

PSU Module II—Farmsteads and Developed Areas

Collection of information on areas of farmsteads, small built-up, and large urban and built-up for

Estimates of conversion based solely on observations at the sample points are subject to considerable sampling error (uncertainty), partly because of the pattern of urban expansion. For this reason a second, complementary procedure is used to monitor the conversion of areas within the entire PSU. When the final NRI data base is developed, the PSU-based observations of converted areas are used in the statistical estimation process to calibrate and improve the accuracy of point-based estimates of rural land conversion.

Guidelines and Clarification

Identify, delineate, and measure the farmsteads and ranch headquarters, small built-up, and large urban and built-up areas in the non-Federal portion of each PSU. It is not enough, however, to consider just the 1997 NRI year. The objective is measurement of true change from one inventory year to the next. Use the 1992 delineations of built-up areas and account for variability in scale to correctly measure differences.

To qualify as built-up, strip development must meet the following qualifications:

Type—Count (include) residences, gas stations, and stores. Do not include the land occupied by sheds and garages associated with residences unless the required density of structures is satisfied by the density of the residences alone. Do not count the areas classified as farmsteads and ranch headquarters. Isolated rural residences or dwellings are part of the rural land base and are not classified as built-up unless they can be joined with others to meet the minimum density.

Density—There must be at least five structures per 1/2 mile (2,640 feet) along one side of a road or five structures per 1/4 mile (1,320 feet) along both sides of a road. The continuous segment of road may be curved or may turn at an intersection; the road may be of any type and surface. When applying the density rule, the area of a single residence must contain at least 0.25 acre to be included in the area delineated as built-up land.

Boundary—If the proper types of structures meet the minimum density, use discernible features or distinct changes in cover or use to define boundaries of the built-up area.

In the absence of discernible features or distinct changes use the following guidelines:

- Define the boundary as 50 feet behind the substantial structure most distant from the road.
- Include the area between structures that are less than 500 feet apart. If the distance between structures is more than 500 feet and there is no obvious boundary, then the maximum distance from the side of the structure is 50 feet.
- Include the area between roads and the front of structures if the frontage is unlikely to revert to rural land use; for example, long driveways, wooded lanes, and maintained lawns.

Exceptions and Special Circumstances—Urbanizing areas may surround and isolate small water areas and non built-up areas. Small water and non built-up areas of less than 10 acres that are completely surrounded by built-up land are automatically included in the total area of built-up.

Enlarging built-up areas frequently includes construction sites. However, neither rezoning nor construction of access roads is sufficient to change an area from non built-up to built-up. Construction sites are considered built-up areas when the construction of sewers, installation of utilities, significant earth moving, and like activities have occurred.

The enlargement of built-up areas may be recognizable as new blocks of industrial parks and housing developments adjacent to older urban areas. These are areas of new growth that are among the easiest to recognize. A more difficult to interpret situation is characterized by branch-like development of strips of businesses and/or residences that leap ahead of high-density urban areas and are gradually interconnected by new construction. For example, farmsteads and ranch headquarters or isolated rural residences gradually may be absorbed by urbanizing areas. Where gradual changes in urbanization are occurring, the density and types of constructions must be carefully studied to determine if areas formerly not qualifying as built-up should be reclassified because of the new development.

1. Farmsteads and ranch headquarters areas

Guidelines and Clarification

Using the 1997 source photography, identify all farmsteads and ranch headquarters that occur within the non-Federal portion of the PSU. The PSU may include more than one area of farmsteads and/or ranch headquarters. Review the 1992 PSU support map and 1992 source photography to determine if the number and/or size of farmsteads and ranch headquarters have changed.

Documentation Required in the PSU Folder

If the number and/or size of the farmsteads and ranch headquarters within the PSU boundary have not changed from 1992 to 1997 and a properly delineated and labeled 1992 PSU support map is in the PSU file folder, the 1992 PSU support map can be maintained as documentation for the 1997 conditions.

If changes have occurred, draw the 1997 boundaries for **all** farmstead and ranch headquarters occurring within the PSU on a 1997 PSU support map. Change means that there has been an increase or decrease in area since the prior inventory. Label **all** farmstead and ranch headquarters areas identified with an **F** on the support map.

Measure the area of farmsteads and ranch headquarters to the nearest 0.1 acre.

2. Small built-up areas

Guidelines and Clarification

Small built-up includes area units as small as 0.25 acre, but no larger than 10 acres. Using the 1997 source photograph, identify all areas meeting the definition of small built-up areas within the non-Federal portion of the PSU. A PSU may include more than one area of small built-up. Built-up areas outside the boundary of a PSU may need to be examined to determine if an area meets the qualifications as small built-up. The small built-up area need not occur entirely within the PSU boundary. Review the 1992 PSU support map and 1992 source photography to determine if the number and/or size of small built-up areas has changed.

Please refer to table 1, Rural and nonrural land use classification, on page 16.

Documentation Required in the PSU Folder

If the number and/or size of the small built-up areas within the PSU boundary has not changed from 1992 to 1997 and a properly delineated and labeled 1992 PSU support map is in the PSU file folder, the 1992 PSU support map can be maintained as documentation for the 1997 conditions.

If changes have occurred, draw the 1997 boundaries for **all** small built-up areas occurring within the PSU on a 1997 PSU support map. Label **all** small built-up areas identified with an **SB** on the support map.

Measure the area of small built-up to the nearest 0.1 acre.

3. Large urban and built-up areas

Guidelines and Clarifications

Large built-up areas include areas meeting the definition of built-up that are 10 contiguous acres or larger. The entire area of 10 acres or more need not occur within the PSU boundary. Using the 1997 source photography, identify all areas meeting the definition of large urban and built-up within the non-Federal portion of the PSU. A PSU may include more than one area of large urban and built-up. Built-up areas outside the PSU boundary may need to be examined to determine if an area meets the qualification of large urban and built-up. Review the 1992 PSU support map and the 1992 source photography to determine if the number and/or size of large urban and built-up areas has changed.

