

TRANSIT TALK

VOL. 39

EDMONTON'S HIGH LEVEL STREETCAR LINE GETS EXTENSION

The iconic streetcar that crosses Edmonton's river valley from downtown to the Arts Barns in Old Strathcona is getting an 800-metre extension. "It will cross Gateway Boulevard and 83 Avenue and then end just on the north side of Whyte Avenue between 102 and 101 streets," Chris Ashdown, President of the Edmonton Radial Railway Society, told reporters.

The ERRS has been working on this expansion since 2011. "Being a complicated project, and so many other things happening in Old Strathcona, it took a long time to obtain the development permit," Ashdown explained. "When we first proposed the project, we were anticipating about a 10 or 15 per cent increase in the number passengers, but we've already doubled that since 2011. So, we do anticipate more people coming on the streetcar because we will be more visible."

The society heard from people who wanted to see the streetcar more out in the open. "In the new location, we'll be in the centre of Old Strathcona — very visible," Ashdown said. "Streetcars actually ran on Whyte Avenue back in the day, so we'll be bringing streetcars back to Whyte Avenue."

Last year, about 90,000 people rode the streetcar. Ashdown believes it could top 100,000 riders this year.

Along with the addition, a multi-use path will be built alongside the track. The extension is expected to be operational before the historic streetcar's operating season ends in October. [Source: Global News April 3, 2019]

FUNDING FOR BIG LRT EXPANSION IN EDMONTON

Major funding announcements were made in March for two of Edmonton's new light rail transit (LRT) extensions.

Through the Investing in Canada Infrastructure Plan, the Government of Canada is providing approximately \$948 million for the Valley Line West LRT and approximately \$127 million for the Metro Line Northwest LRT, totalling over \$1 billion for both projects. Additionally, the Government of Alberta has reaffirmed its commitment of approximately \$1.17 billion towards both projects through the Climate Leadership Plan. This includes approximately \$1.04 billion for the Valley Line West LRT and approximately \$131 million for the Metro Line Northwest LRT. With a projected population of 2 million in the next 50 years, this funding confirms the federal and provincial commitments to supporting smart and sustainable growth in large cities such as Edmonton.

These two major extensions will open up key travel routes in the city, connecting Edmontonians to destinations such as Blatchford on the Metro Line, and the Misericordia Hospital and West Edmonton Mall on the Valley Line West. With Edmonton's population poised to reach 2 million in the next 50 years, the LRT extensions will be a huge investment in moving people.

The City will yet need to finalize municipal funding requirements for both projects. Once all the funding is in place, it will take about one year to select a contractor for the Valley Line West LRT project, and another five to six years to complete construction. It will take about one year to complete design and select a contractor for the Metro Line Northwest LRT extension into Blatchford, and another four years to complete construction and commissioning. Construction on both projects is anticipated to begin as early as 2020.

[Source: Transforming Edmonton March 15, 2019]

CALGARY'S GREEN LINE GETS GREEN LIGHT

A \$3-billion funding agreement between the Government of Alberta and the federal Liberals for Calgary's Green Line LRT project was officially signed at the end of January. It has been dubbed the biggest infrastructure project in Calgary history: a light rail line running from 16 Avenue N. in Crescent Heights to 126 Avenue S.E. in Shepard.

The agreement finalized the approximately \$4.6 billion investment which will be shared by all three levels of government, with the City of Calgary coughing up about \$1.6 billion. The provincial and federal governments are each contributing \$1.53 billion. (con't on p. 2)



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GREEN LINE (con't)

"It is a fundamentally transformational, fundamentally important investment for this city and one that really is about acknowledging where we're going in the future," then Premier Rachel Notley said. Notley said the project would eliminate 30,000 tonnes of greenhouse gas emissions each year — what the City of Calgary said is equivalent to 6,000 vehicles.

Notley said the province's portion is funded through carbon tax revenues. United Conservative Party (UCP) leader Jason Kenney, now Premier, said he would scrap the carbon tax if elected, but indicated that the Green Line would still be built.

