ADVANCING PUBLIC SAFETY OUTCOMES THROUGH NONTECHNICAL TRAINING

FOR U.S. TRANSPORTATION EXECUTIVES: AN EXPLORATORY QUALITATIVE

STUDY

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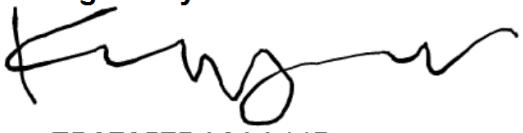
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Abstract

This study evaluates the effectiveness of nontechnical skills training for the U.S. public transportation executives and its connection to executive competencies, leadership, and, in turn, public safety outcomes. Prior research highlights the importance of nontechnical skills as essential components of executive competency in transit agencies. Extant research also emphasizes the value of transformational leadership, which draws heavily on nontechnical skills, as opposed to transactional leadership, which relies on structured rules. Despite this recognition, nontechnical skills training for transit executives remains limited in practice, even though such training is critical for ensuring safety and organizational effectiveness. Furthermore, there is only limited empirical research that examines how nontechnical skills training influences executive competencies and leadership traits, and in turn, impacts safety outcomes in the public transit industry.

In order to address this lack of context-specific research, this study employs a qualitative research design and conducts semi-structured interviews with 12 transit professionals. A qualitative design is chosen as it is best suited for an in-depth exploration of public transportation executives' lived experiences regarding the role of nontechnical skills training in enhancing safety oversight. Specifically, the research explored how the executive competency and leadership traits gained from nontechnical skills training impacted transit executives' ability to ensure public safety and how the executives evaluate the effectiveness of nontechnical skills training. Sentiment and thematic analysis were also applied to identify patterns across participants' experiences.

Results of this study revealed that accountability, communication, education, emotional intelligence (later integrated into collaboration), and ethical leadership (later integrated into

engagement) are the most important for effective transit executives' nontechnical competencies and leadership. Moreover, transformational leadership, gained from nontechnical skills training, was found to be aligned most strongly with organizational decision-making and improved safety oversight. These findings highlight the importance of integrating nontechnical skills training into executive leadership development programs. This study also found that the outcome-based education (OBE) framework works best with nontechnical training, as it provides a structured way to design learning objectives, evaluate skill acquisition, and determine whether training produces executive competency and transformational leadership that ultimately support public safety in transit organizations.

Taken together, these results contribute to both practice and scholarship. The findings offer implications for policy reform, executive training standards, and outcome-based evaluation, contributing to a broader discourse on executive skills development in the public transportation industry. The study also advances the literature by providing empirical evidence on how executive nontechnical skills development supports safety culture and operational integrity across U.S. transit systems.

Keywords: nontechnical skills training, executive competencies, transactional leadership, transformational leadership, transit industry, public transportation organizations, outcome-based training, public safety.

Dedication

I dedicate this dissertation to Tyniesha Braxton, my wonderful wife of 29 years, who provided the endless encouragement and support necessary to manage this dissertation challenge. Tyniesha endured the many hours of my commitment to this research study, demonstrating her patience and understanding, and subsequently made my earning this Doctorate in Business Administration a reality by keeping me focused on the goal. She made this achievement possible. Thank you, and I love you.

To my family and friends, I would like to thank them for their unwavering support and help throughout my life and professional career. To my daughters, Miranda, Ashley, Amber, and Alexis, who constantly keep me grounded while celebrating with me along the way. To my mother-in-law, Gladys Pleasant, for being the bond of it all!

To my late grandparents, Francis Braxton and Eva Braxton (both deceased), I thank them for instilling in me the passion for the sciences. As African Americans, they demanded nothing less than taking full responsibility for their actions at a time when their own rights and the rights of others were not yet considered equal.

To my parents, Joyce Hall (deceased) and Ray Hall, who adopted those virtues. Later in life, after raising five children, my mother, with my dad's support, would be the first in many generations to attend and graduate from college. Even through the tough times of her illness, she felt compelled — and maybe inspired —to accomplish her dreams in higher education (a master's degree in accounting). This has allowed a kid like me to dream bigger than my humble beginnings, which included being raised on the south side of Baltimore City and attending underfunded public schools. A very big thank you to you all – you may never realize how much it all meant!

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To the Marymount University Faculty and Staff

I am incredibly grateful to the faculty and staff at Marymount University for allowing me to achieve my educational goals through their dynamic Doctor of Business Administration program, which I consider an excellent academic program. My sincere appreciation and special thanks to Dr. Darrell Burrell, Ph.D., for advising me about the development of the dissertation research. His affable attitude towards research set the bar and was an excellent example for me.

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CHAPTER 1. INTRODUCTION

Executive competency is very important for keeping the nearly 6.2 billion annual transit riders safe in the United States, especially at a time when public transportation agencies face workforce skill shortages (Miley, 2020). As transit organizations evolve to meet growing demand, executives are increasingly asked not only to make sure that their operations run smoothly on a daily basis but also to anticipate and mitigate new safety risks. The enactment of the Bipartisan Infrastructure Law (BIL) in 2021, which allocates $108 billion to federal public transportation programs, underscores the federal government's commitment to reinforcing state agencies' safety oversight capabilities (Bipartisan Infrastructure Law, 2023). By allocating substantial resources to State Safety Oversight (SSO) functions, the BIL recognizes that executive competency is necessary to turn financial investments into tangible safety outcomes.

Despite this significant infusion of funds, the current regulatory framework governing transit safety oversight is mostly silent on executive training requirements that can influence executive competencies, and in turn, executive leadership and organizational performance. It is also silent on how such training requirements need to be evaluated. For example, existing regulations emphasize procedural compliance, such as periodic review of safety management systems, but do not mandate the development of skills necessary to align organizational performance with Vision Zero strategies (Developing the Safety Management Policy Statement, 2019). Vision Zero, which seeks to eliminate all traffic fatalities and severe injuries, demands visionary leadership that promotes a culture of accountability, continuous learning, and cross-sector collaboration. Without explicit training standards that fit such leadership, executives may lack exposure to best practices in risk communication, ethical decision-making, and adaptive leadership that are vital to operationalizing a zero-fatality agenda.

The lack of adequate executive skills training is particularly concerning given evidence that deteriorations in executive leadership can precipitate adverse organizational outcomes, including increased accident rates and weakened safety cultures (Christopher, 2023). Moreover, transit-related incidents place a disproportionate burden on vulnerable riders, thereby exacerbating existing social inequities (He et al., 2025). Leaders who are unprepared to navigate complex regulatory environments or to engage effectively with frontline staff may inadvertently undermine safety initiatives.

Furthermore, it is worth noting that the rapid pace of technological innovation from automated vehicle systems to advanced data analytics further raises the bar for executive competencies in risk assessment and change management. With the ongoing adoption of new technologies in transit agencies, executives need to have not only a technical understanding but also the capacity to make sound strategic decisions that support organizational change and sustain stakeholder trust. Institutionalizing executive skills training standards that address not just technical but also nontechnical dimensions would enable policymakers to ensure that federal investments in infrastructure and oversight are matched with leaders equipped with the strategic vision and interpersonal acumen needed to advance zero-fatality goals

In line with this view, prior research identifies nontechnical skills such as communication, ethical decision-making, and emotional intelligence as core components of executive competency in transit agencies. Transformational leadership, which depends heavily on these skills, is viewed as more conducive to organizational effectiveness than transactional, rule-based approaches. Yet, nontechnical training for transit executives remains limited, and empirical evidence on how such training shapes executive competencies and leadership, and in turn, influences safety outcomes, is still sparse.

This introduction sets the stage for a comprehensive examination of how nontechnical training enhances executive competency, improves leadership, and ultimately supports public transportation safety, while also extending the conversation to approaches for evaluating such training. Subsequent sections will review the theoretical foundations of leadership development, analyze existing regulatory mechanisms, and present an outcome-based training evaluation model aligned with Vision Zero principles. By addressing the current gap in practice and literature, this study aims to inform policy reforms that enhance transit executives' capacity to lead safety initiatives and advance the literature on executive nontechnical skills training in the transit industry.

Background of the Study

Although technical safety training, especially training for frontline employees, has been emphasized continuously, there is a significant gap in *executive* training inside transit agencies. This deficiency is surprising, because while technical training provides frontline workers with operational skills to manage daily safety responsibilities, executives need to have nontechnical skills training to guide strategic decision-making, promote a safety culture, and align organizational priorities. The Federal Transit Administration (FTA) Public Transportation Safety Certification Training Program (PTSCTP) establishes minimum safety training requirements for personnel involved in the safety oversight of public transportation systems. However, since 2023, executives representing 64 rail transit agencies have experienced underrepresentation within the scope of the national training policy mandate for designated personnel, indicating a potential gap in equitable access to standardized nontechnical skills training (PTSCTP, 2025). This lack of nontechnical skills training for executives could hinder the effective implementation

of safety goals, as safety outcomes are closely related to executives' competencies and their leadership.

To understand how nontechnical training influences executive skills and leadership, it is necessary to first explore different leadership styles. Prior research suggests that transformational and transactional leadership are two of the most significant and widely examined leadership styles in the context of public administration and transportation management (Bass & Avolio, 1994; Van Wart, 2013). Research comparing these leadership styles shows that transformational leadership, which empowers and motivates followers, positively influences executives' commitment and performance quality, whereas transactional leadership, which focuses on structured tasks and rewards, may suppress commitment and hinder productivity (Bass, 2003; Kumar, 2014; Masi & Cooke, 2000). Improving transformational leadership through nontechnical training within transit agencies could help executives make decisions that are more in line with safety goals, thereby ensuring more effective, safer public transportation systems. In other words, addressing the gap in executive training by emphasizing nontechnical training could be critical to enhancing safety and productivity in public transportation.

Problem Statement

The U.S. public transportation industry has experienced a troubling decline in safety culture, with 322 fatalities reported in 2021 (Statista, 2023). This figure represents an 11 percent increase from the previous year and the highest level in a decade, underscoring ongoing safety challenges and gaps in executive training, even amid reduced ridership during the COVID-19 pandemic (McElveen, 2019; Statista, 2023). Such outcomes suggest systemic weaknesses in executive skills training and leadership development that are critical to ensuring effective safety oversight and organizational reliability.

Although transformational leadership has been shown to promote collaboration, innovation, and alignment of organizational goals with public interests such as safety and service quality (Wu et al., 2008), the transit industry lacks consistent, standardized requirements for executive skills training that could promote executive competencies in these areas, and in turn, transformational leadership. Existing federal policy, including 49 CFR Part 672, mandates safety training; however, it prioritizes attendance rather than assessing training outcomes, raising concerns about the effectiveness of these programs ("Ohio Train Wreck," 2022). The absence of nontechnical skills training, particularly in accountability, communication, and education, further limits executive preparedness to address complex safety challenges (PTSCTP, 2023). These gaps are compounded by uneven implementation of outcome-based education models, raising questions about whether existing skills training programs sufficiently produce the intended outcomes—namely, equipping transit executives with the competencies needed to mitigate safety risks effectively (Takamine, 2019).

Given the practical difficulties discussed above, it is surprising that little empirical research has examined how executive competency and leadership traits, which would have been influenced by executive skills training, influence safety outcomes in public transportation (Smith & Khojasteh, 2014). Also, considering that a relationship among executive skills training, competency, leadership, and organizational performance are well studied in other business sectors, this paucity in research is even more surprising.

Although prior studies acknowledge the importance of leadership in shaping safety culture and organizational performance, prior research mostly focuses on frontline operations, technical compliance, or system-level safety metrics rather than executive decision-making and leadership development (Clarke & Ward, 2006). Leadership is frequently analyzed as just a

background factor, missing direct connections between specific executive competencies and measurable safety outcomes, as well as evaluations of how training interventions contribute to leadership effectiveness (Mitchell, Wooldridge, & Johnson, 2021).

Considering that transit executives' decisions can impact public safety directly, this gap, which includes both the lack of nontechnical skills training and limited leadership research in the transit industry, seems critical. Consequently, the current study explores the importance of executive nontechnical skills training and its implications on executive competency, leadership, and public safety outcomes. This study further investigates how such training can best be evaluated.

Statement of Purpose

The purpose of this qualitative study is to investigate the influence of nontechnical skills training on the competency and leadership of public transportation executives across the United States. It specifically examines how nontechnical skill building improves executive competencies in areas such as communication and collaboration, develops executive leadership, and ultimately contributes to strengthened organizational performance in terms of public safety within transit agencies. In doing so, this study also investigates whether outcome-based education (OBE) frameworks should be used to evaluate such nontechnical training programs. This focus illustrates how strengthening nontechnical skills and the competencies derived from them can foster responsive, ethical, and accountable leadership, better equipping executives to protect public interests within the complex context of transit safety oversight.

Employing a qualitative methodology based on phenomenology, supplemented by a grounded theory-inspired coding technique, the study analyzes the lived experiences of transit executives to uncover patterns and themes that illuminate how specific executive competency

and leadership traits gained from nontechnical skills training affect their ability to navigate safety responsibilities. This study also analyzes how they measure the outcomes of a nontechnical skills training program. The findings are intended to inform policy reform, enhance executive training standards, and promote outcome-based assessments, contributing to a broader discourse on executive skills development in the public transportation industry. In doing so, the research also advances knowledge on how executive nontechnical skills development can bolster safety culture and operational integrity across U.S. transit systems.

Research Question

While Technical Training Plans (TTPs) establish minimum training requirements for safety personnel to support Safety Management Systems (SMS) in rail transit, there is no equivalent mandate for overall public transportation executives. This gap raises concerns about whether executives possess the nontechnical skills needed to address complex safety challenges (Staes, 2017). Also, it is noteworthy that only limited empirical research has examined how executive competencies and leadership traits, powered by nontechnical training, influence safety outcomes in public transportation.

In light of this issue, the study aims to provide valuable insights into the effectiveness of nontechnical training programs for transportation executives and their ultimate role in protecting public interests. This study also explores how such training can best be evaluated, focusing on the outcome-based education (OBE) framework. As such, the research is guided by two key questions. To what extent does nontechnical skills training for transportation executives enhance executive competency and leadership in ways that protect public safety? How should the outcomes of nontechnical skills training be evaluated?

By addressing these questions, the study attempts to explore how nontechnical training can enhance executive proficiency, improve leadership development, and ultimately improve safety and organizational effectiveness in the public transportation sector. Through this research, a clearer understanding of the role of nontechnical training in the executive competency and leadership development of transportation executives can be achieved, offering insights that may lead to improved training policies and better protection of public interests within the transit industry.

Nature of the Study

The research employs a qualitative research methodology as it is best suited for an in-depth exploration of public transportation executives' lived experiences regarding the role of nontechnical skills training in enhancing decision-making and safety oversight. A phenomenological research design is selected for this study to capture the essence of participants' experiences, perceptions, and reflections on leadership development practices in high-liability, safety-sensitive transit environments.

Phenomenology is especially appropriate given the study's aim to understand how executives perceive and interpret their executive competencies and leadership in the absence or presence of nontechnical skills training. Through in-depth, semi-structured interviews, this study aims to find the core meanings behind participants' behaviors, challenges, and judgments, directly addressing the problem that current executive skills training programs often lack emphasis on the development of nontechnical skills.

Complementing the phenomenological approach, the study also employs a grounded theory method during data analysis. In other words, phenomenology is used as the overarching methodology to explore the essence of participants' lived experiences, and grounded theory

coding procedures are used as analytic techniques to structure and deepen the phenomenological analysis. Such research methodology allows this study to systematically generate emergent themes from interview data, without imposing pre-existing theoretical frameworks. The grounded theory method supports the development of an inductive understanding of the relationship between leadership traits, safety performance, and training practices across different agencies.

By supplementing phenomenology with grounded theory techniques, the study aligns its methodological choices with the research questions: To what extent does nontechnical skills training for transportation executives enhance executive competency and leadership in ways that protect public safety? How should the outcomes of nontechnical skills training be evaluated? This integrated qualitative approach provides both the depth (phenomenology) and analytical structure (grounded theory) necessary to explore the impact of nontechnical skills in complex operational dynamics in the U.S. public transportation industry.

