



**CITYGATE ASSOCIATES, LLC**  
FIRE & EMERGENCY SERVICES



# LOS ANGELES FIRE DEPARTMENT STANDARDS OF COVER ANALYSIS

## VOLUME 3 OF 3: RISK ASSESSMENT

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 **CITYGATE ASSOCIATES, LLC**

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## COMMUNITY RISK ASSESSMENT

### 1.1 COMMUNITY RISK ASSESSMENT

The third element of the Standards of Coverage (SOC) process is a community risk assessment. Within the context of an SOC study, the objectives of a community risk assessment are to:

**SOC ELEMENT 3 OF 8**  
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**ASSESSMENT**

- ◆ Identify the values at risk to be protected within the community or service area.
- ◆ Identify the specific hazards with the potential to adversely impact the community or service area.
- ◆ Quantify the overall risk associated with each hazard.
- ◆ Establish a foundation for current/future deployment decisions and risk-reduction/hazard-mitigation planning and evaluation.

A hazard is broadly defined as a situation or condition that can cause or contribute to harm. Examples include fire, medical emergency, vehicle collision, earthquake, flood, etc. Risk is broadly defined as the *probability of hazard occurrence* in combination with the *likely severity of resultant impacts* to people, property, and the community.

#### 1.1.1 Risk Assessment Methodology

The methodology employed by Citygate to assess community risks as an integral element of an SOC deployment analysis incorporates the following elements:

- ◆ Identification of geographic planning sub-zones (risk zones) appropriate to the community or jurisdiction.
- ◆ Identification and quantification, to the extent data is available, of the specific values to be protected within the community or service area.
- ◆ Identification of the fire and non-fire hazards to be evaluated.
- ◆ Determination of the *probability of occurrence* for each hazard.
- ◆ Determination of the *probable consequence severity* of a hazard occurrence.
- ◆ Determination of the *impact severity* of a hazard occurrence on the fire agency's overall response capacity.
- ◆ Quantification of overall risk for each hazard based on *probability of occurrence* in combination with *probable consequence severity* and *agency impact severity*.

For this assessment, Citygate used the following data sources to understand the hazards and values to be protected in the City of Los Angeles (City):

- ◆ Esri and US Census Bureau population and demographic data
- ◆ City Geographical Information Systems (GIS) data
- ◆ City General Plan and Zoning information
- ◆ City Local Hazard Mitigation Plan
- ◆ Fire Department and other City data and information

### 1.1.2 Risk Assessment Summary

Citygate’s evaluation of the values at risk and hazards likely to impact the City yields the following:

1. The Department serves a very diverse urban population with densities ranging from less than 5,000 to more than 40,000 people per square mile over a widely varied urban land use pattern.
2. The City’s population is projected to grow by 18 percent over the next 18 years to 2040.
3. The City has a large inventory of residential and non-residential buildings to protect.
4. The City has significant economic and other resource values to be protected, as identified in this assessment.
5. The City has multiple mass emergency notification options available to effectively communicate emergency information to the public in a timely manner.
6. The City’s risk for five hazards related to emergency services provided by the Department range from **Low** to **Extreme** as summarized in the following table.

**Table 1—Overall Risk by Incident Type**

Hazard		Hazard Sub-Type	Risk Rating
1	Building Fire	Outbuilding/ADU	Moderate
		Single-Family Dwelling	High
		Multi-Family Residence	High
		Light Commercial	High
		Heavy Commercial/Industrial	High
2	Vegetation/ Wildland Fire	Grass	Low
		Brush	Moderate
		Grass/Brush (High/Very High Hazard Areas)	High
		Wildland-Urban Interface	Extreme
3	Medical Emergency	BLS Only	Moderate
		BLS/ALS	High
		ALS	High
		Active Shooter / Mass Casualty Incident	High
		Weapon of Mass Destruction	Extreme
4	Hazardous Materials	Alarm / Odor Investigation	Low
		Hazmat Level 1	Moderate
		Hazmat Level 2 Biological/Chemical Threat Natural Gas Leak	High
		Hazmat Level 3 Biological/Chemical Release Railroad Incident	High
		Explosion / WMD	Extreme
5	Technical Rescue	Elevator Rescue	Low
		Trauma / Pin-In / Potential Jumper Rope Rescue	Moderate
		Confined Space / Trench Rescue	Moderate
		Building Collapse / Natural Disaster	Extreme

### 1.1.3 Risk Planning Zones

The Commission on Fire Accreditation International (CFAI) recommends that jurisdictions establish geographic risk planning zones to better understand risk at a sub-jurisdictional level. For example, portions of a jurisdiction may contain predominantly moderate risk building occupancies, such as detached single-family residences, while other areas contain high- or maximum-risk occupancies, such as commercial and industrial buildings with a high hazard fire load. If risk was to be evaluated on a jurisdiction-wide basis, the predominant moderate risk could outweigh the

## Los Angeles Fire Department—Standards of Cover Analysis

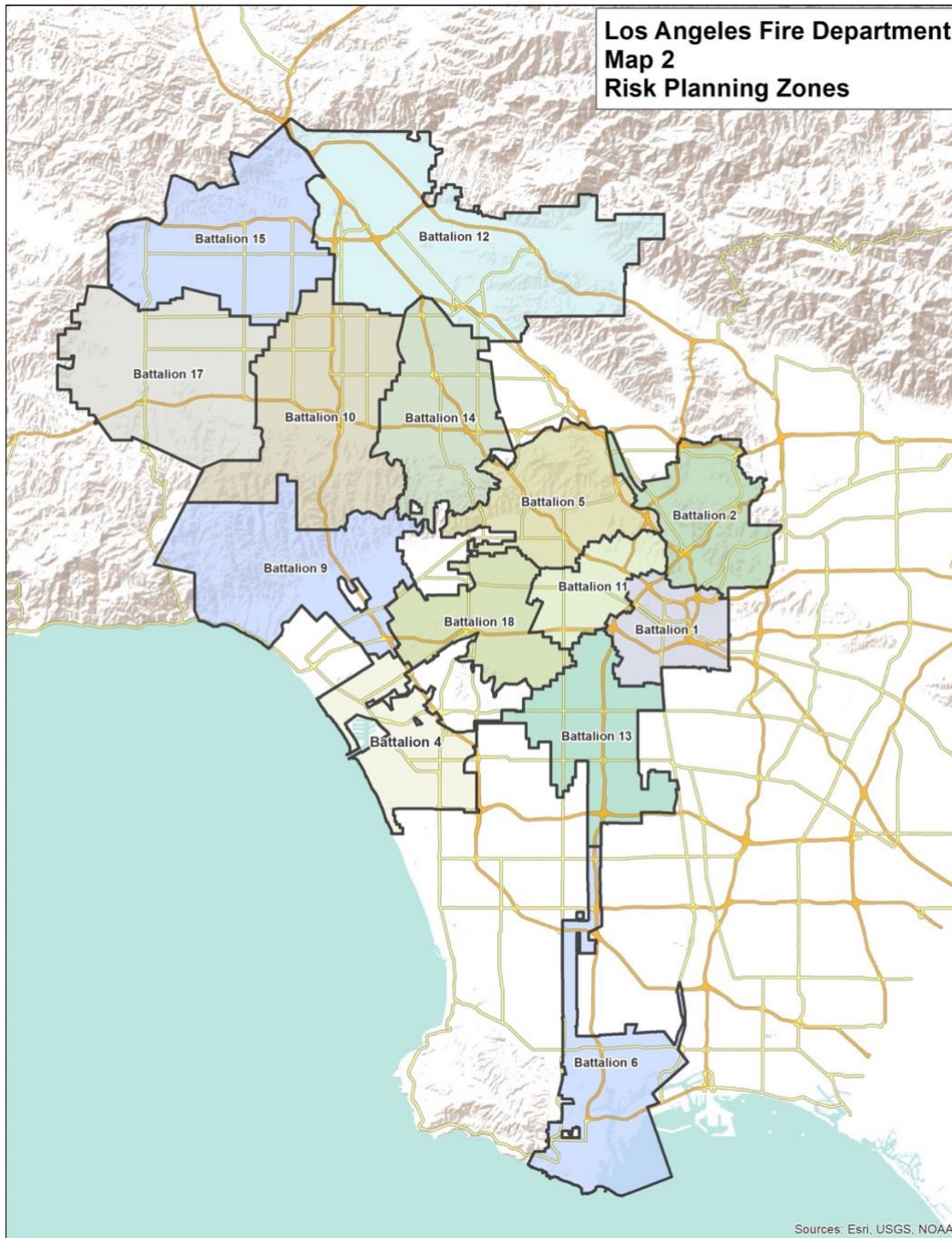
### *Community Risk Assessment*

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high or maximum risk and may not be a significant factor in an overall assessment of risk. If, however, those high- or maximum-risk occupancies are a larger percentage of the risk in a smaller planning zone, then it becomes a more significant risk factor. Another consideration in establishing planning zones is that the jurisdiction's record management system must also track the specific zone for each incident to be able to appropriately evaluate service demand and response performance relative to each specific zone. For this assessment, Citygate utilized 14 planning zones corresponding with Fire Department battalions as shown on the following map.



