Seminar, Seoul, ROK – 2013
- High Speed Rail in America: My Experience on Amtrak's Northeast Corridor
Southwest Jiaotong University, Chengdu, CN – 2013
- Railway Infrastructure Research at the University of Illinois
Southwest Jiaotong University, Chengdu, CN – 2013

Publications

- Establishing an Infrastructure Asset Database and Maintenance Management System using GPS, LiDAR and Video Technologies, *OVG 2000 - co-authors: Dr. Willem Ebersöhn, Conrad Ruppert, Jr*
- Implementing a Railway Asset Information and Maintenance Management System
IHHA 2001 - co-authors: Dr. Willem Ebersöhn, Conrad Ruppert, Jr., Philippus B. Venter
- Establishing an Infrastructure Asset Maintenance Management System on Amtrak
IMECHE 2002 - co-authors: Dr. Willem Ebersöhn, Conrad Ruppert, Jr
- Managing & Measuring Compliance: A Structured Approach to Visual Track Inspections
AREMA 2011 - co-authors: Conrad Ruppert, Jr, Aronlido Cisneros



Rodney E. Slater

Experience

Former U.S. Secretary of Transportation Rodney E. Slater helps clients integrate their interests in the overall vision for the transportation system of the 21st Century—a vision he set as Transportation Secretary to promote a safer, more efficient, environmentally sound and sustainable worldwide transportation infrastructure. Mr. Slater also helps state and local government clients address the vexing challenge of closing the gap between transportation demand and capacity, by employing public/private strategies and innovative financing solutions. Mr. Slater's practice focuses on many of the policy and transportation objectives that were set under his leadership, including aviation competition and congestion mitigation, maritime initiatives, high-speed rail corridor development, and overall transportation safety and funding. He continues to embrace the framework he established as Secretary to lead visionary and vigilant Department of Transportation professionals in making transportation decisions that called for more open, collaborative and flexible decision-making across the transportation enterprise here and abroad.

Rodney E. Slater
Partner
Washington DC
202.457.5265
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Education
University of Arkansas, J.D., 1980
Eastern Michigan University,
B.S., 1977

Mr. Slater's bipartisan and inclusive approach to problem solving has earned him tremendous respect and admiration on both sides of the aisle, enabling him to have one of the best relationships with the White House, Congress, and business, labor and political leaders worldwide in the history of the Department of Transportation (DOT). His work at DOT forever altered America's and the world's appreciation of transportation as more than just concrete, asphalt and steel. Mr. Slater brings the same strategic, results-oriented and collaborative approach to the practice of law.

As Secretary of Transportation under President Bill Clinton, Mr. Slater spearheaded several historic legislative measures over his tenure, including the Transportation Equity Act for the 21st Century (TEA-21), which guaranteed a record \$200 billion in surface transportation investment through 2003, and the Wendell H. Ford Aviation Investment Reform Act for the 21st Century (AIR-21), which provided a record \$46 billion to improve the safety and security of the nation's aviation system. Under his leadership, the federal transportation budget doubled and, in the Department's "best in government" strategic and performance plans, the scope and definition of transportation was expanded to include a focus on safety, mobility and access, economic development and trade, the environment and national security.

Further, Secretary Slater oversaw the designation of the eleven proposed High Speed Rail Corridors across America and the institution of the Acela service by Amtrak along the Northeast Corridor. He played a leadership role in the Clinton Administration's Partnership for a New Generation Vehicle Initiative, headed by Vice President Al Gore, along with other green economy initiatives championed by the Administration. Mr. Slater also helped shepherd the completion of the multi-modal Alameda Corridor in Southern California, the near completion of the Central Artery Third Harbor Tunnel in Boston and he

encouraged varied intelligent transportation system projects and exploration of the promise of nanotechnology as relates to infrastructure improvements. Secretary Slater advocated and the DOT lead an effort to address the transportation access challenges faced by Americans with disabilities as well as mothers moving from welfare to work; and he promoted a renewed push to liberalize aviation relations between the United States and countries around the globe that resulted in a record forty (40) “open skies” agreements, including the first ever multi-lateral agreement among the U.S. and four APEC economies (Chile, Brunei, New Zealand and Singapore).

Previous to his tenure as Transportation Secretary, Mr. Slater served as Administrator of the Federal Highway Administration, where—as the Agency’s first African-American Administrator in its century-long history—he oversaw the development of an innovative financing program that resulted in hundreds of transportation projects being completed two to three years ahead of schedule with greater cost efficiencies. Over that time, the federal highway budget increased an unprecedented 104 percent.

