5. Salt River Project Connectivity Analysis

In this section we explore in greater depth the connectivity to SRP facilities and canal paths. We analyze connectivity from neighborhoods to SRP facilities and canals, as well as connectivity among SRP facilities. Addressing these issues could help reach SRP's automobile trip reduction goals and enable SRP to better serve the neighborhoods near the canals.

5.1. Connectivity To SRP Offices

For this analysis, the SRP Office of Sustainability identified 17 facilities to analyze (Table 11). Facilities in Queen Creek and Fountain Hills were outside the study area.

Table 11 – SRP facilities included in the analysis

Project Administration Building 1521 North Project Drive Tempe, 85281	Papago Buttes Facility 101 West Operations Drive Tempe, 85281
Crosscut Facility 998 West Washington Street Tempe, 85281	Information Systems Building 1600 North Priest Drive Tempe, 85281
PERA Club 1 East Continental Drive Tempe 85281	16th Street Facility 1616 East Lincoln Street Phoenix 85034
Tempe Service Center 110 East Elliot Road Tempe, 85284	Credit Union Building 1511 North Project Drive Tempe, 85281
27th Street Facility 2727 East Washington Street Phoenix, 85034	Kyrene Steam Plant 7005 South Kyrene Road Tempe, 85283
Foothills Training Center 7211 South 16th Street Phoenix, 85040	East Valley Service Center 7050 East University Drive Mesa, 85207
Santan Generating Plant 1005 South Val Vista Road Gilbert, 85296	Power Operations Building 6504 East Thomas Road Scottsdale, 85251
West Valley Service Center 221 North 79th Avenue Tolleson, AZ 85353	Southside Water Service Center 3160 South Alma School Road Mesa, 85210
Agua Fria Steam Plant 7302 West Northern Avenue Glendale, 85303	

Connectivity from neighborhoods to SRP facilities helps identify barriers that may face SRP employees in reaching work by bicycle. Figures 16 and 17 (next pages) show the RDI exclusively for connectivity to the nearest SRP facility. While some SRP employees may not work at the closest SRP from where they live, they are more likely to bike to work if they do. Also, were we to calculate the RDI

from each neighborhood to all SRP facilities, the RDI value would be greatly altered by connectivity to SRP workplaces far from the neighborhood to which few employees would likely bike. No RDI is computed for areas beyond 7 miles of any SRP facility, as this was the maximum biking distance analyzed in this study (for travel to work, CBDs, sports stadiums, and colleges).

