Level of Service Analysis

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What Is Level of Service?

In this study, playspaces were analyzed both individually and collectively to examine their effectiveness in serving the children of Alexandria. Various Level of Service (LOS) calculations were performed as part of the analysis. For the purposes of this study, LOS was defined as follows:

Level of Service (LOS)

● ●

A multi-variable analysis that measures the extent to which the attributes of playspaces are available in proximity to Alexandria residents who might need them. LOS may be computed for the city as a whole, as well as for individual aspects of the playspaces within the city that make up a system. Therefore, LOS is not a single value, but rather a series of values that, taken together, describe the service that is provided.

Mapping Levels of Service

A series of analytical maps were produced to portray the relative LOS for playspaces across the geography of Alexandria. The city was broken into subareas for the purpose of making comparisons among different parts of Alexandria.

Catchment Areas

For each playspace, a boundary was defined that encompassed an area from which most users of the playspace can be expected to come. This is known as the catchment area for that particular playspace. Catchment areas vary in size and configuration depending on who owns the playspace and who it is intended to serve.

For playspaces that serve a particular subdivision, apartment complex, or other defined area, the catchment area was defined as the boundary of the parcel or development within which the playspace is located.

Parks and schools were each given two catchment areas. The first one is a circle around the playspace that has a radius of 1 mile. This was considered to be a typical distance from which a majority of the playspace users might be expected to come by a variety of means including vehicle or transit. The second one is a circle with a radius of 1/3 mile. This is a distance within which a person can typically walk from one location to another in 10 minutes or less, even if the route is not a direct one. These catchment areas were plotted on the map of Alexandria.

Some of the playspaces in homeowners' associations (HOAs) and other semi-private facilities were given the same catchment areas as parks rather than the more restrictive one described

earlier. This was done whenever, in the opinion of the advisory committee, the playspace serves a larger area than its immediate subdivision or development.

The score for each playspace was assigned to both of its catchment areas. Because the smaller 1/3-mile catchment area overlays a portion of the 1-mile catchment, the net effect is a doubling of the playspace's value within a 1/3-mile radius of the playspace. This is done to give a premium to the area within a walkable proximity of the playspace.

