

X. INVENTORY AND LEVEL OF SERVICE ANALYSIS

This section provides an overview and analysis of the parks, recreation, trails, and open space system in Cary, North Carolina. First, the inventory collection process and level of service methodology is described. Next, an overview of the inventory is provided, including municipal facilities and key alternative providers. Finally, the service provided by the parks, recreation, trails, and open space system is analyzed.

A. INVENTORY

The inventory conducted for this Master Plan includes both municipal assets and those of other providers. The inventory was used to assess the park and recreation services available to residents so that plans could be formulated for maintaining, enhancing, and sustaining levels of service now and into the future.

1. Inventory Overview and Methodology

Existing Infrastructure

The parks and recreation system can be thought of as an infrastructure that serves the health and well-being of people. This infrastructure is made up of parts that are combined in various ways to provide service. At the larger scale, individual parks, trails, open space parcels, or indoor facilities form the basic building blocks of the system. However, each of these can be broken down as well into individual components, such as playing fields, interpretive features, or meeting rooms. For this project, a very complete and thorough database of amenities was developed related to the provision of parks and recreation facilities. All of the individual components within the system were evaluated and recorded into the inventory dataset.

The inventory was conducted in June, 2011. The inventory for this project included all of the properties and facilities managed and owned by the Town as well as alternative providers. Alternative providers include elementary, middle, and high schools, as well as the state, county, and surrounding municipalities.

The inventory process consisted of field visits to each of the outdoor sites and indoor facilities. A complete list of all facilities and components is provided in **Appendix X**. This inventory information has been entered into a geo-database for analytical uses and ongoing management tasks.

Alternative provider inventory data was collected by several methods, including site visits, using GIS data attributes, aerial photography and consulting directories, or as provided by Town staff.

The purpose of the inventory was to get a complete and accurate picture of the recreational opportunities available to residents. Information was collected on the indoor and outdoor facilities identified above and included the location of the facilities and the components at each location.

For the purposes of this study, *components* are generally defined as features provided for the purpose of a recreational experience for visitors. This includes fields, courts, and other spaces used

for organized activities, as well as open turf, natural areas, and features that offer passive or non-programmed recreational experiences. The inventory includes an assessment of the functionality of each component.

For each site or facility, an assessment was also made of factors that enhance or detract from the functionality of its components. These are “comfort and convenience” elements, including the availability of adequate shade, seating, parking, restrooms, etc. The overall design and ambience of the site or facility was also assessed, including such things as good design, pleasing surroundings, etc.

Composite-Values Level of Service Analysis

A methodology known as Composite-Values Level of Service Analysis was used to assess the level of service provided by the current park system. A trademarked proprietary version of composite-values methodology developed by the consultants for this project, GreenPlay and Design Concepts, was utilized. It is called **Geo-referenced Amenities Standards Process (GRASP®)**. A detailed explanation of this methodology can be found in **Appendix X**.

In summary, each relevant component was located, counted, and assessed on its functionality for its primary intended use. A GRASP® score was assigned to the component as a measure of functionality as follows:

- **Below Expectations** – The component does not meet the expectations of its intended primary function. Factors leading to this may include size, age, accessibility, or others. Each such component was given a **score of one (1)** in the inventory.
- **Meeting Expectations** – The component meets expectations for its intended function. Such components were given a **score of two (2)**.
- **Exceeding Expectations** – The component exceeds expectations, due to size, configuration, or unique qualities. Such components were given a **score of three (3)**.
- If the feature exists but is not useable because it is unsafe, obsolete, or dysfunctional, it may be listed in the feature description and assigned a **score of zero (0)** or in rare cases even a **negative score (-1)**.

It is important to note that these scores are based on local expectations and norms, and not on comparisons to some national average or standard. It is the opinion of the consultants that if Cary’s facilities were evaluated in comparison to “typical” facilities found in their work across the country, the scores would be higher. But the intent of this analysis is to evaluate Cary’s facilities against its own expectations and standards. Therefore, if a component scores a “2” in this analysis, that indicates that it is meeting expectations for Cary, and not for the typical American community.

Components were evaluated according to this scale from two viewpoints. First is the value of the component in serving the immediate neighborhood, and second, its value to the entire community.

In some cases, components were counted cumulatively within a park or facility. In such cases the component was evaluated according to the *experiences* provided. For example, rather than recording each individual piece of art within a park, a single value was given for art *as an experience* within the park. This was also done for historical, cultural, and educational experiences offered within parks.

Next, amenities that relate to and enhance the component were evaluated. The setting for a component and the conditions around it affect how well it functions, so in addition to scoring the components, each **parcel** or **indoor facility** was given a set of scores to rate its comfort and convenience to the user. This includes such things as the availability of restrooms, drinking water, shade, scenery, etc.

Lastly, the overall design and ambiance of the facility or park was recorded as a part of the inventory. Characteristics such as overall layout, attention to design, and functionality inform the design and ambiance score.

The assessment findings from each location were entered into a master inventory database/spreadsheet. The database serves as a record of the inventory and was also used to perform the GRASP® analysis that follows.

B. INVENTORY DESCRIPTION

The inventoried properties consist of over 9058 acres of land in 42 different locations. 32 properties and 1632 acres of these lands are owned or managed by the Town of Cary. The remaining properties are considered alternative providers. These alternative providers include state parks, regional parks and adjacent community parks within a one-mile radius of the Town of Cary limits. Overall, 562 components were identified during the inventory process among all providers. 353 of these components are owned or managed by the Town of Cary.

GIS ACRES SHOWN IN MAPPING			
	CLASSIFICATION	ACRES	TOTAL ACRES
CARY PARKS AND OPEN SPACE*	COMMUNITY PARK	821	
	COMMUNITY USE FACILITY	32	
	GREENWAY CORRIDOR	455	
	METRO PARK	289	
	MINI PARK	4	
	NATURAL AREA	151	
	NEIGHBORHOOD PARK	10	
	CEMETERY	5	
	PRESERVE	140	
	SPORTS VENUE	208	

TOTAL ACRES	2115
<i>*BASED ON CaryGreenspace_region (Town of Cary provided GIS data)</i>	
ALTERNATIVE PROVIDERS PARKS AND OPEN SPACE	
COMMUNITY PARKS	193
DISTRICT PARKS	60
STATE PARKS	6783
OTHER PARKS	390
TOTAL ACRES	7426
OVERALL ACRES	9541

GIS ACRES USED IN LEVEL OF SERVICE ANALYSIS	
SCHOOL PARK	545
CARY PARKS AND OPEN SPACE	1087
TOTAL ACRES	1632
ALTERNATIVE PROVIDERS PARKS AND OPEN SPACE	
COMMUNITY PARKS	193
DISTRICT PARKS	60
STATE PARKS	6783
OTHER PARKS	390
TOTAL ACRES	7426
OVERALL ACRES	9058

Table 1: Complete Inventory Summary

Facility	Quantity
Parks	9058 acres
Component	Quantity
Ball Diamonds	39
Basketball Courts (full court equiv.)	28
Multi-Purpose Fields	45
Open Turf	17
Picnic Grounds	36
Picnic Shelters	13
Playgrounds	30
Event Space	7
Tennis Courts	64
Water Access	30

Table 1a2: Town of Cary Inventory Summary

Facility	Quantity
Parks	1632
Component	Quantity
Ball Diamonds	33
Basketball Courts (full court equiv.)	25

Multi-Purpose Fields	34
Open Turf	12
Picnic Grounds	16
Picnic Shelters	29
Playgrounds	20
Event Space	3
Tennis Courts	58
Water Access	2

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1. Facility Descriptions

The lands and facilities within Cary range from developed parks to large natural areas and include a variety of trail types and facilities for indoor recreation. These offer a wide variety of components and amenities. Opportunities for active recreation range from team sports like softball, soccer and football to individual sports such as skateboarding and tennis. Passive activities such as picnicking and wildlife watching are also accommodated.

