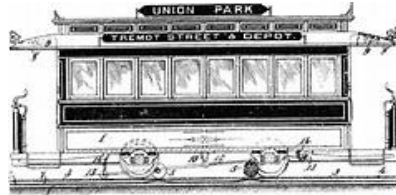


Transit Times



and Gazette

Vol. 1 – No. 5

APRIL 2020

A Publication of the National Museum of Transportation Trolley Volunteers

**2020 SEASON STARTUP TENTATIVELY SET FOR THURSDAY,
MAY 21, 2020!**

**Training/Recertification dates set for
May 13th, 14th, 15th, 16th and 21st & 22nd.
Shift selections in progress!**

Elimination of the Tower Grove Crossings, St Louis*

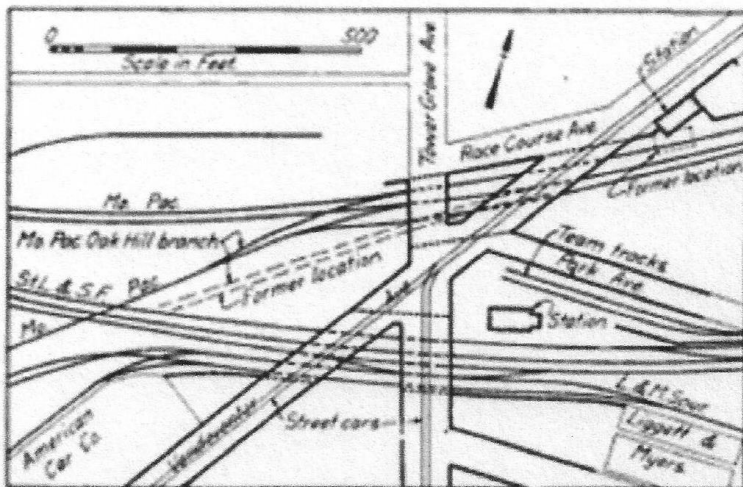
A Complicated Grade Separation Problem Was Solved

Recently by the Missouri Pacific and the Frisco

By E. L. Wonson

Bridge Engineer, Missouri Pacific, St. Louis

The tracks of the Missouri Pacific and the St. Louis & San Francisco lie closely adjacent from the St. Louis union station westward nearly to the city limits. Between Grand Avenue and Kings Highway Boulevard, a distance of 1-1/2 miles, the only main thoroughfares for north and south traffic are Tower Grove and Vandeventer Avenues, which intersect at an angle of 52 degrees at the point of crossing of the railways.



The general location of the railways and the streets is shown on the accompanying map. At Tower Grove Avenue the Oak Hill branch of the Missouri Pacific diverges from the main line. This is a double track belt line connecting with the main line of the St. Louis, Iron Mountain & Southern in South St Louis and is used by all St. Louis passenger trains over the

Iron Mountain, as well as by a considerable industrial switching service. This line crosses the Frisco at grade. Connecting with the Oak Hill branch, the Missouri Pacific also has a track crossing the streets south of the Frisco tracks and leading into the plant of the Liggett & Myers Tobacco Company, it in turn being crossed at grade by two Frisco connections to the plant of the American Car Company.