Significance of the Study

This study contributes to both practice and literature by shedding light on the relationship among executive skills training, competency, leadership, and public safety outcomes within transit organizations. First, from a practical perspective, this study emphasizes that categorizing top-level safety professionals within organizations is essential for understanding competency development and leadership dynamics (Patton & Naji poor-Schutte, 2018). Setting appropriate educational targets can yield valuable milestones in advancing agency-wide goals grounded in conscious leadership (Tcholakian et al., 2023). This study also shows that updating executive skills training policies is critical for strengthening executive commitment to regulatory adherence (Remawi et al., 2011). Furthermore, this study demonstrates that limitations of attendance-based

training are outweighed by the benefits of outcome-based education (OBE) approaches for public transportation executives, as OBE can create clear, observable, and measurable benchmarks for training outcomes, reducing assessment uncertainty (Rao, 2020). Collectively, this study offers implications for policy reform, executive training standards, and outcome-based evaluation, broadening discourse on executive skills development in the public transit industry.

From a scholarly standpoint, this study adds to the literature by providing empirical evidence on how executive nontechnical skills development can enhance executive competencies and leadership, ultimately improving public safety. It also continues in the literature by showing how the OBE frameworks may be used to assess nontechnical skills trainings.

Assumptions

This study uses interview methods and observational data to assess the executive competencies of public transportation executives, trying to understand their performance outcomes and lived experiences deeply. As a result, the research includes baseline efforts from Human Resource Development (HRD) practitioners to identify the root causes of executive competency deficiencies. By examining these past interactions among HRD practitioners, the study facilitates cross-comparison between different public transportation types.

This phenomenological study heavily utilizes targeted interviews with transit professionals, including senior executives, to provide the data for thematic analysis, which assesses nontechnical skills training, competencies, leadership traits, and safety outcomes. Drawing on insights from Mertens and Ginsberg (2008) and Gonnerman et al. (2015), this approach tries to eliminate personal and social psychological biases related to outcome-based education, thereby ensuring a more objective understanding of the phenomena. Therefore, it is assumed that all responses in the study are given honestly, supporting a comprehensive

assessment of executive competencies and contributing to the development of more effective leadership within the public transportation sector.

Limitations

The study's limitations include potential challenges in securing participation from public transportation executives and ensuring an adequate number of participants. This study's qualitative research method, which employs semi-structured interviews, allows for open-ended responses about nontechnical skills training, competency, leadership, and training outcomes in terms of public safety. While there are no limitations on the research method itself, recruiting a sufficient number of participants remains a challenge as this study focuses on the transit industry. Additionally, the need to maintain anonymity for government officials with secret clearances, mandates the concealment of specific citations or references.

Furthermore, the views and conclusions expressed in this study are those of the author and do not necessarily reflect the official policy or position of the U.S. Department of Transportation, its operating administrations, or the U.S. Government. Nonetheless, this does not impact the trustworthiness of the findings, as all interview participants at the public transportation agency must consent, and contributor checks are conducted to ensure reliability. By addressing potential limitations, the study attempts to offer a focused and reliable analysis of nontechnical skills training for executives within U.S. public transportation systems, providing valuable insights into the impact of executive competencies and leadership, powered by nontechnical skills training, on safety outcomes.

Delimitations

This study narrows its focus to a specific research setting, concentrating exclusively on U.S. public transportation systems and their leadership, without considering non-public entities

or individual participant characteristics. It involves only senior-level executives employed or

formerly employed in the U.S. It excludes factors such as sex, age, and other personal

characteristics of participants, as well as financial comparisons between organizations. The focus

of this study is solely on assessing executive competencies and leadership traits developed

through nontechnical skills training and how they influence public safety outcomes.

Definition of Terms

The following terms are used frequently throughout the study and are based on the

following definitions:

Executive Competency.

- These are the skills, knowledge, and abilities expected from executives in the

  transportation sector, particularly those focusing on crisis decisions and actions necessary

  for effective leadership (Shaw & Harrald, 2003).

Front-line Employees.

- Personnel directly involved in the day-to-day operations of public transportation systems,

  including drivers, maintenance workers, and station staff (Artusi & Bellini, 2021).

Nontechnical Skills (NTS).

- Cognitive, social, and personal resource skills that improve technical skills, and

  contribute to safe and efficient task performance (Schreyer et al., 2021).

Outcomes-Based Education (OBE).

- An educational approach focused on achieving specific learning outcomes and

  competencies, rather than simply completing coursework or meeting attendance

  requirements (Thirumoorthy, 2021).

Public Transportation Executives.

- Senior-level executives are responsible for overseeing safety protocols, compliance with regulations, and risk management within public transportation agencies (Balog et al., 2005).

Responsible Leadership.

- A relational and ethical phenomenon, which occurs in social processes of interaction with those who affect or are affected by leadership and have a stake in the purpose and vision of the leadership relationship (Pless et al., 2022).

Safeguarding Public Interest.

- Ensuring passenger safety, regulatory compliance, and executive accountability that are measurable for oversight as a public value (Tollenaar, 2010).

Safety Management Systems (SMS).

- Systematic approaches to managing safety risks and ensuring compliance with safety regulations within organizations, including public transportation agencies (Su, 2021).

Technical Training Plans (TTPs).

- Detailed plans outlining the technical training requirements for designated safety personnel within transportation organizations, aimed at promoting the adoption of Safety Management Systems (SMS) (TTPs and workload assessments, 2016).

Transactional Leadership.

- Leadership approach emphasizing the exchange of rewards and punishments to achieve compliance and meet organizational goals, often focusing on task completion and performance monitoring (Dartey-Baah & Ampofo, 2016).

Transformational Leadership.

- A leadership style that inspires and motivates followers by creating a compelling vision, advancing innovation, and empowering individuals to reach their full potential (Khan et al., 2020).

Vision Zero.

- Comprehensive plans with leading indicators aimed at eliminating transportation-related fatalities and serious injuries, often through a combination of infrastructure improvements, policy changes, and public awareness campaigns (Zwetsloot et al., 2020).

Workforce Skills Shortages.

- Refers to the deficit in qualified personnel within the public transportation industry, which poses challenges in maintaining operational efficiency, safety standards, and impedes innovation (Horbach & Rammer, 2021).

Organization of the Remaining Chapters

The research is composed of five chapters. Chapter 2 contains a review of the literature. Chapter 3 details the qualitative methodology employed in this study. Chapter 4 discusses the data analysis and results. Lastly, Chapter 5 presents the discussion of the results, implications, and recommendations.

CHAPTER 2. LITERATURE REVIEW

Introduction

Nontechnical Skills (NTS) are cognitive, social, and personal resource skills that complement technical skills and contribute to safe and efficient task performance (Schreyer et al., 2021). These skills are related to communication, teamwork, and decision-making that support safe, accountable executive performance (Casali et al., 2021; Kerle, 2015). Mitchell, Woolridge, and Johnson (2021) further examine nontechnical skills from personal and interpersonal perspectives, emphasizing the importance of integrating knowledge and experience across disciplines.

In line with this emphasis, Outcomes-Based Education (OBE), which promotes nontechnical or soft skills within a learner-centered framework (Figure 5), has become increasingly dominant in postsecondary education (Biggs & Tang, 2007; Lennon, 2010; Liu, 2015; Pichette & Watkins, 2018; Spady, 1994, 2020). Research that focuses on nontechnical skills, not just technical skills, often underscores the dynamic interplay among individual skills, organizational contexts, and the changing needs of the various industries. Within this framework, educational approaches aim to provide learners with adaptable competencies that connect academic preparation to real-world demands.

Complementary studies extend the discussion on nontechnical skills and the OBE framework to the leadership of public organizations. For example, Nascimento, Souza, and Adaid-Castro (2020) examine competencies in public safety; Pearce (2018) analyzes technical expertise in federal leadership; and Asencio and Mujkic (2016) explore trust within public institutions. Parallel investigations by Kimball (2015), Mazzi, Passeri, and Bellandi (2015), and

Wingreen and Blanton (2007) examine issues within the public organizations' leadership context and reveal a persistent gap between academic training and professional practice.

These studies underscore the significance of executives' nontechnical skills for organizational effectiveness, expose challenges in aligning training with practice, and emphasize enhancing executive competency to strengthen public interest outcomes. This literature review synthesizes such perspectives to contextualize the present study's focus on public transportation executives to examine how nontechnical skills training, executive competencies, and leadership traits contribute to protect public safety.

Questions that Guide the Research

To what extent does nontechnical skills training for transportation executives enhance executive competency and leadership in ways that protect public safety? And how should the outcomes of nontechnical skills training be evaluated? Studies by Nascimento, Souza, & Adaid-Castro (2020) on the "Professional Competences Scale for Police Officers" and Asencio, & Mujkic (2016) on "Leadership Behaviors and Trust in Leaders" play a pivotal role in shaping the study's comprehension of executive competencies and leadership. These articles provide direct insights into the psychometric measures, attributes, and traits used to assess public service workers in authority, as well as the relationship between leadership behaviors and trust. More specifically, the articles identify specific psychometric tools and indicators used to measure leadership attributes such as integrity, emotional intelligence, accountability, and ethical judgment among public-sector leaders, and demonstrate empirically how leadership behaviors such as transparency, consistency, and ethical decision-making are associated with higher levels of cognitive and relational trust within organizations.

Additionally, other chosen articles about the role of nontechnical skills offer broader perspectives, contributing to a more comprehensive understanding of executive competencies and leadership, powered by nontechnical skills, especially in the public sector. These studies examine topics such as value in analytics-based decision cultures (Mitchell, Woolridge, & Johnson, 2021), technical competency for managing research-focused organizations (Pearce, 2018), perspectives from technical communication managers (Kimball, 2015), the role of complementary competencies in technology transfer (Mazzi, Passeri, & Bellandi, 2015), social cognitive interpretations of person–organization fit (Wingreen & Blanton, 2007), and the measurement of technical competencies (Walsh & Linton, 2002).

Method for Reviewing the Literature

This literature review was conducted through a systematic search of peer-reviewed journal articles, doctoral dissertations, and government reports focusing on nontechnical training, executive competencies, leadership, and public transportation safety. The goal was to analyze existing research methodologies, identify key theoretical frameworks, and uncover gaps in executive training practices within the public transportation sector. Search terms included "executive leadership," "nontechnical skills," "public transit safety," "phenomenological study," and "grounded theory."

Rather than merely emphasizing gaps, this section establishes the methodological basis for selecting and analyzing the literature (Mitchell, Woolridge, & Johnson, 2021; Nascimento, Souza, & Adaid-Castro, 2020). The inclusion of empirical studies and conceptual models allows for comparative insights into how executive competency and leadership traits derived from executive skills training influence safety outcomes. This methodological approach directly supports the research questions by identifying what is known, what is unknown, and what is

contested in the literature regarding the impact of nontechnical skills training in high-stakes, regulated environments such as public transit systems (Pearce, 2018).

Method for Analyzing the Literature
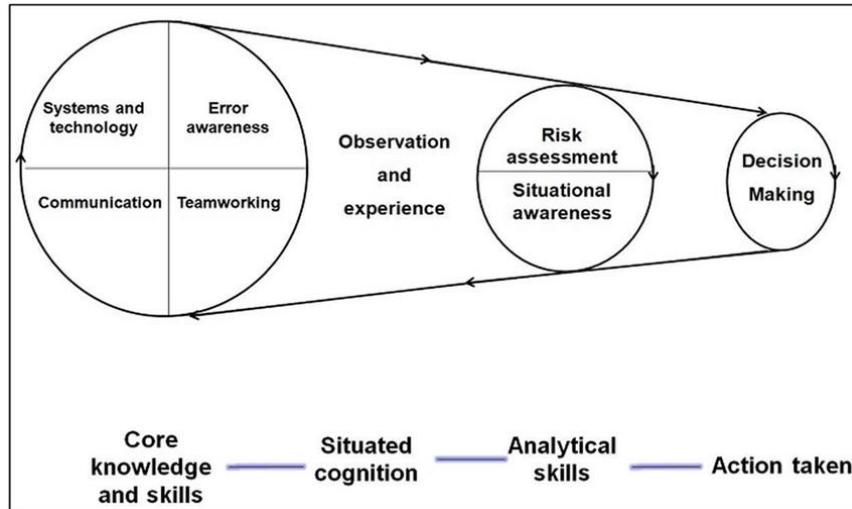
In addition to the more than 211 total articles reviewed for this research, this examination focuses on eight peer-reviewed full-text articles referenced in the Questions That Guide the Research section. These eight articles (Nascimento et al., 2020; Asencio & Mujkic, 2016; Mitchell et al., 2021; Pearce, 2018; Kimball, 2015; Mazzi et al., 2015; Wingreen & Blanton, 2007; Walsh & Linton, 2002) were selected because they provided the strongest and most directly relevant evidence on executive competencies and nontechnical skills in complex transit environments (Figure 1). They are integrated throughout the literature review to strengthen the conceptual foundation of the study rather than discussed in isolation. These studies also demonstrate that leadership competencies can be developed and evaluated with specific purposes, supporting the application of Outcome-Based Education (OBE) as a framework for assessing executive training effectiveness. Collectively, the articles justify the connection between nontechnical skills training and transformational leadership behaviors and organizational outcomes. Consequently, they reinforce their relevance to executive leadership development and public safety oversight within public transportation systems.

Additionally, the study employed a systematic literature search to identify research focused on executive competencies and training outcomes. To understand the skill requirements and cognitive assessments for professionals in high-level positions, this study used the search term "executive competencies". The Boolean method, specifically an "if and" statement, was applied by entering "executive AND competencies" into the advanced search field on Ebscohost.com, resulting in 1,193 outcomes spanning from 2018 to 2024.

Figure 1 links nontechnical skills learning to leadership behaviors and organizational

outcomes. These relationships mirror the safety, regulatory, and trust demands of public transit

systems. This alignment justifies the selection of the eight studies as foundational to

understanding executive leadership and safety outcomes in transit agencies.

Figure 1 - Nontechnical Skills Learning in Public Transit Environments

Source: Gordon et al., 2015

Conceptual Framework
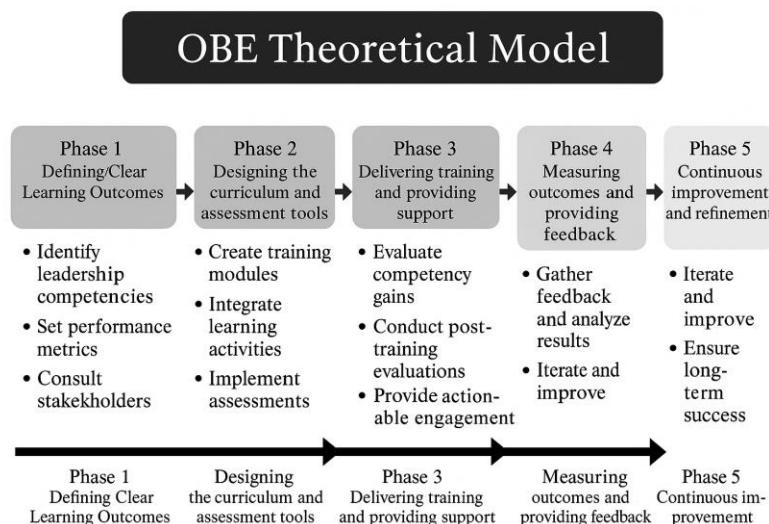
Outcome-based education (OBE), conceptualized by Spady (1994), serves as the guiding

framework for this study. This framework provides a basis for evaluating how nontechnical skills

training shapes executive competencies and leadership, and in turn, advances public safety

outcomes in transportation organizations. Specifically, the framework focuses on defining clear

and measurable outcomes to guide the educational process. It is a transformative approach that is

different from traditional education systems, as this approach begins with desired outcomes and

works its way backward to design curriculum, instruction, and assessment methods. This

backward approach ensures that all educational activities help students achieve significant

learning results (Spady, 1994). A key principle of OBE is the belief that all students can achieve

high standards when the students have appropriate opportunities and resources. In this system,

teachers act as facilitators, who guide students through diverse learning pathways, use

continuous assessments to provide timely feedback, and adjust instructional strategies.

Summative assessments that are in line with the desired outcomes evaluate whether students

have achieved the expected competencies (Spady, 1994). Figure 2 describes an outcomes-based

curriculum development model.

All stakeholders, including teachers, students, parents, and community members, need to

work together to implement OBE successfully. By focusing on student-centered learning and

accountability, OBE not only enhances academic achievement but also helps students develop

essential life skills such as critical thinking, problem-solving, and lifelong learning (Spady,

1994). These competencies prepare students to succeed in a rapidly changing world.

