# I-PLACE3S User Guide

## Table of Contents

### Chapter 1. Working with I-PLACE3S
- A. Using This User Guide ................................................................. 2
- B. Preferred Environment ................................................................. 4
- C. Updates to this User Guide ......................................................... 4

### Chapter 2. User Setup
- A. Creating a New User Account ....................................................... 7
- B. Requesting Project Access .......................................................... 9
- C. Main Menu .................................................................................. 9

### Chapter 3. Introduction to the Project Menu
- A. Create New Scenario ................................................................. 10
- B. Set Project Information ............................................................... 11
- C. Set Global Assumptions ............................................................. 12
- D. Project Place Types Manager ..................................................... 13
- E. Project Transit Stop Manager ...................................................... 15
- F. Project Transit Layer Manager .................................................... 17
- G. Project Energy Manager ............................................................ 17
- H. Compare Scenarios ................................................................. 18
- I. Set Dwelling Unit / Employee Targets ........................................ 18
- J. Project Subarea Manager ........................................................... 19
- K. Project Layer Manager ............................................................. 20
- L. Recent Project Activity ............................................................. 21
- M. Travel Library Manager ........................................................... 22

### Chapter 4. Introduction to the Scenario Menu
- Scenario Tools Overview
  - A. Apply Place Types Using Map .................................................. 25
  - B. Apply Place Types By Query .................................................... 27
  - C. Apply Place Types Using Shapefile ......................................... 30
  - D. Constraints Manager ............................................................... 31
  - E. View Changed Parcels on Map ............................................... 32
  - F. Travel Scenario Menu ............................................................. 35
  - G. Download this Scenario Shapefile and Download with DU/EMP .................................................. 38
  - H. Housing Splits Manager ......................................................... 39
  - I. Delete This Scenario .............................................................. 40

- Scenario Reports Overview
  - A. Compare Scenarios and Compare Scenario Subareas ............... 41
  - B. View Statistics By Subarea ..................................................... 42
  - C. View Place Types Statistics ..................................................... 45
  - D. Scenario Subarea Query Menu ............................................... 47

### Chapter 5. Creating a Project
- A. Preparing Data in GIS ............................................................... 48
- B. Setting Up an I-PLACE3S Project .............................................. 51

### Chapter 6. Creating and Editing Place Types
- A. Creating New Place Types ......................................................... 52
- B. ROI Assumptions ................................................................. 54
Chapter 1. Working with I-PLACE3S

Welcome to the world of I-PLACE3S! I-PLACE3S is a software tool that facilitates a kind of planning known as scenario planning. It provides a web-based platform from which to communicate ideas, store data, and analyze potential outcomes.

In the traditional approach to planning, a single option is evolved through a process of involvement with key stakeholders, usually relating to key goals and objectives. Scenario planning is a process in which professional planners and citizens work together to analyze and shape the long-term future of their communities. Using a variety of tools and techniques, participants in scenario planning assess trends in key factors such as transportation, land use, demographics, health, economic development, environment, and more. The many participants bring factors together in alternative future scenarios, each of these reflecting different trend assumptions and tradeoff preferences. One of the goals of scenario planning is for all members of a community (the general public, business leaders, and elected officials) to reach agreement on a preferred scenario. This scenario then becomes the long-term policy framework or vision for the community’s evolution, and is used to guide decision-making.

In scenario planning, several options are considered and objectively evaluated against quantifiable criteria. Scenario planning is more flexible and allows for more creativity than conventional planning, especially in creating solutions that are not initially obvious. To begin the process a Base Case scenario is created. The Base Case scenario is a land use map and data set built upon demographic and economic projections and an assembly of adopted policy, primarily general plans. The Base Case represents what the study area would be expected to be like if no actions are taken to change its current development path. It is a very important scenario since all other alternative development scenarios will be compared to the Base Case to determine long term net change over what conditions would be if no action is taken.

The problem with scenario planning is that it’s technical – without a software tool like I-PLACE3S, scenario planning can be complex and intimidating, and can devolve either into planning by guesswork (with little or no technical information because it is simply too costly and impractical to create), or the reverse, a simple accounting of numeric data.

Like any tool, I-PLACE3S must be used properly to achieve the desired results. This user guide has been prepared to help I-PLACE3S users navigate through the system, prepare scenarios for analysis, and conduct that analysis.

History of I-PLACE3S

PLACE3S began as desktop software, developed through collaborative efforts among the California, Oregon, and Washington State Energy Departments. In 2002, the California Energy Commission commissioned EcoInteractive (a software development company) to convert the desktop version of PLACE3S to an internet version of the PLACE3S land use model. This internet version is referred to as I-PLACE3S and is the subject of this user guide. The desktop version is no longer updated and is not offered or recommended for use.

Sponsors

The original PLACE3S software application was developed in the public domain by Parsons Brinckerhoff, Fregonese Calthorpe Associates, and Space Imaging, in collaboration with ESRI (the company that developed ArcInfo in 1981 and ArcView GIS in 1992), and with funding from
the California Energy Commission. Additional support for the development of the PLACE3S model has been provided by the U.S. Department of Energy, the Sacramento Area Council of Governments (SACOG), the Association of Bay Area Governments (ABAG), the City of San Diego, the San Diego Association of Governments (SANDAG), the City of Sacramento, the Georgia Regional Transportation Authority (GRTA), the California Department of Transportation, the Sacramento Regional Transit Authority, the Oregon Department of Transportation, and others.

To obtain access to I-PLACE3S demonstration site go to http://places.energy.ca.gov/places/. User name and password “demo” will open a simple neighborhood level project.

Access to the full I-PLACE3S program and all of the related services can be acquired by contacting the California Energy Commission, as noted at the beginning of the manual.

Features of I-PLACE3S

All planning decisions have impacts on the community. Transportation affects housing, for example, and one city's decision to expand or limit development can have a significant impact on surrounding communities. I-PLACE3S immediately shows the effects of those choices based on the input community characteristics. It helps the user evaluate how efficiently a community does the following:

- Integrates the effects of a wide variety of land uses
- Identifies the redevelopment and infill potential of land
- Provides housing and jobs
- Transports people and materials (SACOG has integrated two travel modules into I-PLACE3S, which other regions can borrow and modify. See Chapter 15 for an explanation of these modules.)

I-PLACE3S is designed to support smart growth planning in regions, cities, and communities, and to be easily accessible to planners, policymakers, citizens, and students. Together, the scenario planning method and the GIS model allow an interactive, participatory analytical process to evaluate land use planning scenarios and their impact on a community and region.

The I-PLACE3S model uses a real-time, state-of-the-art GIS tool to analyze and display the results of different land use scenarios in an easily understood geographical format. I-PLACE3S can be used to create multiple future scenarios and present the information in a series of digital maps and data tables that effectively communicate results to the public and decision makers. The data generated in I-PLACE3S can be exported and turned into tables, charts, and maps to help to clarify the trade-offs a community must make, the relative difference among scenarios and provide a common yardstick for measuring land use plans.

A. Using this User Guide

This user guide has been prepared with both the novice and advanced user in mind. It includes detailed information on a variety of functions and components within the I-PLACE3S system. The guide begins with a general introduction to the primary I-PLACE3S components:

- Project Menu;
- Scenario Menu;
- Place Types Manager;
- Map; and
- Query
The following chapters detail how to:

- Create a project;
- Create and edit Place Types;
- Set up an Existing Conditions Scenario;
- Create and use Sub-areas;
- Create and use Constraints; and
- Download shapefiles from I-PLACE3S

Additional information is included on the Return on Investment (ROI) function, Energy Module, and other functions of the program.

This user guide anticipates access to an internet connection. I-PLACE3S can be found on the internet at [http://places.energy.ca.gov/places/](http://places.energy.ca.gov/places/). If you are a COG or MPO that has an I-PLACE3S maintenance contract, you already have full access to the I-PLACE3S website. If you are with a jurisdiction within a region that has a maintenance contract for the I-PLACE3S website, contact your COG or MPO for access to I-PLACE3S. If this is your first time accessing the I-PLACE3S website, you will be able to view the on-line tutorial but may not have full access to the I-PLACE3S website.

This guide also anticipates access to a third-party GIS (Geographic Information System) program (e.g., ESRI's ArcGIS).

The screen shots presented in this user guide are provided for illustrative purposes only. In some instances, your screen will not look the same, either because of periodic updates to the system or because of restricted access to some portions of I-PLACE3S based on your access rights.

For example, a user with partial access to a project might have these Scenario Functions:

<table>
<thead>
<tr>
<th>SCENARIO FUNCTIONS</th>
<th>TOOLS</th>
<th>REPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIEW PLACE TYPES ON MAP</td>
<td>COMPARE SCENARIOS</td>
<td></td>
</tr>
<tr>
<td>APPLY PLACE TYPE USING A QUERY</td>
<td>COMPARE SCENARIO SUB-AREAS</td>
<td></td>
</tr>
<tr>
<td>APPLY PLACE TYPES USING A SHAPEFILE</td>
<td>VIEW STATISTICS BY SUB-AREA</td>
<td></td>
</tr>
<tr>
<td>CONSTRAINT MANAGER</td>
<td>VIEW PLACE TYPE STATISTICS</td>
<td></td>
</tr>
<tr>
<td>VIEW CHANGED PARCELS ON MAP</td>
<td>SCENARIO SUB-AREA QUERY MENU</td>
<td></td>
</tr>
<tr>
<td>TRAVEL SCENARIO MENU</td>
<td>40s CALCULATIONS</td>
<td></td>
</tr>
<tr>
<td>DOWNLOAD THIS SCENARIO SHAPEFILE</td>
<td>AGGREGATE SCENARIO STATISTICS (40s)</td>
<td></td>
</tr>
<tr>
<td>DOWNLOAD SHAPEFILE WITH DYNAD</td>
<td>VIEW TRANSIT STOP DATA</td>
<td></td>
</tr>
<tr>
<td>HOUSING SPLIT STATS MANAGER</td>
<td>VIEW ENERGY REPORTS (BETA)</td>
<td></td>
</tr>
<tr>
<td>DELETE THIS SCENARIO</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

while a user with full access to the same project might have all of these Scenario Functions.
B. Preferred Environment

As an internet-based system, I-PLACE3S can be operated using any internet browser. To use the map function, a Java virtual machine must be installed on the host computer. A dial-up internet connection may be used, but an Ethernet connection is preferred when using the Map application and uploading/downloading shapefiles to/from I-PLACE3S.

C. Updates to this User Guide

This User Guide is intended to be a living document. As users add new functionality to I-PLACE3S, the hope is that new instructional chapters will be added to this guide so that other I-PLACE3S users can benefit from the new functionality. If you would like to add new instructions to this User Guide, contact Kacey Lizon, I-PLACE3S User Group Leader, at the Sacramento Area Council of Governments:

Kacey Lizon
I-PLACE3S User Group Leader
E-mail: klizon@sacog.org
Chapter 2. User Setup

A. Creating a New User Account

The first step to using I-PLACE3S is creating a user account. Go to the I-PLACE3S website (http://www.places.energy.ca.gov/places) and click on the Password Request link near the bottom of the page. In your future visits to I-PLACE3S, you will use this page to log in to the system (Figure 1).

Figure 1
On the Account Setup page, fill in all of the fields on the form and click the **Continue with Account Setup** button (Figure 2). The login and password you create are instantly engaged and you’ll use them for all subsequent access to the website.

**Figure 2**

![PLACE^3'S Account Setup form]

After completing the Account Setup page, you will be automatically logged into I-PLACE3S and will be taken to the “Main Menu” screen. From this screen, you will be able to access all of your I-PLACE3S projects.
B. Requesting Project Access

The first time you log in to I-PLACE3S, there may not be any projects listed on your “Main Menu” screen (Figure 3). To begin using an existing I-PLACE3S project, you will need to request access from the project administrator. Click on the Request Access link to search for an existing project and request access.

Figure 3

Rather than listing all of the projects in the I-PLACE3S database, I-PLACE3S gives you the ability to search for the project title (Figure 4). The search function recognizes so-called “wild cards,” so if you are unsure of the project name, type an * before and after the partial project name (e.g., *Citrus Heights*). You can also leave the project name blank, which will bring up the full list of project names.

Figure 4
To request access to a project, click the check box next to the project name (you can select more than one project) and click on the Request Checked Projects button at the bottom (Figure 5).

**Figure 5**

![Request Projects Table](image)

I-PLACE3S will identify that the selected projects have been requested (Figure 6). To ensure that project access is granted in a timely manner, e-mail the project administrator (their name is located on the same line as the project name, in the right-hand column) and let them know that you have requested access to their project(s). There are three levels of project access: Full, Partial, and Read Only. Full access gives the user full access to editing the project, including downloading and uploading data. Partial access differs from Full access in that the user cannot upload data to the website. Read only, as its name implies allows the user to only view the project. The project administrator will determine which level of access you will receive. Once access has been granted for a project, it does not need to be requested again.

**Figure 6**

![Project Successfully Added](image)
C. Main Menu

After logging in to I-PLACE3S, the first screen to come up is the “Main Menu” (Figure 7). The “Main Menu” provides a list of all current projects which you have access to. It also provides a link to the Request Project Access Menu, as described in Chapter 2. Clicking on a project name will open that project and display its “Project Menu” screen.

I-PLACE3S has two main levels of functionality: projects and scenarios. A project is made up of one or more land use scenarios for any geography the user defines.

Figure 7
Chapter 3. Introduction to the Project Menu

The “Project Menu” holds details for individual projects (Figure 8). It displays the project scenarios and includes all of the project-level functions (i.e. menus and reports that apply to the entire project and all the scenarios in it).

Near the top of the “Project Menu”, the projects’ scenarios are listed. Clicking on an individual scenario name will take you to the “Scenario Menu”, which is outlined in the next chapter (Chapter 4).

Under the projects’ scenarios you will see the entire list of project functions. Most of the project menu’s tasks are set up to be intuitive, even to the novice user. However, a brief overview of each menu is provided in this chapter. Several key project-level functions are covered in greater detail in subsequent chapters of the manual.

Tip: As you read this chapter and want to tour I-PLACE3S as you read, try right-clicking and opening the different menus in a new window. This way you can see the new menu being described as well as keep handy the project menu window. This is a good habit to get into early as you will find that as you use I-PLACE3S, having multiple windows open will streamline your workflow significantly.

A. Create New Scenario

A project is made up of one or more scenarios. The first scenario is created when the project is first created. After that, any number of new scenarios can be added to the project. The Create New Scenario link walks the user through the step by step process of creating a new scenario (Figures 9 and 10). This process is outlined in Chapter 7.
B. Set Project Information

This is where you can update the project name and lead organization (Figures 11 and 12).
C. Set Global Assumptions

I-PLACE3S includes the ability to set a series of global assumptions that will apply to all scenarios within the project (Figures 13 and 14). The primary purpose of these assumptions is to standardize key aspects of the project for data analysis.