Cary is notable for several unique facilities located within the Town. These are “venue” type facilities that are state-of-the-art. They include the Koka Booth Amphitheater, the Cary Tennis Park, WakeMed Soccer Park, USA Baseball Center in Tom Brooks Park, and the new Cary Arts Center.

Detailed information on facilities and components can be found in the Project Atlas that was compiled as part of this master plan effort and in the GIS database that was created.

Outdoor Facilities

Parks

Cary has a wide range of facilities that all contribute to the overall park system. The system consists of multi-purpose parks that serve a variety of users, such as Fred G. Bond Park and facilities with more specialized purposes such as the Koka Booth Amphitheater, as well as smaller neighborhood facilities such as Rose Street Park.

Cary’s parks tend to be well-planned and cared for, and highly-functioning. They exhibit a high degree of sophistication in their design, including skilled use of plants for screening, shade, and interest. Structures, furnishings, and equipment typically are well-fitted for their intended purposes, as well as being aesthetically pleasing. This level of quality sets high expectations that are generally met in all of Cary’s parks, with a few exceptions. For example, Lexie Lane Park is considered by some to fall below the level expected for parks in Cary. However, in most other communities, this park would not be considered sub-standard at all. This is a testament to the high standards that Cary sets for itself and accomplishes.

Trails

Approximately 63 miles of trails were included in the inventory. Some trails are contained within the extent of individual parks and some meander through the area and connect parks and open space to homes and businesses. Like its parks and other facilities, Cary’s trails are well-planned and maintained for the most part.

Open Space

Many of Cary’s parks include natural areas. Fred G. Bond Park is a good example of this. Hemlock Bluffs nature preserve provides a large natural area with naturalized trails and educational features.

Indoor Facilities

Indoor facilities range from specialized facilities such as the Stevens Nature Center in Hemlock Bluffs preserve to multi-purpose facilities such as the Herbert Young Center, which has a gym and multi-purpose rooms. The Page Walker Arts and History Center offers space for meetings, classes, and

other activities in a historic setting, and the new Cary Arts Center offers a full range of facilities for performing and visual arts in a spacious, centrally-located historic schoolhouse.

3. Alternative Provider Inventory Description

Alternative providers included in the inventory and used in the calculations for Level of Service include state parks, regional parks, and adjacent community parks. (See **Appendix X**.) In each case, the GRASP® scoring system is used and assumptions are made based on the typical condition and accessibility of the component. Some other providers were mapped but not scored or used in the LOS calculations such as private facilities, homeowner association facilities, etc. However, the inventory and mapping is not intended to cover 100 percent of all of the facilities and features found in Cary, but only those that are relevant to the purposes of this study.

Table 2: Alternative Provider Inventory included in Level of Service Analysis

Facility	Quantity
Parks	7426 acres
Component	Quantity
Ball Diamonds	6
Basketball Courts (full court equiv.)	3
Multi-Purpose Fields	11
Open Turf	5
Picnic Grounds	20
Picnic Shelters	13
Playgrounds	10
Event Space	5
Tennis Courts	6
Water Access	28

Schools

Schools have features like playgrounds, multipurpose fields, gymnasiums, and other components that can provide for some of the public's park and recreational needs and thus reduce the demand on facilities provided by the Town.

The Town of Cary partners with several schools to provide "School Parks." All of these school parks were inventoried. GRASP® methodology, as previously described was used to score each school and its components.

4. Resource Maps

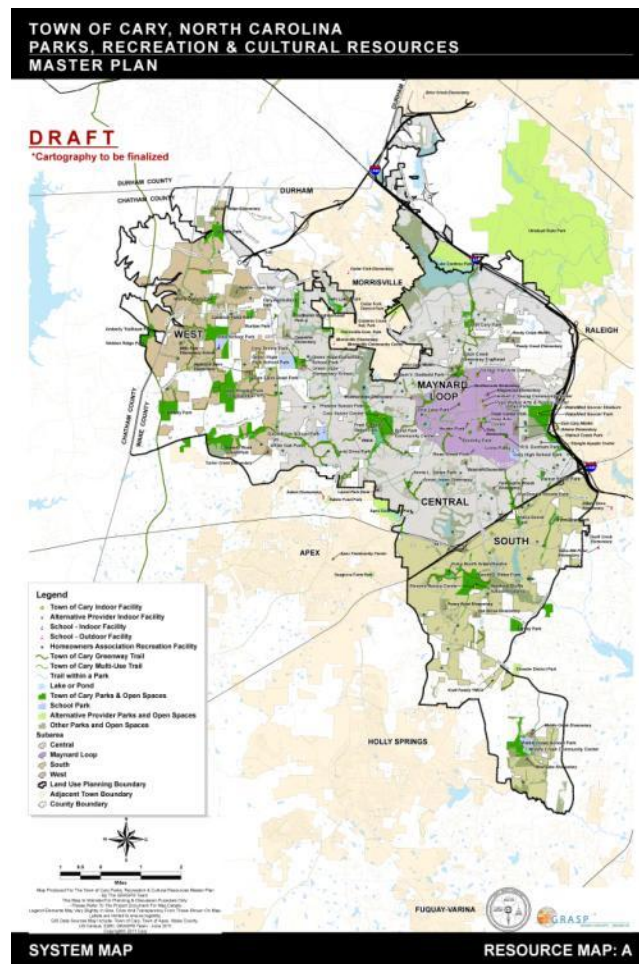
Two different types of maps were created for the inventory and analysis phases of this plan: **Resource Maps** and **Perspectives**. Resource Maps portray raw data and other information that is helpful for understanding existing conditions, such as where things are located. Perspectives are maps on which the results of computations and other analytical processes performed on the data are represented.

NOTE: Thumbnails of maps have been placed within the text of this document to help the reader know which map is being discussed, but these are not intended to be completely legible at this size. The reader should refer to the larger 11" x 17" maps and GRASP® Perspectives found in **Appendix X: Maps and GRASP® Perspectives** when reading the maps themselves.

A single Resource Map was prepared for this report and can be found in **Appendix X: Maps and GRASP® Perspectives**:

RESOURCE MAP A – SYSTEM MAP

Resource Map A – System Map shows the boundaries of the study area, and the locations and extents of primary trails and parcels that were included in the inventory of data.