Subareas
Alexandria was divided into four subareas for the purposes of comparing one part of the city with another and for presenting more detailed information on a smaller scale. The areas were intended to correspond closely with subareas used by planners in Alexandria for other purposes. This will allow information from a variety of other sources and studies to be incorporated and compared with the results of this study. The areas, shown on Map 6 below, are identified numerically from west to east as SubArea One through SubArea Four.
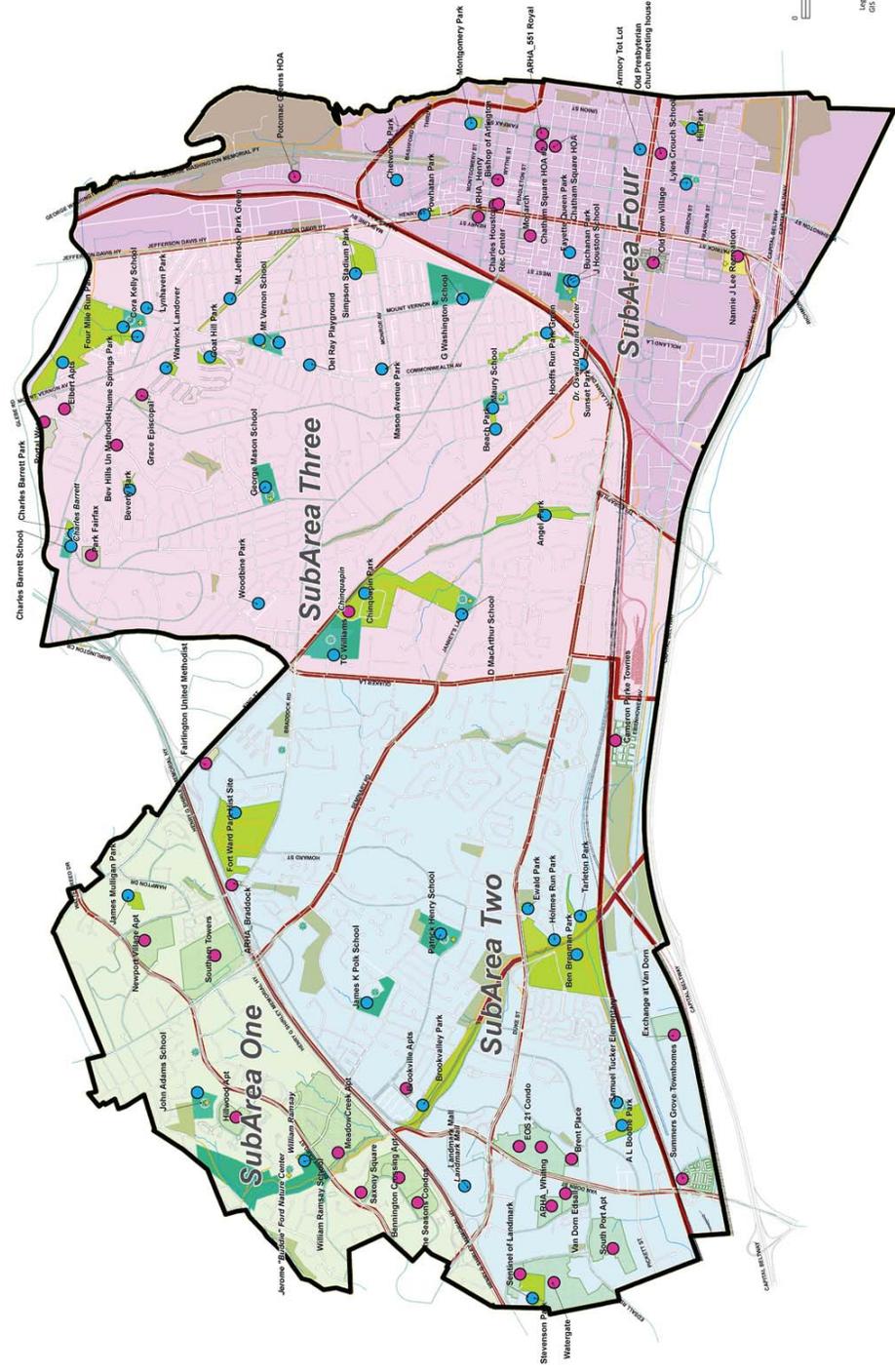
Legend

Playground
- ● Private or Fee
- ● Public*
- ◆ Indoor Facility

Church
Greenway
Park
School
Recreation Center
Other – Private
City Park - Other
Pedestrian Barrier

- ◆ School
- ✦ Bus Route
- Metro
- Railroad
- Bike Lane

* playspaces at public schools have limited hours

Map Produced For The City of Alexandria - By The GRASP® Team
This Map Is Intended For Planning & Discussion Purposes Only -
Please Refer To The Project Document For Map Details.
Legend Elements May Vary Slightly In Size, Color And Transparency From Those Shown On Map
GIS Data Sources May Include: City of Alexandria, US Census, ESRI, GRASP® Team - October 2011
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SubArea Four

SubArea Three

SubArea One

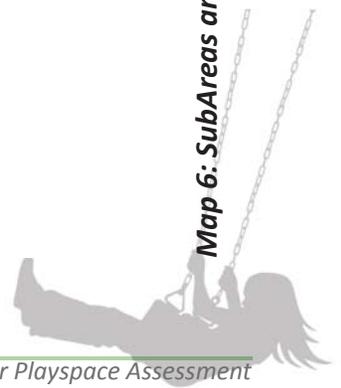**SubArea Two**

Map 6: SubAreas and Pedestrian Barriers

Table 1 below shows statistical information for the subareas, including relative size and the estimated population of children under 5 years of age. The total estimate for all of Alexandria is nearly 10,000 children under the age of 5. Notice that SubArea Three is the largest and has the highest population of children under 5.

