

Oahu Parole and Probation Population Maps, 2012



In Partnership With

**The Department of Urban and Regional Planning
University of Hawaii at Mānoa**

AUGUST 2013

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Prevention & Justice Assistance Division web site:

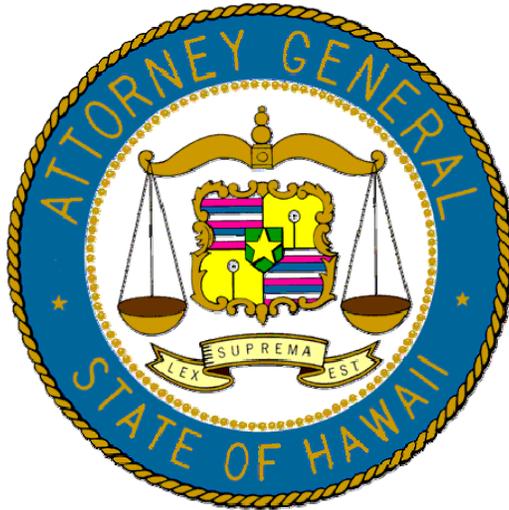
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*The opinions, findings, and conclusions or recommendations expressed
in this publication are those of the authors and do not necessarily
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Note: This report is intended to accompany a series of 231 maps, available in electronic format from the Hawaii Department of the Attorney General's web site for its Crime Prevention and Justice Assistance Division:

ag.hawaii.gov/cpja

Project Background and Description

This mapping project was completed as a partnership between the Hawaii Department of the Attorney General, the Hawaii State Judiciary, the Hawaii Paroling Authority, and the University of Hawaii at Manoa's Department of Urban and Regional Planning. The project represents one step in the process of identifying ongoing uses of geographic information systems (GIS) technology for justice administration and research purposes. This report provides 231 maps that were created using existing electronic data managed by the Hawaii Paroling Authority and the Hawaii State Judiciary and GIS software. The following narrative describes the purpose of the study and provides an explanation of the types of maps and the methods used to create them. Samples of corresponding map types are also provided for illustration purposes.

Many government agencies are using GIS technology for a wide variety of administrative purposes. Applications in law enforcement, criminal justice and social services include spatial assessments for the allocation of resources, the geographic deployment of personnel, assignment of clients to supervisory officers, evaluation of program effectiveness, locating service delivery sites, and future siting of services or monitoring locations. This study is part of an effort to explore the potential applications of GIS within the state's criminal justice system.

The main aims of the project are to:

- (1) Map existing probation and parole data to deepen agency understanding of the spatial distribution and characteristics of adult felony parolees and probationers residing in Hawaii's First Judicial Circuit (i.e., the island of Oahu, including the city of Honolulu) under community supervision.
- (2) Provide maps for the ongoing process of identifying potential administrative uses of GIS and for identifying future research questions with particular attention to the location of client needs relative to availability of services and opportunities.

Methodology

There were four main steps in the completion of the data analysis and mapping process. These include:

- (1) Data collection
- (2) Data processing
- (3) Geocoding and data manipulation
- (4) Preparation of the maps

Data Collection

The first step was to collect various data that would be used to generate the maps. Two types of data sources were used: a) publicly accessible data and GIS shapefiles; and b) state and local data and GIS shapefiles from various government agencies in Hawaii. The following table provides a list of data sources, formats, and dates of access or export for the various datasets used.

Brief Description of Data	Source	Format	Date of Data Access or Export
Data on Parolees	Hawaii Paroling Authority	Table	10/9/2012 & 11/26/2012
Data on Probationers	Hawaii State Judiciary, Adult Client Services	Table	10/11/2012 & 11/26/2012
Clean and Sober Housing	Hawaii State Judiciary, Adult Client Services	Table	9/17/2012
Substance Abuse and Mental Health Treatment Programs	Hawaii State Judiciary, Adult Client Services	Table	9/25/2012
HPD District Boundaries	Honolulu Police Department	Shapefile	9/22/2012
HPD Stations and Sub-Stations	City and County of Honolulu, Department of Planning and Permitting	Shapefile	9/22/2012
State Routes	City and County of Honolulu, Department of Planning and Permitting	Shapefile	9/22/2012
County Routes	City and County of Honolulu, Department of Planning and Permitting	Shapefile	9/22/2012
Major Roads	City and County of Honolulu, Department of Planning and Permitting	Shapefile	9/22/2012
Shoreline of Oahu	City and County of Honolulu, Department of Planning and Permitting	Shapefile	9/22/2012
DEM (10 meter) Hillshade of Oahu	City and County of Honolulu, Department of Planning and Permitting	Shapefile	9/22/2012
City and County of Honolulu ZIP Codes	City and County of Honolulu, Department of Planning and Permitting	Shapefile	9/22/2012
Honolulu Police Department Boundaries	Honolulu Police Department	Shapefile	10/19/2012
Census 2010 Blocks for the City and County of Honolulu	United States Census Bureau	Shapefile	9/22/2012
TIGER Street Address Features for the City and County of Honolulu	United States Census Bureau	Shapefile	9/22/2012
Employment Data for Oahu	Infogroup	Table	1/31/2010

The publicly-accessible data were obtained from the following websites:

<http://gis.hicentral.com/>

<http://www.census.gov/geo/maps-data/data/tiger.html>

<http://www.infogroup.com/>

Data Processing

Data for 740 adult felony probationers who were classified as being at high risk for criminal recidivism and 643 adult parolees, all of whom resided in Hawaii's First Judicial Circuit (i.e., the island of Oahu, which includes Honolulu), were obtained from the Hawaii State Judiciary and the Hawaii Paroling Authority, respectively. Identifiable residential addresses were available for 694 (93.8%) of the 740 probationers and 618 (96.1%) of the 643 parolees. The dataset included all First Circuit probationers classified as being at high risk for criminal recidivism as of October 11, 2012, and all First Circuit parolees as of October 15, 2012. The datasets were joined and categorized into separate tables to be used for geocoding and GIS mapping and data management purposes. Individual data fields included residential address, gender, age, level of supervision, education, employment, offense type and level, and Level of Service Inventory-Revised (LSI-R) needs/assets assessment scores (total and subdomain scores).

In addition, employment data for the City and County of Honolulu (a local governmental agency that is geographically equivalent to the First Judicial Circuit) were obtained from Infogroup (<http://www.infogroup.com>) and overlaid in *ArcGIS* with a grid dividing the island of Oahu into 157,564 1-hectare cells in order to create a raster file representing the density of employment across the island.

Geocoding and Data Manipulation

Geocoding is the process of creating map features from addresses, place-names, or other locational information. The value of geocoding is that it enables the mapping of locations from data that are readily and electronically available. Geocoding requires an address table – a list of addresses stored as a database table. In addition, geocoding also requires an address locator – a file that specifies the reference data and its relevant attributes along with various geocoding rules and tolerances. For the purposes of this project, the United States Census Bureau TIGER Street Address Features for the City and County of Honolulu was chosen as the address locator through a series of tests and comparison with other possible address locators.

The next step was to geocode the data gathered in the *MS Excel* files created for parolees, probationers, Clean and Sober housing, and substance abuse and mental health treatment programs into point location features in *ArcGIS* for further analysis and mapping. A preliminary geocoding test-run of the parole and probation tables using the original residence address data provided by the Hawaii Paroling Authority and Hawaii State Judiciary, Adult Client Services produced results that raised the need for additional “cleaning” and processing of the data to be compatible with *ArcGIS* geocoding standards (initially, only 66% and 63% of the residential addresses for parolees and probationers, respectively, were automatically matched through geocoding in *ArcGIS*). The problems related to geocoding were:

- Misspelled street names
- Misspelled or incorrect street types (such as street, boulevard, lane, circle, etc.)
- Incorrect or non-standard house numbers
- Incorrect ZIP codes

Therefore, the next step was to “clean” the residential address data in order to match *ArcGIS* geocoding standards and the formatting of the address locator. This was done through comparing the residence addresses with the address locator attribute tables, and in some cases, through updating the residence addresses using the City and County of Honolulu, Department of Planning and Permitting’s “Parcels and Zoning Information” database (available at <http://gis.hicentral.com/FastMaps/ParcelZoning>) and Google Maps. Following this procedure, the address matching rates were increased to 99.19% and 99.28% for parolees and probationers, respectively. A similar process was also carried out in geocoding the locations of “Clean and Sober” housing and substance abuse and mental health treatment programs within the First Judicial Circuit.

