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The Community Equity Initiative

In partnership with California Rural Legal Assistance (CRLA), PolicyLink has engaged a Community Equity Initiative to assess unincorporated regions of the San Joaquin Valley. PolicyLink has worked to develop a response to the conditions of poverty, inequity and “unresponsive governance,” as noted in their 2007 report. They seek to 1) identify communities of interest; 2) document the conditions; 3) document the system of governance; and 4) identify a combined approach for action and policy targets. In designing this project, CRLA and PolicyLink have provided a much-needed informational resource—and begun to target legislators, link research and advocates, and generate a basis for study and policy directives.

For this project, PolicyLink has requested a GIS spatial analysis of population and demographic data for 550 unincorporated clusters in the San Joaquin Valley. To add to this analysis, we have included a service area analysis of health care facilities, and fire and sheriff stations in selected counties where data was available.

Background of San Joaquin Valley

The San Joaquin Valley is comprised of eight counties: Fresno, Madera, Merced, Kern, Kings, San Joaquin, Stanislaus, and Tulare. These eight counties reside in the southern Central Valley, an area known for its dairy and agricultural farming. Despite the vast agricultural wealth in this region, the San Joaquin Valley has some of the highest poverty rates in the country (American Community Survey 2007).

Furthermore, the Bureau of Labor statistics reports that based on data as of July 2010, unemployment rates have increased from previous years, at rates almost double that of the national average (see Table A).

<table>
<thead>
<tr>
<th>Area</th>
<th>Unemployment Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>July 2008</td>
</tr>
<tr>
<td>United States</td>
<td>6.0</td>
</tr>
<tr>
<td>Fresno County</td>
<td>9.9</td>
</tr>
<tr>
<td>Kern County</td>
<td>9.6</td>
</tr>
<tr>
<td>Kings County</td>
<td>9.9</td>
</tr>
<tr>
<td>Madera County</td>
<td>9.2</td>
</tr>
<tr>
<td>Merced County</td>
<td>12.1</td>
</tr>
<tr>
<td>San Joaquin County</td>
<td>10.4</td>
</tr>
<tr>
<td>Stanislaus County</td>
<td>10.9</td>
</tr>
<tr>
<td>Tulare County</td>
<td>10.4</td>
</tr>
</tbody>
</table>

As the PolicyLink report on Unincorporated Communities states, “Of the 3.9 million residents, more than one in four live in unincorporated areas; more than 400,000 of those residents live in unincorporated settlements with multiple indicators of concentrated poverty” (2007: 8).

According to Taylor and Martin (2000), in 65 rural towns in the San Joaquin Valley, 28% of households live with below poverty incomes. According to 2000 Census data, the average poverty rate\(^1\) for the San Joaquin Valley eight counties is 20 percent, compared to the national average of 12 percent. Furthermore, the percentage of the population that had had no college education in the San Joaquin Valley is 58 percent, ten percentage points above the national average of 48 percent (see Table B).

### Table B. Poverty, Education Attainment for population 25 years and over\(^2\)

<table>
<thead>
<tr>
<th></th>
<th>Poverty rate</th>
<th>Percent Hispanic</th>
<th>Education Attainment: population over 25 with no college education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresno</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>Kern</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>Kings</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>Madera</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>Merced</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>San Joaquin</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>Stanislaus</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>Tulare</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>SJV Average</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>US Average</td>
<td>0.60</td>
<td>0.40</td>
<td>0.50</td>
</tr>
</tbody>
</table>

The focus of our study: unincorporated communities in the San Joaquin Valley

Unincorporated urban areas tend to be small regions with weak political and economic capital, and tend to be favored for concentrations of public "disamenities" like landfills, sewage treatment plants, recycling plants, other private Industrial disposal sites, public utilities, etc.\(^3\)

Prior to our introduction into this study, PolicyLink has begun the challenge of identifying “communities of interest” across the San Joaquin Valley. The focus of their project (as mentioned above) centers on the questions of equity, governance and service delivery in regions of the Valley that are located outside of traditional municipal boundary lines. Under county jurisdiction, unincorporated communities are vulnerable to uneven distribution of critical government services—such as clean potable water systems, wastewater disposal, street

\(^1\) Poverty rate is calculated as the percentage of the population with incomes at or below the poverty level. Source: U.S. Census 2000

\(^2\) Source: U.S. Census Bureau, Census 2000.

paving, roads, streetlights, and law enforcement among others. These communities typically tend to also suffer from access to public services, education and health care. Often situated on undesirable land, residents tend to be mostly low-income and demonstrate higher percentages of minority residents than state averages. While some of these unincorporated communities lay against municipal boundary lines, they remain outside the purview of city governments and at the margins of public consideration.

