

**Vehicle Parking Facilities Data Collection for the
RELU-TRAN L.A.-Parking Model**

Technical Report Prepared and Submitted by

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1. Introduction

The RELU-TRAN LA-P model is a spatially detailed computer general equilibrium model of a regional economy that includes components reflecting the key choices of consumers, producers, landlords and developers and their interactions in the labor, housing, outputs for industries and land markets.

The goal of RELU-TRAN LA-P is to make six significant extensions to RELU-TRAN 1, so that the power and accuracy of this model in examining certain policies, in particular transportation-related fringe benefits such as employer paid parking, in the Greater Los Angeles Region can be examined. These extensions include: a) adding parking costs into the consumers generalized transportation costs; b) adding road traffic congestion for trips that occur within geographic zones, not just between two different geographic zones; c) allow vehicle ownership decision; d) allow producers to subsidize employees parking expenditures associated with commuting by car to the workplace; e) allow for carpooling as an alternative transportation mode to the workplace and f) have a more realistic representation of the government sector. In particular the model incorporates a wide array of tax instruments, including corporate income tax, property taxes, sales taxes, payroll taxes and taxes on individual labor and capital income. The main activities of the government sector are transferring incomes, purchase goods and services and raising revenue through taxes.

The current model can be used to investigate the effect of parking costs on a consumer's choice of travel mode. However, because parking supply and parking location are not modeled, the current version of the RELU-TRAN LA-P model cannot be used to investigate the effects that parking costs have on the choice between different types of parking (on-street, surface lot, multi-story or illegal parking) or different parking locations. Given these caveats, the current version of the RELU-TRAN LA-P model is suitable to examine the long-run effects of parking costs on consumers' residence location, job location or car ownership. The model is also suitable to examine how parking costs affect mode choices to work and shopping, vehicle miles travelled and transit ridership. The model is not suitable to examine short-term decisions involving trip length (parking cruise), trip start time or parking location.

This report explains how the vehicle parking facilities data sample was collected with the ultimate goal of estimating the average cost of providing different types of parking spaces in each model zone of the RELU-TRAN LA-P model.

This report is structured as follows. Section 2 describes how the Greater Los Angeles Region is represented in the RELU-TRAN LA-P model. Section 3 provides a detailed description of the data sources and data collection methodology. Section 4 describes in detail our final dataset of parking facilities for the SCAG region. Section 5 explains the criteria to classify each model zone as either Central Business District (CBD), urban or suburban area.

2. Representing the Los Angeles MSA

The Los Angeles Region in the RELU-TRAN LA-P model is based on the Southern California Association of Governments (SCAG) region and thus, it is composed of six counties: LA County, Ventura County, San Bernardino County, Riverside County, Orange County and Imperial County. According to the Census, the Los Angeles Metropolitan Area consists of Los Angeles and Orange Counties. The Inland Empire is a metropolitan area located east of the Los Angeles Metropolitan Area and consists of Riverside County and San Bernardino County. Imperial County is a relatively small, predominantly agricultural county, located about 200 miles southeast of Los Angeles.

In the RELU-TRAN LA-P model, the Greater Los Angeles Region is represented by a system of 97 model zones and by an aggregation of the major and local road networks. At each zone, a homogeneous and fixed land area is available for the development of residents and non-residential uses. In addition, each zone has a housing market, a labor market, and output markets for industries. These markets are competitive.

All intra-zonal trips use a congestible local road that is an aggregation of the underlying street and minor road system. Trips choose a path over the road-links which are an aggregation of major roads and highways. Each one-way inter-zonal link is represented by a capacity used to calculate equilibrium flow congestion which determines equilibrium monetary and time costs on the link.

The urban economy is partly closed in the sense that the total population of consumers in the urban area is fixed and exogenously given. Yet, some share of the urban production will not be consumed in the urban area, but will be exported in exchange for some monetary expenditures for goods and services produced or owned (for example land owned by absentee landowners) outside the urban economy but consumed by urban residents. Therefore, there is no interurban migration, utility levels of consumers are endogenously determined and model allocates the given aggregate population of consumers among the 97 zones only. Table 1 presents the distribution of the model zones across the six counties.

