

OSBORN AVENUE BRIDGE

HAER No. NJ-102

(Tuttle Parkway Bridge)

Carrying Tuttle Parkway (formerly Osborn Avenue)

over New Jersey Transit's Raritan Valley Line

Westfield

Union County

New Jersey

HAER  
NJ  
20-WESTFI,  
2-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service

Northeast Region

Philadelphia Support Office

U.S. Custom House

200 Chestnut Street

Philadelphia, P.A. 19106

HAER  
NJ  
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## HISTORIC AMERICAN ENGINEERING RECORD

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HAER No. NJ-102

**Location:** Carrying Tuttle Parkway (formerly Osborn Avenue) over New Jersey Transit's Raritan Valley Line, Westfield, Union County, New Jersey.

UTM: 18.554360.4499680  
Quad: Roselle, New Jersey

**Date of Construction:** 1907

**Present Owner:** New Jersey Transit Rail Operations, Inc.  
NJ Transit Headquarters  
One Penn Plaza  
Newark, New Jersey 07105-2246

**Present Use:** Pedestrian and vehicular bridge (closed to vehicular traffic in 1988).

**Significance:** The Osborn Avenue Bridge (currently known as the Tuttle Parkway Bridge) represents the application of an important technology and is significant as one of the few surviving truss bridges associated with the former Central Railroad of New Jersey's main line. The bridge is a typical example of a steel Warren through truss highway bridge with verticals and is notable for its use as a railroad crossing. The New Jersey State Historic Preservation Officer determined the Osborn Avenue Bridge eligible for inclusion on the National Register of Historic Places under Criterion C.

**Project Information:** This documentation was undertaken in January 1993 in accordance with Historic American Engineering Record standards as a mitigative measure prior to bridge replacement.

Glenn A. Ceponis  
Historic Preservation Group  
Kise, Franks, and Straw  
Philadelphia, PA

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The Osborn Avenue Bridge (currently known as the Tuttle Parkway Bridge) is located in the city of Westfield, Union County, New Jersey.<sup>1</sup> The bridge carries Tuttle Parkway (formerly Osborn Avenue) across two tracks of the former Central Railroad of New Jersey's main line (presently New Jersey Transit's Raritan Valley Line) between North and South Avenues. The bridge is currently closed to vehicular traffic. The approaches to the bridge are narrow and steeply inclined, with a width of approximately thirty-two feet inclusive of sidewalks. The bridge links two residential areas and served as a secondary route for emergency vehicles. Clark Memorial Park is located approximately one block north of the bridge. Westfield Train Station and the town's central business district are located approximately one-half mile east and northeast of the bridge respectively.

The railroad played an important role in the growth and development of Westfield, New Jersey. The Elizabethtown & Somerville Railroad Company constructed the first rail line into Westfield.<sup>2</sup> The E & S Railroad was chartered February 1831, and by 1836 trains traveled the two and one-quarter mile distance between Elizabethport and Elizabeth. The railroad did not reach Westfield until May 1838 and then continued only as far west as Plainfield, New Jersey. The railroad finally reached Somerville, its planned terminus, by 1842. In 1844, six years after the railroad's arrival, the town of Westfield was referred to as a "neat village consisting of about thirty or forty dwellings."<sup>3</sup> This same year the Elizabethtown & Somerville Railroad Company declared bankruptcy. Two years later the firm reorganized as the Elizabethtown & Somerville Railroad of 1846.<sup>4</sup>

The Somerville & Easton Railroad Company, incorporated in 1847, developed a line along a route between Somerville and Whitehouse originally granted to, but not developed by, the E & S Railroad. In 1849 the Somerville & Easton purchased the Elizabethtown & Somerville Railroad of 1846 and changed its name to the Central Railroad of New Jersey (CNJ). Even with the railroad's westward extension to Phillipsburg in 1852 it remained a short line, carrying mostly local passengers. In 1855 and 1857 the CNJ established connections with the Lehigh Valley and Delaware, Lackawanna, & Western railroads respectively, providing access to Pennsylvania coalfields, raw materials, and new passenger markets.<sup>5</sup> Communities along the CNJ's main line, however, still had no direct link to New York City, an extremely important connection for commuters, freight haulers, and prospective residents. In 1864 the CNJ constructed a bridge over Newark Bay to Jersey City and established ferry service into New York City. These connections had profound implications on both the railroad and the many towns along its lines. For twenty-two years the CNJ operated solely in New Jersey, holding a virtual monopoly on freight and

