

FREIGHT RAIL GRADE CROSSING ASSESSMENT STUDY REPORT:

PHASE II SUMMARY

CROSSINGS RANKED #6 TO #15



Prepared by:
Jacobs Engineering
299 Madison Avenue
Morristown, NJ 07962

In association with:
A. Strauss-Wieder, Inc.
Atlantic Rail Services, Inc.

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ABOUT THE NJTPA

The North Jersey Transportation Planning Authority is the federally authorized Metropolitan Planning Organization (MPO) for the 6.5 million people in the 13-county northern New Jersey region. Each year, the NJTPA oversees over \$2 billion in transportation investments. The NJTPA evaluates and approves proposed transportation improvement projects and provides a forum for interagency cooperation and public input into funding decisions. It also sponsors and conducts studies, assists county planning agencies and monitors compliance with national air quality goals. The NJTPA serves the fifth most populous MPO region in the country. The NJTPA Board consists of one elected official from each of the region's 13 counties and two largest cities, Newark and Jersey City. The Board also includes a Governor's Representative, the Commissioner of the NJ Department of Transportation, the Executive Directors of NJ Transit and the Port Authority of NY & NJ and a Citizens' Representative appointed by the Governor. NJTPA Board meetings are held bi-monthly and are open to the public. For more information: www.njtpa.org

DISCLAIMER STATEMENT

This report was prepared by the North Jersey Transportation Planning Authority, Inc. with funding from the Federal Transit Administration and the Federal Highway Administration. The NJTPA is solely responsible for its contents.

Please note that this study evaluated grade crossings on the major freight lines serving northern New Jersey and did not look at the passenger lines. As such, the rankings presented in this report are only for the set of grade crossings on freight lines and are not a complete ranking of all crossings in the region.

NORTH JERSEY TRANSPORTATION PLANNING AUTHORITY FREIGHT RAIL GRADE CROSSING ASSESSMENT STUDY

I. STUDY BACKGROUND

Market forces are creating the need to move more and more freight to, from, and through the northern New Jersey region, exerting additional pressure on the transportation system. Increased traffic on the regional rail and roadway networks is manifesting itself in the form of increased delay to motorists, decreased mobility and adverse affects to overall quality of life. While recent emphasis on rail safety programs and technologies has served to reduce incidents and crashes at grade crossings, more must be done to improve safety wherever possible and additional issues not directly related to safety that remain.

The North Jersey Transportation Planning Authority (NJTPA) undertook a two phase study to examine the potential freight rail grade crossing issues associated with increased amounts of freight moving on the region's freight rail lines. Phase I of the study (completed in September, 2008) developed a methodology to evaluate northern New Jersey freight rail grade crossings, scored and prioritized these and developed detailed problem statements for the top five locations. Phase II continued this work and developed detailed problem statements for the next ten crossings (#6 to #15). The details of the two phases are discussed below and are followed by the detailed descriptions of the Phase II findings.

A Focus on the Major Rail Freight Lines in the Region

Phase I of this study evaluated a total of 64 grade crossings along five (5) rail corridors serving the area – the Chemical Coast, the Port Reading Secondary, the River Line, the West Trenton Line (Trenton Subdivision) and the Lehigh Line. These rail lines provide the primary connections among the Port District -- which contains the State's major freight carload classification and intermodal yards -- the dense petro-chemical operations in Union County, and the national rail network. Hence, the greatest increases in rail activity are expected to occur on these lines. Planned rail network capacity expansions such as the double tracking of portions of the Lehigh Line through New Jersey, and elimination of capacity constraints will serve to eliminate the bottlenecks that meter rail traffic to and from the Northern New Jersey region, and create the potential for increased activity on the local portions of the rail network.

The team visited all 64 crossings, inventorying the equipment and features of each location. Rail activity, road activity, average number of and length of times of gate closures, proximity to schools and residential areas, crash history, and

the availability of alternate routes were among the information catalogued. Based on the information obtained from the 64 crossings, an evaluation framework described below was utilized to develop a prioritized list of rail crossing for further study.

An Ongoing Tool for Assessing Rail Crossings

The NJTPA Grade Crossing Assessment Study establishes a quantitative, objective framework through which existing grade crossings can be evaluated, as well as a range of solutions that can be applied to improve grade crossing conditions. These solutions can be tailored to address specific root causes of operational, mobility and quality of life issues. The end results of this study reflect the extensive involvement of key public agencies, the railroads, the counties, the municipalities and the general public.

Working closely with the study's Technical Advisory Committee, a series of considerations that included safety, mobility, road and rail operations, and community concerns were combined with a weighting scheme to prioritize the 64 crossings. This framework can be applied to other rail crossings in the NJTPA region or the State.

If a crossing was ranked as one of the highest scoring locations, this does *not* automatically imply that a safety concern exists there. The ranking takes into account numerous factors and considerations beyond safety such as impacts on mobility and quality of life. Ranking near the top of the relative score list therefore indicates that further investigation is warranted to identify specific solutions(s) that would be appropriate for addressing the specific issues that contributed most significantly to the higher score.

Identifying Issues and Solutions

Through the field work, literature/internet reviews, and previous experience, the consultant team recognized that each grade crossing is different – different in terms of road, rail and pedestrian movements, different in terms of geometrics, different in terms of surrounding land uses, different in terms of the current operations and equipment at the crossing, etc. These varying characteristics generate different issues and considerations for each crossing. Similarly, a wide range of potential options existed to address the issues.

The approach taken in organizing and assessing to deal with the many different crossings, issues and options was to create a standard quantified framework for evaluating crossings with the goal of identifying root issues. The findings were entered into an “Issues and Solutions” matrix as a tool to facilitate discussions regarding grade crossings. The issue categories include:

- **Roadway issues** – visibility, road congestion/blockage, roadway geometry, and truck “bottoming out” (roadway crest within the crossing).
- **Pedestrian issues** – visibility and lack of sidewalks/walking surfaces within the crossing.
- **Rail operations issues** – visibility, train speed restrictions and local switching in the immediate area of the crossing.
- **Community issues** – general safety concerns, noise, and emergency response/access or times.

Similarly, solution sets potentially suitable for further investigation include:

- **Modification of the crossing** – quiet zones, wayside horn installation/use, crossing equipment upgrades and modifications, enhancement of crossing signage at and within the crossing, trimming trees and shrubs in the immediate vicinity of the crossing, grade separating the crossing and installing median/raised barrier medians.
- **Modification of the roadway at or in the vicinity of the crossing** – reconfiguration of the roadway, modification/addition of road signage, installation/modification/preemption of traffic signals, elimination/closure of the road, and implementations of turn prohibitions (e.g., right turn only permitted from a nearby driveway).
- **Modification of rail operations** – increase train speed, elimination/re-routing of the rail line, relocation of train signals/modification of train controls, and modification of train operations (e.g., change train times).
- **Modifications for pedestrians at or in the vicinity of the crossing** – addition of pedestrian gates, widen pavement to match adjacent sidewalks, “herd” pedestrians to designated crossing locations, grade separation of pedestrian crossings (e.g., create over- or underpasses for pedestrians), and elimination of pedestrian movements at the crossing.
- **Implementation and augmentation of community-wide programs** – Conducting “Operation Lifesaver” education programs (education programs designed to elevate knowledge regarding rail crossings and rights of way and promote safe practices), relocation of rail-using businesses to other sites, and shifting emergency response routes to other roadways.

