# 2014 LAF CSI PROGRAM LANDSCAPE PERFORMANCE SERIES: AT&T Performing Arts Center: Elaine and Charles Sammons Park,

**Research Title: The University of Texas at Arlington's Case Study Investigation 2014: Sundance Square Plaza, & AT&T Performing Arts Center-Elaine and Charles Sammons Park[1] Methodology for Landscape Performance Benefits**

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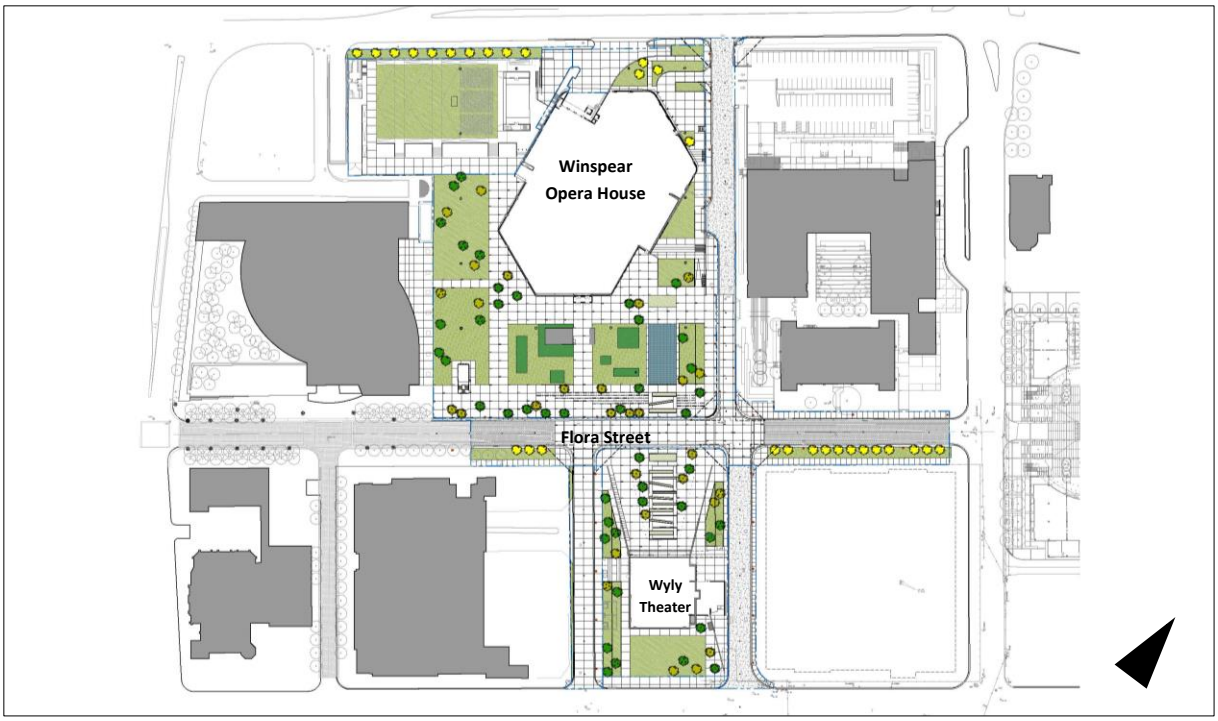



**Overview of UT Arlington's Research Strategy for Both Case Stu** (Source: SmithGroupJJR, 2014)

**Introduction:**

The purpose of this research is to investigate the landscape performance of two acclaimed landscape architectural projects: 1) Sundance Square Plaza, Fort Worth, Texas; 2) AT&T Performing Arts Center: Elaine and Charles Sammons Park, Dallas, Texas. Both projects are landscape architectural centerpieces representing decades of district-level efforts ) in the two largest cities in North Texas. This research is initiated as part of 2014 Case Study Investigation (CSI) program funded by Landscape Architecture Foundation (LAF). It is conducted in collaboration with the project landscape architecture firms: 1) Michael Vergason Landscape Architects (Vergason); and 2) SmithGroupJJR (JJR).

The case study research tasks and reporting are outlined in advance by LAF to present project profile and overview, sustainable features, challenges/solutions, lessons learned, role of landscape architects, cost comparisons, and performance benefits. Within the LAF framework, the UT Arlington research team, with its professional firm partners, collected, reviwed, and analyzed/synthesized project-related data for over 21 weeks between March – August, 2014 to prepare the case studies published online at the LAF website.

The UT Arlington team developed its overall research design strategy in the 2013 cycle as one of the recepients of the LAF's CSI grant/recognition (see Ozdil et. al., 2014). As a second year grant recipient in 2014, UT Arlington team continues to follow the strategy developed last year with slight revisions based on the lessons learned in the 2013 period. The research outlines its inquiry under the three sub-category headings-- environmental, economic, and social (including cultural and aesthetic)--to establish a comprehensive and systematic framework, ease the data collection and analysis process for multiple case studies, and to avoid losing sight of research goals while documenting a diverse set of findings. These sub-categories are used primarily to identify and organize the performance benefits of landscape architecture projects in this collaborative effort.

The UT Arlington research combines quantitative and qualitative methods to document both landscape architectural projects, and to assess their performance benefits (Deming et. al., 2011; Murphy, 2005;

Moughtin, 1999; Ozdil et. al., 2014; Ozdil, 2008). Methodological underpinnings of the research for the case studies are primarily derived from a systematic review of performance criteria and variables from: (1) the LAF's landscape performance series *Case Study Briefs* (LAF, 2014), (2) the case study methods that are developed for designers and planners in related literature (Francis, 1999; Gehl & Svarre, 2013; Gehl, 1988; Marcus et. al. 1998; Ozdil et. al., 2013; Preiser et. al., 1988), (3) the primary data collection methods through surveys (Dilman, 1978), site observations, behavior mapping, and assessment techniques (Gehl & Svarre, 2013; Marcus et. al. 1998; Whyte, 1980 & 1990), and finally (4) project-related secondary data collected from project firms, project stakeholders, public resources and databases. The data gathered from all the research instruments are further analyzed, synthesized and summarized as the performance benefits for the two case studies under investigation. The findings are organized within the LAF framework, as it is outlined earlier in this document for online publication. The research is designed to highlight the value and significance of these two landscape architecture projects by utilizing objective measures and by documenting and evaluating their performance to inform the design of future urban landscapes.