Mayor Naheed Nenshi said the first stage of the project will create 20,000 direct and indirect jobs — and it will be used by 60,000 riders when it opens in 2026. [Global News, January 30, 2019]

ELECTRIC TROLLEYBUS NEWS

Europe's "Trolley 2.0" Demonstrates Advantages of Trolleybuses with In Motion Charging

The European Union's "Trolley 2.0" plan will bring the advantages of both trolleybuses and battery buses together, developing trolleybuses further into a vehicle that can operate both on and off-wire. The result is a more efficient use of trolleybus overhead systems to propel vehicles and charge batteries while in-motion. Nine Trolley 2.0 partners from public transport, industry and research will seek to demonstrate how battery-supported trolleybuses are the best way forward towards a future of electric public transport systems in European cities.

The Trolley 2.0 demonstrations will take place in four cities with existing trolleybus systems from different EU-countries: Szeged (HU), Arnhem (NL), Gdynia (PL) and Eberswalde (DE). New innovations for smart trolley grids will be demonstrated, e.g. automated wiring technology, smart trolley grid management, the usage of renewable energy sources, energy storage concepts and multi-purpose charging stations based on existing DC infrastructure from trolley networks.

Trolley 2.0 will develop tools, guidelines and recommendations for the design and operation of battery-supported trolleybus services under different conditions as well as for the development of smart trolley grids as a charging backbone for other electric vehicles. Trolley 2.0 solutions will simplify the deployment and operation of trolleybuses with in-motion charging and may help to give this well-established technology a new push in cities with as well as those without trolleybuses. [Source: ETB News March 28, 2019. R. C. DeArmond]

Translink Releases Plan for Trolley Re-Routes in Vancouver during Broadway Subway Construction

Vancouver's Skytrain system is being extended to serve the bustling Broadway Corridor in what is known as the Millennium Line Broadway Extension. The extension will be placed underground, becoming a subway, and the tunnel will be completed using a tunnel boring machine. The extension of the Millennium Line, adding six new stations and replacing half of the existing 99 B-Line route, is scheduled for a 2025 opening.

TransLink recently released information on how affected trolleybus routes that use the Broadway Corridor will be re-routed during the construction. To accommodate the reroutes, construction crews began installing new trolley poles and overhead trolley wires in late April along portions of West 12th Avenue, Cambie Street, and Macdonald Street. This 16-month-long project involves the installation of about 300 trolley poles and foundations.

The No. 16 normally runs on West Broadway between Arbutus Street and Granville Street, but during subway construction it will cut its portion along Arbutus Street between West Broadway and 12th Avenue and run on West 12th Avenue to reach Granville Street instead.

Similarly, the No. 17 will also be running along West 12th Avenue between Oak Street and Cambie Street, instead of its usual route continuing along Oak Street north of 12th Avenue and on West Broadway between Oak Street and Cambie Street.

The most significant trolley reroute will be the No. 14, which will operate along West 4th Avenue between Macdonald Street and the Granville Street Bridge instead of its usual route along West Broadway.

Reroutes of these three trolley bus routes are expected to begin sometime in the latter half of 2020, when major construction on the \$2.8-billion tunnelled SkyTrain extension project begins. [Source: Urbanized, Feb. 7 and March 25, 2019]

NEW TROLLEYBUS INFRASTRUCTURE

- ☞ MacDonald between West 4th and West Broadway
- ☞ West 12th between Arbutus and Granville
- ☞ West 12th between Oak and Cambie
- ☞ Cambie between West Broadway and West 12th

Trolleybuses return to Prague after Absence of 46 Years

In July of last year, passengers using Prague public transport took a step into the future as they boarded trolleybuses on Route 58. The Prague Public Transit Company (DPP) commenced regular trolleybus service as a follow-up to the successful testing of In-Motion charging. Prague has not had regular trolleybus service since 1972. At that time trolleybuses had been in operation in Prague since 1936 and had gained many supporters. Their abandonment followed a trend at the time, although viewed as a mistake by many. Later considerations to reintroduce them in the 1990s could not be realized due to financial constraints and a focus on development of the tram network.

