Massachusetts Bay Transportation Authority

Introduction to Workforce Assessment

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Meredith Sandberg, Chief of Quality, Compliance & Oversight

Objectives

- Introduce Workforce Assessment Methodology and approach
- Lay groundwork for future leadership decisions on resource needs
- Begin to describe the complexities that drive the MBTA collective workforce requirements

Workforce Assessment Background

FTA Finding

MBTA's **staffing levels are not commensurate** with the demand for human resources required to carry out current rail transit operations and maintenance in addition to executing capital program activities.

FTA Directive

MBTA must conduct and submit to FTA a workforce assessment and associated workforce planning to include:

1. Required activities that must be performed for rail transit operations, maintenance, and capital projects delivery
2. Required resources to perform mission-critical activities
3. Current staffing capabilities for mission-critical activities
4. Safety risk(s) associated with current staffing shortages and how they are or will be mitigated

MBTA Response

- Perform an Authority-wide workforce assessment to quantify resources needed to complete mission-critical activities at three service level scenarios (**Workforce Model**)
- Conduct a risk assessment of staffing shortages (**Safety Risk Assessment**)
- Perform workforce assessment of alternative scenarios
- Develop a **5-year hiring plan** as required by FTA in Finding 2

Future-ready workforce model
Capturing and Reflecting Organizational shifts.

Red text indicates FTA deliverable

Workforce Assessment Approach

DATA DISCOVERY & REVIEW

- ✓ Department Onboarding and Scoping
- ✓ Develop preliminary activity inventory
- ✓ Define key terms (Qualitative Service Level definitions)

SAFETY CRITICAL ANALYSIS

- ✓ Identify and quantify safety-critical activities
- ✓ Perform supply analysis
- ✓ Develop draft safety-critical workforce assessment

WORKFORCE MODELING

- ✓ Develop model functionality
- ❑ Define service level metrics and modelling approaches
- ❑ Quantify key metrics, levers, inputs, dependencies, and assumptions
- ❑ Estimate and validate time required
- ❑ Calculate FTE required and current gaps

SAFETY RISK ASSESSMENT

- ❑ Conduct Safety Risk Assessment (SRM) Workshops
- ❑ Review and submit Safety Risk Assessment Report

SCENARIO ANALYSIS

- ❑ Determine alternative scenarios that assess varying constraints or additions to MBTA operations, maintenance, and capital project conditions
- ❑ Model alternative scenarios
- ❑ Calculate and assessment model outputs

5 YEAR HIRING PLAN

Workforce Assessment Scope

In Scope

- Activities performed by MBTA employees
- Backlog of state of good repair work
- Historical absenteeism rates (FMLA, vacation, etc.), overtime and fatigue management
- Reflecting reorganizations
- Creating process on maintenance and management of model for Finance and Human Resources

Out of Scope

- Performance/efficiencies*
- Contractors/3rd Party Vendor work
- Revision of job scope and responsibilities

Workforce Assessment Model Methodology

The workforce model uses a “bottoms up” approach to quantify workforce demand across **three service level scenarios**. The model is not an assessment of the MBTA’s current state or performance in execution of activities.

Demand − Supply = Current and Forecasted Gap

Demand: What is needed?

Supply: What do you have? + Attrition

Demand Analysis
Time estimates to measure level of effort required on safety-critical activities and activities at operational service levels

Dependency Modeling
Analytical techniques to identify and model workload drivers and dependencies

Workforce Capacity, Composition, and Distribution
Data to describe and quantify workforce capacity, distribution, and characteristics.

Attrition / Absentee Analysis
Data and assumptions to quantify current and projected attrition (incl. retirements) and absenteeism (how often people are available to work.)