**Figure 1—Risk Planning Zones**



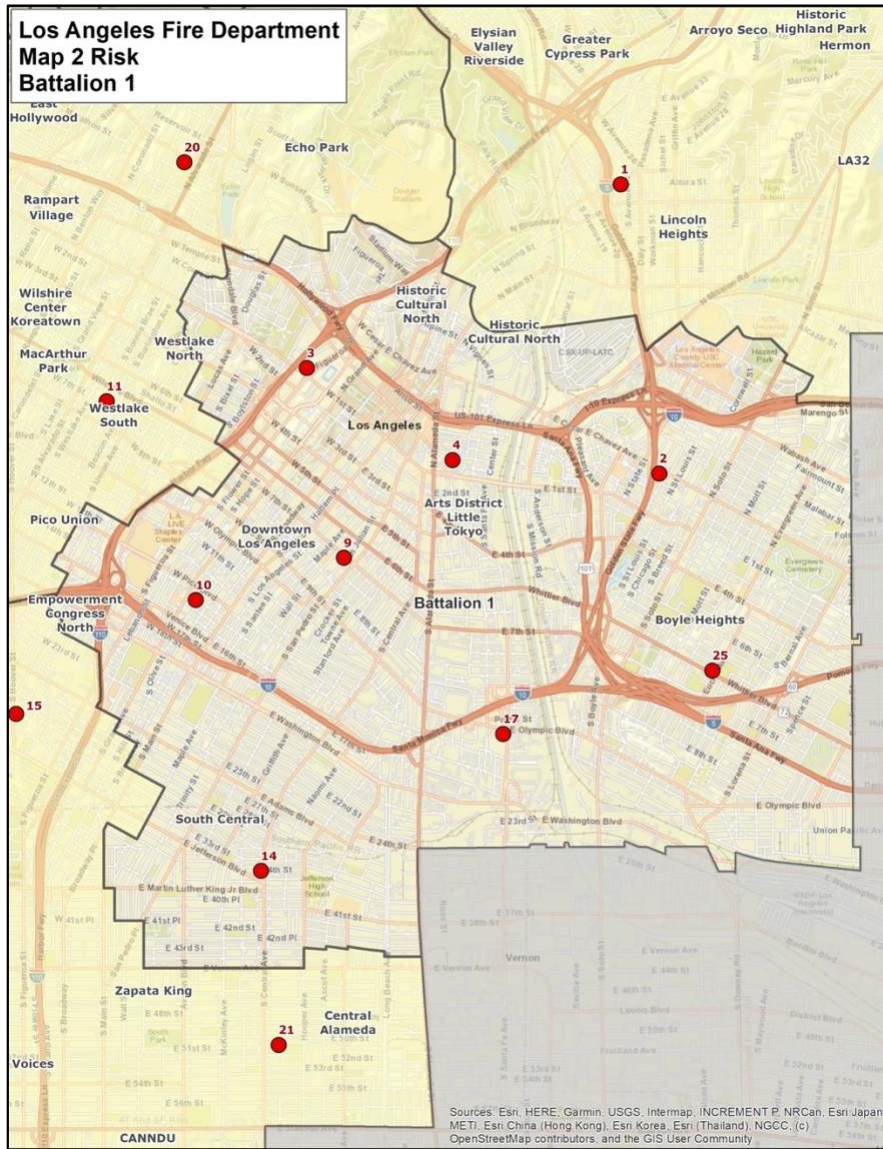
**1.1.3.1 Battalion Risk Profiles<sup>1</sup>**

Following is a map and risk profile for each battalion.

<sup>1</sup> Risk data provided by the Los Angeles Fire Department Planning Section

**Los Angeles Fire Department—Standards of Cover Analysis**  
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**Figure 2—Battalion 1**

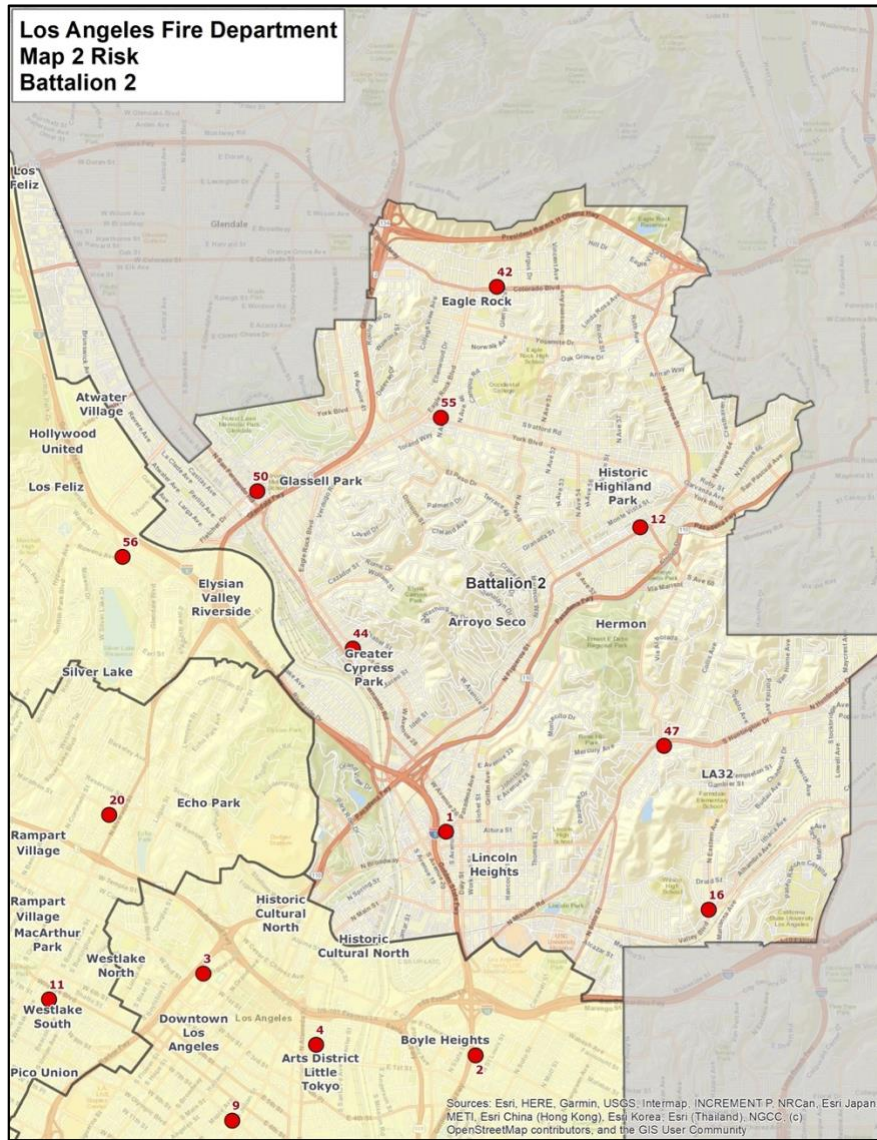


**Table 2—Risk Profile – Battalion 1**

Risk Factors			
Area (sq. mi.)	<b>16.75</b>	Total Buildings	<b>40,461</b>
Population	<b>239,404</b>	Residential	70.70%
Disabled Population	<b>29,738</b>	Commercial/Industrial	25.98%
Population Density per Sq. Mi.	<b>40,461</b>	Other	3.00%
Critical Facilities/Infrastructure	<b>48</b>	High-Rise (>75 feet)	<b>709</b>
Permitted Hazmat Facilities	<b>1,252</b>	Building Density per Sq. Mi.	<b>2,416</b>
Assessed Valuation (\$B)	<b>\$35.15</b>		