Such trends are amplified when land is considered economically unviable, are costly to improve, and populated by vulnerable communities. Residents then must supplement the absence of public goods with private efforts. These regions are also under further pressure from cities and counties as they continue to condemn or redevelop these areas, causing displacement of many multi-generational communities.

As PolicyLink notes, the San Joaquin Valley is in many ways ideal for understanding the issues confronting small, unincorporated communities in California. The Valley contains the largest relative concentration of number of smaller unincorporated communities of any region in the state.4 While some communities fall under Census Designated Places (CDPs), unincorporated communities as a broader category are geographically diverse. For this study, PolicyLink has identified three types of geospatial (and geohistorical) varieties: Fringe, Island, and Legacy (historic).

Fringe communities are described as settlements that are on the outskirts of a city, which is often growing, but whose borders have not yet incorporated the community (PolicyLink 2007: 3). Islands are neighborhoods that were perhaps rural, but have since been “underbounded” and surrounded by municipal boundaries. Land areas with attractive property values get plucked by surrounding municipalities, consequently discarding areas of little economic value. As Michelle Anderson notes,

“In Broward County, Florida, for instance, city incorporations and annexations have consumed nearly every parcel of land that offers advantageous property tax revenues, whether commercial or residential. Today, the only urban residential areas remaining under unincorporated jurisdiction are clustered in a block of low-income neighborhoods that are nearly 100 percent African American.”5

Finally, Legacy communities are areas that are historic and have traditionally occupied these areas.

Complications from complex and fragmented service delivery systems make governing such goods increasingly difficult for county governments. Not only do residents in these unincorporated regions lack the normal avenues of public participation, but providers span

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special districts, community service districts, and jurisdiction jumps from joint powers authorities, municipal advisory councils and county agencies. From this array of government and service agencies, these regions are often caught in a “complex system of state government financing and regulation of taxation, land subdivision, public health, and other components of local government.”

Of particular issue is that these communities also suffer from lack of documentation and uneven data collection. While the U.S. Census has begun documenting Census Designated Places, these are often inadequate in capturing unincorporated communities that are typically found further outside municipal areas. The Census also requires a degree of formality for the community to be recognized as a CDP, such as having a formal name.

Lack of sufficient data is always a challenge for GIS researchers. However, for unincorporated communities that lack municipal governments, these barriers pose critical consequences for planners, policy makers, and legislators hoping to address these problems. While there is an abundance of politically important questions regarding equity and access to basic services such as water and sewage treatment, in this study we are limited to what data was available from County GIS websites, the U.S. Census, and the data provided by PolicyLink. For some counties (as will be further discussed in the Data section below), data was unavailable and not accessible from county or U.S. Census sources.

The Project

PolicyLink requested a GIS analysis to attribute demographic and population data to the unincorporated clusters they have identified—using Census 2000 data at the block level. For the 550 clusters identified across the San Joaquin Valley, we manipulated Census data using Microsoft Excel, and calculated cluster areas using ArcGIS to develop population ratios that could be used to calculate cluster population counts. In using the smallest census unit available, we were able to make “best” estimates for the population count of the 550 clusters. A detailed chart depicting our procedure is below.

From this analysis, we were able to make estimates for a population that is typically statistically disregarded. While this may seem rudimentary as a population analysis, it represents an important step in the mapping and spatial representation of a population that is too often neglected. Once this was achieved, we used similar techniques to calculate demographic information for racial composition—and such strategies could be further used for income and other census analyses. Had we sufficient time available, an additional analysis of workforce, housing, utility networks and income data would be useful for PolicyLink’s efforts in legislative advocacy.