Please refer to table 1, Rural and nonrural land use classification, on page 16.

Documentation Required in PSU Folder

If the number and/or size of the large urban and built-up areas within the PSU boundary has not changed from 1992 to 1997 and a properly delineated and labeled 1992 PSU support map is in the PSU file folder, the 1992 PSU support map can be maintained as documentation for the 1997 conditions.

If changes have occurred, draw the 1997 boundaries for **all** large urban and built-up areas occurring within the PSU on a 1997 PSU support map. Label **all** large urban and built-up areas with **UB**.

Measure the area of large urban and built-up to the nearest acre.

PDA Instructions for Farmsteads and Built-up Areas

Review any prerecorded figures from 1982, 1987, and 1992 for farmsteads and ranch headquarters, small built-up, and large urban and built-up to determine their accuracy. Correct any incorrect prerecorded acreage. Be sure that Federal areas were not included in any of these acreages.

Enter zero in the appropriate 1997 data field, when no area occurs within the PSU for 1997:

- Farmsteads & ranch HQ **0**
- Small built-up (0.25 – 10 acres) **0**
- Large urban and built-up (≥ 10 acres) **0**

Enter the total 1997 area within the PSU, measured to the nearest 0.1 acre for farmsteads and ranch headquarters and for small built-up areas. Enter large urban and built-up, measured to the nearest acre.

- Farmsteads **0.9** (sum of all farmsteads & ranch HQs & ranch HQs)
- Small built-up **4.8** (sum of all SB areas)
- Large urban & built-up **14** (sum of all UB areas) (≥ 10 acres)

Completion check. Upon completion of data entry, click the completion check box to verify data entry. Re-

B. Rural Transportation Areas

Definition

Rural Transportation land. A land area that includes roads and associated rights-of-way of rural roads, ranch headquarters, logging roads, and other roads.

Importance

Rural transportation is an important component of transportation of NRI transportation.

27013/010101R:PSU Specific Data

2.1 Farmsteads and Built-Up Areas

Farmsteads & ranch HQ				Note
82	87	92	97	
0.9	0.9	0.9		
Small built-up (0.25-10 acres)				
82	87	92	97	
Large urban and built-up (≥ 10 acres)				
82	87	92	97	

Guidelines and Clarifications

For the 1997 NRI, rural transportation areas will be identified, delineated, and measured in each PSU for the years 1992 and 1997. Information on rural transportation for 1992 is required for trending. Photography for 1991 through 1993 is acceptable for determining 1992 conditions; if 1991 through 1993 photography is not available, use other means to determine 1992 conditions. Rural transportation areas are divided into three categories: public roads, railroads, and private roads.

Delineate and measure public road, private road, and railroad areas in the PSU that are not included in built-up areas identified in Farmsteads and Built-up Areas. The associated rights-of-way of roads and railroads are included in their acreage calculations. When a road or railroad lies on the boundary between rural land and built-up land, one-half of the road or railroad and its right-of-way are classified as rural transportation; the other half is built-up. Large interchanges in interstate and other limited access highways, outside large urban & built-up areas, are counted as rural transportation acres. Count only those railroads that have tracks and ties in place as rural transportation facilities. Do not count as railroad areas where railroad beds have been converted to other uses, such as bike paths, or where they are abandoned. Private roads include logging roads and other private roads devoted to vehicular and equipment travel. Private roads generally have no right-of-way area.

Documentation Required in PSU Folder

The width of transportation areas may be difficult to delineate on small scale photography. In these cases delineate and measure the distance of public roads, railroads, and/or private roads. The areas covered by the roads and their rights-of-way may be calculated. For example, a public road with 2,100 feet within the PSU boundary and estimated to have a 35-foot road surface and right-of-way would have an area of 73,500 square feet or 1.68 acres. The amount of area in public road would be rounded to the nearest 0.1 acre and recorded as 1.7 acres.

1. Public roads

Guidelines and Clarifications

Public roads include Federal highways, state highways, and county roads of all types. Abandoned public roads that are still in usable condition are included in the public road category. Using both the 1992 and the 1997 source photography, identify all public road areas, including their rights-of-way, within the PSU area, excluding urban and built-up areas. If a change has occurred from 1992 to 1997, identify the area of change. A PSU may include one, multiple, or a system of public roads. Public road areas within the PSU area are to be determined for both 1992 and 1997. Measurement must be to the nearest 0.1 acre. If no change has occurred from 1992 to 1997, only measurement of 1997 public roads is necessary.

Documentation Required in PSU Folder

On a 1997 PSU support map, delineate all public roads including their rights-of-way, excluding urban and built-up areas. Label each public road **PB**. Delineate areas of change (increases or decreases) in public roads from 1992 to 1997. Label increases in public road areas from 1992 to 1997 **+PB**. Label decreases in public road areas from 1992 to 1997 **-PB**.

2. Railroads

Guidelines and Clarifications

Railroads include all operational rail systems and their right-of-way areas. Abandoned railroad beds are not included as railroad areas. Using both the 1992 and the 1997 source photography, identify all railroad areas within the PSU, excluding urban and built-up areas. If a change in railroad areas has occurred from 1992 to 1997, identify the area of change. A PSU may include one, multiple, or a system of railroads. Railroad areas within the PSU area are to be determined for both 1992 and 1997. Measurement must be to the nearest 0.1 acre. If no change has occurred from 1992 to 1997, only measurement of 1997 railroads is necessary.