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<sup>1</sup>Sometime prior to 1980 the Osborn Avenue Bridge assumed the name Tuttle Parkway Bridge. For purposes of continuity the bridge will be referred to by its historic name, Osborn Avenue Bridge, throughout this report.

<sup>2</sup>Joseph Osgood, Jr., *Historical Highlights: The Central Railroad of New Jersey* (New York: Central Railroad of New Jersey, 1949), 3. Much of the information regarding the history of the Central Railroad of New Jersey and its predecessor companies was derived from this publication. See also, Elaine Anderson's *The Central Railroad of New Jersey's First 100 Years 1849-1949: A Historical Survey* (Easton, PA: Center for Canal History and Technology), 1984; Heritage Studies Inc., "The Operating Railroad Stations of New Jersey: An Historical Survey" (Princeton, NJ: Heritage Studies Inc., 1981), 70-73.

<sup>3</sup>A. Van Doren Honeyman, *History of Union County, New Jersey 1664-1923* (New York: Lewis Historical Publishing Company, 1923), 529.

<sup>4</sup>The Elizabethtown & Somerville Railroad of 1846 was reorganized, but not incorporated.

<sup>5</sup>Osgood, *Historical Highlights*, 5; Carl W. Condit, *The Port of New York: A History of the Railroad and Terminal System From the Beginnings to Pennsylvania Station* (Chicago: University of Chicago Press, 1980), 65.

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passenger service across the state.<sup>6</sup> Much of the CNJ's early success and expansion can be attributed to its first president, John Taylor Johnson.<sup>7</sup>

Growth remained slow in Westfield and other outlying towns prior to the CNJ's connections with New York. During the 1870s, however, the railroad began to launch substantial publicity drives to lure New Yorkers into the New Jersey suburbs. Prospective homeowners were taken to Westfield and other suburban communities where, area residents were noted for their longevity and freedom "from all inflammatory or chronic diseases." Proponents asserted that the commute from Westfield would be healthful, scenic, and economical, costing only ten and one-half cents per trip.<sup>8</sup> By 1892 *Taintor's Guidebooks* described Westfield as "a flourishing village giving indication of future importance. It is somewhat scattered, but has a thrifty appearance." A publicity brochure from 1894 continued, "Westfield, indeed hath charms. Where in the wide, wide world is the grass greener, the sky bluer, or the air purer? . . . the very exhilaration of such an atmosphere sets every nerve a tingle, and the whole world aglow."<sup>9</sup>

During the 1890s the CNJ upgraded its main line and constructed new train stations in Westfield and Somerville. The CNJ offered its growing commuter populations fast, frequent, and punctual commuter trains at all times of the day. CNJ trains maintained average running speeds of over 75 miles per hour and in 1893 reported the first train in the country to break the 100 miles per hour mark. The CNJ attained this milestone along its main line west of Fanwood.<sup>10</sup> From the 1880s through the first quarter of the twentieth century Westfield showed prodigious population growth, increasing from 875 in 1882 to 4,315 in 1900 and 9,063 in 1920.<sup>11</sup> Suburban growth and the evolution of satellite towns such as Elizabeth, Cranford, Westfield, and Plainfield partly resulted from the CNJ's efforts and guaranteed the railroad's position as a major suburban carrier.<sup>12</sup>

Westfield's principal rail line comprised a portion of the CNJ Central Division's main line. At the turn of the twentieth century the CNJ's four-track main line physically divided Westfield into northern and southern sections. A central business district evolved north of the railroad tracks near Elm and Broad Streets while the southern portion of the community remained predominantly residential in character. Railroad grade crossings at Broad Street and Central Avenue, as well as a single underpass at Westfield Avenue, linked the two sections of town. West of the town's core less densely developed residential areas occupied both sides of the rail line; however, no track crossing existed in this area at the turn of the century. Osborn Avenue, located approximately one-half mile west of the nearest track crossing (Westfield Avenue), had been laid-out to cross the tracks and connect North and South Avenues, but evidently construction of a crossing did not take place.<sup>13</sup> If the city or railroad desired to complete intended plans and create a crossing at Osborn

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<sup>6</sup>Condit, *The Port of New York*, 65.

