July–December 1999 • $10.00 / A Tale of Two Cities: Portland and Boston • Japan's Fascinating Shonan Monorail

HEADLIGHTS

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COLUMNS

FEATURES

ON THE COVER

Shonan Monorail, Japan. The 4.1 mile Shonan Monorail was designed by Mitsubishi to travel over as many different alignments as possible to demonstrate the versatility of monorails. Here a train emerges from a small hill through one of the line's two tunnels. **BRUCE RUSSELL**

Portland's MAX. (below) A Westside MAX train speeds towards Hillsboro. **FRANK S. MIKLOS**

FRANK S. MIKLOS

Above, Car 108 pauses at the Ledbetter Drive terminal of Dallas's Blue Line during the 1998 ERA convention. Car 117 waits on the adjacent track for a scheduled trip to Pearl Street.

Right, the Dallas skyline provides the backdrop for trains in the vicinity of the Morrell stop on the Blue Line.

DALLAS

DART, which began light rail operations in June 1996, is now designing **extensions to the North Central and Northeast lines** that will add 23.5 miles to the system. The North Central line is to be extended to Richardson by 2002 and to Plano by 2003. The Northeast line is to be extended to central Garland by 2002.

DART has also started studies for possible rail operation—electric light rail, diesel locomotive hauled or self-propelled—in several other corridors. One is the Northwest corridor using Union Pacific rails between Dallas and Carrollton, and Burlington Northern rail between South Irving and Carrollton. Another is the Southeast corridor. Both studies should be completed by the end of 1999.

If rail is chosen, DART could have about **92 miles of rail service by 2007**.

DART has received the first of **55 additional cars** which were ordered for the new line extensions. About 10 of the cars were accepted and in revenue service by the end of September. Pre-service testing includes non-revenue operation individually and in trains with older equipment (the new cars look identical to the original order). The delivery of the new cars allows all trains on the Blue Line to be returned to two cars.

A record-breaking heat wave during the summer of 1998 may have wilted riders' spirits, but DART breezed on. The cars' overbuilt air-conditioning equipment was able to cope with week after week of 100°+ temperatures.

Effective with a **September 27, 1999 schedule change**, weekday service on the Blue Line now operates to the Mockingbird Station until 7 pm. This extension is logical since the Blue Line will diverge from the existing route at that station when the first expansion opens in 2001.

All trains on the Red Line now operate in both directions on the inbound track in the tunnel after 8 pm to facilitate the construction of the City Place station. The outbound track is required for the delivery of construction materials by the contractor using high-rail trucks. The portion of the line between Mockingbird and Park Lane stations will also see single track operation to permit the installation of signals which were not included in the original construction to save costs.

Elsewhere in Dallas, **service on the McKinney Avenue trolley has been curtailed** to permit the reconstruction of the roadway, a project that is expected to take two years to complete. Gone will be the original brick paving and tracks which date back to earlier streetcar days.

McKinney Avenue has been made one-way northbound from Pearl to Allen with traffic shifted to the southbound side of the street. Trolleys now operate from 5 pm to 10 pm on week nights and from 10 am to 10 pm on weekends with periodic interruptions as required such as during September 1999 when all service was suspended.

FRANK S. MIKLOS

STEVEN C. SIEGERIST

Above, the McKinney Avenue Transit Authority's ex-Melbourne tram negotiates the single track section of line during track reconstruction. Spring-loaded gates are provided to deter motorists from driving onto the tracks where trolleys are operating against the temporary one-way traffic flow.

Right, close-up view of temporary switches installed on McKinney Avenue to permit trolleys to operate around the track reconstruction project.

STEVEN C. SIEGERIST

Service runs from downtown to Bowen Street near the car barn. At Bowen, poles are changed and the car operates back down McKinney through the construction zone on the same track almost to Pearl where a crossover allows access to the normal inbound track. This is a temporary crossover which is bolted on top of the concrete street. When operating in the construction zone, the trolleys pass through a series of hinged gates that swing out of the way as they proceed. Rubber bumpers allow the gates to bounce down the sides of the moving trolleys, after which they swing back into position to keep automobiles off the streetcar tracks.

Actual construction of the extensions of the McKinney Avenue trolley service to the City Place station on the north end and the West End Historical District on the south end has yet to begin. New development in the area where the streetcar will run on the north end is underway and streetcar track construction in that area will probably start shortly after the end of the year. The West End extension has been delayed pending a resolution of issues concerning the franchise and an agreement with the telephone company to relocate vaults that are in the path of the trolley extension.

STEVEN D. SIEGERIST

MINNEAPOLIS-ST. PAUL

In April 1998, the Minnesota legislature approved $40 million to build a **12-mile light rail line between Minneapolis and its airport**. The line would also serve the Mall of America (a mega-mall tourist attraction). State, city and area agencies are now studying ways to come up with details of design and route to obtain Federal Transit Administration approval for $120 million of taxpayer funds. The hope is to begin construction by the fall of 1999 and to complete the line by 2003.

PASSENGER TRANSPORT

SACRAMENTO

The Sacramento Regional Transit District has engaged Parsons Brinckerhoff to make final designs for the six-mile at-grade **South Sacramento extension to the existing LRT line**. The extension will be on the right of way and alongside the tracks of the Union Pacific (formerly Western Pacific) railroad. There will be six new stations. Service is planned for 2003.

PASSENGER TRANSPORT

ST. LOUIS

Bi-State Development Agency's **Metro Link light rail started operation on July 31, 1993**, between East St. Louis and Lambert Airport over unused railroad rights-of-way, a downtown tunnel and a Mississippi River bridge deck. It has been so popular that a 17.4-mile extension east from East St. Louis to the Belleville Area College is now under construction, using 13.5 miles of abandoned railroad right-of-way. It is scheduled to start operation in 2001. Planning is now under way for a cross-county line in Missouri from the Forest Park station through Clayton to Interstate 44.

PASSENGER TRANSPORT

VANCOUVER

The British Columbia provincial government signed a memorandum of understanding on June 24, 1998, with Bombardier Transportation for **construction of a 13-mile Sky Train automated rail transit line**. The new line will leave the existing line at Broadway in Vancouver. It will head east along Broadway and Lougheed Highway to Coquitlam and then south and west to join the existing line at Columbia in New Westminster.

The agreement is valued at $300 million and will include 80 cars, train control and communications systems, power supply and distribution, track work, power rail, engineering and testing. Completion is planned for 2001.