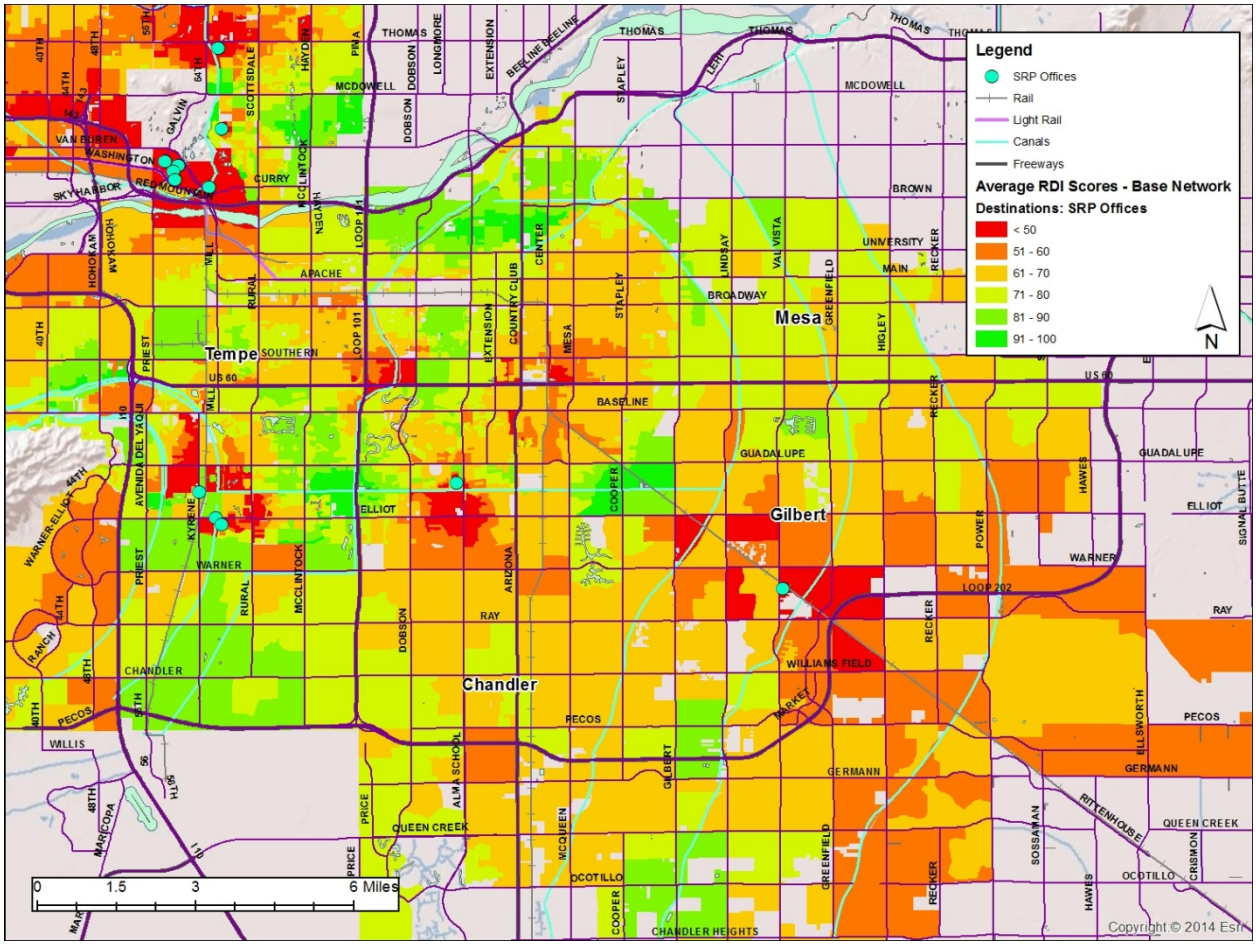

Figure 16. East Valley RDI scores for connectivity to the closest SRP facility from up to 7 miles away.

Moving from east to west, the Santan Generating Facility in Gilbert is best accessed from the southwest or north Mesa along the Eastern Canal, where one can see some extremely high (that is, good) RDIs in the 71-100 range. This illustrates that travel along canal paths, with their direct diagonal routes with low impedance, can provide excellent connectivity to SRP facilities situated near such canals. Connectivity from the east and southeast, however, is blocked by the same canal as well as by the UP railroad tracks and Loop 202. Generally speaking, RDI scores are better for neighborhoods on the same side of the railroad tracks and the canal as the Santan Generating Facility, and worse on the opposite side.

For the Southside Water Service Center on Alma School Road in Mesa, situated north of the Western Canal, we see a similar phenomenon. Employees can connect much more directly from the north side, while the neighborhoods south of the canal form a circle one-mile wide of RDIs below 50, meaning that the best available bike route has more than twice the impedance as a hypothetical direct route on a

residential street. On the other hand, the Western Canal provides great connectivity from the east and west, while the Western Power Line Trail provides great connectivity from due north.

The cluster of SRP facilities around Kyrene and Eliot in south Tempe shows dramatic differences in connectivity, ranging from RDIs below 50 in some directions and RDIs above 80 in other directions. Neighborhoods hemmed in by the L-bend in the Western Canal connect poorly, as do neighborhoods due east and due west on Elliot and due north on Kyrene, which are forced to travel on these major arterials with inconsistent bike infrastructure. In interpreting RDIs in this area, remember that each neighborhood is assigned to its most accessible SRP facility only, not to the average of these three facilities, and that RDIs for extremely close areas can be exaggerated.

