

Ready. Set. Go! ... almost



Asset Management at S.F. BART



- AGENDA
 - Background
 - Premise
 - Assumptions
 - Specific Objectives
 - Approach
 - Take-Aways

- **BACKGROUND**

- Opened September 1972
- Serve ~380K patrons/day
- 104 miles, 44 stations
- 669-car fleet
- 5'6" gauge on
- 1000 VDC
- 80 MPH (avg. 33) with 20" station stops
- Currently valued at about \$25B
- Fragmented inventory and condition data
- Major technology transition in progress



- PREMISE

- What do we have?
- What is its condition?
- What do we need to do about it?
- When do we need to do it?
- How will we pay for it?
- What are the risks?
- How will performance be affected?
- How will region be affected?
- Necessity to be the “mother of smart solutions”

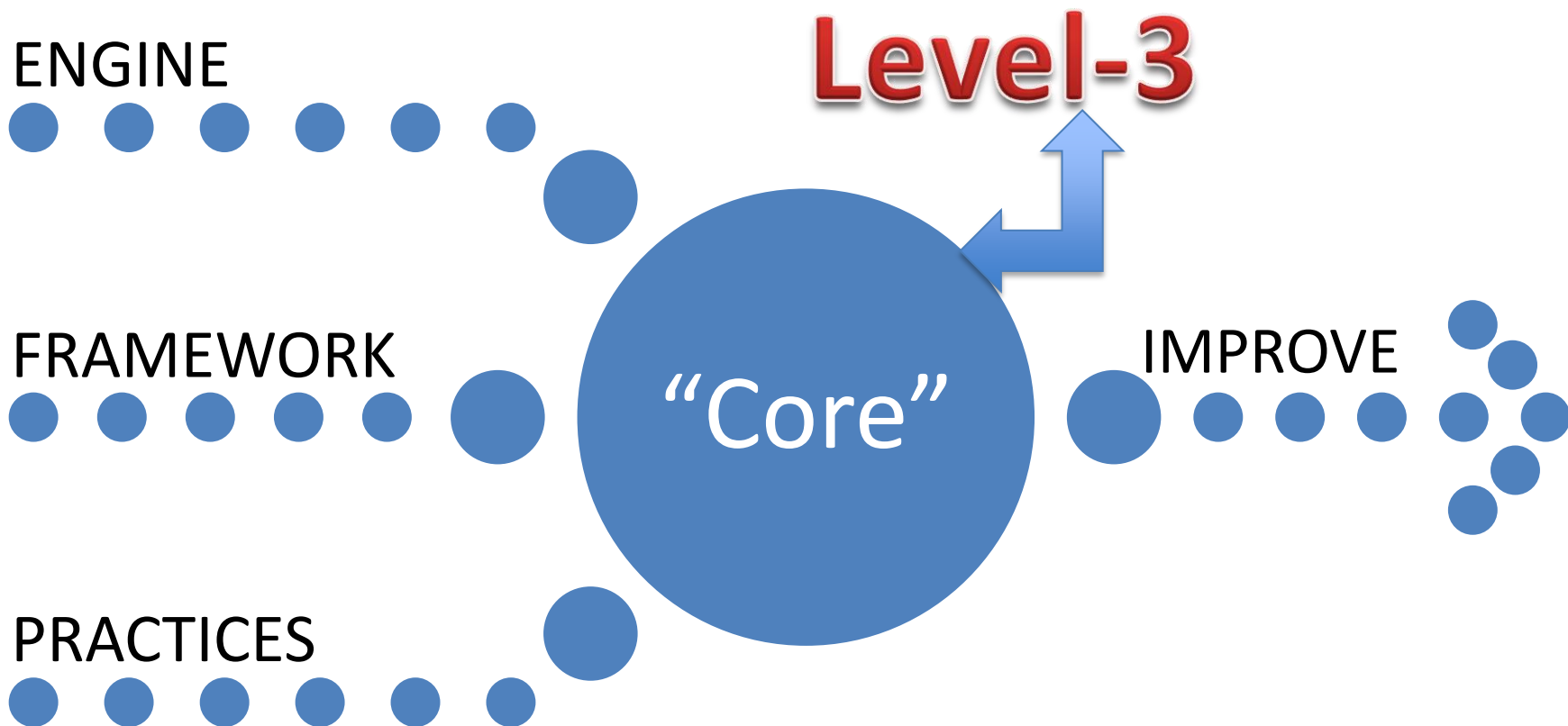
- **ASSUMPTIONS**

- Unlikely we'll ever have enough money
- Drive backward from the destination – the NTD
 - **CMMS-> TERM-Lite -> RTCI -> MTC -> FTA**
- Urgent need to
 - Develop complete asset portfolio/register
 - Develop the ABS (Asset Breakdown Structure)
 - Assess complete/accurate condition ... in stages
- Follow path of least resistance (McGyver it!)
 - Use what's available and laying around
 - TERM Lite
 - IIMM, PAS-55

- SPECIFIC OBJECTIVES

- Create prioritized, time-phased **CapEx** and **OpEx**
- Clearly understand and communicate risks
- Clearly understand and communicate performance and service impacts

