TCRP Research Report 193
“Tools and Strategies for Eliminating Assaults Against Bus Operators”

Presentation to HART Board of Directors
Presented by Bill McCloud, Vice-President & COO, McCloud Transportation and Member of Transportation Cooperative Research Program (TCRP) TOPS Committee

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Overview of TCRP

Transit Cooperative Research Program (TCRP)

- The Transportation Research Board (TRB) is one of 7 major programs of the National Academies of Sciences, Engineering, and Medicine.

- TRB’s mission is to increase the benefits that transportation contributes to society by providing leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary and multimodal.

- TRB annually engages 7,000 engineers, scientists and other transportation researchers and practitioners from the public and private sectors and academia, who contribute their expertise.

- TCRP serves as one of the principal means by which the transit industry can develop innovative near-term solutions.
Overview of TOPS Committee

TCRP Oversight and Project Selection (TOPS)

• It is the responsibility of the TOPS Committee to formulate the research program by identifying the highest priority projects

• As part of the evaluation, the TOPS Committee defines funding levels and expected products

• Once selected, each project is assigned to an expert panel appointed by TRB. The panels prepare project statements/RFP, select contractors, and provide technical guidance and counsel throughout the life of the project
Tools and Strategies for Eliminating Assaults Against Transit Operators

Volume 1: Research Overview
Contributors to TCRP Report 193

- Countermeasures Assessment and Security Experts, LLC
- Transportation Resource Associates, Inc.
- Transit Cooperative Research Program
- Transportation Research Board
- National Academies of Sciences, Engineering, and Medicine
- Transit Labor Unions
To develop a practical toolbox for transit agencies to prevent and mitigate assaults against transit operators.
Research Approach

• A focused review of existing literature was conducted
• A series of interviews with subject matter experts were conducted to provide the foundation for the development of customizable, scalable, issue-specific risk analysis instruments and risk management tools that can perform both “what if” and “trade-off” decision-making for users
Research Tasks

**TASK 1**
LIMITED, FOCUSED LITERATURE REVIEW OF TYPE 2 WORKPLACE VIOLENCE

**TASK 2**
MICROANALYSIS
INCIDENT BASED THREAT ANALYSIS

**TASK 3**
MACRO ANALYSIS
ROUTE BASED VULNERABILITY ANALYSIS

**TASK 6**
UNIT COST ANALYSIS

**F-21**
TRANSIT OPERATOR ASSAULTS

**TASK 5**
COUNTERMEASURES AND STRATEGIES

**TASK 7**
RISK MANAGEMENT
DECISION MAKING

**TASK 4, 8, 11:** INTERIM/FINAL REPORTS

**TASK 9 & 10:** USER GUIDE

**PREVENTION**

**MITIGATION**
There are two major deliverables of the research:

1. a comprehensive and detailed listing of potential countermeasures and strategies available to prevent or mitigate assaults against transit operators;
2. a practical operator assault risk management toolbox that includes:
   - Vulnerability Self-Assessment tool that allows an agency to assess the specific strengths and weaknesses of its operator assault posture,
   - Route-based risk calculator that produces scores identifying assault risk across the system that is also usable to evaluate risk on a route-based level
   - Route-Comparison Summary Table which brings together vulnerability and risk information in an easy-to-interpret format, and

The deliverables also include this research overview that documents the entire research effort and outlines the research results.
Definition of Operator Assault

National Transit Database (NTD) defines assault as “an unlawful attack by one person on another.”

NTD’s definition does not provide a complete representation of all types of assaults (i.e. harassment, verbal abuse, and injuries that do not require transport from the scene). It captures those assaults that are more likely to result in a physically or emotionally-compromised or debilitating operator condition.
Causes of Operator Assault

Contributing Factors of Assault

- Fare enforcement
- Intoxicated passengers or drug users
- Other rule enforcement
- School/youth-related violence
- Individuals with mental illness
- Routes operating in high-crime areas
- Service problem (delays, service reductions, etc.)
- Gang-related violence
- Cash transactions

Source: TCRP Synthesis 93: Practices to Protect Bus Operators from Passenger Assault

