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## Portuguese Trams Imported by Gales Creek Enterprises (1974-1993)

*Richard Thompson*

Beginning in 1974, Gales Creek Enterprises (GCE), headed by Oregon Electric Railway Historical Society (OERHS) co-founder Paul Class, provided at least 70 vintage streetcars to launch trolley operations in a half-dozen American cities. In the process Paul almost single-handedly started what we now call the “heritage streetcar” movement. His company imported many streetcars from Australia and Brazil, but the largest part of that pioneering effort involved trams from Portugal. In fact, during the next 20 years nearly all Portuguese trolleys in the United States came from the “International Trolley Broker” in Glenwood, Oregon.

Of the 48 streetcars described in this account those from Porto are of particular interest to this writer because they came through the Glenwood Trolley Park during my first years as an OERHS volunteer. I had no direct experience of the Lisbon trams since GCE crews met those arrivals directly at docks or railheads and loaded them onto a special roll on-roll off trailer for delivery across the country. So, I will admit that nostalgia, as much as a desire to fill gaps in the record, has driven the creation of an ever-evolving list.



Ex Porto cars 156 and 180 meet at Court Square on the mall in Memphis. Each MATA car has a different paint scheme.

*Van Wilkins heritagetrolley.org*

It has been 25 years since the OERHS departed Glenwood, yet the following story should be of interest to newer members because a Portuguese streetcar joined the collection at Powerland in 2006. Porto No. 210 (renumbered 201 before arrival) is not a part of the Trolley Park story, of course, but it is similar to the streetcars that were kept there. Car 210 was one of a series built during 1938-45 to replace the Brill and St. Louis Car Company classics. A sense of familiarity might also come from the fact that vintage Portuguese trams share a kinship with our beloved Council Crest cars 503 and 506.



Ex-Porto car 180 on Main Street in Memphis in 2010 note the pantograph.

*Thomas R Machnitzki photo MATA*

The COVID-19 quarantine has provided time to add details to the list, however I must warn readers that the saga of Portuguese Trams remains very much a work in progress. There are still unaccounted for streetcars. Nor has the experience been entirely positive; tracing the journey of these trolleys stirred memories of heritage operations that are no more. They have faded away just like Portland’s own Vintage Trolley (for which I was Crew Coordinator) or Seattle’s Waterfront Streetcar. The good news is that the quest also revealed that most of the historic vehicles imported by GCE still exist and nearly half are part of vibrant new railways. Their history has been organized chronologically where possible with technical details provided at the end of the article. Ding, Ding...

# Oregon Electric Railway Historical Society

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If you have overlooked paying your dues for 2019 or 2018 or did not realize that dues are based on a calendar year, this is your reminder that your dues are due. Memberships should be renewed on January 1st each year. New members joining after July 1st should renew on December 31st of the following year. The OERHS is a non-profit 501-C-3 corporation, the benefits of a donation should be discussed with your tax advisor.

Active	\$ 30	Sustaining	\$ 250
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Contributing	\$ 75	Benefactor	\$ 1000
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## Mission Statement

The mission of the Oregon Electric Railway Historical Society, Inc. is to preserve the regional heritage of electric railway transportation as a living resource for the benefit of the present and future generations. To fulfil this mission the Society will promote:

- The study of electric railways, their physical equipment, properties and operations, devoting special attention to the electric railways of western Oregon.
- The procurement and preservation of historic electric railway equipment, materials and property.
- The display, interpretation and operation of surviving historic equipment, materials and properties.

By Laws, Article II, 9/14/93

## Official Notice

The Transfer is published quarterly as the official publication of the OERHS, a state and federally recognized not-for-profit institution and operator of the Oregon Electric Railway Museum at Brooks, Oregon and the Willamette Shore Trolley between Lake Oswego and Portland.

The views expressed herein are solely those of the individual writers identified and of the editor only, and may not necessarily represent the views or policies of the Society, its Board of Trustees, Officers or Members.

Articles, photos and letters for publication are always welcome. Please email to [transfer@oerhs.org](mailto:transfer@oerhs.org) or postal mail to the museum address following.

Please send any change of address, your dues and donations to: Treasurer

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If you wish to volunteer for the Willamette Shore Trolley, call David Harold or Jan Zweerts at 503.697.7436.

