

TASK 17

---

# SAFETY AND SECURITY OPTIONS TECHNICAL MEMO

PREPARED BY: QUANDEL CONSULTANTS, LLC

APRIL 11, 2017



---

SMITHGROUP JJR . AECOM . BERGMANN ASSOCIATES . QUANDEL CONSULTANTS



North-South Commuter Rail  
Feasibility Study  
Task 17: Safety and Security Options  
Technical Memo

# Table of Contents

<b>1. INTRODUCTION AND SCOPE OF WORK.....</b>	<b>3</b>
1.1 Introduction .....	3
1.2 Scope of Work .....	3
<b>2. SAFETY CONCEPTS AND BEST PRACTICES.....</b>	<b>4</b>
2.1 Industry (Safety Management System Approach).....	4
2.2 Railroads .....	5
2.3 Recommendations for North-South Commuter Rail .....	6
<b>3. SECURITY CONCEPTS AND BEST PRACTICES .....</b>	<b>8</b>
3.1 Industry.....	8
3.2 Railroads .....	8
3.3 Recommendations for North-South Commuter Rail .....	9
<b>4. CAPITAL AND OPERATING COST ESTIMATES.....</b>	<b>10</b>
4.1 Capital Cost Estimate.....	10
4.2 Operating Cost Estimate .....	10
<b>APPENDICES.....</b>	<b>10</b>
APPENDIX 1: SOURCE DOCUMENTS AND REFERENCES-SAFETY.....	10
APPENDIX 2: SOURCE DOCUMENTS AND REFERENCES-SECURITY .....	11

# 1. INTRODUCTION AND SCOPE OF WORK

## 1.1 Introduction

The North-South Commuter Rail Project, (WALLY), is a proposed 27-mile long commuter rail operation on existing tracks that would provide service between Ann Arbor and Howell, with intermediate stops along the way. It has been embraced by a number of public and private organizations in Washtenaw and Livingston counties as a way to expand commuting options in a rapidly growing part of southeast Michigan along the US 23 corridor. The Ann Arbor Area Transportation Authority (AAATA) has taken on the role as the “designated authority” for studying and developing the concept.

This report is one of the deliverables in a feasibility study, now underway, which will determine in detail the costs of the project and the estimated number of future riders. It will also define the organization needed to build and operate the service, and the prospects for establishing a funding source for the service. It will help drive the community’s decision about moving forward with the project.

Safety and security are two separate but closely related disciplines which must be addressed by commuter railroads. Safety is defined as the freedom from *accidental* injury or damage. Security is defined as the freedom from *intentional* injury or damage. Commuter railroad safety is primarily under the jurisdiction of the Federal Railroad Administration (FRA). Commuter railroad security is primarily under the jurisdiction of the Transportation Security Administration (TSA).

## 1.2 Scope of Work

Quandel Consultants is serving as sub-consultant to SmithGroupJJR, the project prime consultant to implement the following work scope as defined in the contract documents:

### *Task 17-Safety and Security Concepts*

*Capital and operating plans, including cost estimates, shall incorporate safety and security elements and practices consistent with current best practices in the transit industry.*

#### *17.1 Safety and Security Concepts*

*Prepare a report defining safety and security options and make recommendations for implementation on the proposed system.*

#### *Deliverables:*

- 1. Submit draft recommendations on safety and security options.*

*2. Following review meeting, refine and submit final recommendations on safety and security options.*

## **2. SAFETY CONCEPTS AND BEST PRACTICES**

### **2.1 Industry (Safety Management System Approach)**

The Rail Safety Improvement Act of 2008 mandated a safety risk reduction program for most railroads. Accordingly, the rail and transit industry began to change its focus on safety. Most railroads, commuter railroads and transit agencies are now adopting the Safety Management System (SMS) approach. In March 2016, the American Public Transportation Association (APTA) issued its Safety Management System Manual-Public Passenger Transportation Systems. The SMS approach, as defined in this manual, has four essential components (also termed “pillars”) which are:

#### **2.1.1 Safety Management Policy**

The safety management policy clearly states the organization’s safety objectives and sets forth the policies, procedures and organizational structures necessary to accomplish the safety objectives. It clearly delineates management and employee responsibilities for safety throughout the organization. It also ensures that management is actively engaged in the oversight of the organization’s safety performance by requiring regular review of the safety policy by a designated Accountable Executive (general manager, president, or other person with similar authority).

