

# THE PITTSBURGH AND LAKE ERIE RAILROAD

## OPERATING CHARACTERISTICS AND FACILITIES AND MISCELLANEOUS HISTORICAL AND CORPORATE DATA

### NEW YORK CENTRAL ROUTE BETWEEN CLEVELAND AND YOUNGSTOWN

| Station                              | Miles      |
|--------------------------------------|------------|
| Marcy (Cleveland) - Brady            | LE&P 27.76 |
| Brady - Ravenna Jct.                 | PRR 3.96   |
| Ravenna Jct. - Niles Jct.            | B&O 23.96  |
| Niles Jct. - Grand Jct.              | PRR 8.12   |
| Grand Jct. - Graham                  | LE&E 8.31  |
| Graham - RS (Gateway Yard)           | P&LE 0.84  |
| Total Niles Jct. - RS (Gateway Yard) | 17.07      |
| Total Marcy - RS (Gateway Yard)      | 71.57      |

1. To facilitate movement into Gateway Yard's receiving tracks, some eastbound NYC trains operate on B&O beyond Niles Jct. to N. (west end of Gateway Yard), a distance of 14.08 miles, which is 3.01 miles shorter than from Niles Jct. to RS (near Gateway Yard) via the route shown.

### MAIN LINE CONSTRUCTION RECORD IN EASTBOUND ORDER

| Limit of Construction | From                       | To   | Opened For                      |
|-----------------------|----------------------------|------|---------------------------------|
| LE&E                  | Grand Jct.                 | 64.0 | Crossing No. 4, Brier Hill 1920 |
| LE&E                  | Crossing No. 4, Brier Hill | 61.1 | Graham 1915                     |
| P&LE                  | Shelby St., Youngstown     | 62.9 | Haskell Furnace (Near N) 1902   |
| P&LE                  | Haskell Furnace (Near N)   | 1.69 | 22nd St., Pittsburgh 1879       |
| P&LE                  | 22nd St., Pittsburgh       | 56.4 | Connellsville 1883              |
| P&LE                  | Belle Vernon               | 42.4 | Belle Vernon 1893               |
| P&LE                  | Belle Vernon               | 45.3 | Fayette City 1905               |
| P&LE                  | Fayette City               | 53.9 | Brownsville Jct. 1893           |

1. Miles from Pittsburgh.  
2. Miles east of Pittsburgh.  
3. Purchased by and consolidated with the PMcK&Y in 1890.

### GRADE CROSSINGS WITH OTHER RAILROADS

| Location                 | Mile Post                | Other Railroad | Crossing Protection                                      |
|--------------------------|--------------------------|----------------|--|
| LE&E                     | Manning Ave., Youngstown | 85.9           | Erie <sup>2</sup> Pole target and interlocking           |
| LE&E                     | Lansingville             | 62.8           | PRR <sup>7</sup> Pole target and interlocking            |
| LE&E                     | Graham                   | 60.9           | PRR <sup>7</sup> Interlocking                            |
| P&LE - Main Line         | N. McKeesport            | 62.7           | B&O <sup>3</sup> Safety stop and switch tender           |
| P&LE - Main Line         | N. McKeesport            | 14.7           | B&O <sup>3</sup> Switch tender at MK (Junction with B&O) |
| P&LE - New Castle Branch | Gardner Ave., New Castle | 48.0           | Erie <sup>8</sup> Pole target                            |
| P&LE - New Castle Branch | New Castle Jct.          | 46.6           | B&O <sup>3</sup> Pole target and interlocking            |

1. Miles from Pittsburgh.  
2. Assintown Branch.  
3. Canfield Branch - connection with the Y&S.  
4. Main line from Ashland, O., and Niles, O.  
5. Main line from Chicago.  
6. Side track to National Tube Division of U.S. Steel Corp.  
7. Branch line to Erie, Pa. (E&P).  
8. Ferrona Branch crossing to B&O connection.