**Data Collections Methods:**
The research involves collection of primary and secondary data through online surveys, site observations and systematic review of available secondary data. As a first step, the research team acquired necessary permissions from the Institutional Review Board at UT Arlington prior to primary data collection involving human subjects. The following section briefly reviews some of the major data collection strategies adopted in this research.

**Survey:** A survey instrument is developed to collect social performance data for both sites. The survey measures user perception on topics such as quality of life, sense of identity, health and educational benefits, safety and security, presence of arts, and availability of informal and organized events. The survey is informed by relevant literature, as well as by other survey instruments prepared for parks and other landscape architecture projects (such as Dallas Park & Recreation Survey and New York's Central Park Survey, to name two). The survey instrument and the variables questioned within are kept almost identical in both cases in order to develop a more homogenous measure with which to study varying sites, and to provide LAF with replicable and generalizable instrument. The survey simply asks the visitors for their perceptions and experiences of the site.

The survey is composed of three parts. The first part of the questionnaire documents user profiles as well as user perceptions and choices on activities available on the site by using multiple choice questions. The second part of the survey asks users to rate performance-related statements with Likert scale questions. The final portion of the survey asks for additional comments/concerns of visitors who want to share additional information with the research team.

The survey was voluntary and the respondents were assured that identities would be kept confidential to ease privacy concerns. The survey is kept short (15 minutes to complete) and prepared for both online and on-site platforms in order to increase its utilization by potential respondents. Due to time and resource limitations, researchers utilized the online and on-site surveys interchangeably in some case studies. Surveys for both sites are conducted over the summer months.

**Site Observations:** Passive observation, photography, video recording, and site inventory and analysis techniques (such as use of street furniture counts/measurements, etc.), in addition to people counts, activity mapping and tracing methods are also utilized in 2014 case studies. The research team specifically takes advantage of these methods this year since the case study sites were prone to more concentrated people activity in well-defined urban spaces. The research team primarily benefited from the site visits and observations to understand the user activity and behavior relative to how the spaces

are being used. The passive observations are conducted on both weekdays and weekends in random intervals for better representation of the varying visitor activity at each site.

Observational methods utilized in this research did not involve any intrusive interaction with the subjects and necessary precautions are taken not to impede or govern the subjects' activities. Although photography or video recording was used, the identity of the subjects is blurred unless they allowed researchers to use their images or the research partners provided photos with the appropriate credentials. In both case studies, the research team informed the stakeholders prior to site visits, and acquired necessary permissions. Additional details of these techniques are provided in the following pages.

**Archival and Secondary Data:** This research benefited greatly from archival and secondary data attained from project firms, project stakeholders, public resources, and private databases. In accordance with LAF's mission, this research was a product of a partnership among academic research team, project firm, and LAF. Where and when data were available from the secondary sources, such as the landscape architecture firm, client(s), project partners, scholarly literature, and publicly available sources, the project team systematically collected and organized the data, diligently reviewed its content, and assessed its rigor and integrity. The research team later used the relevant data to document the project, and assessed the landscape performance for both sites.

**Data Analysis and Research Design:**

The UT Arlington team designed its research strategy under three focused thematic areas--environmental, economic, and social (including cultural and aesthetic)--for both case studies. In the beginning of the investigation, the research team benefited from this strategy for conducting a systematic research that produces replicable performance criteria and methods for both sites. After the measurable criteria were identified and the possibilies exhausted, the UT Arlington team further refined its approach by customising performance criteria and procedures to each case study site to better document and report the varyed qualities of each site independently. While achieving a comparable set of performance benefits for all sites was the goal, and this strategy produces the greater framework for the research, customising detailed performance criteria later in the process helped the research team to overcome concerns about data availability, varying project typologies, project goals and outcomes.

The findings of the investigations in both cases focused first on performance benefits related to the site itself, then its immediate adjacencies, and finally on the project block group/neigborhood/district or zip code. For example, performance benefits that are most direct and telling about the project site itself are emphasized more in comparison to indirect performance benefits and findings about the project adjacencies or neigborhoods. This strategy is also used in the reporting of the findings to clarify the document and to ease the review.

In conclusion, the data collected through these strategies were systematically reviewed and appropriate methods for analysis of specific performance criteria are highlighted in the detailed methodology below. The following section presents research design specifics for Sundance Square Plaza, a basic summary of the performance criteria under investigation, and the data sources and procedures involved in measuring that particular performance criteria.