Moving Forward – Municipal Coordination and Problem Statements for the Fifteen Top Ranked Crossings

The fifteen locations that received the highest score in the evaluation process are listed below. Please note that this study evaluated grade crossings on the major freight lines serving northern New Jersey and did not look at the passenger lines. As such, the rankings presented in this report are only for the set of grade crossings on freight lines and are not a complete ranking of all crossings in the region.

Phase I Crossings:

1. Inman Avenue, Lehigh Line, Edison, Middlesex County
2. Cedar Avenue, Lehigh Line, Middlesex Twp., Middlesex County
3. Old Hook Road, River Line, Dumont, Bergen County
4. Route 601, West Trenton Line, Montgomery Twp., Somerset County
5. St. George Avenue, Port Reading Line, Woodbridge, Middlesex Co.

Phase II Crossings:

6. New Bridge Road, River Line, Bergenfield, Bergen County
7. West Clinton Avenue, River Line, Bergenfield, Bergen County
8. Rahway Avenue, Lehigh Line, Town of Westfield, Union County
9. Durie Avenue, River Line, Haworth, Bergen County
10. New Milford Avenue, River Line, Dumont, Bergen County
11. New Market Road, Lehigh Line, Piscataway, Middlesex County
12. South Avenue, Lehigh Line, Piscataway, Middlesex County
13. La Roche Avenue, River Line, Harrington Park, Bergen County
14. Main Street, Lehigh Line, Three Bridges, Hunterdon County
15. West Madison Avenue, River Line Dumont, Bergen County

As part of the Phase I effort, meetings were held with officials representing each of the municipalities within which the 5 top ranked crossings reside. A report containing an assessment of these five crossings, along with issues identified, was produced. The NJTPA Board of Trustees, on September 8, 2008, approved the submission of the Freight Rail Crossing Assessment Study to the NJDOT for review and appropriate follow-up. As part of this subsequent effort, similar meetings were held with representatives of the municipalities within which the next 10 ranked crossings reside. The goal of these meetings was to validate the scoring process as applied to the subject crossings and solicit additional input related to operational issues or concerns that did not arise from the evaluation process. The meetings initiated a dialogue that led to the preparation of these individual crossing summary reports for all 10 locations. These reports are intended to set the stage for further investigating the need for, and nature of, solutions to be implemented at these crossings.

The framework developed in this study provides a fact-based foundation for addressing a subject that has concerned a wide range of stakeholders and the general public. This study is not an end unto itself, but rather a foundation for determining the need for grade crossing improvements and designing improvements most appropriate for addressing specific identified issues.

An evaluation matrix was developed for the purpose of evaluating each of the study crossings, and prioritizing issues based upon the total scores received and the specific criteria that contributed the most to the higher scores of the top ranked locations. All of the criteria were applied with scores ranging from 0 to 5

applied based upon empirical data and field observations. Through a polling of a broad cross section of stakeholder agencies, county officials and rail operators, a weight factor was assigned to each criterion commensurate with its level of importance in overall grade crossing operations. Table 1, below, lists the evaluation criteria applied in this study and the weight factor assigned to each criteria.

As shown, if a score of “5” is assigned to each criterion, the maximum possible score would total 468.75. The 15 highest ranked locations received scores ranging from 258.75 to 195.00.

**Table 1
Evaluation Criteria and Weight Factors**

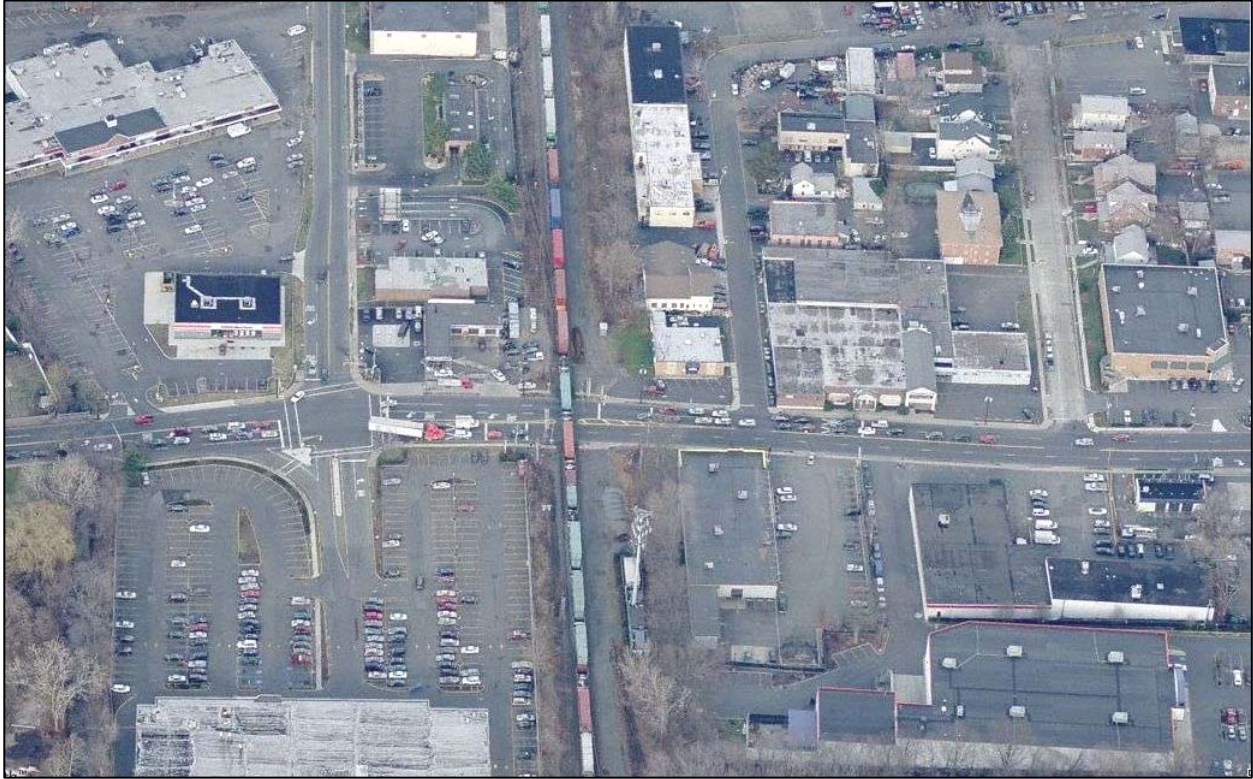
Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	5	5.00	25
Hazard Index	5	4.25	21.25
FRA near misses	5	4.50	22.5
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	5	2.75	13.75
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	5	3.00	15
Proximate/Adjacent driveways and roadways (existing and anticipated)	5	2.75	13.75
Proximate/Adjacent traffic signals (existing and anticipated)	5	3.25	16.25
Existence/Severity of Vertical curvature (crest and/or sag)	5	3.25	16.25
Existence/Severity of Horizontal curvature	5	3.25	16.25
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	5	3.50	17.5
Proximity to other grade crossings on same rail line (bisected community)	5	3.25	16.25
Sight distance	5	3.50	17.5
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	5	2.75	13.75
Frequency of Activity - Activations/Trains per day (see below)	5	4.25	21.25
Duration of closure -Average time (see below)	5	3.50	17.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	5	3.50	17.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	5	3.00	15
Roadway - volume level	5	3.00	15
Roadway - Prevailing Travel Speed	5	2.25	11.25
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	5	3.00	15
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	5	3.75	18.75
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	5	3.00	15
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	5	3.00	15
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	5	3.00	15
Emergency Response Constraint	5	4.25	21.25
Proximity to School	5	3.75	18.75
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	5	3.00	15
Overnight Noise	5	2.50	12.5
TOTAL WEIGHTED SCORE			468.75