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*Community Risk Assessment*

**Figure 3—Battalion 2**

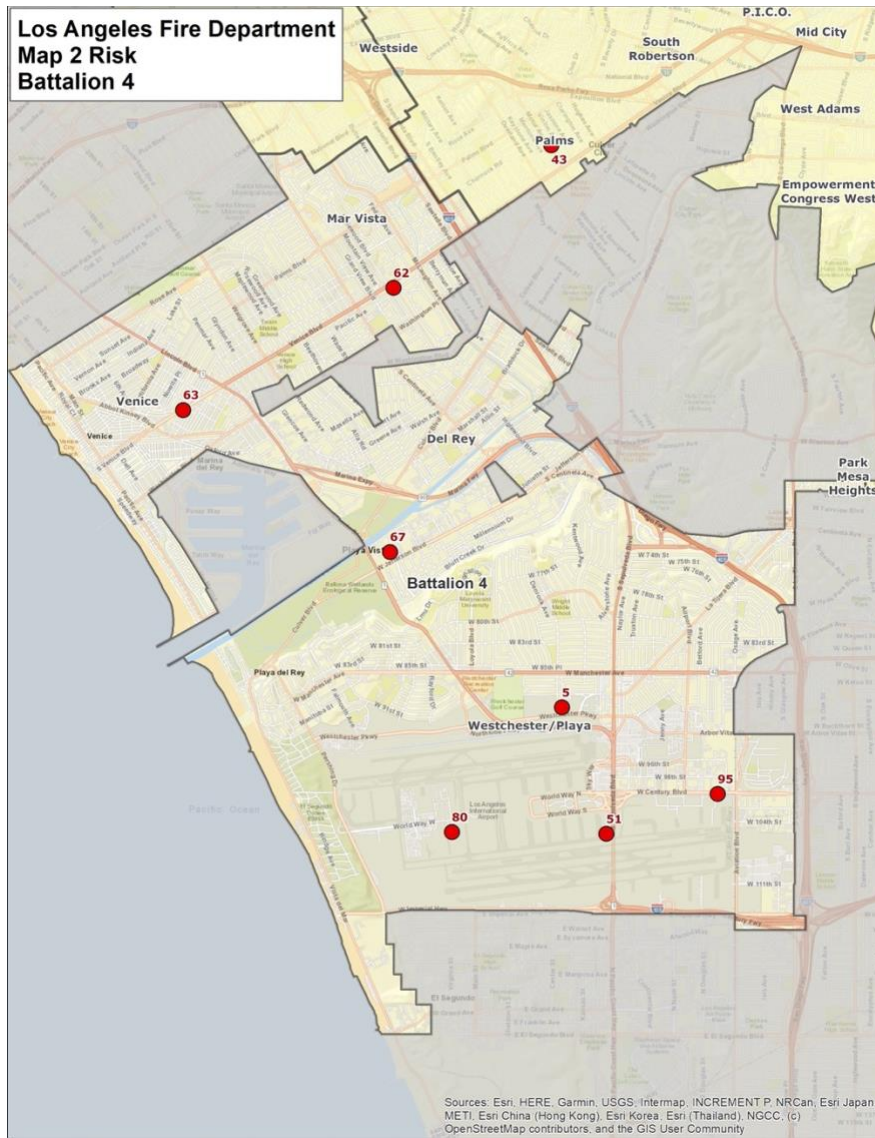


**Table 3—Risk Profile – Battalion 2**

Risk Factors			
Area (sq. mi.)	<b>24.79</b>	Total Buildings	<b>82,242</b>
Population	<b>231,563</b>	Residential	89.72%
Disabled Population	<b>28,097</b>	Commercial/Industrial	7.33%
Population Density per Sq. Mi.	<b>9,341</b>	Other	2.80%
Critical Facilities/Infrastructure	<b>5</b>	High-Rise (>75 feet)	<b>260</b>
Permitted Hazmat Facilities	<b>534</b>	Building Density per Sq. Mi.	<b>3,318</b>
Assessed Valuation (\$B)	<b>\$9.80</b>		

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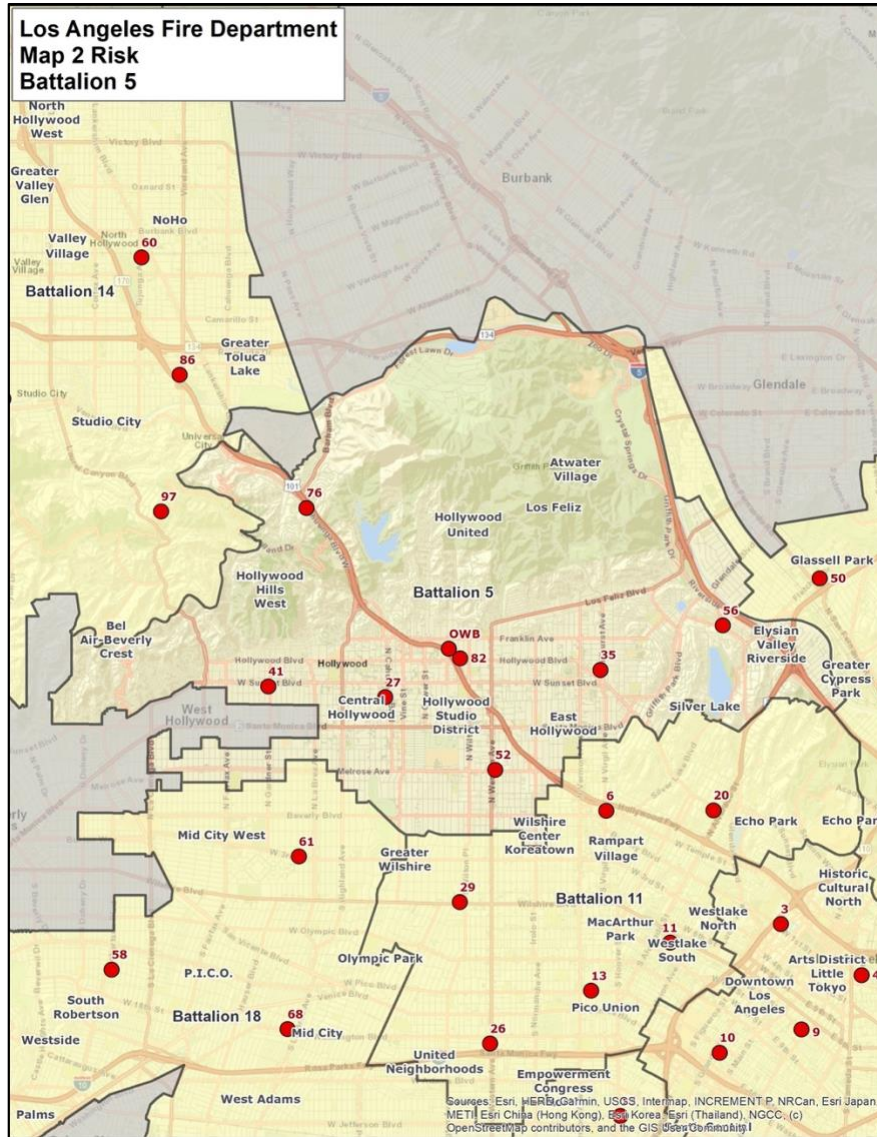
**Figure 4—Battalion 4**