Table 1: RELU-TRAN LA-P Model Zones

Model Zones	County
Zones 1 through 46	Los Angeles
Zones 47 through 49	Ventura
Zones 50 through 66	Orange
Zones 67 through 80	San Bernardino
Zones 81 through 95	Riverside
Zones 96 through 97	Imperial

3. Data Collection Methodology

3.1. Data Sources

This subsection describes the main sources used to collect the information contained in our parking facilities dataset. Data was collected in the Fall of 2014 and Fall of 2015.

We used five parking websites to track parking facilities in the SCAG region: *Parkopedia*, *BestParking*, *Parkme*, *LADOT*, and the *ie511* website. Below we present the details on each of the website sources, how the data was collected and recorded in our dataset. Aside from the parking facility databases, additional sources were also used to gather information on parking facilities in the project area. Some of these additional sources include local governments' websites, press articles and the *Yellow Pages* website.

Parking facilities with a parking price of zero and parking facilities for which parking space information was unavailable in the website sources or needed clarification were investigated further, either by on-site inspections or via phone calls. *Google Street View* and on-site inspections were also used to validate some of the information provided in the parking websites and to identify the type of above-ground parking structure (surface versus structural) when this information was not clear or available in the searched website. *Google Maps Satellite View* was also used to count the number of surface parking spaces and the number of floors of structural facilities when such information was not available in the searched websites.

Parkopedia Website

Parkopedia's stated purpose is to help driver's locate and compare parking at their specified destination in order to find the cheapest and most convenient parking available. Users can type an address, the name of an area, a zip code, or a city name into the search bar on the website and get a list of parking facilities near a given location. *Parkopedia* does not own or manage any parking facilities, but instead supplies information that has been gathered and submitted by users. *Parkopedia* constantly updates the information in its website.

Parking facilities in our dataset were found by entering model zone names as well as the name of the 165 cities used in Zhang and Arnott (2011[2]) into the *Parkopedia* search bar, and recording the resulting parking facilities for each zone. However, the model zone name did not always correspond to the area that the *Parkopedia* website associated with the name. When this was the case, cities or areas within the model zone were found on the LA-Plan project website GUI Map and entered into *Parkopedia* instead.

Once a parking facility was identified, information on its characteristics from the *Parkopedia* website was recorded. *Parkopedia* offers information on facility accessibility, parking type, location, use as a park and ride, price, and the number of parking spaces available. These categories are defined as follows:

1. Accessibility on the *Parkopedia* website designates parking facilities as either public or private.
 - (i) A publicly accessible parking facility is a facility that is available to any driver who pays the listed parking rate, whereas a privately accessible parking facility has restricted access.
 - (ii) A parking facility may be listed as private for a number of reasons, such as when parking at a facility is restricted to employees or patrons of a nearby firm.
 - (iii) Residential facilities are also listed as privately accessible as they are not per se available to any driver, but instead are rented at the discretion of the owner of the residence and under conditions determined by the two parties as part of a private arrangement.

2. Parking type consists of surface, structure and underground parking.
 - (i) Surface parking refers to surface lots that are not within a structure and spaces on private residential driveways that are rented to the public.
 - (ii) Structure parking refers to aboveground parking garages that contain one or more aboveground floors and no belowground floors, and spaces in private residential aboveground garages that are rented to the public.
 - (iii) Underground parking refers to underground garages that contain one or more belowground floors and no aboveground floors, and spaces in private residential underground garages that are rented to the public.
 - (iv) Some facilities listed as either a structure or an underground facility on the *Parkopedia* website were discovered to have both aboveground and underground floors. These facilities are listed as mixed in our dataset, and have separate parking space information for both aboveground and underground floors when this information was available.