Documentation Required in PSU Folder

On a 1997 PSU support map, delineate all railroads including their rights-of-way, excluding urban and built-up areas. Label each railroad area **RR**. Delineate areas of change (increase or decreases) in railroads from 1992 to 1997. Label increases in railroad areas **+RR**. Label decreases in railroad areas **-RR**.

3. Private Roads

Guidelines and Clarifications

Private roads include logging roads, private roads to farmsteads, and private roads to farm or ranch headquarters. Farm field lanes are not included in rural transportation. Using both the 1992 and 1997 source photography, identify all private roads within the PSU area. If a change in private roads has occurred from 1992 to 1997, identify the area of change. A PSU may include one or many private roads. Private roads within the PSU area are to be determined for both 1992 and 1997. Measurement must be to the nearest 0.1 acre. If no change has occurred from 1992 to 1997, only measurement of 1997 private roads is necessary.

Documentation Required in PSU Folder

On a 1997 PSU support map, delineate **all** private roads occurring outside areas identified as small built-up, large urban and built-up, and farmsteads and ranch headquarters. Label each private road **PV**. Delineate areas of change (increase or decreases) in private roads from 1992 to 1997. Label increases in private road areas as **+PV**. Label decreases in private road areas **-PV**.

PDA Instructions for Rural Transportation Facilities

1997 Entry—Enter the total 1997 area within the PSU for each appropriate category, measured to the nearest 0.1 acre, in the 1997 data fields. The number must represent the total of all roads in each category within the PSU area. Enter **0** if there is no rural transportation area within the PSU for any category of transportation.

Roads	1.9	sum all public roads areas (PB)
Railroads	0	sum of all railroad areas (RR)
Private roads	0.3	sum of all private road areas (PV)

Historical entry. Tap the year data field and select the year (date of photography) used to determine the historical basis.

Codes and Categories

Code	Category
91	1991 photography
92	1992 photography
93	1993 photography
00	Estimated 1992

Enter the total area within the PSU for the appropriate category, measured to the nearest 0.1 acre, for the earlier time period (1992, 1992, or 1993).

Roads	1.9	Indicates no change from 1992 to 1997.
Railroads	0	Indicates no change from 1992 to 1997.
Private roads	0.2	This entry indicates that there was a 0.1-acre increase in private roads from 1992 to 1997, within the PSU area.

Completion check. Upon completion of data entry for rural transportation areas, tap the completion check box to verify data entry. Resolve any reported edit checks.

Examples for Small Built-up and Large Urban and Built-up

Figures 1 through 5 illustrate a variety of circumstances that might be encountered during classification of small built-up and large urban and built-up areas. Figure 1 depicts a PSU with structures and roads. Figures 2 to 4 depict the process and steps of identifying and classifying urban and built-up land areas. Figure 5 illustrates labeling required on the PSU support map.

56015/070202P:PSU Specific Data

2.2 Transportation

Rural transportation facilities Note

Enter transportation acres for 1997.

Public roads	1.9
Railroads	0
Private roads	0.3

Enter historic transportation acres the year: ◆

Roads	1.9
Railroads	0
Private roads	0.2

3.1. Water - Large Streams 1/1

(Large streams => 1/8 mile wide) Note

Map label # _____

Area within PSU (acres)

92	97
----	----

3.2. Water - Small Streams 1/3

(Small streams < 1/8 mile wide) Note

Map label # **1**

?
?
C

X


Names


Dates


Extras


Undo


Find


Assist

Figure 1 A PSU with equal sides of 1/2 mile. Roads and their rights-of-way bisect and bound the PSU. Note that the PSU corners (identified by registration marks) are in the middle of crossed roads. Structures are indicated by squares.

