



ASSESSMENT OF PUBLIC FACILITIES

Part of
Social and Planning Study of Youth Needs in
Yanbu Al Sinaiyah

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I. INTRODUCTION

The first step in the preparation of needs analyses consists of compiling a detailed inventory of all existing open space and recreation facilities. An inventory of this type, if properly organized and researched, can provide important indications of community recreation participation and ultimately the adequacy of existing recreation resources. An inventory of existing supply represents the summation of the community's recreation potential. From here one must look at potential recreation participation in order to determine the actual demand upon existing facilities and demand for new or different recreation opportunities. Demand analyses for recreation indicate what people do, how people feel and what people want in the way of open space and recreation. By comparing this information with a detailed inventory of existing recreation opportunities it is possible to determine community needs for open space and recreation. Such determinations can be used to make appropriate policy, allocation and site specific decisions with regard to planning community recreation.

An assessment of the existing public facilities including parks, schools, and mosques at Yanbu was carried out using a Geographic Information Systems (GIS). The GIS is a computerized mapping system that enables both visualization and analysis of spatial data and their non-spatial attributes. The main benefits of using such a system are:

- Knowing the distribution of parks and their overall score for condition, safety, and maintenance can show geographic regions that are in need of additional care and attention to increase access and use.
- The density of certain features could also be determined in a GIS and compared to the locations of potential users of those features. This information would provide administrators with input useful for planning and evaluation.
- By knowing this information, future sites are able to be chosen based on a greater number of important factors such as potential users and the lack of certain facilities in the geographic area.

- Utilizing a GIS system allows for relationships between location and quality to be analyzed, rather than simply mapped.
- Service area maps compare the current status of sites
- A key principle of GIS is the ability to overlay these different types of data for a geographic area such that the spatial relationships between them may be assessed. GIS may therefore be used by park and recreation providers not only to display service areas of their facilities on the basis of walking distances to them, but also to determine the proportion of residents who are served by, or have access to, them.

II. OBJECTIVE

- To identify the recreation needs of the community.
- To make an inventory of existing parks and recreation facilities.
- To map the existing facilities and analyze the future requirement using GIS.
- To locate neighborhood park and recreation facilities to be easily and safely accessed by most people, especially children.
- To utilize smaller sites for youth sport activities (vs. large-scale, regional facilities to which people must drive).
- To utilize public facilities, such as schools, as multi-purpose facilities, especially for recreation services.
- To develop standards for neighborhood parks and recreational facilities.
- To use standards for neighborhood park and recreation facilities to identify under-served areas in the community.
- To identify existing sites or (if necessary) acquire new sites appropriate for development of additional neighborhood park and recreation facilities.
- To develop facilities for youth sports using local parks, school sites, commercial buildings, open space areas, and other sites.

III. THEORITICAL BACKGROUND

The use of population-based standards represents one of the most widely used methods for assessing community demand and need for open space and recreation. The popularity of this method among recreation planners results from the fact that standards are easily understood and administratively convenient. They serve to indicate the adequacy or inadequacy of existing recreation supply in terms of geographically distinct segments of the population, and can be extremely useful in targeting specific neighborhood deficiencies.

As with all methods for assessing community demand for recreation the use of standards has certain limitations. To rely solely on standards, it first must be assumed that all factors affecting recreation opportunities are the same throughout the area in which the standards are applied; second, that all recreation facilities of the same type are identical; and third, that all demographically distinct segments of the population have identical needs and wants for recreation. Because of the broad nature of these assumptions the accuracy of demand analyses generated by studies of recreation standards is questionable. In the long run, standards prove most useful as a means for generating alternatives for consideration and as a means for supporting or offsetting participation data. Both the federal government through the Bureau of Outdoor Recreation and independent researchers has developed recreation standards. They vary to some extent given differences in the basic premises of the research, and recreation planners must be prepared to select the set of standards perceived most applicable to the community. The following tables contain recreation standards collected from various sources.

Neighborhood parks

A. Size and location

- (1) One acre for each 1,000 of total population
- (2) Preferably in combination with a playground, playfield, school or community center - or may be part of a large park
- (3) Within easy walking distance of every home – within 1/4 to 1/2 mile of the resident population, depending upon population density and ease of access
- (4) 4 - 7 acres when developed as an individual unit, 2 - 4 acres when developed adjoining an active recreational area

B. Relatively small park area developed with lawn areas, shrubbery, trees, walks, picnic areas etc. to afford a place for quiet, passive recreation for all ages.

Large parks

A. Size

- (1) One for each 40,000 persons
- (2) Each park about 100 acres or more in size

B. Size, distribution and location to be determined by natural features

Setting standards, planning guidelines and policies

Within the framework of the method or strategy selected, specific planning guidelines and standards can be set. These can be incorporated into overall planning policies to direct development over a specific period of time. Standards can be stated in specific terms as to what type of development should take place and to what degree it will be carried out. Standards can be expressed in quantitative statements or as quantified objectives, such as population ratios. In either case, the standards that are set should be a direct reflection of community preferences and need; should be reasonably attainable and reviewed regularly. Although these standards give

direction and offer a means of evaluation, they should be treated as flexible guidelines. Standards in use by other communities and agencies can be used as planning aids - Recreation departments, starting the task for the first time find other standards useful for comparison or as a starting point. There are examples of these within the tables shown.

Regional Park

A regional park is a park with a fifty-mile service radius that serves several communities or a multi-county region. Approximately 10 acres per 1,000 population served is the standard for providing regional park acreage and generally 400 to 1,000 acres is required for development. The regional park provides access to diverse and unique natural resources for nature oriented outdoor recreation such as nature viewing and study, wildlife habitat conservation, hiking, camping, canoeing and fishing. Usually 80% of the land is reserved for conservation and natural resource management, with less than 20% of the site developed for active recreation. The recreation areas consist of play areas and open fields/meadows for informal use. Exhibit 3-1 illustrates a typical regional park.

District Park

A district park provides more diverse recreational opportunities than the regional park. The district park emphasizes passive recreational opportunities that are similar to the regional park in addition to including limited active recreational facilities. It is easily accessible by the population (typically 40,000) it serves and maintains a 2½ -5 mile service radius. The park contains a minimum of 5 acres per 1,000 population and should be a minimum of 200 acres in size.

Community Park

A community park is easily accessible to either a single or several neighborhoods depending on local needs and population distribution at the time the park is

developed. When possible, the park may be developed adjacent to public schools to provide multiple or joint use of facilities. The community park provides recreational opportunities for the entire family and contains areas suited for intense active recreational purposes including a recreation center building, athletic fields, swimming, tennis, and walking/jogging trails. The park may also possess areas of natural quality for passive outdoor recreation such as viewing, sitting, and picnicking.

Neighborhood Park

A neighborhood park is designed to serve a population of up to 5,000, but in many instances it may even serve more. The park requires 2.5 acres per 1,000 population served and should be a minimum of 7 to 15 acres. Neighborhood parks are typically characterized by recreational activities for each member of the family, such as field games, court games, crafts, playground apparatus, picnicking, and space for quiet/passive activities.

Determining Pedestrian Accessibility

Geographic buffers are commonly used to determine the characteristics of an area within close proximity to transit service, as well as a means to measure the pedestrian accessibility of an area. These buffers are typically defined by circle-shaped polygons which have a radius defined by the maximum distance a person is likely to walk for high capacity transit service. The more commonly used distances are quarter mile, half mile and one mile. Another method that has recently gained a lot of attention in the modeling and research communities involves the development of network-based polygons that are constructed from the actual pedestrian network for an area, as opposed to the “as-the-crow-flies” method that defines the circular-polygons. Because of this characteristic, the network-based approach can be used to provide a better understanding of the overall pedestrian accessibility of an area.

Framework for Assessing Recreation Facilities

- Background or preliminary analysis
- Inventory analysis
- Evaluation of current systems
- Formulation of goals and objectives
- Developing alternate strategies
- Selecting the preferred strategy
- Setting standards, planning guidelines and policies
- Recommendations for action
- Demography and Community Needs Assessment
 - Study the past, present and future population trend and structure
 - Identify the recreation needs of the population
 - Prepare data for input in spatial analysis
- Criteria
 - Develop criteria for recreation facilities development based on consultation and international standard
 - Minimum site area for each activity and population size
 - Minimum service area of the facilities and accessibility requirement
- Spatial Analysis
 - Analysis and evaluation of the existing facilities based on the developed criteria
 - Identification of gaps in the coverage of the facilities and neighborhood segregation
 - Develop scenarios for future facility development

Specific Guidelines

These specific criteria may help:

- locate playgrounds for very small children within viewing and hearing distance of the largest number of dwelling units for parental supervision.
- develop playgrounds that respond to the child's total developmental needs, including physical, social, creative and reflective or feeling needs
- locate playgrounds within walking distance of the greatest number of users; avoid crossing major traffic arteries.
- linkage of play space with other open space is desirable
- develop natural barriers or features to segregate area from conflicting or incompatible use
- organize play zones to facilitate visual and physical accessibility between zones
- locate adult sitting areas for pre-school playgrounds to provide for ease of supervision and for privacy
- supply appropriate lighting for night use and security
- provide shelter from wind, rain and sun; adequate washrooms and water fountains are essential
- design facilities to permit use by the handicapped
- scale equipment and apparatus to the size of the intended users
- if mixed age group is anticipated, provide protective separation of small-scale
- maintenance and waste disposal
- maintain high safety standards

By drawing careful comparisons between existing recreation supply and the community's current recreation demand the recreation planner will be able to determine the community's need for recreation. To facilitate the drawing of this comparison and the application of the resulting conclusions, it is best to organize this analysis on the basis of individual recreation activities. Because the supply of recreation resources for each activity can be represented in numerical form, drawing comparisons between these numbers and unquantifiable measures of recreation demand, may present the recreation planner with some problems. It is vital for the

recreation planner to remember at this stage of the analysis that there are no cookbook recipes for assessing recreation needs. A considerable degree of latitude exists in the determination of community need for recreation and the recreation planner must be prepared to look carefully at all data and exercise personal judgment in making final assessments. In terms of recreation policy, needs analyses can form the basis for the establishment of the goals and objectives for future recreation plans. They can be used to support allocation decisions such as the categorization of activity-specific resources, programs and facilities which the community should provide.