3. Location of parking facilities in *Parkopedia*.

When a facility is selected in *Parkopedia*, its location is given under a tab labeled “Address.” However, for some facilities, only a range of addresses on a given street is listed. For these latter facilities, the mapping option was used. The mapping option is also under the “Address” tab, and allows users to find directions to a facility by mapping from a location to the selected facility. In some cases, the mapping option produced an exact address, which was then recorded in our dataset. In other cases, the mapping option produced the same address range and this range was then recorded.

4. A park and ride on the *Parkopedia* website.

A park and ride facility is a parking facility in which drivers leave their cars in order to use some form of group transportation to get to another location. This, for example, could be a Metrolink station parking facility or a parking facility used for carpooling.

5. Parking Prices in *Parkopedia*.

Facility price refers to the rates charged by each parking facility. On the *Parkopedia* website, rates for facilities were reported for a variety of time intervals. Some facilities gave separate daily, monthly, and/or annual rates, while others gave rates by hour or partial hour.

6. Number of parking spaces.

Parking spaces available refers to the total number of parking spaces at each facility.

After all of the data was collected from *Parkopedia*, there were problems with two categories of information. These categories were parking spaces available and facility price. *Parkopedia* had both pieces of information for many facilities, but some facility listings did not include the number of parking spaces available, and other facility listings had one or both pieces of information with a price of zero. For the zero price facilities, the price needed to be verified. Therefore, the facilities with a price of zero and parking facilities for which parking space information was unavailable were investigated further, either by on-site inspections or via phone calls. For the facilities that were investigated further, additional data beyond the price and number of parking spaces were gathered when available. For more specificity:

- (i) With regard to parking spaces, the number of designated carpool and motorcycle parking spaces were also recorded in our dataset.
- (ii) For structure and underground facilities, the number of floors and the number of parking spaces per floor were reported.
- (iii) Information was gathered on each facility's hours of operation along with its distance from the nearest shopping area.
- (iv) If the facility was a park and ride, information was also gathered on associated transit services.
- (v) Any leased parking spaces were also reported, along with the name of the firm leasing the spaces and the price the firm was charged at the time of the inquiry.
- (vi) Furthermore, for on-site inspections, the local area was reported as either suburban, urban, or CBD.

BestParking Website

BestParking does not own or manage any parking facilities, but has partnered with private parking facility operators to ensure that their information is accurate. This website is another parking search engine that looks to help drivers find the cheapest and most convenient parking available in 115 cities in North America. Of these cities, four were in the project area: Los Angeles, Long Beach, Santa Ana, and Santa Monica. Each of these cities was searched and every new parking facility found was added to the dataset. This website provides information on location, hours of operation, parking type, parking rates, and capacity, which were all recorded in our dataset. These categories are defined as follows:

- (i) Location refers to the address listed for each parking facility on the *BestParking* website.
- (ii) Hours of operation refers to the hours during which drivers are allowed to park in a given facility.
- (iii) Parking type consists of surface, structure, and underground parking. In the *BestParking* website, each facility is listed as either an outdoor lot or an indoor garage. Outdoor lots are equivalent to surface parking facilities. Indoor garages are equivalent to structure or underground facilities. In some cases, it was clear that a facility offered structure or underground parking from the picture of the facility provided by the website or from inspection of the facility on the Google Street website. However, most of the facilities required additional research to determine the type of parking offered.
- (iv) *BestParking* determines parking rates based on the duration of a driver's stay at a parking facility. The website has a side bar in which users enter the specific hours of the day that they plan to park, and the website then calculates the rates for each facility in the chosen city.
- (v) For some facilities, capacity was listed. The capacity of a parking facility is the total number of parking spaces offered. When this was provided, the number was recorded. If this information was not provided, the facility underwent further research as described in our *Parkopedia* discussion.