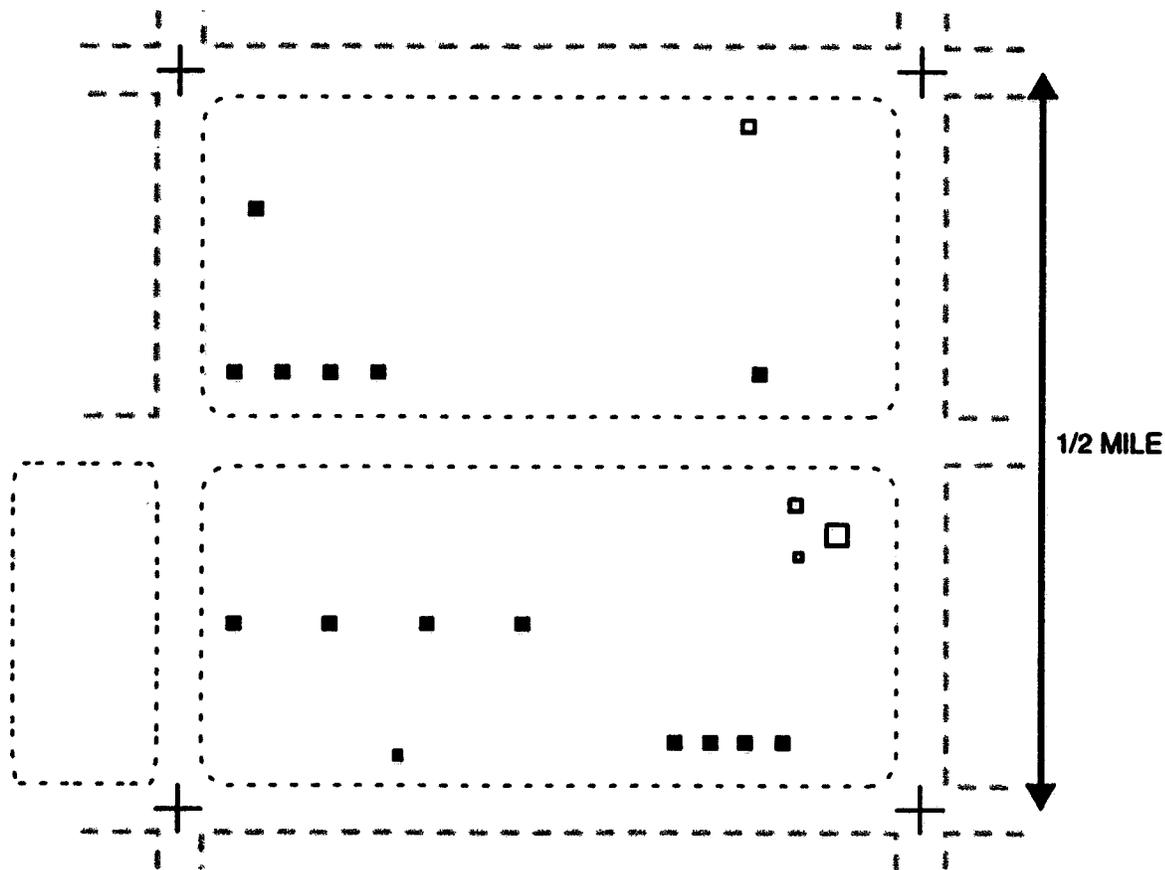
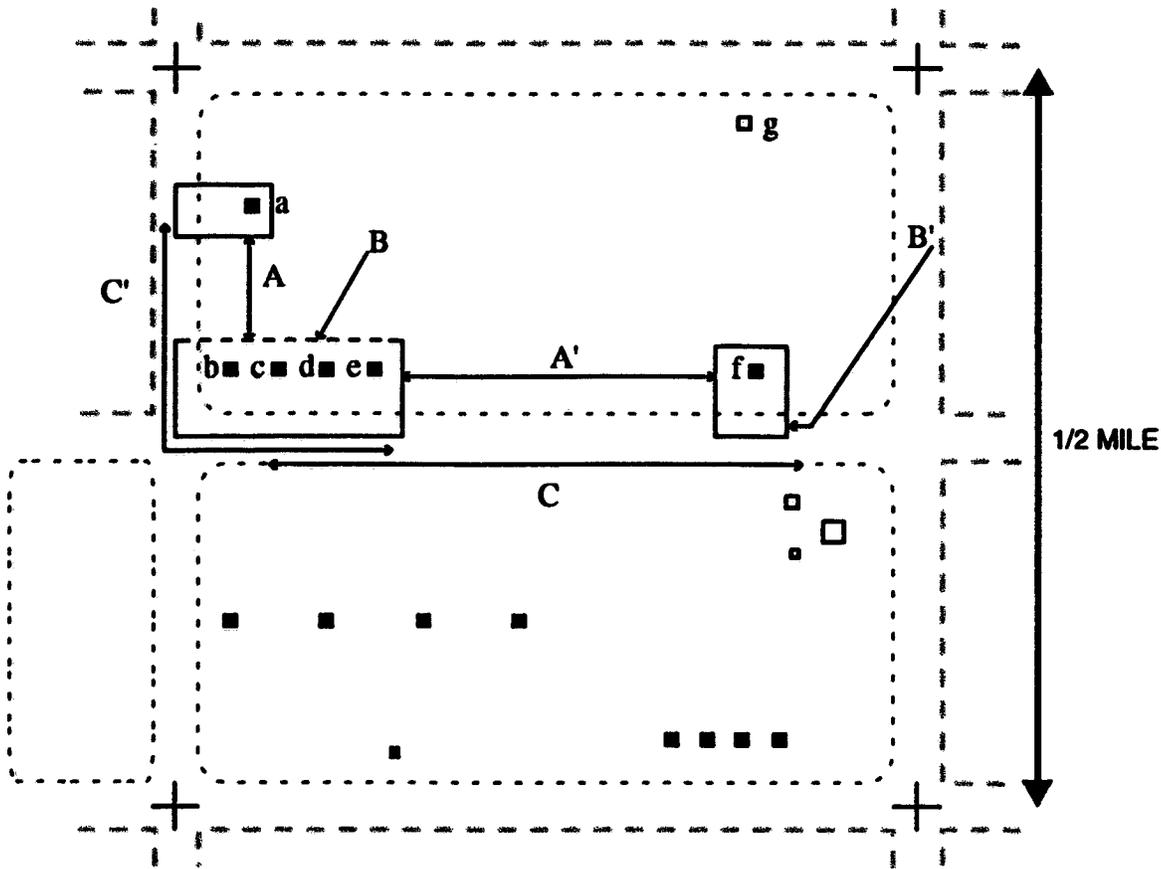


Figure 2



Interpretation of top half of figure 2. Examine the top half of the PSU in figure 2 where seven structures marked **a** through **g** exist along roads. To qualify as built-up, at least five structures (residences, gas stations, stores) must exist within 1/2 mile if along one side of the road, or else exist within 1/4 mile if on both sides of the road.

Structures marked **b** through **f** meet the minimum density along a distance of 1/2 mile (distance marked **C**). Structures **a** through **e** also meet the minimum density (distance marked **C**) because the section of road is continuous.

Structure **g** cannot be connected to at least four other structures within a distance of 1/2 mile along one side of a continuous road. Structure **g** is therefore not classified as built-up. A sample point at the location of structure **g** would be classified as other rural land (land cover/use code 650).

Documentation of top half of figure 2. The boundaries of built-up are delineated in figure 2. Structure **f** is a residence on a large lot. The lot is recognizable on three sides by a distinct break in cover from surrounding rural land. The fourth side is defined by the right-of-way of a road (marked **B**).