Secretary Slater is a past Senior Fellow with the Advanced Leadership Initiative at Harvard University; a fellow with the National Academy of Public Administration and a member of the Clinton Global Initiative, and a NCAA Silver Anniversary Award recipient. He also is a member of a number of corporate and non-profit boards. The corporate boards include Atkins Global, Kansas City Southern Railroad, Southern Bancorp, Transurban, Inc and Verizon. Non-profit boards include the United Way of America (former Chairman), and the United Way Worldwide Board, the National Smithsonian Board and the Smithsonian National Museum of American History Board, as well as the National Urban League, Africare Inc., the Leon Sullivan Foundation, and the Arkansas World Trade Center.

Secretary Slater is married to Cassandra F. Wilkins, an attorney, and they are the proud parents of a daughter, Bridgette Josette.

Professional Affiliations

- Chair of the Toyota North American Quality and Safety Advisory Panel
- Vice Chair of the Congressional Award Foundation
- Founding Partner, Washington Nationals Baseball Team
- Former U.S. Secretary of Transportation
- Former Administrator of the U.S. Federal Highway Administration
- Former Director of Government Relations, Arkansas State University
- Former Special Assistant for Economic and Community Programs to then-Arkansas Governor Bill Clinton
- Former Executive Assistant for Community and Minority Affairs to then-Arkansas Governor Bill Clinton
- Former Assistant Attorney General, Litigation Division of the Arkansas State Attorney General’s Office
- Former Secretary-Treasurer, Arkansas Bar Association
- Former Vice-Chairman and Senior Advisor of James Lee Witt Associates

William (Bill) Van Trump
Senior Assistant Vice President Engineering
Union Pacific Railroad (Retired)

Over 40 years of experience in railroad operations.

Education: BA University of Wyoming.

Work experience includes labor and machine operator positions during summers while in college. Management positions include Roadmaster, General Roadmaster, Division Engineer, Maintenance Engineer, Assistant Chief Engineer, Assistant Vice President of Maintenance, and Senior Assistant Vice President Engineering. Have experience in the maintenance and construction of Track, Bridge and Signal functions of American railroads.

Participated as member of project panels on two completed projects with Transportation Research Board. Project HM-11 (Improving Recovery from Episodic Events Involving Hazardous Materials Transport, Hazardous Materials Cooperative Research Program) and Project 20-59(33) (Pre-planned Recovery and Accepted Practices for Replacement of Transportation Infrastructure, National Cooperative Highway Research Program). Both of these projects are now complete and published.

Currently participating on Transit-Idea 78 (Intelligent Rail Integrity Systems (IRIS)).

Authored a case study that was published in the 2009 edition of "Guidelines To Best Practices For Heavy Haul Railway Operations" that demonstrates some of the early innovations and requirements developed in response to North America's venture into unit train heavy axle car loadings.

Participated on behalf of the International Heavy Haul Association in a workshop in Brazil in 2012; sharing best practices with the Vale Mining Company railway managers.

Worked with the Transportation Test Center to develop best practices for ultrasonic rail flaw detection process, and test car qualifications, in 2012.

Served as a Director, Senior Vice President, and President of the American Railway Engineering and Maintenance Association (AREMA).

APPENDIX “B”

Chronology of Blue Ribbon Panel Activities

Date	Property	Activity
August 26, 2013	All Agencies	Introductory Conference Call
September 20, 2013	All Agencies(held at NYCT)	BRP Kick-off Meeting
September 24-26, 2013	MNR	Technical Expert-Field Visit
October 8-11, 2013	LIRR	Technical Expert-Field Visit
October 29, 2013	MNR	Conference Call
October 31, 2013	All Agencies	Conference Call
November 5-7, 2013	MNR	Technical Expert-Field Visit
November 18, 2013	MNR	Non-Technical Expert Site Visit
December 4, 2013	All Agencies	Conference Call
January 16, 2014	LIRR	Non-Technical Expert Site Visit
January 14-17, 2014	LIRR	Technical Expert-Field Visit
February 3, 2014	All Agencies	Conference Call
March 3, 2014	All Agencies	Conference Call
March 25-28, 2014	NYCT	Technical Expert-Field Visit
March 31,-April 1, 2014	NYCT	Non-Technical Expert Site Visit
April 16, 2014	All Agencies	Conference Call
April 25, 2014	NYCT	Conference Call
May 7, 2014	MNR	Non-Technical Expert Site Visit
June 26, 2014	MNR	Technical Expert-Conference Call
June 27, 2014	NYCT	Technical Expert-Conference Call
June 30, 2014	LIRR	Technical Expert-Conference Call