IV. DATA SOURCES

- Yanbu Al-Sinaiyah Master Plan 2000.
- City Development Plan of 2006-2020.
- Community Land Use Plan 2006 (jpg file).
- Community Land Use Plan 2006 (dwg file).
- Population and Housing Data as received.

V. METHODOLOGY

GIS database has been created based on the sources mentioned above. The features and facilities need to be identified such as Neighborhoods, Schools, Mosques; Parks have been mapped into the GIS system. All the available attributes are linked with the spatial layers such as population, housing, number of schools in each neighborhood.

The main tool used for our analysis to see the coverage of each facility is buffering the feature with the standards developed earlier. Buffering is done on two different levels: city level and neighborhood level. We have carried out analysis of Mosques and Schools in these two levels. All the results are presented in the Analysis section.

ArcGIS 9.2 software, a package produced by the Environmental Systems Research Institute (ESRI Inc.,) is used for GIS Development and Analysis.

VI. DESCRIPTION OF GIS DATABASE

We have converted the Yanbu data from AutoCAD format to GIS format. The details about GIS database are as:

Projection details:

Projected Coordinate System: WGS_1984_UTM_Zone_37N

Projection: Transverse_Mercator

False_Easting: 500000.00000000

False_Northing: 0.00000000

Central_Meridian: 39.00000000

Scale_Factor: 0.99960000

Latitude_Of_Origin: 0.00000000

Linear Unit: Meter

Spatial Data:

We have created layers as described below:

1. Yanbu Zones: Covers all the zones in Yanbu as shown in Fig
2. Mosques: Covers all the mosques as shown in Fig
3. Parks: Covers all the parks as shown in Fig
4. Primary Boys and Girls Schools
5. Secondary Boys and Girls Schools
6. Intermediate Boys and Girls Schools

Attribute Data:

Attributes such as Zone Name, Zone Type, Schools, Colleges, Recreation Centers, Mosquesm Population of each zone, Housing Units in each zone, and other attributes were created in the GIS data which is shown in Fig

VII. ANALYSIS OF FACILITIES

The analysis was carried out at two levels:

- A. City Level Analysis
- B. Neighborhood Level Analysis

A. City Level Analysis

Neighborhoods = 25

Population = 174873

Housing Units = 50004

Mosques = 110;

Schools = 123

 Qur'anic School = 2

 Secondary (boys & girls) = 8

 Intermediate (boys & girls) = 19

 Primary (boys and girls) = 43

 Kindergartens = 26

 Special School = 3

 Private School = 8

 Tertiary (university, college, institute) = 9

We have done analysis of all the public facilities in both the levels.

Figure 1 shows the total number of Neighborhoods in Yanbu.

Figure 2 shows the Public Facilities at Yanbu.

Figure 3 shows Park Analysis with Buffer of 500m in Yanbu Neighborhoods

Figure 4 City Parks with 3000m Buffer in Yanbu Industrial City

Figure 5 Shows 600m Buffer Analysis around Primary Schools

Figure 6 1600 m Buffer Analysis of Secondary Schools

Figure 7 1200m Buffer Analysis of Intermediate Schools

Figure 8 200m Buffer Analysis of Mosques

Figure 9 Shows Attribute Data of all Yanbu Zones in the GIS Database

Figure 10 Shows attributes of one Yanbu zone extracted by identifying it spatially.