Figure 2 - OBE Theoretical Model

Source: Braxton, 2025

Given the nature of the OBE framework as outlined above, it is not surprising that the

OBE is well-suited for evaluating nontechnical training programs for public transportation

executives. Specifically, OBE can frame executive competencies and transformational leadership

in areas such as communication, collaboration, and ethical decision-making as measurable behavioral outcomes of nontechnical skills training.

However, a critical gap remains in both nontechnical executive training and research in executive competency and leadership within the transit industry, as OBE has not been adequately incorporated into training design or research. Moreover, societal pressures exacerbate executive decision-making processes, highlighting the need for leaders to balance technical expertise with nontechnical capabilities such as ethical reasoning, social awareness, and organizational judgment. Prior research indicates that such external pressures can lead leaders to show inconsistencies in behavior and experience greater difficulty in decision-making (Klebe, 2022). Studies also suggest that executives who possess moral imagination better navigate dilemmas and uphold values in partnerships, positioning OBE as a valuable approach for developing responsible leaders in the public transportation sector (Pless et al., 2022).

In addition, it should be noted that OBE aligns closely with executive competency and transformational leadership development. Nontechnical skills training improves executive competency in areas such as communication, collaboration, and decision-making. Strengthened competency in these areas, in turn, enhances transformational leadership (Bass & Avolio, 1990; Gioeli, 2023), which is associated with improved organizational performance and stronger public safety outcomes. Importantly, these executive competencies and transformational leadership attributes that arise from nontechnical skills can be taught and assessed. By framing executive competency and transformational leadership as the measurable outcomes of nontechnical executive training, the OBE framework provides a structured approach for various important educational tasks. These tasks include designing learning objectives, evaluating skill acquisition,

and determining whether training produces leadership behaviors that ultimately support public-interest outcomes in transit organizations.

Overall, outcome-based education (OBE) and transformational leadership theories converge in their emphasis on measurable growth, behavioral change, and the practical application of executive competencies. While transformational leadership provides the behavioral understanding of how nontechnical competencies display in practice, OBE offers a systematic structure for defining, developing, and assessing outcomes of nontechnical skills training. By inspiring followers, transformational leaders create an organizational environment that encourages innovation, ethical conduct, and performance beyond expectations. Taken together, these frameworks form a strong foundation for both executive competencies and transformational leadership, which ultimately improve decision-making and safety culture within transit organizations.

Review of the Literature

Leadership Development in the Public Transit Industry

The literature on leadership development in public transportation documents common challenges and opportunities that shape organizational performance and safety outcomes directly. Prior research examined various dimensions of leadership effectiveness in the transit industry, including structural barriers to skill acquisition, perceptions of leadership traits, the role of training environments, the formation of safety culture, and the impact of different leadership styles (O'Dea & Flin, 2001; Wu et al., 2008; Bian et al., 2019). These interconnected themes provide an outline for examining how skills training and leadership development can improve or hinder executives' ability to oversee their operations where safety is considered critical. The following sections explore each of the five literature themes in detail and demonstrate how

executive competencies are developed, constrained, and applied in the context of public transportation safety oversight.

Barriers to Skill Development

In public transportation, executive skills training is essential for improving executive competencies and leadership that influence safety, workforce engagement, and operational efficiency. Despite significant investment, many training programs are not currently able to deliver measurable outcomes due to ineffective design, inadequate needs assessments, and limited applicability to real-world oversight challenges. This gap is particularly concerning in safety-critical environments such as public transit environments, where executive competency and leadership directly influence safety culture and compliance with federal mandates. Prior research highlights that poorly designed training reduces the transfer of learning to the job (Baldwin & Ford, 1988), wastes resources, and worsens skepticism about the value of leadership development (Awoniyi, Griego, & Morgan, 2002; Eyres, 1998). The inability to evaluate training effectiveness further erodes confidence in leadership programs and diminishes their long-term credibility (Schultz, 2003).

Perceptions of Leadership Traits

Leadership traits, especially those tied to nontechnical skills such as accountability, communication, and emotional intelligence, are increasingly recognized as key features that emerge from executive competencies. These competencies allow leaders to motivate employees and communicate safety goals with them effectively. Leaders who emphasize integrity and values-driven decision-making positively influence organizational commitment, which in turn strengthens safety culture and employee engagement (Wu et al., 2008; Winkleblack, 2018). In the context of the transit industry, such traits reinforce the role of designated safety leaders in

fostering accountability and trust among staff. These traits are also important to make sure managerial decisions are in line with both organizational goals and the public interest.

The Role of Training Environments

The effectiveness of executive skills training depends on the environments in which the training is delivered. Programs that focus on just technical skills or theoretical content often fail to prepare executives for practical oversight responsibilities (Conger, 1993; Staw & Epstein, 2000). By contrast, outcome-based education (OBE) models and its scaffolding approaches provide measurable, incremental learning opportunities and outcomes that link training directly to job performance (American Institutes for Research, 2016). In other words, training environments with OBE that view learning as iterative growth toward competencies and emphasize nontechnical skills such as communication, decision-making, and risk management bridge the gap between academic preparation and professional practice, helping leaders address real-world transit safety challenges (Kimball, 2015; McDonough, 2017).

The Cultivation of Safety Culture

Executives play a decisive role in shaping organizational safety culture. Leaders who show genuine concern for employee safety establish environments where individuals feel empowered to adopt safe practices and voice their concerns. Research confirms that leadership behaviors prioritizing safety positively influence both individual and organizational safety outcomes (O'Dea & Flin, 2001; Hofmann et al., 2003). In high-risk industries, such as the transportation industry, leaders who emphasize safety goals through clear protocols and reinforcement systems achieve stronger compliance and improved safety performance (Clarke & Ward, 2006). Such findings reinforce the notion that leadership effectiveness extends beyond

technical expertise. It requires promoting a culture of responsibility, empowerment, and collective commitment to safety (Bian et al., 2019; He et al., 2021).

The Impact of Different Leadership Styles

Prior literature generally identifies two primary leadership styles, transformational leadership and transactional leadership. Although their effects are different, both leadership styles are linked to safety performance. Transformational leadership is more effective in fostering deep commitment to safety initiatives and building long-lasting safety cultures, as it focuses on vision, motivation, and employee engagement (Clarke & Ward, 2006). Transformational leaders inspire innovation, intellectual stimulation, and shared responsibility, creating resilient teams that work with organizational challenges over time (Lai et al., 2020; Gioeli, 2023). In contrast, transactional leadership, which relies on rewards and punishments, can produce short-term compliance but oftentimes cannot make meaningful cultural change (Mullen et al., 2017). While transformational leadership is considered to be better than transactional leadership in terms of providing a long-term positive impact on safety outcomes, it is worth noting that some studies find that transformational and transactional approaches can complement one another, balancing long-term cultural development with immediate operational compliance (Chaudhry & Javed, 2012).

Building on the evidence that transformational and transactional leadership styles shape safety performance in distinct yet complementary ways, it is also important to consider how leadership approaches influence deeper organizational dynamics such as trust, engagement, and long-term commitment. Positive leadership styles, when reinforced through well-designed competency development, can foster stronger organizational cultures. This connection provides the foundation for examining how Outcomes-Based Education (OBE) can help executives
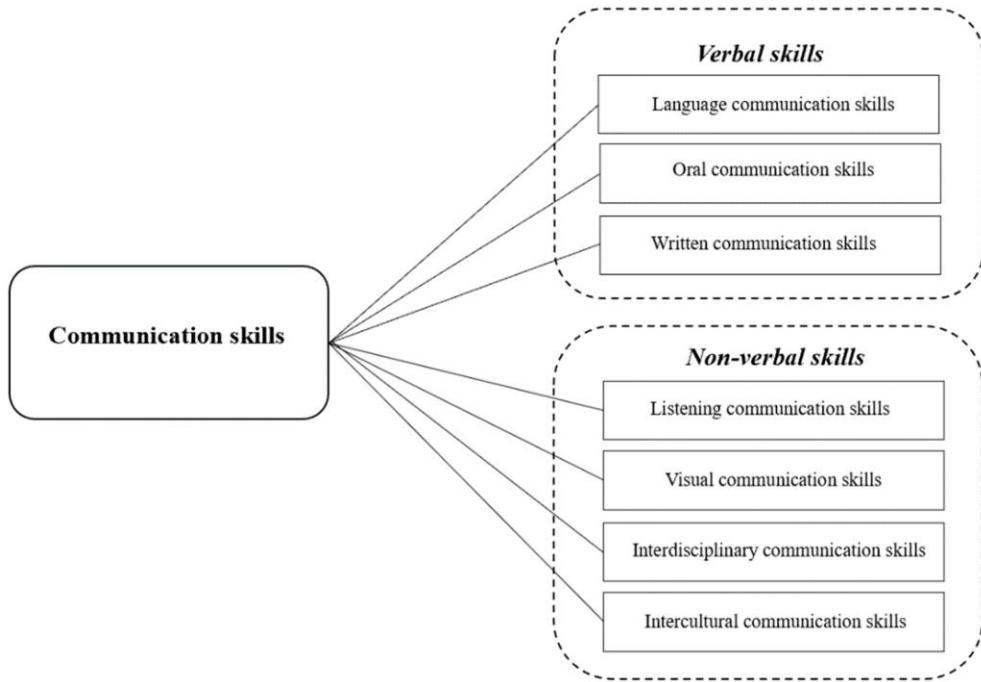
acquire the nontechnical skills that are necessary to enhance trust and strengthen leadership effectiveness.

The shift from a traditional teacher-centered model to an outcomes-based education (OBE) model points out the ability of rigorous skills training from reputable and accredited institutions, equipped with respected credentials and an educational platform, to effectively mitigate risk factors and enhance leadership development, compared to on-the-job, attendance-based training. In exploring the impact of comprehensive, outcome-based training versus traditional methods, this study assesses whether advanced training approaches focusing on nontechnical skills can help develop exemplary leaders and improve risk management in the transit industry.

Because transformational leadership focuses on inspiration, intellectual stimulation, and shared responsibility, the OBE framework works well with this leadership style. Transformational leadership is an outcome-based approach by nature, as it is not just rank-based positional authority, but is competency demonstrated in action. Especially, OBE emphasizes communication skills from transformational leadership as a measurable competency, as such skills help executives build trust, resolve conflicts, and develop the collaborative environments needed to strengthen safety culture and organizational performance. In other words, in OBE, communication is emphasized to make sure learners can apply their knowledge in real-world scenarios, making their capabilities in line with industry standards and societal needs. Thus, well-developed communication skills can contribute to achieving specific outcomes, such as improved safety, efficiency, and team effectiveness in organizational settings (Wu et al., 2023).

Figure 3 - Evaluating the Role of the Communication Skills within an OBE System

Source: Wu et al., 2023

While OBE emphasizes communication as a means of promoting collaboration, innovation, and alignment with organizational goals, transactional leadership often limits these outcomes by mostly focusing on compliance-based interactions. This narrow focus on rewards and punishments may achieve short-term results but undermines the development of trust, engagement, and open communication necessary for sustained safety, efficiency, and teamwork. The transactional model does not focus on motivating or encouraging members. Instead, it is based on two fundamental theoretical principles. First, an individual's behavior, choices, and actions are guided by their life goals. Thus, individuals adopt a rational approach to achieve these goals (McCleskey, 2014). Second, positive behaviors facilitate quicker and more effective goal achievement. These behaviors are typically reinforced by positive rewards when goals are met, while harmful consequences follow if goals are abandoned (Van Knippenberg & Sitkin, 2013).

Moreover, in the transactional model, the primary objective of the group is to follow the leader's clear and precise instructions and commands, rather than focusing on the overarching goal the leader aims to achieve. This is the key difference between transactional leadership and other leadership styles (Yahaya & Ebrahim, 2016). For example, in relational or emotional models, the focus is on collaborative goal achievement. In contrast, transactional leadership requires each group member to perform their specific task without a broader perspective (Vito et al., 2014).

In summary, transactional leadership is a specific model that emphasizes a reward-punishment system to enhance employee performance (Rawung et al., 2015). This leadership style operates on a basis of negotiation. The leader holds the power to bestow rewards, and the employees must complete assigned tasks to earn rewards and avoid punishments (Podsakoff et al., 1990; Odumeru & Ogbonna, 2013; McCleskey, 2014). Some studies even indicate that transactional leadership can be effective on its own. For example, Chaudhry and Javed (2012) explore this by surveying 278 participants to examine whether motivation is positively associated with transactional leadership. Their findings suggest that transactional leadership was successful in motivating employees, indicating its potential usefulness (Chaudhry & Javed, 2012)

Current research often examines whether the combined use of transactional and transformational leadership is effective to encourage employees to do more work that are in line with organizational goals. This stream of research notes that combining transactional and transformational leadership may offer valuable insights into motivating employees and achieving organizational goals, as examining each style in isolation may not fully address the growing competency demands placed on executives in the current business world. What's more, leadership styles may vary in effectiveness depending on industry context, highlighting the

importance of matching leadership approaches with industry needs. This study suggests that transformational leadership is more effective than transactional leadership in the public transit industry, as ensuring public safety requires organization-wide collaboration and communication between executives and employees. All in all, assessing executive competencies calls for a structured framework that can evaluate how these competencies translate into organizational outcomes in a particular industry.

Competency Assessment

As the industry evolves, organizations increasingly depend on robust training programs to ensure that employees have high-level competencies that include not just technical skills but also nontechnical skills. This increasing competency demands require a dual emphasis on hard and soft skill development, particularly at the executive level (McDonough, 2017).

In the context of employee competency, research on the Talent Pipeline Management (TPM), which treats talent development as a supply chain, emphasizes the skills transferable from academic environments to professional practice (Francis, 2020). On that end, TPM underscores the importance of aligning technical and nontechnical skill development with evolving industry demands. However, it also suggests that employee competency assessment cannot be confined to workforce pipeline development alone. Especially for executive competencies, a broader, more holistic perspective is required, one that situates executive skills development within the interrelated dimensions of barriers to skill acquisition, leadership traits, training environments, safety culture, and leadership styles. Prior studies on competency assessment, summarized in Table 1, provide a comprehensive lens for understanding how executive competencies can be cultivated, constrained, and applied in the context of public transportation leadership.

Table 1 – Competency Assessment

References	Data Description
Anthony, K. (2007)	This study examined the level of importance placed on competencies across country-based cultures as they relate to an executive position.
Bennett, J. J. (2005)	This research project addressed the necessity to utilize a wider range of professional development methods to enhance senior leader effectiveness and their ability to make the transition from predominantly leading people, to positions of senior leadership that include leading the institution.
Denkler, J. M. (1975)	The personnel managers' interview provided information to supplement that developed from the Executive Mobility Survey. Greater objectivity was possible by virtue of the unique perspective of each organization and its executives available from this source.
Dominato, L. (2009)	The purpose of this literature review was to explore the organizational change process and considerations for the implementation of change.
Edmondson, A. L. (1987)	The purpose of this study was to identify the executive skills employed by County Extension Directors (CEDs), Trade Association Directors (TADs) and Team Leaders/Chiefs-of-party (TL/COPs), to determine which frequently used executive skills were common to all three positions and to identify the major source of executive skill acquisition.
Furayyan, M. A. (2002)	The study examined the actual executive development efforts of training and development departments in central government agencies, the Institute of Public Administration, the Ministry of Civil Service and the Committee for Training and Scholarship of Civil Service Employees (Training Committee).
McLandsborough, W. G. (1995)	The purpose of this study was to identify and compare the competencies required of a global manager as perceived by executive recruiters.
Menefee, P. A. (1995)	The purpose of this study is to describe the professional development reports of selected sample of public-school executives.
Porter, C. D. D. (1999)	The purpose of this study was to identify the leadership competencies associated with the police executive position.
Shea, Thomas A., I., II. (2015)	The purpose of this study was to increase this criterion validity further, comparing those competencies with perceptions from both executives and the subordinates they seek to lead
Silva, K. A. (2004)	This study seeks to bridge a gap in the literature by testing if these competencies demonstrate significant external validity as well as criterion-related validity.
Teniente-Matson, C. (2013)	The purpose of this study is to test the Higher Education Leadership Competency (HELC) model.

