

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT
2150 Webster Street, P. O. Box 12688, Oakland, CA 94604-2688

NOTICE OF MEETING AND AGENDA
BOND OVERSIGHT COMMITTEE

Friday, June 17, 2022
9:30 a.m. – 12:00 p.m.

COMMITTEE MEMBERS: Marian Breitbart, Daren Gee, Michael McGill (Chair), Catherine Newman (Vice Chair), Cindy Simon Rosenthal, Vinit Shrawagi, Sonja C. Stewart

Please note, pursuant to all necessary findings having been made by the Board of Directors of the San Francisco Bay Area Rapid Transit District (for itself as well as all subordinate legislative bodies) to continue remote public meetings in the manner contemplated under urgency legislation Assembly Bill No. 361, public participation for this meeting will be via teleconference only.

Presentation materials will be available at: www.bart.gov/about/bod/advisory/bond

You may join the Bond Oversight Committee (BOC) Meeting via Zoom by calling 1 (669) 900 -6833 and entering **access code** 859 2543 3073; logging in to Zoom.com and entering access code 859 2543 3073; or typing the following Zoom link into your web browser: <https://us06web.zoom.us/j/85925433073>

If you wish to make a public comment:

- 1) Submit written comments via email to ljohnso@bart.gov, using “public comment” as the subject line. Your comment will be read into the record and will become a permanent part of the file. Please submit your comments as far in advance as possible. Emailed comments must be received before 9:00 a.m. in order to be included in the record.
- 2) **Call** 1 (669) 900-6833, enter **access code** 859 2543 3073, dial *9 to raise your hand when you wish to speak, and dial *6 to unmute when you are requested to speak; log in to Zoom.com, enter access code 859 2543 3073, and use the raise hand feature; or join the Committee Meeting via the Zoom link (<https://us06web.zoom.us/j/85925433073>) and use the raise hand feature.

Public comment is limited to three (3) minutes per person. Your phone will be muted until you are called upon.

AGENDA

1. **Call to Order** (Approx. 5 mins)
 - A. Roll Call
2. **General Public Comment** (10 min)
3. **Meeting Minutes: April 1, 2022** (For Discussion/Action – Approx. 5 mins)
 - A. Minutes approval
4. **Annual Report** (For Discussion/Action - Approx. 35 mins)

- A. Annual Report Subcommittee Report
 - B. Q&A
 - C. Vote on Adopting 2022 Measure RR Annual Report
 - D. Appoint Member to Present to BART Board in July
5. **Measure RR BART Safety, Reliability and Traffic Relief Program Presentation** (For Discussion – Approx. 1 hour 20 mins)
- A. Measure RR Project Successes (For Discussion)
 - 1. Q&A
 - B. **10 Minute Break**
 - C. Preview of Next Year’s Projects by Program (For Discussion)
 - 1. Q&A
 - D. Staff Organization Chart
 - 1. Q&A
 - E. Appendix: Financial Outlook, Project Status & Milestones
 - 1. Q&A
6. **Future Agenda Items & Questions** (For Discussion - Approx. 5 mins)
7. **Committee Member Announcements/Thank BART Staff** (For Discussion - Approx. 5 mins)
8. **Adjournment**

BART provides service/accommodations upon request to persons with disabilities and individuals who are limited English proficient who wish to address Committee matters. A request must be made within one and five days in advance of Board/Committee meetings, depending on the service requested. Please contact the Office of the District Secretary at (510) 464-6083 for information.



San Francisco Bay Area Rapid Transit District

Measure RR Program

BART Bond Oversight Committee

Friday, April 1, 2022

9:30 AM – 12:00 PM

Via Zoom Conference Call

MEETING NUMBER	MEETING DATE	MEETING TIME
Term 3, Meeting 3	Friday, April 1, 2022	9:30 am – 12:00 pm
	Present Members Michael McGill, Chair Catherine Newman, Vice Chair Marian Breitbart Daren Gee Sonja C. Stewart Cindy Simon Rosenthal	

Agenda Item	Meeting Notes
1. Call to Order (15 minutes)	Chair McGill calls the meeting to order at 9:30 am.
A. Roll Call	All committee members except V. Sharawgi are present.
2. Meeting Minutes: January 12, 2022	M. Breitbart moves to pass the minutes. D. Gee seconds the motion. Motion passes unanimously.
3. Annual Report Discussion	Linton Johnson introduces Chris Filippi who leads discussion.
A. Discuss next steps/key milestones	Chris Filippi discusses next steps.
B. Announce virtual Annual Report Subcommittee meeting of April 12, 2022, at 10 am	No action required.
C. Q&A	Committee members discuss what they like and request small improvements to this and future reports.

4. Public Comment	None.
5. Measure RR BART Safety, Reliability and Traffic Relief Program Presentation	Linton Johnson introduces Assistant General Manager of Design and Construction, Carl Holmes.
A. Bond Funded Program Watch List Items Review	Acting Chief Mechanical Officer Sylvia Lamb introduces item. Senior Program Manager Suresh Devarajan presents.
B. 15 Min Break	
C. Measure RR Related Audits	Senior Program Manager Suresh Devarajan presents.
D. Appendix: Financial Outlook, Program Status & Milestones 1. Status update memo on 2022 GO bond issuance 2. Q&A	Interim Controller-Treasurer Christopher Gan presents status update memo on 2022 GO bond issuance. Chair McGill requests a staff briefing on how BART issues bonds.
6. Future Agenda Items	Vice Chair Newman presents. Sylvia Lamb offers a tour of A77 (between Union City and South Hayward stations). Chair McGill requests more lead time to attend tours.
7. Committee Member Announcements	None.
8. Public Comment	Aleta Dupree makes a comment. Requests easier access to the meetings. Director Robert Raburn makes a comment.
9. Adjournment	Chair McGill adjourns meeting.



MEASURE RR BOND
OVERSIGHT COMMITTEE
ANNUAL REPORT

JUNE 2022



DRAFT



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Dear Bay Area residents:

Thank you for your interest in BART’s Measure RR rebuilding program and welcome to the fifth annual report published by the independent Measure RR Bond Oversight Committee. This committee was established when voters in Alameda, Contra Costa, and San Francisco counties approved Measure RR in 2016. The \$3.5 billion bond measure was supported by more than two-thirds of voters in the three counties that comprise the BART District.

Measure RR is meant to build a better BART system by replacing essential infrastructure components that in some cases are more than 50 years old. The independent Bond Oversight Committee is comprised of members with expertise in engineering, finance, and project management. It’s the charge of the committee to verify that BART is spending bond revenues in a manner that is consistent with what was promised to voters in 2016.

This year’s report examines the progress of Measure RR work with a special focus on the impacts of the on-going global pandemic. The report updates key construction milestones, measures the rate of progress compared with initial expectations for the program, and explains how BART is measuring up to legal requirements for spending bond money.

The Bond Oversight Committee wants to hear from riders and taxpayers. The committee holds quarterly public meetings via videoconference that are open to the public. The committee will return to in person meetings once it’s deemed safe by health officials. You can learn more about upcoming meetings at the committee’s website www.bart.gov/bondoversight.

We will publish annual reports throughout the lifetime of Measure RR.

Sincerely,

Michael R. McGill
 RR Bond Oversight Committee Chairperson
 Professional Engineer, Institute of Electrical and Electronic Engineers (IEEE) seat

OTHER COMMITTEE MEMBERS

Full biographies and photographs at www.bart.gov

- MARIAN BREITBART**, Budgeting & Financial Management Seat
- VINIT SHRAWAGI**, Accounting Seat
- DAREN GEE**, Civil Engineering Seat
- CATHERINE NEWMAN**, League of Women Voters Seat
- CINDY ROSENTHAL**, League of Women Voters Seat
- SONJA STEWART**, Project Management Institute Seat

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 Si necesita servicios de asistencia de idiomas, llame al (510) 464-6752.
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 통역이 필요하신 분은, 510-464-6752 로 문의하십시오.
 Kung kailangan mo ang tulong ng mga serbisyo ng wika, paki tawagan ang (510) 464-6752.
 Nếu quý vị cần dịch vụ trợ giúp về ngôn ngữ, xin vui lòng gọi số (510) 464-6752.

EXECUTIVE SUMMARY

The Measure RR infrastructure rebuilding program has made significant advancements in the past year despite the continuing impacts of the global pandemic. This work has taken place as BART has continued to fulfill its role as a transportation lifeline for hundreds of thousands of riders across five Bay Area counties. Now that the Measure RR program has been in existence for five years there are more rebuilding projects taking place across the system than at any point in BART's history.

Throughout the rebuilding work supported by Measure RR, the independent Bond Oversight Committee has continued to fulfill its mandate to evaluate the program with an emphasis on overseeing cost effectiveness, quality, and the timeliness of work completion. This fifth annual report from the Bond Oversight Committee provides an overview of the Measure RR program. The committee reports on what work has been accomplished to date, what comes next, and how the amount of work completed compares with what was promised to BART District voters in 2016.

Through March 2022 \$1.26 billion of Measure RR funds had been invested in rebuilding projects. There is now a total of 150 projects that are in planning, design, construction, or have been completed. The number of completed projects has increased from 22 in this committee's last report in 2021 to 36. Measure RR is now five years, or 25%, into its expected 20-year lifespan of work. Yet 35% of all anticipated Measure RR work has already been completed. This is well ahead of projections made by BART in 2016 when Measure RR was put before BART District voters.

This report examines the progress made on BART's rebuilding efforts in the following major program categories: Renew Track, Renew Power Infrastructure, Repair Tunnels and Structures, Renew Mechanical Infrastructure, Renew Stations, Train Control Modernization, Relieve Crowding, and Access Improvements. Progress has been made across these categories throughout the life of the overall program. Work completed to this point includes:

- Replacement of 42 out of 103 miles of worn rail.
- 31 track switches replaced. Track switches are part of interlockings, which allow trains to safely move from line to line.
- 46 miles out of approximately 103 miles of 34.5kV (kilovolt) cable have been replaced to ensure trains have a reliable source of power.
- Enhancement of 59 miles out of approximately 73 miles of third rail coverboard (coverboards are curved pieces of fiberglass that protect the electrified third rail that powers trains).

In the last year BART has completed work on 14 projects including the successful earthquake retrofit of one of the bores of the Transbay Tube and the Union City Station modernization project. Also, riders in downtown San Francisco are now riding the first of 41 new escalators that will be installed at BART's busiest stations over the next several years.

Based on its review of projects and data presented by BART staff, the Bond Oversight Committee believes BART is living up to the bond mandate from Measure RR and its promises to voters. BART is delivering rebuilding projects in a timely manner, those projects are enhancing the reliability and safety of the system, and the work is being pursued in accordance with industry best practices.

BART RESPONDS TO THE PANDEMIC

BART's response to the global pandemic has been shaped by advance planning and redeploying resources to make the most of reduced service hours during the height of public health orders. Throughout the last two years BART has reevaluated its rebuilding projects and prioritized those that could move forward with available materials and benefit from additional labor. That approach has allowed BART to advance several major initiatives ahead of their initial schedules, which means reduced impacts from that work on riders.

Projects that have achieved some of the most significant gains during the pandemic include:

- **Rail reprofiling, 65% complete.** This work involves resurfacing the rail so that trains make less noise and experience a smoother ride as they travel through the system. This work helps to reduce wear and tear which will save on costs in the future.
- **Cable replacement, 78% complete.** Installing new 34.5 kV cable helps to ensure trains have a reliable source of power. Much of this work has occurred in the core of the system in downtown San Francisco.
- **Switch replacement, 45% complete.** Switches are a railroad's answer to intersections for cars. They allow trains to safely transition from line to line. Switch replacement typically involves moving heavy track components and shutting down sections of trackway on weekends.
- **Replacing fire hosing and piping, 98% complete.** This is a critical advancement for protecting the public and BART employees. This work allows BART to better respond to emergencies in the trackway as well as in maintenance and storage facilities.

As of February 14, 2022, BART restored its service hours to pre-pandemic levels. Before that from March 2020 until early 2022 BART offered reduced service hours including a 9pm closing time for the first seven months of 2021. That increased the available window for crews to complete work in the system. BART employed a practice known as "load shedding" to support RR work. Load shedding refers to shifting BART employees from operating responsibilities to capital projects which require similar skill sets. This strategy had the added benefit of reducing operating costs during a period of low ridership. BART shifted as many as 200 employees from operations to capital rebuilding projects.

Prioritizing worker safety

BART has worked closely with its labor partners to promote the safest workplace possible throughout the pandemic. This on-going dialog led to a series of on-the-job safety measures including:

- Mask requirements at all BART properties.
- KN95 masks provided to workers
- 55-gallon drums of clean water and soap deployed at work sites.
- All contractors must follow local health guidelines and develop safety plans.

The independent Bond Oversight Committee is continuing to monitor supply chain issues stemming from the pandemic and examining if those concerns are impacting the Measure RR program. To this point, BART has been able to prioritize projects to keep the program moving forward but there are ongoing concerns about the rising costs of supplies.

ABOUT THE BOND OVERSIGHT COMMITTEE



Michael R. McGill
Chairperson of the Committee
American Institute of Electrical
Engineers Seat



Catherine Newman
Vice Chairperson of the
Committee League of Women
Voters of the Bay Area Seat



Marian Breitbart
Association of Budgeting &
Financial Management Seat



Vinit Shrawagi
American Institute of Certified
Public Accountants Seat

The independent Bond Oversight Committee (BOC) is comprised of seven members whose primary responsibility is to verify that Measure RR revenues are being spent as promised to the public.

The BOC is responsible for providing diligent, independent, and public oversight of the expenditure of funds from bond sales. The BOC assesses how bond proceeds are spent to ensure all spending is authorized by the ballot measure. The committee assesses whether projects funded by bond proceeds

are completed in a timely, cost-effective, and high-quality manner consistent with the best interests of BART riders and District residents. The BOC also publishes this annual report.



Cindy Rosenthal
League of Women Voters
of the Bay Area Seat



Daren Gee
Civil Engineering Management
and Oversight Seat



Sonja Stewart
Project Management
Institute Seat

The panel is comprised of members who represent a diversity of expertise, geography, and demographic characteristics.

- The American Society of Civil Engineers, or its successor organization, is represented by one member who has expertise in civil engineering management and oversight.
- The Institute of Electrical and Electronic Engineers, or its successor organization, is represented by one member who has expertise in electrical engineering management and oversight.
- The American Institute of Certified Public Accountants, or its successor organization, is represented by one member who has expertise in audit or financial oversight.
- The Association for Budgeting & Financial Management section of the American Society for Public Administration, or its successor organization, is represented by one member who has expertise in municipal finance.
- The Project Management Institute, or its successor organization, is represented by one member who has expertise in project management.
- The League of Women Voters, Bay Area, or its successor organization or chapter is represented by two members.

Members serve two-year terms and are eligible to serve up to a total of six years. Members of the BOC are appointed by the BART Board of Directors. You can find the full text of the duties and responsibilities of the BOC in Section 11 of the resolution that established the committee. It's available at www.bart.gov/about/bod/advisory/bond.

THE STORY OF MEASURE RR

The roots of the Measure RR rebuilding program can be traced back to 2014 when BART staff identified a critical need to rebuild the backbone of the system. Despite employing the best preventative maintenance practices for decades, the critical assets that allowed BART to operate were deteriorating from nearly 50 years of heavy use. Rail, track switches, electrical power cables, coverboards, and many more components were poised to reach the end of their design lives within the coming 10 years.

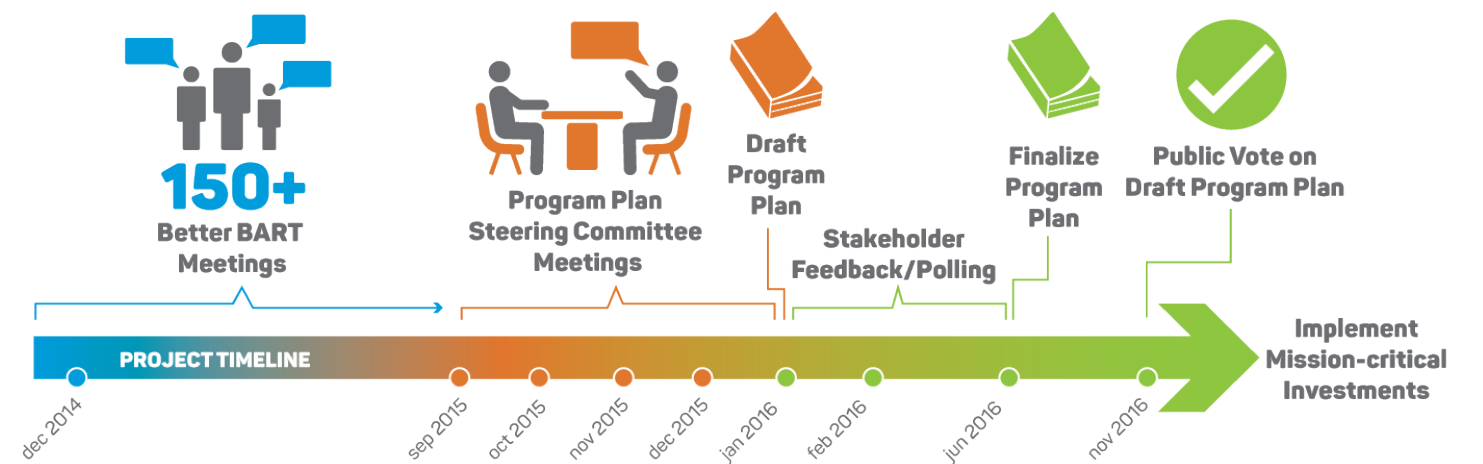
Faced with this reality, BART leaders decided to turn to the voters for support in keeping the Bay Area's critical transportation system operating and moving BART into a state of good repair. BART's Office of External Affairs organized more than 200 meetings starting back in 2014. The Better BART education campaign included meetings with community groups, business organizations, advocacy groups, and elected officials.

In 2015 community leaders and organizations came together to form the Better BART Bond Community Stakeholder Committee. Bike East Bay, Self-Help for the Elderly, East Bay Leadership Council, San Francisco Bicycle Coalition, Metropolitan Transportation Commission, United Seniors of Oakland and Alameda County, Transform, Sierra Club, SPUR, Bay Area Council, League of Women Voters on the Bay Area, and Genesis all had seats at the table to ensure the bond measure reflected the interests and needs of the District's many communities.

BART District voters approved the \$3.5 billion bond in November of 2016. More than 70% of voters in the BART District (Alameda, Contra Costa, and San Francisco counties) cast ballots in favor of Measure RR in that election. The bond measure easily exceeded the two-thirds support requirement to become law.

