

# DENSITY RANGE CALCULATION INSTRUCTIONS

## Procedure for Obtaining the Population Density Range Category Designation for the Qualifying Transit Station (Section 108(a)(5))

For Section 108(a)(5), the TOD Housing Program application will be scored for the population density as of Census 2000 for the primary mode of transit serving the Qualifying Transit Station. The Department (HCD) will determine which of the ten Density Range categories for population per square mile of land area the Qualifying Transit Station and corresponding score is to be assigned, using the methodology described in the example included in this attachment.

Applications may be submitted by the application due date (March 7, 2007) with or without this Density Category Report completed. Applications received without the Density Category Report determined by the Department before the application due date will have this determination made by the Department during application processing, except under circumstances as described below (\*). The Department will make its determination of the appropriate Density Range category designation and score available prior to the application due date for requests submitted to the Department prior to February 21<sup>st</sup> on the following timetable; reports will not be made available prior to the application due date for requests received after February 21<sup>st</sup>. Each prospective applicant may submit requests for a maximum of two qualifying transit stations prior to the due date. The form on the following page is a sample of the form used in submitting the request for the Density Category Report.

### **Date HCD receives request:**

**5 pm Thursday, January 17th**  
**5 pm Thursday, January 24th**  
**5 pm Thursday, January 31st**  
**5 pm Thursday, February 7th**  
**5 pm Thursday, February 14th**  
**5 pm Thursday, February 21st**

### **Date report available to applicant:**

**Friday, January 25th**  
**Friday, February 1<sup>st</sup>**  
**Friday, February 8th**  
**Friday, February 15th**  
**Friday, February 22nd**  
**Friday, February 29th**

\* Following the application due date and upon review and preliminary scoring of all applications received, the Department may determine that an application may not be competitive, relative to other applications received, even with a high Density Category score. In such cases, the Department may not proceed with determining the Density Category for TOD program applications which were submitted without the Density Category Report.

**SAMPLE FORM**

**DENSITY RANGE CALCULATION REQUEST FORM**

For Qualifying Transit Station Scoring Category  
(Section 108(a)(5))

Email Request Form to: cmorrow@hcd.ca.gov  
FAX: (916) 445-0117

Date Request Submitted to HCD:

Applicant Contact Information:  
*(name, telephone, email)*

Proposed Project Name:

Qualifying Transit Station  
Name and Address:

Station Transit Mode: *(check which type)*

- Heavy Rail (BART or Metro Red Line)
- Light Rail or Bus Rapid Transit
- Rapid Bus or Express Bus
- Commuter Rail (Capitol Corridor, Caltrain, Metrolink, Surfliner, Coaster)  
Ferry, Non-express bus hub

Analysis *(to be completed by Department)*

*(EXAMPLE OF COMPLETED DENSITY RANGE CALCULATION  
REPORT TO BE SUBMITTED WITH TOD APPLICATION)*

**DENSITY RANGE CALCULATION REQUEST FORM**

For Qualifying Transit Station Scoring Category  
(Section 108(a)(5))

Email Request Form to: [cmorrow@hcd.ca.gov](mailto:cmorrow@hcd.ca.gov)  
FAX: (916) 445-0117

Date Submitted: February 7, 2008

Applicant Sponsor: Metropolitan Development, Inc.  
123 Olive Street  
Long Beach, CA  
310-974-3256  
[joe@metroplitan.com](mailto:joe@metroplitan.com)

Project Name: Rockford Place

**Qualifying Transit Station**

Name and Address: North Main Corona Metrolink Station  
250 East Blaine Street  
Corona, California 92879

**Station Transit Mode:** *(check which type)*

- Heavy Rail (BART or Metro Red Line)
- Light Rail or Bus Rapid Transit
- Rapid Bus or Express Bus
- Commuter Rail (Capitol Corridor, Caltrain, Metrolink, Surfliner, Coaster)  
Ferry, Non-express bus hub

**Analysis** *(to be completed by Department)*

In order to determine the population density in the vicinity of the station, data from the most recent tract-level census, Census 2000, were used. Geographic, population and land area data may be accessed through the U.S. Census Bureau's American FactFinder database. The map shown in the figure below was created using ArcGIS 9.2 to identify the census tracts within a 4-mile radius of the North Main Corona Station. The station itself is located in census tract 415. The total number of census tracts and blocks entirely and partially contained within a 4-mile radius of the station are shown in Table 1.