### PHYSICAL CHARACTERISTICS

P&LE's Water Level Route permits a 3,000 horsepower locomotive, comprised of two 1,500 horsepower Diesel-electric units, to haul a train of 12,000 gross tons at a 25 mile per hour average speed. This produces 300,000 gross ton-miles of freight transportation per train-hour, or the hourly equivalent of 100 gross ton-miles by each horsepower of locomotive capacity.

| P&LE  | Length of Line Miles | Change in Elevation Initial to Final Station Feet | Average Grade Uncompensated % | RULING GRADES    |                               |
|---|----------------------|---|-------------------------------|------------------|-------------------------------|
|   |                      |   |                               | Compensated 0.3% | Maximum Grades Exceeding 0.3% |
| Eastbound   | 65.58                | 112   | 13.27                         | 94               | 0.13                          |
| Westbound   | 65.58                | 112   | 13.27                         | 94               | 0.13                          |
| 22nd St., Pittsburgh, to BV, McKeesport                   | 13.74                | 31  | 7.83                          | 79               | 0.19                          |
| BV, McKeesport, to Connellsville                          | 43.11                | 157   | 24.48                         | 185              | 0.14                          |
| BV, McKeesport, to Brownsville Jct.                       | 38.55                | 40  | 12.71                         | 142              | 0.21                          |
| Youngstown to Connellsville - Entire Line <sup>2</sup>    | 122.43               | 76  | 15.31                         | 315              | 0.15                          |
| Youngstown to Brownsville Jct. - Entire Line <sup>2</sup> | 117.57               | 47  | 15.31                         | 315              | 0.15                          |
| Brownsville Jct. to BV, McKeesport                        | 38.55                | 40  | 9.01                          | 102              | 0.21                          |
| Connellsville to BV, McKeesport                           | 43.11                | 157   | 3.13                          | 28               | 0.17                          |
| BV, McKeesport, to 22nd St., Pittsburgh                   | 13.74                | 31  | 2.74                          | 46               | 0.32                          |
| 22nd St., Pittsburgh, to Shelby St., Youngstown           | 65.58                | 112   | 27.76                         | 208              | 0.14                          |
| Brownsville Jct. to Youngstown - Entire Line <sup>2</sup> | 117.57               | 47  | 39.51                         | 356              | 0.17                          |
| Connellsville to Youngstown - Entire Line <sup>2</sup>    | 122.43               | 76  | 33.63                         | 282              | 0.16                          |
| LE&E Eastbound  | 8.31                 | 43  | 1.79                          | 24               | 0.25                          |
| LE&E Westbound  | 8.28                 | 43  | 5.15                          | 87               | 0.25                          |

1. Miles from Pittsburgh. 2. Longest ruling and maximum momentum grades. 3. West of Pittsburgh. 4. East of Pittsburgh. 5. Ascent to Monongahela River Bridge, east of Pittsburgh.

**DEFINITIONS**  
**Ruling grade:** The ascent which establishes the maximum tonnage a locomotive can haul, unassisted, over an operating district. The ruling grade may be less than some of the actual grades if the latter are of such limited length and ascent that they can be operated as momentum grades without the crest.  
**Average grade:** The sum of all the ascents on the line divided by their aggregate horizontal length.  
**Compensated grade:** Friction between wheel flanges and rails increases directly with track curvature in such a ratio that this resistance may be stated numerically in terms of grade equivalent. Much of the nation's railway mileage was built before these factors became well known. After that grades were compensated by reducing their rate on curves sufficiently to hold the combined resistance of grade and curvature to that of the ruling grade. The addition of the grade equivalent of curvature to the ascending gradient rates on the P&LE produces some compensated grades exceeding 0.3%. However their moderate length permit operating on them as momentum grades and allow locomotive tonnage ratings to be based on 0.3% ruling grades.