Larger maps are located in Appendix X.

C. LEVEL OF SERVICE ANALYSIS

For this planning study, one tool that was utilized is the examination of Levels of Service (LOS). This tool allows for analysis of the quantity, location, distribution, and access to recreation components.

LOS is typically defined in parks and recreation plans as the capacity of the system's components to meet the needs of the public. In this study, LOS will be more specifically defined as follows:

***Level of Service (LOS):** The computed value that is provided under a stated set of conditions and criteria. LOS may be computed for the system as a whole, or for individual parts of the system. Therefore, LOS is not a single value, but rather it is a series of values that, taken together, form a model of the service that is provided.*

It may be helpful to think of the LOS analysis as being like the dashboard of an automobile. The dashboard is made up of a set of gauges and indicators that inform the driver about decisions that must be made to steer the car on the course the driver intends to take. The dashboard does not tell the driver where to go or how fast to drive. These are decisions that the driver makes by using the information that the dashboard provides.

The LOS information contained here is similar in that it is *descriptive* of the conditions that are present, rather than *prescriptive* of what course should be taken. Deciding the course to take should be done by using the information from the LOS analysis in conjunction with information from other sources, such as surveys, focus groups, staff expertise, etc.

Two methods were used in this analysis. One method used a traditional capacities approach that compared quantity to population. The other analysis used a Composite Values LOS approach. The specific method used here is known by the proprietary name of **GRASP® (Geo-Referenced Amenities Standards Process)**. In this method an evaluation of the functionality and location of each individual component within the entire system is conducted through an inventory process and that information is used to generate a geographic analysis of the service the system provides. This is described below, and a more detailed description of the history of GRASP® and its relationship to traditional planning standards can be found in **Appendix X: GRASP® History and Methodology**.

1. GRASP® Level of Service Analysis and Mapping

GRASP® methodology is a unique way of looking at LOS because it considers not only the quantity and distribution of parks and facilities but also functionality, comfort and convenience, and overall design and ambiance. It is also unique in that it uses individual recreation *components* to create a component-based model for evaluating LOS.

After scoring each component as outlined in the inventory description, GIS software is used to create graphic representations that allow for easy visual and numerical analysis of the parks, trails, open space and recreation system. Some of the representations show raw data collected through the inventory process or received from other sources. These are referred to as **Resource Maps** as discussed earlier. Representations that emerge from the processing of data within the GIS using analytical formulas and processes are called **GRASP® Perspectives**.

The following Perspectives were prepared for this report and can be found in **Appendix X: Maps and GRASP® Perspectives.**

Perspective A: Access to All Components

Perspective B: Walkable Access to All Components

Perspective C: Trailshed Analysis

For each **GRASP® Perspective**, a selection of components from the inventory is used. The components included in the selection set are determined by the intent of the Perspective, and may vary from one Perspective to another.

Catchment Areas: In the inventory process, a score was assigned to each component based on its functionality for its intended purpose. This score was adjusted by a formula that factors in the presence or lack of comfort and convenience modifiers, such as drinking fountains, restrooms, etc. The resulting value for each component was assigned to a geographic area defined by a radial distance that surrounds it. This is referred to as the *catchment* area for that component.

In some cases, two catchment areas were assigned for each component – one based on a walkable proximity to the component and another that represents the typical distance from the component within which a majority of users might be expected to come from. In the first catchment area a 1/2-mile radius from the component was used, in order to represent the area within which a person can walk to the component in a reasonable amount of time. The second catchment area used a 1-mile distance as the radius. This was an assumed distance from which the majority of local users for that component are likely to come, by a variety of transportation means such as bicycle, skateboard, vehicle, etc.

The full computed GRASP® value for each component was assigned to each of its two catchment areas. When all of the catchment areas for all of the components within the selection set were plotted on a map, a picture was created that represents the cumulative LOS. Where the catchments for multiple components overlap, darker shades emerge that indicate locations that are “served” by a combination of more components and/or higher quality ones. In other words, **where there are darker shades, the level of service is higher** for that particular Perspective.

Whenever both catchment areas (i.e. 1/2- mile and 1-mile) were assigned to each component, the net result is a doubling of the value of that component to the area within 1/2 mile of it, because of the overlap of the two catchment areas. *This has the effect of assigning a premium to all locations on the map having components within walkable proximity.*

It is important to note that this system differs from traditional Level of Service analyses in that it portrays the cumulative value received from the surrounding park and recreation system **to an individual situated in any specific location on the map**, rather than showing the service being provided by components at a given location to the areas around it.

2. GRASP® Threshold Scores Analysis

For some of the GRASP® Perspectives, the service that results from catchment areas and associated scores are presented in two ways – with infinite tone ranges (orange) and in two tones based on **threshold values** (purple and yellow).

The **infinite tone map** for each Perspective shows the **GRASP®** values with a tone range that portrays nuances of the service that is being provided to the community. This makes it possible to see the differences in service levels being provided by parks and individual components at various locations.

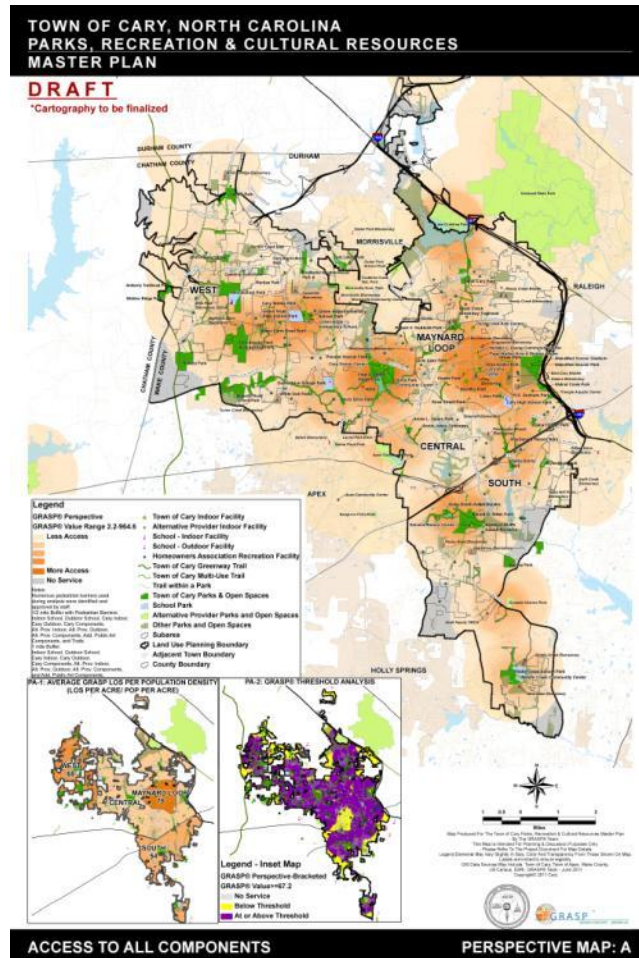
The separate **threshold scores** maps show **GRASP®** score ranges bracketed into categories that represent the following: No Service (gray), Service Below Threshold Score (yellow), or Service At or Above Threshold Score (purple). Threshold scores used for this study were based on an assumed score that would result from a particular “ideal” set of conditions. This is further explained in the description of the individual Perspectives. Because the combination of components used for each Perspective varies based on the set of needs being evaluated, the Threshold LOS value for each Perspective may also vary. The threshold map is derived from the infinite-tones map and is intended to provide additional clarity and interpretation of the infinite-tones map. ***It should not be implied that all parts of the study area should attain the threshold score or that areas below the threshold score are necessarily deficient.*** In some areas, no service or a level of service below the threshold score is completely appropriate (such as an area that has no residential development).