**Overview of AT&T Performing Arts Center: Elaine and Charles Sammons Park, & UT Arlington's Research Strategy:**

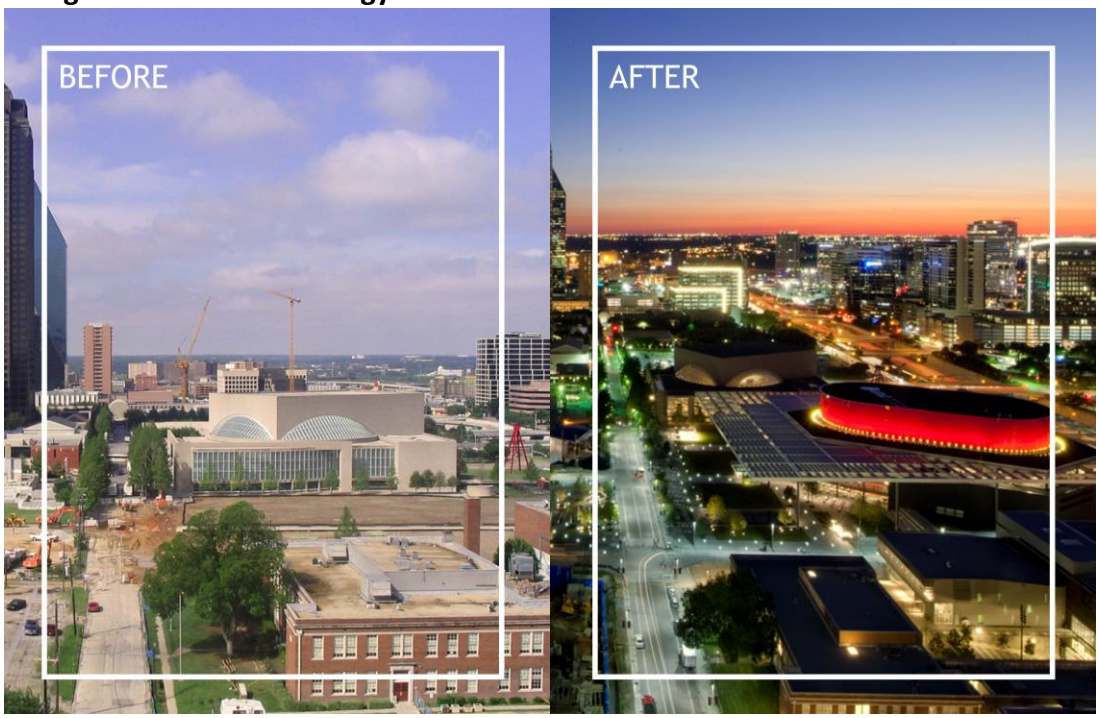



**Figure.1** AT&T Performing Arts Center: Elaine and Charles Sammons Park (Source: SmithGroupJJR, 2014)

**Overview:** In the late 1970's, visionary Dallas leaders foresaw the growing need for new cultural facilities in Dallas. They recognized the clear advantage of clustering these venues within a tight geographic area in the northeast corner of downtown in order to create maximum economic, educational and cultural benefits for each arts entity and for the City of Dallas. The vision of the Arts District Master Plan, designed by Sasaki Associates, became a reality in 1984 with the opening of the Dallas Museum of Art. The Dallas Center for Performing Arts Foundation (DCPAF) created a master plan for 10 acres within the larger District to provide year-round indoor and outdoor performance venues, and constructed the Margot and Bill Winspear Opera House, Dee and Charles Wyly Theatre, Annette Strauss Square, and Elaine D. and Charles A. Sammons Park, as well as associated underground parking areas.

Elaine and Charles Sammons Park at the AT&T Performing Arts Center is a public space design by SmithGroupJJR to serve as the centerpiece for the burgeoning Dallas Arts District. Completed in October 2009, the design is an extension of the broader mission of the district to provide visitors with access to outdoor amenities that open opportunities to experience art, music, history and culture. Formerly the site of a parking lot, the park was designed in conjunction with the Winspear Opera House and Wyly Theatre to act as an entry plaza and outdoor performance space while connecting them to a neighboring high school and symphony center and serving as a spatial anchor for the district. The park spans across two sides of Flora Street, and is comprised of a plaza with a reflecting pool, a side courtyard and green space with café-style seating, a vegetated entry ramp to the Wyly, an enhanced streetscape, and an outdoor performance stage with a sunken lawn. In order to stimulate pedestrian activity and help mitigate the harsh Texas climate, essential amenities include shade and water features, streetscape improvements with native trees, native and naturalized plantings, artwork and a beverage kiosk. A *brise soleil* extending from the Winspear casts dappled shade over an inviting reflecting pool that is an oasis

during the Texas summers. The design and placement of these amenities within a simple green space compliments the architecture of the performance halls rather than compete with it. Overall, the landscape serves to connect at a district level and stimulate at a personal level.

**Challenge:** The two primary venues, the Winspear Opera House and Wyly Theatre, are situated across Flora Street from each other. Led by two different Pritzker Prize winning architectural teams -- Norman Foster & Partners (Winspear) and Rem Koolhaas with OMA (Wyly) -- each building had strikingly different programmatic requirements and architectural design responses. The Winspear Opera House's large building footprint and *brise soleil* suggested a flat plinth as a base. The Wyly Theatre's small footprint and vertical proportion pushed the entrance to the Lower Level, which is 20-feet below Level One, requiring a large sloped opening. To complicate matters further at the Wyly, this 13% sloped opening would require both universal access and valet parking at the door (SmithGroupJJR, 2014).

**Solution:** Creating a plinth for the base of the Winspear Opera House was complicated due to the sloping Flora Street frontage. This was resolved by creating broad steps across the Flora Street frontage which met the existing grade on one end and transitioned to a maximum of six steps on the other. The ramp in front of the Wyly was more challenging. First, a series of 5% sloped ramps arranged in a switchback pattern down the middle of the ramp created an ADA accessible path to the entry. Planters were built in between the switchbacks to create the ADA required landings and to absorb the slope changes. The balance of the ramp's space remains at 13% for those more able to traverse the slope or for valet parking. Planting beds in bold rectangular and square shapes filled with a sophisticated native and naturalized plant palette enhances the landscape setting through dynamic textures, colors and scales of flora while maintaining the controlled and pristine aesthetic of the architecture (SmithGroupJJR, 2014).

**Case Study Strategy:** The research team followed the comprehensive investigation strategies outlined earlier in this document by concentrating on the social, environmental, and economic implications of the project. The team's approach to identifying performance benefits for Elaine D. and Charles A. Sammons Park at the AT&T Performing Arts Center is mainly driven by detecting the district level challenges (see above), by reviewing its spatial organization to create people places, and by evaluating elements influencing its forms and functions to provide visitors with access to outdoor amenities that open opportunities to experience art, music, history and culture. Its status as a destination and its social and recreational qualities as an urban plaza in an arts district for urban dwellers and visitors encouraged the research team to investigate user perceptions. After reviewing the relevant literature, the project information, and the firm archives with SmithGroupJJR, the UT Arlington research team developed detailed procedures and performance measures which can be tied to the project's initial challenges, goals and objectives (see figure.2 for research design).