Parkme Website

Parkme does not own or manage any parking facilities, but instead advertises parking facilities for businesses and municipalities. The website describes itself as an online parking marketplace where users can search for parking by typing an area into the search bar at the top of the page. By creating an account, users can pay for parking in advance for listed parking facilities and thereby have a guaranteed parking space when they arrive.

While many of the facilities listed on *Parkme* in downtown areas were already identified in our dataset based on our *Parkopedia* and *BestParking* searches, *Parkme* offered information on facilities in many areas in which few or no parking facilities had been found. This led to new facilities being found in Riverside,

Pasadena, Hollywood, Long Beach, Santa Ana, Buena Park, Anaheim, Palos Verdes, Baldwin Hills, and Malibu.

The *Parkme* website provides information on location, hours of operation, parking type, parking rates, the number of parking spaces available, and contact information, which was recorded in our dataset. These categories are defined as follows:

- (i) Location refers to the address listed for each parking facility on the *Parkme* website.
- (ii) Hours of operation refers to the hours during which drivers are allowed to park in a given facility.
- (iii) Parking type consists of surface, structure, and underground parking. In the *Parkme* website, each facility is listed as a surface lot, a structure lot, or a subterranean lot. A surface lot is equivalent to a surface parking facility, a structure lot is equivalent to a structure parking facility, and a subterranean lot is equivalent to an underground parking facility.
- (iv) *Parkme* gives detailed descriptions of parking rates for its facilities. Daily and/or monthly rates were recorded when listed. If a rate was given only for a fraction of an hour, or this number was given in addition to a daily and/or monthly rate, this number was recorded.
- (v) Some facilities had information on the total number of parking spaces at the facility. This number was recorded when it was available. If this information was not available, then the facility underwent further research as described before.
- (vi) *Parkme* lists one, and sometimes two phone numbers for many of its facilities. When a phone number was given, it was also recorded in the notes column of our dataset to help with any additional research required for a facility
- (vii) As with facilities found through *Parkopedia*, some of the facilities from *Parkme* that were researched were found to be mixed facilities. Mixed facilities are defined as having both aboveground and underground floors. However, one of the facilities found on *Parkme*, facility #1348 in our dataset, turned out to be a mixed facility with structure and surface parking spaces. Therefore the number of surface parking spaces at the facility and the number of structure parking spaces at the facility are recorded in our dataset.

LADOT Website

The *LADOT* website gives information on parking facilities owned and maintained by the Los Angeles Department of Transportation. The website provides information on location, hours of operation, nearby activities, the number of parking spaces available, and parking rates, which was recorded in our dataset. These categories are defined as follows:

- (i) Location refers to the address listed for each parking facility on the *LADOT* website. Also, each facility has a unique facility number, which was reported in the “Government Owner” column of our dataset. For example, facility #112 in our dataset is *LADOT* Facility 643.
- (ii) Hours of operation refers to the hours during which drivers are allowed to park in a given facility.
- (iii) For many of the facilities, the website provides information on nearby activities in a section labeled “Convenient to.” This information was recorded in the “Convenient to...” column in our dataset. So, for example, facility #116 in our dataset is *LADOT* Facility 662, which the website lists as convenient to “Echo Park, restaurants and shops” and thus this information can be found in the “Convenient to...” column of our dataset.
- (iv) Some facilities had information on the total number of parking spaces at the facility. This number was recorded when it was available. If this information was not available, then the facility underwent further research.
- (v) The *LADOT* website gives detailed descriptions of parking rates for its facilities. Daily and/or monthly rates were recorded when listed. If a rate was given only for a fraction of an hour, or this number was given in addition to a daily and/or monthly rate, this number was recorded.
- (vi) All of the *LADOT* facilities were surface, structure or mixed facilities. While the *LADOT* website did not specifically list parking type for every facility, each structure facility was described as a “garage.” The rest of the facilities were surface facilities. The parking type for each *LADOT* facility was verified using Google Street or, when the parking type was unclear, through on-site inspections or phone calls. The parking type for surface facilities was generally obvious through Google Street, but nearly every structure facility underwent further research along with many surface facilities to ensure that this information was correct, and also to gather additional information about the facilities. There was one *LADOT* facility that was mixed. Facility #298 in Data Set #1 is *LADOT* Facility 732, and was listed as a garage with two underground floors on the *LADOT* website. A phone call was made that established that this was in fact a mixed facility and additional information was gathered for this facility.

