STATE OF NEW JERSEY DEPARTMENT OF TRANSPORTATION

Comprehensive Strategic, Financial & Operational Assessment of NJ Transit

October 5, 2018

northhighland.
WORLDWIDE CONSULTING

Executive Summary

The New Jersey Department of Transportation (NJDOT) engaged The North Highland Company (North Highland) to perform a Comprehensive Strategic, Financial, and Operational Assessment of New Jersey Transit (NJ Transit) in accordance with Executive Order 5 (EO-5), signed by Governor Philip D. Murphy on January 22, 2018.

The purpose of the assessment is to provide insights and recommendations for defining and implementing a new target operating model to create a world-class transportation corporation.

In completing this report, North Highland wishes to recognize and thank the countless managerial and operational personnel at NJ Transit for giving generously of their time in sharing the information contained within this report. Staff's frank insights and assessments of challenges facing the organization have proven invaluable. In addition, North Highland wishes to pay tribute to the many staff members whose day-to-day commitment and dedication to the mission of NJ Transit was evident in their participation in the preparation of this report.

INTRODUCTION

New Jersey's Public Transportation Act of 1979 established the New Jersey Transit Corporation and created a public transportation agency with a corporate vision. Located within, but independent of NJDOT, the law empowered the newly created NJ Transit Corporation to acquire, operate, and contract for the operation of public transportation services and facilities throughout the State. As enacted and currently operating, NJ Transit is overseen by an eight (8) member Board of Directors with seven (7) voting members, including the Commissioner of Transportation as the Board Chair.

As the nation's largest statewide transportation system, NJ Transit is a key contributor to the economic viability of the State of New Jersey. Covering a service area of 5,325 square miles, NJ Transit is the nation's third largest provider of bus, rail, and light rail transit, linking major points throughout New Jersey and across State borders to New York and Pennsylvania, with daily service to New York City and Philadelphia.

NJ Transit operates an active fleet of 2,220 buses, 1,230 trains, and 21 light rail vehicles. Across its 252 bus routes and 12 rail lines statewide, approximately one million people living and working in New Jersey rely on NJ Transit nearly every day to meet their routine public transportation and commuting needs. Annual ridership across the enterprise approaches 270 million passenger trips. ***Table 1*** depicts the ridership and revenue shares between bus and rail/light rail passengers.

NJ TRANSIT FY2017	RIDERSHIP	FAREBOX REVENUE
Bus	58%	39%
Rail / Light Rail	42%	61%

Table 1: Comparison of Bus and Rail/Light Rail Ridership and Revenue

NJ Transit is not without its challenges:

- NJ Transit is an exceptionally large, diverse organization, interacting with multiple governmental, quasi-governmental, and private entities and responding to oversight by the U.S. Department of Transportation (DOT), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA).
- NJ Transit rail operations take place in a very complex environment within the busiest rail corridor in the United States, much of which is owned by Amtrak. Both NJ Transit and the corridor require extensive infrastructure investments.
- Once deemed a national model of commuter rail service, NJ Transit has experienced

performance declines in many areas that are critical to the successful operation of the system. Of note, the combination of a precipitous reduction of more than 90 percent in State subsidies since 2010 combined with a substantial increase in ridership of 23 percent from 2002 to 2017 has resulted in significant fare increases, minimal capital investment, mechanical failures, safety concerns, and overall customer dissatisfaction.

Figure 1 demonstrates some of NJ Transit's major events and challenges.

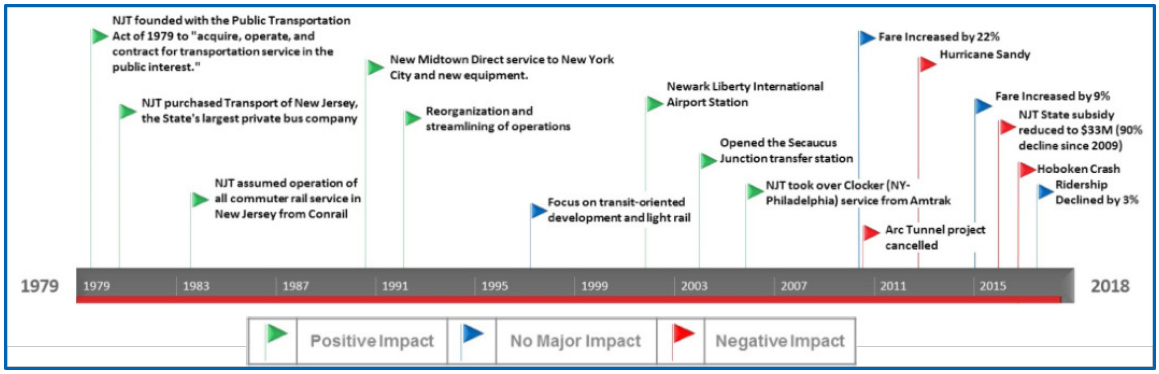


Figure 1: NJ Transit Challenges

THE ASSESSMENT

The North Highland Team performed the Comprehensive Strategic, Financial, and Operational Assessment of NJ Transit over a 100-day period. The scope of the assessment was refined to focus on five specific disciplines graphically depicted in *Figure 2*.

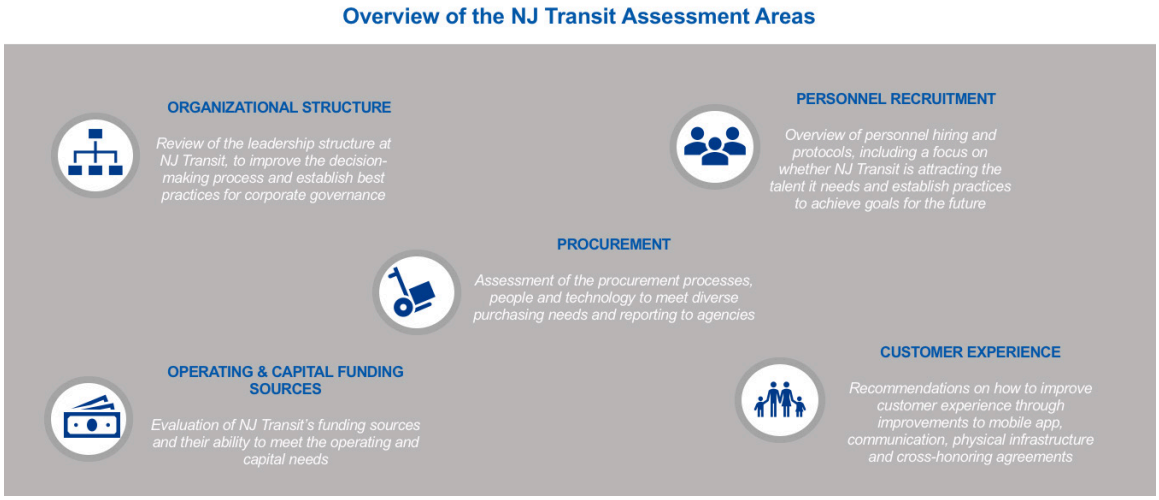


Figure 2: NJ Transit Assessment Discipline Areas

MAJOR FINDINGS AND RECOMMENDATIONS

North Highland identified the absence of ***Strategic Planning*** and a ***Technology Roadmap*** within NJ Transit as two core findings of the comprehensive assessment. Building and executing a strategic plan and technology roadmap represent key opportunities for bringing significant improvement to NJ Transit across the enterprise in general, and across the five assessment areas in particular.

Figure 3 presents a graphical depiction of the major findings and recommendations of the comprehensive assessment of NJ Transit.

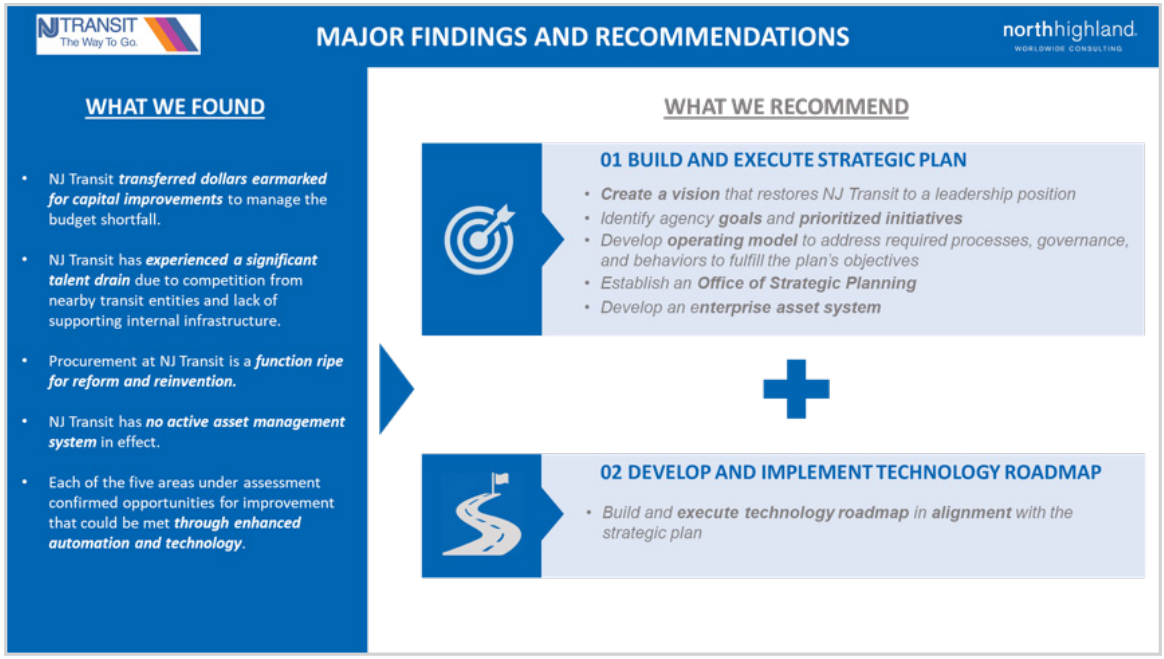


Figure 3: Major Findings and Recommendations

STRATEGIC PLANNING

Strategic planning is an organizational management tool to define an organization's mission, vision, core values, challenges, and opportunities. It envisions a desired future state and translates the vision into organization-wide accepted long-range and short-range goals and objectives, including the steps to achieve them. The planning exercise produces a strategic plan, a document used to articulate and communicate the agency's direction, the actions required for making progress, and the measurements for determining success. Strategic management supports the plan's execution organization-wide by coordinating and aligning resources and actions in accordance with the strategic plan's vision, mission, and goals.

Developing a successful strategic plan starts with executive leadership and then cascades down to the employees while incorporating the needs of the customer. It often favors pragmatic, flexible approaches to problem solving, and anticipates the likelihood that changing conditions may call for shifting targets over time. Given that the transportation industry faces ongoing disruption by current and emerging trends – whether ride-sharing, smart city applications, or autonomous vehicles – strategic plans must become living entities that are both robust and nimble in terms of their approach and implementation. Crafted, communicated and executed correctly, a strategy can align and inspire the workplace and provide long term operational and cultural benefits.

North Highland observed that NJ Transit would benefit from meaningful strategic planning. The development and implementation of a strategic plan would alter the current culture of crisis management.

- Despite its legislative origins as a semi-independent transportation corporation, from a funding perspective NJ Transit has relied on political budgets to form the basis of State and Federal subsidies to support its operations. As State subsidies began their precipitous decline beginning in Fiscal Year (FY) 2013 and because of the lack of a strategy, NJ Transit could not actively pursue alternative revenue solutions – legislative or otherwise – to manage its funding shortfall. Instead, NJ Transit looked to readily available sources of income – the transfer of dollars earmarked for capital improvements and increases in transit fares for the riding public. Today, NJ Transit is facing the unintended long-term consequences of these actions, which have only increased over time as subsidies continued to erode – a deterioration of its assets, continued schedule and safety problems, and a disillusioned ridership.

- Human capital management has suffered from the absence of a strategic plan. Human Resource (HR) planning activities in areas of resourcing, organizational design, compensation, and benefits are not tethered to an agency-wide strategy. The same rings true for assessing the workforce profile against projected anticipated human capital needs. Over the past decade, NJ Transit has experienced a significant talent drain due to competition from nearby transit entities. As budgetary constraints mounted, the loss of key personnel became an inevitable and accepted outcome, with little evidence of succession planning.
- Procurement at NJ Transit is a function ripe for reform and reinvention. To its credit, the Procurement Department has begun an independent visioning initiative. Yet, it must go further in mapping current-state processes for end-to-end procurement lifecycle, identifying gaps, and developing a desired future state. This is best achieved when included in a more robust, organization-wide planning exercise – one that can establish a governance structure to set accountability for activities that take place across multiple business units.
- NJ Transit has more than $5.3 billion[1] in assets under its management. Yet the agency has no active asset management system in place. In fact, our assessment found that NJ Transit experienced a reduction of $1.5 billion in the total capital value of its physical assets since FY2010. World-class transportation agencies oversee their assets by developing and executing effective asset management solutions. These introduce a focus on improved safety and ridership experience through well-defined and disciplined maintenance and replacement strategies.

Elements of effective strategic planning for NJ Transit include creating a future vision, refocusing the agency on its core mission of "moving passengers safely;" considering implications of potential futures (workforce dynamics, population demographics, technology changes); articulating a strategy to succinctly communicate the long-term agency vision; linking strategic priorities to required governance, capabilities, and behaviors inside the organization; and mapping those priorities in accordance with reasonable future funding expectations.

Realizing agency-wide strategic alignment at NJ Transit can be achieved through the adoption of the following three (3) recommendations.

- **Create a vision that restores NJ Transit to a leadership position as a preeminent provider of transit services across the state.** Through personnel engagement at all levels across the organization, the Board of Directors leads NJ Transit in envisioning its desired future state – defining its vision, mission, core values, and goals and objectives to guide the agency's transformation to a world-class transportation corporation.
- **Establish an Office of Strategic Planning to implement strategic planning principles and management across the enterprise.** NJ Transit's cultural transformation from one of crisis to strategic management requires the leadership of strategic planning professionals to institutionalize the change paradigm.
- **Develop an asset management system.** A centralized system consisting of strategy and policy, planning and objectives, and asset registry and lifecycle is essential for the efficient and effective management of NJ Transit's $5.3 billion of assets.

TECHNOLOGY ROADMAP

NJ Transit has made investments in technology to improve the customer experience – particularly in the design of applications for handheld mobile devices. Yet the organization has not applied infrastructure and data management technology across the organization consistent with that of world-class transportation entities. The lack of integrated data limits the ability to understand and improve operations. Each of the five areas under assessment confirmed opportunities for improvement that could be met through enhanced automation and technology. For example, observations reveal that NJ Transit lacks automated Human Resources, Procurement, and Asset Management solutions. In addition, technology solutions to enhance the customer experience, available in the marketplace, have not been implemented.

[1] NJ Transit Annual Report 2017

For NJ Transit to appropriately focus on technology assessment and advancement, it needs to build and execute a Technology Roadmap. A component of the recommended Strategic Plan development is the creation of an associated Technology Roadmap to define the future goals and objective of NJ Transit with respect to technology advancements.

STUDY DISCIPLINE AREAS FINDINGS AND RECOMMENDATIONS

This Comprehensive Strategic, Financial, and Operational Assessment assessed five disciplines within the corporation:

- Organizational Structure - The organizational structure at NJ Transit, and its ability to support effective decision making
- Personnel Recruitment - Personnel hiring protocols and practices and their impact on attracting and retaining the talent necessary to achieve NJ Transit's goals
- Procurement - The procurement processes, people, and technology required to meet NJ Transit's diverse acquisition needs
- Customer Experience - NJ Transit's customer experience as seen through the agency's mobile applications, communication, and physical infrastructure
- Operating and Capital Funding Needs and Sources - NJ Transit's funding sources and their ability to meet the agency's operating and capital needs

FINDINGS

Key findings from the assessment include the following:

- Funding is inadequate, uncertain, and unsustainable. New Jersey Transit's operational and maintenance costs have risen nearly 30 percent in the past 10 years while subsidies have declined, forcing the agency to fund operations through dollars intended for capital projects to meet rising ridership demands.
- Organizational structure requires revision and streamlining. The executive team structure is overly complicated, with roles and responsibilities that do not provide for effective governance and decision making.
- Recruitment policies and processes are inefficient. NJ Transit struggles with staffing shortages and an insufficient pool of high-quality candidates. There is no formal workforce planning process to align organizational strategy with workforce needs. Existing HR systems and processes are outdated.
- Existing procurement processes and systems require overhaul. The agency's Procurement Department has no overall plan and metrics to guide and measure staff performance, creating a reactive environment that continuously operates in response to developing crises. Improvements are necessary in areas of contract vehicles, procurement systems, governance, executive oversight, and Service Level Agreements (SLAs).
- Asset management process is limited and reactive. There is no capital or operational budget plan to guide investments nor a clearly defined objective for how NJ Transit derives value from, and preserves the value of its assets.
- Ontime performance is variable. Physical assets affect customer satisfaction through their reliability, operation, and function. Ontime performance is the key area where physical assets translate directly into customer satisfaction. While New Jersey Transit's Ontime Performance for rail is around 91 percent (2017), the main commuter service line (NEC) stands at 85 percent. The reliability of the assets is getting worse with a six (6) percent decrease in mean distance between failures for the rail cars in the last two years. The operation of the assets (dwell times, dispatch delays, and delays caused by other operators) contributes to over 50 percent of the total delays on average.

RECOMMENDATIONS

The Assessment resulted in specific recommendations by assessment area. These recommendations were categorized into high, medium, and low priority based on a series of factors including the level of effort and value delivered.

The high priority recommendations are provided in ***Table 2***. A summary of recommendations categorized into high, medium and low priority is provided in the ***Appendix***.

FOCUS		RECOMMENDATION	DESCRIPTION
Organizational Structure	1	**Simplify the executive organizational structure to reduce complexity and streamline decision making.**	A Delegated C-Suite model with new positions for General Counsel, Chief Operating Officer, and Chief Administrative Offices would increase leadership focus in these areas and allow the Executive Director to have more engagement with the Board and other State officials.
	2	**Implement specific initiatives to involve employees to improve engagement and morale.**	Employee Town Halls, a communication campaign, and annual survey are ways to deliberately engage employees and measure engagement. Employees with the highest level of commitment perform 20 percent better and are less likely to leave the organization. There is an opportunity to make transformative change as employees seem open to new ideas.
	3	**Adjust HR policies to be more in line with corporate entities as opposed to public agencies, so that NJ Transit can recruit and retain qualified candidates.**	Implementing market-based promotion and raises, and hiring for skills and qualifications are practices not currently in place that would enable NJ Transit to transition away from its current operating mindset as a quasi-state agency toward a more fluid business model.
	4	**Align job tasks and responsibilities to the appropriate jobs to enable role clarity and hold individuals accountable.**	To gain clarity on roles and responsibilities and have well understood decision rights, a prioritized job task analysis will yield the ability to determine and document them for each job.
Personnel Recruitment	1	**Improve or replace technologies used in the hiring and recruiting process to capture target candidates and increase the efficiency and effectiveness of overall hiring in NJ Transit.**	A robust Applicant Tracking System and additional functionality for the TargetRecruit system represent opportunities for needed automation support to the hiring and recruiting process.
	2	**Streamline hiring process by eliminating non-value-add activities.**	Present recruitment practices create innumerable bottlenecks in the system that thwarts the hiring process. By removing non-value-add activities, efficiency is increased, and time-to-fill decreased.
	3	**Clarify recruiting and hiring roles, responsibilities, and accountability between business units and HR/Talent Acquisition.**	A clarification between HR and business unit roles, responsibilities, and accountabilities in the recruitment process is warranted for empowering the business unit to drive strategy and decision making, collaborating with HR as a support function.
	4	**Improve the effectiveness of candidate screening and selection to improve the quality of candidates and reduce the time to acquire them.**	The candidate screening and selection process at NJ Transit is cumbersome and often ineffective, with high degree of HR involvement, not enough from the hiring manager, and unnecessary testing. This is particularly challenging for experienced and credentialed professionals, which dissuades them from applying.
Procurement	1	**Explore expanded opportunities for cooperative purchasing to increase flexibility and control in procurement.**	Cooperative purchasing could involve temporarily outsourcing areas of procurement. Cooperative purchasing allows NJ Transit to gain more control over the vast number of outstanding, high-priority procurement requests.
	2	**In the absence of robust technology to support Procurement, develop standardized spreadsheets and tracking mechanisms to implement short term process, control and data capture.**	Until longer term robust technologies are implemented, short-term consistencies and tools will improve access to data and visibility into key performance metrics.
	3	**Establish a Governance Team for Procurement to involve all stakeholder groups and enable appropriate prioritization.**	A Governance team would be responsible for setting roles, responsibilities, and accountability across all departments and business units and to serve as a resource to make determinations on accountability when gaps in processes exist.
	4	**Develop a process map for end-to-end procurement lifecycle to drive consistency, identify gaps, and develop a desired future state.**	By defining the major phases that take place within the procurement function and identifying the critical processes that take place within each phase, NJ Transit gains better visibility into the full scope of procurement.
	5	**Modernize the organizational structure and role assignments within the Procurement Department and supporting business units to leverage the required balance of skills.**	Continue current organization structure analysis, including implementing role structures with using a mix of professional procurement skills and general business skills.
Operational and Capital Funding	1	**Align asset management objectives with organizational objectives.**	Develop asset management strategy focusing on operational maintenance and capital planning. Develop a strategy that includes frequency, specification, incidents response.
	2	**Make decisions on matters such as capital spending and operational maintenance based on evidence supported by data.**	Set up asset management system for accessible asset data including asset hierarchy, work order, capital projects, maintenance and incidents records to drive decision-making. Create asset data policy by setting up data specification, data governance, data standard including complete asset registry and asset condition.
	3	**Pace level of funding with NJ Transit's Ability to Transform its Asset Management Practices.**	Major capital funding should keep pace with NJ Transit's capacity for reform or it will risk the potential of failed programs, cash misspent and benefits not realized. NJ Transit requires a proper shaping exercise which will establish all organizational gaps between the Current State and Future State.
	4	**Ensure spending is providing optimal value to the asset base, performance and therefore its customers**	Ensure Capital planning and delivery process to effectively account for growth. Deploy data-driven performance monitoring and improvement for operational maintenance delivery.

Table 2: High Priority Recommendations

TABLE OF CONTENTS

Introduction

Governor Philip D. Murphy signed Executive Order 5 (EO-5) directing a Comprehensive Strategic, Financial and Operational Assessment of NJ Transit. Under the direction of New Jersey Department of Transportation, the State engaged North Highland to provide insights and recommendations for defining and implementing a new target operating model to create a world-class transportation corporation.

To complete this effort, North Highland engaged diverse subject matter experts across numerous disciplines and functions – including, but not limited to: transit operations, procurement, asset management, organizational design, performance improvement, strategy, customer experience, and more.

Over the course of 100 days, the team adhered to the following process:

- **Information Collection:** For each of the five areas, the team conducted face-to-face and/or phone interviews with employees and relevant stakeholders within the agency. Over 100 individuals from 15 departments and external organizations contributed to the information collection process.
- **Data Synthesis:** Information was synthesized by the team, supplemented by peer benchmarking, best practices and customer interviews to ensure a holistic view of each subject area.
- **Key Findings and Recommendations:** Key findings were elucidated and summarized across each area along with suggested improvement recommendations.
- **Final Report Publication:** Individual work steams were aggregated and synthesized into a final report.

This document is organized by Chapters and captures all specific requests enumerated in the scope of work.

- Chapter 1: Organizational Structure
- Chapter 2: Personnel Recruitment
- Chapter 3: Procurement
- Chapter 4: Operational and Capital Funding Requirements
- Chapter 5: Funding Sources
- Chapter 6: Cross Honoring
- Chapter 7: Mobile Application
- Chapter 8: Customer Communication
- Chapter 9: Physical Infrastructure

Each Chapter contains the following sections:

- **Introduction:** A description of the function, along with current state and desired future state.
- **Methodology:** Discovery methods used to conduct the assessment specific to each workstream.
- **Assessment Findings:** Detailed descriptions of key findings based on data collection, information interviews, external benchmarks, and other methods of discovery.
- **Opportunities for Improvement**: List of recommendations to make required improvements.
- **Recommended Next Steps:** Consolidated list of recommendations with level of effort, potential value and key success factors.

CHAPTER 1
ORGANIZATION STRUCTURE

Chapter 1 : Organizational Structure

1.1. INTRODUCTION

When considering an organizational transformation, leadership at all levels must be "on the same page" about the change – recognizing and committed to the reasons as to why the called-for change is important to the organization and how essential each leader's responsibility is for promoting not only the change, but leading the employees through the change process. Creating leadership alignment and team cohesion enables communication to be transparent, consistently articulated, and clearly understood. The alignment fosters a unifying approach toward goals, a shared responsibility for supporting others, and an understanding of how each team member can be more personally accountable for achieving the desired results.

In Chapter 1, the focus of the assessment is to review the leadership structure at NJ Transit including changes to be made to the Board and executive organizational structure. Using comprehensive discovery methods, Chapter 1 addresses the following goals:

- Improve the decision making-process.
- Establish best practices for corporate governance.

1.1.1. OVERVIEW

There is no perfect organizational design, only features that are better suited for an organization's unique set of circumstances. Indeed, heroic leaders and a strong culture can overcome many shortcomings in organizational structure. Nevertheless, several reasons suggest good design matters. For instance, if structure can provide quicker and more efficient information flows, information need not cascade up and down through multiple levels. Robust design can improve accountability and decision-making because decisions can be made faster and at the right level. Good design makes optimal use of management capacity and capability by getting the right people spending the right amount of time managing and developing others. Good design also promotes clarity and transparency because it is more logical and easier to understand who in the organization does what and how to navigate the business. Finally, good design supports the development of individuals and helps staff grow and map out their career progression by illustrating clear and logical hierarchical layers.

The first leading practice to consider is organizational layers. The goal is to minimize organizational layers and target having no more than five distinct levels from the top executive. This helps the organization adopt processes that enable decisions to be executed at the most appropriate organizational level without the need for unnecessary referral to individuals or forums. Fewer layers enable problems to be escalated more quickly; to have more people directly answerable to senior managers; and for more decisions are taken by middle management. In a flatter organization, employees also generally have more responsibility, and this can lead to greater motivation.

The next leading practice is around spans of control. Ideally, a ratio of manager to direct report is 1:6 to 1:9 in instances where the line manager has delivery responsibilities in addition to team management. A one-to-one reporting line should not exist anywhere in the organizational design. However, organizational scale influences the ratio as illustrated in ***Figure 1-1***. For example, a larger organization can afford wider spans of control. Organizations that need a more command and control culture use narrower spans. When jobs are very well defined, wider spans are appropriate.

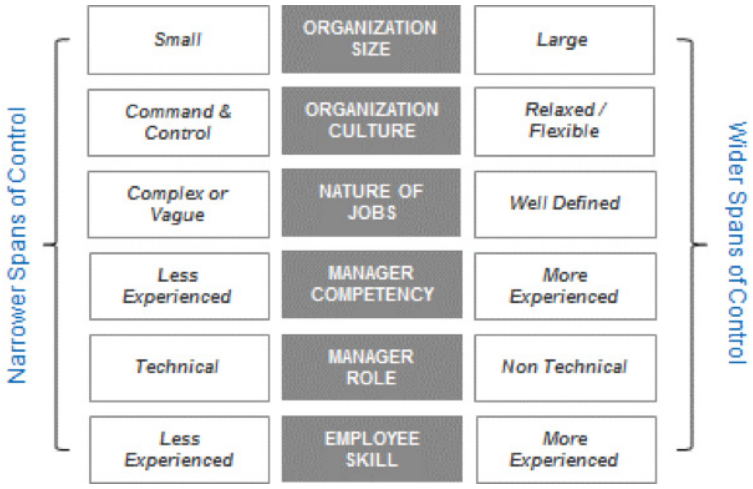


Figure 1-1: Spans of Control Features

There are a number of pros and cons to consider when addressing spans. While too wide a span of control leads to a lack of control, a too narrow a span does not provide the proper oversight. The following ***Figure 1-2*** illustrates some of these cautionary factors.

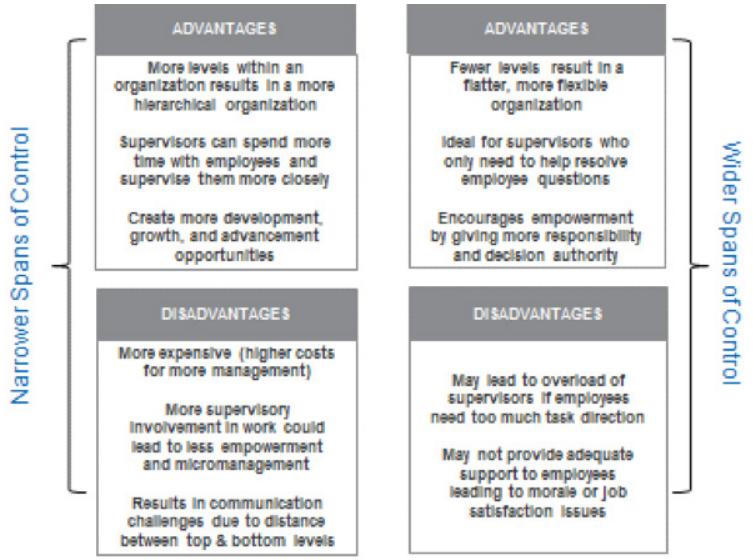


Figure 1-2: Spans of Control Pros and Cons

The next design factor is concerned with the nature and number of reporting lines. The rule here is to implement consistent and meaningful reporting lines where all employees have only one-line manager and the gap between grades within reporting lines is minimized (but not nonexistent). Proper reporting lines provide better clarity on accountabilities and objectives and foster effective career and performance management. Reporting lines also support career development (enable staff to see opportunities open to them) and further the cost-effective deployment of management resources. ***Figure 1-3*** illustrates preferred reporting lines based on North Highland's research and experience.

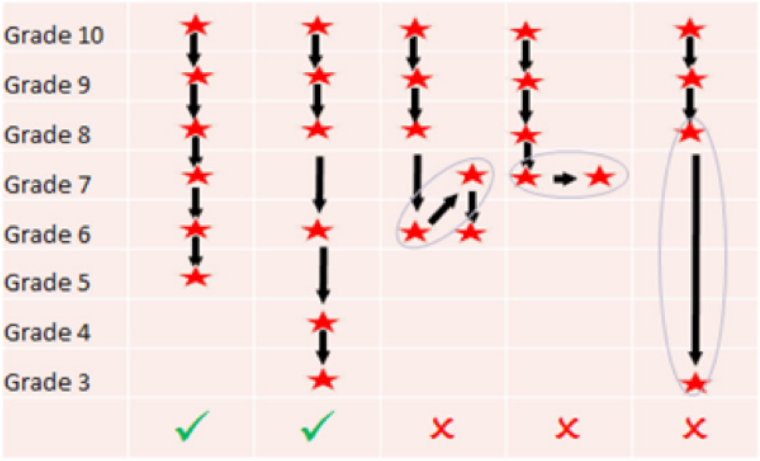


Figure 1-3: Reporting Lines

The final design feature is logical structure. In general, this means like activities are grouped together within a single logical structure. The grouping helps focus resources around the delivery of capabilities (migration toward process centricity). It provides a more transparent structure with obvious "go to" accountabilities. And, more obviously, it helps to create more defined and meaningful role titles. Logical design streamlines and simplifies organizations. It gives an organization a better ability to build expertise in key skill areas, aids effective collaboration, and enables the adoption of single consistent business processes. In short, form should follow function.

1.1.2. CURRENT STATE

NJ Transit was established statutorily as a corporation independent of NJDOT. Yet today it operates with aspects of a corporation and aspects of State government. For example, NJ Transit must comply with the New Jersey First Act[2] , which includes residency restrictions for employees. It must compete in the marketplace, but cannot control its own fares. It must be nimble to respond to customer needs, but cannot change a bus route without a public meeting. It has no dedicated funding source, but carries intense State oversight.

Furthermore, the current state is characterized by uncertainty around funding sources, a broken hiring system, and long procurement delays as discussed elsewhere in this report. In terms of leadership structure, decision-making, and governance, NJ Transit has no strategic plan, no retention program, no knowledge management program, and no succession plans. The organization has an overly complex organizational structure matched by equally as complex business processes. The organizational culture reflects "buck passing" and siloed behaviors, low employee morale, and ill-defined roles, authorities, and accountabilities.

Additional leadership, added funding, and the assessment recommendations contained in this report will present a catalyst for positive change, recognizing that current optimism is fragile, and so there is likely a small window to act to realize most significant benefit.

[2] N.J.S.A. 52:14-7 (L. 2011, Chapter 70)

1.1.3. DESIRED STATE

Based on structured conversations with internal and external NJ Transit stakeholders, North Highland has identified four key elements of the future state.

- **Customer Service:** Responding to rider trends and meeting the needs of customers for safe transportation is an imperative for the future state of NJ Transit.
- **Operational Excellence:** Returning to its legislative roots that established NJ Transit as a corporation, a second mandate for its future state is to operate as a business. Over time, the organization has become more like a state agency. Challenges ahead include: addressing human resource needs (vacancies, leader development) and improving decision making (through process improvement, defined authorities); creating long-term strategic planning for capital projects and other priorities; and setting up clear lines of business with a proper organizational structure.
- **Positive Culture:** The internal climate, including employee morale, is yet another opportunity ripe for improvement in NJ Transit's future state. A cultural change that encourages initiative and accountability and also promotes innovative thinking is required. Trusted leadership guiding the organization to satisfies its core mission is necessary.
- **Great Reputation:** In its future state – perhaps as its future vision – NJ Transit is once again a leading mobility integrator, providing world class transportation services.

1.2. METHODOLOGY

North Highland used two data sources in our diagnostic effort to assemble findings and recommendations for this task. These are:

- **Structured Interviews:** Individual interviews were held with 21 data sources. Included were members of NJ Transit executive leadership, the Board of Directors, and external stakeholders / passenger riders.
- **Peer Benchmarking:** Various characteristics of the organizational structure and Board of Directors composition / function were compared with peer organizations in public transit. Peers include: SEPTA, Chicago Transit Authority (CTA), Metropolitan Transportation Authority (MTA), Massachusetts Bay Transportation Authority (MBTA), Metra (Northeast Illinois commuter rail system), Dallas Area Rapid Transit (DART), and Los Angeles Metro. These comparisons provided examples of potential leading practices and helped inform findings and recommendations.

In addition, North Highland reviewed best practices in organizational design theory as another means of identifying and informing our ongoing analyses. North Highland also reviewed customer satisfaction survey data and internal NJ Transit climate survey to augment our findings and recommendations.

Secondary research from the American Public Transit Association (APTA), North Highland's internal thought capital, and from peer transit organizational benchmarking was conducted as part of the assessment.

1.3. ASSESSMENT SUMMARY

Figure 1-4 illustrates the principles and imperatives used to shape our recommendations for NJ Transit's new leadership organizational structure.

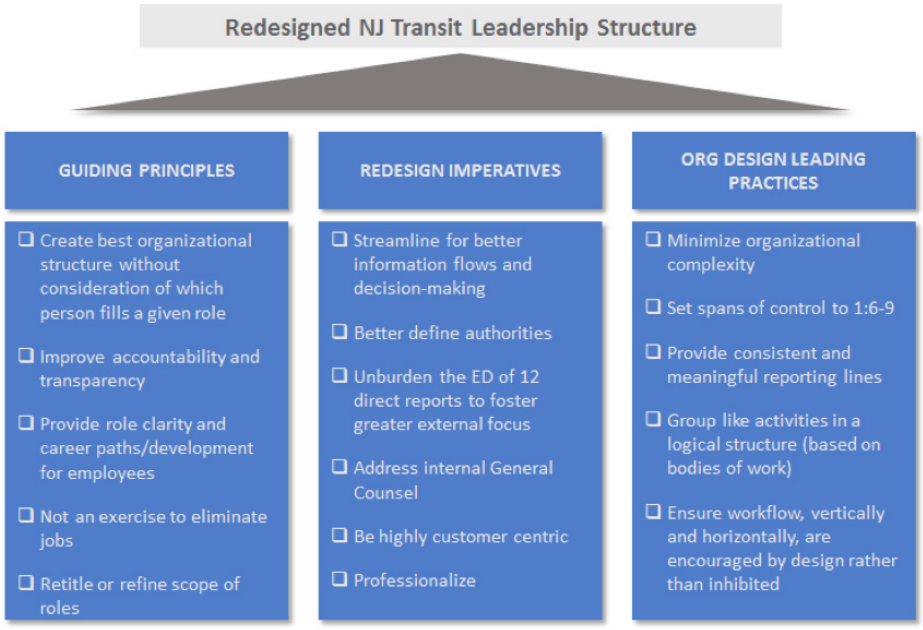


Figure 1-4: Guiding Principles to Develop Recommended Organization Structure

The following *Figure 1-5* is a summary analysis of Strengths, Weaknesses, Opportunities, Threats (SWOT). This SWOT serves as a brief analysis of what was learned from the interviews; associated findings are explained in greater depth in the subsequent section.

Strengths	Weaknesses
▸ Customer satisfaction survey and response ▸ Crisis capabilities (9/11, Sandy) ▸ Newer, more junior staff (under 5 years) ▸ Experienced staff (over 20 years) ▸ Ambassadors / CRM software ▸ Heroic individuals ▸ Corporation status ▸ Core mission clarity	▸ No dedicated funding source ▸ Tight job market ▸ Poor retention ▸ Little leader development or succession planning ▸ No overall long-term strategy ▸ Complex internal bureaucratic practices ▸ Procurement time horizons ▸ Wide spans of control ▸ Too many acting leaders ▸ Hollowed out middle management
Opportunities	**Threats**
▸ New Executive Director ▸ New leadership with fresh perspective ▸ Morale improving (energy, enthusiasm) ▸ Transparency ▸ Recommendations as is a catalyst for change ▸ Recent funding from Governor	▸ Funding predictability ▸ Changing demographics / technologies ▸ "Brain drain" ▸ Vacancies ▸ Micro-management ▸ Compensation gap

Figure 1-5: SWOT Analysis

1.4. ASSESSMENT FINDINGS

We assessed the organization around the following areas:

- Customer engagement
- Transparency and accountability
- Leader development and succession planning
- Internal climate and morale
- Internal structure
- Bureaucratic hurdles
- Corporation status
- Board governance
- Authority and decision making

The heat map illustrated in ***Figure 1-6*** indicates our assessment of urgency in addressing each area. Additional findings about each of these is provided following the Figure.

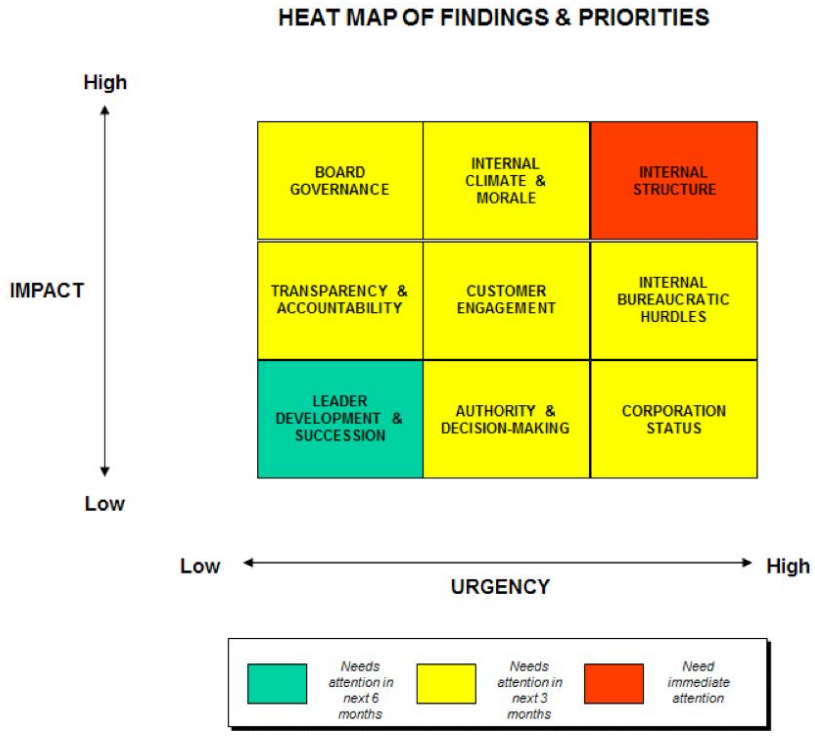


Figure 1-6: Heat Map

1.4.1. CUSTOMER ENGAGEMENT

Because each area of the organization is managed in a silo, there is no one area responsible for overall customer engagement and satisfaction.

- There is broad internal recognition that customer service has declined since the 1990s.
- Innovations are recognized and praised, but opportunities exist to expand use of technology and outreach (e.g., further social media, apps).
- Customer satisfaction surveys are performed twice each year. There is detailed analysis of these results and outputs are posted for the media and the public.
- Ambassadors are a powerful tool and get high marks for customer engagement.

1.4.2. TRANSPARENCY AND ACCOUNTABILITY

Due to a perceived lack of transparency and accountability, stakeholder confidence in NJ Transit has diminished.

- Board meetings are held in Newark and some are scheduled after working hours.
- Key documentation, such as long-range plans are not readily available on public websites.
- Scorecard data on operational performance has not be updated since FY2013. However, customer experience information is updated through FY2018.
- Executive sessions allow for the discussion of legal, personnel, and contractual matters.
- NJ Transit pulls together as a team and responds with determination in crisis situations.

1.4.3. LEADER DEVELOPMENT AND SUCCESSION PLANNING

We observed that formal leader development and succession plans do not exist.

- There are few true deputies or assistants with formal development plans.
- There are no formal mentoring programs.
- Career ladders are ambiguous or completely absent.
- Position descriptions may not align with actual job responsibilities.
- There has been insufficient training in leadership skills and in workforce inclusion.

1.4.4. INTERNAL CLIMATE AND MORALE

Morale has been very low, but there now seems to be a new optimism.

- There has been a lack of attention to hiring qualified leadership to ensure the integrity of the organization.
- Employees witnessed NJ Transit fall from one of the top transit organizations nationwide, to one called a "disgrace" by State officials.
- Organizational dynamics have been characterized as silos, camps and warring states.
- In a dysfunctional environment, employees learned to "game the system" (e.g., using EEO complaints to get what they want).
- With changes among internal leaders, the current climate may provide a catalyst for change.

1.4.5. INTERNAL STRUCTURE

The current executive team structure is overly complex and creates confusion for decision-making.

- There are too many direct reports to the Executive Director, further complicating leadership focus. The organization is also seen as very top heavy.
- NJ Transit does not have an internal general counsel and must rely on the State Attorney General's office.
- The organization has a very siloed structure that reinforces certain unfavorable behaviors (in terms of poor communication, collaboration, and accountability).
- There is a history of high turnover among senior leadership that impacts the pursuit of a clear, long-term vision. This turnover has also weakened institutional memory and the internal cohesion among the executive team.

1.4.6. BUREAUCRATIC HURDLES

In part because of the leadership structure and the culture it creates, there are several internal practices and oversight processes that may be necessary.

- Anecdotal comments describe multiple manual and duplicative steps for major business processes.
- Anecdotal comments describe decision rights for many processes that are too high in the

organization).

- Internal reports from management systems cannot be tailored easily and data collection or edits are made manually.
- People who want to get things done often find workarounds.
- Many required processes are not in statute and are of internal making.

1.4.7. CORPORATION STATUS

The original legislative intent was to create NJ Transit as a corporation and to be independent of the NJ Department of Transportation…

"…the corporation is hereby allocated within the Department of Transportation, but, notwithstanding said allocation, the corporation shall be independent of any supervision or control by the department or by anybody or officer thereof." per N.J. Stat. § 27:25-2; The New Jersey Public Transportation Act of 1979"

…but NJ Transit operates more like a bureaucracy than a corporation.

- The Executive Director does not necessarily appoint/approve key members of his/her own team (for instance, Vice President, General Manger (VP/GM) Rail Operations, VP/GM Bus Operations, Chief Financial/Treasurer, Deputy Treasurer).
- NJ Transit seems to have all of the compliance requirements of being in two worlds and no benefits that might come from such. It must comply with the NJ First Act, but employees are not State employees. It must compete in the marketplace, but cannot control its own fares. It must be nimble to respond to customer needs, but cannot change a bus route without a public meeting. It has no dedicated funding source but carries intense State oversight.

1.4.8. BOARD GOVERNANCE

Relationships and collaboration with and among the Board are moving in a positive direction.

- There are two vacancies on the eight-member Board of Directors; NJ Transit needs to make sure to maintain a full complement of Board members and to improve Board representation of the diverse ridership.
- Two advisory Boards exist to engage informed and constructive public input; they bring an organized structure for legitimate dissent, but they need vacancies filled and clear tasking/direction.
- The Board's bylaws have not been updated since 2012.

1.4.9. AUTHORITY AND DECISION MAKING

Middle managers and other leaders do not feel empowered to make decisions.

- Acting leaders do not feel they have decision rights. There were as many as 34 personnel acting in leadership positions (e.g., Director, Chief, Manager) as of early May 2018.
- The organization concentrated decision-making in a few leaders over the last few years.
- Siloed processes make it easy to avoid accountability or to "pass the buck."
- The many vacancies put extra duties on the incumbent leaders who must take on overly wide responsibilities.
- Often there are not named and accountable sponsors for projects and internal initiatives.
- Employees are hesitant to be proactive; they fear taking initiative or making a risky decision

1.5. OPPORTUNITIES FOR IMPROVEMENT

Figure 1-7 illustrates a proposed organizational structure that reflects findings from stakeholder interviews, peer practices, organizational design theory, and guiding principles. In the current organization, the Executive Director has twelve (12 direct reports and a flat structure. This model involves adding a layer to the model, enabling the Executive Director (recommended to be named Chief Executive Officer to have eight (8) direct reports. This model also proposes several new positions, highlighted in green.

There were several reasons for recommending this structure:

- To reduce the internal, administrative burden on the CEO to enable greater external focus on the Board of Directors, the State government, and the ridership.
- To delegate management authorities to empowered leaders of operations, administration, finance, customer advocacy, and capital projects.
- To equip the organization with its own in-house General Counsel.
- To provide a more hierarchical command and control model to better manage the current challenges facing the organization.

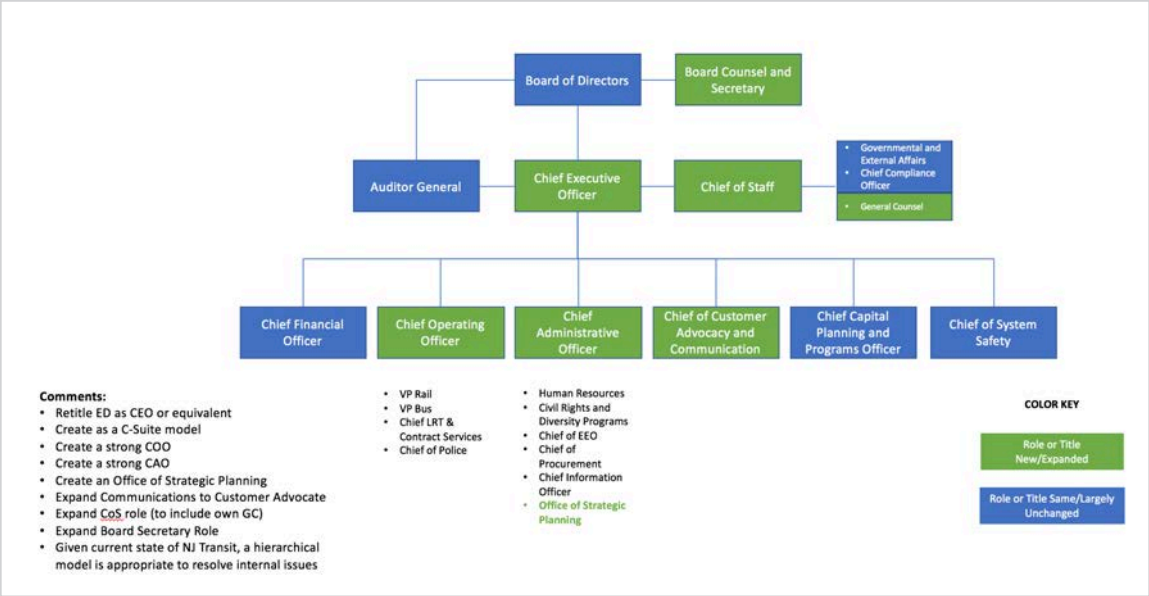


Figure 1-7: Proposed Organizational Structure

1.5.1. CUSTOMER ENGAGEMENT

While NJ Transit effectively tracks customer issues and thoroughly analyzes customer satisfaction surveys, more remains to be done. Customers have competing options for commuter service and social media makes it easier for consumer complaints to reach a wide audience quickly. Good customer engagement mandates an equally rapid response from NJ Transit to share information with riders. Customer experience is increasingly the most critical factor in consumer decision making. This is the sum of all interactions between an individual and an organization as they are perceived, understood, and remembered. Research proves that a positive customer experience creates more satisfied, loyal, and profitable customers who are more engaged, spend more, and churn less frequently. They also may advocate for the company, product, or service. Therefore, a critical goal for NJ Transit is to understand the rider's journey, the touchpoints, and the "moments that matter" in customer experience.

Recommendation: Further emphasize customer centricity and customer advocacy.

- Assign a dedicated Customer Advocate who is a senior leader in NJ Transit.
- Model the customer experience in Journey Maps to have documented use cases for how riders engage NJ Transit Services.
- Centralize all communication functions from across the organizations under the Customer Advocate.
- Expand Ambassadors and Listening Sessions as these techniques are highly effective and appreciated by riders.
- Continue to invest in social media responsiveness and customer satisfaction surveys.

1.5.2. TRANSPARENCY AND ACCOUNTABILITY

There are three key reasons why transparency must be addressed. First, to rebuild customer trust. Delays, accidents, breakdowns, and similar issues have all frustrated riders and cast a negative light on NJ Transit. Honesty, openness, and transparency can play a role in repairing trust. Second, even as a corporation, NJ Transit receives an operating subsidy from the State. Therefore, it must be open and honest with the State and it has an obligation to share information with citizens. Third, transparency helps to hold leaders accountable for meeting their mission and being good stewards of resources, whether from the State or the fare box.

Recommendation: Expand public access to decision making and publish more internal data, specifically through the following:

- Webcast Board meetings to the public to enhance options for public participation.
- Publish internal strategic plans, organizational charts, and leadership salaries to Web.
- Update and publish the performance scorecard.
- Review and update the Code of Ethics.

1.5.3. LEADER DEVELOPMENT AND SUCCESSION

Rather than traditional "horizontal learning" where employees are developed in their own domain disciplines, organizations need to increasingly focus on "vertical learning" to better prepare individuals for career growth to meet the future needs of the organization.

NJ Transit should be concerned about turnover among experienced, technical experts and internal leadership and the impact such turnover may have on operations and service delivery. To address these potential risks, NJ Transit should begin an effort to prepare for turnover by a succession plan for key leadership positions in the organization. This effort is the start of an ongoing initiative to prepare high potential individuals in NJ Transit to ascend to leadership positions either through natural career progressions (promotions) or to fulfil succession plans for key leadership positions.

Recommendation: Create a formal NJ Transit Leader Development Program.

- Establish Career Ladders that define professional career tracks and grade levels to illustrate potential career paths for employees.
- Assign deputies and assistants to senior leaders to foster leadership development.
- Develop internal succession plans.
- Create mentoring circles for high potential employees for coaching and counseling.
- Expand LEAD Program (Leader Exchange and Development) participation.

1.5.4. INTERNAL CLIMATE AND MORALE

Research has confirmed that organizations with higher employee engagement are more successful. Employees with the highest level of commitment perform 20 percent better and are less likely to leave the organization[3]. Organizations with highly engaged employees have 50 percent higher customer loyalty and achieve 44 percent higher profitability. There is an opportunity to make transformative change in NJ Transit now as employees seem open to new ideas.

Recommendation: Engage employees in any internal transformation initiatives and perform expanded "in reach" communication.

- Host virtual Town Halls monthly to better share information and communicate the organization's vision.
- Conduct an internal communication campaign to engage employees in these internal transformational initiatives and return organizational attention and focus to the core mission of "moving customers safely."
- Perform an annual employee Climate Survey.
- Develop an Organizational Change Management Plan for any transformative change effort.

1.5.5. INTERNAL STRUCTURE

Good organizational design matters for many reasons. Quicker and more efficient information flow means that information need not cascade up and down through multiple levels. Improved accountability and decision-making mean that decisions get made faster and at the right level. Smart design makes optimal use of management capacity and capability and gets the right people spending the right amount of time managing and developing others. It also provides clarity and transparency that makes it logical and easy to understand who does what in the organization and how to navigate the business. Finally, good design supports the development of individuals by helping staff to map out their career progression.

Principals in organizational design recommend that the chief executive's span of control be set between 1:3 and 1:9 (not the 1:12 seen today). Consistent and meaningful reporting lines need to be established and like activities grouped in a logical structure (based on bodies of work). To break down silos, workflows, vertically and horizontally, are encouraged by design rather than inhibited.

APTA's analysis of transit organizational structures[4] defined three architypes: The Flat structure (similar to NJ Transit's current model), the Delegated structure (a more hierarchical model), and the Balanced structure (a compromise between the Flat and the Delegated).

Recommendation: Simplify and streamline the executive organizational structure.

- Introduce a new, delegated C-suite model for NJ Transit executive leadership, as illustrated in ***Figure 1-7***.
- Reduce the overall number of direct reports to Executive Director to allow more external focus (to Board of Directors, State officials).
- Seek legislative authority to staff a General Counsel at NJ Transit by amending N.J.S.A. 27:25-5 on Powers and Duties of the Corporation.
- Create new positions for a General Counsel, a Chief Operating Office, a Chief Administrative Office, a Customer Advocate and a Board Counselor.
- Use a hierarchical structure to unify command and control.
- Modify some job titles and expand the focus of some leadership roles.

[3] McCasland, Robin "If You Really Loved Me: Communicating to Engage Employees in Challenging Times" Buck Consultants, Lecture.