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give or sell your email address to any other person or organization. You can see this issue and the previous issues by going to this website: [oregontrolley.com/transfer](http://oregontrolley.com/transfer).

We also mail black & white copies of the newsletter to all members of record. Not as exciting as the color version available at the web site but some members have stated that they prefer physical copies.

The electronic copy that you can get on the web site can be printed in full color (or black and white of course) on your printer at home if you prefer to read The Transfer the traditional way. We are also archiving back issues on the OERHS web site so in the future you will always be able to refer back to previous issues. We believe you will appreciate the higher quality pictures that this process will provide to all the interesting photos that accompany our articles.



**Yakima:** It all began in 1974 when two Porto cars were hauled to Yakima, Washington. Trams 254 and 260, renumbered 1976 and 1776 for the American Bicentennial celebration, were built to Brill specifications in Porto's own shops in 1928. Since 1946 they had been operated by the public transport company Sociedade de Transportes Colectivos do Porto (STCP).

Yakima Valley Trolleys is a non-profit organization that operates vintage streetcars, including these two, on a seasonal weekend and holidays schedule over surviving Yakima Valley Transportation Company (YVT) right-of-way. Today the usual route is a five-mile run to Selah. A copper thief stole much of the overhead wire in 2005, forcing operation with tag-along generators however, sections of the wire have since been replaced. The Yakima Electric Railway Museum is located in the old YVT carbarn. Yakima Valley Trolleys was founded in 2001 to replace the earlier Yakima Interurban Lines Association.



Ex Porto car 254, renumbered 1976, has worn the same livery since arriving in Yakima in 1974.

*Yakima Valley Trolleys*



Ex Porto car 256, renumbered 1776, sports a different paint scheme as conductor Paul Edmondson puts up the pole in June 2011.

*Yakima Herald Republic*



521 520 524 and two other Porto cars in Aspen 1979

*Nick Dewolf Flickr*

**Detroit:** The Detroit Citizen's Railway roster included nine single truck Lisbon trams. The first seven, numbered 405, 412, 457, 469, 517, 523 and 529, came from GCE in 1975. Four of these were 1899 products of the St. Louis Car Company. 517 and 523 were similar but built locally by Companhia de Carris de Ferro de Lisboa (CCFL) during 1924-25. The other two cars in the original group, 457 and 529, were bought for spare parts and never operated. In 1976 car 427 was purchased from the failed Ann Arbor Trolley. Detroit renumbered the first Lisbon cars 1-6; 405 (1), 469 (2), 412 (3), 517 (4), 523 (5) and 427 (6). Later additions to the roster included Lisbon open Brill car 247, English double-decker No. 14 and 1895 closed No. 4 from Switzerland.



Ex Lisbon car 405 was renumbered 1 on the Detroit Citizen's Railway.

*Jao Rui Gomes*





Ex Lisbon cars 412 and 517 became 3 and 4 in Detroit.

Chuck Zeiler Flickr



Ex Lisbon 523 is Detroit Citizen's Railway No. 5 in this 1979 view.

Flickr/trainsandstuff



Ex Lisbon Brill open 247 retained its original number in Detroit.

123 group

In 2002, after more than 20 years of service (and just prior to the Detroit operation shutting down), three cars received a complete overhaul. The renovation of open Lisbon No. 247, Swiss No. 4, and Lisbon No. 3 was carried out by Historic Railway Restoration of Arlington, Washington, a

company founded by long-time OERHS member Tom Mendenhall and his son Vince.

The Detroit Citizen's Railway (later renamed Detroit Downtown Trolley) was operated by the Detroit Department of Transportation from 1976 to 2003. The initial 3/4-mile segment opened in 1976. Year-round service was offered on a route that ran from Grand Circus Plaza to Cobo Hall via Washington Blvd. In 1980 a one-fourth mile extension was added along Jefferson to the Renaissance Center. The entire line was single-track except for two passing sidings and utilized an unusual sidewalk right-of-way. In 2003 the city discontinued operation and reopened the route to automobiles. The trolley barn on Washington Boulevard was demolished in 2004.