The two most important pieces of information to be aware of in the Global Assumptions are the rates for Persons per Household (detached) and Persons per Household (attached). Other fields relate to the Return on Investment function (see Chapter 14).
D. Project Place Types Manager

In I-PLACE3S, development types, or land use categories, are called PLACE Types. Included in these PLACE Types are a unique set of assumptions that define what the PLACE Type is, what its physical form is, and ultimately, the development yield (housing units and/or employees) of the use. Place Types have the same function as general plan or zoning designations; in I-PLACE3S you are able to specify the physical parameters of each designation and then apply them to a growth scenario.

Place Types are created and managed from the Place Type Manager, which is accessed from the “Project Menu” (Figure 15).
The Place Type Manager lists all of the Place Types and Blended Place Types available within the project (Figure 16). It also lists summary information for each Place Type including:

- Dwelling units per acre;
- Employees per acre;
- Percentage of use in each general sector (residential, retail, office, industrial, public, other); and
- Floor Area Ratio.

The process for creating and editing Place Types will be described in Chapter 6.
E. Project Transit Stop Manager

The Transit Stop Manager is where you can upload a transit stop shapefile (Figures 17 and 18). The transit stops must be a point shapefile and contain the field names outlined by the Transit Stop Menu. The stops should be stops for a semi to permanently fixed right of way, such as light rail or BRT, not local bus stops. By clicking the UPLOAD TRANSIT STOP SHAPEFILE FOR THIS PROJECT button, you can upload the shapefile.
link, a page will open with instructions on formatting the transit stop file. A transit layer is only required if you want to use the percent change in light rail/BRT boarding indicator (it could also be added to provide a visual representation of the stop while working in the map view).

**Figure 17**

<table>
<thead>
<tr>
<th>PROJECT MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREATE NEW SCENARIO</td>
</tr>
<tr>
<td>SET PROJECT INFORMATION</td>
</tr>
<tr>
<td>SET GLOBAL ASSUMPTIONS</td>
</tr>
<tr>
<td>PROJECT PLACE TYPES MANAGER</td>
</tr>
<tr>
<td>PROJECT LAND VALUE MANAGER</td>
</tr>
<tr>
<td>PROJECT TRANSIT STOP MANAGER</td>
</tr>
<tr>
<td>PROJECT TRANSIT LAYER MANAGER</td>
</tr>
<tr>
<td>TRANSIT CORRIDOR MANAGER</td>
</tr>
<tr>
<td>PROJECT ENERGY MANAGER (ALPHA)</td>
</tr>
</tbody>
</table>

**Figure 18**

![PLACE3S](image)

**PROJECT TRANSIT STOP MENU**

<table>
<thead>
<tr>
<th>CURRENT PROJECT</th>
<th>PROJECT TYPE</th>
<th>LEAD ORGANIZATION</th>
<th>STUDY AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DELTA SHORES</td>
<td>NEIGHBORHOOD</td>
<td>SACOG</td>
<td>CUSTOM STUDY SHAPEFILE</td>
</tr>
</tbody>
</table>

**UPLOADED TRANSIT STOP LAYERS**

**NO TRANSIT STOP LAYERS EXIST FOR THIS PROJECT**

**TRANSIT STOP MENU**

**UPLOAD TRANSIT STOP SHAPEFILE FOR THIS PROJECT**

**F. Project Transit Layer Manager**

The Transit Layer Manager can be used to upload transit layers (Figures 19 and 20). Unlike the Transit Stop Manager, this menu allows you to add line files. All projects will have a road file visible in the map view. However, if you wish to add a shapefile for transit lines, use the menu here to walk through the steps. The transit lines would then be visible in the map view.

**Figure 19**

<table>
<thead>
<tr>
<th>PROJECT MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREATE NEW SCENARIO</td>
</tr>
<tr>
<td>SET PROJECT INFORMATION</td>
</tr>
<tr>
<td>SET GLOBAL ASSUMPTIONS</td>
</tr>
<tr>
<td>PROJECT PLACE TYPES MANAGER</td>
</tr>
<tr>
<td>PROJECT LAND VALUE MANAGER</td>
</tr>
<tr>
<td>PROJECT TRANSIT STOP MANAGER</td>
</tr>
<tr>
<td>PROJECT TRANSIT LAYER MANAGER</td>
</tr>
<tr>
<td>TRANSIT CORRIDOR MANAGER</td>
</tr>
<tr>
<td>PROJECT ENERGY MANAGER (ALPHA)</td>
</tr>
</tbody>
</table>
G. Project Energy Manager

To measure building energy use (not related to vehicle miles traveled), you will use the Project Energy Manager. The Project Energy Manager is one of the more complex project tools and is described in Chapter 15 (Figures 21 and 22).

Figure 21

Project Menu

- CREATE NEW SCENARIO
- SET PROJECT INFORMATION
- SET GLOBAL ASSUMPTIONS
- PROJECT PLACE TYPES MANAGER
- PROJECT LAND VALUE MANAGER
- PROJECT TRANSIT STOP MANAGER
- PROJECT TRANSIT LAYER MANAGER
- TRANSIT CORRIDOR MANAGER
- PROJECT ENERGY MANAGER (ALPHA)

COMPARISON

- COMPARE SCENARIOS
- COMPARE SCENARIO SUBAREAS
- SET DWELLING UNIT/EMPLOYEE TARGETS
- PROJECT SUBAREA MANAGER
- PROJECT LAYER MANAGER
- RECENT PROJECT ACTIVITY
- TRAVEL LIBRARY MANAGER
H. Compare Scenarios

I-PLACE3S provides the ability to compare scenarios and sub-areas within multiple scenarios. To compare scenarios, click on the Compare Scenario link on either the "Project Menu" or "Scenario Menu" page (Figure 23).

Note: To compare scenario sub-areas, select the Compare Scenario Subareas link on either the "Project Menu" or "Scenario Menu" page. More information on this process can be found in Chapter 12.

I. Set Dwelling Unit/Employee Targets

If your project has a target dwelling unit and/or employment number, you can enter them in this screen (Figures 24 and 25). I-PLACE3S can display these targets in scenario comparisons to serve as a benchmark for future land use scenarios.
J. Project Sub-Area Manager

Sub-areas are polygon shapefiles that can be created in GIS and uploaded into I-PLACE3S. Sub-areas are overlaid onto the project area and allow statistics to be extracted for these smaller areas. This “Project Menu” is where sub-areas can be uploaded to the project as well as where they are managed (Figures 26 and 27). Chapter 7 details the Project Sub-Area Manager and how to add sub-areas to I-PLACE3S.
K. Project Layer Manager

The map view in I-PLACE3S displays the project area and any sub-areas that are uploaded. It also will show roads. If you want to add other data to the map view, it is added using this Project Layer Manager (Figures 28 and 29).
L. Recent Project Activity

Recent Project Activity is a log of all scenarios downloaded within the last two weeks (Figures 30 and 31). If you need to re-download a scenario that was downloaded in this time frame, you can access it from this menu without waiting for I-PLACE3S to prepare and package it for download. However, if you made changes to the scenario after the reported download date, be aware that the scenario you access from the Recent Project Activity menu will not reflect the recent changes.
The Travel Library Manager is used in conjunction with a 4-Step travel model and requires additional licensing from Citilabs (Figures 32 and 33). This is intended to give the user the ability to create custom travel model scripts and transportation networks for use in the travel model. Refer to Chapter 16 for a full discussion on using the Travel Library Manager.
### Figure 33

**PLACE³S**

**TRAVEL LIBRARY MANAGER**

<table>
<thead>
<tr>
<th>CURRENT PROJECT</th>
<th>PROJECT TYPE</th>
<th>LEAD ORGANIZATION</th>
<th>STUDY AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERONA</td>
<td>NEIGHBORHOOD</td>
<td>SACOG</td>
<td>CUSTOM STUDY SHAPEFILE</td>
</tr>
</tbody>
</table>

**TRAVEL LIBRARY MANAGER**

**NO TRAVEL LIBRARIES CURRENTLY EXIST**

**TRAVEL LIBRARY MENU**

**UPLOAD TRAVEL LIBRARY**
Chapter 4. Introduction to the Scenario Menu

By clicking on the name of a scenario on the “Project Menu” page, you will open the “Scenario Menu” for that scenario. The “Scenario Menu” page provides all the management tools for that particular scenario, as well as quick and detailed statistical information about the scenario (Figure 34). There are three main sections of the “Scenario Menu” screen:

- **Scenario Summary** - Contains general statistics for the current scenario. Click on the Show Detailed Statistics link to see additional scenario-specific statistics.
- **Return on Investment** - Allows you to visually view Return on Investment information on the map. (Note: This function must be enabled to be active. See your project administrator for activation.)
- **Scenario Functions** - This is where you will find the main functionality of I-PLACE3S for marking Place Types, making data changes, or running scenario comparisons.

By default, the “Scenario Menu” screen will list summary statistics for the scenario. Summary statistics are limited to only the total acres of the scenario, the total number of employees, and the total dwelling units. To see a list of detailed statistics, click on the Show Detailed Statistics link next to the Scenario Summary title. Additional information listed in the detail view includes:

- **Employee statistics (employees per acre, per dwelling unit, and dwelling units per employee);**
• Dwelling units statistics (total residents, total attached and detached units, and units per acre);
• Resident and job statistics;
• Emission statistics;
• Employee counts by sector (retail, office, industrial, public, other);
• Building square footage by sector (retail, office, industrial, public, other); and
• Transit, pedestrian, and bikeway friendliness statistics.

All of these statistics are hyperlinked with their definition and formula.

After clicking on the Detailed Statistics link the first time, each time you open any subsequent Scenario Menus (regardless of which scenario) during your active login, the detailed statistics will show by default. However, the next time you log in the condensed version will again show by default. To get back to the summary statistics at any time, click the Hide Detail Statistics link.

The “Scenario Menu” also provides links to various tools and reports for the active scenario. These tools include:

• Apply Place Types Using Map;
• Apply Place Types Using A Query;
• Apply Place Types Using a Shapefile;
• Constraints Manager;
• View Changed Parcels on Map;
• Travel Scenario Menu;
• Download this Scenario Shapefile;
• Download Shapefile with DU/EMP;
• Housing Splits Stats Manager
• Delete this Scenario

Reports available from the “Scenario Menu” include the ability to:

• Compare Scenario and Scenario Sub-Areas;
• View Statistics By Sub-Area;
• View Place Type Statistics; and
• Scenario Sub-Areas Query Menu

Each of these functions is introduced here and described in subsequent sections of this user guide.

Overview of Scenario Tools

A. Apply Place Types Using Map

The Map is one of the most fundamental components of I-PLACE3S. It provides the ability to apply Place Types to specific parcels, retrieve parcel level information, and overlay sub-areas on the base map. The Map is specific to each scenario and is accessed from the “Scenario Menu” tools list (Figure 35 and 36). Functions within the Map include:

• Zoom
• Pan
• Identify
• Mark (Place Type)

• Layers
• Transit Layers
• Sub-area Layers
• Sub-area Queries
- Map Size
- Zoom to Scenario Extent
- Quick Indicators
- Undo Last Mark Action
- View/Save This Map Image

**Figure 35**

![Image of PLACE3S User Guide](image-url)
Chapter 8 provides detailed information on working in the map view.

B. Apply Place Types by Query

Another useful function within I-PLACE3S is Query. The Query function is primarily used to apply Place Types using a query, but can also be used to look up information about a group of parcels given a specific set of data. The Query function is accessed from the “Scenario Menu” by clicking on the Apply Place Types Using a Query link under Tools (Figures 37 and 38).
Figure 37
Figure 38

APPLE PLACE TYPES USING A QUERY

CREATE QUERY

CREATE A QUERY USING THE FORM BELOW. CLICK "PERFORM THIS QUERY" WHEN YOU ARE DONE. THE NEXT PAGE WILL SHOW A SUMMARY OF THE RESULTS WHICH YOU MAY USE TO APPLY A SPECIFIC PLACE TYPE. CLICK HERE TO APPLY USING A SUB-AREA AND A QUERY.

<table>
<thead>
<tr>
<th>FIELD NAME</th>
<th>TYPE</th>
<th>OPERATOR</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT PLACE TYPE</td>
<td></td>
<td>EQUALS</td>
<td></td>
</tr>
<tr>
<td>CURRENT DEV PCT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
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<td>CHAR</td>
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</tr>
<tr>
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<td></td>
</tr>
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<td>CHAR</td>
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<td></td>
</tr>
<tr>
<td>COUNTY</td>
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</tr>
<tr>
<td>CT</td>
<td>NUMBER</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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<tr>
<td>GLUC</td>
<td>CHAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRID_ID</td>
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<td></td>
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<tr>
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<td>CHAR</td>
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<tr>
<td>MINORZONE</td>
<td>CHAR</td>
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<tr>
<td>MZUR</td>
<td>CHAR</td>
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<td>CHAR</td>
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<tr>
<td>RAD_OLD</td>
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<tr>
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</tr>
<tr>
<td>RPCTDV</td>
<td>NUMBER</td>
<td></td>
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<tr>
<td>RPTYPE</td>
<td>NUMBER</td>
<td></td>
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<tr>
<td>SQ_MILES</td>
<td>NUMBER</td>
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<tr>
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<td>CHAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAZ</td>
<td>NUMBER</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Perform This Query  Reset Form
The Query page shows a list of all the fields that were part of the original uploaded shapefile. Current Place Type, Current Development Percent, and Place Type FAR (floor area ratio) are also included. This enables you to find parcels based on their Place Type, Place Type Percent, or Place Type FAR as they are currently marked in I-PLACE3S.

There are four columns listed on the page:
1. Field Name - The name of the field from the shapefile.
2. Field Type - The data type for the field (number or character).
3. Operator - The operator for your query: equals, greater than, less than, between, like, not like, not equal to.
4. Value - The value or values for your query.

Chapter 8 provides detailed information on Applying Place Types Using a Query.

C. Apply Place Type Using a Shapefile

The third way of applying place types in a scenario is using a shapefile (Figures 39 and 40). This function allows you to upload a shapefile for the geographic area(s) for which you wish to modify place types. Once the file is uploaded, the place type you select will be applied to all the parcels contained in the uploaded shapefile.

Figure 39
Chapter 8 provides detailed information on using the Apply Place Type by Shapefile function.

**D. Constraints Manager**

I-PLACE3S has the ability to limit, or constrain, development on parcels. This is accomplished by uploading a constraint shapefile—a geographic area that will overlay parcels and apply user specified rules to them that limit the development yield. Constraints are set up at the scenario level and are scenario specific, although you can copy them from scenario to scenario if you want consistency throughout the project (Figures 41 and 42).
See Chapter 10 for a full discussion on constraints and how to apply them to a scenario.

E. View Changed Parcels on Map

I-PLACE3S is essentially a database and most changes are automatically saved. The View Changed Parcels on Map tool allows you to view all changed parcels based on a user defined date (Figure 43). This is a way to review changes in an individual scenario.
Enter the date for which you wish to review all changes made after that date (Figure 44). After entering the date, press the Synchronize button. I-PLACE3S will automatically open the map view and display the changed parcels with a black outline (Figure 45). You can turn this on and off while working in the map view. You cannot specify to see changes for just one day, it will show you all changes made after a specified date.