Given PolicyLink’s additional interest in transportation access questions, and to further utilize GIS tools, we then decided to develop a set of maps to represent transportation and access to

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health care facilities. As an additional analysis, we also developed maps (for counties where data was available) using Network Analyst to show service areas for fire and sheriff stations and health care facilities.

• Questions for our study include:
  • How can we develop a methodology to estimate cluster populations?
  • What is the racial makeup of these clusters?
  • What percentage of these residents are minorities?
  • Are there regions that are beyond access to facilities (health care, fire stations, and sheriff stations)?
  • Are the transportation networks accessible for these outermost communities?
  • In what ways do these regions illustrate challenges for planners and legislators? What data is still needed in order to spatially represent the uneven distribution of resources?

The Data

PolicyLink has provided us with the data for the unincorporated clusters, which was data compiled by their researchers, using a series of steps.

• Layer publicly available data
• Use each layer to exclude places that do not fit the definition established
• Map city boundaries and CDP data to determine incorporation status
• Use land use information to filter agricultural or mountainous areas
• Verify with aerials, available place names, Google maps and streetview
• Eventually, ground-truth with resident guidance

PolicyLink also provided census block files which were collected from the TIGER/Line Census website.

While some regions in California are rich in publicly available data, the San Joaquin Valley tends to be less frequently studied for service and facility analyses. However, we were able to locate Health Facilities for California via the Cal-Atlas website (GIS clearinghouse). Using this pointfile, we could perform Service Area analyses for those counties with complete road files.

County boundaries, census block group boundaries, municipal boundaries and SF3 2000 census attribute information (on population and race) was collected from the U.S. Census website. Counties that had road and facility data available were limited to Kern, Stanislaus and Tulare. This data was collected from County websites. Rail and Bus data was collected via email exchange from a Transportation planner at the California Department of Transportation Office of Geospatial Information Systems.
A complete list of data and sources follows below (see Table C).

<table>
<thead>
<tr>
<th>Table C. GIS Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
</tr>
<tr>
<td>Unincorporated Clusters in San Joaquin Valley</td>
</tr>
<tr>
<td>California Counties</td>
</tr>
<tr>
<td>California Census Block Groups</td>
</tr>
<tr>
<td>California Census Blocks</td>
</tr>
<tr>
<td>Census Places (Cities &amp; Towns)</td>
</tr>
<tr>
<td>CALIFORNIA HEALTH CARE FACILITIES</td>
</tr>
<tr>
<td>Major Roads</td>
</tr>
<tr>
<td>Transportation (Rail, Bus)</td>
</tr>
<tr>
<td>Kern County Roads</td>
</tr>
<tr>
<td>Kern County Fire stations</td>
</tr>
<tr>
<td>Kings County Roads</td>
</tr>
<tr>
<td>Stanislaus County Roads</td>
</tr>
<tr>
<td>Tulare County Roads</td>
</tr>
</tbody>
</table>
Methodology

Our use of ArcGIS involved incremental steps in data preparation, also utilizing Microsoft Excel. Three main processes were carried out during the course of the project. The first one was to calculate the population of the identified 550 clusters in San Joaquin valley. The unincorporated clusters were not spatially located within any one census boundary. On observation we found that they often overlapped at the boundary edges of different census blocks. Therefore each cluster would have one segment in different blocks which is best explained by an example listed below,

Block 1 / Cluster 10 / area of Block 1 / Population of Block 1
Block 2 / Cluster 10 / area of Block 2 / Population of Block 2
Block 3 / Cluster 10 / area of Block 3 / Population of Block 3
Block 4 / Cluster 10 / area of Block 4 / Population of Block 4

To obtain attribute information for the clusters, we used ArcGIS to intersect the attribute table of the San Joaquin block level shapefile with that of the San Joaquin clusters shapefile. On doing the intersection we obtained the population density of each of the cluster segment, and area of cluster segment using the Field Geometry calculator. Once the area of the segment was calculated in ArcGIS, the attribute table was exported for data preparation in Excel.