Disposition: Sale was delayed for years while the streetcars languished in a garage. Only three trolleys made it to an auction in November 2014. They were Lisbon closed No. 6 (427), open No. 247 and Burton & Ashby (UK) double-decker No. 14. By the time they came to auction these cars were not in good shape, having been stripped by metal thieves and occupied by homeless people. Even so, the average price realized was in excess of \$30,000, six times their original value. Car 6 (427) was bought by a restaurateur who planned on installing it the Gandy Dancer restaurant in Ann Arbor's Michigan Central Depot. No. 247 was purchased by Alex Pollack the city planner who helped organize the original line in 1976. Double-deck car 14 returned to England for restoration. Locations for cars not sold at auction are unknown.



Detroit cars 6 and 5, seen in the car barn on March 27, 1983, were ex Lisbon 427 and 523.

Chuck Zeiler Flickr

**Ann Arbor:** In 1976 Lisbon 427 was hauled to the short-lived Ann Arbor Trolley and Museum for use on a proposed heritage trolley line on Liberty Street between State and Main streets. However, the Ann Arbor Transit Authority turned down the idea and within a year car 427 had been sold to the nearby Detroit Citizen's Railway becoming their No. 6.





Ex Lisbon 418 was renumbered 23 and put on display in the early 1970s to promote the Aspen Street Railway.

123 Group

**Aspen:** Six Lisbon cars went to Aspen, Colorado in 1978 as part of a heritage trolley line that never got off the ground. The roster included 418, 519, 520, 521, 524, and 526. In 1982 the nonprofit Aspen Street Railway donated its cars to the city. Numerous proposals to establish a one-half mile vintage streetcar operation were dealt a final blow in 2002 when a ballot referendum failed by a narrow margin. Sadly, the oldest of the cars, No. 418 (renumbered 23 in Aspen), was left to rot in the Aspen dump but, after 20 years in a field, the other five trams found new homes.

In 2003 trams 519 and 521 were transferred to the Issaquah Valley Trolley in Washington, where a short line is now operating. Car 521 was then traded to the GOMACO company in Iowa in exchange for their restoring No. 519.

Another 2003 move saw No. 524, along with parts salvaged from 418, delivered to the Old Pueblo Trolley (OPT) in Tucson, AZ. Since 1985 OPT had been operating a variety of trolleys over six blocks of old streetcar tracks. This ceased in 2011 when the city took back the right-of-way for the new Sun Link light rail system. In the meantime, OPT staff restored car 524 and have focused upon relocating their collection, which includes trolleys, trolley buses and buses.

In 2013 cars 520 and 526 became the last of the former Aspen cars to find a new home when they were moved to the Steam and Model Railway Club in Whangarei, New Zealand. The trams were acquired from a group in Auckland that bought them for an unrealized heritage railway project in 2003. No. 526 remained static while Whangarei members finished restoration on car 520, which included body work (there were bullet holes from its neglected years in Aspen), changing the wheel gauge from 900mm to 1067mm (3' 6" narrow gauge) and building track at the museum. Operation commenced in May 2017 with power provided by a tag-along diesel generator. Running overhead wires through the bush was not deemed feasible.



Ex Lisbon 530 began operating at the Lake Superior Railroad Museum in 2017.

Channel 21 news



Ex Lisbon 531 became the northernmost operating vintage streetcar when it joined the Whitehorse Waterfront Trolley in 1999.

Whitehorse Star

**Duluth:** In 1978 Lisbon trams 530 and 531 went to the Lake Superior Railroad Museum. The museum retained car 530 and sold the other to raise funds. Plans to install overhead wire and operate 530 from an "Old Town depot" exhibit at the museum to the western edge of their property were finally realized in June 2017.

**Whitehorse:** Meanwhile, in 1999, sister car 531 became North America's northernmost operating vintage streetcar. Historic Railway Restoration of Arlington, Washington rebuilt the car for the Waterfront Trolley in Whitehorse, Yukon Territory.

531 was powered by a tag-along diesel generator as it ran along former railroad right-of-way beside the Yukon River from 2000 until 2017. However, government funding was withdrawn in 2018. The line, managed by the MacBride Museum of Yukon History, ceased operation. With portions of the track now removed resumption of service is uncertain.





*This 2008 view of ex Porto 114 and sisters deteriorating outdoors is thought to have been taken in Memphis.*

*Peter Ehrlich Flickr*

**Memphis.** Eight Porto trams, including 156, 164, 180, 187, 194, 204, 266 and 268, joined the Memphis Area Transit Authority (MATA) heritage fleet in Tennessee during the late 1980s and early 1990s. The first four cars had been among the last lot from the Trolley Park. MATA, founded in 1983 to operate vintage streetcars in Memphis, opened its 2.5-mile Main Street route in April 29, 1993. The 4-mile Riverfront Loop was added in 1997 and the 2.2-mile Madison Avenue line in 2004.