The main impetus for the return of trolleybuses to Prague streets has been the improvement of traction batteries during the last decade. The combination of proven trolleybus technology and modern batteries reduces the scope and cost of the trolley infrastructure and offers better options for service deployment than pure battery buses.

“The commencement of the operation of line 58 clearly indicates that we are succeeding in introducing green transport into the Czech metropolis,” states Martin Gillar, CEO and Chairman of the Board of Directors of DPP. Route 58 has been introduced as a trolleybus line, although the overhead line comprises only about 15 per cent of the entire route.

The route was selected for several reasons: There is a distinct and long climb on this route which is common for many bus lines in Prague. This allows DPP to test all the parameters and limits of this technology in typical Prague conditions. Another reason is contact with tram power infrastructure at two locations on the route; this enables DPP to take advantage of power synergies. Last but not least, there are bus garages nearby, and this minimizes the mileage to and from the garage.

DPP has already been preparing for the future expansion of battery trolleybuses to include line No. 140, i.e. Palmovka – Čakovice – Miškovice, with the anticipated deployment of articulated vehicles.

[Source: ETB News (Richard C. DeArmond), July 10, 2018/March 28, 2019]

Solingen E-Bus Conference: Battery Trolleybuses Ready for Action

Summarized from an article by Eric Doherty in Canada’s National Observer

The sixth international E-Bus conference took place in Solingen, Germany in November 2018. Attendees acknowledged that electric buses are poised to replace fossil fueled vehicles, even on the busiest routes. A front runner in the electrification of public transit systems is the modern trolleybus that can charge batteries while operating under wire in central areas, then later travel portions of its route without wire, recharging again when returning to the overhead network. These vehicles can cover the same distance in a day as a diesel bus, but without the emissions and noise pollution. And such a system only requires wire over 1/5th to 2/3rds of the route, meaning that the initial capital investment in infrastructure is low and life cycle costs are comparable with diesel.

The City of Solingen itself is aiming for 80 per cent electric buses within four years, and will phase out burning fossil fuels as older buses are replaced. Such battery equipped trolleybuses will play a major role.

The cities in the best position to quickly shift to electric buses are those that already have trolleybus wires in place.

Erik Lenz of Kiepe Electric told attendees at the E-Bus Conference: “It’s a no brainer . . . to use electric buses which are powered with ‘in motion charging’, a term coined by Kiepe to refer to the battery equipped trolleybuses. “It is a very efficient system, and that’s why [Solingen] went for it.”

With battery trolleybuses, there is no need to wait around for the battery industry to make improbable technical leaps – while batteries are getting cheaper they are still very heavy, and weight will likely still be a big issue a decade from now.

Cities with existing trolleybus wire networks, such as Lyon, Vancouver, Seattle and San Francisco, Shanghai and Beijing, and over 300 other trolleybus cities around the world, already have powerful charging systems in place for battery electric buses.

Trolleybus lines for bus rapid transit (BRT) are becoming popular and are found in cities like Castellon, Spain and Lyon, France. Bus rapid transit (BRT) utilizes reserved bus lanes, typically in the center of the road, to increase the speed of the service by removing traffic interference. Two of the three BRT lines in Beijing, China have been converted to operate with trolleybuses. And San Francisco is constructing a BRT corridor on an existing trolleybus line. The oldest trolleybus BRT line is in Quito, Ecuador, in operation since 1995 and widely used by the public. Rimini, Italy will open up a trolleybus BRT line using battery equipped trolleybuses in 2019. Since BRT lines are less expensive and quicker to build than other forms of rapid transit, electric BRT is a crucial climate solution.

Experts from cities such as Berlin and Stockholm at the E-Bus Conference explained how different types of electric bus charging systems are suited to different types of service. Buses that charge overnight work best for smaller routes that don’t require a lot of service miles in a day. Electric buses that stop and charge at fast chargers have a role on moderately demanding lines. But the heavy lifting is best done by battery electric trolleybuses, which are the most practical technology for large buses on the busiest and most demanding routes.