### PRINCIPAL BRIDGES

| In Eastbound Order             | Location                | Type of Bridge                 | Max. Span In Feet | Total of Load Capacity | Number of Cooper Rating | Year Completed |
|--------------------------------|-------------------------|--------------------------------|-------------------|------------------------|-------------------------|----------------|
| LE&E                           | PRR - Crossing #4       | Brier Hill                     | 33                | 404                    | 2                       | E-60 1914      |
| LE&E                           | Crossing #2             | Ohio Works                     | 94                | 1,640                  | 2                       | E-60 1914      |
| LE&E                           | Crossing #2             | Youngstown                     | 175               | 580                    | 2                       | E-60 1914      |
| Mahoning R. - Crossing #1      | Youngstown              | Through truss-concrete viaduct | 192               | 1,925                  | 2                       | E-60 1914      |
| P&LE Main Line                 | Erie & Pittsburgh (PRR) | New Castle Jct.                | 55                | 55                     | 2                       | E-60 1906      |
| Shenango R. (Eastbound)        | New Castle Jct.         | Deck girder                    | 64                | 330                    | 1                       | E-60 1892      |
| Beaver R. (Eastbound)          | Newport                 | Deck girder                    | 101               | 312                    | 1                       | E-35 1917      |
| Ohio River                     | Beaver-Monaca           | Cast-steel through truss       | 769               | 1,500                  | 2                       | E-50 1910      |
| Charlottesville                | McKees Rocks-Pittsburgh | Through truss                  | 140               | 140                    | 1                       | E-60 1903      |
| Monongahela River              | Munhall-Swissvale       | deck truss-deck girder         | 266               | 1,510                  | 2                       | E-45 1902      |
| Youghiogheny River             | McKeesport              | Through truss-deck girder      | 233               | 926                    | 2                       | E-45 1903      |
| P&LE Branches                  | Mahoning R. - Struthers | Youngstown Branch              | 84                | 554                    | 1                       | E-60 1914      |
| Mahoning R. - Lowellville Jct. | Lowellville Branch      | Through girder-deck girder     | 79                | 271                    | 1                       | E-60 1904      |
| Beaver R. - W. Ellwood Jct.    | Ellwood City Branch     | Through girder-deck girder     | 126               | 1,090                  | 1                       | E-60 1914      |
| Beaver Channel, Ohio R. - FM   | Neville Island Branch   | Through truss-through girder   | 257               | 500                    | 1                       | E-35 1902      |

a. All P&LE bridges with original Cooper ratings of less than E-60 have been strengthened to meet the modern requirement of at least 8,000 pounds trailing load per linear foot. Heaviest P&LE steam locomotives, 2-5-1 Berkshire type, had 70,000 pounds on each driving axle. These single Berkshire engines were operated over all main line bridges. Steam locomotive driving wheels are counterbalanced, causing dynamic augment to their static weight. This necessitated bridges capable of sustaining axle loads greatly exceeding static weight on axles. Maximum axle weight of P&LE Diesel locomotives is 61,800 pounds. Diesel-electric locomotives have lower gross weights than steam locomotives of like tonnage hauling capacity, and since they have no wheel counterbalances, bridges will carry Diesel engines with axle loads 50% greater than indicated by Cooper bridge ratings for steam locomotives, e.g., bridges with E-40 ratings for steam engines have the equivalent of E-60 ratings for Diesel engines. This factor constitutes one of the outstanding economic and operating advantages of Diesel locomotives.

**DEFINITION**  
**Cooper rating:** A system devised in 1894 by Theodore Cooper, a bridge engineer, to establish load limits for railroad bridges. It is computed for a train hauled by two steam locomotives, coupled to operate as a double-header, with a trailing load of uniform weight for each foot of its length. It is the Cooper rating desired for heavy duty main lines. A double track bridge must be designed to support the Cooper rated loading on each track simultaneously. The capabilities of bridges of varying Cooper ratings are established by their ability to carry:  
 1. Two concentrated loads, each 15' long (the wheel) on the four driving axles of each locomotive (axles separated by 5').  
 2. A series of concentrated loads, 109' long (representing the overall length of the double-header steam locomotives, and including the loads shown in 1, above), aggregating 14,200 pounds times the E-rating.  
 3. A trailing load (representing the cars hauled by the locomotives) weighing, per linear foot of train length, 100 pounds times the E-rating.  
 Thus P&LE bridges, according to their original ratings, could carry:

| Structural Capacity, per Track, for Character and Weight of Load | E-35    | E-40    | E-45    | E-50    | E-60    |
|--|---------|---------|---------|---------|---------|
| 1. Driving wheels of each locomotive of a double-header          | 140,000 | 160,000 | 180,000 | 200,000 | 240,000 |
| 2. Aggregate weight of the double-header                         | 497,000 | 565,000 | 639,000 | 710,000 | 852,000 |
| 3. Trailing load of the train (per linear foot)                  | 3,500   | 4,000   | 4,500   | 5,000   | 6,000   |