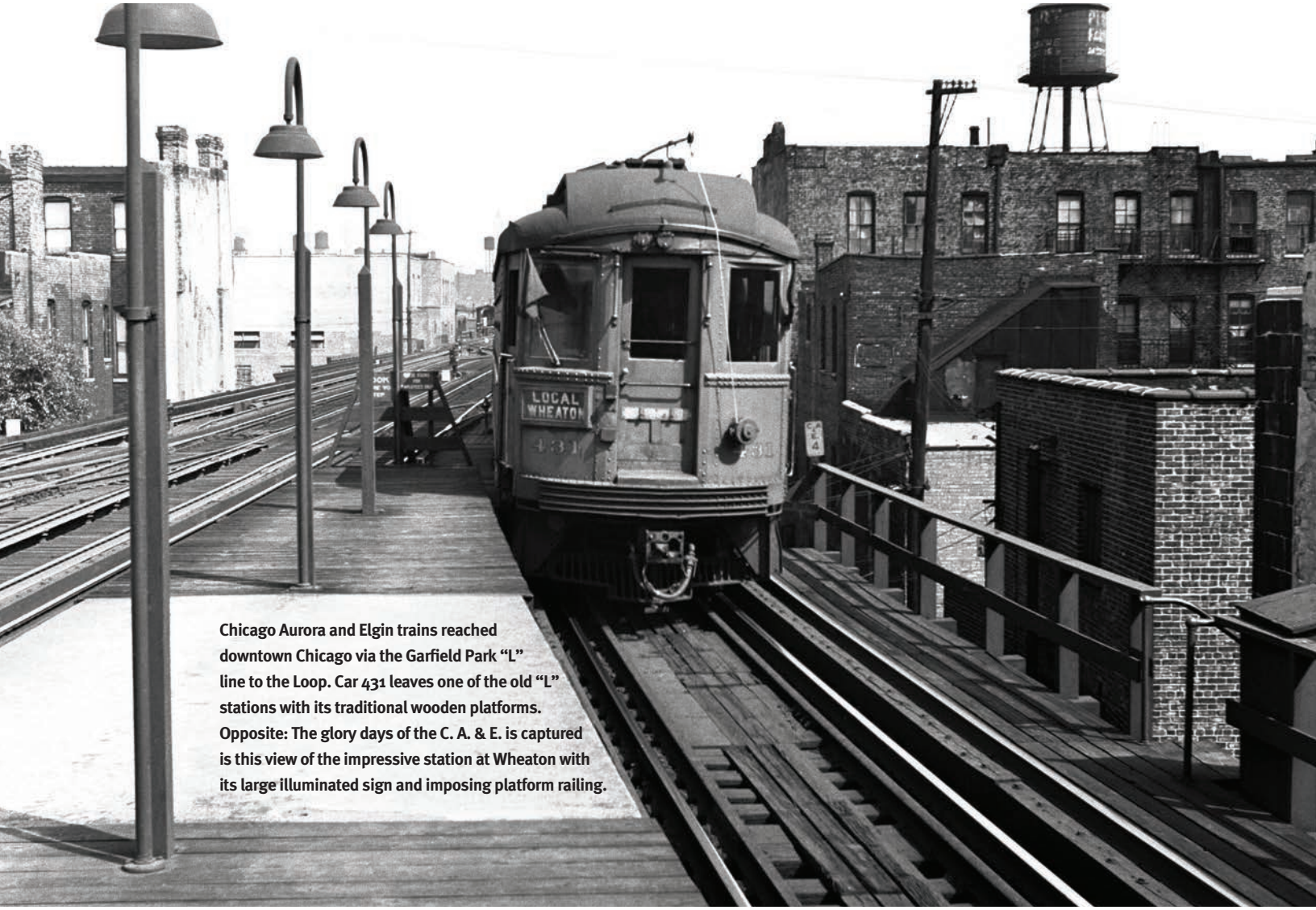
Bombardier is also to promote the Sky Train system worldwide. Sky Train is a driverless, medium- to high-capacity line haul rapid transit system.

PASSENGER TRANSPORT

NEWS COMPILED BY PETER KOCAN

Car 122 pauses at the entrance to the McKinney Avenue carbarn. The single-truck deck-roof car was originally built for the transit system in Porto, Portugal, and was used in the San Francisco trolley festival before being acquired for service in Dallas.

FRANK S. MIKLOS



Chicago Aurora and Elgin trains reached downtown Chicago via the Garfield Park "L" line to the Loop. Car 431 leaves one of the old "L" stations with its traditional wooden platforms. Opposite: The glory days of the C. A. & E. is captured is this view of the impressive station at Wheaton with its large illuminated sign and imposing platform railing.

CHICAGO TRANSIT: AN ILLUSTRATED HISTORY

by David M. Young, 1998
Northern Illinois University Press
DeKalb, Illinois 60115
8½" x 11" hardcover, 213 pp.
$35 plus $4.50 shipping

Chicago and the region around it have long symbolized the American Middle West. *Chicago Transit: An Illustrated History* attempts to describe and analyze the evolution of transportation modes in "Chicagoland" [a term used by local residents to describe Chicago and its environs from its earliest days to the present]. The author is a writer and editor for the *Chicago Tribune* and in many ways the book reflects his professional background.

Chicago Transit is organized topically and it is divided into two parts. Part One, the 19th Century, has seven chapters:
(1) early Chicago;
(2) new mechanical technologies;
(3) railroads;
(4) street railways;
(5) consolidation of traction and elevated companies;
(6) the "L"; and
(7) suburban transit.

Part Two, the 20th Century, contains another eight chapters:
(1) city and state efforts at regulations;
(2) further consolidation and the failure of private enterprise;
(3) the push for public ownership of the city's transit companies;
(4) buses and diesel locomotives;
(5) the increasingly troubled course of the Chicago Transit Authority;

(6) the beginnings of subsidies and the Regional Transit Authority;
(7) the interurbans and commuter railroads; and
(8) the automobile and urban sprawl. A short epilogue follows.

Young has set his sights high in trying to write a comprehensive account of Chicago's regional transit mix over a apan of about 150 years and he has generally succeeded. He writes clearly and with a smooth style. His research is impressive; there are over 700 footnotes and an extensive bibliography. There are several maps and a number of photographs sharply and clearly reproduced. Layout and design are attractive and professionally done, and the book is crammed with information and fascinating details.

However, *Chicago Transit* is not easily read, despite the author's skilled pen. The topical chapters overlap each other, and Young often carries the story in one chapter up to the present, only to begin the next chapter a century earlier. The massive amount of statistics can sometimes be overwhelming. Perhaps the focus is too wide; the book is really a study of urban growth and development, with a concentration of the problems which occur when increasing numbers of people try to move from one spot to another, and use varying means to do so. The book seems, in a way, to be a collection of detailed reports, such as might appear in a series of lengthy newspaper articles.