Areas with yellow shading on the threshold scores maps have at least some service (**GRASP®** score of greater than zero), but the service score is below the threshold. Areas with purple shading have service scores that meet or exceed the threshold value. Gray areas without shading have a service score of zero.

Some alternative providers have been included in the Level of Service (LOS) computations as described earlier and other providers may be shown simply for reference. Alternative providers included in the LOS analysis include schools (elementary, middle and high schools) and facilities provided by other agencies, such as the county or adjacent municipalities.

3. Perspectives for Levels of Service

*Thumbnails of the Perspectives, including inset maps and excerpts from some of the maps and Perspectives are shown here for reference and are not intended to be legible at this scale. The reader should refer to the larger maps in **Appendix E** for legibility and clarity.*



Perspective A: Access to All Components

Larger maps are located in Appendix X.

This Perspective shows the service available from all components in the dataset. This includes all outdoor, indoor, active, passive, and other components, including trails and open space. Service is measured based on the catchment areas described earlier, with a premium placed on proximity to components that are available within walking distance, or 1/2 mile.

Barriers to pedestrian access were taken into consideration for the 1/2 mile catchment areas. Wherever the 1/2 mile catchments crossed these, the catchment was truncated at the barrier to reflect the assumption that pedestrian access is hampered by the barrier.

The Perspective shows concentrations of service distributed throughout the Town. These occur mainly around larger parks, such as Lake Crabtree, Fred G. Bond, and

Harold D. Ritter. Interestingly, a concentration of service is also observed inside the Maynard loop, where there are no large parks. However, this area has several smaller parks and a number of indoor facilities that boost service.

For the most part, all parts of Cary have at least some service, as indicated by the presence of shading over them.

GRASP® Table A – Access to All Components shows the statistics derived from *Perspective A – Access to All Components*.

GRASP® Table A

Perspective A: Access to All Components

	Percent With LOS	Total GRASP Score	Avg. LOS Per Acre W/ Service	Avg. LOS / Acre Per Pop. Den.	GRASP® Index
West	99%	288	142	68	24
Maynard Loop	100%	631	448	79	35
South	95%	572	182	54	23

Central	97%	1352	222	50	16
Cary(2011 Census)	97%	2843	221	56	20

Coverage for Service:

The first column in the table shows the percent of the study area that has at least some service, (i.e., a GRASP® score that is greater than zero). For all of Cary, this number is 97%, meaning that 97% of the entire study area has a GRASP® score that is greater than zero. Within the Maynard Loop there is 100% coverage of service. This makes sense because this subarea is surrounded by the other subareas and receives service from components outside of it as well as those located within it. It is also the most completely developed subarea. The remaining subareas have larger undeveloped areas within them, and therefore may not need 100% coverage of service, as long as service is provided to the developed portions.

It is interesting to note that the West subarea has coverage of 99%. This part of Cary is often thought of as somewhat isolated and remote. The high amount of coverage here comes in part from the trails that are located within it, but there is also a wide distribution of schools and natural areas or preserves within the subarea that contribute to service.

Total Component Values:

The second column shows the total GRASP® value for all of the components located within the subarea boundary. This is taken from the computed values of the components using their functional scores and all modifiers (comfort and convenience, design and ambience). This number represents the net value of all the “things” that are specifically located within the boundary of a subarea.

Density of Service:

The third column shows the average GRASP® LOS score per acre *for all acres with service*. This is effectively a reflection of the density of the catchment areas that overlay a given area. This number will vary from place to place depending upon how components are distributed. Communities with relatively few large parks, where all of the components are concentrated in a small area, will have a high value for this indicator. If many catchment areas overlap one another, the density of service will be higher than when those same catchment areas are spread out and do not overlap. For all of Cary, this number is 221 points per acre.

Density of Service Related to Population:

The third column is labeled Avg. LOS / Acre Per Pop. Density. This is a number that is calculated by dividing the Average LOS Per Acre Served (from the previous column) by the average population density (in people per acre for that subarea). Density was calculated by dividing the current population of each subarea by the number of acres within the subarea.

This was done to normalize the LOS that the system provides to the density of the population it serves. The GRASP® Perspective is a density analysis which measures the density of components and the service they provide. ***Comparing density of service to density of population may be one of the most useful indicators in the LOS analysis, because it is a measure of how the value of service offered by the system is distributed in relation to the people it serves.***

In this case, the resulting number for all of Cary is 56 points, and the values for the subareas range from 50 to 79. These are shown graphically on the inset map **PA-1: Average GRASP® LOS Per Population Density**. While there is no “standard” for this number, when used comparatively it can be a guide in understanding the relative distribution of service across the community. It can also be useful in determining where to provide additional service or adjust service as population shifts occur.

It is interesting to compare this set of numbers with those in the previous column. The previous column shows that the West subarea has the lowest “density” of service (142 points per acre). **But when the density of service is normalized for population density, the West subarea has a higher number than all of Cary except for the Maynard Loop.** This shows that while there are less “things” serving the West subarea, there are also less people concentrated there to make use of them.

There is no “correct” value for what these numbers should be. This information is simply provided to be used in conjunction with other findings to make recommendations for future actions.

Threshold Analysis:

Another way to look at LOS from this Perspective is shown on the inset map on Perspective A labeled **Perspective A-2: Threshold Analysis**. It shows where the cumulative LOS on Perspective A falls above or below a threshold score.

In this Perspective the threshold score is 67.2 points. That number is equal to the total GRASP® value that would overlay a location with walkable access to a “typical” neighborhood park with four components and a trail after all modifiers and computations are applied to assumed base scores of “2” for all components and attributes.

Purple areas on map A2 are those where scores are at or above the threshold. From the map it can be observed that **most of Cary falls above the threshold score**. This is indicative of the high level of service enjoyed by the residents of Cary wherever they live. While LOS values may vary from one part of Cary to another, overall the LOS is high throughout the Town and this is reflected in the map.

Areas where service is measured to be below the threshold score are shown in yellow on this map. These areas are not necessarily deficient in some way; they simply represent areas where service is measured to be below the threshold value. Much of the yellow area lies at the perimeter of Cary, where service can be expected to be lower until surrounding areas become more fully developed. There is what appears to be a gap in service in the Central subarea to the south of the Maynard Loop. However, this area includes the MacGregor planned residential community that has its own privately provided parks and recreation facilities.

In some cases, areas in yellow overlay non-residential parts of the Town, where lower levels of service are acceptable and appropriate. Note that for all areas, this map does not show how much above or below the threshold they are, and the threshold is not intended to represent a “minimum” acceptable level of service for all areas, but simply a point of reference.

