APPENDIX
GRASP® History and Level of Service Methodology

A. Level of Service Analysis

Analysis of the existing parks, open space, trails, and recreation systems are often conducted in order to assess how the systems are serving the public. A Level of Service (LOS) has been typically defined in parks and recreation master plans as the capacity of the various components and facilities that make up the system to meet the needs of the public. This is often expressed in terms of the size or quantity of a given facility per unit of population.

Brief History of Level of Service Analysis
In order to help standardize parks and recreation planning, universities, agencies and parks and recreation professionals have long been looking for ways to benchmark and provide "national standards" for measurements including: how much acreage, how many ballfields, pools, playgrounds, etc., a community *should* have. As examples, in 1906 the fledgling "Playground Association of America" called for playground space equal to 30 square feet per child. In the 1970's and early 1980's, the first detailed published works on these topics began emerging (Gold, 1973, Lancaster, 1983). In time "rule of thumb" **capacity** ratios emerged with 10 acres of parklands per thousand population becoming the most widely accepted standard application. Other normative guides also have been cited as "traditional standards," but have been less widely accepted. In 1983, Roger Lancaster compiled a book called, "Recreation, Park and Open Space Standards and Guidelines," that was published by the National Park and Recreation Association (NRPA). In this publication, Mr. Lancaster centered on a recommendation "that a park system, at minimum, be composed of a core system of parklands, with a total of 6.25 to 10.5 acres of developed open space per 1,000 population" (Lancaster, 1983, p. 56). The guidelines went further to make recommendations regarding an appropriate mix of park types, sizes, service areas, and acreages, and standards regarding the number of available recreational facilities per thousand population. While the book was published by NRPA and the table of standards became widely known as "the NRPA standards," for Level of Service Analysis, **it is important to note that these standards were never formally adopted for use by NRPA**.

Since that time, various publications have updated and expanded upon possible "standards," several of which have also been published by NRPA. Many of these publications did benchmarking and other normative research to determine what an "average LOS" should be. It is important to note that NRPA and the prestigious American Academy for Park and Recreation Administration, as organizations, have focused in recent years on accreditation standards for agencies, which are less directed towards outputs, outcomes and performance, and more on planning, organizational structure, and management processes. The following table gives some of the more commonly and historically used "capacity standards."

Common Historically-Referenced LOS Capacity "Standards"

Activity/ Facility	Recommended Space Requirements	Service Radius and Location Notes	Number of Units per Population
Baseball Official Little League	3.0 to 3.85 acre minimum 1.2 acre minimum	¼ to ½ mile Unlighted part of neighborhood complex; lighted fields part of community complex	1 per 5,000; lighted 1 per 30,000
Basketball Youth High school	2,400 – 3,036 vs. 5,040 – 7,280 s.f.	¼ to ½ mile Usually in school, recreation center or church facility; safe walking or bide access; outdoor courts in neighborhood and community parks, plus active recreation areas in other park settings	1 per 5,000
Football	Minimum 1.5 acres	15 – 30 minute travel time Usually part of sports complex in community park or adjacent to school	1 per 20,000
Soccer	1.7 to 2.1 acres	1 to 2 miles Youth soccer on smaller fields adjacent to larger soccer fields or neighborhood parks	1 per 10,000
Softball	1.5 to 2.0 acres	¼ to ½ mile May also be used for youth baseball	1 per 5,000 (if also used for youth baseball)
Swimming Pools	Varies on size of pool & amenities; usually ½ to 2-acre site	15 – 30 minutes travel time Pools for general community use should be planned for teaching, competitive & recreational purposes with enough depth (3.4m) to accommodate 1m to 3m diving boards; located in community park or school site	1 per 20,000 (pools should accommodate 3% to 5% of total population at a time)
Tennis	Minimum of 7,200 s.f. single court area (2 acres per complex	¼ to ½ mile Best in groups of 2 to 4 courts; located in neighborhood community park or near school site	1 court per 2,000
Volleyball	Minimum 4,000 s.f.	½ to 1 mile Usually in school, recreation center or church facility; safe walking or bide access; outdoor courts in neighborhood and community parks, plus active recreation areas in other park settings	1 court per 5,000
Total land Acreage		Various types of parks - mini, neighborhood, community, regional, conservation, etc.	10 acres per 1,000