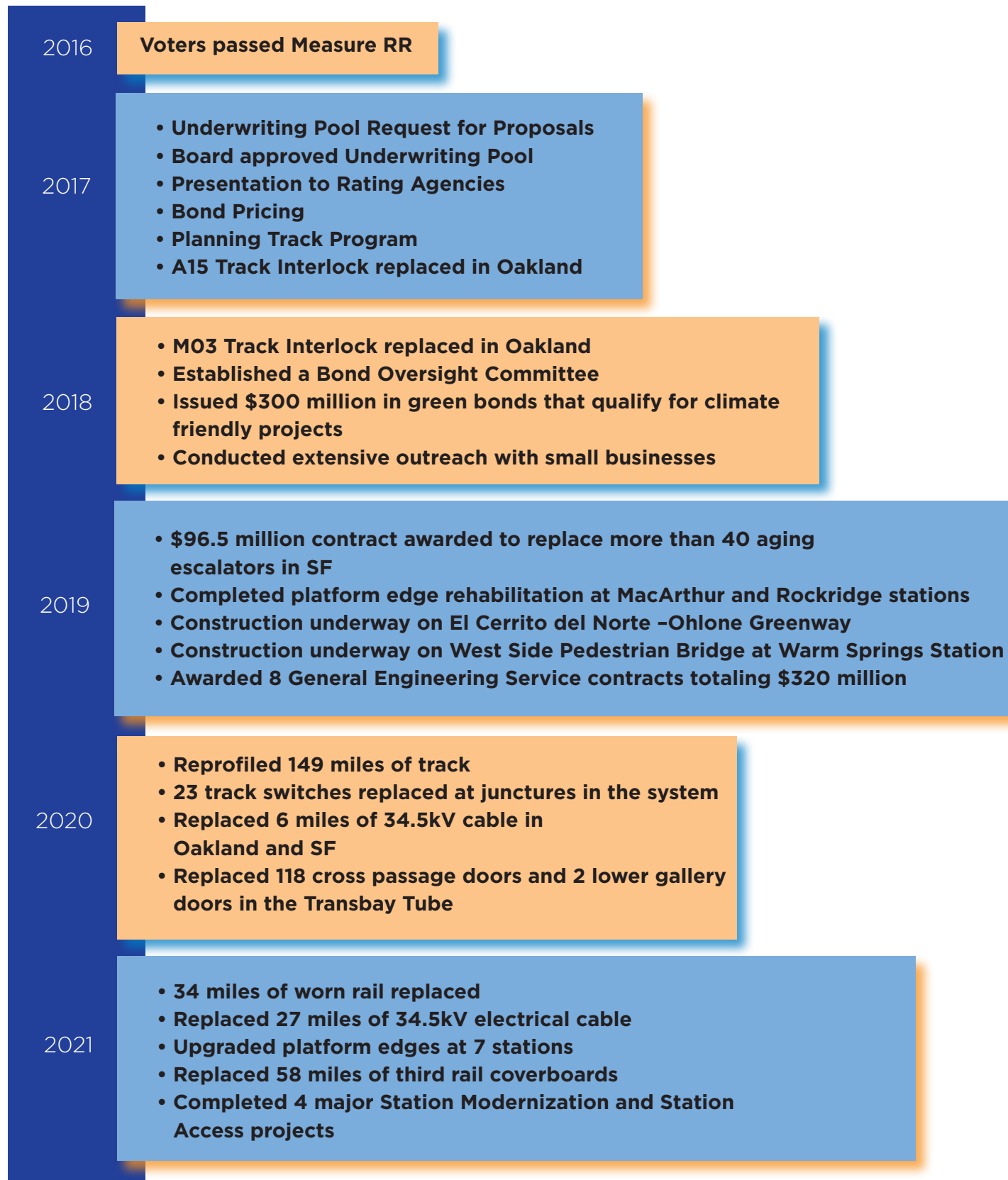
BETTER BART PROGRAM

Your input matters Our process included:

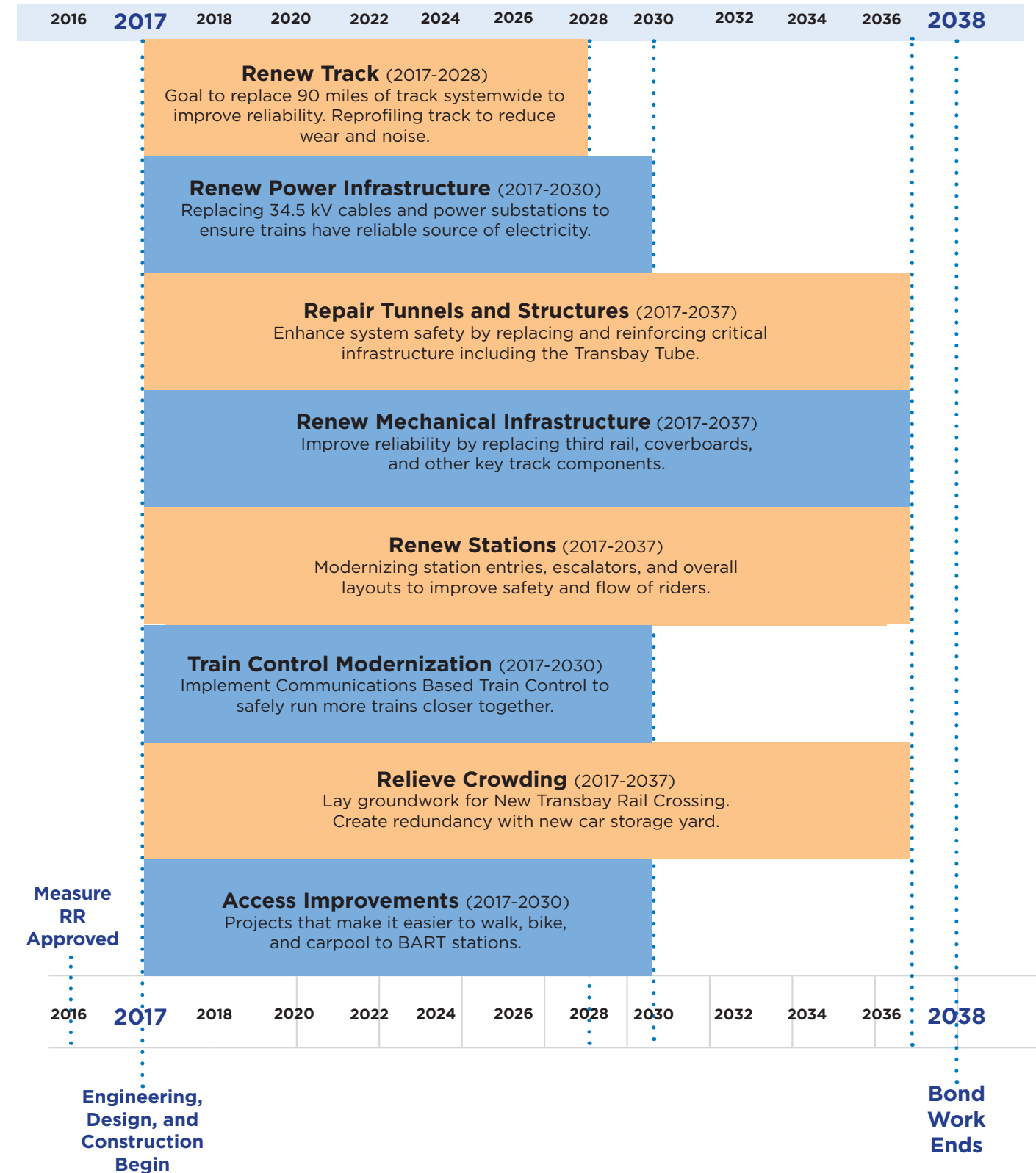


PAST ACCOMPLISHMENTS 2016-2021

THE LIFE SPAN OF MEASURE RR



Measure RR work is organized in to these eight major project areas.



ADVANCING SUSTAINABILITY

In addition to ensuring Measure RR projects are being pursued in a timely and cost-efficient manner the independent Bond Oversight Committee also has a mandate to ensure the work is measuring up to BART's sustainability standards. BART has committed to being a leader in sustainability by providing safe, affordable, and environmentally friendly transit to move people to jobs, recreation, and services. On average, BART is 10 times more efficient than a typical car with only one occupant. There are multiple examples of how funding from Measure RR is helping BART to deliver on its commitment to sustainability.

- Measure RR funding has been used to replace old water mains at shops and yards in Concord, Richmond, and Hayward. New mains improve leak detection capabilities.
- BART's rail grinding efforts are helping to combat noise pollution. The improved rail combines with a new wheel profile on trains to reduce the infamous BART screech. Interior train car noise measurements have decreased from 95 to 75 decibels in some of the loudest portions of the system.
- The Safe Routes to BART program leverages funding from Measure RR to support local projects that enhance bicycle and pedestrian connections to stations. The program identifies projects that offer a minimum funding match of 30%, have evidence of local governing body support, and have at least 35% design completion.



Warm Springs/South Fremont
BART Station

MONITORING PUBLIC IMPACTS OF LARGE PROJECTS

Public outreach is essential to inform riders of potential impacts from the large construction projects that are part of the Measure RR rebuilding program. The independent Bond Oversight Committee has a mandate to monitor impacts on both riders and neighbors of work areas as well as the efforts made by BART to inform the public about the work and how it may impact their daily lives. Though service impacts are often unavoidable for the level of work happening in the BART system, extensive public outreach is essential to maintain public trust in the RR rebuilding program.

Starting in May of 2021 and continuing through October BART crews focused on rebuilding a key section of trackway in southern Alameda County. On seven non-consecutive weekends BART service was stopped between the South Hayward and Union City stations. On shutdown weekends BART riders in that area had to get off their trains and take a free bus between the two impacted stations. Typical delays for riders during this work ranged between 20-25 minutes. In addition, the project required the cancellation of the last trains on worknights.

The shutdown schedule impacted the Memorial Day and Labor Day holiday weekends. BART often schedules track shutdowns on holiday weekends because while a typical two-day shutdown offers 36 hours for productive construction time a three-day shutdown can provide around 60 hours. That's time spent doing actual work as opposed to staging crews or breaking down equipment when the trackway must be reopened. That increase in usable work time represents a nearly 67% increase in productivity.

BART's Communications and Government and Community Relations teams worked in tandem on a public outreach campaign. A news article was posted in the Planned Service Advisory page of BART.gov approximately two months before the first shutdown weekend. The article was regularly updated throughout the work and highlighted on the homepage of BART.gov before weekend shutdowns. A news release was written and shared with a distribution list of more than 300 local news agencies and reporters.

Posters with closure dates and service maps were installed in impacted stations. Social media messages about the work and its impacts were posted on Twitter and Facebook throughout construction and special service advisories were issued on construction days. BART purchased online and radio advertising to promote the work and impacts. BART staff sent three direct mail pieces with information about the project to approximately 15,000 addresses near the work area. BART staff briefed officials from Hayward and Union City as well as Alameda County and the Valley Transportation Authority. Key stakeholders and community groups including the NAACP, chambers of commerce, and school districts were briefed on the project.

Look ahead to future track shutdowns

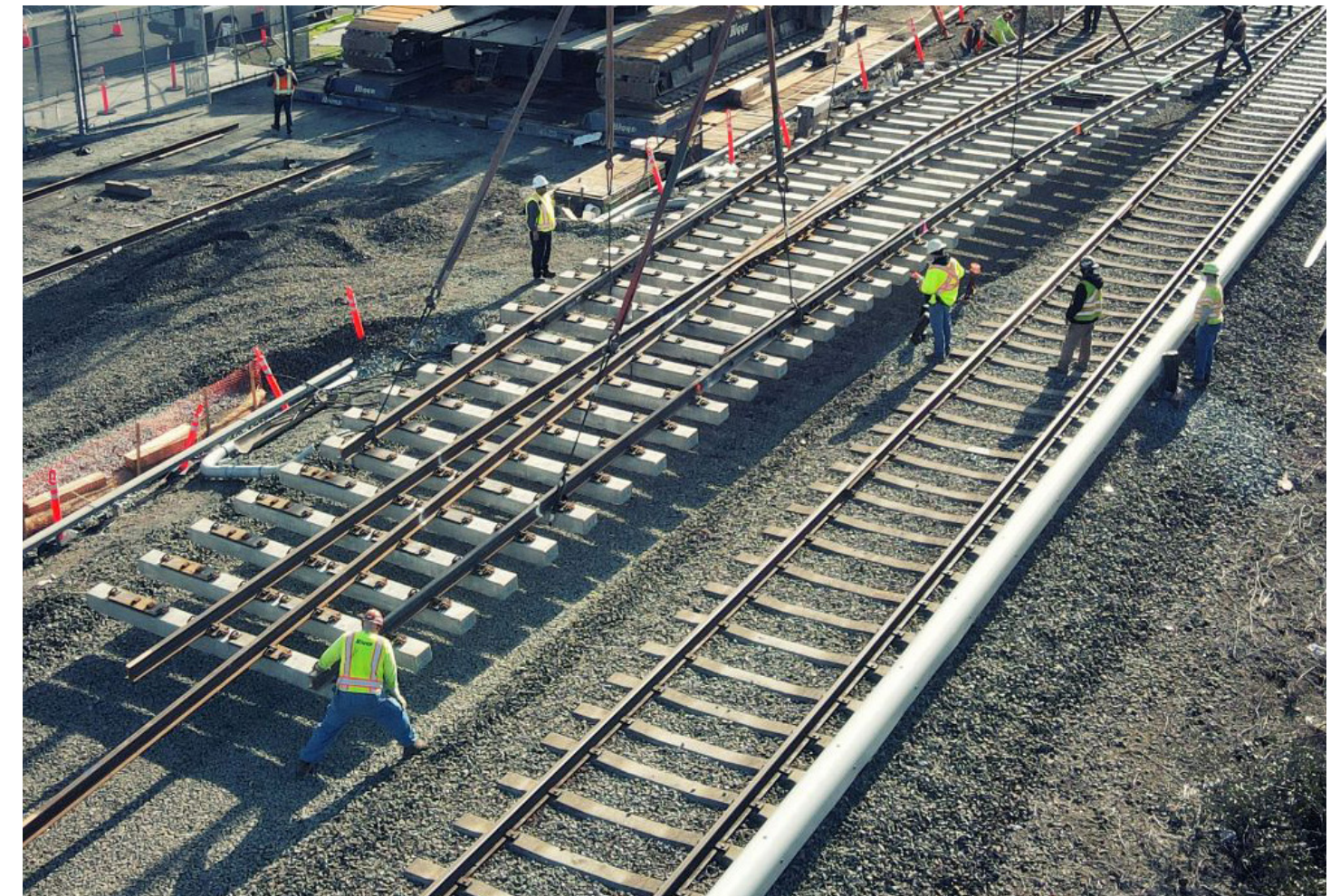
Work in this same section of trackway between South Hayward and Union City continues in 2022. In 2023 BART plans to replace interlockings between Union City and Fremont as well as between Rockridge and Orinda. The work between Union City and Fremont is expected to require shutdowns on as many as six non-consecutive weekends while the work between Rockridge and Orinda may take up to five weekends. Buses that are free for riders will replace trains on all shutdown weekends in the work zones. Dates for the weekend closures have not yet been finalized. The Oversight

Committee will continue to closely monitor impacts. Members of the public can get the latest details on service impacts resulting from rebuilding projects by going to www.bart.gov/schedules/advisories.

Equity and RR

Dollars invested from Measure RR as well as the impacts and benefits of the work have been distributed across the many communities that are part of the BART District. Major track rebuilds have been successfully completed in West Oakland and Hayward in Alameda County as well as Orinda, Lafayette, and Richmond in Contra Costa County. Meanwhile, efforts to replace traction power cables to ensure trains have a reliable source of electricity have been ongoing in San Francisco. Each project is accompanied by extensive public outreach that informs not only the general public but the communities near BART's trackway that face potential construction impacts including noise and lights.

Through March 2022, \$432 million of investments from Measure RR have been awarded to firms located across the three RR counties in the BART District as follows: Contra Costa County \$220 million, Alameda County \$139 million, San Francisco County \$73 million.



PROJECT MANAGEMENT CULTURE

The magnitude of the Measure RR rebuilding program has served as a catalyst for BART to ensure staff members are following industry best practices in the completion of projects. This effort has grown over the first five years of the program with an emphasis on transparency, consistency, and quality.

A key guide in the transformative process of establishing a project management culture has been the Project Management Institute (PMI). PMI is widely recognized as the industry and international standard for project management and project controls. PMI defines project controls as a process that utilizes everything in BART's toolbox for projects including resources, procedures, and people. PMI guidelines are consistent with the Federal Transit Administration and call on BART staff to use schedule, budget/cost, earned value, risk management, and cost tracking to build a single source of truth. That means putting all the data for a project in one place where it's interlaced. It's an opportunity to ensure factors like cost, schedule, and quality are in alignment and telling the same story about a given project. This single source of truth makes it easier to monitor progress on work and ensure a project is delivered in a way that's consistent with what was promised to stakeholders.

A Culture Built on Training

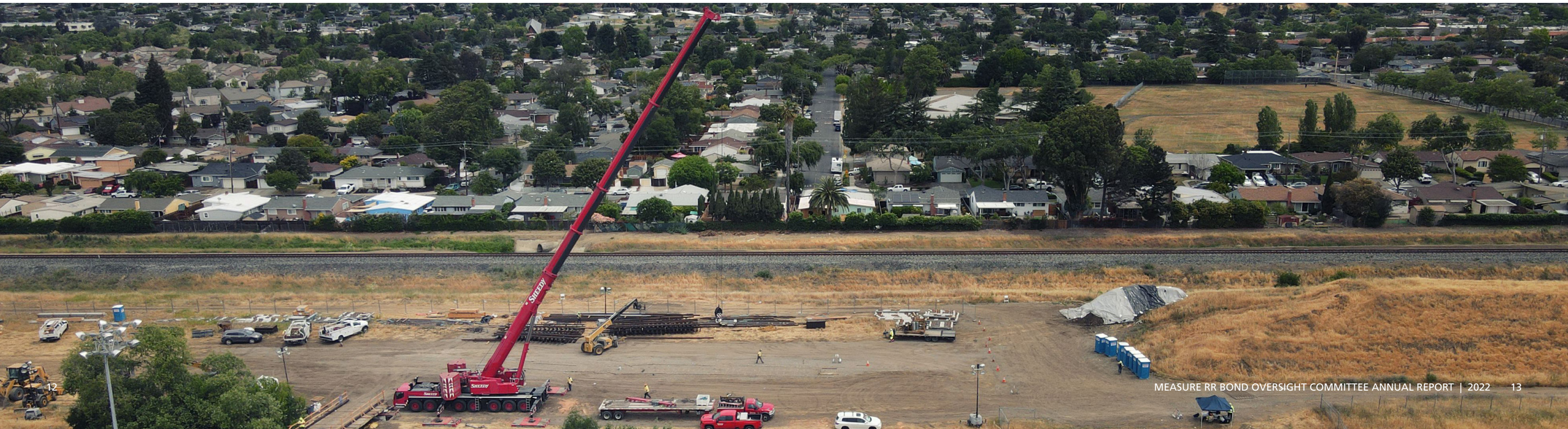
PMI offers a certification program called the Project Management Professional (PMP). BART is not only encouraging project managers to go through the program but other team members such as resident engineers, stakeholders, and executives are receiving this specialized training. BART has started a project management forum, which is held for staff every two weeks. Also, in July staff started attending project manager boot camps offered by BART. These boot camps emphasize and explain the best practices being adopted by the District to deliver RR-funded projects.

REDUCING IMPACTS THROUGH PLANNING

Advanced planning is a critical component of the success thus far of the Measure RR rebuilding program. Coordinating work between dozens of projects happening simultaneously on an active transportation system is a challenge and could become even more complex as the RR program advances.

BART utilizes industry-best practices in its planning with an emphasis on deconfliction. This means taking steps to ensure that work happening on one project does not negatively impact the progress being made on a separate project happening elsewhere in the system at the same time. Deconfliction planning is also a necessary tool to limit delays for the riding public. It's why on weekends when BART must shutdown a section of the system to rebuild a portion of trackway other work that can cause further delays is typically not scheduled.

For major projects BART will begin initial scheduling as much as three years in advance. Standard practice at BART includes developing Work Breakdown Structures (WBS) for projects. This includes developing schedules, examining how the work will be done, identifying the needed resources, and sequencing activities. Once the likely duration of construction is determined BART engages construction teams as well as community stakeholders to review plans before a schedule is established. BART does this level of planning on at least a monthly basis. The RR team builds on that by taking weekly looks at what work is underway, the level of progress being made, and further ensuring projects are not interrupting each other.