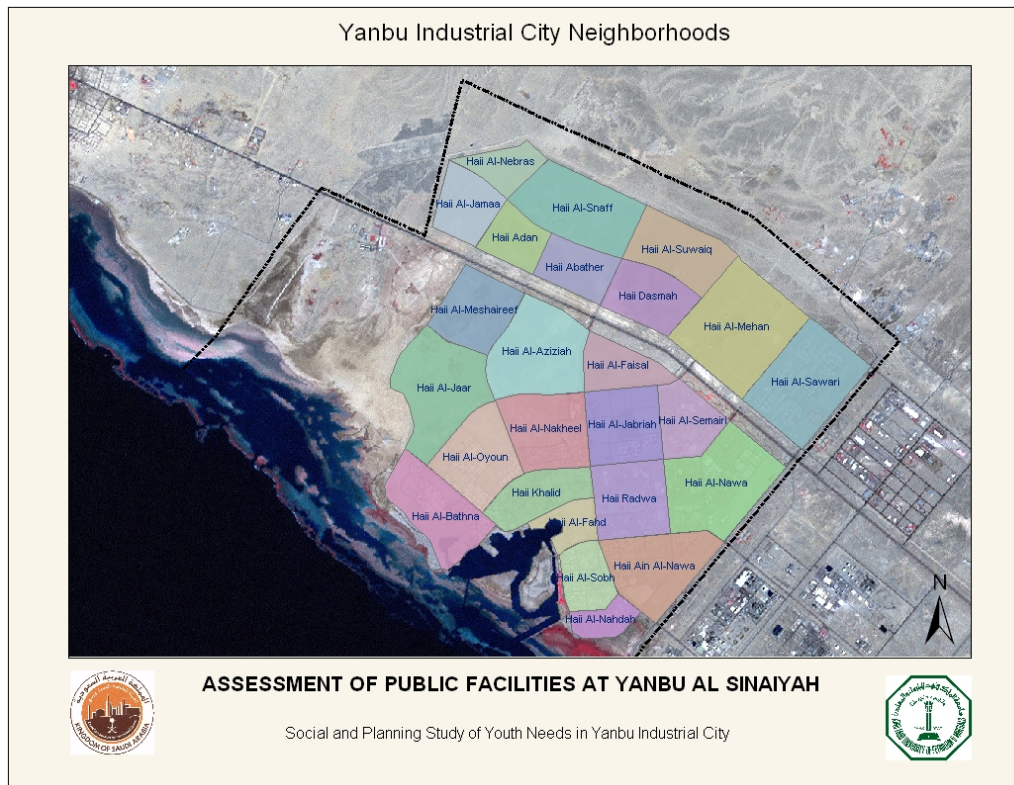


Figure 1 shows the total number of Neighborhoods in Yanbu

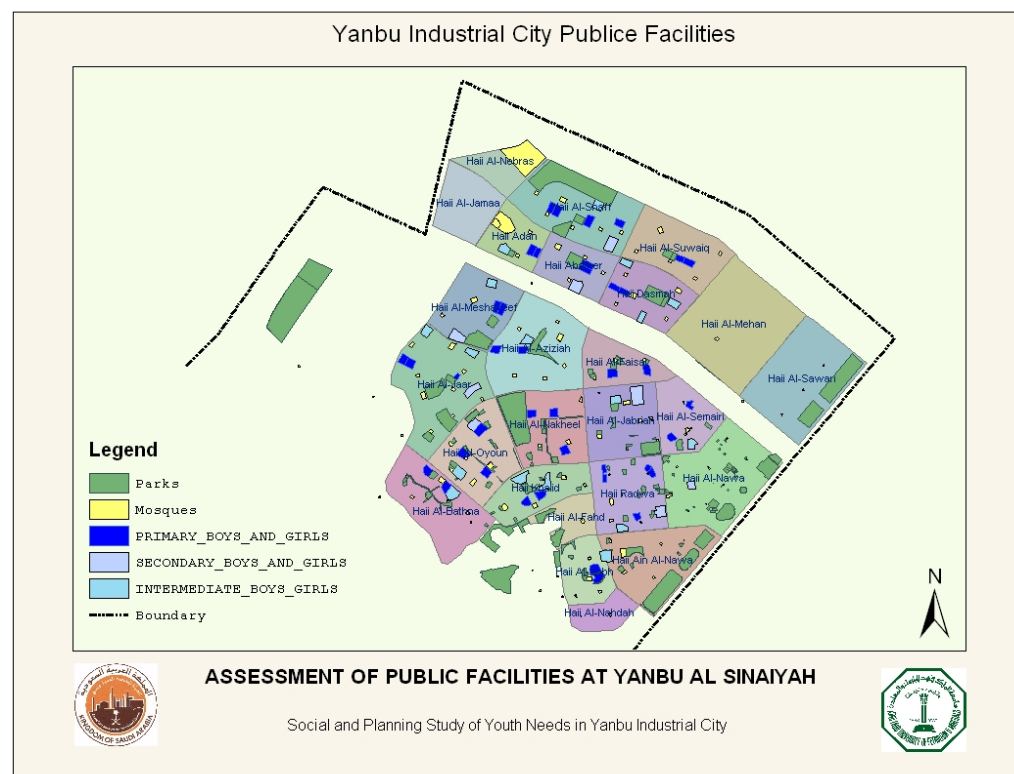


Figure 2 shows the Public Facilities at Yanbu

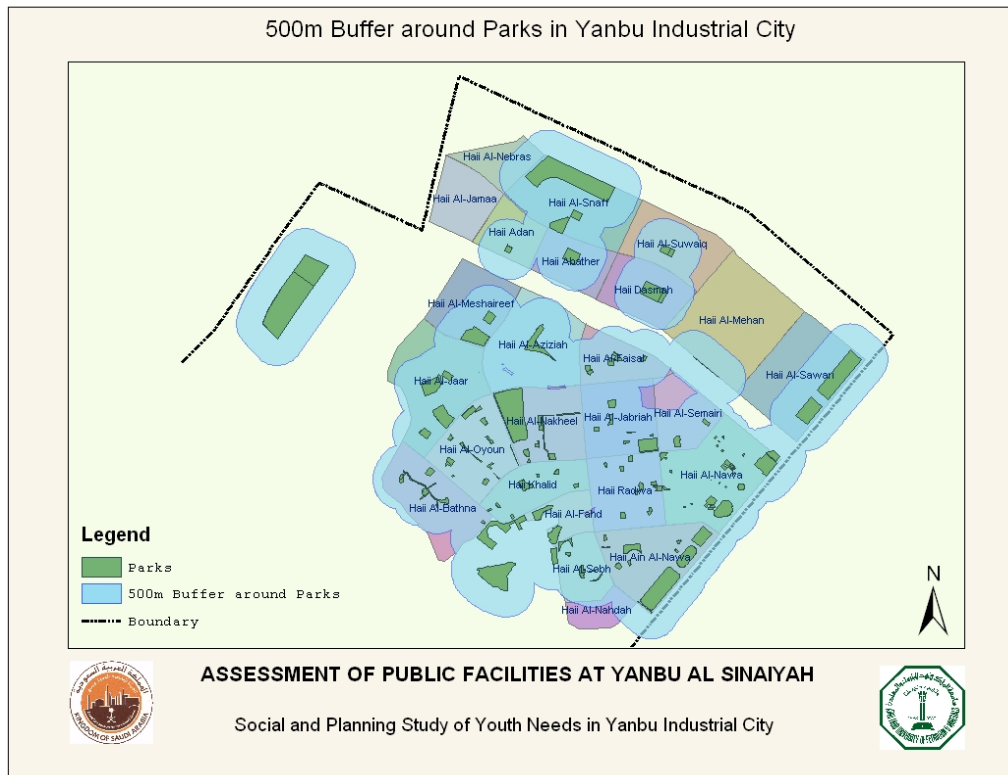


Fig 3. All Parks Analysis with Buffer of 500m in Yanbu Neighborhoods

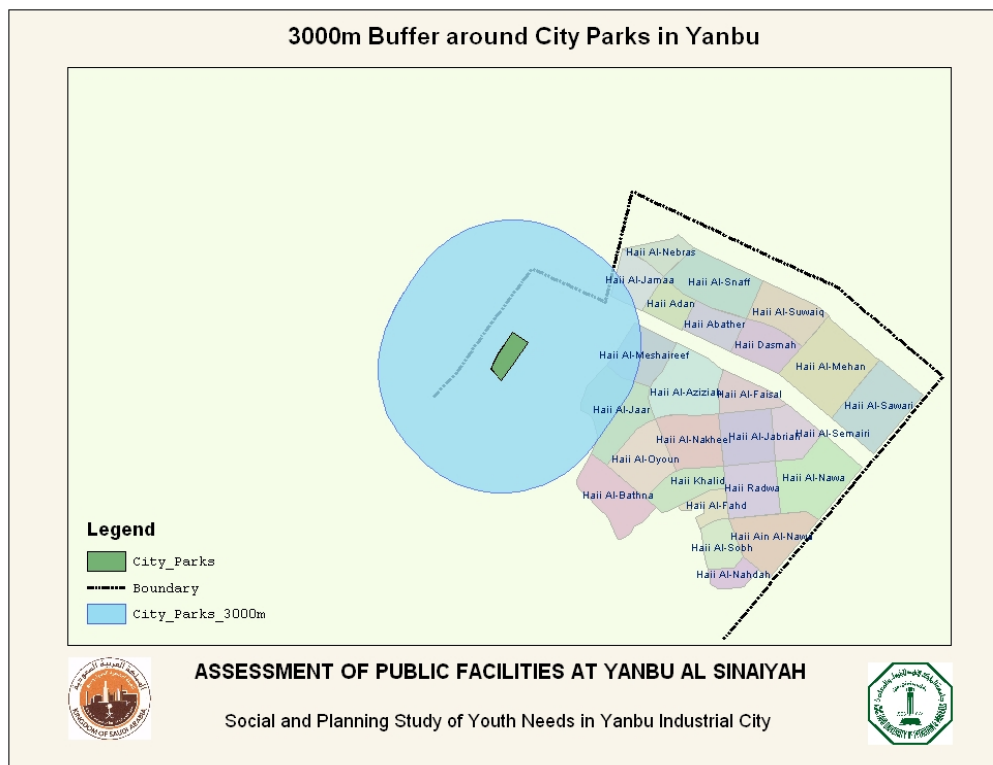


Fig 4. City Parks with 3000m Buffer in Yanbu Industrial City

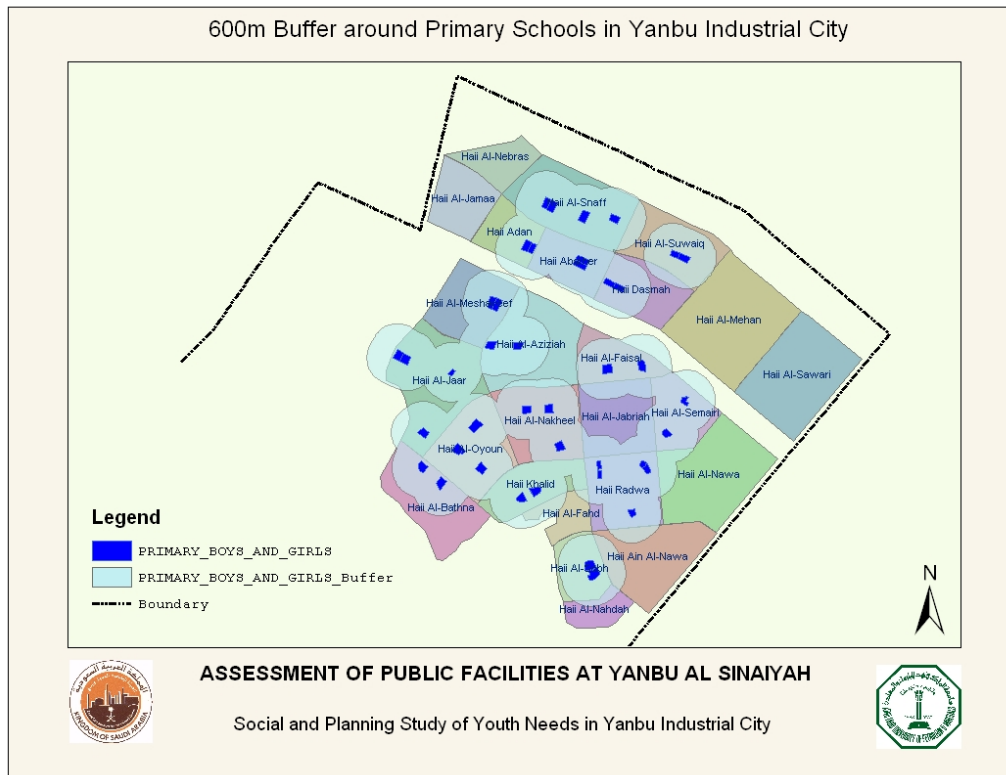


Fig 5. Shows 600m Buffer Analysis around Primary Schools

