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## Commuter Rail Transit and Economic Development

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1 **Commuter Rail Transit and Economic Development**

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41

42 **Abstract**

43 Commuter rail transit (CRT) is a form of rail passenger service connecting downtowns and other  
44 major activity centers with suburban commuter towns and beyond. Between 1834 and 1973,  
45 only three public CRT systems were built in the U.S. serving New York, Chicago and then  
46 Boston. There are now 25 such systems. Modern CRT systems aim to expand economic  
47 development in metropolitan areas. But do they? Our paper evaluates the economic development  
48 performance of five modern CRT systems. We find that several economic sectors perform well  
49 within 0.50 miles of CRT stations. We offer planning and policy implications.

50

51 **Introduction**

52 There is scant empirical analysis of whether and the extent to which commuter rail stations are  
53 associated with economic development. Historically, commuter rail service connected distant  
54 suburbs with downtowns in the northeast and Great Lakes regions, serving mostly affluent  
55 business people working in downtowns. In recent years, commuter rail service has opened  
56 outside these older metropolitan areas. One implicit purpose of these systems is to generate  
57 economic development especially around commuter rail stations. In this paper we explore this  
58 connection for five commuter rail systems.

59

60 Commuter rail transit (CRT) is a form of rail passenger service connecting downtowns and other  
61 major activity centers with suburban commuter towns and beyond. CRT systems are passenger  
62 rail that occupies a niche between intercity rail and heavy rail metro systems. They serve lower-  
63 density suburbs by connecting them to downtowns, city centers, and other major activity centers.  
64 CRT systems usually have less frequent of service than heavy rail metro systems, often hourly,  
65 or just during peak commuting hours. Their service areas extend 10 to 100 miles from  
66 downtown, traveling at speeds from about 30 to more than 100 miles per hour. Due to these  
67 longer travel distances and travel times, they provide more seating options than light rail. They  
68 are typically not electrified, although portions may be. Although the use of tunnels is not  
69 unknown, they are typically not grade separated. They typically make use of existing railroad  
70 rights-of-way, and often share track with freight or intercity rail lines.

71

72 A number of privately-operated railroads have long provided commuter services. In *The*  
73 *Exurbanites*, August Spectorsky (1955) chronicled the lifestyles of families who lived in Bucks  
74 County, Pennsylvania but whose breadwinners commuted daily to work through New Jersey into  
75 midtown or downtown Manhattan via privately operated railroads. Amtrak now provides these  
76 longer-distance commuter services, notably between Boston and Washington, DC.

77

78 The nation's first public commuter rail service was launched in 1834. It was the Metropolitan  
79 Transit Authority's Long Island Rail Road connecting Long Island with Manhattan Island, New  
80 York. Nearly 70 years later, the nation's second public commuter rail service started (in 1903)  
81 connecting South Bend, Indiana with Chicago. It took nearly another 70 years (1973) before the  
82 nation's third public commuter rail service was launched, connecting Boston with its suburbs.  
83 Since 1983, another 22 public CRT systems have been initiated. Table 1 shows key features of  
84 all public systems in place as of 2013.

85

86

87

## **The Unexplored Connection between Commuter Rail Transit and Economic Development**

Commuter Rail (CRT) is part of the family of fixed guide-way transit systems, which includes both rail and Bus Rapid Transit (BRT). Unlike regular buses, streetcars, or mixed traffic light rail, CRT belongs which is formally ‘rapid’ transit, which has exclusive right of way. Rapid transit systems only stop at stations. This family includes metro (subway) systems, elevated systems, and other third-rail systems. While there is extensive literature on the economic development effects of other fixed guide-way transit modes, there is little research on the effects of CRT systems.

Aside from making it more convenient for middle and high income earners to work downtown while keeping their families in the suburbs, CRT systems play a significant role in urban economic development by mitigating the one of the dis-economies of urban aggregation, namely transportation congestion. Yet the existing literature provides no explicit assessment of the role of CRT stations in economic development.

In this paper, we identify the nascent role of CRT as an economic development strategy for moderate and smaller metropolitan areas outside the densely developed areas of the Northeast and Midwest. We then identify five CRT systems in the South and West for analysis. We compare those systems in terms of change in jobs near the CRT stations as well as change in those areas’ share of workers by low, middle, and higher wage brackets. We offer implications for the role of CRT in advancing economic development.

### **Agglomeration Economies, Automobile Dependency, and Fixed Guide-way Transit**

In this section we review the role of agglomeration economies in economic development, assess how the advantages of agglomeration economies are undermined by automobile dependency, and summarize the role of fixed-guideway transit systems in recreating those economies.

Cities are formed and grow in large part by creating agglomeration economies (Glaeser 2011). Annas, Arnott and Small define the term as “the decline in average cost as more production occurs within a specified geographical area” (1998, p. 1427). As more firms in related sectors cluster together, costs of production fall as productivity increases. These economies can spill over into complementary sectors (Holmes 1999). Cities can become ever larger as economies of agglomeration are exploited (Ciccone and Hall 1996). Transportation improvements make it possible to reduce transportation times, increasing the size of market areas, increasing the effective size of industrial clusters. If cities get too large, however, transportation congestion may have a counter-productive force, encouraging the relocation of firms (Bogart 1998). Highway projects have been shown to induce this change in metropolitan form, and at a net cost to society (Boarnet 1997; Boarnet and Haughwout 2000). Because firm location follows residential relocation (Ganning and McCall 2012; Renkow and Hoover 2000), changes in firm location may not be temporally trackable to specific highway projects. If we presume the urban rent curve to be a proxy for accessibility, any transportation improvement having a metropolitan-area effect will shift the value surface of the land market. Thus, firm location in a metropolitan area is a sort of slow-motion equilibrium assignment process. In a static or stagnant economy, any transportation improvement will just shuffle jobs (and housing) around.

133 More recent research shows that the degree of suburbanization significantly varies within  
134 metropolitan regions, in accordance to both variation in the levels of population de-concentration  
135 drivers and due to sub-regional fixed effects (Ganning and McCall 2012). Thus, the preservation  
136 of and creation of new agglomeration economies within metropolitan regions varies  
137 tremendously and can be influenced by policy decisions.  
138

139 A key role of transit is thus to mitigate transportation congestion effects of agglomeration. Voith  
140 (1998) characterizes public transit as essentially “noncongestible” and is best suited to sustaining  
141 agglomeration economies in downtowns and secondary activity centers, and along the corridors  
142 that connect them. Nonetheless, not all economic sectors benefit from agglomeration economies  
143 and/or density.  
144

145 In part because of their role in facilitating agglomeration economies, there is a growing body of  
146 research showing that rail-based public transit enhances economic development (see Nelson et  
147 al. 2009). Transit improves accessibility between people and their destinations by reducing travel  
148 time relative to alternatives (Littman 2009). At the metropolitan scale, adding transit modes in  
149 built-up urban areas increases aggregate economic activity (Graham 2007). There is another  
150 aspect of agglomeration economies identified by Chapman and Noland (2011). Although transit  
151 systems can lead to higher density development by shifting new jobs and population to station  
152 areas, it could lead instead to the redistribution of existing development even in the absence of  
153 growth, as in the case of Detroit (Galster 2012).  
154

155 Economic development can be measured in many ways. Our focus here is whether, and to what  
156 extent, there is a link between a specific form of transit, CRT, and employment changes. We are  
157 specifically concerned with the changes both the numbers and concentration of jobs.  
158 Theoretically, areas proximate to commuter rail stations should have much better accessibility.  
159 Commuter Rail systems tend to run parallel to major freeway corridors, and the main impetus for  
160 their construction tends to be mitigation congestion along parallel freeway corridors. By  
161 reducing the effects of congestion, CRT systems should abet the preservation of existing  
162 agglomeration economies and the creation of new ones. Without the diseconomies of congestion,  
163 existing employment clusters should continue to grow, and the relative concentration of  
164 employment within clusters served by a CRT should continue to increase.  
165