Zone	Percent of City	Population (under 5)
SubArea One	12%	2128
SubArea Two	32%	3106
SubArea Three	34%	3317
SubArea Four	22%	1403
Entire Area	100%	9954

Table 1: Subarea Statistics

Barriers
Significant barriers that might restrict or impede pedestrians in Alexandria were identified. These primarily consist of major streets. The barriers were plotted and are shown on Map 6. The 1/3-mile catchment areas were clipped wherever these barriers were encountered to make the 1/3-mile catchment areas a more accurate representation of the walkable proximity of their associated playspaces.

Summary of Level of Service

A variety of ways were used to analyze the system of playspaces in Alexandria. The information collected in the playspace inventory was processed using computer technology to generate a series of "smart maps" that help understand how Alexandria is served by its playspaces. These maps are called Perspectives, because each one provides a certain perspective on the way service is being provided. The various types of Perspectives include heat maps, threshold maps, and other types of maps that provide analytical information. For a detailed discussion of these, see Appendix D. A summary of the analytical findings and conclusions is presented here.

Heat Maps
A heat map is generated by plotting all of the catchment areas for all of the playspaces onto a single map. Where catchment areas overlap one another, scores accumulate. On heat maps, the Level of Service (LOS) available to a person at any given location is represented by an orange tone. Where the tone is darker, the available LOS is higher, which means that there are more opportunities for play in that area. Locations on the map with no orange tone (i.e., a grey tone) have no service.
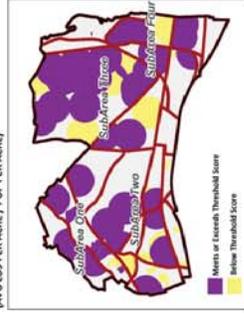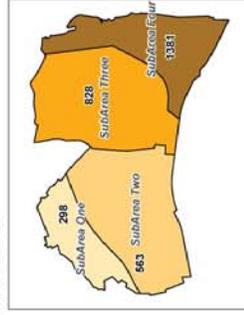
Map 7 is a heat map showing walkable access to all of the playspaces in the inventory. Catchment areas and barriers, as described above, were used to generate this map. The darker orange tones are areas where one or more playspaces with Playspace Scores (also called GRASP® Values) that add up to a high number are found within walking distance. Lighter orange areas have playspaces with scores that add up to lower numbers, and grey areas have no playspaces within walking distance. The range of values represented from the lightest orange to the darkest is 170 to 2708. This means that areas with the darkest orange are served at a level that is many times greater than those with the lightest.
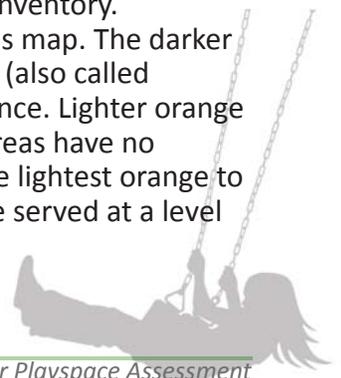
CITY OF ALEXANDRIA

Legend

GRASP Perspective - All Values

GRASPValue

180 — Less Access

2836 — Greater Access

No Service

- Playground
- Indoor Facility
- School
- Bus Route
- Metro
- Railroad
- Bike Lane

- Church
- Greenway
- Park
- School
- Recreation Center
- Other - Private
- City Park - Other
- Pedestrian Barrier

SubArea One 563 298
SubArea Two
SubArea Three 828
SubArea Four 1381

PB1: AVERAGE GRASP LOS PER POPULATION DENSITY
(CHILDREN UNDER 5 YEARS)
(AVG LOS PER ACRE / POP PER ACRE)