Figure 43
Figure 44

**Place3s**

**VIEW CHANGED PARCELS ON MAP**

<table>
<thead>
<tr>
<th>CURRENT PROJECT</th>
<th>PROJECT TYPE</th>
<th>LEAD ORGANIZATION</th>
<th>STUDY AREA</th>
<th>CUSTOM STUDY SHAPEFILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERONA</td>
<td>NEIGHBORHOOD</td>
<td>SACOG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CURRENT SCENARIO:** *BASE CASE*

**DATE AFTER WHICH TO SYNCHRONIZE**

<table>
<thead>
<tr>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/12/2008</td>
</tr>
</tbody>
</table>

**# OF PARCELS CHANGED BY DATE**

<table>
<thead>
<tr>
<th>DATE</th>
<th># PARCELS CHANGED</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/20/2006</td>
<td>4</td>
</tr>
</tbody>
</table>

[Synchronize]
F. Travel Scenario Menu

I-PLACE3S has the ability to act as an interface between the user and a travel model served on the same server (Figures 46 and 47). The user can upload and also edit uploaded transportation networks. I-PLACE3S can conduct a travel model run on the networks and display travel indicators following a run.

(Note: This section is only used if you have a separate license to run a stand alone travel model on the I-Place3s server. See chapter 15 for further detail and contact your I-Place3s administrator to see if this functionality is available.)
I-PLACE3S offers a number of options for downloading shapefiles. Downloading of scenario shapefiles is accomplished from the “Scenario Menu” under the Tools list (Figures 48 and 49). There are two options:
• Download This Scenario Shapefile – Downloads the shapefile for the scenario as a ZIP file.
• Download Shapefile with DU/EMP – Downloads the shapefile for the scenario as a ZIP file, but also adds the composite dwelling units and jobs totals for each parcel as a set of new fields in the attribute table. This is one of several formats that can be used for feeding the data into another model, such as a travel model.

In both cases, I-PLACE3S will add the following fields. You can use these fields to symbolize the data in GIS.

- **OPTYPE** - The current marked Place Type for the parcel in I-PLACE3S.
- **OPCTDEV** - The current marked Place Type percentage for the parcel in I-PLACE3S.
- **OPCTACRE** - The current marked gross to net percentage for the parcel in I-PLACE3S.
- **OPCTYPEC** – The numeric value for the currently marked Place Type (this is a field used by I-PLACE3S website administrators only).
- **RPTYPE** - The redeveloped marked Place Type for the parcel in I-PLACE3S.
- **RPCTDEV** - The redeveloped marked Place Type percentage for the parcel in I-PLACE3S.
- **RPCTCOV** - The redeveloped marked Place Type coverage percentage for the parcel in I-PLACE3S.
- **RPTYPEC** – The numeric value for the redeveloped marked Place Type (this is a field used by I-PLACE3S website administrators only).
- **RPTCACRE** – The redeveloped marked gross to net percentage for the parcel in I-PLACE3S.

Shapefiles for geographic sub-areas can also be downloaded. This is accomplished from the Project Sub-area Menu, accessed from the “Project Menu” page.
Tip: The OPTYPE and RPTYPE fields contain the alpha description of the final Place Type assigned in the scenario so it’s easiest to use those fields for land use visualization purposes in ArcMap. Remember, a redeveloped parcel will have a value for both OPTYPE and RPTYPE; be sure to visualize the RPTYPE place type if redevelopment was assumed.

H. Housing Splits Stats Manager

The Housing Split Data File is used to disaggregate dwelling units into specified types. This might be useful in travel models or demographic models (Figures 50 and 51).

Figure 50
The housing split file uploaded in I-PLACE3S is specific to a geographic region (such as RAD or census tract), selected by the user. The data should include: name, OPTYPE, percentage of each dwelling unit split type (i.e. single family, multi-family 2-4 units, etc.), and a vacancy rate if desired. This option allows the user to download the shapefile with the same information as the Download Shapefile with DU/EMP option, with the addition of dwelling units split into their various sub-categories.

**I. Delete This Scenario**

This tool allows you to delete a scenario from a project (Figures 52 and 53).
Scenario Reports Overview

A. Compare Scenarios and Compare Scenario Sub-Areas

The Compare Scenario and Compare Scenario Subarea reports are found on both the “Project Menu” and “Scenario Menu” (Figure 54). An overview of these reports can be found in the
Chapter 3. The Compare Scenario and Compare Scenario Subareas functions are described in detail in Chapter 8.

**Figure 54**

The “Scenario Menu” screen will list summary statistics or detailed statistics for the scenario. To see a list of detailed statistics, click on the Show Detailed Statistics link next to the Scenario Summary title. These detailed statistics can also be viewed for a specific subarea, rather than the entire scenario, using the View Statistic by Subarea report (Figures 55 and 56). Information listed in the detail view includes:

- Employee statistics (employees per acre, per dwelling unit, and dwelling units per employee);
- Dwelling units statistics (total residents, total attached and detached units, and units per acre);
- Resident and job statistics;
- Emission statistics;
- Employee counts by sector (retail, office, industrial, public, other);
- Building square footage by sector (retail, office, industrial, public, other); and
- Transit, pedestrian, and bikeway friendliness statistics.

B. View Statistics by Sub-Area

The "Scenario Menu" screen will list summary statistics or detailed statistics for the scenario. To see a list of detailed statistics, click on the Show Detailed Statistics link next to the Scenario Summary title. These detailed statistics can also be viewed for a specific subarea, rather than the entire scenario, using the View Statistic by Subarea report (Figures 55 and 56). Information listed in the detail view includes:

- Employee statistics (employees per acre, per dwelling unit, and dwelling units per employee);
- Dwelling units statistics (total residents, total attached and detached units, and units per acre);
- Resident and job statistics;
- Emission statistics;
- Employee counts by sector (retail, office, industrial, public, other);
- Building square footage by sector (retail, office, industrial, public, other); and
- Transit, pedestrian, and bikeway friendliness statistics.
Figure 55

Figure 56
Under Layer Name, click on the subarea for which you want to view detailed statistics.

**Figure 57**

![Table: View Statistics by Sub-Area](image)

Then click the Detailed Stats link to view the detailed statistics (Figure 57). Similar to the main “Scenario Menu”, the page will default to the summary statistics for the subarea, so you will need to click the See Detailed Statistics link next to the scenario summary title (Figure 58).
C. View Place Type Statistics

In addition to viewing overall statistics for a scenario, you can also view Place Type statistics. Place Type statistics are a listing of dwelling units, jobs, acres, and other data for each Place Type category in the scenario. To access the Place Type statistics, click on the link in the bottom right corner of the “Scenario Menu” (Figure 59).
Place Type statistics can also be generated and sorted by sub-area. To do this, select the sub-area you want to view statistics for and then click the Export to Excel button (Figure 60). The resulting Excel file will list all of the Place Types and their development statistics for each sub-area. See Chapter 12 for more discussion on Place Type Statistics.
As discussed in Chapter 7, an Excel file does not need to be generated to view Place Type Statistics for a specific sub-area layer. Rather, you can View Statistics by Sub-Area, then View Place Type Statistics.

D. Scenario Subarea Query Menu

Scenario sub-areas are virtual sub-areas that can be used for generating scenario statistics or viewing specific parcels in the map view (Figure 61). They are created through a query process based on physical attributes of the parcel shapefile. These sub-areas can be saved for future reference, but are only saved to the scenario for which they are created. Scenario sub-areas cannot be shared across multiple scenarios. Chapter 13 provides a full discussion on Scenario Sub-areas.

Figure 61
Chapter 5. Creating a Project

The first step for running I-PLACE3S is setting up the project by adding the first scenario. The first scenario of the I-PLACE3S project is assumed to be the “Base Case” scenario. I-PLACE3S uses the term “Base Case” when setting up this first scenario; however, “Base Case” is really user defined. It could be existing conditions for the project’s base year or it could be the business-as-usual scenario for the project’s future planning horizon date. Generally though, it is the first scenario produced by I-PLACE3S when you create a project. Establishing this scenario involves two steps:

A. Preparing data in GIS
B. Setting up the I-PLACE3S project

Tip: In most cases, you want to begin your I-PLACE3S project with a scenario that represents existing conditions as most projects begin with assessing what is on the ground today. However, in some instances, such as a public workshop setting, you may want your Base Case to be a pre-determined future scenario that can be modified and compared against.

A. Preparing Data in GIS

The initial data you will be uploading to I-PLACE3S will be the base geometry for the study area of your project. This can be a parcel set (as described herein) or some other geometry that describes the physical environment. However, the data must be prepared for I-PLACE3S with certain attributes and properties. This section guides the user through the necessary desktop GIS or ArcView process to format and prepare the existing conditions parcel data. The following sections provide detailed steps for setting up a project in I-PLACE3S using the parcel base prepared in this section.

By default, the parcel shapefile will likely have certain attributes assigned to it. This may include parcel area, APN, ownership, land and building value, SIC codes, and other data as included by the county assessor’s office. I-PLACE3S will automatically add certain fields to this parcel database once the file is loaded into the model. Some of these fields are dynamic and are used exclusively by the model to create and compare scenarios.

Required Fields

The following are database fields that must be added to the parcel database file (DBF) prior to setting up the I-PLACE3S project. They are used to describe the existing characteristics of the built environment, as well as some physical attributes.

- **DEVELOPED** (character field, width 2) – This field contains the built/vacant inventory for the parcel file. It is a character field containing the value “X” for developed parcels and “” (the field is blank) for vacant parcels. Note: This field must be titled and defined as described in order to be recognized by I-PLACE3S.

- **TAZ** (character field, width 5) – This field contains the Transportation Analysis Zone number that corresponds to each parcel. It is a number field. Populate this field with the appropriate TAZ value for each record. Note: This field must be titled and defined as described in order to be recognized by I-PLACE3S.
- **AREA** (number field) - Area for each polygon must be calculated in square feet. All I-PLACE3S calculations are based on the area field. Note: This field must be titled and defined as described in order to be recognized by I-PLACE3S.

  Tip: Always double-check that the area is calculated and/or updated before re-projecting and uploading a shapefile into I-PLACE3S.

Optional Fields

If you want to have fields to reference or query when you start assigning place types, or if you are updating an existing I-PLACE3S project and already know the Place Type names, Percent Development, and Percent Acre values, you can add them into the database by adding fields and populating them. You can then reference these fields when uploading the shapefile and tell I-PLACE3S to copy them over to the appropriate fields for calculation. As optional fields, the field names are what you designate them to be. Here are just some examples of optional fields that you may use.

- **GLUC** (character field, width 10) - This field contains the allowed land use for each parcel. Populate this field with the abbreviation of the general plan designation for each parcel. As described in the I-PLACE3S/Blueprint User Manual, this is the GLUC (Generalized Land Use Code).

- **ACRES** (number field) - Recommended but not required. A field depicting the acreage for each polygon is helpful for running queries in I-PLACE3S.

- **EC_OPTYPE** (character field, width 30) - This field would be populated with existing conditions Place Types (which are translated from the GLUCs as described later in this chapter). For each record, a value should only be assigned to this field if there is an “X” in the Developed field for that record. This is a character field containing the abbreviated GLUC definitions (see appendix for sample definitions). If the parcels are derived from a county assessor file, the land use fields in the assessor file may be used to determine the land use for each parcel. A field survey of existing land uses would be more accurate, if one was performed. For consistency, you can populate this field with the same abbreviations used in the GLUC field.

- **EC_PCTDEV** - This field contains the development percentage for each of the existing land uses. It is a number field. In I-PLACE3S you manipulate this field to balance the yield of each land use to existing conditions control totals. In each scenario, the variable is used to pinpoint the specific density of a Place Type within the range of that Place Type.

  **NOTE:** if you plan to use the Return on Investment (ROI) function, be sure to add fields for land and structure value.

I-PLACE3S-Generated Fields

The first time a shapefile is uploaded into I-PLACE3S, the model automatically generates ten fields. If you ever download a shapefile from I-PLACE3S, do not delete these fields if you plan on uploading the shapefile back into I-PLACE3S; it will look for them each time the shapefile is re-uploaded. The ten fields are:

- **PLCID** - Unique ID field generated by I-PLACE3S.
- **OPTYPE** - Stands for Original Place Type. This field records Place Type names applied to each parcel outside of redevelopment mode.

- **OPTYPEC** - Number that corresponds to the alphabetic description of the OPTYPE value.

- **OPCTDEV** - Development percentage of OPTYPE on a parcel. You can use this field in I-PLACE3S to balance the yield of each land use to existing conditions control totals. In each scenario, the variable is used to pinpoint a specific density of a Place Type within the range of that Place Type.

- **OPCTACRE** - Acre percentage of OPTYPE on a parcel. In planning terms, this is the gross to net ratio. For undeveloped lands, there is typically a portion of the land that is set aside for new roads, right of ways, etc. This field is used by I-PLACE3S to determine the percentage of the parcel that is being developed with the Place Type after these set asides.

- **RPTYPE** - Stands for Redeveloped Place Type. This field records development type names applied to each developed parcel in Redevelopment Mode (this is a field used by I-PLACE3S website administrators only). Redevelopment Mode will be explained later in the manual (Chapter 13).

- **RPTYPEC** - Number that corresponds to the alphabetic description of the RPTYPE value.

- **RPCTDEV** - Development percentage of RPTYPE on a parcel.

- **RPCTACRE** - Acre percentage of RPTYPE on a parcel. This field is used by I-PLACE3S to determine the percentage of the parcel that is being developed with the Place Type. Similar to the OPCTACRE, this acts as a gross acreage set aside. On an individual parcel basis, most redevelopment will happen at 100% as the public lands have already been set aside. However, you can use this function to redevelop all the parcels in a corridor at 50%, essentially modeling 50% redevelopment in the corridor without individually redeveloping half the parcels.

- **RPCTCOV** - Percentage of a parcel that has been redeveloped.

Preparing the Parcel Shapefile

The following are the steps taken to prepare and upload the parcel base file to I-PLACE3S. When working with the attributes table or the shapefile, make sure there are no duplicate field headings in the dbf. I-PLACE3S considers a field heading a duplicate if the first eight characters are identical to those of another field heading (e.g., LANDUSES1 and LANDUSES2 are duplicate field headings).

Step 1: Add the required fields, as described above and in previous tasks, and explained in Steps 1a through 1c below.

1. **Step 1a:** Populate Developed field. Indicate with an X if the subject parcel is developed. If the parcel is vacant, leave the field blank.

2. **Step 1b:** Add and populate the Optional fields (except for acreage).
Tip: Most projects start with an existing land use and/or a general plan land use. If this is also your first step, think about adding a land use field that describes existing land use (e.g. ECOPTYPE) for parcels that are developed and another land use field for the general plan land use (e.g. GLUC), which can be populated for all parcels. Remember, general plan files may not follow parcel boundaries so you may need to do additional GIS work to line them up. If you know the exact number of existing employees and/or houses on individual parcels, you will want to add and populate a development percent field (e.g. EC_PCDEV) as well to facilitate the creation of your existing conditions scenario in I-PLACE3S. See Chapter 8 for further discussion on this step.