#### **2.1.2 Safety Risk Management**

Safety risk management requires the development of processes and activities to help the organization better identify hazards associated with its operational systems. Once identified, the safety risk associated with the potential consequence of the hazards would be evaluated. Mitigation to control the consequences or minimize the safety risk would then be instituted.

#### **2.1.3 Safety Assurance**

Safety assurance requires an organization to monitor the effectiveness of safety risk mitigations established under Safety Risk Management. Safety Assurance is also designed to ensure that the organization meets or exceeds its safety objectives through the collection, analysis and assessment of data about the organization’s performance. One of the key elements of Safety Assurance is a regular review and update of a transit agency’s SMS and overall safety plan to ensure their effectiveness.

#### 2.1.4. Safety Promotion

Safety promotion involves the training, awareness and communication that support safety. The training aspect of SMS is consistent with the statutory requirement contained in the Public Transportation Safety Program at 49 U. S. Code 5329 (d) (1) (G) for a comprehensive staff training program for operations personnel and personnel directly responsible for safety.

## 2.2 Railroads

Commuter, intercity passenger and freight railroads fall under the safety regulatory jurisdiction of the FRA as specified in Title 49 Code of Federal Regulations (CFR) Part 209 (Appendix A). The North-South Commuter Rail Project lies within FRA's Region 4 which is based in Chicago, Illinois.

The majority, but not all, of FRA's safety regulations applicable to railroads including commuter railroads are contained in 49 CFR Parts 200-272. However, regulations concerning Drug and Alcohol Control are contained in 49 CFR Part 40.

Although the Federal Transit Administration (FTA) is active in funding improvements for commuter rail systems and has recently proposed new safety regulations (49 CFR Part 673) for rail transit operations, commuter railroads remain under FRA's jurisdiction as prescribed in 49 CFR Part 209. Commuter railroads are not subject to the requirements of 49 CFR Part 673 and the requirement to submit a Public Transportation Agency Safety Plan.

In recent years, most commuter railroads have voluntarily adopted a System Safety Program Plan (SSPP) that follows the guidelines established by APTA. APTA's Manual for the Development of System Safety Program Plans for Commuter Railroads, contains 21 elements which generally follow the SMS approach.

Working with APTA, FRA issued its Collision Hazard Analysis Guide: Commuter and Intercity Passenger Rail Service (October, 2007). However, due to widespread railroad concerns that hazard information developed using the FRA Collision Hazard Analysis could be obtained through legal discovery processes and used against the railroads in litigation, most railroads did not prepare the collision hazard analysis as proposed.

On September 12, 2012, FRA published a Notice of Proposed Rulemaking (NPRM) at 77 FR 55372 that would require a System Safety Program for certain railroads including commuter railroads. The proposed rule included a requirement for a hazard analysis and hazard management program to mitigate or eliminate identified risks. Again, there was considerable industry resistance due to the concern for liability exposure through the discovery of program documents during litigation. As a result, issuance of the proposed 49 CFR Part 270-System Safety Program (SSP) was again delayed. However, on July 29, 2016 during the preparation of this Technical Memo, FRA issued its new Final Rule 49 CFR Part 270-System Safety Program which is applicable to all commuter railroads. The rule is effective 60 days

after the date it is published. The final rule includes the requirement for a hazard analysis and a hazard management program to mitigate or eliminate identified risks. The rule includes a very limited and narrowly defined provision designed to protect only those documents *developed solely for the purpose of developing, implementing, or evaluating a SSP*.

Commuter railroads have developed their extensive safety programs from a combination of sources. These include Federal and state regulations, industry and company standards for construction and maintenance as well as experience-based industry and railroad-specific operating and safety rules. Through the Association of American Railroads, the American Short Line and Regional Railroad Association and APTA, they have also voluntarily developed best practices in the various disciplines. Extensive capital investments have been made in rolling stock, track and structures, signals and communications and other facilities. These have occurred on the major freight railroads, regional and short lines, commuter railroads and Amtrak. Modern technology is advancing rapidly and is making many important safety improvements available to the railroads.