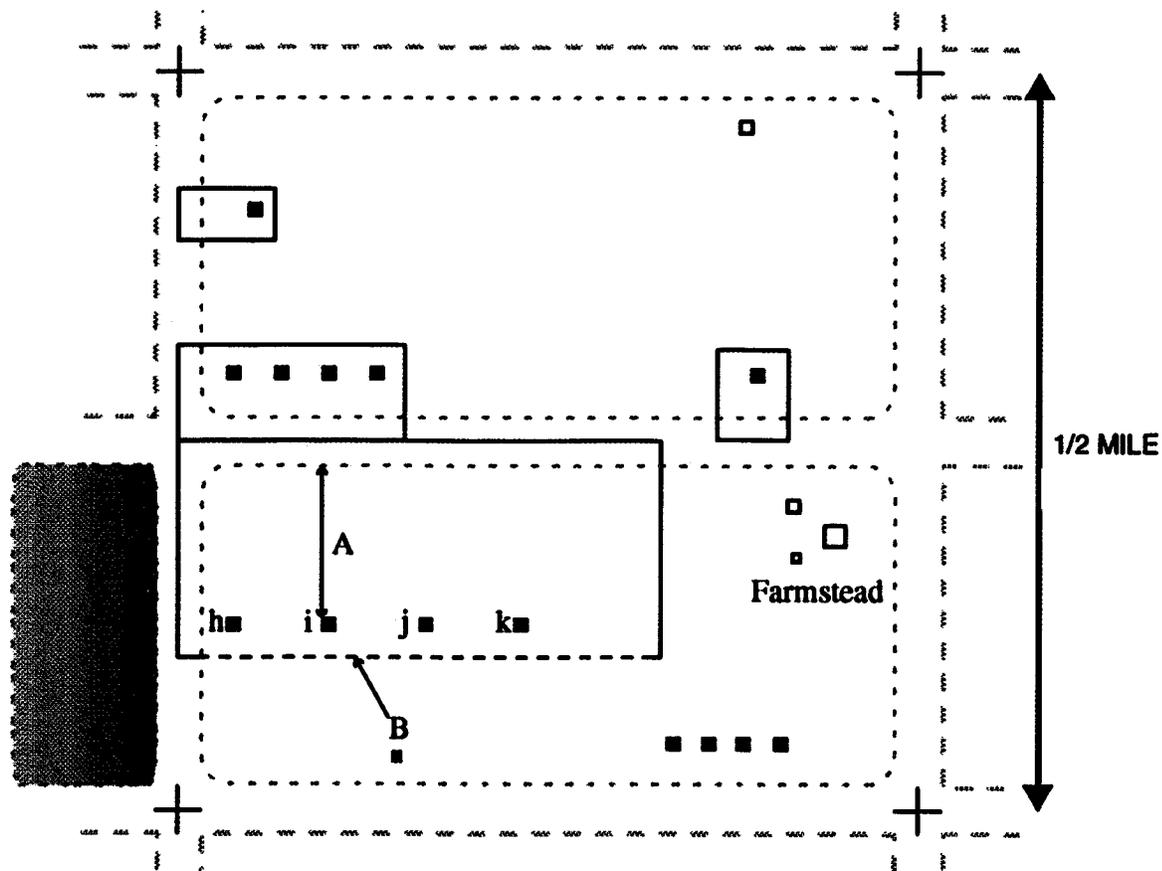
Structures **a**

(marked A) is about 500 feet. The land between boundaries established for structure a and structures b through e is forest land. Establish a boundary 50 feet behind structures b through e (marked B). Three separate areas or map polygons of built-up land areas are drawn.

Refer to the guidelines for establishing boundaries where land use change is not obvious. Include the area between structures that are less than 500 feet apart. If the distance between structures is more than 500 feet and there is no obvious boundary, then the maximum distance from the side of the structure is 50 feet.

Three boundaries are established around structures a through f on figure 2. The area of urban and built-up extends to the middle of the road. The entire road right-of-way, regardless of size and surface, would be included if built-up areas are along both sides.