Prior studies, as outlined in Table 1, collectively demonstrate that executive competency assessment extends beyond the acquisition of technical skills. It includes navigating barriers to skill acquisition, demonstrating appropriate leadership traits, improving effective training environments, reinforcing organizational safety culture, and applying adaptive leadership styles.

Going further into this topic, research on the competency assessment can be broadly categorized into two streams: 1) identification, development, and evaluation of executive

competencies and 2) measurement quality and validation of executive competencies. These two streams work together to explain both what competencies leaders need to have and how those competencies can be reliably measured.

The first stream of research focuses on competency assessment, which involves systematically identifying, developing, and evaluating leadership knowledge and skills that help executives perform effectively in complex environments. Prior cross-cultural work suggests competencies are shaped by organizational context and culture. For example, Anthony (2007) finds that competency assessment is closely tied to organizational culture and directly shapes performance expectations. Bennett (2005) further shows that competencies influence leadership effectiveness, highlighting that "fit" is not purely technical but also socio-cultural. Research on senior leader development argues that advancement from people management to company-level leadership demands a broader set of ideas, including strategic judgment, communication, and making structured competency frameworks essential to successful transitions (Edmondson, 1987). Classic inventories of executive skills also document that leaders acquire competencies through formal training, mentoring, and on-the-job experience, highlighting the value of multi-faceted development rather than seat-time alone (Dominato, 2009).

The second stream of research focuses on measurement quality and validation of executive competencies. Edmondson (1987) compares executive and subordinate perceptions of competencies, strengthening criterion validity and cautioning against reliance on self-reports. Complementary studies test external validity to ensure that competency models travel beyond a single organization or sector (Anthony, 2007). Public-sector research maps how ministries and training institutes' structure learning ecosystems, showing that competency assessment is not merely a curriculum issue but an organizational infrastructure problem requiring governance,

evaluation, and audit trails (Bennett, 2005). Parallel studies in police leadership and higher-education competency models converge on core nontechnical capabilities —accountability, integrity, communication, and adaptability — that predict leadership effectiveness across diverse contexts (Dominato, 2009).

Deficiencies in Current Competency Assessment Literature

Table 1 further situates competency assessment inside a broader system, (1) barriers such as misaligned training and weak evaluation, (2) leadership traits such as accountability and communication that are measurable and developable, (3) training environments that are scaffolded and OBE-aligned, linking classroom learning with executive job performance, (4) safety culture as the organizational climate that mediates how competencies influence outcomes, and (5) leadership styles, particularly transactional and transformational, that determine how competencies are enacted in practice. Weak competency evaluation systems undermine compliance and elevate risk, whereas strong OBE-oriented systems reinforce reliable practice, support learning transfer, and build trust, which are key levers of safety performance (Anthony, 2007; Bennett, 2005; Edmondson, 1987).

Taken together, the works summarized in Table 1 advance three claims. First, competencies, which are likely to be outcomes of executive skills training, are context sensitive. They must be defined and assessed relative to the demands of the role and sector (Anthony, 2007; Bennett, 2005). Second, valid, multi-source competency measurement matters because alignment between what leaders think they do and what organizations experience predicts organizational performance, and therefore, should guide training investments (Edmondson, 1987). Third, OBE-style training design, characterized by explicit outcomes, backward mapping from outcomes to instruction, and authentic assessment, improves the chance that nontechnical

competencies transfer to practice, especially when coupled with transformational leadership models that operationalize trust, communication, and accountability in daily oversight work (Dominato, 2009).

As noted previously, what remains under-researched in the literature is how the outcomes of nontechnical skills training — namely, executive competency and leadership, and their influence on public safety — should be evaluated in the U.S. public transportation environment, which faces unique regulatory, risk, and stakeholder pressures. This unresolved space justifies the focus of this research. In addressing such a gap, the current research seeks to shed light on executive skills training options for both non-accredited and accredited institutions. The application of this research may help reduce assessment uncertainty, mitigate unnecessary risks, and safeguard public interests.

Synthesis of Literature Findings

The reviewed literature reveals that barriers to effective skill development, perceptions and applications of leadership traits, the structure of training environments, the cultivation of a safety culture, and the interplay of leadership styles — all critically shape leadership effectiveness in public transportation. These five themes were reviewed along with the executive competency assessment and deficiencies in the current competency assessment. Together, these five thematic areas illustrate the growing demand for executive skills training and the development of competencies and leadership. Addressing such increasing demands requires integrating nontechnical skills into the training program. Such demands also ask outcome-based models to be adopted as an appropriate competency assessment framework. It is also necessary to make sure leadership frameworks are in line with regulatory expectations and public safety priorities.

In sum, the literature strongly supports the importance of nontechnical skills such as communication, ethical decision-making, and emotional intelligence as critical to executive competencies in transit agencies (Lee et al., 2023; Gioeli, 2023; Wu et al., 2008). Research emphasizes the value of transformational leadership, particularly its role in driving innovation, strengthening safety culture, fostering team cohesion, and enhancing organizational performance (Bass & Avolio, 1990; Clarke & Ward, 2006). Transformational leaders are known for exhibiting competence, engagement, and relatedness through intellectual stimulation, mentorship, and effective communication. They also exceed performance expectations (Bass & Riggio, 2006). Moreover, studies recognize the role of transformational leadership in governmental and corporate contexts, highlighting its connection to cognitive trust, organizational change, and innovation (Wu et al., 2008; Gioeli, 2023). Collectively, the literature finds that transformational leadership is a theoretically sound framework for improving executive capacity and safety outcomes in the transit industry.

Despite these insights, empirical research specifically on how nontechnical skills training and its implications on transformational leadership executive competency are applied within the U.S. public transportation safety context remains limited. Only a few studies have evaluated the measurable outcomes of transformational leadership in U.S. public transportation systems. These studies are narrow in scope and indirect in application. Much of the transformational leadership literature derives from general organizational, private-sector, healthcare, or public administration contexts, with findings often inferred rather than empirically tested in transit environments where safety is considered critical (Bass & Avolio, 1990; Bass & Riggio, 2006; Gioeli, 2023). When transit systems are examined, leadership is frequently treated as a contextual variable rather than being explicitly linked to quantifiable safety indicators, such as safety culture maturity,

corrective action effectiveness, or executive decision quality (Clarke & Ward, 2006; Wu et al., 2008).

Additionally, many prior studies rely on cross-sectional survey designs and perception-based self-reports, which provide little insight into how transformational leadership behaviors translate into long-lasting organizational trust, executive performance, or safety oversight outcomes over time (Smith & Khojasteh, 2014; Mitchell et al., 2021). Few studies explicitly connect transformational leadership to formal nontechnical training interventions. These limited studies suggest that it is still unclear whether observed leadership traits are intentionally developed through structured training or are acquired informally through experience (Takamine, 2019; PTSCTP, 2023).

This lack of research is notable given that current regulatory training models call for transformational leadership, rather than traditional transactional approaches that focus on compliance with standards. Transactional approaches often limit executives' ability to develop the broader competencies necessary for effective leadership. Indeed, the transactional mindsets within government and corporations further hinder the adoption of transformational approaches. In addition, there is a growing demand for competencies among public transportation executives, where leaders are sometimes promoted beyond their preparedness. In this regard, further implications emerge when considering the safety certification depicted in Figure 4, which shows the compliance requirements that every U.S. state with rail transit systems must meet to ensure effective oversight of passenger and worker safety (Federal Transit Administration, 2019).

Figure 4 – U.S. States that have met FTA safety certification requirements.

Source: FTA, 2019

Identified Research Gap and Rationale for the Study

While prior studies have established the theoretical link among nontechnical skills

training, executive competency, leadership styles, and organizational performance, limited

empirical research has examined how executive competencies and leadership traits, powered by

nontechnical training, influence safety outcomes in the public transportation industry. The

research is also limited on how nontechnical training can be measured. This lack of research is

notable given that existing scholarship emphasizes the need for reliable methods to evaluate

executive competencies and leadership in U.S. transit systems, where executive traits and

behaviors shape safety culture and transit outcomes (Bass & Riggio, 2006; Nascimento, Souza,

Adaid, & Castro, 2020). Prior studies also note that safety performance, compliance audits, and

corrective action plan implementation serve as tangible indicators of how leadership translates

into organizational results Mitchell, Wooldridge, & Johnson, 2021).

Addressing such research gaps is essential to safeguarding public interests, including

passenger safety, regulatory compliance, and executive accountability. As noted in the literature

review, prior research suggests that outcome-based education (OBE) and competency-driven

training offer effective pathways, as they prioritize observable and measurable skills over traditional attendance-based results (Spady, 1994). Integrated with transformational leadership, which motivates followers to achieve higher performance (Bass & Riggio, 2006), these approaches can strengthen safety culture and enhance the protection of public interests.

Consequently, the literature calls for outcome-oriented, context-specific competency frameworks that align leadership development with the regulatory and operational demands of U.S. public transportation oversight. Therefore, this study investigates the extent to which nontechnical skills training for transportation executives enhances executive competencies and leadership in ways that protect public safety. This study also examines how the outcomes of nontechnical skills training should be evaluated, focusing on outcome-based education frameworks. In other words, the study examines how nontechnical training for transit executives can enhance executive proficiency and improve transformational leadership development, ultimately improving safety and organizational effectiveness in the public transportation sector, and how such training can best be managed and evaluated using the outcome-based education frameworks.

CHAPTER 3. METHODOLOGY

Introduction

The purpose of this qualitative study is to explore how nontechnical training shapes and influences the executive competencies and leadership of public transportation executives across the United States. This chapter offers a complete overview of the methodology utilized to investigate the research questions: To what extent does nontechnical skills training for transportation executives enhance executive competencies and leadership in ways that protect public safety? How should the outcomes of nontechnical skills training be evaluated?

This chapter introduces the rationale for the research approach, the study design and methods, the population and sample, the procedures, and the assurance of ethical conduct. The qualitative approach, which utilizes open-ended data from semi-structured interviews, was chosen, as it is most appropriate for a comprehensive exploration of public transportation executives' lived experiences regarding the role of nontechnical leadership training in enhancing safety oversight and decision-making. The recruitment process was detailed in the chapter, with emphasis on agency approval. Twelve interviews were conducted and transcribed to extract data related to codes, patterns, and themes. Trustworthiness is discussed, elucidating how credibility, transferability, dependability, and confirmability ensured the accuracy of the design and population in the research. Ethical considerations, including the study's ethical approach, are also outlined. The use of pseudonyms to safeguard participants and the organization is explained. Chapter 4 subsequently presents the findings from twelve semi-structured interviews.

Rationale for Research Approach

There are several accepted approaches to conducting research. Those approaches include quantitative, qualitative, and mixed-methods research. Quantitative research relies on numerical

data collected through surveys or experimental methods. On the other hand, qualitative research relies on detailed narratives that provide deeper insight into lived experiences. In some cases, researchers use a mixed-method approach that employs both numerical and narrative data to have broader perspectives on a research problem.

For this study, a qualitative approach is determined to be most appropriate because the research aims to explore how nontechnical training improves executive competency, influences the leadership effectiveness of executives, and, in turn, enhances public safety outcomes in U.S. public transportation, and how such training should be managed and evaluated. A phenomenological research design, supplemented by grounded theory-based analytical techniques, enables the researcher to capture the lived experiences of executives and systematically analyze them to identify emergent patterns. This design offers insight into how competencies such as accountability, communication, and education that arise from nontechnical skills training influence leadership in safety-sensitive environments. Semi-structured interviews with senior transit executives yield descriptive data, which are coded and analyzed to identify leadership development gaps and their impact on safety oversight, ensuring the findings reflect the perspectives of those directly responsible for executive performance and public safety outcomes (Creswell & Creswell, 2018).

Research Design and Methods

This study employs phenomenology as the overarching methodological approach to explore how transit executives experience and interpret nontechnical skills training. Phenomenology is well-suited for this purpose, as it focuses on finding the meaning and lived experiences as expressed by participants themselves. Through this method, the research aims to capture the *what* and *why* of executive experiences with respect to nontechnical skills training

and its implications on executive competencies and leadership, rather than test predetermined hypotheses or measure variables statistically.

Grounded theory procedures are incorporated as an analytical tool, not as a theoretical framework, to support systematic theme development. Grounded theory coding, particularly open, axial, and thematic coding, provides a structured and inductive process for identifying patterns. This analytical approach supplements phenomenology by organizing participant narratives in a way that shows shared meanings without imposing theoretical assumptions. Importantly, the goal of this study is not to generate a grounded theory. Instead, grounded theory *coding* is used to help phenomenological analysis and ensure that themes emerge directly from participants' accounts (Creswell & Poth, 2016; Saldaña 2011; Saldaña 2021).

The integration of phenomenology with grounded theory coding enhances analytic rigor, allows for rich insight into executive leadership development experiences, and produces empirically grounded findings that reflect the complexities of executive skills training in public transportation settings. The design and methods of this qualitative research enable a nuanced understanding of how executive competencies and leadership influence decision-making and, thereby, organizational outcomes in terms of public safety (Gioeli, 2023). The use of explicit interview methodologies further strengthens the research design by ensuring an organized and rigorous approach to data collection (Power & Gendron, 2015; Malsch & Salterio, 2016; Dodgson & Trotman, 2022).

All in all, a phenomenological research design complemented by grounded theory-inspired coding techniques provides a structured yet flexible framework for analyzing nontechnical skills training, executive competencies, and leadership in the public transportation industry. Through iterative data analysis and thematic coding, the research presents findings

closely related to real-world experiences and offers valuable insights into executive leadership development in the transit industry.

Population and Sample

The study's 12 semi-structured interviews within U.S. public transportation organizations serve as the study's population (Table 2). The collection of open-ended responses from participants yielded sufficient qualitative data to examine executive competencies and leadership traits, as well as to assess the organizational consequences associated with nontechnical skills training—or the absence of such training. Participants encompassed leaders of public transportation agencies. To obtain such comprehensive data, the purposive sampling method was employed to gain access to a broad spectrum of top-level transit leadership. The qualitative approach with extensive data indeed enabled a detailed exploration of how competencies influence executives across U.S. public transportation modes.

Selection of Participants

As noted above, primary data for the research were obtained from transcribed interviews with 12 participants, which formed the basis for thematic analysis within a phenomenological research design. Data collection employed purposive sampling to recruit participants from public transportation agencies. Purposive sampling is a nonprobability sampling technique in which researchers intentionally select participants or data points based on specific criteria relevant to their research question.

The purposive sampling approach is known to enhance qualitative research (Glick, 2011). In line with this view, research suggests that CEOs and top executives are more likely to participate in surveys and interviews when approached by someone they know or trust (Bartholomew & Smith, 2006). This research also recruited participants through the snowball

sampling technique, allowing existing participants to refer others for inclusion (Johnson & Klee, 2007). This recruitment approach was available to individuals who had already been accepted into the study.

As shown in Table 2, which summarizes the demographics of research participants, this study included a cross-section of top-level senior executives with various educational credentials and from diverse sections or different public transportation organizations. 50% (6 of 12) were holders of master's degrees; 25% (3 of 12) held bachelor's degrees or equivalent; 17% (2 of 12) were PhD candidates; and 8% (1 of 12) held Juris Doctorate. Gender representation was equal, with 50% female (6 of 12) and 50% male (6 of 12). Geographically, 41.7% (5 of 12) were from large systems, 33.3% (4 of 12) from medium systems, and 25% (3 of 12) from small systems. Regarding tenure, 33.3% (4 of 12) had 5-19 years of experience; 25% (3 of 12) had 20-29 years; 33.3% (4 of 12) had 30-39 years; and 8.3% (1 of 12) had 40+ years. Senior leadership roles were predominant, with multiple CEOs, Executive Directors, and other high-ranking positions.