Operation started with cars 164, 187, 194 and 204. Porto trams 156, 164 and 180 joined the operating fleet later. Double truck “smokers” cars” 266 and 268 came along in the early 1990s. The first Porto cars in Memphis were restored at the Trolley Park, whereas later additions were overhauled locally by Kerns-Wilcheck Associates. Today, seven are operable, although 266 and 268 have been left to deteriorate outside the MATA shop. Other cars have been purchased for parts



*Ex Porto 313 has been extensively rebuilt to represent a local streetcar in this 2014 view at the French Lick Resort.*

*French Lick Resort*

In 1993 GOMACO built Porto replica No. 1979 for Memphis. By 2003 the fleet also included ten W2 class cars from Melbourne, Australia restored by GOMACO. At least one of these, No. 234, came through the Trolley Park. But that is another story...

**French Lick:** Porto No. 313 was imported by Paul Class in November 1975 for the Waterfront Electric Railway (WER) in Toledo, Ohio but never brought to Glenwood. When the WER ceased operation in 1987 car 313 was acquired by the Indiana Railway Museum. The museum operated it over a section of former Southern Railway track for 15 years. Then it sat neglected until 2010. By 2014 the car had been extensively rebuilt and equipped with hydrostatic diesel power for use at the French Lick Resort. Today it runs over a one-mile line between French Lick and West Baden, IN.



*Ex Porto 167, renumbered 819, poses with Hong Kong double decker 12 at Montgomery Park during the 1990s.*

*Steve Morgan*

**The Naito cars.** During 1981 and 1982 six Portuguese trams were obtained for the proposed Old Town-Downtown Streetcar Line in Portland. A pole barn was constructed at the Trolley Park in Glenwood for their storage. Numbers reported in *The Trolley Park News* were 114, 122, 166, 178, 181 and 189. Paul Class believes that the Naito Corporation was billed for two of these. Naito family sources indicate that the four others may have been bought from Ole Lilleoren, who had intended to use them on a line adjacent to Naito's McCormick Pier apartments on N. Front Street (now Naito Parkway).

As it turned out, these cars never operated in Portland. After the Old Town-Downtown proposal was superseded by Vintage Trolley, Inc. in November 1991 Paul Class facilitated sale of the Naito fleet to interested buyers throughout the country. The last group of Naito cars is thought to have left Glenwood in 1992, after a dozen years of storage. One of these now operates in Dallas and another is awaiting restoration in San Francisco. Most of the others remain stored in poor condition. Please note that many of these details have not been confirmed.

Porto 114 is thought to be stored outside in Memphis.

Porto No. 122 was sold to the McKinney Avenue heritage trolley operation in Dallas after participating (with sister car 189) in the 1983 San Francisco Trolley Festival. Do not confuse the “M Line” service, operated by MATA (McKinney Avenue Transit Authority) with the other MATA (Memphis Area Transit Authority).





Ex Porto 122 was loaned to MUNI for the 1983 Trolley Festival.  
Doug S Richter

Porto No. 165 is reportedly deteriorating in the infamous trolley graveyard in Buckeye Lake, OH. Unfortunately its number cannot be seen for verification.



Ex Porto 181 is tucked inside the new Naito barn next to PRL&P 1067 at the Trolley Park about 1982.

Richard Thompson



Ex Porto 122 is now the McKinney Avenue Transit Authority's "Rosie" in Dallas, TX.

Dallas Arts District

The body of Porto 166 was last seen in a field in Mesquite, TX renumbered 1035. It appears to have suffered fire damage and may have been scrapped by now.



Ex Porto 189 in a posed "near miss" at the Historic Automobile Club of Oregon picnic at the Trolley Park May 23, 1982.

Richard Thompson



Ex Porto 167, renumbered 819, is seen next to TriMet LRV 121 at Ruby Junction in 1986.