Workforce Model Outputs
Quantitative and qualitative analysis of delta between required and current or projected FTE to deliver desired service levels to inform risk assessments and hiring plans

Workforce Assessment project

Metrics & Data based:

Model is based on underlying data on activities or other drivers of workforce time

Activities

Roles where headcount is best modeled based on the number of employees needed to provide a particular level of service

Ex: Admin positions

Coverage

Roles where headcount is best modeled based on the number of employees needed for a given time or area coverage

Ex: OCC Dispatcher

Defects

Roles where headcount is best modeled based on the number and type of corrective maintenance completed

Ex: Track Laborers, Electricians

Projects

Roles where headcount is best modeled based on the type of project and its associated activities

Ex: Capital Project Managers

Example Dependencies in Model

Supervisor to Employee Ratios

Adding staff may require additional supervisors to oversee, manage, and inspect the work of their teams. Supervisor to employee ratios vary by team and department.

➢***Example:*** *Adding more teams to inspect rail cars would require additional supervisors who support and perform inspections.*

Restrictions to ROW Access

Increased or decreased ROW access affects the number of required maintenance staff to perform maintenance work.

➢***Example:*** *If ROW access decreases, maintenance staff cannot complete as much work in a given shift, requiring a higher number of FTEs to accomplish planned work.*

Ops & Maintenance Support for Capital Work

Depending on the service level, Operations and Maintenance utilize varying amounts of overtime to support capital project work.

➢***Example:*** *Motorpersons and Track Laborers supporting capital work (equipment operators, flaggers, etc.) are limited by overtime rules intended to minimize fatigue.*

Required Support Staff

Hiring additional staff will require support from instructors, as well as administrative support staff.

➢***Example:*** *Training more motorperson operators depends on having enough instructors to deliver the training.*

Modeling Utilization and Retention

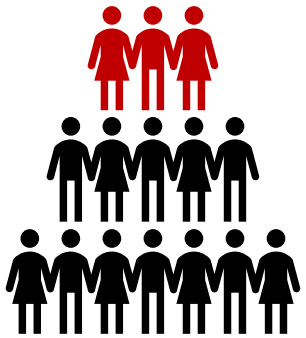
- Utilization refers to average working time by position based on historical payroll hours data and **takes into account vacation, sick, FMLA, etc.) and is derived based on historical payroll hours data**
- Retention refers to the average turnover of a position based on historic employee separations data
- Utilization and retention are calculated on a per position and business unit basis to reflect differences across MBTA functions
- ***Both retention and utilization assumptions will be based on historic data across multiple years to account for anomalies and year over year fluctuations***

ILLUSTRATIVE Utilization EXAMPLE

Suppose 100 unique Rapid Transit Motorpersons logged a total of 160,160 hours over a year. Assuming each Rapid Transit Motorpersons is expected to log 2,080 hours annually (40 hours every week), the number of hours in the year amounts to 77 FTEs.

Assuming a workforce model output of 100 FTEs required, the MBTA would need to hire 130 FTEs to ensure that all activities associated with the service level output are completed.

Rapid Transit Motorpersons	
Actual FTE Headcount	100
Collective Annual Hours Worked	160,160
Assumed Annual Hours per FTE	2,080
Assumed FTE based collective hrs	77
Utilization Rate	**77%**

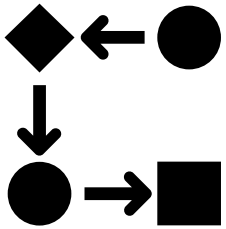


ILLUSTRATIVE Retention EXAMPLE

Suppose current MBTA's headcount for Rapid Transit Motorpersons is 102. The MBTA observed 8 separations, 30 new hires, and 20 promotions to other job classifications in the past year. The prior year, the headcount was 100. We are able to derive an exit rate of 28% and a retention rate of 72% for job classification.

Assuming a workforce model output of 130 FTEs required (after accounting for absenteeism), the MBTA would need to hire 181 FTEs to ensure that all activities associated with the service level output are completed.