Despite my reservations, I recommend *Chicago Transit* because of its detailed text, its comprehensive nature, and its thorough research. Serious students of transportation should certainly buy it, as should public and academic libraries, for no other single volume presents such a broad, and detailed look at the transit evolution in Chicago.

PCC 416 on the Roxbury-Coopersdale Route on Coopersdale Loop at Cooper Ave., near the city limits. Inset, PCC 414 on the Ferndale-Morrellville Route on Strayer Street at Chandler Ave. in Morrellville.
BOTH IMAGES BY JOHN STERN (SPRAGUE LIBRARY COLLECTION)

PENNSYLVANIA TROLLEYS IN COLOR, VOLUME III: THE PITTSBURGH REGION

by William D. Volkmer, 1999
Morning Sun Books
9 Pheasant Lane, Scotch Plains, New Jersey 07076
8½" x 11" hardcover, 128 pp.
$55 plus $3.50 shipping

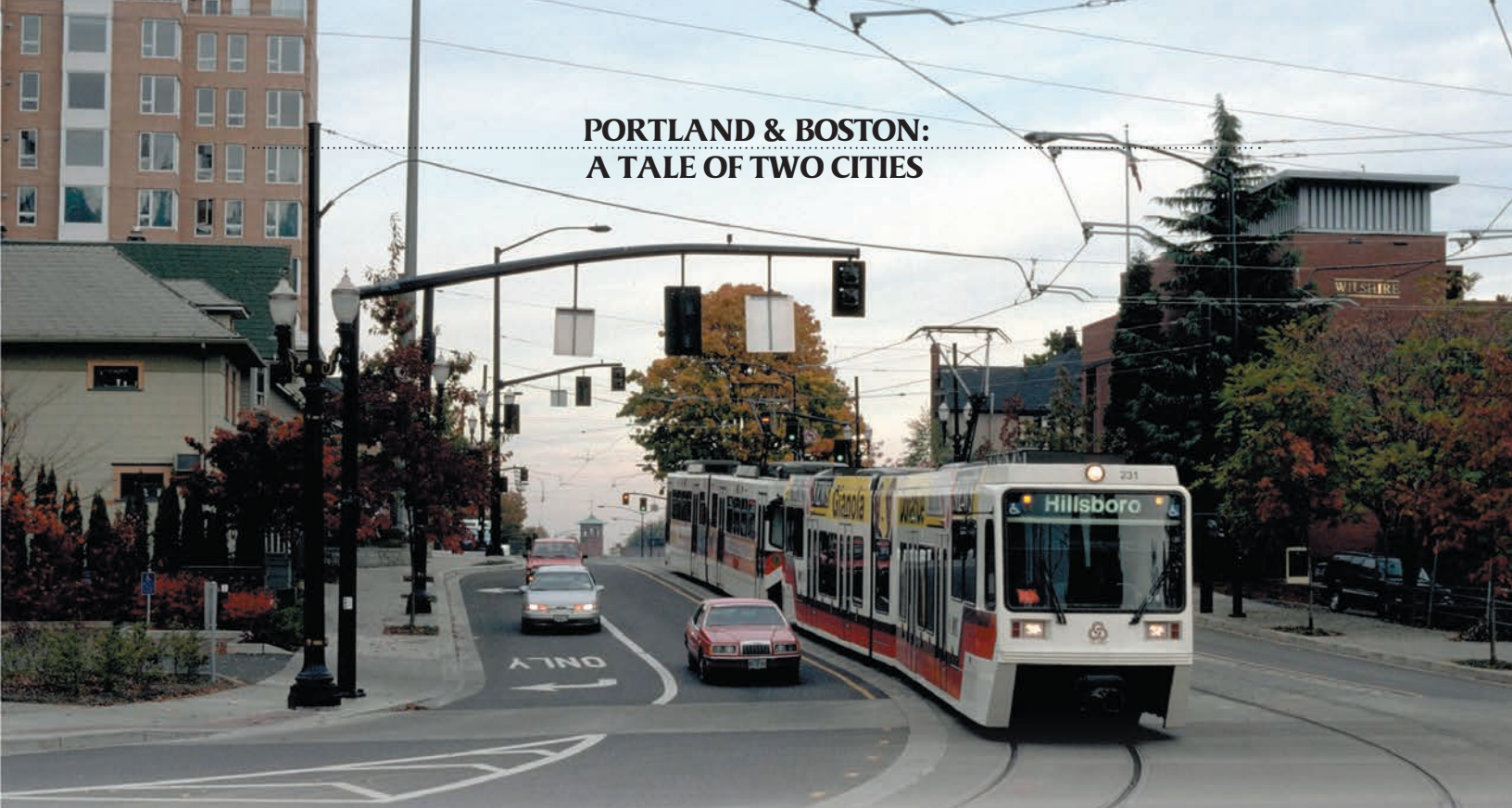
This is the final volume in the trilogy on Pennsylvania trolleys by William Volkmer. It covers the West Penn Railways, the Johnstown Traction Company and the Pittsburgh Railways.

The format is the usual one for books from Morning Sun Books. A brief page of text introduces each section, followed by the photographs, generally two on each page. Maps are provided for the West Penn and Johnstown systems, but not for Pittsburgh. Fewer than a fourth of the pages are devoted to the West Penn and Johnstown, while the Pittsburgh section has over 50 pages. The bulk of the photographs are from the lenses or collections of the author (143), Edward S. Miller (59), James P. Schuman (34), and Eugene Van Dusen (18). A good number were taken on fan trips or other special occasions. The scenes are interesting and reproduction is excellent. As I am is not an expert on western Pennsylvania, I cannot comment on the accuracy of the captions, but judging from the names listed in the acknowledgments section, and from the preponderance of shots by the author, it should be high.