In addition, the attribute tables on the *City and County of Honolulu ZIP Codes* feature data that were expanded and manipulated to calculate population data for each ZIP code area (using Census 2010 Blocks for the City and County of Honolulu data), total number of parolees/probationers, density per 10,000 population of parolees/probationers, and average LSI-R scores for parolees/probationers within each ZIP code.

Preparation of the Maps

The next step was to import, analyze and format the data in *ArcGIS*, and export the information as a preliminary set of maps. This set of maps was reviewed by representatives from the Hawaii Paroling Authority; Adult Client Services, Hawaii State Judiciary; and the Crime Prevention and Justice Assistance Division, Hawaii Department of the Attorney General. Revisions were made and additional maps were created based on the comments received.

Map Types

Ten types of maps were created using dot density and shaded choropleth formats. The following table provides an overview of the types of maps included in this project.

Typology of Maps

	Parole (# of maps)	Probation (# of maps)
All Offenses (with police district boundaries and employment density)	2	2
Type of Offense (22 offense categories)	18	20
Total Number of Parolees/Probationers (by ZIP code and type of offense)	19	21
Density per 10,000 persons (by ZIP code and type of offense)	19	21
Level of Supervision	1	n/a
Employment Status	1	1
Average LSI-R Scores (by ZIP codes)	1	1
LSI-R Sub-Categories	10	10
“Clean and Sober” Housing and Substance Abuse and Mental Health Treatment Programs	1	1
Main Offense Categories* (by gender and offense type)	37	45

* These maps are set at the police district level; the rest of the maps provide islandwide depictions.

Note: The locations mapped are approximated based on electronic street files and do not identify the exact location of residences.

Description of Generated Maps

All Offenses (with HPD District Boundaries and with Employment Density)

These dot density maps present the geographic distribution of all parolee and probationer home residences, respectively, in the First Judicial Circuit. In the first set of maps, the distribution of parolee and probationer residences and descriptive tables are shown according to Honolulu Police Department district boundaries. In the second set of maps, the distribution of residences has been overlaid with the density of employment, based on the total number of employees per hectare, with darker green areas representing the highest density of employees using 2010 employment data.

Type of Offense (22 Offense Categories)

These dot density maps present the overall geographical distribution of parolee and probationer residences, respectively, in the First Judicial Circuit according to offense type and level, using 22 offense categories. For probationers and parolees with multiple offenses, the lead offense (commonly the most severe offense) is used. The types of offenses presented on these maps include murder, violent (four levels), sex (four levels), property (four levels), drug (four levels), other (four levels), and promoting dangerous drugs. The maps are shape-coded by gender, with circles representing males and triangles representing females. The spatial distribution and descriptive tables for parolees/probationers are shown according to Honolulu Police Department district boundaries.

Total Number of Parolees/Probationers, by ZIP Codes and by Type of Offense

These shaded choropleth maps present the relative number of all parolees and probationers, respectively, residing in the First Judicial Circuit, by type of offense and ZIP code areas. In the case of multiple offenses, the lead offense for each parolee/probationer is used. The types of offenses presented on these maps include murder, violent (four levels), sex (four levels), property (four levels), drug (four levels), other (four levels), and promoting dangerous drugs. Darker colors represent higher frequencies and lighter colors represent lower frequencies.

Density of Parolees/Probationers (per 10,000 Population), by ZIP Codes and by Type of Offense

These shaded choropleth maps present the relative density of parolees and probationers per 10,000 area residents, by ZIP code area in the First Judicial Circuit and by lead offense type. Offense type includes 22 offense categories. The types of offenses presented on these maps include murder, violent (four levels), sex (four levels), property (four levels), drug (four levels), other (four levels), and promoting dangerous drugs. Darker colors represent the higher densities and lighter colors represent the lower densities.

Level of Supervision

This dot density map presents the geographic distribution of parolee residences in the First Judicial Circuit based on the parolees' supervision level (administrative, low, moderate, high, and surveillance). The distribution and descriptive tables are shown according to Honolulu Police Department district boundaries. Residence locations are color-coded with a spectrum from green (lower levels of supervision) to red (higher levels of supervision).

Employment Status

These dot density maps present the geographical distribution of parolee and probationer residences in the First Judicial Circuit, shape-coded by gender (circles for males and triangles for females) and color-coded by employment status (green for employed and red for unemployed). The distribution and descriptive tables are shown according to Honolulu Police Department district boundaries.

Average LSI-R Scores (by ZIP Codes)

These shaded choropleth maps present average LSI-R scores among parolees and probationers residing within each ZIP Code area in the First Judicial Circuit. The darker colors represent higher average scores and the lighter colors represent lower average scores. Note that the average scores for some ZIP code areas are based on the scores of very few individuals.

LSI-R Sub-Categories

These dot density maps present the distribution of parolee and probationer residences in the First Judicial Circuit, based on the offenders' LSI-R subtotal scores for the instrument's various criminogenic subdomains (i.e., criminal history, education/employment, financial situation, family/marital situation, living accommodation, leisure/recreation, companions, alcohol/drug issues, emotional/personal status, and attitude/orientation). The distribution and descriptive tables are shown according to Honolulu Police Department district boundaries. The parolee/probationer residence locations are color-coded using a spectrum of colors from green (for lower subtotal scores) to red (for higher subtotal scores).

Clean and Sober Housing and Substance Abuse and Mental Health Treatment Programs

This dot density map presents the geographic location of “Clean and Sober” housing and substance abuse and mental health treatment programs within Honolulu Police Department district boundaries. Blue polygons represent male Clean and Sober housing locations, and female locations are presented in purple. Locations of substance abuse and mental health treatment programs are represented by a brown “+” symbol.

Main Offense Categories (By Gender and Offense Severity Level)

These dot density maps present the distribution of parolee and probationer residences, by type of offense (violent, sex, property, drugs, other) for each of the eight Honolulu Police Department districts. The residential locations of parolees/probationers are shape-coded by gender, with circles representing males and triangles representing females. They are also color-coded by level of offense (pink for murder, black for class A felony, red for class B felony, yellow for class C felony, and white for misdemeanor). These maps also include Clean and Sober housing and substance abuse and mental health treatment programs locations, along with Honolulu Police Department stations and sub-stations.

Map Examples

For the purpose of illustration, the following section presents a sample of each type of map described above (see pages 9-21).