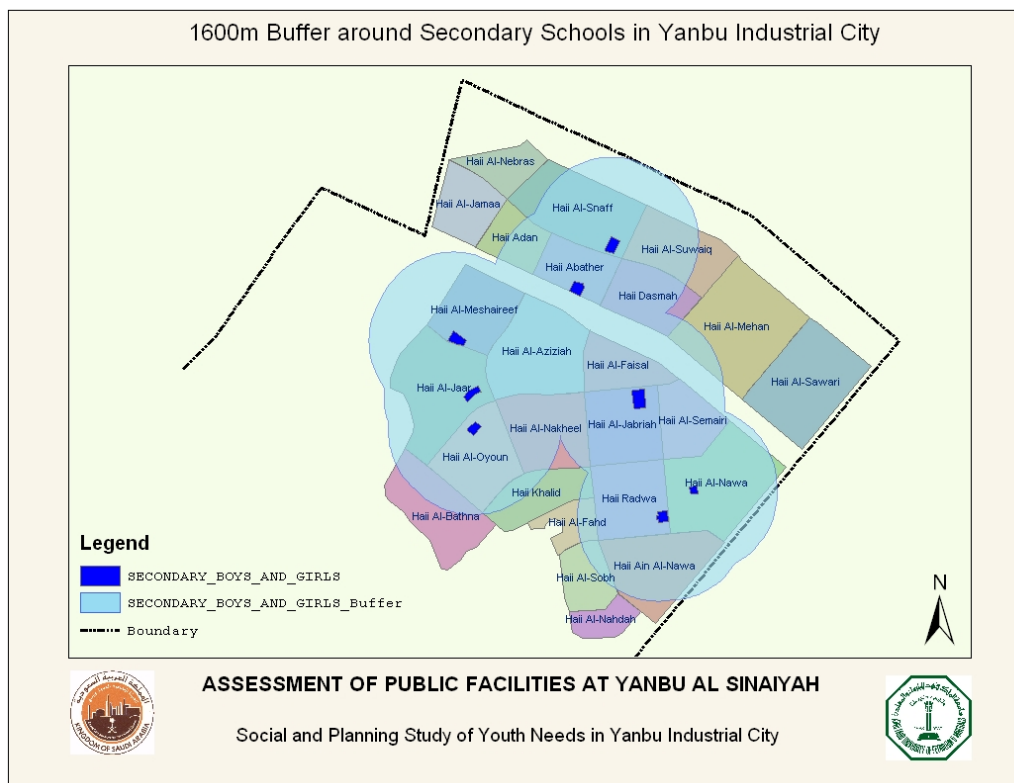


Fig 6. 1600 m Buffer Analysis of Secondary Schools

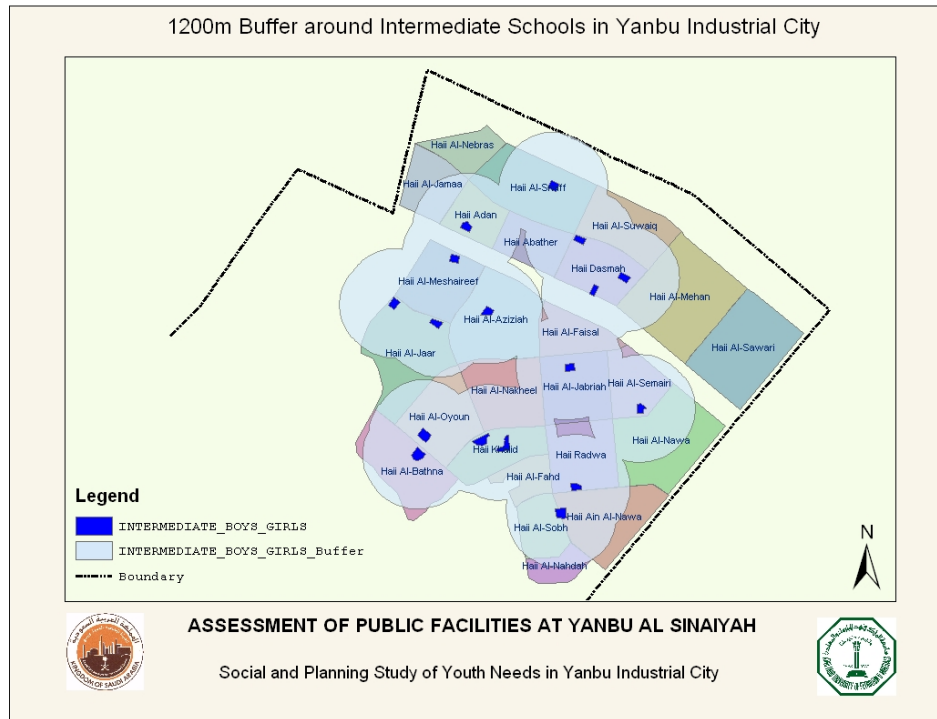


Fig 7. 1200m Buffer Analysis of Intermediate Schools

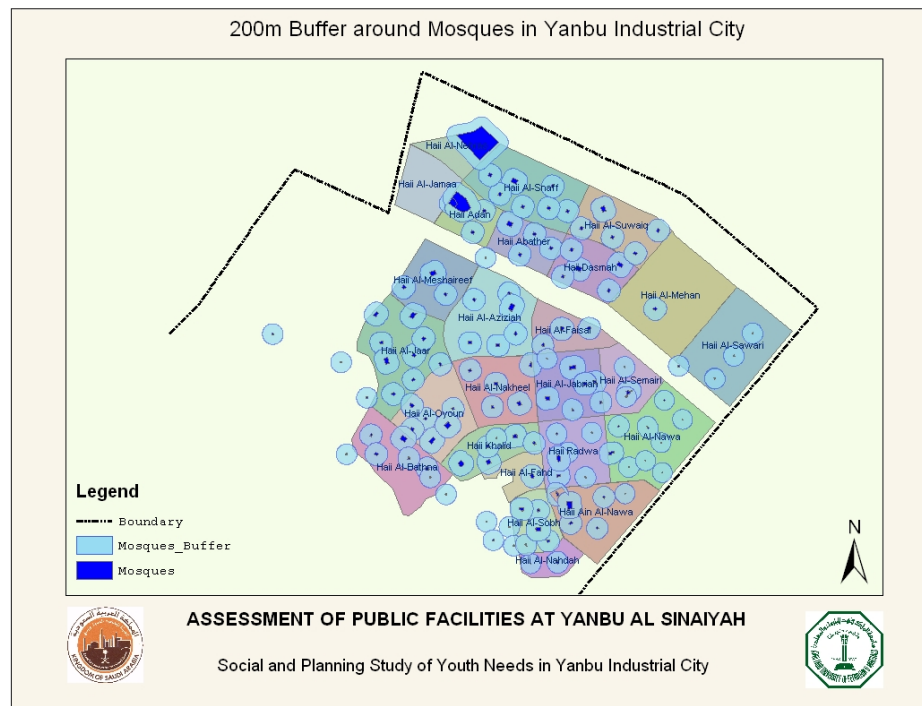


Fig 8. 200m Buffer Analysis of Mosques

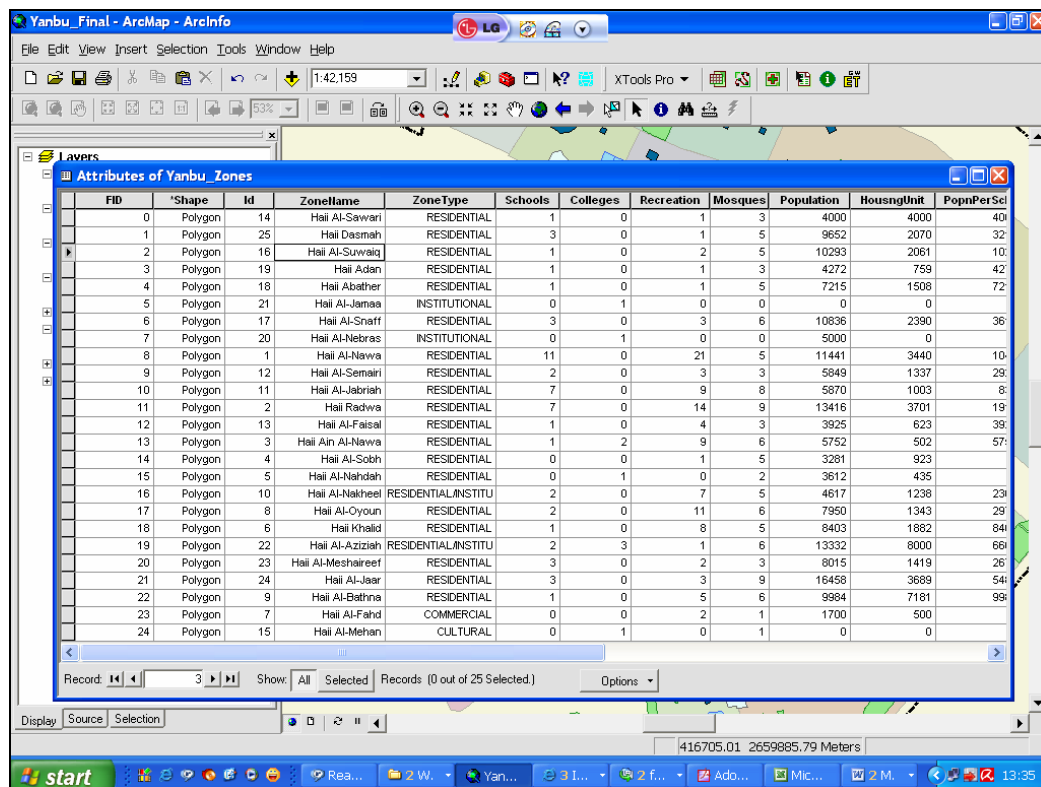


Fig 9. Shows Attribute Data of all Yanbu Zones in the GIS Database

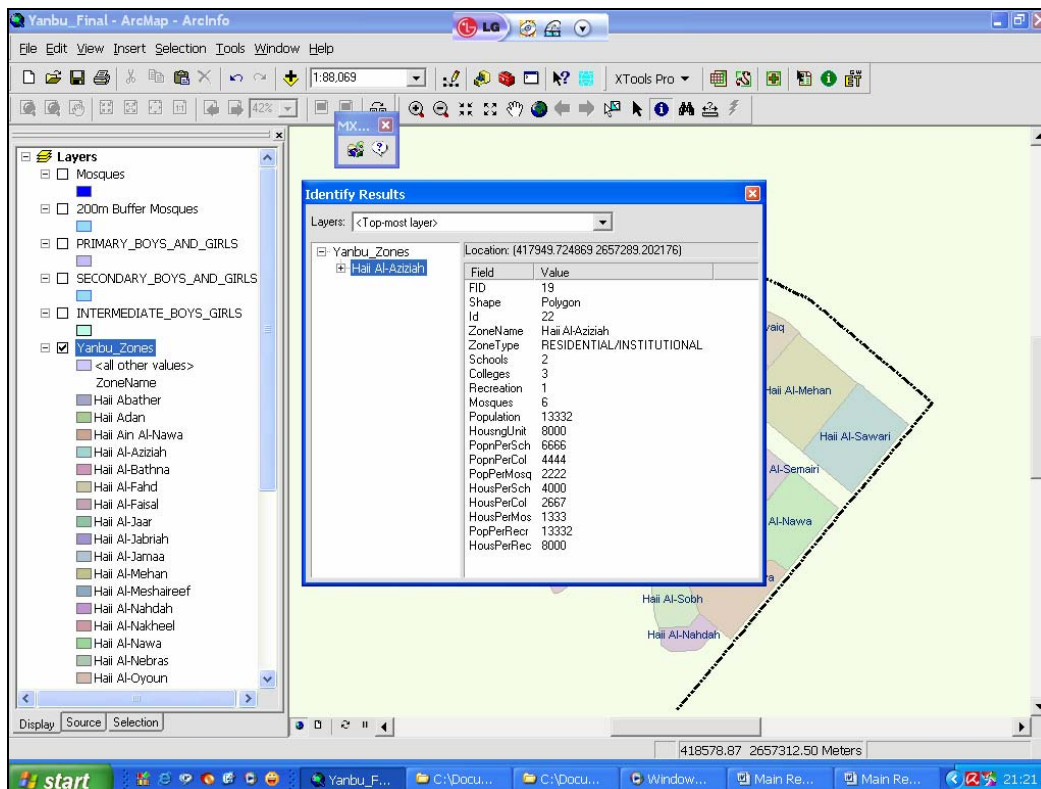


Fig 10. Shows attributes of one Yanbu zone extracted by identifying it spatially.