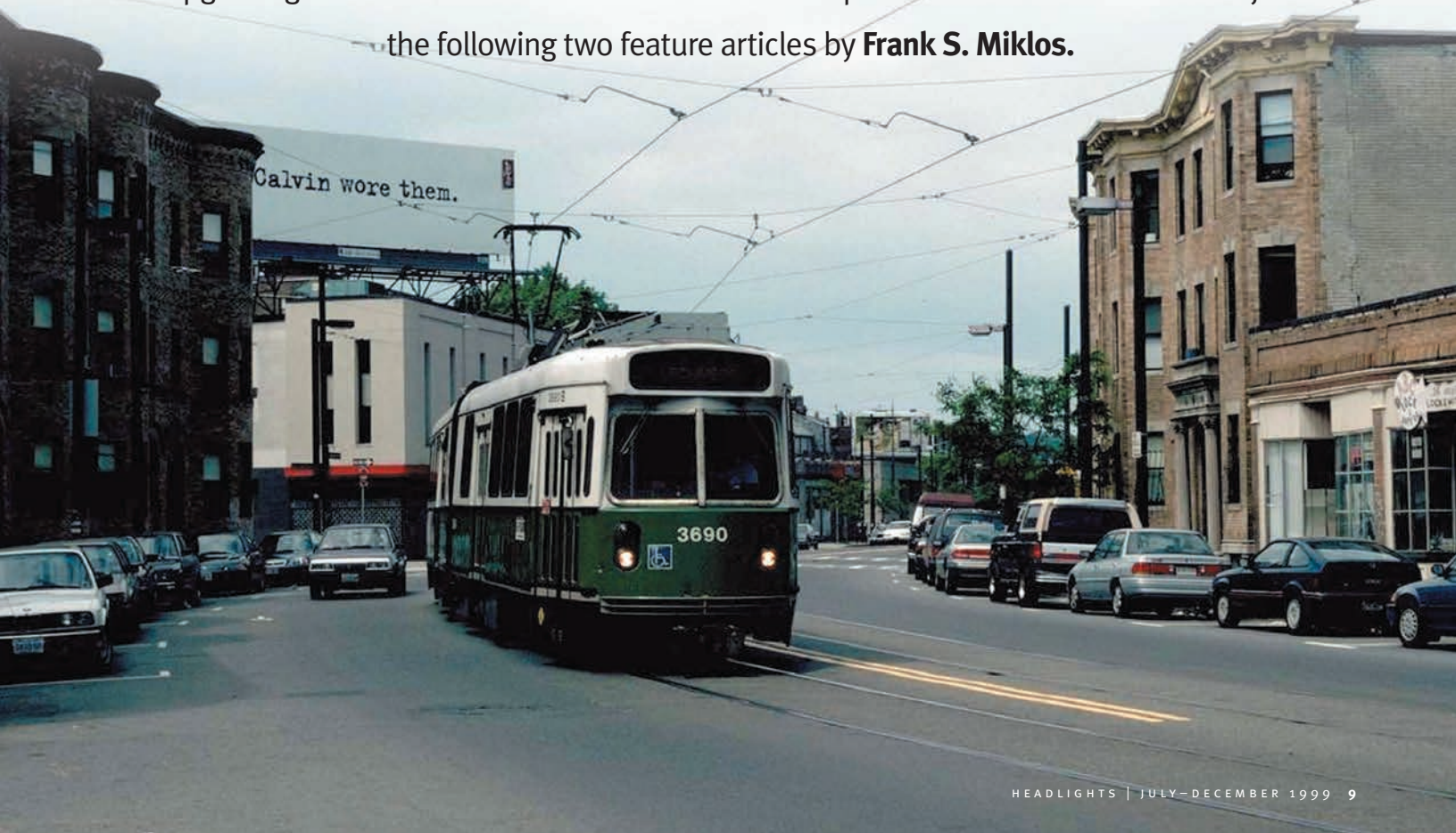
Overall, *The Pittsburgh Region* captures the essence of the trolley systems of about a half-century ago in this part of Pennsylvania. Certainly everyone who has the first two volumes will want to complete the set, but anyone who would like to see how people got about in the days when trolleys were common will enjoy this book.

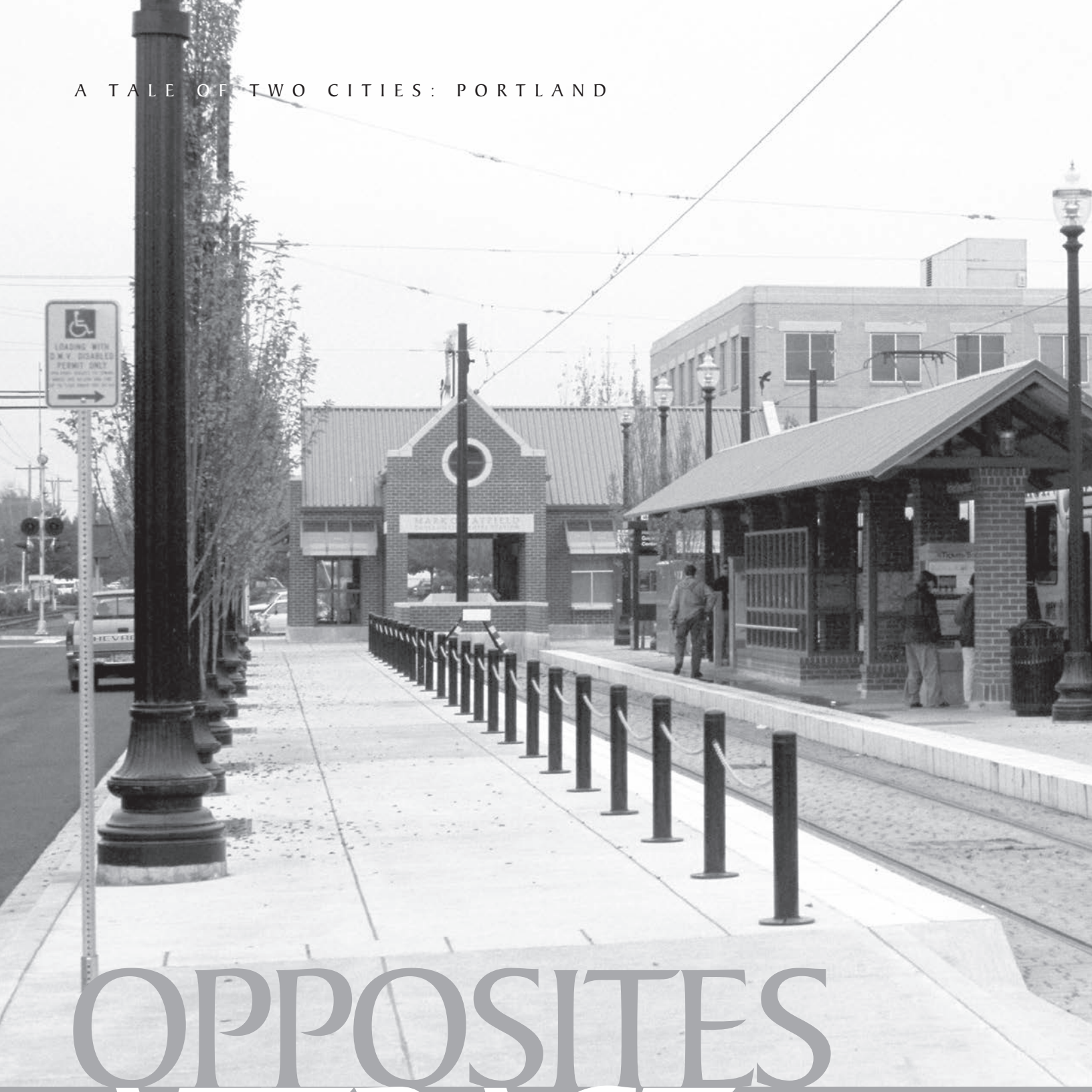
BOOK REVIEWS BY JAMES N. J. HENWOOD

PORTLAND & BOSTON: A TALE OF TWO CITIES



Portland, Oregon and Boston, Massachusetts are on opposite sides of the North American continent and their approaches to solving their urban transit needs are equally divergent. Since the 1980s PORTLAND has built a major light rail transit line and is adding many more miles of rail transit service. During the same period BOSTON has focused its attention on upgrading its bus service. A review of transit development in these cities is the subject of the following two feature articles by **Frank S. Miklos.**