Experience shows that using pure battery electric buses on high demand routes requires buying and operating more buses, with each bus driving a shorter distance per day. Sometimes, twice as many vehicles would be required than needed to provide the same service with diesel buses, which can be cost prohibitive and increases vehicle storage space requirements.

Battery electric buses and battery trolleybuses are now becoming variations of the same product – and prices will come down as a result. (con’t on p. 4)

E-Bus Conference Report (con't from p. 3)

Manufacturers ABB and Kiepe reported at the conference that they use the same components in battery electric buses that charge only while stopped, and buses equipped with trolley poles. This means that as the volume of electric buses goes up, prices of all types of electric buses will come down due to economies of scale.

The organization TrolleyMotion, organizer of the E-Bus Conference, will be involved with the conversion of an ordinary battery electric bus to a battery trolleybus capable of operating all day on a very demanding route. The success of this project would demonstrate that bus manufacturers can offer trolley poles as an option on their electric buses.

[Source: Summarized from an article by Eric Doherty published in Canada's National Observer, December 19, 2018. Eric Doherty is a Victoria, B.C. based transportation planning consultant]

German Transit Supplier visits Dayton

Representatives from the German electric propulsion manufacturer Kiepe Electric visited Dayton, Ohio in March, ahead of the upcoming delivery of NexGen electric trolleybuses that will replace the agency's current trolleybus fleet dating from the late 1990's. They toured Dayton's network of electric-trolley routes aboard the NexGen — a dual-mode electric bus RTA commissioned as a prototype in 2014. Dayton is working with Kiepe to complete the delivery of an entire fleet.

Kiepe will deliver a total of 41 dual-mode electric trolley NexGen buses to Dayton by the end of 2020. As part of that order, 12 to 17 of the NexGens should arrive in Dayton this year, with the first dual-mode electric trolley hitting the streets in regular service in mid-year, according to RTA Director of Maintenance, Daron Brown.

Brown said the new trolleys will be more dependable, meaning a more reliable service for customers. The NexGen buses will have the ability to travel off wire for up to 15 miles using the built-in battery, which charges while the trolleys are traveling on RTA's network of electric wire. Off-wire travel will allow NexGens to take alternate routes around construction, accidents or traffic-related situations by dropping their poles and operating in battery mode, something RTA's current trolleys cannot do. Route extensions beyond the wires may also be considered. The interior of the NexGen fleet will feature RTA's new composite seating, a new seat design that will allow for easier upkeep, resulting in a cleaner bus, Brown said.

Electric transit is not new in Dayton. It began with streetcars in 1888. Dayton's rich history of electric trolleybuses began in 1932, when trolley buses replaced streetcars. In the decades since, Dayton has continued to

operate electric trolleybuses. The RTA utilizes 124 miles of electric overhead wire infrastructure to power its seven trolley routes, which provide more than two million passenger trips a year. That number is expected grow as the new NexGen buses enter into service.

These "green" electric vehicles both reduce RTA's carbon footprint and save on fuel costs. Each NexGen electric trolleybus has up to a 20-year life expectancy, compared to a diesel bus's 12-year lifespan.

[Source: March 8, 2019, Metro for Transit and Motorcoach Business]

St. Etienne, France: Trolleybuses herald 21st Century Electric Revolution in Public Transport

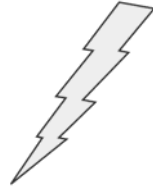
Last year, in July, Saint-Etienne Métropole voted for trolleybuses with In Motion Charging (IMC) for its urban network. A report from the Systra Engineering office and the transit operating agency STAS concluded that the IMC would be the fastest and easiest way to fulfill the "Loi de Transition énergétique pour la croissance verte" (Transition to Green Energy) for the Saint-Etienne urban network. Trolleybuses with IMC will replace diesel buses, running as trolleybuses under wire and as battery buses into suburban areas not currently under wire.

As a result of this decision, European manufacturer Solaris has entered the French trolleybus market. The Polish company won a tender for the supply of 22 Trollino model 12 trolleybuses to Saint-Etienne in the years 2019-2022. The vehicles will be fitted with a Skoda drive system and 40 kWh battery. The value of the contract is over 17 million Euros.