Table 2

Demographics of Research Participants

Participant	Education	Gender	System Size	Tenure	Position
P1	Masters	Female	Large	34	CEO
P2	PhD (candidate)	Male	Medium	45	General Manager
P3	Bachelor	Female	Large	39	CEO
P4	Masters	Female	Medium	29	Executive Director
P5	Bachelor	Male	Small	18	Executive Director
P6	Masters	Female	Large	25	Executive Vice President
P7	Juris Doctorate	Male	Large	24	Executive Director
P8	Bachelor	Female	Medium	5	CEO
P9	Masters	Male	Small	25	CEO
P10	Masters	Male	Small	30	Director
P11	Masters	Male	Medium	39	President and CEO
P12	PhD (candidate)	Female	Small	19	CEO

Participants were recruited by the principal investigator (PI), the author of this study, through established business and social networks to include organizational leaders, employees, and stakeholders in the U.S. public transportation industry. Recruitment followed the approved protocol using email invitations and scripts to ensure clear communication of the study's purpose and voluntary nature of participation. Eligibility was limited to adults aged 18 years or older who live in the United States. No vulnerable populations were recruited without explicit IRB approval. Prospective participants received informed consent materials (Appendix A) before interviews began. The informed consent outlined the study's objectives, expectations, and confidentiality protections. Participation was entirely voluntary, with no monetary compensation, and individuals could decline or withdraw at any time without penalty.

Instrumentation

The data collection instruments for this study consisted of open-ended, semi-structured interview questions outlined in Appendix B – Interview Protocol and Questions (IQ). A semi-structured format was chosen to elicit comprehensive insights while allowing the researcher to investigate participants' responses, in line with the exploratory nature of the study. An initial icebreaker activity was included in the interview protocol to build rapport with participants and encourage deeper reflection on executive competencies through the lens of nontechnical capabilities. In addition, leadership development questions were incorporated to assess perceptions of rigor of current nontechnical skills training, as well as the executive competencies and leadership traits most valued by public transportation executives. Questions 1 through 9 specifically focused on participants' perspectives on nontechnical skills training, its outcomes, and preferred leadership traits.

The twelve research participants were interviewed individually, and each interview began with an icebreaker that also collected demographic information, including name, age, gender, tenure, transit system, and job role. All questions were open-ended on purpose. Probing questions were used to encourage detailed responses. To ensure consistency and reduce bias, interview questions were asked in the same sequence across all interviews. Each interview lasted approximately 90 minutes.

All interviews were conducted in accordance with local, state, and federal regulations and ethical considerations. Individual consent was obtained before conducting interviews. Zoom was employed for virtual recording, and the recordings were stored securely on the University's server.

Upon the completion of the interviews, all interviews were transcribed using NVivo qualitative data analysis software and subsequently manually coded. NVivo software was chosen as Swygart-Hobaugh (2019) explains that NVivo coding enables researchers to review extensive data and identify concepts across different files swiftly.
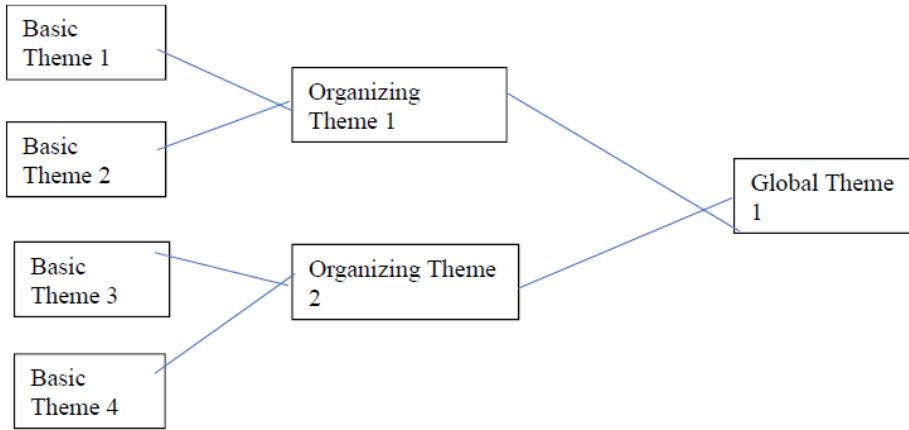
Data Preparation for the Analysis

The thematic network, resulting from data coding, included basic, organizing, and global themes. The selection of themes was based on data saturation, which indicates how many participants showed or agreed with the same theme. Nevertheless, even if only one participant disclosed a theme, it was still considered before acceptance or rejection (Akinyode, 2018). Figure 5 illustrates the process of the thematic network in developing global themes.

Figure 5 - Thematic Network for the Global Theme

Source: Akinyode, 2018

Before coding began, the data were reviewed, and participant names were pseudonymized to ensure confidentiality. Then, open coding in NVivo 15 was done to highlight pertinent words or phrases and descriptive coding themes. It was further used to categorize codes based on observed patterns. The codes primarily focused on executive competency assessments, traits derived from leadership styles, or keywords that exhibit patterns.

As noted previously, the study included twelve semi-structured interviews with public transportation executives, and no new themes or insights emerged after the ninth interview. In other words, data saturation was achieved by the ninth interview. The remaining interviews reinforced the consistency of patterns related to the effectiveness of nontechnical training, leadership traits, and transit safety outcomes, confirming the reliability and completeness of the thematic data (Morse, 2015). This conclusion is in line with established qualitative research standards, which suggest that saturation is often achieved with 12 or fewer interviews when participants have direct expertise and relevance to the focus of research (Guest, Bunce, & Johnson, 2006).

The sample, comprising six males and six females with an average of over 20 years of experience in the transit industry, provided a methodologically sound foundation for analysis. The gender balance and depth of professional expertise enhanced the credibility and transferability of the findings. These characteristics ensured they showed diverse and well-informed perspectives within the public transportation leadership context.

Data Analysis Plan

The data analysis employed a grounded theory-inspired coding technique within a phenomenological research design to identify patterns in the collected interview data. Thematic analysis based on grounded theory coding facilitates a comprehensive understanding of diverse patterns within the extensive dataset by examining perspectives, highlighting both similarities and differences, and revealing unexpected insights (Nowell et al., 2017). Saldana (2011) suggests that descriptive coding is beneficial for categorizing and indexing data collected through varied data-gathering approaches. Consequently, descriptive coding was applied to interview data from executives across multiple transit agencies, which varied in size, structure, and operational characteristics.

To implement this analytic strategy, NVivo software was used to analyze interview responses from a pool of public transportation properties of varying sizes, and the NVivo coding approach was chosen to enhance insights, reduce bias, and facilitate code creation during the data review. Subsequently, the fully coded data were analyzed both within and across interviews to identify patterns, similarities, differences, and emergent themes. Responses from all interviews were used to gain insights into the participants' real-life experiences.

To test the validity and reliability of the selected instruments, data triangulation was used via cross-verifying information from the semi-structured interviews. The data pool included

input from all the interviews. Relevant information was extracted from this source and scrutinized for accuracy and consistency, based on the interview questions that were carefully constructed to directly address the research inquiries and theoretical frameworks outlined in Appendix B.

In addition to thematic analysis, this research also incorporated sentiment analysis to assess the emotional tone and evaluative language present in participant responses. Sentiment analysis was used to identify patterns of positive, negative, or neutral sentiment associated with key leadership traits, training experiences, and perceptions of safety culture. This supplementary analysis provided a deeper understanding of the participants' attitudes and emotional responses. Providing a more nuanced interpretation of the data, this integration supported thematic findings and highlighted the emotional dimensions of executive competencies and leadership developed through nontechnical training in the context of transit oversight.

Trustworthiness

Trustworthiness refers to the confidence in the data, interpretation, and methods employed in a study. Therefore, it ensures the overall quality of the research (Polit & Beck, 2018). Each study must establish procedures or processes to maintain data integrity, assuring the study's reliability. In qualitative research, trustworthiness is essential to guarantee that the data meets standards of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). The following procedures were conducted to meet the standards of the four qualities of trustworthiness.

Credibility - To strengthen credibility, the study employed member checking, a process in which participants from the public transportation agency reviewed and verified their transcribed interview responses to ensure accuracy and authenticity. Consent forms were distributed to a

diverse set of executives. Then, in-depth interviews were recorded, transcribed, and returned to each participant for validation. This confirmation process enhanced the truthfulness of the findings and ensured that interpretations reflected participants' lived experiences accurately.

Transferability - Transferability in qualitative research refers to how well study findings apply to other settings, based on the depth and context of the information rather than statistical generalization. This quality was supported by this study's thick description, which provided detailed and nuanced accounts of participants' experiences of leadership and training in the transit industry. Unlike thin description, which offers only surface-level detail, thick description improves understanding and makes it easier to apply findings to similar environments. Therefore, thick description in this study helps readers assess the findings' relevance to their own contexts.

Dependability - Dependability focuses on consistency of the findings over time. To ensure dependability, data was stored to maintain audit trails. Every occurrence and change to the data were carefully recorded and saved. Even unused data was retained in the records to improve transparency.

Confirmability - Confirmability is about how much the findings are driven by participants' perspectives and the study's actual conditions, rather than by the researcher's personal views. Confirmability ensures the analysis remains objective. To ensure confirmability, all data and associated documents were preserved. Even data identified as biased, though unused, were retained. The comprehensive storage of all data, coupled with transparency in the collection and coding processes, ensured the confirmability of the study's data and established an audit trail.

Researcher Reflexivity and Bias Mitigation

The primary researcher recognized that a professional background in public transportation could introduce unintended bias during data collection and interpretation. To

address this concern, the researcher employed reflexive practices throughout the study, including

maintaining analytic memos to bracket personal assumptions. The researcher also used a

structured interview protocol to ensure consistency across all sessions. The researcher relied on

NVivo software to reduce subjective influence during coding. All interviews were conducted

using the same sequence of open-ended questions, and themes were derived through constant

comparison rather than preconceived expectations. These steps supported neutrality and

enhanced confirmability.

Ethical Considerations

In compliance with ethical research standards and the requirements of Marymount

University's Institutional Review Board (IRB), the CITI Program's web-based training on

human subjects' protection was completed (Appendix D - CITI Program Certificate), and formal

IRB approval (Appendix C - Approval No. 1232) was obtained before initiating participant

engagement. Recruitment was conducted via email and telephone, providing opportunities to

identify key leadership competencies, including collaboration, empathy, inspiration, negotiation,

innovation, and effective communication. Interview skills gained were essential for ethical and

respectful interactions in qualitative research.

In addition, the research complies with all ethical standards outlined in 45 CFR 46 to

protect human subjects. It also adheres to the moral principles established in The Belmont Report

(2022), which emphasize respect for persons, beneficence, and justice in research involving

human participants. The study employs methods such as obtaining full permission from both the

organization and participants affiliated with the public transportation agency. The pseudonym

"Rail Transit Agency" was used to protect the organization's identity, and all collected data was

assigned pseudonyms for participant names to preserve their anonymity. Every precaution was

taken to ensure compliance with ethical assurances, and this precaution also helped ensure the safety and proper permissions for each participant in the study.

Summary

This research employed a qualitative design to explore how nontechnical training influences executive competency and leadership effectiveness among U.S. public transportation executives, and in turn, affect public safety outcomes. Using a phenomenological approach complemented by grounded theory coding techniques, the research captured the 12 senior transit executives' lived experiences on nontechnical skills training and its implications on executive competencies, leadership, and public safety. This study also explored how they measured and evaluated the effectiveness of a nontechnical training program. Purposive and snowball sampling ensured that the study identified participants that held direct oversight responsibilities. Semi-structured interviews, each lasting approximately 90 minutes, allowed the participants to fully reflect on leadership practices, training experiences, and nontechnical competencies such as communication and accountability. The study followed the ethical standards, including informed consent, the use of pseudonyms, and secure data storage to protect participant confidentiality, as outlined in the Belmont Report and Marymount University's IRB protocol.

Interview transcripts were anonymized and analyzed using NVivo software, with systematic open, axial, and thematic coding supplemented by sentiment analysis to capture both cognitive and affective dimensions of leadership. Trustworthiness was established through member checks, audit trails, thick description, and thorough documentation of coding records. These procedures provided the rigor necessary to demonstrate how nontechnical leadership competencies directly inform safety oversight and executive decision-making within the public transportation sector.

CHAPTER 4. ANALYSIS AND RESULTS

Introduction

This study asks to what extent nontechnical skills training for transportation executives enhances executive competencies and leadership in ways that protect public safety. This study also asks how such training should be managed and evaluated. The literature lacks an examination of how competencies of U.S. public transportation executives influence safety outcomes, and this deficiency is exacerbated by a weakened safety culture and the lack of a mandate for nontechnical training tied to Vision Zero goals. Hence, this research investigates whether targeted nontechnical skills training to enhance executive competencies and associated leadership traits in areas such as accountability, communication, collaboration, and engagement can enhance public safety outcomes, and whether the OBE-oriented framework can improve the effectiveness of nontechnical skills training.

Findings from this study show that executives' innate integrity and flexibility, alongside empathy and trust, complement learned competencies such as experiential leadership, systemic understanding, and values-driven decision-making. A blended methodology, which employs a phenomenological research design supplemented by grounded-theory analytic approaches, made the data reach saturation by the ninth of twelve interviews, revealing a strong positive link between such training and improvements in decision-making, risk management, collaboration, and the emotional climate necessary for a resilient safety culture.

Research Findings

As noted earlier, data for this basic qualitative research study were collected from twelve structured interviews. The interviews consisted of 9 questions, including an icebreaker. The participants' responses to each question were recorded in segments below to document results

sequentially and to illustrate whether they were connected to executive competencies and leadership traits.

The responses followed theme and sentiment responses, in the context of data analysis to understand both the central ideas (themes) and the emotional tone (sentiment) expressed during the interview. The coding process utilized thematic analysis with descriptive coding to identify patterns across diverse perspectives, and thematic saturation was confirmed as recurring themes consistently emerged across the dataset, aligning with established qualitative coding practices (Nowell et al., 2017; Saldana, 2011). Additionally, sentiment analysis determined whether the participant was positive, negative, or neutral.

Open codes were also clustered into axial codes, which were then synthesized into five primary thematic codes about the effectiveness of nontechnical skills training. Three themes, *accountability, communication, and education,* emerged as distinct constructs across participant responses. In contrast, emotional intelligence was later integrated into a *collaboration* theme for measurement purposes because the two are interconnected in shaping leadership practices that facilitate trust, open communication, and cooperative relationships. Similarly, ethical leadership was integrated into a theme of *engagement* for measurement purposes, as both emphasize leaders' responsibility to promote trust and shared organizational commitment through integrity. Collectively, accountability, communication, education, collaboration, and engagement constituted the analytical framework for interpreting how measurable executive competencies and their associated leadership traits are expressed across participant responses.