Technical Notes Regarding the Maps and Printing

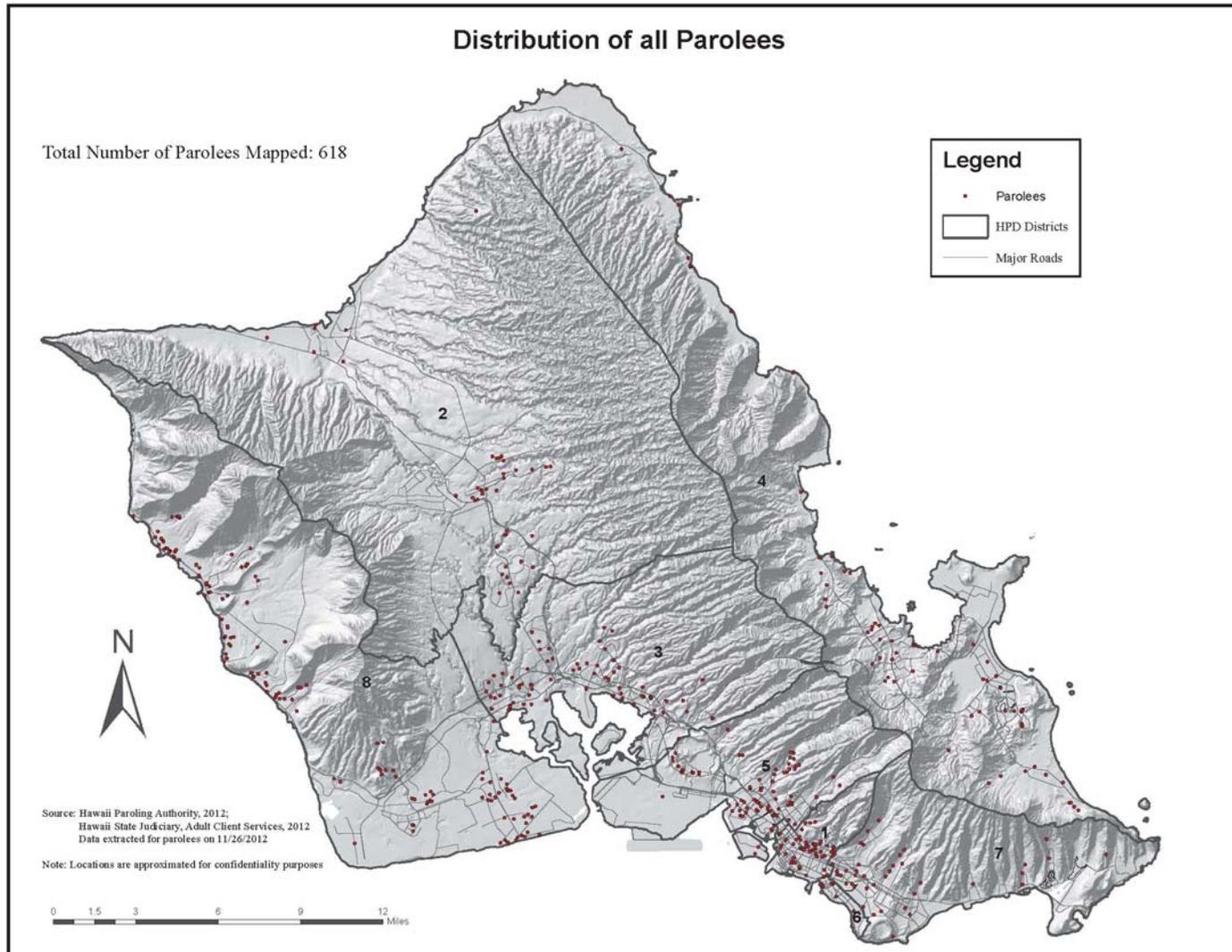
This report accompanies a compendium of 231 maps in digital format, with each map existing in a separate file. These maps are saved in Adobe Acrobat PDF format for maximum flexibility of use. The files are saved at the resolution of 300 dpi and the standard size of 17 x 22 inches, which can be printed on standard 8.5 x 11 inch paper or other paper of equal ratio (set print setting to "fit in page"). When viewing the files on a monitor, the clarity will be maintained at least up to 800 percent of the original size, depending on the quality of the monitor. When zooming in, no further details of the maps will be revealed, though the images will be enlarged for easier viewing. These files cannot be manipulated, as they are fixed graphics. The files on the accompanying CD-ROM are organized in two folders; one for the probation population, and the other for the parole population. Within those two folders, there are additional folders according to each type of map, as described above.

Electronic copies of this report and the maps referenced above can be downloaded from the “Research and Statistics” section of the Hawaii Department of the Attorney General’s web site for its Crime Prevention and Justice Assistance Division:

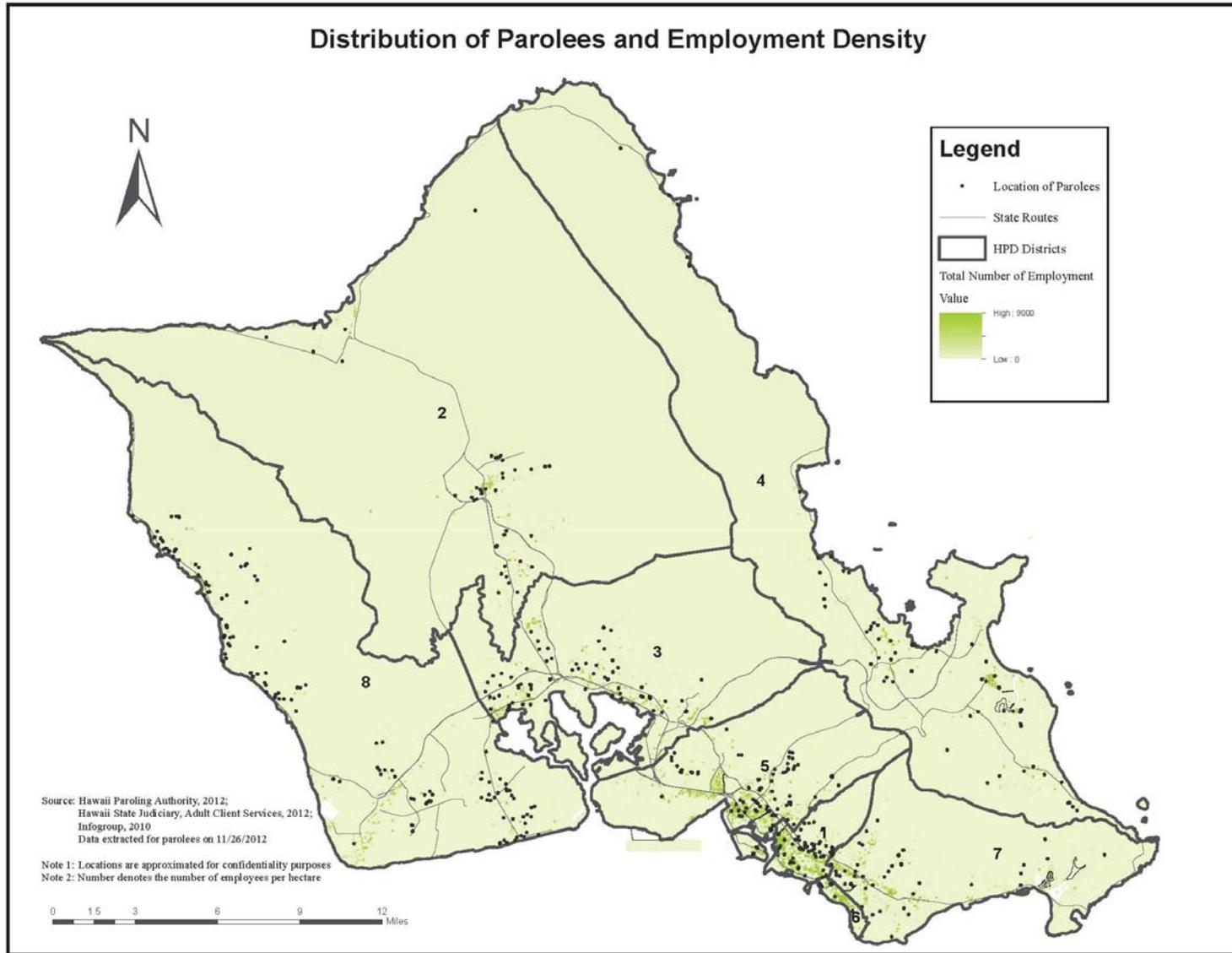
ag.hawaii.gov/cpja

Samples of Generated Maps

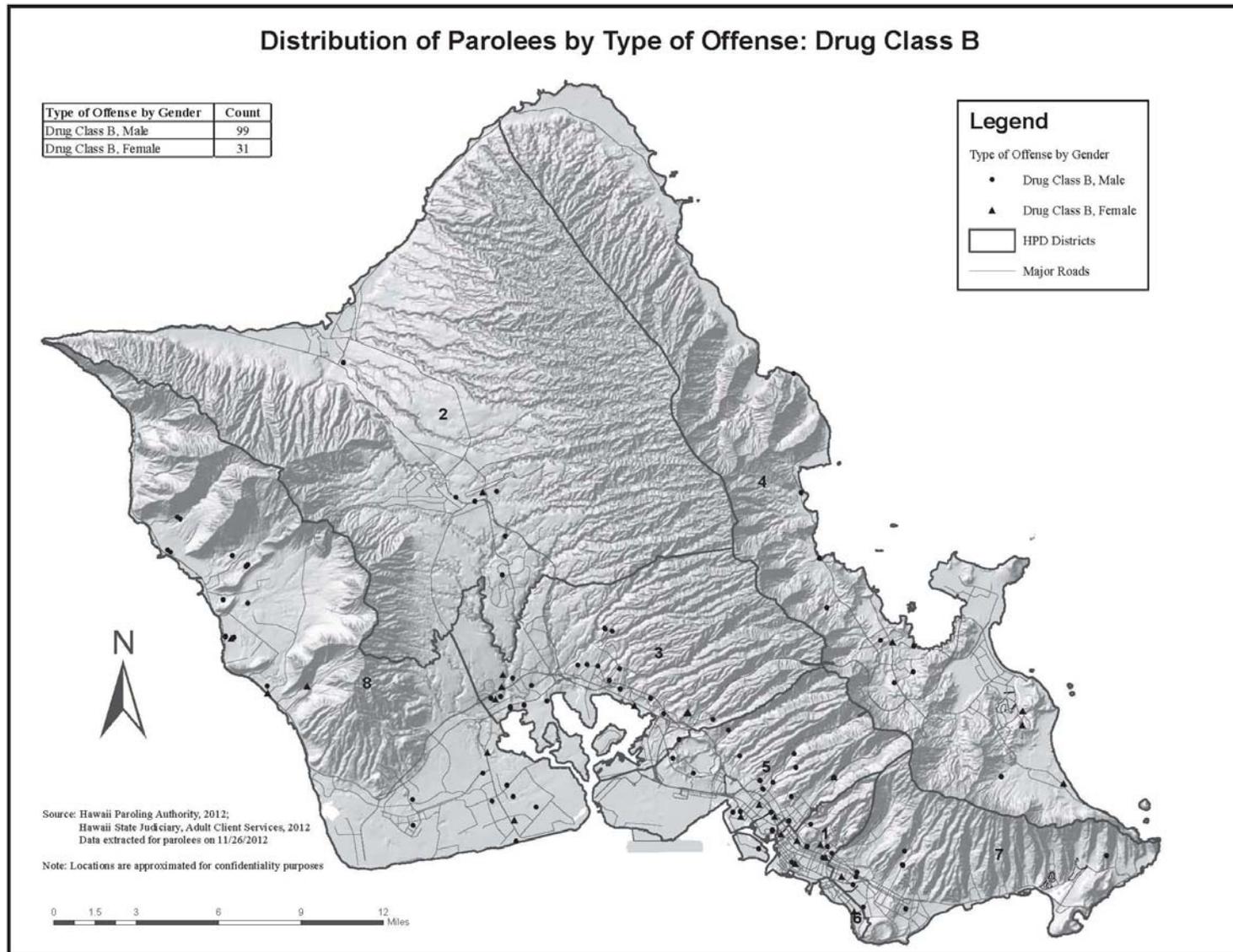
Example of Map Type: All Offenses (with Police District Boundaries)



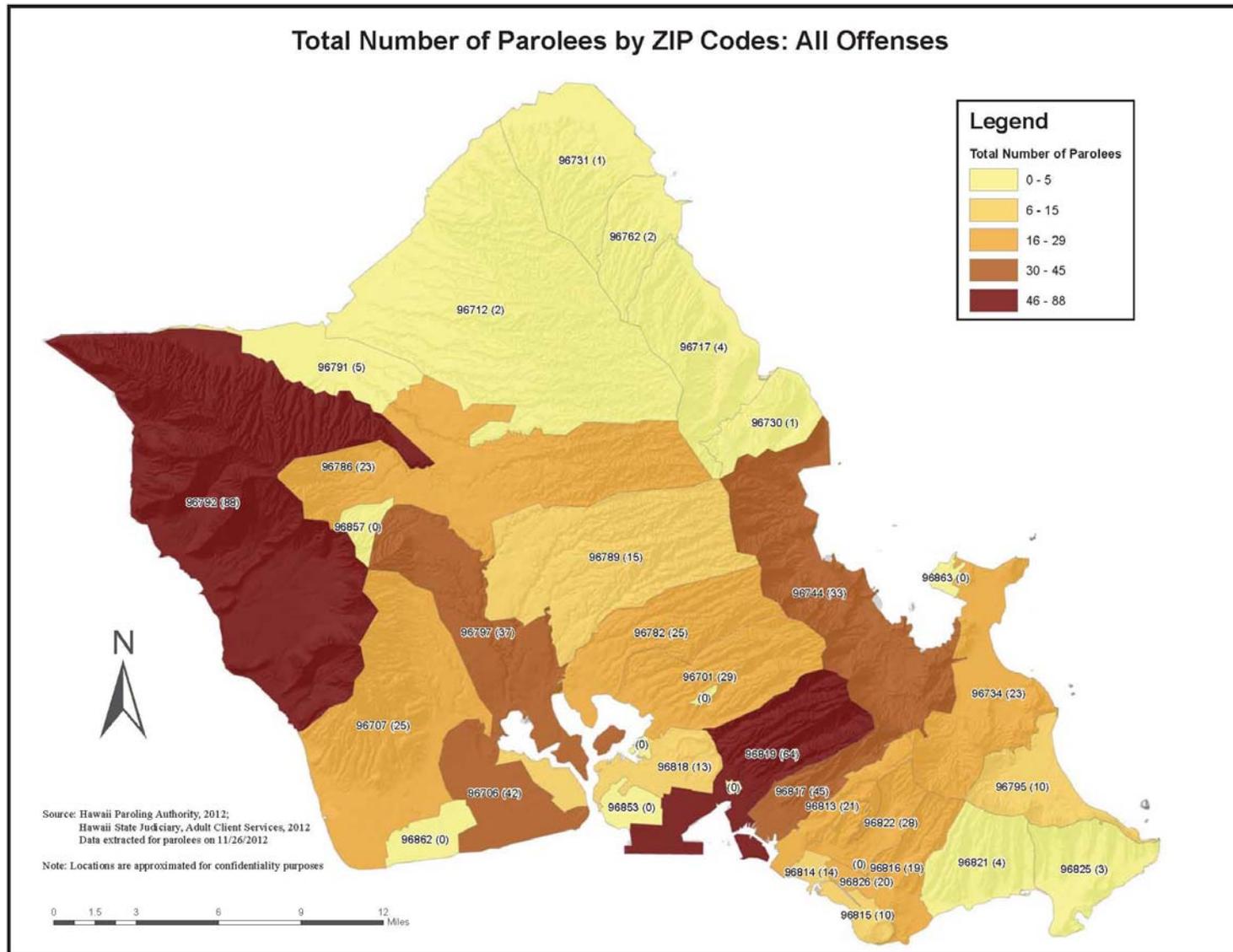
Example of Map Type: All Offenses (with Employment Density)