Sources:
David N. Ammons, Municipal Benchmarks - Assessing Local Performance and Establishing Community Standards, 2nd Ed., 2002

Roger A. Lancaster (Ed.), *Recreation, Park and Open Space Standards and Guidelines* (Alexandria, VA: National Recreation and Park Association, 1983), pp. 56-57.

James D. Mertes and James R. Hall, *Park, Recreation, Open Space and Greenways* Guidelines, (Alexandria, VA: National Recreation and Park Association, 1996), pp. 94-103.

In conducting planning work, it is important to realize that the above standards can be valuable when referenced as "norms" for capacity, but not necessarily as the target standards for which a community should strive. Each community is different and there are many varying factors, which are not addressed by the standards above. For example:

- Does "developed acreage" include golf courses? What about indoor and passive facilities?
- What are the standards for skateparks? Ice Arenas? Public Art? Etc.?
- What if it is an urban land-locked community? What if it is a small town surrounded by open Federal lands?
- What about quality and condition? What if there are a lot of ballfields, but they haven't been maintained in the last ten years?
- And many other questions….

B. GRASP® Composite-Values Level of Service Analysis

In order to address these and other relevant questions, a new methodology for determining Level of Service was developed. It is called a **Composite-Values Methodology** and has been applied in many communities across the nation since 2001, to provide a better way of measuring and portraying the service provided by parks and recreation systems. Primary research and development for this methodology was conducted jointly by GreenPlay, LLC, a management consulting firm for parks, open space and related agencies, Design Concepts, a landscape architecture and planning firm, and Geowest, a spatial information management firm. While Composite-Values Methodology can be utilized by anyone, the proprietary trademarked name for the composite-values methodology **process** that these three firms use is called **GRASP® (Geo-Referenced Amenities Standards Process).** The **GRASP®** methodology for analysis is proprietary, but the software used is common and typical for most agencies, and the data and information collected is owned and can be updated and managed by the agency for ongoing usage.

For this methodology, capacity is only part of the LOS equation. Other factors are brought into consideration, including *quality*, *condition*, *location*, *comfort*, *convenience*, and *ambience*. To create a GRASP® inventory and analysis, parks, trails, recreation, open space and any other relevant amenities and properties being studied are looked at as part of an overall infrastructure for a community made up of various components, such as playgrounds, multi-purpose fields, passive areas, etc. The methodology inventories characteristics that are part of the context and setting of a component. They are not characteristics of the component itself, but when they exist in proximity to a component they enhance the value of the component.

The characteristics of components include:

Quality – The service provided by anything, whether it is a playground, soccer field, or swimming pool is determined in part by its quality. A playground with a variety of features, such as climbers, slides, and swings provides a higher degree of service than one with nothing but an old teeter-totter and some "monkey-bars."

Condition – The condition of a component within the park system also affects the amount of service it provides. A playground in disrepair with unsafe equipment does not offer the same service as one in good condition. Similarly, a soccer field with a smooth surface of well-maintained grass certainly offers a higher degree of service than one that is full of weeds, ruts, and other hazards.

Location – To receive service from something, you need to be able to get to it. Therefore, service is dependent upon proximity and access. All components are geographically located using GPS coordinates and GIS software.

Comfort – The service provided by a component is increased by having amenities. For example, outdoor components are often enhanced by attributes such as shade, seating, and a restroom nearby. Comfort enhances the experience of using a component.

Convenience – Convenience encourages people to use a component, which increased the amount of service that it offers. Easy access and the availability of trash receptacles, bike rack, or nearby parking are examples of conveniences that enhance the service provided by a component.