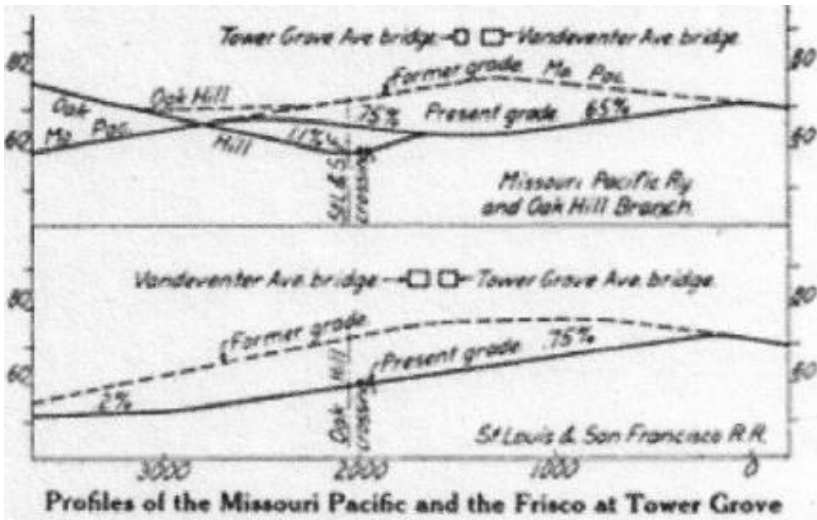
With the development of this section of St. Louis by industries, stores and residences, together with the rapid growth of a large residence territory to the south, served by Tower Grove and Vandeventer Avenues as through thoroughfares, the street traffic over the crossings become continually heavier, amounting in 1909 to approximately 400 street cars, 2,400 vehicles and 600 pedestrians per 24 hours. Protection by gates and watchmen was afforded for some years prior to the elimination of the crossings. Both railways maintain passenger stations at Tower Grove at which practically all passenger trains stop; this, although contributing largely to freedom from serious accidents, increased the inconvenience and delay to street to street traffic by the necessity of occupying the crossings during stops. The total train movements over the crossings average 250 per 24 hours, of which 100 are passenger trains.

The main lines of both railways rise to a natural summit at Tower Grove, while the intersecting streets are practically level, indicating a possible separation of the crossing, either by street depression as less costly, or by track depression as removing the summit in the railway profile. Actually the track depression is limited by considerations of economical adjustment and practical operation of important industry connections, as well as by a long ascending grade on the Oak Hill branch, a short distance south.

The question of eliminating these crossings was first taken up by the city in 1905, on a basis of track depression. After further study, however, by the Board of Public Improvements of the City of St. Louis, and the engineering departments of the railways, an agreement was arrived at early in 1907 on the basis of street depression. Ordinances embodying this agreement were rejected by the Municipal Assembly in 1908, considerable popular opposition having developed to what was called the "tunnel plan."

New ordinances, requiring depression of tracks under the existing street levels, were passed in April, 1909, requiring an approximate expenditure of \$3,000,000, as compared with about \$500,000 for street depression. They were considered by the railways as unduly oppressive and by the industries as destructive of their railway connections, and it became necessary to determine the rights of the parties in court.

The ordinances were upheld by the St. Louis Circuit Court, and appealed to the Supreme Court of Missouri, which in a unanimous opinion, handed down in December, 1912, held in brief that, while the city had power to require elimination of the crossings and to prescribe the general method, as by track or street depression the ordinances in question were void, both as being unreasonably burdensome in their requirements and as not having



originated as prescribed by the City Charter.

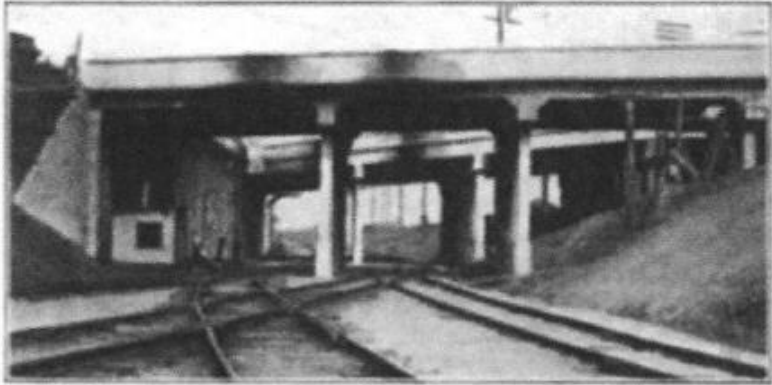
Meanwhile the present management of the Missouri Pacific had assumed charge of the property, and general plans and estimates were prepared for six different methods of elimination, of which one contemplated partial depression of tracks and elevation of streets, being the general method finally adopted.

Immediately following the Supreme Court decision of December, 1912, the Board of Public Improvements called a conference with the railways and announced a preference for partial track depression and street elevation as a basis of elimination. The details were worked out for a new ordinance rapidly, which was passed and approved in March, 1913, and formally accepted by the railways. Actual work was started on November 1, 1913.