MAJOR PROJECTS: RENEW POWER INFRASTRUCTURE

Work to replace aging power cables in the core of the BART system has been accelerated throughout the pandemic and is helping to ensure that trains have a reliable source of electricity. In the lifetime of Measure RR work crews have now replaced 46 miles of 34.5kV cable, an increase from 27 miles replaced as of this committee's annual report in 2021. A total of 29 projects have been initiated in this project category with 17 in construction and 2 completed.

Much of the cable replacement work has been happening on nights and weekends in downtown San Francisco. Reduced service hours throughout 2021 allowed crews to make significant progress and shave months off the initial time frame for the project. Work is continuing in downtown San Francisco and is expected to require service be reduced to only one track in that area on a dozen Sundays in 2022. That reduction to one track is expected to cause delays for riders of 10 minutes.

The workers face challenging conditions in the dark, cramped underground space. Large fans blow fresh air - required for workers to safely breathe - into the tunnel. They're installing modern and robust high-voltage cables to reliably run trains. The cables are run through conduits (protective pipe) that are designed to be lightweight, strong, and durable. They're expected to require less maintenance and offer a longer service life than the conduit being replaced. Cable replacement work has also been happening in Alameda County and has expanded to the Richmond line.

Measure RR dedicates a total of \$1.225 billion towards the renewal of BART's power infrastructure. Through March 2022 \$472.7 million in RR funding has been invested in power infrastructure projects. 37% of planned work has been completed in the Renew Power Infrastructure project category. The completed work has a value of \$455.85 million. Work in this category is proceeding as planned. BART is keeping a close watch to mitigate pricing estimate increases seen recently in the industry.



34.5kV traction power cable ductbank being installed between the Balboa Park and Glen Park stations in San Francisco

Active Projects Completed or Under Construction

Status as of 03/09/2022



MAJOR PROJECTS: REPAIR TUNNELS AND STRUCTURES

It's not a question of if but when the San Francisco Bay Area will be struck by another large earthquake. BART for years has prioritized reinforcing the system to withstand a major temblor, but that work has been accelerated with funding from Measure RR. An area of focus for this RR-funded earthquake safety work is the Transbay Tube where workers have successfully completed the retrofit of one of the tunnel bores. The retrofit involved the installation of an inner steel lining to key sections of the 3.6-mile-long tube as well as an upgraded pumping system to allow larger quantities of water to be removed quickly from the tube. More work is ahead for the tube's second bore. The tube is already structurally sound, but the retrofit will prepare the structure to withstand a rare and devastating quake defined as a 1,000-year-event, something that happens once every thousand years.

Other safety work is being pursued across the BART system. Design work is complete for work to ensure BART train control rooms and other critical infrastructure are better protected against water intrusion. Construction is underway in Alameda County on new aerial fall protection structures and catwalks to enhance safety for BART employees. Work has also started to rehabilitate the fence that secures the Richmond Rail Yard.

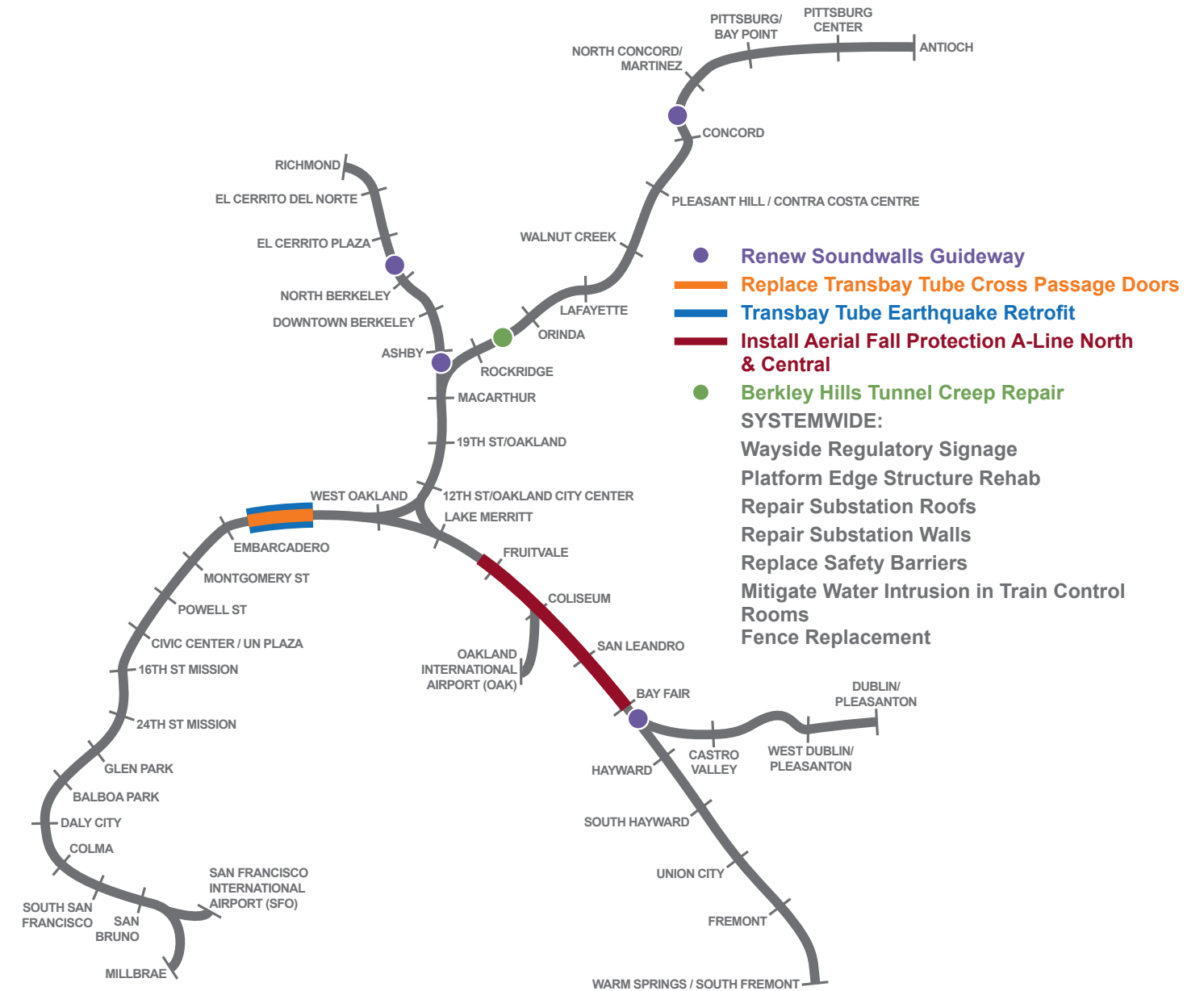
A total of 26 projects have been launched under the Repair Tunnels and Structures category including 8 that have been completed and 6 more that are currently under construction.

Measure RR dedicates a total of \$570 million toward the repair of tunnels and structures. Through March 2022 \$186.7 million in RR funding has been invested in tunnels and structures projects. 34% of planned work has been completed in the Repair Tunnels and Structures project category. The completed work has a value of \$184.16 million. Work in this category is proceeding as planned.



Active Projects Completed or Under Construction

Status as of 03/09/2022



MAJOR PROJECTS: RENEW MECHANICAL INFRASTRUCTURE

The Renew Mechanical category features a variety of projects whose goals range from protecting worker safety to quieting the infamous BART screech. Much of this work focuses on core needs such as updated Heating, Ventilation, and Air Conditioning (HVAC) systems and essential fire services. A total of 25 projects have been initiated in this program category including 5 that have been completed and 9 that are in the construction phase.

Completed construction includes the installation of HVAC replacement units systemwide. Work is also complete on rotoclone replacements. Those are high-efficiency wet dust collectors, which are essential for providing a safe work environment for many BART employees. Ongoing work includes sewage pump replacement and construction of fire services at the Richmond Yard. Design work has been completed for the initial phase of systemwide fire suppression upgrades.

Work will soon begin on the installation of a new wheel truing machine at the Concord Yard. These machines help to improve the wheels of BART trains so that their profile better fits with the rail. Combined with rail grinding, the wheel profile helps to reduce the sound of trains in tunnels and on elevated structures.

Measure RR dedicates a total of \$135 million toward renewing mechanical support structures. Through March 2022 \$68.7 million in RR funding has been invested in renewing BART's mechanical infrastructure. 43% of planned work has been completed in the Renew Mechanical Infrastructure project category. The completed work has a value of \$67.24 million. Work in this category is proceeding as planned and is expected to finish within budget and on schedule.



One of the truing machines that shapes the wheels on BART cars to better fit on the rail.

Active Projects Completed or Under Construction

Status as of 03/09/2022



MAJOR PROJECTS: RENEW STATIONS

Measure RR-funded initiatives are having a direct impact on the quality of the rider experience at BART's busiest stations. This is especially true for work in the Renew Stations category, which includes 9 projects that have been launched including 3 that have been completed and 4 that are currently under construction.

The restrooms at Powell Street Station in San Francisco and 9 other underground stations had been closed for more than 20 years due to public safety concerns stemming from the 9/11 attacks. In February 2022 restrooms at Powell Street and 19th Street/Oakland became the first to reopen as part of the agency's efforts to prioritize the needs of transit riders. The restrooms are designed like an airport's facilities using environmental design to promote safety. The restrooms are all-gender with LED lighting. The touchless sink is located outside of the restroom on the concourse making it easily accessible for those who just want to wash their hands. There is also a drinking fountain and water bottle filling station located nearby. The restrooms are staffed to promote proper use of the space and offer staff presence. BART is bringing in community members from the Oakland-based organization District Works to serve as attendants.

Riders are now using the first of what will eventually be 41 new escalators at BART's 4 downtown San Francisco stations. The new units are part of the Market Street Escalator Project. The first of the new escalators opened at Powell Street Station in August 2021. Another escalator opened at Powell a month later followed by a new escalator being unveiled at Civic Center Station. The new units are constructed with sustainable materials, feature LED skirt lighting, include advanced controller equipment to enhance reliability, and are more energy efficient than the previous units that have been worn down by decades of heavy use.

The escalator work is being done in conjunction with the Market Street Canopy Project, which is modifying at least 19 station entrances to better protect the new units. The canopies provide new entrance gates and include multiple security cameras as well as screens with real-time transit information. Two pilot canopies are already in place at Powell and Civic Center stations. Work is now underway on the next round of canopies at Powell and Montgomery Street stations.

Measure RR dedicates a total of \$210 million toward renewing stations. Through March 2022 \$49.3 million in RR funding has been invested in station renewal. 23% of planned work has been completed in the Renew Stations project category. The completed work has a value of \$49.21 million. Work in this category is proceeding as planned.



Active Projects Completed or Under Construction

Status as of 03/09/2022



MAJOR PROJECTS: TRAIN CONTROL MODERNIZATION

Measure RR is playing an important role in allowing BART to implement a state-of-the-art Communications Based Train Control (CBTC) system over the next 10 years that will allow BART to safely expand its capacity by increasing the number of trains that can operate at the same time. BART is on track to complete preliminary design for this new system by June 2022. 7 projects have been launched in this category including 2 that are in the construction stage.

The preliminary design phase is like putting the pieces of a complex puzzle together for BART. By performing design review work throughout the system now engineers can learn what components would work best for the BART system in the decades to come. Some of the preliminary work on the CBTC system has been happening during non-revenue hours. This includes survey work on routing of the new infrastructure for CBTC. Additional work on the wayside (area next to the track) includes replacing aging power cables and power supply gear for track switches (which allow trains to safely move from line to line). This work will happen in track areas for the Fremont, Richmond, Pittsburg, and Millbrae Lines. Software build-testing has begun on an Automatic Train Supervision software system which will one day be used by BART's Operations Control Center to route and control all trains.

The Train Control Modernization Project is part of the broader Transbay Corridor Core Capacity Program, which also includes 252 additional new (E) railcars (Measure RR dollars can't be used to purchase E rail cars), a new railcar storage facility, and five new traction power substations. BART's current fixed-block train control system is very safe but limits the frequency and number of trains BART can run. The current system relies on widely spaced signal blocks to denote train occupancy on the track. This contributes to longer distances between trains and increased travel times. A new CBTC system will detect a train's location using "moving" block technology that allows for more efficient train movement. This translates to a shorter distance between trains (while maintaining safe braking distances) and means BART can safely operate more trains, improve reliability in service, and decrease travel times.

Measure RR dedicates a total of \$400 million toward the implementation of a new train control system. Through March 2022 \$61.6 million in RR funding has been invested in train control modernization. 12% of planned work has been completed in the Train Control Modernization project category. The completed work has a value of \$49.9 million. Work in this category is in its early stages and is proceeding within the expected tolerance range for this initial phase.



MAJOR PROJECTS: ACCESS IMPROVEMENTS

One of the purposes of Measure RR is to support projects that make it easier for riders to get to and use BART. These projects not only benefit the environment but have the potential to better connect the BART system with the communities it serves. Measure RR has so far supported 28 projects in this category including 9 that have been completed.

The approximately 250-foot-long Warm Springs Pedestrian Bridge opened to the public in February. The span better connects the Warm Springs/South Fremont BART Station with the burgeoning Fremont Innovation District by providing direct access for businesses, offices, and homes on the west side of the station. Since it first opened in 2017, riders on the western side of the Warm Springs/South Fremont Station have had to take an indirect route to get to the station due to the nearby presence of five sets of Union Pacific railroad tracks. The new steel truss bridge crosses over those tracks allowing direct access to the station for thousands of riders and neighbors. The bridge includes a cable-stayed section connected to a massive white 110-foot pointed pylon.

In late 2021 construction was completed on a new 850 stall parking lot at the Antioch Station. In addition to a new parking lot, the project included relocated/expanded ADA and motorcycle parking as well as improved passenger pickup/drop-off and bus lane circulation in the existing parking lot. It also include the construction of a multi-use pathway from Hillcrest Avenue to the entrance of Antioch Station and improved maintenance access to BART facilities near the BART/eBART transfer platform.

Measure RR dedicates a total of \$135 million toward access improvements. Through March 2022 \$36.1 million in RR funding has been invested in access improvements. 24% of planned work has been completed in the Access Improvements project category. The completed work has a value of \$32.29 million. Work in this category is proceeding within the expected tolerance range.



Active Projects Completed or Under Construction

Status as of 03/09/2022



FUNDING RR WITH GREEN BONDS

Since the inception of the Measure RR rebuilding program BART has financed construction through the issuance of climate-certified Green Bonds. This is consistent with BART’s long-term sustainability goals. BART became the first transit agency on the West Coast to earn such a climate certification for its bonds when in June 2017 the District received certification through the Climate Bonds Initiative’s Low Carbon Transport Standard. The Climate Bonds Initiative promotes investments in projects that bring the world closer to a low carbon and climate resilient economy consistent with the 2015 Paris Agreement. As the market for these Green Bonds grows costs for climate-friendly projects everywhere may decrease. Green Bonds are not more expensive than traditional bonds but they allow BART to further demonstrate its commitment to the environment.

BART has offered three tranches of Green Bonds totaling more than \$1.3 billion to support the Measure RR rebuilding program since work started in 2017. The initial tranche was \$300 million and was offered in 2017. The second tranche offering in August 2019 was \$360 million and the latest tranche offered in August 2020 was for \$700 million. BART anticipated issuing the fourth tranche in May 2022 in an amount not to exceed \$700 million. BART has worked closely with its financial advisors to develop a financing plan that ensures funds are available as needed for projects while taking into consideration the rate paid by taxpayers.

The initial plan was to offer bonds in equal installments every two years for 18 years. But BART has been able to advance work ahead of schedule and as a result has needed additional funding sooner than originally anticipated. BART utilized extended work windows during the first year of the pandemic to advance multiple projects. This progress requires more resources earlier than anticipated and demonstrates the RR program is ahead of schedule. If BART stayed with its original financing plan only about \$900-\$950 million in Measure RR green bonds would have been issued so far.

Measuring up to Bond Requirements

The IRS requires that at the time of issuance the BART District must have a reasonable expectation that 85% of bond proceeds, including interest earnings on the proceeds, will be spent within three years. BART has progressed on Measure RR work at a pace that exceeds this requirement. As of December 2021, BART had already utilized 74% of the proceeds from the third tranche and was on track to spend all third tranche money by the third quarter of 2022. The District’s ability to surpass this requirement indicates its success in delivering Measure RR-funded work in a timely manner.

Funds to pay back Measure RR bonds are raised through property taxes assessed in Alameda, Contra Costa, and San Francisco counties. When the program started BART estimated the average yearly tax rate over the life of the bond program would be \$8.98 per \$100,000 of assessed property value. BART further projected that the yearly tax rate would range from \$0.80 to \$17.49 per \$100,000 of assessed value. BART’s latest property tax assessment for Measure RR to cover

debt service in FY 2021-2022 is \$3.50 per \$100,000 of assessed valuation. BART is monitoring future tax rates closely and when it issues its fourth tranche doesn’t anticipate exceeding the \$17.49 estimate given to voters.

BART anticipates that each bond tranche will be fully paid off within 30 years of being issued. From start to finish property owners could pay off Measure RR bonds in 48 years.

RR PROGRAM EXPENDITURES OVERVIEW

Program	Expended Through December 2021	Expended Through March 2022	% Expended Out of Total Bond Investment	MID-TERM	LONG-TERM
				(Through 2025)	(Through End of Bond)
Renew Track	\$302.9	\$313.7	50%	\$433.5	\$625
Renew Power Infrastructure	\$439.4	\$472.7	39%	\$868.0	\$1,225
Repair Tunnels and Structures	\$175.2	\$186.7	34%	\$318.3	\$570
Renew Mechanical Infrastructure	\$65.9	\$68.7	44%	\$133.0	\$135
Renew Stations	\$46.5	\$49.3	23%	\$107.1	\$210
Train Control Modernization	\$55.0	\$61.6	15%	\$113.1	\$400
Relieve Crowding	\$63.5	\$72.3	36%	\$127.8	\$200
Access Improvements	\$34.5	\$36.1	27%	\$69.2	\$135
TOTAL In (\$ Millions)	\$1,182.8	\$1,261.2	31%	\$2,170.0	\$3,500

MEASURE RR SPENDING BREAKDOWN

Total Measure Investment	\$ Millions	% of Total Bond	Benefits		
			 Safety	 Reliability	 Crowding +Traffic Relief
REPAIR AND REPLACE CRITICAL SAFETY INFRASTRUCTURE	\$3,165	90%	✓	✓	✓
Renew Track	\$625	18%	✓	✓	
Renew Power Infrastructure	\$1,225	35%	✓	✓	
Repair Tunnels and Structures	\$570	16%	✓	✓	
Renew Mechanical Infrastructure	\$135	4%	✓	✓	
Renew Stations	\$210	6%	✓	✓	✓
Train Control Modernization	\$400	12%	✓	✓	✓
RELIEVE CROWDING, REDUCE TRAFFIC CONGESTION AND EXPAND OPPORTUNITIES TO SAFELY ACCESS STATIONS	\$335	10%	✓	✓	✓
Relieve Crowding	\$200	6%		✓	✓
Access Improvements	\$135	4%	✓	✓	✓
TOTAL	\$3,500	100%			

RR – ONLY PART OF THE SOLUTION

Measure RR raises \$3.5 billion to address BART’s essential infrastructure rebuilding initiatives but the system has additional capital needs that extend beyond what the bond measure can provide. BART’s last Capital Improvement Program shows the District’s total capital need through Fiscal Year 2033 is \$22.4 billion. As shown in the chart below, funding sources identified to rebuild and enhance the system include Measure RR and other BART funding as well as federal, state, regional, and local sources. These combined sources total \$12.4 billion, which is \$10 billion short of the District’s total 15-year need.