In fact, it is conceivable that some areas shown as purple could be deficient in service, if the underlying conditions (such as higher than normal densities, or unique socio-economic factors) create a situation where a higher threshold is warranted. Such situations should be identified

through other tools, such as input from staff and/or the public process, and if they exist, further study by other means can be prescribed.

In the case of Cary, no such geographic gaps or deficiencies were identified (with the possible exception of a portion of the Central subarea), and this map helps explain why. If the areas of yellow and purple were scattered and intermingled, or if they did not match up well with the residential areas, it is likely that the public input process and other tools would have discovered problems with satisfaction levels and a sense of inequity among residents in different parts of the Town. But because service is being delivered at reasonable levels throughout the locations where people live, such problems are being avoided. *This is a strength of the overall system of parks, recreation facilities, open space, and trails* that the mapping corroborates.

GRASP® Index:

Another way to look at the existing service is to consider the total GRASP® value of all of the components that are physically located within a defined area, regardless of where they are located within or how their service areas overlap one another. **When this total GRASP® number is divided by the population of the defined area in thousands, the result is called a GRASP® Index.** (The GRASP® Index for Access to All Components is shown in the last column of GRASP® Table A.) In Cary, this number is a score of 20 points. For the subareas, it ranges from a low of 16 in Central to a high of 35 in Maynard Loop. An explanation of how the GRASP® Index can be used to plan and manage the system of parks, trails, and open space is presented in **Section xxxx**

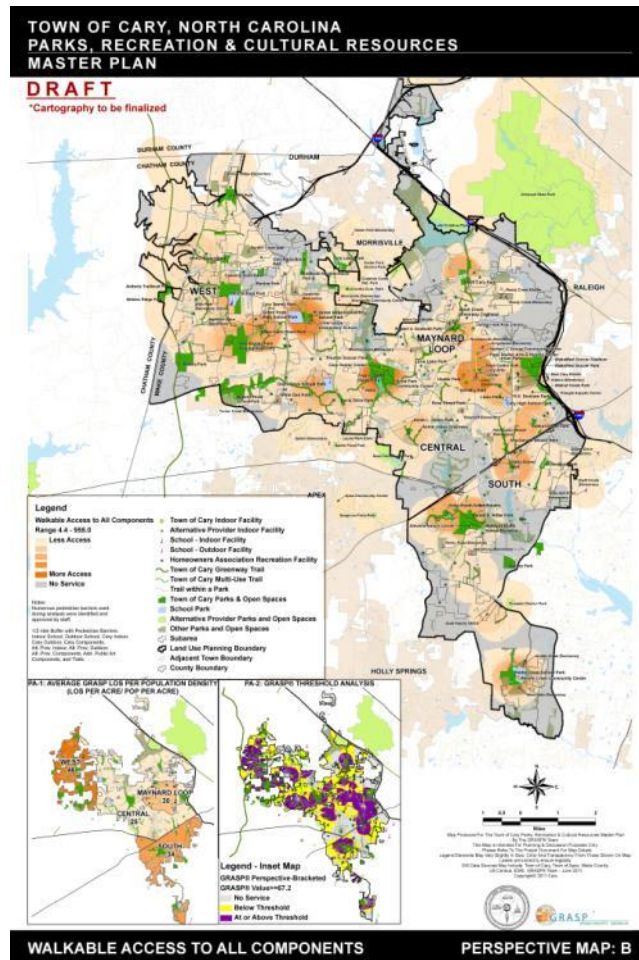
Perspective A Summary:

This analysis is not intended to determine what the minimum scores should be for any of the parameters. Rather, it is intended to provide a way of measuring current Levels of Service so that they can be compared to the findings from other instruments, such as citizen surveys, input from focus groups, etc. If those tools indicate that there are places where satisfaction levels are low, or where service inequities or gaps are reported, the Perspectives can be used to measure the actual difference in LOS between those areas and other ones where service is considered adequate or appropriate. Actions can then be taken to achieve equity. Targets for the resulting LOS can be established and progress towards meeting those targets can be measured.

However, this does not necessarily imply that the ***mix*** of features being offered is the one that residents currently desire. It may be that changes and/or improvements are needed within some areas to fit the specific mix of services to the needs and expectations of residents. Again, this is determined through the public process, and did not appear to be an issue in Cary.

Perspective B: Walkable Access to All Components

Larger maps are located in Appendix X.



Perspective B shows the relative access to all components from a walkability point of view. It uses the same set of components as Perspective A (i.e. all components in the inventory), but only the 1/2 mile catchment areas were plotted. The 1-mile catchment areas were not used. The purpose of this Perspective is to portray the service provided by the system within a walkable proximity across the study area.

Pedestrian barriers were also factored into this analysis. The barriers used were the same as the ones in the previous Perspective and were applied in the same manner.

As in the previous Perspective, darker shades are scattered throughout the Town and primarily clustered around larger parks and facilities. However, the sizes of these areas of concentration are smaller and more scattered due to the smaller catchment areas used to generate the Perspective.

Table B shows the statistics derived from this Perspective. They are the same ones presented for Perspective A and can be compared to those to see how LOS changes when looked at from a walkable proximity only.

GRASP® Table B
Perspective B: Walkable Access to All Components

	Percent With LOS	Total GRASP Score	Avg. LOS Per Acre W/ Service	Avg. LOS / Acre Per Pop. Den.	GRASP® Index
West	96%	288	95	46	24
Maynard Loop	94%	631	172	30	35
South	66%	572	114	34	23
Central	71%	1352	113	25	16
Cary(2011 Census)	76%	2843	116	30	20

The numbers show a decrease in percentage of coverage as well as a decrease in the LOS scores. This is because without the 1-mile catchment areas, there is less overlap of service from components, and components that are more than 1/2 mile away from a given location do not contribute to the LOS for that location. Note that, as in Perspective A, the relative ranking of service changes when population density is factored in. The average LOS Per Acre Served is lowest in the West subarea, but it is highest when density is factored in.

The GRASP® Index is the same in both tables because of the way it is calculated. For the GRASP® Index, the only consideration is whether or not a component lies within the physical boundary of a given area. The relative location of components within the given area, as well as the relative positions of components to one another within the area do not have an effect on the GRASP® Index like they do on the Perspectives. Also, in the Perspectives, components from outside the boundary of a given area can influence the LOS within it, but in the GRASP® Index they do not.

As in Perspective A, areas above and below a threshold score are shown on the **Perspective PB-2 - GRASP® Threshold Analysis**. It shows where the cumulative LOS on Perspective B falls above or below the threshold score of 67.2, which is the same threshold used in Perspective A-1. This threshold was used to allow for direct comparison of service between the two Perspectives.

Areas where service is below the threshold score are shown in yellow on the threshold map PB-1. In and of itself, the fact that an area falls below the threshold score does not mean that it has a deficit in service. The threshold applies primarily to “typical” single-family residential areas. Rural areas, industrial zones, or other areas without significant residential development may have thresholds for service that are much lower than the one used in this analysis. Areas with exceptionally high density (typically found in large urban areas and not present in Essex) may warrant thresholds that are higher than the one used here.