B. Neighborhood Level Analysis

Each zone is analyzed for its service area for Mosques, Schools, and Parks. Buffering was done based on the standards developed for analysis such as:

200m Distance for Mosques

500m for Parks

600m for Primary Schools

1600m for Secondary Schools

1200m for Intermediate Schools

Each zone is analyzed for its coverage areas.

NEIGHBORHOOD LEVEL BUFFER (200m) ANALYSIS OF MOSQUES AT YANBU

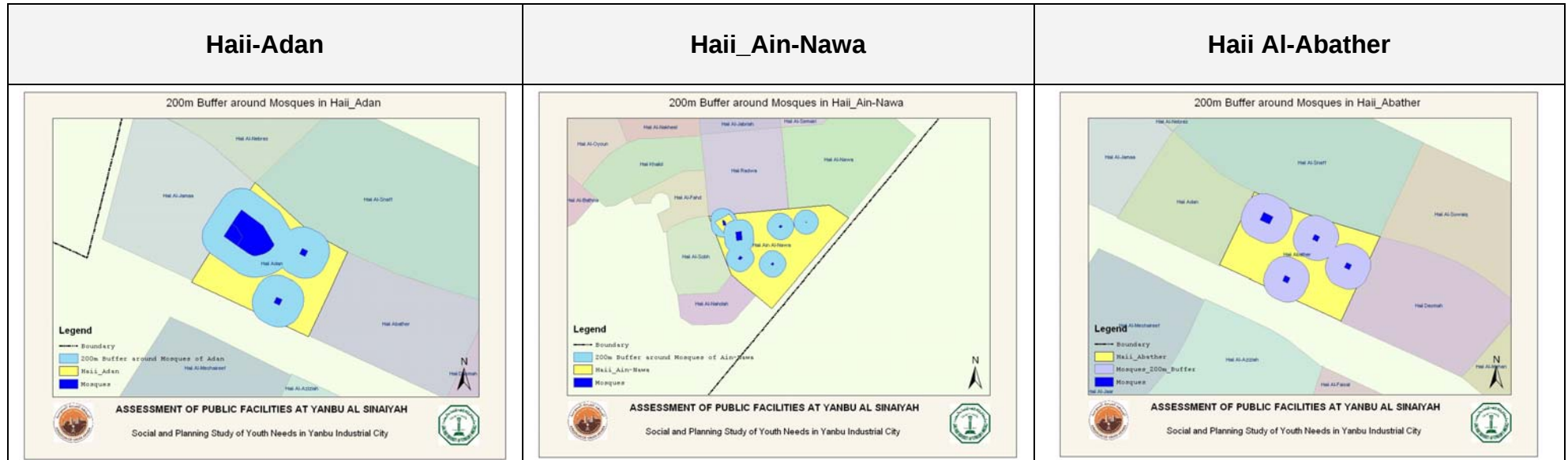


Fig 11a

Fig 11b

Fig 11c

Total Mosques	03
Population	4272
Housing Units	759

Total Mosques	06
Population	5752
Housing Units	502

Total Mosques	05
Population	7215
Housing Units	1508

NEIGHBORHOOD LEVEL BUFFER (200m) ANALYSIS OF MOSQUES AT YANBU

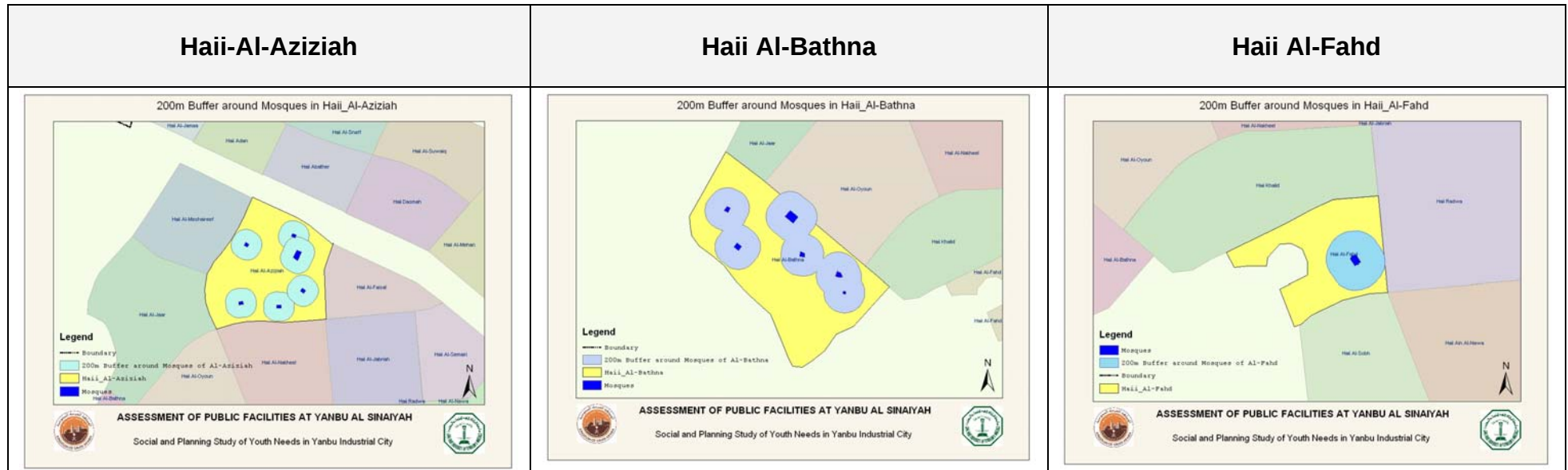


Fig 12a

Fig 12b

Fig 12c

Total Mosques	06
Population	13332
Housing Units	8000

Total Mosques	06
Population	9984
Housing Units	7181

Total Mosques	01