II. ASSESSMENT OF RAIL GRADE CROSSINGS

The top five crossings were addressed in great detail during the first phase of this study completed in September of 2008. The detailed discussions of the next ten crossings (listed below) follow on the next page. Please note that this study evaluated grade crossings on the major freight lines serving northern New Jersey and did not look at the passenger lines. As such, the rankings presented in this report are only for the set of grade crossings on freight lines and are not a complete ranking of all crossings in the region.

6. New Bridge Road, River Line, Bergenfield, Bergen County
7. West Clinton Avenue, River Line, Bergenfield, Bergen County
8. Rahway Avenue, Lehigh Line, Town of Westfield, Union County
9. Durie Avenue, River Line, Haworth, Bergen County
10. New Milford Avenue, River Line, Dumont, Bergen County
11. New Market Road, Lehigh Line, Piscataway, Middlesex County
12. South Avenue, Lehigh Line, Piscataway, Middlesex County
13. La Roche Avenue, River Line, Harrington Park, Bergen County
14. Main Street, Lehigh Line, Three Bridges, Hunterdon County
15. West Madison Avenue, River Line Dumont, Bergen County

6. River Line - New Bridge Road, Bergenfield, Bergen County



At this location, the CSX River Line crosses New Bridge Road at grade. The River Line carried an average of 30 freight trains per day in 2008. While significant growth in the number of daily trains anticipated in the future, the number of trains recorded in 2009 had declined by approximately 20 percent due to current economic conditions.

New Bridge Road is a four lane, bi-directional municipal roadway, with a westbound exclusive left turn lane proximate to the crossing. The intersection of New Bridge road with Woodbine Street, approximately 75 yards west of the grade crossing, is controlled by a traffic signal that affects, and is affected by, the grade crossing. Located within a primarily commercial district, pedestrians routinely traverse the crossing along New Bridge Road.

Maximum authorized speed along the CSX River Line is 50 miles per hour. Routine train activity results in closures of the roadway averaging 2 minutes and 51 seconds per closure, with the roadway being closed for just over one hour each day in 2009.

Of the 15 highest ranking crossings in the study, the crossing at New Bridge Road was identified as number 6. This ranking is the result of the score

calculated using the Evaluation and Weight Factors described previously. The scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 2 on the next page.

The major issues identified at this crossing included:

- The traffic signals at the intersection of Woodbine Street and New Bridge Road started flashing between the hours of 10:30 PM and 6:30 AM. This included the "repeater" traffic signal bracketing the railroad grade crossing nearby. Significantly, the traffic signals governing movements on New Bridge Road were flashing yellow; whereas, the railroad signals were flashing red in close proximity. It should also be noted that traffic signals at another intersection one block away (Windsor and New Bridge Roads) did not blink at all during the 24-hour observation period. The current situation creates confusion for drivers and was immediately reported to the Borough of Bergenfield Police Department. Bergenfield has since taken action to address this situation. (Lead Agency(s): Bergenfield)
- Southbound CSX trains may receive signal indications that require reduction in speed to enter controlled sidings located immediately south of New Bridge Road in Bergenfield, NJ. In this event, the duration of time that crossings are blocked could increase somewhat, especially if the application of air brakes triggers an emergency brake application and a subsequent inspection of the train consist. With several other at-grade crossings on the River Line in close proximity to this location, an obstruction of the crossings by a stopped train could affect the response time of emergency services. Further investigation of this situation is required. (Lead Agency(s): NJDOT, CSX Railroad)
- Significant pedestrian traffic was noted at this location. It is recommended that the conduct of Operation Lifesaver programs be considered for local schools to educate students. (Lead Agency(s): Bergenfield, NJDOT, CSX Railroad)
- Train noise has been raised as an issue along the length of the River Line because of the proximity to residential neighborhoods. A coordinated investigation of options along the right-of-way can be explored. (Lead Agency(s): Bergenfield, NJDOT)

Additional strategies are described in Addendum I and are listed in the Issues Matrix Table at the end of this report.

Table 2

**River Line (MP QR 10.92)
New Bridge Road, Bergenfield, Bergen County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	3	5.00	15
Hazard Index	3	4.25	12.75
FRA near misses	0	4.50	0
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	3	2.75	8.25
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	4	2.75	11
Proximate/Adjacent traffic signals (existing and anticipated)	4	3.25	13
Existence/Severity of Vertical curvature (crest and/or sag)	0	3.25	0
Existence/Severity of Horizontal curvature	1	3.25	3.25
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	0	3.50	0
Proximity to other grade crossings on same rail line (bisected community)	5	3.25	16.25
Sight distance	2	3.50	7
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	0	2.75	0
Frequency of Activity - Activations/Trains per day (see below)	4	4.25	17
Duration of closure -Average time (see below)	3	3.50	10.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	1	3.00	3
Roadway - volume level	3	3.00	9
Roadway - Prevailing Travel Speed	3	2.25	6.75
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	0	3.00	0
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	5	3.75	18.75
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	1	3.00	3
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	4	3.00	12
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	5	4.25	21.25
Proximity to School	1	3.75	3.75
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	1	3.00	3
Overnight Noise	1	2.50	2.5
TOTAL WEIGHTED SCORE			216.5

7. River Line - West Clinton Avenue, Bergenfield, Bergen County



At this location, the CSX River Line crosses West Clinton Avenue at grade. The River Line carried an average of 30 freight trains per day in 2008. While significant growth in the number of daily trains anticipated in the future, the number of trains recorded in 2009 had declined by approximately 20 percent due to current economic conditions.

West Clinton Avenue is a two-lane, bi-directional municipal roadway, providing access to a mix of residential, retail and commercial land uses. South Front Street traverses in a north/south direction abutting the western edge of the rail right of way. South Railroad Avenue parallels the railroad right of way on the eastern side, separated by approximately 30 yards. The intersection of West Clinton Avenue and South Front Street is controlled by a traffic signal that affects, and is affected by, the at-grade crossing. Being located in a predominantly business and retail area, pedestrians routinely traverse the crossing.