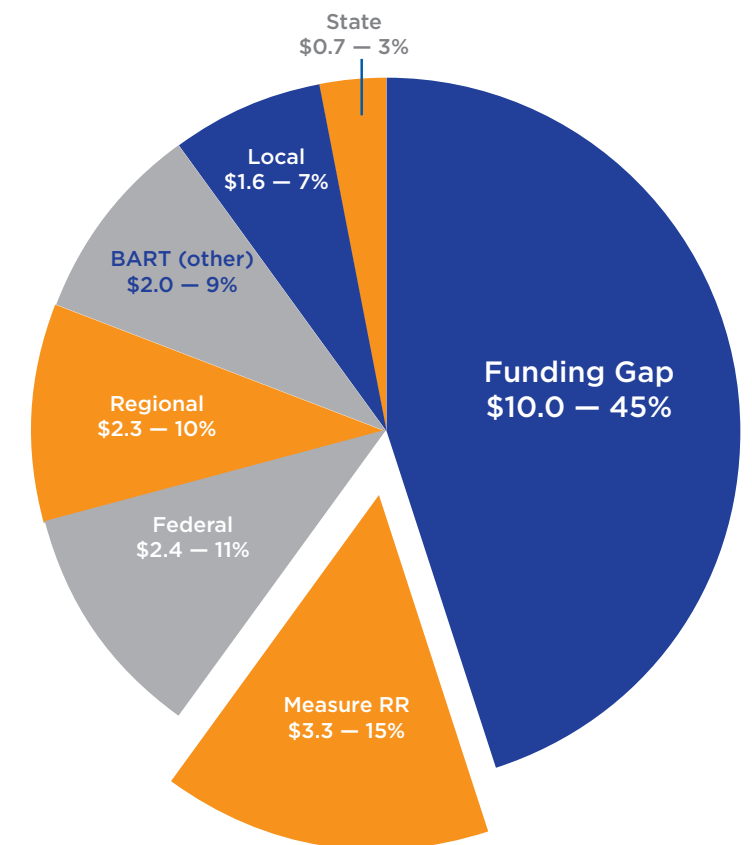
BART faces long-term capital funding challenges and continues to pursue additional grants. In 2021, at least \$15 million from Measure RR was used as a match for external funds totaling more than \$300 million (the list of grants can be seen in Appendix item 1). The grant awards were from partners ranging from the Federal Transit Administration to county transportation agencies. These grants funded a diversity of projects from core state of good repair investments to station modernization projects.

Due to the continued COVID pandemic and its impact on transit ridership and fare revenues, the Metropolitan Transportation Commission deferred the requirement for transit operators to develop a Short-Range Transit Plan and Capital Improvement Program (SRTP/CIP) to Fiscal Year 2023. BART plans to publish its SRTP/CIP in the Summer/Fall 2022.

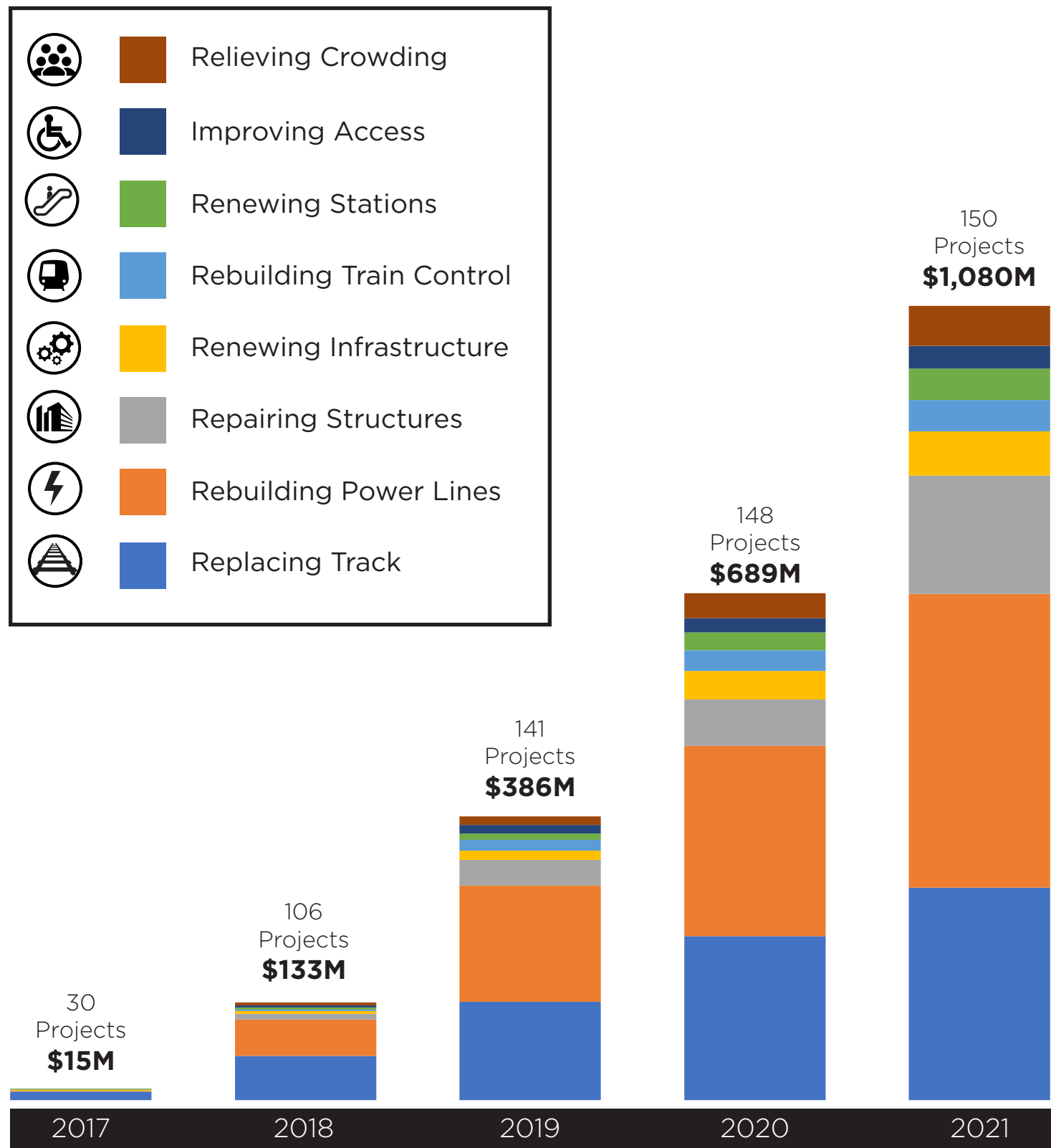
BART FY19–33 Capital Investment Needs and Funding Sources (Billions)

Total capital need: \$22.4
 Total funding identified: \$12.4
 15-year capital funding gap: \$10

NOTE: All numbers are noted in billions.



YEARLY PROGRAM EXPENDITURES

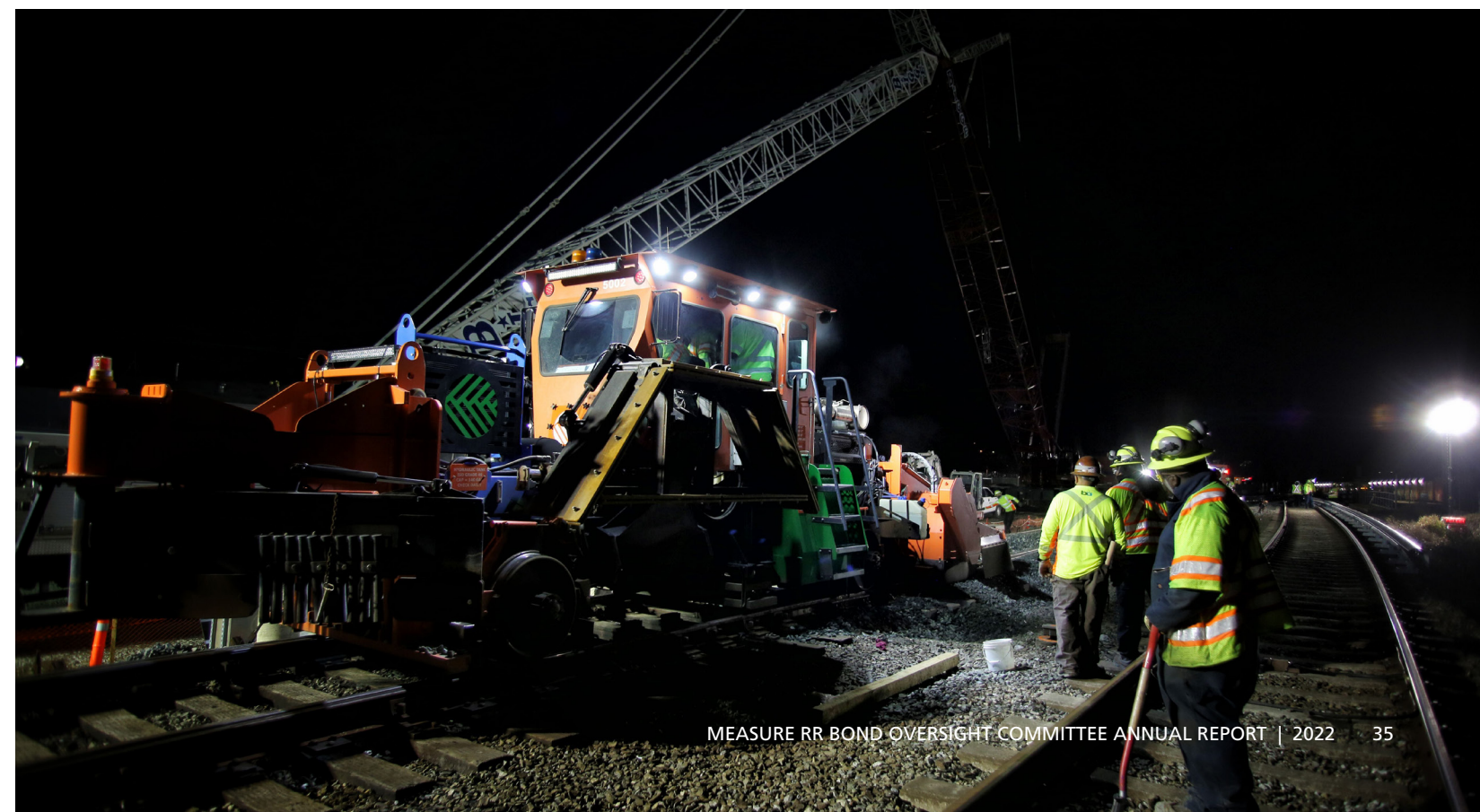


MEASURING COST EFFECTIVENESS

Ensuring the Measure RR rebuilding program is proceeding in a cost-effective manner is one of the mandates of the Bond Oversight Committee. Among the program management practices BART and the Oversight committee utilizes is an integrated method known as Earned Value Management (EVM). EVM is popular, well established, and objective measurement within government contracting and other sectors to evaluate the progress of individual projects and larger program categories.

In reviewing the cost effectiveness of RR funded work, the BART staff present to the oversight committee what work will be done, when will the work happen, and how much money and time will be required to reach completion. EVM simply allows someone to assess whether the value of work completed at a given point in time is worth the money spent at that point in time. By providing both a Cost Performance Index (CPI) as well as a Schedule Performance Index (SPI) EVM is also useful in project forecasting.

When BART staff analyze EVM results they are looking for trends which emerge over multiple quarters. Projects are considered on track when both the CPI and SPI consistently hover around 1.0. When a CPI or SPI rises above 1.2 or below 0.80 in a given reporting period, the program is given additional scrutiny to determine if there are any risks or issues. If there are develop a mitigation plan to either correct or hinder them from growing larger. It's normal for some projects to perform better than others at different times which makes looking at the overall programs so important for the longer term. The Oversight Committee receives regular EVM updates from BART staff and is advised if any issues are identified that require mitigation.



PUTTING PEOPLE TO WORK

Measure RR rebuilding projects are revitalizing BART's core infrastructure while supporting hundreds of professional jobs that are boosting the greater Bay Area economy. The Measure RR rebuilding program from April 2021 through March 2022 supported 611 Full Time Equivalent (FTE) jobs. These employees and contractors are working on projects throughout the BART District. Rebuilding projects were further bolstered through a process called load shedding. When BART reduced its service hours during the pandemic employees who had been in operations were instead shifted to capital projects. That load shedding ensured BART resources were being used in an efficient manner and helped the agency to avoid layoffs, which would have created long-term problems for BART as it resumed pre-pandemic service hours.

There are dozens of engineers working behind the scenes at BART to bring innovation and resiliency to a wide range of Measure RR rebuilding projects.



Mechanical engineer Sam Hoffman (left) is engineering a replacement of the water pipes at the Hayward Yard, BART's largest train yard that is located next to a new maintenance complex. These pipes and fire hydrants were installed in the late 1960s. For BART, a new water distribution system can be a game-changer. BART relies on a lot of water at the yards, mainly to wash the exterior and interior of train cars in service after a long day out in the system. It also needs water in case of fire emergencies.

Perhaps most importantly, Hoffman noted, the pipe replacements and upgrades need to be completed with minimal impact to Yard and Mainline operations. The new pipes are constructed with polyvinyl chloride (PVC) which is durable and much less likely to crack and fail. "You hear, 'they don't make them like they used to', but that doesn't really apply to these pipes," said Hoffman. "The original pipes had a lifetime of 25-30 years and have served for 50. These PVC pipes should last 50 years at a minimum, and probably will last for 100 years, and should be easier to repair if needed. BART will be able to use these new pipes into the next century."

For most of BART's history, detecting broken equipment in the trackway always required a set of human eyes to detect and confirm. But if Wendy Wheeler and Jeff Martz (right) of Computer Systems Engineering can have it their way, this practice would soon be a thing of the outdated past.

Wheeler's team is leading the efforts of digital transformation, a systemwide effort to use data and machine learning to transform how BART manages its infrastructure. With more



and more sensors and equipment with sensors feeding back data to its human operators, digital transformation aims to organize the data and communicate the data via dashboards.

"We're trying to move away from being preventative to more predictive maintenance with our infrastructure," said Wheeler. "We want to be smarter and quicker in responding to the devices before they experience issues or break down completely."

This effort is already helping the traction power department who manages all circuit breakers in the system. Computer Systems Engineering created a dashboard to monitor all circuit breakers which updates every few seconds.

SMALL BUSINESS OUTREACH

Small businesses are essential to the success of the Measure RR rebuilding program. Private contractors are providing valuable expertise for numerous projects including major track rebuilds, replacing power infrastructure, repairing tunnels, and renovating stations. Encouraging small businesses to bid on projects is a priority for BART's Office of Civil Rights (OCR). Those efforts include public outreach events and equity programs which aim to increase small business participation on BART contracts.

In 2021 OCR organized 38 outreach events which had an average audience of 25 participants. That included two dozen Small Business Support Services training and outreach events. OCR also provided opportunities for small contractors to meet project staff, business outreach committee meetings that included tips on how to do business with BART, and Northern California Procurement Technical Assistance Center matchmaking events.

Small businesses have been awarded 25% of all Measure RR contract dollars. BART's Office of Civil Rights administers a Non-Discrimination Program for Subcontracting on Non-Federally Funded Contracts to ensure prime contractors don't discriminate when subcontracting out work. Additionally, BART has a Small Business Program for non-federally funded contracts that provides bid preferences for qualified small businesses. The Small Business Program also includes small businesses that are Local Small Businesses, Disabled Veteran Business Enterprises, and Lesbian, Gay, Bisexual, and Transgender Business Enterprises.

OCR also operates the Small Business Support Services program, which offers help to contractors both while they bid on work and after they're awarded a contract. Dozens of support services are offered including estimating and bidding strategies; matchmaking and teaming introductions; presentation skills training; and aid in creating Site Specific Work Plans. All this help is provided by BART with no charge to the contractor.

The District's Small Business Supportive Services and outreach have been the critical reason why 1,099 RR contracts have been awarded to small businesses through the end of 2021. Those contracts have a value of \$247 million.

Committee Activities and Expenditures

In Memorium

As part of this report, the Bond Oversight Committee also presents a summary of its activities and expenditures.

June 18, 2021 – Regular Meeting

Committee member Leah Edwards announces her resignation. Remaining committee members say they wish to be reappointed. BART staff presents updated draft of '21 RR Annual Report. Vice Chair Catherine Newman says subcommittee wants to include more details on earned value in the next report and to be made aware of any audits of RR work. Committee member Sonja Stewart asks what's being done to share RR info with stakeholders. Committee member Daren Gee requests simple survey on what public thinks of the RR Annual Report. Committee unanimously approves RR Annual Report. Staff provides update on status of the overall RR Program. Committee member Marian Breitbart asks for better explanation of CPI in Earned Value Section of the update. Committee member Stewart asks staff to consider stoplight system for Earned Value Section. Committee approves schedule for future meetings.

September 17, 2021 – Regular Meeting

New committee members Vinit Shrawagi and Cindy Rosenthal are introduced. Committee Chair Michael McGill and Vice Chair Catherine Newman unanimously reappointed to those positions. Committee member Daren Gee unanimously appointed chair of Annual Report Subcommittee, committee member Shrawagi, and committee member Sonja Stewart unanimously appointed to the subcommittee. Stewart requests next annual report include information for stakeholders to stay engaged with RR and list ways to contact BART with questions and comments. Staff provides updates on overall status of RR program. Vice Chair Newman asks staff to provide info on how many open positions must be filled immediately versus vacant positions that don't need to be filled right away. Committee gets update on El Cerrito del Norte modernization project. Staff proposes creation of Earned Value Subcommittee. Gee, Stewart, and Rosenthal appointed to the subcommittee. McGill and Breitbart request update on how staff is estimating bids and dealing with rising construction costs.

January 12, 2022 – Regular Meeting

Meeting begins with a moment of silence to remember Manager of Engineering Programs Jamal Thompson. Committee members Sonja Stewart and Catherine Newman appointed to chair and vice chair respectively of Earned Value Subcommittee. BART staff presents outline for RR Annual Report and committee member Daren Gee provides positive feedback. BART staff provides RR Controls/Project Management update. Committee member Vinit Shrawagi requests both internal and external audits to committee. Committee member Cindy Rosenthal wants steps to be taken to address projects that fall outside of CPI/SPI goals added to Earned Value tables. Newman recommends staff create a slide or graphic that illustrates to the public how BART arrives at best decisions for riders and taxpayers. Newman presents Future Meeting Framework. Gee requests "look ahead" discussion at end of each meeting. Staff requests meetings that had been scheduled for third Friday in December be moved to third Friday in January.

Committee Expenditures: As of this report, the committee has spent \$5,500 in Fiscal Year 2022 on the design and production of the RR Annual Report.

You are invited to participate in future Measure RR Bond Oversight Committee meetings. Those meetings are scheduled to happen on the third Fridays of March, June, September, and January.

The meetings are open to the public via videoconference during the pandemic and will be listed on the BART website at <https://bart.legistar.com/Calendar.aspx>.

Members of the public will be welcome to attend committee meetings in person once it's deemed safe to do so by health officials. The committee will also be publishing an annual report each year to inform the public of BART's progress and activities.

The public can view meeting minutes at www.bart.gov/bondoversight.



The Measure RR Bond Oversight Committee wishes to honor the memory of Jamal Thompson who passed away on Sunday, December 5, 2021. Jamal had been with BART since September of 2017, and he played a vital role in the success of the Measure RR rebuilding program.

Jamal had a fervent passion for planning, sustainability, and mentoring. His face would light up when helping others and his laugh was genuine and warm. He also loved cars and bicycles.

Starting as a Project Manager Jamal immersed himself in maintenance facing projects with Train Control and Traction Power. He learned their pain points and was determined to improve data analytics to help the maintenance teams better monitor component performance trends. He was instrumental in kicking off the project to map the DC negative return system.