*(Example of Density Calculation Report, Page 2)*

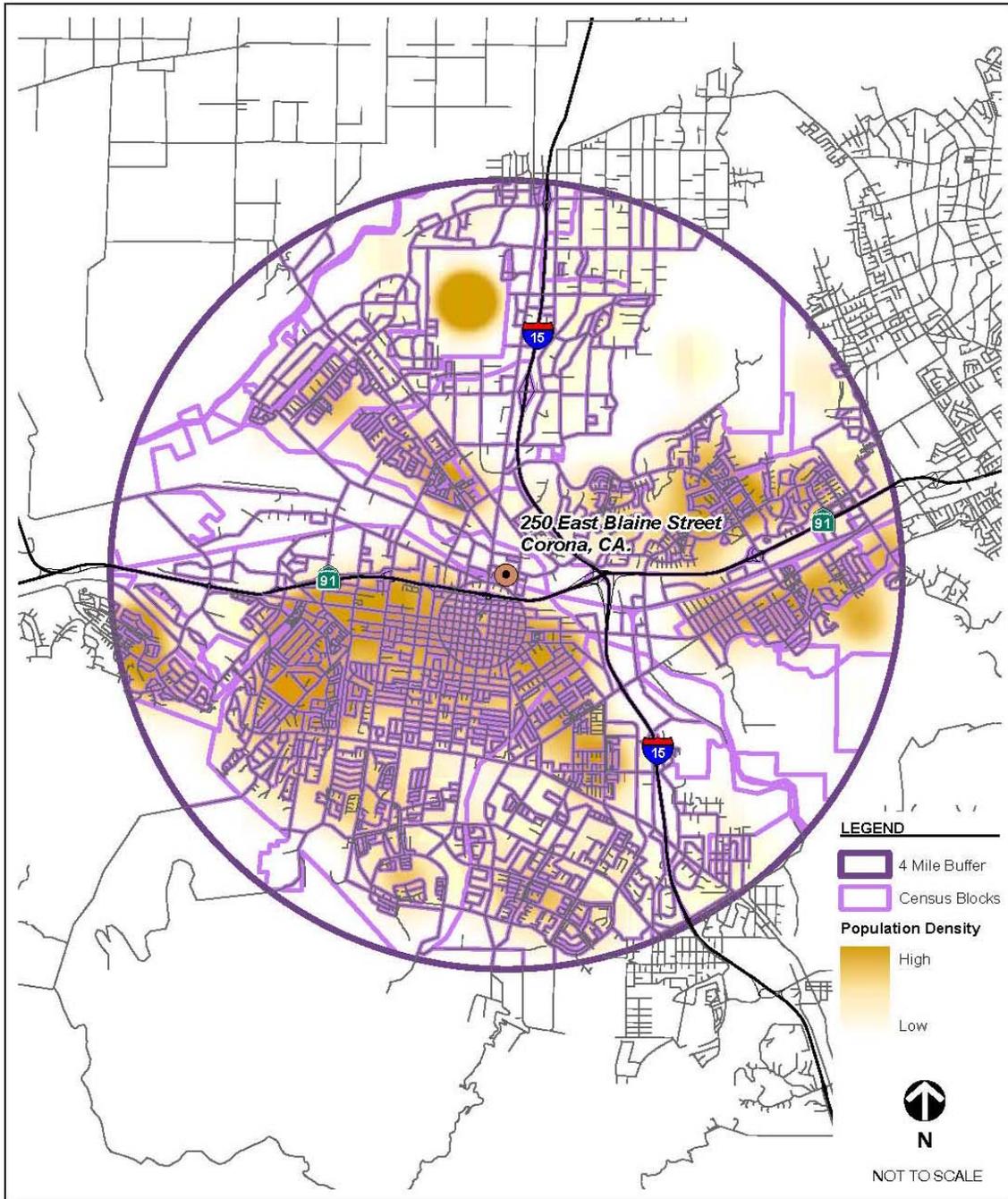
<b>TABLE 1</b>
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<b>CENSUS TRACTS AND BLOCKS WITHIN 4-MILE RADIUS OF NORTH MAIN CORONA STATION</b>		
	<b>Census Tracts</b>	<b>Census Blocks</b>
Completely Contained	25	1428
Partially Contained	19	94
Total	44	1522
Source: Fehr & Peers, 2008		