**Table 4—Risk Profile – Battalion 4**

Risk Factors			
Area (sq. mi.)	<b>23.2</b>	Total Buildings	<b>59,716</b>
Population	<b>176,914</b>	Residential	91.01%
Disabled Population	<b>13,238</b>	Commercial/Industrial	6.29%
Population Density per Sq. Mi.	<b>7,626</b>	Other	1.86%
Critical Facilities/Infrastructure	<b>6</b>	High-Rise (>75 feet)	<b>128</b>
Permitted Hazmat Facilities	<b>587</b>	Building Density per Sq. Mi.	<b>2,574</b>
Assessed Valuation (\$B)	<b>\$23.01</b>		

**Figure 5—Battalion 5**

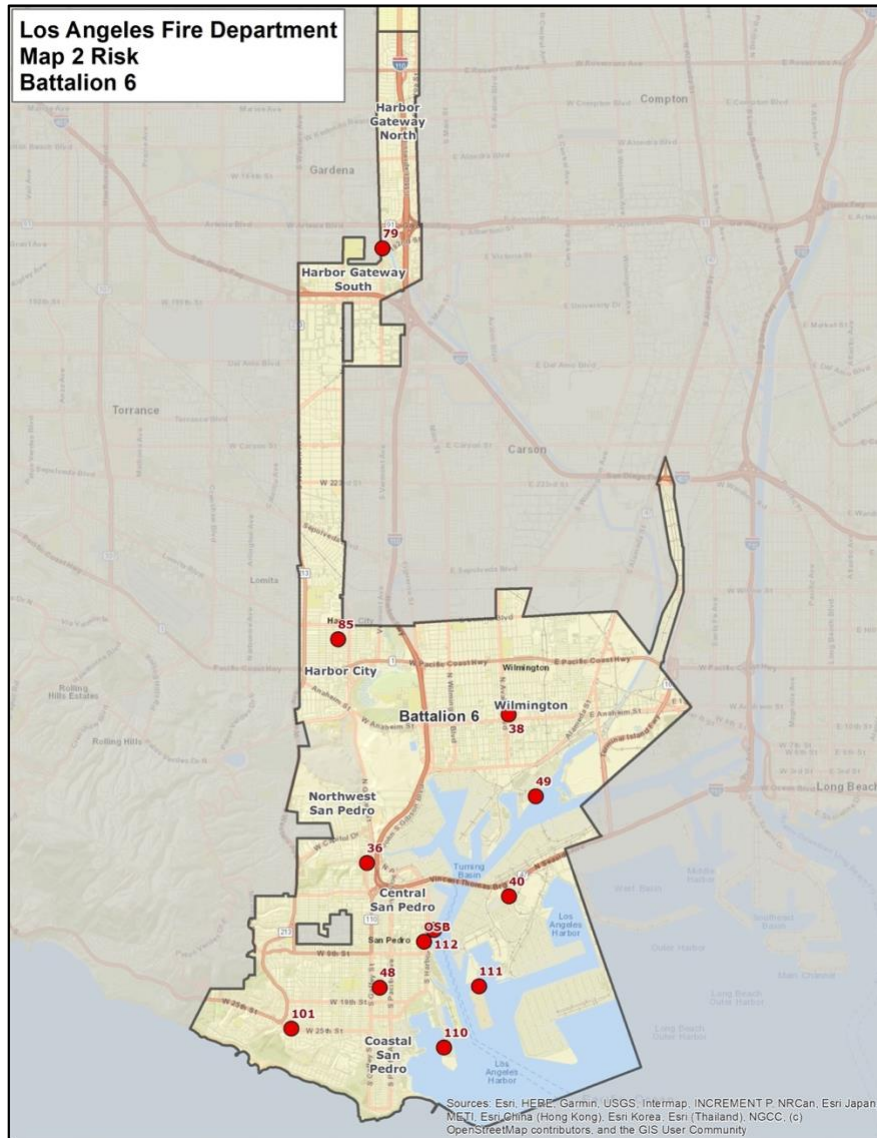


**Table 5—Risk Profile – Battalion 5**

Risk Factors			
Area (sq. mi.)	<b>28.5</b>	Total Buildings	<b>59,816</b>
Population	<b>231,887</b>	Residential	88.91%
Disabled Population	<b>21,196</b>	Commercial/Industrial	8.79%
Population Density per Sq. Mi.	<b>8,136</b>	Other	2.04%
Critical Facilities/Infrastructure	<b>8</b>	High-Rise (>75 feet)	<b>252</b>
Permitted Hazmat Facilities	<b>507</b>	Building Density per Sq. Mi.	<b>2,099</b>
Assessed Valuation (\$B)	<b>\$26.54</b>		

**Los Angeles Fire Department—Standards of Cover Analysis**  
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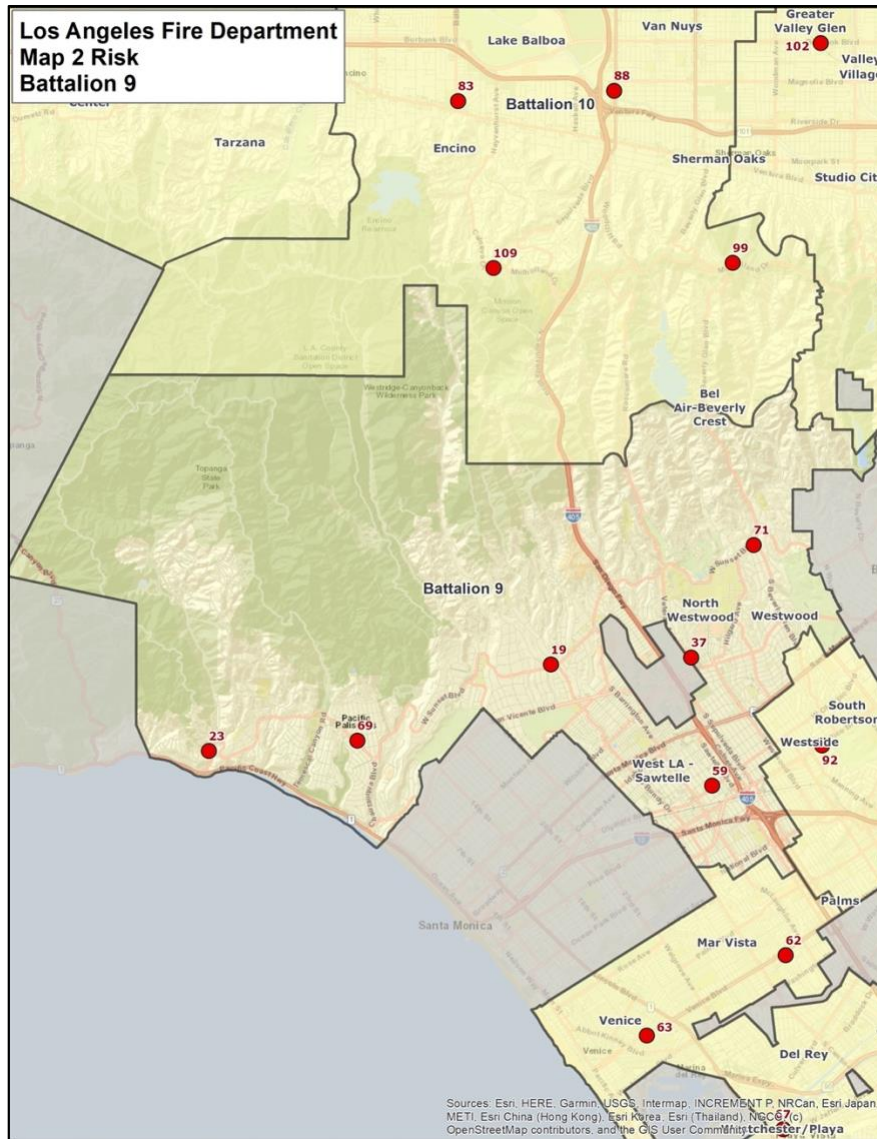
**Figure 6—Battalion 6**



**Table 6—Risk Profile – Battalion 6**

Risk Factors			
Area (sq. mi.)	<b>33.34</b>	Total Buildings	<b>63,356</b>
Population	<b>192,785</b>	Residential	83.97%
Disabled Population	<b>20,627</b>	Commercial/Industrial	13.17%
Population Density per Sq. Mi.	<b>5,782</b>	Other	2.71%
Critical Facilities/Infrastructure	<b>2</b>	High-Rise (>75 feet)	<b>232</b>
Permitted Hazmat Facilities	<b>933</b>	Building Density per Sq. Mi.	<b>1,900</b>
Assessed Valuation (\$B)	<b>\$9.47</b>		