The vehicles will be equipped with a Skoda drive system. Batteries will allow trolleybuses to drive outside the traction network. The vehicles will also be equipped with air conditioning and an innovative interior lighting system that will be partially installed in the passenger handrails. Solaris Trollino model 12 trolleys for Saint-Etienne will be made in the so-called "facelift" version, the standard design for Solaris vehicles since January 2019.

[Source: Sustainable Bus, Jan. 17, 2019]

Transportation ELECTRIFICATION NEWS



ACTIVISTS CALL ON NY TO ADOPT FULLY ELECTRIC VEHICLE FLEET BY 2040

A new group hopes to force gas-guzzling vehicles out of New York's government. ElectrifyNY, a coalition of transit and environmental groups, has formed to call for New York State and local municipalities to transition to fully electric vehicles by 2040.

Transportation is the largest contributor to greenhouse gases in the state, and the only sector where emissions haven't decreased since 1990, according to state data. The group has targeted buses and other mass transit-related vehicles in the state, pushing for change.

"It is a public health and climate justice imperative that we reduce emissions in the transportation sector," said Renae Reynolds, a coalition organizer from the NYC Environmental Justice Alliance, at a news conference outside a Manhattan MTA bus depot, "to ensure the health and safety of our communities who rely on public buses and other vehicle modes to get where they need to go."

The MTA -- the nation's largest transit agency -- has already committed to making its bus fleet entirely electric by 2040 under NYC Transit President Andy Byford, and is currently undergoing a three-year pilot program with 10 battery buses. The MTA recently purchased 15 battery powered articulated buses and charging stations for the Michael J. Quill Depot in Manhattan -- a portion of the 60 electric buses the authority has committed to buying under its current capital plan.

Going electric poses specific challenges for the MTA if battery buses are chosen, according to Nick Sifuentes of the Tri-State Transportation Campaign, an ElectrifyNY coalition member. Not only does the Transit Authority still need to buy the buses, it also needs to buy charging stations for depots and along bus routes. Questions also have been posed as to how electric buses could weather a cold winter when heating could drain batteries. In addition, there are concerns about resiliency if a natural disaster were to knock out the power grid.

"Gas vehicles are not just unacceptably polluting, they're ridiculously inefficient," said Keith Kerman, chief fleet officer at the city's Department of Citywide Administrative Services. "Do you know that 80 percent of the fuel you put in a vehicle does not propel the vehicle? It is complete waste." Kerman championed the use of electric vehicles at a rally in April, but did not comment on whether the 2040 goal of 100% electric would be achievable or not. [Source: amNewYork, April 26, 2019]

CHICAGO TO TRANSITION BACK TO ELECTRIC BUSES Entire fleet to be electrified by 2040

The streets of Chicago once buzzed with the sound of electric trolleybuses. The last of them ran on March 24, 1973, replaced by General Motors New Look diesel buses. But the quiet transit of the trolleybus era may return again to Chicago streets. On April 10th, Chicago City Council approved a resolution to transition to 100 percent renewable energy by 2035, with the Chicago Transit Authority's (CTA) bus fleet to be 100 percent electric by 2040. Chicago becomes the largest city in the U.S. so far to make the commitment to renewable energy.

The city will develop a plan of transition by December 2020, which will outline key strategies, set progression milestones and develop a timeline for achieving the clean energy transition.

The CTA introduced a battery electric bus to its fleet in 2014, and in June 2018, the Chicago Transit Board awarded a \$32 million contract for the purchase of 20 new battery buses. But exactly what forms of electric vehicles will be deployed to realize the 2040 goal remains to be decided.

(continued on page 6)

ELECTRIC STREETCAR NEWS

Oklahoma City Streetcar Debuts

Streetcars returned to Oklahoma City in December 2018 following a ribbon cutting ceremony on December 14th.