ie511 Website

According to the website, the website itself and the associated telephone service are owned and operated through a partnership of the Riverside County Transportation Commission and the San Bernardino Associated Governments. The website provided information on park and rides in the Inland Empire, Los Angeles County, Orange County, and Ventura County. No additional research was done for any of these facilities, and thus all information for these facilities recorded in our dataset is directly from the ie511 website. The amount of information available varied across different facilities, but in general the website

provides information on location, parking rates, the number of parking spaces available, the facility owner, and the transit operator, which was recorded in our dataset. These categories are defined as follows:

- (i) Location refers to the address or cross streets listed for each parking facility on the ie511 website.
- (ii) Parking rates refers to the rate charged to park in a facility. The website states that the listed park and ride facilities in Riverside and San Bernardino counties are free of charge, and therefore these were recorded as zero price facilities. A small number of facilities outside of this area also had a price of zero listed, but the rates for most of the facilities in Orange, Ventura, and Los Angeles counties were not listed and therefore still need to be collected.
- (iii) Most facilities had information on the total number of parking spaces at the facility. This number was recorded when it was available.
- (iv) Most of the facilities listed the park and ride owner, and this was recorded when it was available.
- (v) Most of the facilities listed the transit operator, and this was recorded when it was available.
- (vi) Facility type was not listed on the ie511 website, and was therefore determined using Google Street. It should be noted that for future use, many of these facilities will require further research to gather and verify the information in these categories.

Yellow Pages website

One source which was used extensively was the *Yellow Pages* website. This site allows users to search for parking facilities in a specified location. Many areas were searched using the *Yellow Pages* website, but due to overlap between this source and the sources already used, not every search produced new facilities for our dataset. The searches that did produce additional facilities were those of Lake Arrowhead, Corona, Redlands, Tustin, Banning, Temecula, Palm Springs, La Quinta, Cathedral City, Palm Desert, El Centro, Calexico, and Irvine. However, *Yellow Pages* provides only an address and a phone number for parking facilities, so all facilities found through this source required additional research either via on-site inspection or phone-calls.

Local Governments Websites

Additional city owned facilities were found in Riverside through phone calls and emails to the city government and to the UC Riverside Transportation and Parking Services Department. Nancy Bonk, a supervisor with the City of Riverside, provided rate and parking space information for 17 City of Riverside parking facilities. She also provided information regarding the location of another City of Riverside facility for which information was gathered through an on-site inspection (this is facility #1329 in our dataset). Andrew Stewart, the Facilities and Lot Operations Superintendent at UC Riverside, provided all necessary

information for seven UC Riverside parking facilities that offer public parking. These required no additional research and were added to our dataset.

More facilities were found in Ventura through the city's website. The City of Ventura website provides parking rates and the cross streets where city parking facilities are located. Using this information, exact addressees were found on Google Street and additional research was done for these facilities to verify the recorded information and to determine the missing information required for our dataset.

The City of Laguna Beach's website was also used. The website identified ten city owned parking facilities in Laguna Beach and provided an address and the number of parking spaces at each facility. However, the website was not clear regarding parking rates for these facilities. For example, some facilities had multiple rates listed with no description of when one rate was used as opposed to another. Therefore, further research was conducted regarding these facilities and although multiple phone calls were made to the City of Laguna Beach, no city employee was found that could clarify the parking rates for these facilities. Due to time restrictions, further inquiry into the parking rates was not possible. Thus, additional research is required for future use of these facilities.