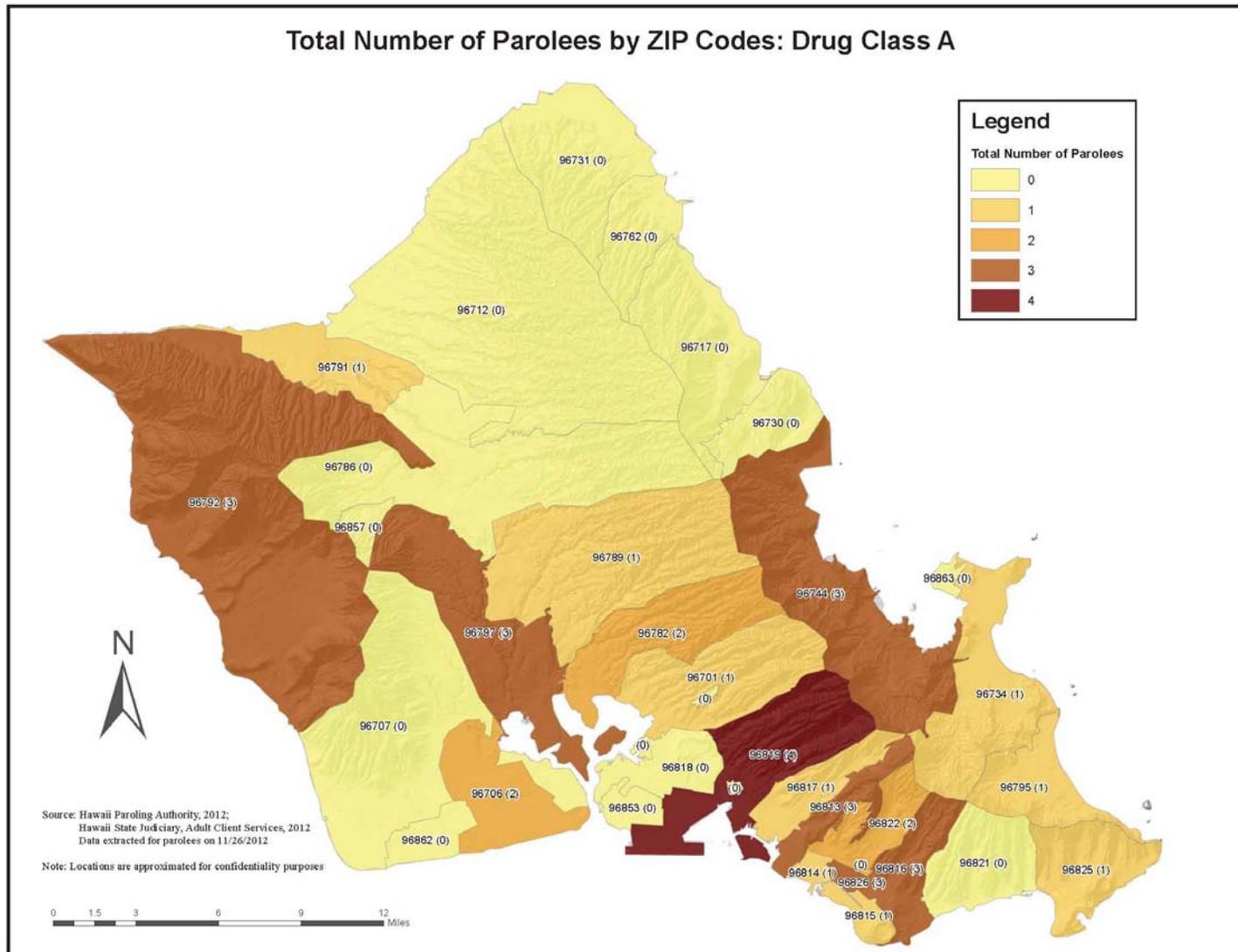
Example of Map Type: Type of Offense (22 Offense Categories)



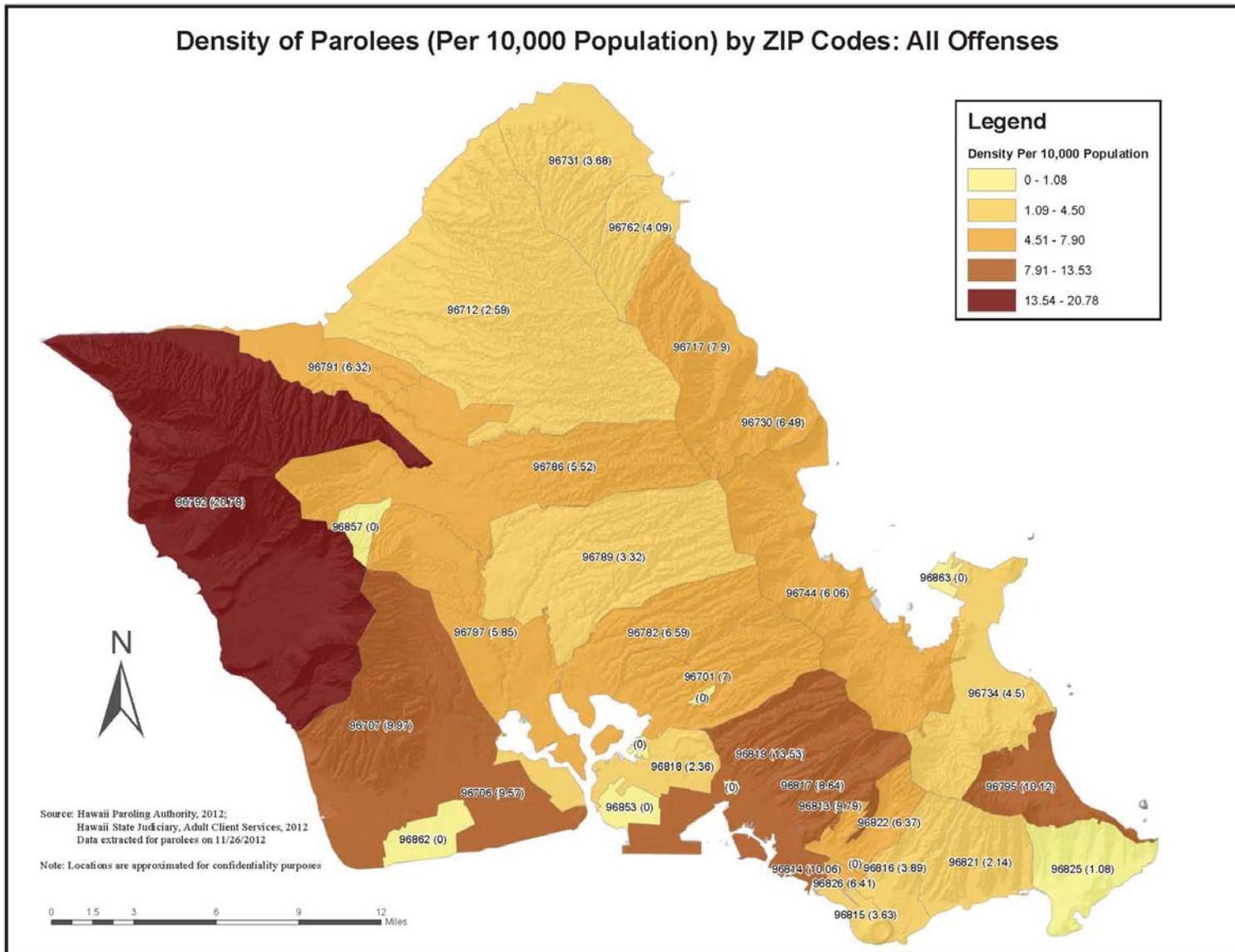
Example of Map Type: Total Number of Parolees/Probationers by ZIP Codes and by Type of Offense