Ambience – Simple observation will prove that people are drawn to places that "feel" good. This includes a sense of safety and security, as well as pleasant surroundings, attractive views, and a sense of place. For example, a well-designed park is preferable to a poorly-designed one, and this enhances the degree of service provided by the components within it.

Capacity is still part of the LOS analysis and the quantity of each component is recorded as well. By combining and analyzing the composite values of each component, it is possible to measure the service provided by a parks and recreation system from a variety of perspectives and for any given location. Typically, this begins with a decision on **"relevant components"** for the analysis, collection of an accurate inventory of those components, analysis and then the results are presented in a series of maps and tables that make up the **GRASP**® analysis of the study area.

Data for Analysis and Making Justifiable Decisions
All of the data generated from the GRASP® evaluation is compiled into an electronic database that is then available and owned by the agency for use in a variety of ways. The database can help keep track of facilities and programs, and can be used to schedule services, maintenance, and the replacement of components. In addition to determining LOS, it can be used to project long-term capital and life-cycle costing needs. All portions of the information are in standard available software and can be produced in a variety of ways for future planning or sharing with the public.

It is important to note that the GRASP® methodology provides not only accurate LOS and facility inventory information, but also works with and integrates with other tools to help agencies make decisions. It is relatively easy to maintain, update, and creates easily understood graphic depictions (analysis maps and/or "Perspectives") of issues. **Combined with a needs assessment, public and staff involvement, program and financial assessment, GRASP® allows an agency to defensibly make recommendations on priorities for ongoing resource allocation along with capital and operational funding.**

C. Inventory Data Collection Process

A detailed inventory of relevant components for the project was conducted. The inventory located and catalogued all of the relevant components for the project, and evaluated each one as to how well it was serving its intended function within the system. The planning team first prepared a preliminary list of existing components using aerial photography and the community's Geographic Information System (GIS) information. Components were given GIS points and names according to the GRASP® list of standard components.

Next, the inventory was reviewed by the consulting team and by Department staff to confirm the preliminary data and collect additional information. Additionally, indoor facilities were scored and for the purposes of this study, each relevant space was considered a component and was scored based on its intended function. During the inventory evaluations, any missing relevant components were added to the data set, and each component was evaluated as to how well it meets expectations for its intended function. The following inventory information was collected:

- Component type and location
- Evaluation of component condition
- Evaluation of comfort and convenience features
- Evaluation of park design and ambience

After the inventory was completed, the project team completes a final review and approval for accuracy.

D. Standardized Process for Scoring Components

Component Scoring
The approved inventory is the basis for the creation of values used in the GRASP® analysis. Each component received a functional score that is related to the quality, condition, and ability of the space to meet operational and programming needs.

The range of scores for each component is as follows:

- **Below Expectations (BE)** – 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 is given a score of **1** in the inventory.
- **Meeting Expectations (ME)** – The component meets expectations for its intended function. Such components are given scores of **2.**

- **Exceeding Expectations (EE) –** The component exceeds expectations, due to size, configuration, or unique qualities. Such components are given scores of **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).**

If a feature is used for multiple functions, such as a softball field that is also used for T-Ball or youth soccer games, it is scored only once under the description that best fits the use that for which the component was designed.

Neighborhood and Community Scoring
Components are evaluated from two perspectives: first, the value of the component in serving the immediate neighborhood, and second, its value to the entire community.

Neighborhood Score
Each component is evaluated from the perspective of a resident that lives nearby. High scoring components are easily accessible to pedestrians in the neighborhood, are attractive for short and frequent visits, and are unobtrusive to the surrounding neighborhood. Components that do not have a high neighborhood score may not be located within walking distance of residents, may have "nuisance features" such as sports lighting, or may draw large crowds for which parking is not provided.

Community Score
Additionally each component is evaluated from the perspective of residents in the community as a whole. High scoring components in this category may be unique components within the parks and recreation system, have a broad draw from throughout the community, have the capacity and associated facilities for community-wide events, or are located in areas that are accessible only by car.