Published Articles

Facilities were found in El Centro through an article published on The Desert Review's website. While the article did not provide information for parking facilities explicitly, it provided a map that identified parking facilities in downtown El Centro. Addresses were obtained using Google Street, along with the names of nearby businesses whose contact information was retrieved through Google searches. Information was then gathered for each of the parking facilities through phone calls to the nearby businesses.

Three facilities were found in Big Bear Lake through an article published in The Big Bear Grizzly. As with the article in The Desert Review, the article in The Big Bear Grizzly did not explicitly provide the desired information for the parking facilities. The article described a project being done to increase the number of parking spaces in a parking lot in Big Bear Lake, and within the article the locations of two additional facilities were given. The exact addresses for these facilities were obtained using Google Street, and, as with the El Centro facilities, nearby businesses were called to gather additional information.

Museum Websites

Our dataset also contains museum owned parking facilities. Many of the museum websites provided parking rate information and the cross street where their parking facility or facilities are located, but not exact addresses. These were The Natural History Museum of Los Angeles County, The Los Angeles County Museum of Art (LACMA), The California Science Center, The La Brea Tar Pits, The Museum of Tolerance, The Norton Simon Museum, and The Pasadena Museum of History websites. For these facilities,

exact addresses were found using Google Street and phone calls were made to gather and verify information about the facilities.

Two sources that differed from the other museum websites were the website for The Autry and the website for El Pueblo de Los Angeles Historical Monument. These two websites were similar to the other museum websites in that they provided parking rate information, but they also provided an exact address for their parking facilities, and these were recorded in our dataset. In addition, the El Pueblo de Los Angeles Historical Monument website provided hours of operation for each of its facilities, and these too were recorded in our dataset. As with the other museum websites, phone calls were made to gather and verify information about the facilities.

Google Maps Satellite View and Google Street View

Google Maps is a Web-based service that provides detailed information about geographical regions and sites around the world. In addition to conventional road maps, google Maps offers aerial and satellite views of many places. In some cities, Google Maps offers street views comprising photographs taken from vehicles. Google Maps offers several services as part of the larger Web application, being Google Street View one of such services. This service enables users to view and navigate through 360 degree horizontal and 290 degree vertical panoramic street level images of various cities around the world.

3.2 Outdoor Ground Truth Evaluation

A total of 934 parking facilities were investigated through on-site visits (721 in total) and through phone calls (213). Only 0.08% of the 82 parking facilities investigated for which the parking price rate was reported as \$0 in the parking websites had an inaccurate price rate. Tables 2 summarizes all the parking facilities that were investigated.

Table 2: Total Parking Facilities Further Investigated, by parking type

Type of Parking Facility →	Surface	Underground	Structure	Mixed	Total
On-site visits	443	69	193	16	721
Phone Call	171	8	33	1	213
Total	614	77	226	17	

4. Structure of Our Excel Dataset

Our final dataset includes information on 1 397 non-residential vehicle parking facilities located in the SCAG region. We define a vehicle parking facility as a controlled entrance and exit building, structure, surface lot, or other facility for parking vehicles that is privately or publicly owned, for which fees or charges may or may not be established for the use of the facility. Thus, our dataset does not include on-street parking, residential parking or, underground parking that’s concealed from above by non-residential buildings (such as retail or offices).

Around 74% of the vehicle parking facilities in our dataset is located in Los Angeles County with 235 of such facilities located in Downtown Los Angeles (model zone 1). Out of the 235 vehicle parking facilities in Downtown Los Angeles, 143 are surface lots, 23 underground structures, 67 structural parking facilities and 2 are mixed parking structures. Table 3 summarizes the distribution of our dataset vehicle parking facilities by type and county. Table 4 summarizes the total number of non-residential off-street parking spaces collected in our dataset by parking type and county. Table 5 summarizes the number of parking floors and finally, Table 6 provides average, maximum and minimum daily parking prices per county.