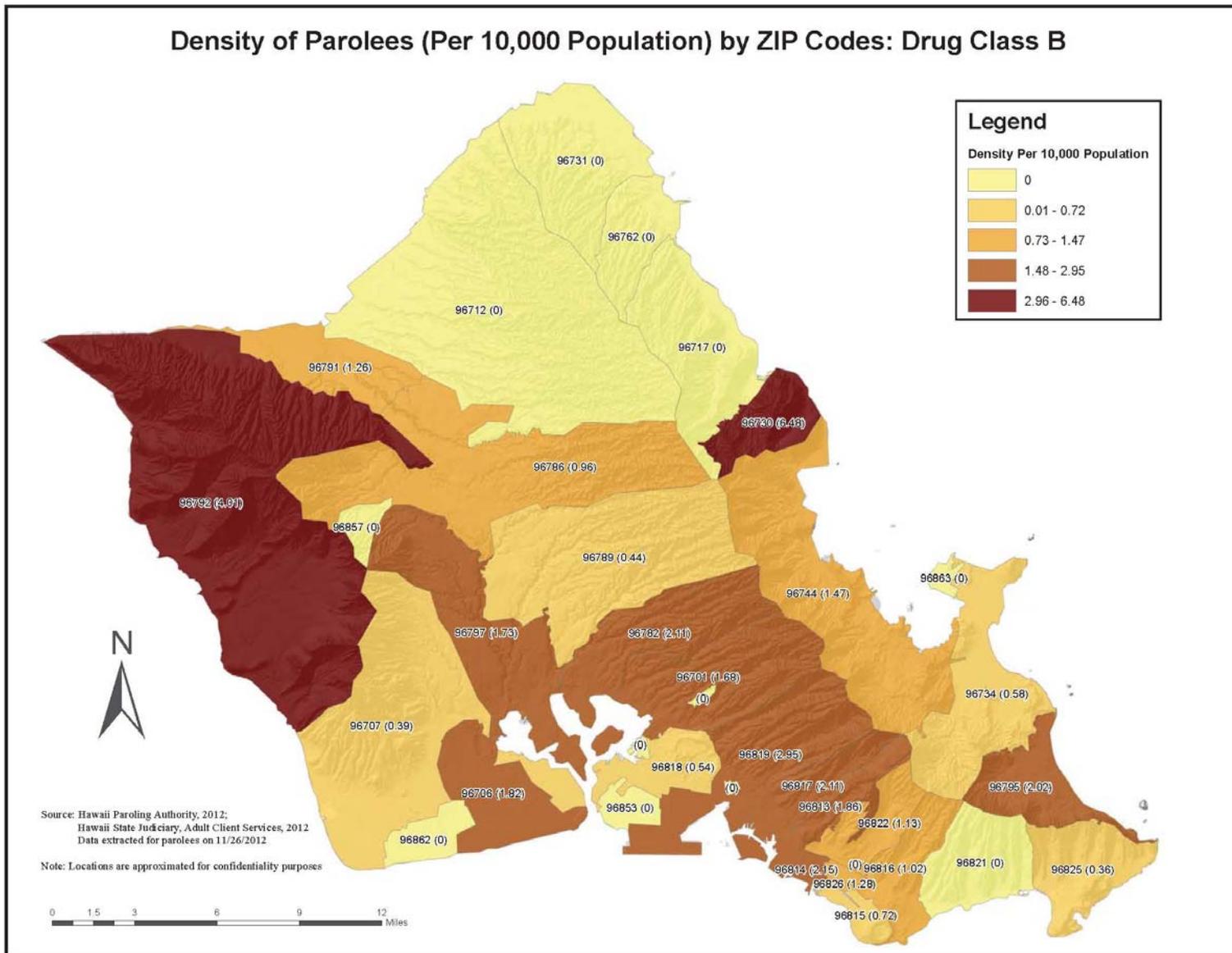
Example of Map Type: Total Number of Parolees/Probationers by ZIP Codes and by Type of Offense



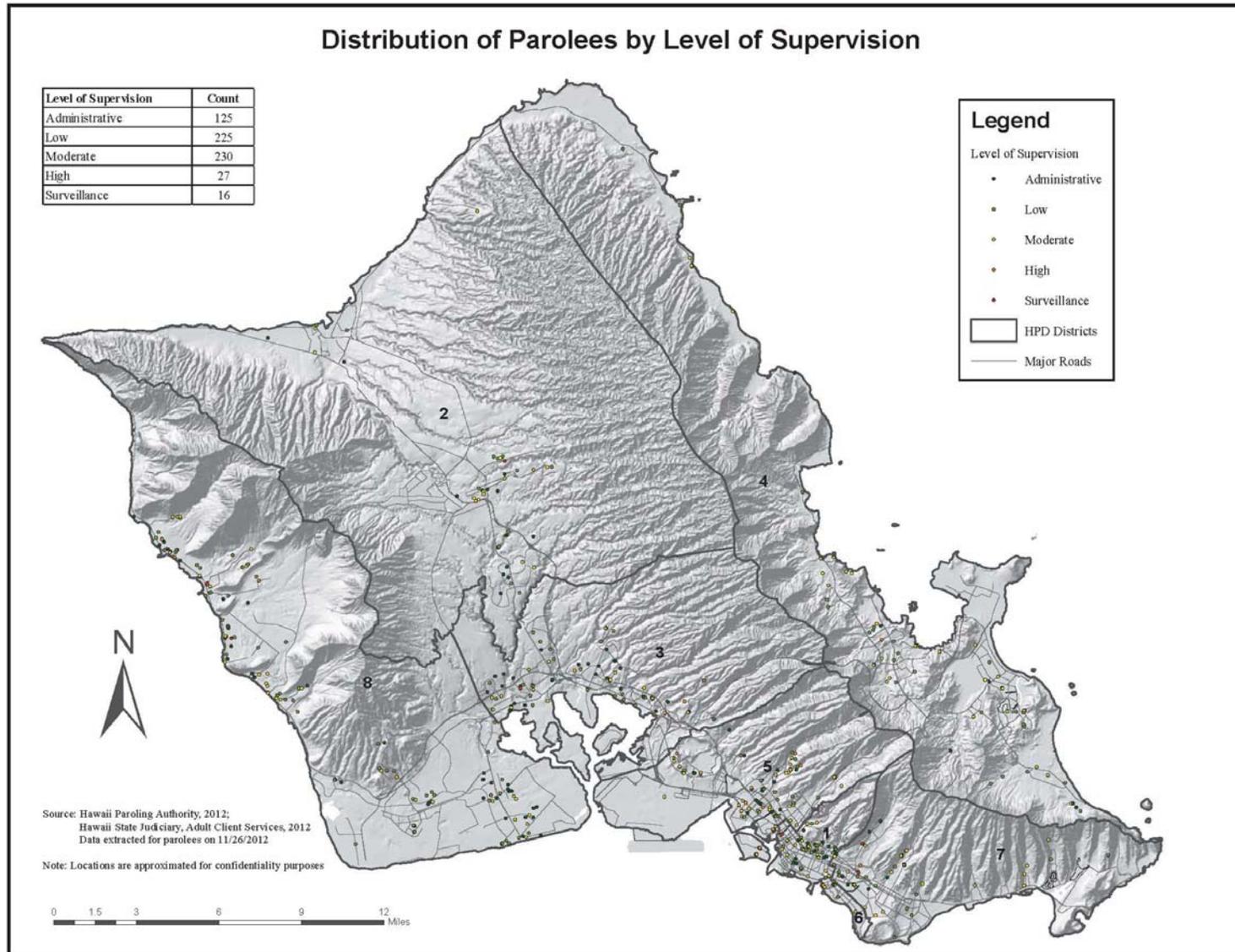
Example of Map Type: Density of Parolees/Probationers (per 10,000 Population) by ZIP Codes and by Type of Offense