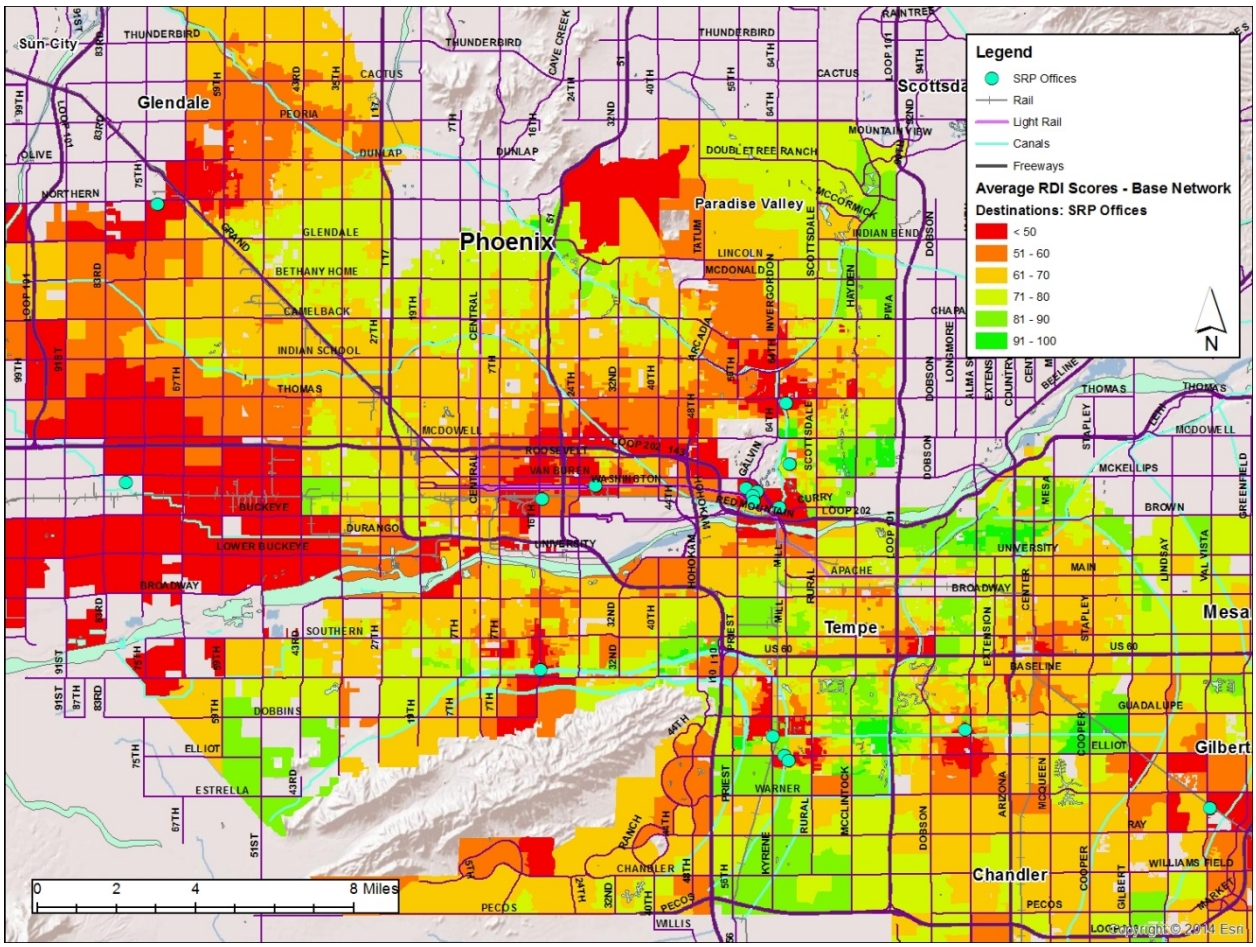

Figure 17. Central and West Valley RDI scores for connectivity to the closest SRP facility from up to 7 miles away.

The Power Operations Building near Thomas and 64th St. in Phoenix has relatively poor connectivity to the east, north, and west, but excellent connectivity through the residential neighborhoods to the southeast and along the Arizona Canal from the northeast and northwest. The PERA Club, situated in and around parks and residential neighborhoods, has great connectivity in most directions except from due south, from which a significant doubling back is required to reach the actual facility.

We skip over the SRP headquarters area for the moment and continue moving west—we will come back to the SRP headquarters later in this section with a more detailed analysis. In Central Phoenix, the 27th St. Facility on East Washington St. and the 16th St. Facility on East Lincoln St. both exhibit relatively poor connectivity in most directions. Numerous linear barriers plague this area, such as Loop 202, AZ 51, and the light rail tracks, as well as large areal barriers such as large industrial facilities and the airport. Direct connectivity actually gets better to these facilities the farther away one gets in the north, northwest, and west directions.

Connectivity is mixed to the Foothills Training Center in South Phoenix on 16th St. just north of the Western Canal. Once again, this can be attributed to the canal's role as both bike corridor and barrier. Neighborhoods south of the canal often have to backtrack down to Baseline Rd. and travel north on 16th St. to reach the Training Center (16th St. has the only bridge over the canal between 10th St. and 24th St.). RDIs are also poor due north on 16th St. because of the high impedance of riding on arterial streets with no bike infrastructure. Yet good RDI scores radiate out to the east and west along the Western Canal's North Highline Lateral Trail.