Maximum authorized speed along the CSX River Line is 50 miles per hour. Routine train activity results in closures of the roadway averaging 2 minutes and 5 seconds per closure, with the roadway being closed for just over one hour each day.

Of the 15 highest ranking crossings in the study, the crossing at West Clinton Avenue was identified as number 7. This ranking is the result of the score calculated using the Evaluation and Weight Factors described previously. The scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 3 on the next page

The major issues identified at this crossing included:

- Southbound CSX trains may receive signal indications that require reduction in speed to enter controlled sidings located immediately south of New Bridge Road in Bergenfield, NJ. In this event, the duration of time that crossings are blocked could increase somewhat, especially if the application of air brakes triggers an emergency brake application and a subsequent inspection of the train consist. With several other at-grade crossings on the River Line in close proximity to this location, an obstruction of the crossings by a stopped train could affect the response time of emergency services. Further investigation of this situation is required. (Lead Agency(s): CSX Railroad, NJDOT)
- It is recommended that the conducting of Operation Lifesaver programs be considered for local schools to educate students and improve pedestrian safety. (Lead Agency(s): Bergenfield, NJDOT, CSX Railroad)
- Train noise has been raised as an issue along the length of the River Line because of the proximity to residential neighborhoods. A coordinated investigation of options along the right-of-way can be explored. (Lead Agency(s): Bergenfield, NJDOT)

Additional strategies are described in Addendum I and are listed in the Issues Matrix Table at the end of this report.

Table 3

**River Line (MP QR 11.67)
Clinton Avenue, Bergenfield, Bergen County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	3	5.00	15
Hazard Index	3	4.25	12.75
FRA near misses	0	4.50	0
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	2	2.75	5.5
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	4	2.75	11
Proximate/Adjacent traffic signals (existing and anticipated)	5	3.25	16.25
Existence/Severity of Vertical curvature (crest and/or sag)	0	3.25	0
Existence/Severity of Horizontal curvature	0	3.25	0
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	0	3.50	0
Proximity to other grade crossings on same rail line (bisected community)	3	3.25	9.75
Sight distance	3	3.50	10.5
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	0	2.75	0
Frequency of Activity - Activations/Trains per day (see below)	4	4.25	17
Duration of closure -Average time (see below)	3	3.50	10.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	1	3.00	3
Roadway - volume level	3	3.00	9
Roadway - Prevailing Travel Speed	3	2.25	6.75
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	0	3.00	0
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	3	3.75	11.25
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	3	3.00	9
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	4	3.00	12
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	3	4.25	12.75
Proximity to School	1	3.75	3.75
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	2	3.00	6
Overnight Noise	3	2.50	7.5
TOTAL WEIGHTED SCORE			208.75

8. Lehigh Line - Rahway Avenue, Town of Westfield, Union County



At this location, the Conrail Lehigh Line crosses Rahway Avenue at grade. The Lehigh Line carried an average of 44 freight trains per day in 2008. Significant growth in the number of daily trains is anticipated in the future. Sections of the Lehigh Line have recently been double tracked. This double tracking appears to have reduced the duration of gate closures at Rahway Avenue. Rahway Avenue is a two-lane bi-directional county road. Median dividers and a left turn lane on Rahway Avenue for Lamberts Mill Road have been installed.

A major Town soccer field and a large church, St. Helens, are proximate to the Rahway Avenue/Lamberts Mill Road intersection. The soccer field abuts the railroad right of way.

Residences exist near the crossing. A L'Oreal warehouse also abuts the grade crossing. Trucks entering and leaving this facility via Rahway Avenue have caused roadway blockages. Trailer parking at this location was found by the Town and NJDOT Diagnostics Team to infringe on sight lines and on the railroad right of way. Westfield notified the owner, and L'Oreal addressed the issue.

L'Oreal will be moving to another location in New Jersey. The future use of this property is not known.

A PSE&G substation abuts the grade crossing across from the warehouse. The substation was recently expanded and new landscaping added.

Maximum authorized speed along the Lehigh Line is 50 miles per hour. Routine train activity results in closures of the roadway averaging 2 minutes and 6 seconds per closure, with the roadway being closed for just over one and one-half hours each day in total.

The Town of Westfield is in the process of completing a quiet zone at this location. Full implementation of the quiet zone is anticipated for August, 2009.

Of the 15 highest ranking crossings in the study, the crossing at Rahway Avenue was identified as number 8. This ranking is the result of the score calculated using the Evaluation and Weight Factors described previously. The scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 4 on the next page.

The major issues identified at this crossing included:

- Noise is a key concern at this location. The pending implementation of the Quiet Zone by the Town of Westfield is anticipated to address this concern.
- Potential back-ups from traffic waiting to turn left onto Lamberts Mill Road are a concern at this crossing. St. Helen's Church is expanding their parking lot, as is the Town, for the soccer field across the street. However, back ups at the left turn on Rahway Ave. may still occur, which could back up to the grade crossing. The installation of a traffic light at this intersection, synchronized with the grade crossing, could be investigated. (Lead Agency(s): Westfield, NJDOT)
- Because of the current spacing of train signals, when eastbound freight trains are detained to allow the priority movement of New Jersey Transit passenger trains at Aldene, train speeds decrease through the Rahway Avenue crossing. This can increase the duration of gate closures. The installation of an intermediate signal could be investigated, as could triple tracking the Lehigh Line at Aldene to alleviate the train delays. (Lead Agency(s): Conrail)
- Grade separation might be considered in the future if rail and/or road traffic significantly increase. Property exists further down Lamberts Mill Road and on the Clark side of the railroad right of way to potentially investigate a grade separated crossing in the future. Grade separation at Rahway Avenue could be investigated but is considered difficult, with significant impacts on the surrounding land uses and roadways. (Lead Agency(s): Westfield, NJDOT)

- While little pedestrian traffic currently exists at this location, extension of the pavement area at the crossing could be investigated to provide a better surface for such traffic. (Lead Agency(s): Westfield, NJDOT)

Additional strategies are described in Addendum I and are listed in the Issues Matrix Table at the end of this report.

Table 4

**Lehigh Line (MP 20.05)
Rahway Avenue, Westfield, Union County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	2	5.00	10
Hazard Index	3	4.25	12.75
FRA near misses	1	4.50	4.5
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	2	2.75	5.5
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	4	2.75	11
Proximate/Adjacent traffic signals (existing and anticipated)	2	3.25	6.5
Existence/Severity of Vertical curvature (crest and/or sag)	1	3.25	3.25
Existence/Severity of Horizontal curvature	0	3.25	0
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	1	3.50	3.5
Proximity to other grade crossings on same rail line (bisected community)	0	3.25	0
Sight distance	2	3.50	7
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	0	2.75	0
Frequency of Activity - Activations/Trains per day (see below)	5	4.25	21.25
Duration of closure -Average time (see below)	3	3.50	10.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	5	3.00	15
Roadway - volume level	3	3.00	9
Roadway - Prevailing Travel Speed	1	2.25	2.25
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	3	3.00	9
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	2	3.75	7.5
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	5	3.00	15
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	1	3.00	3
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	0	4.25	0
Proximity to School	3	3.75	11.25
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	3	3.00	9
Overnight Noise	4	2.50	10
TOTAL WEIGHTED SCORE			206.25

9. River Line - Durie Avenue, Haworth, Bergen County



At this location, the CSX River Line crosses Durie Avenue at grade. The River Line carried an average of 30 freight trains per day in 2008. While significant growth in the number of daily trains anticipated in the future, the number of trains recorded in 2009 had declined by 20 percent due to current economic conditions.