[4] American Public Transportation Association(APTA) leadership team "Transit Organizational Structure Positioning for the Future" APTA 2012 Annual Meeting.

1.5.6. BUREAUCRATIC HURDLES

In NJ Transit, business processes are strictly enforced, and represent what North Highland defines as a Dependent business system model. This model is characterized by complex organizational structures, top-down management plans, and frequent approvals with overly detailed steps. The Dependent business system model is the least advantageous of the operating models as it encourages employees to be more dependent on their leaders for direction, which leads to more authoritarian leadership behaviors and passive employee behaviors. The ideal is an Interdependent model with service-based roles and responsibilities; a supportive organizational structure; aligned management plans with coordinated management reviews; and streamlined service based, end-to-end processes.

Recommendation: Analyze processes to redesign internal processes for greater efficiency.

- Conduct internal process analyses and perform internal "deregulation."
- Reset the dollar thresholds for selected decisions.
- Prioritize entry of data once at source and improve information system reporting.
- Create a dedicated position and function for Process Improvement function in NJ Transit.
- Reset the culture to value internal service rather than compliance (where support functions are true partners to operations).

1.5.7. CORPORATION STATUS

NJ Transit's viability is at risk and the current operating environment is not sustainable. The path forward should be to "corporatize, professionalize, and depoliticize." This means NJ Transit needs to operate more like a business than as a quasi-agency and be more independent of State government. The organization needs to fill key leadership positions with individuals who are true transit domain professionals.

New leadership, additional funding, and these assessment recommendations coincide with a window of optimism in the organization. Positive change must happen quickly.

Recommendation: Run NJ Transit more like a business and less as a State agency.

- Provide market-based promotion raises and offer sign on bonuses for new employees in priority roles.
- Develop new flexibility on route/schedule changes.
- Allow the Executive Director to hire most executive staff (not including Auditor General).
- Professionalize the leadership and workforce where technical skills are valued as qualifications for positions over political connections

1.5.8. BOARD GOVERNANCE

The Board structure and operation works reasonably well and there is consensus that relationships are productive. However, processes could be streamlined, and transparency and responsiveness could be improved with a slightly expanded Board. Expanding the Board membership will require additional onboarding and coaching of new members.

Recommendation: Expand Board members according to set selection criteria for new membership.

- Fill existing Board vacancies immediately.
- Update the Board's bylaws.
- Add two new public members using new criteria defined in the bylaws, and that reflect constructive contributions to the Board (such as technical skills in relevant professional disciplines, regular ridership, diversity of perspectives and geography).
- Leverage the two existing regional advisory Boards more effectively and deliberately.

- Expand the role of the Board Secretary to include current administrative leadership, but also to counsel and enculturate Board members on issues and decision making.
- Host Board Retreat and team building exercise to enhance Board dynamics and build relationships with NJ Transit executive leadership.

1.5.9. AUTHORITY AND DECISION MAKING

At its heart, this issue is about decision rights: the underlying mechanics of how and by whom decisions are truly made, beyond the lines and boxes of the organization chart. In a healthy organization, it should be easy to answer where in the organization should various decisions be made, and by whom. Unfortunately, the implication for NJ Transit is that unclear decision-making authority results in senior management's involvement in too many issues. Also, a lack of empowerment at the frontline can result in poor customer service and reduced employee satisfaction.

Recommendations: Perform a prioritized job task analysis and, as necessary, redefine position descriptions.

- Adjudicate all acting roles to make decisions on whether these can be made permanent.
- Review and refine position descriptions for jobs in NJ Transit (prioritize key positions first).
- Assign accountable sponsors for all internal initiatives.
- Create models that define who is Responsible, Accountable, Consulted, Informed (RACI) to better define authorities for prime processes.
- Reset the internal culture to support and encourage initiative and proactive behavior.

1.6. RECOMMENDED NEXT STEPS

North Highland views the implementation of the above recommendations as part of an organizational transformation that must be deconstructed into discrete phases, workstreams, and associated subtasks. These include:

- **Visioning:** During a visioning phase, an organization defines necessary changes and presents a picture of an improved future state. Essential elements of the visioning for the organizational and governance changes have been accomplished in the content of this Final Report's recommendations.
- **Definition:** This is the phase where greater detail is added to the vision and subtasks are completed that communicate changes and engage impacted stakeholders in shaping the future.
- **Creation:** In this phase, even further detail and fidelity is added to implementation efforts. This is also the phase were the greatest investment of time and effort is required.
- **Implementation:** This phase is where changes are put into play. Unanticipated pain points may emerge here, but also benefits begin to be realized.
- **Sustainment:** In the sustainment phase, the organization lives with the new structural and governance changes and conducts ongoing activities to refine efforts and execute new practices.

The following are the suggested workstreams for dividing and managing the overall implementation effort.

- **Strategy:** In the Strategy workstream, the overarching goals and objectives for changes and new directions for NJ Transit are developed.
- **Governance:** This workstream is dedicated specifically to changes to the Board of Directors.
- **Organization:** This workstream is focused on changing the internal executive leadership structure for NJ Transit.

The next three workstreams are to help embed or "institutionalize" the changes in NJ Transit.

- **Change:** A variety of analyses and execution techniques dedicated to Organizational Change Management are performed in this workstream.
- **Engagement:** This workstream is closely associated with OCM as it is where direct communication and change enablement is performed with impacted stakeholders.
- **Knowledge:** In this workstream, business processes are assessed in detail and essential organizational knowledge and institutional memory are captured, recorded, and transferred.
- **Resources:** The final three workstreams are essentially "administrative." For Resources, the North Highland team defined the funding, headcount, and political capital that must be dedicated to the successful implementation of the new structure and governance.
- **Integration:** In this workstream, changes to organization, decision making, and governance are aligned and coordinated with other changes occurring in NJ Transit to reduce conflicts and cross-leverage efforts.
- **Program Management:** The final workstream is dedicated to managing the cost, schedule, and performance of the implementation effort through regularly scheduled reporting and checkpoint efforts.

Within the framework of phases and workstreams occur all of the specific subtasks that facilitate the implementation. The roadmap in ***Figure 1-8*** illustrates the high-level implementation plan for NJ Transit.

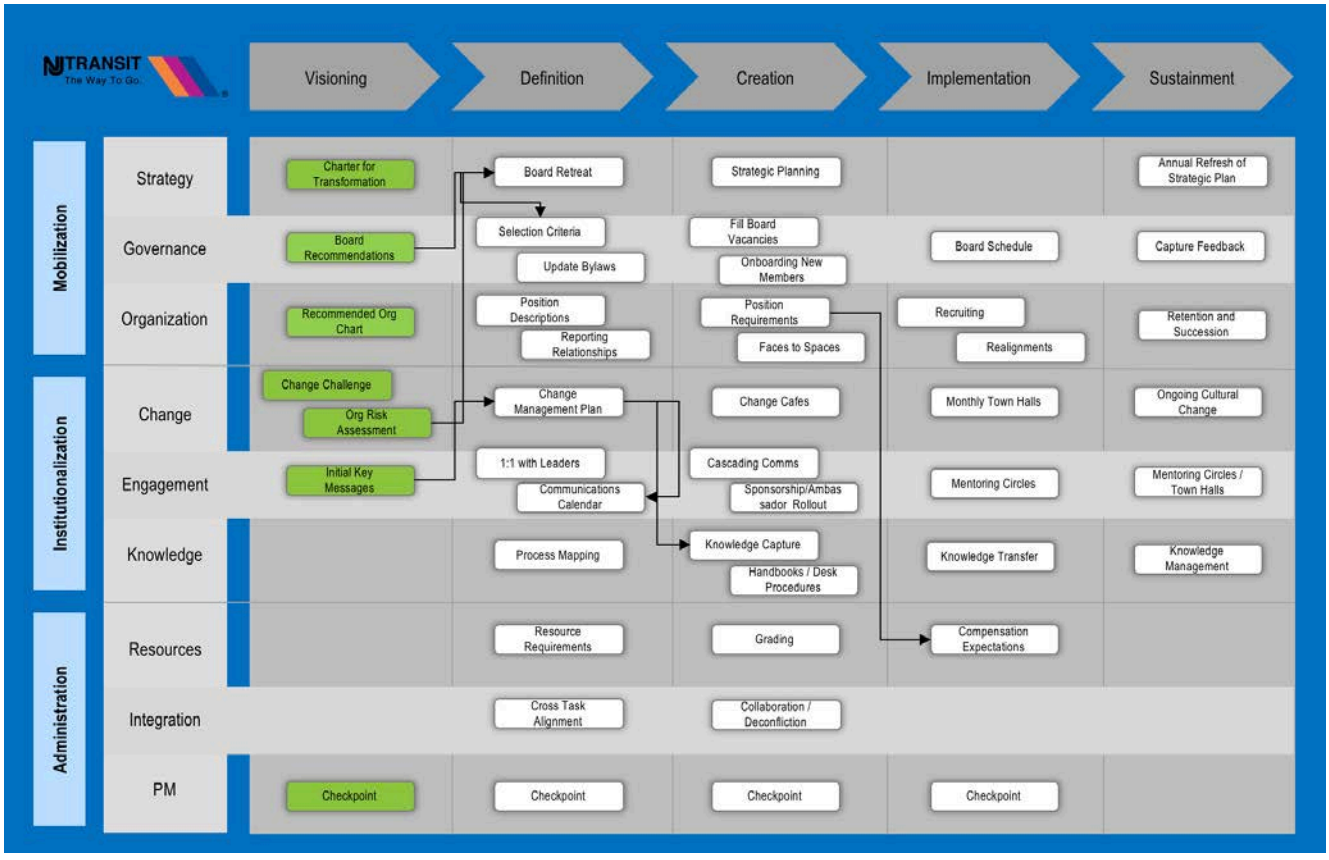


Figure 1-8: Implementation Roadmap

1.6.1. SUMMARY OF RECOMMENDATIONS

Table 1-1 presents a summary of the recommendations listed above, in order of prioritization.

Focus / Sub Task	Recommendation	Priority	Level of Effort	Value Delivered	Key Success Factors
Internal Structure	Simplify and streamline the executive organizational structure.	High	Medium	High	▪ Make structural changes independent of personnel decisions ▪ Acknowledge temporary organizational disorder
Customer Engagement	Further emphasize customer centricity and customer advocacy.	High	Medium	High	▪ Speed to action ▪ Continued investment in social media tools
Internal Climate and Morale	Engage employees in any internal transformation initiatives and perform expanded "in reach" communication.	High	High	High	▪ Face challenges head on ▪ Cultural change techniques ▪ Ongoing measurement of employee climate
Bureaucratic Hurdles	Analyze processes to redesign internal processes for greater efficiency	High	High	High	▪ Subjugation of internal compliance to mission efficiency ▪ Cultural change to internal customer service
Corporation Status	Run more like a business and less as a State agency	High	High	Medium	▪ Reduce State control ▪ Increase autonomy to NJ Transit leadership ▪ Sufficient operating funds
Authority and Decision Making	Perform a prioritized job task analysis and, as necessary, redefine position descriptions	High	High	Medium	▪ Clearly define responsibilities ▪ Willingness to hold individuals accountable
Transparency and Accountability	Expand public access to decision making and publish more internal data	Medium	Low	Medium	▪ Organizational courage ▪ Accessibility of information to public
Board Governance	Expand Board members, according to selection criteria for new membership	Medium	Medium	High	▪ Accept higher administrative burden of larger Board ▪ Increase Board transparency
Leaders Development and Succession	Create a formal NJ Transit Leader Development Program	Medium	High	Medium	▪ Invest time and effort in high potential individuals ▪ Select priority positions ▪ Agree on correct behaviors

Table 1-1: Summary of Recommendations

CHAPTER 2
PERSONNEL RECRUITMENT

Chapter 2: Personnel Recruitment

2.1. INTRODUCTION

In Chapter 2, the assessment provides an insight into the personnel hiring and protocols at NJ Transit and recommendations to improve the hiring practice. The Chapter helps answer the following questions:

- Does NJ Transit have the right infrastructure for attracting the talent it needs?
- How to establish and accomplish those goals for the future?

Public transportation is at a crossroads today as it faces a myriad of major challenges. Operators are strained by increasing regulation, inadequate and disparate funding, political pressure and public scrutiny accompanying highly-publicized accidents, competition arising from the proliferation of ride-sharing services, and rising costs needed to maintain or replace aging infrastructure, to name a few.

To face growing pressures, operators need to attract and retain a highly-skilled, diverse, and engaged workforce, not only to maintain their current operations, but to (1) improve them, and (2) think strategically about the future. As a result, the cost of making a bad hire has never been higher.

Even when organizations recognize that Workforce Development – the process of attracting, developing, and retaining a diverse workforce – is essential to the success of their future plans, getting the right people in place is easier said than done. There are countless people-, process-, and technology-related factors that influence any organization's ability to hire the talent they need.

2.1.1. TALENT ACQUISITION OVERVIEW

Talent Acquisition comprises several sub-functions as mentioned below and shown in ***Figure 2-1***.

- Workforce planning
- Requisition management
- Recruiting and sourcing
- Candidate assessment, screening, and selection
- Onboarding

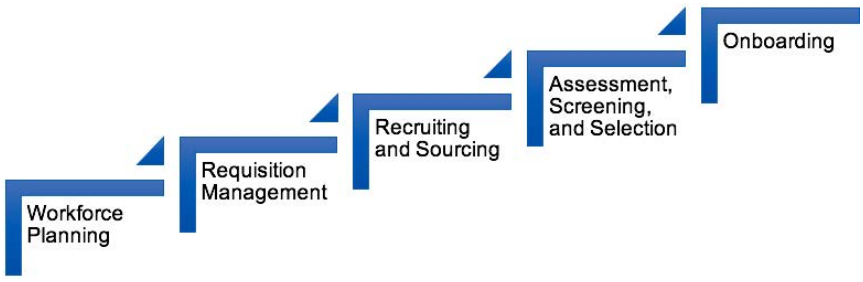


Figure 2-1: Talent Acquisition Sub-Functions Overview

Workforce planning focuses on aligning organizational strategy with workforce needs. It begins with developing an understanding of the current composition of the workforce as well as the critical skills and talent needed to execute on the organization's vision and strategic goals, in order to analyze the talent gap and identify the best way to fill it. This is followed by **requisition management**, the process of developing, approving and opening job requisitions, handling job descriptions and information on both internal and external job postings, managing requisition and job posting dates and deadlines, and communicating with hiring managers. **Recruiting and sourcing** candidates focuses on identifying, locating and attracting people with the skills the organization needs. It involves determining the appropriate recruiting technique for the given position, performing recruiting activities, and hosting or participating in recruiting events to build a candidate pool. Once a candidate pool is in place, the

candidate **assessment, screening, and selection** process to evaluate the effectiveness of candidates begins with resume reviews and/or filtering systems, screening calls, pre-hire assessments and testing, and interviews, followed by the selection and rejection of candidates evaluated. Finally, **onboarding** involves welcoming and introducing new hires, providing the necessary initial information to acclimate to their new role and become a successful contributor to the organization.

2.1.2. CURRENT STATE

One of the biggest challenges facing NJ Transit is hiring and retaining needed talent; staffing challenges came up time and again across the different task areas in this assessment. Antiquated processes that are lengthy, paper-based, and highly manual result in inefficiencies, ineffectiveness, and, consequently, create a major bottleneck to hiring the right people at the right time. Absent an Applicant Tracking System, NJ Transit is unable to track data and maintain reliable metrics such as time to fill, applications received, or the time each step in the hiring process takes — information critical to understanding the true effectiveness of systems and practices and how to improve. Business units and hiring departments feel frustrated by the amount of time it takes to fill a vacancy, multiple approvals required, and general lack of transparency in the process, while understanding the talent acquisition team is understaffed for the scale of NJ Transit's hiring needs.

Despite the high percentage of retirement eligible or soon-to-be eligible personnel and the almost 400 open requisitions — as well as additional vacancies and staffing needs for which new requisitions have not been requested — NJ Transit does not conduct any formal workforce planning to align its organizational strategy and workforce needs, nor does it perform succession planning. Instead, the talent acquisition process is ad hoc and reactive to immediate demands.

From the candidate perspective, the internal challenges in the hiring process have a major impact on creating NJ Transit's reputation in the market as an employer of choice. Most positions require paper applications given the lack of a digital system, and thus most applicants are not able to confirm if their application was received by NJ Transit. Pre-employment tests, also paper-based, are largely outdated and may not adequately assess for the skills needed to perform a given position. Trainee programs, such as the Locomotive Engineer program, have a reputation of being exceedingly difficult and long, which may prevent quality candidates from applying, lest they not make it through and lose their jobs. For those successful candidates, particularly internal ones, that make it through the lengthy recruitment process, the inflexibility in the interpretation of compensation and promotion policies becomes another issue deterring quality employees from promoting up.

2.1.3. DESIRED STATE

Attracting and retaining the right talent is critical to organizational success. In fact, 73 percent of business leaders report that they have been unable to meet business goals due to talent shortfalls resulting from poor planning[5]. Organizations that are strategic and structured in their Talent Acquisition processes are more efficient and better able to retain top talent. The following are summarized recruitment process best practices by top performing organizations.

Workforce Planning - Top performers for workforce planning observe the following best practices:[6]

- Tying HR plans—especially those regarding resourcing, organizational structure, compensation, and benefits—to overall organizational strategic plans
- Tracking the demographic profile of the workforce and adjusting resource plans to account for gaps between workforce projections and anticipated organizational needs
- Forecasting supply and demand gaps for critical positions and taking action to fill those gaps
- Having HR collaborate with business units to forecast and define staffing requirements

[5] "Tackling Talent Strategically: Winning with Workforce Planning," Harvard Business Review Analytics Services, 2015.

[6] "Develop and Manage Human Resources Plans, Policies, and Strategies: A Summary of Best Practices," and "Recruit, Source, and Select Employees: A Summary of Best Practices," APQC Knowledge Base, 2018.

Requisition Management - Top performers for requisition management observe the following best practices:[7]

- Having recruiters and hiring managers identify realistic expectations for job candidate qualifications
- Automating job requisitions with technology, such as a solid applicant tracking system

Recruiting and Sourcing - Top performers for recruiting and sourcing observe the following best practices:[8]

- Establishing a strong employment brand to attract potential recruits
- Customizing the employment brand and candidate experience for different types of talent (e.g., technical talent, recent college graduates, etc.)
- Leveraging employee referral programs
- Using data about successful hires to select sources of future job candidates
- Forming relationships with proven sources of desirable job candidates, such as university career centers and professional associations

Candidate Assessment, Screening, and Selection - Top performers for assessment, screening and selection of candidates observe the following best practices: [9]

- Utilizing automated candidate screening tools
- Implementing a competency-based selection program that includes pre-employment assessment tests
- Using behavior-based interview techniques and multi-function team interviews
- Selecting for fit with organization culture and values
- Using data about successful hires (e.g., performance and attrition data) to select future hires
- Offering realistic job previews, using internships and job shadowing, for example
- Involving employees in screening and selecting candidates who could become their coworkers and/or fill job roles similar to their own

Onboarding - Top performers for onboarding observe the following best practices:[10]

- Automating new hire processes (e.g., welcome communications, filing of employment documents, training invitations, etc.) to ensure consistency and reduce cycle time
- Keeping candidates informed throughout the hiring process
- Starting onboarding upon offer acceptance
- Offering comprehensive onboarding (e.g., new hire portals, training, mentoring, and networking tools) upon offer acceptance
- Making the onboarding process easy for new hires to follow
- Giving new hires some control over the onboarding process (e.g., choice regarding different ways to obtain knowledge and build relationships, such as mentoring, classroom training, affinity groups, etc.)
- Measuring and working to improve on candidate and new hire satisfaction and establishing plans for improvement
- Incorporating on-the-job learning where experienced workers train new hires as they perform actual work tasks

[7] "Recruit, Source, and Select Employees: A Summary of Best Practices," APQC Knowledge Base, 2018.

[8] Ibid.

[9] Ibid.

[10] "Recruit, Source, and Select Employees: A Summary of Best Practices," and "Develop and Counsel Employees: A Summary of Best Practices," APQC Knowledge Base, 2018.

Technology and Data Management - Top performers for data management observe the following best practices:[11]

- Having a paperless recruiting process where all candidate data is entered into an electronic candidate record
- Having external candidates use a self-service portal to enter personal data, work history, and education
- Notifying recruiters electronically of other positions for which a candidate might be qualified to apply

2.2. METHODOLOGY

North Highland's approach is based on an understanding that NJ Transit requires a systemic assessment of the strategy (protocols) and processes currently in use to attract and hire the talent it needs to meet both today's and tomorrow's challenges. The overarching goal of this assessment is to determine how effectively the organization attracts the talent it needs, how efficiently it makes hiring decisions and brings new employees on board, how it establishes recruitment plans (goals), and how it successfully accomplishes those goals.

To conduct a diagnostic of NJ Transit's recruiting and hiring functions, North Highland used the following data sources:

- **Stakeholder Interviews:** Between May and June 2018, the North Highland Team conducted stakeholder interviews with 16 individuals associated and familiar with the recruiting, hiring, and retention processes in the organization. Interviewees included NJ Transit Human Resources and Operational Executive Leadership, Talent Acquisition and Development staff members, Corporate, Bus, and Rail management involved in the hiring process, Equal Employment Opportunity (EEO) staff, and an external stakeholder.
- **NJ Transit Human Resources and Hiring Data:** Available data was collected and analyzed, including documented corporate policy on employment, personnel requisition processing and job posting, vacancies and open requisitions, onboarding protocols, turnover and upcoming retirements, workforce demographics and diversity, HR IT systems, and an employee engagement survey.
- **Additional Sources:** In addition to these data collection efforts, research from supplementary sources informed the detailed analysis and recommendations provided in this report, including human resources best practices research, local workforce talent pool analytics, as well as insights on NJ Transit's position in the market as an "employer of choice."

2.3. ASSESSMENT SUMMARY

North Highland's activities were informed by the following guidelines, designed to provide the data necessary to conduct this systemic assessment; evaluate the effectiveness of current recruitment and hiring strategies and processes; and make detailed, actionable, and organization-specific recommendations designed to address the major pain-points identified.

- **Assess the current NJ Transit workforce and hiring strategy** - Documenting the current composition of the NJ Transit workforce is the starting point for understanding organizational capability, current challenges, and the impact of current strategies and processes on recruitment, hiring, and retention.
- **Assess the current NJ Transit personnel/HR systems and processes** - Related to Recruitment, Hiring, and Performance Management High-level process analysis is used to pinpoint personnel/HR systems that are not meeting current needs as the basis for process improvement recommendations.

[11] "Recruit, Source, and Select Employees: A Summary of Best Practices," APQC Knowledge Base, 2018.

- **Conduct a High-level organizational culture assessment to determine impact of current culture on engagement, retention, and NJ Transit's reputation in the market as an "Employer of Choice"** - Organizational culture has a major impact on the internal effectiveness of personnel/ HR strategies and practices, as well as creating a reputation in the market for what people perceive about NJ Transit as an employer.

2.4. ASSESSMENT FINDINGS

The assessment findings are organized into three major categories: People and Culture, Process and Capabilities, and Technology and Data.

2.4.1. PEOPLE AND CULTURE FINDINGS

Critical factors influencing personnel hiring in the 'people and culture' arena include:

- Demographics of the current workforce and high-need positions
- Applicants, and the skillset of the regional workforce
- Talent Acquisition Department and the quality of recruiters
- Morale

Current State of the Workforce

Transit operators are, in general, organizations with valuable physical assets; however, one of NJ Transit's most important assets is its people. An organization with 11,000 employees, one of the biggest challenges it is facing is hiring and retaining the talent it needs. As of April 2018, NJ Transit has 396 open positions actively being recruited for, 63 of which are for Bus Operators alone, even after an additional 49 operator positions were filled by April. Other critical maintenance positions, such as bus and rail mechanics, electricians, and cleaners, as well as supervisory and managerial positions across Bus and Rail, also have a high number of open requisitions. The problem extends to corporate departments as well. For instance, the Capital Planning department currently has at least 60 vacancies, 54 of which are actively recruited for; the Procurement department has struggled with 16 open positions; Technology Services has an additional 20 vacancies to fill; and Human Resources has nine open requisitions. Some requisitions have been open for over a year.

	Current Total Workforce[12]		Total Open Positions as a % of Workforce[13]	
Agreement	9,527	84.47%	197	2.07%
Non-Agreement	1,751	15.53%	199	11.36%
Total	**11,278**	**100.00%**	**396**	**3.51%**

Table 2-1: Current State of Workforce

It is important to contextualize the hiring crisis NJ Transit is facing by distinguishing between agreement and non-agreement positions. Agreement employees make up the vast majority of NJ Transit, accounting for 84.5% of personnel, while the remaining 15.5% represents non-agreement employees. As reported by NJ Transit in the April 2018 Actively Recruiting Position Report and presented in *Table 2-1*, the 396 open positions are divided roughly in half between both groups, 197 agreement to 199 non-agreement, or 2.1% and 11.4% of the current agreement and non-agreement workforce, respectively. Thus, to a large extent, non-agreement supervisory, managerial, and corporate vacancies are inhibiting NJ Transit from operating efficiently at present and creating the critical managerial and support structures necessary to meet needs into the future.

The inability to put qualified individuals into positions impacts the organization in a number of ways, including high rates of overtime, project delays or incompletions due to insufficient available labor, and low morale among employees. Interviews suggest even if the 396 open positions are filled, questions remain about organization's ability to function at full-capacity; one way that the agency met the demands of budget cuts was by eliminating positions as they became vacant. As such, headcount has been reduced over time and satisfying the current number of requisitions may not enable NJ Transit to meet its operational needs.

Retaining talent once acquired is another challenge NJ Transit is facing, and there are two main factors that appear to be contributing to turnover: retirements and compensation-based departures. One strength of NJ Transit's workforce, specifically with management positions, is that they are experienced in their roles and have a tremendous amount of institutional knowledge that they leverage to improve the organization's operations and serve the public. As demonstrated in *Table 2-2*, many of NJ Transit's most experienced individuals are retirement- or soon-to-be retirement-eligible, particularly non-agreement Rail personnel and agreement and non-agreement Bus personnel. If the organization does not move to quickly address these issues, NJ Transit faces the serious risk of losing institutional knowledge and not having qualified individuals ready to backfill departures.

	Retirement Eligibility[14]	Numbers of Employees	% of Employees Retirement Eligible
Rail Non-Agreement	89	426	21%
Rail Agreement	172	4097	4%
HQ and Bus Non-Agreement	178	1318	14%
Bus Agreement	502	5178	10%
Sworn-in Police	3	262	1%
Total	**944**	**11,281**	**8%**

Table 2-2: Retirement Eligibility at NJ Transit

[12] NJ Transit demographic data provided by HR
[13] NJ Transit's Actively Recruiting Position Report for April 2018
[14] Retirement eligibility estimates provided by NJ Transit as of September 25, 2017

According to exit interview data and anecdotal information, most of the individuals leaving NJ Transit who are not retirement eligible cite compensation as one of the main factors contributing to their decision. NJ Transit's pension plan for non-agreement employees was closed to all new non-agreement employees who were hired after July 1, 2006; instead, these new personnel were offered a 401(a) Defined Contribution plan. The effective elimination of the pension removed a significant incentive for individuals hired post-2006 to stay and grow within the organization. Consequently, some talented employees have left the organization for other transit agencies. In some cases, interviewees noted quick turnover has been difficult to curb as private competitors such private bus companies that do not pay for employee training are encouraging individuals to apply to NJ Transit to receive training – specifically CDL certification – and to then accept a higher-paying job with them, at times even offering signing bonuses. This has been one of the main difficulties in hiring and retaining bus operators.

Finally, compensation-based departures are not the only compensation issues that NJ Transit is facing; positional stagnancy is also problematic to the organization. Because of the budget restraints put on the organization—including the elimination of the pension and the growth of overtime pay due to headcount reduction—many qualified agreement employees are unwilling to promote to non-agreement first-level management. In most cases, promoting would result in a pay cut and, in many cases, long hours without the benefit of overtime; in fact, Rail Labor Relations, the office that handles hiring for internal rail agreement positions, has indicated an increase in non-agreement management employees returning to agreement positions given the opportunity to receive greater pay.

Applicants

Although there are many contributing factors, one of the main challenges preventing NJ Transit from hiring qualified candidates is the applicant pool. However, opinions vary among recruiters and hiring managers about the quality of applicants, as some are satisfied with the knowledge and skills that they see in the candidates applying for open positions, while other groups do not believe that the individuals who apply are qualified. One factor that may contribute to the mixed quality of candidates is that most recruiters are not engaging in proactive candidate sourcing; given the extent of current hiring needs, recruiters are reactively screening the applications that are submitted to them by candidates. In a few instances, there are sourcing relationships being built with trade schools and other groups, yet this occurs on an ad hoc basis. Another contributing factor may be the State of New Jersey residency requirement established by the New Jersey First Act in 2011, which applies to NJ Transit hires, limiting the available candidate pools to State residents or those willing to relocate to the State upon hire. While NJ Transit will support an exemption for critical need positions, it requires additional external approvals and, as such, contributes to the already drawn-out process of hiring quality candidates that meet hiring managers' needs. Lastly, for many positions—specifically, agreement positions—the candidate pool is full of current employees looking to promote or transfer from their current position; consequently, many of the openings are filled by current employees rather than external hires, with the impact of one vacancy closing being that another vacancy elsewhere has opened, and another position must be filled by the Talent Acquisition Department.

> "We don't have time for true sourcing… We are not truly a 'talent acquisition' department. To get there, we need to work more alongside the department, not just when there's a vacancy. We need to be a part of staffing meetings, succession planning…"

Candidate Perspective Spotlight

James,[15] an engineer for a freight transportation company with over 15 years of experience in rail, has submitted at least a dozen applications for a variety of roles with NJ Transit over the past few years: Signal Maintainer Trainee, Conductor, and various other track positions. However, he's only heard back from NJ Transit on two of those occasions. In one of those occasions, he was invited to test yet found the pre-employment screening test was not relevant to the skills the position required. He further found it odd that his engineering license was irrelevant, while other competitors give preference to such candidates. In addition, while in his experience other transit operators allow for electronic application portals that notify the candidate if positions that fit their skills become available, NJ Transit continues to rely on paper-based applications—and without any communication channels, candidates may never know if their application was rejected or if it was ever received and reviewed. Despite being a licensed engineer, James has never applied for NJ Transit's locomotive engineer position—one that NJ Transit has had trouble filling vacancies and building a pipeline for. The training program has a reputation within the region for being long and difficult, yet unfair and not any more effective for it; trainees are not coming out better prepared than in comparable, shorter locomotive trainee programs. He has heard trainers "take pride in failing people."

> "NJ Transit doesn't care if you're a licensed engineer or a busboy"

> "Why would I leave my job now for the likelihood that I'll fail out of the program?"

James would prefer to work for NJ Transit because his current work requires a heavy travel schedule; NJ Transit's location is convenient, would continue to contribute to his railroad retirement plan, and provide more stability. However, with engineer trainee pass rates well below 50%, James "can't risk not passing the program," as that will mean he is out of a job—and he, like many candidates, has a family to support. And, unfortunately, his attempt to apply to other positions have been unsuccessful. James' experience indicates that there are potentially qualified candidates who want to work for NJ Transit but are either falling through the cracks during the screening process or are not even applying given NJ Transit's reputation.

Talent Acquisition Department

NJ Transit's Talent Acquisition Department works incredibly hard to satisfy the open requisitions given to them. One of the main inhibitors to getting hiring managers the candidates they need, however, is manpower, something acknowledged by recruiters and hiring managers alike. While the operating departments communicated much frustration about the Talent Acquisition Department during the interviews, they also communicated much sympathy, conceding that recruiters have an "impossible task" because of the small size of their department. This level of understanding, even amidst strained relationships, is a strength of NJ Transit. One hiring manager, when referring to the need for the Talent Acquisition Department to increase headcount, noted that the department should "fix themselves" before trying to help the operating departments with their hiring issues. For example, there are only two recruiters allocated to hiring for over 100 current corporate openings, one recruiter for all bus operator openings, currently at 63, and one recruiter for all rail hiring outside of locomotive engineer trainees. It has become common, therefore, for operating departments to provide their own staff's time to backfill the recruiting role when there is a significant need. In short, recruiters are understaffed and overworked, especially considering additional responsibilities which take away from their time to screen received applications (e.g., new hire onboarding documentation).

> "Everything happening with a candidate is driven by Recruitment... the tail wagging the dog."

[15] Candidate's name has been changed to protect the individual's privacy.

The organizational structure of the Talent Acquisition Department is also disjointed, potentially contributing to inefficiencies and intra-department discord. Specifically, problematic is the Department's unfulfilled transition to a model of staffing that utilized Human Resource Business Partners (HRBPs). The individuals in this position would more closely liaise with the operating departments and manage all recruiting, employee relations, and compensation support for each business unit; consequently, these HRBPs would have a higher salary than recruiters. While some individuals were hired with the HRBP title, the transition was not fully completed, and currently HRPBs perform much of the same functions as recruiters. Recruiters, however, lacking any opportunity to gain experience in compensation and employee relations issues, do not have a career promotion path to allow them to grow into the higher paying HRBP position.

> "We used to tell our kids to come work here. Now we tell them 'don't come.'"

Morale, Corporate Culture, and Retention

Morale

Morale is currently very low at NJ Transit for several reasons. One of the main reasons is the direct result of the compensation and benefits issues discussed in the above subsection Current State of the Workforce (e.g., closing pension to new employees post-2006, freezing salaries). As turnover and headcount reduction has increased at NJ Transit over the years, the remaining employees are left to fill the gaps as necessary; these individuals are overworked and are, therefore, dissatisfied, especially when they do not feel adequately rewarded or recognized. Interviewees also shared that there are very few career progression opportunities; all those who wish to promote up must apply and interview for roles, but there may not be specific "tracks" to promote into with the experience gained in a current role, instead requiring additional education or experience outside of current responsibilities.

> "At the end of the day we all love this place. We love what we do, we love the people we work with, we love the excitement…in spite of the things we need to change."

Adding to the benefits and operations-related issues outlined above, many NJ Transit employees have felt the effects of politics and patronage in the organization, which contributes to the already demoralized organizational climate, particularly as it has been accompanied by negative press coverage in local and national news. For example, many mentioned Governor Murphy's remark that NJ Transit is a "national disgrace" was discouraging to the hard-working individuals who strive to serve their customers daily despite the difficulties and problems they too recognize.

Despite the current climate, employees expressed their own as well as their teams' and colleagues' pride for working for NJ Transit. They show up and get work done because they are committed to NJ Transit's mission and their role as public servants. A number of long-time managers and leaders remain with the organization despite their retirement eligibility and opportunities for higher pay at neighboring transit agencies because they feel they can make a difference to improve NJ Transit.

Training

Professional development and training opportunities for non-agreement employees are scarce at NJ Transit. When new employees join the organization, their initial training, aside from typical compliance training, may be limited to a checklist of responsibilities. While internal classes are offered throughout the year in computer skills, management and supervisory roles, and other professional development topics, employees do not feel offerings will enhance their career opportunities.

Performance Management

Performance management, the process of planning, monitoring and reviewing an employee's overall contribution to the organization and performance against objectives, is absent at NJ Transit. Documentation exists for a formal performance assessment "Score Card" process, which includes goal setting, a mid-year review and development planning, and a year-end review, with specific Key Performance Indicators (KPIs) in the categories of Safety and Security, Customer Experience, Corporate Accountability, Financial Performance, and Employee Excellence. However, interviews with NJ Transit staff indicate performance appraisals in which an employee receives feedback and guidance on their work are not conducted unless an internal candidate is interviewing and being considered for a promotion. Most employees have gone years without an evaluation or candid feedback session with their managers, and in cases where performance conversations need to occur, supervisors will request HR to be present and/or lead the discussion. Additionally, when evaluating candidates for new roles, internal candidates' performance and absenteeism records are not taken into consideration.

Resistance to Change

Like in many public organizations of NJ Transit's size, implementing change can be difficult. Convoluted bureaucracy, approvals needed from a variety of funding sources, and low morale are just a few of the causes. This difficulty is especially true of organizations that have undergone – or, have attempted to undergo – transformations in the past, resulting in a latent, but powerful "change fatigue" that can paralyze the organization. Interviews uncovered that pockets of resistance to change exist at a variety of levels across the organization. While many of the above factors contribute to this, there appears to be a general pessimism that currently prevents the organization from addressing some of its most substantial problems.

Retention

NJ Transit struggles to keep qualified and valuable employees as unpredictability of salary leads to turnover. Most promotion pay raises are capped at 10% and employees trained by NJ Transit are hired away by other transit organizations.

NJ Transit made a dataset available containing compensation information for non-agreement employees; these data were provided for determining whether the salaries and compensation increases provided to NJ Transit employees are aligned with industry standards. The data indicate that the organization has an established practice of promoting employees from within, typically accompanied by compensation increases. However, interviews uncovered that these compensation increases were limited to a percent increase from the promoted employee's previous salary, regardless of the additional responsibilities required of the new role. The data also indicate that NJ Transit regularly provides salary increases for certain positions (often on work anniversaries).

Large numbers of employees currently are eligible for retirement, and this situation has existed for many years without resolution. Without the competitive compensation and State pension, employees now have opportunities and portable retirement plans that make it far easier to move to new jobs.

2.4.2. PROCESS AND CAPABILITIES FINDINGS

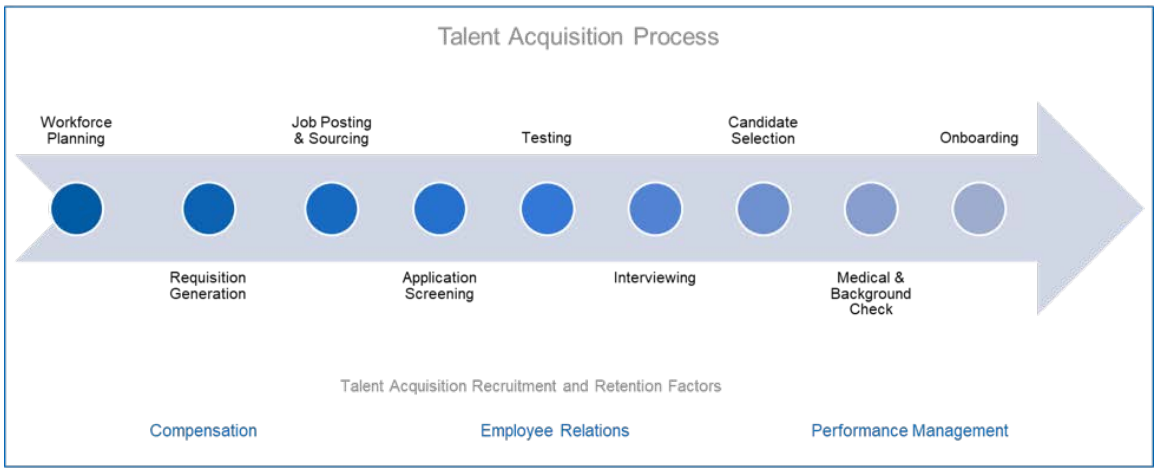


Figure 2-2: High-Level NJ Transit Talent Acquisition Process

The overall recruiting and hiring process at NJ Transit is lengthy, highly manual, prescriptive, and labor intensive. It requires 22 steps, nine (9) paper documents and forms, and approximately seven (7) approvals from the moment a need is identified to when the position is filled. Candidate applications and other documentation must be kept in hard copy folders. The time to fill a vacancy can take anywhere from five (5) weeks to nine (9) months, with some requisitions remaining open for over a year. Further, the process is inconsistently followed, and a Hiring Manager's experience may vary from recruiter to recruiter. While Strategic Staffing and HM roles and responsibilities are documented in corporate policy, in many cases the division remains unclear and the operational units lack authority and autonomy across many steps in the hiring process.

> "The bar set [for who we hire] is 'who can wait that long?' And good candidates are not around three to four months later."

Without an Applicant Tracking System in place, NJ Transit is unable to track and maintain reliable metrics; as such, the organization does not have accurate estimates of the average time to fill a vacancy, the number of applications received for a given requisition, or verifiable estimates of the time each step in the process takes to be completed. While some staff members, both in HR and the operational groups, maintain home-grown spreadsheets to track recruiting and hiring data relevant to their departments and jobs, this data is unreliable, inconsistent, and unavailable at a centralized, organization-wide level. Additionally, given the manual, paper-based nature of the process, both candidates and HMs lack visibility into what step in the process they are in, and where there may be a bottleneck.

From a candidate experience perspective, given the paper-based nature of the process, many are not able to confirm if their application was received by NJ Transit. There is no channel for external candidates to communicate with recruiters unless the candidate is contacted directly to schedule a test or an interview. After having progressed through various stages of the hiring process, some may not receive a formal rejection notification. This can be especially demoralizing for internal candidates, who may not know they were not selected until a promotion or new hire is announced for the position. In addition, Strategic Staffing does not provide feedback to candidates who request it. Moreover, there is no feedback mechanism in place to improve the recruitment process when the selected candidate turns out to be a poor hire decision.

The following subsections list pain points identified in at each major step of the talent acquisition process in greater detail.

Workforce Planning

According to NJ Transit's Corporate Policy 3.02 on the employment of personnel, Directors of Strategic Staffing and Assistant Executive Director or VP and GM's of operational departments meet quarterly to discuss and assess the department's key people issues, current and anticipated organization structure, critical positions and skills, current and anticipated vacancies, and retention and sourcing strategies. However, these strategic staffing discussions are either not occurring at regular intervals or, in the case of some departments, not occurring at all. Given the current State of open requisitions and hiring needs NJ Transit is facing, communication between Strategic Staffing and business units tend to be more reactive to the immediate need. Forward-looking dialogue as outlined in the policy is absent in most cases. In the absence of these discussions and taking into account the volume of work recruiters are currently handling, Strategic Staffing is not building talent pipelines for critical needs, but rather is recruiting for needs as they arise. Further, no succession planning formally takes place at NJ Transit, which makes it more difficult to fill roles with experienced, capable employees when they become available, leaving managerial vacancies open for longer periods. This is alarming considering the number of upcoming expected retirements.

Requisition Generation

Once a vacancy or need is identified, the first major bottleneck identified in the recruiting process is the requisition generation. Corporate Policy 3.03, Processing of Personnel Requisitions, states that for new positions—defined as a position that was not previously authorized and included in the applicable Fiscal Year budget, the approval of which will increase a department's approved headcount—the HM must obtain four approvals before a requisition is generated: from the department AED/VP, the AED of HR, the CFO, and the Executive Director. For existing positions—defined as a position that has been authorized and included in the applicable Fiscal Year budget and which is included in a department's approved headcount—the HM notifies the appropriate Position Control System (PCS) Coordinator (designated department budget personnel) to initiate the requisition. Once this is confirmed, the position is budgeted for, the requisition is generated, and recruiting personnel are notified.

In practice, re-justification of existing roles has been requested by HR before approving a requisition, which can add weeks to the recruiting cycle. In the case of Rail Operations, for instance, a list of 215 out of 380 non-agreement positions have required submission of a re-justification and approval from the AED of HR and NJ Transit's Chief of Staff each time there is a hiring need, regardless of previous existence of the position. These approvals are not only time consuming and redundant, but they require input at a higher level than necessary (i.e., from the AED of HR, Chief of Staff) when positions are budgeted and included in the approved headcount.

> "You can feel the loss of institutional knowledge during emergencies."

Job Posting

Once the necessary approvals have been secured, the recruiter either meets with the HM to discuss the job description, qualifications and desired skills, or simply sends the HM the job description for their concurrence. HMs do not have direct access to job descriptions before this point in the process unless directly requested from HR. Should any change be necessary to the desired skills or qualifications, a new requisition is required. In some cases, inexperienced HMs may not be familiar with the hiring process and realize job qualifications are not representative of the position until later in the process, requiring the cycle to start over from the requisition approval.

NJ Transit uses both internal and external methods to identify candidates for open positions. All non-agreement positions are posted internally in NJ Transit's Intranet for a period of eight days. Concurrently, an external search may take place, with jobs posted on different platforms including Monster, Indeed, and LinkedIn. Agreement positions, on the other hand, follow the internal posting and bid process prescribed in the applicable labor agreement, and Strategic Staffing will only coordinate recruitment for those agreement positions not filled internally through this process.

Managers have indicated consistently experiencing delays in jobs being posted unless directly following up with recruiters. The volume of positions that recruiters are attempting to fill require them to prioritize which roles will actively be recruited for, and many positions therefore are not posted immediately. However, without a tracking system in place, HMs lack visibility into the status of an open position.

Sourcing

Proactive candidate sourcing does not take place at NJ Transit, but rather recruiters post positions as need arises and reactively screen applications that are received. In some cases, recruiters become involved in ad hoc sourcing activities, such as when a position is particularly hard to fill and requires special skillsets.

Some HR employees have taken initiative to build relationships with high schools, trade school, community colleges, and the Department of Labor to build interest and create a talent pipeline. Operational groups have also been involved in planning and executing open houses or hiring days with an accelerated screening, testing, interviewing, and job offer process. However, these are not formalized processes.

Screening

In most cases, applicants must complete hard copy job applications, submitted over mail, fax, or hand delivery to NJ Transit offices. Some applications are received over email or electronically, particularly corporate and/or other roles posted on external job sites. As of March 2018, bus operator applications can also be submitted electronically through the Applicant Tracking System (ATS) currently being piloted. The recruiter conducts an initial screen of applications and selects those that match qualifications. If the position is one that requires pre-employment testing, then the recruiter sends the hard copies of the successfully-screened candidates to Test; if the position does not require testing, the recruiter then scans applications and resumes and sends over email to the HM, at which point the HM advises which applicants are selected for interview. The pre-screen is necessary to limit the volume of applicants sent to HMs for interview selection, however HMs have expressed frustration with recruiters' inflexibility in the interpretation of job qualifications. In some cases, HMs believe recruiters screen out qualified candidates due to an unwillingness or an inability to accurately interpret technical qualifications. On the other hand, recruiters have also expressed frustration with this process and indicate they follow written job descriptions as closely as possible to avoid legal repercussions down the line for deviating.

> "We [recruiters] try to bring in the best individuals based on the job description. We stick to it because we've gotten burned when deviating from it, but being sticklers causes pushback from the field."

The recruiter and HM must both complete a Disposition Form for each rejected applicant indicating the reason why they were not selected for the next step in the process. This additional form adds minimal value to the hiring decision while significantly increasing the workload for those involved in the recruiting cycle. For instance, one recruiter indicated having screened 400 applications on one occasion and completing the above-mentioned form for all 400. Many have simply stopped completing this form.

Testing

After application screening, selected candidates are invited to complete pre-employment tests to demonstrate that they have the skills and/or knowledge to complete the activities required on the position. Pre-employment testing is utilized by most of NJ Transit's agreement positions, although tests can be used as a screening mechanism for non-agreement positions if certain parameters

are met. To begin this process, the recruiter takes the selected candidates' paper applications and delivers them to the testing staff, who then reach out to the candidates directly and schedule them for a pre-set date and time to take the relevant test. On the day of testing, candidates are given paper-based tests, after which tests are graded and the applications are returned to the recruiter with notes indicating which candidates passed and failed.

NJ Transit's testing function is like many of the other steps in the Talent Acquisition Process in its reliance on manual activity. For example, the invited-to-test list that recruiters provide Testing is a stack of the candidates' original applications; scheduling of candidates for testing is also a manual process whereby the Testing staff make phone calls or email each candidate. Tests are delivered via pen and paper; with the exception of Scantron tests provided to some positions including bus operators, which are mailed to a vendor to grade, tests are graded by hand. These manual steps in the process are not only problematic because they are inefficient – it takes longer for a person to grade a test than it takes a computer – but because it allows for both intentional and unintentional errors, such as marking an incorrect answer as correct.

Test security is another issue that arose during conversations with recruiters. In some cases, NJ Transit staff has been concerned that candidates have obtained tests and their answers, allowing unqualified individuals to pass. This problem is common with agencies that utilize pen-and-paper tests. One factor compounding this issue is that, in most cases, NJ Transit only has one version of the test; as such, each candidate sees the exact same questions and the exact same answer choices in the exact same order, every time. At least one operational area has updated tests within the past three years and now use different versions of the same test to avoid this problem. However, this has not been addressed at a larger scale for all testing. Another major concern is that tests may no longer be relevant to the duties of the position. Although the positions may have evolved with the implementation of better processes or newer technology, the relevant tests have not been updated in years, rendering them obsolete. Therefore, tests may be screening in poor candidates and screening out good ones. For example, one commonly used test is no longer in print; it was purchased in bulk prior to the tests' discontinuation, but testing and operational staff have not had the bandwidth to validate and procure new ones.

Interviewing

Before interview candidates are selected, the recruiter and HM coordinate to develop questions to be used during the interview process. Once candidates have been selected to proceed to the interview round, the recruiter manually schedules with candidates and coordinates with selected interviewers.

In practice, interviews for all positions—from managerial to custodial—are conducted in a panel format by instruction from HR. However, corporate policy indicates it is left to the HM's discretion to select the interview format best suited for the area and position in question, either panel or individual. (A minimum of two representatives from the department must conduct interviews regardless of format.) Panels may range from two to five interviewers. This not only increases the time it takes to find a time that works for all interviewers, but additionally some HMs believe the panel interview to be ineffective in finding the best candidate for some positions, as the format may fluster or intimidate qualified candidates.

> "[In panel interviews] the person coming out is the one that can take the heat of the panel, not the person who can do the job best."

Another inconsistency between policy and practice is the role HR plays in the interview process. In the vast majority of cases, a recruiter or other HR representative is not only present during candidate interviews but is a scoring member of the evaluation panel. Once interviews are conducted, recruiters lead a discussion with the remaining panelists to reach a consensus score for each candidate. This practice can be problematic, as NJ Transit has HR representatives making judgements on the quality of candidates' answers and hiring recommendations that they do not have the subject matter expertise to accurately judge. Feedback

from interviews indicated HMs feel that, despite policy indicates the final hiring decision is in their hands, how much authority they have in practice can be unclear, and in some instances the final decision is being made by HR.

Candidate Selection and Salary Offer

After each interview, either the HM or the recruiter completes an Interview Evaluation Summary documenting whether the candidate will be hired or rejected. Following final candidate selection, the HM must complete an additional Candidate Selection Form, also documenting the reason the candidate was selected. The selection form requires the AED of HR's signature for final approval before an offer can be made. This was an informal (undocumented) rule set by a predecessor of the current Acting AED of HR, which has become one of the main bottlenecks in the process. In some cases, HMs and recruiters indicated it could take weeks, or even months, for a selection form to be approved.

Before a salary offer is made, the recruiter consults the HM. If a HM would like to make an offer outside of the normal compensation guidelines, another justification form must be filled and submitted to the Compensation Committee for approval. The committee does not include representation from the operational groups; in fact, there is a single compensation decision maker for all non-agreement positions across the organization who is a part-time employee of NJ Transit.

Issues with the compensation approval process were the most brought up during interviews with NJ Transit's operational staff. Operational groups indicated the majority of all out-of-policy salary requests are denied by the Compensation Committee, even if those requests make business sense and would keep salaries below or at the midpoint of the pay scale for the given position. Non-agreement salaries have been frozen at NJ Transit for at least eight (8) years, leading salaries for most of these positions to be well below market value. Internal candidates seeking promotions will therefore often request an out-of-policy increase that is reasonable, and which operation leaders approve, as this is the only opportunity to improve their salaries.

In one example, the top candidate selected by the HM for a position was an internal NJ Transit employee who was offered a 15% increase over their current salary, which was slightly over $70,000 at the time. The employee requested a 20% increase salary exception, a difference of less than $4,000 from the offered salary. The 20% increase would bring the employee's salary in line with the average salary of similar managerial positions at NJ Transit. The exception request was denied by the Compensation Committee, and the HM was instructed to make an offer to the second candidate, whose 10% increase, within policy standards, was over $7,000 above the initial offer, and over $3,500 above the requested salary exception for the top candidate. In short, NJ Transit paid $3,500 to hire the HM's second choice.

External candidates, on the other hand, often come in at higher salaries, and are afforded greater flexibility in their offers, as they do not need to adhere to an internal percentage increase rule.

Medical and Background Check

Any offer of employment by NJ Transit is contingent on the selected candidate passing a medical examination, which includes a drug and alcohol screening for safety-sensitive positions, as well as background and reference checks.

All background checks for NJ Transit employment candidates are conducted through the NJ State Police. This may be a lengthy process; however, there is no verifiable data to estimate how long the background check typically takes. Some employees indicated that the background check is sometimes used as an excuse for hire approval delays, particularly when waiting on executive level signatures.

Onboarding

NJ Transit has made strides in improving the employee onboarding experience for non-agreement

employees. In October 2017, new enhancements to the process were announced to HMs. These include a new online portal where new employees can electronically fill and submit new hire paperwork; a new resource guide for HMs and new hires; and a formal orientation. New hire orientations take place twice a month and include a benefits orientation, tours of various NJ Transit offices and operations facilities, and an opportunity to complete online compliance training, over two and a half days. HMs receive a New Hire Checklist to ensure all administrative items pertaining to onboarding are completed, both before and after the new hire's start.

The recruiter remains responsible for the standard onboarding process all new employees follow. The recruiter remains the new hire's point of contact from the time an offer is made to the new employee's start date, and coordinates all relevant paperwork and information is provided, completed and received. This is an additional administrative responsibility that keeps recruiters from dedicating more time to their principle function: recruiting.

> "The onboarding standard process has really improved with the formal two-day orientation."

2.4.3. TECHNOLOGY AND DATA FINDINGS

Critical factors influencing personnel hiring in the 'technology and data' arena include:

- IT systems, including Applicant Tracking Systems
- Hard copy versus digital paperwork

Applicant Tracking System

NJ Transit does not have an Applicant Tracking System (ATS) to electronically handle the recruitment process. Instead, recruiting and hiring follow highly-manual, paper-based steps, making recruiting more labor intensive and time consuming. In the absence of an ATS, objective data pertaining to the recruiting process is difficult to obtain, unreliable, and, in some cases, not tracked at all. Because of the manual nature of the recruiting process, it is difficult to estimate critical metrics, such as the average time to fill.