Similar methodology was followed for calculating the race information within the clusters with a slight difference. As the first step we had to join the Census table (showing race information for each group) at the block level for the entire California state to the San Joaquin block level shapefile to isolate the race information particular to the San Joaquin valley. This was an important step since it weeded out a lot of information that was not required for this project. The rest of the method is similar to the first process mentioned above. The third process involved doing network analysis, which involved work solely in ArcGIS using both ArcMap and ArcCatalog—since a lot of the data was already prepared to be used readily. The shapefiles were clipped to San Joaquin Valley, in order to enable easy map processes.

Limitations

Originally our hope was to use network analysis to run an origin-destination cost matrix and assess time traveled as a measure of access to points of interest. However, after downloading the Local Roads file from the Cal-Atlas website, we discovered that the file contained many roads that were broken, and had no categorical distinction for residential roads or otherwise. Since there was also no speed limit attribute information, even had we been able to repair all the many roads which were broken, we would be unable to perform an origin-destination cost matrix based on time. Instead, we located what road data was available from County websites. Stanislaus, Kern and Tulare County had complete road data available (without speed limit information), and therefore we performed a service area analysis based on shape length of roads—at two and three-mile increments.
Process 1: Calculating Population for Clusters

San Joaquin Valley Block level file

- Project to: NAD 1983 Albers
- Projected San Joaquin Valley Block level file

San Joaquin Valley Cluster level file

- Project to: NAD 1983 Albers
- Projected San Joaquin Valley Cluster level file

Intersect the Block level shape file (.shp) with the cluster shape file (.shp)

San Joaquin Valley Block Cluster Intersect

- Attribute info for Cluster segment within each block
- Calculate area of each cluster segment (ArcMap Function: Calculate Geometry)

- Cluster segment area calculated in Sq. miles

Export Attribute Table (.dbf file) to calculate density (pop/sq.mile) for each of block (Excel function)

- Cluster Segment area * people per sq. mile

- Excel function: SUMIFS- Sum of cluster segments for total cluster population

Projected San Joaquin Valley Cluster Intersect

- Join table to SJV Cluster shapefile in Arc Map

- Total the Cluster Segment Population for Population count for Cluster

Functions in Arc Map

Functions in Excel
Process 2: Calculating Race proportions for Clusters

Join the census table for each race group (at block level) with population attribute table (ArcMap function)

Projected San Joaquin Valley Block level file

Projected San Joaquin Valley Cluster level file

San Joaquin Valley Block Cluster Intersect

Attribute info for Cluster segment within each block

Export Attribute Table (.dbf file) to calculate proportion of each race (ArcMap function: Export)

San Joaquin Valley Block Cluster Intersect

Proportion of each race taken as a percentage of the whole

Calculate proportion of each race for each block (Excel Function)

Calculate number of people in each racial group (Excel function)

Total the Cluster Segment Population for total cluster population/race

San Joaquin Valley Cluster Intersect

Join Total cluster population/race table to SJV Cluster shapefile in Arc Map

Functions in Arc Map

Functions in Excel

Functions in ArcMap
Process 3: Network Analysis

- **San Joaquin Valley Block Group level file (.shp)**
  - Project to: NAD1983 Albers

  ---
  **Projected San Joaquin Valley Block Group level file (.shp)**
  
  **Clip California schools shapefile, Geonames locales Pop places point file, Developed Major roads, Health care, Fire stations and Sheriff stations point file (ArcMap function: Arc Tools- clip)**

  ---
  **San Joaquin Valley Block Group Clip (.shp)**

  **Create Network database in ArcCatalog**

  **Load Locations (Health care facilities, Fire stations, sheriff Stations)**

  **Start Service Area Analysis**

  **Click Solve**

  **San Joaquin Valley Block Group Clip (.shp) with service areas**

### Set properties for Service Analysis:
1. **Impedance- “Length (feet)”**
2. **Polygon default breaks- 15840ft (3miles) or 10,560ft (2miles)**
3. **Away from facility**
4. **U- turns- no where**

### Network analysis generates polygons with 2 or 3 mile service areas
Analysis

Cluster Analysis

In earlier studies the San Joaquin valley has been identified to have 550 unincorporated clusters. Among the eight counties that these clusters are spread into Tulare has the maximum number of cluster concentration followed by Fresno and Kern.