Durie Avenue is a municipal road in a residential area, with the Borough's Department of Public Works (DPW) building located nearby.

This location experiences higher vehicular traffic from about 8:30 to 9 AM as parents transport their children to a nearby school. This route is also used to access Oradell and the Parkway.

Maximum authorized speed along the CSX River Line is 50 miles per hour. Routine train activity results in closures of the roadway averaging 2 minutes and 5 seconds per closure, with the roadway being closed for just over one hour each day.

Of the 15 highest ranking crossings in the study, the crossing at Durie Avenue was identified as number 9. This ranking is the result of the score calculated using the Evaluation and Weight Factors described previously. The scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 5 on the next page.

The major issues identified at this location included:

- When a train obstructs the crossing, road access to the Department of Public Works (DPW) building is blocked, with the nearest alternative being a one-lane bridge. An investigation of potentially developing a two-lane overpass at Sunset Road was suggested during the outreach meeting with Haworth representatives. This location is approximately ½ mile from the Durie Avenue crossing. (Lead agency(s): NJDOT, Haworth)
- Train noise has been raised as an issue along the length of the River Line because of the proximity to residential neighborhoods. A coordinated investigation of options along the right-of-way can be explored. (Lead Agency(s): NJDOT, Haworth)

Additional strategies are described in Addendum I, and are listed in the Issues Matrix Table at the end of this report.

Table 5

**River Line (MP QR 14.85)
Durie Avenue, Haworth, Bergen County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	0	5.00	0
Hazard Index	5	4.25	21.25
FRA near misses	0	4.50	0
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	2	2.75	5.5
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	2	2.75	5.5
Proximate/Adjacent traffic signals (existing and anticipated)	0	3.25	0
Existence/Severity of Vertical curvature (crest and/or sag)	2	3.25	6.5
Existence/Severity of Horizontal curvature	3	3.25	9.75
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	0	3.50	0
Proximity to other grade crossings on same rail line (bisected community)	3	3.25	9.75
Sight distance	3	3.50	10.5
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	0	2.75	0
Frequency of Activity - Activations/Trains per day (see below)	4	4.25	17
Duration of closure -Average time (see below)	3	3.50	10.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	1	3.00	3
Roadway - volume level	2	3.00	6
Roadway - Prevailing Travel Speed	2	2.25	4.5
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	1	3.00	3
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	3	3.75	11.25
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	3	3.00	9
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	4	3.00	12
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	3	4.25	12.75
Proximity to School	1	3.75	3.75
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	4	3.00	12
Overnight Noise	4	2.50	10
TOTAL WEIGHTED SCORE			203

10. River Line - New Milford Avenue, Dumont, Bergen County



At this location, the CSX River Line crosses New Milford Avenue at grade. The River Line carried an average of 30 freight trains per day in 2008. While significant growth in the number of daily trains is anticipated in the future, the number of trains recorded in 2009 had declined by approximately 20 percent due to current economic conditions.

New Milford Avenue is a four lane, bi-directional county roadway. The crossing has significant pedestrian traffic and is very close to the town's high school. The rail right of way abuts the high school's football field. Residences and businesses are also in the immediate area.

Maximum authorized speed along the CSX River Subdivision is 50 miles per hour. Routine train activity results in closures of the roadway averaging 2 minutes and 5 seconds per closure, with the roadway being closed for just over one hour each day.

Of the 15 highest ranking crossings in the study, the crossing at New Milford Avenue was identified as number 10. This ranking is the result of the score

calculated using the Evaluation and Weight Factors described previously. The scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 6 on the next page.

The major issues identified at this crossing included:

- Southbound CSX trains may receive signal indications that require reduction in speed to enter controlled sidings located immediately south of New Bridge Road. In this event, the duration of time that crossings are blocked could increase somewhat, especially if the application of air brakes triggers an emergency brake application and a subsequent inspection of the train consist. With several other at-grade crossings on the River Line in close proximity to this location, an obstruction of the crossings by a stopped train could affect the response time of emergency services. Further investigation of this situation is recommended. (Lead Agency(s): CSX Railroad, NJDOT)
- Given this crossing's proximity to the local High School, it is recommended that Operation Lifesaver programs be conducted at this and other local schools to educate students. (Lead Agency(s): Dumont, NJDOT, CSX Railroad)
- The roadbed at this crossing is replaced about every two years. Each time a roadbed is replaced, the crossing is closed for about three days. Dumont recommends that alternative roadbed construction techniques be considered that would increase the lifetime of the roadways, potentially reduce the cost to the railroads, and reduce the construction closures at this location. (Lead Agency(s): NJDOT, CSX Railroad)
- Train noise has been raised as an issue along the length of the River Line because of the proximity to residential neighborhoods. A coordinated investigation of options along the right-of-way can be explored. (Lead Agency(s): Dumont, NJDOT)

Additional strategies are described in Addendum I and are listed in the Issues Matrix Table at the end of this report.

Table 6

**River Line (MP QR 13.12)
New Milford Avenue, Dumont, Bergen County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	0	5.00	0
Hazard Index	2	4.25	8.5
FRA near misses	0	4.50	0
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	3	2.75	8.25
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	4	2.75	11
Proximate/Adjacent traffic signals (existing and anticipated)	0	3.25	0
Existence/Severity of Vertical curvature (crest and/or sag)	0	3.25	0
Existence/Severity of Horizontal curvature	0	3.25	0
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	0	3.50	0
Proximity to other grade crossings on same rail line (bisected community)	2	3.25	6.5
Sight distance	2	3.50	7
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	0	2.75	0
Frequency of Activity - Activations/Trains per day (see below)	4	4.25	17
Duration of closure -Average time (see below)	3	3.50	10.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	5	3.00	15
Roadway - volume level	3	3.00	9
Roadway - Prevailing Travel Speed	3	2.25	6.75
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	0	3.00	0
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	5	3.75	18.75
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	1	3.00	3
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	4	3.00	12
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	2	4.25	8.5
Proximity to School	5	3.75	18.75
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	4	3.00	12
Overnight Noise	4	2.50	10
TOTAL WEIGHTED SCORE			202

11. Lehigh Line - New Market Road, Piscataway, Middlesex County



At this location, the Conrail Lehigh Line crosses New Market Road, a municipal roadway, at grade. The Lehigh Line carried an average of 44 freight trains per day in 2008. Significant growth in the number of daily trains anticipated in the future. Sections of the Lehigh Line have recently been double tracked, including the section that crosses New Market Road. A park, some local businesses and residences are proximate to the crossing. New Market Road is a two-lane bi-directional local road.