The Agua Fria Steam Plant on Northern Ave. in Glendale and the West Valley Service Center on 79th Ave. in Tolleson lie just inside (Glendale) and just outside (Tolleson) of our study area. Therefore, RDIs are shown in only some directions from these two SRP facilities. The Tolleson facility suffers from very poor connectivity. Part of this is due to being sandwiched between freight railroad tracks to the south and the I-10 to the north, but even directly to the east connectivity is terrible due to an almost complete lack of bike infrastructure in this industrial zone (see Figure 6). For the Agua Fria Steam Plant, the barrier effect of Grand Ave. can be seen in the low RDI scores to the northeast, but on the facility's side of Grand Ave., RDI scores are hurt by a lack of bike infrastructure on arterial streets. While there is a canal near the Tolleson facility, there is no path, only a service road with many discontinuities. What decent RDI scores are achieved are mostly by routing via residential streets.

Figures 16 and 17 are not well suited to analyzing the facilities near the SRP headquarters, for several reasons. First, because each census block or block group is allocated to its closest (in terms of impedance) SRP facility, and the facilities are so tightly clustered, it is unclear to which facility the RDI is calculated from any given polygon. Second, because we used the census designations of block groups for any area where the census block had fewer than 10 residents, many of the areas directly surrounding the Project Administration Building were modeled using the coarser geographic block groups. Therefore, we reanalyzed the connectivity solely to the Project Administration Building using all census blocks within 7 miles, regardless of whether there are other SRP facilities that are closer to those neighborhoods. The results are shown in Figure 18 (next page). The connectivity analysis within a 7-mile buffer around the Project Drive SRP office shows troubled areas around the terminus of the Hohokam Freeway and 48th St. There is also some disconnect around Papago Park to the north and west as well as south of Tempe Town Lake. However, connectivity is good from Downtown Scottsdale thanks to the canal connections along the Arizona Canal Trail and the path along the Arizona Cross Cut Canal. The other two well-connected areas within the buffer are the Riverside Mesa area connected by the Tempe Town Lake canal system paths and the Guadalupe area connected via the Hardy Drive bike lanes.