166 A necessary caveat for this phenomenon to occur is fixed amount of urbanized area. While most  
167 metropolitan areas with commuter rail system are characterized by geographical and regulatory  
168 constraints to their expansion, they cannot be considered fixed. Thus, employment concentration  
169 near CRT stations may not always rise. In such cases, it is possible to assess the effect of  
170 proximity to a CRT station by determining if employment near the station grew faster than  
171 would be expected on the basis of general metropolitan growth and industry mix.  
172

173 Secondly, we are concerned about which industries in which total employment or employment  
174 concentration increase. We know from recent work that not all firms benefit from transit. In their  
175 recent study of employment within one-half mile of transit stations serving 34 transit systems,  
176 Belzer, Srivastava and Austin (2011) found that while jobs increase in the arts, entertainment,  
177 and recreation sector as well as the food and accommodation, and health care and social  
178 assistance sectors, they fell in the manufacturing sector. They also found that public

179 administration had the greatest share of jobs found near transit stations. Several other sectors also  
180 concentrated around transit stations such as professional, scientific, and technical services, and  
181 retail. On the other hand, as a whole the station areas experienced declining shares of jobs  
182 relative to their regions, with the exception of jobs in the utilities, information, and the arts,  
183 entertainment, and recreation sectors. Belzer, Srivastava and Austin surmised that much of the  
184 metropolitan job growth continues to favor auto-oriented locations. Their study did not report  
185 results for individual systems or even types of systems. Also, with a study period from 2002 to  
186 2008, it did not include the Great Recession. In sum, there is no research directly linking CRT to  
187 economic development. We aim to close this gap in literature.

### 188 189 **Research Question**

190 Fixed-guideway transit systems generally should capture a higher share of jobs in certain  
191 economic sectors than the metropolitan area as a whole (Belzer, Srivastava & Austin 2011).  
192 Whether this applies to CRT as well is unknown. Our research question is simple:

193  
194 *Do public commuter rail stations capture proportionately more jobs in certain sectors than the*  
195 *metropolitan area as a whole over time?*

196  
197 We mean the term “capture” to mean the share of total jobs, and jobs by 2-digit NAICS sectors,  
198 that are within 0.25 and 0.50 mile of a CRT station, and whether that share changes from the  
199 beginning of the study period (2002) to the end (2011). We elaborate on this below.

### 200 201 **Research Design**

202 Given that the employment capture rate and change in rate over time is our principal concern we  
203 choose descriptive and economic base (location quotient and shift-share) analysis approaches.  
204 Descriptive analysis was used to compare jobs by 2-digit NAICS sector in the base year (2002)  
205 to the most recent year for which data are available (2011). Location quotients are used to  
206 calculate industry-specific capture rates at the beginning and ending years of analysis. Shift-  
207 share analysis is used to estimate the sources of those changes in capture over time??. We want  
208 to see whether there are intra-metropolitan shifts in the share of jobs by sector our region in the  
209 metropolitan area itself.

### 210 211 **Method**

212 We will first report absolute shares of jobs within 0.25 and 0.50 mile of CRT stations in 2002  
213 and compare those shares in 2011. We will then report location quotients (LQ) for each year,  
214 again comparing changes over time. LQ analysis allows us to decompose changes in shares of  
215 jobs between transit and control corridors during the same time period. This has the advantage of  
216 identifying economic sectors that are attracted to, or repelled by, transit corridors during  
217 economic shocks and recovery.

218  
219 LQs are calculated as the share of jobs in one economic sector compared to (divided by) all jobs  
220 in that small area as the numerator, compared to (divided by) the share of all jobs in a larger area  
221 compared to (divided by) all jobs in that area as the denominator.<sup>1</sup> They are an efficient way to  
222 assess concentrated a particular economic sector is in a region compared to other sectors, and  
223 compared to other parts of the same region such as transit and control corridors in our study.

224

225 LQs for economic sectors quantifying how “concentrated” the sector is in the smaller area  
226 compared to the larger one. Because they can be measured at any given point in time, changes in  
227 LQs can identify emerging or lagging economic activity in a specific sector of a smaller area  
228 relative the larger one, again in our case transit and control corridors compared to the  
229 metropolitan area as a whole. LQs can be considered a measure of the capture rate in a given  
230 sector so that LQs >1.0 indicate local advantage in attracting jobs. Over time, as LQs rise or fall,  
231 analysis can detect growing or declining attractiveness of the smaller area. In our case, if transit  
232 corridor LQs rise in some sectors over time such would indicate growing attractiveness of the  
233 corridor for new economic activity.

234  
235 Third, we will use shift-share analysis to conclude our study. The first two techniques are  
236 straight-forward.

237 Shift-share analysis assigns the change or shift in the number of jobs with respect to the region,  
238 other economic sectors, and the local area. The “region” can be any level of geography and is  
239 often the nation or the state. In our case, the region is the Metropolitan Area.

240 The “local” area is often a city or county or even state but it can be any geographic unit that is  
241 smaller than the region. Our local areas are the station areas within 0.25 miles and between 0.25  
242 and 0.50 miles of the nearest CRT station. We call this the CRT station area. As shifts in the  
243 share of jobs may vary by sector over time because of changes in economic sector mixes there is  
244 also an “industry mix” adjustment that we call “sector mix”.

245  
246 Adapting notations by the Carnegie Mellon Center for Economic Development (no date), the  
247 shift-share formula is:

$$248 \quad SS_i = MA_i + SM_i + CRT_i$$

249  
250  
251 Where

252  
253  $SS_i$  = Shift-Share  
254  $MA_i$  = Metropolitan Area share  
255  $SM_i$  = Sector Mix  
256  $CRT_i$  = CRT station area shift

257  
258 The Metropolitan Area (MA) share measures by how much total employment in a CRT station  
259 area changed because of change in the metropolitan area economy during the period of analysis.  
260 If metropolitan area employment grew by 10 percent during the analysis period, then  
261 employment in the CRT station area would have also grown by 10 percent. The Sector Mix (SM)  
262 identifies fast growing or slow growing economic sectors in a CRT station area based on the  
263 metropolitan area growth rates for the individual economic sectors. For instance, a CRT station  
264 area with an above-average share of the metropolitan area’s high-growth sectors would have  
265 grown faster than a CRT station area with a high share of low-growth sectors. The CRT station  
266 area shift, also called the “competitive effect”, is the most relevant component. It identifies a the  
267 portion of the change in jobs attributable to characteristics of the local area (station area). A  
268 leading sector is one where that sector’s CRT station area growth rate is greater than its  
269 metropolitan area growth rate. A lagging sector is one where the sector’s BRT station area  
270 growth rate is less than its metropolitan area growth rate.



271

272 The equations for each component of the shift-share analysis are:

273

274  $MA = ({}_i\text{CRT station area}_{t-1} \cdot MA_t / MA_{t-1});$

275  $SM = [({}_i\text{CRT station area}_{t-1} \cdot {}_iMA_t / {}_iMA_{t-1}) - MA];$  and

276  $CRT = [{}_i\text{CRT station area}_{t-1} \cdot ({}_i\text{BRT station area}_t / {}_i\text{BRT station area}_{t-1} - {}_iMA_t / {}_iMA_{t-1})].$

277

278 Where:

279

280  ${}_i\text{CRT station area}_{t-1}$  = number of jobs in the CRT station area sector (i) at the beginning of the  
281 analysis period (t-1);

282  ${}_i\text{CRT station area}_t$  = number of jobs in the CRT station area in sector (i) at the end of the analysis  
283 period (t);

284  $MA_{t-1}$  = total number of jobs in the metropolitan area at the beginning of the analysis period (t-  
285 1);

286  $MA_t$  = total number of jobs in the metropolitan area at the end of the analysis period (t);

287  ${}_iMA_{t-1}$  = number of jobs in the metropolitan area in sector (i) at the beginning of the analysis  
288 period (t-1); and

289  ${}_iMA_t$  = number of jobs in the metropolitan area in sector (i) at the end of the analysis period (t).