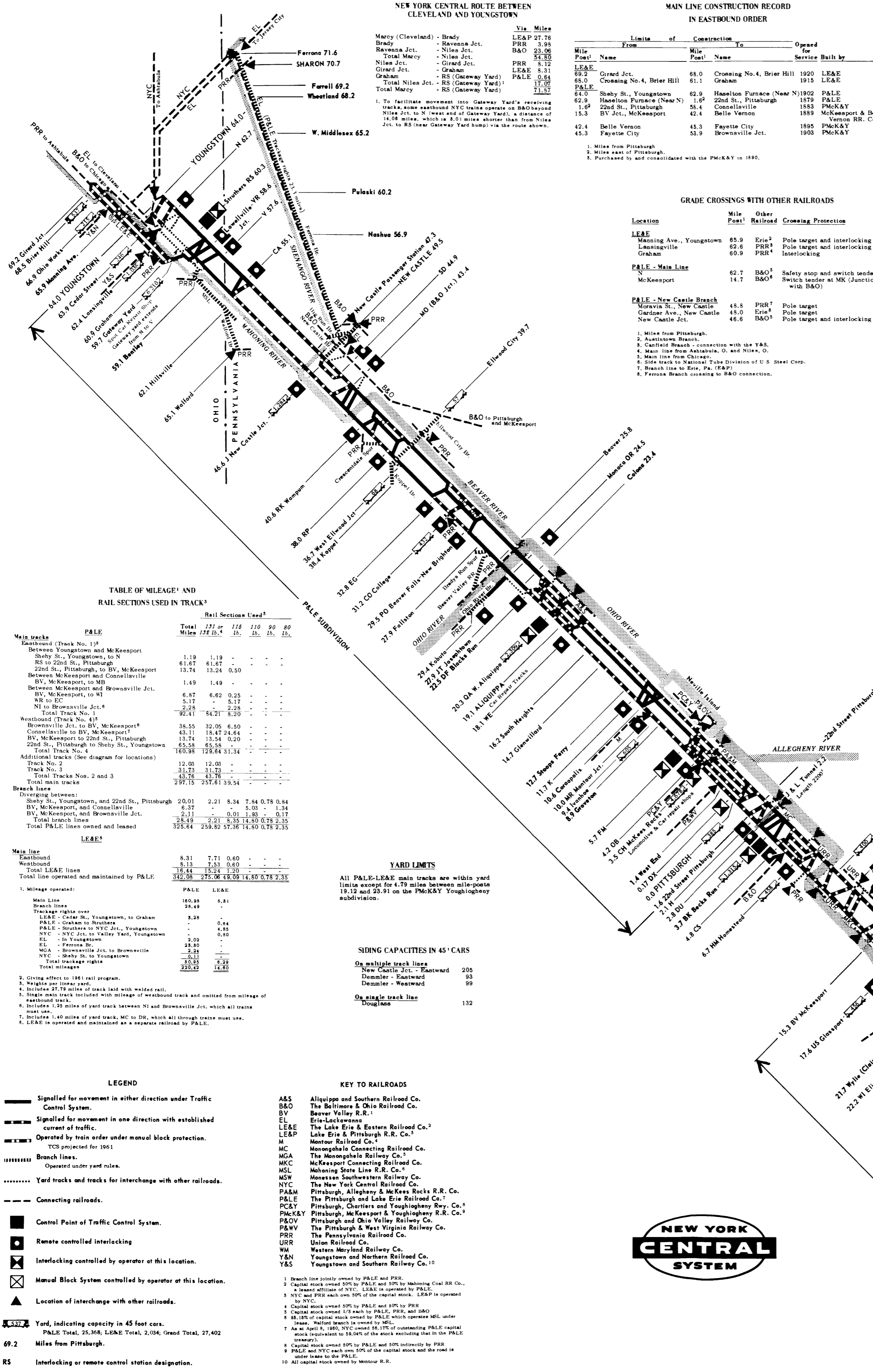
### WRECKING DERRICKS

| Location     | Capacity Tons | Type of Power |
|--------------|---------------|---------------|
| Youngstown   | 160           | Diesel        |
| McKees Rocks | 160           | Steam         |