Areas in gray on the map fall outside the catchment area of any components. The LOS in these areas is zero. This may be acceptable if the area is undeveloped, preservation lands, or other non-residential use. Residential areas that are colored gray on this map may be lacking in service.

Purple areas on the map PB-2 are those where scores are at or above the threshold. The purple area makes up about half of the total area that has service (i.e. the total area that is either yellow or purple). This can be used as a baseline to set targets and measure progress in increasing the walkability of the Town. For example, a goal might be established to increase the percentage of purple from 50% to 75% over some period of time.

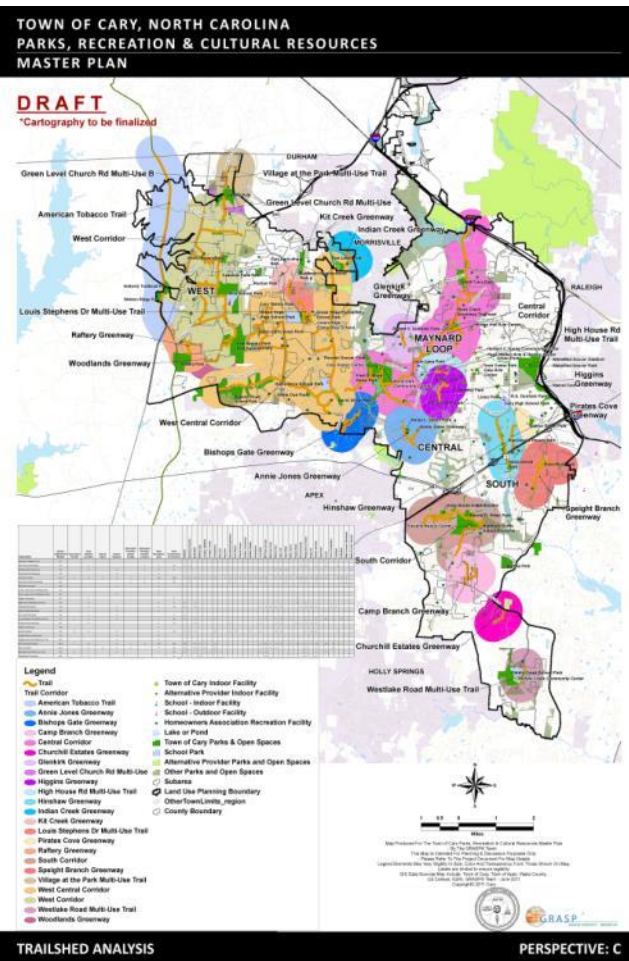
The map shows many areas where the yellow overlays residential areas. If improving walkability is a goal in Cary, these should be examined in more detail for potential ways to increase the LOS score.

Also, note that this map does not show how much above or below the threshold any given location might be. Relatively small improvements in the facilities that are serving areas in yellow may be enough to raise them into the purple category. Areas that are yellow and not gray on the map are presently served by one or more components. It can be assumed that these components lie within property owned or managed by one or more of the providers included in the inventory and analysis. What this means is that land upon which service upgrades can occur is currently available within a walkable proximity to these under-served locations. Simple improvements such as adding walking

paths, interpretive features, benches, or other amenities may be all that is needed to raise the LOS to the threshold score in these areas.

As in Perspective A, it is conceivable that areas shown as purple could be deficient in service, if underlying conditions create a threshold that is higher than 67.2 points. This analysis is not intended to determine what the actual score for any given location should be. The threshold score is simply an assumed guideline that applies primarily to typical residential areas. Also, because the score can be attained from any combination of components, this analysis does not determine whether or not the *mix* of components within walkable proximity of any given location is the one that people desire.

In summary, this analysis is intended to provide a way of measuring current Levels of Service so that they can be compared to the findings from other instruments, such as citizen surveys, input from focus groups, etc. If those tools indicate that there are places where satisfaction levels are low, or where service inequities or gaps are reported, the Perspectives can be used to measure the actual difference in LOS between those areas and other locations. Actions can then be taken to achieve equity. Targets for the resulting LOS can be established and progress towards meeting those targets can be measured.



equity. Targets for the resulting LOS can be established and progress towards meeting those targets can be measured.

Perspective C: Trailshed Analysis

Larger maps are located in Appendix X.

Perspective C provides a way of looking at the service provided by trails. In this Perspective, the trails within the dataset are identified as individual networks or **“trailsheds.”** Each individual network is a set of continuously connected trails. This means that within an individual network, **all segments of trail are connected and any segment can be reached from another without leaving the network.** 24 discreet trailsheds were identified in Cary. These were labeled as shown on the Perspective.

In Perspective C, a 1/2 mile catchment area distance has been applied to all segments of each network. The resulting area within this catchment is the *trailshed* for that network. The GIS data was queried to determine the number and types of facilities and

components that fall within each trailshed. This provides an assessment of what facilities and components are accessible within a 1/2 mile distance of the trail, and therefore can be reached by way of the trails within the network without having to leave the trail, other than at the beginning and end of the journey.

GRASP®Table C– Trailshed Analysis shows some of the data associated with each trailshed and allows for comparison of the connectivity and service provided by each trail network. An expanded version of this table with more information on the specific components that fall within each trailshed is found in **Appendix X**.

Whenever two trailsheds are connected together, a new trailshed emerges that is equal to the sum of the two, meaning that it has access to all of the components found in both trailsheds. This can be used for planning purposes to identify places where linking existing trails together will yield the greatest benefit in terms of connectivity.

Trailshed Statistics

TRAILSHED	TOTAL LENGTH (IN MILES)	Cary Indoor Facility	Cary Outdoor Location	School Indoor	School Outdoor	Alternative Provider Indoor Facility	Alternative Provider Outdoor Location	HOA Recreation Area	Total Components In Inventory
American Tobacco Trail	4.7								
Annie Jones Greenway	1.2		2				1	2	15
Bishops Gate Greenway	1.5		2		1		1	2	5
Camp Branch Greenway	1.2				1			1	
Central Corridor	11.3	3	8	2	2	1	2	14	119
Churchill Estates Greenway	0.5					1	1	1	24
Glenkirk Greenway	0.4				1			2	
Green Level Church Rd Multi-Use	1.2							2	
Green Level Church Rd Multi-Use B	0.7				1			1	
Higgins Greenway	0.7		2						2
High House Rd Multi-Use Trail	0.3		3					2	5
Hinshaw Greenway	1.6		3		1			3	23
Indian Creek Greenway	0.7				1			2	
Kit Creek Greenway	0.4		1		1				1
Louis Stephens Dr Multi-Use Trail	1.1	1	3		2			1	59
Pirates Cove Greenway	0.7		4					2	21
Rafferty Greenway	0.8							1	
South Corridor	4.5	1	3		2			3	23
Speight Branch Greenway	1.6				1			2	
Village at the Park Multi-Use Trail	0.5				1			1	
West Central Corridor	14.4	1	8		4	1	1	16	94
West Corridor	11.9		2	2	1	1		5	32
Westlake Road Multi-Use Trail	0.5	1	1		2			1	26
Woodlands Greenway	0.5		1						6

SUMMARY TABLE

Table 3 below shows the values from the Perspectives in a format that allows for different parameters to be compared to each other. Colors are used to show the high and low values for each parameter. The yellow color represents the low value for that parameter, and the green represents the high value.