Adopted Plans

The streets were elevated 13ft. over the tracks on reinforced concrete bridges, the tracks being depressed 13ft. to afford a 22-ft. clearance above top of rail. The filled street approaches are on 3-1/2% grades with retaining walls along the street lines, except where abutting property is raised to conformity with the new street grade.

The railways endeavored to induce adjoining property owners to raise their buildings as lots, offering to provide the necessary filling, and pointing out that the expense of restoring the property to the street grade would constitute a definite and easily-adjusted claim for damages.



West Elevation of Viaduct Over Missouri Pacific Tracks

Several owners proceeded along these lines, but the majority preferred to await a definite adjustment with the city, which, under the ordinance, assumed the damages. The city officials were successful in making such an adjustment in a number of cases, and under waiver of damages, raised the buildings and built retaining walls at the rear of the lots, the

railways providing the filling.

A profile shows the former and present railway main line grade lines with the summit lowered by the depression. The most unsatisfactory features as to gradient are found on the tracks leading into the Liggett & Myers Tobacco Company and American Car Company, upon which, although depressed as far as practical into the plants, grades from 2-1/2 to 3% are required, which add materially to the expense of operating and maintaining these connections.



Overhead View of the Viaduct Looking North

A photograph shows the finished street bridges, which, with their limited abutments and retaining walls, form an X-shaped structure with a section of solid fill at the central portion between the railways. The construction, except the abutments of two bridges, is of reinforced concrete throughout, consisting of a beam and slab deck resting on abutments and intermediate bents and forming four and five spans as shown. The bents have rectangular columns and footings spaced about 12ft. center to center. The columns are 18in. by 24in. and 20in. by 24in. they are joined at the top by cross girders supporting the deck beams, and at the bottoms by continuous diaphragms extending to 4ft. above the top of the rail, serving primarily as a guard against damage to the bridge from derailed equipment. The footings of bents and abutments are designed for a maximum pressure of 2-1/2 tons per square foot on the firm yellow clay found at this point. At Vandeventer Avenue the angle of intersection between street and railway is only about 27 deg. At the Missouri Pacific tracks, and 42-1/2 deg. At the Frisco tracks; consequently the deck beams are built normal to the bents, and supported with the deck slab at the street line by fascia girders from 26 to 72 ft. long, those over 35ft. being steel plate girders encased in concrete. The abutments of the Frisco bridges are of gravity section, while for the abutments and connecting retaining walls of the Missouri Pacific bridges, a reinforced counterfort type is used on the north side, and a bent and slab

design on the south side.

At Race Course Avenue, requirements of street width at the elevated level and track room at the depressed grade, necessitated the use of cantilever brackets for supporting the sidewalk and concrete rail along the retaining wall, between the Tower Grove and Vandeventer bridge abutments. As the face of the retaining wall and street line are not parallel, the overhang of the sidewalk slab is variable throughout.

With the exception of Park Avenue, which is paved with granite blocks, the elimination ordinance required all streets affected by the work to have creosoted wood block paving on a concrete base, full width concrete sidewalks, steel curbs on the viaducts and granite curbs on the approaches.

Material changes were required in the brick station buildings of each railway. It was decided to relocate the Missouri Pacific station at the new street grade on a slightly different location. New foundations were built in trenches down to the depressed track level and partly under the building, which was kept in service until the new foundation walls were brought up to the former street level. Station service was then transferred temporarily to two large box car bodies fitted up for the purpose, location and the foundations completed. The Frisco station has been maintained without change in level or position; it was underpinned with new foundation walls to the depressed track level and stairway connections to street and track were constructed.

Division of Cost

The elimination ordinance provided that the construction cost, including the relocation of municipal sewers and water mains, should be assumed by the railways, and the damages to the abutting property, by the city. The expense of rearranging utilities other than those municipally owned, such as street car tracks, gas mains, conduits, wires, etc., was assumed by the proprietary interests. Prior to starting work, an agreement was reached between the two roads whereby each should build the viaducts over its own tracks and the approaches thereto; this agreement also provided for a specified division of the work of raising Park Avenue and those portions of Tower Grove and Vandeventer Avenues between the tracks. There resulted a distinct division of the work on the basis of location, except as to the construction by the Missouri Pacific of two spans over its Liggett & Myers spur south of the Frisco tracks and of the retaining walls and building underpinning required by its depression. With the exception of these latter items and of the raising and moving of its station building, the Missouri Pacific handled all work with its own forces. The Frisco performed its track depression and rearrangement with its own forces and the remainder of its work by contract.