OPPOSITES ATTRACT

PORTLAND CONTINUES TO EXPAND ITS AMBITIOUS LIGHT RAIL SYSTEM BY FRANK S. MIKLOS

Terminal Beauty. Low floor car 224 lays over at the attractive terminal of Portland's West Side line at the Hatfield Government Center station in Hillsboro. **FRANK S. MIKLOS**

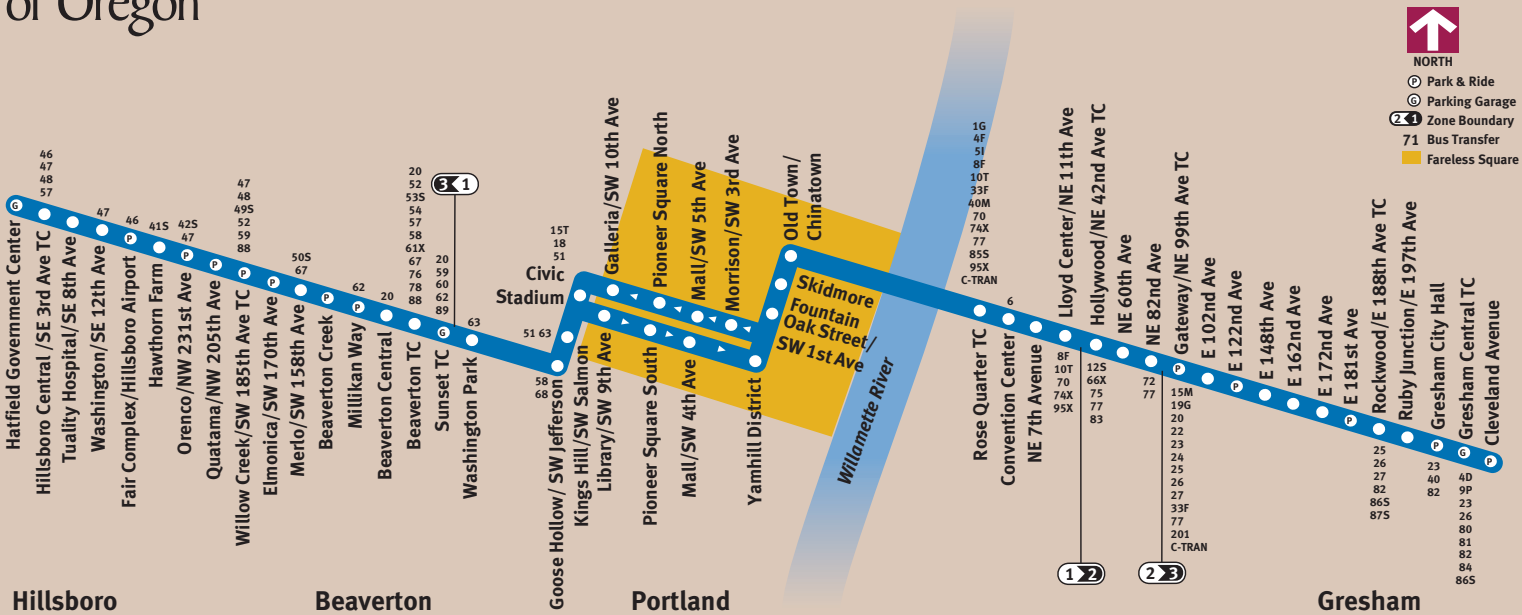
MAX, a 33-mile light rail system, runs east and west from Portland and connects the communities of Gresham, Beaverton and Hillsboro. The system was built in two segments. Eastside MAX, opened in 1986, stretches 15 miles eastward to Gresham; Westside MAX, opened in September 1998, runs 18 miles west to Hillsboro.

MAX is part of an integrated regional transit system that also includes 102 bus routes in the urbanized portion of the three counties in the Portland metro area. Eighty-eight bus lines connect with MAX at various light rail stations. Combined, Tri-Met monthly ridership has grown seven straight years (as of Dec. 1999), providing more than 1.5 million rides weekly. MAX carries about 25% of Tri-Met's total ridership.

MAX

TRI-MET

Tri-County Metropolitan Transportation District of Oregon



TRI-MET

FRANK S. MIKLOS

Deepest Station. (above) Passengers board a light rail train at the inbound platform of the Washington Park Station. At a depth of 260' below the surface, this is the deepest rail transit station in North America.

TRI-MET

TRI-MET

Airport MAX Extension. Inset above is a rendering of the Parkrose-Sumner Station, one of five stations along the MAX extension to Portland International Airport (PDX). The upper map at left shows the full 5.5-mile route, which will open in the fall of 2001.

Interstate MAX Extension. The lower map at left shows Interstate MAX, a proposed 5.8-mile segment now awaiting federal funding. It will connect the Expo Center in North Portland with downtown.

Future Connections

A new 5.5-mile Airport MAX extension developed through an innovative public/private venture involving the Port of Portland, Tri-Met, the City of Portland, Portland Development Commission and Bechtel Enterprises will begin service in fall 2001. Because of this private/public venture, Airport MAX requires no additional property tax dollars, state general funds or federal appropriations. The extension will link Portland International Airport to the existing regional light rail system. Additionally, Interstate MAX, a proposed 5.8-mile segment now awaiting federal funding, would connect the Expo Center in North Portland with downtown.

Westside MAX

On September 12, 1998 Portland, Oregon extended its MAX light rail line to Hillsboro. The new Westside service is through-routed with the original Eastside line to Gresham. A ride from one terminal to the other now takes just under 1½ hours and covers a distance of 33 miles. MAX service now operates every 10 minutes during the day with more frequent service during the rush hours. Evening service operates every 15 minutes.