Maximum authorized speed along the Lehigh Line is 50 miles per hour. Routine train activity results in closures of the roadway averaging 2 minutes and 6 seconds per closure, with the roadway being closed for just over one and one-half hours each day in total. There was one fatality at this crossing in 2002 attributed to a bicyclist who went around lowered gates. An additional collision occurred in 2003 when a train struck an automobile that was hung up on the tracks. There were no injuries in this collision.

Of the 15 highest ranking crossings in the study, the crossing at New Market Road was identified as number 11. This ranking is the result of the score calculated using the Evaluation and Weight Factors described previously. The

scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 2 on the next page.

The major issues identified at this crossing included:

- Reducing the potential for “going around” lowered gates should be explored. Options, including the installation of quad gates and medians on the roadway, can be explored. The NJDOT, as a result of a recent Quiet Zone petition for this crossing, held a Diagnostic Team meeting. The above options for improving this crossing are among those that will be looked at as part of the NJDOT evaluation. (Lead Agency(s): Piscataway, NJDOT, Conrail)
- Pedestrian traffic. It is recommended that Operation Lifesaver programs be conducted at local schools to educate students. (Lead Agency(s): Piscataway, NJDOT, Conrail)

Additional strategies are described in Addendum I and are listed in the Issues Matrix Table at the end of this report.

Table 7

**Lehigh Line (MP 29.01)
New Market Road, Piscataway, Middlesex County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	4	5.00	20
Hazard Index	3	4.25	12.75
FRA near misses	0	4.50	0
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	2	2.75	5.5
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	4	2.75	11
Proximate/Adjacent traffic signals (existing and anticipated)	3	3.25	9.75
Existence/Severity of Vertical curvature (crest and/or sag)	1	3.25	3.25
Existence/Severity of Horizontal curvature	5	3.25	16.25
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	1	3.50	3.5
Proximity to other grade crossings on same rail line (bisected community)	1	3.25	3.25
Sight distance	1	3.50	3.5
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	0	2.75	0
Frequency of Activity - Activations/Trains per day (see below)	5	4.25	21.25
Duration of closure -Average time (see below)	3	3.50	10.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	3	3.00	9
Roadway - volume level	2	3.00	6
Roadway - Prevailing Travel Speed	2	2.25	4.5
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	0	3.00	0
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	3	3.75	11.25
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	0	3.00	0
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	1	3.00	3
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	1	4.25	4.25
Proximity to School	0	3.75	0
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	5	3.00	15
Overnight Noise	3	2.50	7.5
TOTAL WEIGHTED SCORE			200.5

12. Lehigh Line - South Avenue, Piscataway, Middlesex County



At this location, the Conrail Lehigh Line crosses South Avenue at grade. The Lehigh Line carried an average of 44 freight trains per day in 2008. Significant growth in the number of daily trains anticipated in the future. Sections of the Lehigh Line have recently been double tracked, including the section that crosses South Avenue. Residences are proximate to the crossing. South Avenue is a two-lane bi-directional municipal road. The railroad right of way crosses the roadway on an angle at this location.

Maximum authorized speed along the Lehigh Line is 50 miles per hour. Routine train activity results in closures of the roadway averaging 2 minutes and 6 seconds per closure, with the roadway being closed for just over one and one-half hours each day in total. There was one fatality at this crossing in 1999 attributed to a motorist who drove around lowered gates. In 2005, there was another collision at this crossing when a train struck an automobile that had been abandoned on the tracks.

Of the 15 highest ranking crossings in the study, the crossing at South Avenue was identified as number 12. This ranking is the result of the score calculated

using the Evaluation and Weight Factors described previously. The scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 8 on the next page.

The major issues identified at this crossing included:

- An “equipment defect” detector is located about a mile from the South Avenue grade crossing and could trigger unplanned train stops at the crossing (trains triggering the detector are required to be stopped and checked by the train crew before proceeding). A review of the location of this detector can be investigated. (Lead Agency(s): Conrail)
- Reducing the potential for “going around” lowered gates due to the angle at which South Avenue approaches the crossing leaving a large opening between the existing gates. Options, including the installation of quad gates and medians on the roadway, can be explored. (Lead Agency(s): NJDOT, Piscataway)
- Discussions with the NJTPA Technical Advisory Committee included thoughts on a possible “corridor” solution to Cedar Avenue -- combining the New Jersey Transit and Lehigh Line rights of way into a single grade separated line (with multiple tracks) extending from Bound Brook (which would be tied to eliminating a grade crossing in that town on the Port Reading Secondary) to beyond grade crossings at South and Mountain Avenues. This proposed corridor solution could be explored as part of a larger corridor study of the entire Lehigh Line looking at future needs resulting from increased rail demand. (Participating Agency(s): NJDOT, NJ Transit, NJTPA, Piscataway, Middlesex, Bound Brook, Conrail, Middlesex County, Somerset County)

Additional strategies are described in Addendum I and are listed in the Issues Matrix Table at the end of this report.

Table 8

**Lehigh Line (MP 30.05)
South Avenue, Piscataway, Middlesex County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	5	5.00	25
Hazard Index	3	4.25	12.75
FRA near misses	0	4.50	0
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	3	2.75	8.25
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	2	2.75	5.5
Proximate/Adjacent traffic signals (existing and anticipated)	0	3.25	0
Existence/Severity of Vertical curvature (crest and/or sag)	3	3.25	9.75
Existence/Severity of Horizontal curvature	4	3.25	13
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	1	3.50	3.5
Proximity to other grade crossings on same rail line (bisected community)	4	3.25	13
Sight distance	3	3.50	10.5
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	0	2.75	0
Frequency of Activity - Activations/Trains per day (see below)	5	4.25	21.25
Duration of closure -Average time (see below)	3	3.50	10.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	1	3.00	3
Roadway - volume level	2	3.00	6
Roadway - Prevailing Travel Speed	2	2.25	4.5
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	0	3.00	0
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	0	3.75	0
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	0	3.00	0
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	5	3.00	15
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	4	4.25	17
Proximity to School	0	3.75	0
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	0	3.00	0
Overnight Noise	1	2.50	2.5
TOTAL WEIGHTED SCORE			200.5

13. River Line- La Roche Avenue, Harrington Park, Bergen County



At this location, the CSX River Line crosses LaRoche Avenue at grade. The River Line carried an average of 30 freight trains per day in 2008. While significant growth in the number of daily trains anticipated in the future, the number of trains recorded in 2009 had declined by 20 percent due to current economic conditions.

LaRoche Avenue is a municipal road with a 25 mile per hour speed limit. The crossing is located near the center of a small business district and commuter bus stop, with several roads feeding into LaRoche Avenue. Some of these roads do not have crossing signage. A large evergreen, used as the local Christmas tree, is also located at the crossing and blocks visibility of the crossing from one of the unmarked streets. Residences are located in the immediate vicinity of the crossing.