Conduct of the Work

Owing to the considerable volume of street traffic and the absence of other crossings in the vicinity, it was necessary to provide for maintenance of street traffic throughout the construction. The plan carried out involved closing the two west legs of the "X;" that is: Tower Grove north and Vandeventer south of the intersection, the plan being to complete the elevation of these sections and turn street traffic over them, permitting in turn the closing and elevation of the other two legs of the "X."



Construction View. Temporary Crossing of Street Car Tracks Over Missouri Pacific Westbound Tracks and at Grade with Missouri Pacific Eastbound Track

In making the Missouri Pacific track depression, the two main tracks were first thrown over to the south side of the right of way, and a steam shovel cut was started as wide as practical along the north side from the west end of the depression. In the vicinity of the streets the cut was widened to include excavation for the bridge abutments and retaining walls along the north side of the tracks in order that the concrete work might be started. When the cut had been carried up to the

streetcar tracks in Vandeventer Avenue, a wooden bridge was built behind the shovel to carry the street traffic over the excavation by a slight detour. The cut was then continued through the street and to the east end of the depression. East of the street, sufficient width could not be left between the operated surface tracks and the edge of the excavation for the proper accommodation of passengers and the handling of baggage and a temporary platform 500 ft. long was built along the tracks for this purpose, connection with the station being provided by a temporary foot bridge over the excavation.

A permanent track was then laid in the excavation to which westbound Missouri Pacific traffic was transferred, the temporary street bridge at Vandeventer Avenue being raised about 4 ft. to provide overhead clearance. This permitted the removal of one of the two surface tracks, widening the excavation and the construction of the second permanent track at the depressed level. The depression of the Oak Hill branch was performed in a similar manner, except that for a distance of 1,000 ft. from the Frisco crossing south to McRee Avenue only one track has been depressed, pending a possible relocation at this point.

The greater portion of the material for raising streets and private property was dumped from the dirt trains brought on a temporary track from the west end of the depression into Tower Grove, Race Course and Vandeventer Avenues. A considerable amount was also deposited directly on the ground by the steam shovel, when working near the streets and spread by teams. The balance of the excavation not required for filling, was disposed of at nearby points on the line.



West Elevation. Frisco Tracks on the Right Crossing Missouri Pacific Oak Hill Branch in the Foreground

The Frisco excavation was also made by steam shovel under somewhat less operating conditions, as it was possible here to divert traffic on two temporary tracks largely clear of the excavated area. A portion of the cutting beneath and between the street bridges was handled successfully by a Thew? Shovel loading on cars or into wagons as conditions dictated. It had been intended to change all railway traffic to the depressed level and the highway traffic to the elevated level on the same day, but unforeseen delays and complications

made it impossible to abandon all the surface tracks at this time. A temporary bridge was therefore built to carry street traffic over the incomplete portion of Tower Grove Avenue north, and Vandeventer Avenue south of the street intersections. To provide for clearance over the surface track used by Oak Hill trains and the Frisco detour tracks, this bridge was raised about 4 ft. above the permanent street grade with runoffs on the completed concrete viaducts. After this change in street traffic, a comparatively free opportunity was afforded for the remaining steps of the work. All railway traffic was removed from the surface in February, 1915, and on July 31, all streets were opened for travel.



Construction View Showing Conditions Before Grades Were Separated

To handle concrete the Missouri Pacific installed a tower plant with chutes at the corner of Park & Vandeventer Avenues, served by a temporary spur track. Sand and gravel were unloaded by a derrick and clamshell bucket into a divided bin and drawn by gravity into a divided truck, which was moved to the mixer and dumped into the hopper by a cable attached to the hoisting engine. On the Frisco work, a small portable tower traveling with the mixer was used, and the material was hauled to it in wagons from the team tracks at Park Ave. The

total cost of the construction work to the railways, the city, and the public utility companies was \$830,000. It involved 230,000 cu. Yds. of excavation, 60,000 cu. Yds. of filling, 17,400 cu. Yds of concrete, 540 tons of reinforcing steel, 78 tons of structural steel, and 23,300 sq. yds. of paving. Owing to the conditions imposed upon both design and construction, the work required attention out of proportion to its magnitude. More than 200 drawings covering the permanent work as constructed were prepared by the Missouri Pacific alone.