PB2: GRASP LOS MEETING THRESHOLD SCORE

Meets or Exceeds Threshold Score

Below Threshold Score

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0 0.25 0.5 1 1.5 Miles
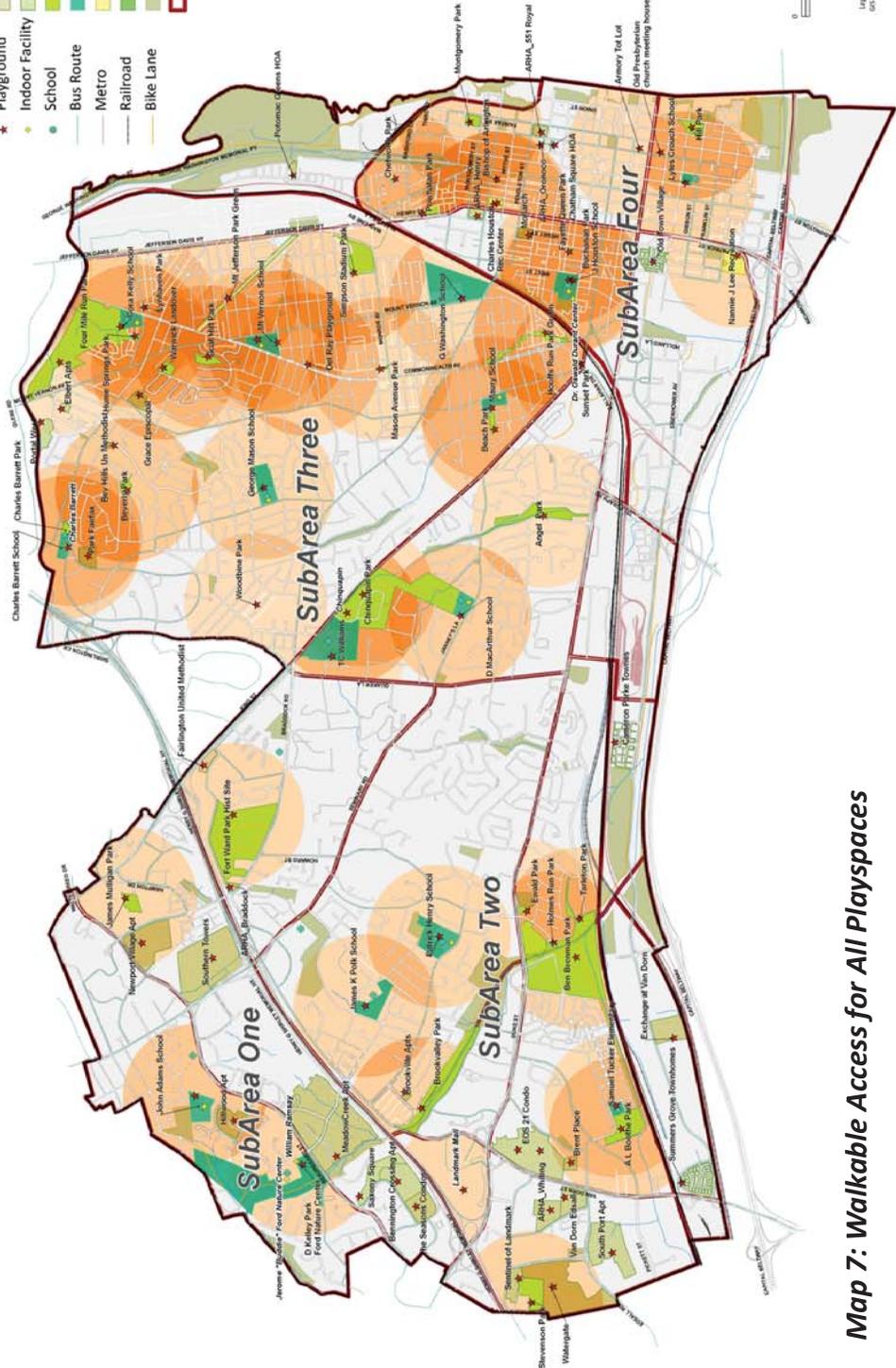
PB: WALKABLE LOS FOR ALL PLAY SPACES

