American Public Transportation Association

Streetcar Subcommittee
2019 Rail Conference

Sheraton Centre Hotel
123 Queens Street West,
Toronto M5H 2M9, Ontario, Canada

Sunday June 23, 2019
10:30am to 1:00pm

Timothy R. Borchers	Chair
Eric Sitiko	Vice Chair
James D. Schantz	Secretary

Summary Notes

1. **Welcome** — Tim Borchers

   Committee Chair Tim Borchers called the meeting to order shortly after 10:30 am and thanked Herzog Transport Services for sponsoring lunch for the attendees.

2. **Meeting minutes from Jersey City, NJ** — Jim Schantz

   Subcommittee Secretary Jim Schantz reviewed the main points covered in the minutes of the April 7, 2019 meeting in Jersey City held in conjunction with the TRB LRT and Streetcar Conference. The notes had been circulated in advance. After the review, the attendees voted to accept the notes.

3. **Old Business** — Tim Borchers

   Charles Joseph reviewed the procedure for elections to fill the Subcommittee leadership positions, with a vote to be held in September. Tim Borchers' term as Chair will end at that point; Eric Sitiko may run for Chair or remain as Vice Chair and Jim Schantz plans to remain as Secretary. Anyone having interest in standing for election should contact Charles Joseph (until his retirement in early August) (cjoseph@apta.com) and subsequently to his successor, Marie Benton (mbenton@apta.com).

4. **New Business**

   - FY19/20 Work Plan — John Smatlak

     Due to work commitments, work plan coordinator John Smatlak was unable to attend but he continues to lead efforts on the modern streetcar safety technologies as well as revisions to the modern streetcar guidelines previously developed by the Subcommittee, and John will have a full report at the next meeting in New York.

5. **Presentations**

   - **TTC- Bombardier Flexity In-Depth review** — Richard Wong
     Acting Chief Vehicle Officer, Toronto Transit Commission

     Joining Richard Wong in the presentation were Claire Patrigeon – Manager of Vehicle Engineering and Peter Hrovat – Manager of Streetcar Infrastructure. For the past 40 years the TTC has been operating its legacy fleet of 196 CLRV 40-foot cars and 52 ALRV articulated cars, all of which are high floor. The first Flexity entered service in 2014, two years late. Currently about three quarters of the 204 car order have been delivered. The new cars are 100 feet long and will offer greatly increased capacity over the legacy fleet. The cars operate in mixed traffic and many motorists have passed cars on the right, claiming that they could not tell doors were open despite flashing warning lights. Increased enforcement is planned to address this as are video cameras capturing all sides of the streetcar. Accessibility ramp designs have been evolving as have finding the optimum balance of PA announcements so that passengers can hear and neighbors are not disturbed. The new cars introduce air conditioning, larger windows, and bike racks. Of note to operators, the new cars feature hand master controllers

and operator access to all internal and external video streams. A diagnostic screen for the first time allows operators to communicate faults more accurately with central control. The new cars can operate with one of the three motor trucks out of service and two traction units or two disk brakes. Reliability challenges include loose or leaking hydraulic brakes and inconsistent operation of the very complicated doors. Snow, salt, slush, and dirt are penetrating bearings and causing corrosion in some areas under the cars or on the roof. The TTC is now on its 6th design mod program to address issues on the cars.

Infrastructure changes needed to accommodate the new cars include changes to maintenance facilities, an entire new maintenance facility, lengthening station platforms, and a changeover from trolley pole to pantograph current collection. The overhead conversion was the most complex change and was planned to operate the new cars in three stages: 1- Trolley pole only, 2 – Pole and pantograph to allow continued legacy fleet use, and 3 – pantograph only. Conversion would be sequenced from shortest to longest route, or those with fewest to most complex intersections, or where opportunity exists to coordinate with city projects. The network is now 50% hybrid with 100% planned for Q1 2022 then pantograph-only by 2025. Frogs, crossovers, and section insulators are major components requiring change for pantograph operation.

Changes in operations include an easier-to-fill enclosed sanding refill system; conversion of yard track switches to central control; preventive maintenance records and tracking using off the shelf software; and advanced training of technical staff.

A copy of the presentation is available on the Subcommittee website at http://heritagetrolley.org/images/TTC_Flexity_Review_06_2019.pdf.

- **Bosch Collision Warning System** Florian Waldenmaier
  Project Manager, Bosch Engineering North America

  Bosch borrowed technology from the auto industry in developing the collision warning system for trams. Initial applications were in developed in partnership with Hannover and Frankfurt transit agencies, and the system has since been implemented widely in Europe. Bosch predicts that fully autonomous cars will be available by 2025, and that rail sector versions will come several years later. The components of the system are a rail control unit, a radar unit, and a camera unit. Camera and radar readings are merged to improve the accuracy of the system. Components of modern Bosch automobile adaptive cruise control systems are incorporated in this system. The system can track cars, trucks, other trams, and buses. Different warning levels are triggered by speed, surroundings, and complexity of threats and are programmed to meet the specific environment of the customer. The driver can override the warning if conditions warrant it. The system also can protect pedestrians by anticipating a collision. Levels of warning include brake intervention, acoustic warnings, or optical warnings. Vehicle manufacturers are incorporating this system in new trams if the customer requests.