Step 1c: Add the TAZ field. Populate this field with the TAZ number for each parcel. TAZs may not always correspond to parcel lines; you’ll have to decide how to align parcels and TAZs.

Step 2: Create and populate other fields for data relevant to your region. Be careful though—the more fields you add to your parcel file, the slower I-PLACE3S will run when you work with the parcel file.

Step 3: Split large parcels. This is a tricky step in the process, and your team should discuss the pros and cons of parcel splitting. Because I-PLACE3S does not have the functionality to split parcels, it must be done in GIS. However, you don’t necessarily want to split parcels as you go because I-PLACE3S projects require each scenario to be based on the exact same number and size of parcels. Furthermore, keep in mind that parcel files will continually be updated by counties as your project moves forward. Think about how you will update your parcel datasets during the various stages of the project. If you have a lot of very large parcels, it might be wise to split those into 160-acre or 640-acre pieces (again, depending on the size of your study area). Then again, you may decide that Blended Place Types will sufficiently simulate the detailed land use mix of smaller parcels (Blended Place Types are discussed further in Chapter 6).

Step 4: When all of the fields have been created and populated and all parcel splits accomplished, update the Area (and Acres) field(s).

Step 5: Delete any fields that you do not need. This will keep the file size down and help improve processing time in I-PLACE3S.

Step 6: Re-project the parcel layer to a new shapefile in the Geographic Assumed NAD83 projection (e.g., GSC_North_American_1983). This is the native projection for I-PLACE3S.

Step 7: Package the shapefile (remember you need all the files that make up a shapefile e.g., dbf, projection file, etc.) into a ZIP file.

B. Setting Up an I-PLACE3S Project

Prior to uploading the parcel shapefile to I-PLACE3S, the project will need to be created. Most users do not have access to create a new project. It is reserved for I-PLACE3S system administrators and managers. Work with your administrator to set up the new project. After a project has been created, you can upload new scenarios to the project. Chapter 7 discusses how to create and upload scenarios.
Chapter 6. Creating and Editing Place Types

Chapter 3 provided an overview of the Place Type Manager. This chapter describes how to create and edit Place Types, how to include Return on Investment assumptions, how to create and edit Blended Place Types, and how to manage Place Types.

Tip: Before creating your Place Types, you may want to think about the scale of your project and what you are really trying to model with the Place Types. For example, a project that spans a county or region is likely to use Place Types that represent a generalized set of land use categories, while a neighborhood sized project might work better with Place Types that represent specific building types. The same Place Type setup information (such as sq ft) is required, the difference would be the number of Place Types you set up and how specific you want each one to be. Also, note that the ROI function is more effective when the assumptions you input are building specific.

Place Types are applied to individual, specific parcels. When a user applies a Place Type to a parcel or set of parcels, the physical parameters of the Place Type are applied to the acreage of the parcel(s) to generate a development yield (i.e. number of dwelling units, employees, square feet of office space, etc.). Place Types are the major means for describing land uses and are the analytical foundation of I-PLACE3S. A sample Place Type menu that was used by SACOG is included in the Appendix.

The Place Type Manager is accessible from the “Project Menu”. All Place Types and Blended Place Types will be listed in the Manager, along with composite development statistics (percentage of type by sector, dwelling units per acre, employees per acre, floor area ratio). Clicking on the title of a Place Type will bring up the properties for the type. To add a new Place Type, click on the Add New Place Type link in the upper right corner.

A. Creating New Place Types

A number of assumptions are needed to establish Place Types in I-PLACE3S (Figures 62 and 63). The following is a list of what is required. I-PLACE3S will use these assumptions to generate development potential (e.g. “dwelling units/acre” and “employees/acre”) for each Place Type.

Figure 62
The inputs for Place Types include:
(Note: Items denoted with an * are not required for yield calculations.)

- **Place Type Name** - The name of the Place Type.
- **Affordable Housing** - If there is a residential component to the Place Type, does it qualify as “affordable housing?” (This does not feed into any indicator at this time.)
- **Transit Friendliness** - How “friendly” or supportive transit services is the Place Type?
- **Pedestrian Friendliness** - How “friendly” or supportive to pedestrian activity is the Place Type?
- **Default Mark Place Type** - This is the default Percent Development that will appear in the Map and Query functions when marking Place Types on parcels.

Tip: You don’t need to set a Default Mark Place Type. However, it can come in handy in a few situations. If you are using I-PLACE3S in a public workshop setting, the Default Mark Place Type setting frees a computer operator to enter Place Types without having to specify the various Development Percents. In another instance, if you are creating scenarios and want every Place Type to be applied at a certain density, using the Default Mark Place Type also frees you from manually entering the developments percents over and over again.
• Image* – You can upload an image of the Place Type for reference. This image is only available on the Place Type properties window.
• Place Type Legend* – This is the color used on the map to represent the Place Type.
• Mixed Use* – Is this Place Type considered “Mixed Use”?
• Percent of Place Type by Sector – What percentage of the Place Type is covered by the six land use sectors in I-PLACE3S? The total of all the general categories (residential, retail, office, industrial, public, and other) should always equal 100 percent. Sub-sectors are provided for interface with the Sacramento 4Ds and Transportation modules. Within each sector, the subs should total 100 percent.
• Square footage by sector
  o For residential, this is the average square footage per unit.
  o For all other sectors, this is the average number of square feet per employee.
• Parking ratios per 1000 SQ FT or per dwelling – The number of parking spaces required per 1000 square feet of non-residential use or per dwelling unit.
• Parking Types Distribution (# of levels) – The number of parking levels and distribution across the site. For instance, 1 Above Ground Parking would be a surface lot. 2 or more Above Ground would be structured parking.
• Landscaping/Setback (%) – The percentage of the site developed by landscaping or building setback.
• SQFT Per Parking Space – The amount of land required per parking space, including stall space and drive aisle.
• Residential Type – If the Place Type includes residential, is it detached (e.g., standard single-family) or attached (e.g. town home, condominium, apartment, etc.)?
• Avg Lot Size – The average lot size for the Place Type. (Note: This only applies to detached residential uses.)
• Maximum height – The maximum height of the Place Type in stories. (Note: Partial stories may be used.)
• Number of Bedrooms* – The number of bedrooms, on average, per residential Place Type.
• Accessory Units – Are accessory dwelling units allowed as part of the Place Type? (Note: Accessory Units do not have a direct impact on a Place Type yield. They are treated as “free” density by I-PLACE3S. I-PLACE3S uses Accessory Unit Assumptions to calculate the number of accessory units assumed in a scenario, but they are separate from the “Total Dwelling Unit” count.)
• Existing Units Accessory Ratio – The ratio of accessory units to primary units, for residential development. Applied to existing conditions units (Developed = X). (Note: Accessory Units do not have a direct impact on a Place Type yield. They are treated as “free” density by I-PLACE3S. I-PLACE3S uses Accessory Unit Assumptions to calculate the number of accessory units assumed in a scenario, but they are separate from the “Total Dwelling Unit” count.)
• New Accessory Ratio – The ratio of accessory units to primary units, for new residential development. (Note: Accessory Units do not have a direct impact on a Place Type yield. They are treated as “free” density by I-PLACE3S. I-PLACE3S uses Accessory Unit Assumptions to calculate the number of accessory units assumed in a scenario, but they are separate from the “Total Dwelling Unit” count.)

A sample set of Place Type assumptions is provided as an appendix to the I-PLACE3S/Blueprint User Manual. When you set up a project, you can start with these place type assumptions then modify them or add to them as needed.
To create a new Place Type, input as much of the above information into the assumption set as possible. Click the Save Changes button when done. Repeat the process for additional Place Types.

Note: When you change an existing Place Type, your change will affect ALL scenarios in the project. If you do not want the change to be global, you may just want to create a new Place Type, which you can apply to the individual scenario.

**B. ROI Assumptions**

If you plan on using the Return on Investment function of I-PLACE3S, you will need to add ROI assumptions to each of the Place Types and land and structure values to the shapefile. To add ROI assumptions to a place type, click on the Edit Detailed ROI Assumptions link on the Place Type assumptions page. More information on the ROI function, including how to set up the Place Type assumptions, can be found in Chapter 14.

**C. Summary Data**

Summary data for the Place Type is listed on both the Place Type Manager screen and on the Place Type assumptions page. On the assumptions page, the numbers are static to the last time the Place Type was saved. They will update only as you save changes to the place type assumptions.

This summary data is what is actually used by I-PLACE3S to calculate development potential on a parcel-by-parcel basis.

**D. Blended Place Types**

I-PLACE3S has the ability to combine two or more Place Types into a Blended Place Type. This method is especially helpful when working with large parcels in new growth areas where exact land planning detail is not possible or appropriate.

To create a Blended Place Type, in the Place Type Manager, click on the Add New Blended Place Type link at the bottom right corner of the screen. (Note: You may need to scroll down the page if you have a lot of Place Types.) This will bring up the Blended Place Type assumptions page (Figure 64).
Blended Place Types are created by mixing existing Place Types together. Using the Percent Development Type field next to each Place Type Name, indicate the percentage of the Blended Place Type made up by the selected Place Type. It may be helpful to think about this mixture as a percentage of a 100-acre site and how Place Types are distributed. The total of all Place Types used in the Blended Place Type should equal 100 percent. Any changes made to Place Types used in a Blended Place Type will be transferred automatically to any Blended Place Type that uses the Place Type.

Note: If you are looking at providing a Mixed Use Place Type, it is better to accomplish this through the creation of a new Place Type, rather than mixing Place Types through the Blended Place Type process (unless you plan on modeling a site with multiple kinds of mixed use buildings on it).

Be sure to name the Blended Place Type, identify the default Percent Development, and give the Blended Place Type a color for use on the map. Click Save Changes when you are done.

E. Managing Place Types
In addition to adding and editing Place Types (and Blended Place Types), I-PLACE3S also gives you additional management functions for Place Types and Blended Place Types. These functions can be accessed under the “Place Type Marking Rules” link at the top center of the Place Type Manager screen (Figure 65).

**Figure 65**

![PLACE3S Place Type Manager Screen](image)

The Place Type Marking Rules page provides you the ability to restrict how Place Types (and Blended Place Types) are treated on the Map and your ability to use them.

The functions available include (Figure 66):

1. **Hide on Place Type Dropdown** - These Place Types will not show up in the Mark Place Type drop-down on the Map and can therefore not be marked on the Map.
2. **Cannot Overwrite on Map** - These Place Types cannot be overwritten/marked over on the map. If you mark a large section of parcels on the Map, only parcels that are not marked with Place Types that “Cannot be Changed” will be changed.
3. **Hide on Legend** - These Place Types will not show up on the Place Type Legend (available on the Map).
4. **Developed** - When this box is checked, the Place Type is considered developed for the purposes of the Energy Module.
5. **Local Place Type** - Used to identify a Place Type that is used as part of a regional model. This can be used to visually separate out place types specific to a given project.
F. Copying Place Types

Within a project, you can copy the marked place types from one scenario to another. For example, if you redevelop a parcel in Scenario B, but later want to change it back to its original place type as marked in the Existing Conditions Scenario, you can use this copy function to “rollback” the parcel to the place type and development percentages used in the Existing Conditions Scenario.
### Manage Project Place Types

<table>
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<tr>
<th>Place Type Name</th>
<th>Stories</th>
<th>DLU/Acre</th>
<th>EMP/Acre</th>
<th>% Residential</th>
<th>% Retail</th>
<th>% Office</th>
<th>% Industrial</th>
<th>% Public</th>
<th>% Other</th>
<th>Floor Area Ratio</th>
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<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0.02</td>
</tr>
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<td>B. Single Family Large Lot 2</td>
<td>2</td>
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<td>0.00000</td>
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<td>0%</td>
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<td>75%</td>
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<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0.00</td>
</tr>
</tbody>
</table>
To use the copy place type function, scroll to the bottom of the PLACE TYPE MANAGER and select the scenario you wish to copy from in the “COPY SCENARIO 1” pulldown menu (Figure 67). You can have up to two different scenario choices to copy from at a time. Enter the name of the scenario or some identifying title in the “COPY PLACE TYPE NAME 1” box. The text you enter into this field is what you will see at the bottom of the PLACE TYPE drop-down menu, preceded by an asterisk, when you are marking place types in a scenario (Figure 68).
Chapter 7. Creating New Scenarios

As an I-PLACE3S project develops you may need to create new scenarios. In most cases, these new scenarios will be based on a scenario already in the project. You may also have amended your parcel base in GIS and be looking to re-upload the shapefile into a new scenario. I-PLACE3S can accomplish all of these options.

A. Creating a New Scenario from an Existing Scenario

Creating a new scenario from an existing scenario is a very straightforward process. I-PLACE3S copies the shapefile and Place Types (with development percentages and acre percentages) to the new scenario. It will not copy over constraints as part of this process – that is an extra step as described in Chapter 10.

To create a new scenario from an existing scenario, begin at the “Project Menu”. Click on the link to Create New Scenario (Figure 69).

Figure 69
Give the new scenario a name and description. Click Next Step (Figure 70).

**Figure 70**

Select the existing scenario that will be the basis for the new scenario. Click on the link at that scenario’s name (Figure 71).

**Figure 71**
I-PLACE3S will generate the new scenario. When this is completed, click on the link to go to the new scenario’s menu page (Figure 72).

**Figure 72**

![Image of the PLACE3S interface showing scenario creation complete](image)

The new scenario is now complete.

Tip: Remember to copy or add constraints to this scenario, if applicable. Chapter 10 gives a full discussion of constraints.

**B. Creating a New Scenario from a New Shapefile**

Creating a new scenario from a shapefile is similar to uploading the base parcel file the first time. This process is particularly useful when you want to add additional data to the attribute table for the parcel file, as this is a function that is not available in I-PLACE3S.

To create a new scenario from a shapefile, begin at the “Project Menu”. Click on the link to Create New Scenario (Figure 73).
Give the new scenario a name and description. Click Next Step (Figure 74).

Click the link to Upload a Scenario Shapefile (Figure 75).
On the next screen, click the Browse button to locate the ZIP file containing the parcel geometry (Figure 76).

Note: The file must use the same number of polygons with the same shape ID number in order to process correctly. Additionally, the polygons themselves must be in the same order; you cannot delete a polygon and replace it with a new polygon and give it the old ID. As in other shapefile uploads, the shapefile must be projected in Geographic NAD83, and the .shp, .shx, and .dbf files must packaged into a ZIP file. See Chapter 5 for more information on how to set up the parcel file for I-PLACE3S.
I-PLACE3S will run verification tests to ensure the file is formatted properly. When this is done, click the link to complete the process (Figure 77).
The next screen will allow you to match one of the I-PLACE3S attribute fields with one of your provided fields (Figure 78).

**Figure 78**

![Diagram of I-PLACE3S interface with various fields for matching attributes](image)
If I-PLACE3S cannot match one of its fields to one of your fields, it will leave the drop-down menu for that field blank (Figure 79). You can assign a field from the shapefile to this category, or you can leave it blank and proceed. You can also match the I-PLACE3S field to a different field in your shapefile, such as the GLUC field.