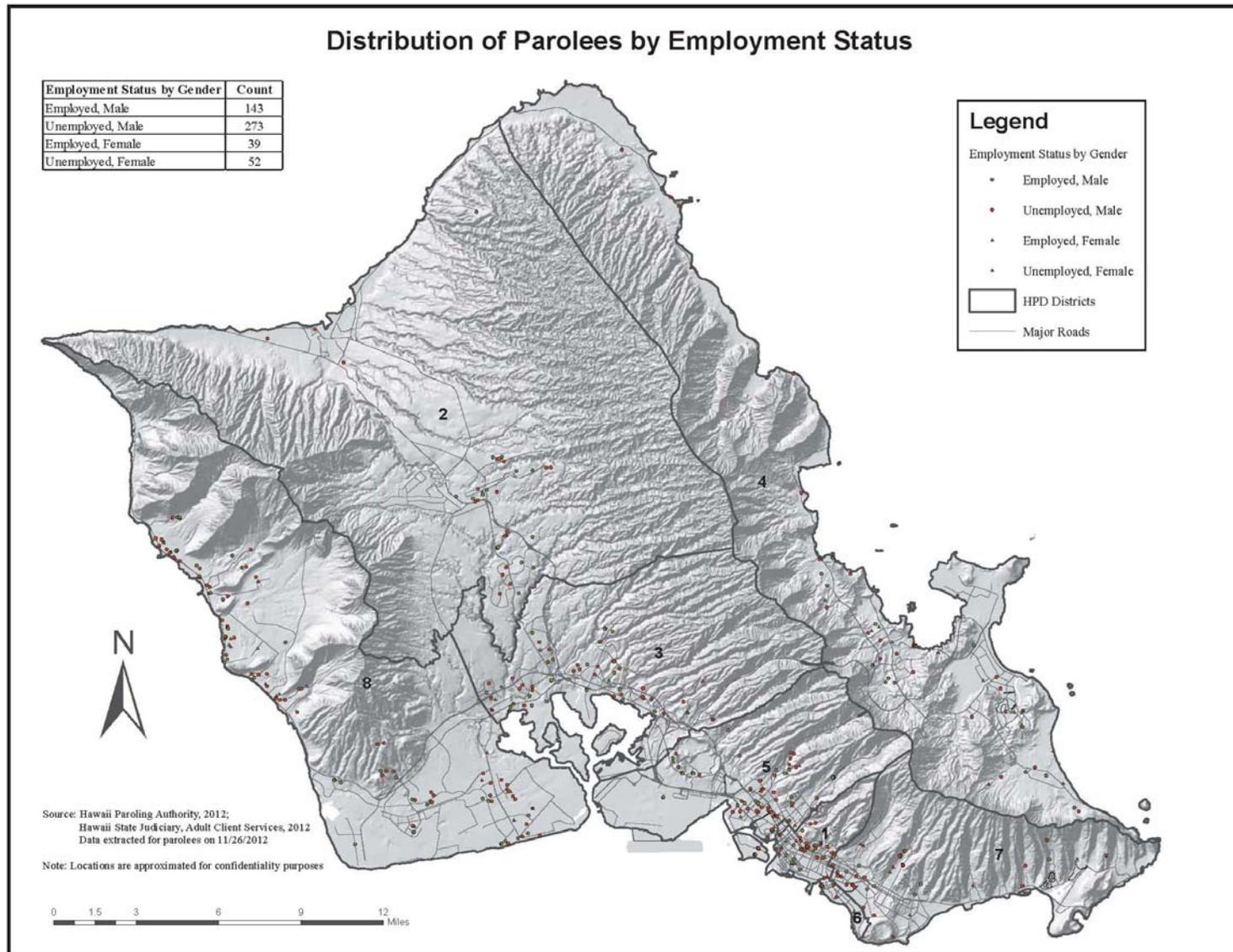
Example of Map Type: Density of Parolees/Probationers (per 10,000 Population) by ZIP Codes and by Type of Offense



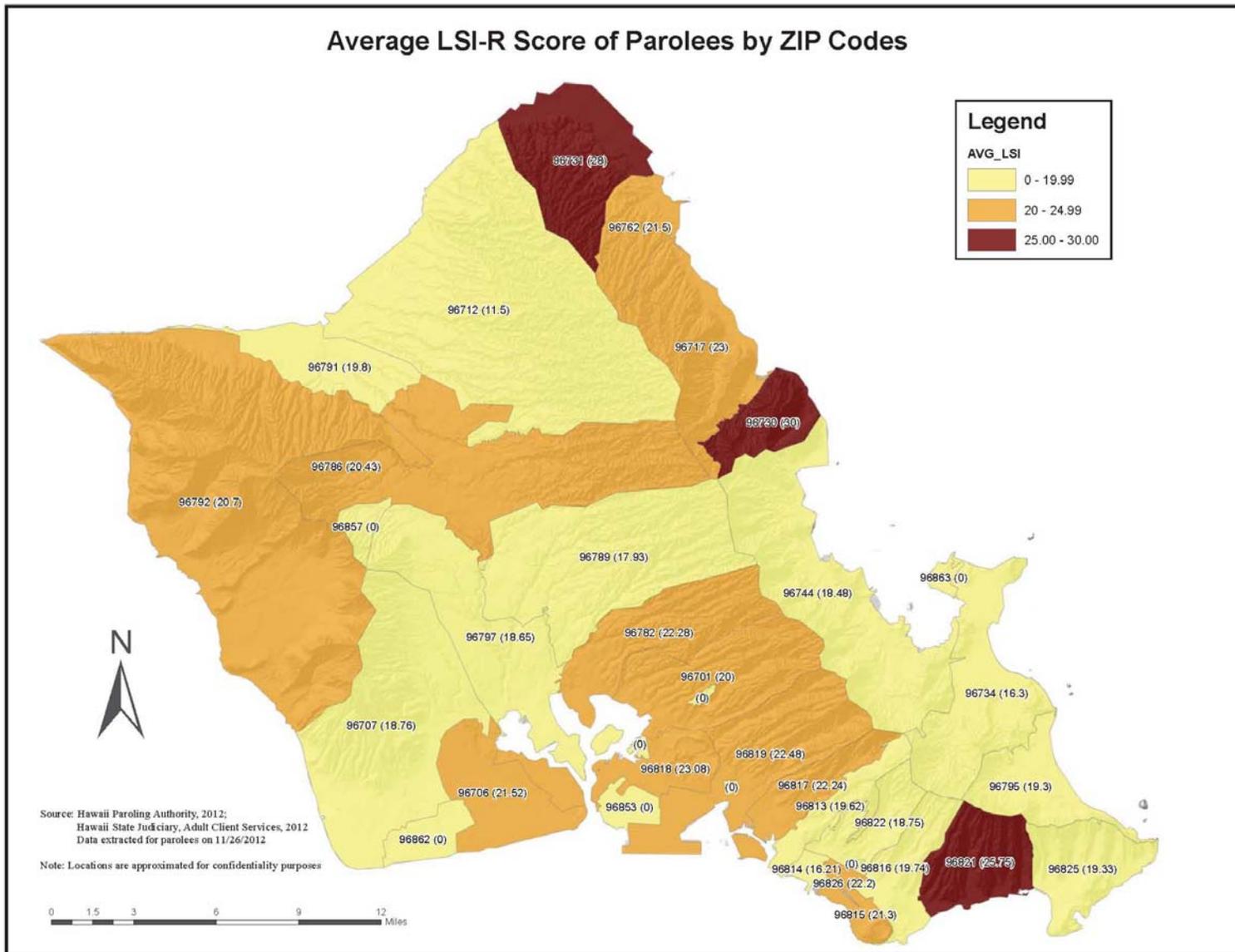
Example of Map Type: Level of Supervision