**Figure 7—Battalion 9**

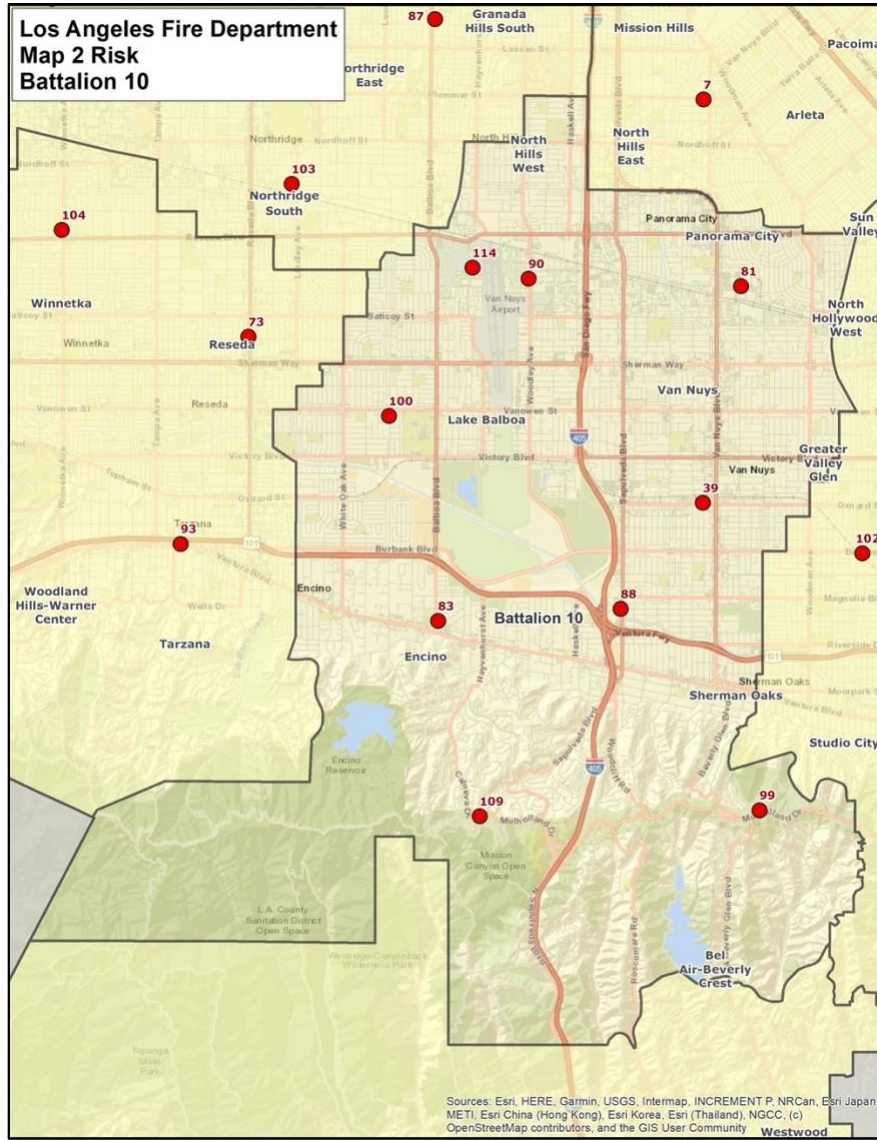


**Table 7—Risk Profile – Battalion 9**

Risk Factors			
Area (sq. mi.)	<b>43.5</b>	Total Buildings	<b>43,619</b>
Population	<b>159,058</b>	Residential	92.42%
Disabled Population	<b>11,818</b>	Commercial/Industrial	4.76%
Population Density per Sq. Mi.	<b>3,657</b>	Other	2.42%
Critical Facilities/Infrastructure	<b>1</b>	High-Rise (>75 feet)	<b>184</b>
Permitted Hazmat Facilities	<b>471</b>	Building Density per Sq. Mi.	<b>1,003</b>
Assessed Valuation (\$B)	<b>\$37.54</b>		

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**Figure 8—Battalion 10**



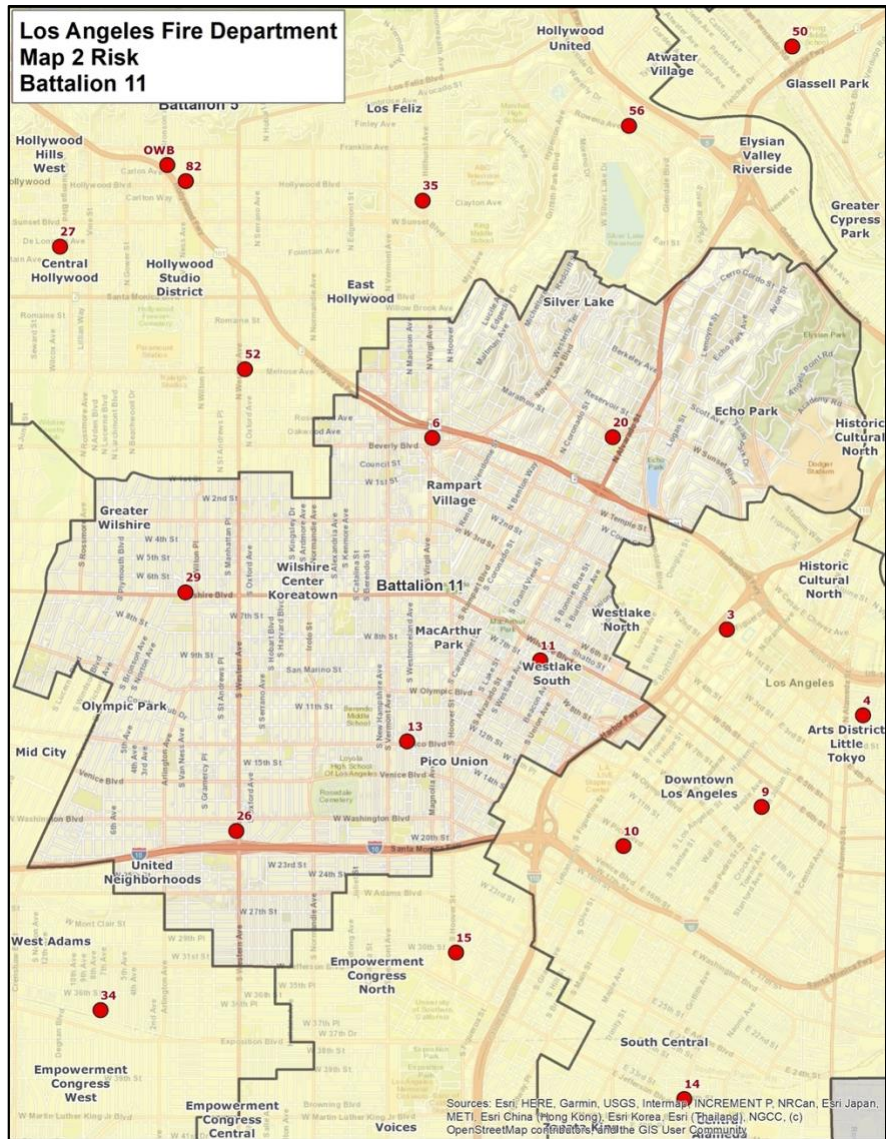
**Table 8—Risk Profile – Battalion 10**

Risk Factors			
Area (sq. mi.)	<b>49.53</b>	Total Buildings	<b>82,650</b>
Population	<b>311,505</b>	Residential	91.21%
Disabled Population	<b>31,385</b>	Commercial/Industrial	6.52%
Population Density per Sq. Mi.	<b>6,289</b>	Other	1.92%
Critical Facilities/Infrastructure	<b>6</b>	High-Rise (>75 feet)	<b>99</b>
Permitted Hazmat Facilities	<b>867</b>	Building Density per Sq. Mi.	<b>1,669</b>
Assessed Valuation (\$B)	<b>\$25.86</b>		