"This is a historic day decades in the making," proclaimed Oklahoma City Mayor David Holt. "Our streetcar will be an important economic development tool for our entire city, accommodating visitors and residents alike. It will encourage walkability downtown, answer the question of how residents and visitors will circulate downtown once they arrive and will inspire private investment all along the route."

The streetcar system encompasses 4.8 route miles and serves 22 platforms using five streetcars. There are two routes, a Downtown Loop and a Bricktown Loop. One car runs every 15-18 minutes. The stops are all covered and accessible with level boarding; real-time arrival information is provided. Most of the routes are wired, but the cars do traverse some sections on batteries.

The \$135-million project was financed through a sales tax between April 2010 and December 2017. [Sources: News 9, December 14, 2018; Mass Transit, December 14, 2018]

CHICAGO (continued from page 5)

“For more than a century, Chicago’s transit system has connected people, communities, jobs, opportunities and has helped shape the City of Chicago as we know it today,” said CTA President Dorval R. Carter, Jr. at the release of the renewable energy plan. “CTA is proud to be an integral part of Mayor Emanuel’s vision to make Chicago one of the greenest cities in the world; and we will continue our role of helping shape this great city and its future by committing to transition to an all-electric bus fleet by 2040.” [Source: CTA, April 15, 2019]

California to go Fully Electric with Bus Fleets in Next 22 Years

The California Air Resources Board approved a first-of-its-kind regulation last December that sets a goal for public transit agencies in the state of California to transition to 100 percent zero-emission bus fleets by 2040.

“A zero-emission public bus fleet means cleaner air for all of us. It dramatically reduces tailpipe pollution from buses in communities and provides multiple benefits, especially for transit-dependent riders,” CARB Chair Mary D. Nichols said.

“Putting more zero-emission buses on our roads will also reduce energy consumption and greenhouse gases, and it provides cost savings for transit agencies in the long run.”

The Innovative Clean Transit regulation is part of a statewide effort to reduce emissions from the transportation sector, which accounts for 40 percent of greenhouse gas emissions and 80-90 percent of smog-forming pollutants. The transition to zero-emission technologies, where feasible, is essential to meeting California’s air quality and climate goals.

Full implementation of the regulation is expected to reduce greenhouse gas emissions by 19 million metric tons from 2020 to 2050 – the equivalent of taking 4 million cars off the road. And it will reduce harmful tailpipe emissions (nitrogen oxides and particulate matter) by about 7,000 tons and 40 tons respectively during that same 30-year period. Additionally, transit agencies are expected to save an estimated \$1.5 billion in maintenance, fuel and other costs by 2050 after the full buildout of infrastructure.

As longtime partners for clean air in California, the state’s 200 public transit agencies play a pivotal role in transitioning vehicle fleets away from fossil fuel-powered technologies to zero-emission alternatives. There are already a number of zero emission buses operating in California. San Francisco has a sizeable zero-emission fleet with its electric trolleybuses, and several municipalities have adopted small battery bus fleets in recent years. But the large scale adoption of green fleets has a long way to go in many areas of the state. [Source: CARB, December 14, 2018]

SWEDEN TO BUILD ELECTRIC ROAD

The Swedish Transport Administration has announced that the consortium Smart Road Gotland has won a bid to erect a demonstration dynamic electric road system for test purposes.

This public-private initiative will be the first in the world to charge inductively (i.e. wirelessly) both an electric truck and a bus while in full motion.

To enable the mission-critical knowledge transfer to the Swedish Transport Administration, the Smart Road Gotland consortium will deploy a fully functional public shuttle service and test bed through a 1.6 km long electric road as part of the total route of 4.1 km between the airport and city center of Visby on the island of Gotland in the Baltic Sea.

The electric vehicles will be test-driven by professionals in varied seasonal conditions to ensure that the system is ready for large-scale projects on highways. Of particular concern are snow and ice on the roadway in winter.

As an integral strategic step towards implementing the Swedish government’s national roadmap for electric road systems in future, the Smart Road Gotland project will create a vital learning opportunity for the authority.

Long haul heavy trucks benefit significantly from this solution since no heavy and costly batteries, nor stops for charging, are needed. If the demonstration proves successful, this solution would enable installation of electric road systems (ERS) without a catenary system.