- APPROACH



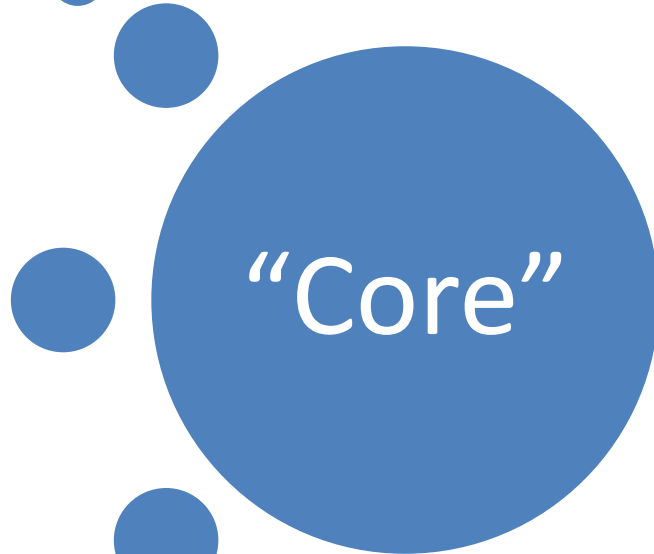
ENGINE **CMMS + TERM-Lite + PPM**



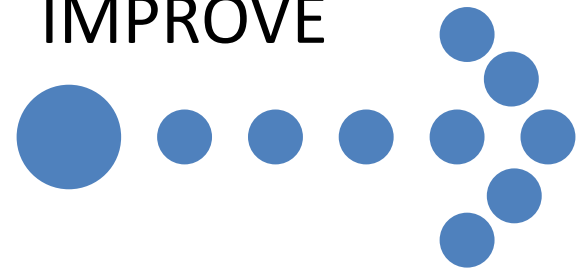
FRAMEWORK



PRACTICES

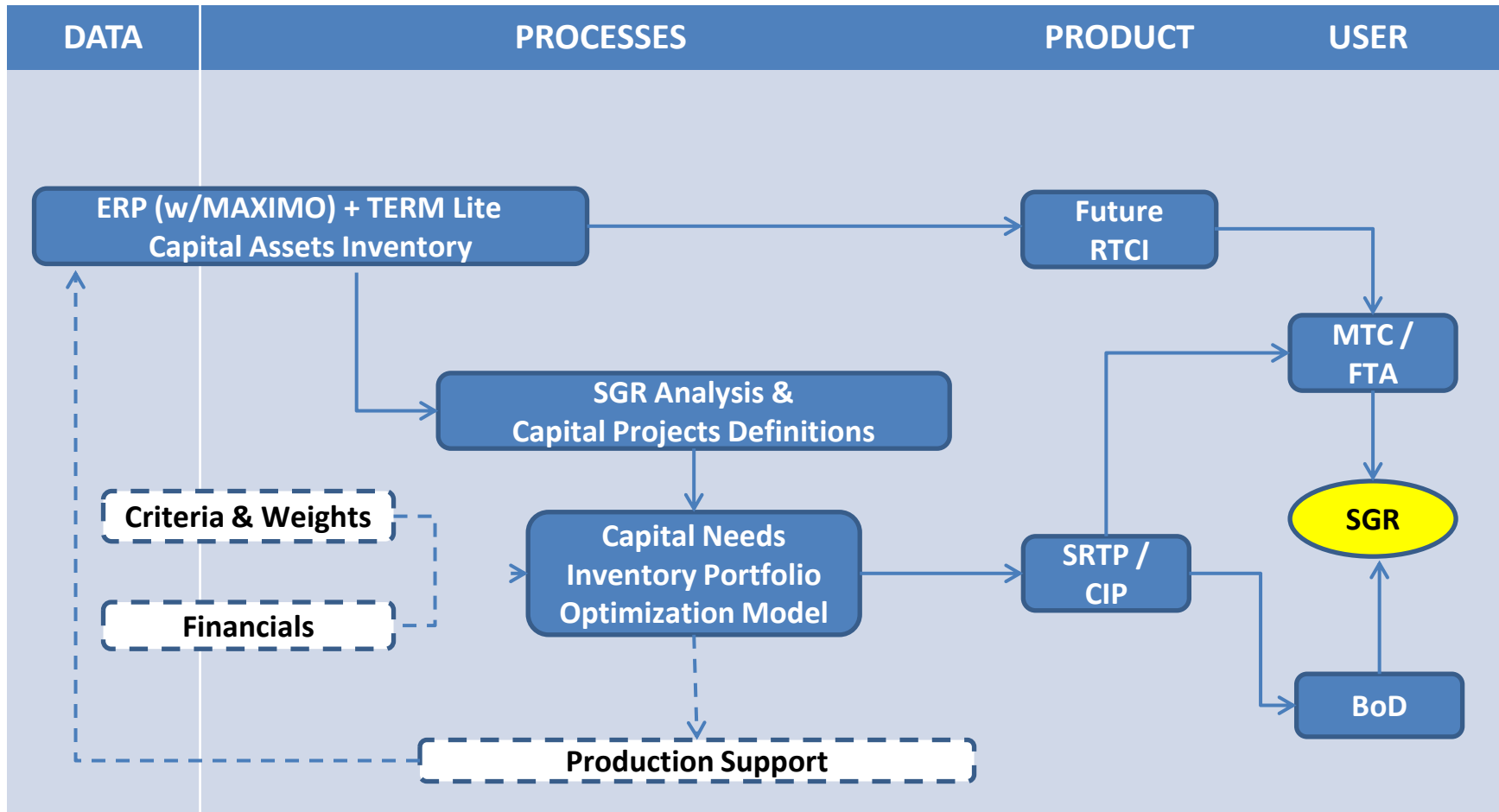


IMPROVE



- ENGINE:
 - Develop the inventory (in progress)
 - Instrument to accommodate attributes
 - Enable as single work authorization system
 - Use smart tech to accelerate data collection
 - Define ABS based on TERM-Lite's model
 - Preliminary SGR condition analysis via TERM-Lite
 - Define preliminary CapEx/OpEx
 - Reconcile CapEx based on 'expert judgment' with 'decay curve'-based analysis
 - Prioritize and time phase CapEx via PPM

- BEAM (BART's Enterprise Asset Management)