Peter Ehrlich Flickr



Ex Porto 167 had been renumbered 30 by the time it arrived at the Belmont Trolley in North Carolina

Belmont Trolley



The unidentified tram is this picture at the Buckeye Lake, OH trolley graveyard may be ex Porto 165.

trainboard.com

No. 167 was sold to a group in British Columbia, which repainted it and renumbered it 30. The car became part of the Fraser Valley Historical Railway Society in Surrey, British Columbia, but it did not remain in Canada. Around 2015 it was sold to the Belmont Trolley in North Carolina.



Plans are well underway to build a car barn and operate the car along a one-mile track powered by a towed generator.

Porto car 178 is thought to have survived, but at an unknown location.

Porto 189 was purchased by the San Francisco Municipal Railway after its successful participation in the 1983 and 1984 San Francisco Trolley Festivals. It now awaits restoration as part of Muni's historic fleet.



*Ex Porto 189 at the 1983 San Francisco Trolley Festival.*

*Doug Richter*

**Exclusions:** The following cars were not included in this listing because they were not imported through GCE.

Porto 201 (renumbered 210 while still in Portugal) was not imported by GCE. It was added to the OERHS collection in 2006.

Paul Class explains that John Wilson “went around us” (i.e., Gales Creek Enterprises) in 1984 when he acquired Lisbon cars 510, 514 and 516 for his proposed Pasadena Marketplace in California. I can find no information about their present disposition.

Several Portuguese streetcars have been imported to America since closure of the Trolley Park. They include Lisbon 346, which was purchased in 1997 for the New Jersey Transportation Heritage Center in Boonton, and is now stored at an undisclosed New Jersey location, Lisbon cars 614 (location unknown), 762 and 776 (both in Colorado). They are not part of this story but are mentioned for clarification.

**Loose ends:** A half dozen Portuguese cars remain unaccounted for. These mystery cars are either stored by private owners or by companies hoping to restore them. Several may have once belonged to the Bill Naito fleet.

Porto 123 and a sister (number not yet located) have been stored since 1992 in the WWII blimp hanger that now houses the Tillamook Air Museum. Paul says the trucks from both Tillamook cars were sold to Memphis.

Although its truck was sold to Memphis years ago the body of Porto No. 183 is stored at a private home near the old Trolley Park in Glenwood.

No. 165 is thought to be deteriorating in an open field at the infamous Buckeye Lake, OH trolley “graveyard.” It is unclear as to whether this car was acquired through GCE.

As reported above Porto tram 166 is thought to have been renumbered 1035 while in a collection in Mesquite, TX. Indications are that it burned.

I have no current disposition for Porto car 198, last seen in a 1991 photo in Glenwood.

Paul Class says that Lisbon cars 436, 518 and 522 are stored in the Portland area. I can find no record of these having been part of a heritage operation.

Although I cannot confirm details at least six additional Porto streetcars (157, 160, 174, 175, 181, and 188) are thought to have been stored in Memphis. It is unclear whether they were acquired through GCE.



*Ex Lisbon 518, 522 and 436 stored in a Portland warehouse.*

*123 Group*

## Technical Details

Lisbon cars are 900 mm European narrow gauge (2'11-7/16"). Porto cars are 1435 mm (4' 8 1/2" standard gauge). All cars but Porto 266 and 268 are single truck (four wheels). All are closed except for Lisbon No. 247.

### Lisbon cars –

203-282 “Carros Americanos” were ordered from J. G. Brill in Philadelphia in 1899 and introduced in 1901. These were single truck eight bench open cars with seating for 32 passengers. They were 26 feet long, 7 1/2 feet wide and weighed 8 1/2 tons. They were retired between 1932 and 1937 although some of their fleet numbers were reused. 203-282 and 415, 455, 467, 468, 483 were built in 1935 to replace the 1900 Brill cars with the same numbers. They were similar in appearance to the 508-531 class built during the 1920s. Do not confuse Lisbon No. 247 with Porto car 247, which is in the Carris tram museum.

400-474 “St. Louis” were single truck cars with 24 seats and clerestory roofs, ordered from the St. Louis Car Co. in 1899 for the hillier routes of Lisbon and introduced in 1900-01. They had two General Electric 25 hp motors and Dick Kerr controllers from Preston in the U.K. They weighed 11 tons and measured 26 1/2 feet by 7.4 feet. Number 444 survives in the Carris museum in Lisbon. Cars 435 and 437 became Lisbon tourist trams No. 1 and 2. The rest of the class were slowly withdrawn between 1935 and 1963. Four of these, cars 405, 469, 412, and 427, became part of the Detroit Citizen's Railway in 1975. They were renumbered 1, 2, 3 and 6. Two



other cars, renumbered 4 and 5 were part of the series below dating from 1925.