HR has recognized the need to implement an ATS to increase the efficiency of the recruiting process at NJ Transit. Planning for an ATS began in the fall of 2017, and a pilot of TargetRecruit, a cloud-based ATS built on the Salesforce platform, began in March 2018 for the recruitment of Bus Operators. Although the bus operator recruiters were involved in the design, build, and implementation of the ATS, the pilot has had several issues. While it has automated the application intake, allowing candidates to submit application forms online, the rest of the internal process remains hard-copy driven. This means recruiters still need to print out electronic applications and maintain hard copy documentation in candidate folders. If information is missing from the electronic application, it falls to the recruiter to request the missing information from the candidates who have made it to interview and manually enter it themselves, as candidates cannot edit their online applications after it has been submitted.

Further, TargetRecruit has not been configured to connect to NJ Transit's HR and payroll IT system, ePersonality (eP). Therefore, when a successful candidate has been selected for hire, the printed electronic application is physically handed to an HRIS staff member to manually enter the candidate's information into eP as a new employee. It is unclear if these IT systems have the capability to integrate. The pilot began implementation without an end-to-end plan to expand functionality, integrate with existing systems, and phase out the need for hard copy, manual steps in order to fully realize the benefits of an ATS.

While the vast majority of HR staff interviewed have expressed a desire to automate much of the process through an ATS, the perception is that the TargetRecruit pilot has increased paperwork rather than streamlined the process. Some recruiters have been concerned about the system being rolled

out for the rest of the operational groups they recruit for. However, others have indicated that the concern among recruiters may be due to the increased transparency and accountability that an ATS would provide.

Learning Management System

NJ Transit also lacks a Learning Management System (LMS) or other form of record keeping for the internal and/or external trainings that employees take. Without proper tracking, there is no real understanding of the manpower cost of training to the business unit.

2.5. OPPORTUNITIES FOR IMPROVEMENT

The following opportunities for NJ Transit to improve its personnel hiring protocols have been identified as a result of the findings presented in the previous section. A summary and prioritization of these recommendations follows.

2.5.1. PEOPLE AND CULTURE

Recommendation: Clarify recruiting and hiring roles, responsibilities, and accountability between business units and HR/Talent Acquisition to empower the business units to drive strategy and decision making, collaborating with HR as a support function.

- **Revisit Compensation Committee composition, role, and level of decision-making authority.** The normal compensation guidelines established in the Promotion, Demotion and Lateral Transfer policy cap salary increases for promotions at 10 to 15 percent, and the vast majority of out-of-policy salary requests are denied by the Compensation Committee, even if those requests make business sense, keep salaries around the midpoint of the pay scale for the given position, and present a more cost-effective option than the next in-policy option available. (See the example in the "Candidate Selection & Salary Offer" section above.) With a single, part-time employee who has the authority to make compensation decisions for all non-agreement positions across NJ Transit, North Highland strongly advises the agency make changes to the Committee's composition to include business unit representation and dilute its current concentrated level of authority by giving business unit leaders greater authority and accountability over compensation decisions within their departments.
- **Restructure the Talent Acquisition Department.** There are a handful of issues regarding the org structure of NJ Transit's Talent Acquisition Department that, if left unaddressed, will likely mitigate the positive impact of efforts for improving the hiring process. Most notably, NJ Transit's partial implementation of Human Resource Business Partners (HRBPs) has resulted in two positions — recruiter and HRBP — that are compensated differently yet, in practice, do not have very differentiated responsibilities. Other issues, such as a suboptimal manager-to-recruiter/HRBP ratio and an inefficient division of labor, have decreased the effectiveness of the hiring process and increased staff costs. Consequently, opportunities exist for expanding the management pool, launching a recruitment coordinator position to complete low-skilled administrative tasks that would otherwise be completed by recruiters and HRBPs, and clarifying the roles and responsibilities of each position within the department. Before creating and staffing any additional positions, however, a structure that enables the hiring process must be in place.
- **Clarify roles, responsibilities, and accountability between HR and the business units.** A number of interviewees, both from the operational and HR sides, expressed that it is HR that is driving talent acquisition at NJ Transit, rather than the business units. There is a disconnect between the roles policy dictates are for each group and what they are in practice. For instance, many HMs indicate they are required to conduct panel interviews for all positions, which was just one of the many points of frustration. However, policy states interview format is at the HM's discretion based on what is best suited for the position. HMs also mentioned that although they are supposed to be the final hiring decision makers, they felt HR pushes for its preferred candidates and often "get its way". Finally, the AED of HR has final authority over who is and is not hired, not only creating a bottleneck at the end of the process, but further placing decision-making authority with HR over the business unit. To accelerate recruiting, a necessary first step is to revisit the set of responsibilities assigned to each stakeholder involved in the process with the

goal of empowering business units to make the decisions that best suit their departments, with HR acting as a supporting, enabling partner.

- **Integrate workforce planning with strategic planning at an organization-wide level.** Formal workforce planning and alignment to NJ Transit's broader organizational strategic planning does not currently take place. Communication between Talent Acquisition and business units tends to be more reactive to the immediate recruitment needs to fill open vacancies, while forward-looking dialogue is absent in most cases. A comprehensive workforce strategy will identify the actions NJ Transit needs to take today to ensure it can meet the talent needs of the future. Because no one knows the talent gaps better than the business units experiencing them, business unit leaders need to be the drivers of the workforce strategy, with HR supporting the execution.

Recommendation: Create concerted avenues for career growth and advancement to develop NJ Transit's workforce internally and increase the retention and longevity of newer employees.

- **Develop career paths to encourage career advancement.** There are very few defined career progression opportunities at NJ Transit. All those who wish to promote up must apply and interview for roles, and there are no specific career tracks employees can follow. The lack of advancement opportunities was often mentioned in exit interviews as one of the negative factors contributing to outgoing employees' decision to leave. Defining and communicating career paths will encourage employees to seek career advancement within NJ Transit rather than look elsewhere for growth opportunities.
- **Establish formal performance management cadence to monitor and track the progress of employees and work groups through individualized development plans.** Performance management plays an important role in keeping employees engaged. It is also a necessary tool to measure both employee contributions and potential. While NJ Transit has an outlined process for annual goal setting and performance evaluations, in practice these only take place when an employee is considered for a salary increase. A structured, metrics-driven approach to performance management needs to be implemented to effectively identify high potential employees and drive internal mobility. Employees will feel more engaged and motivated if they can tie their daily actions to a performance metric and understand how certain behaviors can help them reach the next level in their career.
- **Establish formalized succession planning to identify candidates for critical positions where the departure of key talent poses the highest risk for the organization.** The loss of institutional knowledge due to retirements and general turnover is already affecting the organization. There is a high risk of continued experience and knowledge drain given the high number of retirement- and soon-to-be-retirement-eligible employees. However, no succession planning or other form of leadership development exists at NJ Transit. An effective succession plan will identify expected skills gaps and match them up with internal talent, using data to identify high potential employees and setting the organization up for long-term success.
- **Conduct review of Training Programs to identify opportunities for improvement.** Discussions with interviewees identified the new hire training programs as areas in need of change. (Recertification and professional development trainings for current employees were also discussed and should be reviewed.) Certain programs have gained a reputation for being unnecessarily difficult and taking pride in failing new hires. This reputation is known by qualified external candidates at other transportation properties and has dissuaded them from applying to NJ Transit; indeed, some training programs have pass rates below 50 percent.

Recommendation: Invest in initiatives to improve overall morale and work environment to boost NJ Transit's employer brand and encourage hiring and retention.

- **Conduct pulse surveys of both agreement and non-agreement employees to identify issues of greatest concern to them as well as to gauge employee engagement and satisfaction.** Morale is at an all-time low at NJ Transit. However, many view the changes in leadership as an opportunity for change. NJ Transit should use this momentum to solicit feedback from employees through

surveys. Surveying employees can be easily implemented and not only make employees feel empowered and heard, but also help identify culture strengths and weaknesses in order to drive engagement initiatives that have the most impact on employee satisfaction. Considering NJ Transit has not conducted an employee engagement survey since 2014, establishing a regular cadence is necessary to measure the success of initiatives, and understand how closely current culture resembles the desired culture. Identified strengths should also be highlighted in recruiting content in order to build NJ Transit's employment value proposition.

- **Create/expand employer brand through increased online engagement.** Social media is an important tool to leverage for interaction not just with customers, but potential candidates as well. Understanding what employees perceive as NJ Transit's strengths (through engagement survey data) is key. Once identified, the information allows for the creation of content that promotes NJ Transit as an employer of choice and builds the organization's employment brand to attract the right talent. Content may include promotional videos, employee spotlights, community outreach, etc.
- **Develop employee recognition programs.** Recognition and appreciation go a long way in improving employee satisfaction and driving engagement. When employees feel appreciated, they are more satisfied with their careers and less likely to quit. In NJ Transit's most recent engagement survey, recognition for high performance was the lowest scoring attribute, and 16 percent of outgoing employees who gave exit interviews mentioned lack of recognition as a negative factor contributing to their departure. NJ Transit should develop employee recognition programs, both for agreement and non-agreement employees, that resonate with each group; for example, featuring an "employee of the month" on NJ Transit's website or social media channels.

Recommendation: Revise salary and compensation policies and practices to become more competitive in the marketplace.

- **Conduct a salary benchmark study.** Understanding compensation levels that peer organizations in the region who compete for talent with NJ Transit set for their employees will help develop more fair and competitive pay grades to attract and retain the most qualified candidates.
- **Adjust Promotion, Demotion and Lateral Transfer policy to take into consideration compression adjustments and benchmark study findings.** In addition to capping increases to salary for promotions, the current policy does not account for discrepancies that come up between the established salary bands and compression adjustments to salary. For instance, a compression adjustment may have changed the next level position's salary minimum above the 15 percent cap in increase for an internal employee looking to promote into the position. Thus, a review of the policy is warranted to standardize the interpretation of compression minimums and other future adjustments, as well as to consider any modifications to established caps based on findings from the salary benchmark study.

2.5.2. PROCESS AND CAPABILITIES

Recommendation: Streamline hiring process by eliminating non-value-add activities to remove bottlenecks, increase efficiency and decrease time to fill.

- **Reduce the approvals needed for Requisition Generation.** Currently, four approvals are needed to fully approve a requisition for a new position. These approvals — required from the hiring department AED/VP, the AED of HR, the CFO, and the Executive Director — increase the time-to-fill and were routinely brought up by HMs are one of their biggest frustrations with the process. Oftentimes, these approvals can get lost as they're being handed off from one signee to another. As such, North Highland proposes that NJ Transit immediately reduce the approvals needed from four to two: the hiring department AED/VP and the CFO.
- **Eliminate re-justification of existing positions requested for Requisition Generation.** While NJ Transit HR policy does not require it, in practice, HR requests a re-justification of a number of existing roles before approving a requisition. This justification is redundant as existing roles are accounted for in operational budgets and headcount. North Highland recommends the immediate discontinuance of this practice in favor of the documented requisition procedure for existing positions.

- **Eliminate the need to complete the Disposition Form for candidates who do not make it past screening.** Maintaining documentation of hiring decisions is important and required for legal and compliance purposes. However, it is unreasonable to expect recruiters to complete a Disposition Form for each of the potentially hundreds of applicants screened daily — particularly external applicants who do not meet the minimum qualifications necessary to be considered for the position. Further, it is unclear how many recruiters follow through with this paperwork. Thus, North Highland proposes the elimination of the Disposition Form specifically during the initial screening of applicants.
- **Eliminate the practice of the AED of HR approving all hires.** This additional approval practice was initially instituted by previous HR leadership and became one of the main bottlenecks to getting timely offers to preferred candidates once a hiring decision was reached. In many cases, recruiters indicated struggling to come up with excuses for delays in finalizing hiring decisions to avoid "throwing their boss under the bus." On one occasion, candidates interviewed at the same time in December for management positions, and the business unit wanted to hire both. One was given the offer in February, while the other was not finalized until May, with the bottleneck presumed to be receiving the AED of HR's signature. As such, it is recommended that final hiring decision approvals reside with the AED/VP of the hiring department rather than the AED of HR.
- **Streamline NJ First Act exemption requests.** While NJ Transit can request exceptions for critical positions (which tend to be granted), the additional external approval increases the already-lengthy time it takes to fill a vacancy. Recognizing much of NJ Transit's work takes place in neighboring states, it would be in the agency's interest to work with the governor's office to streamline the exemption request process, particularly for workers who will spend most of their time operating out of State.
- **Review background check process and vendor.** Stakeholders' perspectives on the background check process differed widely. During interviews, staff shared that background checks have taken up to six months to complete in the past, lengthening the time-to-fill even after a candidate has been selected and received a conditional job offer; Hiring Managers, however, shared they believed that the background check is sometimes used as an excuse for hire approval delays, particularly when waiting on executive level signatures. While this information was merely anecdotal, the length of this step is cause for concern, as selected candidates end up taking jobs elsewhere. (For example, the background checks of a peer regional transit agency — which includes criminal, education, and driver's license checks — takes between one and six weeks to complete.) As such, North Highland recommends NJ Transit conduct an in-depth review of the background check process, including the effectiveness of relevant vendors, to improve the organization's time-to-fill.

Recommendation: Improve the effectiveness of candidate screening and selection to fill vacancies with the most qualified candidates.

- **Discontinue the practice of allowing HR to score interviews.** Although HR's involvement in the evaluation process is important, it is not always appropriate for HR representatives, who do not have the technical subject matter expertise of the HMs, to make judgements on the quality of candidates' answers to interview questions. To this end, North Highland recommends HR's role in the evaluation phase to be limited to ensuring compliance and supporting the hiring manager as needed, in lieu of scoring candidates, as dictated in current NJ Transit policy.
- **Develop strategies for streamlining the hiring process for experienced, credentialed professionals.** NJ Transit's hiring practices sometimes dissuade quality candidates from applying because the organization does not seem to give preference to individuals with direct experience. Consequently, experienced candidates who are interested in working for NJ Transit end up applying elsewhere instead because getting through the door is easier at other agencies. For example, during one of the interviews conducted for this assessment, an applicant noted that providing one regional operator with his FRA Locomotive Engineer certification exempted him from taking the pre-employment test for the conductor position. As such, considering ways to make the hiring process more attractive for candidates who have proven experience, especially for positions where credentialing is required is warranted.

- **Increase level of communication and partnership between the hiring manager and recruiter early on in the process.** Presently, communication between the HM and recruiter does not take place until a requisition has been approved. However, the requisition approval process requires a job description to be attached. If any changes need to be made to the job description or requirements, a new requisition is required. Additionally, HMs have expressed frustration with how recruiters pre-screen candidates, or are "too by the book". Ensuring HMs and recruiters are on the same page from the start of the process in terms of expectations, required skills, and different ways of meeting those requirements through a combination of education and experience is necessary to avoid qualified candidates being screened out and vice versa. Additional communication points should be triggered when a candidate moves to a new step in the process ensuring HMs are fully aware of how the recruiting effort is progressing.
- **Revise or replace the current pre-employment tests, as necessary, and establish a cadence for future review.** For many organizations, pre-employment testing is one of the main screening mechanisms that recruiters and hiring managers have at their disposal to thoroughly vet candidates. At NJ Transit, many of the current tests are antiquated, are no longer relevant to the position, and may be in the hands of individuals who should not have them, eliminating the effectiveness of testing as a screening tool. Considerable time and money may be wasted ushering a candidate through the hiring process who passes the test but does not have the requisite knowledge or skills to complete the duties of the position, only to remove that individual later. A review of the alignment of the current tests to the job duties, creating new tests or revising current material to better align them with the job, and scheduling future reviews of every test to ensure that the material stays relevant over time are all worthy improvement strategies.
- **Launch efforts of proactive candidate outreach to provide candidates with information about where they are in the process.** Improving the hiring process is not merely about making operations more efficient or making candidate selection more effective; organizations must also seek to improve the candidate experience. A poor candidate experience can frustrate quality candidates, leading them to voluntarily remove themselves from consideration and seek employment elsewhere. In these cases, NJ Transit is often left with less qualified candidates. Perhaps even more problematic, however, is that a poor candidate experience often leads new hires to come into the organization with a chip on their shoulder; a poor candidate experience can infect new hires with low morale. One of the biggest complaints about the candidate experience at NJ Transit is the "opaqueness" of the process. After taking care to gather their most up-to-date work experience and tailor their resume to the position, candidates drop their application into a "black box," not even receiving notification that it has been received. Some candidates go months without receiving any sort of notification from the organization. In the interim, many of these quality candidates receive an invitation to the next step in NJ Transit's hiring process only after accepting job offers from other employers; had they known they were still in consideration at NJ Transit, they may have waited before accepting other offers. Consequently, NJ Transit's poor candidate experience causes the agency to miss out on quality candidates and frustrate new hires from Day One.

Recommendation: Develop a purposeful approach to sourcing in order to attract the right talent and build talent pipelines for future hiring needs.

- **Formalize relationships with local institutions.** Although not formalized across the organization, some HR employees have taken initiative to build relationships with high schools, trade schools, community colleges, and the State Department of Labor to create a talent pipeline. To make the most of these connections, North Highland recommends NJ Transit formalize relationships with local institutions by establishing measurable goals (e.g., hold X number of recruiting/informational events at X, Y and Z schools annually) and finding opportunities to collaborate (e.g., partnering to develop curricula for hard-to-fill positions). In addition, measuring the effectiveness of partnerships based on set goals to determine which relationships are producing the most/best talent to continue to invest in those is also recommended.
- **Implement candidate sourcing activities.** NJ Transit's current applicant pool is made up almost exclusively of candidates who apply to NJ Transit of their own volition; this fact fails to appreciate

that there are many qualified candidates who are not applying to NJ Transit. NJ Transit treats the individuals who submit an application as its only candidate pool; in reality, however, its candidate pool has the potential to be much, much larger. The challenge facing NJ Transit's Talent Acquisition Department, then, is how to encourage qualified candidates to apply for a position at NJ Transit (i.e., sourcing). By implementing candidate sourcing activities, both for recruitment staff and other employees, NJ Transit can expect to receive higher-quality applications to usher through the hiring process, providing hiring managers with even better candidates to choose from. By doing this, NJ Transit's Talent Acquisition Department can begin to satisfy both parts of their twofold role: reactively screening applications that are received and proactively inviting candidates to apply. Assess what have been effective sources of candidates in the past and determine what sources may be most effective in the future—consider social media, employee referrals, campus recruitment, job fairs, etc.—and leverage them for future sourcing. Other helpful sourcing activities to build a talent pipeline for future hiring needs include flagging previous candidates with in-demand skills for other roles in the organization.

2.5.3. TECHNOLOGY AND DATA

Recommendation: Invest in the use of technologies in the hiring and recruiting process to capture target candidates and increase the efficiency and effectiveness of overall hiring in NJ Transit.

- **Assess the results of the TargetRecruit pilot to determine what worked and what needs improvement, considering any additional functionality that has not been tested.** The Talent Acquisition Department is in the middle of piloting TargetRecruit, an Applicant Tracking System, for the bus operator position. Initial feedback on the pilot has been mixed, as some stakeholders believe that, although it has improved the candidate experience by allowing them to submit applications online, it has not improved the process—and, potentially, has even made it more difficult—for the recruiters. That said, this pilot has the potential to be very instructive to NJ Transit as it considers future technology implementation to assist with the hiring process. As such, NJ Transit should assess the results of the pilot to determine what went well, what went poorly, and what the organization still needs to learn before making future technology decisions.
- **Invest in a robust Applicant Tracking System.** Applicant Tracking Systems are critical in helping organizations — especially those with a high volume of applicants—manage their hiring process efficiently and effectively. With the exception of the recent pilot, NJ Transit's Talent Acquisition Department has always operated without this key technology. Upon the conclusion of the TargetRecruit pilot, NJ Transit needs to make a full investment in an ATS technology, whether that be scaling up TargetRecruit or selecting another vendor. The selection of a particular system should consider some of the main features of ATSs, including workflow automation, API integration, and the ability to assign tasks, among others, and it is important for NJ Transit to take the time to scope out requirements needed for the ideal ATS that not only fits current needs, but also meets needs into the future. In addition, NJ Transit's investment in an ATS must not stop with the procurement of the technology, but also include valuable training and change management activities to assist with the implementation across all relevant stakeholders, from the Talent Acquisition Department to the hiring managers. By investing in a robust Applicant Tracking System, NJ Transit can expect to see a significant improvement in the efficiency and effectiveness of their hiring process.
- **Digitize pre-employment tests to deliver via computer.** Currently, NJ Transit uses pencil and paper to conduct pre-employment testing for many positions. Hard-copy tests present organizations with a number of problems, including intentional or unintentional grading and reporting errors, time-intensive test session preparation, and the risk of candidates making copies or taking photos of tests. More than just preventing problems, however, computer-based testing provides a number of benefits to both the candidate and the organization. For example, computer-based testing allows candidates and recruitment personnel to get immediate results, improving the candidate experience and expediting the time-to-hire. In addition, it allows for easy analysis of tests, including identifying passing rates at the test level, at the question level, and by candidate group (internal vs. external), helping recruitment staff quickly determine whether any changes need to be made to improve the test. Migrating all pre-employment tests to a secure,

computer-based test delivery program is the solution of choice for improving hiring process operations and enhancing the candidate experience.

Recommendation: Implement standardized data collection and management practices to begin leveraging analytics in measuring the effectiveness of recruiting, hiring and retention practices.

- **Standardize metrics tracked and methods of data collection across Talent Acquisition for better data that is consistent, robust, and centralized.** Data collection and metric tracking is an important tool to measure performance and thus to improve it. Currently, objective data pertaining to recruiting are difficult to obtain, unreliable, and, in some cases, not tracked at all in NJ Transit, mainly due to the manual nature of the agency's recruiting process. Standardizing definitions and reporting metrics is a critical first step for allowing NJ Transit to identify with greater accuracy where pain points exist in the process and work to improve them in the future. This standardization process becomes easier, more consistent, and reliable once a full-scale ATS implementation has been completed. However, it is important that an ATS evaluation, selection, and roll-out not delay data collection efforts — as such, implementing an interim solution of manual data collection to inform planning and decision making represents a worthwhile first step.

2.6. RECOMMENDED NEXT STEPS

Table 2-3 presents a summary of the recommendations listed above, in order of prioritization.

Focus / Sub Task	Recommendation	Priority	Level of Effort	Value Delivered	Key Success Factors
Technology and Data	Invest in the use of technologies in the hiring and recruiting process	High	High	High	Capture target candidates Increase the efficiency and effectiveness of overall hiring
Process and Capabilities	Streamline hiring process by eliminating non-value-add activities	High	Low	High	Remove bottlenecks, increase efficiency and decrease time to fill
People and Culture	Clarify recruiting and hiring roles, responsibilities and accountability between business units and HR/Talent Acquisition	High	Medium	High	Empower the business units to drive strategy and decision making, HR as a support function
Process and Capabilities	Improve the effectiveness of candidate screening and selection	Medium	Medium	High	Fill vacancies with the most qualified candidates
People and Culture	Revise salary and compensation policies and practices	Medium	High	High	Become more competitive in the marketplace
People and Culture	Invest in initiatives to improve overall morale and work environment	Medium	Low	Medium	Boost NJ Transit's employer brand and encourage hiring and retention
People and Culture	Create concerted avenues for career growth and advancement	Medium	High	Medium	Develop workforce internally and increase the retention and longevity of newer employees
Process and Capabilities	Develop a purposeful approach to sourcing	Low	Low	Medium	Attract the right talent and build talent pipelines for future hiring needs
Technology and Data	Implement standardized data collection and management practices	Low	Medium	Medium	Begin leveraging analytics in measuring the effectiveness of recruiting, hiring and retention practices

Table 2-3: Summary of Recommendations

CHAPTER 3
PROCUREMENT

Chapter 3: Procurement

3.1. INTRODUCTION

In this Chapter, gaps and opportunities associated with processes, people and technology within the procurement department at NJ Transit are addressed. The focus of the Chapter is to evaluate whether NJ Transit has proper contracting vehicles needed to meet its diverse purchasing requirements.

In both the public and private sectors, procurement is at an "inflection point" resulting from increasing pressure to reduce spending while simultaneously spurring growth and innovation. Procurement professionals are expected to "work smarter" with fewer resources in an environment of increased risk and compliance oversight.

Procurement executives are expected to deliver measurable business value by:

- Delivering a procurement service that meets business needs.
- Increasing the reach of Procurement (i.e., spend under management, standardization across the organization).
- Increasing operational agility and flexibility.
- Reducing / avoiding purchased costs and cost per transaction.
- Enhancing employee / talent retention and development.
- Increasing innovation and product / service support.
- Increasing and tracking savings through sourcing efforts.

Yet, another key challenge facing the procurement team is to ensure agreement on alignment between its support function and that of the business side of the organization. In other words, within each step of the procurement process, who is tasked with doing what? Unclear expectations frequently lead to tension, frustration, and negative opinion of the value being delivered from the procurement group.

3.1.1. CURRENT STATE

One of the challenges facing NJ Transit is the time taken to procure; procurement challenges came up time and again during interviews with different stakeholders (rail, bus, finance) in this assessment. The NJ Transit procurement department suffers from a lack of vision and strategic plan creating a reactive environment. Complex processes that are paper-based and highly manual result in inefficiencies, ineffectiveness, and, consequently, create a major bottleneck with pending procurement requests spanning over months. The high degree of manual processes has burdened the procurement team to a point where managing the volume of procurement requests is no longer feasible. The lack of staff has further slowed down the process as the vacancies in the team have forced the staff to assume expanded roles, limiting staff's ability to perform required tasks in timeframes needed to support the business units. Without the data and integrated systems, NJ Transit is unable to track data and maintain reliable metrics such as procurement dollar spend, RFx turnaround time, vendor performance, contract compliance — information critical to understanding the true effectiveness of systems and practices and how to improve.

Many of the challenges stated above result from continued inefficient and paper-based processes, a lack of an integrated system environment, inadequate staff, absence of service-level agreements and no stated expectations surrounding key metrics that should be tracked throughout the procurement lifecycle. Business units and hiring departments feel frustrated by the amount of time it takes to fill a paper-based request, multiple approvals required, and general lack of transparency in the process, while understanding the procurement team is understaffed for the scale of NJ Transit's needs.

A more detailed dive into the current state is included in the Assessment Findings section.

3.1.2. DESIRED STATE

Effective procurements bring great value through cost effective contracts, smooth project rollouts, and goods and services that meet the needs of the organization. As a core function affecting multiple departments, it is essential to equip the procurement team with the right resources to meet the growing needs of the organization. Based on the assessment of the current state and needs of the organization, North Highland has identified the following key factors that will enable the procurement team to function effectively and efficiently in the future.

- **Strategic Plan.** Formal developed Vision, Mission, Strategy objectives and Governance plan that align with the larger organizational goal.
- **People.** Adequate staffing with clearly defined roles, responsibilities and opportunities for progression.
- **Process.** Simplified procedures that align with procurement lifecycle supported by well-defined policies and manuals.
- **Capabilities.** Opportunities to collaborate with vendors and stakeholders. Focused initiatives to promote cost-effective and efficient ways of working.
- **Performance.** Well defined and documented KPI's to measure internal and external performance.
- **Technology.** Robust procurement system with an ability to manage internal processes, high volume of procurements and multiple vendor contracts effectively.

3.2. METHODOLOGY

To satisfy the needs of organizations such as NJ Transit that are looking to address the above challenges, North Highland developed its proprietary Professionalizing Procurement Methodology, which is focused on transforming procurement and vendor management organizations to ensure they maximize business value by leveraging the latest procurement developments, proven best practices and effective organization, and governance and process design.

Figure 3-1: Professionalizing Procurement Methodology

As noted in ***Figure 3-1***, there are four critical steps addressed by this methodology as defined below:

Align. Setting direction for the future, how it is achieved, and how to measure success. Achieved through developing a vision, strategy, and plan for the procurement function.

Professionalize. Changing the way the procurement function is structured, how it operates, and executes. Achieved by building out the right organizational structures, supported by operating processes and governance, and staffed by people with the right capabilities.

Enable. Transforming how procurement works to support business outcomes and set the foundations for success. Achieved through using the right tools and technology to increase visibility of spend and cycle times; automate processes and track compliance to policies.

Sustain. Empowering and inspiring people to embed the change and make it stick. Achieved through establishing measures of strategic and individual accountability, empowering professionals to make decisions that are best for the organization and their careers.

3.3. ASSESSMENT SUMMARY

In this section, the initial assessment of the current-state environment and challenges associated with NJ Transit Procurement Processes, People, and Technology is presented. Findings were generated based on feedback during interviews, data analysis, and conversations with peer organizations from around the country. *Figure 3-2* highlights a few overarching themes identified.

THEMES	SUPPORTING EVIDENCE
Strategy	The NJ Transit Procurement Department suffers from a lack of vision, strategic plan, and goals/KPIs to guide and measure staff performance, creating a reactive environment that continuously operates in response to "fire drills"
Staffing	Vacant positions in Procurement and supporting business units have forced staff to assume expanded roles, blurring core responsibilities and limiting staff's ability to perform required tasks in timeframes needed to support the business
Technology	Lack of an integrated, central procurement management system for bid management, sourcing, supplier management, and contract management forces manual workflow for development of procurements, receipt and evaluation of bids/proposals, tracking of contracts, and reporting of procurement activities, and inhibits cross-organizational collaboration
Governance	Need for stronger executive oversight and governance to assign clear roles, responsibilities, and accountability for cross-organizational activities, including specification writing, cost analysis, and business management and contract administration functions
Process	Procurement process is complex and involves several organizations outside NJ Transit Procurement that appear to have no service level agreements/performance criteria, lengthening overall procurement development and release time

Figure 3-2: Procurement Themes Across the Organization

3.4. ASSESSMENT FINDINGS

The following subsections group the initial findings into three categories: 1) Strategy, Organization, and People, 2) Processes, Capabilities, and Governance, and 3) Technology and Data.

3.4.1. STRATEGY, ORGANIZATION, AND PEOPLE

Procurement Vision, Strategy, and Goals

A Vision Statement describes where an organization (or business unit) wants to be – its desired future state. A Mission Statement describes why the organization or entity exists. Strategies provide direction around the approach to achieve the mission and vision, while goals provide targeted outcomes that are in alignment with the overall mission and vision. Clearly defining each of these areas offers an organization and its employees a roadmap to achieving a desired end state.

The North Highland team obtained a draft copy of the new Procurement Manual. The draft manual includes the following NJ Transit Procurement Policy and Objectives:

1. To promote open, full, and free competition in the procurement of goods and services
2. To procure quality goods and services in a reliable and timely manner at a reasonable cost
3. To conduct NJ Transit's business in a transparent manner with integrity, fairness and impartiality so as to maintain the trust and confidence of the public
4. To make positive efforts to utilize small business enterprises (SBEs, State-funded) and disadvantaged business enterprises (DBEs, Federally-funded) as sources of supply and maximize their opportunity for participation in all contracts, dependent on the funding source
5. To require all Contractors and Subcontractors to take affirmative action in their employment and contracting practices to ensure that applicants and employees are not discriminated against

based on age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex, and to comply with the Americans with Disabilities Act

Figure 3-3: Strategic Pyramid

While these objectives provide some direction, the statements are open ended and do not include specific details or measurements that define success for each objective. Additionally, no plans exist to achieve the objectives included in the manual. Without these details, challenges arise for staff in understanding the processes and steps to achieve the objectives as well as identify issues and gaps when objectives are not met. Consequently, feedback received during interviews suggests that employees are more focused on time-sensitive, critical, and outdated procurement requests rather than strategic plans to move the organization to a desired future state. NJ Transit currently experiences a lengthy procurement cycle, in some instances taking over 450 calendar days to complete.

NJ Transit currently experiences a lengthy procurement cycle, in some instances taking over 450 calendar days to complete

Organizational Structure

NJ Transit Procurement is part of the Project and Strategic Investment Department and managed by the Chief Procurement Officer. Procurement is organized into four distinct groups:

1. Materials Purchasing and Management
2. Construction and Related Services (Contracts)
3. Commodities Purchasing
4. Procurement Systems and Support

The Materials Purchasing and Management group handles acquisition of spare parts, non-professional services, IT equipment and services, furniture, and equipment repair firms, as well as management of P-Card purchases and management of parts warehouses. The Construction and Related Services or Contracts group is responsible for procuring construction and professional service firms as well as capital investments like rail cars and buses. The Commodities Purchasing group procures commodity type items including fuel, cleaning and maintenance services, and some parts. It also handles exchanges and returns. The Procurement Systems and Support group is responsible for parts inventory planning (min/max) which is maintained in the Oracle system. This grouping of responsibilities is fairly typical in procurement organizations. Of note, the NJ Transit Procurement organization is very centralized with a single organization serving both rail and bus operations. Some large transit agencies have a central procurement organization for non-core supplies/materials and separate procurement organizations that reside within the operations unit (i.e., a procurement group dedicated to rail and another procurement group dedicated to bus). As an advantage, NJ Transit's structure offers a single source for strategic direction and control as well as

economies of scale to the procurement function. The disadvantage is the structure does not provide for the familiarity and specialization that might come from having a more coordinated or "center-led" structure with separate rail and bus procurement units.

In total, the Procurement organization has 16 open positions (almost 30%) with a few of the positions vacant for over a year.

The lack of an executive governance structure has caused delays in the procurement process (even stopping the process at times) due to disagreement over accountability between business units. An example provided during interviews highlighted situations where vendors submit incomplete DBE/SBE information upon initial bid submission. Procurement and Office of Business Development (OBD) staff disagree on which group is responsible for coordinating with the vendor to obtain missing information. Additionally, OBD has developed checklists, templates, and other supporting documentation that has been provided to other business units to ensure smooth processing of DBE/SBE compliance. However, certain groups seem reluctant to use these tools and continue to omit information or use old language and templates, which creates delays and rework for key suppliers. Without a governing authority, no group exists to make determinations on which groups or roles are responsible for certain activities.

Staffing

Based on the NJ Transit organizational chart, the Procurement organization has 55 positions at full staffing. At present, the organization has 16 open positions (almost 30%) with a few of the positions vacant for over a year. Two of the four groups (noted above) reporting to the Chief Procurement Officer are without directors/managers (i.e., the lead positions are vacant). The inability to staff a full complement of qualified individuals impacts the organization in several ways, including high rates of overtime, procurement delays due to insufficient available labor, and low morale among employees. The procurement delays in turn impact the availability of parts and equipment, delaying maintenance in both rail and bus operations.

With so many vacant positions, staff is required to take on additional roles and responsibilities. This strains staff from being able to effectively perform core responsibilities and creates an environment where roles are more informally assigned to individuals. Additionally, the lack of formal training inhibits the ability to implement standardized business processes that align with overall organizational and departmental goals. An example was provided where staff teach "their way" of performing a process, which may differ from how others perform the same task.

Training, Certification, and Capability Development Framework

NJ Transit does not require any type of procurement certification for its procurement staff. Professional development and training opportunities for non-agreement employees within the Procurement organization are almost nonexistent. Although comprehensive job descriptions exist, job capability frameworks or competency models that define needed competencies by role and level do not. The absence of a capability framework and a competency model leaves staff without a means to understand the professional procurement and business skills, related competencies needed across all roles, the career path and opportunities that may be available to them, and the requirements (skill and/or experience) for moving into a new position.

New employees who join the Procurement organization receive some on-the-job training and guidance and are given a copy of NJ Transit Procurement Manual. The manual is not a complete procurement tutorial and parts of the manual are out of date. A new, draft manual is in development, but it has not yet been approved for use. Lack of an up-to-date manual as well as sufficient training for new employees means they are entering their roles without the knowledge needed to effectively handle some procurement tasks. The lack of knowledge takes time away from more experienced staff who need to assist with certain of the functions, contributing to procurement delays.

Performance Management

Performance management, the process of planning, monitoring, and reviewing an employee's overall contribution to the organization and performance against objectives, is absent within the Procurement organization. Some employees report not having had a performance review in almost ten years. Also, there are no performance standards against which Procurement staff is measured. The Procurement organization recently began tracking overall procurement lifecycle time (i.e., time from completion of procurement specifications to award and execution of a contract), but it is not clear that every procurement is being tracked and there are no individual performance measures or targets. Lack of such standards and measures make it nearly impossible for the organization to understand its current performance or who are its top individual performers. This limits the potential improvements to performance that procurement personnel can generate for the organization, be it quicker procurement development time, higher (internal) customer satisfaction, enhanced supplier relationships, improved quality of procurements, etc.

Customers

Although NJ Transit frequently leverages Invitation for Bid (IFB) and Request for Proposals (RFP), there is a tendency for the Procurement Department to be more reactive with customers (i.e., the Requesting Department). Typically, a Project Manager is responsible for managing the programmatic aspects of a contract, including developing the budget and technical specifications. Requisition requests are routed via electronic workflows, approvals, and email notifications until they are directed to individuals within the Procurement Department for further processing. Generally, there are unplanned or unintentional relationships between the Requesting Department and individuals within the Procurement Department. This means that the Requesting Department has little visibility into who in the Procurement Department will assist with purchasing requests. Additionally, no indication has been seen where the Procurement Department conducts surveys or solicits feedback from the Requesting Department around the experience during the purchasing process.

The current practices with customers displays an environment where the Procurement Department is highly segregated from Requesting Departments. Since the Procurement Department tends to be more reactive to purchasing requests, it has difficulty effectively planning and efficiently processing requests from multiple departments across the organization. Additionally, the lack of official relationships with Requesting Departments prevents the ability for procurement staff to specialize in and align with specific purchasing requests. A stronger relationship with Procurement staff and Requesting Departments could allow for purchasing requests with highly technical specifications to be routed to someone in Procurement with the necessary knowledge to process such requests. Lastly, soliciting feedback from Requesting Departments could allow the opportunity to identify gaps or challenges within the current process and highlight potential opportunities for improvement.

Supplier and Contract Management

NJ Transit does not have a dedicated business unit or assigned roles to perform contract administration functions. Of note, a new business unit within the Procurement Department is being established to perform contract management activities. Today, however, these roles are performed inconsistently by various operating units, with the exception of capital programs. Without dedicated roles and responsibilities to perform these functions, NJ Transit possesses no strategic contract management plan, which has shown to negatively impact relationships with key suppliers. Individuals in multiple organizations have noted that suppliers are calling them to understand the status of POs, payments, etc. In some instances, supplier payments have been delayed for extended periods, resulting in credit holds and an inability to get needed parts or materials in a timely manner. This has led to more deferred maintenance due to lack of parts.

3.4.2. PROCESSES, CAPABILITIES, AND GOVERNANCE

The overall procurement process at NJ Transit is lengthy, extremely manual, labor intensive, inconsistent, and inefficient. This significantly increases the time needed to develop, issue, and conduct procurements. Many procurements take six to eight months to conduct, with higher dollar

value procurements taking more than 12 months as highlighted in *Figure 3-4*. Procurement delays are causing corresponding delays in various NJ Transit programs.

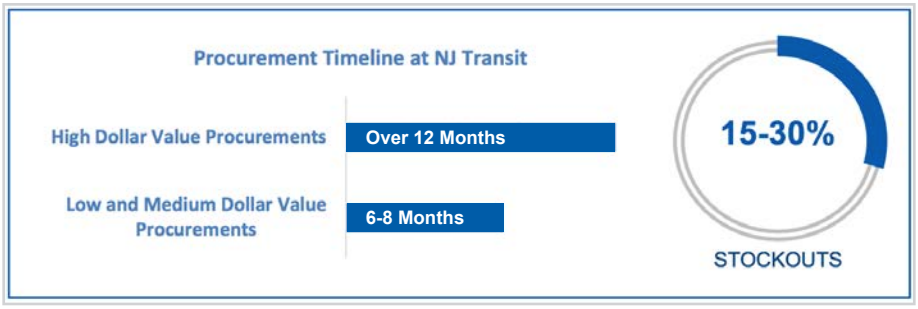


Figure 3-4: Procurement at NJ Transit

The materials (spare parts, etc.) acquisition and inventory management process does not seem to be functioning properly, leading to frequent stockouts (estimated 15-30%) on spare parts. The procurement delays and stockouts are both contributing to deferral of maintenance activities, including scheduled quarterly maintenance, in both rail and bus operations. This increases the time that crews keep cars and busses out of service, negatively impacting service and revenues.

Figure 3-5 presents the key activities performed across the procurement lifecycle for the purchasing of goods and services above $40,000, thus requiring competitive bids. The Figure, or process flow, is intended to be a simplified view of what is a very complex process with multiple streams of activity that are dependent upon the type of material or service, dollar value, as well as additional factors.

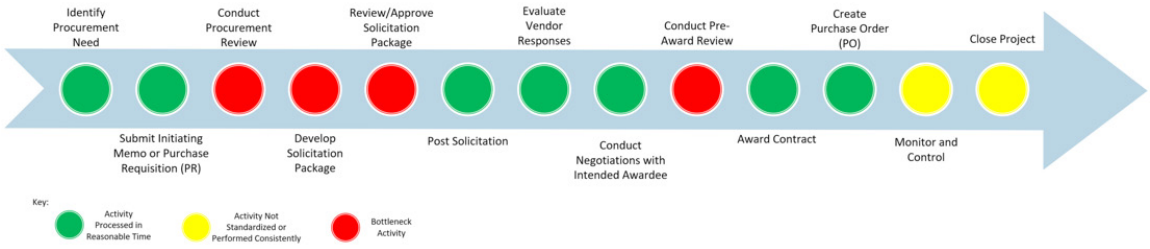


Figure 3-5: Procurement process at NJ Transit

The main purpose of the process flow is to highlight key steps that cause delay throughout the procurement lifecycle, as reflected by the red circles/activities. Several staff noted delays following the submission of a Purchase Requisition (PR) to the Procurement Department for review and development of the solicitation package. Delays are likely the result of several factors, such as an overwhelming number of procurement requests, misalignment between procurement staff conducting the review and the technical nature of certain procurement requests, and the manual processing of such requests. Possibly the greatest delay throughout the procurement lifecycle takes place during the review and approval steps prior to posting a solicitation package. These steps reflect the review and approval from the Division of Law, Office of Business Development, Risk Management, Office of State Comptroller, and NJ Transit Board. Solicitations requiring Board approval require multiple steps, including Board Item Review Committee (BIRC), Executive Director's (ED) Review, Board of Directors Committee Review, Chair Review, Board Meeting Review, and Governor's Review and Veto Period. The Board review alone generally adds at least two to three months of time to the procurement process. A similar review and approval period further delay the process after NJ Transit identifies the two highest scoring bidders prior to awarding a contract.

The process flow also highlights two yellow activities, "Monitor and Control" and "Close Project," that do not seem to be standardized or consistently performed across business units. Staff seem to be unclear as to the specific roles and responsibilities for monitoring performance throughout the execution of a contract. As a result, little to no documentation exists around contract management and vendor performance. Also, not all staff seem to properly close projects upon completion or receipt of goods, which has led to vendors not receiving payments and several outstanding projects remaining open in tracking reports. This prevents NJ Transit from having clear visibility into the actual number of open contracts that need to be further managed.

Processes

NJ Transit relies heavily on manual and paper-based processes to conduct procurement activities. Most activities are focused around managing current and outstanding procurement requests. While tools are being implemented to electronically create Purchase Orders (POs), several review and approval activities are still completed manually. Additionally, tracking and reporting is largely done manually through spreadsheets across different departments, which limits visibility into spend profiles for procurement requests. While OBD routinely conducts audits related to DBE and SBE participation, whether the Procurement Department conducts regular audit activities into the performance and delivery of goods and services is unclear.

The high degree of manual processes has burdened the Procurement Department and Requesting Departments to a point where managing the volume of procurement requests is no longer feasible. Multiple Requesting Departments have several high-priority outstanding requests, some that date back five or more years. Not only does the backlog prevent the processing of current and outdated requests, but anticipating and developing plans for upcoming requests is futile. Additionally, the manual tracking and reporting of procurement data creates low visibility into current statuses, causes discrepancies with planned and actual spending, and adds additional administrative work for staff.

Policy

NJ Transit has formal documentation for policies and procedures, however, the currently released version is outdated. An updated policies and procedures document is in draft form and awaiting release to the organization. NJ Transit has clearly defined delegation of spend activities where delegated departments or individuals must adhere to certain procurement standards. Approval levels are clearly defined, thresholds are generally low for an organization of this size and relative to the size of many procurements.

The current use of an outdated policies and procedures document makes it difficult for staff to know which policies and procedures to follow. This has led to an informal evolution of the policies and procedures and causes staff in different business units to have alternative or unclear perspectives as to which policies are considered current or "official." Low approval thresholds lengthen or slow the overall procurement process for certain goods or services that could leverage a more streamlined process.

Procurement Planning and Forecasting

Procurement planning at NJ Transit is limited. North Highland did not evidence any formal procurement planning process. The Capital Planning organization and several of the engineering organizations create multi-year estimates of planned acquisitions that they provide to the Procurement organization, but none of these plans are necessarily integrated nor are the planned acquisitions managed as a single investment portfolio. In addition, because of the uncertainties in the procurement process as well as funding considerations, staying on track with these estimates has been difficult, resulting in frequent renewed planning efforts.

Procurement Package Development

Development of competitive procurements typically involves several organizations within NJ Transit, as well as organizations external to the agency. The creation of specifications and preparation of a

cost analysis are the first steps in the development of a new procurement package. The responsibility for the specifications and cost analysis should rest with the operating group with the procurement need. This is generally the case in peer organizations and is also best practice. NJ Transit's Procurement staff indicates specification and cost analysis preparation are handled inconsistently across NJ Transit with Procurement staff occasionally having to cobble together specifications themselves using information from previous procurements or their own research. This practice tends to increase procurement package development time and at times also leads to inappropriate or incorrect specifications.

NEW JERSEY TRANSIT CYCLE TIME FOR COMPETITIVE PROCUREMENTS (CAPITAL AND ADMINISTRATIVE) *

Type of Procurement	Avg. Calendar Days to Contract Execution - 2016	Avg. Calendar Days to Contract Execution - 2017
Federal		
IFB	193	279
RFP	656	279
State		
IFB	313	278
RFP	341	342

As reported by New Jersey Transit Procurement organization (7/1/18). No data available for 2018.

Table 3-1: Cycle Time for Competitive Procurements

Once a specification and cost analysis are completed, Procurement includes relevant procurement guidelines and information as well as standard forms, clauses, contract language, etc. The procurement package is then routed to several organizations including Office of Business Development, Risk Management, and the AG for review and comments. For larger procurements (see Procurement Competitive Bid and Approval Thresholds), the package also needs review and approval by the NJ Transit Board of Directors and possibly the Office of State Comptroller (OSC). The Assessment Team was unable to identify any service level agreements / performance criteria that any of these organizations have to govern their review time. Lack of any review time agreements leads to an inconsistent and somewhat open-ended process that is both impossible to quantify and predictable. The general result is that this lengthens the time required to complete a package and advertise a procurement.

The AG review was frequently cited by NJ Transit staff as being an area where procurement packages tend to get delayed. Typical review timeframes are estimated to be a minimum of 30 days. The AG staff reviewing procurement packages are not dedicated to NJ Transit and handle other matters both within and outside of NJ Transit. This differs markedly from most other peer agencies that have in-house legal counsel or, in some cases, dedicated legal counsel focused solely on procurement matters. The lack of dedicated legal counsel appears to contribute to some of the procurement delays. In addition, the AG reviews all procurements regardless of whether the procurement is using standard contract language and procurement clauses, or templates. Peer agencies typically only route procurement packages to their legal counsel when there are deviations from standard contract language or use of non-standard procurement clauses and templates. The impact of needing to route all NJ Transit procurements to the AG is contributing to the lengthy review time and procurement delays.

Procurement Competitive Bid and Approval Thresholds

Currently, NJ Transit requires competitive bidding for goods and services acquisitions that are expected to exceed $40,000 and construction contracts expected to exceed $65,000. Given the size of NJ Transit, the number of procurements NJ Transit releases, and the scope and size of many of the procurements, these thresholds for competitive bids are low and, in part, contribute to the procurement delays and backlogs reported by NJ Transit staff.

In addition, procurements (contracts or purchase orders) of $250,000 or more using competitive procurement policies other than competitive bidding require NJ Transit Board of Directors approval, as do competitively bid procurements of $1,000,000 or more. Although the $1,000,000 threshold is consistent with and in some cases higher than the threshold used in peer transit agencies, the $250,000 threshold is on the low side and results in additional procurements needing to go before the Board. Getting on the Board's calendar has been described as "difficult" and the preparation required leading up to the Board meeting where a specific procurement is scheduled for review is extensive, requiring significant time on the part of staff in multiple departments. The Board approval cycle typically adds two to three months to most procurements. Also, procurements expected to exceed $10,000,000 require the approved of the Office of the State Comptroller.

PROCUREMENT TYPE	PERFORMANCE	PROCURMENT VALUE
Competitive Bidding	🔴	Goods and Service acquisitions >$40,000
	🔴	Construction contracts >$65,000
Competitive Bidding with Board approval	🔴	Procurements (contracts or purchase orders) >$250,000 or more which are using competitive procurement policies
	🟢	Competitively bid procurements of $1,000,000 or more
Competitive Bidding with approval from the Board and Office of the State Comptroller	🟢	Procurements which are expected to exceed $10,000,000

🔴 *Ineffective* 🟢 *Effective*

Table 3-2: Types of Procurement

Purchase Requisitions and Purchase Orders

Purchase Requisitions and Purchase Orders are handled through the Oracle system, deployed in October 2017. Payment issues are a concern. The Oracle system matches invoices received from vendors with receipt of the materials/parts and issues a check when the two match. Multiple groups report that even when a match occurs and the invoice is included in the record in Oracle, vendors are not receiving payment. One group reported they are spending three (3) hours/day chasing down and attempting to

> Numerous vendors who have not received payments have placed NJ Transit on "credit hold" and refused to deliver any additional materials/parts until outstanding invoices have been paid.

resolve unpaid vendor invoices. In many cases, awareness of the non-payments was only apparent when the vendor called NJ Transit to inquire about the status of payment. Numerous vendors that have not received payments have placed NJ Transit on "credit hold" and refuse to deliver any additional materials/parts until outstanding invoices are paid. The impact of this circumstance is that necessary materials/parts for maintenance of rail cars and buses are unavailable, resulting in maintenance deferrals. In addition, the non-payments are damaging relationships with key NJ Transit vendors.

Vendors

Although NJ Transit actively maintains a pre-approved vendor and sole-source vendor list, most vendor management activities are informal or take place on an ad-hoc basis. Generally, end users or requesting departments are responsible for tracking vendor performance, however, the metrics being tracked outside of late deliveries is unclear. DBE/SBE vendors are categorized according to OBD (via the NJ Selective Assistance Vendor Information – SAVI – website for available SBE vendors and the NJ Unified Certification Program – NJUCP – for available DBE vendors). However, whether additional vendor categorization is maintained (outside of obvious instances, such as rail car manufacturers) remains a question.

Again, vendor management issues are a lower priority compared to other areas, but the combination of additional metrics, categorization, and qualifications allow for a more streamlined procurement process.

Cooperative Purchasing and Shared Service Contracts

Part of the Supplier and Contract Management review assessed the use of shared service contracts and cooperative purchasing opportunities. There is an inconsistent understanding among stakeholders as to what constitutes cooperative purchasing. For the purposes of the assessment, North Highland viewed cooperative purchasing to be any contract vehicles that allow NJ Transit to partner with other agencies or businesses to combine purchasing requests in an effort to obtain lower prices from selected suppliers.

Historically, NJ Transit was able to leverage various contracting vehicles for the purchasing of goods and services including, for example, GSA schedules, other State contracts, National Joint Powers Alliance, National Association of Procurement Officials, Port Authority of New York and New Jersey, and NJ Turnpike contracts. However, the Attorney General's office has since provided guidance that limits the use of external (to NJ Transit) contract vehicles to only NJ State contracts and GSA Schedules 70 and 84. The use of other forms of contracts is no longer permitted. Guidance to the Procurement Department and supporting business units regarding the current use of contract vehicles may not be clear as several stakeholders seem to be under the impression that the use of all GSA schedules was no longer permitted.

NJ Transit was able to provide a report containing a list of all cooperative purchases (i.e., any contracts that were not solely NJ Transit procurements) from 2014. Analysis of the report shows that only a small percentage of procurements used contracts outside of NJ Transit, NJ State, and GSA Schedule 70 and 84 contracts. Although NJ Transit only used a small percentage of contracts over the past four years that are no longer available, the use and option for additional contract vehicles helps relieve the burden of additional procurements requests.

Insight was also gained during peer agency interviews around the use of shared services and cooperative purchasing. Current feedback suggests a common practice for other transportation agencies to leverage these types of contract vehicles. However, the use of these contracts is usually limited to specific purchasing needs. Peer agencies noted that oftentimes the organization is large enough to gain economies of scale by individually purchasing most items. Nevertheless, the peer agencies agreed that having the authority to use shared services and cooperative purchasing contracts provided value and helped streamline the procurement process for certain goods and services.

3.4.3. TECHNOLOGY AND DATA

One of the biggest challenges faced by NJ Transit and the Procurement Department is the lack of data and ability to quickly and efficiently gather basic information related to the procurement function. This shortcoming was most evident through delays or an inability of NJ Transit to provide the North Highland Team with requested data to support in our Procurement Assessment. Certain reports or metrics, such as the list below, should be readily available and integrated in normal oversight activities to help drive performance.

- Procurement dollars spent by product or service
- Breakout of dollars spent with each vendor
- Average contract turn-around time
- General vendor performance information
- Defects or returns of parts by vendor (to assess quality of product delivered)
- On-time deliveries by vendor
- Contract compliance

Requested data took as long as several weeks to be received. Some of the data was incomplete or unreliable, which prevented the North Highland Team from producing meaningful analytics into the current-state performance of the Procurement Department. For instance, certain reports provided suggested that 35 to 40 contracts are awarded per year. However, feedback received during interviews suggested the number of contracts awarded per year was closer to 60 to 100. These situations raise concerns about the validity of the data provided.

Many of the challenges stated above result from continued manual and paper-based processes, a lack of an integrated system environment, and no stated expectations surrounding key metrics that should be tracked throughout the procurement lifecycle. North Highland data requests handled by the Procurement Department often required identifying who in the organization could provide the requested information. Those individual resources manually compiled information from multiple sources (e.g., Excel or Access sheets) to generate a report or findings that provide the best attempt to fulfill the information request.