290

## 291 **Study Areas**

292 We selected all five CRT systems that were in the South and West, not in one of the top 10  
293 largest combined statistical areas, and having more than one million riders in 2013 (see Table 1).  
294 They include Albuquerque, Miami, Salt Lake City, San Diego and Seattle. Key features of each  
295 study area follow.

296

### 297 *Rail Runner*

298 The RailRunner runs along a 97 mile corridor from Santa Fe to Albuquerque and south to Belen  
299 (see Figure 1). It began with 3 stations in 2006 and was expanded to 13 stations by 2013. It was  
300 developed as part of an ongoing project to connect Albuquerque with Santa Fe and relieve  
301 congestion along I-25, and almost more of a regional rail system than a commuter rail, requiring  
302 over two hours of travel from one end to the other. It makes use of existing freight rail right of  
303 way, and consists largely of single track with passing sidings.

304

### 305 *Tri-Rail*

306 This study examines Miami-Dade commuter rail system, Tri-Rail, a heavy rail rapid transit  
307 system. Opened in 1984, it had 70 miles of track along a freight rail corridor with 19 park and  
308 ride stations. The corridor was intended as congestion relief for the parallel I-95 corridor. It has  
309 gradually added several additional stations over the past few years. As a commuter rail system,  
310 its length is extensive as it connects multiple metropolitan areas running along the narrow strip  
311 of land between the Atlantic Ocean and Lake Okeechobee (see Figure 2).

312

### 313 *FrontRunner*

314 The Utah Transit Authority's Front Runner commuter rail system started operations in 2008. It  
315 has since been extended to almost double its length. Only the initial segment between downtown

316 Ogden and downtown Salt Lake City is used in our analysis. The study corridor has 8 stations  
317 along 42 miles of track. The corridor was intended as congestion relief for the parallel I-15  
318 corridor. As seen in Figure 3, the FrontRunner runs down the spine of a long, narrow  
319 metropolitan area.

320

### 321 *Coaster*

322 The Coaster is a commuter rail service that operates in the central and northern coastal regions of  
323 San Diego County, California. The service is operated by TransitAmerica Services through a  
324 contract with North County Transit District (NCTD). The Coaster has 8 stations along 41 miles  
325 of track. Its route is shown in Figure 4.

326

### 327 *Sounder*

328 Sounder commuter rail is a regional rail service operated by the Burlington Northern-Santa Fe  
329 Railroad on behalf of Sound Transit serving the greater Seattle metropolitan area. Service began  
330 in 2000 and by 2013 it had 9 stations along 80 miles of track. The corridor was intended as  
331 congestion relief for the parallel I-5 corridor between Everett and Seattle. Its service area runs  
332 the narrow urbanized land area is between the Cascade Mountains and Puget Sound, as seen in  
333 Figure 5.

334

## 335 **Data**

336 We use data from the Longitudinal Employer-Household Dynamics (LEHD) program which is a  
337 venture of the Center for Economic Studies and the Census Bureau. The data offers public-use  
338 information combining federal, state and Census Bureau data on employers and employees under  
339 the Local Employment Dynamics (LED) Partnership. With the exception of Massachusetts, all  
340 states and the District of Columbia participate in the LED Partnership. As we are interested in  
341 employment data, the LEHD provides census block level employment at the 2-digit level of the  
342 North American Industrial Classification System (NAICS). However, we consider only those  
343 jobs that normally require space to occupy; as such, we do not include the natural resources  
344 (NAICS 11 and 21) or construction (NAICS 23) sectors.<sup>2</sup>

345

346 For all metropolitan areas included in our analysis, such data are available from 2002 through  
347 2011, a span of 10 years. For each system we use figures for 2002 and 2011. This provides for  
348 consistency in data analysis while also aiding in interpreting results, as will be seen next. In the  
349 case of the Rail Runner and FrontRunner systems, which are the newest and started operations  
350 after 2002, those systems were planned if not under construction in 2002 or shortly thereafter.

351

## 352 **Economic Development Outcomes**

353 In this section we assess economic development performance in terms of descriptive changes,  
354 capture-rate changes, and shift-share outcomes over the study period for all five CRT systems  
355 combined.

356

### 357 *Descriptive Changes*

358 Table 2 reports the change and percent change in jobs for the selected CRT systems within 0.25  
359 mile, within 0.50 mile and between 0.25 and 0.50 mile of CRT stations over the period 2002  
360 through 2011. It also reports those sectors that grew or declined for all 34 systems studied by

361 Belzer, Srivastava and Austin for the period 2002 through 2008; we use their analysis to compare  
362 and contrast CRT outcomes.

363  
364 For the area within 0.25 mile of CRT stations, total employment remained about the same yet  
365 employment in several sectors grew especially Utilities, Transportation and Warehousing, and  
366 Arts, Entertainment and Recreation. The outcome for the first group of sectors is sensible as  
367 CRT systems largely use existing freight lines. We are perplexed by the outcome for Arts,  
368 Entertainment and Recreation. Out to 0.50 miles total employment grew. With one exception  
369 (Arts, Entertainment and Recreation) all sectors that grew within 0.25 mile also grew out to 0.50  
370 mile along with several others, notably the Real Estate, Management, Administrative, Health and  
371 Social Services, and Public Administration sectors.

372  
373 While much if not all the literature on TODs focuses on the first 0.50 mile from transit stations,  
374 our analysis allows for differentiation the first and next 0.25 mile. For the band between 0.25 and  
375 0.50 mile, Table 2 shows substantial job growth overall as well as in several sectors.

376  
377 These results are very different from those found by Belzer, Srivastava and Austin for 34 transit  
378 systems between 2002 and 2008. Their analysis showed growth in only the Utilities, Information,  
379 and Arts, Entertainment and Recreation sectors. While they do not report the figures, we deduce  
380 they also found a considerable reduction in total jobs. As their analysis included 2008, the first  
381 full year of the Great Recession, much of those losses may be attributable to layoffs especially in  
382 the Manufacturing sector and to a lesser extent in the Education sectors. Nonetheless, for the five  
383 CRT systems we analyzed, job gains were evident in about half the sectors with overall job gains  
384 between 0.25 and 0.50 miles.

### 385 386 *Changes in Capture Rates*

387 Job gains, or losses, however can mask an important economic development consideration:  
388 Capture rates. That is, to what extent do CRT stations' rate of capturing jobs in any given sector  
389 for a given year and change over time? This can also be called "leakage" or "capture" analysis. If  
390 LQ falls over time in a given economic sector, the implication is that jobs are relocating to other  
391 places and thus "leaking". If LQ increases over it is an indication that the local area is attracting  
392 more of those jobs in a given economic sector than the broader region.

393  
394 In Table 3, we see that within the first 0.25 mile of a CRT station, more than half the sectors – 10  
395 of 17 – saw a gain in share of the metropolitan area's jobs. In contrast, only six sectors  
396 experience a gain over the next 0.25 mile. However, between 0.25 and 0.50 mile, two sectors  
397 gained share that did not also gain share within 0.25 mile. In other words, within 0.50 mile of  
398 CRT stations, nearly three-quarters (12 of 17) of the economic sectors saw gains in job capture  
399 relative to metropolitan area jobs.