ENGINE

CMMS + TERM-Lite + PPM

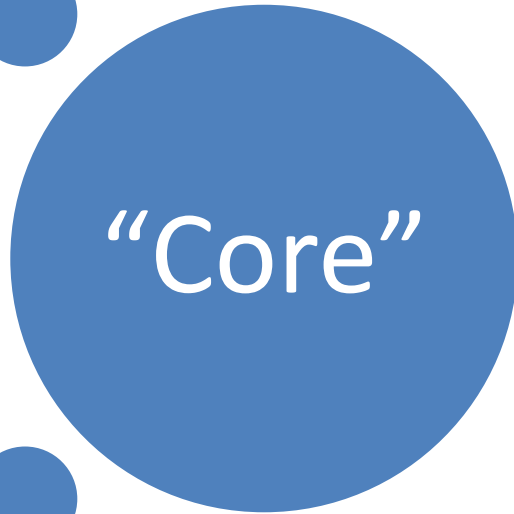


FRAMEWORK

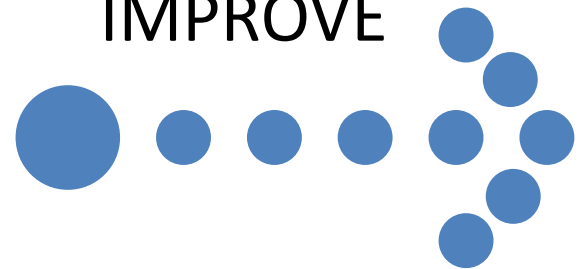


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PRACTICES



IMPROVE

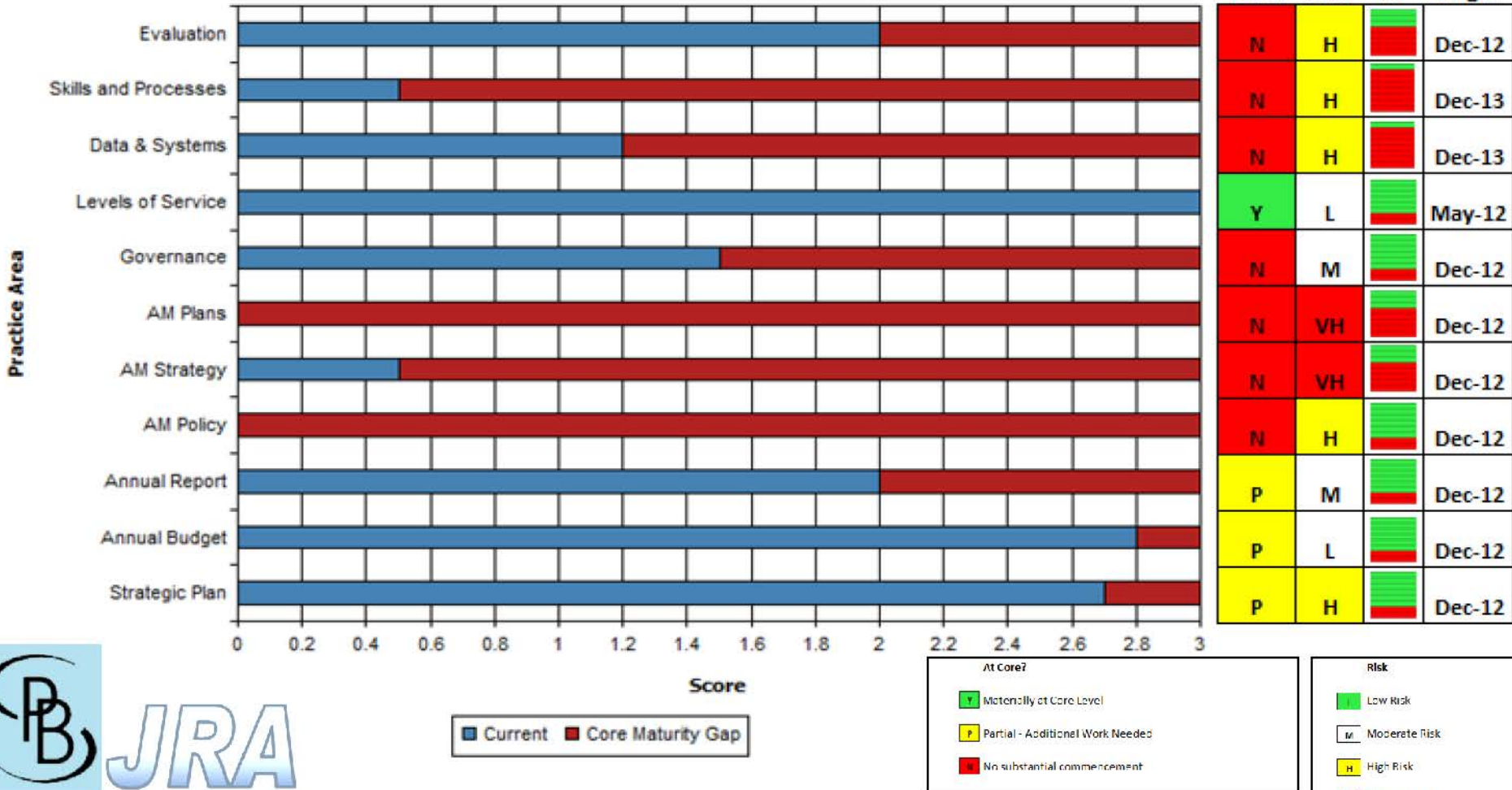


- FRAMEWORK:
 - Conduct Asset Management Maturity Assessment
 - Establish governance elements
 - Establish policy, strategy and standards
 - Develop [one or more] AM Plan[s]
 - Train staff and develop capacity to do this!!