Population	1700
Housing Units	500

NEIGHBORHOOD LEVEL BUFFER (200m) ANALYSIS OF MOSQUES AT YANBU

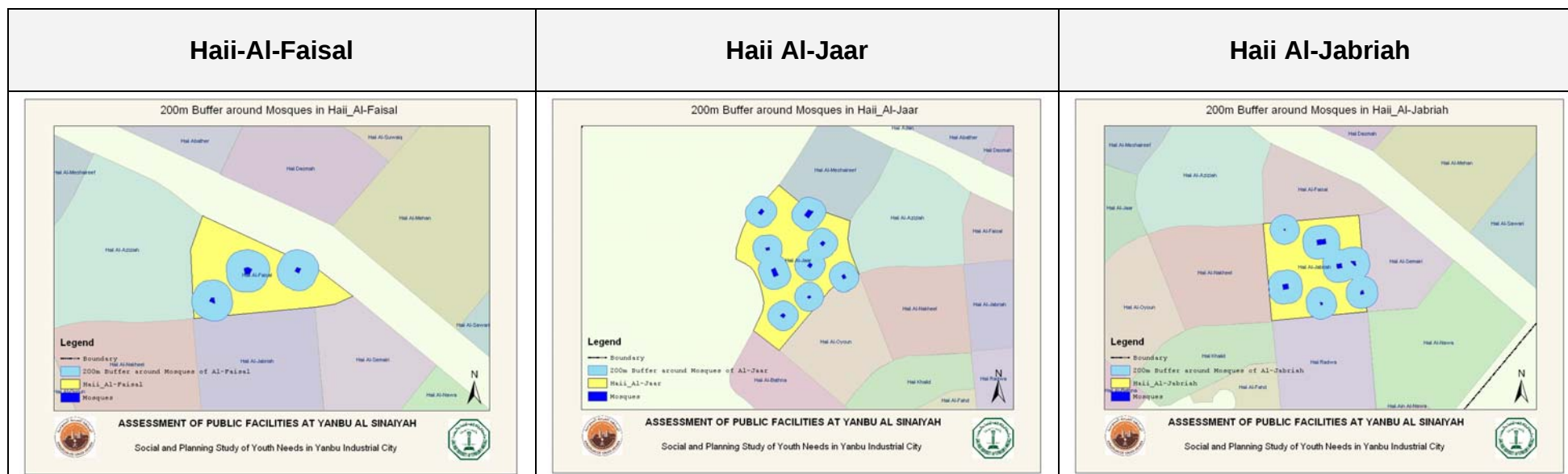


Fig 13a

Fig 13b

Fig 13c

Total Mosques	03
Population	3925
Housing Units	623

Total Mosques	09
Population	16458
Housing Units	3689

Total Mosques	05
Population	5870
Housing Units	1003

NEIGHBORHOOD LEVEL BUFFER (200m) ANALYSIS OF MOSQUES AT YANBU

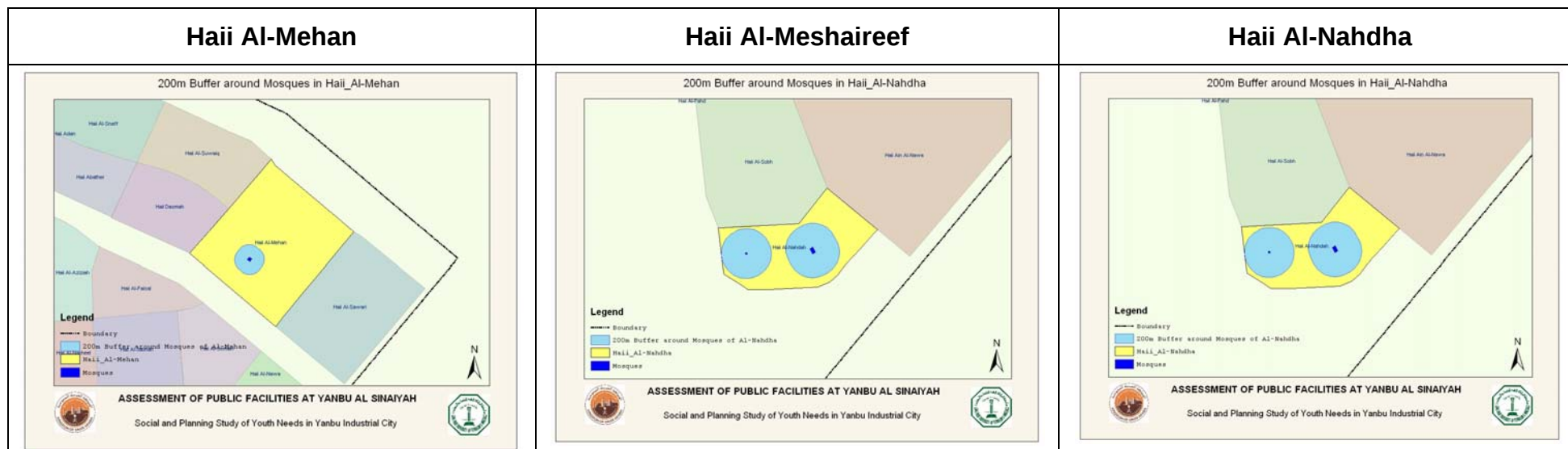


Fig 14a

Fig 14b

Fig 14c

Total Mosques	01
Population	-
Housing Units	-

Total Mosques	03
Population	8015
Housing Units	1419

Total Mosques	02
Population	3612
Housing Units	435

NEIGHBORHOOD LEVEL BUFFER (200m) ANALYSIS OF MOSQUES AT YANBU

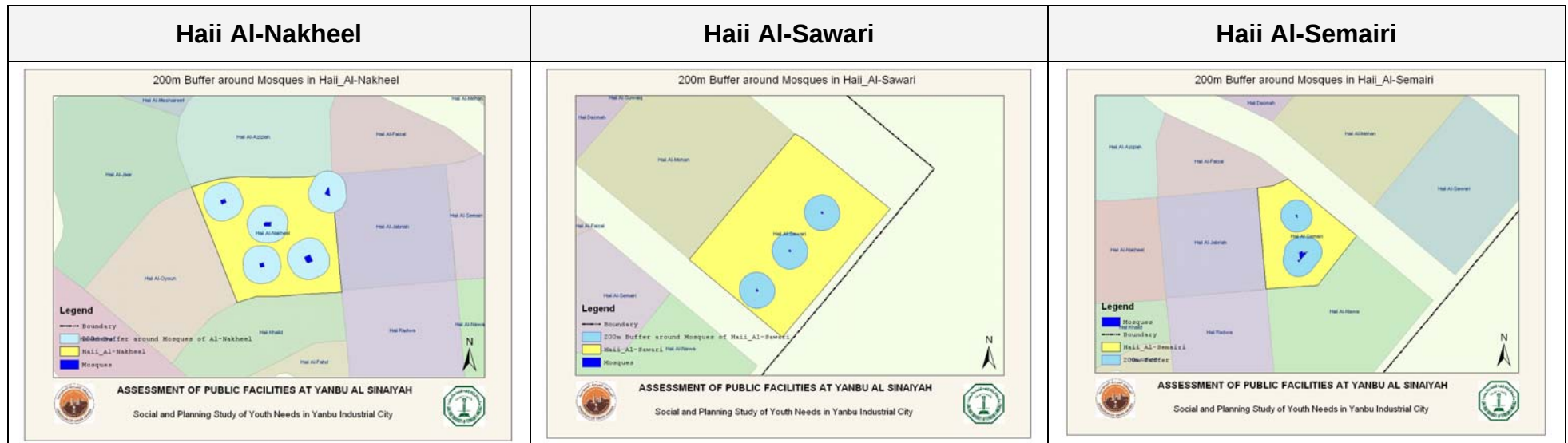


Fig 15a

Total Mosques	05
Population	4617
Housing Units	1238

Fig 15b

Total Mosques	03
Population	4000
Housing Units	4000

Fig15c

Total Mosques	03
Population	5849
Housing Units	1337