<sup>7</sup>Johnson's presidency spanned twenty-seven years, from the railroad's inception in 1849 to 1876.

<sup>8</sup>James P. Johnson, *Westfield: from Settlement to Suburb* (Westfield, NJ: The Westfield Bicentennial Committee, 1976), 36.

<sup>9</sup>Taintor's Guide Books, *Pennsylvania Coal Regions Via Central Railroad of New Jersey and Branches* (New York: Taintor Brothers and Merrill & Company, 1892), 26; Johnson, *Settlement to Suburb*, 36.

<sup>10</sup>Heritage Studies Inc., "The Operating Railroad Stations of New Jersey: An Historical Survey" (Princeton, NJ: Heritage Studies, Inc., 1986), 70.

<sup>11</sup>Honeyman, *History of Union County*, 531.

<sup>12</sup>Condit, *Port of New York*, 137.

<sup>13</sup>Sanborn Map Company, *Fire Insurance Map of Westfield, New Jersey* (New York: Sanborn Map Company, 1909); *Map of Westfield, New Jersey*, circa 1903. Reproduced and issued by the Westfield Historical Society in

Avenue, an at grade crossing was probably not seriously considered due to rising concerns regarding the intersection of highways and railroads.

The need to separate or keep separate the intersections of highways with railroads manifested itself in the third quarter of the nineteenth century as both rail traffic and municipal populations increased.<sup>14</sup> The advent of the automobile after the turn of the century increased the urgency of the problem. Statistics compiled in the early twentieth century indicate that approximately three-fourths of all rail-highway crossing deaths involved the general public, rather than passengers, trespassers, or railroad employees.<sup>15</sup> Although rail lines constructed during the late-nineteenth century generally avoided rail crossings at grade, existing rail lines passing through densely developed areas posed serious problems to both the railroads and the communities through which they passed. Some railroad companies eliminated grade crossings during construction programs intended to improve and upgrade older track incapable of supporting increased traffic loads; however, few railroads had comprehensive programs requiring the elimination of grade crossings. Expanding communities, like Westfield, needing crossings where none had previously existed compounded the problem. Dangers to the general public caused by grade crossings reached unacceptable levels during the third quarter of the nineteenth century, and certain states and municipalities initiated legislation eliminating grade crossings. In 1876 Connecticut became the first state to mandate the elimination of railroad grade crossings. Buffalo and Philadelphia enacted similar legislation by the 1880s, and other states and cities soon followed suit, including Massachusetts (1890), Ohio (1893), and New York (1897).<sup>16</sup> By 1913 nineteen states had enacted legislation mandating some form of railroad grade separation. New Jersey enacted similar legislation in 1913. New Jersey's strict legislation required railroads to absorb the entire cost of grade elimination and granted a Board of Public Utilities Commission authority to, at its discretion, order grade separation projects. Grade crossing elimination projects provided municipalities with a certain measure of control in the management of the rail traffic passing through the community. These projects provided both the railroads and communities with safer environments and allowed railroads to operate at higher speeds with fewer delays.

There were two primary methods for eliminating or avoiding grade crossings, elevating the tracks above the streets, or depressing them below grade. Elevated tracks required construction of embankments and bridges to carry the tracks through populated areas, while depression projects entailed excavation of the railroad right-of-way and stabilization of the adjacent earth with retaining walls. Elevated rail projects enjoyed certain advantages in terms of rail safety and ease of maintenance, and could more easily accommodate existing spur lines, an important consideration, especially if the tracks provided freight service. Depression projects, however, kept trains largely hidden from view, reduced locomotive noise, and proved safer for automobile traffic. Highway bridges constructed in association with depression projects could be constructed with lighter steel than was required for the heavy structures that supported elevated tracks. Nevertheless, track elevation projects proved fifty to one hundred percent less expensive than depression projects, largely because they did not require extensive excavations.<sup>17</sup> Grade crossing eliminations through

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commemoration of the American Revolution Bicentennial, 1975. On file at the Westfield Public Library, Westfield, New Jersey.

