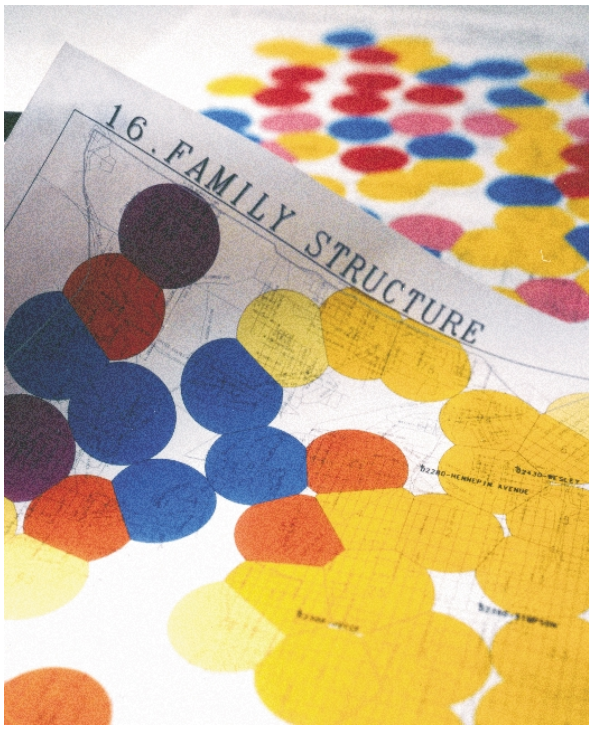
People Area Analysis

Comparing Oranges to Oranges

The challenge of perceiving the present is to "listen" to what is going on in a particularly defined geographic area. At a regional level, Percept employs PeopleArea Analysis which is based upon its proprietary PopNet Technology. This methodology was created specifically to enhance strategic mission planning efforts.



What is PopNet Technology?

The term PopNet refers to a network of geographically determined population centers. PERCEPT'S PopNet technology is used to create circular population areas referred to generically as PeopleAreas.

What are PeopleAreas?

PeopleAreas are relatively uniform circular geographic areas optimized to encompass the largest number of people in the fewest number of areas. They are primarily intended to provide an analysis framework for translating and simplifying large and often unwieldy amounts of available data into a useable planning resource. This basic PeopleArea principle insures that analysis revolves around population centers. More traditional geographic units are not able to accomplish this.

Every geographic unit is designed to meet a particular need. This need is translated into a design model that determines how a geography will be formed. Typically, the design model will hold constant one of two variables: population or uniform geography. In other words, either a population threshold will be constant and the size of geography varies or the size of geography is constant and the population within it varies.

Population Units

Population based geographic units seek to create geographies with roughly the same number of people. Since the size of the population is constant, the size of the geography varies. Traditional examples of population driven geographies include:

- Census Tracts
- Zip codes

While such geographies work well for congressional districting and postal delivery strategies, their inconsistent size complicates planning efforts. It is very difficult to compare one geography to another when they differ in geographic size. For example, two census tracts may each contain 4,000 people. But one may encompass four city blocks and a second hundreds of square miles. Furthermore, the second further complicates planning questions because how the population is distributed across the census tract is critical. Are the people generally concentrated in a corner? Or are they distributed relatively evenly across the tract?

Uniform Geography Units

It is the problem of incomparability between population based geographic units that occasions the need for uniform geographic units. Generally, such uniform geographic units must be custom created. Such geographies are based upon a uniform geographic area regardless of the number of people within them. One common implementation of this is geographic grids.

Geographic grids are created by dividing a designated area into uniform sized grids. The size of the grid unit varies based upon need. The problem of population based geographies is solved since it now allows two geographies to be compared. The constant is the size. The variable is the particular population configuration.

But there are problems with grids as well. They are completely blind to communities. As a result, a grid analysis may divide what is really a population center based upon no logic other than size of the grid specifications. The actual center of a population is immaterial to grid analysis.

The Best of Both Models: PopNet Technology

An ideal geographic unit would capture the best of population driven geographies (i.e. where the people reside) and the comparability of uniform grid geographies (i.e. where the geographic unit is uniform). This is what PERCEPT'S PopNet Technology does when it creates PeopleAreas.

How PeopleAreas are Created

The steps in the development of a PeopleArea are illustrated on the following page.