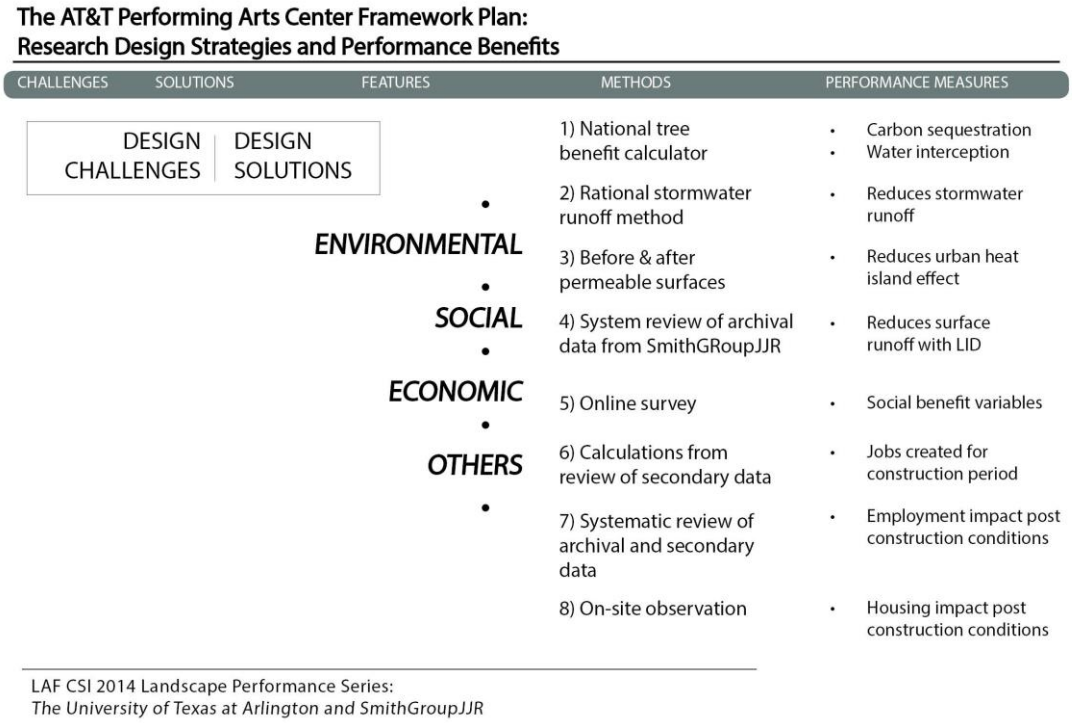



**Figure.2** Research Design

The research team followed the research design strategies outlined in the earlier portion of this document for the AT&T Performing Arts Center: Elaine and Charles Sammons Park case study (see figure.2 above). The team explored all social, economic and environmental performance measures. Given the district level focus to arts and culture, the research team emphasized performance criteria that are more telling about the perceptions of the users, programmatic elements of the various components of the park, innovative construction practices, and cultural implications for visitors, as well as its economic impact to its immediate context. The park's close proximity to UT Arlington allowed the research team to emphasize site observations and survey as effective data collection strategies. After acquiring Institutional Review Board permissions for human subjects from UT Arlington, the survey is distributed via e-mails, social media outlets, and/or professional network. Passive observations, specifically people count and activity mapping techniques allowed researchers to quantitatively document the performance of Elaine and Charles Sammons Park.

The research procedure also involved documenting the economic performance indicators for this case study. Various secondary data sources were reviewed to determine the project's economic influence, and numerous positive indicators are found representing the larger context of the project site. However, the causality between the improvements and the economic changes in most instances were not direct and not specific enough to the project, and not as informative as the researchers desired. Therefore only a few selected economic performance measures are highlighted for the AT&T Performing Arts Center: Elaine and Charles Sammons Park case study. The next section outlines the specific performance benefits documented for this 10 acre park by illustrating data sources and procedures followed, as well as the limitations encountered measuring the particular performance criteria.

## Performance Indicators:

***The following bullet points explain and illustrate some of the more complex performance indicators summarized on the LAF CSI website. The performance indicators listed below are in their full form, and explained in detail to inform the reader about the calculations, procedures, limitations and/or***

***significance of the research. These bullets are later formatted, summarized and/or further revised to comply with the online portal restrictions.***

## Environmental:

**Performance Indicator.1:**

*Sequesters 18,000 lbs of CO2 annually in 66 newly-planted trees, equivalent to driving 21,500 miles in a single passenger vehicle. These trees also intercept 81,300 gallons of rainwater in their canopies.*

| Scientific name | DBH (inches) | CO2 sequestered by one tree (lbs) | Quantity of trees | Total CO2 sequestered (lbs) |
|---|---|---|---|---|
| Ilex vomitoria | 3 | 20 | 5 | 100 |
| Quercus lyrata | 10 | 393 | 19 | 7467 |
| Quercus lyrata | 4 | 88 | 4 | 352 |
| Quercus virginiana | 10 | 269 | 29 | 7801 |
| Quercus virginiana | 4 | 61 | 2 | 122 |
| Quercus shumardii | 10 | 313 | 7 | 2191 |
| **Total** | | | **66** | **18033** |

**Table.1: Tree's potential for carbon sequestration.**

**Methods:** As illustrated in the table above the carbon sequestered is calculated with National Tree Benefit Calculator (http://www.treebenefits.com/calculator/, 2014).

For example: A single *Quercus lyrata* of 10" DBH sequesters 393 lbs of CO2. There are total of 19 *Quercus lyrata* in the planting plan of the AT&T Performing Arts Center. Thus, the total amount of CO2 sequestered by 19 *Quercus lyrata* would be:

393 lbs*19 = 7467 lbs

One metric ton is comprised of 2204 lbs. Thus, the total CO2 sequestered with the help of all of the trees would be:

18033/2204 ~ **8.18 metric tons**

| Annual Vehicle Distance Travelled in Miles and Related Data - 2011 (1) By Highway Category and Vehicle Type March 2013 | | | | | |
|---|---|---|---|---|---|
| | ITEM | LIGHT DUTY | | SUBTOTALS | |

| YEAR | Motor-Vehicle Travel:(millions of vehicle-miles) | VEHICLES SHORT WB (2) | MOTOR-CYCLES | ALL LIGHT DUTY VEHICLES (2) | SINGLE-UNIT 2-AXLE 6-TIRE OR MORE & COMBINATION TRUCKS | ALL MOTOR VEHICLES |
|---|---|---|---|---|---|---|
| 2011 | Number of motor vehicle registered | 192,513,278 | 8,330,210 | 233,841,422 | 10,270,693 | 253,108,389 |
| 2010 | | 190,202,782 | 8,009,503 | 230,444,440 | 10,770,054 | 250,070,048 |
| 2011 | Average miles traveled per vehicle | 10,614 | 2,221 | 11,318 | 26,016 | 11,640 |
| 2010 | | 10,650 | 2,311 | 11,493 | 26,604 | 11,866 |
| 2011 | Average fuel consumption per vehicle (gallons) | 460 | 51 | 530 | 4,126 | 666 |
| 2010 | | 456 | 53 | 534 | 4,180 | 681 |
| 2011 | Average miles traveled per gallon of fuel consumed | 23.1 | 43.5 | 21.4 | 6.3 | 17.5 |
| 2010 | | 23.3 | 43.4 | 21.5 | 6.4 | 17.4 |

**Table.2: Carbon emissions comparison to annual vehicle distance travelled.**

The numbers for the miles travelled in a year (11,318) and average (21.4mpg) of the passenger vehicle is set as bench mark (for comparison of the CO2 emitted) from Federal Highway Administration (FHWA) 2013 data as can be seen below:

Source: http://www.fhwa.dot.gov/policyinformation/statistics/2011/vm1.cfm

With the help of Carbon Calculator (http://www.americanforests.org/discover-forests/carbon-calculator/), a gas fuelled passenger vehicle travelling 11,318 miles in a year at 21.4 mpg average emits 9394 lbs of CO2 which is equivalent to 4.24 metric tons.

9394/2204 ~ 4.24 metric tons

The total CO2 sequestered by trees is equivalent to the approximate CO2 emitted from 1 passenger vehicle in a year:

8.18/4.24 ~ 1.9 passenger vehicles

11,318 miles*1.9 = **21,504 miles**

Finally, the 8.18 metric tons of CO2 sequestered by the trees is equivalent to 21,504 miles travelled in a year in a single passenger vehicle.

| Common name | DBH (inches) | Stormwater intercepted by one tree (gallons) | Quantity of trees | Total stormwater runoff intercepted (gallons) |
|---|---|---|---|---|
| Ilex vomitoria | 3 | 80 | 5 | 400 |
| Quercus lyrata | 10 | 1586 | 19 | 30134 |
| Quercus lyrata | 4 | 402 | 4 | 1608 |
| Quercus virginiana | 10 | 1290 | 29 | 37410 |
| Quercus virginiana | 4 | 195 | 2 | 390 |
| Quercus shumardii | 10 | 1619 | 7 | 11333 |
| | | | | |
| **Total** | | | **66** | **81275** |

**Table.3: Trees' potential for water interception.**

**Methods:** As illustrated in the table above the stormwater intercepted is calculated with National Tree Benefit Calculator (http://www.treebenefits.com/calculator/).

For an example: A single *Quercus lyrata* of 10" DBH intercepts 1586 gallons of stormwater runoff. There are total 19 *Quercus lyrata* in the planting plan of the AT&T Performing Arts Center. Thus, the total amount of stormwater intercepted by 19 *Quercus lyrata* would be:

1586 gallons*19 = 30,134 gallons

The EPA's Water Trivia Facts states that an American resident uses 100 gallons of water in a day (http://water.epa.gov/learn/kids/drinkingwater/water_trivia_facts.cfm).

81,275 gallons/100 gallons ~ **812 American residents**

**Finally, 812 American residents use 81,275 gallons of water in a day, equivalent to the stormwater intercepted by the trees in the AT&T Performing Arts Center.**

**Limitations:** This indicator relies on tools and estimations that are developed or provided by third parties and may be subject to errors beyond the research team's control. Since the project was completed in October 2009, the plants are still not fully mature. The DBH for the plants is considered as 3", 4", and 10" as per the information sourced from SmithGroupJJR. As another example, the data highlighted in the table for using a passenger vehicle as a benchmark is the US national average of the

**Performance Indicator.2:**

- *Reduces surface temperatures under the brise soleil by an average of 17°F for the concrete seating areas. During the spring/summer season, 67% of the entire site is shaded, compared to 28% pre-development.*

The surface temperature of 31,900 square feet of concrete-paved seating areas under the brise soleil were compared to an adjacent concrete-paved seating area in full sun during the week of observation. The highest surface temperature measured under the brise soleil was 90 degrees and the area in full sun was108 degrees.

**Method:** Spot surface temperatures were taken hourly at various designated zones in the park, all with the same concrete paving. The coolest surface temperatures were consistently on the concrete areas under the *brise soleil*. For the final measurement, the surface temperatures of one spot under the *brise soleil* was compared to the surface temperature of a seating area on concrete paving about 20 feet away, not receiving any shade during the day.

**Limitations:** With no tools to quickly measure spot air temperatures we resorted to taking area surface temperatures. While surface temperatures are telling of the benefit of the shade, air temperatures would have been more telling about the comfort of the area.

For the shade figures, modeling suggests nearly 67% total shade coverage of the overall plaza post-development as opposed to 28% shade coverage pre-development during Spring-Summer season days, which increases the usability of the plaza and the comfort of the plaza visitors, especially during the warmest months.

| **Shade Comparison - post-development** | | | | |
|---|---|---|---|---|
| **Season** | **Daily Morning Average (~sq. ft)** | **Daily Afternoon Average (~sq. ft)** | **Seasonal Average (~sq. ft)** | **Acres (Acres)** |
| Fall | 184,390 | 185,200 | 184,795 | 4.2423 |
| Winter | 206,180 | 197,890 | 202,035 | 4.6381 |
| **Total Average (Fall + Winter)** | | | **193,415** | **4.4402** |
| | | | | |
| Spring | 171,340 | 183,350 | 177,345 | 4.0713 |
| Summer | 169,950 | 170,340 | 170,145 | 3.9059 |
| **Total Average (Spring + Summer)** | | | **173,745** | **3.9886** |

| **Shade Comparison - pre-development** | | | | |
|---|---|---|---|---|
| **Season** | **Daily Morning Average (~sq. ft)** | **Daily Afternoon Average (~sq. ft)** | **Seasonal Average (~sq. ft)** | **Acres (Acres)** |
| Fall | 95,220 | 95,040 | 95,130 | 2.1839 |
| Winter | 125,210 | 115,490 | 120,350 | 2.7629 |

| | | | | |
|---|---|---|---|---|
| **Total Average (Fall + Winter)** | | | **107,740** | **2.4734** |
| | | | | |
| Spring | 75,280 | 76,390 | 75,835 | 1.7409 |
| Summer | 73,460 | 68,670 | 71,065 | 1.6314 |
| **Total Average (Spring + Summer)** | | | **73,450** | **1.6862** |