The parking facilities summarized in Table 3 have each been given a unique identification number and have been grouped by model zone. Model zones are separated by county and are classified as suburban, urban, or CBD. Also, zones located on the coast are specifically identified. Within each zone, parking facility entries are categorized by parking type. Each parking facility entry consists of the information found on its corresponding source website and, if applicable, information found through phone calls and on-site inspections. All the information was stored in an excel sheet. The columns in our excel database are explained next:

Columns A through J: record the parking facility ID number, information on the location of the parking facility (County, Model Zone, Address, City/Area) and the type of parking facility (Surface, Underground, Structure and Mixed).

Column K identifies residential parking facilities, which were collected from Parkopedia. This refers to various types of garages and driveways located on residential property that are rented to drivers through advertisement on the Parkopedia website.

Columns L and M are under the heading “Accessibility” which is broken into public and private. A publicly accessible parking facility is a facility that is available to any driver who pays the listed parking rate, whereas a privately accessible parking facility has restricted access. A parking facility may be listed as private for a number of reasons, such as when parking at a facility is restricted to employees or patrons of a nearby firm. Residential facilities are also listed as privately accessible as they are not per se available to any driver, but instead are rented at the discretion of the owner of the residence and under conditions determined by the two parties as part of a private arrangement.

Columns N, O, P, Q, R, and S describe park and ride facilities. Column N identifies facilities as park and rides. Columns O, P, Q, and R contain information found on the ie511 website. Column O is labeled “Publicly Owned Park and Ride Facility” which refers to park and ride facilities that are owned by a government entity. Column P is labeled “Privately Owned Park and Ride Facility” which refers to private parking facilities that are rented out to be used as park and rides. Columns Q and R give the specific park and ride owner and transit operator for each of the facilities as listed on the ie511 website. For example, facility #949 is a parking facility used as a park and ride that is owned by United Methodist Church and is operated by Caltrans. The information in Column S was gathered specifically from phone calls and on-site inspections for park and ride facilities found in any of the sources with the exception of the ie511 website. This column identifies the transit services associated with these facilities.

Columns T, U, V, and W provide ownership information for non-park and ride facilities. Columns T and U identify government owned facilities and the specific government entities that own them. Columns V and W identify museum, entertainment center, and historical monument parking facilities. Entertainment center refers to parking facilities associated with specific entertainment venues. For example, facility #203 is the parking facility for the Walt Disney Concert Hall. Historical monument parking facilities were included specifically to identify El Pueblo de Los Angeles Historical Monument parking facilities.

Columns X, Y, Z, and AA give the rates charged by parking facilities for partial hourly, daily, monthly, and annual parking. When the price information was gathered, some facilities offered specific daily, monthly, and/or annual rates. When this was the case, these stated rates were recorded. For other facilities, one or more of these rates were missing, but hourly rates or rates for some fraction of an hour were available. In order to calculate the desired rates for facilities that did not offer specific daily, monthly, and annual rates, some basic assumptions were made. These assumptions were that people work eight hours per day, people work five days per week, and people work 250 days per year. Using these assumptions and with the information gathered on partial hourly (or hourly) rates, the daily, monthly, and annual rates were calculated as needed.

Columns AB, AC, and AD list the number of parking spaces at each facility. This information was found in the sources described in the previous section or through the phone calls and on-site inspections.

The **remaining columns in our dataset** all contain the information collected through the phone calls or on-site inspections, with the exception of columns AL, AM, BJ, BM, and BN.

Column AL is labeled “Convenient to...” which was described in the summary of the LADOT website in the previous section.

Columns Am through BI record the total number of floors, total number of floors above and below ground as well as the number of parking spaces per floor.

Column BJ contains the hours of operation of facilities when this information was available from a given source, or when it was obtained from phone calls or on-site inspections.

Column BK gives the maximum number of hours a vehicle can stay in a given facility when this information was available/applicable, and this information was gathered by the same means.