After being promoted to Manager of Engineering Programs, his most recognizable contribution was that of the RR Program Manager. Jamal was responsible for coordinating with project teams to pull together, validate, publish, and present the quarterly report to this committee. His knowledge of project management, and project controls along with his knowledge of the projects themselves, and his ability to communicate was foundational to the success of the RR program.

The contributions Jamal made as part of the Planning and Analytics team, though less obvious, are nonetheless significant. He was personally responsible for leading the development and implementation of the primary project controls tools used by BART project teams to track progress today. He took rudimentary spreadsheets, added his own vision, engaged a team, and elevated them into an innovative and comprehensive monitoring and reporting framework. To use terminology he might have, he took BART's processes from an AMC Pacer to a Maserati.

Jamal's mantra was, "make your own path and leave a trail". He was kind, patient, friendly and simply a good human being. Most of all he was loved, considered family, and will be sorely missed.

Helpful Links

Additional information about the Measure RR Rebuilding Program can be found on bart.gov. Here is a list of helpful links if you'd like to learn more about the details of Measure RR.

<p>Previous Measure RR Annual Reports published by the Bond Oversight Committee</p>	<p>2021 Annual Report www.bart.gov/sites/default/files/docs/BART%20Measure%20RR%20June%202018_2021%20FINAL%20%20sp.pdf</p> <p>2020 Annual Report www.bart.gov/sites/default/files/docs/Measure%20RR%20Report%202020%20June%20Final.pdf</p> <p>2019 Annual Report www.bart.gov/sites/default/files/docs/RR%20Report%20July%202019.pdf</p> <p>2018 Annual Report www.bart.gov/sites/default/files/docs/BART_Measure_RR_AReport_6_27_18_WEB.pdf</p>
<p>Measure RR Standing Rules and Original Documents</p>	
<p>Bond Oversight Committee Standing Rules</p>	<p>This document outlines the basics of how the Measure RR Bond Oversight Committee operates including length of committee member terms, how many meetings must occur each year, and rules to safeguard against conflicts of interest. www.bart.gov/sites/default/files/docs/Bond%20Oversight%20Committee%20Standing%20Rules_Adopted%202012-18-2020%20.pdf</p>
<p>Original Measure RR Bond Resolution</p>	<p>This is the document approved unanimously by the BART Board of Directors on June 9, 2016 that lead to Measure RR being placed on the November 2016 ballot in the BART District. www.bart.gov/sites/default/files/docs/Bond%20resolution.pdf</p>
<p>2016 Treasurer's Tax Rate Statement</p>	<p>The statement from BART's Treasurer was issued in compliance with the state election code ahead of the November 2016 vote and offers best estimates of the highest tax rate which would be required to be levied to fund the bond issue, the total debt service and more. www.bart.gov/sites/default/files/docs/2016%20Tax%20Rate%20Statement%20SIGNED.pdf</p>
<p>2016 Measure RR Fact Sheet</p>	<p>Includes details put before District voters in advance of the 2016 election including how the bond would work, how much property owners could expect to pay, and a financing schedule for Measure RR. www.bart.gov/sites/default/files/docs/BART%20%243%205%20Billion%20GO%20Bond%20Measure%20Tax%20Analysis%20%284%25%20AV%20Growth%20Assumption%29%20Summary%20FINAL%20WEBSITE%20POSTING%208%2019%2016.pdf</p>
<p>Green Bond Background</p>	
<p>Green Bonds</p>	<p>BART provides updated information on its climate-certified green bonds including preliminary offering statements and credit reports at www.bart.gov/greenbonds.</p>

Appendix

Appendix 1: List of capital grants awarded to BART in 2021 through the use of Measure RR matching funds.

Grant/Funding Program	Awarding Entity	Gov't. Level	Amount
FY21 FTA Sections 5307/5337 Formula Programs	FTA	Federal	\$188,764,022
American Rescue Plan Supplemental CIG Funds	FTA	Federal	\$87,075,134
Transit Security Grant Program	FEMA	Federal	\$4,512,704
FTA Pilot Program for Transit Oriented Development	FTA	Federal	\$350,000
Alameda County Measure BB	Alameda CTC	Local	\$15,000,000
Quick Strike Program (OBAG)	SFCTA	Local	\$3,144,302
San Francisco Proposition K	SFCTA	Local	\$950,000
State of Good Repair (STA - Formulaic)	Caltrans	State	\$6,471,025
Local Partnership Program - Formulaic	Caltrans	State	\$845,000
California Community Power Resiliency Allocation	CAL OES	State	\$300,000
Transit Center District Impact Fees	City/County SF	Local	\$1,250,000
Low-Carbon Transit Operations Program (LCTOP)	Caltrans	State	\$4,368,203
Mobility Pilot HUB	MTC	Regional	\$750,000

Keep up with Measure RR

The independent Bond Oversight Committee encourages you to stay updated on Measure RR and share comments or questions about BART's rebuilding efforts. Community engagement and feedback from stakeholders is essential to the success of the Measure RR program.

Follow and comment via social media:



Facebook
@bartsf



Instagram
@sfbayarearapidtransit



Twitter:
@sfbart



Email BART directly:
BetterBART@bart.gov

Attend a public meeting and email comments to the oversight committee:

Details on upcoming Bond Oversight Committee meetings can be found at **www.bart.gov/bondoversight**. Meetings are open to the public via videoconference during the pandemic. You may also email public comments that will be entered into the public record. List "public comment" as the subject line and email ljohnson@bart.gov.





5. Measure RR BART Safety, Reliability and Traffic Relief Program Presentation (For Discussion)

Bond Oversight Committee
June 17, 2022



Bond Oversight Committee

Duties & Responsibilities

- Provide diligent, independent and public oversight over the expenditure of funds from the sale of District general obligation bonds
- Assess how bond proceeds are invested to ensure that all spending is authorized by the ballot measure
- Assess whether projects funded by bond proceeds are completed in a timely, cost-effective and quality manner consistent with the best interest of BART riders and District residents
- Publish an annual report that includes a detailed account of the Committee's activities including its expenditures

Executive Summary

- Through March 2022, \$1.26B of the Measure RR funds have been invested to complete 38% of the work
- Successes
 - Completion of Design of Fire Suppression Upgrade System Wide Phase 1, Balboa Park – Upper Plaza project
 - Begin Construction for Turntable Replacement at Concord Yard
 - Bridge Opening for Warm Springs West Pedestrian Bridge and Plaza Project
 - Completion of Construction for Public Restrooms for Powell and 19th Street Stations
- Challenges
 - COVID-19
 - Material availability
 - Schedule recovery from stop notice issued to consultant team
 - Emergency repairs impacted capital improvement work

# Projects in Planning	# Projects in Design	# Projects in Bid/Award	# Projects in Construction	# Projects Completed	TOTAL # Projects
3	37 (-5)	18 (+4)	50 (+2)	43	151(+1)

+ (Projects added in the phase)

- (Projects no longer in the phase)

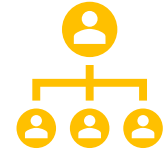
Introduction



Measure RR Project Successes



Preview of Next Year's Projects by Program



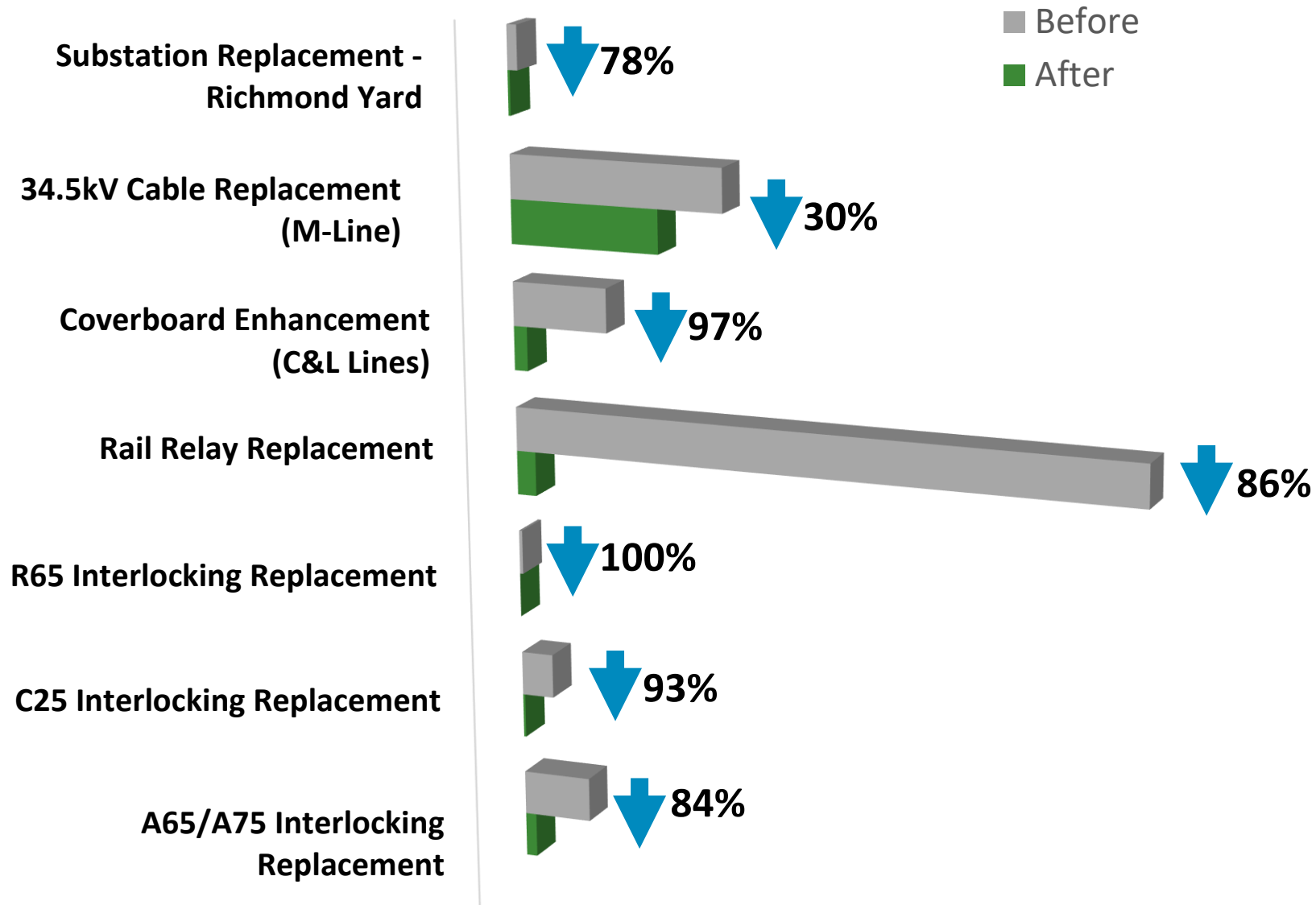
Staff Organization Chart



Appendix: Financial Outlook, Project Status & Milestones

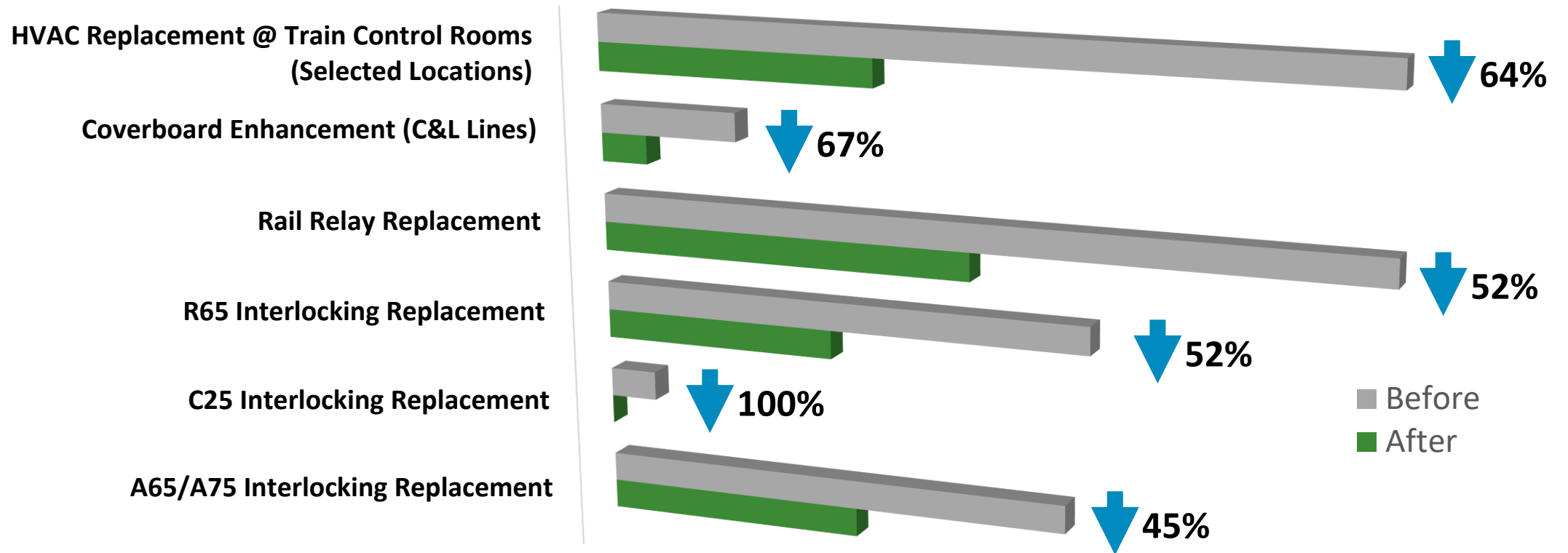
5.A. Measure RR Project Successes

Service Delay Improvement



% values are measured based on delayed trains/year

Unscheduled Maintenance Improvement



% values are measured based on Number of Work Orders

Project Progress – Accomplishments

Period of Performance: April 2021 to March 2022



Renew Track

- *R65 interlocking replacement*
- *Replacement of 8 miles of rail*



Renew Power

- *Emergency 34.5kV cable replacement R Line*
- *Replacement of 19 miles of 34.5kV Cable*



Repair Tunnels & Structures

- *Construction of safety barriers*
- *Transbay tube M1 bore earthquake retrofit*



Renew Mechanical

- *Renovation of Richmond Yard fire infrastructure*
- *HVAC replacements at 6 facilities*



Replace Train Control/ Increase Capacity

- *CBTC conceptual design review*
- *Initial surveys for train control rooms*



Renew Stations

- *Construction of El Cerrito del Norte*
- *Construction of Union City station modernization*



Safe Access to Stations

- *Reconfiguration of Dublin/Pleasanton parking lot*
- *Construction of new eBART Antioch parking lot*



Relieve Crowding

- *Begin steel erection for Civic Center station scissor stairs*
- *60% Design of Hayward maintenance complex phase 2: east storage yard*

Project Progress Overview

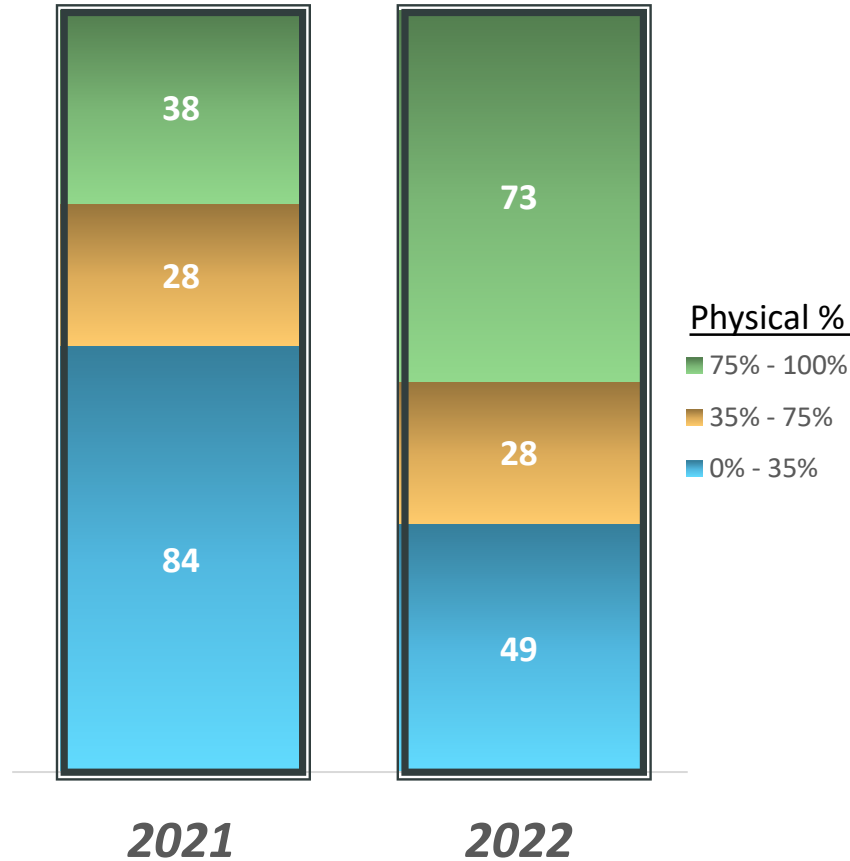
Period of Performance: April 2021 to March 2022