- Causes and contributors to operator assault vary widely.
- FTA found in an analysis of NTD that the most likely causes of operator assaults are fare disputes (44%), rules disputes (18%), and verbal argument escalation (12%)
- For agencies operating rail systems, FTA found the most likely causes are rules dispute (35%), followed by waking a sleeping patron (29%), and patron unhappy with service (10%)
- TCRP Synthesis 93 confirmed the FTA assessment, concluding that the primary factors contributing to operator assaults were fare enforcement and intoxicated passengers or drug users, followed by rule enforcement other than fare enforcement
The assault type considered to be most problematic for agencies was verbal threats, intimidation, or harassment.

This result mirrors those of workplace violence studies that indicate that verbal attacks are the most common form of workplace violence. The next most problematic assault type was spitting.

<table>
<thead>
<tr>
<th>Problematic Assault Type</th>
<th>%</th>
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<tbody>
<tr>
<td>Verbal threats/intimidation/harassment</td>
<td>81</td>
</tr>
<tr>
<td>Assaults involving spitting</td>
<td>60</td>
</tr>
<tr>
<td>Assaults involving projectiles thrown at the bus</td>
<td>38</td>
</tr>
<tr>
<td>Assaults involving projectiles thrown inside bus</td>
<td>26</td>
</tr>
<tr>
<td>Assaults while vehicle is in motion</td>
<td>9</td>
</tr>
<tr>
<td>Assaults due to operator race/gender/size</td>
<td>5</td>
</tr>
<tr>
<td>Simple assault</td>
<td>3</td>
</tr>
<tr>
<td>Assaults involving weapons</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total Responses** 58

Source: TCRP Synthesis 93
Interventions with Deterrent Effects
## Effective Countermeasures to Preventing Assaults

<table>
<thead>
<tr>
<th>Category</th>
<th>Countermeasure</th>
</tr>
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</table>
| **Physical Controls** | - Barriers (partitions) between drivers and passengers
  - Left-side driver exit doors
  - Security cameras to discourage violent behavior and identify the perpetrator if an assault does occur
  - Silent alarms and radio communication to allow drivers to safely request help
  - Vehicle tracking devices, such as a global positioning system (GPS), to locate a driver in distress
  - Improved interior and bus stop lighting to allow the operator to be aware of passenger behavior |
| **Procedural Controls** | - Cashless fare collection
  - Elimination of operator enforcement responsibilities
  - On-board police presence and/or increased police patrols and stops
  - De-escalation training and procedures |
| **Policy Measures**     | - Cooperation with police
  - Work rules/policies/procedures
  - Signage
  - Prosecution of offenders
  - Management support/media campaigns
  - Zero tolerance/suspension of service
  - Community/school outreach, committees
  - Legislation increasing penalties |
| **Communications**      | - On-board technologies facilitating communication with supervisors and responders, and fast response to incidents
  - Surveillance systems
  - Improvements in communication between the Operations Control Center staff, operators, and police |
Toolbox Overview

Agency Self-Assessment

- Gaps
- Recommended Approaches

Route-Based Risk Calculator

- Prioritization

Countermeasures

- Options
- Usage Examples
Tools And Strategies

Vulnerability Self-Assessment Tool is comprised of 7 dimensions of countermeasures that an agency can deploy to decrease the risk of bus operator assault:

- Category 1: Policies, Plans and Protocols
- Category 2: Police or Security Staffing
- Category 3: Voice Communications Technology
- Category 4: Data Communications and Telemetry Systems
- Category 5: Surveillance and Observation Systems
- Category 6: Driver Protection Systems
- Category 7: Training
Countermeasures Catalog Categories (7)

• **Category 1: Policies, Plans and Protocols** - Written documents and working protocols that specifically describe the agency’s security approach for preventing, reducing or mitigating operator assaults.