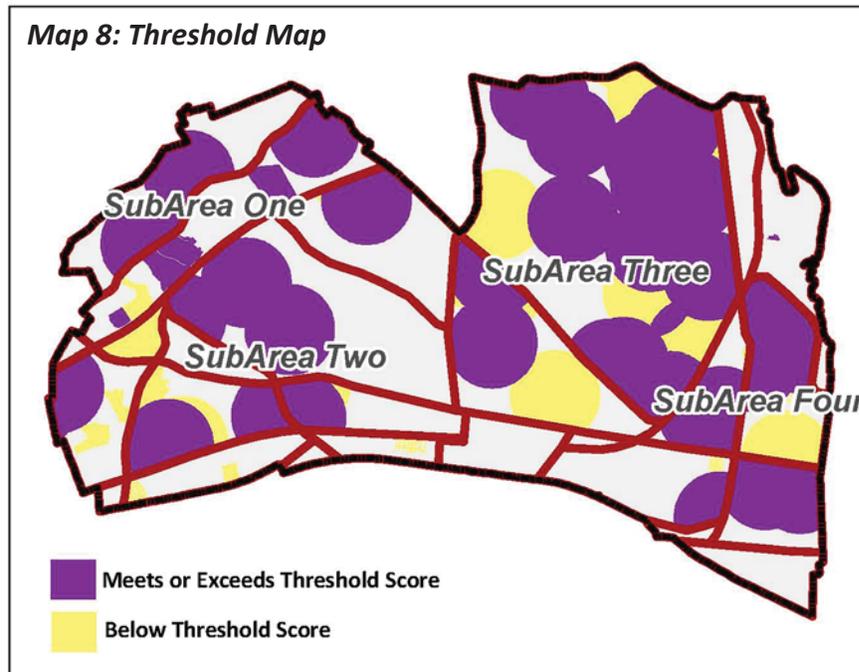*Map 7: Walkable Access for All Playspaces*

Threshold Maps

Heat maps can be further analyzed to find out where the values represented by the orange tones are above or below a given threshold. For the walkable access map, a threshold was determined based on the score that a playspace would have if all of the attributes evaluated in the inventory were scored at the mid-range of possible values.

Applying this threshold to the heat map results in Map 8. Any point on the map where the heat map value is at or above the threshold is shown in purple. Any point where the heat map value is below the threshold but greater than zero is shown in yellow. All other areas have a score of zero and are shown in grey.

Map 8: Threshold Map

SubArea One

SubArea Three

SubArea Two

SubArea Four

■ Meets or Exceeds Threshold Score

■ Below Threshold Score

Where grey areas coincide with higher densities of children, new playspaces are needed. Yellow areas may be considered areas of opportunity. The yellow color indicates that there is at least one playspace serving that location. By adding components or otherwise upgrading those playspaces, yellow areas can be improved, which would increase their threshold score and turn the area to purple on the map.

Heat maps, threshold maps, and other analytical maps for a variety of LOS perspectives are found in Appendix D.

GRASP® Index

Another tool used to evaluate the availability of play facilities in Alexandria is the GRASP® Index. This index is a number calculated by adding up all of the Playspace Scores (as explained on page 17) within a defined area and dividing the total by the number of people living there (in thousands). It is, in effect, a per-capita value for all of the playspaces in the inventory that are located within a given area. To most accurately reflect the situation, the population figure used to calculate the indices is the number of children, not the total population.
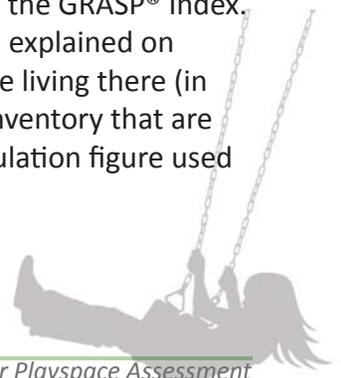
In the table below, the GRASP® Indices shown correspond just to those playspaces determined appropriate for 2-5-year-olds, and the population number used is the number of children under the age of 5. (Population figures for the 2-5-year-old bracket were not available.) The yellow shade in the tables indicates the highest value in each category.