Figure 79

On the next screen, you will be able to match your OPTYPE values (or GLUC value) to Place Types in the project (Figure 80). (Note: You will have needed to create Place Types to make this work. This is described in Chapter 6.)
If the Place Types exist and their titles match the titles in the attribute table, I-PLACE3S will automatically connect the dots.

**Figure 80**

If I-PLACE3S cannot match the attribute values to the Place Types, you will need to make the connection yourself (Figures 81 and 82).

**Figure 81**
I-PLACE3S will then complete the uploading process by adding its own unique identifier, importing the dbf file, and setting up the scenario (Figure 83).
When I-PLACE3S is finished, click the link to open the scenario and view the “Scenario Menu” (Figures 84 and 85).

Figure 84

![Figure 84: PLACE3S Scenario Menu](image)

Figure 85

![Figure 85: PLACE3S Scenario Details](image)
Chapter 8. Applying Place Types

From the “Scenario Menu”, there are three tools for applying Place Types: using the map view, using a query, and using a shapefile. Depending on the size of your scenario, you will likely use more than one of these methods.

Discussion: Now that you have uploaded your parcel shapefile into I-PLACE3S and have created Place Types for use in the project, you are probably wondering how this is going to model the real world. Well, let’s assume the shapefile you are starting with is representative of existing conditions in your project area. You have current housing and employment totals for the area, but how do you get that information into I-PLACE3S? You need to calibrate your I-PLACE3S scenario. To do this, you will first need to assign the correct land uses to the parcels. This can be accomplished using one or all of the methods outlined in this Chapter for applying place types.

A. Apply Place Types Using Map

The Map is one of the most fundamental components of I-PLACE3S. It provides the ability to apply Place Types to specific parcels through visual selection them, query information about parcels, and view sub-areas overlaid on the parcel base. The Map is specific to each scenario and is accessed from the “Scenario Menu” tools list. Functions within the Map include:

- Zoom
- Pan
- Identify
- Mark (Place Type)
- Layers
- Transit Layers (if applicable)
- Sub-area Layers (if applicable)
- Sub-area Queries (if applicable)
- Map Size
- Zoom to Scenario Extent
- Quick Indicators
- Undo Last Mark Action
- View/Save This Map Image
Zoom

Zooming in and out of the map is accomplished with the ZOOMIN and ZOOMOUT functions. With these functions, you can either:

1. Select magnification (2X, 4X, 8X, 12X) then click on a place on the map; or
2. Draw a box around the map area you want to zoom in or out on.

Pan

The Pan function allows you to re-center the map based on the location at which you click. It cannot actively move the map.

Identify
The Identify function is similar to a Query function in GIS and will bring up the Place Type information for a particular parcel. Only one parcel can be identified at a time. When you select the parcel, the yellow band at the top of the map will update with ID results and list all of the Place Types applied to that parcel. Multiple Place Types will be listed when Blended Place Types are used. By clicking on the hyperlinked Place Type name, detailed information for the parcel will be displayed (Figures 87 and 88).

**Figure 87**
**Figure 88**

### Sub-area Layers Information

<table>
<thead>
<tr>
<th>Parcel Information from DB File</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AREA</strong></td>
</tr>
<tr>
<td><strong>PERIMETER</strong></td>
</tr>
<tr>
<td><strong>GLUE</strong></td>
</tr>
<tr>
<td><strong>AUTONUMBER</strong></td>
</tr>
<tr>
<td><strong>PIN</strong></td>
</tr>
<tr>
<td><strong>DEVEL</strong></td>
</tr>
<tr>
<td><strong>ACRES</strong></td>
</tr>
<tr>
<td><strong>MCXHR</strong></td>
</tr>
<tr>
<td><strong>HOZONETZ</strong></td>
</tr>
<tr>
<td><strong>JURISCODE</strong></td>
</tr>
<tr>
<td><strong>TAX</strong></td>
</tr>
<tr>
<td><strong>CT</strong></td>
</tr>
<tr>
<td><strong>RAGDOLD</strong></td>
</tr>
<tr>
<td><strong>GRADED</strong></td>
</tr>
<tr>
<td><strong>CITY_NAME</strong></td>
</tr>
<tr>
<td><strong>RADIUM</strong></td>
</tr>
<tr>
<td><strong>SQ_MILES</strong></td>
</tr>
<tr>
<td><strong>RAO</strong></td>
</tr>
<tr>
<td><strong>NAME</strong></td>
</tr>
<tr>
<td><strong>COUNTY</strong></td>
</tr>
<tr>
<td><strong>GRID_ID</strong></td>
</tr>
</tbody>
</table>

### Parcel Information

- **REDEV_PER**: 0
- **LAMBDWE**: AE0802
- **GENERAL**: RESIDENTIAL
- **SPECIFIC**: MODELS HOME PARK
- **DESKIL**: 0
- **UNITS**: 0
- **MULTIPLI**: 2.63
- **DENSITY**: 0
- **JURISCODE**: SACRAMENTO
- **GLUE_A**: HIGH
- **STRAW_CST**: 0.09
- **STRAW_NFR**: 0
- **LAND_COST**: 7
- **LAND/new**: 0
- **PLACE_TYPE**: Small Lot SF Residential
- **PCT_DEV**: 0
- **PCT_TYPE**: 0
- **PCT_TYPE**: 0

### Parcel Statistics

- **Place Type**: 3/4TH, Townhouse (Mort)
- **Place Type Pct**: 100.00%
- **% Acem**: 100.00%
- **% Endogal Units**: 0.00%
- **# Employees**: 0.00 EMPLOYEES
- **Land Area**: 2,273,600.00 SQ FT
- **Building Total Gross Area**: 939,999.00 SQ FT
- **Building Floorplats**: 315,290.00 SQ FT
- **Group Years Commerce**: 60,999.343
- **Yield Operating Costs**: 15,548.346
- **Building Construction Costs**: 594,832.725
- **Parking Requirement**: 542,199.00 SQ FT
- **Parking Construction Costs**: 32,484.405
- **Total Construction Costs**: 1,135,514.737
- **Yield Not Operating (Accrual)**: 34,022.627
- **Market of Per. Solds Residential**: 0
- **Reappraisal**: 1,135,514.737
- **Calculated BCL**: 0.00%
- **Weighted AVG**: 9%

### Constraints

<table>
<thead>
<tr>
<th>CONSTRAINT NAME</th>
<th>INTEREST BCT</th>
<th>CONSTRAINT BCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAIRB</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

### Redevelopment Information

- **Original Place Type**: 3/4TH, Townhouse (Mort)
- **% Acem**: 100.00%
- **Redeveloped Places Type**: 3/4TH, Townhouse (Mort)
- **Coverage / Density / % Amp**: 100% / 0.00% / 0.00%
- **Date Redeveloped**: 12/27/2007 3:33:53 AM
This page contains up to five areas of information, each within its own box (Figure 88). Depending on what sub-areas or constraints cover the subject parcel or whether Redevelopment Mode has been used, these boxes may or may not appear. The boxes are ordered as follows:

- “This Parcel Belongs to the Following Sub-area Layers” - Lists the sub-areas that cover the subject parcel.
- “Parcel Information from DBF File” - Contains information from the original parcel file uploaded to I-PLACE3S. This is information that does not change inside of I-PLACE3S; it is static data about the polygon that is added in GIS prior to uploading into I-PLACE3S.
- “Parcel Statistics” - Contains statistics calculated by I-PLACE3S for that parcel based on the Place Type and other user-defined inputs.
- “Constraints” - Lists the constraints assumptions that are applicable to the subject parcel.
- “Redevelopment Information” - Contains information about any redevelopment that has taken place though the Redevelopment function on the Map.

**Mark Place Type**

The most important function of the map is the Mark Place Type function (Figure 89). This function allows you to change land uses on the map. You must have Mark Place Type selected to mark parcels on the Map. Within the Mark function are four fields or sub-functions:

1. Redev Mode: This sub-function is used when applying redevelopment to an already developed parcel. Parcels that are not identified as Developed (DEV <> X) are not affected by redev mode. For more information, see Chapter 9. **If you are not using Redevelopment Mode, make sure the box is not selected.**
2. Percent Dens: This field represents the percentage of the maximum development potential under the Place Type that is being applied to the parcel. (Note: Formerly referred to as Percent Underbuild.)
3. Percent Acre: This field represents the percentage of the parcel that is being developed with the Place Type, assuming the balance of the parcel will be held out, to account for infrastructure set-asides such as roads, parks, schools, etc.
4. Place Type: All of the Place Types available for the project are listed in the drop-down menu. Select a Place Type from the drop-down menu.

To apply a Place Type, select your Place Type from the drop down menu then fill in your redevelopment, % DENS, and %ACRE assumptions. These will change to their defaults as you change Place Types.

Important note: When you mark a parcel with a Place Type, the change is automatically saved in the shapefile.
Layers

Layers in I-PLACE3S include the parcels and any roadways added during project setup or added later using the Project Layer Manager menu outlined in Chapter 2. These layers can be turned on and off from the check boxes in the Layers Menu on the left side of the map. After changing the status of a check box, click the Redraw button to update the map.

Transit Layers

Transit layers that have been added to the project will be listed under the Transit Layers list (see Project Transit Layer Manager in Chapter 2). These layers can be turned on and off from the check boxes under the Transit Layers Menu on the left side of the map. After changing the status of a check box, click the Redraw button to update the map. This box will only be available if transit layers have been added to the project.

Sub-area Layers

Sub-area Layers (discussed in Chapter 12) can be turned on and off from the Sub-areas Menu on the left side of the map. After changing the status of a check box, click the Redraw button to update the map. This box will only be available if sub-area layers have been added to the project.

Sub-area Queries

Sub-area Queries (discussed in Chapter 12) can be turned on and off from the Sub-area Queries Menu on the left side. After changing the status of a check box, click the Redraw button to update the map. This box will only be available if sub-area queries have been created for the scenario.

Map Size

The Map Size function will increase the size of the map in the Web browser window. By default, the map is displayed at 1x. After changing the status of the map size in the drop-down box, click the Redraw button to update the map.

Zoom to Scenario Extent

The Zoom to Scenario Extent link will zoom the map to the full extent of the data (similar to GIS Zoom to Extents command) and will also change the layer settings to the default on-off settings.

Quick Indicators

The Quick Indicators link will bring up a pop-up window showing a short list of indicators for the project. These include total employment, total dwellings, total developed acres, and total reinvestment acres for the entire project area.

Undo Last Mark Action

Undo Last Mark Action will undo the previous mark action on the map (Figure 90). A confirmation screen will appear first to ensure that you want to undo your previous action. The screen will also list the number of parcels being affected by the undo. This link will only appear after the first marking of a parcel(s) after the map is opened.
View/Save This Map Image

The View/Save This Map Image command will export the current map view (including the extent of the view and the layer settings) to a gif image (Figure 91). This image can then be saved by right-clicking on the image in the browser window. Clicking the browser's back button will take you back to the map.

B. Apply Place Types by Query

The second way to apply Place Types to a scenario within I-PLACE3S is by Query. The Query function is primarily used to apply Place Types, but can also be used to look up information about a group of parcels given a specific set of data. The Query function is accessed from the “Scenario Menu” by clicking on the Apply Place Types Using a Query link under Tools (Figure 92).
The Query page will show a list of all the fields that were part of the original uploaded shapefile (Figure 93). Current Place Type, Current Development Percent, and Place Type FAR (floor area ratio) are also included. This enables you to find parcels based on their Place Type, Place Type Percent, or Place Type FAR as they are currently marked in I-PLACE3S.

There are four columns listed on the page:
1. Field Name - The name of the field from the shapefile.
2. Field Type - The data type for the field (number or character).
3. Operator - The operator for your query: equals, greater than, less than, between, like, not like, not equal to.
4. Value - The value or values for your query.
Let's say you want to develop all undeveloped parcels in a specific jurisdiction (Figure 94):
1. Next to the field Current Place Type, select "EQUALS" from the operator drop-down.
2. Select "Blank Place Type" from the value box.†
3. Next to the field CITY_NAME, select "EQUALS" from the operator drop-down.
4. Enter the city’s name in the value box.
5. Next to the field DEVELOPED, select "NOT EQUAL TO" from the operator drop-down.
6. Enter "X" in the value box.
7. Click the Perform this Query button at the bottom of the page.

† Note: “Blank Place Type” is the default Place Type value in I-PLACE3S. It is a “blank” Place Type that has no development characteristics. Essentially, it means that the parcel is vacant and no Place Type has been applied.
The resulting page will give you the total number of parcels found that match your query parameters (Figure 95). Below that, you will also see all of the field data for the first 20 parcels found matching the query (you will likely have to scroll to the right to see all of the data). You can view more than the first 20 records by clicking on the link for 50/100/500 results. It will take some time to display a larger number of results.
You can view the query results on the map by clicking View Query Results on Map (Figure 96). You can then zoom and pan around on the map to ensure your query is correct.

Once you've verified that your results are correct, you can apply a Place Type to the full list of parcels in the same way you would for just one parcel in the Map function (Figure 97). This includes:

1. Redevelopment Mode: This sub-function is used when applying redevelopment to an already developed parcel. For more information, see Chapter 12.
2. Percent Dens: This field represents the percentage of the maximum potential under the Place Type that is being applied to the parcel.
3. Percent Acre: This field represents the percentage of the parcel that is being developed with the Place Type (the area not developed is assumed to be withheld for public infrastructure).
4. Place Type: All of the Place Types available for the project are listed in the drop-down menu. Select a Place Type from the drop-down menu.
It may take a few seconds for your query to apply.

Tip: If you’re applying multiple queries in a row, an easy way to check your indicators after each query is by having a second window open. If you have the second window open to the Scenario Detail Menu or Development Type Acre Statistics, you can refresh that screen after each query you apply to see how the query affected your indicators. You can also use the Apply Previous Query function or run a historic query (see below).

One you’ve applied your query, a new page gives you the following options (Figure 98):
- Go Back to the Scenario Detail Menu
- Apply Place Type Using Another Query
- Apply the Previous Query

I-PLACE3S keeps a log of queries that have been run for each scenario. When you complete a query and I-PLACE3S confirms that the query has been applied (as in the above image), you can click on the Apply the Previous Query link to run the same query again.

A list of historic queries can be accessed from the Create Query page (Figure 99). The history page shows a full listing of all of the features queried, as well as the date and time the query was made. Click on the date/time link to load the query.
C. Applying Place Types through Shapefile

The third way to apply Place Types is through a shapefile. The Apply Place Type using a Shapefile tool allows you to upload a polygon layer and use it to mark Place Types on the map. Clicking on a polygon will mark all parcels whose centroid falls within the polygon.

The Apply Place Types Using a Shapefile tool is accessible from the “Scenario Menu” (Figure 100).

The Apply by Shape Manager page will show a list of shapefiles that have been uploaded in the past. If no shapefiles are available, you can upload a new shapefile from this page (Figure 101).
Figure 101

Click on the Browse button to select the shapefile from your system you’d like to upload and click the Upload Selected Shapefile button (Figure 102).