### LOCATION OF LOCOMOTIVE FUEL DISPENSING FACILITIES

| Location          | Storage Capacity Gallons |
|-------------------|--------------------------|
| Gateway Yard      | 400,000                  |
| College           | 60,000                   |
| West Alliquippa   | 18,000                   |
| McKees Rocks      | 850,000                  |
| Gleason           | 8,000                    |
| P&LE Total        | 1,884,000                |
| LE&E - Lanesville | 15,000                   |
| Grand Total       | 1,899,000                |

1. Normal annual fuel oil consumption is 8,000,000 gallons. Total storage capacity equals about two months' requirements.



### TABLE OF MILEAGE AND RAIL SECTIONS USED IN TRACKS

| Main tracks                                      | Rail Sections Used <sup>1</sup> |            |       |       |      |
|--|---------------------------------|------------|-------|-------|------|
|  | Total                           | 121 or 118 | 110   | 90    | 80   |
| Eastbound (Track No. 1) <sup>2</sup>             |                                 |            |       |       |      |
| Between Youngstown and McKeesport                | 1.19                            | 1.19       | -     | -     | -    |
| Shelby St., Youngstown, to N                     | 61.67                           | 61.67      | -     | -     | -    |
| RS to 22nd St., Pittsburgh                       | 13.74                           | 13.24      | 0.50  | -     | -    |
| Between McKeesport and Connellsville             | 1.49                            | 1.49       | -     | -     | -    |
| BV, McKeesport, to MB                            | 6.87                            | 6.82       | 0.25  | -     | -    |
| BV, McKeesport, to N                             | 5.17                            | -          | 5.17  | -     | -    |
| NR to EC   | 2.24                            | -          | 2.24  | -     | -    |
| NI to Brownsville Jct. <sup>4</sup>              | 92.41                           | 84.21      | 8.20  | -     | -    |
| Total Track No. 1                                | 205.74                          | 195.14     | 17.26 | -     | -    |
| Westbound (Track No. 4) <sup>3</sup>             |                                 |            |       |       |      |
| Brownsville Jct. to BV, McKeesport <sup>6</sup>  | 38.55                           | 32.05      | 6.50  | -     | -    |
| Connellsville to BV, McKeesport <sup>7</sup>     | 43.11                           | 18.47      | 24.64 | -     | -    |
| BV, McKeesport, to 22nd St., Pittsburgh          | 13.74                           | 13.54      | 0.20  | -     | -    |
| 22nd St., Pittsburgh, to Shelby St., Youngstown  | 65.58                           | 65.58      | -     | -     | -    |
| Total Track No. 4                                | 160.98                          | 129.64     | 31.34 | -     | -    |
| Additional tracks (See diagram for locations)    |                                 |            |       |       |      |
| Track No. 2                                      | 12.03                           | 12.03      | -     | -     | -    |
| Track No. 3                                      | 31.73                           | 31.73      | -     | -     | -    |
| Total Tracks Nos. 2 and 3                        | 43.76                           | 43.76      | -     | -     | -    |
| Total main tracks                                | 297.15                          | 257.81     | 39.54 | -     | -    |
| Branch lines                                     |                                 |            |       |       |      |
| Diverging between:                               |                                 |            |       |       |      |
| Shelby St., Youngstown, and 22nd St., Pittsburgh | 20.01                           | 2.21       | 8.34  | 7.84  | 0.78 |
| BV, McKeesport, and Connellsville                | 6.37                            | -          | 6.03  | 1.31  | -    |
| BV, McKeesport, and Brownsville Jct.             | 2.11                            | -          | 0.01  | 1.93  | 0.17 |
| Total branch lines                               | 28.49                           | 8.22       | 15.38 | 14.80 | 0.78 |
| Total P&LE lines owned and leased                | 325.64                          | 256.02     | 54.92 | 14.80 | 0.78 |
| LE&E <sup>8</sup>                                |                                 |            |       |       |      |
| Eastbound  | 8.31                            | 7.71       | 0.60  | -     | -    |
| Westbound  | 8.13                            | 7.53       | 0.60  | -     | -    |
| Total LE&E lines                                 | 16.44                           | 15.24      | 1.20  | -     | -    |
| Total line operated and maintained by P&LE       | 342.08                          | 270.26     | 56.12 | 14.80 | 0.78 |