Contract → Self-Perform
Construction



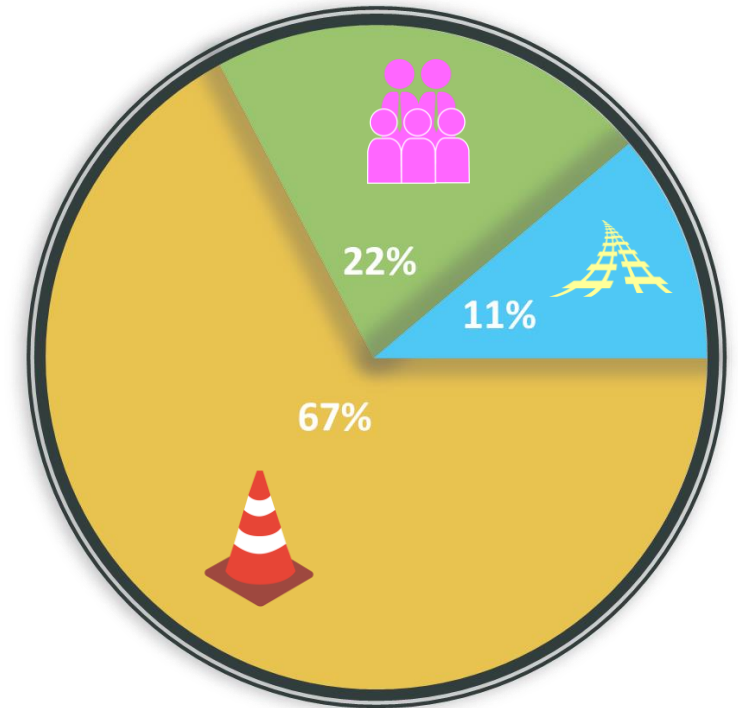
* - Estimated Construction RR Dollars

Work Progression



Values represent Count of Projects

Purchase Orders Issued



Professional & Tech Services



Construction



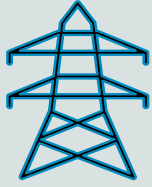
Materials

% based on estimated RR dollars





Richmond Line - Update



BART Traction Power System Overview

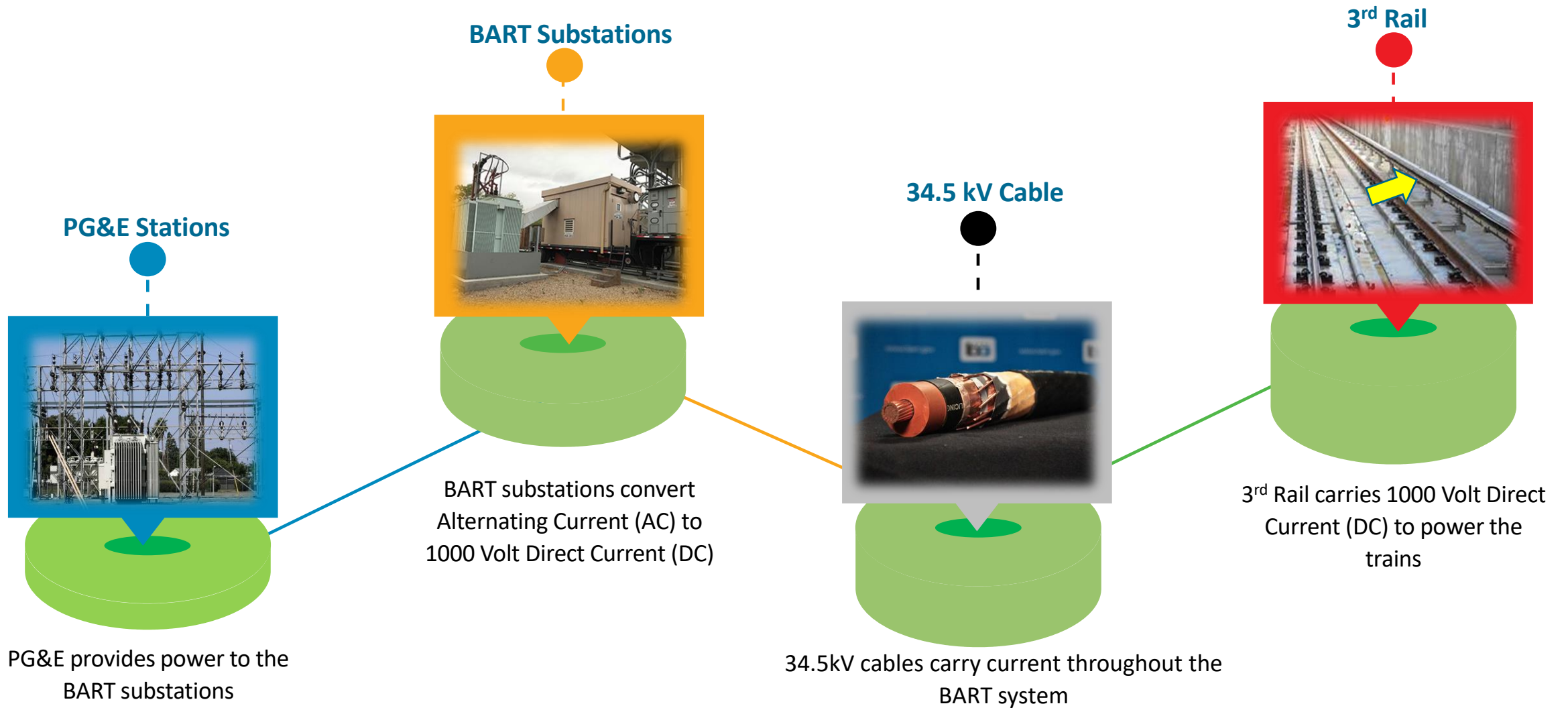


Event Summary

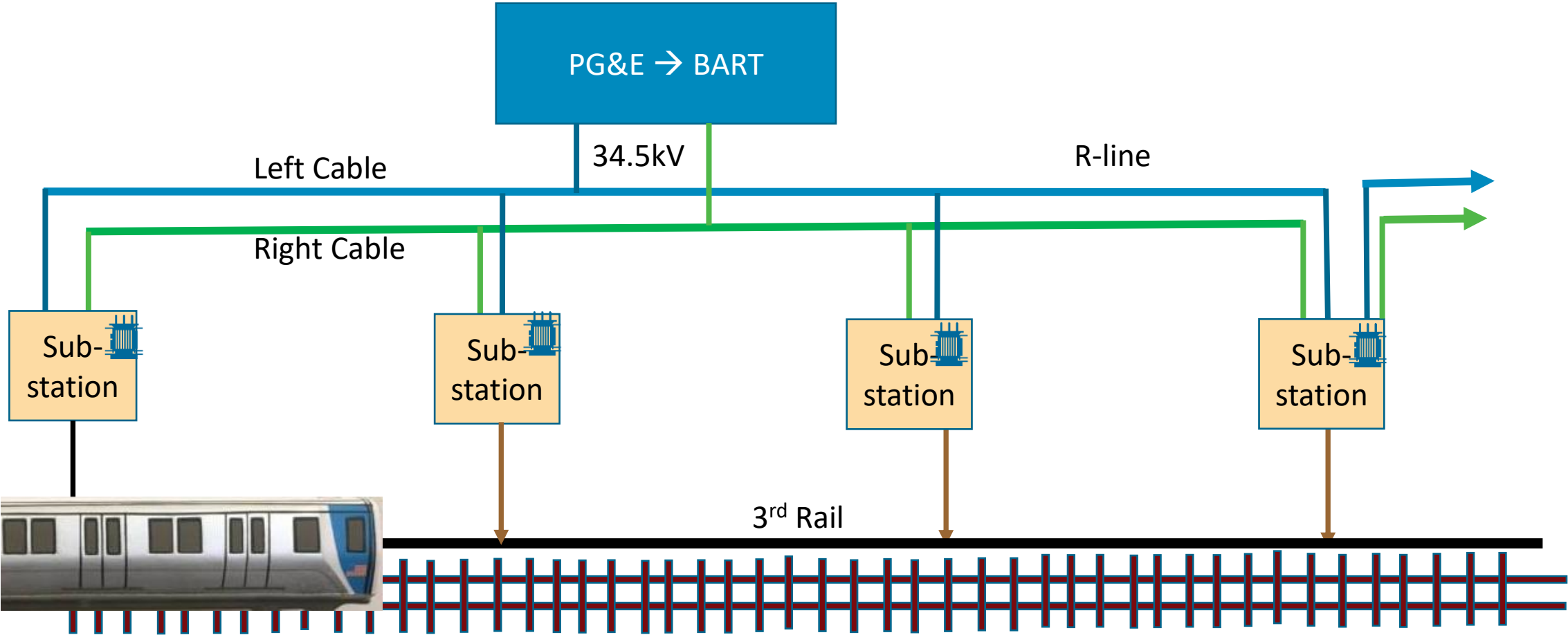


Service Restoration




BART Traction Power Overview



BART Traction Power System Redundancy



Richmond Line Faults

-  Left Cable El Cerrito del Norte
-  Right Cable El Cerrito del Norte
-  El Cerrito Plaza Substation

Why BART's red line is still out of service, and when it might return

Limited BART Service Returns To Richmond's Red Line

Trouble on BART's Richmond line may take weeks to repair, officials say

BART in the News!!!
BART 'coming to resume full Red Line service in the coming weeks' following power cable failure

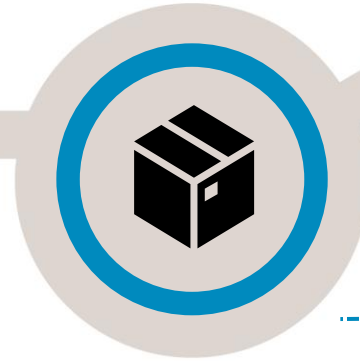
Update: BART resumes service on Red Line through Berkeley

BART line suspended 'for a few days'

Plan of Action Overview

INVESTIGATION

- Site Evaluation
- Forensic
- Root Cause



ACTIONS TAKEN BY TEAM

- Mobilized Team Immediately
- Analysis Launched
- Evaluate service for Red & Orange lines
- Develop Service Restoration Plan

COMMUNICATIONS

- Provided periodic service updates to the Public
- Updated Board of Directors



COLLABORATION

- Maintenance & Engineering
- Community Relations
- Transportation
- Rolling Stock & Shops
- Operations Planning
- Contractor
- 3rd Party

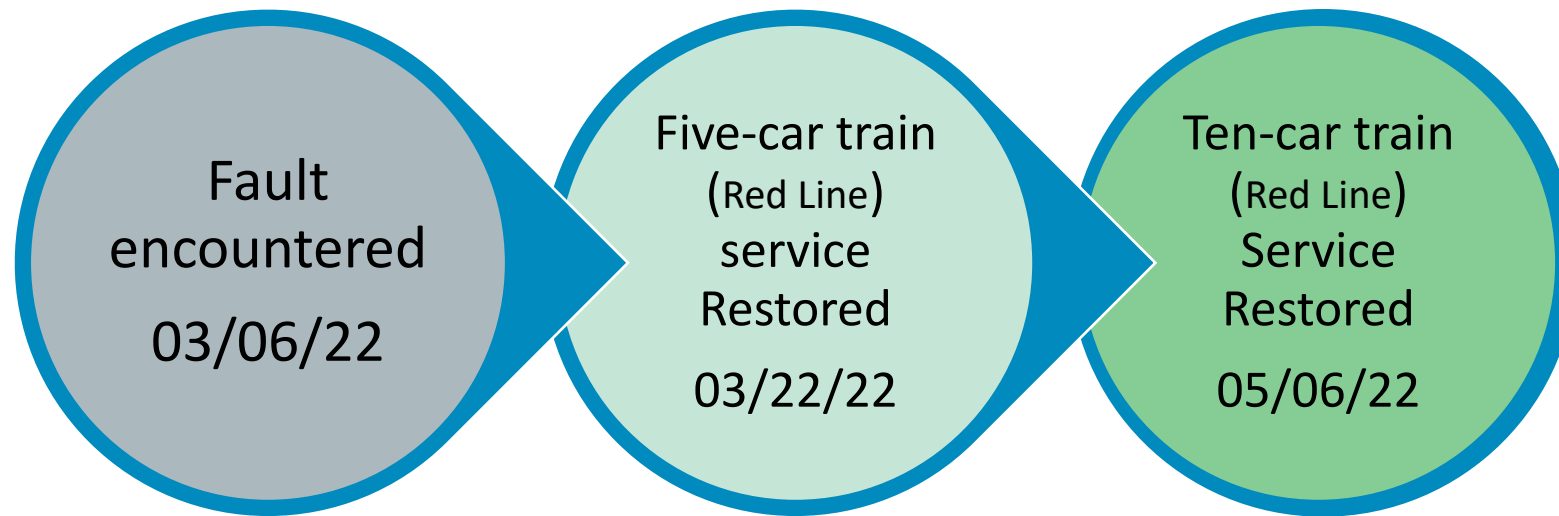
SIMULATION

- Load Study, Train Configuration
- Performed Scenarios of Train Length and Frequency

Restore Service



Richmond Lines - Restored



5.A.1. Q&A

5.B. 10 Minute Break

5.C. Preview of Next Year's Projects by Program

Project Progress – Forecast

Period of Performance: April 2022 to March 2023



Renew Track

- Complete A77 Interlocking
- Complete Rail Reprofilng



Renew Power

- Complete M-Line 34.5kV Cable replacement
- Award Construction Contract for CWC Substation



Repair Tunnels & Structures

- Complete Fence replacement at Richmond Yard
- Begin construction for water intrusion at Escalator & Elevator



Renew Mechanical

- Advertisement for wheel truing facility
- Complete Turn Table Construction at Concord yard



Replace Train Control/ Increase Capacity

- Receive Release #2 of the ATS Software from Hitachi
- Begin installation of LIDAR survey bench markers on W, Y, M Lines



Renew Stations

- Complete Escalator construction (Phase 2&3)
- Complete Canopy Construction (4 Locations)



Safe Access to Stations

- Final Acceptance for Warm Springs West Access Bridge

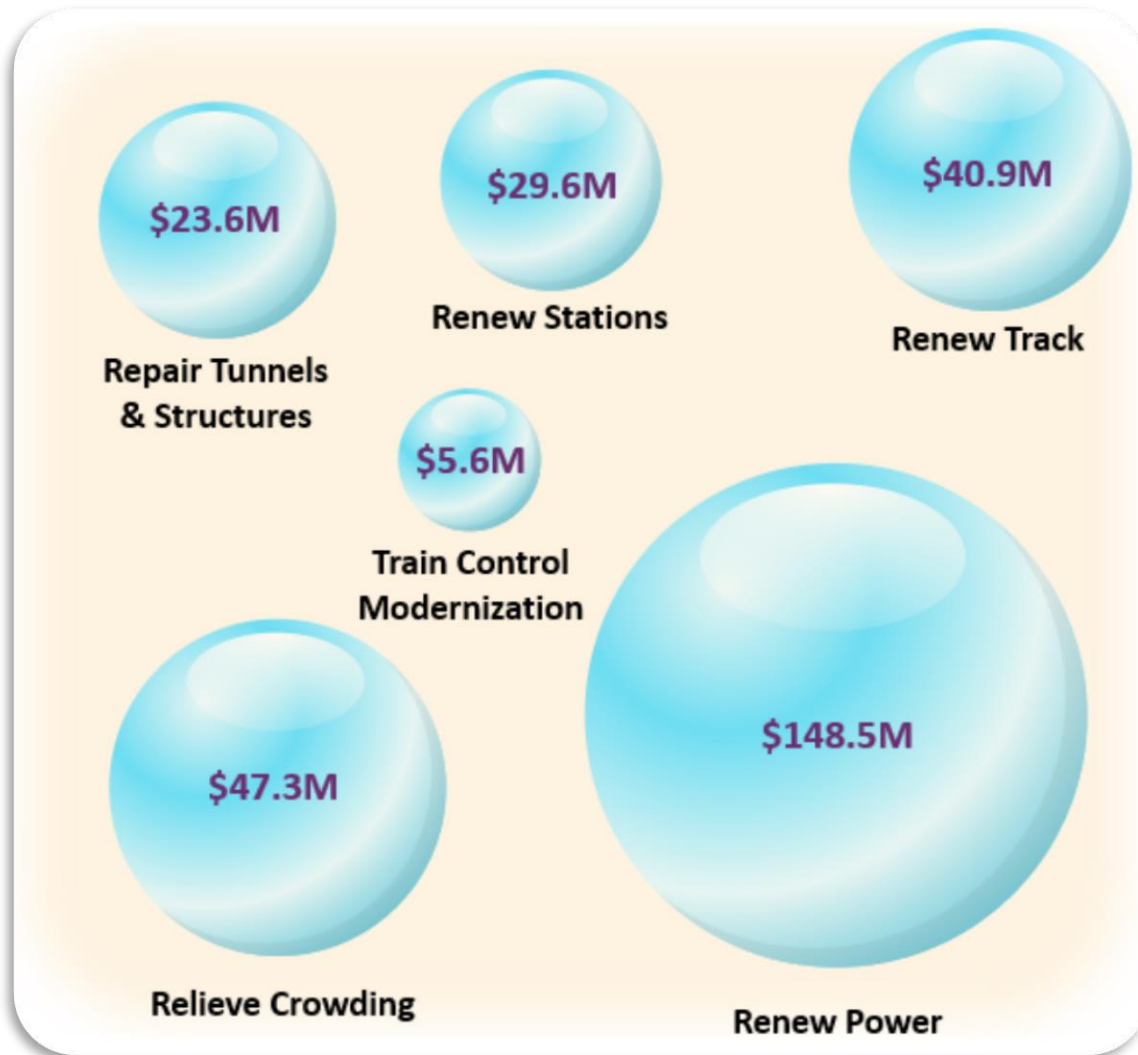


Relieve Crowding

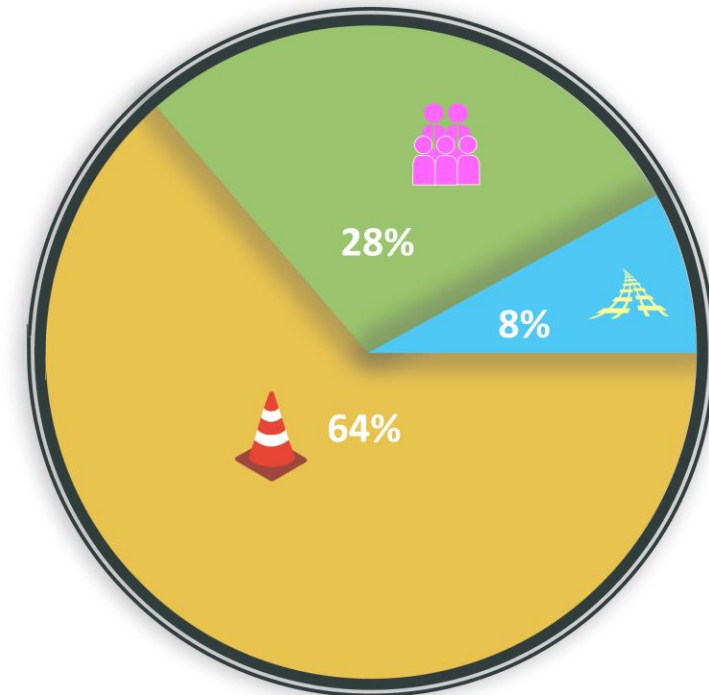
- Complete Civic Center Scissor Stairs Project




Project Progress - Forecast

FY23 Capital Budget - RR Investment



Purchase Order Issuance



-  Professional & Tech Services
-  Construction
-  Materials

Period of Performance: April 2022 to March 2023

% based on estimated RR dollars

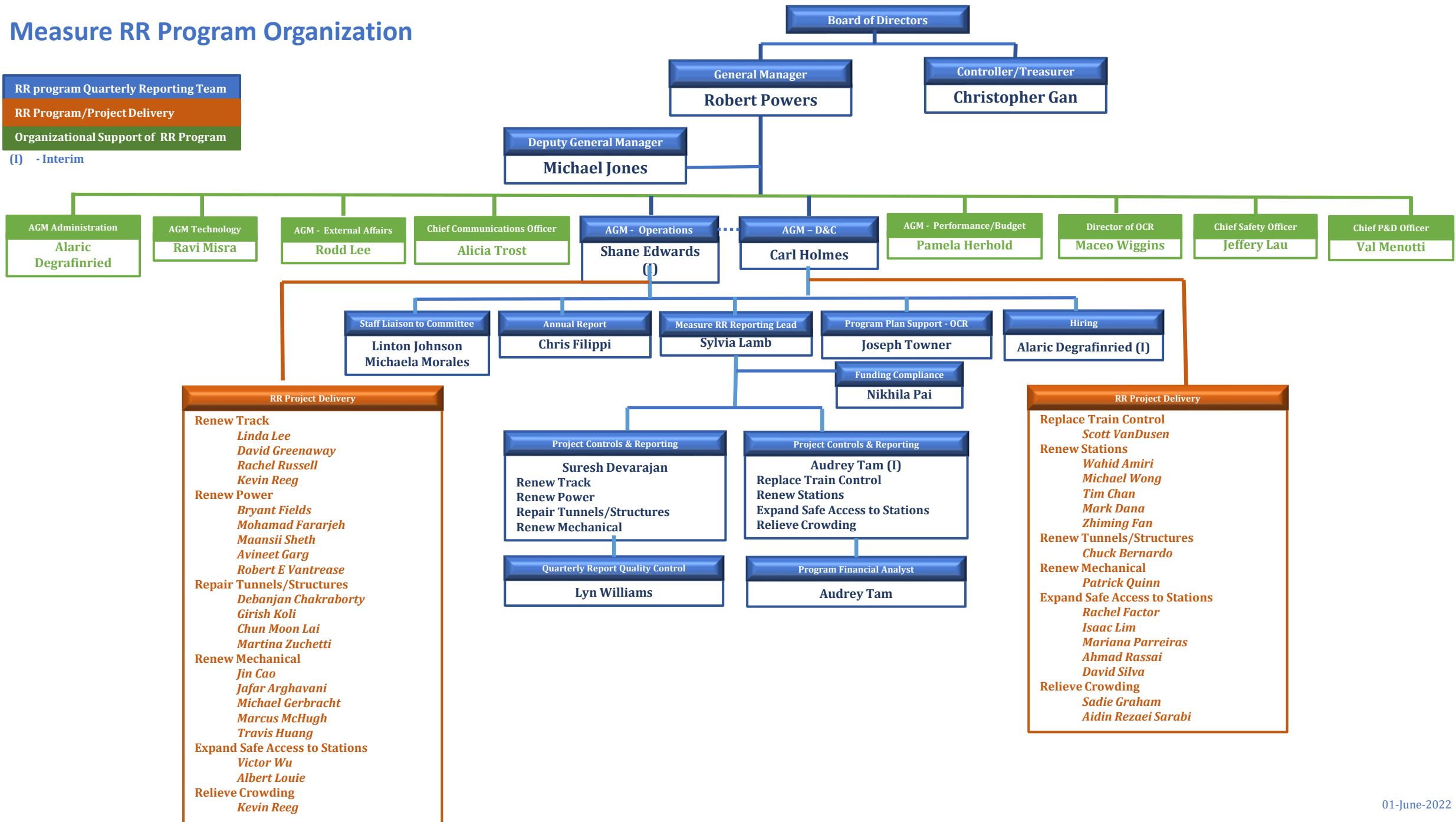


5.C.1. Q&A

5.D. Staff Organization Chart Q&A

Measure RR Program Organization

RR program Quarterly Reporting Team
RR Program/Project Delivery
Organizational Support of RR Program
 (I) - Interim