Interviews disclosed that various business units use personal discretion around the data being tracked as well as the format used to track such data. Additionally, Excel and Access files appear to be updated by multiple individuals, creating multiple versions of the same file. Again, this creates an environment where NJ Transit has no single source of truth for its data, which greatly reduces the overall reliability into the agency's available information. Without better visibility into key data and metrics, and supporting technology to track such information, NJ Transit is unable to identify areas that are in the greatest need of improvement, as well as define actionable plans to make corrections.

Tools and Systems

Procurement and supporting departments are in the process of developing and using various system tools to support the overall procurement process. Oracle was implemented in October 2017 to support the electronic creation of purchase requisitions (PR) and purchase orders (PO). Bid Express and Bid X are being used to support eRFx submissions and vendor portal capabilities. Also, B2GNow is used to support DBE/SBE reporting and tracking. Although these systems have been put into place, most are used with limited functionality and, collectively, operate in a siloed system environment. Even with the use of these systems, the end-to-end procure-to-pay process requires several manual review and approval steps.

The Oracle implementation resulted in steep learning curves and possible configuration, workflow, and data conversion errors. The transition to Oracle has been extremely difficult for NJ Transit. Initial problems related to requisitions and purchase orders seem to have been corrected, although most operations staff feel the situation has not improved. Aside from continued support from an external consultant for the Inventory module, most other staff are forced to manage issues internally. Identifying where errors exist, why they exist, and how to resolve them is a very time consuming and labor-intensive activity for staff. Staff cite the difficulty or lack of knowledge as to how to produce reports from Oracle particularly troublesome. Additionally, workflow and notification capabilities were not setup properly forcing staff to manually check the status of PR and PO requests. Staff shared that they had spent significant time outside of the provided training to get up to speed on the system and its capabilities.

A major challenge for the entire organization is the lack of a central document management solution. Most files, templates, and tracking spreadsheets are maintained within local drives or shared with select groups. This shortcoming has created significant challenges with version control and collaboration across business units.

NJ Transit has made progress with moving away from entirely manual-based processes, however, more can be done to leverage system capabilities to automate procurement processes. Also, developing interfaces across each of the systems will help with process automation as well.

Value/Key Performance Indicators (KPIs)

Due to continued manual tracking and reporting, visibility and data accuracy are limited with respect to key Value measurement elements, such as:

- Number of contract disputes
- Contract risk level
- Contract turnaround time
- Cost Avoidance / Cost Savings
- RFx Turnaround Time (estimates have been provided of 450+ days for the full procurement cycle)

Supplier and Contract Management

Some of the biggest challenges with NJ Transit's supplier base is the lack of data, tools, and assigned roles to effectively execute a supplier relationship management strategy. NJ Transit does have a pre-approved vendor list of roughly 190 vendors as well as a list of roughly 171 sole-sourced vendors. However, little data exists for these vendors and the contracts to which they are assigned. This is, in part, due to an absence of a comprehensive contract management system (although the Procurement Department may be in the process of acquiring one). Without the ability to track supplier performance, NJ Transit has no understanding of which suppliers in each category are reliable. Individual staff members may possess this knowledge, but it's important for NJ Transit to capture this information to facilitate with knowledge transfer as staff move in and out of the organization. Additionally, more sophisticated tracking mechanisms provide information on suppliers that could be used for implementing corrective action, building stronger long-term relationships with key suppliers, reassessing vendor value propositions, cutting costs, alleviating risks, and driving continuous improvement.

TYPE OF VENDORS	NUMBER OF VENDORS
Pre-approved Vendors	190
Sole-sourced Vendors	171

Table 3-3: Types of Vendors

Performance management and analytics used for suppliers/vendors including Service Level Agreements (SLAs), dashboards and monitoring metrics

NJ Transit does not currently have methods to track and report against performance management for suppliers and vendors, including SLAs or other performance metrics (e.g., on-time delivery, quality of performance, etc.). Insight gained during interviews suggests that any performance management or tracking is informally conducted by end users or requesting departments. However, the nature of information, if any, captured or documented is unclear. The intention is for the new Contract Administration branch being established under the Procurement Department to be responsible for performance and contract management. Additionally, an expectation is that NJ Transit plans to procure a contract management solution or module to support tracking performance management metrics.

Historically, NJ Transit has not performed any monitoring and reporting activities around performance management, contract management, on-time delivery, quality of performance, compliance with SLAs, etc. Without this data, NJ Transit is unable to establish direction into vendor and contract management improvement initiatives as well as control and mitigate risk.

Being deliberate about the specific metrics that should be tracked and used to define success in performance management is critical for NJ Transit. The use of measurable goals and strategies will assist in driving success for these outcomes.

Management and delivery of complex projects and programs and ongoing performance

No evidence was found for formal tools and templates being used to manage the delivery of complex projects, programs, and ongoing performance. Staff responsible for the management of capital program projects described the use of spreadsheets to manually track status updates and action items. Updates are requested from individual Project Managers that subsequently get incorporated into the "master" spreadsheet. Other business units may use different variations of tracking spreadsheets, but the processes to manage and track the delivery of projects are largely manual.

The use of manual processes to track and manage project delivery continues to highlight similar challenges discussed previously. The combination of manual spreadsheets and no central document management solution make it challenging for version control, cross-organizational collaboration, and the use of standardized best practices.

3.5. OPPORTUNITIES FOR IMPROVEMENT

The following sections provide recommendations associated with the findings discovered during the primary and secondary research, best practices, stakeholder interviews, peer benchmarking and evaluation of the existing procurement function. The recommendations have been categorized into following - 1) People and Culture, 2) Processes and Capabilities, and 3) Technology and Data.

3.5.1. OPPORTUNITIES TO IMPROVE PERFORMANCE THROUGH PEOPLE AND CULTURE

Recommendation: Prioritize the formal development of Vision, Mission, and Strategy objectives across the procurement lifecycle.

- The Procurement Department is in the process of developing a new Vision statement. Members across the Procurement Department are being included in the development of the statement to support as a team building activity. Including operations personnel in this activity would provide Procurement with a holistic perspective about the department's position within the organization and the interrelationships with other business units.
- Developing a Procurement Process Vision Map as a part of the Vision statement would be valuable. This deliverable works similarly to a work breakdown structure by providing a hierarchal decomposition of the total scope for the procurement department. At the highest level, the vision and mission statements illustrate the future NJ Transit can "see" (vision) and what the organization does well every day (mission). From there, the Vision Map continues to drill-down into more specific values, strategic initiatives, and ideas to support the overall objective of the Procurement Department. The Vision Map ultimately breaks down to specific measures of success. An important aspect of the Vision Map is that all lower level activities rollup to a unified vision for the Procurement Department. This creates consistency, alignment, and measurement for agreed upon objectives within the organization. A sample Procurement Process Map has been provided in ***Figure 3-6*** to illustrate this concept.

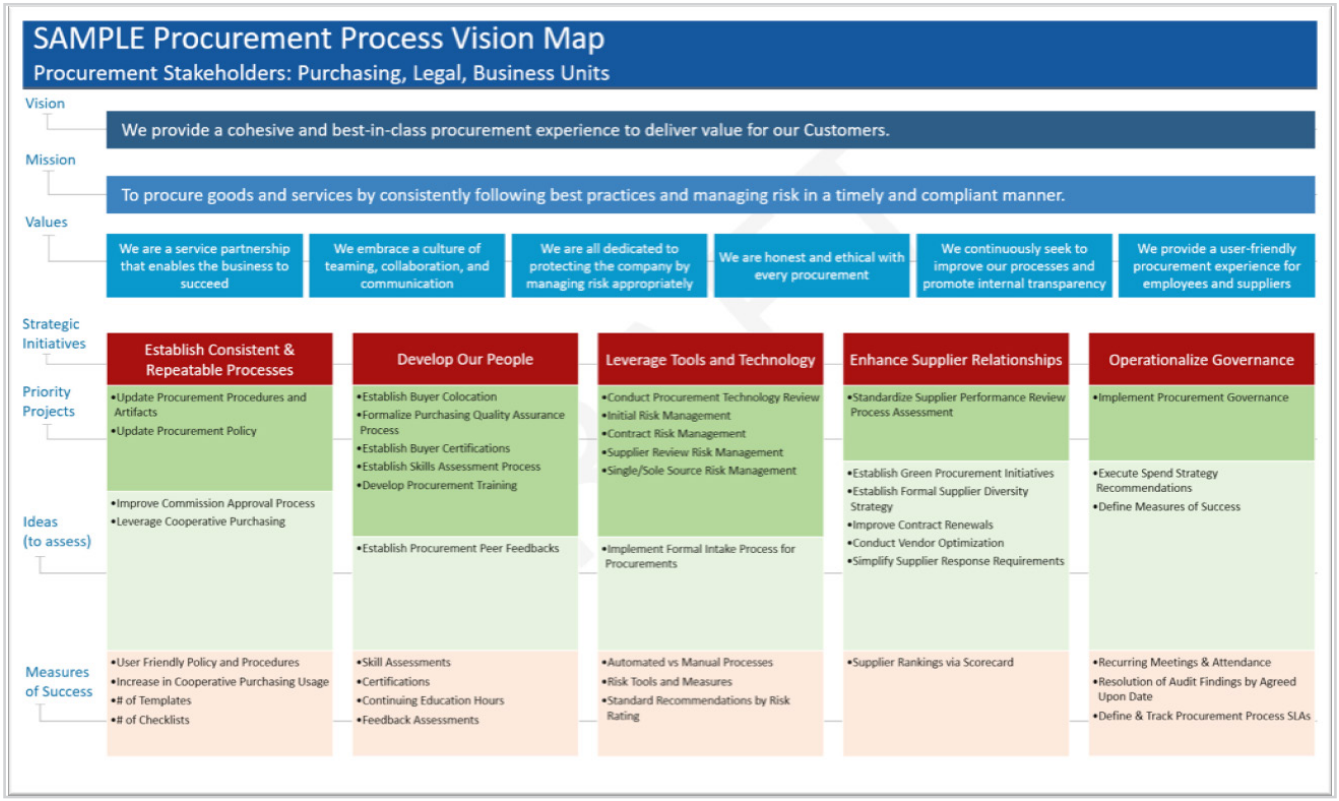


Figure 3-6: Sample Procurement Process Map

Recommendation: Establish a Governance team responsible for setting roles, responsibilities, and accountability across all departments and business units and to serve as a resource to make determinations on accountability when gaps in processes exist.

- A Governance team includes representation from senior level resources from across the organization. Business units outside of just procurement are important to include for building a common understanding and establishing agreement across the end-to-end procurement lifecycle. A best practice is to limit participation to those who have decision-making authority over their respective business units. Suggested participants are: Chief of Procurement, Director of Purchasing (Commodities), Director of Purchasing & Materials Management, Director of Contracts, Director of Construction Management & Related Services, Chief of Civil Rights & Diversity Programs, Chief of Compliance, and a representative from each of the following: Procurement Systems & Support, Capital Planning and Programs, Rail Operations/Maintenance, Bus Operations/Maintenance, and Light Rail. These individuals would be responsible for communicating key decisions to their direct reports, who in turn distribute messages to the relevant staff within each business area.
- The Governance team is most effective when it prioritizes the areas of greatest need and importance, and meets monthly on an ongoing basis to make decisions on next steps and monitors progress.

Recommendation: Modernize the organizational structure and role assignments within the Procurement Department and supporting business units.

- The Procurement Department is currently in the process of redesigning its organizational structure, with a focus on reporting lines. Including the creation of role profiles and key skills required to be successful in each role serves to enhance the final product. North Highland has had success implementing new procurement role structures by using a mix of Professional Procurement skills and general Business Skills as shown in ***Figure 3-7***.

Procurement Skills	
Technical Skills	Commercial Acumen
	Analysis & Reporting
Pre Contract Award	Strategic Sourcing Management
	Procurement Project Management
	Negotiation
	Contract Development
Post Contract Award	Contract Management
	Managing Supplier Relationships
	Category Management

Business Skills
Business Leadership
Managing Ambiguity
Setting Direction
Communicating & Influencing
Innovation & Change
Commercial Awareness
Resource Management

Figure 3-7: Procurement and Business Skills

- Procurement skills are required specifically for the procurement roles and can be transferable across other roles within Procurement or to other Procurement functions. Business Skills are not specific to Procurement and are easily transferable to roles outside of Procurement. The use of Procurement Skills and Business skills allows NJ Transit to create role profiles that show the mix of skills needed to be successful in the role and level at which a resource should be operating. More senior and specialized roles require higher level of skills. General descriptions can be used to show the activities expected to be performed at various skill levels, as shown in ***Figure 3-8***.

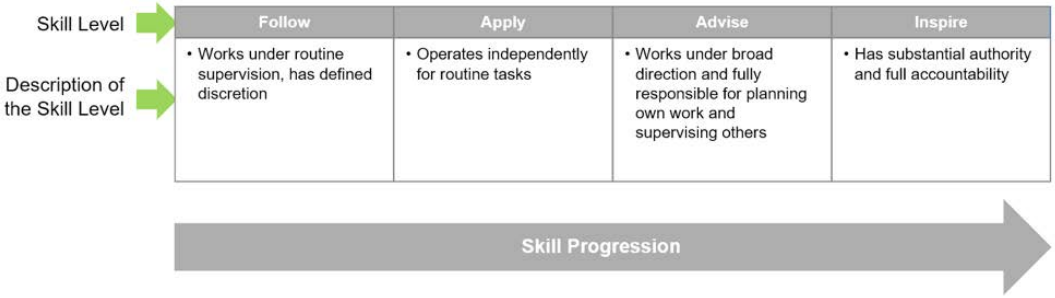


Figure 3-8: Skill Progression Chart

- The image in ***Figure 3-9*** provides an example of a complete role profile for a Business Leadership role.

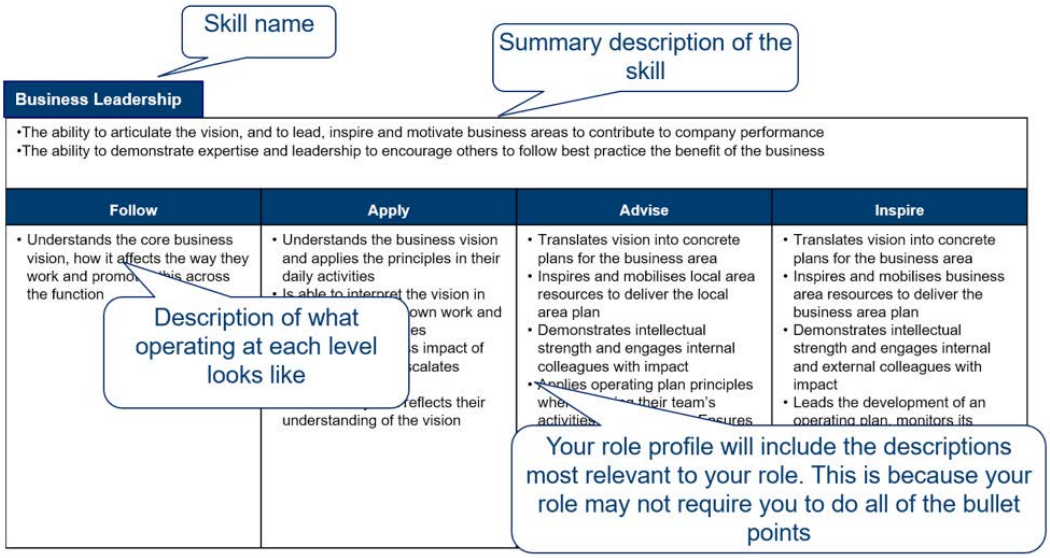


Figure 3-9: Role Profile for Business Leadership Role

Other issues discovered during the assessment period were challenges associated with specialized procurement requests made from Rail and Bus operating units. Some procurement requests require advanced, technical specifications. Generally, there is no procedure for directing those requests to specific individuals within the Procurement Department. Requests are typically handled by resources based on availability. A more viable approach is for NJ Transit to align procurement resources with specific types of requests to improve efficiency, capability, and collaboration from requesting departments.

3.5.2. PROCESS AND CAPABILITIES OPPORTUNITIES FOR IMPROVEMENT

Recommendation: Explore expanded opportunities for cooperative purchasing, temporarily outsourcing areas of procurement, and communicate expectations to entire organization.

- NJ Transit could further explore options to increase the use of cooperative purchasing contract vehicles. This has the potential for providing relief from the current AG guidance, even if only temporarily, to reduce the backlog of procurements. The option allows NJ Transit to gain more control over the vast number of outstanding, high-priority procurement requests. As NJ Transit improves its leverage over outstanding requests, the organization can begin to plan, develop, and implement steps to transition to a future state and build proficiency in other areas of the business.
- To facilitate an increased use in cooperative purchasing contracts, NJ Transit should categorize specific products and services that can best leverage cooperative purchasing vehicles. Also, NJ Transit should perform a review of state and local contracts to identify contracts currently available for use.
- Developing formal communications and outreach to Purchasing and requesting departments around the accepted use of cooperative purchasing is beneficial to NJ Transit. A key finding suggests that employees generally have confusion or a conflicting understanding for the current accepted use of cooperative purchasing. Several stakeholders have indicated that NJ Transit is no longer able to use any cooperative or GSA purchasing vehicles, which is not accurate as schedule 70 and 84 contracts are still permitted.

Recommendation: Conduct a detailed review of the potential of a Vendor Managed Inventory (VMI) solution.

- NJDOT is currently exploring a VMI solution in support of its vehicle fleets, which has direct applicability for NJ Transit. Managing inventory to provide 100 percent support for operations and maintenance while maintaining inventories at efficient and fiscally sound levels is a significant and delicate task. Achieving this level of inventory control requires a constant monitoring of inventory levels combined with a carefully analyzed inventory level that considers actual usage of the materials, scheduled usage of the materials, and lead time to replace the materials.
- Since the private firms offering VMI represent several transit agencies, their buying power is significantly increased through volume. Subsequently, cost for materials is often less than the individual transit agency's currently experience. Many of these private firms have both national and international participation further increasing their buying power.
- This comprehensive management approach is currently absent from NJ Transit's inventory operation due to many reasons including manpower levels. VMI provides NJ Transit's Procurement Department relief from a substantial number of recurring smaller procurements and allows the organization to focus on large capital projects as well as support of non-operational requisitions. VMI also provides a cash inflow from transfer of inventory (both active and obsolete) and NJ Transit would benefit from contractor disposal of obsolete, damaged, and/or unusable inventory as well as environmentally sensitive materials (e.g. batteries and used oil).

Recommendation: As part of the current effort to revise the Procurement Manual and Policy and Procedure documents, NJ Transit could perform a more comprehensive design effort.

- NJ Transit/Procurement is in the process of updating its Procurement Manual and Policy and Procedure documents, and additional activities can be performed around these areas to support the development, improvement, and delivery of policies and procedures. One such way that North Highland has had success in this area with procurement departments in other organizations is through a Procurement Procedure and Artifact initiative. This type of effort starts by outlining a conceptual sourcing framework. The Figure *3-10* provides an example sourcing framework structure:

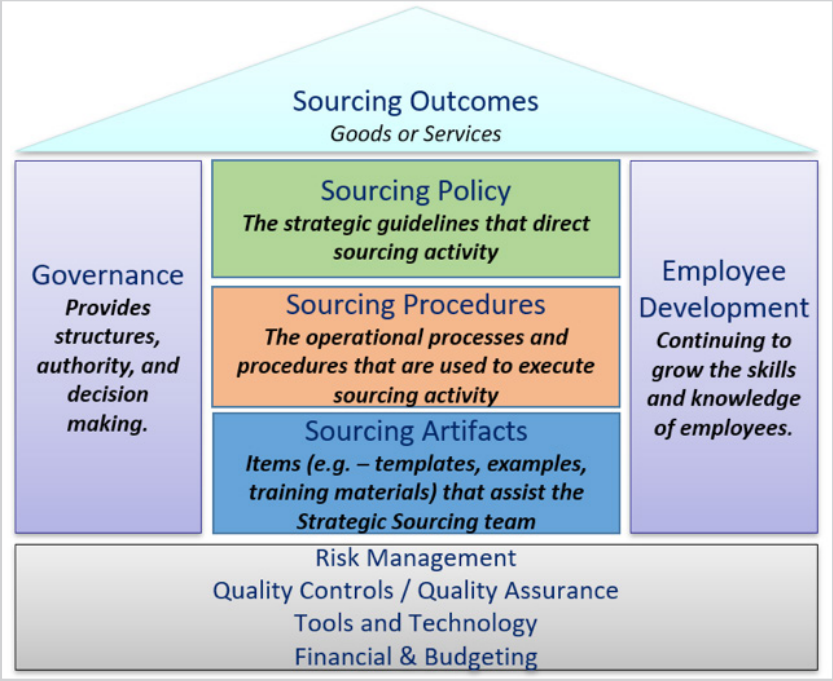
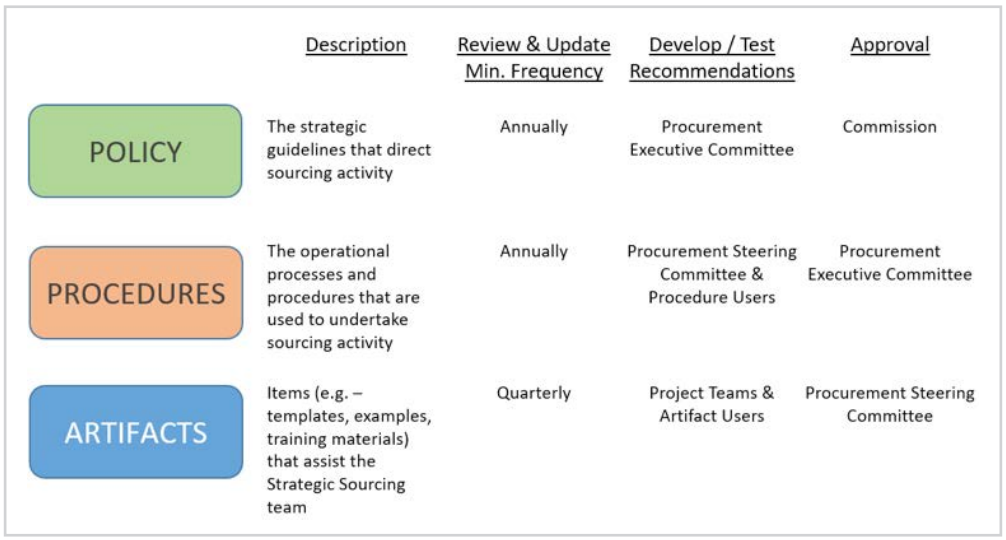


Figure 3-10: Sourcing Framework

- The framework provides a useful visual to show how key procurement components fit together. The framework above incorporates several of the key areas within NJ Transit Procurement where current gaps and challenges exist, such as Governance, Risk Management, Quality Assurance, Tools and Technology, Employee Development, etc. A key benefit to the sourcing framework is that it provides a structured and guided approach to designing policies, procedures, and artifacts that serve to align and incorporate other procurement components needed for targeted sourcing outcomes. The policy, procedure, and artifact areas can be further defined to specify the frequency of updates, the stakeholders that should be involved in developing and testing recommendations, and the approval levels needed for changes as shown in ***Figure 3-11***.



	Description	Review & Update Min. Frequency	Develop / Test Recommendations	Approval
POLICY	The strategic guidelines that direct sourcing activity	Annually	Procurement Executive Committee	Commission
PROCEDURES	The operational processes and procedures that are used to undertake sourcing activity	Annually	Procurement Steering Committee & Procedure Users	Procurement Executive Committee
ARTIFACTS	Items (e.g. – templates, examples, training materials) that assist the Strategic Sourcing team	Quarterly	Project Teams & Artifact Users	Procurement Steering Committee

Figure 3-11: Sourcing Framework Defined

- The framework is designed to provide a continual method to drill down into further levels of detail in ***Figure 3-12***, so that NJ Transit can build comprehensive and cohesive policies, procedures, and artifacts to support in the procurement lifecycle.

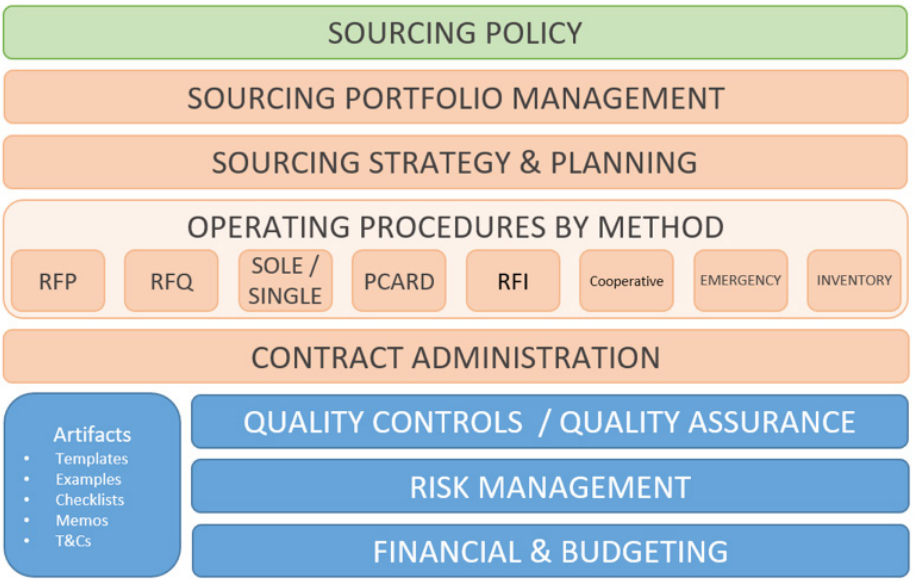


Figure 3-12: Sourcing Framework Detailed

- The next step is for NJ Transit to map its current procedures as they take place throughout the complete procurement lifecycle (i.e., Need Identification/Strategic Planning, Requirements Gathering and Planning, Solicitation Development, Selection/Negotiation, Contract Award, and Ongoing Contract Management). Analysis can be used to identify ways to simplify procedures under a new design subsequently incorporated into formal Policies and Procedure documents. When done successfully, NJ Transit can expect to realize the following outcomes detailed in *Table 3-4*.

SUCCESS	BENEFIT	METRICS
Clear, logical, and complete Procurement Procedures	• Simplified Training / Onboarding • Clear QC / Auditability • Ease of use and maintenance • Minimized process iterations • Reduced single / sole source requests	• "Temperature Check" / "Pulse Survey" with business customers • # of Bounces • Cycle Time • QC/Audit Findings
Effective and consistent suite of templates with embedded quality controls	• Simplified Training / Onboarding • Clear QC / Auditability • Ease of use and maintenance • Minimized process iterations	• "Temperature Check" / "Pulse Survey" with business customers • # of Bounces • Cycle Time • QC/Audit Findings
Agreed criteria for AG Review of RFPs	• Appropriate use and focus of resources • Clearly defined expectations • Reduce backlog of work for legal team	• Cycle Time • *Legal Team "work tracker"*
Path Forward (incl. roll-out planning and planned next steps/enhancements)	• Path to continuous improvement • Increased probability of successful implementation and adoption • Maintainability	• Adherence to Roadmap Milestones

Table 3-4: Sourcing Outcomes

Recommendation: Explore opportunities to streamline and improve legal review for procurement requests.

- As presented in the Organizational Structure Chapter, North Highland is recommending the position of in-house legal counsel, in part for approving procurement requests. Having in-house counsel is a best practice that has been employed at peer agencies around the country, providing NJ Transit better control and visibility into the review process. Alternatively, better alignment within the AG, allowing for specific resources assigned to review NJ Transit procurement requests represents another option for NJ Transit consideration. Currently, AG staff reviewing procurement packages are not dedicated and handle other requests both within and outside of NJ Transit. Better resource alignment is likely to produce a more streamlined and efficient review period. Lastly, NJ Transit could work to establish preapproved contract language, clauses, and procurement templates that do not require AG review, unless deviations exist. This is another best practice being used at peer agencies that limits the need for legal review for standard or common purchasing requests.

Recommendation: Map current state processes for end-to-end procurement lifecycle, identify gaps, and develop a desired future state.

- By defining the major phases that take place within the procurement function and identifying the critical processes that take place within each phase, NJ Transit gains better visibility into the full scope of procurement. ***Figure 3-13*** illustrates a typical breakout of the procurement lifecycle and supporting processes.

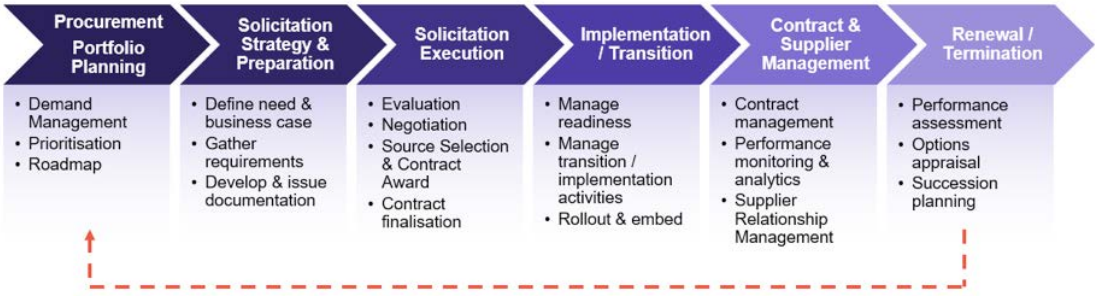


Figure 3-13: Procurement Lifecycle

- With this view, NJ Transit can begin to build connections with other stakeholder groups (i.e. customers and suppliers) involved throughout the procurement lifecycle and align phases with the procurement function, as illustrated by ***Figure 3-14***.

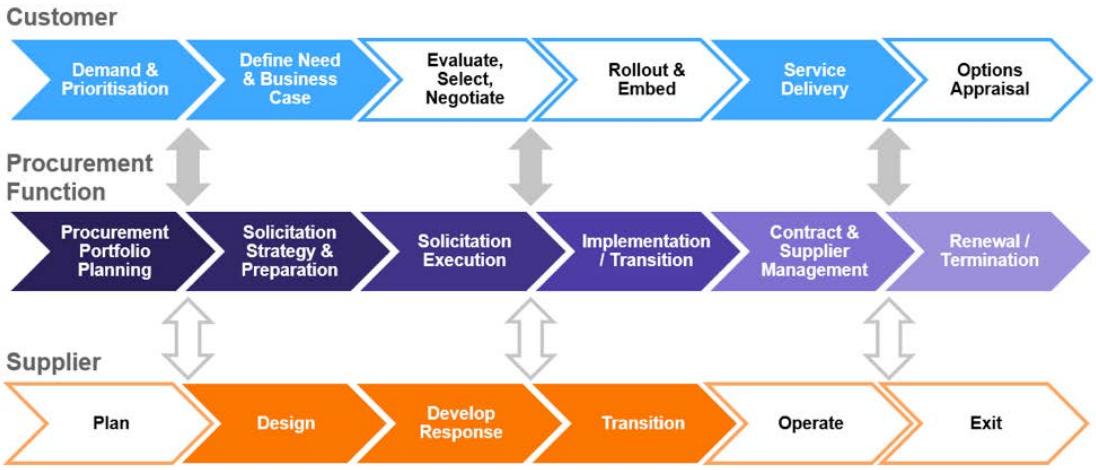


Figure 3-14: Procurement Function Phases

- These high-level process deliverables provide NJ Transit with simple, easily digestible illustrations of the procurement lifecycle. Although the figures above are only examples, the exact language and terminology can be adjusted to establish clear and consistent lifecycle phases that can be communicated across the organization.
- NJ Transit has the option to perform deeper process analysis by developing activity level process models that assign clear steps to individual stakeholders, further strengthening accountability to individual groups and roles. This type of analysis is best achieved when all relevant stakeholder groups participate, so that input is provided from all involved parties and a shared understanding is developed around the needs and expectations from each role/business unit. Although process modeling efforts require time and participation from multiple groups, these efforts are highly effective and efficient in uncovering gaps and disagreement in process steps.

3.5.3. OPPORTUNITIES FOR IMPROVEMENT USING TECHNOLOGY AND DATA

Recommendation: Prioritize the selection, implementation, and use of a central document management solution.

- One of the biggest challenges plaguing the procurement lifecycle is the continued reliance on manual, paper-based processes and tracking. A central document management solution would provide NJ Transit with support necessary to improve document storage and retrieval efficiency, increase collaboration across business units, better manage and control templates, and leverage electronic workflow and approval capabilities. The implementation effort for document management solutions tend to be less burdensome than more comprehensive solutions (i.e. Oracle). This could provide NJ Transit with a shorter-term approach to improve procurement document organization as well as provide access to Operation end users (where appropriate), while NJ Transit works to select a fully-comprehensive procurement system.
- Aside from operational improvements, a document management solution also offers NJ Transit an accessible knowledge base that could be used to support with the onboarding and offboarding of staff. One of the biggest challenges for organizations that have staff with 20+ years of tenure is the loss of institutional knowledge when those individuals leave. With files stored in an electronic, central location, NJ Transit retains permanent records of past work and data. Additionally, NJ Transit would likely realize substantial cost savings in the long run by reducing the need for paper, ink, printers, etc. Lastly, moving toward a paperless environment demonstrates that NJ Transit is committed to sustainable business practices.

Recommendation: Review and assess the current status of the Oracle materials management system to identify what is working and what needs improvement, considering any additional functionality that may be available but not yet implemented.

- North Highland recommends a comprehensive review of the system, associated processes, and end user training and use of the system to pinpoint the root causes of the ongoing difficulties.
- Review of the methodology used to determine minimum and maximum quantities for ordering materials and the implementation of this methodology in the Oracle system. NJ Transit needs to understand where the inventory management process is breaking down whether it be inaccurate data on actual spare parts usage, misapplication of the min/max inventory calculation, errors in the implementation of the min/max calculation within Oracle, delays in the purchase order process when minimum inventory is triggered, failure of users and/or the system to properly update when parts are taken from inventory, or something else. Without understanding the underlying issue(s) surrounding the high level of stock outs, it is difficult to affect an appropriate fix.
- Review of the materials invoice payment process. Given that multiple vendors have put NJ Transit on "credit hold" and are refusing to ship materials until NJ Transit's balance is paid, an imperative is to understand and correct any flaws or delays in the materials invoice payment process. North Highland recommends a review of the process from receipt of invoice to vendor payment including identification of criteria used by the Oracle system to match invoices to receipt of materials, notifications/alerts of unmatched invoices, handling of unmatched invoices by operations and/or accounting staff, system configured or manual time delays included in the process (e.g., pay invoices no sooner than 25 days after receipt), and the automated and manual steps involved in actually making payment to a vendor (cutting a check, ACH deposit, etc.). Concurrently with the payment process review, North Highland suggests an organized, cross-functional initiative to focus immediate attention on resolving overdue vendor payments, particularly for key vendors who supply materials critical for rail and bus maintenance needs and who have placed NJ Transit on "credit hold". Swift resolution of these overdue payments will go a long way toward having NJ Transit removed from "credit holds" and re-storing the flow of materials. The longer-term payment process review and addressing of issues found during the review provides a solid foundation for helping to ensure invoices are paid timely and minimizes future "credit holds".

- Review of reports available in Oracle and alignment with end user reporting needs. Users across NJ Transit noted that generating reports from Oracle is difficult and many users are not aware of what reports are available and how to produce those reports. The North Highland Team was unable to identify a list or description of reports available to end users and recommend NJ Transit undertake a cataloging of existing reports configured in the system with brief descriptions of each to provide users more information on what reports are available. In addition, also recommended is holding discussions with a cross-section of operational end users to identify specific data that would aide them in their jobs and to determine if reports exist to provide that information. If no such report exists, development and implementation of such reports, or augmentation of existing reports, should be considered.

Recommendation: Invest in a robust Procurement System.

- Procurement Systems are critical in helping organizations—especially those with a high volume of procurements and a large number of vendors—manage their processes efficiently and effectively. With the exception of the Oracle materials inventory and management system, NJ Transit's Procurement Department has operated in a manual fashion aided by user-created spreadsheets and Access databases, but without any integrated procurement system. NJ Transit needs to invest in a procurement management system able to provide an integrated procurement environment accessible across NJ Transit.

Recommendation: Develop standardized spreadsheets and tracking mechanisms that can be used in the interim until more sophisticated solution technologies are implemented.

- While most of the Technology and Data recommendations above focus on enhancing system capabilities, NJ Transit also needs to make short-term steps to improve its access to data and visibility into key performance metrics. The first steps to accomplishing this is for NJ Transit to define the metrics that should be tracked and identify the various data sources needed to produce the metrics. Once this is accomplished, NJ Transit can begin to develop standardized spreadsheets, processes, and tracking mechanisms for use across the Procurement Department and supporting business units. Currently, most staff and teams use informal, ad-hoc reporting procedures and have developed personalized spreadsheets to track information. Also unclear is how data is being maintained across the organization, as well as where individuals pull data to populate their reports. Standardization is an important aspect to improving access to and reliability of information.
- Some business units, such as the Capital Projects group, appear to use more sophisticated tracking and reporting processes and tools (i.e. spreadsheets). A review of the various tools being used across business units is recommended as a means of identifying best practices that could be used to facilitate in the standardization of tools across NJ Transit. Important aspects to identify across higher performing business units are formats being used for tracking tools, processes used to update and manage reports, and sources of data being used to pull information. Using feedback from multiple stakeholder groups allows NJ Transit to deploy standard tools and reports that best meet the needs of the entire organization.
- Once standard tools are created, NJ Transit needs to establish roles and responsibilities for maintaining data and updating reports. Given that these responsibilities likely extend beyond just the Procurement Department, the Governance team (recommendation above) needs to be deliberate in outlining expectations and accountability. If done successfully, the use of standardized tools and tracking procedures will provide NJ Transit with the quickest, most viable option to understand current state challenges and gaps throughout the procurement lifecycle. Manual processes will likely still exist until more comprehensive software solutions can be implemented. However, the use of standard reports and processes hold promise for greatly reducing the time to gather information while also increasing the overall reliability of the data being used.

3.6. RECOMMENDED NEXT STEPS

Table 3-5 presents a summary of the recommendations listed above, in order of prioritization.

Focus / Sub Task	Recommendation	Priority	Level of Effort	Value Delivered	Key Success Factors
Process and Capabilities	Explore expanded opportunities for cooperative purchasing, temporarily outsourcing areas of procurement.	High	Medium	High	▪ Categorize specific products and services that can best leverage cooperative purchasing ▪ Review of State and local contracts ▪ Develop formal communications and outreach
People and Culture	Prioritize the formal development of Vision, Mission, and Strategy objectives	High	Medium	High	▪ Measurable strategic objectives and goals that roll-up to a unified Vision and Mission Statement ▪ Ability for staff to clearly articulate NJ Transit and Procurement Vision and Mission ▪ Measurable goals aligned to specific roles or business units
Technology and Data Performance	Develop standardized spreadsheets and tracking mechanisms	High	Medium	Medium	▪ Define metrics that should be tracked ▪ Develop spreadsheets, processes and tracking mechanisms
People and Culture	Establish a Governance team	High	Medium	High	▪ Participation in governance team from decision-making resources ▪ Adherence to an agreed upon meeting schedule ▪ Targeted objectives and a defined path for improvement
Process and Capabilities	Perform Policy and Procedure Redesign	Medium	High	High	▪ Development of sourcing framework ▪ Easily digestible artifacts to reflect key policies and procedures ▪ Simplified procedures aligned with procurement lifecycle ▪ Defined path for continuous improvement
Technology and Data Performance	Implement Central Document Management Solution	Medium	Medium	High	▪ Development of folder hierarchy and standardized file naming conventions ▪ Establishment of storage procedures and guidelines, permission management, and workflows ▪ Reduction in the use of hard copies/printed documents
Technology and Data Performance	Review and asses the current status of Oracle materials management system	Medium	Medium	High	▪ Review of the methodology used to determine minimum and maximum quantities for ordering materials Deployment of system training materials specific to role assignments ▪ Review of the materials invoice payment process ▪ Review of reports available in Oracle and alignment with end user reporting needs
Process and Capabilities	Conduct Current State and Future State Process Analysis	Medium	Medium	High	▪ Identification of major process areas across procurement lifecycle ▪ Engagement with stakeholder groups outside of Procurement who are involved in processes ▪ Documentation of gaps and challenges within current state environment ▪ Establishment of clear and consistent lifecycle phases and process activities that can be communicated to all impacted stakeholders
People and Culture	Modernize the organizational structure and role assignments	Medium	High	High	▪ Clearly defined role profiles for all procurement roles ▪ Ability of staff to articulate current operating level for given role ▪ Staff understands progression opportunities for future roles
Process and Capabilities	Explore options to streamline legal review	Low	Low	Medium	▪ Stronger relationships within the AG ▪ Examples of purchasing requests that could use standard language/contracts ▪ Targeted list of viable options ▪ Supporting evidence into the delays caused by AG review
Process and Capabilities	Explore potential for Vendor Managed Inventory (VMI) Program	Low	Medium	High	▪ Identification of inventory items which might benefit from use of VMI program ▪ Insight from peer agencies on their use of VMI programs ▪ Assessment of potential cost savings, risk, reduction in inventory, and cash flow from moving inventory to third-party vendor(s) ▪ Analysis of impact to current warehouse space ▪ Review of requirements and considerations needed for vendors to manage inventory

Table 3-5: Summary of Recommendations

CHAPTER 4
OPERATIONAL AND CAPITAL FUNDING REQUIREMENTS

Chapter 4 : Operational and Capital Funding Requirements

4.1. INTRODUCTION

Asset management ensures that an organization's assets are used in the most efficient manner possible. An asset management program affords an organization a better understanding of its assets, which ones need to be upgraded or repaired and where investments may most benefit the operation. A valuable tool utilized by organizations to manage their assets is an asset register. An asset register improves an organization's understanding of its assets by identifying the location, condition, performance and the remaining useful life and value of the assets. Establishing a more comprehensive asset register would enable NJ Transit to better prioritize and allocate capital resources. Without an up to date asset register for this assessment, North Highland collected the asset information available and estimated capital funding requirements based on overall volumes by type (infrastructure, rolling stock and stations) along with NJ Transit's financial statements from the last 10 years to establish the high-level trends in asset value.

4.1.1 CURRENT STATE

NJ Transit provides approximately 270 million passenger trips every year and maintains a rail network of 530 miles, a fleet size of 1230 trains and 2220 buses. With this large asset base, a more comprehensive asset register would afford NJ Transit a better opportunity in allocating its resources to maintain these assets in a state of Good Repair. An asset register is a key tool for a transit agency of this size, as it will contain the data needed to inform strategic decision making. The ongoing effort in the development of the Transit Asset Management (TAM) plan is a good start to more appropriately managing NJ Transit's assets.

4.1.2 DESIRED STATE

Table 4-1 outlines the minimum level of data an organization requires regarding its physical infrastructure that should be included within an asset registry and shows the key processes that those data underpin. The key capabilities and outcomes from those processes are shown alongside, to demonstrate how the underlying data delivers long term strategic value from the assets

DATA	PROCESSES	CAPABILITY/OUTCOME
Asset type Asset location Asset Age Asset Condition	Maintenance execution, capital planning	Sustainable capital asset value, sustainable operational performance, controlled operational expenditure
Lifecycle Activity Records	Safety assurance, lifecycle optimization, capital planning	Safety and operational risk assurance, lowest whole lifecycle costs (capital and operational)

Table 4-1: Minimum Data for Asset Registry

It is important that these capabilities are put in place to ensure that capital investment funding delivers value for dollars as well as tangible and sustainable improvements to the infrastructure.

4.2 METHODOLOGY

The practice of asset management assists organizations in establishing a connection between the physical assets and financial planning, thus providing a better understanding of the organization's budget from capital and operational perspectives. For the purposes of this assessment, an estimate of the required annual capital and operational expenditure of NJ Transit's assets was developed from two key sources:

1. **Financial Statement Analysis.** The annual financial statements published by NJ Transit provides a detailed breakdown of the value of the capital assets (defined as the physical assets themselves, capital projects in process, and non-depreciable items such as land). By plotting the trends in overall capital value, capital expenditure (CapEx) and operational expenditure (OpEx), it is possible to establish whether or not capital spending levels are enough to sustain the value of the infrastructure. Long-term, sustainable asset performance is unlikely to be achieved in situations where overall capital asset value is not being at least maintained, if not increased in line with inflation and passenger demand.
2. **Asset Volume Analysis.** By making some reasoned assumptions about the average residual life of the asset base and the estimated cost of replacement for each asset type, it is possible to determine a first pass estimate of the capital funding requirement. While this estimate does not represent a detailed capital plan or forecast, it does provide a long-term average for the annual capital spending required to maintain the residual life (and therefore value) of the assets.

In addition to these two analyses, a range of interviews were conducted with key stakeholders across NJ Transit to establish the processes, procedures and challenges associated with capital funding and long-term asset sustainability.

In the remainder of this section, the methodology employed in both analyses and the interviews are outlined in detail.

4.2.1 FINANCIAL STATEMENT ANALYSIS

The Financial Statement analysis consisted of an assessment of the NJ Transit statements with a specific focus on developing a clear picture of the physical asset value and capital expenditure. NJ Transit's financial statements are the published record of the yearly financial condition, including a quantified summary of the physical assets that are owned at the end of the financial year, and the resources expended on them (capital and operational) over the course of that year.

By collating these statements over time, the trends in expenditures and overall values can thus be shown. The following sections describe in more detail the line items within the financial statements that were used in the analysis and the accounting treatments and definitions used to generate them.

Asset value

Physical assets are depreciated linearly over their "useful life", which is defined by asset type and stated clearly within the financial statement commentary as per the accounting standards. From an asset management perspective, the value of assets calculated from the financial statements is a representation of the asset age profile, which can be used as an indicator of asset condition and asset performance. Renewal-focused CapEx is designed to offset the depreciation and maintain the long-term performance of an infrastructure operator.

[16] Capital Expenditure is defined as "money spent on acquiring or renewing fixed (i.e. physical) assets". New assets and life-for-like wholesale replacements of existing assets would be regarded as capital expenditure

[17] Operational Expenditure is defined as "money spent on the ongoing running costs of the infrastructure". This covers all lifecycle delivery activities such as planned maintenance, fault fixing, and minor repairs.

CapEx vs. OpEx

Another key asset management practice is to establish an optimum trade-off between CapEx and OpEx. CapEx spending mitigates long-term risks associated with asset deterioration impacting asset performance and OpEx addresses the immediate performance-related issues, such as routine maintenance, repair, and response to incidents. It has been recognized internationally that lack of CapEx investment puts pressure on OpEx, making the overall spending less efficient. Meanwhile most CapEx spending on infrastructure assets is associated with large demands for resource, need for access, and (planned) outages of normal service. ***Figure 4-1*** a "spiral of decline" an organization enters when insufficient CapEx spending eventually leads to high demand on OpEx, normally due to the increased levels of incidents. At this point, there is no physical room in the transportation network for planned work without adverse impacts on the system. This continues to affect the infrastructure operator's ability to schedule work and adversely affects how much funding is forecasted for future capital works. This eventually leads to further decline in performance and income, putting even more pressure on corporate finance and capital investments.

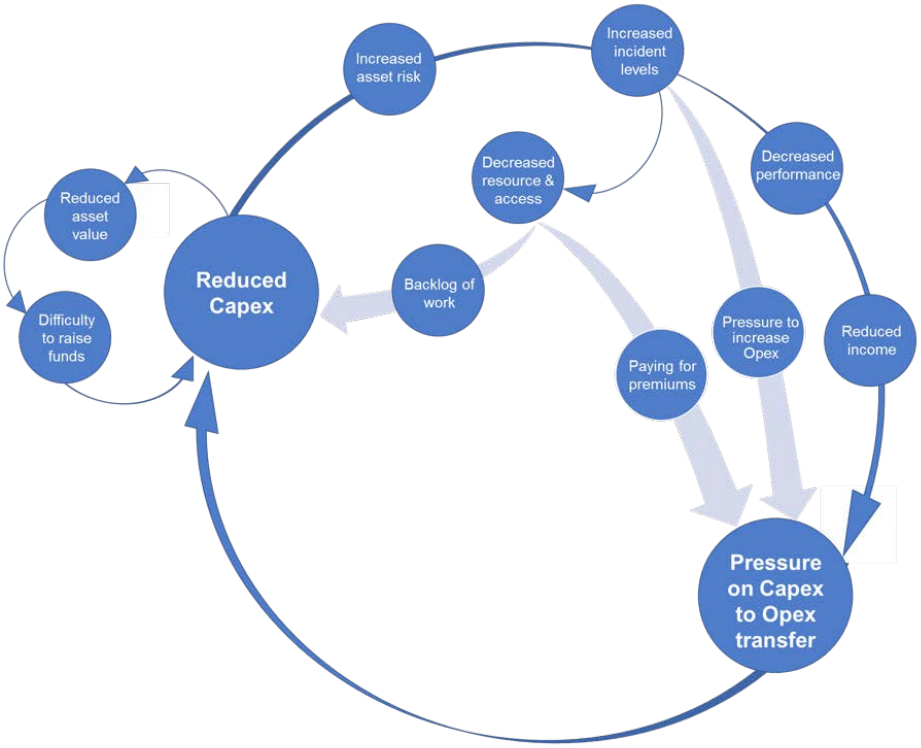


Figure 4-1: Spiral of Decline

By pulling together the historical spending on NJ Transit's CapEx and OpEx, it is possible to test the above asset management principles and understand whether NJ Transit is in a sustainable position in terms of CapEx and OpEx investment.

[18] Modern asset management highlights risk based or condition based management instead of age based, but many studies have found strong correlations between asset age, asset condition and asset performance.

4.2.2. INTERVIEWS

Interviews with NJ Transit personnel and key stakeholders were designed to understand the current asset management regime of the organization, with a focus on expenditure. It was also an opportunity to identify any data and information that could provide insight into the organization and enable an asset volume analysis.

The interviews were designed following asset management best practices and aim to identify gaps that need to be addressed for NJ Transit; the gathered information will also contribute to the recommendations. For the purpose of this assessment of NJ Transit's infrastructure and assets, ISO 55000 standard was used that defines asset management as: **"the coordinated activity of an organization to realize value from assets," and where an asset is: "item, thing or entity that has potential or actual value to an organization."**

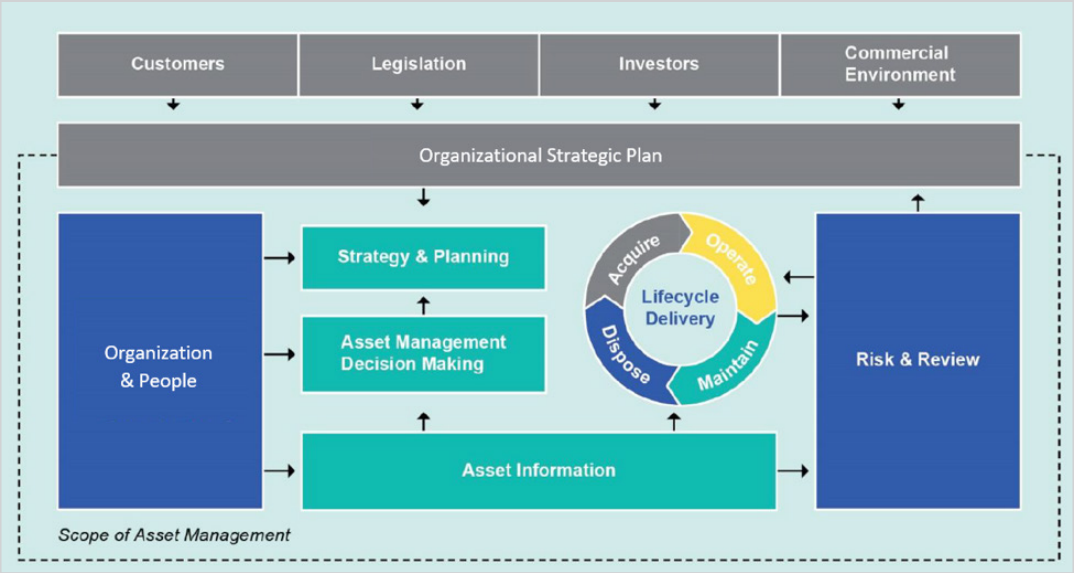


Figure 4-2: Institude of Asset Management (IAM) Conceptual Model

Figure 4-2 illustrates the asset management best practice (the Institute of Asset Management (IAM model) widely adopted internationally. Based on the IAM model, the interviews were carefully designed to answer questions about sufficient, efficient, sustainable OpEx and CapEx planning and delivery based on the following areas:

- **Asset strategy and planning** which covers asset management policy, strategy and objectives, strategic planning, asset management plans, and demand analysis.
- **Organization and people** which covers procurement activity and supply chain management, asset management leadership, organization structure and culture, and competence management.
- **Asset management decision-making** which covers access and possession strategy, capital investment and operations and maintenance decision making, lifecycle value realization and resourcing strategy.

- **Lifecycle delivery** is a highlight of a mature asset management organization. This area encompasses: technical standards and legislation, asset creation and acquisition, system engineering, configuration management, maintenance delivery, asset operations, resource management, incident response, access and possession management, fault and indecent response, asset decommissions and reliability engineering.
- **Asset Information** is the enabler for the asset management model and driving force for an efficient, mature asset management organization. It includes: asset information strategy, standards and systems as well as data and information management.
- **Risks and review** include risk assessment and management, contingency planning and resilience analysis, sustainable development, change management, stakeholder engagement, accounting, management review, audit and assurance, as well as asset performance and condition monitoring and asset management system monitoring. Effective management of value, risk and liability is also part of the standard business case, in which:
  - **Asset Performance:** Improved understanding of asset performance through data and analytics, which drive targeted, efficient, and effective asset management plans and activities.
  - **Safety:** Effective asset management improves both personal safety and process safety, reducing the risk of injury and catastrophic events.
  - **Reputation:** Assets contribute to the reputation and image of the organization, just as they contribute to its operation.

4.2.3. ASSET VOLUME ANALYSIS

Estimates for the OpEx and CapEx were developed for requirements of the infrastructure using available data on asset volumes.