Maximum authorized speed along the CSX River Line is 50 miles per hour. Routine train activity results in closures of the roadway averaging 2 minutes and 5 seconds per closure, with the roadway being closed for just over one hour each day.

Of the 15 highest ranking crossings in the study, the crossing at La Roche Avenue was identified as number 13. This ranking is the result of the score calculated using the Evaluation and Weight Factors described previously. The scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 9 on the next page.

The major issues identified at this crossing included:

- There is limited visibility of the grade crossing from the roads adjacent to the crossing including Semmens Road, Carman Road, Ward Way and Elm Street. This situation could be potentially handled through additional signage, street markings and selective pruning. A review by the New Jersey Department of Transportation Diagnostics Team may be required. (Lead Agency(s): NJDOT, Harrington Park)
- Train noise has been raised as an issue along the length of the River Line because of the proximity to residential neighborhoods. A coordinated investigation of options along the right-of-way can be explored. (Lead Agency(s): NJDOT, Harrington Park)

Additional strategies are described in Addendum I and are listed in the Issues Matrix Table at the end of this report.

Table 9

**River Line (MP QR 16.10)
LaRoche Ave, Harrington Park, Bergen County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	0	5.00	0
Hazard Index	2	4.25	8.5
FRA near misses	0	4.50	0
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	2	2.75	5.5
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	5	2.75	13.75
Proximate/Adjacent traffic signals (existing and anticipated)	1	3.25	3.25
Existence/Severity of Vertical curvature (crest and/or sag)	3	3.25	9.75
Existence/Severity of Horizontal curvature	4	3.25	13
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	0	3.50	0
Proximity to other grade crossings on same rail line (bisected community)	1	3.25	3.25
Sight distance	5	3.50	17.5
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	0	2.75	0
Frequency of Activity - Activations/Trains per day (see below)	4	4.25	17
Duration of closure -Average time (see below)	3	3.50	10.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	1	3.00	3
Roadway - volume level	2	3.00	6
Roadway - Prevailing Travel Speed	2	2.25	4.5
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	0	3.00	0
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	3	3.75	11.25
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	3	3.00	9
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	4	3.00	12
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	1	4.25	4.25
Proximity to School	1	3.75	3.75
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	4	3.00	12
Overnight Noise	4	2.50	10
TOTAL WEIGHTED SCORE			197.25

14. Lehigh Line - Main Street, Three Bridges, Hunterdon County



At this location, the Norfolk Southern Lehigh Line crosses South Avenue at grade. The Lehigh Line at this location carried an average of 23 freight trains per day in 2008. Significant growth in the number of daily trains is anticipated in the future. Residences are proximate to the crossing. Main Street is a two-lane bi-directional county road. The Black River and Western Railroad crosses Main Street proximate to this crossing.

Maximum authorized speed along the Lehigh Line is 50 miles per hour. Routine train activity results in closures of the roadway averaging about two minutes per closure, with the roadway being closed for just over 41 minutes each day in total.

Of the 15 highest ranking crossings in the study, the crossing at Main Street was identified as number 14. This ranking is the result of the score calculated using the Evaluation and Weight Factors described previously. The scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 10 on a subsequent page.

The major issues identified at this location included:

- A school exists about one-quarter to one-third of a mile away in Three Bridges. Conduct of an Operation Lifesaver program can be explored. (Lead Agency(s): NJDOT, Three Bridges, Norfolk Southern Railroad, Black River & Western Railroad)
- While some pedestrians were observed (there are a number of local businesses in the vicinity of the crossing), the crossing currently has no pedestrian accommodations. Widening the paved area at the crossing to better accommodate pedestrian traffic can be investigated. (Lead Agency(s): NJDOT, Three Bridges)
- Train noise has been raised as an issue in the area. Establishment of a quiet zone can be explored, along with using concrete and rubber components in the crossing roadbed that would reduce noise. (Lead Agency(s): NJDOT, Three Bridges)
- A catering firm's parking lot in the immediate vicinity of the crossing did not distinguish between the end of the parking lot and the railroad right of way. As a result, some vehicles were parking in the right of way. The firm's owners could be contacted to explore means to keep vehicles out of the right of way. (Norfolk Southern Railroad, Three Bridges).

Additional strategies are described in Addendum I and are listed in the Issues Matrix Table at the end of this report.

Table 10

**Lehigh Line (MP 48.61)
Main Street, Three Bridges, Hunterdon County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	0	5.00	0
Hazard Index	1	4.25	4.25
FRA near misses	0	4.50	0
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	3	2.75	8.25
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	4	2.75	11
Proximate/Adjacent traffic signals (existing and anticipated)	0	3.25	0
Existence/Severity of Vertical curvature (crest and/or sag)	2	3.25	6.5
Existence/Severity of Horizontal curvature	1	3.25	3.25
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	3	3.50	10.5
Proximity to other grade crossings on same rail line (bisected community)	3	3.25	9.75
Sight distance	1	3.50	3.5
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	2	2.75	5.5
Frequency of Activity - Activations/Trains per day (see below)	4	4.25	17
Duration of closure -Average time (see below)	2	3.50	7
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	3	3.00	9
Roadway - volume level	1	3.00	3
Roadway - Prevailing Travel Speed	1	2.25	2.25
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	1	3.00	3
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	3	3.75	11.25
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	5	3.00	15
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	4	3.00	12
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	3	4.25	12.75
Proximity to School	0	3.75	0
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	4	3.00	12
Overnight Noise	4	2.50	10
TOTAL WEIGHTED SCORE			196.25

15. River Line - West Madison Avenue, Dumont, Bergen County



At this location, the CSX River Line crosses West Madison Avenue at grade. The River Line carried an average of 30 freight trains per day in 2008. While significant growth in the number of daily trains anticipated in the future, the number of trains recorded in 2009 had declined by approximately 30 percent due to current economic conditions.

West Madison Avenue is a four-lane, two direction municipal roadway. The crossing has significant pedestrian traffic and pedestrians were observed crossing the tracks while the gates were lowering and rising. The crossing is extensively used by students and other pedestrians. Stores, businesses and residences are in the immediate area.

Maximum authorized speed along the CSX River Subdivision is 50 miles per hour. Routine train activity results in closures of the roadway averaging 2 minutes and 51seconds per closure, with the roadway being closed for just over one hour each day.

Of the 15 highest ranking crossings in the study, the crossing at New Bridge Road was identified as number 6. This ranking is the result of the score calculated using the Evaluation and Weight Factors described previously. The scores assigned to each category are the product of field observations by NJTPA staff and the study consultant team, and empirical data collected from state, county and local sources. The results of this calculation are shown in Table 11 on the next page.