SubArea One has a relatively low GRASP® Index, indicating a low level of service and suggesting that the subarea is lacking in the number and quality of playspaces found there.

Zone	Total GRASP® Value	Population (under 5)	GRASP® Index (population 1,000s)
SubArea One	1151	2128	541
SubArea Two	3469	3106	1175
SubArea Three	5999	3317	1809
SubArea Four	3773	1403	2689
Entire Area	14572	9954	1464

GRASP® Index for Playspaces Serving 2-5-Year-Olds

Implications

From the input collected during the focus groups and other meetings, as well as on-site observations, a perception emerged that indicated that the western part of Alexandria does not offer opportunities for play commensurate with those found in the eastern part of the city. The Perspectives and other analyses in Appendix D seem to support this perception and allow the differences to be quantified in various ways. The results are described below.

SubArea One (the westernmost part of Alexandria) does indeed appear to have lower LOS than the eastern parts of the city. It ranks **lowest** in many categories of service, including:

- *Average LOS per acre served for walkable access to all playspaces and those playspaces serving 2-5-year-olds.* This indicator means that even where walkable service is available, the playspaces that contribute to that service scored lower in the evaluation than those in other parts of Alexandria.
- *Average LOS in relation to average density of children under 5, for all of the analyses performed (see Appendix D).* This indicates that, compared with other parts of Alexandria, the value of the playspaces provided is low compared to the density of children living here.
- *GRASP® Index, a computed value that relates the value of playspaces to population (see Appendix D).*

These indicate that having a good playspace within walking distance is less common in SubArea One than elsewhere in Alexandria and that the number and quality of playspaces is low compared to the number of children found there.

The low GRASP® Index is particularly revealing, in that it indicates a low per-capita value for the playspaces located within the subarea. On the other hand, SubArea One fared better in terms of the percentage of its area covered by service. This combination of moderate service coverage but low GRASP® Index suggests that the high density of children in SubArea One places a

greater demand on the need for both more playspaces and better ones. *So while additional playspaces may be needed in SubArea One, a focus on improving the quality of existing ones should also be a priority. It should also be noted that SubArea One has a high proportion of playspaces that are located in private developments.*

SubArea Two ranked lowest (actually, tied for lowest with SubArea Four) in only one category: percent of its area with walkable access to all playspaces. Large portions of SubArea Two have low densities of children, so providing walkable access throughout the subarea may not be as critical here as it is in the other subareas. The focus should be on assuring that neighborhoods where there are higher densities of children have access to good playspaces.

SubArea Two does have some localized areas of higher density that lack a playspace, particularly the area to the southeast of Patrick Henry School, in between Raleigh Avenue and North Gordon Street. This area should be looked at more closely to determine if there is a need to create a playspace within it. Another area to take a look at within SubArea Two is the complex just south of the intersection of Van Dorn Street and Seminary Road.

SubArea Three ranked highest in several categories and lowest in none, so it might be considered to have the lowest priority overall among the subareas. However, this does not mean that there could not be specific locations where improvements are needed. Playspaces within the subarea that received a score of 1 for any components or modifiers can be found in Appendix C. They should be targeted for improvement. In particular, TC Williams and Cora Kelly School should be targeted. These playspaces were among the lowest-scoring in terms of components, modifiers, and overall score.

SubArea Four (easternmost Alexandria, including Old Town) rated highest in many, but not all categories of analysis. In particular, SubArea Four fell short in providing walkable access to playspaces. This could be due to the large portion of this subarea that lies within freeway rights-of-way and in newly developing and redeveloping areas. The density map (Map 3) shows relatively low density for children under five in that part of the subarea. Therefore, the problem may not be urgent and might be resolved as new development occurs in the southern and western parts of SubArea Four.