

LRV Fleet Expansion

*Citizen Oversight Panel
3/3/2021*

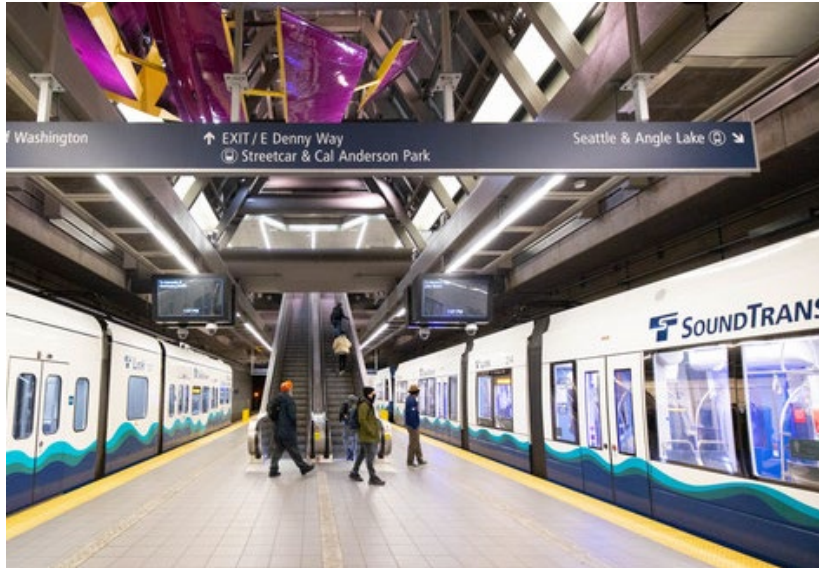
Light Rail Vehicle (LRV) Fleet Expansion

152 new light rail vehicles to support expansion of Link service through 2024

- Northgate, East Link, Lynnwood, Downtown Redmond and Federal Way Link Extensions

- On budget, 36% complete
- Manufacturing on/ahead of target
- Commissioning behind schedule

- Covid-19 challenges being addressed and monitored



***Burn-In Test, Capitol Hill Station
S700 test train on right***

Path to Revenue Service

8-year duration

- Notice to proceed with Siemens issued September 2016
- Multiple interim milestones based on rate of delivery and acceptance

Phases of work managed to-date:

1. Design
2. Manufacturing
3. Transport and On-site Inspection
4. Testing and safety certification
5. Conditional Acceptance

LRV Design phase – complete

21 packages and 283 design-related deliverables

- On-board control systems, passenger information, efficient lighting, heating, power supply, wayside signal and operator interfaces

Preliminary design

- ~10 month effort, major focus on: new crash-worthiness standard, interiors, propulsion system design for ST's unique 1500V power supply

Final design

- ~2 years detailed review, factory tests and first-article inspections



Center Car Interior

LRV Manufacturing

82 cars assembled by Siemens in California to-date

- 196 suppliers, located in 27 states
- Over 1.1M labor hours
- Quality oversight by two full-time, ST inspectors

Challenges addressed:

- Covid-19 work conditions
- Supply chain delays
- Re-work due to unacceptable quality
- Concurrence on qualitative standard



Transport and On-Site Inspection

40 LRVs on-site

- Delivered by truck, 1st car arrived June 2019
- Receiving inspections
- Static tests, pre-mainline preparation
- Large volume of work, on 3 shifts

Challenges addressed:

- Recruiting technicians and inspectors
- Large number of “field modifications”
- Safety plan adherence and Siemens coordination with ST maintenance



Testing & Commissioning

Purpose:

- Ensure safe and reliable fleet, validate LRV performance
- Phase began July 2019
- Location: off-site tests before shipping, OMF Central yard, mainline track access during non-revenue hours

Qualification Tests – Siemens led

- 100% complete, includes reliability test of one thousand-mile “burn-in”

Systems Integration Tests – ST led

- 100% complete

“OCS Live Wire test”



Burn-in Test

Photos of simulated operation between in-service trains – evenings and weekends.

Series 2 LRVs:



Tweet

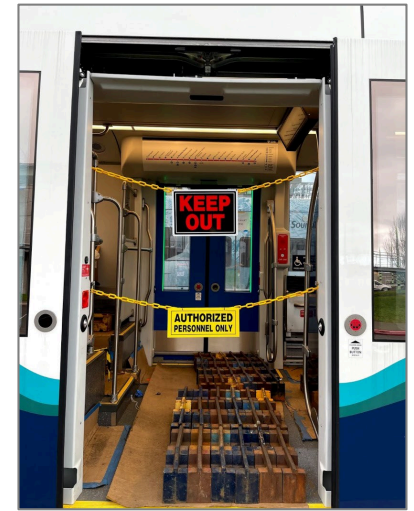
#



Jonathan Hopkins 🇺🇸 🇩🇪 🇨🇦 🇬🇧 🇫🇷 🇮🇹 🇯🇵 🇰🇷 🇸🇪 🇻🇪 🇨🇦 🇺🇸
@JHop_Seattle



New @SoundTransit trains out in the wild for testing this weekend (no passengers).



Safety & Security Certification

Safety & Security Certification – 86% complete

- Documentation review to verify compliance with requirements

Readiness to Operate and Maintain

- Parts, tools & manuals, database required for preventative maintenance – in progress
- Mainline training of operators, 25% complete
- One maintenance procedure update pending
- Infrastructure modifications - ready
- Emergency preparedness - complete

Receiving inspection, 37th car in shop



Conditional Acceptance

LRV verified as safe and reliable for passenger service

- Milestone for each car delivered
- ST accepts ownership
- Warranty period begins

ST requires six cars conditionally accepted to put first new train in-service

- 40 cars in Seattle, 20 ready for mainline testing
- Routine testing continues on every single car

Passenger information updates

- Milestone video, press release, rider information



Project Risks and Next Steps

Budget

- Sufficient to manage foreseeable issues

Schedule risk:

- Resurgence of COVID-19 presents new, unexpected delays
- Competing demands for resources impact rate of recovery

Schedule Recovery status:

- 42 days float on Northgate Link Baseline date

Next steps:

- Monitor progress, Update Sound Transit Board again in Spring 2021
- Update plan for coordinating improvements in Series 1 (Kinkisharyo) fleet



 **SOUNDTRANSIT**

 [soundtransit.org](https://www.soundtransit.org)