Figure 102

Remember, as with the base shapefile you uploaded in Chapter 4, all shapefiles must:

- Be in the Geographic NAD83 coordinate system;
- Be packaged into a ZIP file; and
- Include the .shp, .shx, and .dbf files for the shapefile.

Note: For the Apply Place Types Using a Shapefile process, no database fields are required to be specified in the dbf file.

I-PLACE3S will verify the shapefile and, after following the prompts, will process the file (Figure 103 and 104).
Once processing is done, click on the link to go back to the Apply by Shape Manager (Figure 105).

Click on the Apply on Map link next to the shapefile you just uploaded (Figure 106).
The Apply Shape layer has been added to the clickable Layers list. Zoom in to an area where you know there are polygons in the shapefile just uploaded (Figure 107).

The polygons from your shapefile will show up with dark black outlines (Figure 108).
Select Mark Place Type from the command menu and then select the Place Type you'd like to mark (Figure 109). Clicking on a polygon will mark all parcels that are contained within the polygon with the Place Type you have selected.
You can uncheck the box next to Apply Shape along the left-hand side of the screen to go back into normal mark Place Type mode.

Discussion: Now you’ve applied your Place Types and have an existing conditions scenario that reflects the uses that are on the ground today. The next step in calibrating your existing conditions is to check your scenario’s housing and employment totals. Compare these to your current housing and employment estimates (which are essentially the “control totals”, or targets, for your scenario). Remember if you’re project is larger in scale, it might be good to use targets at a sub-area level. If you have sub-areas in your scenario that are not matching the control totals, adjust the scenario’s totals by adjusting the Place Types and/or the development percentages used. Be prepared to spend as much time as needed to review and edit.
Chapter 9. Redevelopment Mode

The Redevelopment Mode allows you to identify redevelopment of an already developed parcel within the study area. It is intended to provide for full or partial turnover of the existing development, based on both the current and future land use.

A. How Redevelopment Mode Works

Redevelopment Mode works by applying a future Place Type on top of all or a portion of an existing Place Type. Through Redevelopment Mode, you can specify either the entire parcel (100 percent) or a fraction of the parcel (less than 100 percent) to apply the new Place Type toward (called the Percent Cover). I-PLACE3S will then apply the new Place Type to the specific percentage of the parcel, with the remainder subject to the existing Place Type.

For instance, a 10-acre parcel is currently identified as Neighborhood Retail at 20 employees per acre yields 200 employees. Using Redevelopment Mode, you apply the Medium Density Residential Place Type (10 dwellings per acre) to 20 percent of the parcel. I-PLACE3S would then apply the Medium Density Residential Place Type to the first two acres of the parcel and the remaining portion would remain Neighborhood Retail. The resulting development yield would be 20 dwelling units and 160 employees.

If your project size is small, e.g. neighborhood scale, then you can probably target individual parcels for 100% redevelopment. However, if your project geography is citywide or larger, you may want to be more general in your redevelopment assumptions. This is where the redevelopment percentage is most helpful. If you want to designate a portion of a subarea for some redevelopment in the planning horizon of your scenario you can use the redevelopment percentage to simulate that. For example, if corridor B is being planned for 50% redevelopment, you can redevelop all the parcels in corridor B, using 50% as the redevelopment percent cover. By redeveloping all of the parcels at 50%, you are essentially simulating 50% redevelopment for the entire corridor without having to select which half of the parcels in the corridor are actually going to redevelop.

B. Using Redevelopment Mode

Since Redevelopment Mode is based on the existing development, you will start by copying your existing conditions scenario to a new scenario. See Chapter 7 for more information on how to do this.

New Place Types can be applied through either the Map or Query functions. The process is generally the same as applying normal Place Types, except that you will enable the Redevelopment Mode check box (Figure 110). Be sure to specify the Percent Cover before applying the new Place Type.

If a parcel is not coded as “Developed” (DEV = X), it will be marked with the redevelopment place type at 100% cover and will not be considered “Redeveloped”.

Figure 110
When you identify a parcel that has Redevelopment Mode applied to it, the ID Results bar will look as follows:

![ID Results Bar](image)

The ID Results bar will only show the new Place Type and will not show the original Place Type. To get more information about the parcel, including the original Place Type information and Percent Conversion, click on the ID Result.

The Parcel Statistics box will show the new (redeveloped) Place Type, along with the total number of dwelling units, employees, and other development data. However, a new box will appear at the bottom of the page – the Redevelopment Information box (Figure 111). This new box will describe original Place Type and its assumptions (percent density and percent acre), and the Redevelopment Place Type and its assumptions (percent coverage, percent density, and percent acre). The box will also list the date and time the redevelopment was applied.

![Figure 111](image)
Chapter 10. Constraints

I-PLACE3S has the ability to limit—or constrain—development yield on parcels. This process is accomplished by overlaying other geometry on top of the parcel layer to determine the extent of the constraint, then removing this land area from the development calculations based on user defined rules. Constraints are set up at the scenario level and are unique to each scenario, but can be copied from one scenario to another, as described below.

I-PLACE3S has the ability to accommodate multiple constraints layers, regardless of overlap. Each type of constraint is hosted on its own shapefile.

Typical examples of constraints layers can include:

- Wetlands
- Vernal pools
- Streams
- Hardwoods
- Animal habitat
- Slopes

Tip: Constraints are assumed to be environmental constraints, where development does not currently exist; and where you want to continue withholding some or all development. A constraint file cannot be used to preserve existing development, such as a historic structure for example. However, if the historic structure were given a unique Place Type, you could set a Place Type Marking Rule to prohibit a user from changing its Place Type. Place Type Marking Rules are described in Chapter 6.

A. Creating Constraints in GIS

The development of a constraints layer begins in GIS. Begin by clipping each constraint shapefile to the project area. As an added option, you can also clip the constraints shapefile to exclude areas where there is overlay with already developed areas; however I-PLACE3S has the ability to make this exclusion on its end.

Each type of constraint, be it wetlands, streams, animal habitat, or other feature, must be in its own shapefile. Multiple constraint types cannot exist within one shapefile. However, if all constraints are being treated equally, then the constraints can be unioned or merged together into one set of polygons. Working with constraints in this way removes a level of flexibility and is generally not recommended. Therefore, each type of constraint should be uniquely held within its own shapefile.

Create a field in the constraint shapefile DBF and title it XXX_CODE, where XXX is a unique 3-letter identifier between all of the constraint shapefiles - for example WET_CODE to indicate wetlands are the constraint. The next constraint shapefile may have a field titled SLP_CODE to indicate steep slopes are the constraint, and so on. You will use this title within I-PLACE3S to identify each type of constraint. The field must be a number-type field.

Populate the XXX_CODE field for each polygon in the shapefile with a 1. When the constraints file is uploaded to I-PLACE3S, you will be able to specify the constraint percentage.
Once the shapefile is created, place it in a ZIP file (including the .shp, .shx, and .dbf files). Be sure to re-project the file into the Geographic NAD83 format before packaging for upload. Each constraint shapefile must be within its own ZIP file.

B. Uploading Constraints to I-PLACE3S

The upload process for constraints is similar to other uploads. The process begins on the “Scenario Menu” page for the scenario to be constrained. Click on the link under Tools for Constraint Manager (Figure 112).

Figure 112

The Constraint Manager will appear. As no constraints have been added to the scenario, none will be listed. Click on Upload Constraint (Figure 113).
To upload a new constraint, first enter the name of the constraint. Second, click Browse and select the constraint zip file you want to upload. Third, click on Upload Selected Shapefile (Figure 114).

You will see a window with a bar showing the progress of your upload. Once the upload is done, you will see the constraint just uploaded on the list of constraints. If you have more than one constraint layer, click upload constraint to upload an additional constraint (Figure 115). If this is the only constraint you have, click on Click Here to Process These Constraints (Figure 116).
As the constraints are processed, you will see a message indicating I-PLACE3S progress. The page will refresh every 10 seconds until the constraints have finished processing. When I-PLACE3S is done, click the link to return to the Constraint Manager (Figures 117 and 118).
C. Managing Constraints

There are three different methods by which constraints can be applied:

1. **Apply Constraints Using Constraint Priority** - The priority entered on the Constraints Detail Menu (Edit Constraints link) determines which constraint percentage is used when multiple constraints overlap on a parcel. For example, say Wetlands and Vernal Pools have polygons that overlap. If Wetlands has a priority of 2 and Vernal Pools has a priority of 1, portions of scenario parcels that fall within both constraint polygon overlays will be constrained by the percentage entered for Vernal Pools. The constraint percentage for Wetlands will not apply.

2. **Apply Constraints Using Max Constraint Percentage** - If a parcel is covered by more than one constraint polygon, the constraint with the higher percentage of holdout will be applied. For example, if wetlands have a constraint percentage of 30 percent and vernal pools have a constraint percentage of 60 percent, portions of scenario parcels that fall within the constraint polygon will be constrained by 60 percent.
3. **Apply Constraints Using Product of Constraint Percentages** - If more than one constraint applies to a parcel, the parcel will be constrained by 100 percent minus the product of the percentages for the constraints layers. For example, if wetlands have a constraint percentage of 30 percent and vernal pools have a constraint percentage of 60 percent, portions of scenario parcels that fall within the constraint polygon will be constrained by 82 percent (100% - [30%*60%] = 82%).

Changing the Constraint Method requires you to click **Save Changes** and then follow up by clicking **Synchronize Constraints** with Scenario. You may also want to determine which constraint method you’ll apply before setting your priorities and percentage withholdings in the **Edit Constraint Details** page (Figure 119).

**Figure 119**

![Constraint Manager Interface](PLACE3S_user_guide/chapter_10/image119.png)

After selecting the constraint method, modify the priority and percentage for each constraint layer. This is done by clicking on the link to **Edit Constraints Details** from the Manager window (Figure 120).
In the Details window, set the priority and percentage of constrained values (Figure 121). The priority determines the order that constraints are applied if constraint polygons from separate constraint layers overlap. This only applies if the Constraint Method (discussed below) that is chosen is Apply Constraints Using Constraint Priority. The constrained percentage determines what percentage of the parcel that intersects with the constraints layer cannot be developed on.

When you have adjusted the values as you want them, click the Apply button.

Note: Constraints layers can also be deleted from this screen. To do so, click the Delete link on the right-hand side on the same line as the constraint name.

Now that the constraint details have been filled out, you must synchronize the constraints with the scenario. After any change is made in the Constraint Manager, you must always resynchronize the constraints with the parcels. Note the red warning message box near the top of the window when constraints are not synchronized with the scenario (Figure 122).
The red warning message no longer displays. You should now see the number of acres affected by the constraints under Acres Affected.

On this page, you also have the option to not constrain developed parcels (where DEVELOPED = X). When this is checked, parcels overlapped by constraints that are developed will not be constrained (Figure 123).
D. Copying Constraints

Constraints can be copied from one scenario to another. Once constraints have been set up for one scenario, open the scenario that is to receive the constraints by going to its “Scenario Menu”. Then open the Constraint Manager for that scenario (Figure 124).

**Figure 124**

![ Constraint Manager in PLACE3S](image1)

Next, click on the **Copy Constraint** link in the center of the window (Figure 125).

**Figure 125**

![ Constraint Manager in PLACE3S](image2)
All scenarios in the project that have constraints will be listed. Click on the link for the scenario that is providing the constraints to the recipient scenario (Figure 126).

**Figure 126**

I-PLACE3S will copy the constraints over to the new scenario. This will include both the geometry of the polygons and the details (priority and percentage constrained). You can now edit these constraints specific to this scenario by clicking on the Edit link.

Once your changes are complete, Apply (on the Details screen) and Save (on the Constraint Manager screen) the changes and Synchronize the constraints with the scenario. Note the red warning message box near the top of the window (Figure 127).

**Figure 127**
Chapter 11. Geographic Sub-areas

Geographic sub-areas, or sub-area layers, are portions of the study area/I-PLACE3S project area. Sub-areas can be overlaid onto the project area, allowing for statistics to be extracted for these smaller areas. They can be useful in tracking housing and employment, looking at detailed statistics for neighborhoods and other specific areas of the project, and providing data for traffic model runs.

This chapter describes the process for creating sub-areas, preparing them for I-PLACE3S, uploading them to the model, and using them to extract statistics for a scenario.

A. Creating Sub-areas in GIS

The creation of sub-areas begins in GIS. Using your GIS program, create a new polygon shapefile or open an existing polygon shapefile. The geometry of the polygons can be anything you want; however, when I-PLACE3S utilizes the sub-area, it will assign the underlying parcel(s) to a sub-area if 50 percent or more of the parcel area is within the sub-area. It is important to remember this when creating your sub-area layer if accuracy will be important to your subarea reporting.

Once all of the polygons have been drawn the way you want them, open the attribute table for the shapefile. Make sure that:

- Each shape has a unique shape ID number;
- A field for shape area is added and the area is calculated; and
- All other extraneous information has been removed.

Next, you will need to name each polygon in the shapefile. Each name must be unique to that polygon. Names must be recorded in a field titled SUB_NAME. This is the field title that I-PLACE3S will recognize when processing the sub-area.

Finally, make sure the shapefile is projected in Geographic NAD83. You may need to re-project the file. Combine all of the shapefile’s files (e.g., .shp, .shx, .dbf) into one ZIP file.
B. Uploading a Sub-area to I-PLACE3S

New sub-areas are added to an I-PLACE3S project through the Sub-area Manager. The Sub-area Manager is accessible from the “Project Menu” (Figure 128).

Figure 128

The Sub-area Manager window will list all sub-areas that have been uploaded to the project. If no sub-areas have been uploaded, the page will look as follows (Figure 129):

Figure 129

Click on the Upload Sub-area Layer Shapefile link to add a new sub-area to the project.
Enter the name for your sub-area layer and then click on Browse to select the shapefile on your computer you’d like to upload (Figure 130). Remember:

- The shapefile must be in the Geographic NAD83 coordinate system.
- The shapefile must be zipped with a program such as WinZip.
- The zip file should include the .shp, .shx and .dbf for the shapefile.
- You should have a field in your shapefile database file (.DBF) called SUB_NAME that specifies the name of each sub-area.

Click the Upload button to process the upload.

Figure 130

I-PLACE3S will verify that the shapefile has been properly formatted and packaged for the model. If the file passes the test, click the links to complete the uploading process. Once processing is done, click on the link to go back to the Sub-Area Manager.

The Sub-area Manager will now show that the new sub-area has been uploaded. It will list data including the number of sub-areas and the date the file was uploaded.

**C. Managing Sub-areas**

Additional functions available on the Sub-area Menu include (Figure 131):
1. Clicking on the sub-area layer name will show you the parcel statistics;
2. Setting the view ability of the sub-area on the map (the check box under Viewable on Map; be sure to click the Save Changes button);
3. Downloading the sub-area shapefile; and
4. Deleting the sub-area (available only to the user that uploaded the sub-area).

Figure 131

Figure 132

Clicking on the title of a sub-area will take you to a page listing the names of sub-areas and the number of parcels in each sub-area (Figures 132 and 133). This is a useful way of making sure that the shapefile is functioning properly in the model and including all of the parcels that it should.