### 400 401 *Shift-Share*

402 To what extent can CRT stations themselves be considered an advantage in economic location?  
403 For this we turn to shift-share analysis, the results of which are reported in Table 4 for the first  
404 0.25 mile and Table 5 for the next 0.25 mile. Before we proceed with interpretations, we caution  
405 that shift-share analysis does not demonstrate cause-and-effect between job formation and CRT  
406 station proximity.

407  
408 For the most part, shift-share analysis does not ascribe many regional shifts of jobs necessarily to  
409 CRT stations; indeed, fewer sectors show positive shift-share outcomes over time than the  
410 analysis of change in capture rates. One reason is that metropolitan-scale job markets are much  
411 larger, offering many times more location options for firms than CRT stations. For instance, with  
412 a radius of 0.50 miles all the CRT station areas included in our analysis sum to just 50 square  
413 miles where the urbanized land area of the five metropolitan areas within which they are located  
414 exceed 2,000 square miles. Moreover, individual economic sectors are also much larger than  
415 firms in those sectors located within CRT station areas. For instance, while CRT station areas  
416 gained relative share of jobs in Utilities between 2002 and 2011 – seeing a relative shift of 269  
417 of the 457 or nearly 60 percent of the jobs created; yet because of its sheer size the metropolitan  
418 areas as a whole accounted for more than 26,000 jobs in that sector or 60 times more than CRT  
419 station areas captured in 2011.

420  
421 Nonetheless, shift-share analysis provides further insights into CRT station area attractiveness.  
422 Within the first 0.25 mile, the CRT advantage was attractive to the Utilities, Management and  
423 Administrative sectors while for the next 0.25 mile the Transportation/Warehousing and Real  
424 Estate sectors were added. These are also sectors that gained in share of jobs within CRT station  
425 areas between 2002 and 2011.

426  
427 **Policy Implications for Economic Development**

428 There is very little analysis of the association between commuter rail transit stations and  
429 economic development. Our work helps close this gap but more analysis is needed to establish  
430 cause-and-effect relationships. Nonetheless, we deduce from shift-share analysis that these  
431 sectors appear especially attracted to CRT station areas within the first 0.25 mile:

432  
433 Utilities  
434 Wholesale Trade  
435 Management  
436 Administrative  
437 Education Services  
438 Arts, Entertainment and Recreation

439  
440 While, with some overlap, these sectors are attracted to the next 0.25 mile:

441  
442 Utilities  
443 Transportation/Warehousing  
444 Real Estate  
445 Management  
446 Administrative

447  
448 Based on our analysis of changes in capture rates over time, these additional sectors may be  
449 attracted to CRT station areas within the first 0.25 mile

450  
451 Transportation/Warehousing  
452 Finance, Insurance

453 Accommodation, Food Service  
454 Other Services

455  
456 And these may be attracted to the next 0.25 mile, with some overlap:

457  
458 Transportation/Warehousing  
459 Health, Social Services

460  
461 We also suspect that for the most part commuter rail transit is not seen as an economic  
462 development investment per se. In the past, CRT's role has chiefly been in transporting mostly  
463 while-collar, upper-middle and affluent workers to downtowns of large metropolitan areas.  
464 Those workers may have held their jobs in downtown anyway so there would thus not be much  
465 of an economic development relationship with CRT. On the other hand, CRT facilitated the rise  
466 of suburban and exurban developments accessible to CRT stations.

467  
468 From an economic perspective, CRT systems facilitate the continued growth of existing high-  
469 density employment centers by mitigating the negative agglomeration effects of congestion. CRT  
470 and related other forms of fixed guideway investments can sustain the growth of centers leading  
471 to a virtuous cycle where increased transportation expenditures mitigate the effect of congestion,  
472 which makes more agglomeration possible, and which may provide the political will for other  
473 rounds of transit infrastructure.

474  
475 We also note that all the CRT systems we studied serve linear corridors. Miami, San Diego and  
476 Seattle serve coastal areas hemmed in by mountains and/or water bodies. Salt Lake is hemmed in  
477 by two mountain ranges and a large water body. The Rail Runner is also hemmed in by public  
478 and tribal ownerships. For these metropolitan areas, using CRT may be more important than  
479 other metropolitan areas to help sustain economies of agglomeration.

480  
481 Our research of all five CRT systems operating in the South and West, outside of the 10 largest  
482 CSAs and serving more than one million passengers in 2013 finds that CRT stations may be  
483 attractive to a large range of economic sectors. Indeed, we suspect there are important  
484 opportunities for expanding economic activity around many of these stations. For instance,  
485 during our study period, the newest of these CRT systems, FrontRunner, served only one major  
486 employment center – downtown Salt Lake City. Once arriving in downtown, numerous job  
487 opportunities exist within a half-mile walk but many more exist by connecting directly to the  
488 TRAX light rail line which serves the CRT station. At the northern terminus, FrontRunner serves  
489 Ogden but because the job centers are quite distant from the station with little bus service, that  
490 station is used mostly as a park-and-ride facility. Between Ogden and Salt Lake City, the  
491 Farmington CRT station is exclusively a park-and-ride facility. Important long-term economic  
492 development opportunities would seem to exist at these and other FrontRunner CRT stations.

493  
494 As our research reveals that several economic sectors perform well within 0.50 miles of CRT  
495 stations. We recommend that planners consider unlocking the economic development potential  
496 of all CRT stations throughout CRT networks, not just the high-density destinations they may  
497 have been initially designed to serve.

498

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**Table 1**  
**U.S. Commuter Rail Systems, 2003**

Rank	System	Major cities served	Annual Ridership (2013)	Ave. Weekday Ridership (Q4 2013)	Route miles	Ridership per mile (Q4 2013)	Lines	Stations	Year Opened
1	MTA Long Island Rail Road	New York	97,090,300	334,100	335.9	994.6	11	124	1834
2	MTA Metro-North Railroad	New York	83,326,200	298,700	329.6	777.9	5	121	1983
3	New Jersey Transit Rail	New York / Philadelphia	81,942,000	302,500	398.2	758.4	11	164	1983
4	Metra	Chicago	73,603,100	292,600	487.7	600.0	11	241	1984
5	SEPTA Regional Rail	Philadelphia	36,532,900	130,900	280.0	467.5	13	153	1983
6	MBTA Commuter Rail	Boston	34,865,700	124,400	368.0	338.0	13	127	1973
7	Caltrain	San Francisco / San Jose	16,294,900	50,800	77.0	659.7	1	32	1987
8	Metrolink	Los Angeles / San Bernardino	11,543,600	40,800	388.0	105.2	7	55	1992
9	MARC Train	Baltimore / Washington, D.C.	9,147,000	34,100	187.0	182.4	3	43	1984
10	Virginia Railway Express	Washington, D.C.	4,520,600	15,900	90.0	138.7	2	18	1992
11	Tri-Rail	Miami	4,351,000	14,800	70.9	208.7	1	18	1987
12	UTA FrontRunner	Salt Lake City / Ogden / Provo	3,800,400	14,700	88.0	167.0	1	16	2008
13	NICTD South Shore Line	Chicago / South Bend	3,606,800	11,600	90.0	128.9	1	20	1903
14	Sounder Commuter Rail	Seattle / Tacoma	3,035,500	11,900	80.0	148.8	2	9	2000
15	Trinity Railway Express	Dallas / Fort Worth	2,144,900	8,000	34.0	235.3	1	10	1996
16	NCTD Coaster	San Diego / Oceanside	1,689,200	5,200	41.0	126.8	1	8	1995
17	Capitol Corridor	San Jose / Oakland / Sacramento	1,615,400	4,300	168.0	25.6	1	15	1991
18	New Mexico Rail Runner Express	Albuquerque	1,082,400	3,500	97.0	36.1	1	13	2006
19	Altamont Corridor Express (ACE)	San Jose / Stockton	1,019,700	4,100	86.0	47.7	1	10	1998
20	Capital MetroRail	Austin	817,300	2,400	32.0	75.0	1	9	2010
21	Northstar Line	Minneapolis	787,300	2,500	40.0	62.5	1	6	2009
22	Shore Line East	New Haven	658,000	2,200	59.0	37.3	1	13	1990
23	A-Train	Denton	521,700	2,000	21.0	95.2	1	6	2011
24	Westside Express Service	Beaverton	478,600	2,000	15.0	133.3	1	5	2010
25	Music City Star	Nashville	245,900	900	32.0	28.1	1	6	2006