508-531 were semi-convertibles based on the earlier St. Louis class built by CCFL during 1924-25. Some survived in service until 1980. Cars 517 and 523 went to the Detroit Citizen's Railway in 1975.

### Porto cars -

112-114 were 23 passenger cars with a mix of longitudinal and transverse seats. Although sometimes called Brills they were not actually built by that company but were of a similar type.

120-146 "Brills" were semi-convertibles ordered during 1909-10. They were 23 passenger single truckers with windows that slid into barrel-shaped roofs.

150-199 were 28 passenger cars. The first were ordered from Brill in 1912. Cars 164 and 187 were built in 1927, and 194 in 1935. Similar to 120-146, these cars were nearly 8 feet wide as opposed to the earlier 7.2 feet width. The original batch had 2+2 transverse seating. Later models built by CCFP from the mid-1920s until 1938 were 30 ½ feet long and weighed nearly 13 tons.

200-223 were large platform 28 passenger cars built to Brill specifications by CCFP from 1938 until 1945. The extended platforms on these cars made them 32 ½ feet long. Cars 201 and 204 were built in 1940. Cars 267 and 269 are now preserved in the Porto tram museum.

250-261 "Italianos" were eight-window semi-convertibles built by STCP during 1928-29. These cars were 32.3 feet in length and weigh 13 tons. They were known as "Italians" because their Brill trucks were equipped with Italian motors.

266-269 "Fumistas" were double truck convertibles built in 1930 with domed roofs and removable side windows. They originally seated 40 in 2+2 transverse seating, but this was later changed to 31 seats in a 2+1 set up. Length was 38.4 feet and width 8 feet. Weight was 17.3 tons. They are nicknamed "Fumistas" (smokers' cars) because they were designed to run without windows in summer.

300-315 "Fumistas" were single truck smokers' cars similar to 266-69 but with smaller eight window bodies and 28 seats. Length was 31.4 feet and weight nearly 13 tons.



Porto 266, Melbourne 234 and Porto 198 sit amidst tarped Porto trams at the Trolley Park in June 1991.

Richard Thompson



Ex Porto 164 on the Main Street Line in Memphis, TN.

Canadian Public Transit Discussion Board



Ex Porto 166, renumbered 1035, shows fire damage as it rests on rubber tires in Mesquite, TX.



Ex Porto 187 has been equipped with a pantograph for service on the MATA system in Memphis, TN.

Canadian Public Transit Discussion Board





Ex Porto 194 on the Main Street Line in Memphis, TN.  
Canadian Public Transit Discussion Board



During its tenure with the Indiana Railway Museum ex Porto 313 was lettered for the Springs Valley Electric Railway.



Ex Porto 204 in Memphis, TN.  
Canadian Public Transit Discussion Board



GOMACO restored Ex Lisbon 519 for the Issaquah Valley Trolley it is seen at the Issaquah depot with its tag along power supply in 2014.  
Issaquah Valley Trolley



266 and 268, the only double truck ex Porto cars sent to Memphis, have been left to the elements outside the MATA shops.



Ex Lisbon 520, the last of the former Aspen Street Railway Fleet to find a home, now operates at the Whangarei museum in New Zealand.  
123 Group/Kiwi North





Ex Lisbon 521 awaits restoration at GOMACO's Iowa facility. Issaquah traded the car in return for the restoring of No. 519.

GOMACO



Ex Lisbon 524 has been restored in Old Pueblo Trolley's new car barn in Tucson

YouTube



Ex Lisbon 526 awaits restoration at the Whangarei, NZ museum.