**Table. 5: Shade Area; pre and post development comparison**

**Methods:** As illustrated in the tables above, the shade area is calculated by finding the square footage of shaded areas for twice a day and for one day every month of the year. A Google Sketch Up model was built to replicate four different seasons of the year for both pre-development and post-development conditions, shown below (Summer season Post-Development example):

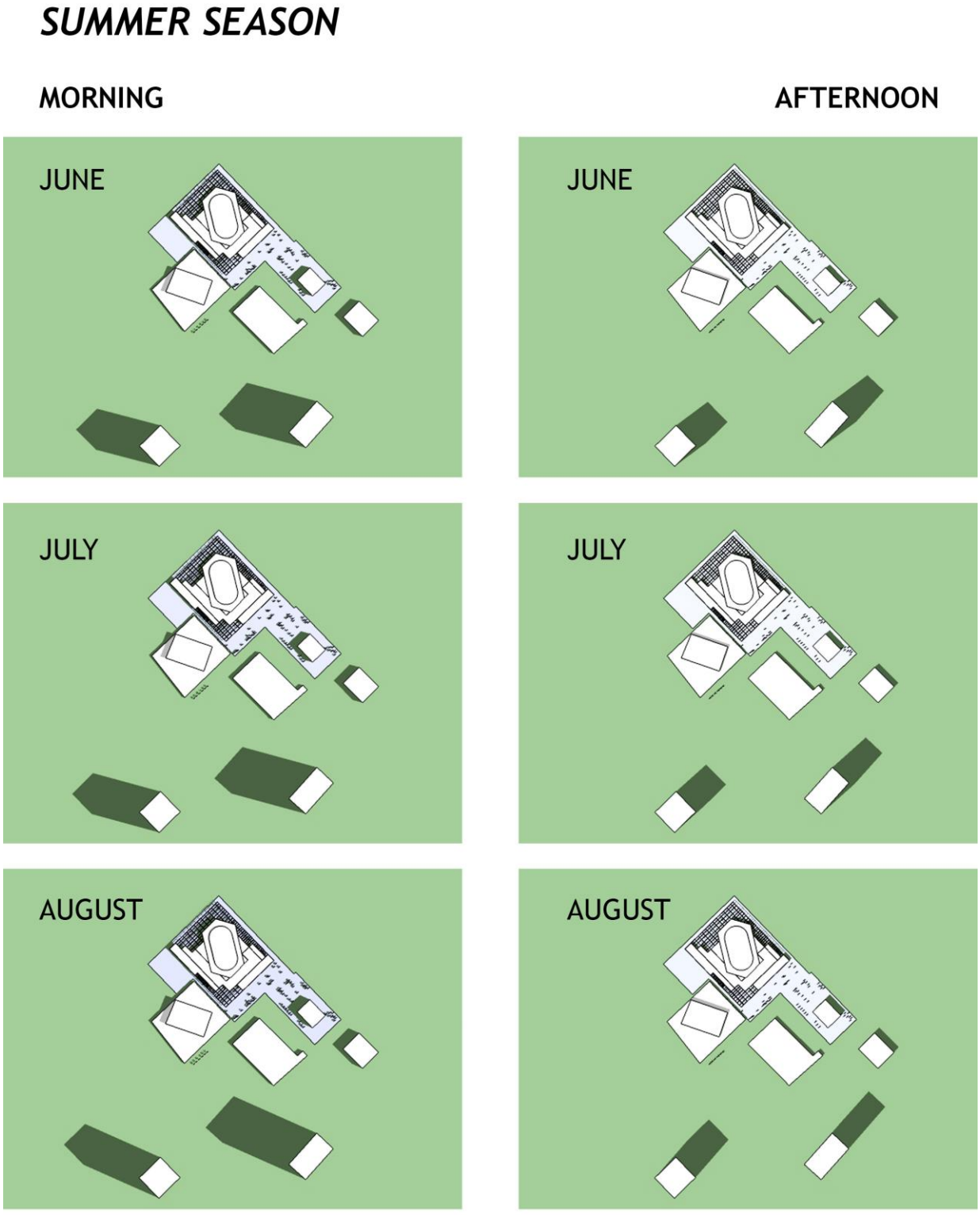



**Figure.3: Post Development; Morning shade studies**

For example: For each month of the year (12), an image was taken. For each month, 2 images were taken for 2 different times of the day; Morning and Afternoon. Those images were replicated for both Pre-Development and Post-Development conditions:

12 Months * 2 Images (Morning+Afternoon) = 24 images
24 images * 2 development stages (pre + post) = 48 images

For each image, the Area of the shaded zones were mapped and calculated, shown as an example for both Post and Pre-Development conditions below (Please note that each "Before Image" represents the image prior to any Area calculations and each "After Image" represents the image after the Area calculations have been complete):