Based on interviews with NJ Transit staff, the key operational lifecycle activity for the assets is the weekly track inspection. Therefore, to construct an estimate of the required OpEx a number of engineering and operational judgements were made about the speed of inspection that could be achieved and the likely shifting patterns of maintenance staff. This allowed a calculation to be made on the minimum number of staff required to deliver the maintenance standards as defined by the NJ Transit engineering organization.

Estimations were made using data to determine the magnitude of the CapEx. Since the level of capital investment is estimated, the whole asset portfolio is assumed to be in a relative steady state for aging and replacement (i.e., assuming no replacement wave/peak and/or any peaks should be spread over multiple years to achieve a stable replacement profile). One of the major CapEx challenges is therefore to balance the aging and natural deterioration of the assets.

The steady-state capital budget required, can be calculated, for each asset type using the following:

$$\frac{Quantity}{Expected\ Asset\ Life} \times Replacement\ Unit\ Cost$$

4.3. ASSESSMENT SUMMARY

The assessments indicate that the capital funding requirement of the NJ Transit infrastructure is substantially more than what is currently being invested. The two analyses indicate that a significant increase in capital funding is needed annually to sustain the current assets. However, the interviews indicate that there are key capability gaps in the organization that must be closed before a substantial level of capital funding could be effectively expended. Capital funding should keep pace with NJ Transit's capacity for reform or risk the benefits not being realized. Closing the organizational gaps between the current state and future state of NJ Transit is a recommended shaping exercise.

4.4. ASSESSMENT FINDINGS

The findings in the following sections have been categorized into the following:

- Assessment Findings from Financial Statement Analysis
- Assessment Findings from Interviews
- Assessment Findings from Asset Volume Analysis

4.4.1. ASSESSMENT FINDINGS FROM FINANCIAL STATEMENT ANALYSIS

Financial statements were used to provide an understanding of the value of the physical infrastructure of the organization in an accounting sense. The bullet points below outline how the financial statements were evaluated and presented in *Figure 4-3.*

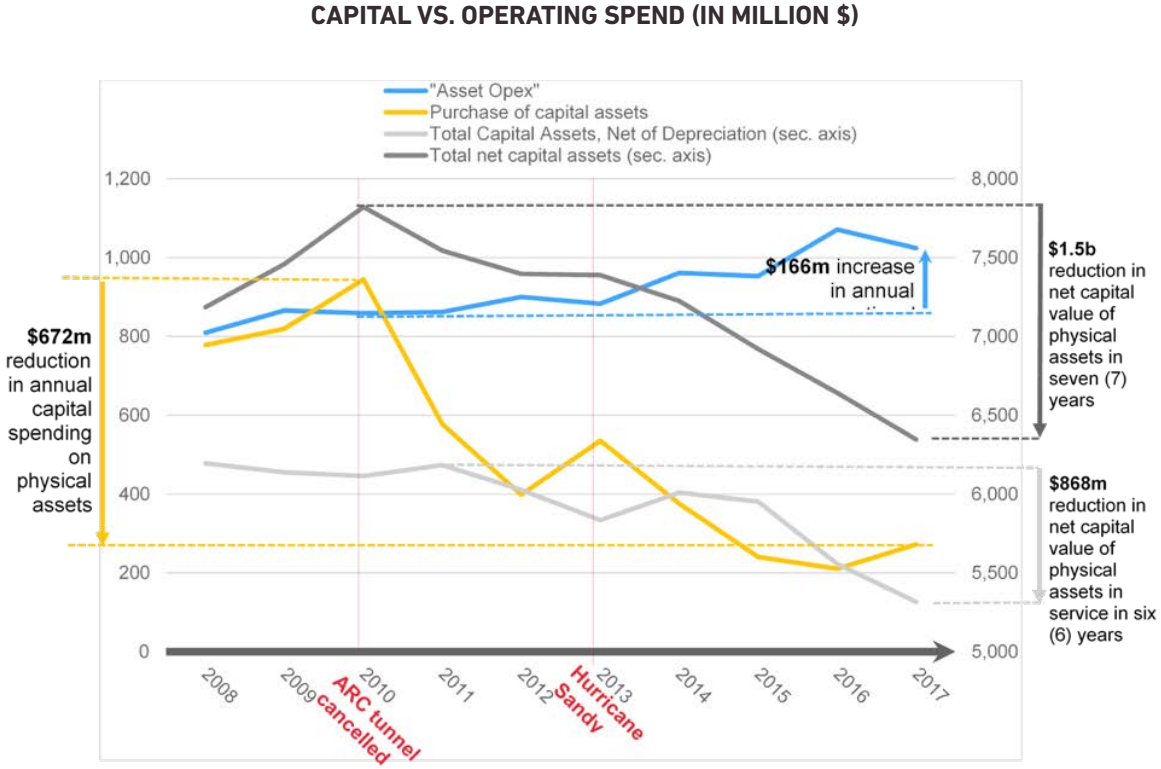


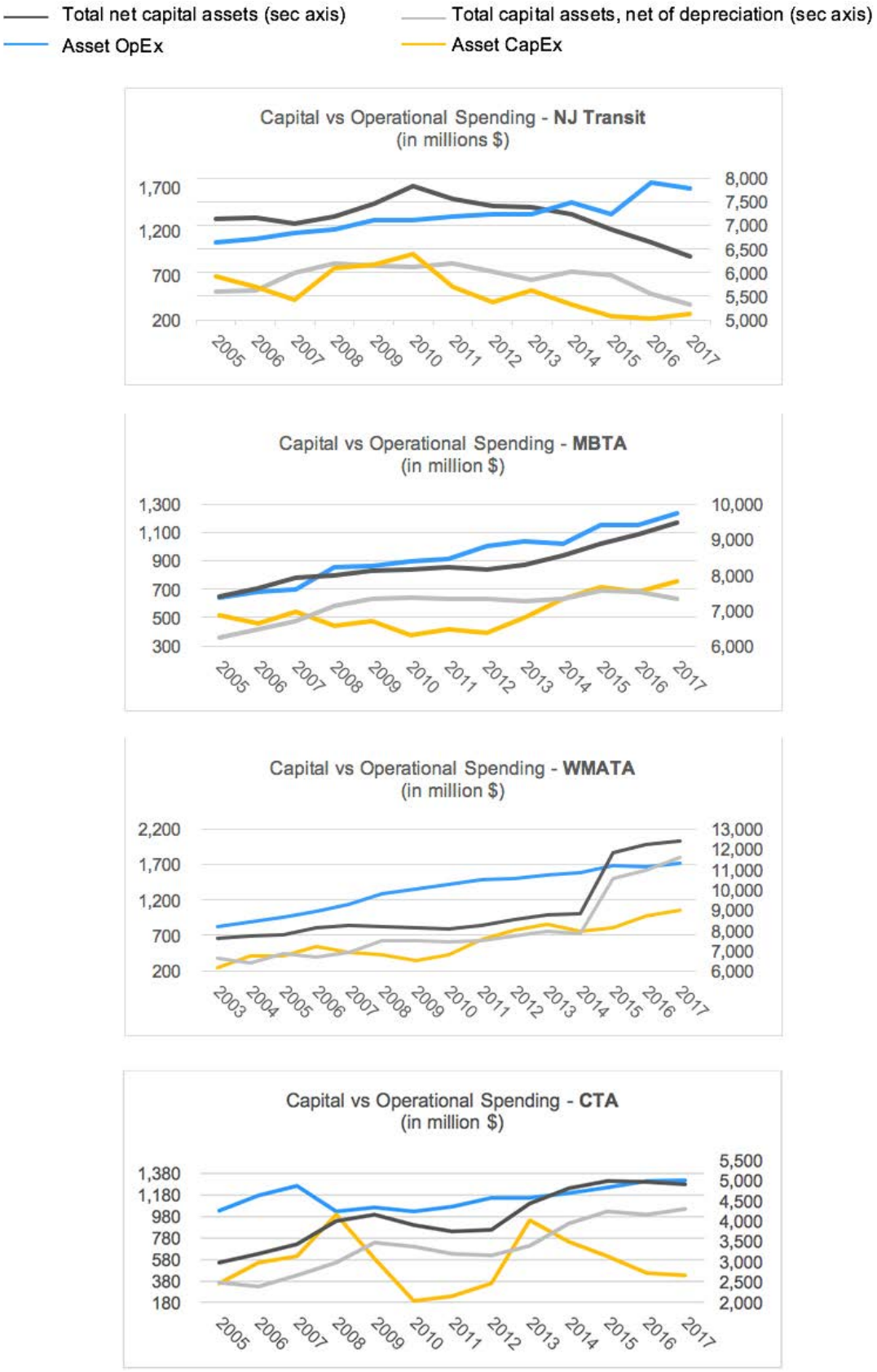
Figure 4-3: Physical Captial Assets vs. Relating Operational Spending as per Financial Statements

- All figures used are taken from the NJ Transit Financial Statements, published as part of the Annual Reports.
- Four items were selected to represent the total value of asset base, the total value of asset base in service, capital and OpEx:
  - **Purchase of Capital Assets** – These figures are taken from the line item of the same name in the "Consolidated Statements of Cash Flows" table in the consolidated statements (line item "Purchase of Capital Assets") and are a record of the in-year cash spending on physical/fixed capital assets.
  - **Total Net Capital Assets** – These figures are taken from "Capital Assets" table (line item "Total Net Capital Assets") in the notes to the consolidated statements. The figures are the total value of the physical/fixed asset base with linear depreciation according to the stated useful lives.
  - **Total Capital Assets, Net of Depreciation** – These figures are taken from "Capital Assets" table (line item "Total Capital Assets, Net of Depreciation") in the notes to the consolidated statements. The figures are the value of the physical/fixed asset base that is in service (i.e., excludes capital projects in process, land value and operating rights).
  - **Asset OpEx** – These figures are calculated by summing the following line items from the "Consolidated Statements of Revenues, Expenses and Changes in Net Position" table in the consolidated statements: Labor; Parts, materials and supplies; and Services.
- The three categories in Asset OpEx comprise much of the underlying cost of maintaining and operating the infrastructure, while excluding ancillary items such as fuel, utilities, insurances and pension benefits.
- The purpose of calculating Asset OpEx is to attempt to isolate the cost of/expenditure on interventions to the physical assets.

As shown in ***Figure 4-3***, the annual spend on capital assets decreased by $672 million from 2010 to 2017, resulting in the value of physical assets decreasing by $868 million in the same timeframe. This led to an overall $1.5 billion reduction in net capital value of the physical assets. This is significant because it shows that the reduction in net capital value is due to a lack of investment in the physical infrastructure which supports an aging physical infrastructure with safety implications and inability to meet the growing demand of the transport system. It will require significant investment to bring the value of the capital assets back to par, and continued maintenance over time.

Peer Benchmarking

Peer Benchmarking is a concept used to compare an organization's process and performance metrics to industry bests and best practices of other organizations. For this assessment, the following data was collected from the Washington Metropolitan Area Transit Authority (WMATA), Massachusetts Bay Transportation Authority (MBTA), Chicago Transit Authority (CTA), and Metropolitan Transportation Authority (MTA). Note that the Asset OpEx in ***Figure 4-4*** includes benefits as many operators report salaries and benefits as a combined value and Asset CapEx corresponds to Capital Purchases/ Spending/Construction for various agencies. All numbers are in million dollars.


Total net capital assets (sec axis)
Total capital assets, net of depreciation (sec axis)
Asset OpEx
Asset CapEx
Capital vs Operational Spending - NJ Transit
(in millions $)
1,700
1,200
700
200
8,000
7,500
7,000
6,500
6,000
5,500
5,000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
Capital vs Operational Spending - MBTA
(in million $)
1,300
1,100
900
700
500
300
10,000
9,000
8,000
7,000
6,000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
Capital vs Operational Spending - WMATA
(in million $)
2,200
1,700
1,200
700
200
13,000
12,000
11,000
10,000
9,000
8,000
7,000
6,000
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
Capital vs Operational Spending - CTA
(in million $)
1,380
1,180
980
780
580
380
180
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

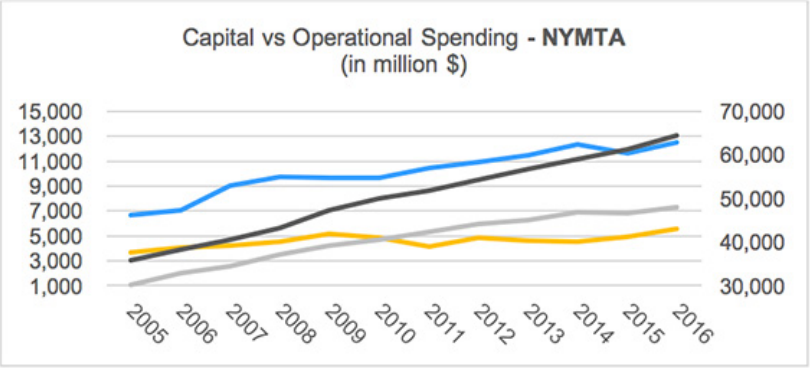


Figure 4-4: Competitive Benchmarking

As illustrated in ***Figure 4-4***, the transit agencies other than CTA show significant increase in the following categories.

- Annual capital spend
- Value of the total capital assets
- Value of the capital assets in service

NJ Transit is the outlier of its peer group in both reducing its annual capital spend and allowing its asset base to depreciate. It is worth noting that, although the latest decreasing trend in annual capital spend from CTA, it has not had as much of an impact on the value of its asset base than it has on NJ Transit.

Case Study: WMATA

WMATA has gone through a period of deteriorating physical assets and have a number of fatalities on the network. They are undertaking a transformation to focus on best practices for capital asset management. They have identified their key problems as lack of asset condition data, qualitative approach, and mixing assets and projects.

As shown in ***Figure 4-5*** asset value plateaued from 2003 to 2014. However, continued increased investment since 2010 resulted in an increase of total capital asset value from $8.8 billion to $12.4 billion, an increase of $3.6 billion. It is also important to note that it took five (5) years of increasing investment for the value to be realized.

CAPITAL VS. OPERATING SPENDING - WMATA (IN MILLION $)

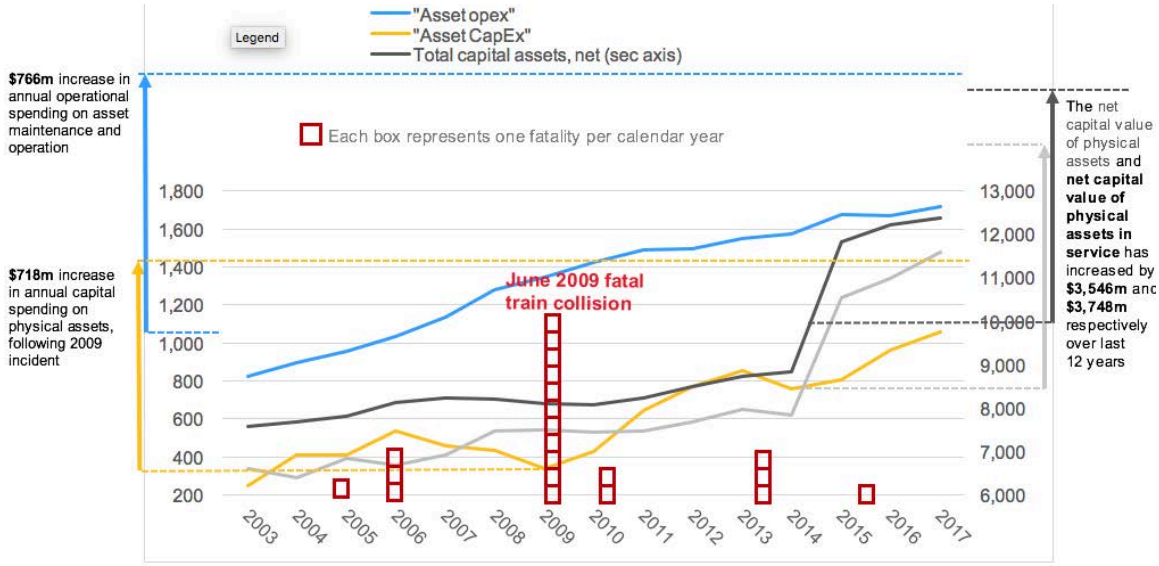


Figure 4-5: WMATA Case Study

4.4.2 ASSESSMENT FINDS FROM INTERVIEWS

Key findings from interviews are provided in the subsections below.

Strategy and Planning

- A central Asset Management Policy is lacking. The absence of this results in a lack of evidenced or accurate capital requirements, planning or management.
- An Asset Management function, accountable and responsible for the State of Good Repair of the NJ Transit assets, is also lacking. As a result, there is no asset maintenance strategy and objectives, demand analysis process, strategic planning across all assets, or any centralized asset maintenance planning.
- Local units define asset maintenance policy, scheduled and preventative maintenance, without any reference to centralized standards or policy.
- The delivery of Transit Asset Management for MAP-21 currently resides under Capital Planning function. MAP-21 has introduced the requirement for a Transit Asset Management (TAM) Plan and the production of this Plan has been given appropriate attention and is under strong leadership. Based on the data reviewed, the function is being well led and well managed. The function is not integrated into a single accountable asset management and maintenance function and as such relies on the cooperation and assessment of business unit leaders.
- While the TAM may meet the basic requirements of MAP-21, it will not, in its first version, provide the necessary asset register, asset strategy, policy, plans and processes to enable a full bottom-up accurate infrastructure plan to be generated.

Organization and People

- It appears that NJ Transit has, over time, organized itself to align with the vertical cascade of funds, by business function, rather than developing as an asset owner and asset operator.
- Engineering and Operations business units are siloed.
- Maintenance activities operate on engineering judgement to Original Equipment Manufacturers' standards. These are mainly time-based maintenance and without any economy of scale.
- The views from interviews are that people in senior management positions have endured years of lack of investment, pay freezes and staff attrition.
- There is a general observation that the organization carries a decreasing number of rail and bus professionals and has been unable to recruit and retain new talent.
- The CFO has no oversight of capital planning, and this is also evidenced in the organizational chart as Finance and Capital Planning departments are separate entities.

Decision Making

- There is no evidence of any lifecycle value realization planning, resourcing strategy or shut down and outage strategy.
- The Capital planning process is driven by evidence-based asset policy and State of Good Repair information.
- Operational and maintenance planning and budgeting is aligned mainly to business commitments. There is no evidence of bottom-up planning to influence budgeting.
- There is no evidence of centralized Risk and Review process driving the capital infrastructure and asset management. Activities within Risk and Review exists in pockets to various degrees; however, they are not joined up across the asset system and do not appear to feed into the capital planning process.

Asset Information

- A review of the IT strategy and plans showed there is no enterprise asset management system plan, asset standards, data mastering or asset information specifications.
- Asset data is at the heart of efficient and effective infrastructure management and this is an area recognized in all asset management models and in MAP-21. From the interviews, NJ Transit staff did describe a vision to achieve an asset management IT system. However, they also express frustration that they were not involved in the business requirements, asset data requirements and options selection process.
- There is no single asset capital work bank renewals plan.
- Quotes from interviews include, "Forced to use systems which are not fit for purpose," "Customers have better technology," "Needs better analytics," and "Inability to extract information from systems."
- A request was made for the asset register, asset hierarchies and asset information standards and specifications. However, only a list of asset transactions from the financial system was received.
- The MAP-21 team has supplied data that they are collecting for TAM, however, based on what has been shown it is insufficient to inform asset management processes.

Overall NJ Transit operates the infrastructure on a reduced budget as their assets age. As such, the staff is focused on emergencies, and they do this well.

If completed in stages, with limited initial investment in key areas, along with a transformation roadmap aligned with areas of maximum value, then NJ Transit has a lot of opportunity to improve. Asset Management excellence will unlock sunken costs, evidence the work bank and help focus limited investment freeing up the organization and State to focus on longer term transformational improvements.

4.4.3. ASSESSMENT FINDINGS ASSET VOLUME ANALYSIS

To provide an informative strategic plan for managing physical assets, one requires a comprehensive asset information base to inform decision making and strategies. Without comprehensive asset information and asset management strategy in place, an asset volume analysis could be done as shown in *Figure 4-6*.

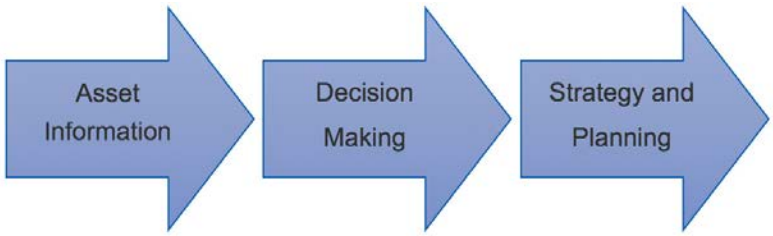


Figure 4-6: Asset Volume Analysis

A high-level view of the requirements for CapEx and OpEx with the data sources is provided in *Table 4-2*.

	FLEET	INFRASTRUCTURE
CapEx	▪ Budget for CapEx (FY2018 Capital Budget) ▪ Number of fleet and type (Facts at a glance FY2016) ▪ Cost of rehab (Assets category Excel files) ▪ Cost of new fleet (Asset category Excel files) ▪ Asset life (estimate)	▪ Budget for CapEx (FY2018 Capital Budget) ▪ Size of the railway infrastructure (Facts at a glance FY2016) ▪ Cost of infrastructure renewal (estimate) ▪ Infrastructure asset life (estimate)
OpEx	▪ Budget for OpEx (FY2018 Operating Budget) ▪ Fleet maintenance schedule (four types of inspection) ▪ Number of people working on maintenance – fleet (not known)	▪ Budget for OpEx (FY2018 Operating Budget) ▪ Infrastructure maintenance schedule (weekly walking the track) ▪ Number of people working on maintenance – infrastructure (not known)

Table 4-2: Information Requirement for CapEx and OpEx

If NJ Transit continues to operate in this way (as a reactive asset operator) the state of the asset will continue to degrade without the ability to determine, how, when and where a critical failure will occur.

The derailment of the Virgin West Coast Pendolino West Coast Main Line InterCity service from London Euston to Glasgow Central, in the North West England region of the United Kingdom on February 23, 2007 is one example of the consequence of not having asset condition information across the infrastructure or a knowledge of where problems may lie. The cost of this derailment was in the millions of dollars and required 18 months of costly inspections.[20]

[20] 20 "Grayrigg derailment." Wikipedia, The Free Encyclopedia. 20 Jun, 2018.

OpEx Analysis

OpEx asset volume analysis requires more detailed information than CapEx, as it involves different moving parts such as labor, maintenance, parts. The required minimum information needed to perform a bottom-up OpEx analysis was not available, however, illustrated below is what can be achieved. As an example, for rail infrastructure, a team of engineers walk the entire network once a week as part of the routine inspections. Assuming that each engineer can inspect three (3) miles per day and each engineer works five (5) days a week, a logical assumption can be made that approximately 67 engineers are required at a minimum for the weekly inspections. Minimum number of engineers required for weekly track inspection:

1001 track miles / (3 miles per day * 5 days a week) = 67

Similar analyses can be performed for all parts involved in OpEx to provide an asset volume analysis.

CapEx Analysis

As outlined in the methodology above, the steady-state capital budget required can be calculated for each asset type using the following:

$$\frac{Quantity}{Expected\ Asset\ Life} \times Replacement\ Unit\ Cost$$

- **Quantity:** With a focus on rail, the assets can be divided into three categories; infrastructure, rolling stock and stations. From the Facts at a Glace FY2016 document, a list of rail asset types can be found.
- **Asset Life:** Asset life (for an asset type) is defined as the average time before the asset reaches the end of life and require replacements for the same asset type, with the necessary inspections, repairs, and maintenance, and refurbishment performed. Specific data for asset life for the infrastructure and rolling stocks for NJ Transit was not available. In lieu of that, defined nominal life of an asset was used to be the period of time before a replacement is required. Each asset type and class would have different nominal life, however, an average value can be assumed with a good degree of accuracy based on industry standards.
- **Replacement Cost:** Replacement cost differs from class and type, similar to asset life, an average value can be assumed with a good degree of accuracy.
- **Capital Budget Required Per Annum:** Together with the three components below (Infrastructure, Rolling Stock and Stations in ***Table 4-3***), the capital cost required per annum for rail assets can be estimated to be around $534 million. The capital replacement cost assumes like-for-like replacements for all assets. It is a lower bound calculation as conservative estimation was used regarding asset life and unit cost, by assuming there is no premature replacement due to unexpected damage and operational reasons, and by assuming like-for-like replacement for the assets. The calculation also does not include the refurbishment cost and cost of expanding the fleet size/infrastructure network.

Capital Assets Composition Analysis

The asset volume analysis shows what is required to maintain a healthy asset base by maintaining or reducing the risk level using the appropriate level of CapEx.

- **No Replacements Made in the Next Five (5) Years:** Asset age profile was used as an estimation of asset condition. As shown in ***Figure 4-7***, the age profile of the rolling stocks is plotted by grouping assets into four age groups. Blue is the youngest and red is the oldest asset age. If no replacements are made in the next five years, the asset age profile will grow, posing significant risk to the network and passengers. This is shown in the graph on the right-hand side: average age and average age of oldest assets.
- **Replacements Made in the Next Five (5) Years:** If the steady State replacement volume in ***Table 4-3*** is used, the age profile for the next five (5) years can be seen in ***Figure 4-8.*** The figure shows that the age profile, especially for the oldest and second oldest quartile (shown as red and yellow), is much more stable, due to sufficient CapEx being injected to reduce the risks. Although the level of risk which can be tolerated is dependent on the organization's risk appetite and performance level, it is a reasonable assumption that the CapEx estimation is on the right order of magnitude.

	Asset type	Quantity	Expected life	Implied replacement volume	Replacement cost per unit	Capital cost estimate per annum
Infrastructure	Track (miles)	1001.8	35	29	$2,000,000	$57,245,714
	Underbridge	575	85	7	$7,000,000	$47,352,941
	Overbridge	103	85	1.2	$10,000,000	$12,117,647
	Moveable Bridge	12	65	0.2	$30,000,000	$5,538,462
	Interlocking	111	30	4	$5,000,000	$18,500,000
	Signals	1350	15	90	$400,000	$36,000,000
	Switches	1290	20	65	$1,000,000	$64,500,000
	Level Xing	325	20	16	$5,000,000	$81,250,000
	Catenary (miles)	264	20	13	$3,000,000	$39,600,000
	Traction Power Substation	52	35	1	$15,000,000	$22,285,714
Rolling Stock	Diesel locomotives	63	35	2	$6,500,000	$11,700,000
	Electric locomotives	64	33	2	$6,500,000	$12,606,061
	Dual mode locomotives	35	25	1	$6,500,000	$9,100,000
	Electric multiple units	157	30	5	$4,000,000	$20,933,333
	Push-pull rail cars	912	35	26	$350,000	$9,120,000
	Railroad and construction equipment	168	20	9	$1,000,000	$8,400,000
	Non-revenue equipment cars	75	30	3	$100,000	$250,000
	Non-revenue diesel locomotives	9	30	0.3	$6,500,000	$1,950,000
Stations	Average Capital Maintenance Budget per station	152	Performed annually		$500,000	$76,000,000

Table 4-3: Capital Expenditure Asset Volume

* Quantity: numbers as per Facts sheet; Expected Life: estimated numbers; Implied replacement volume: Quantity / Expected Life; Replacement cost per unit: estimated numbers; Capital cost estimate per annum: (Quantity / Expected Life) * Replacement cost per unit.

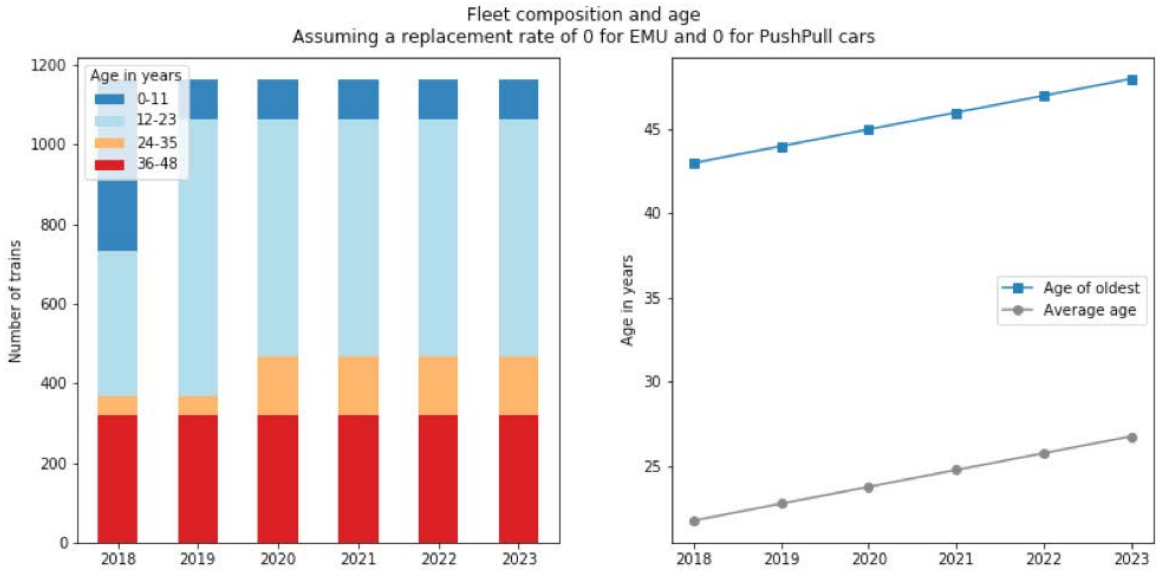


Figure 4-7: Quartiles of Age Profile Assuming No Replacements

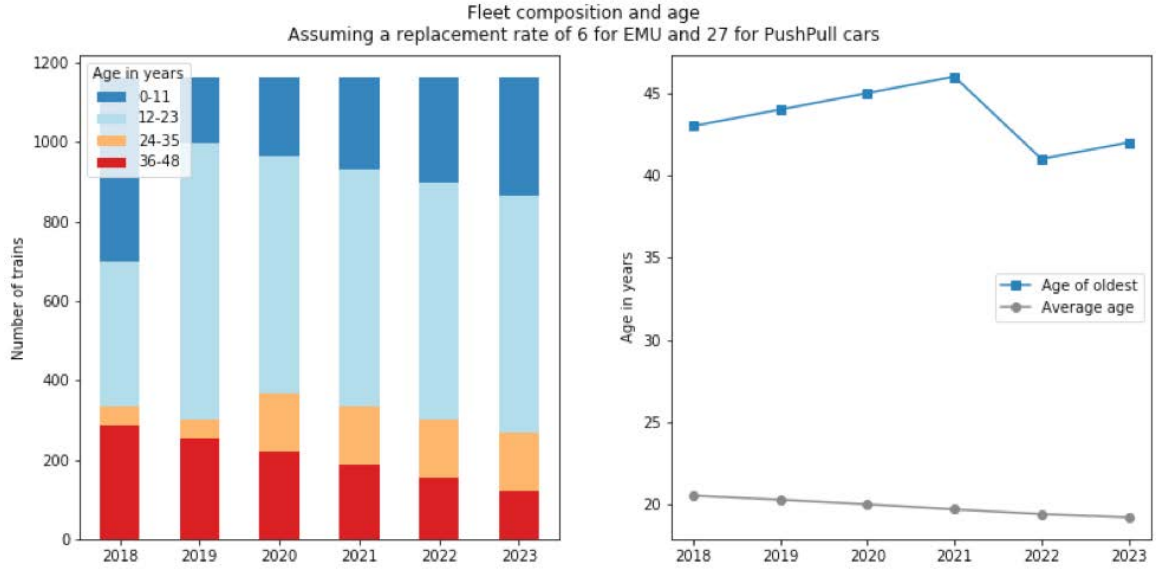


Figure: 4-8: Quartiles of Age Profiles Assuming Annual Replacements in the Next Five Years

Capital Budget Plan

The FY2018 Capital Budget is shown in *Table 4-4*.

CATEGORY	FY2018 ($ IN MILLIONS)
Capital maintenance / debt service	601
Pass-through	42
Rail infrastructure improvements	201
Rail rolling stock improvements	109
Rail station improvements	47
Bus / light rail improvements	168
System-wide improvements	86
System expansion	33
Competitive resiliency projects	80
Total	**1,367**

Table 4-4: FY2018 Capital Budget

From the asset volume CapEx analysis, the relevant categories of the capital budget plan for FY2018 were compared. It can be seen in *Figure 4-9* that NJ Transit is spending more than estimated on rolling stock, this is probably due to an aging rolling stock fleet in need of renewing. The CapEx on infrastructure is well below the expected estimate.

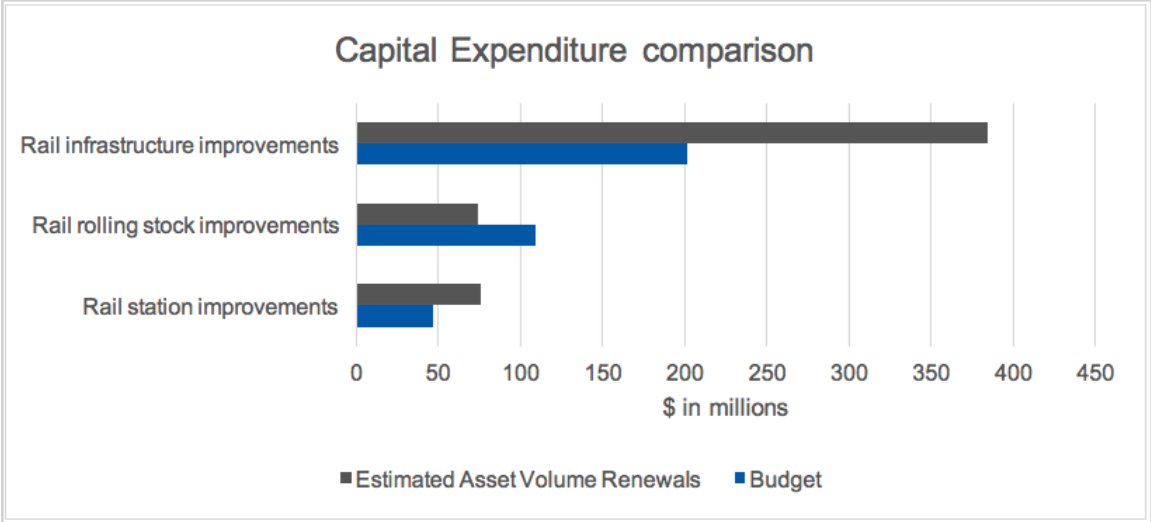


Figure 4-9: Captial Expenditure - Estimated Asset Volume Renewals vs. Budget

With the required information and data, an asset volume analysis provides a data-driven approach to budget planning. This is one piece of the puzzle to get to a steady state for the organization.

4.5. OPPORTUNITIES FOR IMPROVEMENT

In line with Asset Management best practice, striking the correct balance between capital investment and operational costs is essential to delivering long term performance at optimal cost, by maintaining the value of the infrastructure and controlling the risks., The organization needs to build capability to ensure the effective, evidenced and efficient spending of capital funds.

4.5.1. RECOMMENDED NEXT STEPS

A structured and effectively supported program of works is needed to build the aforementioned asset management capability. The specific recommendations below outline the key elements of the required asset management transformation:

As illustrated in the IAM model, lifecycle delivery is one of the most important concepts in modern asset management practices. Specifically, the data-driven whole-life cost modeling has proven to be a powerful method to drive asset management efficiencies. By considering all aspects of asset lifecycle, whole-life cost modeling facilitates decision making between CapEx and OpEx (e.g., the trade-off between maintenance and replacement/refurbishment), optimize timing of asset-intervention, enable optioneering for investments, and manage asset portfolio and risk.

The main principle behind the whole-life cost modeling is establishing an optimum trade-off between capital investment, operational/maintenance cost, de-commissioning cost and performance impact (and the cost associated with it). As assets age, the annual OpEx costs will increase due to increased defects, enhanced maintenance, and ad hoc repairs. Meanwhile, the longer the assets are in use, the annual CapEx costs (equivalent annual cost, or EAC) decrease. There is a point in time when the asset cost aggregated over the whole-life is minimized, indicating the optimum timing of intervention. Similar principles apply to evaluating the cost of performance and de-commission, as well as comparing different intervention options (e.g., replace vs. refurbish) and different design options.

The assessment area aims to perform a whole-life cost analysis for NJ Transit's capital program to understand:

- Whether NJ Transit has the right level of CapEx
- The current and desired trade-off between CapEx and OpEx

A full whole-life cost analysis requires information and data as illustrated in ***Figure 4-10*** For asset volume OpEx analysis, the minimum requirement of information is understanding job volume and cost per job. To establish the trade-off between CapEx and OpEx requires additional information about asset performance (e.g., fault rate). As an alternative, the CapEx from the bottom-up calculation, and the inter-play between CapEx and OpEx from the top-down approach can give some insights of the overall OpEx.

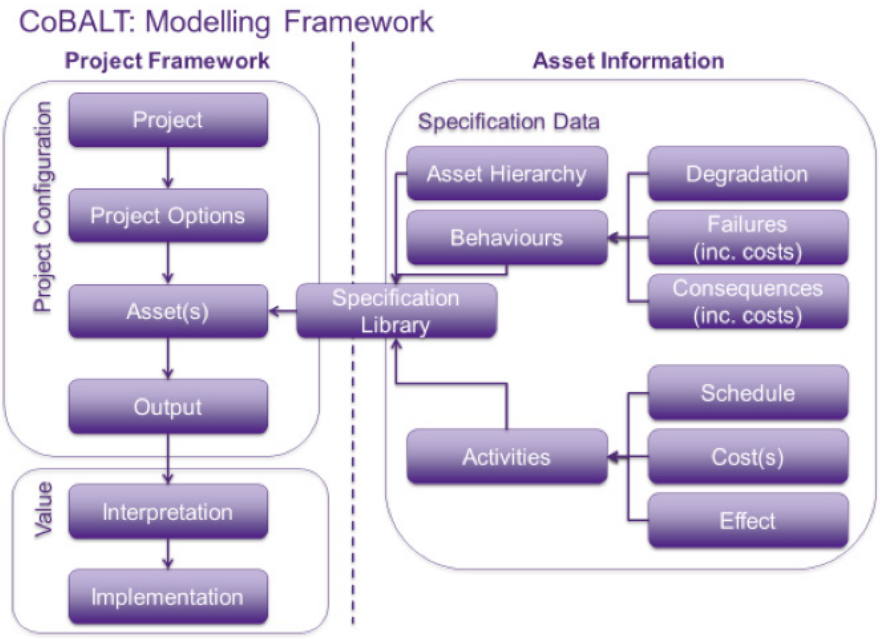


Figure 4-10: Example of whole lifecycle modeling requirements[21]

[21] CoBALT (cost benefit analysis tool), an established solution developed by North Highland partner, Amey Strategic Consulting.

Recommendation: Align asset management objectives with organizational objectives.

- Develop asset management strategy focusing on operational maintenance and capital planning.
- Develop asset management system and information strategy.
- Develop maintenance strategy including frequency, specification, incidents response.
- Promote asset management culture across the organization.

Recommendation: Make decisions on matters such as capital spending and operational maintenance based on evidence supported by data.

- Put an asset management system in place for accessible asset data including asset hierarchy, work order, capital projects, maintenance and incidents records.
- Create asset data policy by setting up data specification, data governance, data standard including:
  - Complete asset registry
  - Develop asset condition specification.
- Create a data collection plan including time, cost and resource
- Utilize decision support tools.

Recommendation: Ensure spending is providing optimal value to the asset base, performance and therefore its customers, as illustrated in the Right Delivery step in the capability building model in *Figure 4-11*.

- Capital planning and delivery process to effectively account for growth
- Data-driven performance monitoring and improvement for operational maintenance delivery
- Project whole life cycle management for effective delivery.

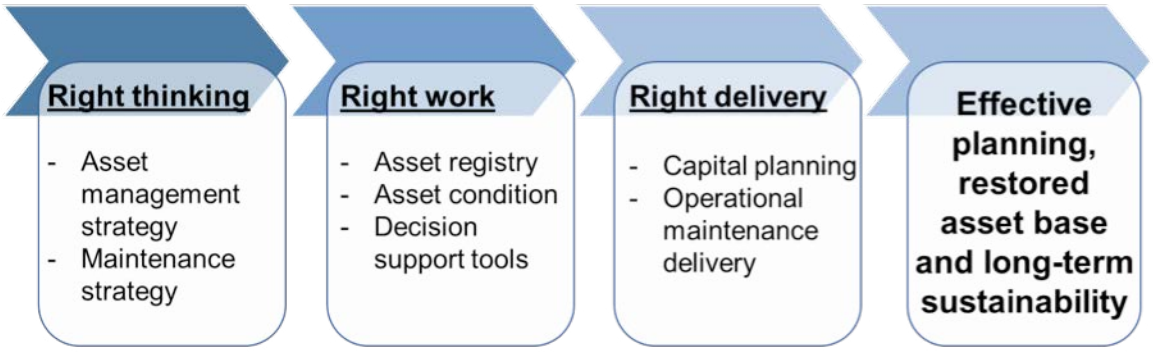


Figure 4-11: Capability Building for Effective Asset Management

CHAPTER 5
FUNDING SOURCES

Chapter 5 : Funding Sources

5.1. INTRODUCTION

Transportation agencies are grappling with issues of balancing the costs of operations, infrastructure, maintenance and labor with the increased demand by the public for mobility services. Many jurisdictions are struggling to maintain service levels while dealing with aging and obsolete infrastructure while competing against ride-sharing services.

NJ Transit is not unlike many agencies across the country in dealing with these increased demands. NJ Transit is unique, however, in that it is the largest statewide public transportation system in the nation. The agency's commuter rail, light rail, and bus systems take more than 800,000 trips off the highway system each weekday. Nearly one in every ten workers in New Jersey uses public transit to get to work, twice the national average.

Funding for the system has been and continues to be a topic of significant discussion in New Jersey. In 2016, the legislature approved a gas tax increase and its citizens approved ballot box Question 2 that discontinued diversions from its Transportation Trust Fund into operations. Question 2 also allowed the State to authorize up to $12 billion in bonds for transportation projects.

The focus of this Chapter is providing a general understanding of the sources of funding currently available to NJ Transit to support funding requirements for operational and capital needs based on a bottom-up analysis. It also highlights innovative ways other transit agencies are financing their capital and operational needs beyond annual appropriations. While many of these programs would require legislative approval, they offer a glimpse of what may be possible to close the investment gap documented in Chapter 4.

5.2. METHODOLOGY

To identify and assess the funding sources, North Highland conducted interviews with NJ Transit Senior representatives, from the offices of the Controller, Capital Programs, Mechanics for Rail and Bus, Facilities, and Real Estate. The team also conducted a thorough review of existing operating statements and annual reports, compared NJ Transit operations and budgets with comparable agency financial statements, and reviewed the minutes of the legislative meetings for allocation of funds of NJ Transit. In addition, interviews with Federal transportation officials on grant and financing programs, discussions with peer transit agencies, extensive research on innovative funding.

5.3. ASSESSMENT SUMMARY

Figure 5-1 provides an overall picture of the operating funding sources. As highlighted in this Figure, State Operating Assistance was dramatically reduced and nearly eliminated over the past eight years forcing NJ Transit to transfer much needed capital funds to capital maintenance. At the same time, over ten years, operation and maintenance costs increased by 30 percent. It should be noted that NJ Transit revenue from the farebox has remained consistent despite the decline in investment and the competition from ride share services that have greatly impacted other transit organizations.

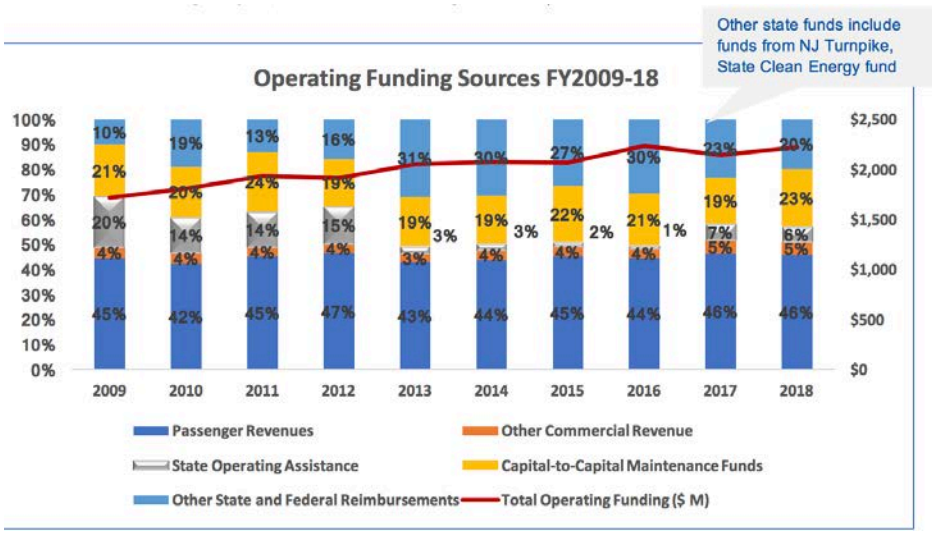


Figure 5-1: Historical Operating Funding Sources FY2009-FY2018

There is a direct correlation between the decrease in State funding and increase on the draw of capital funds, as illustrated in ***Figure 5-2.***

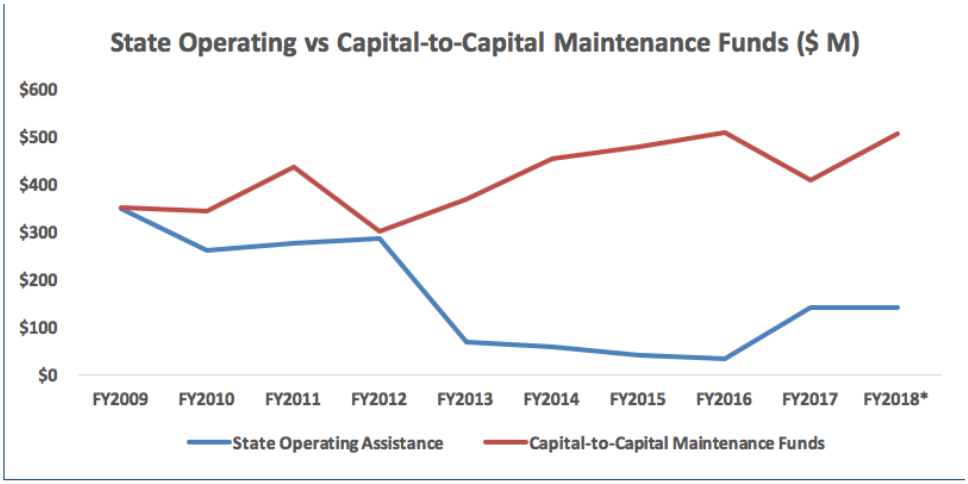


Figure 5-2: State Operating vs. Capital-to-Capital Maintenance FY2009-FY2018

NJ Transit had the lowest State operating assistance in FY2016 in comparison to other peer agencies (Metropolitan Transportation Authority [MTA], Washington Metropolitan Area Transit Authority [WMATA], Chicago Transit Authority [CTA], Massachusetts Bay Transportation Authority [MBTA], and Southeastern Pennsylvania Transit Authority [SEPTA], as highlighted in ***Figure 5-3***. This has caused a severe drain on NJ Transit's assets that is described in detail in Chapter 4. On the positive side, NJ Transit derives nearly 45% of its operating and maintenance needs through farebox revenues. This has been consistent over the past ten years and puts NJ Transit near the top of comparable transit agencies of similar size.

Also illustrated in ***Figure 5-3***, NJ Transit has employed the highest percentage of Federal funding among other Transit agencies. Federal funding is not predictable now and will be even more unpredictable and unreliable in the future as it has been historically. As a result, industry trending in peer transit agencies indicates a shift away from reliance on Federal funds. The appropriations and authorizations at the Federal level are decreasing and could go away in the future. NJ Transit should consider this as it plans its funding in the coming years.

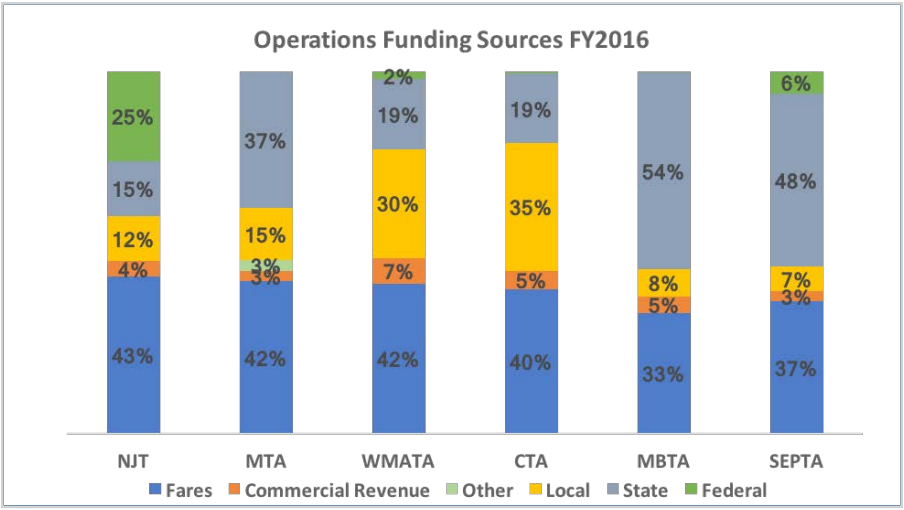


Figure 5-3: Competitive Operational Funding Sources FY2016[22]

5.4. ASSESSMENT FINDINGS

The assessment findings are organized into three major categories: Federal Funding Sources, State Funding, and Local and Other Funding.

5.4.1. FEDERAL FUNDING SOURCES FINDINGS

NJ Transit derives the majority of its Federal funding from the Federal Transit Administration (FTA). NJ Transit, in partnership with New Jersey Department of Transportation (NJDOT) and Metropolitan Planning Organizations (MPOs), has also worked to acquire certain categories of Federal Highway Administration (FHWA) funding.

NJ Transit and the NJDOT clearly recognize the criticality of ensuring that the State of New Jersey is certified by FTA for its State Safety Oversight Program. If the State is not certified by April 15, 2019, FTA will be required to withhold all new FTA funded awards to NJ Transit. The process of certification is ahead of schedule and it is expected that certification will be granted well before the deadline.

Figure 5-4 presents the total amount of FTA funds allocated to NJ Transit over the past ten (10) fiscal years. Funding from the FTA has remained relatively constant except for fluctuation of discretionary grants.

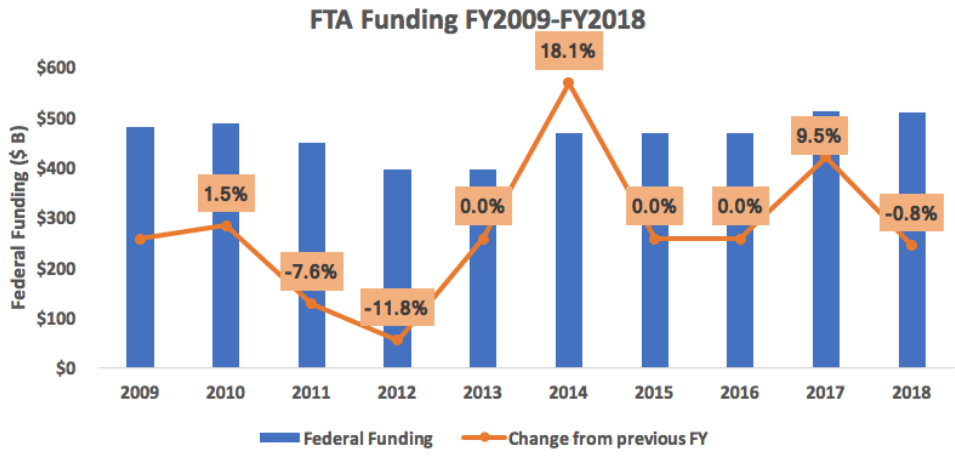


Figure 5-4: FTA Historical Funding FY2009-FY2018

[22] 2016 Funding Sources" National Transit Database, 2016.

Funding from the Federal Highway Administration (FHWA) has fluctuated greatly through the last ten (10) fiscal years, typically tied to allocations made available from partners. Funding for Congestion Mitigation and Air Quality (CMAQ) and alternative transportation funding has remained constant over the years, but other sources have not. This has resulted in FHWA funding falling nearly 40% since FY2015.

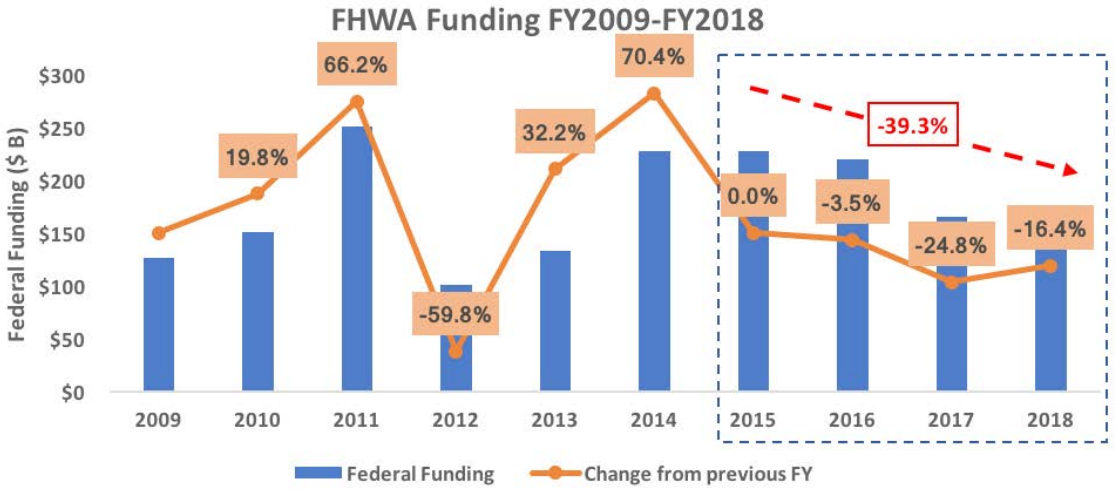


Figure 5-5: FHWA Historical Funding FY2009-FY2018

The Federal Transit Administration, under the direction of the U.S. Congress, recognized the continued delay in maintenance of many of its stakeholders. In response, Congress has mandated a systematic review of all Federally-funded assets to establish a benchmark for determining future "State of Good Repair." This action was to ensure that all Federal assets held by stakeholders are being maintained in a State of Good Repair by their caretakers. Congress mandated an accounting of each stakeholders Federally-funded assets in 2012 with the Moving Ahead for Progress in the 21st Century initiative (MAP-21). Current guidelines require a formal Management Asset Plan to be submitted and approved by the FTA prior to the end of 2018. NJ Transit only recently initiated its efforts to develop its Management Asset Plan with the target of meeting the FTA 2018 deadline. However, the ability of NJ Transit to bring its existing Federal assets up to a 'State of Good Repair' consistent with Federal guidelines will take several years and require substantial funding. Failure to meet these guidelines will eventually impact NJ Transit's ability to acquire replacement asset funding from the FTA. This could impact and endanger NJ Transit's second largest capital funding source.