### Disposition of Portuguese Trams Imported by Gales Creek Enterprises 1974-1993

Lisbon Trams		Porto Trams	
247	Detroit, now stored	114	Naito, Stored in Memphis
405	Detroit, missing	122	Naito, Dallas, M Line
412	Detroit, missing	123	Body stored in Tillamook
418	Aspen, rotting in dump	138	Missing
427	Detroit, missing	156	Memphis, MATA
436	Stored in Portland, OR	157	Stored in Memphis
457	Detroit parts car, missing	160	Probably to Memphis,
469	Detroit, missing	164	Memphis, MATA
517	Detroit, missing	165	In Buckeye Lake, OH
518	Stored in Portland, OR	166	Mesquite, TX, body only
519	Aspen, now Issaquah	167	Now Belmont Trolley, NC
520	Aspen, now Whangarei	174	Probably to Memphis
521	Aspen, now GOMACO, IA	175	Probably to Memphis
522	Stored in Portland, OR	178	Naito, missing
523	Detroit, missing	180	Memphis, MATA
524	Aspen, now Tucson	181	Stored in Tillamook?
526	Aspen, now Whangarei	183	Glenwood, body only
529	Detroit parts car, missing	187	Memphis, MATA
530	Duluth now Whitehorse	188	Probably to Memphis
531	Duluth Railroad Museum	189	Naito, MUNI
		194	Memphis, MATA
		198	Glenwood 1991, missing
		204	Memphis, MATA
		254	Yakima, YVT
		260	Yakima, YVT
		266	Memphis, rotting
		268	Memphis, rotting
		313	WER, IRM, now French Lick, IN

#### Legend (car originally imported for):

<span style="color: blue;">■</span>	Aspen Street Railway
<span style="color: red;">■</span>	Detroit Citizen's Railway
<span style="color: orange;">■</span>	Memphis Area Transit Authority (MATA)
<span style="color: green;">■</span>	Old Town-Downtown Streetcar (Naito)
<span style="color: purple;">■</span>	Yakima Valley Trolley



## Willamette Shore Trolley Update

The Battery Project at Willamette Shore Trolley on Vintage Trolley 514 is slowly progressing. Vintage Trolley Inc. has been receiving generous donations from various organizations in our area. The largest donation of \$100,000.00 came from Bill Naito Corp. Bill Naito was the driving force to get all four Vintage Trolleys to Portland in the 1990's.

EVDive.com, located in Hillsboro, OR, has been providing much of the project's design expertise along with Kevin Reilly who has experience from Bay Area Rapid Transit. The software and control system were designed by EVDive. There are four brushless AC drive motors and five inverters which were manufactured at Cascadia Motion in Wilsonville, OR. The custom-made display was manufactured in Lake Oswego, OR.

The 800-volt 87 kWh battery consists of 6912 Lithium-Ion 3.6-volt cells made by Samsung. EVDive packages the cells into manageable size modules with 432 cells in each and a total of 16 modules that are assembled into the main pack housing. This housing, which replaces the original power resistor box which was previously used to control the motor torque in a very inefficient way. The new motors and their respective drive Inverters are significantly more efficient using the latest technology which also has the benefit of slowing/stopping the rail car with regenerative braking that puts power back into the battery pack.

Kevin Reilly and Dave Rowe have been designing as they go for the mounting and wiring to all components. We hope to have Trolley 514 tested and running by the first of 2021.

*All pictures Dave Rowe. CAD illustrations Bob Simpson.*



*This is a wood mock-up of the battery case that will be installed where the old DC resistor rack used to be.*



*View from the intake side of the radiator shroud. The left side has the screen removed to show the fan. The right side has the screen installed. This screen mesh has proven best to keep cottonwood seeds from the radiator. In the right corner is a coolant pump is one of three.*



*The two radiator mounts front and back still under design. When finished they will be painted with a powder coat. The two radiators will cool four AC motors, five inverters and the battery charger. View of the exhaust side of one installed radiator and the fan without the second radiator.*



*This is the receptacle for charging power into the trolley that will be mounted on the trolley anti-climb bumper. It is an industry-standard SAE J1772 connector, the same type used on domestic Electric Vehicles for a Level 2 charge. It accepts 120 to 240VAC single-phase at up to 75A although is more typically 30A to 50A (7.5kW to 10kW).*





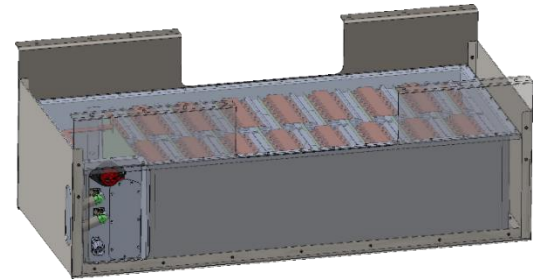
At the corner of the battery will be access to the main fuse and disconnect switch. The disconnect switch will have linkage rods to each side of trolley to be used by first responders if ever needed. Bob Simpson is pictured with a COVID-19 mask.