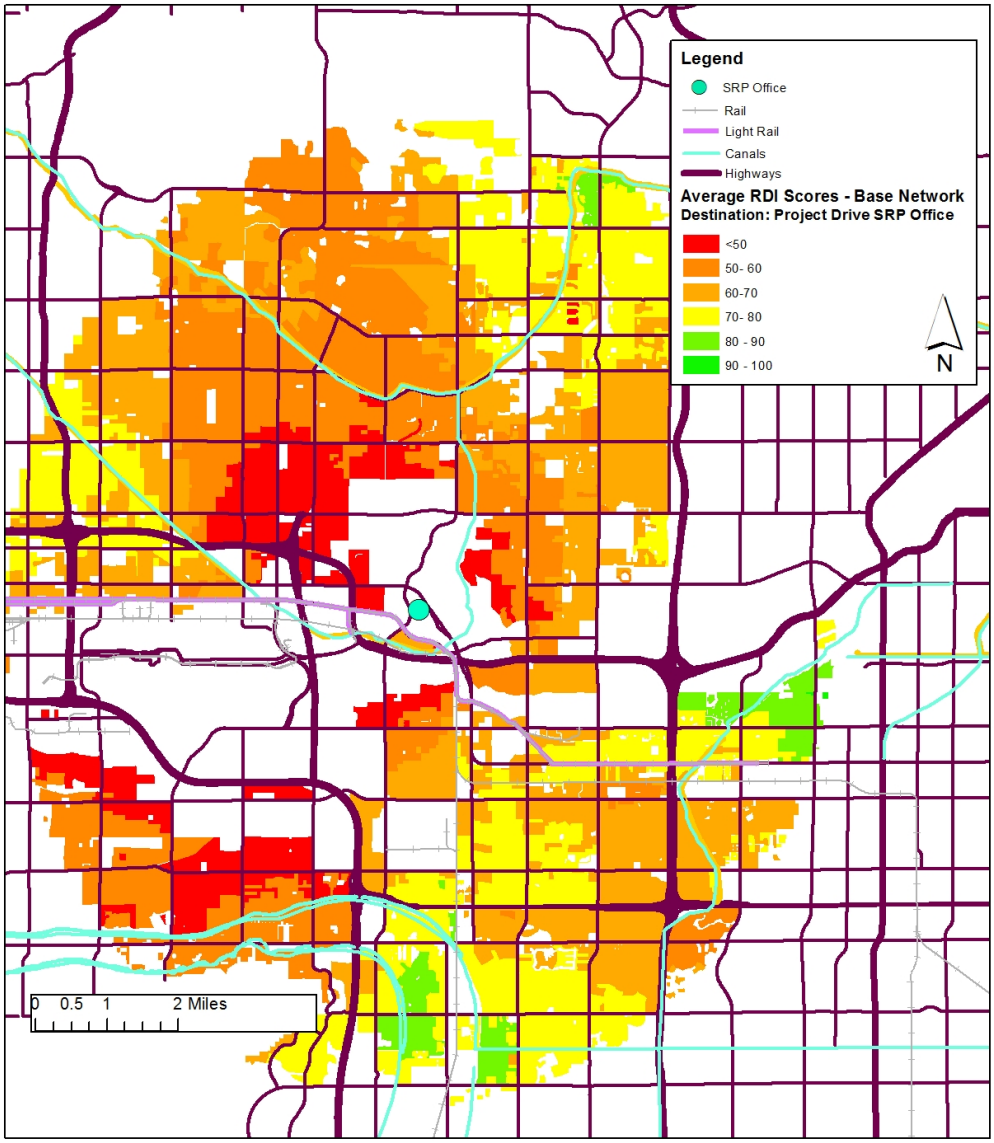

Figure 18. RDI scores for connectivity to the Project Administration Building from census blocks up to 7 miles away.

5.2. Connectivity To and Among SRP Offices

Analyzing connectivity *among* SRP offices is important for understanding where barriers may be faced by SRP employees in traveling between offices by bicycle as a substitute for driving. To investigate the barriers to biking between SRP facilities, we computed the RDI among the 17 major SRP facilities. Each facility was treated as both an origin and a destination. The RDI score for each facility is the average RDI to all other facilities. Again, when looking at these maps, keep in mind that RDI connectivity does not take into account proximity, and in fact, for very short trips, small detours can lead to disproportionally poor RDI scores. Figure 19 (next page) presents these results for the entire Valley, while Figure 20 (page 40) zooms in on the SRP headquarters area.