NEIGHBORHOOD LEVEL BUFFER (200m) ANALYSIS OF MOSQUES AT YANBU

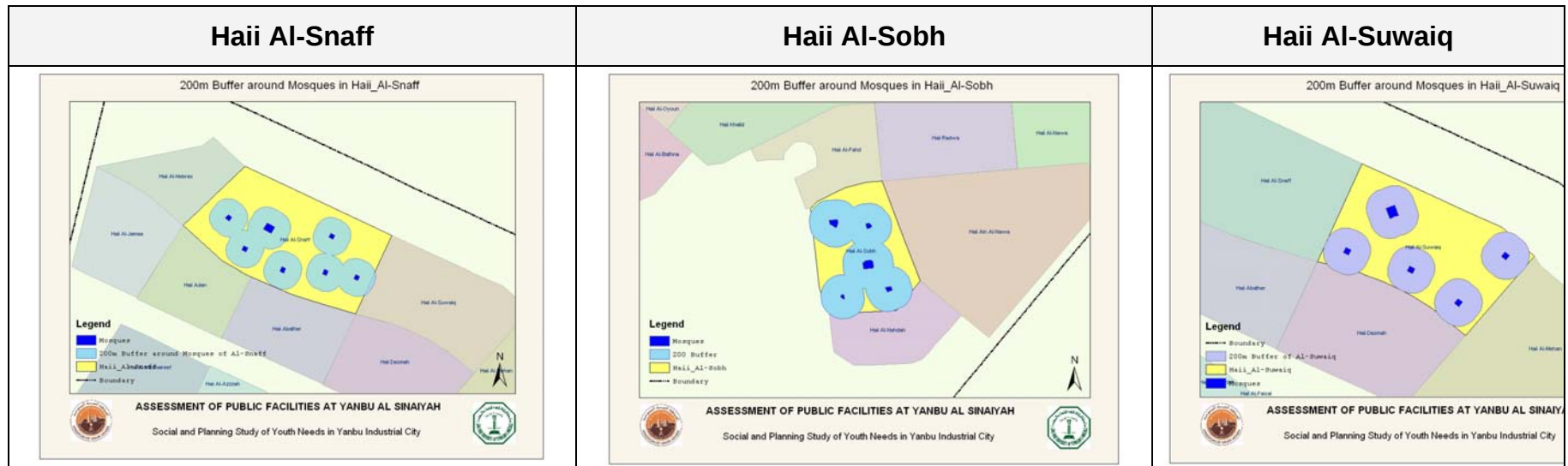


Fig 16a

Fig 16b

Fig 16c

Total Mosques	07
Population	10836
Housing Units	2390

Total Mosques	05
Population	3281
Housing Units	923

Total Mosques	05
Population	10293
Housing Units	2061

NEIGHBORHOOD LEVEL BUFFER (200m) ANALYSIS OF MOSQUES AT YANBU

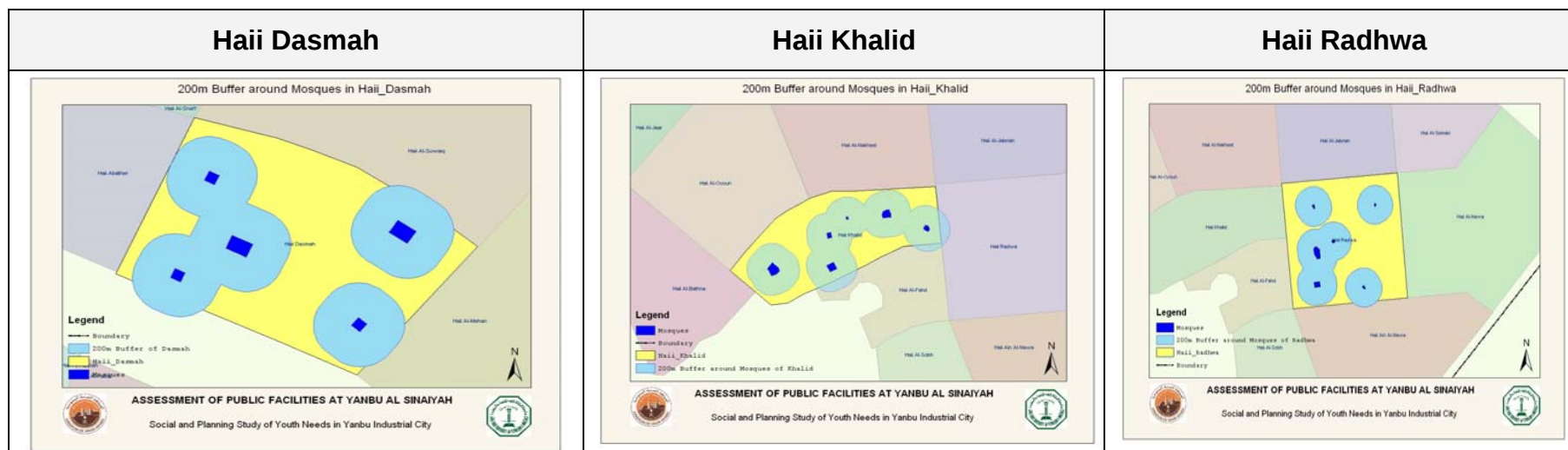


Fig 17a

Fig 17b

Fig 17c

Total Mosques	05
Population	9652
Housing Units	2070

Total Mosques	05
Population	8403
Housing Units	1882

Total Mosques	09
Population	13416
Housing Units	3701

BUFFER ANALYSIS OF SCHOOLS AT HAIL_AI-JAAR

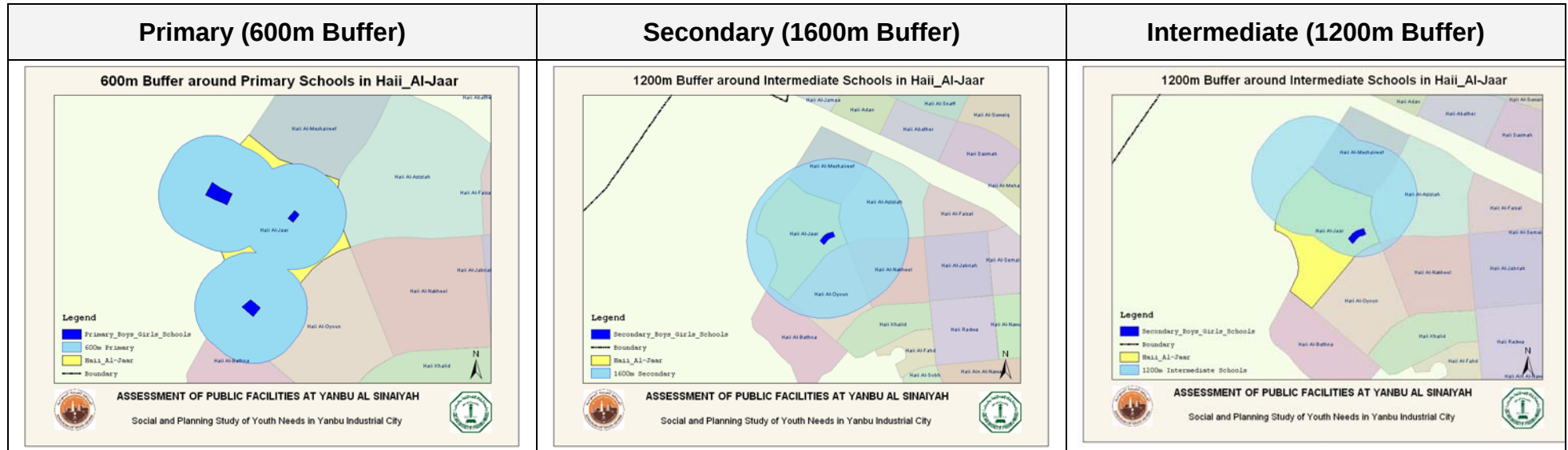


Fig 18a

Fig 18b

Fig 18c

Total Schools	07
Population	16,458
Housing Units	3,689

BUFFER ANALYSIS OF SCHOOLS AT HAIL_RADHWA

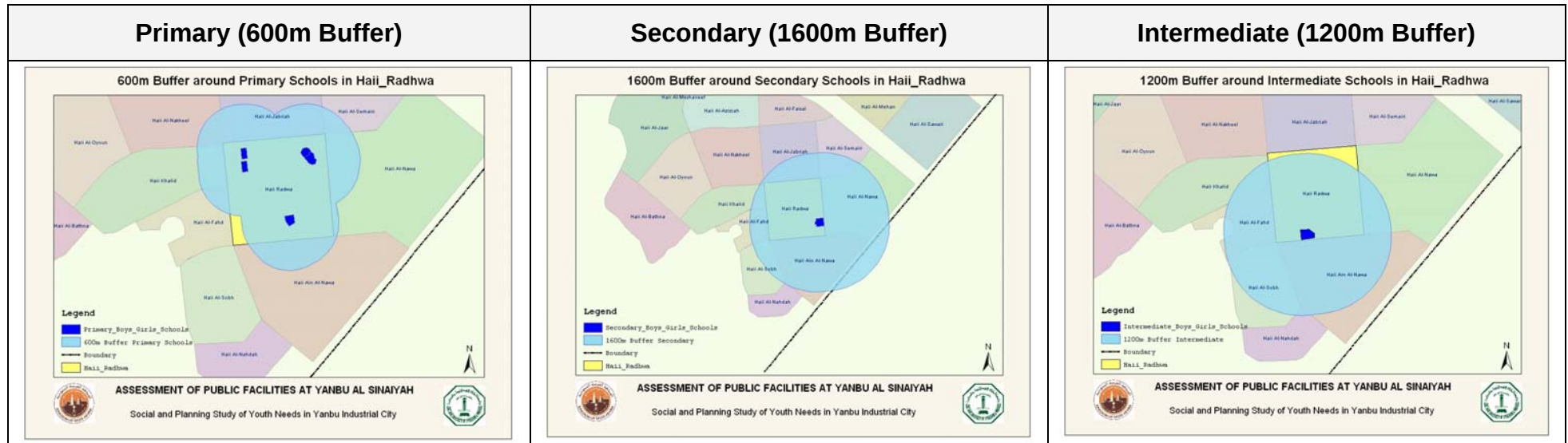


Fig 19a

Fig 19b

Fig 19c

Total Schools	09
Population	13416
Housing Units	3701