Figure 6 - Coding Tree

Coding Tree: Open Codes → Axial Codes → Thematic Codes
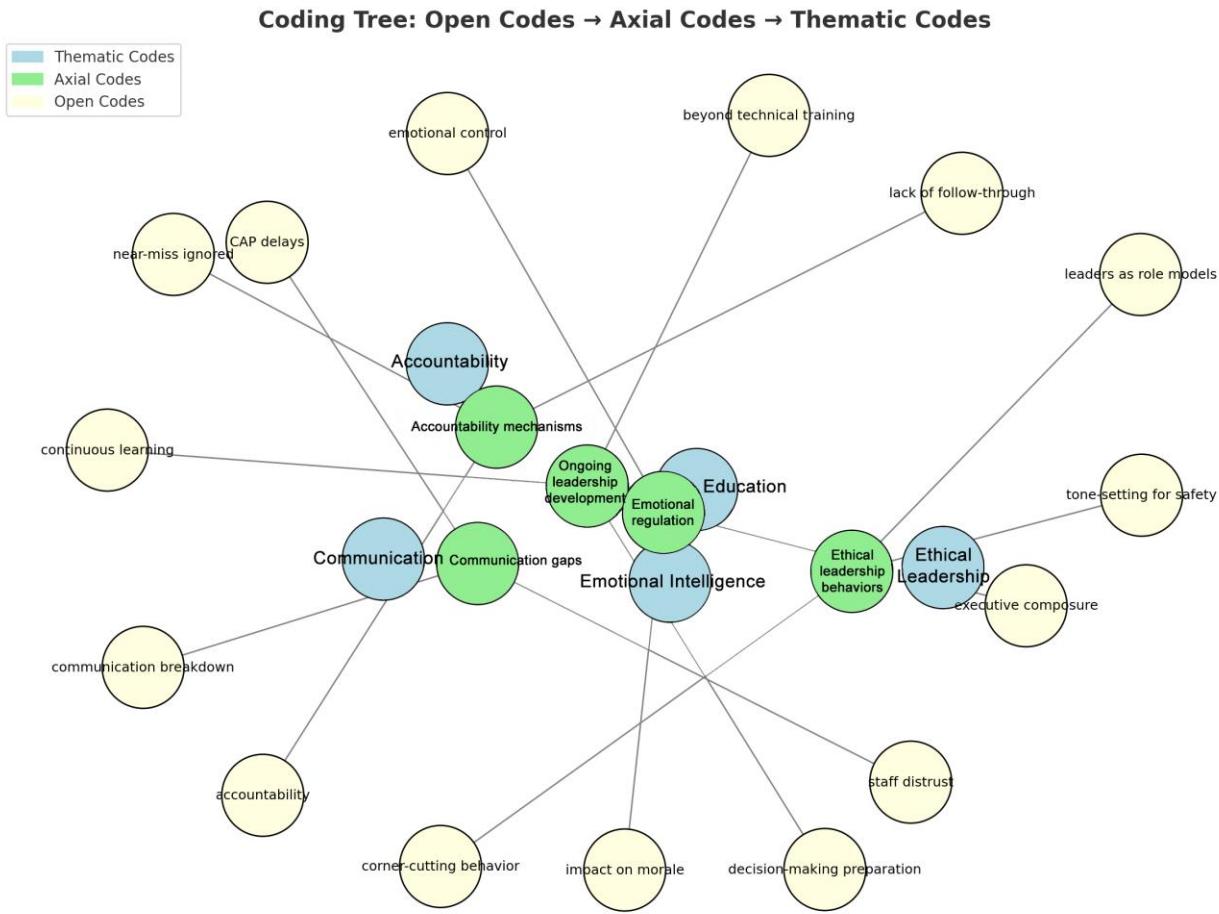
Figure 6 illustrates the progression of qualitative data analysis from open coding to axial

coding and finally to the thematic codes used in the findings. Open codes (yellow) were generated

directly from interview excerpts, capturing participant language and meaning. These were then

grouped into axial codes (green), which represented broader conceptual categories. Axial codes were

synthesized into higher-order thematic codes (blue), which reflect the dominant nontechnical

executive competencies identified in the study, including accountability, communication, education,

as well as emotional intelligence (later integrated into collaboration as a measurable executive

competency) and ethical leadership (later integrated into engagement as a measurable executive

competency). This coding tree demonstrates the inductive process that was used to ensure that

thematic findings were firmly grounded in the data, while remaining aligned with the OBE

framework and transformational leadership frameworks guiding the research.

Table 3

Themes in relation to measurable executive competencies

Participants	Sentiments	Measurable executive competencies					
		Number of references (Accountability)	Number of references (Collaboration)	Number of references (Communication)	Number of references (Engagement)	Number of references (Education)	Total References
P1	Strong commitment to leadership	1	1	0	2	4	8
P2	Advocates for holistic approach	0	0	0	1	5	6
P3	Commitment to continuous improvement	1	1	2	1	2	7
P4	Commitment to continuous learning	1	0	4	0	0	5
P5	Commitment to organizational performance	0	0	1	0	4	5
P6	Desire for continuous improvement	1	0	1	0	5	7
P7	Commitment to effective leadership	3	2	1	1	2	9
P8	Commitment to ethical leadership	1	0	0	0	1	2
P9	Strong emphasis on transparency	1	1	1	0	2	5
P10	Strong emphasis on social issues	0	2	1	1	5	9
P11	Strong emphasis on understanding industry	0	0	5	0	0	5
P12	Strong commitment to customer service	3	1	0	1	0	5
Total		12	8	16	7	30	73

Table 3 outlines how the five higher-order themes (i.e., accountability, communication,

education, emotional intelligence, and ethical leadership) about the effectiveness of nontechnical

skills training are related to measurable executive competencies (i.e., accountability,

collaboration, communication, engagement, and education), along with the frequency of

occurrence for each category. The data reflects the measurable executive competencies of twelve

participants, highlighting key leadership qualities. Specifically, education (30) was mentioned

most frequently, followed by communication (16), accountability (12), collaboration (8), and

engagement (7).

Education was viewed as continuous, outcome-oriented learning rather than passive

training. OBE supports this view by emphasizing defined learning outcomes and application to

real-world leadership challenges. This aligns with transformational leadership's intellectual

stimulation, enabling adaptive, safety-focused leadership.

Communication was identified as a critical executive competency affecting safety culture and decision-making. OBE treats communication as an observable leadership outcome, rather than a byproduct of experience or tenure. Participants' descriptions of vision-setting and active listening reflect transformational leadership's inspirational motivation.

Accountability emerged as a core executive competency influencing safety oversight and organizational reliability. Within an Outcome-Based Education (OBE) framework, accountability works as a measurable training outcome, demonstrated in decisions and actions. These behaviors reflect transformational leadership, which reinforces trust and safety responsibility.

Collaboration surfaced as a critical executive competency for coordinating safety oversight and cross-functional decision-making. Within the OBE framework, collaboration works as an observable and assessable training outcome, demonstrated through joint problem-solving and shared accountability. These behaviors reflect transformational leadership, which promotes collective responsibility and teamwork around safety goals.

Engagement showed executives' ability to motivate staff, keep their commitment, and reinforce ownership of safety initiatives. From an OBE perspective, engagement is a measurable outcome of nontechnical training, evidenced by active participation and continuous conversation within the organization. These behaviors are in line with transformational leadership, which focuses on inspirational motivation and supports a stronger safety culture and organizational performance.

Taken together, these five themes demonstrate how nontechnical skills training functions as a structured mechanism for developing executive leadership capacity. Across themes, participants described competencies that align with the Outcome-Based Education (OBE)

framework by emphasizing observable, measurable outcomes rather than attendance-based training, including responsible decision-making, empathetic engagement, clear communication, values-driven judgment, and continuous learning. These outcomes consistently manifested as transformational leadership behaviors, such as idealized influence, individualized consideration, inspirational motivation, moral modeling, and intellectual stimulation. Collectively, the findings illustrate that nontechnical training grounded in OBE principles enables the intentional development of transformational leadership, which in turn strengthens safety culture, executive decision-making, and public safety outcomes in U.S. public transportation systems.

Among 73 sentiment occurrences across all themed categories, key sentiments included a strong focus on leadership commitment, transparency, continuous learning, and customer service, with participants also stressing the importance of social issues and organizational performance. The table shows the importance of nontechnical skills training in developing important leadership qualities that improve both organizational success and individual growth.

Table 4

Themes in relation to natural inclinations

Participants	Sentiments	Natural inclinations					
		Number of references (Empathy)	*Number of references (Courage)*	*Number of references (Flexibility)*	*Number of references (Integrity)*	*Number of references (Trust)*	*Total References*
P1	Strong commitment to leadership	1	1	0	1	1	4
P2	Advocates for holistic approach	0	0	0	2	0	2
P3	Commitment to continuous improvement	0	0	0	1	0	1
P4	Commitment to continuous learning	0	0	2	1	0	3
P5	Commitment to organizational performance	0	0	1	0	0	1
P6	Desire for continuous improvement	1	0	0	0	0	1
P7	Commitment to effective leadership	0	0	0	0	0	0
P8	Commitment to ethical leadership	0	0	0	1	0	1
P9	Strong emphasis on transparency	0	0	0	0	3	3
P10	Strong emphasis on social issues	1	0	0	0	0	1
P11	Strong emphasis on understanding industry	1	1	0	0	0	2
P12	Strong commitment to customer service	0	0	2	0	0	2
Total		*4*	*2*	*5*	*6*	*4*	*21*

Extending the results presented in Table 3, Table 4 shows how the effectiveness of nontechnical skills training is related to participants' natural inclinations (i.e., empathy, courage, flexibility, integrity, and trust), along with the frequency of occurrence for each category. The data reveals insights from twelve participants, with a total of twenty-one sentiment occurrences across categories in Table 4. Integrity was the most frequently mentioned instinctive theme, followed by flexibility, with a notable emphasis on empathy and trust. Some participants expressed the significance of firm commitments to leadership and improvement, specifically mentioning a holistic approach, ethical leadership, and social issues. The table confirms the importance of these innate qualities in shaping effective executive leadership, with integrity and trust being key elements of the leadership development process.

Collectively, the analysis presented in Tables 3 and 4 suggests that the five higher-order themes (i.e., accountability, communication, education, emotional intelligence, and ethical leadership) about the effectiveness of nontechnical skills training are related to measurable executive competencies (i.e., accountability, communication, education, collaboration, and engagement). It also suggests that the effectiveness of nontechnical skills training is related to executives' natural inclinations (i.e., empathy, courage, flexibility, integrity, and trust).

Those five themes are also related to barriers to skill development, perception of leadership traits, training environments, safety culture, and leadership styles, each encompassing distinct elements that influence leadership effectiveness.

Barriers to skill development include a lack of accountability, in which individuals fail to take personal responsibility, and fear of failure, which discourages them from taking courageous action. Such barriers also include resistance to acquiring new skills or adapting to change, which requires flexibility. To overcome these barriers, the perception of leadership traits such as

empathy, integrity, trust, and courage are essential. Empathy allows leaders to connect with others, and integrity promotes ethical decision-making. Trust establishes credibility, and courage helps leaders take necessary risks and make difficult decisions.

Training environments benefit from collaboration, clear communication, effective education, and active engagement, as these factors collectively enhance the learning process and skill acquisition. A strong safety culture is built on accountability for safety outcomes, adherence to ethical practices rooted in integrity and trust in safety protocols, and empathy for employees' well-being. Lastly, leadership styles are shaped by flexibility, courage, engagement, and collaboration, with leaders adapting their approaches to situations, making bold decisions, nurturing team involvement, and encouraging collective decision-making to guide organizational success.

To guide the reader through the progression of findings, Interview Questions (IQs) 1 through 9 are organized to move from foundational perspectives to complex reflections on leadership behavior, executive competency development, and training impacts. IQs 1–3 explore executives' baseline understanding of leadership, how executives measure or evaluate the effectiveness of nontechnical training programs, and how leadership traits gained from nontechnical training impact their ability to manage safety outcomes in the transit industry. Next, IQs 4–6 examine how nontechnical executive competencies are learned, demonstrated, and reinforced within transit environments. Lastly, IQs 7–9 then connect these executive competencies to organizational outcomes, including safety culture, decision-making, and public accountability.

This structured sequence directly supports the research questions by showing how nontechnical training influences executive competencies and leadership effectiveness.

Specifically, while transformational leadership explains how those competencies are enacted

through communication, engagement, vision, and empowerment, outcome-based education

(OBE) provides an idea about examining how executive competencies are defined and measured.

Collectively, transformational leadership and OBE form a coherent storyline that connects each

table to the overarching purpose of the study.

Table 5

Critical Leadership Traits

Interview Question 1: In your opinion, what are the most critical leadership traits transportation executives need to safeguard public interests effectively?

Participants	Sentiments
P1	Empathy, courage, listening, understanding.
P2	Complexity understanding is essential.
P3	Communication and relationship-building essential.
P4	Integrity and trust are essential.
P5	Critical leadership traits: Understanding, analysis, communication.
P6	Critical thinking, communication, operations focus.
P7	Strong communication and resource acquisition.
P8	Integrity, transparency, servant leadership.
P9	Transparency, trust, honesty, strong will.
P10	Essential for safeguarding public interests.
P11	Understanding, courage, data-driven decisions.
P12	Customer focus and accountability.

Table 5 presents participants' views on the most critical leadership traits that

transportation executives need to safeguard public interests (Interview Question (IQ) 1)

effectively. Across the twelve participants, key sentiments show the importance of empathy,

communication, integrity, and trust, with several participants emphasizing the value of

understanding complex issues and building strong relationships. Critical thinking and

transparency also emerge as significant traits, alongside a focus on data-driven decision-making

and customer accountability. The responses reflect a consensus on the necessity of personal

integrity, strong communication skills, and the ability to make informed, transparent decisions to ensure the safety and effectiveness of public transportation systems.

Table 6

Measure or Evaluate the Effectiveness of Nontechnical Training Programs

Interview Question 2: How do you measure or evaluate the effectiveness of nontechnical (soft skills) training programs?

Participants	Sentiments
P1	Surveys, success definition, engagement.
P2	Current programs are ineffective.
P3	Engagement and participation are key.
P4	360 evaluations are critical.
P5	Measure effectiveness: Attendance, engagement, outcomes.
P6	Project management, soft skills integration.
P7	Employee feedback and engagement metrics.
P8	Return on investment focus.
P9	Focus on communication and values.
P10	Use assessments and evaluations.
P11	Nine elements drive effective training.
P12	Team ownership and accountability.

Table 6 outlines participants' perspectives on (IQ2) how to measure or evaluate the effectiveness of nontechnical (soft skills) training programs. Key evaluation methods include surveys, engagement levels, attendance, and the integration of soft skills into project management. Several participants emphasized the importance of evaluation methods such as 360-degree evaluations, employee feedback, and assessment of outcomes to measure training success. Other responses include measuring return on investment and focusing on communication and values. Participants also noted the significance of defining success, team ownership, and accountability, as they are essential elements in evaluating training effectiveness.

The responses demonstrate a multifaceted approach for assessing the impact of nontechnical training, including both quantitative metrics and qualitative evaluations.

Table 7

Leadership Traits Gained from Nontechnical Training

Interview Question 3: How has the leadership traits gained from nontechnical training impacted your ability to manage safety and service outcomes in transit? Walk me through that.

Participants	Sentiments
P1	Continuous improvement, informed decisions.
P2	Significant gap exists.
P3	Improved understanding and collaboration achieved.
P4	Communication fosters safety outcomes.
P5	Improved management, enhanced outcomes.
P6	Enhanced communication, understanding complex issues.
P7	Peer collaboration enhances safety management.
P8	Improved safety and service outcomes.
P9	Enhances communication and safety awareness.
P10	Enhances safety and service outcomes.
P11	Communication and active listening essential.
P12	Leadership training enhances management effectiveness.

Table 7 presents participants' insights on (IQ3) how leadership traits gained from nontechnical training have impacted their ability to manage safety and service outcomes in transit. Many participants emphasized that improved communication, collaboration, and understanding complex issues have played a significant role in enhancing safety and operational outcomes. Some participants noted that nontechnical skills training has fostered continuous improvement and informed decision-making, while others mentioned the importance of peer collaboration and active listening. The responses indicate that nontechnical training, especially in communication and collaboration, positively influenced the management in terms of safety outcomes in transit operations.

Table 8

Current Nontechnical Training Programs

Interview Question 4: How has current nontechnical training programs for transportation executives aligned with the goal of improving transit safety outcomes?

Participants	Sentiments
P1	Engaging, user-focused, iterative solutions.
P2	Lack of operational experience.
P3	Some alignment but needs improvement.
P4	Culture of communication is vital.
P5	Needs improvement, inconsistent application.
P6	Safety and reliability are paramount.
P7	Delivery methods need improvement.
P8	Needs better alignment and focus.
P9	Needs continuous evaluation and adaptation.
P10	Aligns with safety improvement goals.
P11	Needs improvement for safety alignment.
P12	Strategic plan guides safety initiatives.

Table 8 highlights participants' views on (IQ4) how current nontechnical training programs for transportation executives align to improve transit safety outcomes. Although many noted gaps in operational experience and inconsistent application, several participants expressed that the programs engage users and focus on iterative solutions. Also, while some participants recognized alignment with safety goals, there was consensus that improvements are needed in program delivery methods. Participants further agreed to a need for a greater focus on safety and continuous evaluation. Additionally, a few participants emphasized the importance of strategic planning and the culture of communication in fostering safety improvements. The responses indicate that while the programs align with safety outcomes, there is room for improvement in their effectiveness and application.

Table 9

Examples of Nontechnical Training

Interview Question 5: Can you share examples of nontechnical training that you believe are effective in developing leadership skills for transit executives?

Participants	Sentiments
P1	Coaching, design thinking, collaboration.
P2	Ineffective, lacks practical application.
P3	Personality and executive leadership training effective.
P4	Risk analysis training is effective.
P5	TSI courses, field experience.
P6	Practical application, job shadowing opportunities.
P7	Peer collaboration is highly effective.
P8	Conflict resolution, restorative justice training.
P9	Leadership workshops, peer discussions, real experiences.
P10	Empathy and communication training effective.
P11	Design thinking enhances leadership development.
P12	Clear expectations and accountability training.