<sup>14</sup>Deleuw, Cather and Company and Engineering Science, Inc., "New Jersey Transit Historic Railroad Bridge Survey," 54. Manuscript on file at New Jersey Transit Office of Engineering, Newark, New Jersey.

<sup>15</sup>Ibid., 55.

<sup>16</sup>"Grade Separation Laws and Requirements," *Railway Age Gazette* 55, no. 24 (12 December 1913), 1120.

<sup>17</sup>Deleuw, Cather and Company, "New Jersey Transit Historic Railroad Bridge Survey," 57-58.

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Westfield generally did not alter the existing railroad grade but rather accommodated the existing tracks through the construction of underpasses or highway bridges. Most of Westfield's crossings went below the railroad, however, in the case of Osborn Avenue the prevailing topography already partially depressed the railroad tracks in the vicinity of the proposed crossing and therefore logically suggested raising the roadway over the tracks at this location.

At least fourteen community-coordinated and planned grade crossing elimination campaigns occurred in New Jersey between 1901 and 1932.<sup>18</sup> The Delaware, Lackawanna & Western Railroad conducted nine of these projects (sixty-four percent of the total). The Central Railroad of New Jersey conducted approximately three such campaigns (twenty-one percent).<sup>19</sup> The CNJ, along with the DL&W, began removing grade crossings in Newark, New Jersey in 1901. Other CNJ community-derived projects included Westfield Avenue overpass in Westfield (1917) and complete track elevation in Cranford (1929). The Westfield Avenue work entailed elimination of a crossing at Broad Street as well as shifting, up-grading, and enlarging the Westfield Avenue underpass from a narrow single-span structure to a three-span structure. Most grade elimination work conducted by the CNJ was not part of these community-coordinated campaigns, but instead was initiated, constructed, and paid for wholly by the railroad. In the case of Osborn Avenue in Westfield the entire cost of the bridge was born by the railroad company, however, the additional cost of regrading the Osborn Avenue approaches appears to have been paid for by the community.<sup>20</sup>

The Osborn Avenue Bridge is an eight-panel, steel, Warren through truss highway bridge with verticals.<sup>21</sup> The basic Warren truss form consists of a series of diagonal members connecting top and bottom chords. These diagonal members act alternately in tension and compression. The whole looks like a series of equilateral triangles. Added strength can be attained by adding vertical compression members or by superpositioning an increased number of diagonal members within the truss. Truss members can be either pin-connected or riveted; however, Warren trusses were generally riveted, rather than pin-connected, to form more rigid connections. A grid-work of floor beams and stringers help tie the two trusses together and support the decking. Two British engineers, James Warren and Willoughby Monzani, patented the Warren truss in 1848. The Warren truss joined the Pratt truss as the most prevalent truss types used between 1850 and 1925, both demonstrated versatility, durability, and economic desirability.<sup>22</sup> The Warren truss became especially prevalent in the early twentieth century, coinciding with changing bridge erection practices. On site, or field-riveting techniques greatly improved at this time with the invention of a portable pneumatic riveting system that allowed easier, faster, and cheaper field erection of riveted

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<sup>18</sup>Ibid., 60.

<sup>19</sup>Ibid., The three campaigns associated with the CNJ are: Westfield (1917), Somerville (1924-25), and Cranford (1929).

<sup>20</sup>Central Railroad of New Jersey Engineering Department, "Osborn Avenue Bridge, n.p." Files in private collection of Frank T. Reilly, Executive Director of the Morris County Department of Transportation, Morris County, New Jersey.

<sup>21</sup>Three basic bridge types exist for trusses; through truss, pony truss, and deck truss. A through truss carries traffic with its bottom chords. A pony truss is a form of through truss without lateral bracing of its top chords. Pony trusses were used on small spans where additional strength was not required. Deck trusses carry traffic with its top chords. Often below deck clearances determined whether a truss was a through or deck truss bridge.