BUFFER ANALYSIS OF SCHOOLS AT HAI_AI-SNAFF

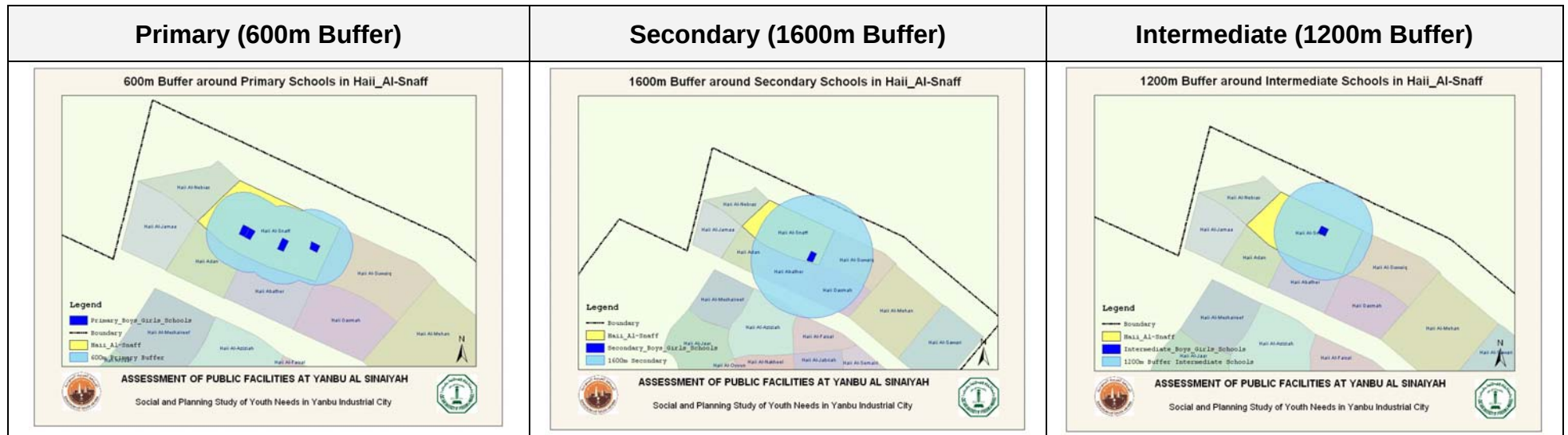


Fig 20a

Fig 20b

Fig 20c

Total Schools	06
Population	10836
Housing Units	2390

BUFFER ANALYSIS OF SCHOOLS AT HAIL_KHALID

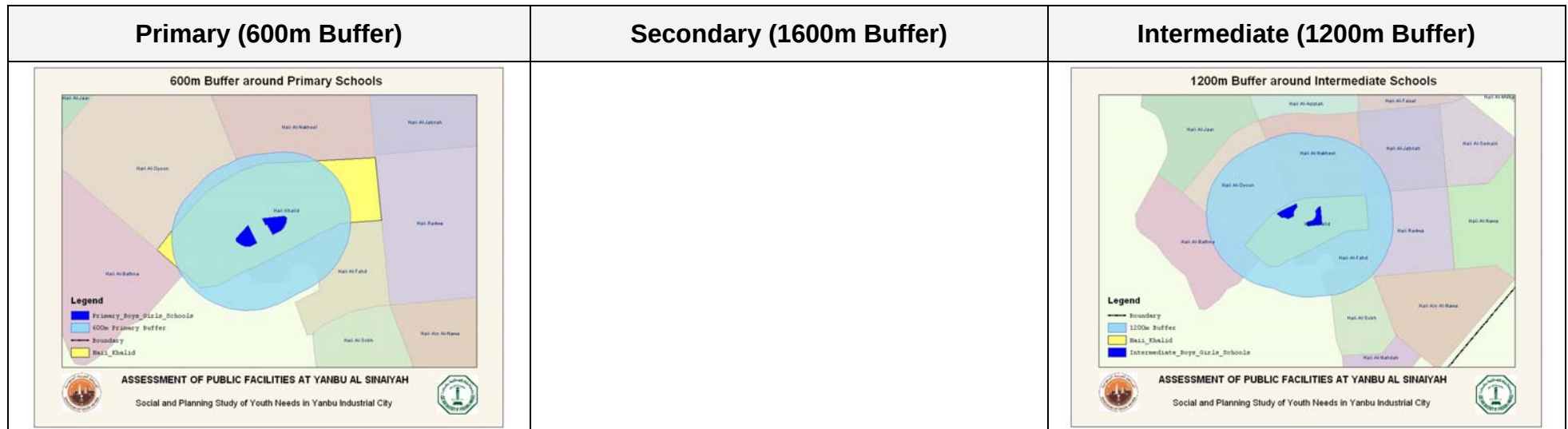


Fig 21a

Fig 21b

Total Schools	04
Population	8403
Housing Units	1882

BUFFER ANALYSIS OF SCHOOLS AT HAIL_AI-MESHAIREEF

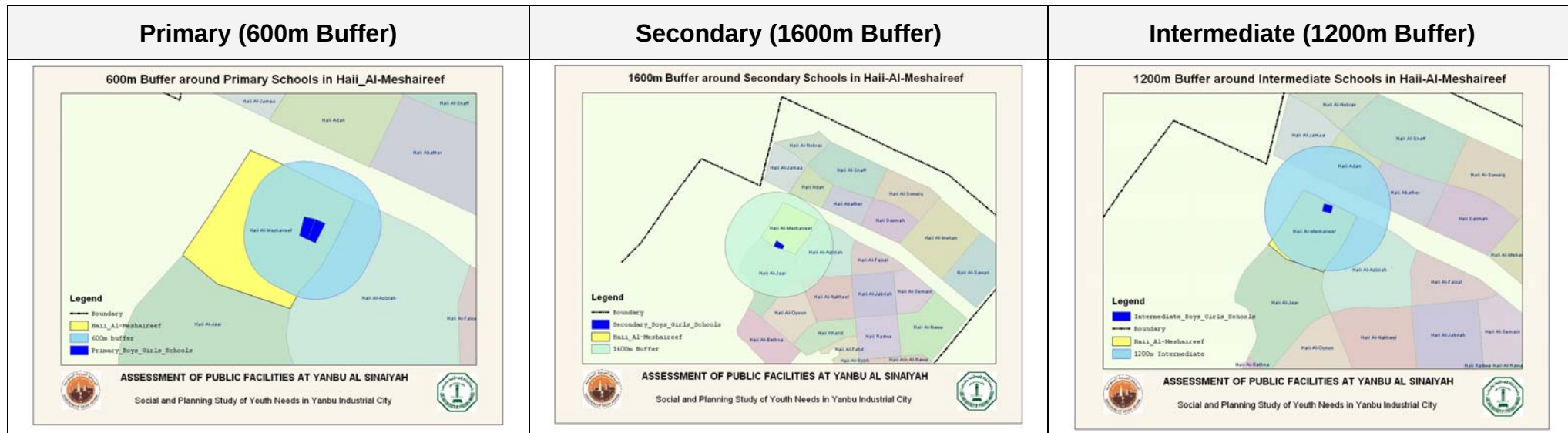


Fig 22a

Fig 22b

Fig 22c

Total Schools	04
Population	8015
Housing Units	1419

BUFFER ANALYSIS OF SCHOOLS AT HAIL_AI-OYOUN

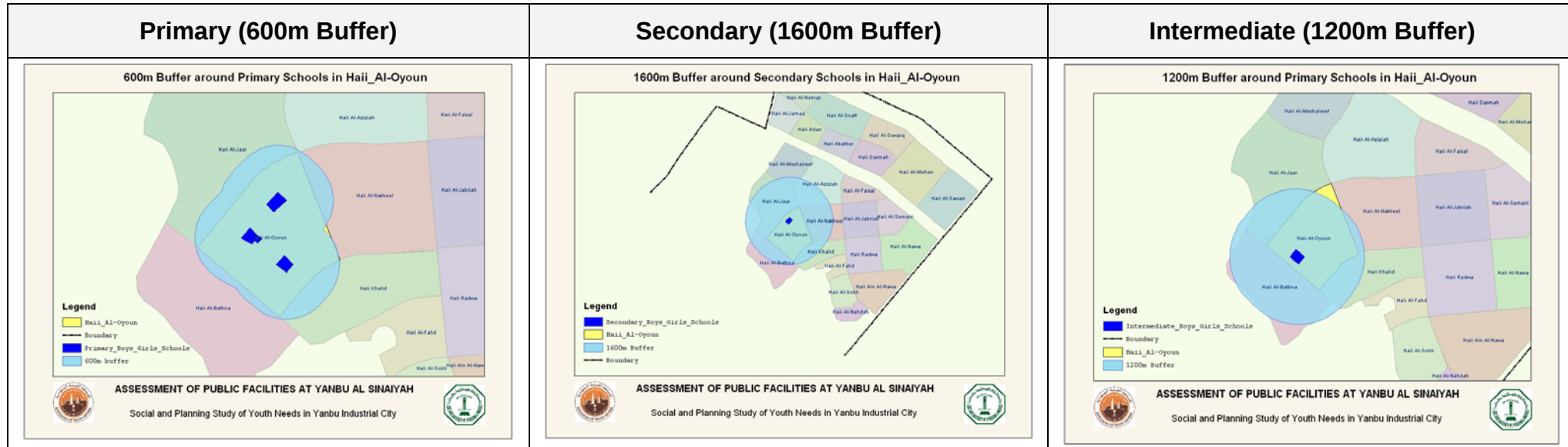


Fig 23a

Fig 23b

Fig 23c

Total Schools	06
Population	7950
Housing Units	1343

BUFFER ANALYSIS OF PARKS AT DISTRICT AND NEIGHBORHOOD LEVELS

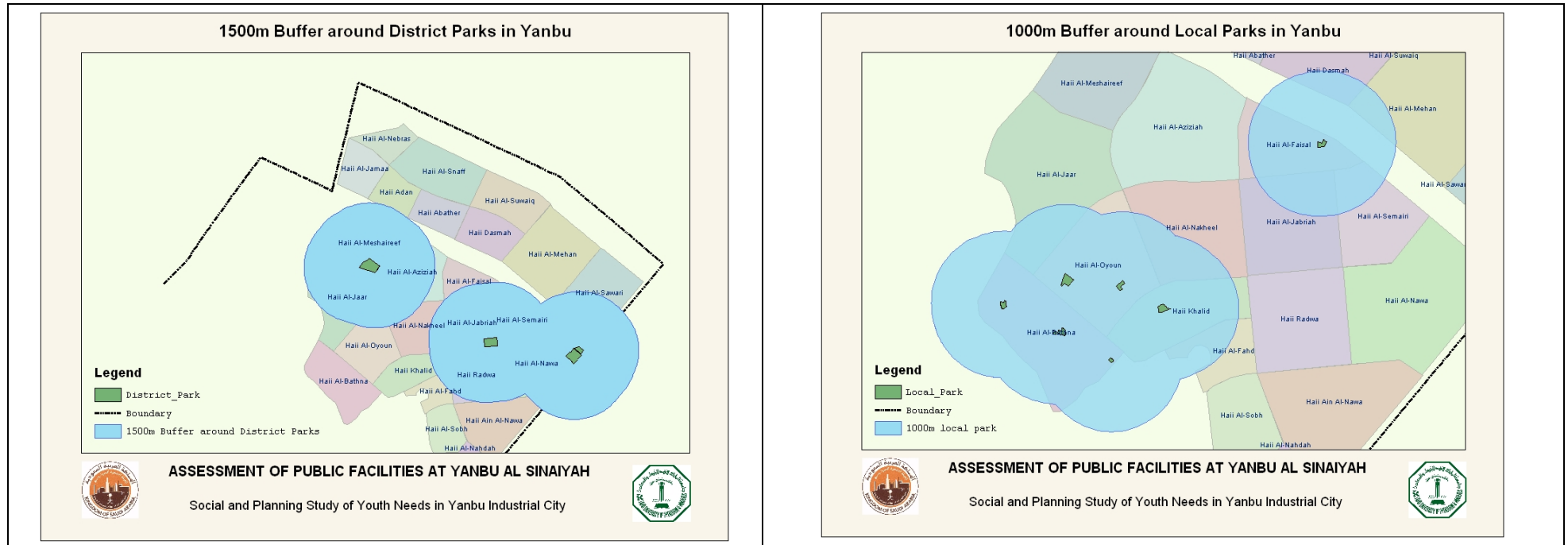


Fig 24. District Parks with 1500m Buffer in Yanbu Neighborhoods

Fig 25. Neighborhood Parks with 1000m Buffer in Yanbu Neighborhoods