From the PolicyLink notes we are aware of the three distinct geospatial (and geohistorical) distinctions that have been attributed to these clusters- The Fringe, Island and the Legacy. Table D provides a detailed breakup of this classification within each of the eight counties. It is interesting to note that the over 50% of the clusters within San Joaquin valley are classified as legacy (264/ 550) making them historically significant. The county of Madera has the highest percentage of clusters that are “legacies.” A majority of the clusters within each individual county however fall into the category of Fringe. These clusters tend to fall outside the service areas of most towns or cities that they are a part of, which explains why most often they are poorly serviced.

Our analysis of the clusters furthers earlier studies and findings that each of the clusters has a large concentration of minority population (about 50%) (see Table E) as residents. Looking at the cluster demographics for each of the eight counties individually, it is interesting to note that all most all of them have 40% or more its residents to be of a minority race. Unincorporated clusters in counties of Tulare, Merced and Fresno have a minority population over 50%, with Tulare being the highest at 63%. These demographics raise questions of equity and justice about the geospatial distribution of minority communities, and their related access to services.

For the service area analysis we will continue to use the PolicyLink’s geospatial classification to understand how best each of these clusters are served based on their spatial placement with respect to the larger context of the town or city to which it adheres.

<table>
<thead>
<tr>
<th></th>
<th>Fringe</th>
<th>Island</th>
<th>Legacy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresno</td>
<td>48</td>
<td>10</td>
<td>44</td>
<td>102</td>
</tr>
<tr>
<td>Kern</td>
<td>28</td>
<td>10</td>
<td>65</td>
<td>103</td>
</tr>
<tr>
<td>Kings</td>
<td>15</td>
<td>0</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Madera</td>
<td>9</td>
<td>0</td>
<td>33</td>
<td>42</td>
</tr>
<tr>
<td>Merced</td>
<td>26</td>
<td>1</td>
<td>21</td>
<td>48</td>
</tr>
<tr>
<td>San Joaquin</td>
<td>27</td>
<td>7</td>
<td>17</td>
<td>51</td>
</tr>
<tr>
<td>Stanislaus</td>
<td>27</td>
<td>7</td>
<td>13</td>
<td>47</td>
</tr>
<tr>
<td>Tulare</td>
<td>57</td>
<td>8</td>
<td>56</td>
<td>121</td>
</tr>
<tr>
<td><strong>All Clusters</strong></td>
<td><strong>243</strong></td>
<td><strong>43</strong></td>
<td><strong>264</strong></td>
<td><strong>550</strong></td>
</tr>
</tbody>
</table>
Table E. Demographic Data for clusters

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Total Population</th>
<th>Minority Population</th>
<th>Percent Minority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresno</td>
<td>28201.91</td>
<td>14312.71</td>
<td>51%</td>
</tr>
<tr>
<td>Kern</td>
<td>130359.52</td>
<td>51006.31</td>
<td>39%</td>
</tr>
<tr>
<td>Kings</td>
<td>1594.15</td>
<td>725.75</td>
<td>46%</td>
</tr>
<tr>
<td>Madera</td>
<td>8617.63</td>
<td>3738.82</td>
<td>43%</td>
</tr>
<tr>
<td>Merced</td>
<td>20861.50</td>
<td>11446</td>
<td>55%</td>
</tr>
<tr>
<td>San Joaquin</td>
<td>29257.53</td>
<td>14041.61</td>
<td>48%</td>
</tr>
<tr>
<td>Stanislaus</td>
<td>31247.40</td>
<td>15377.82</td>
<td>49%</td>
</tr>
<tr>
<td>Tulare</td>
<td>55315.73</td>
<td>34607.31</td>
<td>63%</td>
</tr>
<tr>
<td>All Clusters</td>
<td>305528.95</td>
<td>145261</td>
<td>48%</td>
</tr>
</tbody>
</table>

Transportation Service Area Analysis

Owing to its location between the two largest metropolitan areas in California, San Francisco and Los Angeles, major transportation networks tend to run north/south through the San Joaquin valley. The major routes include State route 99, Interstate 5, Union Pacific railroad, Burlington Northern and the Santa Fe railroad, intersected by smaller highways and other routes running east/west. A large majority of the Valley’s population resides along the State route 99 in four cities- Fresno, Bakersfield, Stockton and Modesto.7

Most trips within the valley are often through trips and not generated or ending in the Valley. This is one of the key reasons why the local east/west connections within the valley are most neglected. San Joaquin County for example has 75% of the workforce driving alone to work, with an average daily commute of almost 30 minutes or more. 8 However this may not be the case with other counties.