<sup>22</sup>T. Allan Comp and Donald Jackson, "Bridge Truss Types: a guide to dating and identifying." American Association for State and Local History Technical Leaflet 95, *History News* 32, no. 5 (May, 1977), 1, 3.

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spans.<sup>23</sup> Span lengths for truss bridges generally began at one hundred feet for railroad bridges and eighty feet for highway bridges.<sup>24</sup> Truss-designed bridges were often replaced by plate girder bridges for shorter spans.

The Central Railroad of New Jersey's Engineering Department designed the Osborn Avenue Bridge beginning in August 1905, and based its design on their standard bridge design 2878-A-3.<sup>25</sup> Joseph Osgood headed the CNJ's Engineering Department between 1901 and 1916. Osgood designed many of the the CNJ's railway stations during this time period, including the 1912 South Side Station in Westfield. Austin L. Bowman was chief engineer of the CNJ at the time of the Osborn Avenue Bridge's construction. Construction of the bridge began in September 1906. The Passaic Steel Company of Patterson, New Jersey and "S. Bopdy Br." received contracts from CNJ for fabrication and construction of the Osborn Avenue Bridge. The Passaic Steel Company employed timber falsework and a timber erection traveller during construction of the Osborn Avenue Bridge. The erection traveller moved on two small rails laid on top of the falsework. The traveller measured approximately thirty feet high, thirty-eight feet wide, and thirty feet long. The total cost of the bridge amounted to \$16,401.35, entirely paid for by the CNJ.<sup>26</sup> The town apparently took responsibility for regrading the approaches to the new bridge. Creating a bridge crossing at Osborn Avenue required inclining Osborn Avenue between North and South Avenues to accommodate the additional height requirement for train passage.<sup>27</sup> Westfield Town Council passed and adopted Special Ordinance No. 112 on June 18, 1906 to grade Osborn Avenue between North and South Avenues. Despite the passage of the ordinance, the Town Council continued deliberating the question of grading Osborn Avenue throughout 1907.<sup>28</sup> In September 1907, approximately one year after construction began, the CNJ and its contractors completed the Osborn Avenue Bridge. Construction of the approaches, however, was still being discussed at Town Council meetings. On December 4, 1907 Westfield Town Council again passed and adopted an ordinance for grading portions of North Avenue, Charles Street, and Osborn Avenue. The existing road grade, over ten feet above the railroad bed, changed to accommodate the required twenty-two-foot minimum clearance needed below the new bridge. The south approach's slope increased to nearly nine percent while the north approach increased to just above seven percent. The approaches were probably completed in the early spring of 1908.<sup>29</sup>

The Osborn Avenue Bridge is typical of steel, through Warren truss (with verticals) highway bridges in both composition and form. It is composed of a single span with an overall length of approximately 102 feet and a width of approximately twenty-seven feet, inclusive of an east side sidewalk. The bridge's clear roadway width is approximately twenty feet, with an overhead clearance of fourteen feet. The bridge has a ninety degree skew to its north and south connecting abutments. The bridge's superstructure consists of two parallel, eight-panel, Warren trusses with verticals. The truss's top and bottom chords are composed of steel channels, angles, plates, and

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<sup>23</sup>Donald C. Jackson, *Great American Bridges and Dams* (Washington, DC: Preservation Press, 1988), 27-29.

<sup>24</sup>F. C. Kunz, *Design of Steel Bridges: Theory and Practice* (New York: McGraw-Hill Book Company, 1915), 167.

<sup>25</sup>"Central Railroad of New Jersey Engineering Records," Osborn Avenue Bridge, n.p.

<sup>26</sup>*ibid.*

<sup>27</sup>A minimum clearance of twenty-two feet was required for the Osborn Avenue Bridge. "Central Railroad of New Jersey." Original construction drawings, Osborn Avenue bridge, dated 1905.