Total

474,720,400

1,714,900

3,895

6,579

1,242

*Source:* Adapted from [http://en.wikipedia.org/wiki/List\\_of\\_United\\_States\\_commuter\\_rail\\_systems\\_by\\_ridership](http://en.wikipedia.org/wiki/List_of_United_States_commuter_rail_systems_by_ridership)

**Table 2**  
**Job Change by 2-Digit NAICS Sector by CRT Station Distance Band, 2002-2011**

<b>Sector</b>	<b>CRT Change within 0.25 Mile 2002-2011</b>	<b>CRT Percent Change within 0.25 Mile 2002-2011</b>	<b>CRT Change within 0.25 Mile 2002-2011</b>	<b>CRT Percent Change within 0.50 Mile 2002-2011</b>	<b>CRT Change 0.25-0.50 Mile 2002-2011</b>	<b>CRT Percent Change 0.25-0.50 Mile 2002-2011</b>	<b>Growth or Decline 2002-2008 Among all Fixed Guideway Systems<sup>a</sup></b>
Utilities	269	<b>163%</b>	666	<b>17%</b>	397	<b>11%</b>	<b>Growth</b>
Manufacturing	(1,921)	-41%	(6,141)	-40%	(4,220)	-39%	<i>Decline</i>
Wholesale	292	<b>10%</b>	(27)	-0%	(319)	-4%	<i>Decline</i>
Retail	(656)	-14%	(3,006)	-17%	(2,350)	-17%	<i>Decline</i>
Trans/Warehousing	1,445	<b>75%</b>	1,722	<b>19%</b>	277	<b>4%</b>	<i>Decline</i>
Information	(1,531)	-49%	(5,498)	-39%	(3,967)	-36%	<b>Growth</b>
Finance, Insurance	(132)	-5%	(1,101)	-12%	(969)	-14%	<i>Decline</i>
Real Estate	(514)	-31%	1,518	<b>38%</b>	2,032	<b>88%</b>	<i>Decline</i>
Prof., Sci, Tech	(108)	-2%	1,641	<b>7%</b>	1,749	<b>10%</b>	<i>Decline</i>
Management	125	<b>11%</b>	1,568	<b>70%</b>	1,443	<b>126%</b>	<i>Decline</i>
Administrative	651	<b>22%</b>	2,367	<b>18%</b>	1,716	<b>17%</b>	<i>Decline</i>
Education	320	<b>9%</b>	(1,924)	-21%	(2,244)	-39%	<i>Decline</i>
Health, Social	(502)	-13%	5,320	<b>39%</b>	5,822	<b>61%</b>	<i>Decline</i>
Arts, Ent., Rec	177	<b>25%</b>	(315)	-5%	(492)	-9%	<b>Growth</b>
Accomm, Food	378	<b>6%</b>	854	<b>4%</b>	476	<b>3%</b>	<i>Decline</i>
Other Services	41	<b>2%</b>	69	<b>1%</b>	28	<b>1%</b>	<i>Decline</i>
Public Admin	574	<b>9%</b>	12,902	<b>21%</b>	12,328	<b>22%</b>	<i>Decline</i>
Total	(1,092)	-2%	10,615	<b>4%</b>	11,707	<b>6%</b>	<i>Decline</i>

a. Adapted from Belzer, Srivastava and Austin (2011).

Note: Sectors that grew around CRT station areas highlighted in bold.

Source: Data from LEHD. Data exclude natural resources and construction sectors.

**Table 3**  
**Location Quotients by 2-Digit NAICS Sector by CRT Station Distance Band, 2002-2011**

<b>Sector</b>	<b>LQ CRT Jobs within 0.25 mile Jobs 2002</b>	<b>LQ CRT Jobs within 0.25 mile Jobs 2011</b>	<b>LQ Gain or Loss within 0.25 mile 2002-2011</b>	<b>LQ CRT Jobs 0.25-0.50 mile Jobs 2002</b>	<b>LQ CRT Jobs 0.25-0.50 mile Jobs 2012</b>	<b>LQ Gain or Loss 0.25-0.50 mile 2002-2011</b>
Utilities	0.63	1.81	<b>Gain</b>	4.23	4.76	<b>Gain</b>
Manufacturing	0.89	0.67	Loss	0.61	0.44	Loss
Wholesale	0.93	1.09	<b>Gain</b>	0.79	0.75	Loss
Retail	0.64	0.56	Loss	0.58	0.45	Loss
Trans/Warehousing	0.85	1.68	<b>Gain</b>	0.91	0.99	<b>Gain</b>
Information	1.38	0.83	Loss	1.46	1.02	Loss
Finance, Insurance	1.06	1.12	<b>Gain</b>	0.75	0.66	Loss
Real Estate	1.24	1.00	Loss	0.51	1.03	<b>Gain</b>
Prof., Sci, Tech	1.62	1.50	Loss	1.24	1.18	Loss
Management	1.16	1.43	<b>Gain</b>	0.36	0.84	<b>Gain</b>
Administrative	0.74	0.95	<b>Gain</b>	0.77	0.87	<b>Gain</b>
Education	0.65	0.73	<b>Gain</b>	0.33	0.19	Loss
Health, Social	0.62	0.46	Loss	0.45	0.56	<b>Gain</b>
Arts, Ent., Rec	0.56	0.69	<b>Gain</b>	1.30	1.07	Loss
Accomm, Food	1.32	1.37	<b>Gain</b>	0.82	0.77	Loss
Other Services	0.98	1.01	<b>Gain</b>	0.68	0.64	Loss
Public Admin	2.54	2.39	Loss	6.60	6.43	Loss

*Source:* Data from LEHD.