  A copy of the presentation is available on the Subcommittee website at http://www.heritagetrolley.org/images/BOSCH_TFCW_Toronto.pdf

- **Newcastle Tram System Overview** Andrew Whitten,
  Director Rolling Stock, LTK Australia

  The city of Newcastle is located 100 miles north of Sydney and is now the 7th largest city with 440,000 residents. An industrial city it is the largest coal exporting port in the world. The city is at the tip of a peninsula focusing travel in any direction on the peninsula neck. In recent decades some businesses and residents migrated to the suburbs. With less industry the city has become known for its many beaches and proximity to wine country, but the city center deteriorated with many vacant storefronts. The state government formed in 2015 the Newcastle Urban Transformation and Transport Program to try to reverse the decline. Light rail was one of the projects adopted to promote connectivity and economic development. A fenced heavy rail corridor divided the city center and waterfront. Light rail was chosen to replace this service with frequent service and improved cross route movement. The line is 1.6 miles long with six stops and 7,5-minute headways. Part of the rail corridor has been reused and part was relocated to street running. The reason for not using the rail corridor in its entirety is that the city is undermined by old coal mines, but the rail roadbed was not, so it became prime real estate for high rise development. The depot is on a small parcel on the edge of downtown. The system ordered 6 CAF 5-section low floor trams by exercising the option on a Sydney order. Surfboard racks inside are a distinctive feature. One year

into the project the decision was made to go offwire. However, production of the cars was so far along that they were completed as on-wire, then retrofitted with the On-Board Energy Storage System adding about 2,400 kg to the vehicle's weight. A combination of super capacitors with backup batteries was found to be the best combination or charging time and ability to handle traffic delays. Charging bars are present at each stop with pantographs raised and lowered automatically. Dwell time is 45 seconds needing higher current capacity pantograph carbons to handle the intense current flows. Overhead wire is present only in the depot yard. The line opened in February 2019. New buildings are being built along the route indicating the economic development goal is being met. Planning is underway for extensions to the system.

A copy of the presentation is available on the Subcommittee website at http://heritagetrolley.org/images/Newcastle_Revitilization_06_2019.pdf.

- **Wheel Truing Technology Development and Innovation** Brandon Teal
  Product Manager, Simmons Machine Tool Corporation

Simmons is a manufacturer of precision machine tools for railway applications. The firm perceived a need for innovation in wheel truing, particularly in milling applications. Partnering with other firms they have developed a new approach. Reprofiling is defined as the machining process to remove defects from a wheel and return the profile to its optimal shape. Two approaches are used: milling and turning. Simmons manufacturers both. In milling the machine tool turns rapidly while the wheel rotates slowly. In turning the tool is stationary but the wheel rotates rapidly. Innovation in turning is difficult s it has reached the limit of the materials used and faster turning risks tool damage. To increase productivity more machines have to be added at great expense and use of floor space. Milling cuts the full profile of the wheel and performs better when cutting through defects while requiring minimal operator intervention. The machines are installed underfloor and are manufactured in Albany, NY. Typical cycle time is 40 minutes with normal wear conditions. Innovation include doubling the cutters per tool, therefore increasing productivity. New cutters are smaller, lighter, last longer, have a quick-change coupling, and provide a better finish. These changes have reduced cycle time 40% or more. Another new feature is that The machine will self-center and correct any out-of-round wheel defect automatically. The new machine can be installed above-floor, underfloor, or above floor "portal" for rapid wheel set production.

A copy of the presentation is available on the Subcommittee website at http://www.heritagetrolley.org/images/Simmons-wheel-truing-innovation-apta-06_2019.pdf

6. Updates

- **Introduction to the new APTAconnect (collaboration page)** Marie Benton
  This is a new collaboration page accessible through www.apta.com.

- **Announcing a new *Compendium of Rail Transit Definitions & Acronyms*** Marie Benton
  Developed by Charles Joseph this document is intended as a living document that can help standardize the use of terminology throughout the industry. It can be found on apta.com under standards then rail transit systems.

- **Light Rail Technical Forum** Tom Furmaniak
  The forum met earlier in the day and had update presentations on a variety of light rail projects under construction, newly opened, and planned in Ontario. The revision to the streetcar vs. streetcar brochure should be available by fall 2019.

- **Web Site Update** Jim Schantz
  The Subcommittee's site at www.heritagetrolley.org and www.streetcarcommitte.org continues to be updated regularly with news and other resources that could be of use to groups planning or implementing modern or heritage streetcar systems. Presentations from this and earlier meetings are on the Technical page on the site.

- **Leslie Barns Technical Tour** was held later in the afternoon featuring a chartered Flexity LRV taking attendees directly to the new, large facility designed for these cars. The TTC staff were excellent hosts for this very informative visit.

7. Next meeting:

APTA's TRANSform Conference 2019: A *Reimagined* Annual Meeting
October 13-16, 2019, Marriott Marquis, New York, NY

Summary Notes prepared by Jim Schantz