5.E. Appendix: Financial Outlook, Program Status & Milestones Q&A



BART Safety, Reliability, and Traffic Relief Program (Measure RR) Update

(Not To Be Presented)



Table of Contents

Topic:	Page No.
• RR Program Small Business & Outreach	28
• Work Progress Since Last Meeting	31
• Individual Program Milestones	33
• Budget and Schedule Status	42
• Next Steps	53

RR Program Small Business & Outreach



RR Program Update – Small Business

Program	Total RR Commitment	Total RR SB Commitment	SB Commitment %	# of SB Contracts	Total RR Payments on RR Contracts	RR Payments to SBs	SB Payment %
Renew Track	\$150.9 M	\$33.8 M	22%	141	\$115.2 M	\$23.4 M	20%
Renew Power	\$361.3 M	\$115.1 M	32%	312 (+18)	\$227.2 M	\$105.1 M	46%
Repair Tunnels & Structures	\$144.2 M	\$30.3 M	21%	146	\$110.4 M	\$14.9 M	14%
Renew Mechanical	\$35.1 M	\$12.1 M	34%	78	\$23.7 M	\$9.2 M	39%
Replace Train Control/Increase Capacity	\$31.8 M	\$6.5 M	21%	117	\$22.2 M	\$2.5 M	11%
Renew Stations	\$150.7 M	\$28.6 M	19%	121	\$41.4 M	\$9.5 M	23%
Expand Safe Access to Stations	\$20.4 M	\$6.2 M	30%	163	\$13.4 M	\$4.7 M	35%
Design/Engineer to Relieve Crowding	\$136.0 M	\$34.7 M	26% (+4%)	191 (+33)	\$65.6 M	\$17.6 M	27%
Total	\$1,030.4 M	\$267.3 M	26% (+1%)	1268 (+84)	\$619.2 M	\$187.0 M	30%

Notes: All amounts are based on RR fund percent only. Amounts are updated to Apr. 30, 2022. Includes formal contracts only; does not include informal purchases or work performed by BART's own forces. SB totals include DBEs, MSBEs, SBs, and LSBs. Sources: RR commitments are based on RR Requisitions report, Procurement Sealed Bids Report and PeopleSoft Work Plans application. RR% for each project is based on Financial Analysts' report, RR Funds / Total Project Budget. Payments based on PeopleSoft and B2GNow.



RR Program Update – 2022 Outreach



Recently Completed Events

- Small Business Construction Expo – Richmond, CA
- Meet Project Staff and Learn About Upcoming M&E Opportunities - Zoom



Upcoming Events

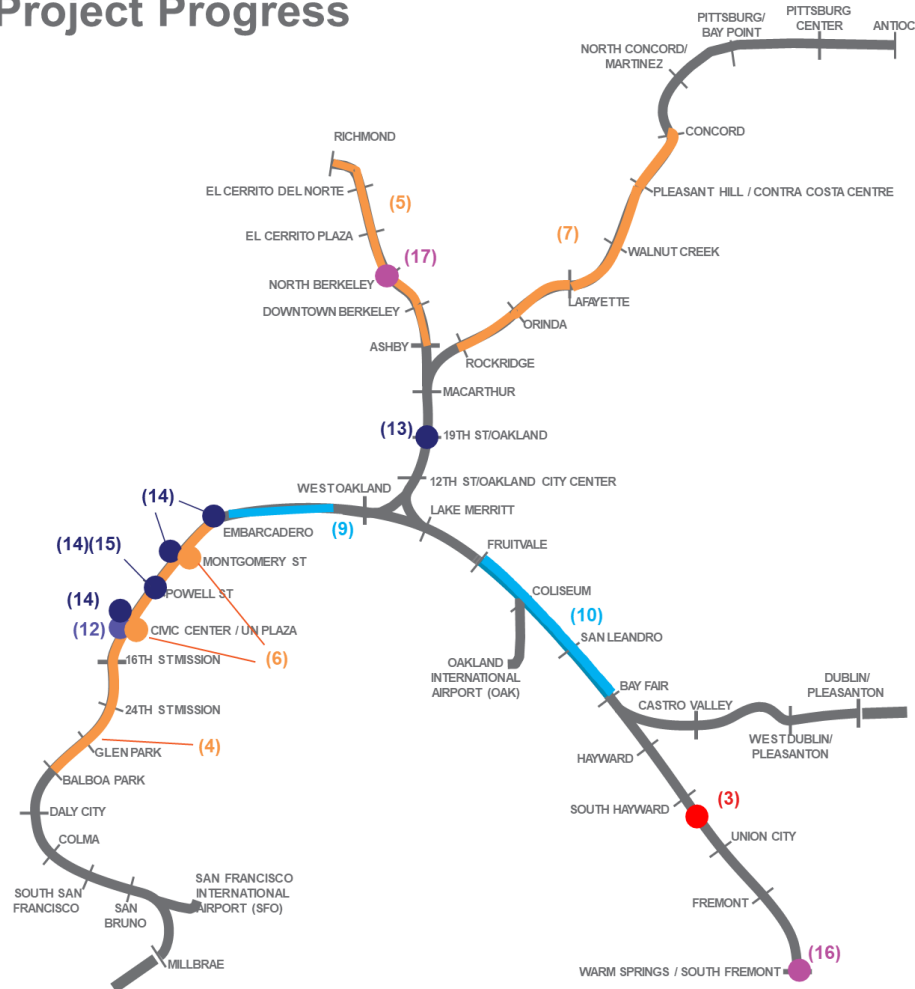
- Learn BART's Procurement Process and Meet Procurement Staff – Zoom
- Intro to Equity Programs – OCR Series of Recorded Training Videos for Small Businesses

Work Progress Since Last Meeting



Examples of Active RR Projects in January 2022 – March 2022

Measure RR – Project Progress



*Updated projects

Renew Track

- 1 Replace Direct Fixation Pads (Systemwide Not Mapped) – Ongoing Construction
- 2 Rail Relay (Systemwide Not Mapped) – Ongoing Construction
- 3 A77 Track Interlocking Replacement – Ongoing Construction

Renew Power Infrastructure

- 4 M-Line 34.5kV Cable Replacement Ph.II– Ongoing Construction
- 5 R-Line 34.5kV Cable Replacement – Ongoing Construction
- 6 Substation for Core Capacity – Ongoing Construction
- 7 C-Line 34.5kV Cable Replacement – Ongoing Construction

Renew Tunnel & Structures

- 8 Water Intrusion at Train Control Rooms - Ongoing Construction - (Systemwide Not Mapped)
- 9 Earthquake Safety Program – Transbay Tube Retrofit – Ongoing Construction
- 10 Aerial Fall Protection A Line North – Ongoing Construction

Renew Mechanical

- 11 Facilities HVAC Equipment Replacement System Wide Phase 1 - Completion of Construction (Not Mapped)

Design/Engineer to Relieve Crowding

- 12 Civic Center Scissor Stairs – Ongoing Construction

Renew Stations

- 13 19th Street Station Modernization – Ongoing Construction
- 14 Market Street Canopies and Escalator – Ongoing Construction
- 15 Powell Street Station Modernization – Ongoing construction*

Expand Safe Access

- 16 Warm Springs West Pedestrian Bridge and Plaza Project – Bridge Opening*
- 17 North Berkeley Access Improvements – Ongoing Construction

Replace Train Control/Increase Capacity

- 18 Train Control Rooms (Systemwide Not Mapped) – Ongoing Construction*



Individual Program Milestones



Renew Track

STATUS & MILESTONES

EXPENDED Thru 3/2022: **\$313.7**

FORECAST Thru 6/2025: **\$433.5**

TOTAL PROGRAM VALUE: **\$625**

PERIOD CASHFLOW: **\$10.6**

STATUS – Renew Track

# Projects in Planning	# Projects in Design	# Projects in Bid/Award	# Projects in Construction	# Projects Completed	TOTAL # Projects
0	2	1	8	9	20

MILESTONES			
Completed (Jan 2022 – Mar 2022)	Q4 (Apr 2022 – Jun 2022)	Q1 (Jul 2022 – Sept 2022)	Q2 (Oct 2022 – Dec 2022)
<ul style="list-style-type: none"> Issue for Bid K Line Interlocking Replacement Special Trackwork (near Rockridge Station) 	<ul style="list-style-type: none"> Issue for Bid K Line Interlocking Replacement Special Trackwork (near MacArthur Station) Contract Award for K Line Interlocking Replacement Special Trackwork (near Rockridge Station) 	<ul style="list-style-type: none"> <i>Substantial Completion of Construction by Contractor Oakland Yard Tracks</i> <i>Completion of Design K Line Interlocking Replacement</i> <i>Issue for Bid for K Line Interlocking Replacement Traction Power Materials</i> 	<ul style="list-style-type: none"> <i>Substantial Completion of Construction A77 Track Interlocking Replacement</i> <i>Contract Award K Line Interlocking Replacement Special Trackwork (near MacArthur Station)</i> <i>Substantial Completion of Rail Reprofilng (Systemwide)</i>

Italic: Modified milestones from previous report.



Renew Power

STATUS & MILESTONES

EXPENDED Thru 3/2022: \$472.7

FORECAST Thru 6/2025: \$868.0

TOTAL PROGRAM VALUE: \$1,225

PERIOD CASHFLOW: \$32.8

STATUS – Renew Power Infrastructure

# Projects in Planning	# Projects in Design	# Projects in Bid/Award	# Projects in Construction	# Projects Completed	TOTAL # Projects
0	5	4	18	2	29

MILESTONES			
Completed (Jan 2022 – Mar 2022)	Q4 (Apr 2022 – Jun 2022)	Q1 (Jul 2022 – Sept 2022)	Q2 (Oct 2022 – Dec 2022)
<ul style="list-style-type: none"> Issue for Bid Station Fire Alarm Replacement Phase 3 	<ul style="list-style-type: none"> Completion of Power to the Transbay Tube for the Oakland Emergency Generator Project Completion of Design for the K Line 34.5kV Cable Replacement Substantial Completion of Steppable Trays and AFM IDS Installation for A Line 34.5kV Cable Replacement 	<ul style="list-style-type: none"> Completion of Design for MET G Generator Replacement Project <i>Issue for Bid Walnut Creek Traction Power Substation Replacement</i> 	<ul style="list-style-type: none"> <i>Contract Award Station Fire Alarm Replacement Phase 3</i> <i>Issue for Bid PG&E Feed for Gap Breaker Project</i> <i>Substantial Completion of CWS Transformer Replacement</i>

Watchlist:

- Bid Package Development for Walnut Creek Traction Power Substation Replacement

Italic: Modified milestones from previous report.



FUNDS AT WORK

Tunnels & Structures

STATUS & MILESTONES

EXPENDED Thru 3/2022: \$186.7

FORECAST Thru 6/2025: \$318.3

TOTAL PROGRAM VALUE: \$549

PERIOD CASHFLOW: \$11.2

STATUS – Repair Tunnels & Structures

# Projects in Planning	# Projects in Design	# Projects in Bid/Award	# Projects in Construction	# Projects Completed	TOTAL # Projects
0	9	2	7	8	26

MILESTONES

Completed (Jan 2022 – Mar 2022)	Q4 (Apr 2022 – Jun 2022)	Q1 (Jul 2022 – Sept 2022)	Q2 (Oct 2022 – Dec 2022)
<ul style="list-style-type: none"> Completion of Design for Slope Stabilization (MW-12) 	<ul style="list-style-type: none"> Completion of Construction for Renew Catwalks - Phase 1 Completion of Design for Water Intrusion at Track and Platform Joint at C and R Lines Completion of Design for Water Intrusion at Track and Platform Joint at A Line 	<ul style="list-style-type: none"> Completion of Design for Slope Stabilization Systemwide Completion of Design for Tunnel Waterproofing at R Line Begin Construction for Water Intrusion at Escalator & Elevator 	<ul style="list-style-type: none"> Completion of Construction Aerial Fall Protection (A Line North & Central) Completion of Design for Tunnel Waterproofing at M Line Completion of Construction for Richmond Yard Fence Rehabilitation Completion of Design for Water Intrusion at Train Control Rooms (Package 2)

Italic: Modified milestones from previous report.



Renew Mechanical

STATUS & MILESTONES

EXPENDED Thru 3/2022: \$68.7
 FORECAST Thru 6/2025: \$133.0
 TOTAL PROGRAM VALUE: \$156
 PERIOD CASHFLOW: \$2.7

STATUS – Renew Mechanical

# Projects in Planning	# Projects in Design	# Projects in Bid/Award	# Projects in Construction	# Projects Completed	TOTAL # Projects
1	7	4	4	10	26

MILESTONES			
Completed (Jan 2022 – Mar 2022)	Q4 (Apr 2022 – Jun 2022)	Q1 (Jul 2022 – Sept 2022)	Q2 (Oct 2022 – Dec 2022)
<ul style="list-style-type: none"> • Notice to Proceed for Fire Services at Hayward Yard • Begin Construction for Turntable Replacement at Concord Yard • Completion of Design for Fire Suppression Upgrade System Wide Phase 1 	<ul style="list-style-type: none"> • Completion of Construction for Rotoclones Replacement • Completion of Design for LMA HVAC Renovation • Completion of Design for Control Tower HVAC 	<ul style="list-style-type: none"> • Completion of Design Facilities HVAC Replacement (Yard Control Towers) • <i>Begin Construction for Fire Services at Hayward Yard</i> • <i>Procurement of Concord Yard Wheel Truing Machine</i> 	<ul style="list-style-type: none"> • <i>Issue for Bid LMA HVAC Renovation</i> • <i>Issue for Bid Concord Yard Wheel Truing Facility Construction</i>

Italic: Modified milestones from previous report.



Replace Train Control

STATUS & MILESTONES

EXPENDED Thru 3/2022: \$61.6

FORECAST Thru 6/2025: \$113.1

TOTAL PROGRAM VALUE: \$400

PERIOD CASHFLOW: \$6.6

STATUS – Replace Train Control / Increase Capacity

# Projects in Planning	# Projects in Design	# Projects in Bid/Award	# Projects in Construction	# Projects Completed	TOTAL # Projects
0	0	2	4	0	6
MILESTONES					
Completed (Jan 2022 – Mar 2022)	Q4 (Apr 2022 – Jun 2022)	Q1 (Jul 2022 – Sept 2022)	Q2 (Oct 2022 – Dec 2022)		
<ul style="list-style-type: none"> Resolve Vital Train Length testing on Test Track Review of the Automatic Train Supervision (ATS) Human Machine interface (HMI) Specification and ATS Sub-system requirement specifications Issue for Bid for Enabling Works (Vehicle Procurement) 	<ul style="list-style-type: none"> <i>Begin installation of LIDAR survey bench markers on W, Y, M Lines</i> <i>Complete CBTC Preliminary Design – Gate 1 and start CBTC FDR.</i> <i>Begin prep work for Enabling Works In-house and NTP for non-revenue equipment Hi-Railers</i> 	<ul style="list-style-type: none"> <i>Complete CBTC Preliminary Design – Gate 2 and continue FDR</i> <i>Start Automatic Train Supervision (ATS) Human Machine Interface (HMI) & ATS sub-system requirement specifications Release 3 testing</i> <i>Issue NTP to support traffic control and disposal for Enabling Works</i> Design of Daly City Yard interface for CBTC Advertise K-Line Contract <i>Complete electromagnetic interface and conductivity test (EMI/EMC) Survey on ROW for CBTC</i> 	<ul style="list-style-type: none"> <i>Complete CBTC equipment installations at Hayward Test Track</i> <i>Complete CBTC Oakland Lab Installation</i> <i>Issue NTP for Haz Mat On-Call for Enabling Works</i> 		

Italic: Modified milestones from previous report.



Renew Stations

STATUS & MILESTONES

STATUS – Renew Stations

EXPENDED Thru 3/2022: \$49.3

FORECAST Thru 6/2025: \$107.1

TOTAL PROGRAM VALUE: \$210

PERIOD CASHFLOW: \$2.6

# Projects in Planning	# Projects in Design	# Projects in Bid/Award	# Projects in Construction	# Projects Completed	TOTAL # Projects
0	2	0	4	3	9

MILESTONES			
Completed (Jan 2022 – Mar 2022)	Q4 (Apr 2022 – Jun 2022)	Q1 (Jul 2022 – Sept 2022)	Q2 (Oct 2022 – Dec 2022)
<ul style="list-style-type: none"> • Completion of Construction for 1st escalator of the 2nd Group Market St. Escalators and begin 1st escalator of the 3rd group • Begin Construction of Canopy 12 at Montgomery St. Station and Canopy 16 at Westfield of Powell St. Station. • Completion of Construction for Public Restrooms as part of Powell St. Station Modernization • Completion of New Glass Barriers Installation at Hallidie Plaza entrance for Powell St. Station Modernization • Completion of Construction for Public Restrooms as part of 19th St. Modernization • Formal restroom opening with restroom attendants for Powell St. Station Modernization • Complete Market St. Entry Canopies Systems Infrastructure within Embarcadero Station 	<ul style="list-style-type: none"> • Opening of the new offices/breakrooms at Sector 6 for Powell St. Station Modernization • Completion of New glass barriers & faregates at Secondary Entrance/Sector 4 for Powell St. Station modernization • Relocation of TVMs at Secondary Entrance for Powell St. Station Modernization • Completion of Trash Bin Enclosure Renovation for Powell St. Station Modernization • Completion of remainder of escalators in the 2nd Group of Market St. Escalators and begin construction on the remainder of 3rd Group • Begin Construction of Canopy 3 at Embarcadero Station and canopy 22 at Civic center Stations. 	<ul style="list-style-type: none"> • Complete first two canopies and continue with second two canopies for the Market Street Entry Canopies Contract. • Continue with 3rd Group of Market Street Escalators installation • <i>Completion new office, breakroom and utility room at Sector 6 – Powell Modernization</i> • <i>Completion of LED lighting at platform and trackside – Powell Modernization</i> • <i>Completion of painting at platform level – Powell Modernization</i> 	<ul style="list-style-type: none"> • <i>Complete renovation of System Services Offices for Powell St. Station Modernization</i> • <i>Completion of staircase LED lighting enhancement – Powell Modernization</i> • <i>Installation of Light Box Art Work at Hallidie Plaza – Powell Modernization</i>



Italic: Modified milestones from previous report.