The total population for the entire area within a 4-mile radius of the North Main Corona Metrolink Station is 158,361. The resulting density is 3,150 people per square mile. This places the station in Density Category 4, according to the rubric provided in Table 2.

<b>Table 2</b>		
<b>PATH TOD Tool density table</b>		
<b>Density Category</b>	<b>Population per square mile of land area</b>	
	<b>Low</b>	<b>High</b>
1	0	1,000
2	1,001	2,000
3	2,001	3,000
4	3,001	4,000
5	4,001	5,000
6	5,001	6,000
7	6,001	8,000
8	8,001	10,000
9	10,001	13,000
10	13,001	above
Source: Fehr & Peers, PATH Resource Center, UC Berkeley, November 2007.		

**As a commuter rail station in Density Category 4, the North Main Corona Metrolink Station is assigned 20 points for vehicle trip reduction.** Research suggests that this level of population density correlates to a vehicle trip reduction rate on the order of 5 percent compared to areas not located within one-quarter mile of a transit station.



## **Methodology**

The following describes the method used to determine the transit station's density score. This is provided to allow applicants to replicate the density calculation should they desire to do so.

### **1. Extract population from Census 2000 geography, using ArcGIS 9.2.**

Before extracting the population within the 4-mile buffer, add the following fields to the Census geography:

- Original Area
- Percent
- Adjusted Population

Duplicate the values under Shape Area field and apply them to the Original Area field.

Intersect the 4 mile buffer with the census geography. This will act like a cookie cutter and cut overlapping census boundaries that cross the buffer boundary. Upon the intersection, the Shape Area field will update as this is a dynamic field.

Under the Percent field, calculate the percentage of area by taking the Shape Area field and dividing it by the Original Area field. Any census boundaries that are completely contained within the 4 mile buffer will show a value of 100% and those that cross the buffer boundary will be less. From this point, use the percent field to adjust the population under the Adjusted Population field. The total of the Adjusted Population field is the total population for the station area, to be used in steps 2 and 3.

Note: Census blocks return a higher population number as compared to census tracts and block groups, due to the smaller geography shapes. Therefore, the population calculation should be performed based on census block data. **Determine density category.**

Take the total population found in step 1, and divide it by the area of the 4-mile radius circle ( $50.265 \text{ mi}^2$ ) to get the density of the station area. Use Table 2 in the Analysis section, above, to find the density category that corresponds to this density.

### **2. Determine score**

Finally, use Table 3, below, to find the score that corresponds to the station's density category and transit mode.

**Table 3 Score by Density Category and Transit Mode**

Score → ↓ Transit Mode	Density Category (1=Lowest, 10=Highest)									
	1	2	3	4	5	6	7	8	9	10
Heavy Rail (e.g., electrified 3 <sup>rd</sup> Rail: BART, METRO)	29	31	33	37	41	44	48	50	53	55
Light Rail, Bus Rapid Transit (BRT)	21	22	23	27	31	35	38	42	46	50
Rapid Bus/Express Bus	20	20	20	22	24	26	28	30	33	36
Commuter Rail, (e.g., Capitol Corridor, Caltrain, Metrolink, Surfliner) Ferry, Non-Express Bus Hub	19	19	19	20	22	24	26	27	29	30

Source: Housing & Community Development Guidelines, January 2008.