The above article appeared in the Railway Age Gazette Vol. 59 dated January 1, 1915.

Gleaned from the "St. Louis Streetcar Facebook Page (Posted by a TNMOTTV Member)

Here are some tips for dating old photos of St. Louis containing streetcars. These are things which their presence on non- presence can help determine the age of a photograph in the St. Louis.

If there are streetcars present in the photo, you automatically know that the photo was shot prior to May 21, 1966. This was the date Bi-State pulled the plug on the original street railway system in St. Louis. This excludes Loop Trolley. If there are horses pulling the streetcar, you automatically know that the photo was shot prior to 1896. This was the year the Jefferson Line was converted to electric operation. If it has a cable car in the photo, it was shot prior to 1900. This is the year the last cable line, the Broadway line, was converted to electric. How do you know if you are looking at a photo of a cable car? If there is no trolley pole on the roof, there are no horses in front and there is a slot running down the middle of the rails, you are looking at a cable car. If it has a pantograph on the roof, you are looking at Loop Trolley.

These are the dates that the various street railway lines were discontinued: 01 Kirkwood-Ferguson: it ran as one line until October 1, 1940. On that date, the line was essentially split. The tracks on Mehlville Avenue in University City to Maple Avenue in Wellston were abandoned. The southern portion of the line became the 01 Kirkwood and only ran from Clay and Adams in Kirkwood to the Big Bend Loop in University City. The northern portion of the line was added to the 16 City Limits line. You could still go from Kirkwood to Ferguson but you now had to transfer twice to do it. The 01 terminated public streetcar service on August 2, 1950. However portions of the line continued after that date. Public service kept track and wire from Walinca Drive in Clayton down to Brentwood Boulevard and Russell Avenue for the sole purpose of bringing streetcars out to be burned for scrapping. This lasted one year. The portion of the line from Walinca Drive to Mehlville Avenue remained in service as part of the 11 University and 14 University Clayton line until February 2, 1963. The portion from Maple Avenue to the Suburban Gardens Loop remained in service until the last day of streetcar service on May 21, 1966. Today, the portion of the line from Big Bend to Mehlville Avenue is now part of Metrolink. You could not kill the Kirkwood-Ferguson line.

Here are some of the other discontinuance dates: 02 Florissant line 11/13/31; 02 Berkley 2/21/48; 03 Midland 6/29/30; 04 Clayton 3/12/49; 05 Creve Couer 7/25/50; 07 Spaulding 6/7/30; 10 Delmar 4/14/64; 11 University (West of De Baliviere Avenue 2/2/63, east of De Baliviere 4/14/64; 14 University Clayton 2/2/64; 16 City Limits (after 9/1/40 City Limits Ferguson) 2/21/48; 17 Page 5/24/47; 18 Taylor 6/15/46; 20 Cherokee 1/14/39; 21 Tower Grove 11/2/40; 22 Jefferson 10/12/58; 30 Cass 7/12/47; 31 Natural Bridge 8/1/36; 32 Wellston 7/28/63; 33 Vandeventer 7/22/29; 34 Marcus 6/7/30; 41 Lee 7/6/46; 42 Sarah 6/15/46; 43 Barracks 3/6/32; 44 Chippewa 2/17/34; 44 Broadway-Chippewa 2/15/49; 50 Southampton 6/6/51; 51 Market 5/27/33; 52 Laclede 5/27/33; 51 Forrest Park 12/16/50; 53 Manchester- Maplewood 4/2/49; 54 Manchester- Webster 4/2/49; 55 Manchester-Clay and Adams 4/2/49; Manchester-Kirkwood 4/2/49; 57 Brentwood 1/29/49; 58 Osage Hills 7/24/32; 64 St. Charles 1/17/32; 65 Woodson Road 12/28/48; 66 St. Peters 4/8/31; 67 Bridgeton 8/15/31; 70 Grand 1/3/60; 71 Fourteenth Belt 3/15/30; 72 Eighteenth Street 7/6/46; 73 Bellefontaine 7/12/47; 80 Compton 11/2/40; 81 Park 6/6/51; 82 Fourth Street 6/22/30; 83 Thirty-ninth Street 5/15/37. Now, just because a line went off on a certain date, does NOT necessarily mean its track was not used for other lines or purposes after the discontinuance date. There were cases where one line was discontinued but part of its route was then used by another line, there were portions of lines that were kept for moving cars to and from shops and there were various odd ball pocket tracks kept here and there that could be used for short turning cars or parking breakdowns. I already mentioned the Kirkwood-Ferguson and City Limits Ferguson changes. Here are some others:

In 1929, the Vandeventer line was abandoned. However, the southern portion of the line was added to the Sarah line and ran until 1946.

In 1933 the Market and Laclede lines were combined to create the Forest Park line. However, the former Market Street tracks and overhead on Chouteau between Sarah and Kingshighway remained until 1950 for transporting Forest Park cars to the Park Avenue car barns and for transporting school children to the Forest Park Highlands for school picnics.

In 1940 the Tower Grove line was switched to bus but its trackage from Kingshighway and Arsenal to downtown was used to re-route the Southampton Line.

The Hodiament Line was re-routed 3 times during its history. It originally ran downtown on Franklin to 12th (Tucker) and then east on Locust; in 1940 it was re-routed off Franklin onto Leffingwell and then east on Washington to a loop in front of the entrance to the Eads Bridge. In 1956 is was re-routed off of Washington Avenue and started running in tandem with the Wellston Line all the way down Franklin (ML King Drive) to a Loop at Third and Franklin. Finally, the line was re-routed in 1963 by way of Taylor Avenue and ran in tandem with the University and Delmar lines until the end of service.

The Marcus line went off in 1930 but Public service kept almost 2 blocks of track on that street as an emergency track until the end of Wellston line in 1963.

The Maryland line was discontinued in 1948 but a short piece of track was kept at Olive & Boyle for emergency use until the end of service.

The City Limits line was discontinued in 1948 but the track between Millbrook (Forest Park Expressway) and Delmar remained until 1963 for returning University cars to the De Baliviere Car Barns. The City Limits tracks on Etzel and Hamilton remained until the end of service for transporting Hodiament Cars to the car barns

The Delmar line was discontinued in 1964 but the tracks from Hamilton Avenue to De Baliviere remained for transporting Streetcars to the car barns.

The Chippewa trackage remained completely intact until 1960 for transporting Grand Avenue cars to and from the South Broadway Car Barns.

The Broadway line went off in 1956 but the tracks between Chippewa and the South Broadway car barns remained until 1960.

The Grand Line officially was converted to bus on 1/4/1960 but as late as April of that year it was still possible to street railway equipment on Grand or Chippewa. The tracks were used to move all remaining street railway equipment out to the De Baliviere car barns.

The Park Avenue line went off in 1951 but its track between Grand and the Park Avenue car barns remained intact until April of 1960 for equipment moves.

All the lines that used Twelfth Street (Tucker) were gone by 1951. However, a track was kept on that street until the end of service for short turning cars and breakdowns. If car was turning on Twelfth Street, the role sign would read "Twelfth Only."

Some Other tips:

If the car is painted red, the photo was taken after 1940. Prior to 1940, the cars were orange. Some cars stayed orange until the late 1940's. The red scheme was introduced with the Streamline PCC cars in 1940. It was borrowed from Pittsburgh.



If it has a UR on the side it was probably shot between 1898 and 1928 because that was when United Railways had control. If it has the winged Public Service logo on the side it was probably shot between 1928 and 1940. Briefly from 1940 to 1942 Public Service used a logo with 2 streetcars on it but I have never seen a photo of it on a streetcar. If it has the National City Lines logo on

it was shot between 1942 and February of 1963. If it has the Bi-State logo on it was shot from that date until the end of service. All streetcars remained red until the end.

Hopefully this will help people date photos. This is not exhaustive. For more information, Look for Andrew D Young's books on Streetcars on Amazon and in the Library. I used St. Louis Streets and Streetcars as a source.