Station Access

STATUS & MILESTONES

EXPENDED Thru 3/2022: \$36.1

FORECAST Thru 6/2025: \$69.2

TOTAL PROGRAM VALUE: \$135

PERIOD CASHFLOW: \$1.6

STATUS – Expand Safe Access to Stations

# Projects in Planning	# Projects in Design	# Projects in Bid/Award	# Projects in Construction	# Projects Completed	TOTAL # Projects
0	10	4	4	10	28

MILESTONES			
Completed (Jan 2022 – Mar 2022)	Q4 (Apr 2022 – Jun 2022)	Q1 (Jul 2022 – Sept 2022)	Q2 (Oct 2022 – Dec 2022)
<ul style="list-style-type: none"> • Bridge Opening for Warm Springs West Pedestrian Bridge and Plaza Project • Completion of Design of Balboa Park – Upper Plaza project 	<ul style="list-style-type: none"> • Final Acceptance for Warm Springs West Access Bridge Project • <i>Begin Construction of SR2B-funded City of Dublin Iron Horse Trail bridge</i> 	<ul style="list-style-type: none"> • Begin Construction for Balboa Park – Upper Plaza Project • Complete Design for 19th St. Active Access Improvement Project • Re-Advertise for Accessibility Improvement (Phase 1 & 2) • Advertise for PA System Improvement • <i>Begin Construction of SR2B-funded City of Pittsburg BART Ped/Bike connectivity project</i> • <i>Begin Construction of SR2B-funded City of Fremont Walnut Ave./Liberty St. protected intersection</i> 	<ul style="list-style-type: none"> • Award for Accessibility Improvement (Phase 1 & 2) • <i>Complete construction of SR2B-funded SFMTA 5th Street Improvement project</i> • Completion of Construction for 12th St. Bike Racks

Italic: Modified milestones from previous report.



Relieve Crowding

STATUS & MILESTONES

EXPENDED Thru 3/2022: **\$72.3**
 FORECAST Thru 6/2025: **\$127.8**
 TOTAL PROGRAM VALUE: **\$200**
 PERIOD CASHFLOW: **\$8.7**

STATUS – Design / Engineer to Relieve Crowding

# Projects in Planning	# Projects in Design	# Projects in Bid/Award	# Projects in Construction	# Projects Completed	TOTAL # Projects
2	2	1	1	1	7

MILESTONES			
Completed (Jan 2022 – Mar 2022)	Q4 (Apr 2022 – Jun 2022)	Q1 (Jul 2022 – Sept 2022)	Q2 (Oct 2022 – Dec 2022)
<ul style="list-style-type: none"> Stage Gate 1 for Link 21(NTRC) Program 	<ul style="list-style-type: none"> NTP for Hayward Maintenance Complex Phase 2: Civil/Grading Board adoption of Stage Gate 1 for Link 21 (NTRC) Project 	<ul style="list-style-type: none"> Mobilization for Hayward Maintenance Complex Phase 2: Civil/Grading Round 3 of Public Outreach for Link21 (NTRC) Program and creation meeting for Link21 (NTRC) Program Complete Opportunities and Constraints Report and Freight Rail Coordination Study for Link 21 (NTRC) 	<ul style="list-style-type: none"> Completion of Construction for Civic Center Platform Stairs Round 4 of Public Outreach and cocreation meeting for Link21 (NTRC) Program)

Italic: Modified milestones from previous report.



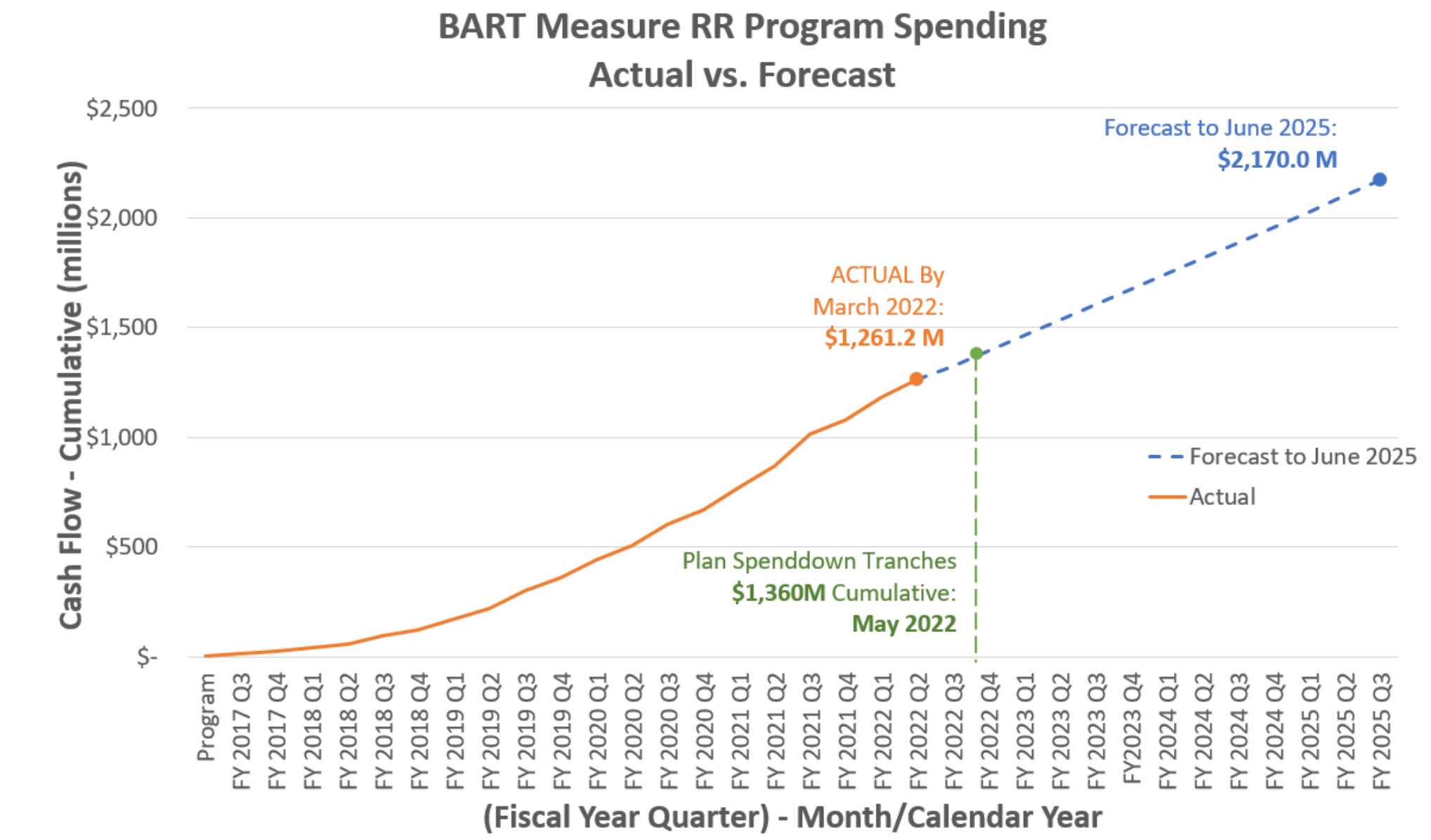
Budget and Schedule Status



Measure RR Cashflow (\$ Millions) – Mid-Term & Long-Term Outlook

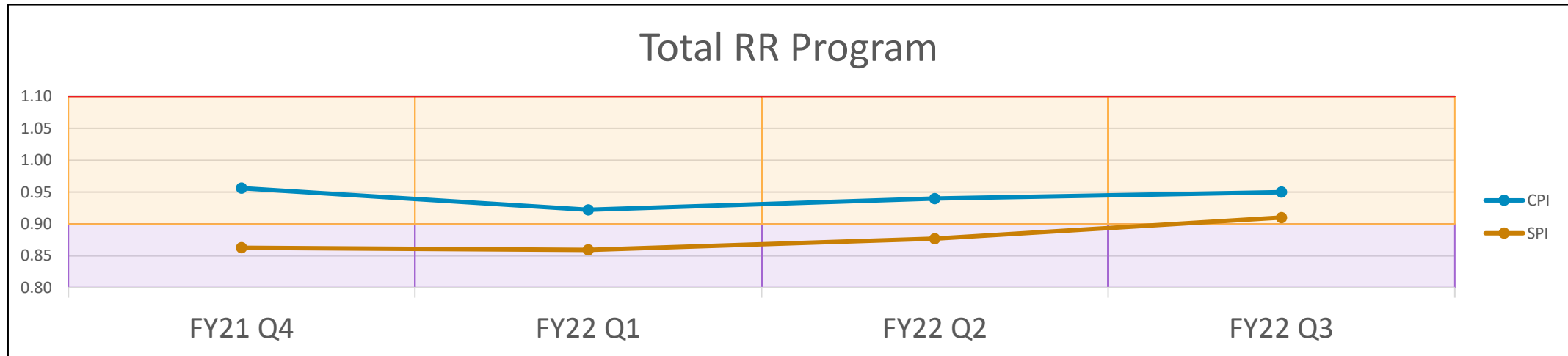
Program	Expended (thru Dec 2021)	Expended (thru Mar 2022)	Period Cashflow (Jan 2022 – Mar 2022)	% Expended out of Total Bond Investment	Forecast Expenditures	
					MID-TERM (thru 2025)	LONG-TERM (thru End of Bond)
Renew Track	\$303.1	\$313.7	\$10.6	50%	\$433.5	\$625
Renew Power Infrastructure	\$439.9	\$472.7	\$32.8	39%	\$868.0	\$1,225
Repair Tunnels & Structures	\$175.5	\$186.7	\$11.2	34%	\$318.3	\$549
Renew Mechanical	\$66.0	\$68.7	\$2.7	44%	\$133.0	\$156
Replace Train Control/Increase Capacity	\$55.0	\$61.6	\$6.6	15%	\$113.1	\$400
Renew Stations	\$46.7	\$49.3	\$2.6	23%	\$107.1	\$210
Expand Safe Access to Stations	\$34.5	\$36.1	\$1.6	27%	\$69.2	\$135
Design/Engineer to Relieve Crowding	\$63.6	\$72.3	\$8.7	36%	\$127.8	\$200
Total	\$1,184.3	\$1,261.1	\$76.8	36%	\$2,170.0	\$3,500

RR Overall Program Budget Progress



Earned Value Rollup by Program As of March 2022

Goal: CPI and SPI between 0.9 and 1.1



RR Program	Total RR Budget	Physical % Complete	Planned Value	Earned Value	RR Accrued to Date	CPI	SPI
Renew Track	\$625	57%	\$354.59	\$358.81	\$353.85	1.01	1.01
Renew Power	\$1,225	41%	\$556.14	\$497.05	\$571.14	0.87	0.89
Repair Tunnels and Structures	\$549	36%	\$253.30	\$199.87	\$196.97	1.01	0.79
Renew Mechanical	\$156	44%	\$75.07	\$68.68	\$67.75	1.01	0.91
Replace Train Control/ Increase Capacity	\$400	15%	\$60.92	\$58.32	\$61.60	0.95	0.96
Renew Stations	\$210	25%	\$55.07	\$52.59	\$49.44	1.06	0.95
Expand Safe Access to Stations	\$135	27%	\$39.52	\$36.81	\$36.10	1.02	0.93
Design/Engineer to Relieve Crowding	\$200	37%	\$79.23	\$73.02	\$77.40	0.94	0.92
Total	\$3,500	38%	\$1,473.84	\$1,345.14	\$1,414.24	0.95	0.91

CPI – Cost Performance Index SPI – Schedule Performance Index



Track Program Drill Down

Project	Count
Number of Projects (>25% Spent)	17
CPI <0.9 or >1.1	6
SPI <0.9 or >1.1	2
Number of Risk Register Updates Performed in Previous Period	16
Number of Project Quality Reviews Performed in Previous Period	6

Project	Physical % Complete	CPI	SPI	Comments
R65 Mainline Interlocking	99%	1.14	0.99	Realized savings during construction
A65/A75 Interlocking Replacement	99%	1.31	0.99	Realized savings during construction
Replace Direct Fixation Pads	82%	1.03	1.71	Realized efficiencies during construction
Joint Elimination Systemwide	82%	1.21	1.05	Delivery method changed from Contractor to in-house
Rail Relay	80%	0.88	0.97	Cost of demolition and removal of material higher than planned
Frog Capital Maintenance	76%	1.15	0.96	Work performed shifted to normal blanket hours
Switch Replacement	60%	0.86	1.20	Realized efficiency from extended blanket hours but at higher cost

Power Program Drill Down

Project	Count
Number of Projects (>25% Spent)	18
CPI <0.9 or >1.1	7
SPI <0.9 or >1.1	5
Number of Risk Register Updates Performed in Previous Period	4
Number of Project Quality Reviews Performed in Previous Period	4

Project	Physical % Complete	CPI	SPI	Comments
Emergency Generator for Transbay Tube	91%	0.89	0.92	Change notice executed to address project complexity
M-Line 34.5 kV AC Cable Replacement	87%	0.98	1.20	Benefitted from extended blanket hours due to COVID-19
San Leandro and Transbay Tube East Substation Replacements	83%	0.81	1.06	Costs of pre-requisite work increased due to complex site conditions. Working with contractor to minimize project impact
CWS Bulk Supply Transformer	66%	0.84	0.95	Material procurement and PSPS-related delays increased construction management and design costs
MPR Install & Rectifier Rehab	48%	0.95	0.80	Installation progress impacted by R-Line emergency repairs
A-Line 34.5kV AC Cable Replacement	45%	0.89	1.01	Differing site conditions lead to multiple change orders. Working with contractor to minimize project impact
Stations Emergency Lighting	38%	0.84	0.51	Change notice executed to address differing site conditions
34.5kV Blocking Scheme Systemwide	38%	0.62	0.96	BART labor resources reprioritized to required emergent repair work impacting continuity of the project
SFTS Transformer / Bus Upgrade	26%	0.71	0.26	Coordination with external agencies for transformer design, testing and installation plans

Tunnels & Structures Program Drill Down

Project	Count
Number of Projects (>25% Spent)	26
CPI <0.9 or >1.1	3
SPI <0.9 or >1.1	2
Number of Risk Register Updates Performed in Previous Period	4
Number of Project Quality Reviews Performed in Previous Period	6

Project	Physical % Complete	CPI	SPI	Comments
Rehab Expansion Joints at Abutment	88%	1.18	0.94	Savings realized from efficiencies in design
Water Intrusion Escalator/Elevator	74%	1.03	0.84	Onboarding of new Contractor
Wayside Regulatory Signage	45%	1.16	0.96	Savings realized from application of lessons learned from repetitive work
Tunnel Waterproof R-Line	27%	0.76	0.27	Redesign methodology to potentially reduce construction cost

Mechanical Program Drill Down

Project	Count
Number of Projects (>25% Spent)	21
CPI <0.9 or >1.1	1
SPI <0.9 or >1.1	0
Number of Risk Register Updates Performed in Previous Period	1
Number of Project Quality Reviews Performed in Previous Period	3

Project	Physical % Complete	CPI	SPI	Comments
Replace Fire Hoses and Piping	99%	1.25	0.99	Self-performed to improve efficiency. Benefitted from reassignment of labor resources due to COVID-19 response

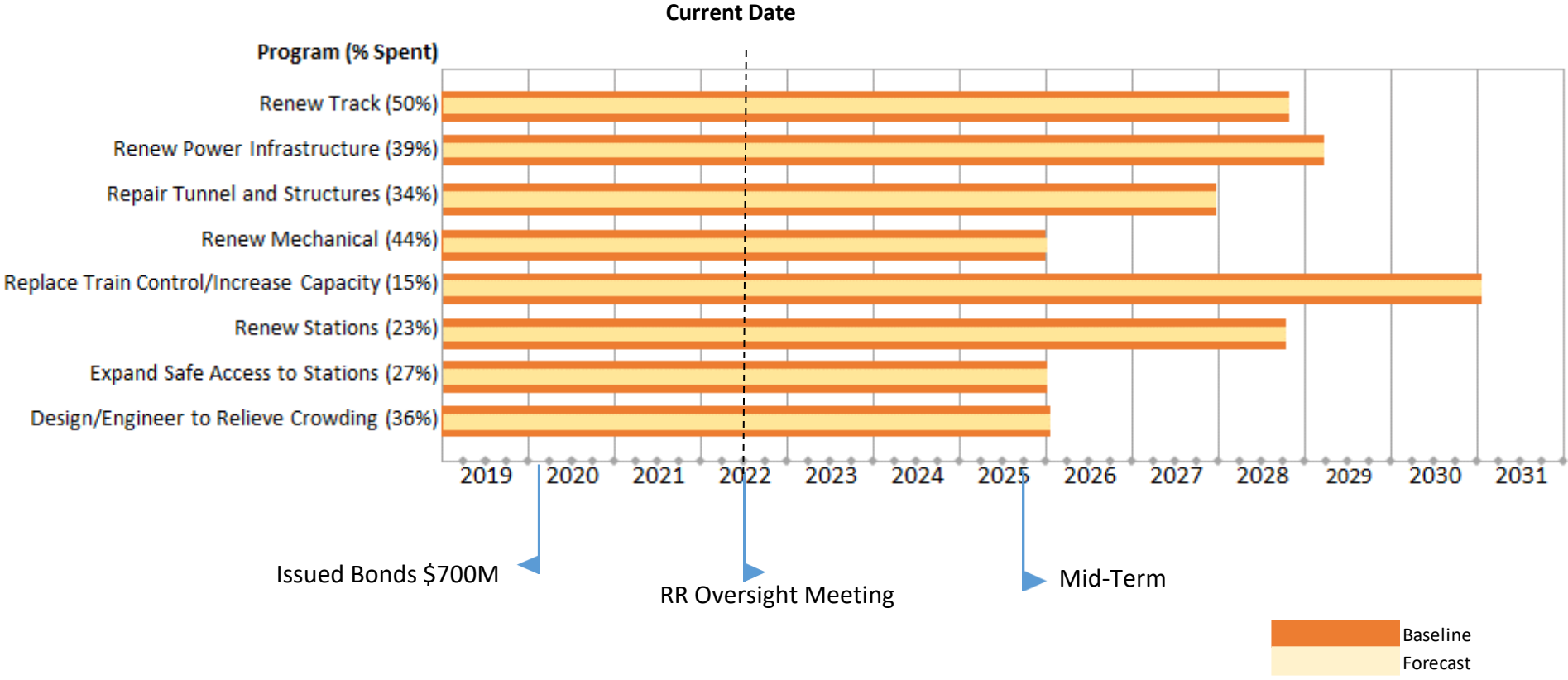
Station Access Program Drill Down

Project	Count
Number of Projects (>25% Spent)	15
CPI <0.9 or >1.1	0
SPI <0.9 or >1.1	0
Number of Risk Register Updates Performed in Previous Period	0
Number of Project Quality Reviews Performed in Previous Period	0

Relieve Crowding Program Drill Down

Project				Count
Number of Projects (>25% Spent)				5
CPI <0.9 or >1.1				0
SPI <0.9 or >1.1				1
Number of Risk Register Updates Performed in Previous Period				4
Number of Project Quality Reviews Performed in Previous Period				1
Project	Physical % Complete	CPI	SPI	Comments
Civic Center Scissor Stairs	78%	1.07	0.82	Stainless steel cladding fabricating taking longer than anticipated

Program Level Schedule Update



Next Steps

- Board Presentation RR Annual Report
- September 2022 Bond Oversight Meeting



Thank you!