Westside light rail trains operate in street paving between the original downtown terminal and the Goose Hol-

FRANK S. MIKLOS

Separated at Birth? Two cars pause for passengers at the Goose Hollow station. The topography in this area bears a strong resemblance to the suburbs of Pittsburgh, even to the concrete arch bridge spanning the ravine in the background.

low station. They then run through a three-mile long tunnel under the West Hills. Consisting of twin tubes (one for each direction), the tunnel includes a station at Washington Park, home of the Portland Zoo. Located 260′ below ground, Washington Park is the deepest transit station in North America. Elevators provide access to the surface. This is also the longest light rail tunnel in the world, overshadowing the Twin Peaks tunnel in San Francisco which previously held that title.

Emerging from the tunnel, the line parallels an expressway as far as the Sunset Transit center where a large commuter parking garage is located. Several bus routes also serve this station. A long curving underpass takes the line under the expressway to connect with a surface reservation leading to the Beaverton Transit Center where 11 bus routes provide connecting service.

Between Beaverton and the Washington/SE 12th Avenue station in Hillsboro the line operates on the right-of-way of the old Oregon Electric interurban line. It then operates down the middle of Washington Street to the Hatfield Government Center terminal in Hillsboro.

A fleet of 52 low-floor cars was obtained for the new service. Although widely used on European light rail systems, this is the first use of such a vehicle in North America. The low floor design allows passengers to board without climbing steps. Ramps are extended for passengers in wheelchairs. Every train has at least one low floor car, thereby allowing the retirement of the wayside wheelchair lifts at stations on the eastside line. The original fleet of high-floor cars has been rehabilitated for use in conjunction with the low-floor fleet. All light rail vehicles are now air conditioned.

Perhaps spurred on by the opening of the new Westside line, a proposition was placed before the voters for a new light rail line that would run north and south. Despite a strong media push for the approval of this new rail link, the proposition was defeated in the November 1998 elections. Opponents waged a strong drive against the measure arguing among other things that the Westside line did not attract any new transit riders. They maintained that the passengers were former bus riders who merely changed their mode of transportation. Coupled with the usual "NIMBYs" who oppose any type of new construction, and the citizens who

Located 260′ below ground, Washington Park is the deepest transit station in North America.

regard any public expenditures as pork barrel raids on the taxpayers, the measure failed to gain approval.

Airport MAX

Despite this setback work has started on a branch of the MAX Eastside line to the Portland International Airport. This line will diverge from the line at the Gateway Transit Center and operate in the median of Highway I-205 to the airport where it will terminate next to the south baggage claim area. Costing $125 million, the 5½ mile line is being built as a public/private venture with Bechtel Enterprises Inc. and will not require any new tax dollars. Bechtel plans to develop 120 acres of commercial real estate at the entrance to the airport. Travel time from downtown Portland to the airport will take about 37 minutes. In addition to the airport terminal there will be three other stations on the line: Parkrose/Summer, Cascade Station East, and Cascade Station West. Bechtel plans to construct hotels, retail facilities, entertainment centers and offices on the land adjacent to the Cascade stations. This is the first light rail design/build contract for Tri-Met and another example of how Portland combines transit and land use development to create livable communities.