Due primarily to funding limitations and budget considerations, some railroads, especially short lines and start-up commuter systems, are not initially able to afford the high level of investment these improvements require. However, commuter railroads must still provide for the safety of their passengers, employees and the public. Agreements between railroads and agencies to alter facilities, change physical train operations, modify operating rules and make smaller capital investments can be effective in achieving the needed safety improvements. This is the process that is recommended for the North-South Commuter Rail Project.

## **2.3 Recommendations for North-South Commuter Rail**

The North-South commuter rail service is proposed to operate over a 28.4-mile route between Howell and Ann Arbor, Michigan. Most of the route is owned by MDOT which contracts with the Great Lakes Central Railroad (GLC) for operations and maintenance. The southern section of the route, beginning near Barton Road north of Ann Arbor, is owned and operated by the Ann Arbor Railroad. (NOTE: It has been suggested that the Ann Arbor Railroad may consider leasing the southern section of the route to MDOT or GLC, so that the proposed new service would be operated over a single carrier's track. Although the new service is proposed to operate over a distance of 28.4 miles, the actual amount of track and right-of-way needed for the project would be approximately 30.1 miles.)

Under the arrangement proposed above, the North-South commuter rail system would conduct its operations over the track dispatched and maintained by GLC, the host railroad. Accordingly, GLC's operating rules, amended as necessary to accommodate the new commuter system, would apply to North-South train operations. The North-South Commuter Rail Project has been in active consultation with the FRA and is currently following the FRA's New Starts Checklist as it advances the planning process. A substantial amount of careful coordination and cooperation with GLC will also be required to meet all of the applicable safety requirements and develop an SSPP.

Another task of this feasibility study recommends the creation of a governance organization to further develop the N-S Rail Service concept. The recommendation calls for an exploratory organization or committee composed of all the communities served by the project. Among its many early activities, it is recommended that the new governing organization begin the development of the SSPP at its earliest opportunity. This is important because the SSPP must be first be approved by FRA. There are also many long lead time items that must be addressed and accomplished in the initial service planning. One of the first steps in that process would be to increase communications with FRA's Region 4 field staff. An important second step would be to further utilize the FRA's New Starts Worksheet to identify the specific requirements that must be included in the detailed safety planning for the project. While the worksheet is not all encompassing, it is exceptionally useful in identifying regulatory requirements for staff who may have limited experience in handling such matters. FRA staff should be kept updated on progress and should be consulted on any questions or issues that may develop as the project advances.

Even though the North-South Commuter Rail Project is a small start-up system, it must still make major capital improvements to enable it to begin operations. These infrastructure and system improvements would be integral parts of the SSPP. Differing combinations of improvements have been incorporated in the capital and operating plans for each of the specific service plan options.

Depending on the final service plan option selected, the infrastructure improvements could include:

- Constructing commuter rail maintenance and layover facilities.
- Constructing new commuter rail stations and office facilities.
- Upgrading the GLC main track with tie replacement, track surfacing and alignment as well as derails to prevent freight intrusion at both the north and south ends of the system.
- Installing switch heaters at controlled switches for snow and ice melting to keep track switches operational during winter.
- Upgrading bridges.
- Upgrading pavement and warning systems at selected rail-highway grade crossings.
- Installation of a Centralized Traffic Control (CTC) operating system and associated communications capabilities.
- Installation of a Positive Train Control (PTC) system and associated communications capabilities.
- Expansion of the existing two-way railroad radio communication system from the railroad's control center, installation of equipment-based radios for locomotives, cab control cars, vehicles, track machines and highway maintenance vehicles and the purchase of portable two-way radios for use by train crews and other personnel involved in operations and maintenance.

Beyond these improvements, no further capital investments for major safety systems are anticipated. However, other safety costs have been included in the proposed operating costs. Please refer to Section 4 below (Effects on Capital and Operating Cost Estimates) for further information.



## 3. SECURITY CONCEPTS AND BEST PRACTICES

### 3.1 Industry

Prior to the events of 9/11, many commuter rail security plans followed the Transit System Security Program Planning Guide issued by the Federal Transit Administration in January 1994 and updated in 1997. FTA's requirement for a System Security Plan (49 CFR §659.21) does not apply to commuter railroads. Instead, under the Department of Homeland Security, the Transportation Security Administration (TSA) has jurisdiction over most security aspects of commuter rail operations (49 CFR Part 1580 Subpart C). To assist transit agencies and commuter railroads, APTA published its Recommended Practice entitled "Security Planning for Public Transit" (APTA SS-SIS-RP-011-13 March 26, 2013). This document is used by commuter railroads to develop their Security Emergency Preparedness Plans (SEPP).