<sup>28</sup>*Westfield Leader*, 8 May 1907; 15 May 1907; 11 September 1907; 18 September 1907; 20 November 1907; 4 December 1907.

<sup>29</sup>*Westfield Leader*, 4 December 1907.

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lacing bars. Each top chord is approximately seventy-six feet long, while the bottom chords measure approximately 102 feet in length. The height of each truss is approximately nineteen feet. The trusses' webs consist of struts, hangers, and diagonals composed primarily of latticed steel angle sections. Each panel length measures approximately twelve feet eight inches. The bridge's portals are composed of angle sections and plates, as are its top and bottom lateral bracing. All structural members are riveted. Fixed and expansion bearings are set on concrete shelves and consist of riveted vertical plates with pins. Bridge decking consists of a system of twenty-inch deep rolled steel floor beams and ten-inch deep rolled stringers with wood decking and asphalt paving. The bridge has nine lateral floor beams and eight (per panel) longitudinal stringers, both of I-beam section. Wood decking, laid on the stringers' top flanges, is composed of laminated three-by five-inch pine boards set on edge. Wheel guards are six-inch square timbers. Asphalt paving is placed directly atop the wood decking. The Osborn Avenue Bridge has a single sidewalk located along its east side. The bridge's substructure consists of unreinforced concrete gravity abutments and includes straight-backed wing walls with twelve-inch concrete coping. Small retaining walls extend from the south abutment's wing walls. The substructure is founded on spread footings. The bridge's concrete abutments were constructed to receive a potential west side sidewalk; however, construction of this sidewalk did not occur. The east sidewalk is supported by triangular-shaped, built-up steel brackets cantilevered from the truss at corresponding floor beams. Stringers of I-beam section sit on top of the sidewalk floor beams. Wood planks serve as sidewalk decking. The sidewalk includes an approximately four-foot high decorative railing composed of steel angle sections with lattice bars assembled in bi-level diamond patterns. The railings' upper section includes a cast rosette placed on the crossing of the lattice bars. The railings' design did not include formal handrails.<sup>30</sup> The approaches to the bridge are severely inclined. Modern metal guardrails and wood barricades presently prohibit vehicular traffic onto the bridge.

In 1946 the Central Railroad of New Jersey performed substantial reconstruction on the Osborn Avenue Bridge, replacing floor beams, stringers, and lateral bracing. Replacement activity centered around the third, fourth, and fifth bridge panels (from the north). Approximately twenty-seven stringers and two floor beams were replaced, along with requisite lateral bracing. Additional repair work conducted in 1949 included replacement of the bridge's wood decking and asphalt paving. Osborn Avenue Bridge is presently in a severe state of disrepair. The bridge's superstructure suffers from substantial rusting, scaling, and various degrees of section loss of members. Its substructure is also in poor condition, with areas of deteriorated concrete. During the 1980s a ten-ton weight limit was imposed on bridge traffic. In 1988 Osborn Avenue Bridge closed to vehicular traffic.<sup>31</sup>

The Central Railroad of New Jersey retained ownership of the Osborn Avenue Bridge until the 1970s, when the Regional Rail Reorganization Act established special procedures for restructuring financially troubled rail systems within the Northeast and Midwest. On April 1, 1976 the CNJ along with the Lehigh Valley, Erie-Lackawanna, Reading, Lehigh & Hudson, Pennsylvania-Reading Seashore Line, and Penn Central railroads relinquished control of their rail lines to Consolidated Rail Corporation (ConRail). In 1979 NJ Transit was created and assumed responsibility of New Jersey rail lines operated by ConRail; however, ConRail continued operation

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<sup>30</sup>"Central Railroad of New Jersey," Original construction drawings: Osborn Avenue Bridge, dated August 1906. Microfiche on file at New Jersey Transit, Newark, New Jersey.

<sup>31</sup>New Jersey Transit, "Bridge Inspection Reports: Tuttle Parkway Bridge, mp 19.03." On file at New Jersey Transit Rail Operations, Newark, New Jersey.