The motorman's display. It is mounted at eye level and is a touch screen similar to a cell phone screen. It will display speed, controller notch, battery health and other information.



The mock-up battery was raised in place by a lift table.



Conceptual illustration of the 87 KWH Lithium-Ion battery pack for Trolley 514. Sixteen modules will hold 6912 battery cells.



The 11kW battery charger that will be installed on the trolley. The trolley will be charged overnight from a 40 amp 208 three phase wall plug.

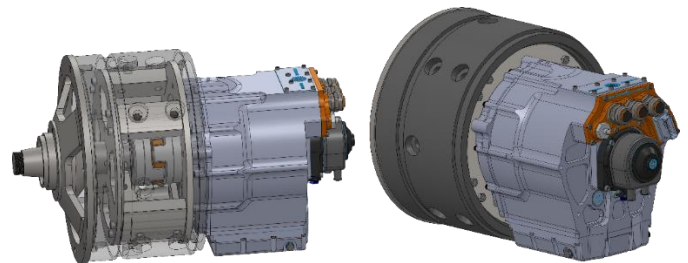


Illustration of the brushless AC drive motors that will drive the wheels. Four of these will be installed, one on each wheel.



## DONATION REQUEST (Tax deductible receipt will be mailed to you)

*Remember the OERHS in your Will or Trust. Even a small bequest can help the museum grow!*

### Did You Know?

Members 70.5 years and older can make tax free donations to the OERHS from their 401(k) that count towards the mandatory percentage 2.5% that they need to take out of their IRA anyway. Consider making a donation today!

### Donation Opportunities

	<u>Items</u>	<u>Description</u>	<u>Amount</u>
<b>Endowment Fund</b>	Endowment Fund	<i>Helps create an endowment fund to support operations, staff (future) and general projects</i>	\$_____
<b>Board Fund</b>	Unrestricted Funds	<i>Allows Board to allocate funds as needed (Projects, events, car acquisition, etc.)</i>	\$_____
<b>Capital Projects</b>	Carbarn #2	<i>Build the 2<sup>nd</sup> carbarn (will also be the temporary restoration shop) – (~\$450k)</i>	\$_____
	Mainline Loop	<i>Complete the mainline loop to run multiple cars at a time and operate cars that are single-ended. Adding less than 2000 additional feet will complete the loop. (~\$45k)</i>	\$_____
	Interpretive Center	<i>Flooring, archives, displays, and exterior landscaping (sidewalks, platforms, etc.)</i>	\$_____
	Buy A Tie	<i>\$55 buys us a new fir tie to replace worn out ones (we need about 2000 of them so every single tie is a great help)</i>	\$_____
	Buy Concrete	<i>~\$120/yd<sup>3</sup> for track, curbs, platforms, etc.</i>	\$_____
<b>Restoration Projects</b>	PRL&P #1067	<i>Help refurbish the running gear we obtained the NWRM to restore this car</i>	\$_____
	Car Restoration	<i>All our cars need love &amp; care and many are awaiting restoration. Donate to the car fund or specify a car. Some of the projects underway are: 813 (Broadway car), 1159 (PCC), 1455 (snowsweeper) &amp; locos 254 &amp; 401</i>	\$_____ Car:_____
<b>Specific Items:</b> <i>(Donate items or \$)</i>	Uniform Parts	<i>Hats, pants, vests &amp; jackets for volunteers</i>	\$_____
<b>Name Your Project</b>		<i>Do you have an idea you would like to see done? Tell us about it!</i>	\$_____
<b>TOTAL</b>			\$_____

**To: OERHS, 3995 Brooklake Rd, Brooks, Oregon 97303**

Name \_\_\_\_\_ Date \_\_\_\_\_ Cash \$\_\_\_\_\_ Check \$\_\_\_\_\_

Credit Card: \$\_\_\_\_\_ Visa ☐ MasterCard ☐ American Express ☐ Discover ☐

Card # \_\_\_\_\_ Sec Code \_\_\_\_\_ Expires \_\_\_\_\_ Signature \_\_\_\_\_

**THANK YOU!**