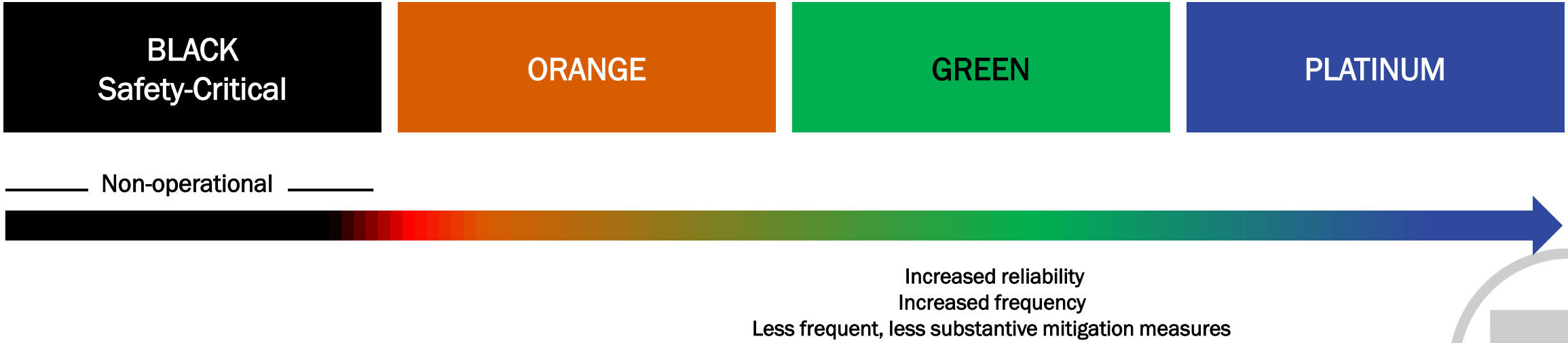
Rapid Transit Motorpersons	
Prior Year FTE Headcount	100
Employee Promotions	-20
Employee Separations	-8
Employee New Hires	30
Current FTE Headcount	102
Retention Rate (Exit Rate)	**72% (28%)**



Workforce Assessment models several service level

- The MBTA has developed service levels to inform estimates for labor demand.
- The service levels are scenarios; they do not represent the current state.
- Quantitative metrics to define the service levels are developed on a divisional or departmental basis, where applicable.
- Each service level also identifies the level of use for mitigations (ex: Overtime work)

Modeling our needs at several different service levels enables an output that is "decision agnostic" and also allows us to dynamically understand how different staffing goals at one division impacts other service decisions



Safety Risk Assessment

As workforce gaps in specific roles are identified, we are conducting Safety Risk Management (SRM) Workshops to analyze risks and hazards that a gap could introduce and identifying mitigation strategies to ensure we are operating safely.

Workforce Assessment timeline

- The Workforce Assessment, and its associated Hiring Plan, are for a 5-year timeline.
- The timeline below has been submitted by the MBTA to the FTA; we are pending their approval of this timeline

2024					
January	**February**	**March**	**April**	**May**	**SUMMER**
Mid Dec: Staff receive Safety outputs **Mid Jan:** Staff receive Maintenance outputs	**Mid Feb:** Staff receive Capital outputs		**Early April:** Staff receive Wave 1* dependency outputs	**Early May:** Receive Wave 2 outputs	[Ongoing: Scenario outputs, Training guides, 5-year Hiring Plan] MBTA Staff brings WFA results to Board