### YARD LIMITS

All P&LE-LE&E main tracks are within yard limits except for 4.79 miles between mile-posts 19.12 and 23.91 on the PMcK&Y Youghiogheny subdivision.

### SIDING CAPACITIES IN 45' CARS

| On multiple track lines    | Capacity |
|----------------------------|----------|
| New Castle Jct. - Eastward | 205      |
| Demmler - Eastward         | 93       |
| Demmler - Westward         | 99       |

On single track line  
 Douglas 132

### LEGEND

- Signalled for movement in either direction under Traffic Control System.
- Signalled for movement in one direction with established current of traffic.
- Operated by train order under manual block protection.
- TCS projected for 1961.
- Branch lines.
- Operated under yard rules.
- Yard tracks and tracks for interchange with other railroads.
- Connecting railroads.
- Control Point of Traffic Control System.
- Remote controlled interlocking.
- Interlocking controlled by operator at this location.
- Manual Block System controlled by operator at this location.
- Location of interchange with other railroads.
- Yard, indicating capacity in 45 foot cars.
- Miles from Pittsburgh.
- Interlocking or remote control station designation.

### KEY TO RAILROADS

- A&S Allegheny and Southern Railroad Co.
- B&O The Baltimore & Ohio Railroad Co.
- BY Beaver Valley R.R.
- EL Erie-Lackawanna
- LE&E The Lake Erie & Eastern Railroad Co.<sup>3</sup>
- M Montour Railroad Co.<sup>4</sup>
- MC Monongahela Connecting Railroad Co.
- MCA The Monongahela Railway Co.<sup>5</sup>
- MKC McKeesport Connecting Railroad Co.
- MSL Mahoning State Line R.R. Co.<sup>6</sup>
- MSW Monessen Southwestern Railway Co.
- NYC The New York Central Railroad Co.
- P&M Pittsburgh, Allegheny & McKees Rocks R.R. Co.
- P&LE The Pittsburgh and Lake Erie Railroad Co.<sup>7</sup>
- P&WY Pittsburgh, Charities and Youghiogheny R.R. Co.<sup>8</sup>
- PMcK&Y Pittsburgh, McKeesport & Youghiogheny R.R. Co.<sup>9</sup>
- P&OV Pittsburgh and Ohio Valley Railway Co.
- P&VY The Pittsburgh & West Virginia Railway Co.
- PRR The Pennsylvania Railroad Co.
- URR Union Railroad Co.
- WM Western Maryland Railway Co.
- Y&N Youngstown and Northern Railroad Co.
- Y&S Youngstown and Southern Railroad Co.<sup>10</sup>

1. Branch line jointly owned by P&LE and PRR.  
 2. Capital stock owned 50% by P&LE and 50% by Mahoning Coal RR Co.  
 3. Former affiliate of NYC. LE&E is operated by P&LE.  
 4. NYC and PRR each own 50% of the capital stock. LE&P is operated by NYC.  
 5. Capital stock owned 50% by P&LE and 50% by PRR.  
 6. Capital stock owned 1/3 each by P&LE, PRR, and MSW.  
 7. 80% of capital stock owned by P&LE which operates MSW under lease. Waiford branch is owned by MSW.  
 8. As of April 8, 1960, NYC owned 84.1% of outstanding P&LE capital stock (equivalent to 58.04% of the stock excluding that in the P&LE treasury).  
 9. Capital stock owned 50% by P&LE and 50% indirectly by PRR.  
 10. P&LE and NYC each own 50% of the capital stock and the road is under lease to the P&LE.  
 11. All capital stock owned by Montour R.R.



### SCALE OF TRACK MILES