**Table 4**  
**Shift-Share Analysis with Respect to 0.25 Mile from CRT Stations, 2002-2011**

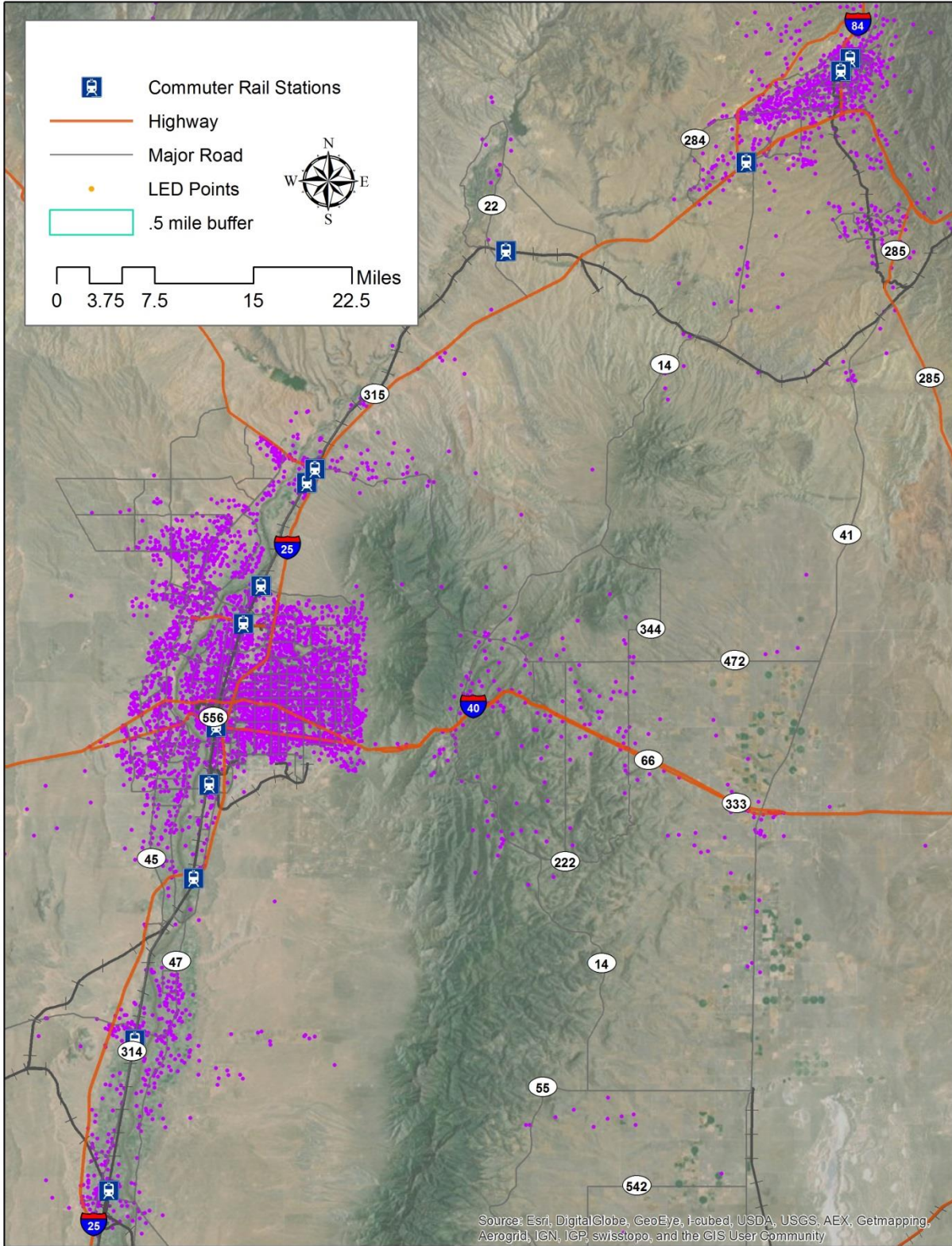
<b>Sector</b>	<b>CRT 2002</b>	<b>CRT 2011</b>	<b>MSA 2002</b>	<b>MSA 2011</b>	<b>Metropolitan Area Share</b>	<b>Industry Mix</b>	<b>CRT Advantage</b>
Utilities	165	434	25,588	26,045	150	18	<b>266</b>
Manufacturing	4,682	2,761	510,933	446,468	4,259	(168)	(1,330)
Wholesale	2,856	3,148	299,692	314,026	2,598	394	<b>155</b>
Retail	4,535	3,879	683,883	755,159	4,126	882	(1,129)
Trans/Warehousing	1,935	3,380	221,190	218,494	1,760	151	1,469
Information	3,123	1,592	220,314	208,150	2,841	109	(1,359)
Finance, Insurance	2,855	2,723	260,446	263,702	2,597	293	(168)
Real Estate	1,682	1,168	131,799	127,427	1,530	96	(458)
Prof., Sci, Tech	6,845	6,737	410,442	489,427	6,227	1,935	(1,425)
Management	1,100	1,225	91,727	93,331	1,001	119	<b>106</b>
Administrative	2,978	3,629	392,193	417,573	2,709	462	<b>458</b>
Education	3,477	3,797	521,892	566,754	3,163	613	<b>21</b>
Health, Social	3,987	3,485	619,885	820,876	3,627	1,653	(1,795)
Arts, Ent., Rec	695	872	119,630	137,550	632	167	<b>73</b>
Accomm, Food	6,730	7,108	493,243	563,762	6,123	1,570	(584)
Other Services	2,206	2,247	217,810	241,163	2,007	436	(196)
Public Admin	6,466	7,040	246,823	320,029	5,882	2,501	(1,344)
<b>Total</b>	<b>56,317</b>	<b>55,225</b>	<b>5,467,490</b>	<b>6,009,936</b>	<b>51,234</b>	<b>11,230</b>	<b>(7,239)</b>

*Source:* Data from LEHD.

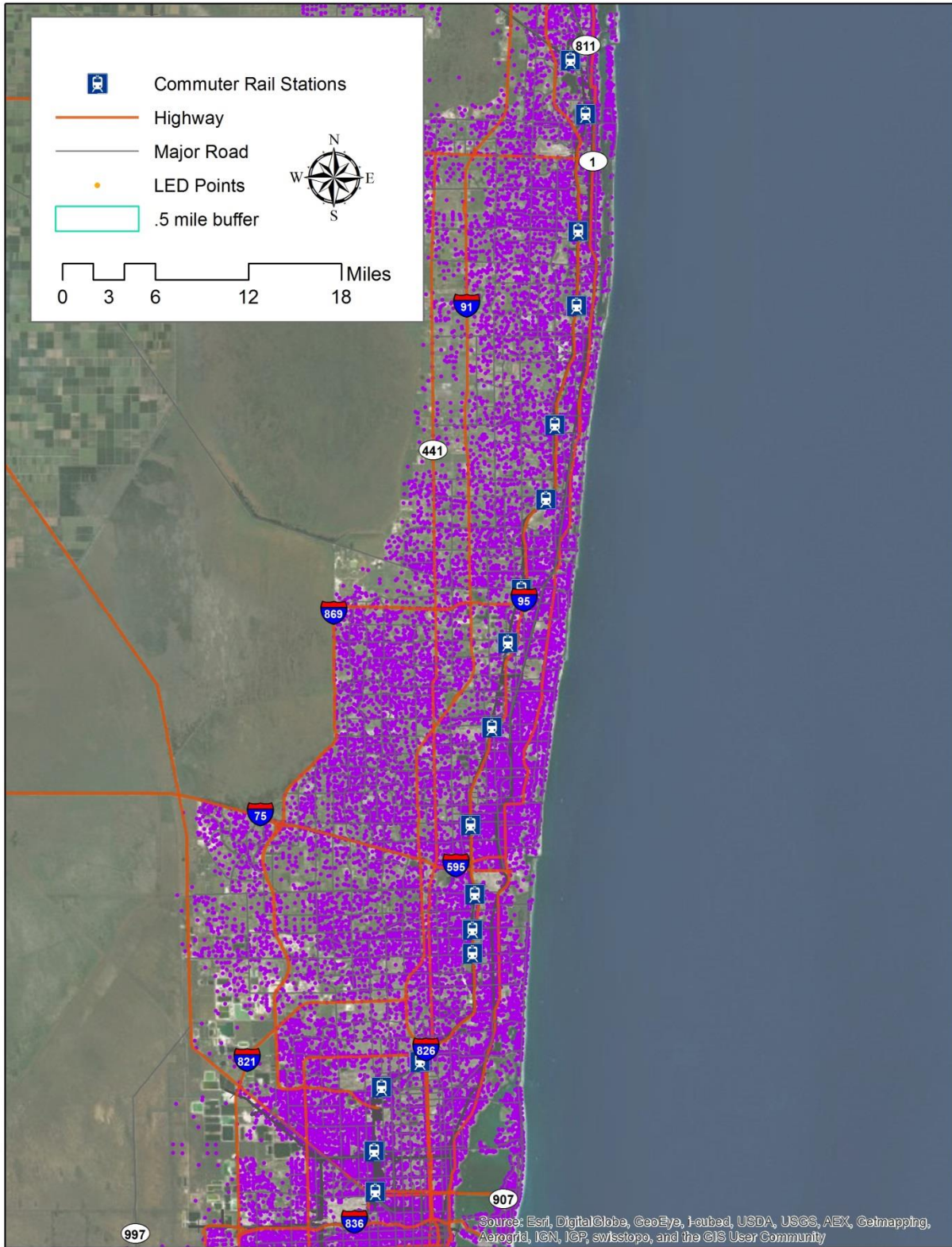
**Table 5**  
**Shift-Share Analysis with Respect to 0.25-0.50 Mile from CRT Stations, 2002-2011**