 - Develop a risk register and manage risks
 - Update the Strategic Long Term Plan
 - Develop a dashboard reporting capability
 - Integrate Knowledge Management elements
 - Achieve “Core” maturity level

Maturity Assessment Result

BART - Maturity Assessment ID 104

Risk Level



At Core?

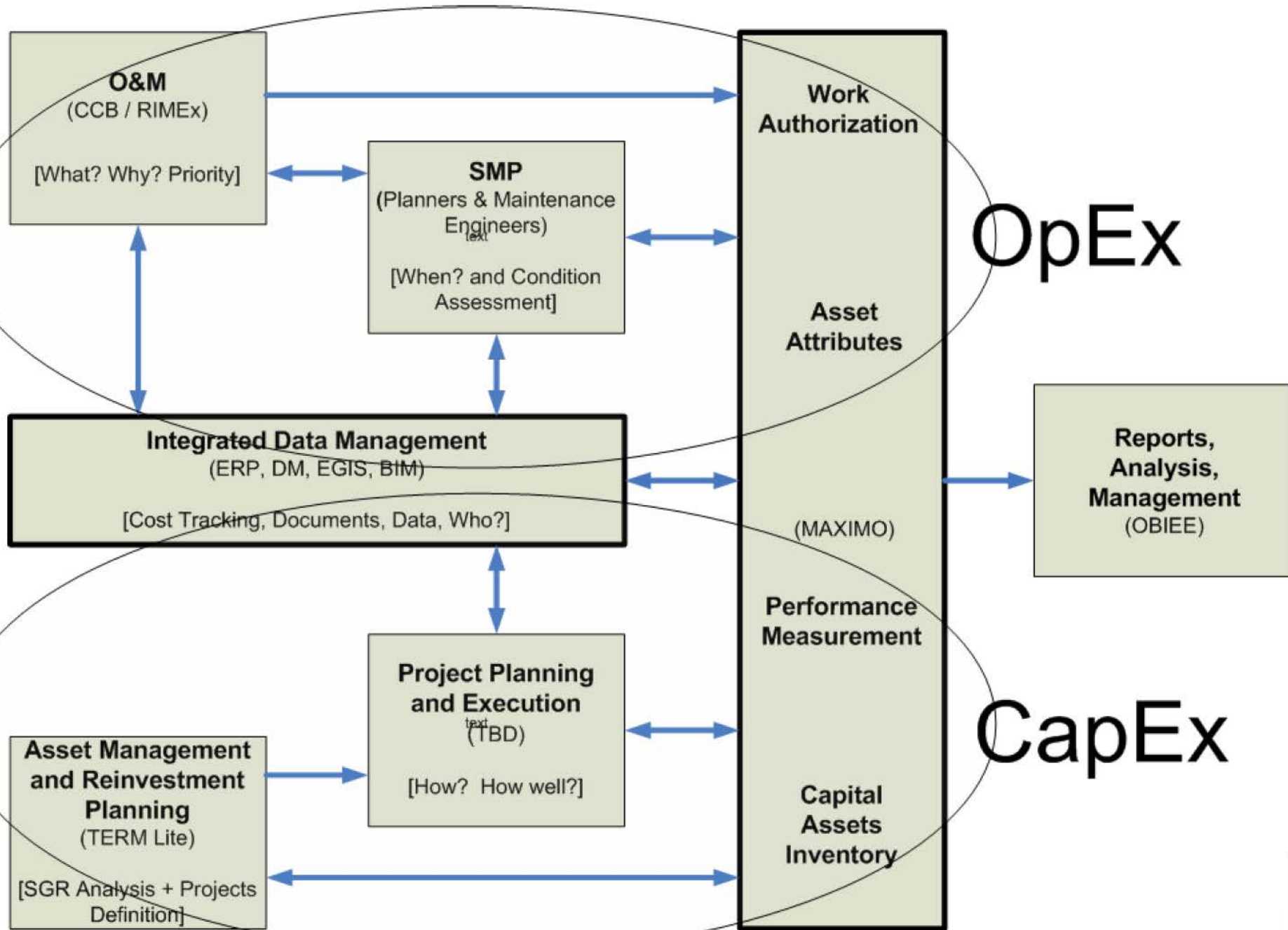
- Y: Intentionally at Core Level
- P: Partial - Additional Work Needed
- N: No substantial commencement