People often live in rural areas or edges of cities due to lower living costs. Public transportation in the valley for its rural residents has been almost nonexistent and there is a larger reliance on private vehicles (see Table F). Access to schools, jobs and medical services are often ensured by innovative systems like the Kings County Area Public Transportation Agency.9 Contrary to this in cities across the valley this scenario reverses with low income residents located spatially close to transit systems but far away from jobs (see Table G).10

Table F. Transit System facts Kings County, California Department of Finance

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kings County</td>
<td>154,434</td>
<td>100</td>
<td>23</td>
</tr>
</tbody>
</table>

---

8 Council of Fresno County Governments. “Fresno County: Coordinated Human Services Transportation Plan”2008 www.fresnocog.org
Table G. Relative proximity to Employment by Residential Location, Fresno County, 1999

<table>
<thead>
<tr>
<th>Job access Quartiles</th>
<th>% Working-Age Population</th>
<th>% Welfare Recipients</th>
<th>% Urban Welfare Recipients</th>
<th>% Rural Welfare Recipients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job Rich</td>
<td>26</td>
<td>35</td>
<td>43</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>33</td>
<td>41</td>
<td>0</td>
</tr>
<tr>
<td>Job poor</td>
<td>21</td>
<td>10</td>
<td>0</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>390,051</td>
<td>24,974</td>
<td>20,079</td>
<td>4,895</td>
</tr>
</tbody>
</table>

Accessibility to transportation services is often governed by the precise nature of development and on the local conditions. Based on the data that was available to us, we were able to do transportation service area analysis for Kern, Fresno, Tulare, Stanislaus and Kings Counties. We were severely impeded due to the lack of available data on the rest of the counties.

Research indicates that traditionally transportation programs and policies aimed at low income workers have largely been predicted on studies showing a spatial mismatch between the residential locations in central cities and rapidly expanding jobs in the suburbs. However the spatial hypothesis cannot be applied to smaller urban areas and counties in which the urban structure does not fit the stereotype of the central city neighborhoods. Studies suggest that close to 40% of all U.S rural residents live in areas without public transportation and another 28% rural residents live in areas with low levels of transit service. San Joaquin valley has a predominantly rural geography, with most rural areas facing inadequate public services (see Table H). Fresno County is a unique example to be studied as it has a very varied urban structure- with a medium sized metropolitan area, small cities scattered throughout the county and rural areas. However this may not be the case with other counties.

Table H. Access to Public Transit, Fresno County

<table>
<thead>
<tr>
<th>Geographic Area</th>
<th>Transit Agency</th>
<th># of Recipients</th>
<th>Transit Lines-% within 0.25 mile</th>
<th>Transit Lines-% within 0.5 mile</th>
<th>Bus Stops-% within 0.25 mile</th>
<th>Bus Stops-% within 0.5 mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresno City</td>
<td>FAX&amp; Clovis</td>
<td>17,739</td>
<td>88.2</td>
<td>98.0</td>
<td>85</td>
<td>98</td>
</tr>
<tr>
<td>Clovis city</td>
<td>FAX&amp; Clovis</td>
<td>1,171</td>
<td>87.5</td>
<td>98.2</td>
<td>- -</td>
<td>--</td>
</tr>
<tr>
<td>Urbanized Area</td>
<td>FAX&amp; Clovis</td>
<td>20,087</td>
<td>87.2</td>
<td>97.6</td>
<td>84</td>
<td>97</td>
</tr>
<tr>
<td>Outside Urbanized Area</td>
<td>FCRTA</td>
<td>4,894</td>
<td>43.6</td>
<td>64.3</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Research done on accessibility to public transit system though varied, did not include any references of parameters that could be adopted to do the accessibility analysis. The GIS maps that we generated juxtaposes the bus and rail routes over each of the counties, and visual analysis was conducted with respect to the clusters located within the same. As mentioned we

have used the geospatial classification made by PolicyLink to spatially locate the clusters within the counties.