### 3.2 Railroads

While some transportation facilities such as ports and airports have defined perimeters which can be protected and hardened enabling only strictly controlled access, railroads do not. Security for freight, passenger and commuter railroads presents many challenges not common to ports and airports. Railroad tracks, like highways, stretch over many miles of varying terrain through urban, suburban and rural environments.

Especially in rural areas, there may be no barriers to entry onto railroad property. Even where the right-of-way may have fencing and warning signs at key locations, public and private grade crossings as well as highways, streams and rivers may cross a rail route and provide unrestricted access to railroad property. Constructing infrastructure consisting of barriers, fencing, locked gates, security lighting, cameras, intrusion detection and alarm systems and the necessary communications capability to secure the entire right-of-way are both impractical and cost prohibitive.

TSA's regulations applicable to commuter rail carriers (49 CFR Part 1580 Subpart C) are much less restrictive than those applicable to the freight railroads. However, each commuter railroad must have a designated primary and at least one alternate Rail Security Coordinator (RSC) appointed at the corporate level, which are available to TSA on a 24 hours/day, seven days/week basis. The RSC also coordinates security practices and procedures with appropriate law enforcement and emergency response agencies. In addition, each commuter railroad must have a procedure for immediately reporting significant security concerns (in any of 10 different specific categories) to DHS's Freedom Center.

In accordance with 49 CFR Part 1520, certain information about railroad facilities, infrastructure and operations is classified as Security Sensitive Information (SSI). As such, it must be designated, marked and controlled. SSI is not subject to disclosure under the Freedom of Information Act (FOIA).

Commuter railroads find themselves balancing the need for secure infrastructure and operations against the limited resources available. As a result, while complying with best practices and regulatory requirements, commuter railroads and their freight railroad partners have had to devise additional best practices to provide a level of security commensurate with the relative levels of risk that may exist. This is the approach that is recommended for the North-South Commuter Rail Project.

### 3.3 Recommendations for North-South Commuter Rail

The North-South Commuter Rail Project is defined by the following physical and operational characteristics relative to the provision of system security:

- Small start-up operation with most facilities located in a primarily rural environment.
- Route is not in or near a High Threat Urban Area (HTUA) as defined in 49 CFR 1580-Appendix A.
- Route is not part of the Strategic Rail Corridor Network (STRACNET).
- Operation would be over the State of Michigan owned property of the host freight railroad-GLC, based in Owosso, MI and State of Michigan or GLC leased property of Watco Companies, LLC, a shortline railroad holding company based in Pittsburgh, KS.
- All proposed options involve a low frequency of commuter train operations.
- Freight train operations on the route are normally limited to one or two round trips per day.
- No current sources of funding for capital and operating expenses have yet been identified.

In accordance with the assessment above, it is recommended that the governing organization responsible for developing North-South Commuter Rail Service follow a four-part approach to accomplish system security:

- Consult with TSA and comply with the appropriate TSA security regulations contained in 49 CFR Parts 1520 and 1580 discussed above.
- Prepare a System Security Program Plan appropriate to the size of the proposed operation using the format contained in APTA's Recommended Practice "Security Planning for Public Transit" discussed above.
- Construct the limited capital investments prescribed for each option to meet the security needs for the start-up operation. These improvements include security fencing, gates and lighting for maintenance and layover facilities as well as warning signs posting the right-of-way and specific areas such as maintenance and layover facilities and stations as railroad or agency property.
- Coordinate with and utilize local law enforcement agencies to provide first responder security capability for the project.

The four recommendations listed above have been incorporated in the capital and operating plans for each of the specific service plan options. Beyond the minimum security improvements incorporated in each of the service plan options, no further capital investments for security systems are anticipated. However, the future system designers may reassess the security threat based on conditions at the time

to recommend the installation of security elements such as CCTV systems, emergency call boxes, public address systems, security fencing and enhanced lighting, particularly in passenger station facilities. Please refer to Section 4 below (Capital and Operating Cost Estimates) for further information.