Figure 3

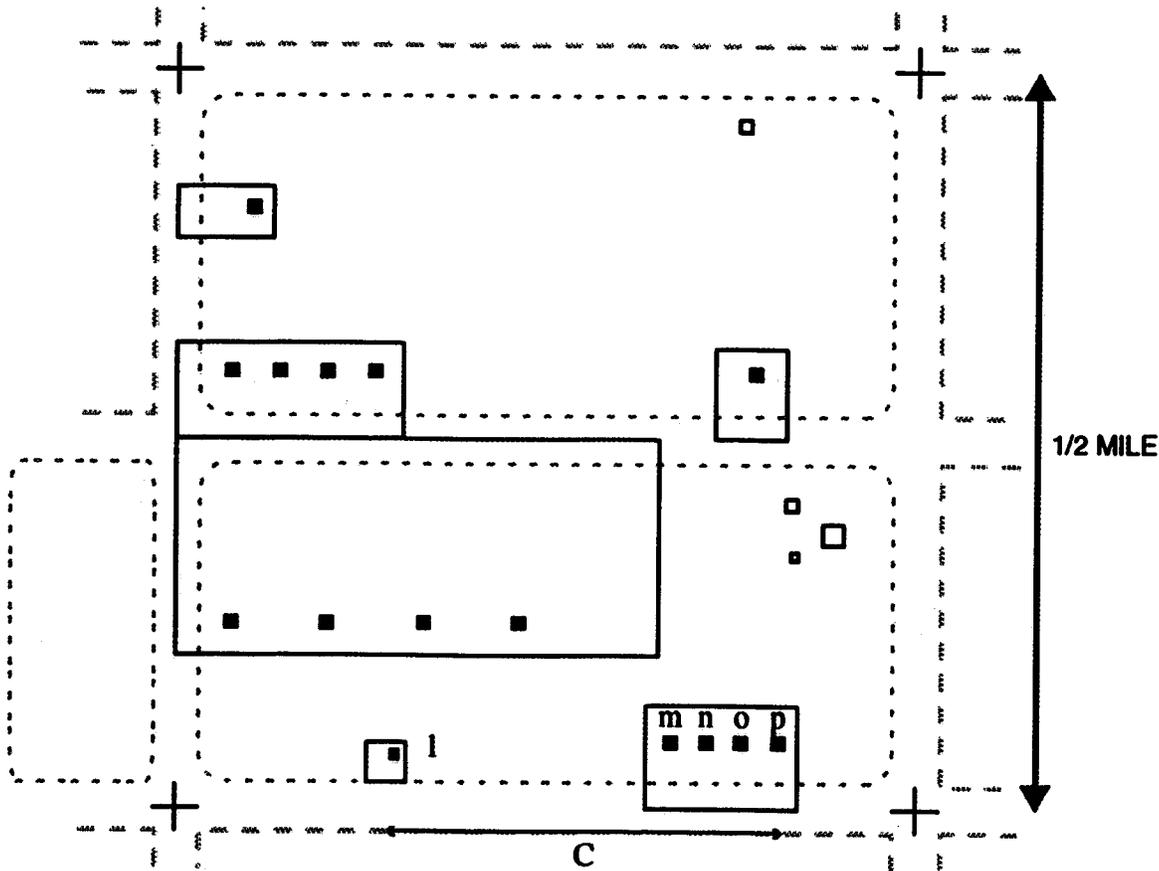


Interpretation of bottom half of figure 3. Examination of figure 3 indicates structures h through k are large residences with maintained frontages. The frontages are over 600 feet from house to road right-of-way (marked A). The margin of the PSU (lower left corner) is adjacent to a dense housing tract (shaded). A farmstead is clearly identifiable and has been included as Farmsteads and is not included as urban and built-up.

Structures h through k qualify as urban and built-up because they are contiguous with the adjacent urban area (shaded) along the margin of the PSU. Distances of 300 feet separate the residences, and

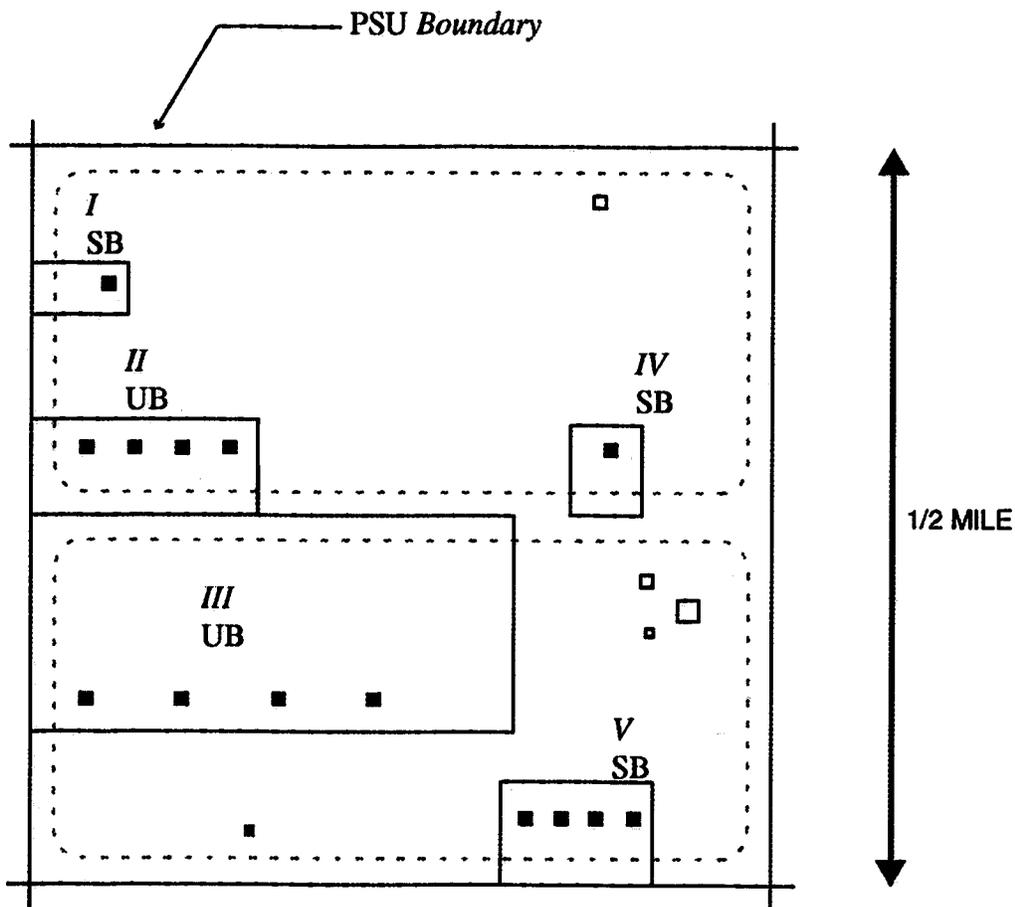
there is no break in land use. Structures **h** through **k** also meet the density criteria when combined with structure **b** through **e** across the road. Density guidelines of “at least five structures on both sides of the road over a distance of 1/4 mile” are met. Boundaries of the built-up area around structures **h** through **k** are defined by distinct boundaries with other rural land and road rights-of-way.

Figure 4



Interpretation of figure 4. Structures **l** through **p**, along the bottom margin of the PSU meet the density requirement of five structures along one side of a road within a distance of 1/2 mile. Their boundaries are distinct. However, structure **l**, a residence, includes an area of less than .025 acre and is separated from structure **m** by more than 500 feet of rural land use. Structure **l** may be used with structure **m** through **p** to measure density. Because structure **l** is so small, it cannot be included in the area delineated as built-up. Additional road rights-of-way are included in the built-up area.