PeopleAreas can be created in any size area, from a community to the entire, US and can vary dramatically in size from less than a 1/4 mile radius up to a 15-mile radius. The actual size of a PeopleArea is based upon how the information will be applied. Or to put it according to PERCEPT'S Information Principle: What are the questions that need to be answered?

Levels of PeopleArea

Currently, four levels of PeopleAreas can be created, each to serve a different purpose: RegionAreas, ImagineAreas, FocalAreas and NeighborAreas.

RegionAreas (RAs)

Radius Size
8 to 20 mile radius, usually 15

Square Mileage
200 to 1,250, usually 700 square miles

Purpose
To help develop strategy over an extremely large area such as the entire United States. The first layer in a coordinated and integrated national to regional to local strategy.

Maximum Area
The contiguous 48 states of the United States (3 million square miles, 2,000 geography units)

Minimum Area
Two or three average sized states, or one really large state. (100,000 square miles, 100 geography units)

ImagineAreas (IAs)

Radius Size
3 to 7 mile radius, usually 5

Square Mileage
28 to 150, usually 78 square miles

Purpose
Primary community planning units. Large enough to define a community-wide strategic planning effort, but small enough to distinguish local community character. Designed for use from multiple counties up to several states. Generally, create 5 to 10 times the detail of an RA.

Maximum Area
Two or three average states, or one really large state. (200,000 square miles, 500 geography units)

Minimum Area
Two or three average counties, or one really large county. (3,000 square miles, 100 geography units)

FocalAreas (FAs)

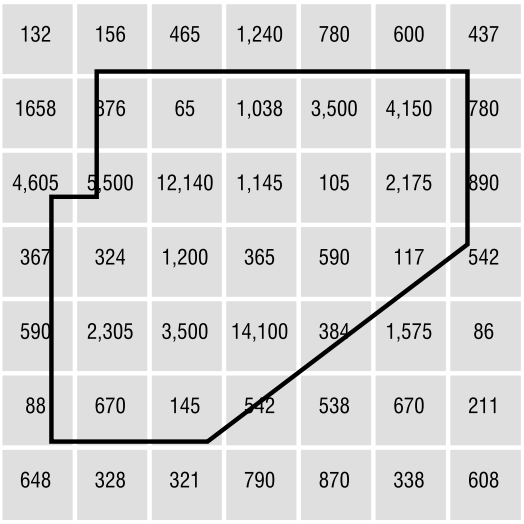
Radius Size
1.5 to 2.5 mile radius, usually 2

Square Mileage
7 to 19, usually 12 square mi.

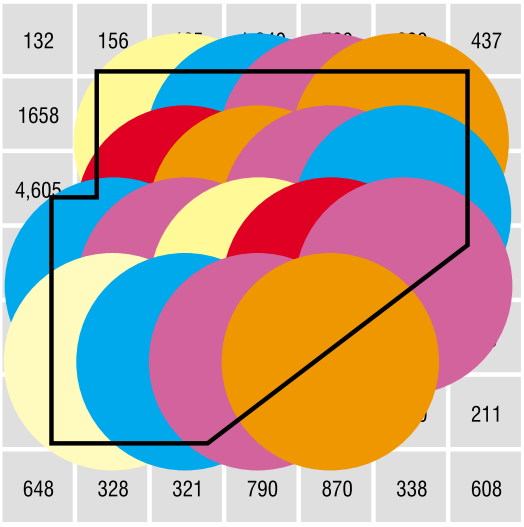
Purpose
To further refine understanding of a more targeted area such as a county or major metropolitan area. Generally, create 5 to 10 times the detail of an IA.

Maximum Area
Two or three average counties, are one really large county. (2000 square miles, 150 geography units)

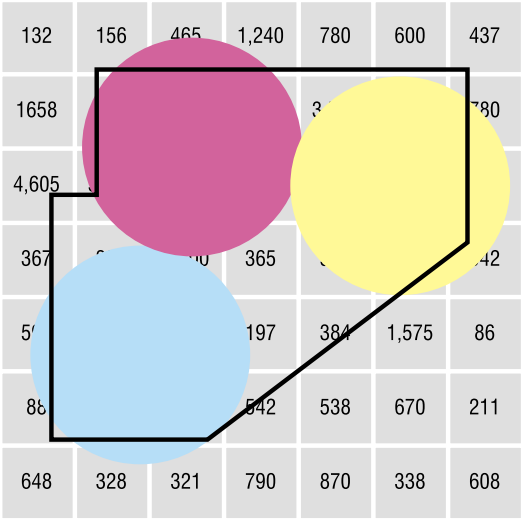
Minimum Area
Two or three contiguous 5 mile radii circles. (300 square miles, 40 geography units)



STEP 1 Divide study area into small grid squares and compute the population for each.