<b>Sector</b>	<b>CRT 2002</b>	<b>CRT 2011</b>	<b>MSA 2002</b>	<b>MSA 2011</b>	<b>Metropolitan Area Share</b>	<b>Industry Mix</b>	<b>CRT Advantage</b>
Utilities	3,709	4,106	25,588	26,045	3,374	401	<b>331</b>
Manufacturing	10,716	6,496	510,933	446,468	9,749	(385)	(2,868)
Wholesale	8,099	7,780	299,692	314,026	7,368	1,118	(706)
Retail	13,524	11,174	683,883	755,159	12,303	2,630	(3,760)
Trans/Warehousing	6,922	7,199	221,190	218,494	6,297	540	<b>361</b>
Information	10,990	7,023	220,314	208,150	9,998	385	(3,360)
Finance, Insurance	6,703	5,734	260,446	263,702	6,098	689	(1,053)
Real Estate	2,322	4,354	131,799	127,427	2,112	133	<b>2,109</b>
Prof., Sci, Tech	17,436	19,185	410,442	489,427	15,862	4,929	(1,606)
Management	1,141	2,584	91,727	93,331	1,038	123	<b>1,423</b>
Administrative	10,324	12,040	392,193	417,573	9,392	1,600	<b>1,048</b>
Education	5,813	3,569	521,892	566,754	5,288	1,024	(2,744)
Health, Social	9,498	15,320	619,885	820,876	8,641	3,937	<b>2,742</b>
Arts, Ent., Rec	5,346	4,854	119,630	137,550	4,863	1,283	(1,293)
Accomm, Food	13,826	14,302	493,243	563,762	12,578	3,225	(1,501)
Other Services	5,109	5,137	217,810	241,163	4,648	1,009	(520)
Public Admin	55,847	68,175	246,823	320,029	50,806	21,604	(4,236)
<b>Total</b>	<b>187,325</b>	<b>199,032</b>	<b>5,467,490</b>	<b>6,009,936</b>	<b>170,417</b>	<b>44,246</b>	<b>(15,632)</b>

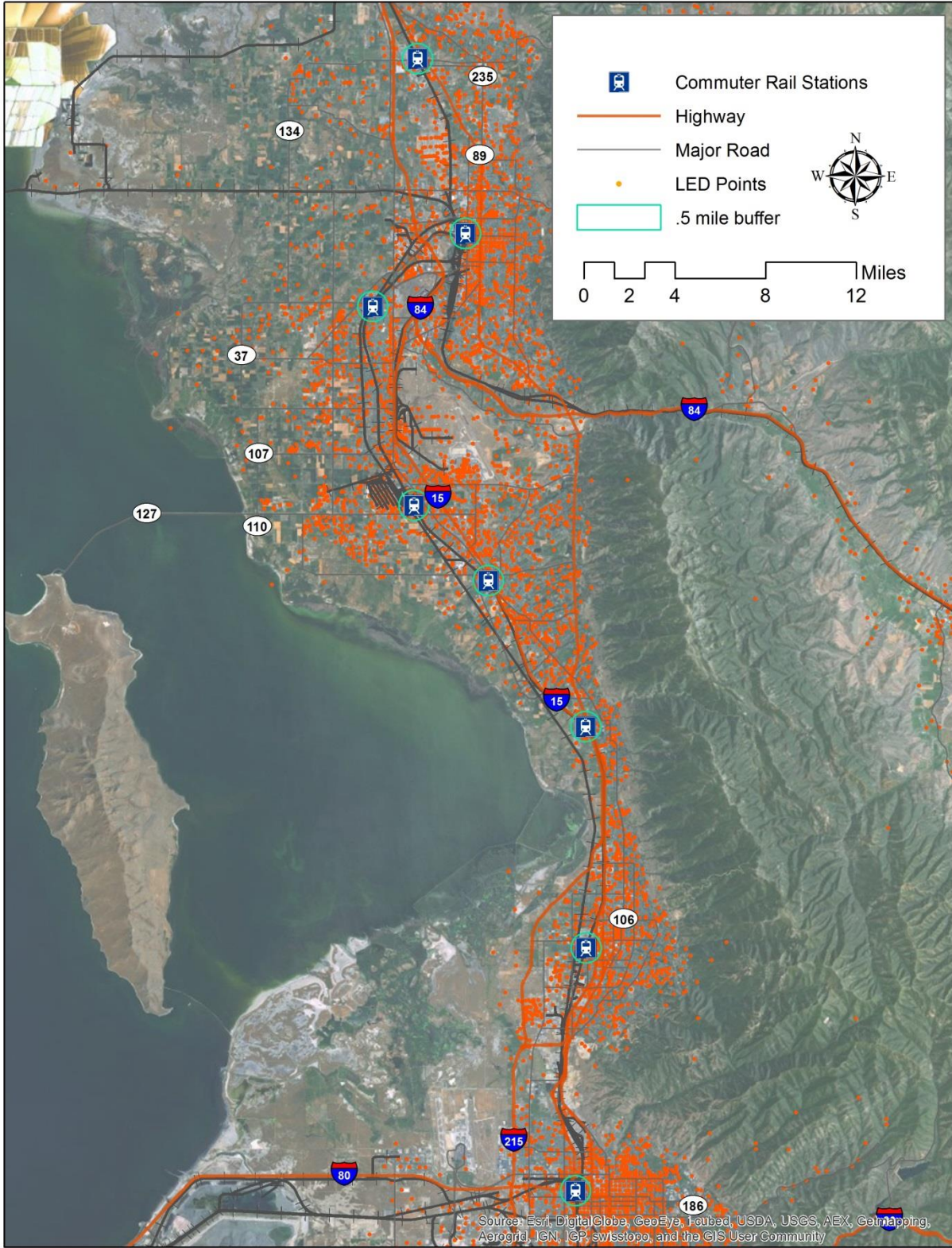
*Source:* Data from LEHD.