Figure 132
D. Viewing Sub-areas on the Map

To view the sub-area layer on the map, click on the Apply Place Types Using Map link from the “Scenario Menu” (Figure 134).

Figure 133

Figure 134
The sub-area layers that have been marked as Viewable on Map will be listed under Sub-area Layers in the left column (Figure 135). Mark the box next to one of your layers and then click the Redraw button.

Figure 135

The sub-area layer shapes will now be visible on the map. In this example, there are four large sub-area shapes. The sub-area shapes are outlined with thick black lines (Figure 136).
E. Viewing Statistics by Subarea

Statistics for sub-areas can be viewed from the “Scenario Menu”. Click on the View Statistics by Sub-area link under Reports (Figure 137).
Select a sub-area layer you wish to look at by clicking on the layer name (Figure 138).

A list of the different sub-area shapes for the sub-area layer will be displayed. Click on the Detailed Stats link next to the shape for which you want to view statistics (Figure 139).

The statistics shown will be for the specific sub-area shape you selected on the previous step. Click on the Show Detailed Statistics link to see more detailed statistics (Figure 140).
Figure 140
Chapter 12. Comparing Scenarios

I-PLACE3S has the ability to compare scenarios and sub-areas. The compare scenario function should be used when you want to compare entire scenarios to each other. This function can also be used to compare scenarios from one or more different projects. The compare scenario subareas tool is ideal for comparing different scenarios within a subarea. Since subareas are project specific, this function can only be used to compare scenarios within the same project.

This chapter describes the process for comparing scenarios and comparing scenarios by subarea.

A. Compare Scenarios

You can compare the statistics for different scenarios through the Compare Scenario feature. It can be found on both the “Project Menu” and “Scenario Menu” page (Figure 141).

Figure 141

First, mark the scenarios you wish to include in the comparison. If you only want to compare scenarios within the current project, click the Continue with Comparison button in the lower left corner. If you wish to compare to scenarios in a different project, click the Include Scenarios From Another Project link on the bottom right (Figure 142).
If you chose to include scenarios from another project (Include Scenarios From Another Project), you will be directed to the “Project Menu” to select the project from which you wish to add scenarios for comparison. You can only select one project at a time. After you’ve clicked on the project, the scenarios in that project will be listed. The screen will list all of the scenarios available in the new project and will allow you to again Include Scenarios from Another Project.

After you have selected all the scenarios you wish to compare (from one or more projects) and clicked Continue with Comparison, next, select all of the indicators you wish to include in the report (Figure 143). Select either Web Report or Excel Spreadsheet.
### Figure 143

#### PLACE3S

<table>
<thead>
<tr>
<th>INDICATORS TO COMPARE</th>
<th>PLACE3S</th>
<th>SCENARIOS</th>
<th>SELECT INDICATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCOME MARKERS</td>
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<tr>
<td>TOTAL JOBS</td>
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<td>TOTAL EMPLOYEES</td>
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<tr>
<td>TOTAL RESIDENTS</td>
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<tr>
<td>ACRES IN URBANITY</td>
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<tr>
<td>ACRES OF BUSINESSES</td>
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<td>EMPLOYEES PER ACRES</td>
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<td>DWELLING UNITS PER ACRE</td>
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<td>ATTACHED DWELLING UNITS</td>
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<td>RESIDENTS PER ACRE</td>
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<td>JOBS PER RESIDENT</td>
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<tr>
<td>EMPLOYMENT PLUGS: AREA RATED</td>
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<tr>
<td>RETAIL JOBS - TOTAL</td>
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<tr>
<td>RETAIL JOBS - RESTAURANTS</td>
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<td>RETAIL JOBS - RETAIL</td>
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<tr>
<td>RETAIL JOBS - OTHER</td>
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<td>OFFICE JOBS - TOTAL</td>
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<td>OFFICE JOBS - GOVERNMENT</td>
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<td>OFFICE JOBS - SERVICE</td>
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<td>OFFICE JOBS - MEDICAL</td>
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<td>INDUSTRIAL JOBS</td>
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<td>PUBLIC JOBS - TOTAL</td>
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<td>PUBLIC JOBS - GOVERNMENT</td>
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<tr>
<td>OTHER JOBS</td>
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<tr>
<td>RETAIL JOBS BUILDING SQUARE FOOTAGE - TOTAL</td>
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<td>RETAIL JOBS BUILDING SQUARE FOOTAGE - RESTAURANTS</td>
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<tr>
<td>TOTAL POPULATION</td>
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<td>TOTAL EMPLOYEES</td>
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<tr>
<td>TOTAL NON-RETAINING</td>
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<tr>
<td>TOTAL POPULATION CHANGE</td>
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<tr>
<td>TOTAL EMPLOYEES CHANGE</td>
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</tr>
<tr>
<td>TOTAL NON-RETAINING EMPLOYEES CHANGE</td>
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<tr>
<td>ACRES REDEVELOPED (ETA)</td>
<td></td>
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<tr>
<td>DWELLING UNITS (REDEVELOPED) (ETA)</td>
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<td>EMPLOYEES (REDEVELOPED) (ETA)</td>
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<td>DWELLING UNITS (REDEVELOPED) CHANGE (ETA)</td>
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<td>EMPLOYEES CHANGE (REDEVELOPED) (ETA)</td>
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<td></td>
</tr>
<tr>
<td>% CHANGE IN RETAINED HOUSING</td>
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</tr>
<tr>
<td>TOTAL FAMILY ELECTRICAL ENERGY CONSUMPTION (APHA)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>NET DWELLING UNIT &amp; EMPLOYEE STATISTICS (ETA)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Report Type**
- WEB REPORT
- EXCEL SPREADSHEET

*CONTINUE WITH COMPARISON*
The statistics may take some time to generate depending on the size of the project. The statistics will display once they have finished processing (Figure 144).

**Figure 144**

<table>
<thead>
<tr>
<th>COMPARISON SCENARIOS - RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT PROJECT</td>
</tr>
<tr>
<td>DELTA ACRES</td>
</tr>
<tr>
<td>CURRENT SCENARIO : BASE CASE</td>
</tr>
</tbody>
</table>

**SCENARIO COMPARISON**

<table>
<thead>
<tr>
<th>SCENARIO NAME</th>
<th>TOTAL ACRES</th>
<th>TOTAL EMPLOYEES</th>
<th>TOTAL DWELLING UNITS</th>
<th>TOTAL JOBS</th>
<th>VMT PER RETAIL</th>
<th>VMT PER NON-RETAIL</th>
<th>CHANGE</th>
<th>CHANGE</th>
<th>CHANGE</th>
<th>CHANGE</th>
<th>CHANGE</th>
<th>CHANGE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASE CASE</td>
<td>1,424</td>
<td>11,893</td>
<td>62,934</td>
<td>1,333</td>
<td>8,298</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRED ALT</td>
<td>1,514</td>
<td>7,717</td>
<td>11,520</td>
<td>1,453</td>
<td>5,136</td>
<td>-35%</td>
<td>-33%</td>
<td>-24%</td>
<td>+1.1%</td>
<td>+0.0%</td>
<td></td>
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<tr>
<td>LOW DENSITY ALTERNATIVE TEST</td>
<td>1,257</td>
<td>9,074</td>
<td>6,185</td>
<td>5,256</td>
<td>3,171</td>
<td>-30%</td>
<td>-34%</td>
<td>-0.8%</td>
<td>-5.6%</td>
<td>-5.6%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**B. Compare Scenario Subarea**

You can compare the statistics for different scenarios based on sub-areas through the Compare Scenario Sub-areas feature. It can be found on both the “Project Menu” and “Scenario Menu” page (Figure 145).

**Figure 145**

First, select the sub-area you wish to do a comparison for and then click Continue with Comparison (Figure 146).
Mark the scenarios you wish to include in the comparison and click Continue with Comparison (Figure 147).

Select all of the indicators you wish to include in the report (Figure 148). Select either Web Report or Excel Spreadsheet. Note: For sub-area layers with more than 15 sub-areas, Excel Spreadsheet will be the only option for generating sub-area statistics.
The statistics may take some time to process depending on the size of the project and number of sub-areas. The statistics will display once they have finished processing (Figure 149).

**Figure 149**

[Image of a table showing statistics for different sub-areas]
Chapter 13. Scenario Sub-area Query Menu

Scenario sub-areas are virtual sub-areas used for generating scenario statistics or identifying specific parcels in the map view. They are created through a query process based on physical attributes of the parcel shapefile. These sub-areas can be saved for future reference, but are only saved to the scenario for which they are created. Scenario sub-areas cannot be shared across multiple scenarios.

A. Creating Scenario Sub-areas

From the “Scenario Menu”, click on Scenario Sub-area Query Menu (Figure 150).

Figure 150

The resulting page will show a list of all sub-area query layers for the current scenario. To create a new sub-area query, click Create a New Sub-area Query (Figure 151).
The Query page will show a list of all the fields that were part of the original uploaded shapefile. This page functions the same as the Apply Place Types by Query function. Input the query parameters and click the Query button (Figure 152).

Figure 152
The resulting page will give you the total number of parcels found that match your query parameters (Figure 153). Again, this page functions the same as the Apply Place Types by Query function.

Figure 153

You can view the query results on the map by clicking View Query Results on Map. You can then zoom and pan around on the map to ensure your query is correct (Figure 154).

Figure 154

Once you've verified that your results are correct, type in a Sub-area Name for your query and then click the Create Sub-area button (Figure 155).
Your new sub-area query will now show up in the sub-area query list. From here, you can mark whether the sub-area query will be available for viewing on the map (Figure 156). After changing its status, make sure to click the Save Changes button.
B. Viewing Scenario Subareas on Map

After creating a subarea query, you can view the results on the map.

From the “Scenario Menu”, click the Apply Place Type Using Map link (Figure 157).

Figure 157

This will take you to the map view. On this page, select the subarea query for which you want to display on the map. Refresh the map by clicking the Redraw button. This will display a black outline around the parcels that are affected by the subarea query (Figure 158).
D. Viewing Statistics for Scenario Sub-areas

Statistics for Scenario Sub-areas are viewed through the link for the corresponding sub-area on the Scenario Sub-area Manager page (Figure 159).
Note: If you change the Place Type of a parcel in the sub-area query so that it doesn’t match the original parameters of the query, the parcel will no longer be part of the sub-area query. For example: If your query pulled up all parcels with Blank Place Type as the Place Type, and you subsequently marked one of those parcels as another Place Type, that parcel will be removed from the sub-area query because it no longer fits the parameter Current Place Type EQUALS Blank Place Type. That parcel will not be calculated into the sub-area’s scenario statistics.
Chapter 14. The Return on Investment (ROI) Function

The Return on Investment (ROI) function provides a projected return on investment from development or redevelopment of a parcel. This projection is based on a number of factors, including current land and structure costs and construction costs (both hard and soft costs). The output of the ROI function is a map that illustrates the percentage of return on investment. This type of information can be useful when advocating for redevelopment or rezoning of a study area.

A. I-PLACE3S Requirements

To use the ROI function, the base parcel file must include two additional pieces of information. These are:

- The land value per square foot of land (the site’s land value divided by the total square footage of the site). This information must be in a field titled “land_cost.”

- The existing structure value per square foot of existing structure (the existing structure’s value divided by the total square footage of structures on the site). This information must be in a field titled “struc_cost.”

Both pieces of information can be gathered from various brokerage listings and/or the local assessor’s office. The value varies by geography and existing land use. I-PLACE3S uses this information to calculate the acquisition costs for each parcel.

B. ROI Assumptions in Place Types

Within each Place Type (both existing and new), additional assumptions must be added. To do so, click on the Edit Detailed ROI Assumptions link within the Edit Place Type Menu (Figure 160).
The page will update with additional assumption fields relative to the ROI function (Figure 161). These fields include the following and will be populated with inputs unique to each Place Type.

- **Fiscal assumptions:**
  - Operating costs by sector in dollars per square foot per month - The cost to operate the associated use. This information is gathered by surveying local brokerage listings.
  - Rents by sector in dollars per square foot per month - The rents per square foot for residential, retail, office, industrial, or public uses associated with the Place Type. This information is gathered by surveying local brokerage listings.
  - Occupancy rate per sector (as a percentage of total units on site) - This information is gathered by surveying local brokerage listings.
  - Residential owner occupied sale price in dollars per square foot - The square foot sale price for the associated residential Place Type. This information is gathered by acquiring local residential sales by a given geography (e.g., zip code).

- **Construction costs:**
  - Hard costs (construction materials and labor) by sector in dollars per square foot - The square foot construction costs associated with developing the Place Type (the “sticks and bricks”). This data can be estimated from R.S. Means Square Foot Costs, which is published each year and has a regional multiplier.
  - Soft costs (design) by sector in dollars per square foot - The other fees associated with development. This data can be estimated from R.S. Means Square Foot Costs, which is published each year and has a regional multiplier.
o Permit costs (entitlements, grading/improvement/building permits) by sector in dollars per square foot – Each jurisdiction within the study area must be contacted to finalize all applicable permit costs.

o Impact fee (e.g., transportation, schools) by sector in dollars per square foot – The sum of the development fees levied against the developer by local jurisdictions. In order to gather this data, each jurisdiction in the study area must be contacted to find all applicable impact fee districts and fees.

### C. ROI Calculation

The ROI calculation is based on the following methodology:

\[
\text{Total Cost} = \text{Land Cost} + \text{Structure Cost} + \text{New Construction} + \text{Parking Construction}\ast
\]

\[
\text{Total Income}** = \text{Residential Sale Price or Yearly Rents} - \text{Yearly Operating Costs}
\]

\[
\text{Margin} = \text{Total Income} - \text{Total Cost}
\]

\[
\text{ROI} = \frac{\text{Margin}}{\text{Total Cost}}
\]

Notes:
* Parking construction costs are a fixed cost in I-PLACE3S.
** Sale price for residential for sale products only
For additional information on ROI economic assumptions, please see the Land Use Economic Database methodology report available from SACOG.

D. ROI Reports in I-PLACE3S

ROI reports are displayed as maps. These maps can be accessed from the “Scenario Menu” (Figure 162). Note: This link is only available if the necessary information has been added to the parcel shapefile and the Place Types include the necessary assumption data.

Figure 162

Clicking on the link will bring up the map (Figure 163).
As with the general map function, you can zoom in and out, pan, identify a parcel, and view/save the map image. You can also turn layers and sub-area layers and queries on and off. The ROI percentage represents the return on investment based on acquisition costs for the land and existing improvements as well as design, permitting, and construction costs for the new development and includes operating costs and income (rents and sales).

Discussion: An example of using the Return on Investment functionality within I-Place3s is the partnership between a developer and a public agency on a particular development proposal. Staff from both parties can sit down and develop a suite of place types to be considered on a particular development. Running the return on investment will signal to the developer whether the decisions made in the land use assumptions return a result that is consistent with their intended goals. Working with the developer, the public agency can adjust the land use assumptions to better address the wants of the developer and the needs of the community. They can work on assumptions like parking ratios and setbacks to get a return on investment that works for both parties.
Chapter 15. I-PLACE3S Travel Model Options

There are two levels of travel model analysis that can be conducted within I-Place3s. The first option is to interface I-Place3s with a travel model housed on the same servers, and the second is a built in 4Ds post processor, both are outlined in this chapter.