STEP 2 Combine neighboring grid squares into potential PeopleArea circles.



STEP 3 Select PeopleAreas for maximum population coverage in fewest number of full circles.

NeighborAreas (NAs)

Radius Size
.25 to .75 mile, usually .5

Square Mileage
.2 to 1.75, usually .78 square miles

Purpose
To support specific local strategies which are not only sensitive to the larger community, but take into account particular neighborhood attributes. Generally, 10 times as detailed as FAs and 50 to 100 times as detailed as an IA.

Maximum Area
Two or three contiguous 5 mile radii circles (300 square miles, 150 units)

Minimum Area
One 5 mile radius circle. (78 square miles, 25 geographic units)

Ultimately, once PeopleAreas have been created, PopNet technology allows any geographically-oriented information such as census data or church locations to be computed for and analyzed within each individual PeopleArea.

Population on the Boundary of a Study Area

Normally, the goal of PeopleArea creation is to locate 95% of the population within the study area inside the PeopleAreas. **PeopleAreas contain the same square mileage and never overlap one another.**

There is a special circumstance that can occur near the boundaries of the study area. Occasionally, the most optimal location for a PeopleArea may be centered very close to the boundary of your study area. In fact, some of the population for the PeopleArea may actually reside in a neighboring area outside of your boundary. These are referred to as Boundary PeopleAreas and are identified with a "(b)" after the People Identification Number. There are two rules which govern these special situations:

Boundary PeopleAreas may contain some population from outside region, but it must always be less than 50% of the total population in the PeopleArea.

The centerpoint of the PeopleArea must always be found inside the study area boundary.

PeopleArea Flexing

What happens when several PeopleAreas cluster together? Multiple circles can create gaps. How is this handled so that people and population centers are not lost? Percept has developed a technique called flexing to address this problem.

Flexing means that a PeopleArea can both shrink and bulge within very tight limits to accommodate the fact that people do not always live in clean circular population centers. The result is that PeopleAreas may become slightly less than a perfectly full and complete circle.

One important outcome of this technique is the virtual removal of partial PeopleAreas caused when a gap opens between PeopleArea circles. It is possible that even flexing will not completely remove partials in unusual population areas, but the prospect is remote with flexing.

The flexing technique also tends to represent the same relative geographic area, even if not in perfectly round circles. Consequently, the goal of inter geography comparability is maintained. Though the shape may be slightly distorted, the geographic area is basically the same. Remember, in every study area, each PeopleArea contains the same square mileage.

How PeopleAreas are Identified

PeopleAreas are assigned a unique identification number at the time of their creation. The numbers always begin with 1 and continue until all PeopleAreas have been assigned a number. ID Numbers serve dual purposes of identification and projected population ranking; i.e., PeopleArea Number 1 is also the most populated PeopleArea. Occasionally, a PeopleArea may have the characters "(b)" appended to the number which indicates that some of the population in that PeopleArea resides outside the boundary of your study area.

Since the numbers alone do not initially provide geographical orientation, a Direction Finder is also

provided for all PeopleArea types except NeighborAreas. The Direction Finder is a short phrase that is temporarily assigned to each PeopleArea to make it easier to get started working with the PeopleAreas. Direction Finders are not intended to represent official names for either the PeopleArea or the geographical area represented by the PeopleArea. They are based upon the 1990 US Census Place Centroid File and may not reflect local naming conventions or recent developments. Later in the planning process, you will be able to assign official working names to each PeopleArea. NeighborAreas are generally too numerous and small to use city-based naming scheme (since a single city name might have to be used for dozens of NeighborAreas).

The PeopleArea Advantage: A Custom Unit of Geography for Mission Planning

- Optimally placed based upon location of population
- Uniform in size for comparative analysis and modeling
- Encompass an area more consistent with ministry planning needs
- Adaptable over time to reflect population changes