Figure 5



Measurement of figure 5. All of the built-up areas that have been delineated (figs. 2-4) are measured. Figure 5 shows all built-up delineations in areas I through V with the following acreage:

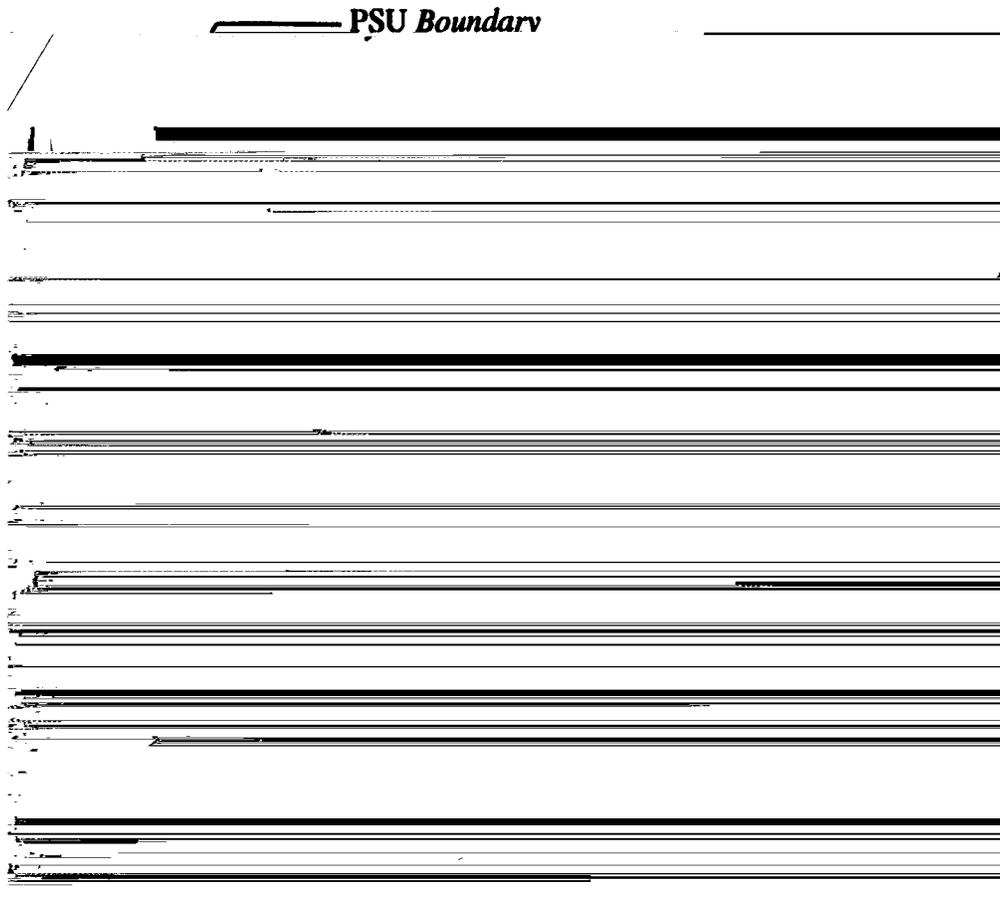
Area	Acres
I	2.3
II	7.5
III	31.6
IV	2.1
V	3.9

Classification of Small built-up or Large urban and built-up. Areas of large urban and built-up (UB) are differentiated from the small built-up (SB) areas. Area I is not contiguous with other built-up areas and is less than 10 acres. It is classified small built-up (SB). Area II is 7.5 acres. However, it is not small built-up because it is contiguous with area III (31.6 acres), which is large urban and built-up. In addition, area II and III are contiguous with the large urban and built-up area outside the PSU. Areas II and III are labeled **UB** (large built-up). For mapping convenience, areas II and III in the PSU could be joined as one unit. Areas IV and V are each less than 10 acres and are not contiguous with other areas of urban and built-up. Each is therefore classified as small built-up (SB).

Examples for Rural Transportation

Public roads include interstate highways, state highways, and county roads that are paved, asphalt, gravel or dirt. The identification of rural transportation can not be accomplished until after all Farmsteads and Built-up areas have been identified and delineated. Built-up areas along public road rights-of-way extend to the midpoint of the roads. The portion of roads included in built-up areas are not included as part of rural transportation.