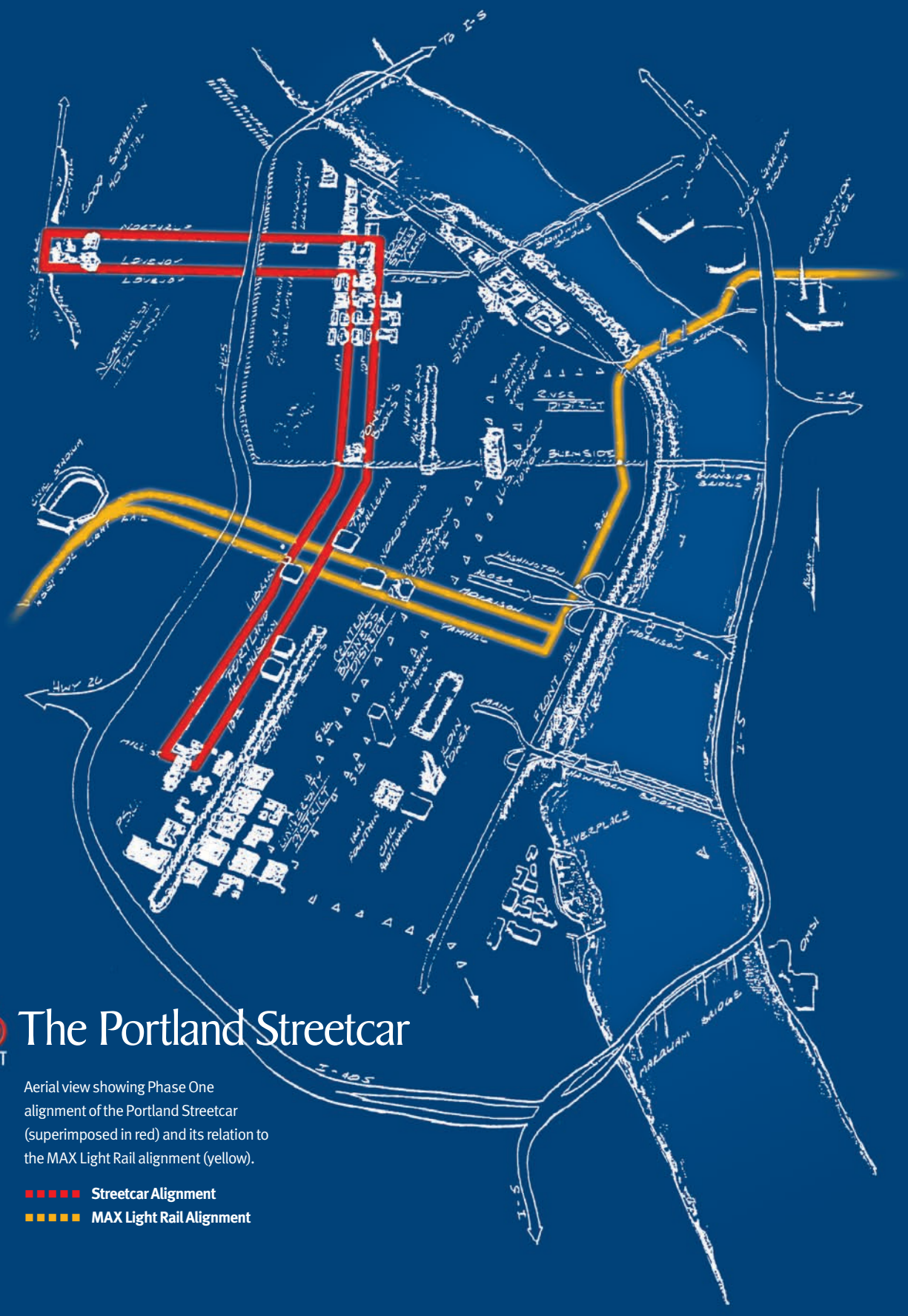
Streetcar Line Advances

Construction has begun on a 4.3 mile loop streetcar line which will connect the Pearl District with the downtown area and Portland State University. The Pearl District is a 150-acre site which is scheduled for upscale development. Running entirely in street paving, the new line is seen as a catalyst for development in parts of the city that are ripe for it. Five cars with air conditioning and ramps for the disabled are being built for the line by Skoda in the Czech Republic. They will be 66′ long three-section articulated units with a full low floor design. Fares will be the same as the bus and light rail lines run by Tri-Met. Within the downtown area the ride will be free. The route will have everything from a hospital to churches, retail shops and restaurants. If the new service is successful similar lines may be constructed in the future to serve other parts of the city where development is taking place.

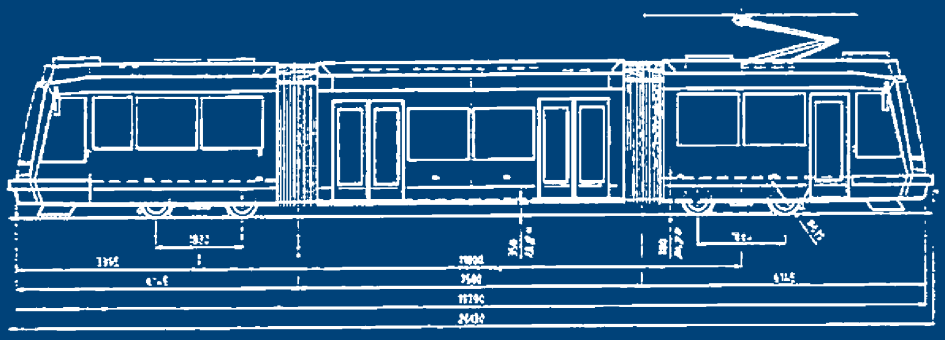
The new line will begin at SW Mill Street and will run through the downtown area on SW 10th Street. Outbound cars will turn west from 10th Street and operate along NW Northrup Street to NW 23rd Street. Inbound cars will run along

FRANK S. MIKLOS

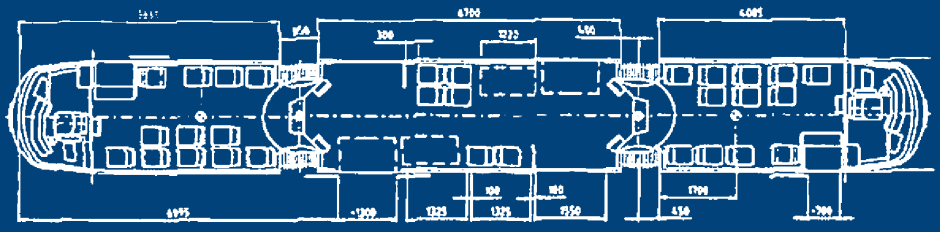
Good to the Last Stop. A pair of trains take their layover at the Hatfield Government Center terminal in Hillsboro. The platforms front on an attractive brick building with provisions for a newsstand and other concessions.


TRI-MET
The Portland Streetcar
Aerial view showing Phase One alignment of the Portland Streetcar (superimposed in red) and its relation to the MAX Light Rail alignment (yellow).
Streetcar Alignment
MAX Light Rail Alignment

Five cars with air conditioning and ramps for the disabled are being built for the Portland Streetcar line by Skoda in the Czech Republic.



Streetcar Elevation. 20 meter (66') length.



Streetcar Floor Plan. 2.46 meter (8') width.

The Skoda Plant. (top left) A view of the assembly line where new cars are being built for the Portland Streetcar by Inekon Group/ Skoda in Plzen, Czech Republic.

Skoda's Astra. (top right) Completed car of the same type ordered for Portland, the Astra, pauses for the camera. The roof-mounted air-conditioning unit can be seen in front of the pantograph.

No Free Ride. (center right) The Astras will have a provision for on-board ticket vending machines in the center section.

Smooth Operator. (lower right) Clean layout of the operator's control console. **TRI-MET PHOTOS**

125 YEARS OF PORTLAND TRANSIT HISTORY

From the modest beginnings of horse-drawn rail cars on First Avenue in the early 1870s, public transit in Portland has flourished, declined, and gone through a resurgence. Here are some important dates from the complex and colorful history of Portland's public transportation system. **SOURCE: TRI-MET / IMAGE BY JOHN STERN (SPRAGUE LIBRARY COLLECTION)**

1872: Portland's first trolleys were horse and mule drawn, operating on First Avenue from Glisan to Caruthers. They were brought by steamer from San Francisco by Ben Holladay.

1890: This was a major expansion era for trolleys with the addition of lines on the east and west sides of the Willamette River. Several trolley companies provided service at this time with the first electrified streetcar service beginning in the Albina area by the Willamette Bridge Railway Company. Fares were five cents. The first cable cars in Portland were operating on Fifth Avenue.

1891: Large consolidations of financially troubled rail companies occurred. The City & Suburban Railway absorbed four smaller companies and their lines.

1892: Portland Consolidated Street Railway Company was formed, absorbing three lines.

1893: The East Side Railway Company, incorporated in 1891, provided the first electric railroad passenger service in the United States between Oregon City and Portland. The Company carried both passengers and freight on rail lines. The East Side Railway, which ran to Oregon City, was the first interurban line in the United States.

1896: The Portland Consolidated Street Railway Company was foreclosed and the Portland Railway Company was formed.

1902: The East Side Railway Company, with its electric passenger/freight railroad service, was sold in foreclosure. This resulted in the formation of a new company, the Oregon Water Power and Railway Company.

1904: The electric streetcar was reintroduced on the Council Crest line just prior to the Lewis and Clark Exposition. The car operated on Washington to 23rd and south along Ford to Patton Road.

1905: Portland Railway and City & Suburban merged and were sold to the Clark Family of Philadelphia and Seligman Company of New York for $6 million.

1906: The Portland Railway and City & Suburban consolidated with Oregon Water Power, to become the Portland Railway, Light and Power Company, a system of 28 electric streetcar lines and interurbans.

1912: Portland saw the high point of electric streetcars around the city. The city's population was 257,490.

1918: After the World War I, streetcars began to feel the pinch from the automobile.