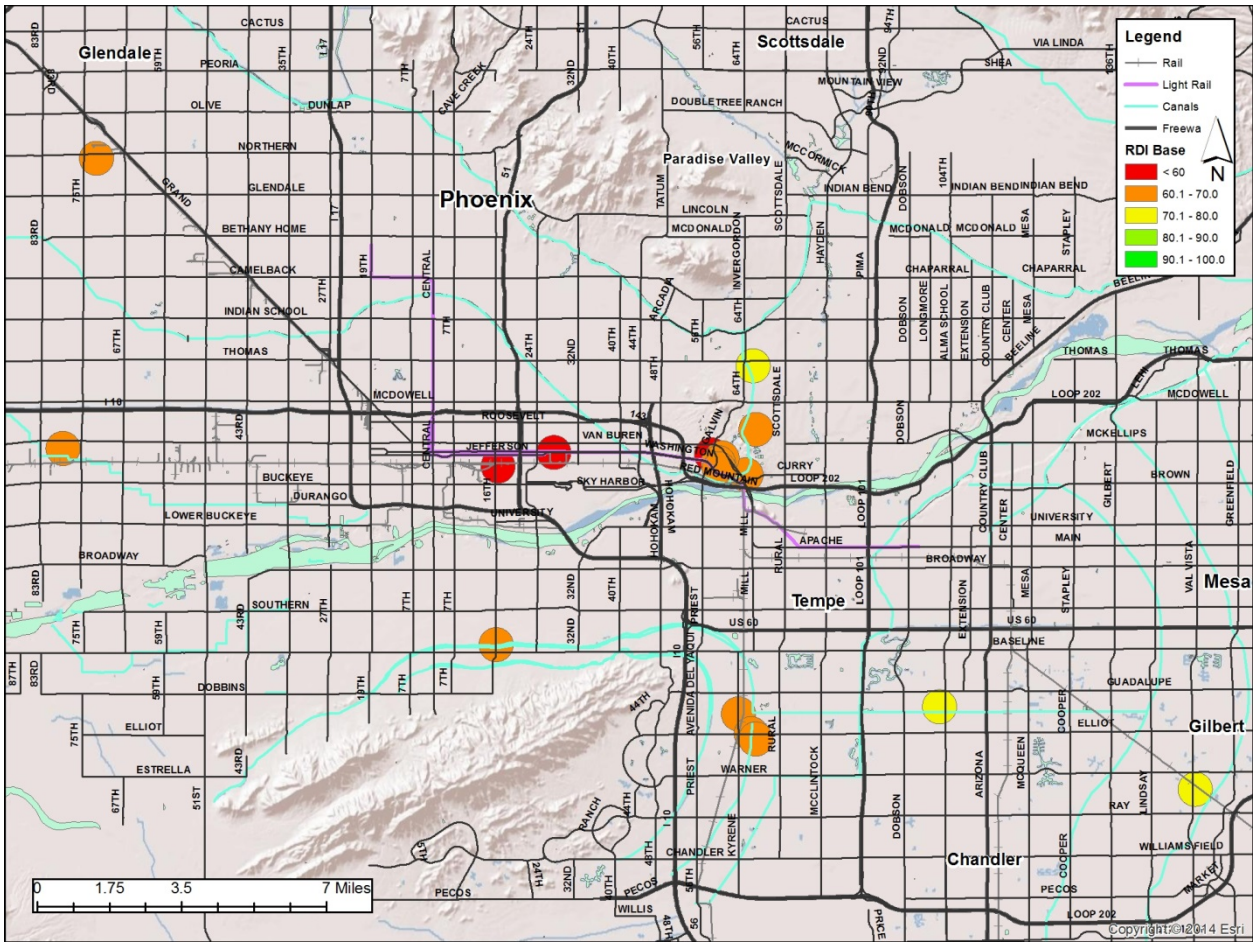

Figure 19. RDI scores for connectivity from each SRP facility to every other facility.

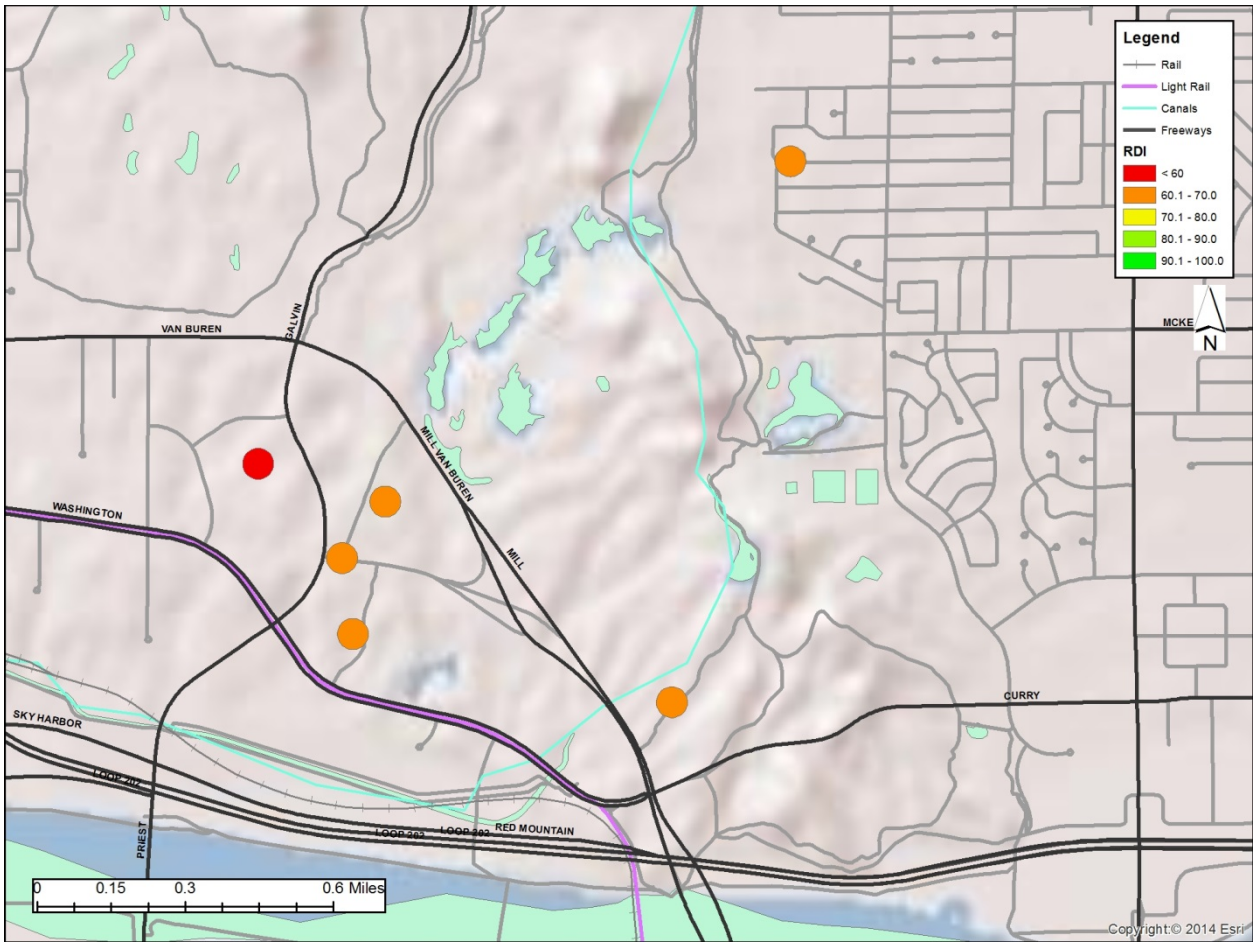

Figure 20. RDI scores for connectivity from each SRP facility to every other facility—close-up of headquarters area.