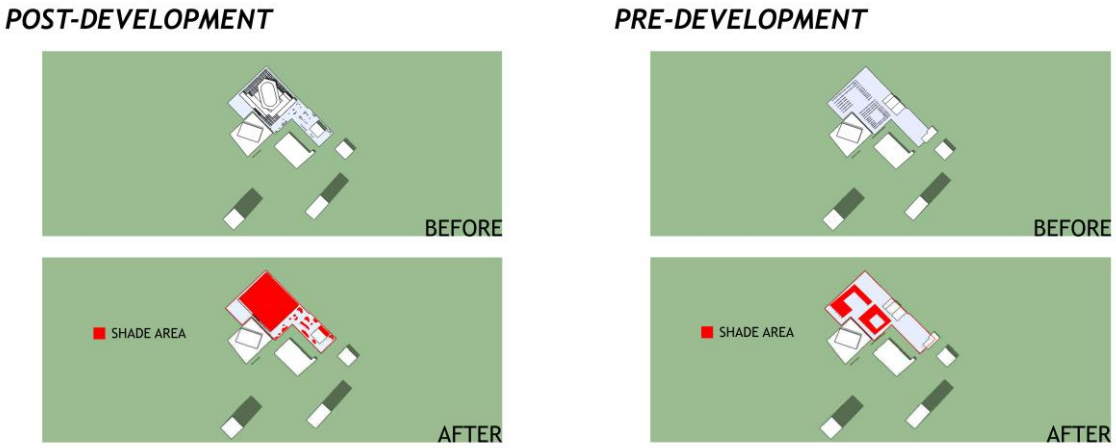



**Figure.4: Shaded area Before and After; Post and Pre Development**

The seasonal calculations were taken, totaled, and averaged by the 3 images for Morning (1 image per Month) and the 3 images for Afternoon (1 image per Month). For the summer season Post-Development condition (example below), (Please note that the area used in the following calculation is converted into acres. The area of an acre is equivalent to 43,560 sq. ft.):

(509,857 sq. ft. (Morning) / 3 Images) = 169,950 sq. ft. (average)
(511,028 sq. ft. (Afternoon) / 3 Images) = 170,340 sq. ft. (average)
(169,950 sq ft. + 170,340 sq. ft.) / 2 = 170,145 sq. ft. (average)
170,145 sq. ft. (average) / 43,560 sq. ft. = 3.9059 Acres

After replicating the calculations above, comparing them to the summer season Pre Development condition, and adding the Spring season average to the Summer average:

Summer season Post-Development = 170,145 sq. ft.
Summer season Pre-Development = 71,065 sq. ft.
Spring season Post-Development = 177,345 sq. ft.
Spring season Pre-Development = 75,835 sq. ft.

(170,145 + 177,345) / 2 = **173,745 sq. ft. (Summer+Spring average Post-Development)**
(71,065 + 75,835) / 2 = **73,450 sq. ft. (Summer+Spring average Pre-Development)**

Considering the overall sq. ft. of the studied site is approximately 5.9 acres (258,245 sq. ft.) , therefore the total shade coverage is:

Post-Development: 173,745 sf / 258,245 sf = **67%**
Pre-Development : 73,450 sf / 258,245 sf = **28%**

**Limitations:** This study was conducted in a simulated computer environment and did not take into account every day of the year (365) individually, which would allow more sample images for more accurate calculations. The times of day taken were 11:00AM for the Morning samples and 4:00PM for the Afternoon samples in order to simulate the most impactful environments for shade. To gather more efficient results, ideally every hour would be measured, showing the constant shifting of the shaded areas. In addition, the models built for the study were not shaped exactly as the structures/buildings are in reality, hindering the potential for even more precise area measurements.

## Social:

**Performance Indicator.3:**

- *Served as the entry courtyard for an estimated 407,896 annual AT&T Performing Arts Center patrons for 2013 fiscal year. The park also hosts free and ticketed outdoor concerts and free weekly exercise classes as well as arts district-wide events such as the Aurora Light Festival which attracted over 35,000 people in October 2013.*

  407,896 patrons attended events at the AT&T Performing Arts during the 2013 fiscal year. The park also hosts free and ticketed outdoor concerts and free weekly exercise classes as well as arts district-wide events such as the Aurora Light Festival which attracted over 35,000 people in October 2013.

  **Methods**: Data sourced from a systematic review of archival data and literature from the AT&T Performing Arts Center and the Dallas Arts District, 2014. Fiscal Year period is FY 13 8-1-12 to 7-31-13. (AT&T PAC2014).

**Performance Indicator.4:**

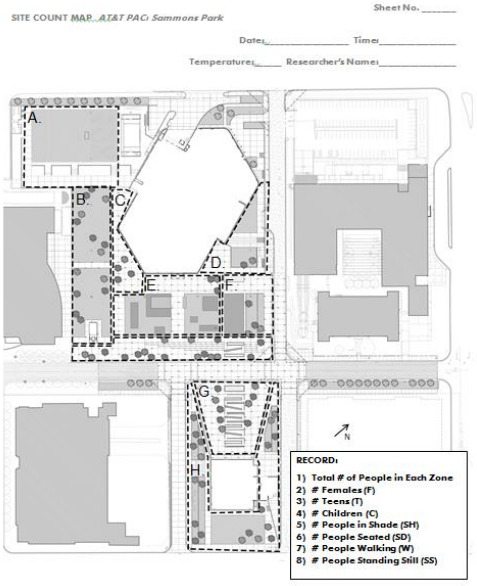
- *Encourages people to enter the park and enjoy the amenities. Of the 938 people observed entering the park, the average length of stay was 10 minutes. 22% of groups sat down in the park, staying for an average of 18 minutes. 14% walked or played in the water skin pool.*

Of the 938 people observed entering the park and staying longer than one minute, the average length of stay was 10 minutes, with 39% staying between 3-10 minutes, 7% staying between 11-15 minutes and 11% staying between 16-20 minutes. Of the groups of people observed visiting the park, 14% walked or played in the pool. 22% of the groups visiting the site sat down in the park, staying for an average of 18 minutes.

**Methods:** Onsite observations were conducted on four days during a one week period – Saturday, June 28, 2014 (9:00 a.m. – 9:00 p.m.), Tuesday, July 1, 2014 (9:00 a.m. – 12:00 p.m.), Wednesday, July 2, 2014

(1:00 p.m. – 5:00 p.m.) and Thursday, July 3, 2014 (5:00 p.m. – 9:00 p.m.). A total of approximately 50 hours of time was collectively spent on site by UTA Arlington research team members. For the observation methods the UTA research team followed the Jan Gehl site counting method described in *How to Study Public Life* (Gehl, 2013) as well as the activity mapping method described in *People Places (Marcus et.al, 1998)*. Three researchers were present onsite for all days of study and are assigned zones for which they are responsible. Every hour, on the hour, researchers contact a head count for their assigned zones that must be completed within 10 minutes. For the remainder of the hour, researchers observe randomly selected individuals or groups and track their activities as well as time spent in the plaza.