Indoor Components
Indoor components are generally thought to be accessible to the entire community, partially because it is often not financially feasible to provide indoor facilities at a walking distance from every distance from each residence. Additionally indoor facilities often provide programs and facilities that are geared to the community as a whole, or in larger communities, are intended for a region of the community. For these reasons, unless a detailed indoor analysis is completed, indoor facilities are given only one score.

Modifiers (Comfort and Convenience Features) Scoring

Outdoor Modifiers
Besides standard components, this inventory also evaluates features that provide comfort and convenience to the users. These are things that a user might not go to the parks specifically to use, but are things that enhance the users' experience by making it a nicer place to be and include: drinking fountains, seating, BBQ grills, dog stations, security lighting, bike parking, restrooms, shade, connections to trails, park access, parking, picnic tables, and seasonal and ornamental plantings. These features are scored as listed above with the 1-3 system. In this case it is not important to get a count of the number or size of these components; instead the score should reflect the ability of the item to serve the park.

Indoor Modifiers
For indoor facilities the comfort and convenience features change slightly to reflect the characteristics of the building. Building modifier categories include: site access, setting aesthetics, building entry function, building entry aesthetics, overall building condition, entry desk, office space, overall storage, and restrooms and/or locker rooms.

Activity and Sports Lighting
This modifier accounts for lighting that allows for component use in the evening/night hours and is applied to the quantity of the component as it affectively expands the capacity of the component. This modifier does not apply to security lighting.

Shade
Like Activity and Sports lighting, shade can be added to outdoor components to extend use beyond normal hours or seasons.

Design & Ambience Scoring
Using the same rating system that is used for components and modifiers, the quality of Design and Ambience is scored. Good design not only makes a place look nice, it makes it feel safe and pleasant, and encourages people to visit more often and stay longer.

Trails Scoring
Trails can be scored as independent parks or greenways or as individual components within another park. The former type of trail receives its own set of scores for modifiers and design and ambiance. The trail in the latter situation takes on the modifiers and design and ambiance of the larger park in which it resides. Multi-use trails are assumed to consist of three (3) components including one active component, one passive component, and the parcel itself. Because traveling the length of any given trail is time consuming, trail information is often collected with the aid of staff.

Ownership Modifier
This modifier is generally weighted with a percentage that is applied to the GRASP® score after other modifiers have been applied. It accounts for access and control of components that are provided by alternative providers. For example, in most cases components that are owned and managed by schools are given a 50 percent weighted ownership modifier, which halves the GRASP® score to account for the limited access that the neighborhood has to school facilities (it's only open to the public outside of school hours).

E. Calculating GRASP® Functional Scores

Once the components are inventoried and scored, calculations can be made for any combination of components to derive average scores, scores per combinations of various components, scores per sub-areas, etc., depending on the key issues being studied and objectives for the project. These are very helpful for analyzing area comparisons and setting of target scores for component service and agency target standards.

For example, a total composite GRASP® score for each individual component is determined by using the following formula:

$$\text{(total component score) x (adjusted modifier score) x (design and ambiance score) x (ownership modifier) = Composite GRASP}^{®}\text{ Score}$$

These individual scores can be additively combined in various ways to examine service from various subsets of the agency's system.

F. GRASP® Perspectives and Target Scores

GRASP® scores are often used to create analysis maps, called **Perspectives**, to show the cumulative level of service available to a resident at any given location in the community service area. The scores provided blended quantitative values based on the number and quality of opportunities to enjoy an experience (or level of service) that exist in a reasonable proximity to the given location. Tables and charts are created along with the Perspectives to help provide quantitative and graphic analysis tools.

If a philosophy is adopted wherein the goal is to provide some minimum combination of opportunities to every residence, a GRASP® score can be calculated that represents this minimum. These scores can be used to create standards for the agency to maintain a measurable level of service over time. A variety of Perspectives are created to analyze and depict the communities LOS through a variety of combinations and composites, depending on the key issues being studied.

Typical and Standard GRASP® Perspectives
Often Perspectives are created that analyze the actual level of service being obtained as compared to a "standard" target.