Figure 6 Identification and delineation of public road areas within a PSU

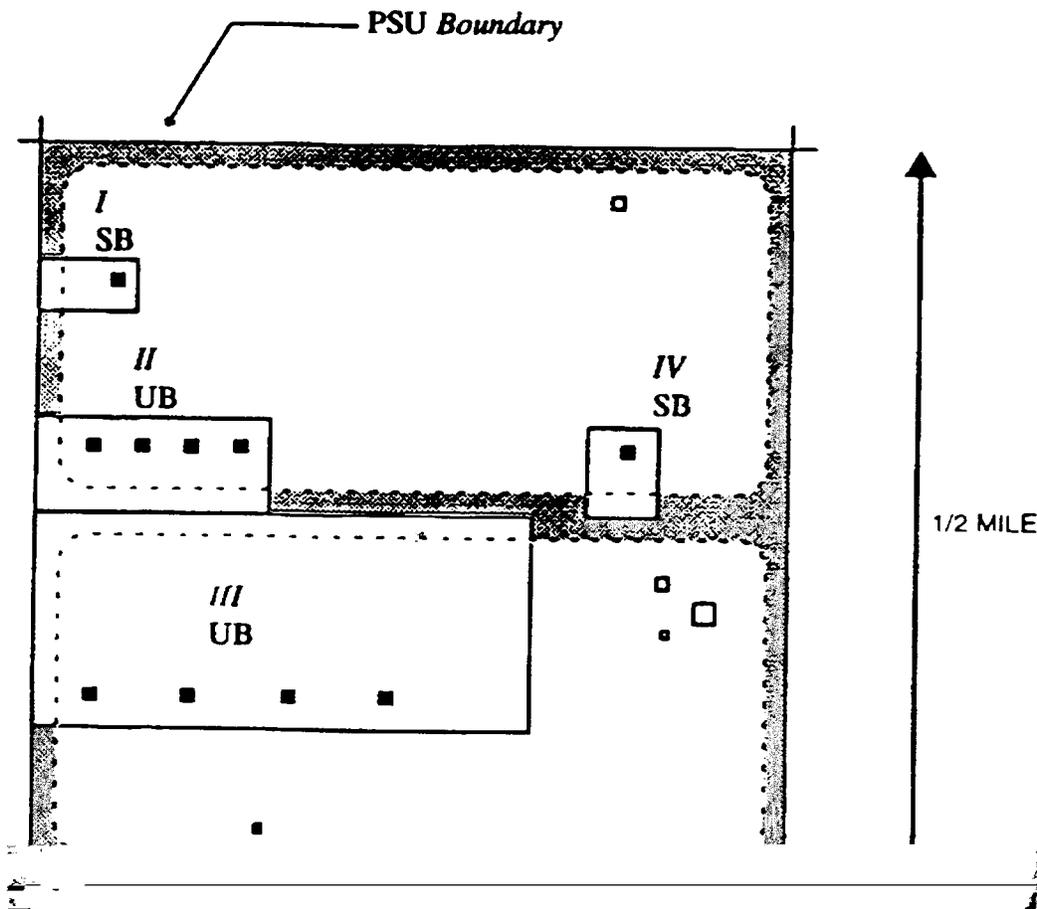


Identification of rural transportation. Figure 6 illustrates an identification and delineation of public road areas within a PSU. The darkened area includes all public road rights-of-way within the PSU and outside of built-up areas. If railroads or private roads occurred in the PSU depicted in figure 6, they would also be delineated and labeled.

Measurement of public roads. Measure the total area of public roads within the PSU boundary of figure 6. Area of public roads within the PSU is 7.8 acres. This amount would be entered in the PDA under **transportation areas for 1997 - Public roads.**

Delineating change for rural transportation

Figure 7 1992 photography for PSU



Interpretation of 1992 photography. An examination of 1992 photography (fig. 7) for the PSU area found that the strip of four buildings located in the lower right portion of the PSU had not been built in 1992. Change in rural transportation can be caused by development of new or enlargement of roads, abandonment or decrease in roads, or a change in small or large urban and built-up. The road system in figure 7 was the same in 1992 and 1997. However, because of the increase in small built-up, the portion of the public road that is within the PSU and in front of the four new buildings is now classified as small built-up rather than rural transportation.

Measurement. A measurement of the public road area for 1992 within the PSU indicated that area of public roads was 8.0 acres. This, when compared with 1997 information of 7.8 acres, indicated a decrease of 0.2 acre of public roads from 1992 to 1997. The 8.0 acres measured from 1992 photography would be entered in the PDA under **historic transportation acres - Roads**.

Table 1 Rural and nonrural land use classification

Types of areas	Farm/ranch HQ	Built-up	Public roads	Railroad
Commercial feed lots	never	never	never	never
Greenhouses	never	never	never	never
Poultry facilities	never	never	never	never
Overnight livestock pastures	never	never	never	never
Field windbreaks	never	never	never	never
Strip mines, quarries, gravel/borrows pits	never	never	never	never
Airports	never	always	never	never
Cemeteries	never	always	never	never
Commercial/industrial sites	never	always	never	never
Construction sites	never	always	never	never
Golf courses	never	always	never	never
Institutional sites	never	always	never	never
Parking lots	never	always	never	never
Playgrounds with permanent structures	never	always	never	never
Public administration sites	never	always	never	never
Railroad yards	never	always	never	never
Sanitary landfills	never	always	never	never
Sewage treatment plants	never	always	never	never
Water control structures and spillways	never	always	never	never
Dense residences	never	always	never	never
Rural residences	never	never	never	never
Farmsteads and ranch headquarters	always	never	never	never

PSU Module II Glossary

(The following definitions are extracted from the 1997 National Resources Inventory glossary.)

Commercial/Industrial. A use of land category (under Business/Commercial) that includes downtown areas, shopping malls and centers, strip shopping/businesses, lodging facilities, resorts, marinas, manufacturing buildings and plants, warehouses, docks and port facilities, truck terminals, tank farms, airports, and heliports. [NRI-97]

Construction site. A portion of the urban and built-up area of land where earthmoving and building activities in addition to roads are evident. [NRI-92]

County base data. The basic statistics for the surface area of a county that include total surface area, large water areas, Federally owned land, and land devoted to rural transportation facilities and right-of-ways. As per interagency agreement, Bureau of the Census figures are used for total surface area. [RISS]

Isolated rural residences. Dwellings that are a part of the rural areas that do not meet the classification of built-up because of insufficient density of structures and size of area. [NRI-97]

Private roads. A category of rural transportation areas that includes logging roads, private roads to farmsteads, and private roads to ranch headquarters. Farm field lanes are not included in rural transportation. [NRI-97]

PSU Support Map. A map used as a permanent record to document the extent and location of where data elements were collected. A separate PSU support map is created for each PSU. A different PSU support map is created for each new data collection activity for which the PSU is included in the inventory sample. For example, a PSU selected for the 1982, 1987, and 1992 inventories has three separate PSU support maps, one for each year. [NRI-92]

Public roads. A category of rural transportation areas that includes Federal highways, state highways, county roads of all types, and the associated rights-of-way. Abandoned public roads that are still in usable condition are included in the public road category. [NRI-97]

Railroads. A category of rural transportation areas that includes all operational rail systems and their rights-of-way areas. Abandon railroad beds are not included as railroad areas. [NRI-97]