The GIS map of Fresno indicates that the clusters within the Fresno central city area are well serviced, while those in smaller cities and towns may or may not be serviced. In Easton and Caruthers the clusters are like islands and are located off the transportation grid and are neither serviced by bus nor rail. Clusters in smaller towns like Sanger and Redley do have bus routes marked but most of the clusters within them are fringe communities and are thus spatially located away from the bus routes. The analysis is further strengthened by the data in Table H, which indicates the lack of any bus stops outside the urbanized areas. This circumstance exacerbates the poor living conditions of people living in clusters outside urbanized areas.

Tulare County seems to be largely serviced by rails and the smaller towns like Lindsay, Exeter, Tulare, etc. have clusters located on the fringe. The service thus becomes inaccessible to them unless they have a privately owned vehicle.

The GIS map of Stanislaus County on the contrary, exhibits proximity to transportation corridors. The clusters seem to aggregate around either the bus or the train routes. Since we do not have any bus or train station data, it is difficult to say at this point if indeed these clusters are well serviced by requisite stops. Detailed proposals for including stops (if there aren’t any) could be made after analyzing the commuter patterns.

Health Care Service Area Analysis
Due in large part to its rural geography, the San Joaquin Valley suffers from Health Professional shortages. As noted in a report by the Central Valley Health Policy Institute, there are dramatic shortages in physicians (see Table H) in the San Joaquin Valley. Most often attributed to the lack of physicians (both specialists and primary care), the challenge of geography is also critical in assessing this issue. Recent recommendations have been made to initiate telemedicine programs that would increase access to specialists for rural residents.12

<table>
<thead>
<tr>
<th>Region</th>
<th>All MDs/100,000</th>
<th>Primary Care MDs/100,000</th>
<th>Specialists/100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Joaquin Valley</td>
<td>173</td>
<td>87</td>
<td>43</td>
</tr>
<tr>
<td>Northern/Sierra Co.</td>
<td>226</td>
<td>107</td>
<td>55</td>
</tr>
<tr>
<td>Central Coast</td>
<td>274</td>
<td>116</td>
<td>79</td>
</tr>
<tr>
<td>Southern California</td>
<td>294</td>
<td>120</td>
<td>86</td>
</tr>
</tbody>
</table>

To analyze the accessibility to health care facilities we did a network analysis using 2 and 3-mile service areas based on the research of mile radii from emergency services.\textsuperscript{14} As most “response times” are measured in minutes, and since we were unable to do a time-cost matrix, we utilized distances for our analysis.

GIS was used to conduct health care service area analysis for counties of Tulare, Kings, Stanislaus and Kern. The network analysis of Stanislaus County a large number of the clusters located within the 3 mile service area of health care facilities with an exception of a few located on the fringe. From the previous analysis of accessibility to transportation, it can be deduced that health care facilities are accessible to most of them.

Kings county network analyses indicate that very few clusters in the study area of Hanford have access to health care facilities, with a majority of the clusters located on the fringe or as islands. In the county of Tulare, which has the largest percentage of historically significant legacy clusters, there are clusters in small towns like Tipton, Rixley etc. that do not have access to any kind of health care facilities within a three-mile radius. Clusters located in Woodville and Poplar cotton center have access to neither healthcare nor any kind of public transportation facilities. The larger towns / cities have most of the clusters located on the fringe of the 2-mile service area radius which without local public transportation renders it difficult to access.