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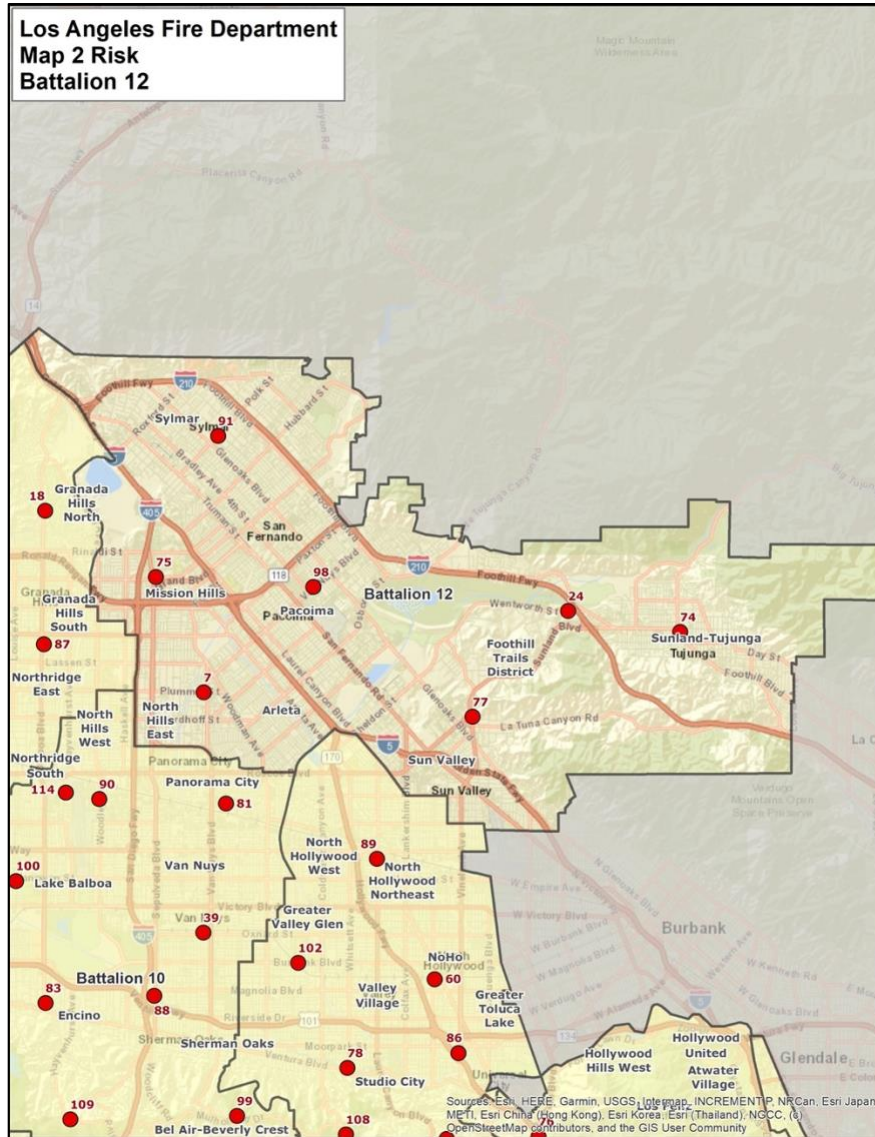
**Figure 9—Battalion 11**



**Table 9—Risk Profile – Battalion 11**

Risk Factors			
Area (sq. mi.)	<b>14.71</b>	Total Buildings	<b>47,659</b>
Population	<b>355,048</b>	Residential	85.80%
Disabled Population	<b>35,092</b>	Commercial/Industrial	12.58%
Population Density per Sq. Mi.	<b>24,137</b>	Other	1.45%
Critical Facilities/Infrastructure	<b>8</b>	High-Rise (>75 feet)	<b>294</b>
Permitted Hazmat Facilities	<b>473</b>	Building Density per Sq. Mi.	<b>3,240</b>
Assessed Valuation (\$B)	<b>\$20.78</b>		

**Figure 10—Battalion 12**

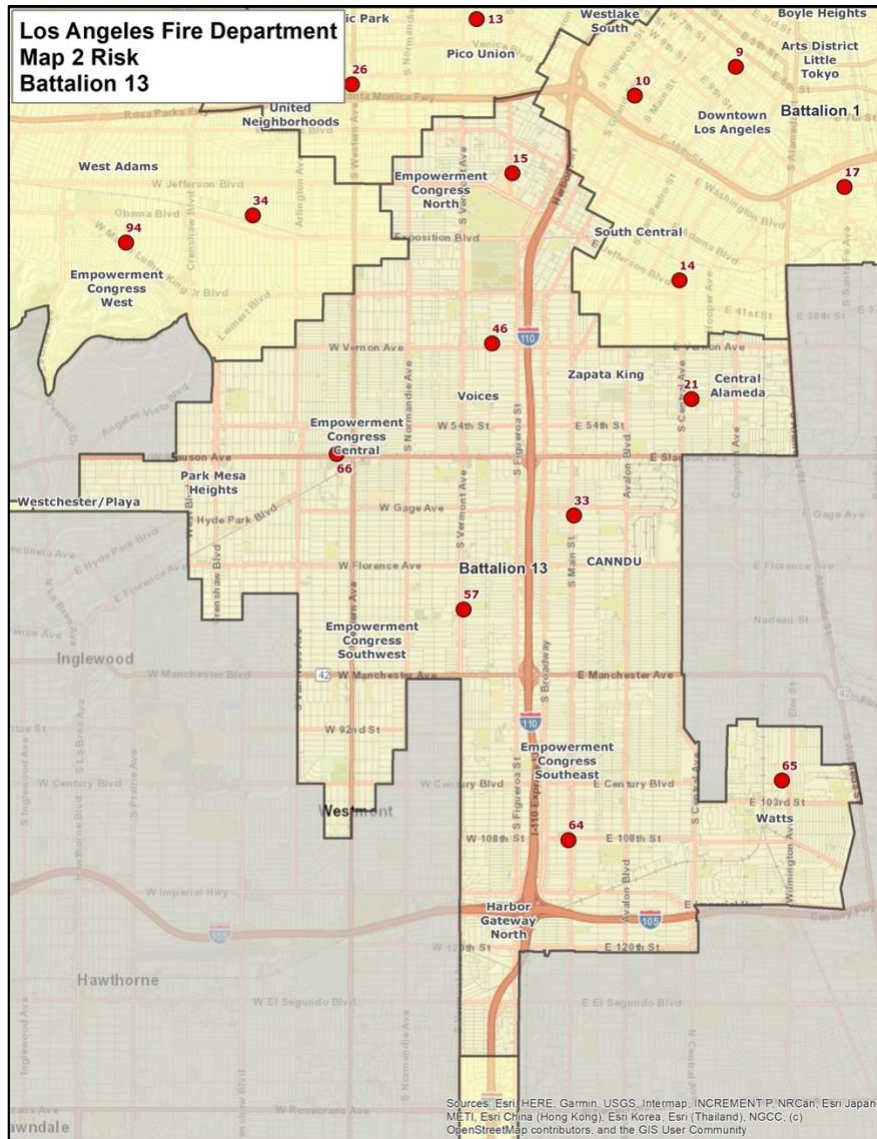


**Table 10—Risk Profile – Battalion 12**

Risk Factors			
Area (sq. mi.)	71.77	Total Buildings	133,368
Population	410,654	Residential	91.71%
Disabled Population	49,839	Commercial/Industrial	5.86%
Population Density per Sq. Mi.	5,722	Other	2.43%
Critical Facilities/Infrastructure	7	High-Rise (>75 feet)	29
Permitted Hazmat Facilities	994	Building Density per Sq. Mi.	1,858
Assessed Valuation (\$B)	\$17.74		