Travel Model Module
The full travel model option gives the user the ability to add a pre-existing travel network and information from an independent travel model, change the network and rerun a limited travel model to see change. This travel module allows the user to make edits to the only road and transit networks and analyze the differences they those edits have on scenarios. The land use scenarios in the travel model are static. There are project level and scenario level components to using the Travel Module of I-PLACE3S.

4Ds Module
The other option is to use 4Ds calculations, which are based on changes in land use only using a set travel model network. This option analyzes how various land use scenarios behave as compared to a base line travel model run.

Travel Model Overview

A. Requirements for using the Travel Model Module

I-PLACE3S has the ability to act as an interface with a separately licensed travel model, allowing for limited editing of transportation network attributes. All land uses, in this module, are held constant. In order for the travel model within Place3s to function, a license to operate Citilabs Cube and Voyager programs must be purchased and installed on the Place3s server. This allows for the direct connection of Place3s and the travel model software. Once installed, a travel modeler familiar with the scripting language for the Citilabs products will have to generate scripts and shapefiles for use in the program.

The scripts used will depend on the time needed for results from the travel model. The quicker the results are needed, the less complex the scripts should be. Excluding skims or assignments may be necessary.

In addition to the scripts, road network and transit network shapefiles are needed. These files must contain, in addition to all fields required by Cube and Voyager, a name field for each road or transit project (i.e. HOV lanes, LRT expansion, etc).

B. Adding the Travel Library to I-PLACE3S

When the scripts, road network and transit network files are complete, they should be bundled together into zip files for upload in the Place3s Travel Library Manager, which can be accessed from the “Project Menu”. The Travel Library is then associated with a scenario and used in the travel model.

From the “Project Menu”, click the Travel Library Manager link (Figure 164).
Then, click the **Upload Travel Library** link (Figure 165).

**Figure 165**

![PLACE3S Travel Library Manager](image)

**TRAVEL LIBRARY MANAGER**

- **CREATE NEW SCENARIO**
- **COMPARE SCENARIOS**
- **SET PROJECT INFORMATION**
- **SET GLOBAL ASSUMPTIONS**
- **PROJECT PLACE TYPES MANAGER**
- **PROJECT LAND VALUE MANAGER**
- **PROJECT TRANSIT STOP MANAGER**
- **PROJECT TRANSIT LAYER MANAGER**
- **TRANSIT CORRIDOR MANAGER**
- **PROJECT ENERGY MANAGER (ALPHA)**
- **COMPARE SCENARIO SUBAREAS**
- **SET DWELLING UNIT / EMPLOYER TARGETS**
- **PROJECT SUBAREA MANAGER**
- **PROJECT LAYER MANAGER**
- **RECENT PROJECT ACTIVITY**
- **TRAVEL LIBRARY MANAGER**

**TRAVEL LIBRARY MANAGER**

- **DELTA SHORES**
- **NEIGHBORHOOD**
- **SACOG**
- **CUSTOM STUDY SHAPEFILE**

**NO TRAVEL LIBRARIES CURRENTLY EXIST**

**UPLOAD TRAVEL LIBRARY**
After clicking the Upload Travel Library link, fill out the Library Name, Descriptions, and then add the zipped Travel Library (Figure 166). The Travel Library should include the following:

1. A folder named “Cube” with the following files:
   - A3V5sel.net
   - conimap
   - hbwt
   - HBWY
   - HHH
   - INDICATORS
   - MDV5sel.net
   - nwtd
   - sacnet_iplaces_dp.s
   - SKWK
   - TGNW
   - thru
   - ZACC

2. A folder named “Input” with the following files:
Click the Upload Library button. Only one library can be associated with a project.

**Figure 167**

This page will display the library available for the given scenario (Figure 167). Enter a Travel Scenario Name, select the appropriate Library and click Create This Travel Scenario. Once
complete you will have the option of Editing Highway Network (the road and transit network as part of the Library) or running the travel model (Figure 168).

**Figure 168**

If no edits are needed, click Run Travel Model. Once finished, I-PLACE3S will show the results to be displayed or files available for download.

**C. Editing the Road and Transit Networks**

After the travel library is uploaded, you can edit the road and transit networks and then run, or re-run, the travel model for new indicators.

To make edits, click Edit Highway Network (Figure 169).

**Figure 169**

The screen that is displayed is basically the same as the land use map, but with Road and Transit networks shown instead of land uses. These are the road and transit networks from your travel library (Figure 170).
Although both Highway and Transit networks can be displayed at the same time, only one can be edited at a time. Selecting either the Edit Highway Link button or the Edit Transit Link button allows the user to click on a particular segment and make edits. In addition, in order to make edits to the transit network, a transit type must be selected from the pull down menu located below the Transit Network layers display option.

There are two options for editing both Highway and Transit links. The first is the “Select Individual Links” as noted above. Once a link is selected for editing, a dialog appears allowing the user to edit five features for Highway Links:

- Enabled – a check box if the link is considered part of the network or not,
- Toll Road – a check box if the link is a Toll Road or not,
- Road Type – a pull down menu with pre-defined types of roads (i.e. Highway, Expressway, Freeway Ramp, etc),
- Lanes Per Dir – a pull down menu for the number of lanes per direction of travel,
- Speed – a pull down menu with the allowed speeds of travel.

And four features for Transit Links:

- Transit Type – a pull down menu with the types of transit available for the link,
- Enabled – a check box if the link is considered part of the network or not,
- Freq1 – a pull down menu with time intervals between service for peak hour travel,
- Freq2 – a pull down menu with the intervals between service for off-peak hour travel.
Once all edits are made, click Save Changes and continue editing.

The other option available is to edit groups of named links. To use this option, click Edit Travel Model Road Projects for highway links or Edit Travel Model Transit Projects for transit links found below the map. Instead of editing each roadway or transit link one segment at a time, segments that share a name can be edited as a group. This is useful when editing a large stretch of highway or transit. The options to edit are exactly the same, but all changes will be made to every member of the grouped link.

When editing is complete, return to the Travel “Scenario Menu” and click Run Travel Model. Travel model run time will depend on the size of the networks uploaded in the Travel Library, as well as the robustness of the script. Typical run time for an I-PLACE3S travel model run is 15-20 minutes, compared to a full travel model run, which at the very least takes several hours.

Discussion: SACOG used the I-PLACE3S travel model interface for a group of workshops as part of the public outreach portion of the update of its Metropolitan Transportation Plan. Participants were asked to select one of three proposed alternatives to a county wide transportation network and make edits. The type of road, the speed of traffic, the number of lanes, the frequency and type of transit service were among the variables users were allowed to change. At the end of the workshop the travel model housed on the I-PLACE3S server was run, and, on an average of 17 minutes later, participants were able to see results ranging from percent of traffic in heavy congestion to total VMT.

The 4Ds Module

The other option available in I-Place3s is to apply the method of estimating travel behavior based on land use change. Research efforts have documented how four key factors influence the rate of vehicle use per capita. The four key factors are often referred to as the “4Ds.” They include:

- Density - population and employment per square mile
- Diversity - the ratio of jobs to population
- Design - pedestrian environment variables including street grid density, sidewalk completeness, and route directness
- Destinations - accessibility to other activity concentrations expressed as the mean travel time to all other destinations in the region

Research that resulted in the 4Ds characteristics also produced estimations of elasticities regarding vehicle travel per capita with respect to changes in each of the 4D variables. “Elasticity” is defined as the percentage change in one variable that results from a one percent change in another variable. More discussion of the 4Ds method, and its applications in I-PLACE3S, can be found in Appendix X, which contains a final report, “Assessment of Local Models and Tools for Analyzing Smart-Growth Strategies” (California Department of Transportation, July 2007).

A. The 4Ds Method Applied in I-PLACE3S
I-PLACE3S can measure how different land use scenarios (using a constant travel network) can effect transportation indicators such as vehicle miles traveled (VMT) and vehicle trips per household, and mode choice based on the 4D variables.

In order to use the 4Ds indicators, data from a travel model may need to be added to your I-PLACE3S project(s). If you are setting up the 4Ds functionality within I-PLACE3S for the first time, the 4D elasticities will need to be programmed into your I-PLACE3S application. They are not a separate tool or module that you can upload into your project. Work with your project administrator to determine what data are needed to enable this function. If your project administrator has enabled the 4Ds functionality for your projects, read on for an explanation of its applications.

You will also need to include a TAZ field in your project shapefile, so that I-PLACE3S can relate the location of the project area to the regional travel model data.

**B. Compare Scenarios and Compare Scenarios Sub-Areas using 4Ds**

The 4Ds Module of I-PLACE3S provides a list of indicators that can be accessed from the Compare Scenarios and Compare Scenarios Sub-Areas menus.

To run the 4Ds indicators, click on one of these two Compare Scenarios options from either the Project Menu or Scenario Menu (Figure 171).
Figure 171

I-PLACE3S User Guide

Chapter 15

Figure 171

Mark the scenarios you wish to compare (Figure 172) and click the Continue with Comparison button.
On the “Indicators to Compare” screen, the 4Ds indicators are grouped in the sixth section of indicators from the top of the screen (Figure 173). The first six indicators in the list are generated from the land use assumptions of your scenario (e.g. Total Population, Non-retail and retail jobs). These are somewhat redundant with the other land use indicators available on the screen and do not necessarily need to be generated. The other indicators in the list are travel indicators generated by the 4Ds calculations. Select these to generate indicators for your project and Continue with the Comparison.
If you select all of the 4Ds indicators, you’ll see a Compare Scenarios Result screen that includes absolute Vehicle Trips by Household, Non-retail and Retail Job, percent change in Vehicle Trips by the three categories, and corresponding indicators for Vehicle Miles Traveled. Figure 174 shows the percent change indicators as an example. Also included in the list are percent Transit and percent Bike/Walk share as well as percent change in those mode shares. The resulting percent change indicators show change relative to the pre-run regional scenario, referred to as a Base Case. Note: This is not necessarily the “Base Case Scenario” listed in your Scenario Menu.

Important Note: While the absolute values are available for your reference, the indicators that should be viewed in a workshop or other setting are the Percent Change indicators. The 4Ds Module in I-PLACE3S was developed to provide estimates of change in travel based on changes in the 4Ds variables; it was not designed to forecast or estimate precise travel indicators. The
absolute values come in handy when you’re comparing performance of land use scenarios, created in your I-PLACE3S project, to each other.

D. 4Ds Calculations

If you want to dig deeper into the 4Ds indicator results, the 4Ds Calculations report allows this (Figure 171). The 4Ds Calculations allow you to view the actual TAZ-level indicators for the first five TAZs in the study area.

Figure 175

Clicking on the link will bring up the 4Ds information (Figure 172).
E. Aggregate Scenario Statistics (4Ds)

Aggregate Scenario Statistics provide aggregate 4D statistics for an entire project (e.g., if you wanted to summarize the average, minimum, and maximum of all plans produced at a neighborhood workshop). This function is currently disabled.
Chapter 16. Miscellaneous Functions

A. Project Transit Stop Manager

The Transit Stop Manager provides for the importation of transit stations into I-PLACE3S. This data can be useful in determining summary information about the number of employees and residents within a certain distance of a transit station, along with projected boarding data. The transit stops should be a point file that represents stops for a semi to permanently fixed right of way, such as light rail or BRT, not local bus stops.

Multiple stations can be stored in one layer and multiple layers can be added to the project. For instance, one layer could hold bus stops and another could hold rail stops. Or different layers could be created for different station location alternatives as a way of identifying the best locations for stops.

The transit stops being uploaded must be a point shapefile. The shapefile being uploaded must be in the same Geographic NAD83 coordinate system as other shapefiles used in I-PLACE3S. The shapefile must include the following fields in the attribute table. This information can be modified in I-PLACE3S later.

- **RAIL_NAME** - This field contains the names of each station or stop. When appropriate, use the two cross streets that intersect an LRT station.
- **DIST_CBD** - This field contains an estimate of the distance of the station to the outermost limit of the study area’s central business district (CBD). The unit of measure should be in miles (down to the hundredth of a mile). In the absence of a CBD, the distance to the main transit hub could be measured as an alternative.
- **DIST_STOP** - This field contains an estimate of the distance to the next station. The unit of measure should be in miles (down to the hundredth of a mile).
- **RAIL_STOP** - This field indicates whether the station is a “terminal” stop. An LRT station is a terminal stop if it has connecting transit options (i.e., bus or rail transfers). This field is populated with either a Y or N.
- **PARK_AVAIL** - This field indicates whether parking (i.e., park-and-ride lot) is available or assumed to be available for a proposed station. This field is populated with either a Y or N.

Stations are added to I-PLACE3S through the Project Transit Stop Manager function on the “Project Menu” Page (Figure 173).
Click on the Upload link to upload a GIS shapefile of station data (Figure 174).

When uploading the shapefile, include a descriptive name for the layer. Also identify the buffer distance you would like to use for generating reports (Figure 175).

After the shapefile has finished processing, it will be listed on the menu page (Figure 176).
Clicking on the layer name will bring up the list of transit stations in the shapefile and will include the attribute data for each station (Figure 177).

Clicking on the edit link next to a station name will bring up the attributes for the station. On this screen, you can edit the attributes (Figure 178).

Once the station data has been added to the project, you can query information about the stations from the “Scenario Menu”. Click on the View Transit Stop Data link under Reports (Figure 179).
Click on the layer name for the stations you want to view (Figure 180).

Information about each station in the layer will be listed (Figure 181).

The transit stations can be displayed on the map by turning them on and off from the map (see Chapter 3, Section F).
B. Project Transit Layer Manager

The Transit Layer Manager provides for display of transit lines or routes within the I-PLACE3S map. Types of transit lines can include heavy rail lines, light rail lines, subways, bus routes, bike trails, pedestrian paths, or streets. Transit layers can include any type of GIS data – polygons, lines, or points. This function only provides for displaying additional information in the map. Data cannot be queried against this geometry. There are no requirements for the attribute data for these shapefiles. The only requirement is that the file be projected in Geographic Assumed NAD 83.

Transit layers are added to the project from the Transit Layer Manager link on the “Project Menu” page (Figure 182).

Figure 186

Initially there will not be any layers in the project. Click the Upload link to import a new layer (Figure 183).

Figure 187

Name the layer, browse to its location on your local computer, and click Upload (Figure 184).
After I-PLACE3S completes its verification test, click the link to complete the upload and return to the Transit Layer Manager (Figure 185).

From the Transit Layer Manager, you can (Figure 186):

- Change the color of the layer by clicking on the color swatch;
- Change the width of the line or scale of the point;
- Change the order in which the layers are displayed;
- Change the availability of the layer within the map (similar to sub-area layers); and
- Delete the layer.
The transit layers can be displayed on the map by turning them on and off from the map (see Chapter 3, Section F).

Note: this function is separate from the Travel Model Module.
Index

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