1920s: Trolley transportation growth slowed. Cutbacks in service and labor economies, such as remodeling equipment to facilitate one-man car operation, became the norm. Portland Railway changed its name to Portland Electric Power Company (PEPCO), a holding company that included Portland General Electric (PGE), Portland Traction Company, and an interurban system. Control of PEPCO changed to a third party; they eventually filed for bankruptcy. Portland Traction Company was eventually sold to Portland Transit Company of San Francisco.

1930s: During the Great Depression, buses and trolley coaches began to replace electric streetcars.

1950: World War II slowed down the process, but by 1950 the last city streetcars were retired. The Council Crest, Willamette Heights, and 23rd Avenue lines ceased operationswith fanfare. Two cars were preserved by the Oregon Electric Railway Historical Society and the City of Portland.

1956: Rose City Transit assumed the city routes of the Portland Traction Company.

1958: Trolley buses ceased operating, replaced by gasoline powered buses. Interurban railroad passenger service between Oregon City and Portland suspended operations.

1969: The Portland City Council passed a resolution to create Tri-Met under authority granted by the Oregon State Legislature. Operations of Rose City Transit were turned over to Tri-Met. 34 companies had served the Portland area in the nearly 100 years previous.

1970s: Portland community leader and light rail advocate, Dr. Lawrence Griffith, led the effort to bring back historic trolleys to Portland.

1978: Tri-Met's efforts to bring light rail to Portland included a Landmarks Commission approval of light rail operation with mandated mitigation of light rail impact through operation of vintage trolleys through downtown historic districts.

1986: MAX Light Rail commenced operation to Gresham, renewing rail passenger service in Portland. A $2 million grant was announced from the Urban Mass Transit Administration that enabled purchase of vintage trolleys.

1987: Vintage Trolley Inc. was formed to assure operation of the Vintage Trolley system. A Local Improvement District was formed to finance the local share of federal grant.

1991: Replicas of the Council Crest cars arrived in Portland in spring and summer. Vintage Trolley service between Lloyd Center and downtown Portland began November 29.

1998: Westside light rail service to begin operating between Portland and Hillsboro.

Welded rail encased with polymer rubber will be used over the entire line to ensure a smooth, quiet ride.

NW 23rd Street and turn east along NW Lovejoy Street to 11th Street where they will turn south through the downtown area to Mill Street. The NW 23rd Street shopping district is situated in an area with the highest population densities in the state. Bus ridership is high and the new rail line is expected to attract an even larger number of passengers.

Rail transportation is a key element in Portland's efforts to attract development and employment. Developers, investors, business and prospective residents have indicated that unlike buses whose routes may change or disappear, a new rail line will operate consistently and reliably. The City of Portland hopes to absorb 20% of the region's new jobs and residents through the first years of the 21st Century. Plans call for the creation of 50,000 new households inside the city, 15,000 of which will be within the central area. In addition, the central city is expected to attract 75,000 new jobs. The success of this effort will rely, in large part, on redevelopment in the River District, North Macadam, Pearl District and the University District. The presence of a fixed rail system serving these areas will represent the community's commitment to redevelopment plans, as well as a commitment to a livable city. The streetcar will link these emerging communities to downtown and other nearby neighborhoods, along with the regional rail system in a way that is easy, convenient and appealing.

An expansion of the MAX light rail service into these areas was rejected in favor of the streetcar service. Light rail provides a regional transit service with fast-moving, large cars designed to transport high numbers of people rapidly between suburban and urban areas. The streetcars are intended to go shorter distances in highly populated city neighborhoods. They are not intended to carry the high volume of rush hour passengers as the MAX trains and therefore the cars are smaller. They will operate in mixed traffic, preserving the traffic patterns of neighborhood streets. Plans call for the streetcars to stop more frequently and offer a more flexible service appropriate for a high density neighborhood. Experience with MAX has shown that the streetcar will be a cost-effective way to provide the service levels and quality necessary to increase ridership.

FRANK S. MIKLOS

Open Wide. The interiors of the new MAX low-floor cars have many attractive features including digital displays which indicate the next stop. The articulation joints are extra wide, giving the cars an open spacious appearance.

Attention to Details

Representatives from neighborhood associations, business groups, property owners, developers, institutions and the

community-at-large have been meeting monthly since 1995 to provide input on the design and features of the new streetcar line. Stops will be located about every two or three blocks in order to provide good neighborhood access and service. Tracks will be located in the right traffic land. At stops, the sidewalk will be widened into the parking lane for a distance of about 40′ to provide curbside loading for the streetcars.

Special welding techniques will be used for 90° turns to minimize wheel-squeal, vibration and track wear. Welded rail encased with polymer rubber will be used over the entire line to ensure a smooth, quiet ride. Power will be provided through a single overhead trolley wire suspended from three cantilevered poles in each block. Other suspension methods, such as connecting to adjacent buildings or existing poles, will also be considered where appropriate to minimize visual clutter.

Although the streetcar will operate independently of the MAX light rail service, both systems will be compatible. The streetcars will have the same track gauge and power voltage. A single trailing point switch at Southwest 10th and Morrison will allow for major maintenance on the streetcars at the MAX repair shops, thus avoiding a costly duplication of facilities, but a maintenance and inspection facility for the streetcar will be located beneath I-405 at Lovejoy Street.

Future Streetcar Plans

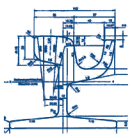
Streetcar service is expected to begin late in 2000. Plans call for the extension of the line through Portland State University to 5th and Harrison to connect with bus routes on 5th and 6th Avenues. Subsequent extensions may continue via SW Harrison to River Place and SW Macadam at Johns Landing. The section on SW Harrison would be shared with Tri-Met's North-South light rail line if it is approved in the future. Additional streetcar lines serving other Portland neighborhoods may be built if this first line is successful.

THE PORTLAND STREETCAR

Excavation. (top) Track laying gets underway on Portland's streetcar line with the excavation of the street in preparation for the rails.

Paving. (middle left) A worker puts the finishing touches onto the tracks prior to the installation of paving.

(middle right) Concrete paving has been poured around the traditional streetcar girder rail.



Finishing Touches. (bottom) Rails are in place and the poles with bracket arms are ready for trolley wire in preparation for the new streetcar line. The sidewalk at the car stop has been extended past the parking lane for passengers entering and exiting the low-floor cars.

Typically, a single wire will be suspended from an arm cantilevered from the poles. The suspension system at turns and at the MAX crossing are more complex. At some locations where building owners have agreed, the overhead wire is attached to adjacent buildings eliminating the need for poles. The galvanized poles will be painted black after the electrical contact wire is in place.

TRI-MET PHOTOS