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of its passenger service until January 1, 1983 when New Jersey Transit Rail Operations assumed New Jersey commuter operations from ConRail.<sup>32</sup>

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<sup>32</sup>CNJ Veterans Employee Association, *Historical Highlights of the Central Railroad Company of New Jersey*. (n.p.: CNJ Veterans Employees Association, 1983), 54-55.

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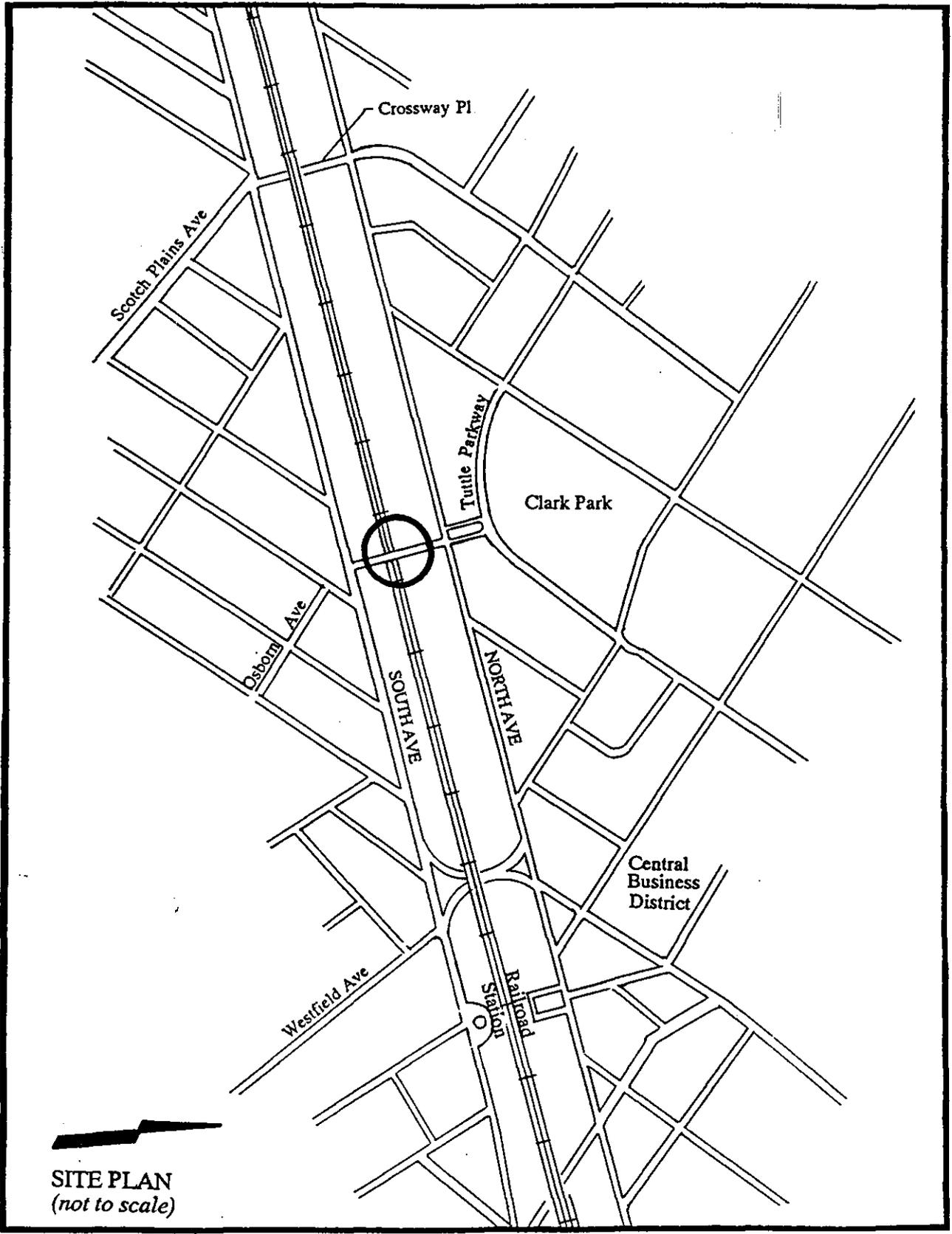
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SITE PLAN  
(not to scale)