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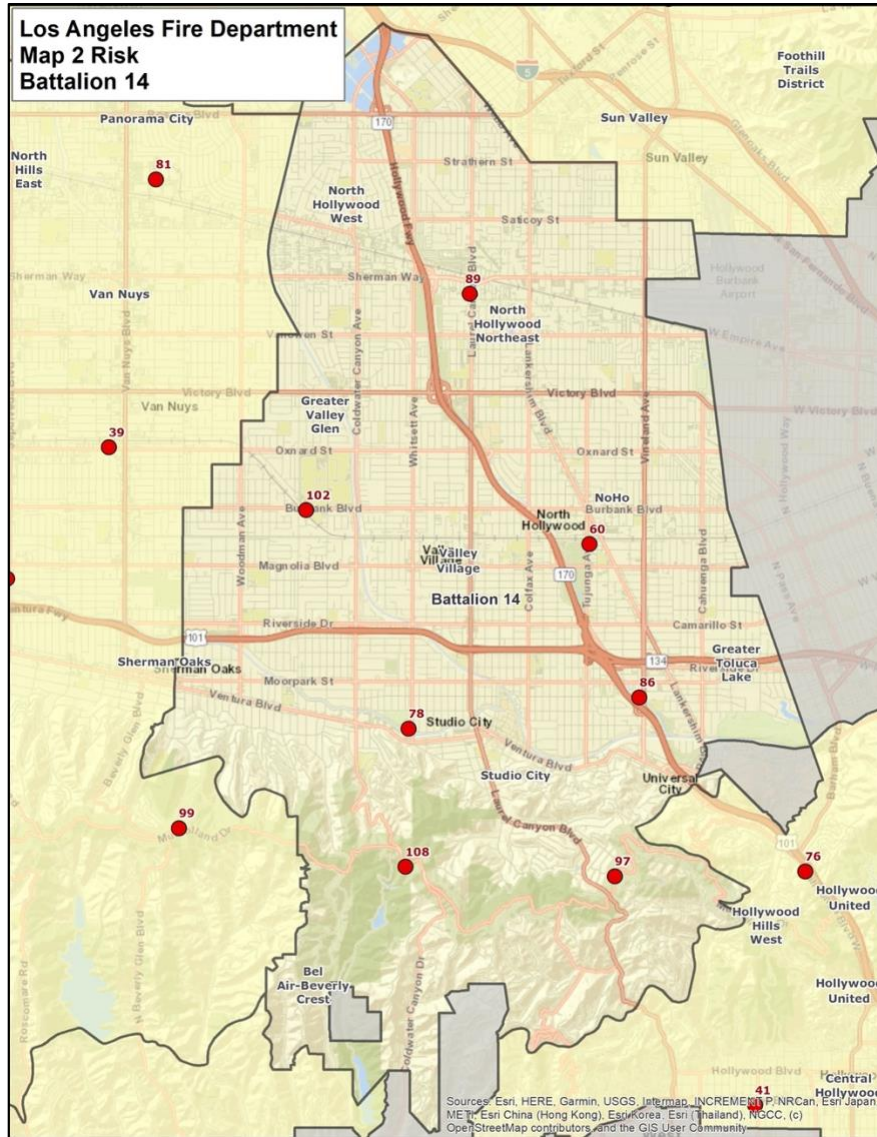
**Figure 11—Battalion 13**



**Table 11—Risk Profile – Battalion 13**

Risk Factors			
Area (sq. mi.)	<b>27.91</b>	Total Buildings	<b>141,874</b>
Population	<b>489,654</b>	Residential	88.69%
Disabled Population	<b>55,068</b>	Commercial/Industrial	10.10%
Population Density per Sq. Mi.	<b>17,544</b>	Other	1.18%
Critical Facilities/Infrastructure	<b>4</b>	High-Rise (>75 feet)	<b>87</b>
Permitted Hazmat Facilities	<b>729</b>	Building Density per Sq. Mi.	<b>5,083</b>
Assessed Valuation (\$B)	<b>\$13.56</b>		

**Figure 12—Battalion 14**

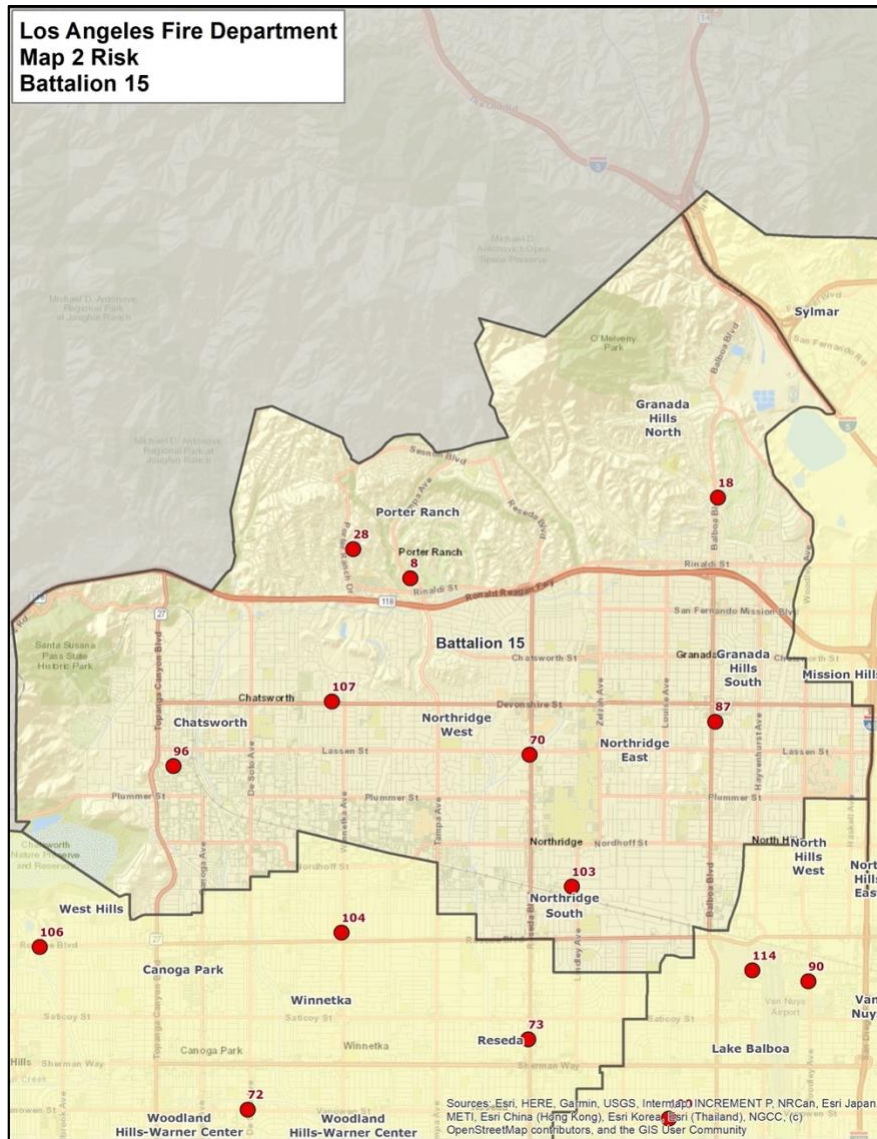


**Table 12—Risk Profile – Battalion 14**

Risk Factors			
Area (sq. mi.)	<b>32.31</b>	Total Buildings	<b>86,297</b>
Population	<b>277,384</b>	Residential	92.47%
Disabled Population	<b>26,777</b>	Commercial/Industrial	6.05%
Population Density per Sq. Mi.	<b>8,585</b>	Other	1.68%
Critical Facilities/Infrastructure	<b>1</b>	High-Rise (>75 feet)	<b>62</b>
Permitted Hazmat Facilities	<b>627</b>	Building Density per Sq. Mi.	<b>2,671</b>
Assessed Valuation (\$B)	<b>\$25.19</b>		