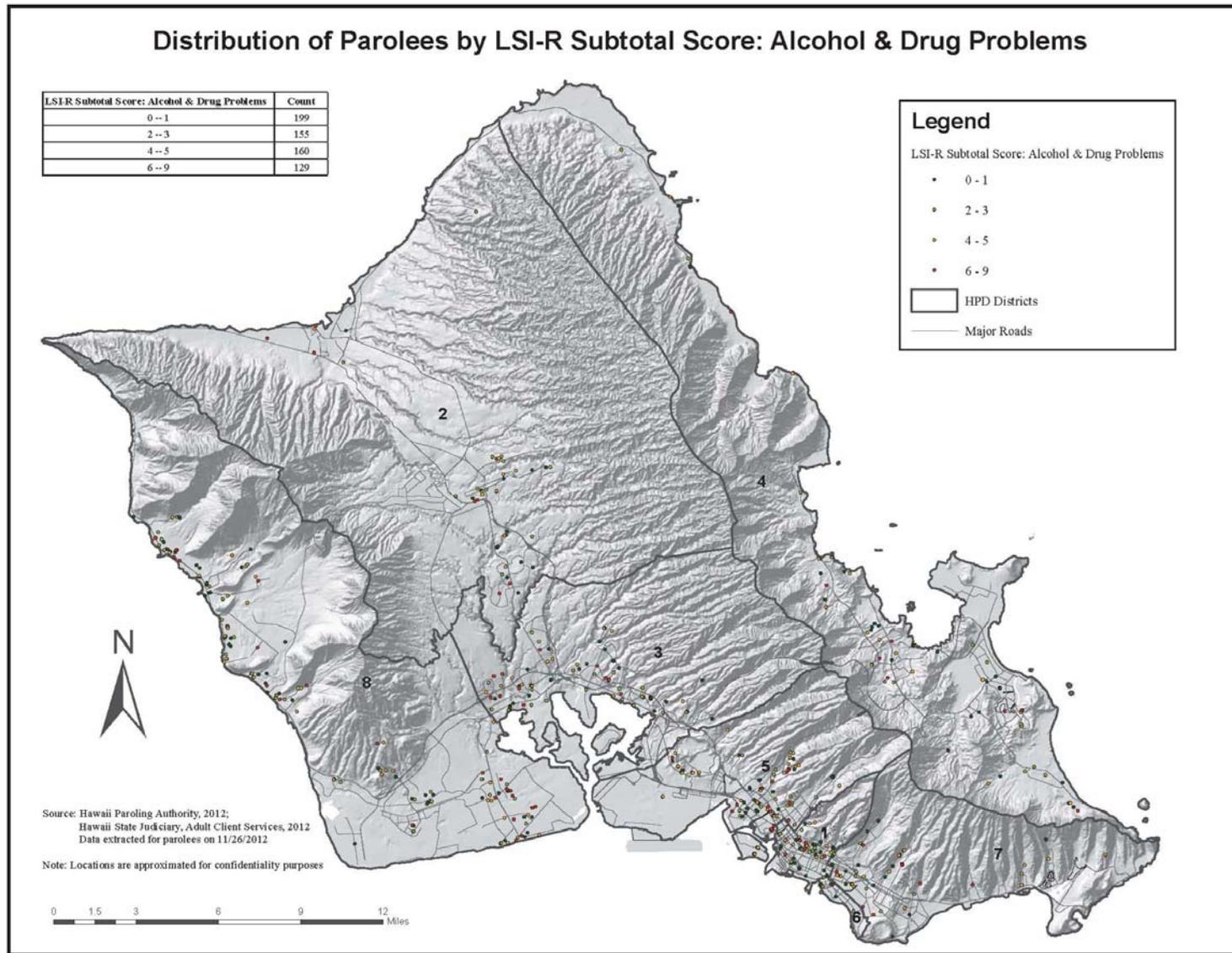
Example of Map Type: Employment Status



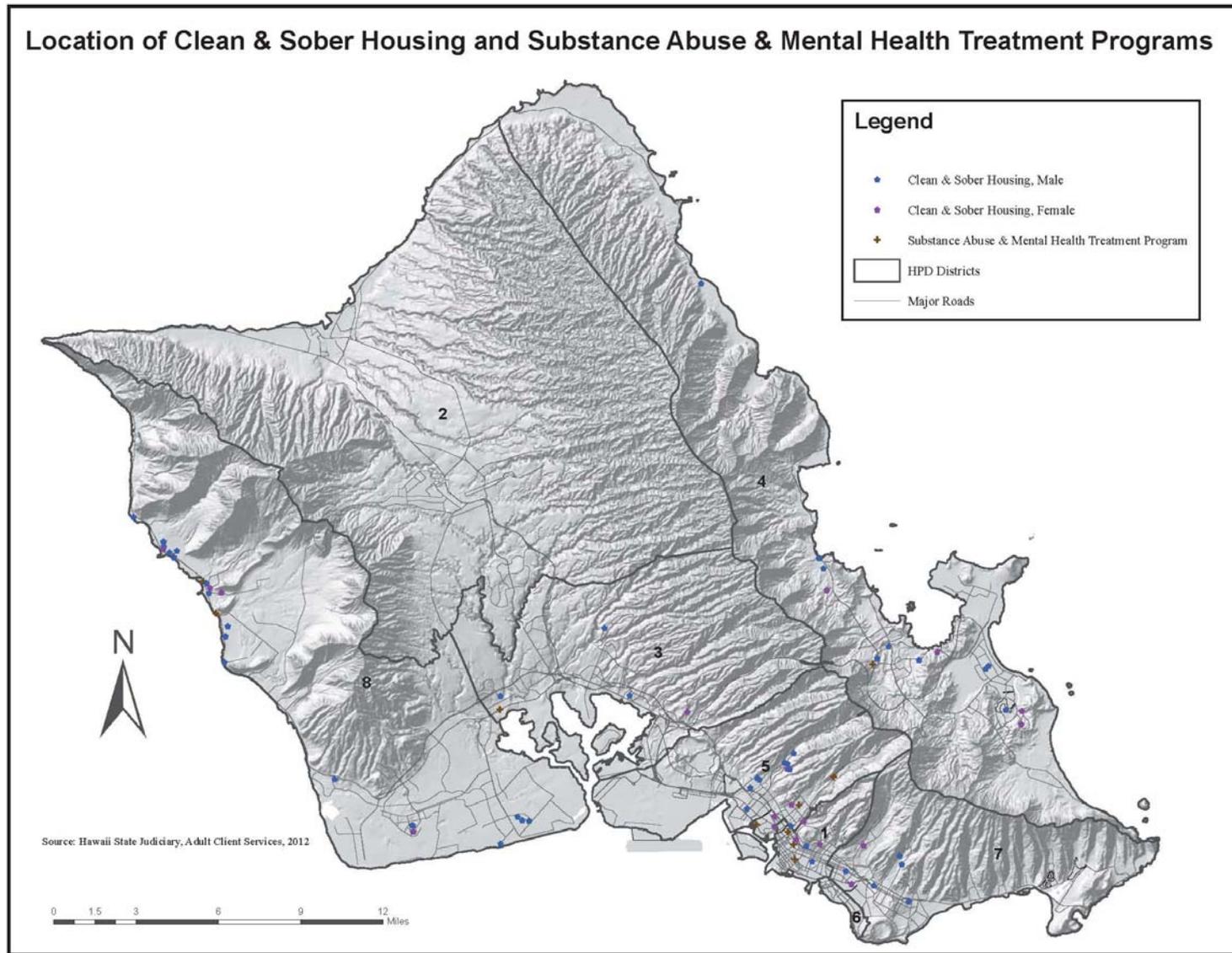
Example of Map Type: Average LSI-R Scores



Example of Map Type: LSI-R Sub-Categories



Example of Map Type: “Clean and Sober” Housing and Substance Abuse and Mental Health Treatment Programs



Example of Map Type: Main Offense Categories