NJ Transit has received Federal funding for several Hurricane Sandy projects for damaged assets. Repairs of the assets has not been initiated at this date due to delays in placing procurement orders with contractors. The failure to upgrade these damaged facilities will not allow NJ Transit to certify the assets in a State of Good Repair for the Federal government and gives a perspective of the work ahead to meet Federal guidelines.

There are several Federal discretionary programs NJ Transit could pursue, including:

- **The Build America Bureau** is responsible for driving transportation infrastructure development projects in the United States. The Bureau streamlines credit opportunities and grants and provides access to the credit and grant programs with more speed and transparency, while also providing technical assistance and encouraging innovative best practices in project planning, financing, delivery, and monitoring. To achieve this vision, the Bureau draws upon the full resources of the U.S. Department of Transportation to best utilize the expertise of all the modes within the Department while promoting a culture of innovation and customer service. This includes the administration of the application processes of the Railroad Rehabilitation and Improvement Financing (RRIF) credit program and Transportation Infrastructure Finance and Innovation Act (TIFIA).

Railroad Rehabilitation and Improvement Financing (RRIF): This program has $35 billion in Federal loans with favorable terms allowing up to 35 years for repayment, seven (7) years of upfront deferrals and cost of government lending interest rates.

- The RRIF program was established by the Transportation Equity Act for the 21st Century (TEA-21) and amended by the Safe Accountable, Flexible and Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU).
- Under this program the FRA Administrator is authorized to provide direct loans and loan guarantees up to $35.0 billion to finance development of railroad infrastructure. Not less than $7.0 billion is reserved for projects benefiting freight railroads other than Class I carriers.
- The funding may be used to: Acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings and shops; Refinance outstanding debt incurred for the purposes listed above; and Develop or establish new intermodal or railroad facilities.
- Direct loans can fund up to 100% of a railroad project with repayment periods of up to 35 years and interest rates equal to the cost of borrowing to the government. Transit-Oriented Development (TOD) capped at 75%.
- Eligible borrowers include railroads, state and local governments, government-sponsored authorities and corporations, joint ventures that include at least one railroad, and limited option freight shippers who intend to construct a new rail connection.
- Several transit agencies have recently utilized the RRIF program to advance critical capital needs and implement new PTC systems, as illustrated in *Table 5-1*.

FISCAL YEAR	ORGANIZATION	AMOUNT
2018	MTBA	$220,000,000
2016	Amtrak	$2,450,000,000
2015	Metropolitan Transportation Authority	$967,100,000

Table 5-1: Agencies Use of RRIF

Transportation Infrastructure Finance and Innovation Act (TIFIA): TIFIA is a Federal program that provides transportation projects with low-interest, flexible loans, loan guarantees, and standby lines of credit. These loans and loan guarantees can save millions of dollars in financing charges over a standard public bond offering. Moreover, project sponsors have the option to defer repayment, which can allow a project to successfully scale up and begin generating tax revenues or user fees before the bill from the Federal Government comes due.

- Principal amounts of credit assistance provided by TIFIA are generally limited to 33% of eligible project costs
- MAP-21 allows for a project loan size of up to 49% of eligible project costs but this is seldom done in practice.

The project must have a dedicated revenue source pledged to secure both the TIFIA and senior debt financing. *Table 5-2* provides an example of the projects and corresponding revenue source pledges used by transit agencies.

Project name	Project costs	Tifia assistance	Primary revenue pledge	Fy closed
MBTA Positive Train Control	$516.7 M	$162 M	Sales Tax Revenues	FY2018
Sound Transit Operations & Maintenance Satellite Facility: East	$265.6 M	$87.7 M	Sales Tax Revenues	FY2017
Chicago Transit Authority Rail Fleet Replacement Project	$772.49 M	$254.9 M	Farebox Revenues	FY2016

Table 5-2: Agencies Use of TIFA Program

Pilot Program for Transit-Oriented Development (TOD) Planning - Section 20005(b): This Pilot Program for TOD Planning helps support FTA's mission of improving public transportation for America's communities by providing funding to local communities to integrate land use and transportation planning with a new fixed guideway or core capacity transit capital investment. Comprehensive planning funded through the program must examine ways to improve economic development and ridership, foster multimodal connectivity and accessibility, improve transit access for pedestrian and bicycle traffic, engage the private sector, identify infrastructure needs, and enable mixed-use development near transit stations.

- **Transit Cooperative Research Program - 5312(i):** The Transit Cooperative Research Program (49 U.S.C. 5313; TCRP) is an applied, contract research program that develops near-term, practical solutions to problems facing transit agencies. The transit industry driven program, TCRP, promotes operating effectiveness and efficiency in the public transportation industry by conducting practical, near-term research designed to solve operational problems, adopt useful technologies from related industries and introduce innovation that provides better customer service. The industry driven program serves as one of the principal means by which the transit industry can develop innovative short-term solutions to meet demands placed on it.
- **Better Utilizing Investments to Leverage Development (BUILD) Transportation Grants Program (formerly TIGER):** The United States Department of Transportation's (USDOT) BUILD Transportation Discretionary Grants program funds investments in transportation infrastructure, including transit. This competitive discretionary program could leverage existing State funds to field a competitive application for State of Good Repair capital projects.

5.4.2. STATE FUNDING SOURCES FINDINGS

During the previous ten years, funding from the State of New Jersey has diminished and only recently has it begun to increase with an eye to address the continued aging infrastructure. NJ Transit's Capital Program Department has done a solid job in managing a constantly diminishing capital budget. *Figure 5-6* shows how funding progressed over a ten-year period and shows a continued decrease in State of New Jersey funding until 2017.

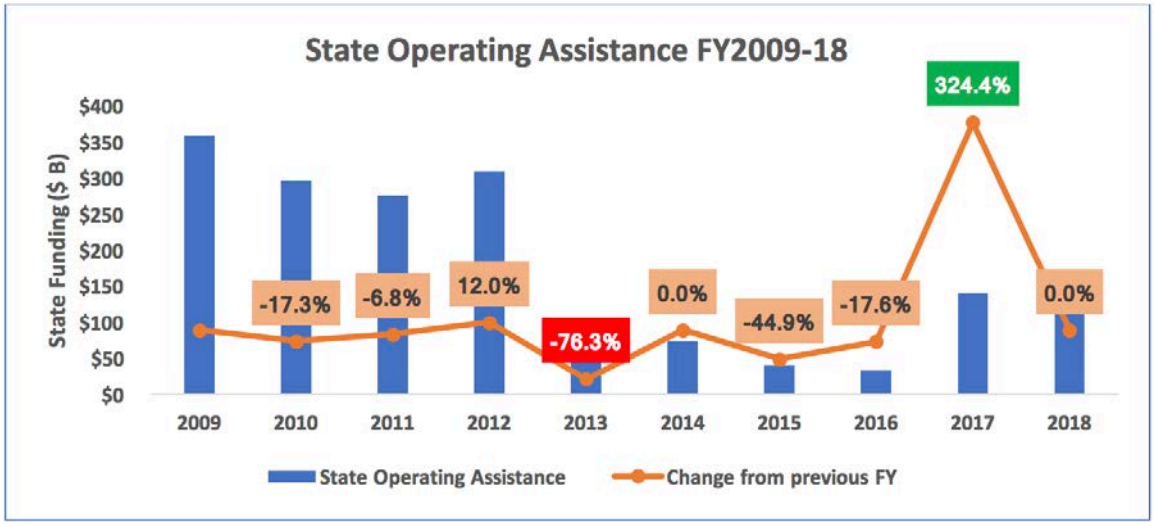


Figure 5-6: State Operating Assistance FY2009-FY2018

The rapid decrease in State funding required drastic reductions in NJ Transit operating and capital expenditures. With funding reductions, NJ Transit immediately began the release of all non-critical employees, reduced or eliminated non-essential maintenance and reduced functional support positions dramatically. Hiring became burdened with a multi-level approval structure. Non-Federally funded capital programs were eliminated, and repair of existing assets was allowed to deteriorate. Maintenance materials were limited to emergency requirements only and replacement parts became critical as a reduced procurement operation required more than one year to release purchase orders for replacement parts.

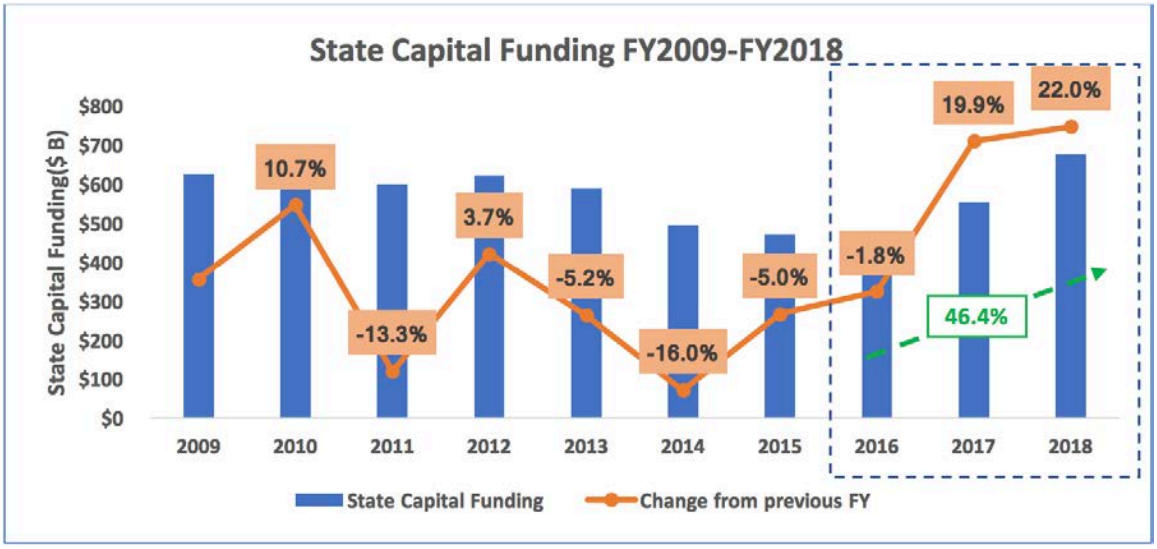


Figure 5-7: State Capital Funding FY2009-FY2018

This deterioration of State funding has had the effect of NJ Transit reducing maintenance on all non-critical assets and delay needed repairs to ailing. Continued funding decreases will bring NJ Transit's viability as a primary mode of transportation in the State into question.

5.4.3. LOCAL AND OTHER FUNDING SOURCES FINDINGS

Among non-Federal sources of revenue, passenger fares represent the biggest source of NJ Transit revenues. Fare box and other revenues fell short of the 2017 budget of $1.138 billion by $43.6 million, or 4%. NJ Transit planned on bringing in $1.014 billion in the FY2018 budget from the farebox, a decrease of almost one percent from FY2017. Reduced revenue in 2017 can be attributed to reduction in the price of gasoline which has led to more riders relying on personal vehicles and on rideshare services such as Uber and Lyft. Negative public perception of the agency may have also factored into the drop in these revenues. NJ Transit has increased its 2018 revenue projection in anticipation of recovery of fare box revenue and increases in "Other" revenues. However, the 2018 budget did not anticipate the reduction of access to New York Pennsylvania Station attributed to mechanical failure of Amtrak equipment. This resulted in a loss in revenue estimated at $17.7 million and a cost increase of $9.3 million in purchased transportation for cross-honoring agreements with adjacent modes of transportation. Commercial revenue is another major source of revenue, bringing in $115.2 million each of the last three (3) years as growth in this category has remained constant. *Figure 5-8* summarizes this data over the last decade.

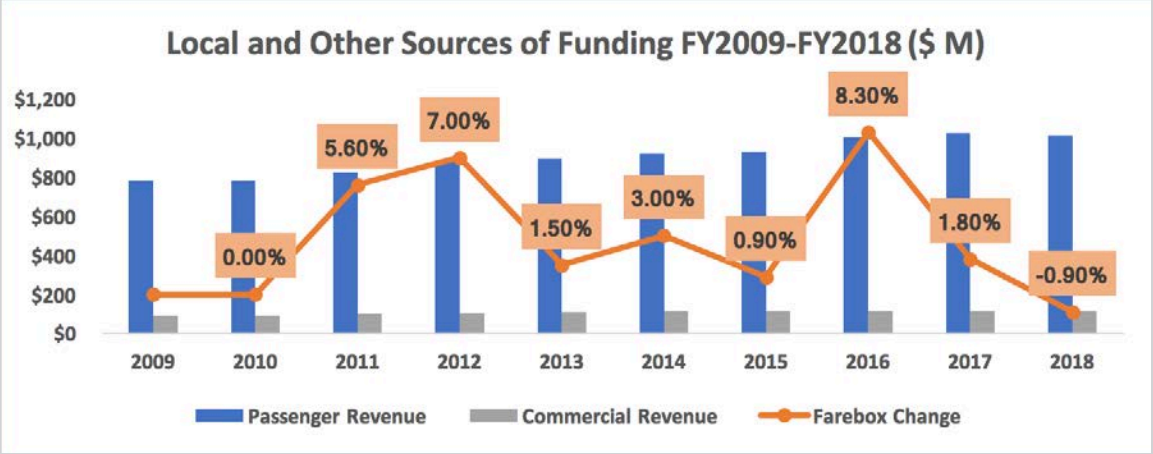


Figure 5-8: Local and Other Sources FY2009-FY2018

In summation, NJ Transit's State-obtained revenues have only begun to slightly recover after a lean period; other revenue sources have remained constant in the past decade. As operating budgets continue to increase, capital budgets have not increased and have allowed existing equipment to become more rundown.

5.5. OPPORTUNITIES FOR IMPROVEMENT

Following are two sections that identify potential additional funding sources, first within NJ Transit, and then other sources.

5.5.1. ADDITIONAL FUNDING SOURCES WITHIN NJ TRANSIT

Additional funding sources that NJ Transit might be positioned to pursue include:

- Business-to-business institutional sales
- Real estate development
- Energy cost savings
- Public-private partnerships
- Additional ridership
- Additional advertising

Business-to-Business (B2B) Institutional Sales

NJ Transit does not have a formal B2B sales program that focuses on large ticket sales to corporations, universities and other organizations. Agencies such as MBTA and King County Metro derive 40% and 60% of their ticket sales through their institutional portal program. Combined with electronic fare payment, these programs are very popular and can provide organizations a competitive advantage when recruiting and retaining employees.

Real Estate Development

NJ Transit currently owns considerable real estate adjacent to stations and along their right of way. This real estate has the potential to expand both residential and commercial revenue for NJ Transit. It is North Highland's belief that the development of this property has the potential for long term growth for NJ Transit ridership. Subsequently, NJ Transit should explore pursuing a full-time real estate development manager to focus on developing this opportunity. Transit agencies around the country have put dedicated staff or established an office to leverage, with the private sector, owned real estate for the benefit of new revenue streams and increases in ridership.

Improving the customer experience on NJ Transit property should be a continued focus. As many local stations are locally owned. NJ Transit should explore legislation within the State of New Jersey for the establishment of Community Improvement Districts (CIDs). CIDs, used in Georgia, are a self-taxed district that is comprised of membership of at least 75% of businesses in a proposed area. The district levies a tax on all commercial property in the district. The levy is used to fund infrastructure improvements. In Atlanta, CID funding has been used for Metropolitan Atlanta Rapid Transit Authority (MARTA) station and access improvements, shuttle service to transit, and better bicycle and pedestrian access to transit.

Finally, another concept that NJ Transit should examine centers on value capture. Value capture is the public recovery of a portion of increased property value created as a result of public infrastructure investment. Common value capture mechanisms include:

- Impact Fees
- Joint Development
- Land value taxation
- Negotiated exactions
- Parking fees
- Sale or leasing of air rights
- Sales tax and special assessment districts
- Station naming rights
- Tax increment financing

Transit agencies in Boston, Denver, Kansas City, and more have used some combination of value capture for improvements to existing or new infrastructure.

Energy Cost Savings

NJ Transit has implemented the NJ TRANSITGRID initiative through a Federal grant. This will "construct a first-of-its-kind electrical microgrid capable of supplying highly reliable power during storms or other times when the centralized power grid is compromised. NJ TRANSITGRID comprises two projects: The NJ TRANSITGRID traction power system and NJ TRANSITGRID distributed generation solutions.[23]

Many U.S. transit agencies are instituting policies and programs to reduce energy needs to offset operating costs. In addition, several of these systems are pursuing opportunities to generate revenue through the implementation of alternative energy technologies; by selling energy that the agency produces to support transit operations; or entering into joint development agreements for energy facilities using publicly-owned land.

Benefits of these approaches include:

- Serving long-term agency sustainability programs goals
- Developing new, annually recurring revenue streams that can be used for operations
- Financing improvements through the energy savings (lighting, electrical systems, Heating, Venting, Air Conditioning [HVAC], etc.)
- Leveraging existing assets such as publicly-owned right of way

Organizations employing this mechanism include SEPTA, Santa Clara Valley Transportation Authority - San Jose, and Metropolitan Atlanta Rapid Transit Authority (MARTA).

New Electrical Multiple Units (EMUs) like those used by NJ Transit are now being designed with the capability to use dynamic braking of the vehicles to return power back into the power grid. The one problem inherent in the technology is the loss of voltage from the rail to the power grid. Recent designs are now looking at storage capacitors to capture the regenerated power and gradually release it back into the power grid. NJ Transit should investigate cooperatively with Jersey Central Power and Light, Public Service

Enterprise Group, and Atlantic City Electric energy service performance contract opportunities for reducing its energy use or returning power to the grid.

Working with the utilities in the State, NJ Transit can immediately engage their services as they would not need to bid for this service by nature of public utility laws. NJ Transit recently worked the local power companies to redesign the Morrison sub-station to resolve issues affecting NJ Transit and the power company resulting in the replacement of century old technology with an updated and redundant power supply. Similar opportunities exist and should be explored.

Public Private Partnerships (P3)

NJ Transit had a successful Public Private Partnership that enabled the Hudson/Bergen Light Rail and Riverline. In New Jersey, government entities are permitted to enter into P3 agreements for the development, construction, reconstruction, repair, alteration, improvement, extension, operation, and maintenance of any building, road, structure, infrastructure, or facility constructed or acquired by a government unit to house government functions. NJ Transit should leverage the opportunity to enter into new P3 agreements.

[23] NJTRANSITGRID" NJ Transit Resilience Program Overview August, 2018.

Additional Ridership

NJ Transit and New York's Metropolitan Transportation Authority (MTA) have an existing agreement allowing Metro-North to operate service between Port Jervis, NY and Hoboken, NJ with ongoing connecting service to New York City. There is an opportunity to build on this existing relationship by forging an agreement with the MTA to expand this established relationship. Specifically, New York Penn Station is a primary transfer point between NJ Transit and MTA's subway services, yet no unified fare card or connection mechanisms between the two systems exists. The opportunity to share the use of the existing NY Metrocard and New Jersey's fare card systems for travelers between the two states could capture additional ridership fares for NJ Transit and also capture expanded ridership information for New Jersey's use in supporting requests for a larger share of Federal funding.

New York and New Jersey could also begin to promote expanding ridership to Newark Airport as a third international airport with comparable travel time from New York City as LaGuardia and JFK. NJ Transit would also have the opportunity to promote additional ridership between New York City and other destinations such as Atlanta City and Philadelphia.

Once the relationship is firmly established, the two agencies could use this partnership to promote seamless travel throughout the Four-State region (Connecticut, New Jersey, New York and Pennsylvania). Specifically, both agencies can focus on promoting each other's transport options, including Newark Liberty International Airport, sports arenas such as the Prudential Center and MetLife Stadium, Six Flags Great Adventure, and Atlantic City, all of which NJ Transit serves directly.

Additional Advertising

NJ Transit leverages the ability to generate advertising revenue with wrapping busses and trains, and some signage in stations and on cars. NJ Transit does not fully benefit from existing tenants and advertising outside of NJ Transit's major hubs and transit stations, as advertising represents $24 million a year in revenue and that number could be much higher. This funding source has basically remained constant over the past three fiscal years. It is recommended that NJ Transit explore additional forms of advertising consistent with new technologies and advertising vehicles. Every opportunity to take advantage of existing stations for third party advertising should be explored, potentially through partnerships.

5.5.2. EXAMPLES OF OTHER INNOVATIVE FUNDING SOURCES

State and local officials around the country have faced similar financial challenges as NJ Transit. To meet these challenges, key stakeholders have launched bold initiatives, often requiring voter approval, to finance major capital improvements. Examples of these programs follow:

Southeastern Pennsylvania Transit Authority (SEPTA)

- **Act 89:** Following on the recommendations of the Governor's Transportation Funding Advisory Commission, lawmakers crafted a comprehensive transportation funding bill to provide long-term, dedicated funding for public transit as well as roads, bridges and multimodal transportation. State Act 89 of 2013 (House Bill 1060) was signed into law on November 25, 2013.
  - Act 89 of 2013 provided a comprehensive transportation funding solution for the Commonwealth of Pennsylvania. The funding is indexed to inflation and has no legislative sunset. New revenues for transportation were generated through uncapping the Oil Company Franchise Tax (OCFT) which basically means an increase in the gas tax by $0.08, adjusting various fees for inflation, and surcharges on traffic tickets.
  - For FY2018, funding provided under Act 89 is forecasted at $351.7 million.
  - Starting in FY2023, funding for the Public Transportation Trust Fund currently provided by the Pennsylvania Turnpike Commission will be replaced by new, bondable revenue sources, including sales and use tax.

- **EB-5 Financing:** The FY2018-FY2029 Capital Program includes anticipated capital financing pursuant to the Employment Based Immigration - 5th preference (EB-5) program administered by United States Citizenship and Immigration Services (USCIS). The loan will be made available to SEPTA over a period of several years and may provide up to $300 million to partially fund certain capital projects.
- **ESCO – Energy Savings Company:** The Authority has recently taken advantage of the Pennsylvania Guaranteed Energy Savings Act to advance capital construction projects without using capital grant funds. Projects are designed and built by a certified energy savings company (ESCO) that specializes in energy efficient technologies. SEPTA arranges for private financing for the capital construction, and the ESCOs guarantee the energy savings. If the savings do not materialize, the ESCOs will be responsible for covering the difference in repayment. SEPTA is able to use the self-funding approach to improve its environmental performance without utilizing the Authority's own capital resources.
- **Partnerships with public and private entities:** Another potential source of alternative funding for capital projects is through partnerships with public and private entities. SEPTA is partnering with the Philadelphia Water Department (PWD) on the Southern Garage Stormwater Management and Paving Improvements project. Based on the scope and impact of the project, PWD is providing SEPTA with funding to help support the capital improvements, leveraging SEPTA's grant dollars.

California – Los Angeles Metropolitan Transportation Authority (LA Metro), Bay Area Rapid Transit (BART)[25]

- **Tax increases:** A measure was approved last year that provided a 12-cent-per-gallon gas tax increase, 20-cent diesel fuel excise tax increase, and new annual vehicle fees. In addition, State officials announced in April that $2.4 billion from increases in the gas tax and vehicle fees will be spent on dozens of transit projects.
- **Carbon emission credits:** An additional $1.9 billion for the transit projects will come from funds collected by the state's landmark climate change program, which requires polluters to buy carbon emission credits.

Los Angeles County Metropolitan Transportation Authority (LA Metro)

Measure M: LA Metro passed a transportation measure in 2016, Measure M, that authorized an additional 0.5 percent sales tax for transportation and the indefinite extension of an existing 0.5 percent sales tax (Measure R) also dedicated to transportation and originally set to expire in 2039. LA Metro estimates the sales tax hike would raise $120 billion over 40 years and $860 million in the first year. About 35 percent of the revenue would fund major new transit projects and about 25 percent will be used for rail/bus operations.

Metropolitan Atlanta Rapid Transit Authority (MARTA)

In November 2016, Atlanta voters approved a **half-penny sales tax** for MARTA, increasing the tax contribution to MARTA from 1% to 1.5%. As a result, it is expected to generate approximately $2.5 billion to spend over the next 40 years.[26]

[24] "Rebuilding the Program" SEPTA Fiscal Year 2018 Capital Budget and Fiscal Years 2018-2029 Capital Program Proposal March 2017.

[25] McGreevy, Patrick and J. Nelson, Laura. "Billions from gas tax and vehicle fees will go to transit projects, California officials announce" LA Times 26 April, 2018.

[26] Wickert, David. "MARTA'S Atlanta expansion: More demands for service than money" The Atlanta Journal-Constitution 03 August, 2018.

Chicago Transit Authority (CTA)[27]

- **Ride-hailing Fee:** The City of Chicago 2018 proposed a $0.15 per-ride fee starting in 2018 with a $0.05 increase starting in 2019 on ride-hailing services like Uber and Lyft to be collected by the City of Chicago as part of the Ground Transportation Tax (GTT) to fund CTA improvements.
  - The new revenue source is expected to generate $16.0 million for CTA in 2018 and will be dedicated for capital improvements to the track infrastructure that will improve rail commute times and also enhancements related to safety and security.
  - The new fee will enable the CTA to raise $179 million in bond funding for track and station upgrades.
- **Sales tax:** Illinois has dedicated a portion of its sales tax to transit. Specifically, 4% of the net monthly revenue from the 6.25% State General Sales Tax and State Service Occupation Tax and 4% of the net monthly revenue from the State Use Tax on personal property purchased at retail outside the State but registered or titled with a State agency within the State (i.e., 0.25% of total) is transferred into the County and Mass Transit District Fund in the State Treasury (the "CMTD Fund")
- **Advertising:** The 2018 budget is $38.3 million, which is approximately $3.2 million higher than the 2017 budget and $3.1 million higher than the 2017 forecast due to an increase in minimum guarantees in advertising contracts, and management initiatives to increase digital advertising. The increase in advertising and concession revenue by more than $3 million per year was made possible by renegotiating the contract to expand the number of advertising screens

Central Puget Sound Regional Transit Authority (Sound Transit)

Tax Increase[28]: In 2016, the region's voters approved the Sound Transit 3 (ST3) ballot measure that will provide $27.7 billion in new local sales, motor vehicle excise, and property taxes over a 25-year construction phase.

The tax increases are as follows:

- Sales tax of 0.5 percent ($.50 on a $100 purchase) in addition to the 0.9 percent currently collected.
- Motor vehicle excise tax (MVET) of 0.8 percent of vehicle value ($80 annually on a $10,000 vehicle) in addition to the 0.3 percent MVET Sound Transit is collecting through 2028.
- Property tax of 25 cents for each $1,000 of assessed valuation ($100 annually for a $400,000 home). A property tax was identified as a new way to establish a more progressive revenue source for regional transit investments that reduces reliance on the sales tax.
- Rental car tax of 0.8 percent ($0.80 on a $100 car rental).

[27] CTA: Investing in a 21st Century Transit System" CTA President's 2018 Budget Recommendations March, 2018.
[28] Regional Transit Taxes: Voter Approved Funding Sources" SoundTransit August, 2018.

Massachusetts Bay Transportation Authority (MBTA)

Sales Tax:[29]

- Often described as "a penny on the sales tax," the actual amount of sales taxes transferred to the MBTA excludes sales taxes on meals and includes a provision to protect against actual declines.
- The State Comptroller certifies a base revenue amount for the fiscal year by calculating a base revenue rate of growth that is applied to the previous year's transfer to the MBTA. This rate is the lesser of the inflation index or the percent increase in gross sales tax revenue, excluding meals, from the previous calendar year. The base revenue rate cannot be negative or exceed 3 percent. After calculating the base revenue amount, the Comptroller compares it to the dedicated penny of sales taxes (excluding meals but with an additional $160 million, with no cap on its possible rate of increase). The greater of these two sums is transferred to the MBTA.
- The Legislature in FY2015 added $160 million to that year's base revenue amount and to the amount from the dedicated penny as a way to replace $160 million in annual appropriations for MBTA Contract Assistance which the Legislature discontinued that year. The $160 million appears in the Comptroller's calculations each year as an addition to the dedicated penny amount. On the base revenue side, the $160 million is embedded in the calculations as well, because the growth rate is applied to a statutorily-elevated amount as of the 2015 fiscal year.
- Throughout the fiscal year, the Comptroller certifies whether the dedicated sales tax revenues from "the penny" to the MBTA (plus the $160 million) are falling short of the base revenue amount based on the most recent revenue estimates. If the dedicated revenue from the "penny" (plus $160 million) lags behind the base revenue amount, then additional monthly transfers from the General Fund make up the shortfall.

5.6. RECOMMENDED NEXT STEPS

It is evident NJ Transit cannot continue to operate under its present financial model. The deterioration of the overall asset value and the need to implement new safety technology and meet customer experience needs of NJ Transit customers requires significant and predictable funding. However, this assessment does not make recommendations where those funds should come from. Rather, this assessment identifies revenue enhancement ideas, federal grant and financing and other innovative ways state and local authorities are funding transit.

In conjunction with the Governor, Legislature and NJDOT, NJ Transit should explore:

- Growing Internal revenue streams such as real estate, B2B programs and public-private partnerships.
- Whether the Federal RRIF and TIFIA financing programs are viable options to finance critical capital and/or safety initiatives.
- Innovative funding programs from other States and local municipalities and whether they would be feasible in New Jersey.

[29] Baxandall, Phineas. " How Slow Sales Tax Growth Causes Funding Problems for the MBTA" MassBudget MBTA Sales Tax 10 January, 2018.

CHAPTER 6
CROSS HONORING

Chapter 6 : Cross Honoring

NJ Transit strives to constantly maintain a high level of rail and bus service to its customers. Subsequently, NJ Transit, as part of their daily operations, proactively anticipates delays due to unforeseen problems such as rail outages, adverse weather, and area traffic congestion. To that end, NJ Transit has established contingencies, including informal interagency relationships with adjacent transit providers and motor carriers, to assist NJ Transit in protecting their riding customers from service interruptions. These agreements are known as "cross-honoring" agreements.

Cross-honoring agreements enable NJ Transit customers to use their NJ Transit ticket and/or pass on alternate travel modes to their ticketed destination. When cross-honoring is in effect, NJ Transit passengers can travel on other rail or light rail service and, in some circumstances, private bus and water carriers. NJ Transit places no restrictions on its riders to assist them in arriving at their original destination. However, other carriers may apply additional fees should the rider extend their travel beyond NJ Transit's ticketed destination.

Current cross-honoring agreements for emergency services have been enacted between NJ Transit, 16 private bus carriers such as Greyhound, the New York Waterway, the PATCO Speedline, Port Authority Trans-Hudson (PATH), the Southeastern Pennsylvania Transportation Authority (SEPTA), the Long Island Railroad (LIRR), and Metro-North. NJ Transit does not currently have cross-honoring agreements with Amtrak or the New York City subway system.

NJ Transit's ongoing cross-honoring agreements also involve daily, non-emergency situations. NJ Transit currently has agreements with both SEPTA and Metro-North Railroad and these relationships have worked well and generated revenue for all concerned parties. NJ Transit equipment is used to provide New York and New Jersey riders along the Main and Bergen County Lines one ride transportation from Port Jervis partially along Metro-North rail into Hoboken Station where riders have the option to change to New York-bound PATH trains to their final destination. Metro-North and NJ Transit are currently planning a capital expansion project to riders on the Port Jervis line with the option of a one seat ride from Port Jervis to New York City using the Secaucus loop. When this loop is completed around 2030, ridership is anticipated to increase by allowing both New York and New Jersey residents a one seat (no change of train in Hoboken) ride into New York City.

SEPTA's cross-honoring agreement with NJ Transit varies somewhat from the Metro-North agreement. SEPTA's agreement allows NJ Transit and SEPTA to carry riders between Philadelphia's 30th Street Station and Trenton on a regularly scheduled basis. However, a unique requirement of this cross-honoring agreement is that both railroads can carry passengers in only one direction. As a result, once SEPTA uploads passengers at either 30th Street Station and transports them to Trenton, that train must "dead head" (carry no passengers) back to 30th Street Station. Similarly, when NJ Transit carries passengers from Trenton to 30th Street Station, the NJ Transit train must dead head back to Trenton. This process is both inefficient and costs both agencies excessive crew time and operation of empty vehicles that are not generating revenue.

FINDINGS

- Consistent communications during cross-honoring is an important part of the implementation process. The communication of when cross-honoring is invoked is not formalized. In the case of a major service disruption, operations staff will inform Contract Services. Contract Services will communicate with the appropriate partner that operates service in a similar corridor to invoke cross-honoring. In many cases, operations staff has "short-circuited" this process and informed partners to begin service so that the service can be provided more quickly.

- From a customer standpoint, once cross-honoring is invoked, there is good communication within the station between customers and operations staff on how to mitigate service changes. However, there is limited use of social media for giving information to customers ahead of their visit to the station.
- NJ Transit personnel make an effort to put the customer first and ensure they are able to have continuity of their trip despite an event or construction.
- The operating department's main objective, during delays encountered, is getting the passenger to their destination efficiently with as little inconvenience as possible.
- The process of cross honoring works and provides the needed alternative transportation that riders need. There is opportunity to further assess Cross Honoring from a long-term sustainability standpoint, but the need to improve what is in place is not a priority.

CHAPTER 7
MOBILE APPLICATION

Chapter 7 : Mobile Application

7.1. INTRODUCTION

Mobile application improvements are all about the user experience. Getting to the point of how the user is best satisfied across a wide range of often diverse users is the challenge. North Highland employs a behavioral design approach to developing user experience improvements across digital channels such as mobile.

In today's online world, what was formerly viewed as experience design is evolving from 'can they' to 'will they' and further measuring 'did they'. The movement is from "Experience Design" to "Behavioral Design." This concept is graphically displayed below in ***Figure 7-1***.

Figure 7-1: Summary of Recommendations

The service that NJ Transit provides for riders is dynamic and complex. The focus in this task was on the front- and back-end technological offerings provided by NJ Transit with a stronger emphasis on the mobile application on Android and iOS. This Chapter examines the mobile application with an aim to identify opportunities to improve the customer experience.

Technology and data are transforming the transportation industry. The ability to plan trips, use the services, track and pay for trips via mobile devices is changing the way people get around and interact with cities. With growing customer demands and need for better experience via different channels, innovation in the next generation of transportation services continues to gain speed, and today mobility companies have been developing apps to encourage multimodal information. With the advancement of technology, multimodal trips, personalization and innovative travel modes are becoming more common. The widespread usage of smartphones and mobile devices enable riders to access more information about the transportation modes available to them.

Transit agencies are focused on increasing customer touchpoints and adapting to the changing technology trends to drive customer experience. With a feature-rich app, NJ Transit can capitalize on customer data and provide riders with an improved experience.

7.1.1. CURRENT STATE

The NJ Transit mobile application on both Android and iOS is very feature-rich—it contains many capabilities such as planning a trip, buying tickets for all kinds of transit options, holding credit card information on file, providing customized alerts for a rider's train line or bus, schedules for each line and bus, providing feedback, control settings and much more. However, the data shows that some

key features are not being accessed as often as they should be some features as lower than 1% of usage versus other features. Our research shows that the app's information architecture – the way the information is organized for all features–has room for improvement. The app can be made evenmore user friendly to complete core job tasks. When compared to other transit apps in the space in the Northeast region, as of now, the app is one of the relatively easiest to use when looking at the core job to be done. Our analysis will show that there are small tweaks in key spots that need to be made to improve customer experience.

Furthermore, all features are not implemented in an in-context personalized way; the experience is very siloed. As a result, all trip planning happens in the Trip Planner, for example. There is no other way to access it globally throughout the experience. Alerts and notifications also are in one specific area in the app. If a user is not actually in the app itself, there is no actual notification sent to them–a best practice seen in majority of popular apps such as Google Maps.

NJ Transit app provides users with an ability to customize their screen based on specific needs. But, personalization and customization are not the same. They are merely two methods of creating an experience unique to an individual. Both methods require special attention to be implemented properly, and both are great tools to allow users to feel more in control or have power over the experience.[30] A truly personalized and motivating system tries to interpret the needs of the user via minimal interaction or zero interaction. At most, they have to opt-in or opt-out, or paternalistically, they are offered no choice at all. This reduces user friction by not forcing users to necessarily interact to start, but instead offers the ability to override via customization. As of now the NJ Transit app does not offer any ability to do this. Many other modern apps in the space however, do, such as Google Maps, Uber and Lyft. To that point, customization is best used in situations where personalization cannot be fully trusted, or the algorithms are not perfect.

7.1.2. DESIRED STATE

The NJ Transit application is not far from the desirable state. Basic foundational elements need to be improved to evolve rather than overhaul the experience. After all, the numbers don't lie. The app currently supports 1.8 million "MyTix" (branded term for mobile app ticket sales) accounts with around 500k+ monthly average sessions, and continues to outpace other modes of purchasing tickets, such as ticket vending machines, in terms of growth in revenue. The MyTix sales have steadily grown since the app's inception of $156K in 2013 to $20.3M in 2018 while ticket vending machine sales are descending. These facts along with a study of the behavioral analytics were taken into consideration in our analysis and recommendations. We feel that an upgraded app must cover the existing app's gaps; re-architect some key interactions with trip planning, and payment, and overall navigation; compensate for features that are needed by an extremely diverse group of users; ensure real-time data reliability; and finally, grow more advanced features on the foundations that are already built.

An upgraded app that would be considered best-in-class would be described according to the following four attributes: **Accurate • Intuitive • Fast • Visual**.

7.2. METHODOLOGY

North Highland's approach is based on behavioral design approach to develop user experience improvements across digital channels such as mobile applications. It requires a systematic assessment of the design features, data processing, user feedback and overall architecture of the NJ Transit app as detailed in ***Figure 7-2***. The overarching goal of this assessment is to determine how effectively NJ Transit can leverage the growing technological trends to improve the overall customer experience.

[30]Schade, Amy "Customization vs. Personalization in the User Experience" Nielsen Norman Group 10 July, 2016.

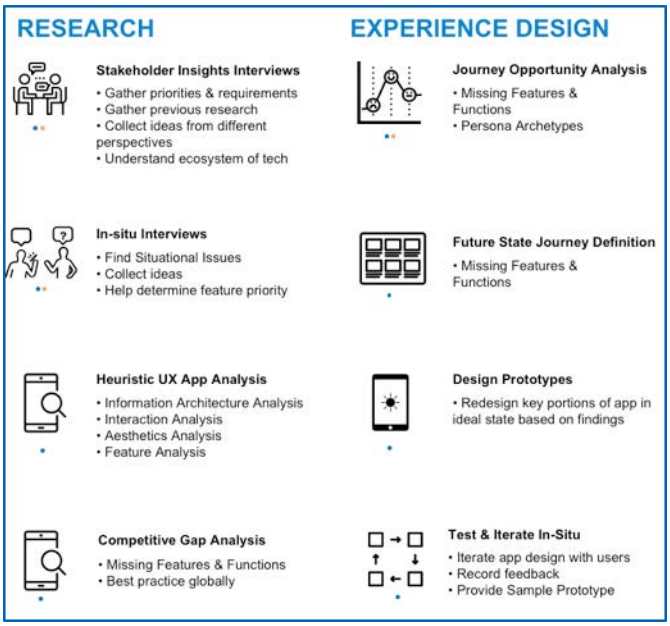


Figure 7-2: Methodology

In addition to North Highland's expertise in mobile applications, North Highland used the following data sources to conduct a diagnostic of NJ Transit's app:

- **Stakeholder Interviews:** We conducted stakeholder interviews with 8 individuals associated and familiar with the mobile app. Interviewees included leadership team, department heads and members of the information technology, emergency response, customer service and app development departments to understand the current state, gaps and planned changes in the app.
- **Customer Interviews:** We also conducted 40 customer interviews (at both peak and off-peak times with NJ Transit users at Trenton, Hamilton, NY Penn, NY Port Authority, Newark Penn and Metropark stations) spanning across diverse demographics to gain insights on user needs, feedback and recommendations for the app.
- **Archetype Developments:** A persona archetype is a type of persona that represents states of mind and other broader categories of people that define a use of a product or interaction at a touchpoint. ***Figure 7-3*** shows a sample archetype. We developed archetypes for users and employees to illuminate the key jobs to be done for that personality, identify this type of user's needs, their desires, and emotions to watch out for, as well as shine a light on what the business needs to support in the form of features and offerings for each identified need. We designed archetype personas by layering insights gained from qualitative research onto segmentation data and other quantitative research findings. Personas are used in the design process as guardrails and directional input. They help constrain and point the way for the creative process. ***Table 7-1*** provides a list of Archetypes developed.

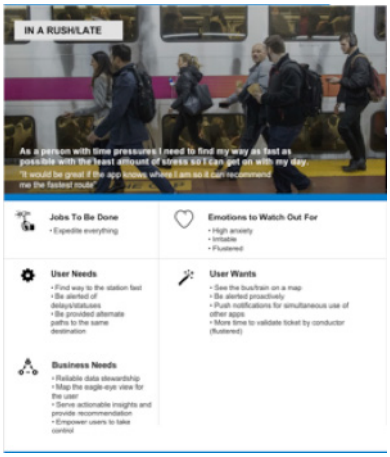


Figure 7-3: Sample Archetype

ARCHETYPE CATEGORY	TYPE OF ARCHETYPES
Customer	Late/In Rush, Daily Commuter, Underbanked, Limited English Proficiency Speaker, Senior Citizen, Digital Savvy, Veteran, Disabled, Infrequent/New, Anti-Pattern
Employee	Train Conductors, Bus Operators, Customer Service Managers/Coordinators

Table 7-1: Types of Archetypes

- **Customer Journey Map:** The Customer Journey Map was created by "mapping the system" to every major point along the customers' dynamic journeys. Mapping out the points of entry and exit of how a user enters and interacts with technology in the system, helps identify gaps and opportunities for improvement along the customer journey. Focus was on how the mobile application plays its role in the following phases of the journey:
  - Planning: Based on what the customer experiences, sees, hears, feels, and interacts with while planning their trip or route. Also, shows what all necessary actions the user needs to take to prepare for a trip using public transportation.
  - Service: Based on what the customer experiences, sees, hears, feels, and interacts with while riding the transit (Bus and rail)
  - Wayfinding: Based on what the customer experiences, sees, hears, feels, and interacts with while finding their way to the station, next leg of their journey or to their destination
- **User Experience (UX) App Analysis, Prototyping and Testing:** We conducted an in-depth analysis of the app to understand the dynamics of the app and the experience or product's response to the user needs. Following the analysis, we developed app prototypes and tested the app with users to record customer feedback. The app was evaluated based on the following factors:
  - Information Architecture analysis
  - Interaction analysis
  - Aesthetics analysis
  - Feature analysis

- **Competitive Benchmark Analysis:** To supplement the assessment, a comparative analysis between other transportation apps in the local region was performed. Other transportation apps seen in the space such as the MTA, MBTA, SEPTA, and CTA all relatively score the same in the Apple iTunes App store – none received a score above 3 out of 5 stars from their respective user-bases. Our gap analysis revealed however that NJ Transit's app is as of now the most feature-rich and with upcoming fare modernization practices the app in terms of features will cover any gap it's missing found in other transportation apps in the region.

7.3. ASSESSMENT SUMMARY

The NJ Transit app analysis encompassed the following assessment factors for the different process dimensions listed below.

- **Aesthetics** – Interface Styles, Imagery/Branding/Emotional Impact, Animation Effects, and Accessibility & Contrast.
- **Interactivity** – Affordances, System Feedback, Navigation Patterns/Ease of Use, and Micro interactions.
- **Information Architecture** – Value Proposition Communication, Copy Effectiveness & Clarity, Information Hierarchy and Ease of Content Consumption.
- **Technology** – Performance, Flexibility & Scalability, Cross-Platform Analysis and Analytics.

7.4. ASSESSMENT FINDINGS

For this assessment North Highland Designers evaluated the current aesthetics, function, and usability of the NJ Transit app. Findings are presented below for the Main Screen, Side Bar, Wayfinding and Route/ Trip Planning, Ticketing Purchasing and Validation, Alerts and Notifications, Managing Settings.

The findings in each section are numbered, and they correspond to the red numbers in the visuals of the screens.

7.4.1. MAIN SCREEN

1. Alert area takes up a large portion of the screen and is not complete.
2. The white space in the center of the screen is very large space to use for the primary choices for the user to take. Modern apps do this differently and there are more streamlined ways to improve this such as revealing shortcuts to buy a ticket for the bus or train immediately without having to tap twice.
3. The expected information architecture does not really appear in this application (app). It still is very functional and able to be used easily, but there are ways to streamline the content and most critical needed features even more. This app is more organized like a mobile website. (As an aside, the mobile website should be equal to in terms of features and functions of the app. There is also no guide offered on how to use the app. The app does not orient the user, it expects him/her to figure it out on his own.

Figure 7-4: Main Screen

7.4.2. SIDE BAR

1. The use of a menu icon at the top left is a common practice for a multi-function app and is well recognized by users.
2. The icons appear to be blurry. It is best practice to create custom icons that all carry the same consistent style. These are very close, but they can be even more closely designed together. Settings for example is much thinner than the rest and Police is the only colored one.
3. App owners indicate in interviews that the "NEW" in red means this is a "new feature." To the user it can seem that there is a new alert. Consider an alternate way to show new features to the user and be consistent with how new status update notifications are handled. Also, brand terms like "DepartureVision" are not self-evident and won't translate well into other languages.

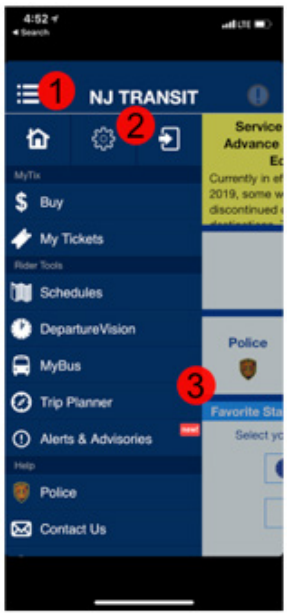


Figure 7-5: Side Bar

7.4.3. WAYFINDING AND ROUTE/TRIP PLANNING

Figure 7-6: Wayfinding and Trip Planner

1. MyBus is useful to see when the bus will be arriving at particular stops, however, it does not work consistently (unclear if technology issue).
2. Users interviewed really want to see the bus or train on a map to allow them to track how many stops are left on their journey.
3. The app is incapable of recognizing malformed addresses. Other transportation apps that riders use such as Google Maps and Uber allow users to search "live" as they type the results come up to help with this. The app is also incapable of recognizing New York city addresses. Less than 1% (0.49%) of users in a given month access the trip planner.

7.4.4. TICKET PURCHASING AND VALIDATION

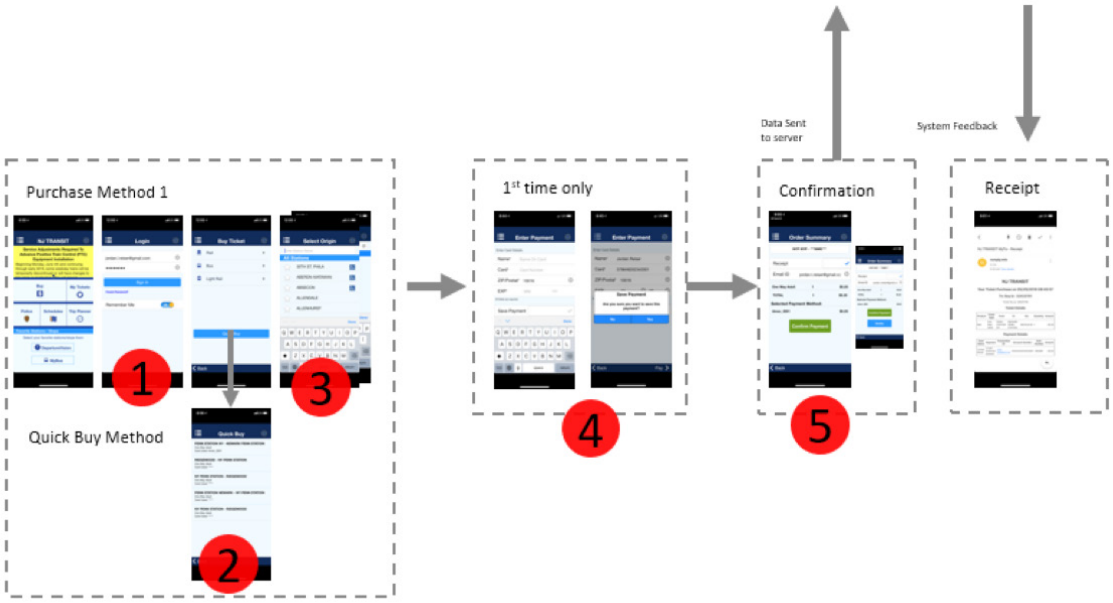


Figure 7-7: Ticket Purchasing and Validation

1. Forcing the user to sign-in each time they purchase a ticket is not ideal. The technology should support persistent logged in State. Users expect this in all apps. Currently, the app saves the password so there is an additional unnecessary step with the log on.
2. Quick buy function is best practice but the access button should be more globally accessible. It currently has a 97% success rate when users choose this method.
3. Infrequent or new users may have trouble as they may not know the right station names to input. The trip planner helps but is a separate experience and there is no way to buy a ticket, pre-configured from the trip planner.
4. The entry form is fairly standard and easy to use. It can be advanced further with options such as camera scanning. Also, the payment screen uses a lot of text instead of icons, impacting the customer experience and interaction.
5. Receipts are usually given without consent and stored permanently in a transaction log. This is a critical juncture screen, no need to distract the user with more choices.

7.4.5. ALERTS AND NOTIFICATIONS

1. This icon has low affordances, meaning it does not look like something that supports interaction. Also, this icon is not considered best practice as most users do not understand that it means "filtering."
2. There are opportunities to improve the interactivity of the alerts and notifications area. Other apps offer robust control over alerts. Personalized push notifications to indicate status adjustments is a big ask of users interviewed.
3. There is no clear immediate indication of what the difference between types of notifications is. In this example, travel alerts and service advisories have identical styling, but un-identical uses.
4. The information is presented clearly, but the separation between unique alerts can be improved aesthetically.
5. Our research indicates that people don't seem to mind ads as long as they don't interfere with what they are doing.

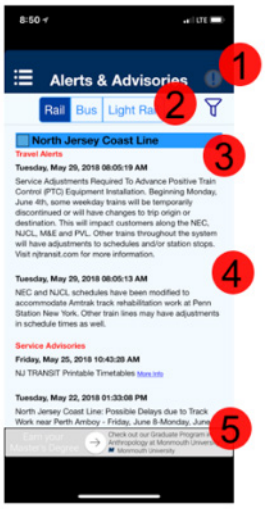


Figure 7-8: Alerts and Notifications

7.4.6. MANAGING SETTINGS

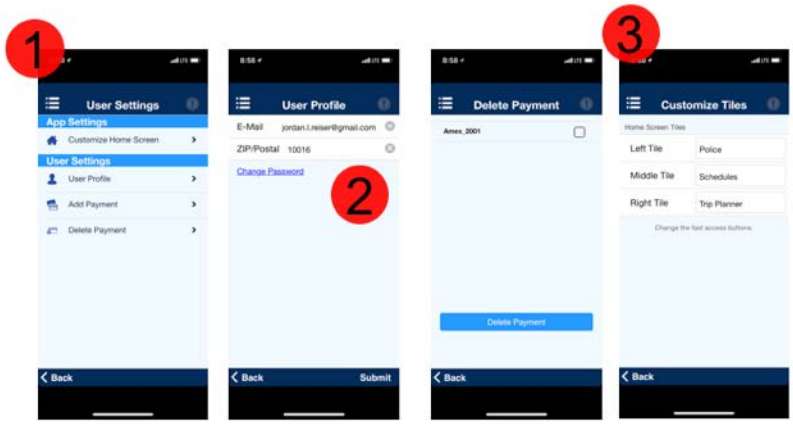


Figure 7-9: Managing Settings

1. Settings appear to be organized very well. However, the functions for adding, editing and deleting could all be controlled in one screen instead of two and there doesn't appear to be a reason that alerts and notification settings are not also contained here.
2. Many user profiles provide additional options for personalization, such as the opportunity to select favorite routes.
3. Although offering customization options is a plus, the app lacks automated personalization features that can determine what users need without asking them or forcing them to do so.

7.5. OPPORTUNITIES FOR IMPROVEMENT

The app has improved customer experience and is relatively easy to use but has room for further improvement from an information architecture perspective. The app is also feature rich; however, a couple of key navigational changes will further enhance the customer experience.

- Readability and proper information design contrast between elements would improve the overall design aesthetics.
- We believe that upgrading the app to take advantage of the features that the Apple and Android devices offer for native applications will deliver a seamless interaction.
- The biggest opportunities to enhance in the immediate future is the alerts and notifications, trip planning, and ticket purchasing in the app as these factors directly influence rider behaviors. Trip Planning needs to be better integrated into the experience. The planning experience itself is subpar when compared to other popular trip planning apps like Google Maps and as a result, users simply don't use it.

It is our opinion that NJ Transit's must focus on a stronger architecture and user experience supported by technology to continue to provide a sustainably engaging environment. Over the next 10 years, improving ridership will need transit agencies to meet the following requirements :

- Reliable Systems
- Real-time Updates
- User-Friendly and Intuitive Experience

The recommendations in each of the following sections are associated with numbers, and they correspond to the numbers from the customer journey map in ***Figure 7-10*** that highlight the opportunities along the customer journey for NJ Transit.