The major issues identified at this crossing included:

- Southbound CSX trains may receive signal indications that require reduction in speed to enter controlled sidings located immediately south of New Bridge Road. In this event, the duration of time that crossings are blocked could increase somewhat, especially if the application of air brakes triggers an emergency brake application and a subsequent inspection of the train consist. With several other at-grade crossings on the River Line in close proximity to this location, an obstruction of the crossings by a stopped train could affect the response time of emergency services. Further investigation of this situation is recommended. (Lead Agency(s): CSX Railroad, NJDOT)
- Heavy pedestrian traffic was noted at this crossing due to the concentration of businesses and a nearby school. It is recommended that Operation Lifesaver programs be conducted at local schools to educate students. (Lead Agency(s): Dumont, NJDOT, CSX Railroad)
- The roadbed at this crossing is replaced about every two years. Each time a roadbed is replaced, the crossing is closed for about three days. Dumont recommends that alternative roadbed construction techniques be considered that would increase the lifetime of the roadways, potentially reduce the cost to the railroads, and reduce the construction closures at this location. (Lead Agency(s): NJDOT, CSX Railroad)
- Train noise has been raised as an issue along the length of the River Line because of the proximity to residential neighborhoods. A coordinated investigation of options along the right-of-way can be explored. (Lead Agency(s): Dumont, NJDOT)

Additional strategies are described in Addendum I and are listed in the Issues Matrix Table at the end of this report.

Table 11

**River Line (MP QR 12.84)
Madison Avenue, Dumont, Bergen County**

Criteria	Score	Weight	Total
<i>FRA/FHWA Quantitative Considerations</i>			
FRA crash history	0	5.00	0
Hazard Index	5	4.25	21.25
FRA near misses	0	4.50	0
<i>Location, Configuration and Control Considerations</i>			
Functional Class of Roadway (see below)	3	2.75	8.25
Active vs. Passive Control at grade crossing (1=full active, 3=combination, 5=passive)	1	3.00	3
Proximate/Adjacent driveways and roadways (existing and anticipated)	4	2.75	11
Proximate/Adjacent traffic signals (existing and anticipated)	1	3.25	3.25
Existence/Severity of Vertical curvature (crest and/or sag)	0	3.25	0
Existence/Severity of Horizontal curvature	0	3.25	0
Proximity to other rail crossings (NJ Transit, shortline, active spurs)	0	3.50	0
Proximity to other grade crossings on same rail line (bisected community)	2	3.25	6.5
Sight distance	1	3.50	3.5
<i>Operational Considerations -- Roadway, Rail, Pedestrian</i>			
Rail -- Local rail operations/switching involving the grade crossing (0=non-existent, 5=exists)	0	2.75	0
Frequency of Activity - Activations/Trains per day (see below)	4	4.25	17
Duration of closure -Average time (see below)	3	3.50	10.5
Projected Change in Rail Traffic (0=none, 3=moderate, 5=significant)	3	3.50	10.5
School Buses Using Crossing (0=none, 3=minor use, 5=major use)	3	3.00	9
Roadway - volume level	4	3.00	12
Roadway - Prevailing Travel Speed	2	2.25	4.5
Roadway - Projected Change in Roadway Traffic (0=low, 3=moderate, 5=high)	0	3.00	0
Pedestrian -- level of activity (0=none, 1=sidewalks exist, 3=modest, 5=significant)	5	3.75	18.75
Pedestrian -- level of accommodation and control (5=none, 3=modest, 0=extensive)	0	3.00	0
Proximity to Adjacent Grade Separated Crossings and Alternate Routes (see below)	4	3.00	12
<i>Community Considerations</i>			
Proportion of Actuations during peak roadway activity periods	2	3.00	6
Emergency Response Constraint	2	4.25	8.5
Proximity to School	2	3.75	7.5
Adjacent Sensitive Land Use (i.e.: residential, school, park, etc)	4	3.00	12
Overnight Noise	4	2.50	10
TOTAL WEIGHTED SCORE			195

ADDENDUM I. THE ISSUES / SOLUTIONS MATRIX

Considering the broad spectrum of issues identified at the various crossings evaluated, it is clear that there is no one size fits all solution to enhancing rail grade crossing operations and minimizing their implications to the surrounding community. Different solutions, or sets of solutions, would prove to be the most effective under different conditions. To facilitate the identification of the most applicable solution(s), a matrix system was developed to work in concert with the evaluation tables presented above. The application of the issues/solutions matrix follows the following steps:

1. Identify the particular issues associated with a specific crossing location as determined in the evaluation table.
2. Locate those issues along the top header row of the issues/solutions matrix.
3. Scan down the columns in the issues/solutions table to the boxes that are check-marked. Scan left across these rows to locate the solution type or solution sets most applicable to addressing the identified issues.

Implementation of the identified solutions may then be advanced in a focused manner, without expending time or resources addressing perceived issues and solutions that are not appropriate for addressing the specific issues that define the crossing operations.

While each crossing location is unique, regardless of which crossing is under investigation advancement of a solution will likely require a partnership amongst the jurisdictions that are responsible for the roadway and the rail line, as well as the municipal and/or county officials for the location in which the crossing resides. The New Jersey Department of Transportation Diagnostics Team is charged with monitoring and maintaining operations and safety at all grade crossings within the state. As such, it is recommended that the NJDOT Diagnostic Team assume a lead role in advancing an appropriate solution(s).

Grade Crossing Issues / Solutions Matrix												
Potential Solution Sets for Further Investigation	Roadway Issues			Pedestrian Issues		Rail Operations Issues			Community Issues			
	Visibility	Road Congestion/Blockage	Road Geometries	Tuck Bottoming Out - Roadway Crest within Crossing	Visibility	Lack of Sidewalks/Walking Surface	Visibility	Train Speed Restrictions	Local Switching in Area	Noise	Emergency Response Access or Times	General Safety Concerns
Crossing Modification	Quiet Zones											
	Wayside Horns											
	Crossing Equipment Upgrade/Mod/Sensor Relocation	✓				✓	✓				✓	✓
	Enhance Crossing Signage - All/Within Crossing		✓			✓						✓
	Trim Trees/Shrubs	✓				✓						✓
	Grade Separation	✓	✓			✓		✓			✓	✓
	Median - Raised Barrier	✓	✓									
Roadway Modification	Roadway Reconfiguration	✓	✓	✓							✓	✓
	Road Signage - Advance and Special Condition		✓	✓								✓
	Install/Mod/Preempt Traffic Signals		✓								✓	✓
	Eliminate/Close Road	✓	✓	✓	✓	✓		✓			✓	✓
	Implement turn prohibitions	✓	✓	✓								✓
Rail Modification	Increase Train Speed	✓									✓	
	Rail Line Re-routed (Rail Eliminated)	✓	✓							✓	✓	✓
	Move Train Signals/Mod Train Control		✓							✓		
	Modify Train Operations (Change Train Times)		✓							✓	✓	✓
Pedestrian Modification	Add Ped Gates											✓
	Widen Pavement to Match Sidewalks											✓
	"Herd" Pedestrians to Designated Crossing Sites											✓
	Grade Separate Pedestrian Crossing											✓
	Eliminate Pedestrian Crossing											✓
Community Wide Program	Operation Lifesaver - Educational Programs											✓
	Move Rail-Using Businesses to Other Locations	✓									✓	
	Shift Emergency Response Routes to Other Streets										✓	