Service Coverage Summary - Percent With Service

	P-A: All	P-B: Walkability
<i>West</i>	99%	96%
<i>Maynard Loop</i>	100%	94%
<i>South</i>	95%	66%
<i>Central</i>	97%	71%
<i>Cary(2011 Census)</i>	97%	76%

LOS. Summary - Avg. LOS Per Acre Served

	P-A: All	P-B: Walkability
<i>West</i>	142	95
<i>Maynard Loop</i>	448	172
<i>South</i>	182	114
<i>Central</i>	222	113
<i>Cary(2011 Census)</i>	221	116

LOS. Summary - Avg. LOS Per Acre / Population Per Acre

	P-A: All	P-B: Walkability
<i>West</i>	68	46
<i>Maynard Loop</i>	79	30
<i>South</i>	54	34
<i>Central</i>	50	25
<i>Cary(2011 Census)</i>	56	30

LOS. Summary - GRASP® Indices

	P-A: All	P-B: Walkability
<i>West</i>	24	24
<i>Maynard Loop</i>	35	35
<i>South</i>	23	23
<i>Central</i>	16	16
<i>Cary(2011 Census)</i>	20	20

4. Other Tools for Measuring Level of Service (LOS)

Besides the GRASP® Perspectives and associated LOS numbers, this assessment also uses capacities based analysis tools. One tool determines capacity by comparing GRASP® scoring to population, and the other tool models traditional methods of determining LOS by using straight quantity as compared to population.

Table 4 shows numerical indices for LOS that account for both quantity and functionality of components. The table shows the community GRASP® Index for each component, as well as the number of GRASP® points needed to maintain the current indices as the population grows.

GRASP® Index

The first part of the GRASP® Index Table shows the total GRASP® score for that component when all of the components in the dataset are included. During the inventory process, two sets of scores were assigned to each component, a Neighborhood score and a Community-wide score. The Community-wide scores are used to create this table.

Table 4: Overall GRASP® Indices

Projected Community Components GRASP® Index 2020

	Current Population		Projected Population 2020*	
	139,382		175,598	
	Total GRASP® Community Score per component type	GRASP® score per 1000 population (GRASP® Index)	Total GRASP® score needed at projected population	Additional GRASP® score needed
Ballfield	304.2	2.18	383.2	79.0
Basketball	159.7	1.15	201.2	41.5
Community Garden	11.7	0.08	15	3.0
Ed. Exp	25.8	0.19	32.5	6.7
Horseshoes	50.7	0.36	63.9	13.2
Loop Walk	55.2	0.40	69.5	14.3
MP Field, all sizes	167.3	1.20	210.8	43.5
Open Turf	96.75	0.69	121.9	25.1
Picnic Grounds	159.3	1.14	200.7	41.4
Playground, all sizes	141.45	1.01	178.2	36.8
Shelter, all sizes	246.35	1.77	310.4	64.0
Skate Park	11.7	0.08	14.7	3.0
Tennis	838.35	6.01	1056.2	217.8
Volleyball	99	0.71	124.7	25.7
Water Access, all	29.25	0.21	37	7.6

*Based on "Census Revised Pop Estimates GP - Planning1" (Sept. 30, 2011)

The second column in the table shows the index that results when the GRASP® score is divided by the current population in thousands. This is the overall GRASP® Index for that component. The third column in the table shows the total GRASP® score that must exist to achieve the same GRASP® Index at the projected population 2020, and the fourth column shows the additional number of GRASP® points needed to achieve that score.

This information can be used to plan for future improvements to the parks and recreation infrastructure to accommodate growth. Because GRASP® scores are a blend of quantity and quality; it is possible to increase them by either adding components or improving the quality and functionality of existing ones. In most cases, a combination of the two will be recommended. Used in conjunction with the Capacities LOS Table that follows, the best combination of quantity and quality can be determined for planning purposes.

The GRASP® Indices also allow the community to benchmark its combined LOS for quality and quantity of service over time and measure its progress. For example, if a community's population stays the same over time, and components are neither added nor removed, the LOS will remain constant *as long as the quality of the components is maintained*. If the quality and functionality of components is allowed to decrease, resulting in lower GRASP® scores for those components, a decrease in LOS will show up in the GRASP® Index. Conversely, if the population remains the same and no components are added or deleted, but some components are upgraded in quality, and increase in LOS will show up in the GRASP® Index.

This is particularly useful as communities shift their emphasis from growth (i.e. adding components) to sustainability (maintaining what you have). The GRASP® Index is a good tool for tracking LOS as the components in the system begin to age and need replacing. This idea will be discussed in more detail in the recommendations section.

Capacities Level of Service

For some components, the quantity needed is proportional to the population that will be served by that component. This is a fairly easy calculation when components are programmed for use. The programming determines how many people will be using the facilities over a period of time. Sports fields and courts fall into this category. For other components, the ratio of components to the population may vary, depending upon the size or capacity of the component and the participation levels within the community for the activity served by the component. Skate parks and group picnic facilities fall into this category.

Table 5 shows the current capacities and projected needs for community components as the population grows. This table closely resembles a traditional LOS analysis and shows how the quantities of certain park and recreation components compare to population. For each component, the table shows the current quantity of that component on a “per-1000 persons” basis (referred to as the Capacity (LOS) and the pro-rata number of persons in the community represented by each component. This kind of analysis can be used to show the capacity of the current inventory – in other words, how many people are potentially being served by park components. It can also be combined with the GRASP® Index to assure that the qualitative aspects of service are included in the planning process for the future. Just adding new components as the population grows will not be

sufficient to maintain existing levels of service if the quality of existing ones is allowed to deteriorate, either through wear and tear or obsolescence.

It is important to note that capacities tables are simply one tool that can be used to make final recommendations and establish budgets. **The tables assume that the current ratios are satisfying today's needs and that the same ratios will satisfy needs in the future. In reality, needs and desires change over time due to changes in demographics, recreational trends, and other factors.** The numbers of facilities shown on this table may differ from the final recommendations due to availability of land, ability to upgrade existing facilities, and other factors.