After acquiring relevant demonstration results, the Swedish Transport Administration can evaluate whether there is any potential for larger scale ERS investments of this type. [Source: PR Newswire, April 12, 2019]

BATTERY BUS NEWS

TORONTO'S FIRST BATTERY BUS GOES INTO SERVICE ON 35 JANE ROUTE

The TTC has deployed a battery powered bus into regular service for the first time.

The vehicle, one of 60 “zero-emissions” buses the TTC is set to receive by early next year, left the agency’s Arrow Rd. garage just after 8 a.m. packed with politicians and transit officials for its inaugural ride operating on the 35 Jane route. Among the first passengers was TTC chair Jaye Robinson, who told reporters that by 2020 Toronto’s transit agency will have the one of the largest fleets of battery buses in North America.

“The TTC is already an environmentally friendly way to travel the city, but today we’re taking it one step further,” she said. “I am so proud that the TTC is leading the way. We all need to do our part to confront the growing challenge of climate change.” The TTC plans to convert its entire fleet to zero-emissions vehicles by 2040. Whether this will mean a return to trolleybuses on heavily used routes, or whether another technology will serve satisfactorily under such conditions, remains to be seen. Mayor John Tory said the initial \$140-million battery bus purchase, which is being jointly funded by the city and the federal government, would help Toronto reach its target of cutting its greenhouse gas emissions by 80 per cent from 1990 levels by 2050. “This I think is proof positive of the fact that we are committed as a city and that we have a great partnership with the federal government to achieve that target,” Tory said.

The TTC is buying the first 60 battery buses from three manufacturers and will test the vehicles in order to decide how to proceed with any future purchases. If successful, the agency proposes to buy 160 of the vehicles per year starting in 2021, but those future purchases are currently unfunded.

The bus that entered service Monday was built by a Winnipeg-based company. The other two companies supplying vehicles are California’s Proterra and Chinese manufacturer BYD.

TTC riders will be able to recognize the electric buses by the colourful green “wraps” on their exterior. But passengers are most likely to notice the new buses’ sound — the electric vehicles are significantly quieter.

While the buses are propelled by battery power, they also have on-board diesel-powered heaters that will kick in when temperatures drop below 5 C. Using the bus battery to operate the heating system would deplete its power by between 30 and 50 per cent and drastically reduce the vehicles’ range. The vehicles still meet the official designation of zero emissions because their propulsion systems are electric. Each electric bus is projected to reduce the TTC’s carbon dioxide emissions by 100 to 150 tonnes per year, compared to the agency’s diesel vehicles.



Toronto’s first battery bus, clad in the TTC’s iconic red and white livery, prepares to enter service on the 35 Jane route. TTC Chair Jane Robinson says that Toronto will have one of the largest battery bus fleets in North America by 2020. [Image courtesy Toronto Star]

The electric buses take about three hours to charge, and have a range of up to 200 km per charge. A typical run on the 35 Jane route is about 78 km. A TTC spokesperson explained that line was selected for the initial deployment because it features varying topography and passenger loads, allowing the agency to test how the bus operates under different conditions. [Source: Toronto Star, Mon., June 3, 2019]

SPOKANE TRANSIT'S CENTRAL CITY LINE WINS \$53.4 MILLION IN FUNDING

It took twenty years and will not be built as envisioned, but Spokane’s Central City Line has finally received funding approval. It will be the city’s first bus rapid transit line, although it is being seen more as an express bus system with stations by some.

The fixed-route, zero-emission bus is scheduled to begin running through the city’s core sometime in 2021, connecting Browne’s Addition with Spokane Community College on a 6-mile loop. The federal grant also will fund infrastructure costs as well as the purchase of 10 vehicles for the Spokane Transit Authority.