*With interdependencies, some later outputs could impact earlier outputs

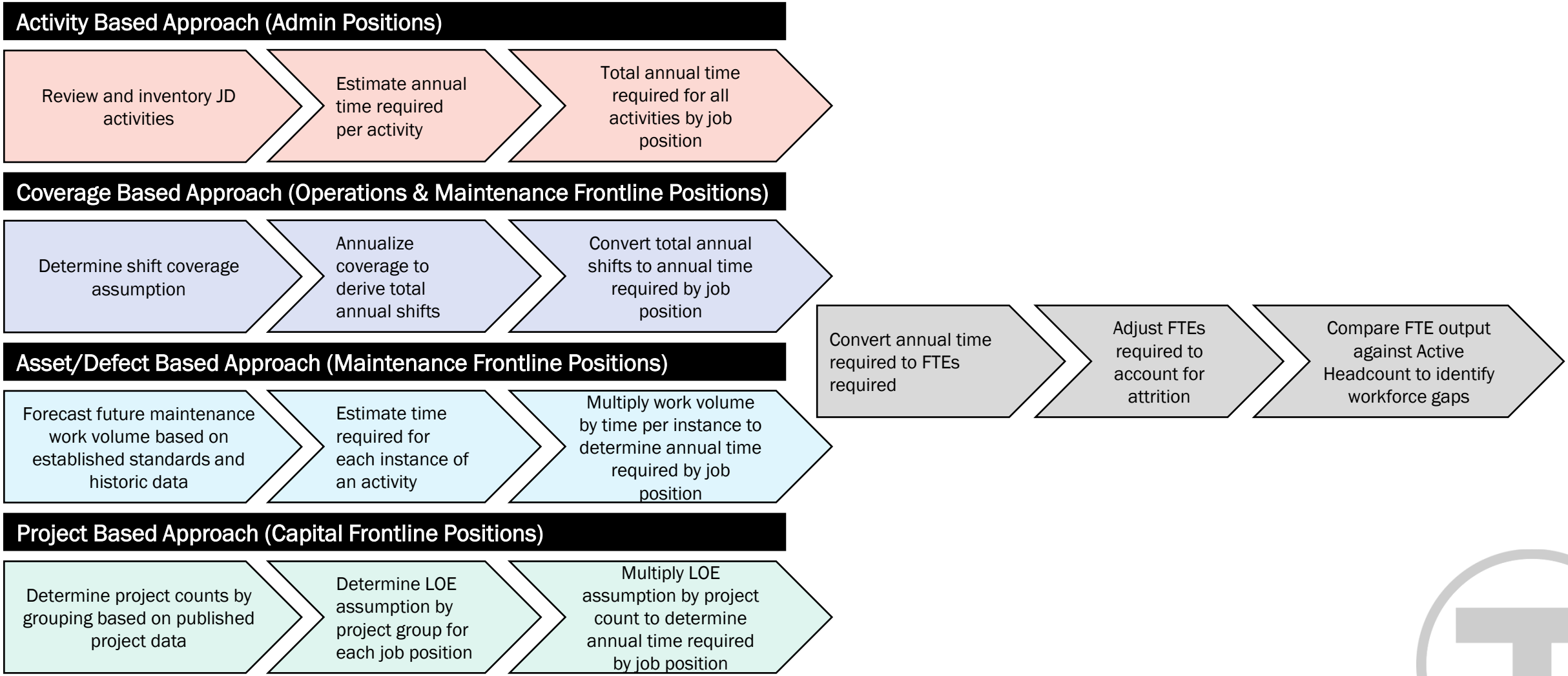
Looking forward

- Workforce Model is being developed in partnership with MBTA Workforce Department and will be handed over to integrate with our planning processes
- Workforce Department is building out People Analytics capabilities to enable further refinement of our model
- MBTA intends to continue to update the model so that it continually better reflects our operating conditions
- We can also use it to drive better understanding of our workforce patterns and needs

Questions

APPENDIX

Model Approach



Utilization Rate Methodology

- Our approach calculates utilization rate by leveraging account code which categorizes payroll hours entries into the following categories: regular-productive, regular-absence (i.e., holiday, vacation, sick leave, etc.), and overtime.

Sample Payroll Hours Data				
Week Ending	Account	Job Code	Hours	Category
8/18/2023	511000	035000	32	Regular – Productive
~~8/18/2023~~	~~511900~~	~~035000~~	~~5~~	~~Overtime~~
8/18/2023	513000	035000	8	Regular – Absence

$$Util.Rate = \frac{Regular\ (Productive)}{Regular\ (Productive) + Regular\ (Absence)}$$

$$Util.Rate = \frac{32}{32 + 8} = 80\%$$