Figure 7-10: Customer Journey Map

7.5.1. CORE, NAVIGATION AND ORIENTATION

Recommendation: Streamline app navigation and refine orientation to provide a seamless user experience.

3 – **Provide Persistent Login/Biometric Password protection.** Enhance customer experience by providing persistent login and biometric protection via touch or facial recognition in-line with the iOS and Android applications.

3 – **Improve Information Architecture and remove unnecessary interactions.** Some labels in the app are difficult to understand. (e.g., DepartureVision is difficult to understand for LEP user types, "Contact Us" is typically about contacting a company but a feedback form exists in this section, a label on the alerts menu option saying "new" can confuse a user into thinking that there is a new feature, not a new alert.) Improving the information architecture and eliminating redundant interactions will make it easier for users to navigate through the app.

3 – **Improve social media linking in Ecosystem.** There are currently no direct links or feeds on the app to NJ Transit's social media feeds (e.g., Twitter). Providing social media links will boost brand perception and image.

3 – **Provide an interactive tutorial on how to use the app.** It is a best practice to do this for elaborate multi-function apps. Interactive tutorials are especially useful for new users who have never interacted with this interface and it gives them a head start in how to use features and where items are located.

12 – **Comply color and design with ADA requirements.** The color design currently needs to be in compliance with the ADA (American with Disabilities Act) guidelines for contrast and other accessibility features.

– **Update Iconography.** Some icons on the app are blurry and not consistent in colors. Also, it would be a good idea for the icons for trains/buses stations to match the physical signs seen in stations.

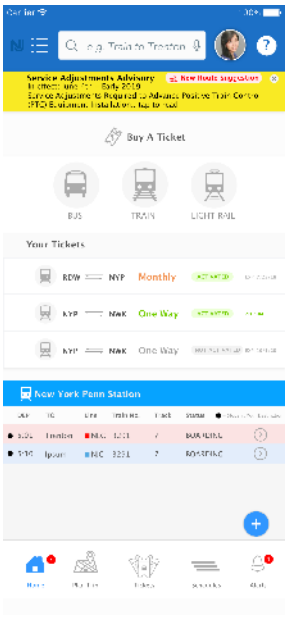


Figure 7-11: Home Screen Prototype

7.5.2. WAYFINDING/ROUTE PLANNING

Recommendation: Invest in wayfinding initiatives through personalization and data integration to improve customer engagement with additional features.

- (4) **Improve Route Planning experience.** The current Trip Planner is ineffective when compared to other popular apps like Google Maps. The majority of users we spoke to use Google Maps instead of the trip planner. NJ Transit should consider integrating the app with Google Maps and revamping the trip planner to meet user needs.
- (5) **Add station location labels/number of stops.** The app doesn't display stop information currently along a route, it only plans out beginning and final destinations based on purchases. As users expect to know how often the bus or train stops along their journey, adding the labels with station locations or remaining stops would help the users customize their journey in real-time.
- (6) (13) (10A) **Provide real-time tracking of Bus or Train on the map.** Real-time map tracking was the most sought-after feature among the users. Users expect an "Uber" like experience, meaning being able to see the bus or train on a map with an indicator of how long it will take to arrive. Providing the real-time updates on the map would improve the interaction and increase the user activity on the app. SEPTA app currently provides the map feature.
- **Provide personalized schedule display.** The schedule displays on the app currently are not personalized to the user based on the journey. Instead, the user has to manually select the routes from the home screen. Adding personalized schedules based on the user journey, would eliminate manual interactions and upgrade the journey experience.

Figure 7-12: Route Planning Screen Prototype

7.5.3. TICKET PURCHASING AND VALIDATION

Recommendation: Upgrade ticket purchasing processes and platforms by leveraging new technologies to improve efficiency and effectiveness.

5 14A 14B – **Improve ticket validation process.** The ticket purchase, activation and validation process are slowing down the experience and creating confusion. Offline activation of tickets with validation via QR code scanning will help improve the experience and make the process efficient for conductors.

12 – **Allow app to app ticket purchasing integration.** (e.g., Buy tickets from Google Maps.) Integrating the ticket purchasing with Google maps would allow a user to see prices for NJ Transit tickets directly when creating a route in google maps. Rideshare apps like Uber, Lyft, and Juno do this currently. When the option is selected, the user is taken to the respective app to complete the purchase and order the ride, with all details carried over from google maps automatically. Integration would allow NJ Transit to create additional avenues to purchase tickets and provide an opportunity to increase the number of app users. (And possibly have a positive influence on the NJ Transit rail and bus ridership.)

13 – **Enhance ticket information (e.g., Schedules on Activated Ticket).** There is under-utilized space on the ticket screen. It would be a good idea to add schedule and departure time information to the activated ticket screen so that users don't have to switch screens to find the information, improving efficiency and customer experience.

7 – **Leverage Voice Service Assistants to purchase tickets.** Virgin Trains recently announced that customers with an Amazon Echo device can book Virgin Trains Advance Single tickets via Alexa using the Amazon Pay service. NJ Transit could leverage the voice service assistant technology through partnerships to be the first transit agency in US to provide the service, thereby increasing purchasing flexibility for customers.

13 – **Provide feature to add ticket on lock screens.** Tickets should be able to appear on the lock screen. Airline apps perform this by integrating with the device's digital "wallets". It allows the QR code to be displayed in a notification box as well as act as a link so that users can jump directly to the app to display the ticket.

11 – **Allow users to print mobile tickets.** Printing mobile tickets would enable users to redeem app tickets in situations where they are unable to use their smartphone after purchase (e.g., dead battery, software failure). Integrating the app with the ticket vending machine would allow users to get access to a printed ticket.

7 – **Increase ticket payment options.** In addition to PayPal, debit and credit cards, NJ transit should consider adding improved payment options such as Apple Pay or Android Pay for users. It will help drive efficiency and experience as users can simply pay with a single biometric touch.

7 – **Offer ability to buy packages through the app.** Certain special products offered on the website or through other avenues outside the app (e.g., special promotions such as tickets to "Six flags" with transportation on the app). Providing packages and bundles on the app would increase the uptake and improve brand image through increased awareness of offers.

7 – **Enable purchasing of student discounted passes using mobile app.** Student's currently can't redeem their benefits in the app, so they have to use the website/offline methods to get their student discounts. All university level students have an ID specific to the school and an email address that can be used for authentication. Integrating the student discounts on the app would improve the experience and make the process more efficient.

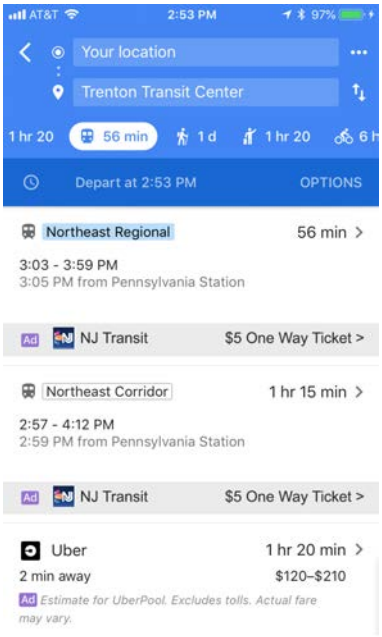


Figure 7-13: External App Purchasing Prototype

7.5.4. ALERTS AND NOTIFICATIONS

Recommendation: Personalize alerts and notifications based on user journeys and real-time data integration to boost the customer journey experience.

9A 19 15 – **Personalize push notifications to elevate experience.** The Alerts and Notifications features are not currently not personalized. (e.g., "Reminder to leave notifications" is an example of an important one that tells users when they should leave from their current location in order to catch the bus or train.) The user can opt-in to this notification when they buy a ticket or opt-in for it to be notified daily based on a desired time slot. There are many other kinds of notifications needed as well that push to the user rather than the user having to "pull" the information. (e.g., Your bus is delayed by 20 min.)

- **Integrate notifications with Voice Assistant Services.** NJ Transit is already working on integrating the app with Alexa to provide users with an option to check status of the trains or buses via Alexa. NJ Transit should also consider integrating app with other voice services such as Google Home and device assistants such as Siri to capture larger customer base.
- **Provide reminders based on Global Positioning Service (GPS).** An add-on feature that would help increase customer experience by providing notifications to get off at the stop or transfer trains based on their journey.
- **Develop personalized route status indicator.** A daily commuter should be able to quickly glance at the app to understand if their normal route is affected by service outages or not. A simple green light or red light against the train/bus route should suffice as used by London tube app.
- **Provide users with option to opt-In email Notifications.** Users may want to receive email notifications in addition to or instead of push notifications. This ability is standard among airlines for reservation-based trips.

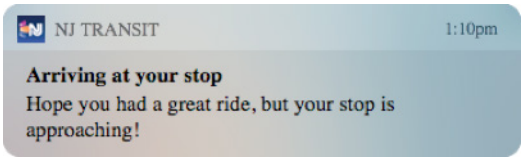


Figure 7-14: Push Notification Prototype

7.6. RECOMMENDED NEXT STEPS

Table 7-2 presents a summary of the recommendations listed above, in order of prioritization.

Focus / Sub Task	Recommendation	Priority	Level of Effort	Value Delivered	Key Success Factors
Alerts and Notifications	Personalize alerts and notifications based on user journeys and real-time data integration to boost the customer journey experience.	High	High	High	▪ Robust back-end data architecture to provide real-time updates ▪ Native app rather than web-based app with persistent login ▪ Integration with Voice Service Assistants ▪ Incorporating machine learning to understand user behavior
Ticket Purchasing and Validation	Upgrade ticket purchasing processes and platforms by leveraging new technologies to improve efficiency and effectiveness.	Medium	Medium	High	▪ Integration and data sharing with Google ▪ Integration with external devices to ensure offline validation ▪ Data sharing and collaboration across multiple teams
Wayfinding/Route Planning	Invest in wayfinding initiatives through personalization and data integration to improve customer engagement with additional features.	Medium	Medium	High	▪ Data sharing with external partners such as Google ▪ Robust back-end data architecture to support updates on map ▪ Personalization and data integration
Core, Navigation and Orientation	Streamline app navigation and refine orientation to provide a seamless user experience.	Low	Medium	Medium	▪ Integrating with Apple iOS and Android platforms to enable biometric login ▪ Standardization across app in terms of iconography and color scheme

Table 7-2: Summary of Recommendations

CHAPTER 8
CUSTOMER COMMUNICATION

Chapter 8 : Customer Communication

8.1. INTRODUCTION

Advancement of technology, rise of social media, and growing customer needs have transformed the transportation industry with an increased focus on customer service and communication.

For Customer Communication, the North Highland team evaluated the channels, content, technology, processes and teams associated with customer communication and reporting of services. The objective of this Chapter is to examine the issues associated with customer communications and explore areas for improvement for NJ Transit as they relate to technology-enabled and customer focused communication.

Communication and reporting of services is key to customers. As the service is so vital to their personal and professional lives, the slightest problems generate much bigger complaints than other services used by the public. NJ Transit faces the unique confluence of factors that magnify the difficulty in that there are thousands of customer touch-points and large swathes of the service are owned, shared and ultimately dependent on other transit companies. The service has also faced a lack of investment to maintain what was traditionally a leading approach when it came to customer-facing technology at least.

These circumstances create considerable challenges when it comes to communicating and reporting services to customers. This section of the report details where NJ Transit could focus efforts to improve. It is worth bearing in mind while reviewing these findings that they will almost all serve to not only improve the intangibles of customer experience and NJ Transit's brand image but also tangible benefits such as process efficiency, employee job satisfaction and cost to serve to name a few.

8.1.1. CURRENT STATE

The current state of NJ Transit is explained best under our three themes in this review:

- **Technology** – Data is in silos across the organization with teams unable to access vital information to be able to provide necessary reporting to customers.
- **People and Organization**– An approach of silos manifests within teams as well. People work within their areas of responsibility but are not linked in well with others. As the customer experience spans multiple teams there can often be gaps due a lack of collaboration.
- **Channels and Content** – There is varying levels of success across the four areas reviewed within this task (Mobile, In-Transit, In-Station and Social Media). These areas are dependent on more than one technology or team, that could be improved to meet best-practices.

8.1.2. DESIRED STATE

The desired state of NJ Transit is to have data stored in a central data or a content management system. Then, all teams could push and pull data when required, enabling customers to be empowered with accurate and automated reporting and self service. Other customers who do need help in understanding NJ Transit services have effective and efficient channels where employees have efficient tools to help them respond to statements correctly in a timely manner that enables customers to get to their objective with the least amount of hassle as possible.

8.2. METHODOLOGY

Our research methodology requires us to insert ourselves into the experience and observe people already in use of the application in the experience. We observed numerous people as they engaged NJ Transit services and interviewed 40 customers and eight (8) stakeholders (from customer-centric and technology departments) to get both the customers' perspective on the application in-situ and gain the understanding from stakeholders to understand the current thinking within NJ Transit.

We also conducted secondary research on leading transit authorities around the world as well as interviews with subject matter experts who have worked in some of these transit agencies. Services of Atlanta, New York, Boston and Chicago were assessed to identify trends and practices within the United States, while transit authorities from London, Amsterdam, New South Wales and Singapore were assessed for best practices. Additionally, we also looked at different stakeholder groups to identify best practices in meeting needs of a diversified customer base. We took our insights on global best practices and applied them to the context of NJ Transit's experience to identify tangible, realistic and attainable goals that customers confirmed would provide them a better experience.

8.2.1. BEST PRACTICES TO ADDRESS DIVERSIFIED CUSTOMER BASE

Title VI requirements mandate that no customer be excluded from participation in the services of NJ Transit. To identify best practices and guidelines to ensure compliance with this law, research was conducted with leading NJ Stakeholder groups. Provided below are the best practices that can be leveraged to improve communications across the Visually Impaired, Hearing Impaired, Limited English Proficiency and Elderly segments of the customer base.

Visually Impaired

Stakeholder Groups:

- New Jersey Commission for the Blind and Visually Impaired
- Vision Loss Alliance of New Jersey

Website

- **Make Allowances for Enlarged Text.** Often, simply making text larger is all that a user requires. Consider offering alternate stylesheets with larger font sizes and make sure layout doesn't break when text-only zoom is enabled in the browser.
- **Be Mindful of Colors for Action Items.** One place where the use of color should be given the utmost attention on a website is action items. When creating buttons or notices that call the user's attention and require their direct interaction, try to avoid using color combos that are easily confused by color-blind users (red and green, blue and yellow) and make sure these elements contain clear, visible text or iconography that makes their purpose clear.
- **Mobile sites are not ideal for blind users.** Mobile sites can be quite useful for sighted persons with vision problems. However, mobile websites that utilize large amounts of JavaScript and AJAX functionality are not ideal solutions for blind users who need to access the web via screen reading technology.
- **Use keyboard shortcuts to aid navigation.** In addition to being useful to persons with screen readers, keyboard shortcuts can make site navigation for the visually impaired user far easier. With the addition of keyboard commands, it's possible to navigate a site with the use of arrow keys and a few quick keystrokes, eliminating the need to follow a mouse cursor across a screen.

App

- **Utilize Voice Service Assistants on phones.** These features on smart phones are a game changer, granting the same access to the digital world to non-sighted users as everyone else.
- **Design account to support dynamic type.** It is important to design account to support Dynamic Type. This is the simplest and arguably most common way you can make your app accessible for low-vision users. In the OS for almost all devices, the user can change the text size to be larger. For users who change the OS font to be larger, downloading an app that doesn't allow Dynamic Type can be discouraging and could prevent users from being able to use your app at all.
- **Ensure proper contrast.** It is easy to assume that everyone who uses your app is a millennial with 20/20 vision—but this is far from the truth. It is essential to ensure that colors, typography, and visuals are legible and readable to all users.
- **Implement dark mode.** Implementing a night or dark mode in the app will make it much easier for low-vision users to read light text on a dark background than the traditional dark text on a light background.
- **Use sound to communicate messaging.** Sound is something that visually impaired people use to communicate. For example, when users go from one item to the next, there should be a sound to let them know that something on the screen has changed and what they just tapped on worked. In the same way, if the user enters an incorrect password or if an error occurs, there should be a distinct sound to let the user know that something is wrong.

Stations

- **Install guiding strips.** Installing guiding strips in stations that lead from one key point to another.
- **Provide Audio files for trip planning.** The ability to plan a trip online and download it to a MP3.
- **Install location indicators.** Install sound tiles for location indication (e.g., service desk; entry/ exit stall; elevator/escalator etc.)
- **Install tactile maps.** Tactile maps in priority stations
- **Utilize Braille at stations.** Braille signs on elevators; handrails on escalators and stairs for platform identification. Braille on card machines with clear, descriptive and audible user directions for the blind

Hearing Impaired

Stakeholder Groups:

- The New Jersey Division of the Deaf and Hard of Hearing (DDHH)
- The Hearing Loss Association of New Jersey

Website

- **Provide multiple contact options.** Some companies only provide a phone number, which can be very stressful for those with hearing issues. Most deaf people cannot hear well on the phone, so other means of contact are always being sought. The incorporation of other contact methods onto the sight could prove to of tremendous benefit for the hearing impaired (e.g., email, Skype, online forms or live webchat).
- **Present messaging that is brief, concise and simple.** Avoid using jargon and technical words. For some deaf people, English isn't their first language. It is helpful for the hearing impaired to read key details. Also, the use of simple short sentences and images to assist in illustrating a topic can be helpful.
- **Caption Video Content.** Video content should be captioned and synchronized with the audio. This ensures that the users fully understand the content even though they miss the audio. Video captions can also be helpful to people who have trouble understanding your audio due to poor playback on dial up Internet lines.

- **Consider the use of American Sign Language in Multimedia.** American Sign Language users in America alone range from a half million people to 2 million people. In Britain, the number of sign language users is between fifty thousand to seventy thousand people. Investigating benefits of using sign language for the provision of multimedia content, would assist the users in understanding the content even better.

App

- **Promote push notifications.** The ability to alert the hearing impaired on things that are announced overhead could be put into text and pushed to smart phones in the area. An example of this would be text updates on when boarding begins; when a train is arriving or delayed; when buses changes numbers mid-route; and when crucial changes or emergency announcements are made during trips.

Stations/Transit

- **Install LED panels.** Incorporating these into buses and trains that warn a stop is coming as well as the name of the stop can greatly help users.

Limited English Proficiency

Stakeholder Groups:

- LS NJ Law (Spanish Population Research)
- Dartmouth University (Spanish Population Research)
- Asian Women in Business
- South Asian Americans Leading Together

Website

- **Get translated.** Google Translate is a free translation service provided by Google with more than 50 supported languages that instantly translates the web site's text. In recent years it has become much more reliable and plug-ins now allow for sites to be translated without considerable development efforts.
- **Ensure font compatibility.** The web fonts need to be compatible with all the languages supported, especially for non-Latin-based languages. This means that the font used must contain all the characters and glyphs commonly used.
- **Verify Left to Right and Right to Left.** Languages don't have a direction, but the script they're written in does. For example, Azeri (spoken by the people of Azerbaijan) can be written using Latin or Cyrillic scripts, in which case it's written LTR (left to right). Alternatively, it can be written in Arabic script, in which case it's written RTL (right to left). Most languages use scripts which are written and read from left to right, but where that's not the case it's helpful to mirror the layout of the whole web page.

App

- **Promote push notifications.** The ability to alert the non-English speakers on things that are announced overhead could be put into text and pushed to smart phones in the area. An example of this would be text updates on when boarding begins; when a train is arriving or delayed; when buses changes numbers mid-route; and when crucial changes or emergency announcements are made during stops.
- **Advanced translation needs.** Google offers an API (application programming interface) that enables software to interact with other programs if advanced translations needs are not met by the standard version of Google Translate.

Stations/Transit

- **Install LED panels.** Multi -Language LED panels incorporated into buses and trains that warn a stop is coming as well as the name of the stops.

Elderly

Stakeholder Groups:

- The Advisory Panel on Mobility and the Aging, New Jersey
- Division of Aging Services
- Leading Age, New Jersey

Website

- **Allow for customization.** Users should be able to customize based on preference: options for customization include display elements, e.g. fonts, font style, cursor screen layout, text size etc. as well as interface features, e.g. timing of events and keyboard settings.
- **Provide equivalent access.** Should provide similar access to auditory and visual content based on user preferences: for people with disabilities all applications should combine equivalent access for all auditory and visual aspects of learning technologies and content by providing text equivalents.
- **Provide compatibility.** Compatibility with assistive technologies is needed and should include complete keyboard access. Provide content and orientation - information and maintain a consistent layout between pages. Follow relevant - specifications, standards, and/or guidelines, e.g. WCAG 2.0, Section 508, etc.
- **Consider Technologies.** Recommended to use W3C recommended technologies (XHTML, SVG, SMIL, etc.)

App

Check font sizes - Avoid font sizes smaller than 16 pixels (depending of course on device, viewing distance, line height etc.; Allow people to adjust text size themselves; Pay attention to contrast ratios with text; Avoid blue for important interface elements; Provide subtitles when video or audio content is fundamental to the user experience.

Station/Transit

Install LED panels - Multi-Language LED panels incorporated into buses and trains that warn a stop is coming as well as the name of the stops.

8.3. ASSESSMENT SUMMARY

The customer communication analysis encompassed the following assessment factors listed below.

- Systems and tools: Content Management System (CMS), Analytical tools
- Workforce and culture: Organizational collaboration, Strategic focus, Workforce skills
- Communication channels: App, Website, Conductor announcements, Ticker screens, Wayfinding,
- Social media communications

8.4. ASSESSMENT FINDINGS

We categorized our findings into the following themes – 1) People and Process, 2) Channels and Content and 3) Technology as detailed in the following sections.

8.4.1. PEOPLE AND PROCESS ASSESSMENT FINDINGS

People and Process assessment findings focusses on the gaps and opportunities across the teams involved in customer communication in the organization. The findings in this section have been grouped into the following - Organizational Silos, Strategic Focus and Culture and Workforce Skills.

Organizational Silos

- Lack of formal communication channels across NJ Transit make it challenging for teams to seamlessly handover responsibility or incorporate information from other teams.
- The Emergency Operation Center (EOC) has proven to be an invaluable tool to effectively run services during stressful events. During the 'summer of hell' satisfaction rose as NJ Transit was coordinated from here. Services should be coordinated during peak times from the EOC at the very least, though there was interest from NJ Transit stakeholders to make this a 24/7 operation.

Strategic Focus and Culture

- The focus of NJ Transit is more aligned to the efficient and safe service of rail, bus and light rail. While this is rightly the primary focus, customers often come as an after-thought. This isn't a unique issue for transit operators as most have a strong engineering focus and lose sight of how to make things better for customers.

Workforce Skills

- There is a wide variety of skill levels amongst those who are involved in crafting communications or reports. There doesn't seem to be a set of guidelines for employees to ensure their writing is aligned to the "voice of NJ Transit" (e.g., tone, simplicity/complexity of wording).
- Some are excellent, but others could benefit from formal learning to ensure communications are to the standard NJ Transit expects.
- Communications are often written in complicated language and seem to be done so to satisfy an internal audience made up of various teams. Whether on signs in stations or in alerts within the app, guidelines need to be created to identify the goal of different communications and make sure they are written for customers and not internal staff.

8.4.2. CHANNELS AND CONTENT ASSESSMENT FINDINGS

Channels and Content assessment findings deals with areas of improvements in the communication content shared with the customers and different channels used by NJ Transit to engage with the customers across multiple customer touchpoints along the journey. The findings are further categorized by channels into the following – Mobile and Digital, In-Station, In-Transit and Social Media.

Mobile and Digital Findings

The Mobile and Digital findings are associated with digital content and communication improvement areas that include the mobile app, website, and text and email alerts.

NJ Transit App

Most of the findings regarding the app are discussed in depth in Chapter 7. However, the app is well positioned to be the primary source of communication and reporting with customers.

- **Empower Customers** - There was a clear indication from customers (and potential customers) that reporting more via the app would enable them to self-serve better. This would reduce points of friction along with their repetitive questions to call centers and conductors.
- **Personalize Communications** - The key objective is to report and communicate in a personalized way where the app automatically alerts when useful to a journey. The current approach of customization is used by less than 5% as it requires users to manually set it up. By understanding a commuter's or a first-time user's journey and sharing only what is relevant this becomes a product as it helps them navigate their day.

- **Simplify Interactions** - The User Interface (UI) of, and language used, within the app increases the time it takes for users to get a clear understanding of whether they are impacted and what they need to do. By personalizing we remove one hurdle but by presenting information at the right time, in more intuitive ways and writing clearer, simpler English we remove other hurdles. The information shown is beneficial but by enhancing the information architecture and ensuring messages are written to maximize customer understanding we can make it much more valued and useful.

NJ Transit Website

The NJ Transit website is a powerful tool for those travelling around the State. We have found a few ways in which the website could better report and communicate important service information.

- **Intuitive Experience** - The information architecture does not create an environment that enables a customer to easily know where to go to complete a given task. A vast amount of valuable information is available on the website, but it is organized in a siloed way rather than presenting itself when a user might find it valuable. Best practice sites organize their data around user objectives and tasks. This approach would work well.
- **Consistent Approach** - Some pages present information very differently to the user compared to similar pages. There should be more consistency in style so that users don't have to learn how to interact with new sections of the site having previously used others. Some bus pages require you to know origin/destination while others list by bus number.
- **Communicate Visually** - To see if services on a route requires a lot of effort for users. For Train/ Light Rail selecting a line returns up to 12 hyperlinks a user must read through to determine if they need to take action. A map could clearly show lines and even stations that are experiencing issues. The information for buses is clearer but requires a user to know the bus number first. A visual mapping tool would be more useful here too but the key need here is the ability to let a user set an origin and destination point or a bus number.

Text and Email Alerts

Text and email alerts are effective channels to communicate to the public and are especially useful in helping to fulfill Title VI requirements and providing communications to those without smart phones.

- **Backend Data** - A core issue with alerts is the data provided at the backend. Like myBus etc., an alert is only as good as the information it has been provided to share. Multiple back-end issues can prevent alerts from operating effectively. Observed issues include; drivers changing the bus's route number so it 'falls off the map', phantom buses where the countdown reaches zero, but no bus appears and text alerts advising about an event after the event has passed. A review of data architecture and gaps that cause these issues is needed with a view to fixing them when removing data silos.
- **Language Used** - In some messages short-hand is used which may appear to be unclear to new users. In others, messages are overtly complicated and should use simplified language. As explained in previous sections, guidelines need to be adopted to standardize messages and ensure they are written in a customer-centric way.
- **Sign-up Process** - While text alerts can be requested at bus stops, setting up regular updates or email alerts is more complicated than it should be. Users are asked to create an account, submit a lot of information and given the option to set up multiple methods of contact.

In-Transit Findings

NJ Transit has opportunities to interact with customers via multiple customer touchpoints during the train or bus ride. In-Transit findings focus on the gaps and opportunities for improving customer experience while travelling in the trains and buses.

Conductor Announcements

Conductors are a vital source of information for public transit customers. There are some key issues experienced by most of transit operators around the world that affect NJ Transit (loud speaker quality not clear or not loud enough to be heard over vehicle) but these are difficult to resolve so we'll focus our findings on a particular issue. Some communications are shared on other channels such as social media before conductors have been made aware. New technology is being adopted (Vic2) to ensure the bespoke and correct communications are delivered directly to conductors. However, we need to review the internal processes to enable this to find success. Communications should be delivered to conductors a certain amount of time before they appear on social media feeds. This would greatly improve the professional image of NJ Transit as conductors have the opportunity to update passengers before they stumble upon the information on social media. It would also improve the consistency of messages from NJ Transit which can at times be conflicting as different groups share different information. For this to work, the silos of communication and data amongst teams would need to be removed.

Ticker Screens

The ticker on a vehicle is a key channel to deliver information to passengers as the vast majority will have good enough eyesight to notice and process. During interviews there were also multiple requests for this to show more useful information.

- **Easier Journeys** - The next decision a customer needs to make while on board transit is simply, "where or when do I get off?" Sharing this information is a simple change to improve customer experience. It was reported by many archetypes but especially late, new/infrequent riders, Limited English Proficiency (LEP) (who may not understand conductors) and disabled customers. Simply showing the list of next stops would reduce anxiety and boost satisfaction.
- **Valuable Information** - Besides next stops, NJ Transit should consider which pieces of information deliver useful insights and which do not. For example, it was observed on trains that passengers would get onboard and because the station may not have identified the train they would look for information on-board to verify they were on the right train. Passengers were observed becoming stressed at the ticker not showing the information they needed so they began asking other customers. The information that was shown was the train number but for a person anxiously trying to find if it was going in the right direction the key information to share was the following stops or the destination. It needs to be determined which other pieces of information would be valued by other archetypes.

Seat Drops and Newsletters

Seat drops, or small pamphlets dropped in seats, are a great way of engaging archetypes who may not be as adept as others with technology.

- **Prioritization of Information** - Certain seat drops can try to share too much news or too many updates about NJ Transit. While passengers were asked during this research phase what they found useful within seat-drop documents, a more in-depth review of topics covered needs to be conducted. Some found that there was priority profiling irrelevant topics while key service announcements were less noticeable. Value in each topic should be analyzed (based on customer need) and a percentage space for each should be planned out. Decisions should be made as well as to which topics deserve key locations.
- **Hierarchy of Information and Modernization of Templates** - Some documents read suffer from an overload of text. Titles of stories don't stand out distinctly enough from the body of the text which means that readers skimming over the seat drops don't notice headlines. Part of this issue is also caused by the layout. Stories on seat drops are haphazardly structured and, while the goal to share as much as possible is noble, the result is that stories are missed by readers. Areas hosting stories should be distinct from one another and similar stories should be grouped together under a section title.

- **Diversifying Communications** - A picture tells a thousand words and nowhere is this truer than a map. Some documents explaining directions to events decided to show a picture of a bus or taxi while that valuable space could have shown a map to help with navigation. Using multiple methods help more users to understand information.

In-Station Findings

Within the station, NJ transit uses different channels to communicate with the customers such as brochures, posters, digital screens and signage. Addressing the gaps associated with each of the channels will help NJ Transit provide a more positive customer experience in the station.

Brochures and Campaign Posters

Brochures and posters used for longer term communications stand out as well thought through. The use of visuals makes it more engaging for customers and communications easier to understand.

- **Clear and Engaging Brochures** - The brochures that were reviewed as part of this research were probably the best materials produced by NJ Transit. Clear thought went into sharing the most important information and smart visuals, as well Spanish language, were used to make communications as clear as possible to the most customers.
- **Language Used** - Some in-transit posters included words/terms which might not be easily understandable to new/infrequent riders or LEP riders. Language should be kept simple and jargon free. Also, text can be quite small on some posters which can be challenging for those with poor eyesight but even those with good eyesight when on a moving vehicle that is rocking.
- **Brand Consistency** - As the public at large are inundated with an incredible amount of advertising these days they are hardened to noticing important service announcement posters around them. To ensure as many NJ Transit messages get to customers there should be greater brand consistency across documents. This way people will know that a poster might be relevant to them instead of just being an ad.

Static Signage and Same Day Service Posters

In-station signs and notices are a very important communication and reporting tool and are very important to certain needs of customers. It became clear during interviews and also while travelling around new stations that more could be done to help with the main goals of NJ Transit signage—to "provide for efficient passenger flow, indicate accessible facilities, identify commuter services and provide travel information for customers."

- **Station Signage** - Sign posting does not enable riders to know where to go. Specifically, for late, in a rush, new, or infrequent travelers this can often be the communication that they depend upon the most and depend upon to make their train or bus. A review should be done to observe new visitors as they try to navigate their way through stations to make the changes required so that NJ Transit meets the four goals listed above.
- **Simplified Notices** - Many notices around stations are unnecessarily complicated. Some describing service outages or issues are long, text heavy documents that take customers a long time to read and thus a longer time to navigate their way to their end-goal. A service notices in a station should enable customers to quickly assess if relevant to them within seconds and without having to read details. A lot of documents will show impacts to the morning commute on one side (AM) and the evening commute on the other (PM). This requires users to spend a lot longer than they should need to read the documents and assessing if they have to change their journey. This leads to station congestion, delays and so on. As outlined above in the website section, visual tools and imagery of maps should be used to indicate if a user needs to give the poster attention.
- **Adopt KPIs -** To assess if communication tools are fit for purpose KPIs (should be adopted to test how long it takes a customer to read one type of poster versus the other. Goals regarding average time should be set to help increase through-put in stations.

Platform/Station Digital Signage

Digital screens on schedules are a crucial channel for transit operators. Research by the Massachusetts Institute of Technology has shown that people are happier to wait the same amount of time at a train station/bus stop when they have regular updates telling them how long is left. Leaving people without this information can increase frustration.

- **Data Quality** - The data at the back-end of Estimated Time of Arrival (ETA) notices are questionable. It was mentioned during several interviews and observed at one station that a train was due but never showed up. In our observed event there was an issue with trains and one was showing as arriving in five (5) minutes. The clock counted down to zero before the listing reappeared. This cycle happened three (3) times before the train arrived at a random time. Buses report similar issues as previously mentioned. This can be caused due to a driver changing a bus number, so it disappears from a map. Other causes of this issue for trains and buses need to be identified as well as a review of data existing in silos.

Social Media Findings

The emergence of social media has created a new avenue for facilitating daily information and communication needs. As technology grows and expands the range of communication, social media is becoming a vital tool for daily social interaction. Social media findings focus on gaps in the online communication channels such as Facebook, Twitter, Instagram and LinkedIn dedicated to network and community-based input, interaction, content sharing and collaboration.

Facebook

Facebook can be a perilous channel for some organizations, and this is especially true for transit authorities as they can often be shot down with angry comments as they try to engage the public. A key use of Facebook as opposed to other channels is to try to humanize a brand and build a rapport with customers. Overall, between multiple warnings of being safe while crossing light-rail lines and use of jargon such a "positive train control" the overall experience is unengaging and bordering on negative.

- **Two-Way Conversations** - There are some great responses by NJ Transit social media employees that converted those complaining on Facebook from being detractors to promoters. That being said, more could be done by NJ Transit to put a more positive foot forward, rather than defending itself. Some of the transit authorities with more success on social media avoid criticism by requesting and sharing their content from users. By sharing entertaining content such as photos they've taken while travelling around New Jersey it creates a positive brand image and uplifting conversation. If it was called out to be a customer's photo it will also be less likely to draw negative comments. It also shows NJ Transit engaging with and celebrating the culture of the State which is more aligned to users' expectations of content on Facebook. This is done on Instagram under the #sightsfromNJTransit
- **Non-Peak Postings** - During rush hours when traffic or services are more strained customers will be more likely to lash out if they see a NJ Transit posting on Facebook. Some of the more critical comments on the Facebook page are likely during the early morning or evenings commuting times. When posting content designed to create a positive atmosphere it would be best done after 11am and before 3pm. Some users may see the content during rush hours when they next use Facebook, but it will avoid the majority who are having a difficult commute.

Twitter

In our interviews we found that Twitter was a valued source of information and alerts for NJ Transit customers. The team is attentive and so the response rate in helping answer customer questions is admirable.

- **Crafting Messaging** - Maintaining an active presence on Twitter can be a challenging task with a lot of vitriol thrown back at social media employees. However, they could make their lives

easier by crafting a more helpful message at times. For example, on a daily basis they sign off at 8pm and wish everyone a good night. This is guaranteed to rile customers who aren't having a pleasant commute. Instead this message should call out the fact that this team' shift is finishing but that NJ Transit can be contacted via other channels. Also, some messages like "We made it halfway through the week" are good attempts to build rapport with customers but could easily be read in an embarrassing light for a transit authority. New guidelines should be developed to yield the best responses and reduce negative engagement in messages.

- **Cross Promotion** - Sub-channels used by NJ Transit share automatically generated tweets based on data from the Transit Alert System. These are very useful to commuters and most interviewees didn't know that this existed. The main twitter channel should direct people to these sub-channels for automatic updates on services. These channels should delay tweets by a certain amount of time though (possibly a minute) to allow conductors to share the message over loudspeakers first as is common practice at other leading transit organizations.

Instagram

Instagram has become increasingly popular due to the fact that most of the content on the network is trying to create a positive experience. While the NJ Transit Instagram channel has some negative comments the ratio of positive to negative is a lot better than other channels. The use of requesting content from users helps with this, though thanking them rather than just adding their username/ handle would do more to encourage commenters that this was another person's photo. Overall though, the content of communications aligns well to what is successful on Instagram.

- **Celebrate New Jersey** - There is a sub-culture within Instagram that NJ Transit has yet to take advantage of. For example, the most successful photos shared by NSW Transit in Australia are those showcasing old photos of the State featuring transit with #throwbackthursday. By categorizing content to align with these trends NJ Transit could elevate their discussion with customers. TfL in London engage users by celebrating and showcasing London's community and even with ten times the number of followers as NJ Transit they rarely get a negative comment.
- **Avoid Services** - Unlike other channels, Instagram is not a good channel for reporting on, or responding to questions about service alerts. It is for building brand awareness and a rapport with customers. This is practiced well, and most customers seem to understand they won't be given service updates via this channel. Another transit channel that is world leading in this is New York's Grand Central Station's channel.

LinkedIn

LinkedIn is a niche social media channel for an organization such as NJ Transit. The channel should and is being used to promote NJ Transit as a career option and to build the brand awareness amongst businesses. Current efforts to feature employee successes is a great approach but there are other areas such as expertise that could be more conversation starters. A key metric for LinkedIn though is how much engagement a company has started and maintaining conversations in posts lead to much more users seeing the content than other networks.

- **Sharing Expertise** - Lots of research is conducted at NJ Transit to understand, for example, how it can better serve customers. These are insights that would be valued by the business community of NJ. Later in this section we document our learnings on how to best design apps and websites for those with disabilities or special needs. There are insights which would be hugely valued by the business community (as many aren't likely to consider these groups when designing their own services and are even less likely to do the same research). NJ Transit should identify from the research done in the past what will help start conversations on LinkedIn, how it can help other organizations learn from its work and ultimately how it can boost its brand as a thought leader.
- **Engage Users** - To continue the conversation NJ transit should do more to respond to users. Users aren't thanked for kind words or positive engagement. Doing this will further increase how long posts keep appearing on various users' feeds.

8.4.3. TECHNOLOGY ASSESSMENT FINDINGS

Technology is vital to the success of any organization as it drives efficiency and effectiveness. Leveraging technology will enable NJ Transit to improve customer communication. The technology assessment findings focus on systems and tools to improve content management and collaboration across teams.

Content Management System

- Multiple content management systems used to source data for customer communications are used. This leads to data silos and inhibits teams from effectively delivering the relevant information and reporting to customers in a timely and effective way. For example, Rail Operations control data related to rail services, so customer service does not have the ability to generate insights on service performance.
- A single CMS needs to be adopted to enable information to be pushed and pulled by various communication channels and teams.

Communication and Collaboration Tools

- Content creation and approval is done via email rather than a centralized tool (where contributors from different teams can co-create and collaborate). This would help as an easier first step toward removing data silos.
- Access levels could be set to prevent anyone but approvers/editors from publishing on a CMS.
- Salesforce is used for customer-related cases. This could be used more widely for other collaboration needs.

Content Writing Tools

- A tool exists to help content writers create communications for public channels. A system allows un-experienced writers to select from pre-approved text to populate content.
- This is the correct approach, but the tool itself used isn't intuitive and the pre-created text was not signed off by skilled writers. It should be reviewed and potentially re-written by these members of staff.

8.5. OPPORTUNITIES FOR IMPROVEMENT

The following sections provide recommendations associated with the findings discovered during the primary and secondary research, best practices, stakeholder interviews and evaluation of the existing infrastructure. The recommendations have been categorized into following themes:

- People and Process
- Channels and content

8.5.1. PEOPLE AND PROCESS

Riders can touch multiple transport methods in single trips and have a variety of goals and challenges. The current model of teams operating in a disconnected manner for communications or processes can lead to poor customer experience. The result of enacting the people-focused recommendations listed here will not only improve the customer experience, but also provide a platform for seamless flow across the teams. NJ Transit has proven during the 'Summer of Hell' that when teams are given the mandate and tools to work together they can produce exceptional results. By implementing a program to operate more consistently with the same mindset customer satisfaction would undoubtedly rise.

Recommendation: Promote collaboration between teams and empower employees with necessary tools to ensure efficient and seamless transfer of information across the teams.

- As reported in Assessment Findings section, the lack of formal communication channels across NJ Transit make it challenging for teams to seamlessly handover responsibility or incorporate information from other teams. Once the technology at NJ Transit is enhanced to provide for efficient flow of data and information to facilitate effective customer reporting and communications, the next step is to ensure people and teams are empowered and structured to do enable this.
- A people focused work-stream to help teams at NJ Transit understand their shared goals, and to explore and re-think how best to work together would be a valuable exercise. A successful model to reach a heightened state of collaboration is shown in *Figure 8-1*.

Figure 8-1: Collaboration Model

- Once each team has used this model to understand and reflect on how they fit into the world of NJ Transit, a facilitating team could then develop a series of recommendations on how they can approach similar goals and pain points more collaboratively with others.

Recommendation: Review messaging and refine team skills to standardize communication and ensure it meets the required standards.

While there is a core team with the necessary skills and experience, it was observed that messages do not meet the NJ Transit standards. An audit of the messages should be conducted to identify which teams have the skills required, and which need further training. In addition, a review of the tool used for automated messaging should be carried out to ensure that the tool has the desired quality of pre-written statements and clarity of language to help minimize the amount of manual intervention needed in creating communications.

8.5.2. CHANNELS AND CONTENT

The team reviewed a number of channels used by NJ Transit to communicate and report services to customers. Different channels help NJ Transit connect to a diverse customer base, each empowered in different ways. It is important that while crafting communications or reporting, NJ Transit recognizes who is best served by each channel. While all channels should be helpful to all archetypes, special attention should be given to the main archetypes that each channel best serves. ***Figure 8-2*** and ***Figure 8-3*** demonstrate which archetypes should be a key focus for each channel.

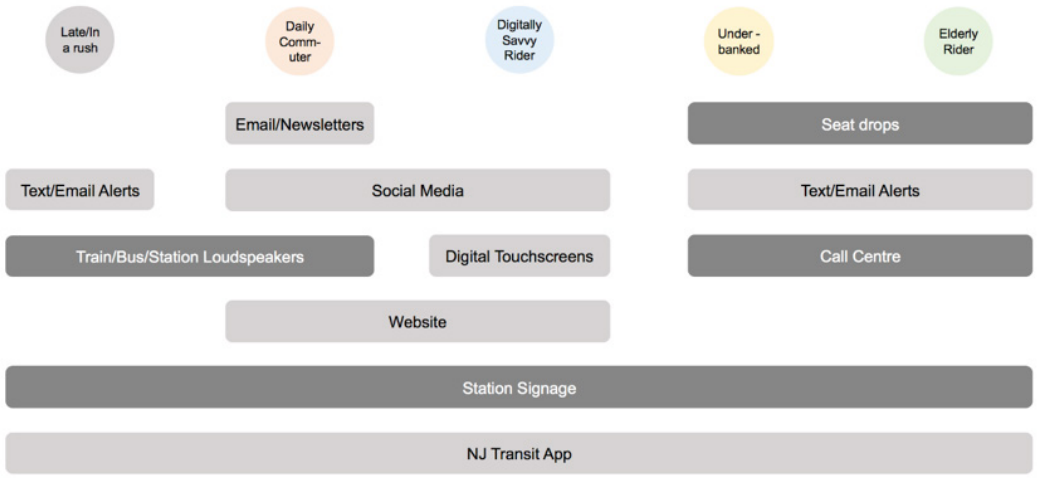


Figure 8-2: Channel Focus Based on Archetypes

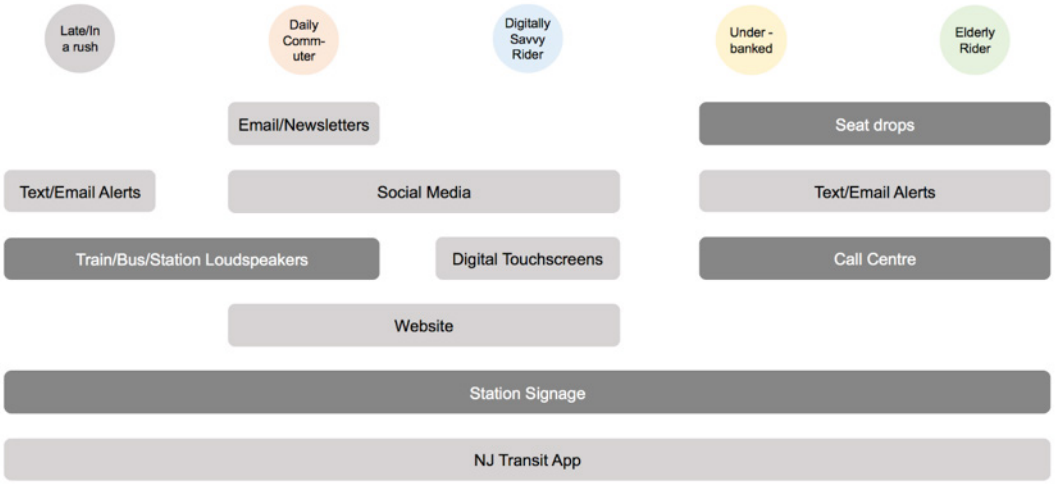


Figure 8-3: Channel Focus Based on Archetypes

Station and Conductor Announcements

There are some key issues experienced by most transit operators around the world including NJ Transit (such as speakers not being clear or loud enough to be heard over vehicles), but these are more to do with vehicle age or maintenance efforts, so we'll focus our recommendations on more specific issues.

Recommendations: Review processes and upgrade channels to provide seamless communication and address needs of a diverse customer base.

- **Review internal processes to prioritize content recipients -** A common issue experienced by conductors (which then leads to a negative customer experience) is the fact that some communications are shared on other channels such as social media before conductors have been made aware. New technology is being adopted (Vic2) to ensure the bespoke and correct communications are delivered directly to conductors; however, we need to review the internal processes to enable this to find success.
- **Improve channels to address needs -** For those with impaired vision, who can't read digital screens or tickers with schedules and key information, speakers are crucial. However, it's unreasonable to bombard all passengers with audio of content on these screens. At London Overground stations, speakers are directional so that only those who stand right below them hear a constant audio stream of everything that appears textually on digital screens and tickers. Incorporating such systems will enable communication to meet the needs of a diversified customer base.

Ticker Screens

The ticker screens on vehicles are key channels to deliver information to passengers in-transit.

Recommendation: Incorporate list of next stops on the ticker screens to help customers identify the stops and boost customer satisfaction.

The decision a customer needs to make while on board transit is simply, "where or when do I get off?". Sharing this information is a simple change to improve customer experience. It was reported by many archetypes but especially late, new/infrequent riders, LEP (who may not understand conductors) and disabled customers. Simply showing the list of next stops would reduce anxiety and boost satisfaction.

8.6. RECOMMENDED NEXT STEPS

Table 8-1 presents a summary of the recommendations listed above, in order of prioritization.

Focus / Sub Task	Recommendation	Priority	Level of Effort	Value Delivered	Key Success Factors
People and Process	Promote collaboration between teams and empower employees with necessary tools to ensure efficient and seamless transfer of information across the teams.	High	Medium	High	▪ Stakeholder buy-in to ensure transparent communication across teams ▪ Tools, platform and data to support collaboration ▪ Organizational and technological assessment to identify gaps and opportunities
Channels and Content	Review internal processes and upgrade channels to provide seamless communication and address needs of a diverse customer base	Medium	High	Medium	▪ Processes and systems must align with the data ▪ Collaboration across teams to eliminate redundant processes
Channels and Content	Incorporate list of next stops on the ticker screens to help customers identify the stops and boost customer satisfaction	Medium	Medium	High	▪ Centralized data channeling to provide real-time updates ▪ Automated systems and technology
People and Process	Review messaging and refine team skills to standardize communication and ensure it meets the required standards.	Low	Low	Medium	▪ Assessment of the team and message log to identify areas of improvement

Table 8-1: Summary of Recommendations

CHAPTER 9
PHYSICAL INFRASTRUCTURE

Chapter 9 : Physical Infrastructure

9.1. INTRODUCTION

Public transportation in metropolitan areas is at the heart of the mobility of the workforce. Providing an economical, accessible and reliable service is essential in driving ridership. The value of the service provided is dependent on customer perception. Throughout the customer journey, customers interact with the physical infrastructure of the transport system, with many opportunities to influence their experience from origin to destination.

The infrastructure of the transport system plays a vital role in successful delivery and therefore, customer experience. In our experience with improving customer perception of transportation systems, being able to quantify the impact of the infrastructure is essential. This involves assessing the existing infrastructure data and information.

NJ Transit rail serves 166 stations and operates 152 of those stations; owns and operates 147 locomotives and 990 cars. As NJ Transit owns and operates most of its physical infrastructure, any improvements can be directly implemented and managed by NJ Transit.

Best practice models of customer satisfaction drivers normally conclude that the majority of customer perception (particularly of public services) is made up of a combination of (in order of importance):

- **Cost -** Is the service value-for-money and affordable?
- **Delivery -** Is the final outcome achieved despite any problems that may have occurred?
- **Timeliness -** How long does it take overall, and how long is the initial wait?
- **Information –** Is the information about the service accurate, timely and continuous throughout the service?
- **Professionalism –** Is the staff present, visible, polite, friendly, competent and do they treat the public fairly and with sympathy?
- **Physical Environment -** Is the space clean and comfortable?

At NJ Transit, customer experience is measured by the customer satisfaction survey. The vast number of attributes measured from the survey can be grouped into six categories which relate to the performance of the infrastructure. In our effort to locate data sources within the organization, we have seen opportunities to quantify and understand infrastructure issues. These opportunities are not necessarily being seized within the organization. In the section following, we illustrate how the impact of infrastructure can influence the customer experience.

9.1.1. CURRENT STATE

Customer experience and satisfaction on the NJ Transit network is presently evaluated using the "Score Card" customer satisfaction survey. The survey started in 2011 and is conducted every quarter up until Fall 2017, it has changed to become a 6-monthly survey. The score has been the lowest in Spring 2017 since 2013, following a disruptive 3-month period for rail passengers.

NJ Transit is data rich especially in areas where real value could be added to improve the network performance and understand customer needs. Our effort to attempt a data-driven approach has revealed the lack of integrated system infrastructure and processes to support the accessibility and usability of these data. Getting the right solution would be key in (re)building the foundation for a data-driven organization and performing at a high level serving its customer base.

9.1.2. DESIRED STATE

In order to effectively address customer experience and infrastructure issues, the organization needs to establish the right capability to extract the insights and values from the data it owns. The focus should move from regular reporting for ticking boxes to reporting to inform short, medium and long

term decisions. Without this, the organization will continue business as usual and be left behind by its peers.

An investment needs to be made in IT systems, data and performance monitoring, to arrive to a steady state where customer can reliably travel from A to B on a sustainable and well-performing network.

Conducted 14 stakeholder interviews to pinpoint data owners and to get explicit data sources to identify areas of improvements or concerns. The process of identifying and locating data sources has allowed us to establish the data flow within the organization, providing information on accuracy and effectiveness of the data. Finally, all information provided has been evaluated and, where possible, analyzed using various statistical techniques.

9.2. METHODOLOGY

Conducted stakeholder interviews to pinpoint data owners and to get explicit data sources to identify areas of improvements or concerns. The process of identifying and locating data sources has allowed us to establish the data flow within the organization, providing information on accuracy and effectiveness of the data. Finally, all information provided has been evaluated and, where possible, analyzed using various statistical techniques.

9.3. ASSESSMENT SUMMARY

At NJ Transit, customer experience is measured by the customer satisfaction survey. The vast number of attributes measured from the survey can be grouped into six categories which relate to the performance of the infrastructure. In our effort to locate data sources within the organization, we have seen opportunities to quantify and understand infrastructure issues. These opportunities are not necessarily being seized within the organization. In the following section, we illustrate how the infrastructure can influence the customer experience.

The customer experience can change throughout a journey. Using the customer satisfaction survey results, we can clearly see the areas which need investment to improve customer experience and the customer perception of the organization.

For the main areas that require improvement, we will show that NJ Transit has available data to quantify the underlying problems and have scratched the surface of what value can be provided.

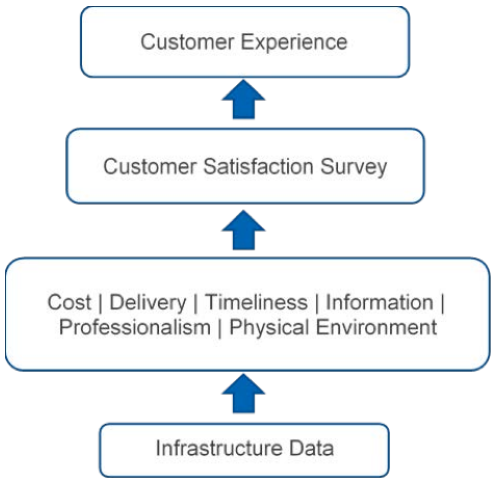


Figure 9-1: How Infrastructure Data Can Inform Customer Experience

9.4. ASSESSMENT FINDINGS

We categorized our findings into the following themes – 1) Customer Satisfaction Survey, 2) Customer Journey Map, 3) Customer Experience Survey 4) Delivery: Fleet Availability, On-time Performance, Platform and Delay Attribution and 5) Information as detailed in the following sections.

9.4.1. CUSTOMER SATISFACTION SURVEY

The NJ Transit customer satisfaction survey is the benchmark in measuring customer satisfaction in using the transportation system. The survey has been ongoing since 2011 on a quarterly basis, changing to bi-annual from Fall 2017. In the last two surveys (Fall 2017 and Spring 2018), 24,700 and 33,780 responses were captured respectively. This large sample size in principle allows NJ Transit to draw valid conclusions about customer satisfaction of its users.