Capacities LOS for Community Components																
Cary, NC	Draft: September 2011															
		System Acres #	Ballfield	Basketball	Horseshoes	Loop Walk	MP Field, all sizes	Open Turf	Picnic Grounds	Playground, all sizes	Public Art	Shelters	Tennis	Trailhead	Volleyball	Recreational Trails (in miles) All Trails
INVENTORY																
Town of Cary			25	22	5	8	16	11	16	19	12	26	58	8	8	
Town of Cary / Public School			1	1			3			1		1				
Town of Cary / State/ Public School											1	1				
Public School			7	2			8	1				1				
State							7				1					
Total Components		1632	33	25	5	8	34	12	16	20	14	29	58	8	8	62.7
CURRENT RATIO PER POPULATION																
CURRENT POPULATION 2011	139,382															
Current Ratio per 1000 Population		11.71	0.24	0.18	0.04	0.06	0.24	0.09	0.11	0.14	0.10	0.21	0.42	0.06	0.06	0.45
Population per component		85	4,224	5,575	27,876	17,423	4,099	11,615	8,711	6,969	9,956	4,806	2,403	17,423	17,423	2,223
Commonly Referenced " Standards"		10	5,000	5,000	5,000	20,000*							2,000	2,000	2,000	
PROJECTED POPULATION - 2020*	175,598															
Total # needed to maintain current ratio of all existing facilities at projected population		2056	42	31	6	10	43	15	20	25	18	37	73	10	10	79
Number that should be added to achieve current ratio at projected population		424	9	6	1	2	9	3	4	5	4	8	15	2	2	16

*Based on "Census Revised Pop Estimates GP - Planning1" (Sept. 30, 2011)

Comparisons to Other Communities

The following table is a summary of results from some other communities. The values in the table are intended to provide a context and comparison for the analysis, not to imply a set of standards. Results of the analyses will vary from community to community due to a number of reasons, including underlying geography, local expectations, and variations on the set of assumptions on which the analyses are based.

For example, data for some of the communities may include alternative providers while others do not. Some may include undeveloped parks and other sites while others do not.

Table X: Comparative Data

STATE	AGENCY	POPULATION	STUDY AREA SIZE (Acres)	# OF SITES (Parks, Facilities, etc.)	TOTAL # OF COMPONENTS	AVG. # COMPONENTS per SITE	TOTAL GRASP® VALUE (Entire System)	GRASP® INDEX	AVG. SCORE/SITE	% of TOTAL AREA w/LOS >0	AVG. LOS PER ACRE SERVED	AVERAGE LOS/POP DEN PER ACRE
MA	M-NCPPC	828,770	318,926	526	2369	4.5	11800	14	22.4	93	168.8	65.0
OK	TULSA	384,037	356,383	186	1588	8.5	5536	14	29.8	87	111.3	103.3
FL	FT LAUDERDALE	181,095	23,230	91	483	5.3	2662	15	29.3	98	221.4	28.4
CO	LAKEWOOD	144,369	27,494	105	738	7.0	6476	45	61.7	100	NA	
IA	CEDAR RAPIDS	143,788	45,987	98	759	7.7	2467	17	25.2	86	299.6	95.8
CO	FORT COLLINS	130,681	33,388	45	619	13.8	2675	20	59.4	83	217.0	55.4
FL	WINTER HAVEN	100,000	42,191	31	230	7.4	328	3	10.6	37	174.9	73.8
NC	ASHEVILLE	75,948	27,027	58	378	6.5	1043	14	18.0	77	322.9	114.9
IN	BLOOMINGTON	72,032	15,001	45	258	5.7	2125	30	47.2	99	197.4	41.1
CA	PALM SPRINGS	50,663	60,442	16	123	7.7	1030	20	64.4	1	85.5	102.1
NC	CARY	139,382	35,578	43	562	13.1	2843	20	66.1	97	221.0	56.4

The *GRASP® Index* may be the most useful comparison to look at in this table. The table shows that Cary has a *GRASP® Index* that, while not the highest, is higher than many communities. This suggests that the combined overall quantity and quality that its system offers to residents on a per-capita basis compares favorably to other communities.

The Average Score/Site number is determined by dividing the Total *GRASP® Value* of the entire system by the number of sites. Cary has the highest number of all the communities in the table. This indicates that in general Cary's parks are larger in size and/or have more components in them than typically found in other communities. It is true that in general, Cary seems to have fewer parks spread a bit farther apart than other communities, but these parks are of high quality and contain a full complement of amenities. This shows up in the analyses as high LOS coverage and values for the overall composite (Perspective A), but lower coverage and average LOS values for walkability (Perspective B).

5. Level of Service Key Findings

The findings from the *GRASP®* analysis show what the current levels of service are for a variety of parks and recreation needs. While the *GRASP®* methodology allows quantitative measurements to be made for Levels of Service, there are no established standards for what the resultant numbers should be. This is because every community is different. In this sense, the *GRASP®* analyses are *descriptive* and not *prescriptive*. **The numerical analyses presented here provide a measurement for what the level of service is for a given location, but not what it should be.** Threshold scores have been used to get a sense of where the service value falls above or below an assumed value, but that value is not intended to represent a target or minimum standard. Other tools are used to

determine what the value should be in specific cases. These include surveys, focus groups, demographic composition, and others. However, the **GRASP® values can be used in conjunction with other findings**, such as community surveys and public input, **to determine whether current LOS is meeting needs and expectations, then used as a benchmark for creating targets and measuring results in the future.**

An interesting finding from the analyses is that the computed LOS in various parts of the Town may not line up with the perceptions that people have, especially when LOS is normalized for population density. Some areas that may be perceived to have lower LOS actually score higher than areas where service is perceived to be adequate. It does not mean that the perceptions are necessarily wrong, just that they may be due to the composition and location of facilities, rather than the pure quantity or quality of what is available.

Another finding is that because Cary has a high LOS for conventional access to services (i.e. driving), the focus can now shift towards improving walkability instead of having to address gaps in service or poor quality of service. (From a big picture perspective, at least – there may be localized exceptions.)

Also, trail connectivity is important to people, and connectivity improvements can also improve walkability. The Trailshed Analysis can be used to determine how linking existing trails to one another can yield the greatest results, and where key areas that lack access to trails are located.

The most obvious finding from the analysis is that Cary is well-served for parks and recreation in the traditional sense. This is commendable, given the challenge of serving a community that varies from quite rural to moderately urban in some areas. This does not mean that there are no people or places in Cary that lack service in some specific way. The GRASP® analyses are intended to measure what the current levels of service are and the relative differences in LOS from one location to another, but do not in themselves prescribe what the LOS should be. Used in conjunction with other tools, recommendations for target LOS can be developed.

While the analyses indicate that Cary enjoys an overall excellent LOS, the challenge will be to sustain that as the system ages and matures. In the past, parks and recreation master planning was often focused on meeting the challenges of growth. Growth and new development bring land and dollars into the system and offer opportunities to provide facilities that are new, exciting, and in line with the latest needs and desires. When land and money from growth are no longer driving the system, other resources must be found to not only maintain the system as it ages, but also to update facilities and provide new ones that address evolving changes in demographics, lifestyles, and other trends. The Levels of Service identified in this analysis are benchmarks against which Cary can measure its success in sustaining the quality of its system of parks, trails, and open space over time.

While the analyses used to determine LOS are very effective at putting numerical values on the physical assets that are offered, it does not measure how effectively the assets offered fit the desires of the public they are intended to serve. This must be determined by other means, such as citizen surveys and other public input. However, once certain types of assets are determined to be desired, the analyses can be used to determine how adding those assets to the system (and possibly replacing other assets with them) will affect the LOS that the system provides. The current value then becomes a baseline from which targets for improved values can be set and progress over time can be measured.