**Figure 1**  
**Rail Runner Express with LED census block centroids**

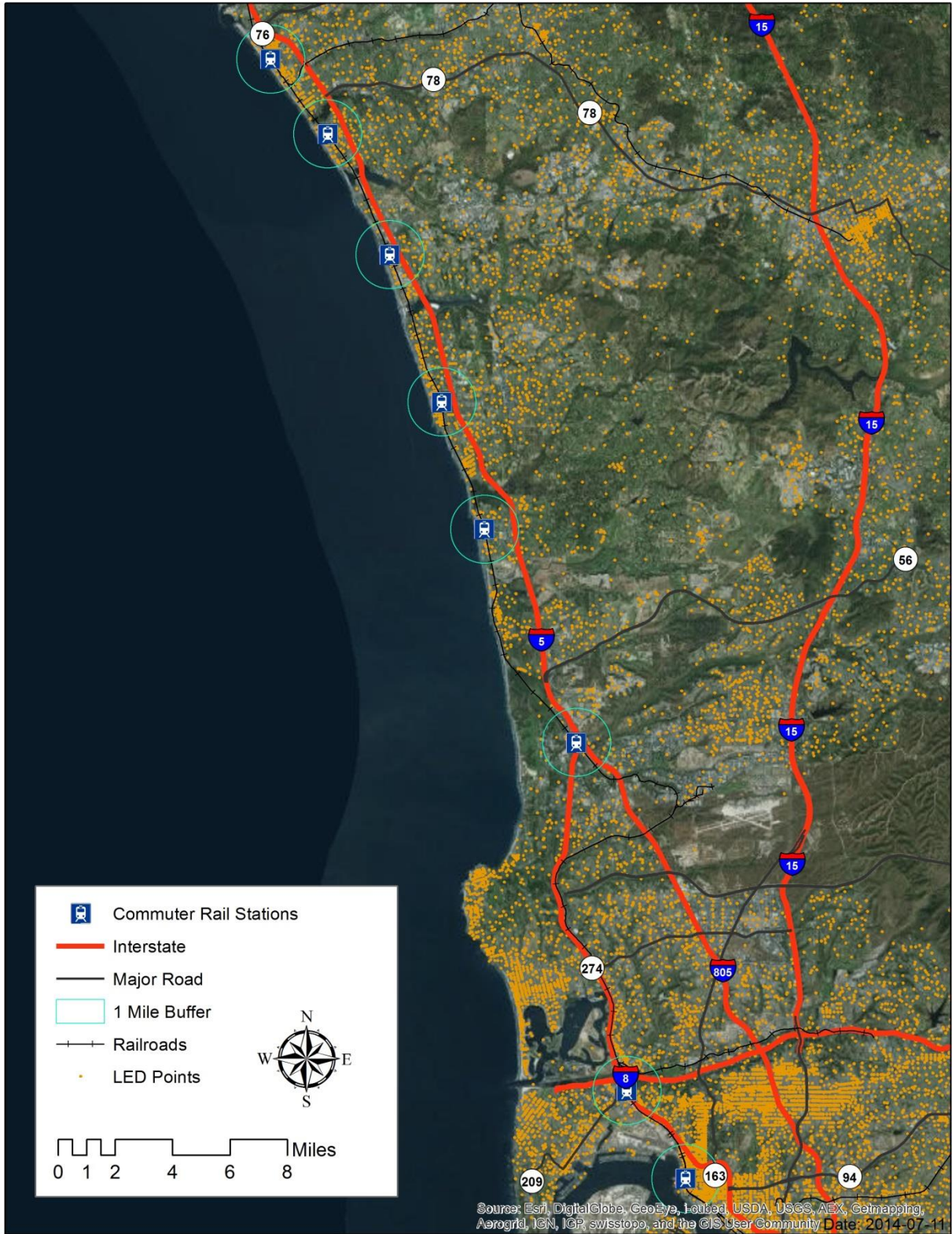


**Figure 2**  
**Tri-Rail CRT with LED census block centroids**

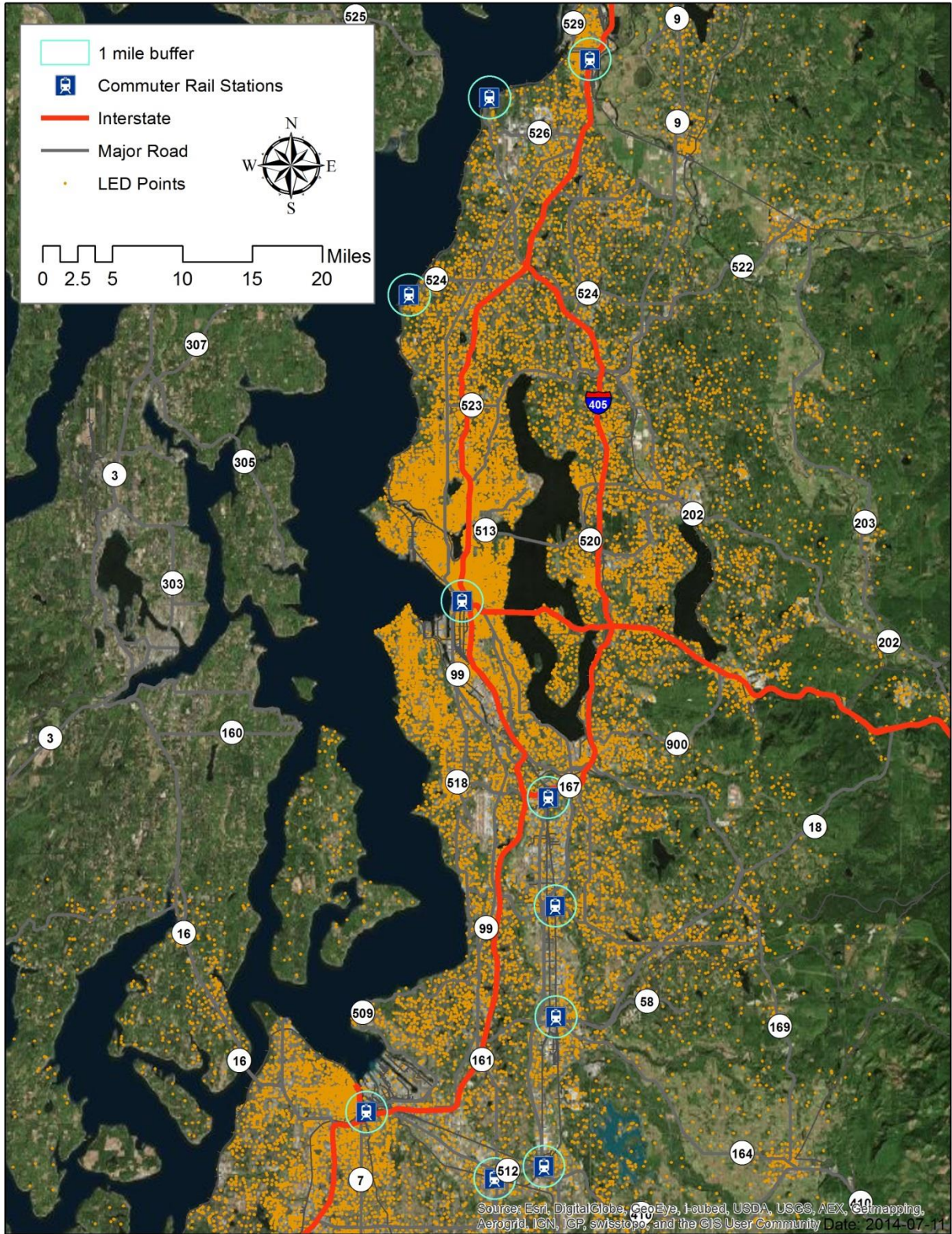


**Figure 3**  
**FrontRunner CRT with LED census block centroids**





**Figure 4**  
**Coaster CRT with LED census block centroids**



**Figure 5**  
**Sounder CRT with LED census block centroids**

## Endnote

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<sup>1</sup> The formula is:

$$LQ = \frac{e_i/e}{E_i/E}$$

Where:

$e_i$  = Local employment in industry i

e = Total local employment

$E_i$  = Reference area employment in industry i

E = Total reference area employment

<sup>2</sup> For brevity we use condensed or abbreviated titles for the NAICS sectors we evaluate. For complete titles of these sectors please see <https://www.census.gov/eos/www/naics/>.