Table 9 presents participants' opinions on (IQ5) effective nontechnical skills training programs for developing competencies and leadership in transit executives. Various forms of training were mentioned, including coaching, design thinking, collaboration, and personality and executive leadership training. Specifically, some participants emphasized the effectiveness of risk analysis training, conflict resolution, and restorative justice programs. A few practical applications, such as job shadowing and field experience, were also highlighted as key components. In addition, some participants mentioned leadership workshops, peer collaboration, and empathy and communication training, as they are thought to be valuable for enhancing leadership skills. The responses indicate that training that combines practical experience with collaborative and reflective elements is most effective for developing leadership skills among transit executives.

Table 10

Gaps Observed in Existing Training Programs

Interview Question 6: What gaps have you observed in existing training programs has the potential to impact transit outcomes?

Participants	Sentiments
P1	Interactive engagement, practical application needed.
P2	Discrimination affects training opportunities.
P3	Resistance to change is prevalent.
P4	Decision-making framework needs improvement.
P5	Insufficient training, outdated methods.
P6	Lack of big picture understanding.
P7	Delivery methods and funding issues.
P8	Lack of analytical decision-making skills.
P9	Gaps in adaptability and responsiveness.
P10	Gaps hinder effective transit outcomes.
P11	User perspective needed for training.
P12	Limited engagement in day-to-day training.

Table 10 outlines participants' observations on (IQ6) gaps in existing nontechnical skills training programs and their potential impact on transit outcomes (e.g. public safety). Commonly noted gaps include a lack of interactive engagement and practical application, as well as outdated training methods. Some participants identified issues such as discrimination affecting training opportunities, resistance to change, and insufficient decision-making frameworks. Others pointed out a lack of big-picture understanding, inadequate delivery methods, and funding issues. Additionally, gaps in analytical decision-making, adaptability, and responsiveness were identified as critical obstacles. The responses indicate that these gaps hinder the effectiveness of training programs and, consequently, negatively affect transit outcomes.

Table 11

Leadership Traits Influence on Decision Making

Interview Question 7: In your experience, how do leadership traits influence decision-making in high-stakes transportation scenarios? Tell me why?

Participants	Sentiments
P1	Trust, collaboration, respect, ownership.
P2	Critical for safety and outcomes.
P3	Traits drive informed, timely decisions.
P4	Leadership is crucial in crises.
P5	Critical, shapes responses, enhances safety.
P6	Empathy, understanding community concerns.
P7	Calmness and preparedness are crucial.
P8	Consistency and fairness in decisions.
P9	Trust fosters open communication, better decisions.
P10	Critical for informed decision-making.
P11	Active listening improves decision-making.
P12	Execution is crucial for decisions.

Table 11 explores participants' views on (IQ7) how leadership traits influence decision-making in high-stakes transportation scenarios. The responses emphasized that qualities such as trust, collaboration, respect, and ownership are essential for effective decision-making, especially in crisis situations. Several participants highlighted the importance of traits like empathy, calmness, and active listening in making informed, timely, and safe decisions. Leadership traits were also noted to enhance safety as they foster open communication, ensure consistency and fairness, and improve preparedness. The sentiments indicate that leadership traits significantly shape responses to high-stakes situations, contributing to better outcomes through informed and collaborative decision-making.

Table 12

Role Leadership Traits Play in Risk Management

Interview Question 8: What role do you think leadership traits play in risk management within the public transportation sector? Explain

Participants	Sentiments
P1	Values alignment, trustworthiness, collaboration.
P2	Essential for managing risks.
P3	Critical for safety and compliance.
P4	Integrity influences risk management.
P5	Essential, proactive, informed decisions.
P6	Strategic thinking, stepping back needed.
P7	Analytical skills prioritize risks effectively.
P8	Essential for morale and productivity.
P9	Essential for assessing and mitigating risks.
P10	Influences risk management strategies significantly.
P11	Clear communication mitigates risks.
P12	Practical execution of strategies needed.

Table 12 presents participants' views on the role of leadership traits in risk management within the public transportation sector (IQ8). The responses indicated that leadership traits such as values alignment, trustworthiness, integrity, and collaboration are essential for effectively managing risks. Several participants emphasized the importance of proactive, informed decision-making and strategic thinking in risk management. Traits such as analytical skills, clear communication, and the ability to assess and mitigate risks were also highlighted as critical qualities for developing effective risk management strategies. Overall, the responses reflect that leadership traits significantly influence risk management as they improve decision-making, morale, and the implementation of safety and compliance measures.

Table 13

Additional Skills and Attributes to Enhance Effectiveness

Interview Question 9: What additional skills or attributes do you believe could further enhance the effectiveness of your position?

Participants	Sentiments
P1	Strategic leadership, emotional intelligence, engagement.
P2	Holistic approach needed for improvement.
P3	Performance management and KPI training needed.
P4	Delegation and confidence are key.
P5	Listening, budgeting, vision development.
P6	Effective communication, emotional intelligence training.
P7	Tailored communication for diverse audiences.
P8	Conflict resolution and restorative justice.
P9	Authenticity, adaptability, and self-awareness.
P10	Continuous learning and self-management skills.
P11	Empathy enhances leadership effectiveness.
P12	Strategic execution and innovation focus.

Table 13 summarizes participants' views on (IQ9) additional skills or attributes that could enhance the effectiveness of their positions. Participants identified several key areas for improvement, including strategic leadership, emotional intelligence, and engagement. Some emphasized the need for a holistic approach, performance management, and KPI training, while others highlighted the importance of delegation, confidence, and effective communication. Additional skills mentioned were tailored communication for diverse audiences, conflict resolution, and restorative justice. Several participants also pointed to the value of continuous learning, self-management, adaptability, and empathy in enhancing leadership effectiveness. The responses indicate that a combination of emotional intelligence, communication skills, and strategic execution is essential for improving leadership performance.

Across Tables 5 through 13, the findings show that executive competencies and leadership developed through nontechnical skills training — communication, collaboration,

accountability, engagement, and education — play a critical role in improving safety and organizational performance in public transportation. Collectively, the results reinforce the outcome-based education (OBE) framework by demonstrating that these competencies must be clearly defined as measurable learning outcomes and assessed through observable executive behaviors to ensure that training leads to meaningful improvements in leadership effectiveness and transit safety.

Table 14

Aggregate of Data Codes

Data Codes	Participants												Total Frequency
	P1	*P2*	*P3*	*P4*	*P5*	*P6*	*P7*	*P8*	*P9*	*P10*	*P11*	*P12*	
Leadership Accountability	1	0	1	1	1	1	1	1	1	1	1	1	11
Experiential Leadership Competency	1	1	1	0	1	1	1	0	1	1	1	1	10
Human-Centered Risk Management	1	1	0	1	1	0	1	1	1	1	1	1	10
Outcome-Based Nontechnical Training	1	1	1	1	1	1	0	1	1	1	0	1	10
Systemic Understanding	1	1	0	1	1	1	1	1	0	1	1	1	10
Collaborative Problem Solving	1	0	1	0	1	1	1	0	1	1	1	1	9
Courageous Conversations	1	1	1	1	0	1	0	1	1	1	1	0	9
Empathetic Leadership	1	1	1	0	1	1	1	1	1	0	1	0	9
Values-Driven Decision Making	1	0	1	0	1	1	1	0	1	1	1	1	9
Holistic Safety Culture	1	1	0	1	1	1	0	0	1	1	0	1	8
Total Frequency	10	7	7	6	9	9	7	6	9	9	8	8	95

Table 14 presents an aggregate of data codes derived from the thematic analysis outlined in Tables 3 and 4, excluding sentiments. These codes serve as analytical labels for discrete segments of participants' responses, supporting systematic categorization and interpretation. The table includes manual counts of coded line segments from multiple participants, with each entry reflecting perspectives on executive competencies and leadership traits. Participant responses emphasize a range of coded descriptions, including the importance of empathetic leadership,

strategic decision-making, and integrating technical and nontechnical skills within leadership roles.

For example, one participant emphasizes that a CEO should possess strong emotional intelligence and the ability to balance personal ego with organizational goals. Another participant stresses the importance of having a clear focus on vision and execution, arguing that leaders need to understand the context and practical needs of their teams and organizations. Many responses highlight the need for leadership traits such as authenticity, courage, and adaptability in public transportation settings, particularly for managing challenges and fostering collaborative environments.

One may note that the total frequencies in Table 14 differ from those in Tables 3 and 4. This difference reflects the combined and reorganized coding structure. That is, overlapping or closely related codes from both tables have been reclassified and merged into broader categories that more accurately capture the study's core themes. As such, individual codes related to "communication," "active listening," and "verbal engagement" may have appeared separately in earlier tables but are grouped under a unified code in Table 14 to reflect their thematic similarity. Similarly, the frequency totals differ because Table 14 does not simply add the raw counts from Tables 3 and 4. Instead, it presents adjusted frequencies based on how many times the broader, synthesized codes appeared across all interviews after reclassification. This approach allows for a more holistic understanding of the data. It also supports a clear narrative that is in line with the study's focus on executive competency and training effectiveness.

The data codes are an aggregate of the transcriptions to protect participant identities. It depicts the growing recognition of nontechnical skills critical to executive competencies and leadership, particularly in public service sectors where safety, service quality, and community

engagement are paramount. These insights underscore the idea that leadership is not only about strategic knowledge but also about emotional and interpersonal capabilities, which help leaders navigate complex organizational and societal dynamics.

Table 15

Primary Thematic Code and Quotes

Primary Thematic Code	Participant	Coded Line Segment
Empathetic Leadership	P1	"The attributes I would say a CEO need is to be empathetic."
Systemic Understanding	P2	"Many of the transit leaders today do not understand the complexity of transit safety."
Collaborative Problem Solving	P3	"They have to have good communication … and build relationships with regulatory agencies."
Leadership Accountability	P4	"Operate in such a way that has high integrity and fosters a high level of trust."
Systemic Understanding	P5	"They need to have an understanding of how the system works."
Systemic Understanding	P6	"Critical traits for executives, critical thinking … to understand the full playing field."
Values-Driven Decision Making	P7	"You should be communicating well externally to stakeholders and internally to employees."
Leadership Accountability	P8	"Integrity, transparency … we have to be servant leaders to both our community and our people."
Leadership Accountability	P9	"When you're working with public tax dollars … you have to be fully transparent at all times."
Leadership Accountability	P10	"Whether it's public or private, you have to have financial management skills."
Courageous Conversations	P11	"At times, you'll have to make decisions that are not popular … based on data, not just on how you feel."
Values-Driven Decision Making	P12	"The most critical trait is a focus on customer experience … people serving people."

Table 15 provides a detailed account of thematic codes derived from participants' responses to interview questions about leadership traits and nontechnical skills training. Specifically, Table 15 presents the single most prominent quote for the primary thematic code, the participant identifier (i.e., P1, P2, etc.), and the corresponding coded line segment, which is a verbatim quote from the interview. Thematic codes such as "Empathetic Leadership," "Systemic Understanding," and "Collaborative Problem Solving" highlight the key leadership qualities identified by the participants. These quotes presented in Table 15 offer insights into how participants view leadership traits in the context of public transportation, emphasizing the

importance of empathy, integrity, communication, and a deep understanding of systemic issues in the sector.

Additionally, a few additional quotes are worth mentioning as they help connect specific leadership traits to participants' experiences and viewpoints on effective leadership. For example, codes on strategic communication can also be described by excerpts such as "I have to tailor my message depending on the board or operator I'm dealing with." (P3), "Our job isn't just technical, we're managing perceptions, too." (P7) or "Clear, timely communication makes all the difference in an emergency." (P10).

Tables 14 and 15 collectively illustrate how the five higher-order themes of accountability, communication, education, as well as emotional intelligence (later integrated into collaboration) and ethical leadership (later integrated into engagement) emerge from both the frequency and contextual dimensions of the data. Table 14 provides an aggregate of data codes, demonstrating how participant responses cluster around key leadership traits that align with these themes. Table 15 complements this by presenting illustrative quotations from participants, providing qualitative depth and contextual evidence that enrich and substantiate the thematic patterns identified in the analysis.

Summary

Chapter 4 presents the findings from twelve semi-structured interviews with senior executives from U.S. public transportation agencies. Using a phenomenology research design supplemented by grounded theory coding techniques, this research identified five theme codes as the most critical nontechnical leadership and executive competencies: accountability, communication, education, ethical leadership, and emotional intelligence. The coding process

moved from open codes, drawn directly from interview data to axial codes, and ultimately to these higher-order themes.

Sentiment analysis revealed generally positive perceptions of nontechnical skills training, with participants consistently linking nontechnical training to enhanced decision-making, improved collaboration, and stronger organizational performance. Data saturation was achieved by the ninth interview, reinforcing the reliability and validity of the themes, which were further aligned with the guiding frameworks of outcome-based education (OBE) and transformational leadership theory.

CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

This study asked the following research questions. To what extent does nontechnical skills training for transportation executives enhance executive competency and leadership in ways that protect public safety? How should the outcomes of nontechnical skills training be evaluated? From the codes and themes identified in Chapter 4, the findings indicate that executive competencies and leadership, such as accountability, communication, and education, play a critical role in shaping executive effectiveness in safety oversight. Participants consistently emphasized that nontechnical skills enhance their ability to manage organizational risks, build trust, and foster collaborative safety cultures, thereby directly influencing transit safety outcomes.

Contribution to Literature

By addressing the fundamental research questions of how much nontechnical training for transportation executives, which focuses on leadership attributes and transit safety outcomes, protects public interests, and how such training should be evaluated, this study demonstrate that the five higher-order themes of accountability, communication, education, ethical leadership, and emotional intelligence have a significant influence on shaping executives' managerial effectiveness in U.S. public transportation systems. Participants consistently tied these traits to public safety outcomes, including incident reporting accuracy, corrective action plan closure rates, and audit compliance, establishing a direct link between executive competencies and public safety performance.

The contribution of this study lies in extending prior scholarship that emphasized the theoretical value of nontechnical competencies (e.g., Bass & Riggio, 2006; Nascimento et al., 2020) by providing empirical evidence from senior executives directly responsible for transit

safety oversight. Unlike earlier research that often stopped at conceptual alignment, this study offers grounded qualitative data showing how executive competencies such as accountability and communication, are closely related to transformational leadership, translate into observable improvements in oversight practices and organizational trust.

Moreover, integrating phenomenological insights with grounded theory-based analysis enhances the rigor of the findings, yielding a thematic outline that connects leadership development to safety outcomes in a way not previously described in the literature. This study also advances the literature by providing empirical evidence that positions executive training within the dual lenses of outcome-based education and transformational leadership. It also proposes an outcome-based model that illustrates how nontechnical skill development strengthens safety culture and helps safeguard public interests in high-risk transit environments.

Contribution to Applied Practice

This study contributes to applied practice by providing an evidence-based analysis of nontechnical skills training for public transportation executives, explicitly focusing on leadership traits and their impact on organizational effectiveness. The interviews conducted for this study highlight the five most prevalent traits related to the effectiveness of nontechnical skills training — accountability, collaboration, communication, engagement, and education — and the sentiments expressed by participants regarding these traits. The themes are determined by frequency of confirmed statements, allowing for a reasonable assessment of the importance of each trait in nontechnical skills training.

The analysis provides valuable insights into how these traits are cultivated through training programs and how they translate into real-world outcomes, including improved leadership effectiveness, better decision-making, and enhanced safety and service management

in the transit sector. By analyzing the frequency of the various executive traits and transit safety outcomes mentioned, the analysis informs applied leadership development practices, offering data-driven recommendations to improve training programs and align them with the needs of public transportation agencies.

Furthermore, the detailed breakdown of themes and sentiments facilitates the identification of deficiencies in existing executive skills training, ensuring that future programs can better address executive competencies and leadership. This can help agencies optimize their training programs to create more effective, well-rounded leaders who are better equipped to navigate the complexities of the public transportation industry, thereby improving overall safety, service delivery, and organizational performance.

Discussion of Findings

This study examined the extent to which nontechnical skills training for transportation executives enhances executive competencies and leadership in ways that protect public safety, documenting that traits such as accountability, communication, education, ethical leadership (later integrated into engagement), and emotional intelligence (later integrated into collaboration) are important. The findings indicate that such leadership traits gained from nontechnical skills training play a critical role in enhancing executive decision-making, promoting a safety culture, and improving oversight practices.