**Emergency Services Service Area Analysis - Fire Stations, Sheriff Stations**

The San Joaquin Valley also suffers from poor response times from Fire Stations. As mentioned in PolicyLink’s 2007 report, the unincorporated areas of Fresno County have fire stations further apart from one another (than in the cities) therefore increasing response times.\textsuperscript{15} Similar issues are also noted in Stanislaus and Tulare Counties where unincorporated rural areas can’t expect timely responses to fires.\textsuperscript{16,17}

Sheriff stations are similarly inadequate, as the Fresno Bee reports that Fresno County had “5,641 [calls to domestic violence hotline] in the city of Fresno...and 927 in the unincorporated areas of the county.”\textsuperscript{18}

\begin{tabular}{|l|c|c|c|}
\hline
Sacramento Area & 310 & 132 & 89 \\
Greater Bay Area & 415 & 170 & 122 \\
California & 302 & 126 & 87 \\
\hline
\end{tabular}

\textsuperscript{14} Town of FlowerMound, Texas, \url{www.flower-mound.com/smart/sq_7.pdf}. “The generally accepted standard is to located fire stations within a 1.5-mile radius of all protected property to facilitate a five-minute response time. To facilitate a 6.5-minute response time, all protected properties should be located within a 2-mile radius from a fire station.”

\textsuperscript{15} Fresno Bee, June 10, 2007, \textit{Playing With Fire; Overtaxed fire departments in Fresno Co. – particularly in rural areas – are failing to meet the national standard for response time}, Brad Branan.

\textsuperscript{16} Modesto Bee, August 31, 2006, \textit{Fire Agencies Faulted; Report Notes Spotty Coverage, Urges Mergers; Inefficiency, Low Revenue, Slow Rural Response Cites}, Garth Stapley.

\textsuperscript{17} Tulare Advance-Register, March 6, 2007, \textit{Fire calls rise in 2006}, Luis Hernandez.

\textsuperscript{18} Fresno Bee, August 16, 2007, \textit{Chilling news reports remind of domestic violence’s impact; Even when number of cases declines, we must be alert to dangers}.
We could conduct emergency service area analysis only for Kern County. A three-mile service area based on route lengths was demarcated, and each of the fire stations identified. The city of Kern has two fire stations. When compared to clusters in smaller towns like Mountain Mesa and Squirrel Mountain Valley that are located outside the three-mile radius of the neighboring stations, these areas are not serviced by any fire stations. Similarly there is only one sheriff’s office located in the town of Lake Isabella which is inadequate.

In circumstances where the town falls out of the service area of the emergency services, special systems are developed where the fire station is paid a nominal fee by the residents to come, in case of an emergency.

**Conclusion**

Given our above analysis, one can quickly recognize the uneven distribution of resources for low-income minority residents of unincorporated communities. To make basic service and infrastructure improvements in these areas is often difficult for fragmented, and fiscally constrained local governments. However burdened counties and municipalities may be, there is still great value in assessing how government resources are allotted and spatially represented. Moreover, as California’s population continues to grow, particularly as a result of undocumented agricultural workers, these economic actors have few avenues for political and economic justice.

Thus, the research and legislative advocacy of PolicyLink and California Rural Legal Assistance will provide a critical voice for these issues of safety, equity and access.
Resources


Council of Fresno County Governments. “Fresno County: Coordinated Human Services Transportation Plan”2008 www.fresnocog.org


Fresno Bee, August 16, 2007, Chilling news reports remind of domestic violence’s impact; Even when number of cases declines, we must be alert to dangers.

Fresno Bee, June 10, 2007, Playing With Fire; Overtaxed fire departments in Fresno Co. – particularly in rural areas – are failing to meet the national standard for response time, Brad Branan.


Modesto Bee, August 31, 2006, Fire Agencies Faulted; Report Notes Spotty Coverage, Urges Mergers; Inefficiency, Low Revenue, Slow Rural Response Cites, Garth Stapley.


Tulare Advance-Register, March 6, 2007, Fire calls rise in 2006, Luis Hernandez.

Kern County Health Facility Service Areas

*Kern County zoom in on cluster of vulnerable communities

Legend
- Health Care Facility
- 3 mile service area
- Cluster
- Bus line
- Roads
- Major Roads

Authors: Dhanya Elias & Rebecca Baran-Rees
Source: U.S. Census 2000, Cal-Atlas, PolicyLink
Projection: NAD 1983 Albers
Community Equity Initiative: Unincorporated Communities

Map 10