RI - Resource Index

- High Resource to Achieve and Maintain Core Level
- Moderate Resource Input to Achieve and Maintain Core Level
- Low Resource Input to Achieve and Maintain Core Level

Risk

- Low Risk
- Moderate Risk
- High Risk
- Very High Risk





Service Aims

- A Quality Customer Experience
- A Mission & Value-Driven Workforce
- A Stable, Sustainable System

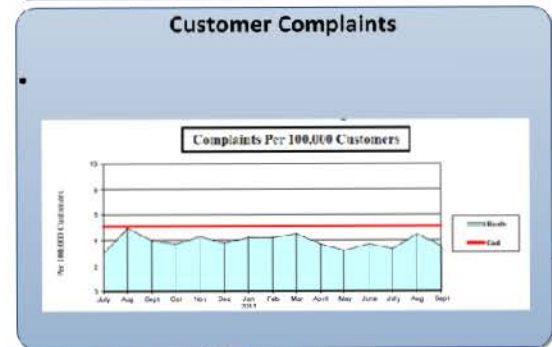
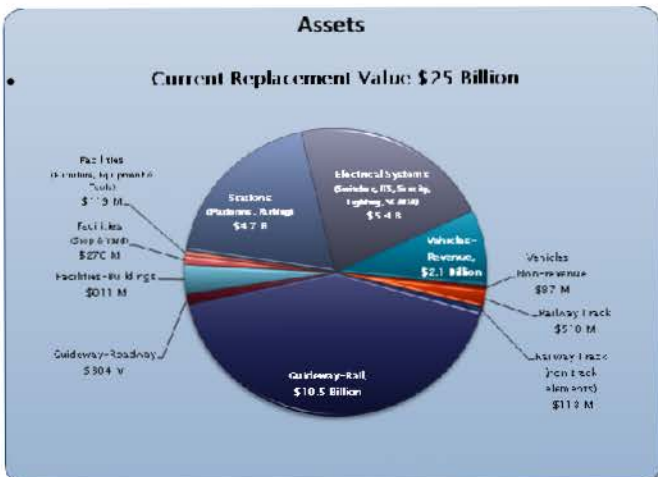
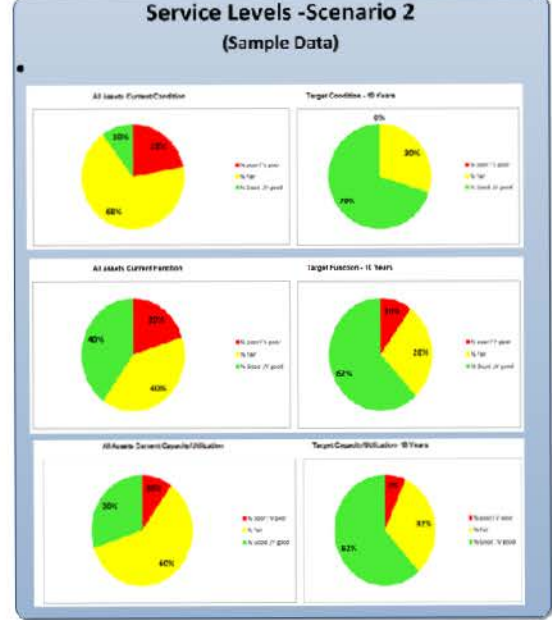
BART is a high-quality transit service that supports a sustainable region