In exploring how these nontechnical skills training should be evaluated, this study also found that an OBE-oriented framework works best for nontechnical skills training. By defining executive competencies and leadership traits as the desired measurable outcomes of nontechnical executive training, OBE provides a structured approach to designing learning objectives, evaluating skill acquisition, and determining whether training produces leadership behaviors that

ultimately support public-interest outcomes in transit organizations. These results affirm the

proposition that transformational leadership traits extend beyond technical knowledge and

directly influence system-wide safety performance. The summary of these results is presented in

Table 16.

Table 16

Summary of Results According to the Themes, Leadership Style, and Evaluation Framework for

Nontechnical Skills Training.

Theme / Leadership Trait	Summary of Findings
Accountability	Participants emphasized that clear accountability structures help prevent minor safety issues from escalating and strengthen a proactive safety culture.
Communication	Transparent, timely, and cross-agency communication improves coordination, accelerates corrective action plan closure, and reduces compliance delays.
Education	Ongoing professional development / formal training are essential for adapting to evolving technologies, regulatory changes, and workforce demands.
Ethical Leadership	Integrity, fairness, and values-driven decision-making build trust and support public interest, particularly in high-stakes safety oversight contexts.
Emotional Intelligence	Empathy, self-management, and conflict resolution skills help leaders maintain team morale and make sound decisions under pressure.
Transformational Leadership	Described as a style that inspires shared vision, empowers staff, and supports cultural change, closely aligning with OBE's emphasis on measurable growth and development.
Outcome-Based Education	Framework to produce clear, measurable learning outcomes essential for developing and evaluating executive competencies that influence performance and public safety.

As presented in Table 16, the five overarching higher-order themes (i.e., accountability,

communication, education, ethical leadership, and emotional intelligence) emerged from the

analysis, indicating the nontechnical competencies most essential to effective executive

leadership in public transportation. Accountability consistently surfaced as a critical requirement,

as executives emphasized that without clear responsibility structures, near-miss events and minor

safety concerns often escalated into more serious incidents, reaffirming scholarship that

identifies accountability as a cornerstone of a robust safety culture. Communication was

repeatedly identified as both a facilitator and a barrier to safety oversight; participants noted that

clear, transparent dialogue across state oversight agencies and operating entities accelerated the

closure of corrective action plans, whereas communication breakdowns hindered compliance and

delayed safety improvements. Education, including formal learning and ongoing professional

development, was viewed as a vital mechanism for preparing leaders to respond to changing

technologies, regulatory updates, and workforce challenges. In addition, ethical leadership

emerged as a necessary competency for promoting trust, modeling integrity, and ensuring

fairness in decision-making, particularly when safety outcomes and public interests are at stake.

Finally, emotional intelligence was described as essential for navigating high-stress operational

environments, supporting teams, and promoting collaborative problem-solving, especially during

incidents that require calm and empathetic leadership.

Collectively, these five higher-order themes align with the outcome-based education

(OBE) framework by illustrating that clearly defined, measurable learning outcomes are

necessary to develop and assess executive competencies that directly shape executive judgment,

organizational performance, and public safety outcomes.

Importantly, the findings extend the literature by demonstrating that transformational

leadership traits, such as vision, innovation, and individualized consideration, are in line with

effective safety oversight, while transactional traits may provide only short-term compliance.

Through integrating nontechnical competencies into leadership training, executives better

influence organizational culture and deliver sustainable safety outcomes. These insights

contribute to both scholarship and practice by bridging the gap between theoretical models of

leadership and the lived experiences of transit executives. The careful collection and analysis of

the data in this study provides confidence that the patterns found in this study are robust and transferable across transit systems of varying size and complexity.

Implications of the Findings

Applying the outcome-based education (OBE) framework provides a structured way of translating findings into leadership development for public transportation executives. The OBE emphasizes the definition of outcomes, the alignment of instructional strategies with those outcomes, and the systematic assessment of demonstrated competencies. Consequently, by positioning executive competencies and transformational leadership as the desired measurable outcomes of nontechnical skills training for executives, OBE provides a systemic way to design learning objectives, assess skill acquisition, and determine whether training helps leaders develop behaviors that ultimately support public-interest outcomes in transit organizations.

The findings from this study highlight three interrelated outcome domains: safeguarding public interests through enhanced safety and accountability, improving transit performance through strengthened safety culture, and advancing executive leadership by cultivating trust, communication, conflict management, and ethical decision-making. Executive traits such as accountability, communication, emotional intelligence, and ethical leadership emerged as critical drivers of these outcome domains. As mentioned above, within the OBE model, these traits are conceptualized as observable, measurable abilities that can be defined, developed, and systematically assessed, rather than as abstract leadership ideals.

OBE also emphasizes aligning training content with the outcomes to be achieved. For public transportation executives, this necessitates moving beyond compliance-focused training that mostly deals with technical and regulatory knowledge. Instead, training must deliberately incorporate nontechnical competencies through pedagogical approaches such as case studies,

simulations, mentoring, peer feedback, and role-playing exercises. These methods allow executives to apply decision-making, communication, and conflict management skills in complex transit oversight environments.

Assessment within the OBE model focuses on tangible evidence of competency application. For transportation organizations, this involves monitoring whether executive training produces measurable improvements in safety performance indicators (e.g., incident rates, audit outcomes, and corrective action plan implementation), employee engagement, and stakeholder communication. Assessment tools that use multiple sources, such as 360-degree evaluations and organizational surveys, can provide long-term oriented evidence of leadership competency development.

The integration of OBE into transit leadership development can address a regulatory deficiency. It is noteworthy that while federal mandates require safety training for frontline staff, there are no equivalent standards for executive leadership training. Establishing minimum requirements for executive leadership training that prioritize nontechnical competencies would enable agencies to cultivate leaders who are better able to safeguard public interests in terms of safety. Establishing such requirements would also enable the embedding of leadership development within broader workforce strategies.

Recommendations for Future Research

Future research can extend this study by examining the applicability of nontechnical skills training beyond the public transportation sector. For example, future research could examine the extent to which nontechnical skills training influences executive competency in areas such as healthcare or education and examine whether the outcomes are consistent with

those found in the transportation industry. Expanding the scope across industries would help

determine whether the competencies identified here are universally beneficial or sector-specific.

Another area for future research is related to methodological approaches. A quantitative

design could provide empirical validation of the themes identified in this study. Thus, future

studies might ask how the effectiveness of nontechnical skills training on executive performance

and organizational outcomes can be tested and confirmed quantitively. Likewise, longitudinal

designs could address the question that examines the long-term impacts of nontechnical

leadership training on leadership development, safety performance, and organizational culture.

Within the transportation context, nontechnical competencies such as communication,

emotional intelligence, and ethical decision-making warrant further focused exploration. This

raises the question: how do specific nontechnical skills influence leadership outcomes such as

safety, employee satisfaction, and organizational performance when integrated into executive

training? Related to this, future studies could explore the most effective teaching methods and

best practices for embedding nontechnical competencies into leadership development curricula.

The potential of outcome-based education (OBE) also offers fertile ground for additional

investigation. Researchers can examine how OBE models can be structured and applied within

public transportation leadership training to improve executive performance. A longitudinal

approach can extend this inquiry further by asking how participation in OBE-based training

influences executive decision-making, risk management, and organizational outcomes over time.

Finally, transformational leadership emerged as a central theme that warrants a deeper

investigation. Future studies might ask in what ways transformational leadership traits, such as

vision, empowerment, and trust-building, shape organizational culture and safety outcomes in the

transit sector. Additionally, comparative studies can address how transformational leadership

styles compare with other leadership approaches in shaping safety culture, employee

engagement, and overall organizational performance.

Conclusion

This study investigated the extent to which nontechnical skills training for transportation

executives improves executive competencies and leadership in ways that protect public safety.

This study also explored how such training should be evaluated. The findings from this study

suggest that it is nontechnical training that plays a critical role in strengthening leadership

effectiveness and safeguarding public interests within the U.S. public transportation sector. The

findings also indicate that nontechnical competencies are indispensable to effective leadership,

shaping safety oversight, organizational performance, and public trust. Lastly, the findings

suggest that the OBE framework works best with nontechnical skills training, as it defines

executive competencies as measurable outcomes, employs backward-design training structures,

and uses authentic assessments that evaluate observable behavior in practice—making it a strong

model for developing communication, ethical decision-making, and other soft skills essential to

executive leadership and safety performance.

Another important takeaway from this study is that although measurable abilities such as

accountability, collaboration, communication, engagement, and education provide administrative

clarity, overreliance on these indicators alone obscures intrinsic dispositions like empathy,

adaptability, strategic vision, and ethical judgment that fundamentally influence leadership

effectiveness. Both the measurable abilities and intrinsic dispositions should be considered

together.

Current leadership development approaches within transit agencies still remain largely

compliance-driven and emphasize only technical skills at the expense of critical nontechnical

traits. Agencies must adopt integrated leadership development frameworks that elevate both measurable nontechnical skills and intrinsic dispositions. Embedding nontechnical competencies through structured methods such as outcome-based education, targeted mentoring, and sustained professional learning is now a strategic necessity. Agencies that invest in these capacities will be better equipped to meet emerging challenges, strengthen safety culture, and uphold their role as stewards of the public interest.

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Appendix A: Informed Consent Form

Marymount University Informed Consent for Participation in Research

Research Purpose: The interviews are being conducted as part of the dissertation process at Marymount University. This study is concerned with your experience managing, working with, or interacting with organizations. We are taking all necessary steps to protect your anonymity and confidentiality.

Study Expectations: This Interview will last 1-1.5 hours and will include questions about your work. Interviews will be audio and video recorded for further review by the researchers. Audio and video recordings will be destroyed three years after their creation to give ample time for review and validation of transcription.

Risks: We do not anticipate that participating in this study poses any risks greater than those encountered in day-to-day life.

Compensation: There is no compensation for participation in this study.

Benefits: Participants are not entitled to any benefits from participating in this study such as access to data or reports aside from any public output of the study.

Privacy and Confidentiality: If you agree to participate in this research, we will protect your privacy and confidentiality by removing any identifying information for yourself or your organization from any publication of this research. Data collected from this interview will be reported as aggregate or anonymized pull-quotes only. Identifying information such as position and company will be scrubbed before analysis or reporting. To protect confidentiality, recordings and transcripts of these discussions will not be made available outside of the researchers analyzing them. Any information obtained in this study will remain strictly confidential and will be used for research purposes only. Employers, colleagues, and associates will not have access to the comments you make or be able to identify you from any report. In case of a breach of confidentiality, all potentially affected participants will be alerted by the contact information provided.

Sharing Study Findings: The results of this study will be used for primarily academic purposes of the dissertation and publication.

Voluntary Participation: Taking part in this study is completely your choice. If you decide to participate, you are free to skip parts or stop participating at any time for any reason. Your participation or lack of participation will not affect your current or future relationship with the researcher(s) or with Marymount University.

Questions: For questions about this study, you can contact Timothy Braxton Principal Investigator doctoral student at (t0b78603@marymount.edu) or chair faculty Assistant Professor Youree Kim, PhD (ykim@marymount.edu). If you have any questions or concerns regarding your rights as a participant in this research, you may contact Marymount University's Institutional Review Board (IRB) via email, irb@marymount.edu, or phone, (703) 526-6898.

Statement of Consent:

□ I fully understand the contents of this consent form and agree to participate in this study. I also agree not to disclose the details of the study to other parties. I am at least 18 years of age. By clicking the check box and clicking to proceed, I consent to participate in this study.

This consent form will be kept by the researcher for at least three years beyond the end of the study and was approved by the Marymount IRB on **02/22/2025**.

VERBAL CONSENT

Introduction (please read to participants): This interview is being conducted as part of the dissertation process at Marymount University. For any questions about this study, you can contact Timothy Braxton (t0b78603@marymount.edu) or the chair faulty, Assistant professor Youree Kim, PhD (ykim@marymount.edu). This study is concerned with your experience managing, working with, or interacting with organizations. We are taking all necessary steps to protect your anonymity and confidentiality. We will protect your privacy and confidentiality by removing any identifying information for yourself or your organization from any publication of this research. Although we won't ask for any confidential company information, it's your responsibility to know what information is confidential or secret within your organization and to not divulge it.

Signature Print and Sign_____ Date_____

Appendix B: Interview Protocol and Questions

Date _____ Interviewer _____Timothy J. Braxton___

Time _____ Interviewee 1,2,3…25_____

Location _____ Release form signed? _____

Step 1: Introduction and explanation

Introduction (Interviewer): Hello (Interviewee 1, 2, 3…25), I appreciate you taking the time to meet with me today. Before we commence, I'd like to provide some additional details regarding the purpose of this interview and the confidentiality of our discussion.

Purpose and Format (Interviewer): Thank you for agreeing to sit down with me. As part of my work to complete my doctorate in business administration, business intelligence at Marymount University, I have developed the following interview protocol for my dissertation. In reference to my prior communication about my research, I would like to further explore the lived experiences of executives in the public transportation field, with a focus on leadership traits and transit outcomes.

Videotape (Interviewer): To optimize our conversation and ensure accurately document your valuable insights, I would be grateful if you would grant me permission to video record our conversation. This recording will be used solely for research purposes and will be maintained with the utmost confidentiality. Please be assured that you have the right to request that I cease recording at any time.

Confidentiality (Interviewer): The confidentiality of our discussion is paramount. While a transcript will be prepared for research purposes, your name will be identified as Interviewee 1, 2, 3…25, company, and any references to individuals or organizations will be omitted. Your responses will be analyzed alongside those of other participants.

Acknowledgment (Interviewer): Before we start, I'd like to confirm your consent to proceed with the interview and record our conversation. If you have any questions or concerns, please feel free to ask before we move forward.

Step 2: Interview questions

1. (General Q) In your opinion, what are the most critical leadership traits transportation executives need to safeguard public interests effectively?
    a. (Probing Q) What specific challenges or situations have you encountered that highlight the importance of those traits?
    b. (Probing Q) How did having those traits influence the success of those outcomes, walk me through the experience?
2. (General Q) How do you measure or evaluate the effectiveness of nontechnical (soft skills) training programs?

      a. (Probing Q) What specific metrics or performance indicators are used to assess improvements in nontechnical skills?

      b. (Probing Q) How does the incorporation of risk reward systems and performance monitoring, influence the evaluation metrics of nontechnical training programs?

      c. (Probing Q) What actions do you take to mitigate risks, walk me through the process?

3. (General Q) How has the leadership traits gained from nontechnical training impacted your ability to manage safety and service outcomes in transit? Walk me through that.

4. (General Q) How has current nontechnical training programs for transportation executives aligned with the goal of improving transit safety outcomes?

5. (General Q) Can you share examples of nontechnical training that you believe are effective in developing leadership skills for transit executives?

6. (General Q) What gaps have you observed in existing training programs has the potential to impact transit outcomes?

7. (General Q) In your experience, how do leadership traits influence decision-making in high-stakes transportation scenarios? Tell me why?

8. (General Q) What role do you think leadership traits play in risk management within the public transportation sector? Explain

9. (General Q) What additional skills or attributes do you believe could further enhance the effectiveness of your position?

Step 3: Closing

Closing remarks (Interviewer): Thank you once more for your willingness to share your lived experiences. Please be assured that your responses will be treated with utmost confidentiality and anonymity. Following this interview, I may have additional questions. Furthermore, during the data analysis phase, I plan to engage a few participants in reviewing the identified themes as part of a member-checking process to ensure data saturation and validity in the findings. Would you be open to participating in this review if invited? Lastly, it's important to note that you have the option to withdraw from the study at any point in the process.

Appendix C: IRB Exemption

COMPETENCY ASSESSMENT AND LEADERSHIP TRAITS AMONG U.S. PUBLIC
TRANSPORTATION EXECUTIVES: AN EXPLORATORY QUALITATIVE
EXAMINATION

MARYMOUNT
UNIVERSITY

Exemption Verified - IRB ID: 1232
To submit post-approval continuing reviews, amendments, additional documents and other
required reports, please use the sub-tabs found at the bottom of this page.

Student Investigator Timothy Braxton Student	Faculty Mentor Youree Kim Accepted 02/21/2025 3:18 PM EST	Approval Status Exemption Exemption Verified (2) Tests, Surveys, Interviews	Created 11/01/2024 Received 11/10/2024 Date of Completion 02/22/2025	Approved 02/22/2025 Approval Expires 02/21/2026 Date Closed Set Date

Appendix D: CITI Program Certificate