Column BN is the last column in the dataset and is labeled “Notes.” Any relevant information about a facility that was not already addressed by another column in the dataset was recorded in this column, including contacts information along with any other important information gathered through phone calls and on-site inspections.

Table 3: Total Vehicle Parking Facilities in our Dataset by County and Facility Type

Type → County↓	Surface (1)	Underground (2)	Structural (3)	Mixed (4)	Total (1)+(2)+(3)+(4) =(5)	Residential out of (5)	Park & Ride out of (5)
Los Angeles	636	114	271	18	1039	69	155
Ventura	35	0	2	0	37	0	23
Orange	108	2	52	1	163	8	25
San Bernardino	46	0	5	0	51	2	30
Riverside	75	2	14	1	92	4	32
Imperial	15	0	0	0	15	0	0
Total	915	118	344	20	1397	83	265

Table 4: Total Parking Spaces in our Dataset by County and Space Type

Type → County↓	Surface (1)	Underground (2)	Structural (3)	Total (1)+(2)+(3)
Los Angeles	90 353	45 197	150 217	285 767
Ventura	4 726	0	1 069	5 795
Orange	29 187	1 219	43 696	74 102
San Bernardino	9 738	0	3 527	13 265
Riverside	9 131	905	5 391	15 427
Imperial	1 572	0	0	1 572
Total	144 707	47 321	203 900	395 928

Table 5: Number of Floors in a non-surface Parking Facility by County and Type

County	Average # Floors above ground	Maximum Floors above ground	Minimum Floors above ground	Average # Floors under ground	Maximum Floors below ground	Minimum Floors below ground
Los Angeles	4.06	11	1	3.42	7	1
Ventura	5	5	5	-	-	-
Orange	4.36	8	1	3	3	3
San Bernardino	3.5	5	2	-	-	-
Riverside	3.8	4	3	3	3	3
Imperial	-	-	-	-	-	-

Note: The statistics on table 5 were calculated based on a subsample for which we had complete information for the number of floors.

Table 6: Daily Parking Rate in our Dataset by County

County	Average Daily Parking Rate (\$/Day)	Maximum Daily Parking Rate (\$/Day)	Minimum Daily Parking Rate (\$/Day)	% of Private Facilities
Los Angeles	9.34	37	0	30%
Ventura	0.42	5	0	0%
Orange	8.33	32	0	0%
San Bernardino	0.57	8	0	0%
Riverside	5.82	20	0	0%
Imperial	2.2	12	0	0%

5. Listing of Model Zones as Suburban, Urban or CBD

In addition to parking facility information, our dataset lists each model zone as suburban, urban, or CBD (central business district). These classifications were made based on the square foot land values for each model zone given by Zhang and Arnott (2011[1]). The square foot values were used to calculate per acre values, which were then used to make the classifications.

Zones with per acre land values less than \$500,000 are listed as suburban, zones with per acre land values of \$500,000 to less than \$3,000,000 are listed as urban, and zones with per acre land values of \$3,000,000 and above are listed as CBD.

To ensure that the model zone classifications resulting from these criteria were correct, they were compared to three sources. These sources were Giuliano and Small (1991), Ban and Arnott (2013), and anecdotal evidence from on-site inspections.

The first two sources, Giuliano and Small (1991) and Ban and Arnott (2013), determined employment subcenters in the Los Angeles area. It should be noted that Giuliano and Small (1991) identified 32

employment subcenters and Ban and Arnott (2013) identified 70. While most of the subcenters found in LA County are the same in these two sources, Ban and Arnott (2013) identified additional subcenters in Orange County, San Bernardino County, Riverside County, and Imperial County. The employment subcenters identified by these two sources consistently matched the zones determined to be CBD's by land values. Further, the anecdotal source classified individual parking facilities as suburban, urban, or CBD based on observed features of the surrounding areas during on-site inspections. These observations were also consistent with the land value classifications. Thus, after comparison, the land value classifications used in our dataset are consistent across all three sources.

References

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