Mission

Provide safe, clean, reliable and customer-friendly regional public transit service that increases mobility and accessibility, strengthens community and economic prosperity and helps preserve the Bay Area's environment.

Service Activities, Service Levels and Risks (Sample Data)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
C1 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C2 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C3 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C4 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C5 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C6 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C7 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C8 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C9 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C10 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C11 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C12 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C13 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C14 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C15 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C16 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C17 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C18 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C19 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C20 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C21 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C22 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C23 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C24 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C25 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C26 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C27 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C28 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C29 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C30 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C31 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C32 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C33 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C34 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C35 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C36 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C37 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C38 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C39 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C40 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C41 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C42 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C43 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
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C47 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C48 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C49 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
C50 - System Revenue	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green



ENGINE

CMMS + TERM-Lite + PPM

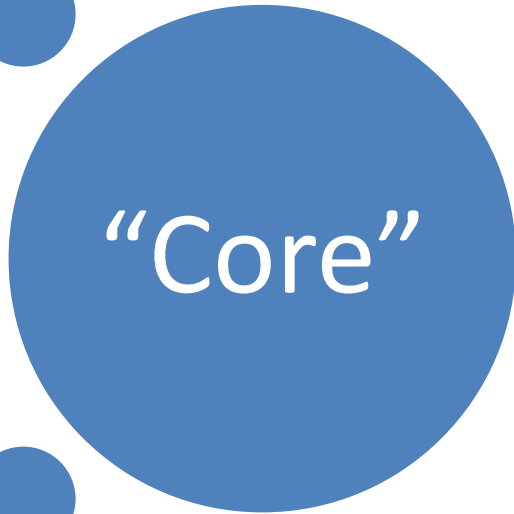


FRAMEWORK

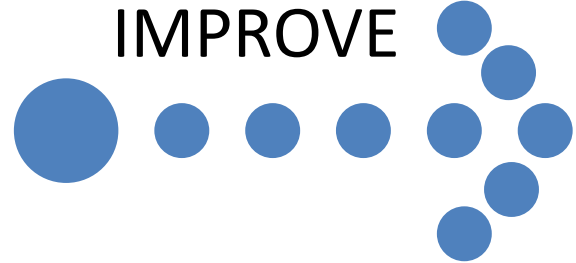


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PRACTICES



IMPROVE



Strategic Maintenance Program

- PRACTICES:
 - A systematic effort to modernize the way we conduct our maintenance work
 - Predictive
 - Reliability-centered
 - Integrate condition measurements
 - Collect, store, analyze asset data
 - Substitute actual data for decay curves over time
 - Decide on reinvestment priorities based on risk, performance and service requirements and costs
 - Improve and standardize PgM and PM practices

- TAKE-AWAYS
 - The journey has no final destination
 - Assess your current status (you may be surprised)
 - Do not reinvent the wheel
 - Collaborate internally and externally
 - Define the processes first, then apply technology
 - Define “good enough”, then consider further improvement goals and drivers
 - Place the risk burden where it belongs
 - Stare down institutional cynicism
 - KISS it! ... for the sake of the ‘natives’

- THANK YOU!
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