• **Category 2: Police or Security Staffing** - Adding personnel for any purpose is often the most costly operating expenditure that the agency will face. It is therefore prudent for transit agencies to be thorough and diligent in determining security personnel requirements. Determining the necessity for security personnel or the extent to which forces should be deployed on board transit vehicles can be loosely estimated based primarily on issues such as size, population served and operating locale. Statistics support a view that transit systems operating in high density population areas are likely at higher risk of crime or disorder than more rural systems.
• **Category 3: Voice Communications Technology** - Communication is the transfer of information and some means of ensuring that what is sent is also received. New technology increases the ways in which information can be communicated. Typically radios have been deployed to enable two way communications about operating conditions. Advanced communications cover digital video & voice, computer graphics, and systems & applications. Newer systems require some infrastructure and cover network-based, web based and wireless based control and monitoring functions.

• **Category 4: Data Communications and Telemetry Systems** - More advanced technologies now exist that can be used to enable better communications between drivers and their station. These technologies include: Mobile Data Terminals (MDT), Automatic Vehicle Locators (AVL), Global Positioning System (GPS) units and emergency alert buttons.
• **Category 5: Surveillance and Observation Systems** - Generally designed to attain complete or nearly complete coverage of identified space in a defined area using closed-circuit television or CCTV’s. Digital video surveillance is an appliance that enables embedded image capture capabilities that allow video images or extracted information to be compressed, stored or transmitted over communication networks or digital data link.

• **Category 6: Driver Protection Systems** - Physical (engineering) controls that are aimed at making it difficult or impossible for an attacker to inflict harm on an operator and are incorporated into the design of the bus itself or added later as an upgrade.

• **Category 7: Training** - An organized activity aimed at imparting information and/or instructions to improve the recipient's performance or to help him or her attain a required level of knowledge or skill. Training can help operators to handle situations when they arise.
Toolbox Benefits

**Speed** – The agency evaluation can be completed swiftly using data that are readily available.

**Clarity** – Direct, step-by-step instructions guide agency personnel on completing the assessment.

**Simplicity** – No extensive research is necessary to make use of the tools; pre-weighted countermeasure and assault risk inputs to the agency evaluation system reflect the latest industry research on bus operator assaults.

**Flexibility** – The tools can be implemented on an agency-wide or route-based level, and provide actionable results no matter the size of the transit system.
Summary of Toolbox Contents

- Incident-based threat assessment response protocol and evaluation methodology
- Practical, scalable, and adaptive route-based self-assessment tool
- Comprehensive, detailed listing of potential countermeasures and strategies
- Unit cost analysis of identified countermeasures and strategies
- Descriptive numerical rating system to support risk management decision-making
- User’s Guide
  - Information about security methods, systems and countermeasures currently deployed by transit systems to reduce operator assault-related vulnerabilities
  - Identification of integrated security practices and solutions that have maximum utility for small, medium, and large-sized transit agencies
  - Description of transportation security planning processes covering goal setting, prioritization of activities, roles and responsibilities, applying countermeasures and strategies to reduce risk.
  - Best practices for reporting crime, offenses and incidents to management, employees, system users, State and federal agencies
CATS employs a multi-agency team approach to system security and operational safety. The team is comprised of:

- CATS general manager
- CATS safety and security team
- Charlotte Police Department
- Mecklenburg County Sheriff’s Department
- Outlying municipal police departments

Full team participated in the discussions with the research team and in the completing the self-assessment instrument.
CATS Pilot Lessons Learned

• The self-assessment instrument is a good mechanism for an agency to look closely at all the facets of an agency’s operations that can reduce bus operator vulnerabilities to assault.

• The self-assessment instrument is straightforward to use.

• CATS does well on most dimensions of the self-assessment. However, there are some notable areas with the opportunity to improve:
  – It highlighted areas where they are trading-off operating vs. capital expenses.
  – It raised questions related to Agency policy of implementing all countermeasures system-wide vs. route-based implementation.
Final Thoughts

• Transit operators are frontline ambassadors for the transit agency

• The safety of operators and customers is paramount to providing optimal transit service to the community

• TCRP Research Report 193 is a valuable resource for evaluating policies and risk
Statement From TCRP

“I am so sorry to learn of the brutal stabbing and death of Mr. Thomas Dunn. Our prayers are with both his biological and HART families, friends and the Tampa community.”

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