## 4. CAPITAL AND OPERATING COST ESTIMATES

### 4.1 Capital Cost Estimate

The capital costs for the physical improvements related to safety and security included in each of the specific service plan options have been included in the capital cost estimate for that option. Please refer to the Technical Memo for Task 10: Capital Costs dated November 4, 2016.

### 4.2 Operating Cost Estimate

The operating costs to meet safety and security requirements for each of the specific service plan options have been included in the operating cost estimate for that option. These costs include:

- Pre-employment and employee background checks.
- Alcohol and drug testing program requirements.
- Safety and security training including preparation of required safety and security plans.
- Locomotive engineer and conductor training, qualification and certification.
- Training for maintenance personnel-all crafts.
- Financial security measures related to the revenue and accounting systems. Please refer to the Technical Memo for Task 11: Detailed Long Term Operating Costs dated November 4, 2016.

## APPENDICES

### APPENDIX 1: SOURCE DOCUMENTS AND REFERENCES-SAFETY

Text Reference	Source Document	Date Issued
Rail Safety Improvement Act (RSIA 2008)	Public Law 110-432 Rail Safety Improvement Act of 2008	October 16, 2008
Safety Management System Manual-Public Passenger Transportation Systems	American Public Transportation Association	March 2016
Public Transportation Safety Program 49 U. S. Code 5329 (d) (1) (G)	Moving Ahead For Progress in the 21 <sup>st</sup> Century Act (MAP-21) Section 20021, 49 U. S. Code 5329 (d) (1) (G)	July 6, 2012

Federal Railroad Administration 49 CFR Part 209-Railroad Safety Enforcement Procedures	Chapter II Title 49 Code of Federal Regulations –Transportation	Revised October 1, 2015
49 CFR Part 40-Procedures for Transportation Drug and Alcohol Testing Programs	Chapter II Title 49 Code of Federal Regulations-Transportation	Revised October 1, 2015
49 CFR Part 673- Public Transportation Agency Safety Plan	Notice of Proposed Rulemaking- Proposed Rule to be added to Chapter II Subtitle B of Title 49 CFR Part 673-Federal Transit Administration (NPRM) at 81FR 6344	February 5, 2016
Manual for the Development of System Safety Program Plans for Commuter Railroads	American Public Transportation Association-Washington, DC.	May 15, 2006
Collision Hazard Analysis Guide: Commuter and intercity Passenger Rail Service	U. S. Department of Transportation Federal Railroad Administration Office of Safety	October 1, 2007
49 CFR Part 270-System Safety Program-NPRM	Notice of Proposed Rulemaking- Proposed Rule to be added to Chapter II, Subtitle B of Title 49 CFR Part 270-Federal Railroad Administration (NPRM) at 77 FR 55372	September 7, 2012
49 CFR Part 270-System Safety Program Plan-Final Rule	Federal Railroad Administration- Announcement of issuance of final rule to be effective in 60 days.	July 29, 2016
New Starts Worksheet	U. S. Department of Transportation Federal Railroad Administration Office of Safety Passenger Rail Division	May 1, 2012

## APPENDIX 2: SOURCE DOCUMENTS AND REFERENCES-SECURITY

Text Reference	Source Document	Date Issued
System Security Plan 49 CFR 659.21	Chapter II Title 49 Code of Federal Regulations Part 659-Federal Transit Administration	April 29, 2005
49 CFR 1580 Subpart C -Rail Security Coordinator -Reporting Significant Safety Concerns	Title 49 CFR Subtitle B Chapter XII Subchapter D Part 1580-Rail Transportation Security Subpart C-49 U.S. Code 114	November 26, 2008
Security Planning for Public Transit	American Public Transportation Association-Recommended Practice APTA SS-SIS-RP-011-13	March 26, 2013

49 CFR 1520- Protection of Sensitive Security Information	Title 49 CFR Subchapter B Security Rules for All Modes of Transportation-Part 1520	August 18, 2011
49 CFR 1580-Appendix A High Threat Urban Area (HTUA)	Title 49 CFR Subtitle B Chapter XII Subchapter D Part 1580-Rail Transportation Security Subpart C-49 U.S. Code 114	May 20, 2009
STRACNET	Strategic Rail Corridor Network (STRACNET) and Defense Connector Lines-Military Traffic Management Command Transportation Engineering Agency	December 1998