Neighborhood Composite
This Perspective depicts service from a neighborhood point of view. The threshold score for this analysis is that each resident will have access within 1/4 mile of their home to the equivalent of 4 recreation components and one recreational trail. Further expanded, the goal is to offer a selection of active and passive recreation opportunities (indoor or outdoor) to every residence, along with access to a recreational trail of which components, modifiers, and design and ambiance are meeting expectations.

Walkability (same as Neighborhood Composite but with only ¼ mile catchment areas)
The idea for this threshold score and Perspective is that each resident will have access within 1/4 mile of their home to the equivalent of 4 recreation components and one recreational trail.

Perspectives showing Neighborhood LOS for one component
The threshold score here is that each resident will have access within 1/4 mile of their home to the equivalent to the selected component of which the component, modifiers, and design and ambiance are meeting expectations.

Note: Aside from meeting this goal, the mix of components also needs to be considered. For example, a home that is within 1/4 mile of four tennis courts and no other amenities would meet the basic numeric standard, but not the intent of the standard. Based on this, it is recommended that the target be to provide the minimum score to as many homes as possible, but also to exceed the minimum by some factor whenever possible.

G. GRASP® Project Technical Standards for GIS Data

The GRASP® Team utilizes the most up to date computer hardware and software to produce and enhance project-based GIS data. The following technical details are standard with all GRASP® Team projects.

- All GRASP® Team GIS workstations employ Microsoft® Windows® operating systems. All project files conform to PC-based architecture and extension naming standards.
- The GRASP® Team employs ESRI® ArcGIS™ 9.3 for all GIS applications. Final project GIS data is submitted to the client in Microsoft® Access™-based Geodatabase (*.mdb) Feature Class format and/or Shapefile (*.shp/*.dbf/*.shx) format. ArcMap™ Layer files (*.lyr) are submitted to ease client replication of all project map legend formats. The GRASP® Team will not resubmit original client source data that has not undergone enhancement.
- All final GIS datasets (deliverables) area submitted to the client using the geographic coordinate system(s) from the original client source data. The GRASP® team will assign a coordinate system that is most appropriate for the client location if the client does not require a predetermined standard coordinate system. Most GRASP® project data is submitted in State Plane Coordinates (Feet) with a NAD83/NAD83 HARN datum.
- The GRASP® Team employs Trimble® GPS units for all (spatial) field data collection. All data is collected with sub-foot and/or sub-meter accuracy when possible. All GPS data is post processed with Trimble® Pathfinder Office® software. All GPS data will be submitted to client as an ESRI®-based Geodatabase Feature Class or Shapefile.
- All GRASP® Perspectives and Resource Maps (deliverables) are submitted to the client in standard PDF and JPEG formats. The project PDFs are high resolution, print-ready files for scalable print operations. Most project map-based PDFs are 300dpi, 36"x54" images. The project JPEGs are lower resolution digital presentation-ready files for insertion into Microsoft® Office® productivity suite applications – MS Word®, MS Power Point®, etc. Most project map-based JPEGs are 300dpi 4x6" images.

H. Project Deliverables and Future Use

All information and deliverables described above are transmitted "as-is" to fulfill specific tasks identified in the scope of services for this contract. While these may be useful for other purposes, no warranties or other assurances are made that the deliverables are ready for such use.

The database can be modified to add, change, or delete information as needed by personnel trained in use of these standard software applications. For example, if new parks or facilities are constructed, the components of these may be added to the database to keep it current. The database may also be queried in a variety of ways to produce tables, charts, or reports for use in operations, management, and planning or other agency tasks. Such modification, updating, reformatting, or other preparation for use in other purposes is the sole responsibility of the client.

Similarly, the database information can be used to prepare a variety of maps and analysis perspectives using GIS software. Such use by the client is beyond the scope of this contract, and no warranties or assurances are made that the deliverables are ready or intended for such future use. If desired, the

GRASP® Team can make such modifications, and/or prepare additional or updated maps or Perspectives upon request for a negotiated fee.