Results for inter-office travel are somewhat consistent with the results for connectivity to neighborhoods, with a few notable exceptions. The two central Phoenix facilities still have the worst connectivity to all other facilities, due again to Loop 202, AZ 51, I-10, and Sky Harbor. The two far East Valley facilities again have excellent connectivity, partly due to the ability to connect to numerous other facilities via the Western Canal path, but the relative isolation of these facilities make it somewhat unlikely that many employees would take advantage of that connectivity to travel to or from these two locations. One result that stands out is the reversal of the RDI score for the Power Operations Building near 64th St. and Thomas in Phoenix. While it had very poor connectivity to nearby neighborhoods, especially those to the north, it has excellent connectivity via 64th St. and Cross-Cut Canal path to the cluster of other SRP facilities to the south. Travel between the main cluster and the Power Operations Building by bicycle could be encouraged by SRP.

5.3. Connectivity to SRP Canals

For access to canal paths, we decided that an important aspect of connectivity was how easy it was to arrive at a “mid-point” on a canal path halfway between where two arterial roads cross the canal. This approach would highlight areas where it was difficult to access the canal path from a neighborhood

street rather than having to access it from the nearest arterial street, which is important for safe bicycle access to the canals. Figures 21 (below) and 22 (next page) show the connectivity to canals in the east and west Valley. It can be seen that certain 1-mile blocks can access the canal paths by a fairly direct route from one or both sides of the canal, while others have fairly indirect access to the midpoints.

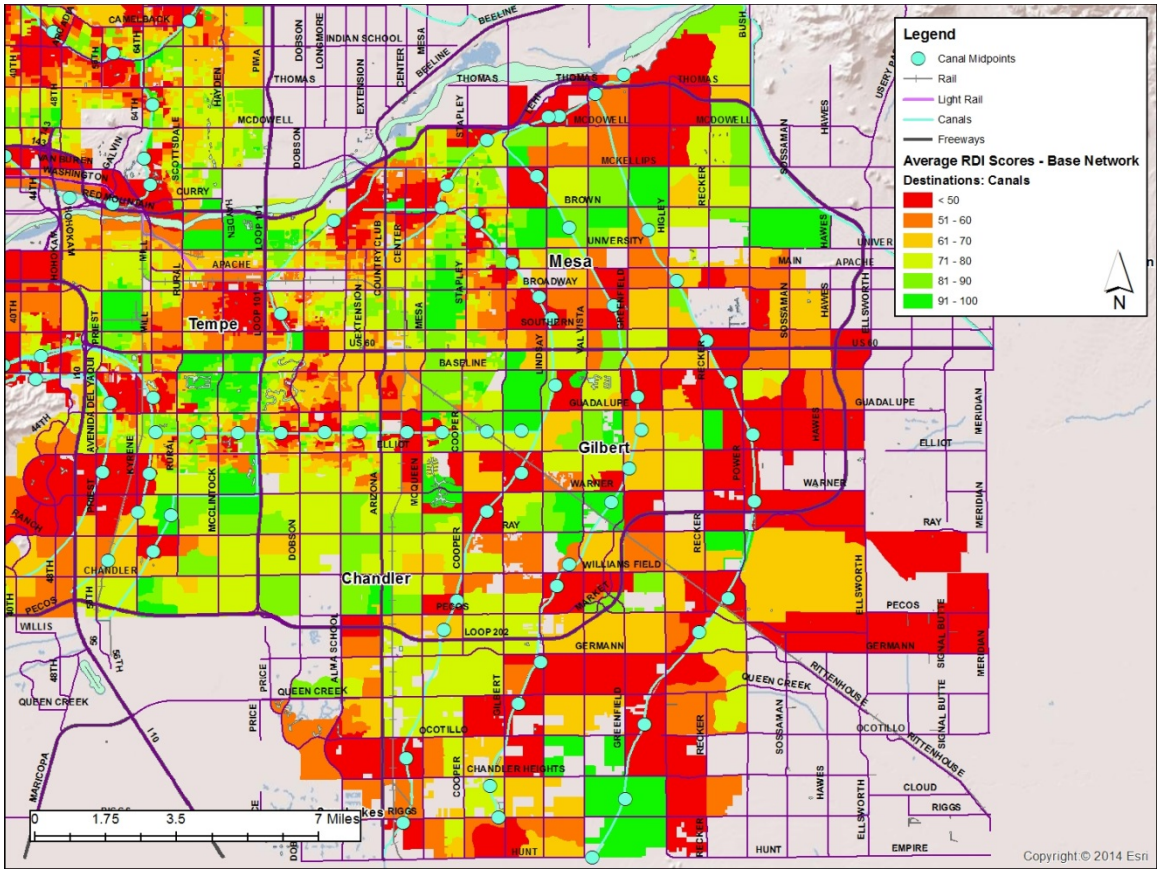

Figure 21. Existing connectivity to canal mid-block points in the East Valley.