Spokane County Commissioner Al French, who has been in local politics almost as long as the idea for such a transit line began circulating in 1999, said the Federal Transit Administration awarded the money due to the “creativity” of Spokane’s system, which will look and operate something like a “train on rubber tires”. “We have a very creative project. One of the first of its kind in the country,” said French, who sits on STA’s board of directors. “It’s the midpoint between having a sleek, upscale -- and very expensive -- light rail system, and a bus.” (continued on page 8)

The idea that eventually became the Central City Line began in 1999, with the Plan for a New Downtown. That plan envisioned a light rail system running from the east side of town along Riverside Avenue, through the University District and terminating at the STA Plaza. At the same time, the plan described a complementary trolleybus system with an east-west line running from Browne's Addition to the University District.

As the sizeable costs of this plan were realized, it was scaled back. But the idea of a modern transit system did not die. In 2011, the concept of what is now known as the Central City Line was born. It was envisioned to run with articulated electric trolleybuses and use dedicated lanes. Again scaled down, the project as approved will not use electric trolleys, nor will it have dedicated lanes. Instead, five priority traffic signals may be installed to help speed the buses through downtown, but beyond that, the vehicles will not have any special priority.

But the vehicles will look different than Spokane's current fleet, and passengers will be required to purchase fares at special kiosks before boarding, eliminating on-board fare collection. There will be 21 stations level with the bus door, to allow for easy boarding, and boarding can take place through any door. Service will be more frequent than other routes, with 7.5 minute service in rush hours, and 10-15 minute service during the rest of the day and on weekends. [Source: The Spokesman-Review, April 10, 2019]

GREENSBORO NORTH CAROLINA GETS SMALL BATTERY BUS FLEET

State and local officials gathered Feb. 21 to celebrate Greensboro Transit's commitment to "dump the pump" to become the first transit agency in North Carolina to begin service with battery-powered buses. The first of the vehicles went into service in late January.

The 40-foot no-emission, low-noise buses are being designed and built by Proterra and are capable of providing up to 175-200 miles of sustainable transportation service before recharging is required. Overnight charging kiosks constructed at the GTA Maintenance facility ensure each bus begins the day with a full charge. 13 of the vehicles in total will comprise the initial battery bus fleet. [Source: Mass Transit, Feb. 22, 2019]

PROTERRA PARTNERS TO CREATE FACILITY TO SCALE BATTERY LEASING

Battery bus maker Proterra recently partnered with Mitsui & Co. Ltd. to create a \$200 million credit facility in support of a battery lease program. The battery leasing credit facility, the first of its kind in the North American public transit industry, is expected to lower the upfront costs of battery buses. By decoupling the batteries from the sale of its buses, Proterra enables transit customers to purchase the vehicle and then lease the batteries over the 12-year lifetime of the bus. As a result of the battery lease, the initial capital expense for the electric bus will be similar to a diesel or CNG bus. It is hoped that customers can utilize some of the operating funds previously earmarked for fuel to pay for the battery lease. Additionally, under the 12-year battery lease, Proterra will own and guarantee the performance of the batteries through the life of the bus, decreasing operator risk.

[Source: Metro for Transit and Motorcoach Business, April 16, 2019]

SAN FRANCISCO AIRPORT TO GET BATTERY BUSES

Battery bus maker Proterra announced that San Francisco International Airport (SFO) has purchased six 40-foot Proterra Catalyst E2 electric buses and three 60 kW Proterra plug-in chargers, joining a growing list of airports across North America transitioning to electric buses for airport ground transportation. The new battery-electric Proterra Catalyst buses will replace six diesel buses in the airport's current operating fleet. [Source: Proterra, April 23, 2019]

BOSTON GETS UNIQUE HYBRIDS

Massachusetts Bay Transportation Authority (MBTA) has ordered 194 electric-hybrid buses that will include BAE Systems Series-ER extended range propulsion system. While not a full battery bus, the Series-ER system allows for operating a portion of the day electrically on battery power with the engine off, thereby reducing maintenance, idling, fuel use and emissions. "Cities like Nashville are using Series-ER technology to drive on battery-electric power near hospitals, schools and in the downtown tourist area, and Boston plans to use the technology to drive through their tunnels with zero emissions," a BAE Systems spokesperson stated. [Source: BAE Systems, Jan. 3, 2019]