However, we have found that the survey is not statistically representative of the population of NJ Transit's users. Rail users reply with more frequency than bus users, and higher income users reply with more frequency than lower income users. When compared to US Census data, higher income users are overrepresented in the survey. This is more striking if we consider only users who have left a comment.[38]

While by itself this does not invalidate the results of the survey, it introduces the need for extra care when analyzing the results. For example, this bias can lead to the concerns of underrepresented users to be given less attention. Also, as is the case for other surveys, when the possible number of responses is large, respondents tend to reply zero (0), five (5), or ten (10) and not to the anticipated granularity. To mitigate, NJ Transit might consider only having one (1) through four (4) as possible responses.

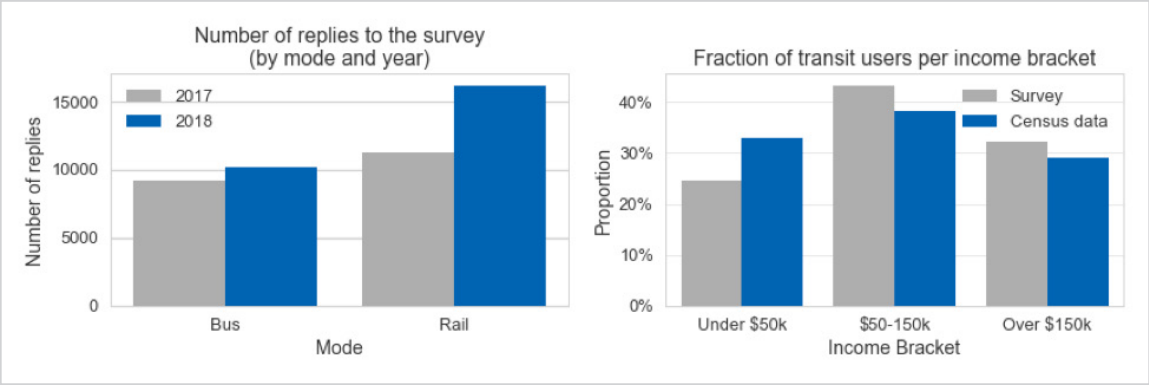


Figure 9-2: Customer Satisfaction Survey

Objective

It is unclear from our interviews that there is a clear objective in what the survey is trying to measure and inform. There seems to be lack of feedback and direction to tailor the survey for a specific need. The survey covers a lot of aspects of the transit service, it therefore takes a long time for users to complete. As discussed above, the survey does not necessarily accurately represent the customer base of the organization. Depending on the objective, this might be the right approach. Alternatively, if the survey is targeted, results might be different.

From here on, unless explicitly stated, all analysis is for rail users.

[38] Sources: Census data from https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_pums_csv_2016&prodType=document . The population (individual) level data contains income and mode of commute. We adjusted personal income to obtain household income to compare it to the satisfaction survey by multiplying by 1.43. This figure is arrived to by dividing the number of workers by households in NJ. Our conclusions are robust to changes in this adjustment factor of +/- 0.3.

NJ Transit's Key Drivers

NJ Transit compiles 42 attributes from the survey results and picks ten key drivers to focus on. The definition is the top ten most important to customers with satisfaction below the overall survey rating. This can mean that an attribute is important to customers, however due to the average rating being higher than the survey score, it would not be considered as a key driver for customer satisfaction. The threshold is set by the overall survey rating rather than an acceptable threshold set by the organization.

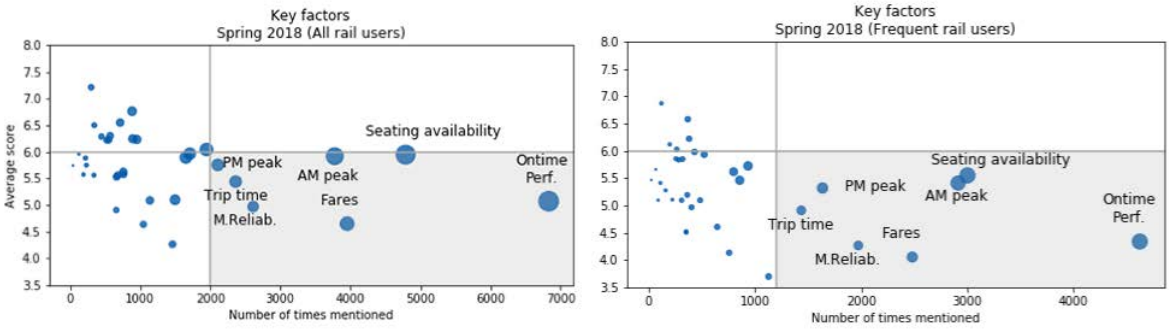


Figure 9-3: Three Most Important Attributes by Users from the Surveys

Alternative Key Drivers

As with NJ Transit's metric of key drivers, we have found a series of attributes that were identified as most important by many of the respondents when asked to choose the three attributes they consider to be the most important. We weighted the number of times mentioned by the average score for each attribute, as presented by the size of the bubbles in ***Figure 9-3***. We found that On-time performance, AM peak, Seating availability, Fares and Mechanical reliability to be the key attributes that should be improved to raise overall scores. On-time performance clearly has the highest impact on customer satisfaction. This once again enforces the importance of how performance can influence ridership.

We also show that the survey can provide many insights, including diving further into different transport mode users, seen in ***Figure 9-3***. For example, frequent rail users have similar concerns for attributes, but their scores are generally lower.

9.4.2. CUSTOMER JOURNEY MAP

Around 212,000 passenger trips are made daily on NJ Transit's rail system. A successful system allows passengers to travel smoothly from their origin to destination. The end-to-end customer journey can be divided into stages. Each stage is a bifurcation point where the customer experience can change depending on their interaction with the transport system. In this section, we will explore the customer satisfaction and the factors that influence it at these bifurcation points.

From the customer satisfaction survey, we can use some attributes to infer the satisfaction score at each bifurcation point of the customer journey. The attributes have been arranged in a temporal fashion, starting with schedule and following the customer through to buying tickets, receiving information, boarding, travelling, which is impacted by delays and comfort, and finally arriving. We have picked the attributes as follows to represent each bifurcation point: Schedule and Boarding Station for Arrive at station, Payment Options and Communications for Information, On-Time Performance, Mechanical Reliability and Onboard Satisfaction for Platform and Onboard, Arrival Station for Arrive and Exit. See ***Figure 9-4***.

The two lines represent the 25% and 75% percentiles of the scores for each category, the former representing a low satisfaction journey and the latter representing a high satisfaction journey.

Where the gap is largest (on-time performance and mechanical reliability) between low and high is where the most urgent actions are required to address customer satisfaction.

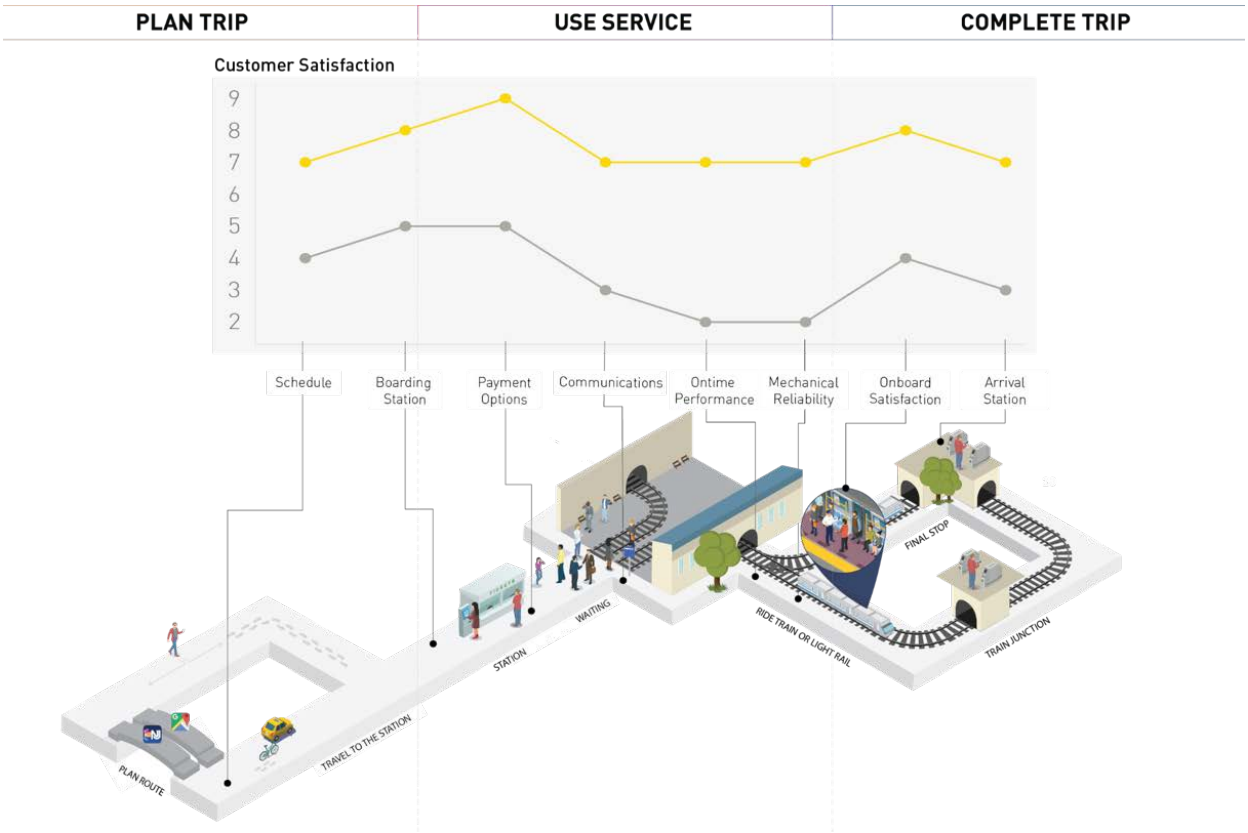


Figure 9-4: Customer Journey Map by Customer Satisfaction Surbey of Fall 2017 and Spring 2018

9.4.3. CUSTOMER EXPERIENCE SURVEY

As shown in ***Figure 9-4***, we can use the customer satisfaction survey to pin point improvement areas. In this section, we demonstrate how the available data or reporting at NJ Transit can be linked to and inform on customer satisfaction to improve customer perception of the physical infrastructure.

Customer satisfaction is a main driver behind ridership especially if there are alternative transportation methods. The six (6) customer satisfaction categories can be mapped to the customer satisfaction survey attributes shown in ***Table 9-1***.

NJ Transit Customer Satisfaction Survey	
Topic Area	Customer Satisfaction Category
FACILITIES	
Boarding Station/Stop Parking Availability	Physical Environment
Boarding Station/Stop Parking Fee	Cost
Ease of Access and Exit from the Parking Lot	Physical Environment
Safety of Parking Lot	Physical Environment
Security of Parking Lot	Physical Environment
Boarding Station/Shelter Condition	Physical Environment
Boarding Station/Stop Cleanliness	Physical Environment
Arrival Station/Stop/Terminal Condition	Physical Environment
Overall Satisfaction with Facilities	Physical Environment
SCHEDULING	
Weekday AM Peak Schedule	Timeliness
Weekday Midday Schedule	Timeliness
Weekday PM Peak Schedule	Timeliness
Weekday Evening/Night Schedule	Timeliness
Weekend/Holiday Schedule	Timeliness
Overall Satisfaction with Scheduling	Timeliness
VEHICLES	
Seating Availability	Physical Environment
Comfort On-board	Physical Environment
Cleanliness On-board	Physical Environment
Overall Satisfaction Onboard the Vehicle	Physical Environment
COMMUNICATIONS	
Availability of NJ Transit Information	Information
Signage/Information Availability	Information
NJ Transit Website	Information
My Transit	Information
My Bus	Information
PA/General Announcements	Information
Availability of Accessible Service Information	Information
Announcements/Information during Service Disruptions	Information
Overall Satisfaction with Communications	Information
OVERALL	
On-time Performance	Delivery
Trip Time	Timeliness
Quality of Transfer	Physical Environment
Handling of Service Disruptions	Delivery
Employee Performance	Professionalism
Customer Service	Professionalism
Fares	Cost
Payment Options	Information
Safety	Physical Environment
Security	Physical Environment
Reliability of Accessible Features	Physical Environment
Mechanical Reliability	Delivery
Overall Value for your Money	Cost

Table 9-1: Surbey Categories Mapping

Having more than 42 attributes in the survey makes interpreting the data difficult. Using the mapping, the survey results can then be categorized accordingly.

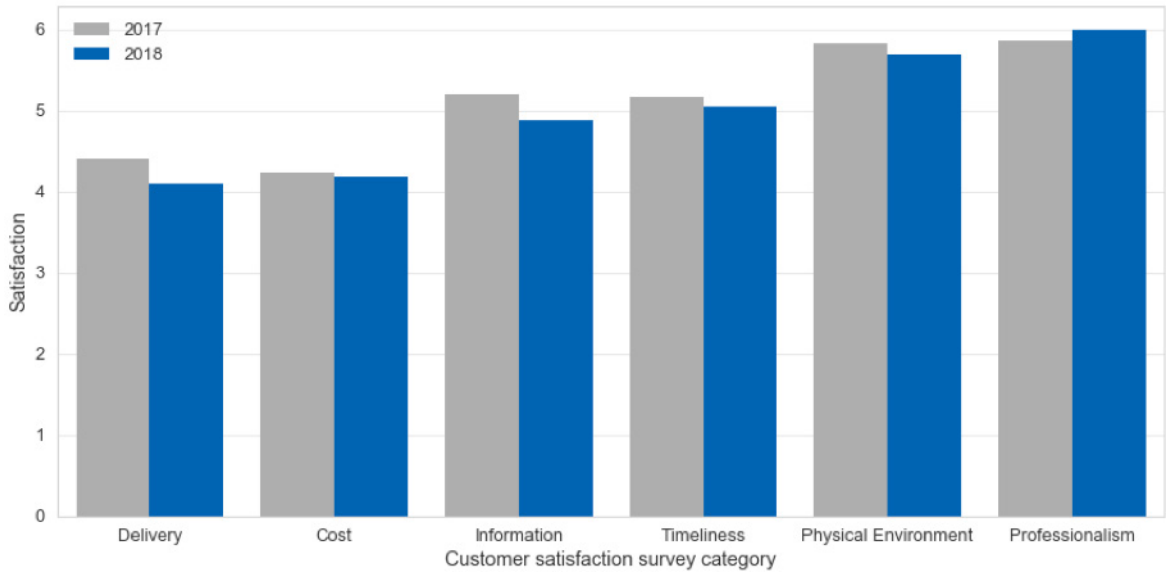


Figure 9-5: Survey Results by Categories, Fall 2017 and Spring 2018

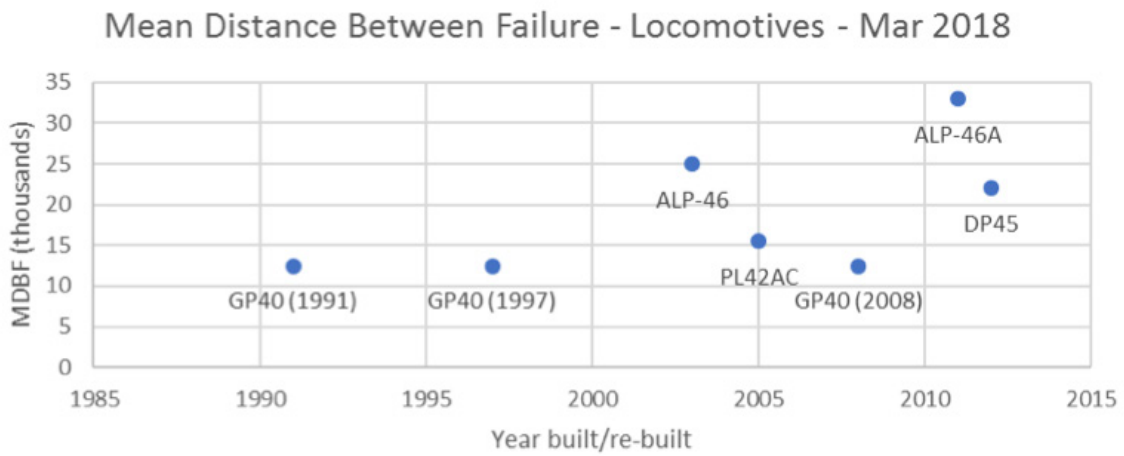
After grouping the attributes from the survey into six (6) categories, we can see that Delivery and Cost are the lowest scoring categories. Delivery affects the Platform, Onboard and Arrival stages of the customer journey. We will drill down into the factors affecting the Delivery score, which are On-time Performance, Handling of Service Disruptions and Mechanical Reliability.

9.4.4. DELIVERY: FLEET AVAILABILITY

The Mean Distance Between Failure (MDBF) reports show the trend in how an asset class is performing. Information about the age of the assets can be extracted from the Rail Operations Equipment Roster. From 2016 to 2018, the average MDBF has decreased by 5% all rolling stock. In *Figure 9-6* we attempt to correlate the age of asset class against the MDBF. The general expectation is that the newer the asset, the higher the MDBF.

This is overall true except for GP40s. There exists one MDBF value for GP40, however from the equipment roster, we can see that there are variations in the GP40 with different built and re-built years. Three built years have been chosen as low, mid and high to represent the impact the age would have. It is also difficult to interpret the MDBF failure for GP40 if the assets have very different built years.

The ALP-46 and 46A seem to be outperforming the rest of the locomotives.



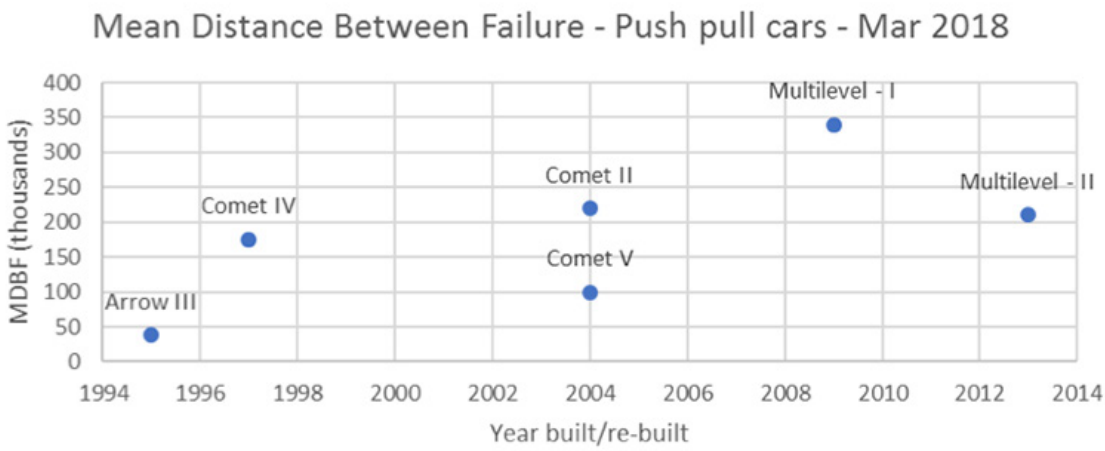


Figure 9-6: MDBF Against Age March 2018

9.4.5. DELIVERY: ON-TIME PERFORMANCE

On-time Performance is the key metric for NJ Transit measuring the performance of its transport system. The definition of On-time Performance is the percentage of trains arriving within six (6) minutes of its scheduled time. Although this is a crude method, it is a common method and allows for benchmarking against other transit agencies. To show the impact on customers, we evaluate on-time performance with minutes delayed.

Delay Minutes

The following analysis shows that delays have been increasing over time and that the causes behind those are directly reflected in the customer satisfaction survey.

NJ Transit operates trains on Amtrak's Northeast Corridor, inevitably not all delays experienced by NJ Transit trains are caused by the organization. We look at delays first from a high level.

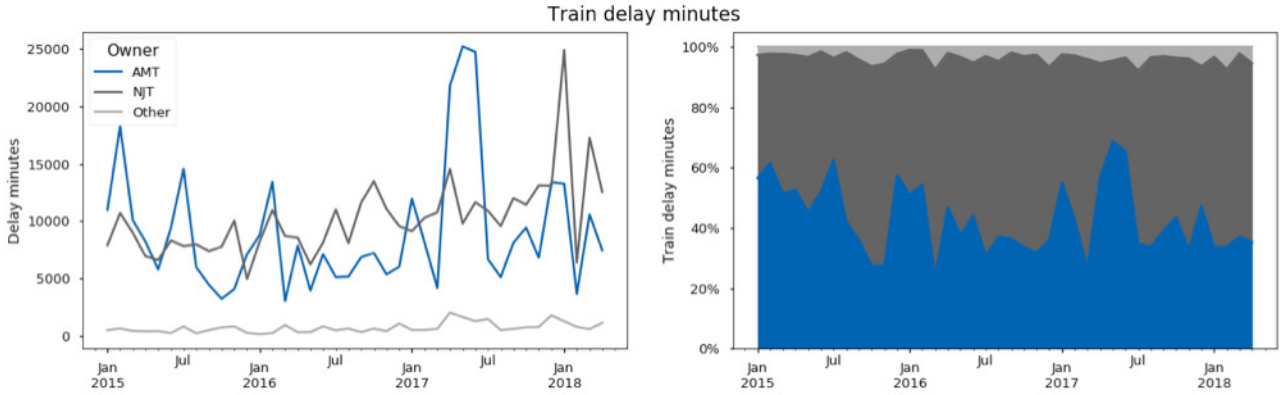


Figure 9-7: Delay Minutes by Carriers 2015 to April 2018

From April 2015 to April 2018, on average Amtrak caused 42% of the delay minutes suffered by NJ transit every month. Since the beginning of 2018 this figure has remained stable around 35%. ***Figure 9-7*** shows the evolution of both the share of delays by Owner (right) and the trend in overall delays by Owner (left). Even when considering only NJ Transit delays, these have been increasing since 2016.

Amtrak-caused Delay Minutes Jan through April 2018

The biggest reason for Amtrak caused delays has been track failure *(see Figure 9-8)*. NJ Transit relies on Amtrak's rail infrastructure for their North-East Corridor rail journeys. These delay minutes are also directly outside of NJ Transit's control.

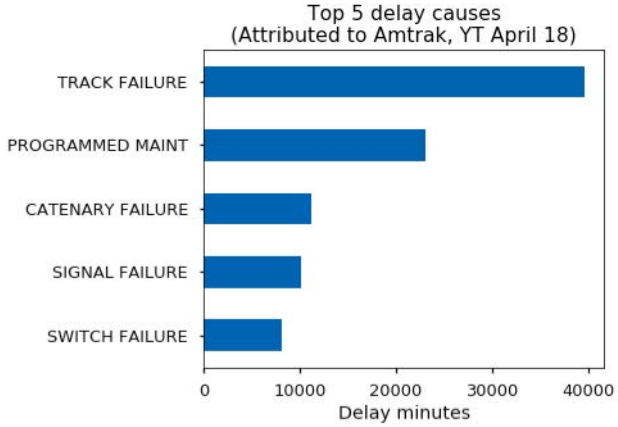


Figure 9-8: Amtrak Delay Causes

On-time Performance and Delays by Line

The On-Time Performance for FY2017 on rail is 91.2%, below the target of 94.7%. The best performing line is Main-Bergen County at 95.8% and the worst performing line is North East Corridor at 87.4%.

The performance at each line is probably affected by different causes. In the graph at *Figure 9-9*, we show one way of exploring the profile of each line. Although Amtrak causes on average 42% of delay minutes to all of NJ Transit's train, not all lines are equally affected. Most delays at Bergen/Port Jervis and Morris and Essex lines are caused by NJ Transit, whereas it's the opposite at North East Corridor and North Jersey Coast lines.

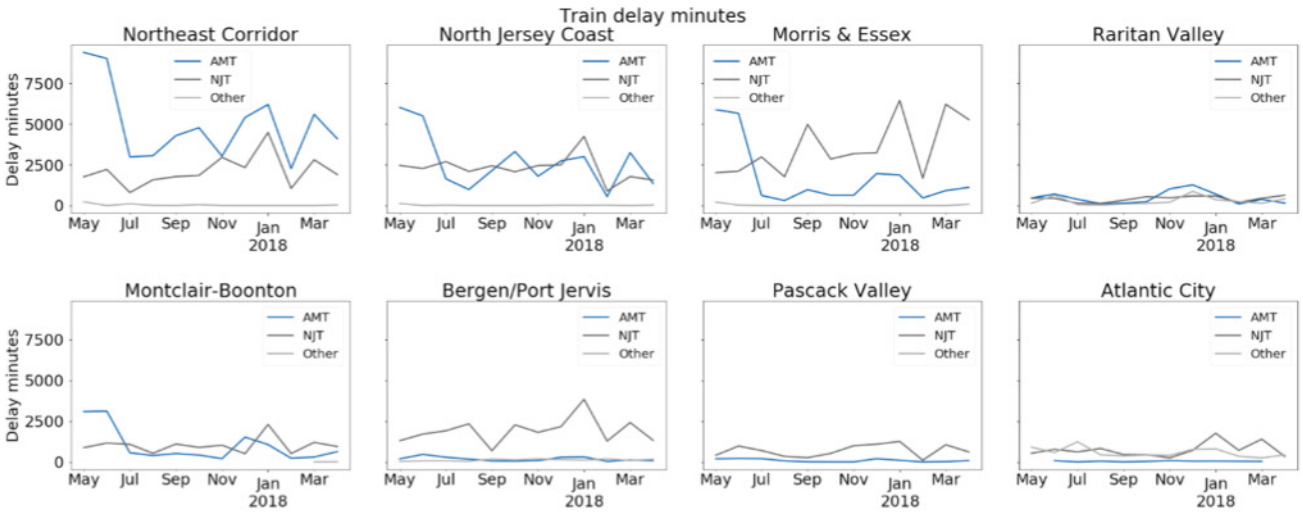


Figure 9-9: Delay Minutes by Line

NJ Transit Delays

Figure 9-10 shows a graphical representation of all of the sources of delays. Data exists for over 90 delay reasons under NJ Transit, the top ten biggest causes of delays from 2015 to April 2018 in ***Figure 9-10***, considering only those attributed to NJ Transit and other operators.

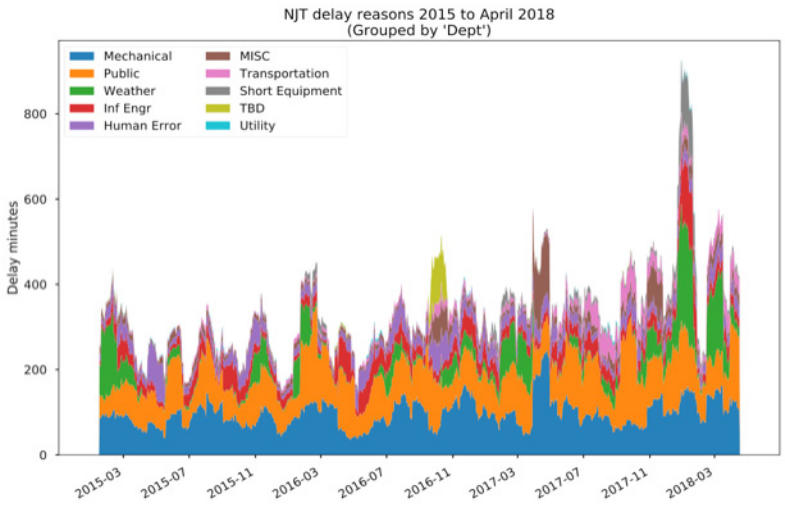


Figure 9-10: Rolling 30-day Daily Average of NJ Transit Delay Minutes

As there are around 90 delay reasons under NJ Transit, we have picked the top ten biggest causes of delays from 2015 to April 2018 in ***Figure 9-10,*** considering only those attributed to NJ Transit and other operators.

The delay data spreadsheet we have received has a series of columns that break down the origin of a delay, one of them is the official cause attributed to a delay, but other columns have been added to provide a more high-level view. This high-level categorization seems to make sense and provide value, we will therefore include in our analysis. This delay reason hierarchy was created by one NJ Transit staff and not the official categories, therefore we refer to this as the "unofficial categories."

The hierarchy is as follows: **Cause Code -> Subgroup -> Sub Dept -> Dept.** An example is NJ Transit CAB CAR FAILURE -> Cab Car -> Equipment Failure -> Mechanical.

Delay Impact

The high-level findings above must be complemented by more fine-grained analysis into the when and where of delays. Depending on whether it happened at peak time, and on a line with high ridership, the delay could have a higher impact in terms of user-minutes. ***Figure 9-11*** shows that Morris and Essex has the highest delay minutes per month and that Northeast Corridor has the highest ridership.

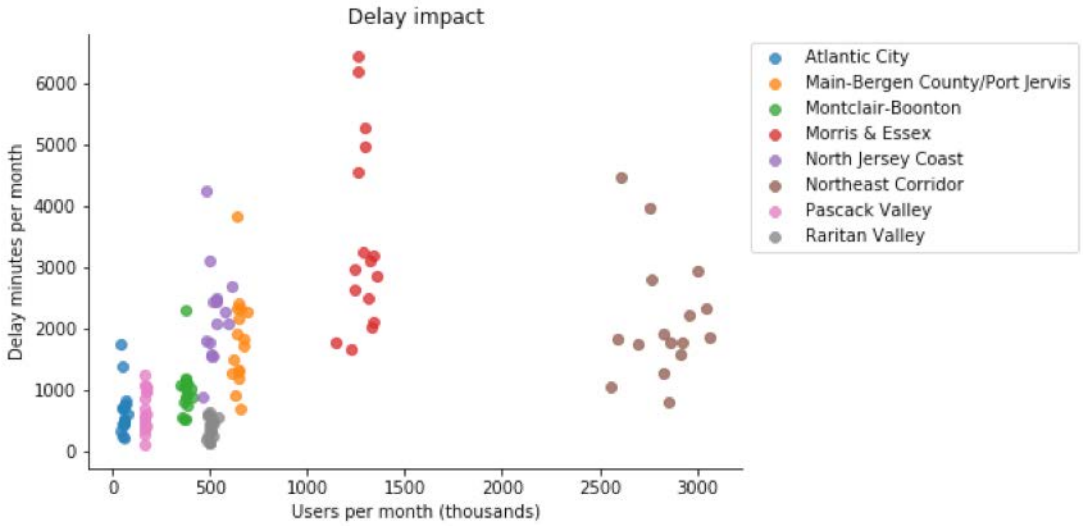


Figure 9-11: Delay Impact

As per *Figure 9-10*, **Mechanical failures,** followed by **Public** are the most relevant ones, accounting for the most minutes. Only weather, when there are adverse weather events, reaches such magnitude among the other categories. shows a rolling 30-day average. If shown without any averages, the graph would be overwhelmed by spikes caused by poor weather conditions, making it difficult to discern other causes.

We further break down Mechanical and Public into the underlying causes, showing that **diesel and Arrow multiple unit failures** on the Mechanical side, and **trackside interference** on the Public side are the key drivers of delays. See *Figure 9-12*.

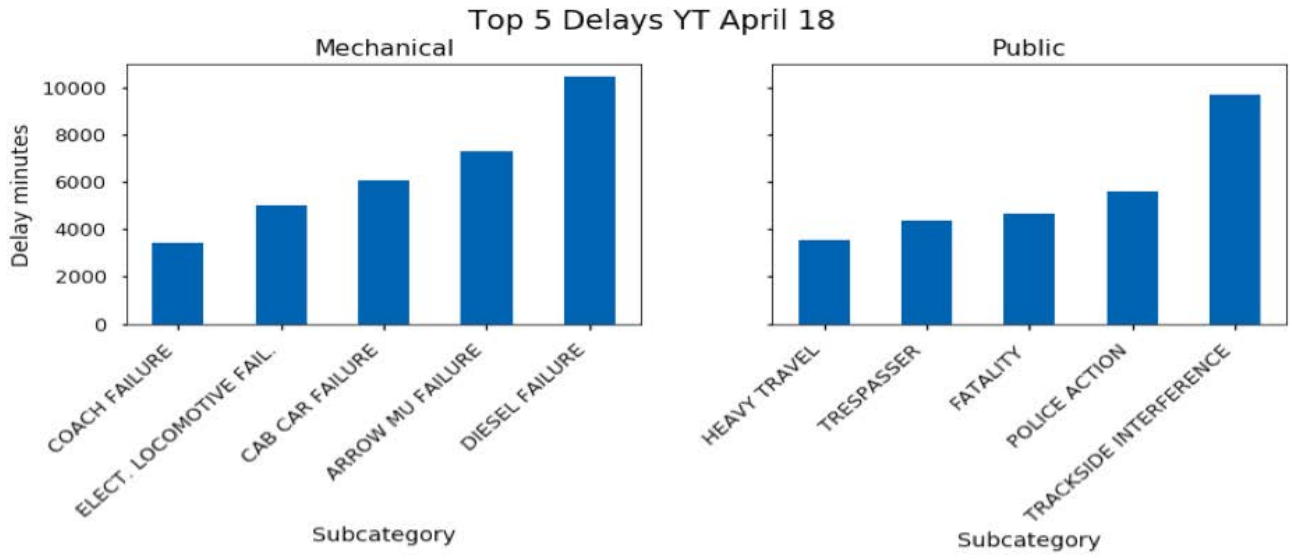


Figure 9-12: Top Five Delay Causes (MEchanical and Public)

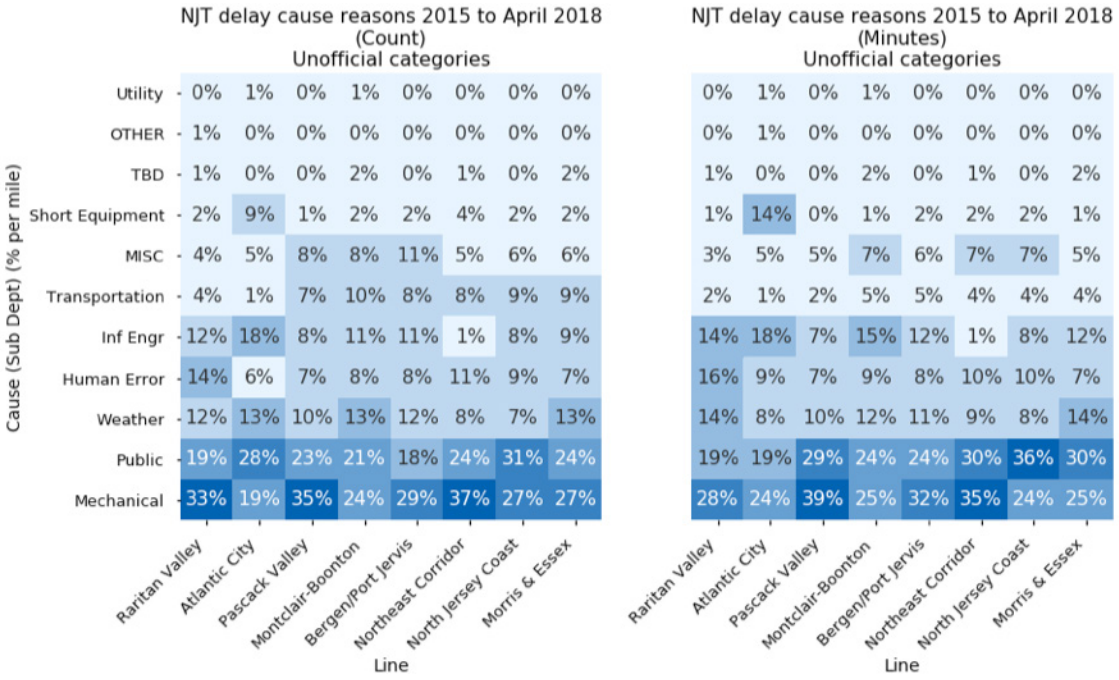


Figure 9-13: Delay Reasons by Line Using the Unoffical Categories

Using the unofficial delay reasons categories, we can see in ***Figure 9-13*** that Mechanical failure is the biggest cause of all delay minutes, consistently from 2015 to April 2018 – a third of all delay minutes. Mechanical includes delay reasons such as Coach Failure, Diesel Failure, Multi-level Cab Car Failure. Other is everything not in the top 10, includes Safety, CPP and Late Equipment.

The figures above also imply that the impact of a given failure has not been, historically, the same across all lines. For example, in the Raritan line, a Mechanical failure causes about three times (on average) the delay minutes compared to other lines, although further drill down by primary and secondary delays can give a better understanding

9.4.6. DELIVERY: PLATFORM

Our experience in Network Rail South East has proven that every second counts. Each train is scheduled an amount of dwell time at platform for intermediate stops, these could be as low as 30 seconds. During the dwell time, passengers need to descend, board and the train ready to depart. Currently there are no staff stationed on the platforms. The presence of staff on platforms at major stations can have at least three effects:

- Ensure on time departure, do not exceed dwell time unnecessarily
- Provide guidance to passengers
- Serve as crowd control on platform

From our interviews, it is understood that effort has been made toward having additional staff at New York Penn station platforms.

9.4.7. DELIVERY: DELAY ATTRIBUTION

A train is considered late if it is six (6) minutes or more late arriving its destination. The method of assigning delay reasons seems to differ from management to front-line staff. One method is to assign delay reason to the portion of delay which pushes the train over the reportable threshold. Another method is to assign delay reason to the first or biggest delay. No official documentations received to support one or the other.

9.4.8. INFORMATION

Information is the third-lowest customer satisfaction category, covering survey attributes such as Availability of NJ Transit Information and Signage.

Communication Channels

There are seven (7) main forms of communication channels for customers: website, mobile app, social media, rail stations, onboard announcements, Interactive Voice Response messaging and MyTransit Alerts.

Signage

Signage appears to be inconsistent across stations and at stations, with sometimes confusing signing.

Customer Information - Rail Stations Management

Rail stations are managed by different teams and vendors, covering roles outlined below. The combinations of roles differ by stations.

- Customer service
- Station managers
- Elevator and Escalator – vendor
- Janitorial - vendor
- Bag and Baggage – in-house
- Custodial – in-house
- Electrical – in-house

Due to legacy contracts, the same type of asset can be managed by different teams. One example of misalignment is station inspections. For example, customer service team and the station managers at New York Penn both perform a variation of station inspections. Looking at the inspection forms, there are overlaps especially in inspecting customer facing facilities. Both teams are managed by different people from areas of business, efforts are siloed in providing a presentable and consistent station to customers.

Live Departure Boards and DepartureVision –Train Management and Control (TMAC) Data

Live departure boards and Departure Vision are both powered by the TMAC data. Due to the location of the existing track circuits, the timings are not 100% accurate. Some rolling stock have Global Positioning System (GPS) fitted which provides accurate location information, currently used mainly for monitoring fuel usage. The GPS data would be beneficial for the Departure Vision team to explore, however there are no official channels or business directions for collaboration.

The TMAC data is not accessible outside of the immediate team. Departure Vision team streams and saves the TMAC data in its own database in order to have access to the data. Similarly, the Timetable Planning team also has a copy of a version of the TMAC data for validating timetable changes.

TMAC is one of the main sources of performance data; the lack of transparency and accessibility is restricting the business to function optimally and, in a data-driven way.

9.5. OPPORTUNITIES FOR IMPROVEMENT

From the findings and analysis, the primary conclusion is that operational performance is key to customer satisfaction. A structured and sustainable approach to improving performance, with a program of works to build capability to analyze performance, isolate root causes and execute improvements is needed. This will achieve a sustainably high performing network and deliver significant improvements in customer satisfaction.

9.5.1. RECOMMENDED NEXT STEPS

Being able to effectively measure and understand customer concerns provides the means to addressing specific issues. Whilst there is a method in place for measuring customer satisfaction, improvements can be made to provide more useful and actionable insight from this data. Improvements in the analytics capability of the organization to better understand and respond to the customer survey outputs is recommended.

Recommendation: Better utilize the Customer Satisfaction Survey.

- Set clear expectations and objectives for input (respondent) and output (what decisions are the results trying to inform).
- Capability needed to utilize the survey data effectively.
- Set feedback loop from executives to survey team for a linked-up approach in understanding and addressing customer satisfaction.

A unified plan is needed to achieve an overall high-performing network and delivering the values to customers. This can be achieved by building the capability as seen in the following recommendations.

Recommendation: Utilizing data to consolidate a reliable and auditable source to provide a basis for any further improvement works

- Aggregate all the disparate data sources in one place.
- Validate the data and check its integrity.
- Identify any gaps or outliers in the data.
- Identify missing information to build the full view of the operational performance across the network
- Review data capture procedures to ensure they are consistent and allow to record descriptive and accurate data.
- Implement a single source of truth and make data accessible across teams.

Recommendation: Assess and analyze performance to provide a holistic overview of the operational performance across the entire network which business can understand and use.

- Build analytics capability to assess operational performance and benchmark it against business objectives.
- Quantify problem such as timetable, dwell/dispatch, sectional run times, junctions.
- Unify and distribute analysis results amongst all relevant teams to break down information silos.

Recommendation: Provide evidence-based context for variations in operational performance to make informed decisions on improvement initiatives.

- Identify root causes
- Identify improvement areas aligned with business objectives
- Develop evidence-based performance improvement initiatives
- Forecast how changes in network operations/usage will affect performance

Recommendation: Monitor and measure the performance of the network on a consistent basis to build a sustainable high-performing network which is resilient enough to mitigate for unexpected circumstance

- Execute improvement initiatives
- Monitor performance by establishing key performance metrics
- Evaluate efficacy of initiatives

Figure 9-14 illustrates a roadmap to implement these recommendations. The minimum state is validating and aggregating all relevant performance data to create a single source of truth. Steady state is feeding from clean and reliable data obtained in step one, set up a process of continual operational performance review, analysis, improvement and monitoring.

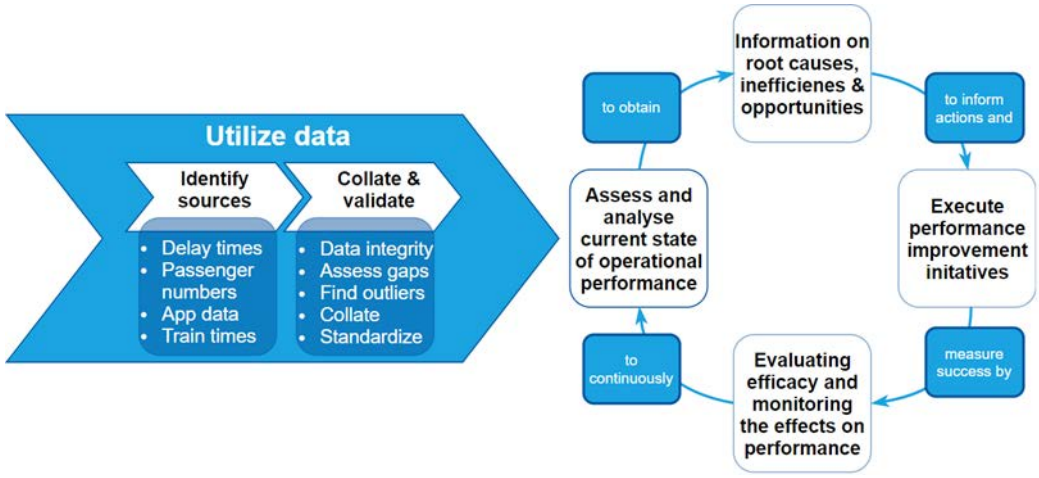


Figure 9-14: Roadmap

APPENDIX

Summary of Recommendations

HIGH PRIORITY

FOCUS		RECOMMENDATION	DESCRIPTION
Organizational Structure	1	**Simplify the executive organizational structure to reduce complexity and streamline decision making.**	A Delegated C-Suite model with new positions for General Counsel, Chief Operating Officer, and Chief Administrative Offices would increase leadership focus in these areas and allow the Executive Director to have more engagement with the Board and other State officials.
	2	**Implement specific initiatives to involve employees to improve engagement and morale.**	Employee Town Halls, a communication campaign, and annual survey are ways to deliberately engage employees and measure engagement. Employees with the highest level of commitment perform 20 percent better and are less likely to leave the organization. There is an opportunity to make transformative change as employees seem open to new ideas.
	3	**Adjust HR policies to be more in line with corporate entities as opposed to public agencies, so that NJ Transit can recruit and retain qualified candidates.**	Implementing market-based promotion and raises, and hiring for skills and qualifications are practices not currently in place that would enable NJ Transit to transition away from its current operating mindset as a quasi-state agency toward a more fluid business model.
	4	**Align job tasks and responsibilities to the appropriate jobs to enable role clarity and hold individuals accountable.**	To gain clarity on roles and responsibilities and have well understood decision rights, a prioritized job task analysis will yield the ability to determine and document them for each job.
Personnel Recruitment	1	**Improve or replace technologies used in the hiring and recruiting process to capture target candidates and increase the efficiency and effectiveness of overall hiring in NJ Transit.**	A robust Applicant Tracking System and additional functionality for the TargetRecruit system represent opportunities for needed automation support to the hiring and recruiting process.
	2	**Streamline hiring process by eliminating non-value-add activities.**	Present recruitment practices create innumerable bottlenecks in the system that thwarts the hiring process. By removing non-value-add activities, efficiency is increased, and time-to-fill decreased.
	3	**Clarify recruiting and hiring roles, responsibilities, and accountability between business units and HR/Talent Acquisition.**	A clarification between HR and business unit roles, responsibilities, and accountabilities in the recruitment process is warranted for empowering the business unit to drive strategy and decision making, collaborating with HR as a support function.
	4	**Improve the effectiveness of candidate screening and selection to improve the quality of candidates and reduce the time to acquire them.**	The candidate screening and selection process at NJ Transit is cumbersome and often ineffective, with high degree of HR involvement, not enough from the hiring manager, and unnecessary testing. This is particularly challenging for experienced and credentialed professionals, which dissuades them from applying.
Procurement	1	**Explore expanded opportunities for cooperative purchasing to increase flexibility and control in procurement.**	Cooperative purchasing could involve temporarily outsourcing areas of procurement. Cooperative purchasing allows NJ Transit to gain more control over the vast number of outstanding, high-priority procurement requests.
	2	**In the absence of robust technology to support Procurement, develop standardized spreadsheets and tracking mechanisms to implement short term process, control and data capture.**	Until longer term robust technologies are implemented, short-term consistencies and tools will improve access to data and visibility into key performance metrics.
	3	**Establish a Governance Team for Procurement to involve all stakeholder groups and enable appropriate prioritization.**	A Governance team would be responsible for setting roles, responsibilities, and accountability across all departments and business units and to serve as a resource to make determinations on accountability when gaps in processes exist.
	4	**Develop a process map for end-to-end procurement lifecycle to drive consistency, identify gaps, and develop a desired future state.**	By defining the major phases that take place within the procurement function and identifying the critical processes that take place within each phase, NJ Transit gains better visibility into the full scope of procurement.
	5	**Modernize the organizational structure and role assignments within the Procurement Department and supporting business units to leverage the required balance of skills.**	Continue current organization structure analysis, including implementing role structures with using a mix of professional procurement skills and general business skills.
Operational and Capital Funding	1	**Align asset management objectives with organizational objectives.**	Develop asset management strategy focusing on operational maintenance and capital planning. Develop a strategy that includes frequency, specification, incidents response.
	2	**Make decisions on matters such as capital spending and operational maintenance based on evidence supported by data.**	Set up asset management system for accessible asset data including asset hierarchy, work order, capital projects, maintenance and incidents records to drive decision-making. Create asset data policy by setting up data specification, data governance, data standard including complete asset registry and asset condition.
	3	**Pace level of funding with NJ Transit's Ability to Transform its Asset Management Practices.**	Major capital funding should keep pace with NJ Transit's capacity for reform or it will risk the potential of failed programs, cash misspent and benefits not realized. NJ Transit requires a proper shaping exercise which will establish all organizational gaps between the Current State and Future State.
	4	**Ensure spending is providing optimal value to the asset base, performance and therefore its customers**	Ensure Capital planning and delivery process to effectively account for growth. Deploy data-driven performance monitoring and improvement for operational maintenance delivery.

Table A-1: High Priority Recommendations

MEDIUM PRIORITY

FOCUS		RECOMMENDATION	DESCRIPTION
Organizational Structure	1	Analyze and redesign internal processes for greater shared decision making and efficiency. Analyze and redesign internal processes for greater shared decision making and efficiency.	The transition away from a bureaucratic, top-down decision-making model organizationally requires corresponding process change to create and implement processes in line with delegation and decision making.
	2	Organizationally emphasize customer centricity and advocacy with the creation of a Customer Advocate.	A senior-level Customer Advocate would be responsible for expanding the Ambassador program, continued social media responsiveness, and customer satisfaction surveys, all key to long-term customer satisfaction.
	3	Strengthen the NJ Transit Board of Directors to better establish representation of the diverse ridership.	Opportunities exist for strengthening the current Board of Directors by immediately filling all vacancies and expanding the membership as a means of creating greater diversity of credentials and/or geography.
	4	Expand agency transparency and accountability to regain customer trust.	Greater public access to decision making and internal data, webcast Board meetings, website enhancements for data access, will increase visibility to the progress being made and increase ridership confidence.
Personnel Recruitment	1	Revise salary and compensation policies and practices for recruiting and retaining necessary talent.	By periodically benchmarking peer agency compensation and benefit packages NJ Transit is better positioned to develop competitive strategies.
	2	Create clear avenues for career growth and advancement to improve employee development and retention.	Key components include establishing career paths for advancement, training programs, performance management systems, and formalized succession plans.
	3	Implement standardized data collection and management practices so that analysis and continuous improvement can be data-based.	Objective data pertaining to the recruitment process are difficult to obtain, unreliable, and in certain instances not tracked. Continuous process improvement is thwarted without the availability of measurable data.
Procurement	1	Finalize current version of the Procurement Manual and Policy and Procedure document and develop a plan for implementation to fill current process gaps and manage stakeholder expectations.	Continue current revisions with a focus on the development, improvement, and delivery of policies and procedures.
	2	Select and implement a central document management solution to improve document storage and retrieval efficiency.	A central document management solution would provide NJ Transit with capability necessary to increase collaboration across business units, better manage and control templates, and leverage electronic workflow and approval capabilities.
	3	Review and assess the current status of the Oracle materials management system to identify what is working and what needs improvement, considering any additional functionality that may be available but not yet implemented.	A comprehensive review of the system, associated processes, and end user training and use of the system would pinpoint the root causes of the ongoing difficulties.
	4	Explore opportunities to streamline and improve legal review for procurement requests to reduce duration of reviews.	Dedicated AG support specific to the Procurement area and use of preapproved contract language would shorten timeframes for procurements.
Mobile App	1	Personalize alerts and notifications to proactively push information to the customers based on their behaviors.	Currently customers have to request information like schedule and service updates. Using more robust customer views and real time data integration, the app could provide a more positive experience.
	2	Improve ticket purchase process to be more intuitive and with fewer steps.	Leveraging new technologies will improve processes and platforms.
	3	Revise route planning process to be more aligned with experience in standard apps.	Invest in wayfinding initiatives through personalization and data integration to improve customer engagement with additional features, including integration with external partners such as Google.
Customer Communication	1	Promote collaboration between teams for customer communication.	Empower employees with necessary tools to ensure efficient and seamless transfer of information across the teams.
	2	Address diverse customer needs.	Review internal processes and upgrade channels to provide seamless communication and address needs of a diverse customer base.
	3	Post next stops on ticker screens.	Incorporate list of next stops on the ticker screens to help customers identify the stops and boost customer satisfaction.
Physical Infrastructure	1	Utilizing data to consolidate a reliable and auditable source to provide a basis for any further improvement works	Aggregate all disparate data sources, validate data for integrity and identify any missing data to build fully operational performance across network. Ensure accessibility of data to all teams.
	2	Assess and analyze performance to provide a holistic overview of the operational performance across the entire network which business can understand	Build analytics capability to assess operational performance and benchmark it against business objectives, quantify problems and finally aggregate analysis results amongst all teams to break down silos
	3	Provide evidence-based context for variations in operational performance to make decisions on improvement initiatives	Identify root causes and improvement areas aligned with business objectives. Develop evidence-based performance improvement initiatives and forecast how changes will affect performance

Table A-2: Medium Priority Recommendations

LOW PRIORITY

FOCUS		RECOMMENDATION	DESCRIPTION
Organizational Structure	1	**Create a formal Leadership Development Program to develop needed skills and the loyalty of employees who gain those skills.**	With an emphasis on "vertical learning" that serves to prepare individuals for career growth based upon the future needs of the organization, elements of a Leadership Development Program include defined career ladders, mentorship and coaching strategies, succession planning, and job exchange programs with peer transit agencies.
Personnel Recruitment	1	**Develop a purposeful approach to sourcing to attain higher qualified candidates in less time.**	Candidate sourcing activities and outreach programs are necessary attributes for building a talent pool to meet future resource demands of the organization.
Procurement	1	**Accelerate the development and implementation of vision , mission, and strategy objectives across the procurement life cycle to provide much needed direction to the Procurement team.**	Current work to develop a vision, mission, and strategy is essential and completed as quickly as possible, including the creation of a Procurement Process Vision Map.
	2	**Invest in a robust Procurement System to manage the processes and data of the end-to-end procurement cycle.**	Procurement Systems are critical in helping organizations—especially those with a high volume of procurements and a large number of vendors—manage their processes efficiently and effectively.
	3	**Conduct a detailed review of the potential of a Vendor Managed Inventory (VMI) solution to enable the team to focus on more impactful projects and less on smaller procurements.**	VMI provides NJ Transit's Procurement Department relief from a substantial number of recurring smaller procurements and allows the organization to focus on large capital projects as well as support of non-operational requisitions.
Mobile App	1	**Streamline app to address ADA guidelines and Limited English Proficiency users, which will also improve the experience for all users.**	There are opportunities in the app to modify layout, language and color to increase usability for all users.
Customer Communication	1	**Improve team writing skills and enforce NJ Transit standards for customer communications.**	More deliberate focus on improving the wiring skills of those writing customer communications will improve quality, readability, and consistency. Standards exist but they are often not followed, so enforcement of those standards is needed.
Physical Infrastructure	1	**Monitor and measure the performance of the network on a consistent basis to build a sustainable high-performing network which is resilient enough to mitigate for unexpected circumstance**	Monitor performance by establishing key performance metrics and evaluate efficacy of the implemented initiatives.
	2	**Better utilize the Customer Satisfaction Survey**	Set clear expectations and objectives, build capability needed to utilize the survey data effectively and develop feedback loop from executives to survey team for understanding and addressing customer satisfaction.

Table A-3: Low Priority Recommendations