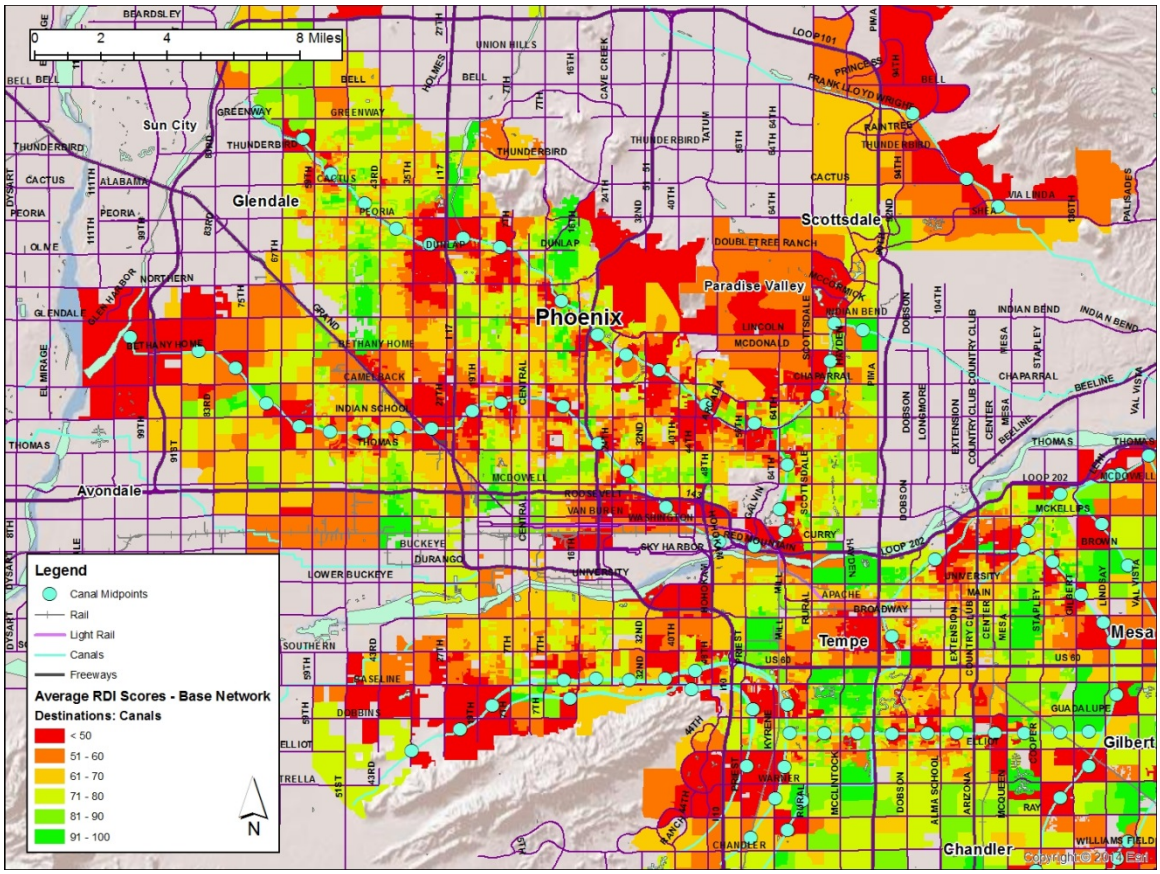

Figure 22. Existing connectivity to canal mid-block points in the Central and West Valley.

The areas with low RDI scores could be investigated further to assess whether there are any relatively inexpensive solutions to give the neighborhoods better access. In cases where access is good on one side of the canal and poor on the other, a small bridge might be able to solve the problem. In other cases, access to the canal might be blocked by a row of houses that back up to the canal, with no way for bike riders to cut between homes for several blocks. In still other cases, access to the canal mid-block points could be restricted by a barrier having nothing to do with the canals per se, such as a freeway barrier (see the area west of Loop 101 between Broadway and Southern in Tempe in Figure 11 on page 26).