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**Figure 13—Battalion 15**

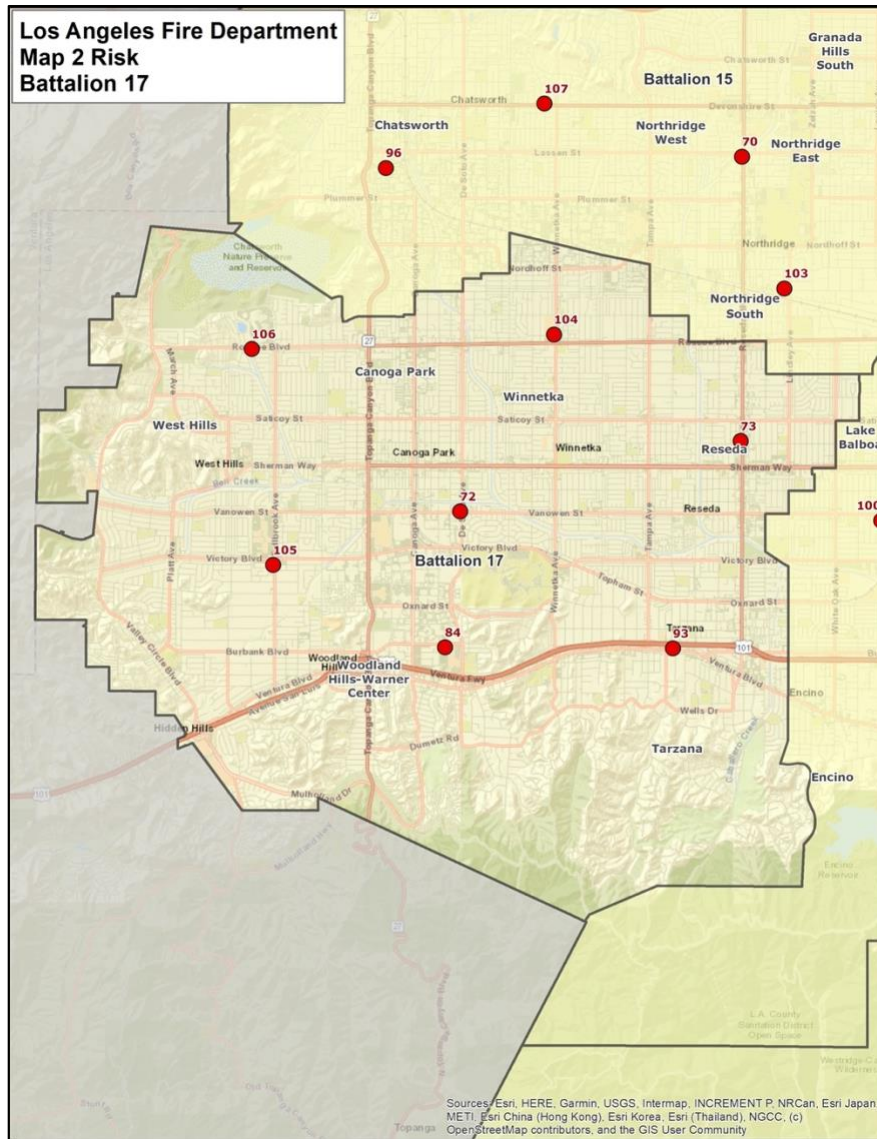


**Table 13—Risk Profile – Battalion 15**

Risk Factors			
Area (sq. mi.)	<b>43.97</b>	Total Buildings	<b>70,741</b>
Population	<b>210,991</b>	Residential	90.30%
Disabled Population	<b>22,434</b>	Commercial/Industrial	6.93%
Population Density per Sq. Mi.	<b>4,797</b>	Other	2.60%
Critical Facilities/Infrastructure	<b>3</b>	High-Rise (>75 feet)	<b>5</b>
Permitted Hazmat Facilities	<b>635</b>	Building Density per Sq. Mi.	<b>1,608</b>
Assessed Valuation (\$B)	<b>\$17.56</b>		

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**Figure 14—Battalion 17**

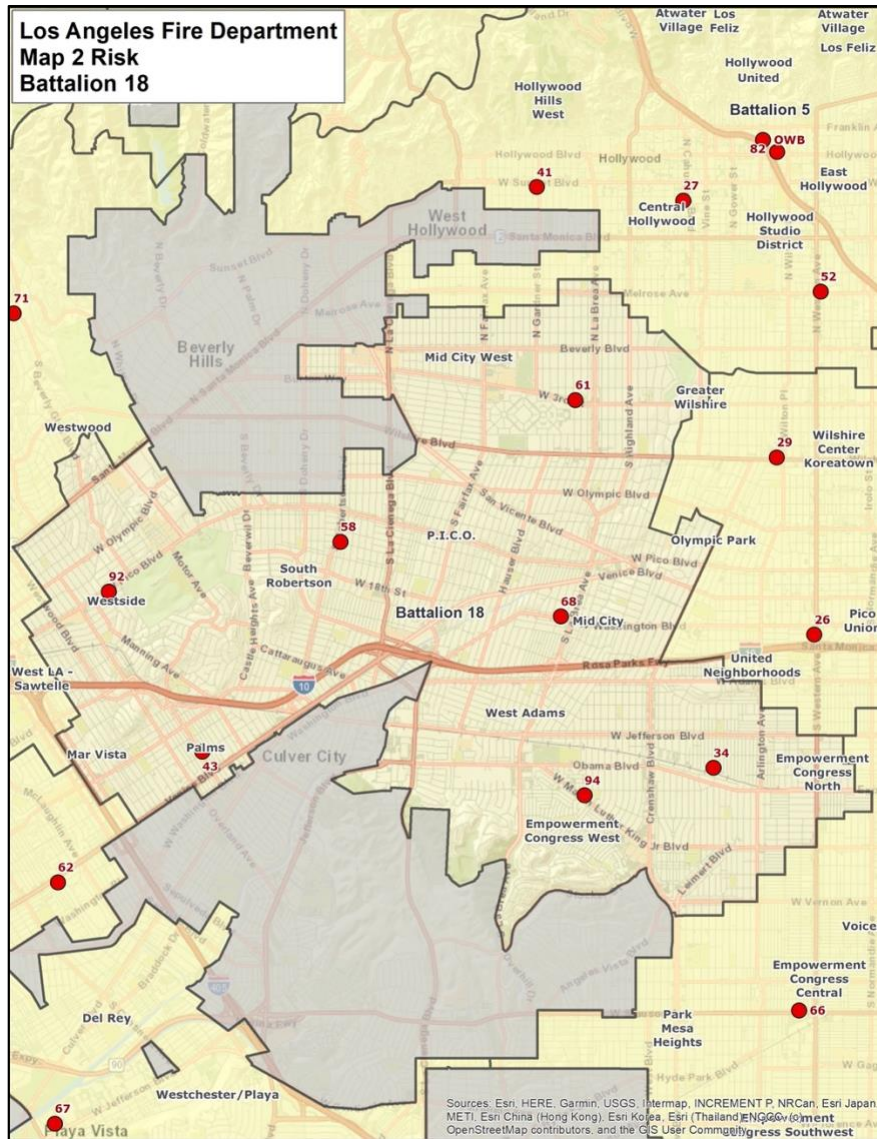


**Table 14—Risk Profile – Battalion 17**

Risk Factors			
Area (sq. mi.)	<b>46.11</b>	Total Buildings	<b>98,061</b>
Population	<b>322,716</b>	Residential	93.35%
Disabled Population	<b>34,455</b>	Commercial/Industrial	4.81%
Population Density per Sq. Mi.	<b>6,999</b>	Other	1.71%
Critical Facilities/Infrastructure	<b>1</b>	High-Rise (>75 feet)	<b>77</b>
Permitted Hazmat Facilities	<b>766</b>	Building Density per Sq. Mi.	<b>2,127</b>
Assessed Valuation (\$B)	<b>\$26.93</b>		

**Los Angeles Fire Department—Standards of Cover Analysis**  
*Community Risk Assessment*

**Figure 15—Battalion 18**



**Table 15—Risk Profile – Battalion 18**

Risk Factors			
Area (sq. mi.)	<b>24.27</b>	Total Buildings	<b>101,156</b>
Population	<b>324,998</b>	Residential	92.53%
Disabled Population	<b>29,592</b>	Commercial/Industrial	6.64%
Population Density per Sq. Mi.	<b>13,391</b>	Other	0.80%
Critical Facilities/Infrastructure	<b>8</b>	High-Rise (>75 feet)	<b>189</b>
Permitted Hazmat Facilities	<b>675</b>	Building Density per Sq. Mi.	<b>4,168</b>
Assessed Valuation (\$B)	<b>\$34.10</b>		