**Limitations:** The limited number of days studied in one week is a relatively small sample size and only presents a snapshot of the site for that one week. The performance of the site recorded during the observation week does not take into account special daily conditions, such as special events and weather conditions impacting the district and the city. Ideally, a sampling of days throughout the year would give a more representative count of the number of people on the site at different times of the day and the activities they engage in. The advantage of conducting the observation studies in the hot summer months, as the UTA team has, is that the researchers can study site usage during the unpleasant climactic conditions that many features of the site were designed to mitigate. The following images (figure .4 & 5) are recording instruments developed by the research team based on samples from the relevant literature.



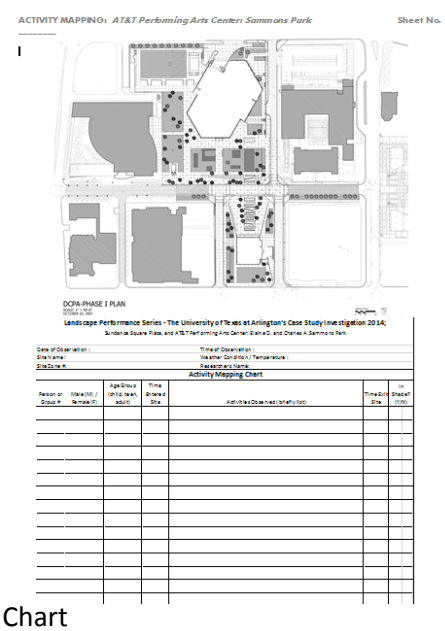




**Figure 4 and 5:** Site Count Map and Site Activity Mapping Chart

**Performance Indicator.5, 6, 7:**

- *Promotes art and artistic activities for 95% of 90 survey respondents, primarily through performing arts, water features, garden design, and sculptures.*

- *Improves quality of life for 92% of the survey respondents by providing a place to be outdoors, bring visitors and be with friends. Also improves the perception of the area.*
- *Improves perception of the city, according to 89% of the survey respondents (53% strongly agree).*

According to the AT&T Performing Arts Center: Elaine A. and Charles D. Sammons Park Survey conducted by the UT Arlington research team, respondents **agree or strongly agree with the statement** that Sammons Park (N: **90**):

- **Promotes art and artistic activities for 95%** of the survey respondents primarily through performing arts, water features, garden design, and sculptures.
- **Is perceived favorably by 93%** of the respondents (56% strongly agree).
- **Improves the quality of life for 92%** of the survey respondents primarily through providing a place to be outdoors, improving perception of the area, a place to bring visitors, and a place to be with friends and community.
- **Promotes a safe & secure environment for 92%** of the survey respondents primarily through the visibility, lighting design, and security personnel.
- **Promotes scheduled/organized events for 91%** of the survey respondents through music concerts cultural events, festivals and outdoor movies.
- **Improves perception of the city for 89%** of the survey respondents (53% strongly agree).
- **Creates a sense of identity for 81%** of the survey respondents.
- **Accessible for all (American Disability Act-ADA) for 81%** of the survey respondents.
- **Promotes healthy living for 75%** of the survey respondents primarily through relaxing, leisurely, stroll or vigorous walking.
- **Improves understanding of landscape architectural practice for 58%** of the survey respondents (while 18% disagree and 21% neutral about this statement).
- **Promotes educational activities for 58%** of the survey respondents (34% neutral).
- **Increases participation in outdoor events for 57%** of the survey respondents (28% neutral).
- **Promotes a better understanding of sustainability for 44%** of the survey respondents through urban greenery, walkability, and native planting.
- **Encourages them to live within walking distance for 26%** of the survey respondents (while 33% disagree and 30% neutral about this statement).

**Survey notes: 90** Sammons Park users are surveyed between late June and early August, 2014 by UT Arlington research team. **26%** of the park users surveyed noted themselves as '**resident'** while **21%** as '**visitor' and 49% as 'employee'.** Survey findings also illustrated that only **1%** of the users were visiting the park **first time, 27%** visited **daily** while **61%** visits the park at least **one time per month**. Additionally, nearly **84%** of the respondents arrived at the park by using a **personal vehicle** while **6%** arrives by public transportation and **5%** arrives the park **on foot.** Median respondents' travel **8** miles (11.9 miles average respondent) to get to *Elaine A. and Charles D. Sammons Park***.**

**Method:** Please see the data collection methods in the beginning of the paper.
**Limitations:** This survey is conducted only on online platform due to resource, time, and permissions limitations. Online survey recruitment letter is circulated among various e-mail lists and social media groups throughout Dallas and North Texas. It is realized that online survey may produce more targeted results depending on where the survey can be circulated in a short amount of time. However, it does not assure high response rate as it can be seen from the numbers above. Another potential limitation is that the recruitment strategies used in this instance do not assure randomized sampling which may have influenced the results.

**Not all of the survey results/findings are reported in their entirety due to LAF's online formatting restrictions, therefore the list only includes a sample of the survey findings. For further information, contact the UTA research team for this case study: Dr. Taner R. Ozdil, ASLA, tozdil@uta.edu.*

## Economic:

**Performance Indicator.8:**

- *Contributed to an 85% increase in the total market value of the AT&T Performing Arts Center between 2004 and 2013. Additionally, the total market value for adjacent parcels increased by 79% during this timeframe.*

**Methods:** Primary data was sourced from the Dallas Central Appraisal District (DCAD) and further analyzed to study the economic dynamics of the ATT PAC. Please see figure.7 below for the coverage of market value study.

**Limitations:** Given that the data was collected from secondary sources, there may be inherent errors and/or omissions to such data beyond the researchers' control. Also, the reader must be aware that understanding the economic impact of a project like Sammon's Park in an urban environment is a complex task and the bullet reviewed above uses appraised value. Although this bullet takes into account very promising market activity surrounding the park, it is not taking into consideration some of the larger economic trends within the greater district.

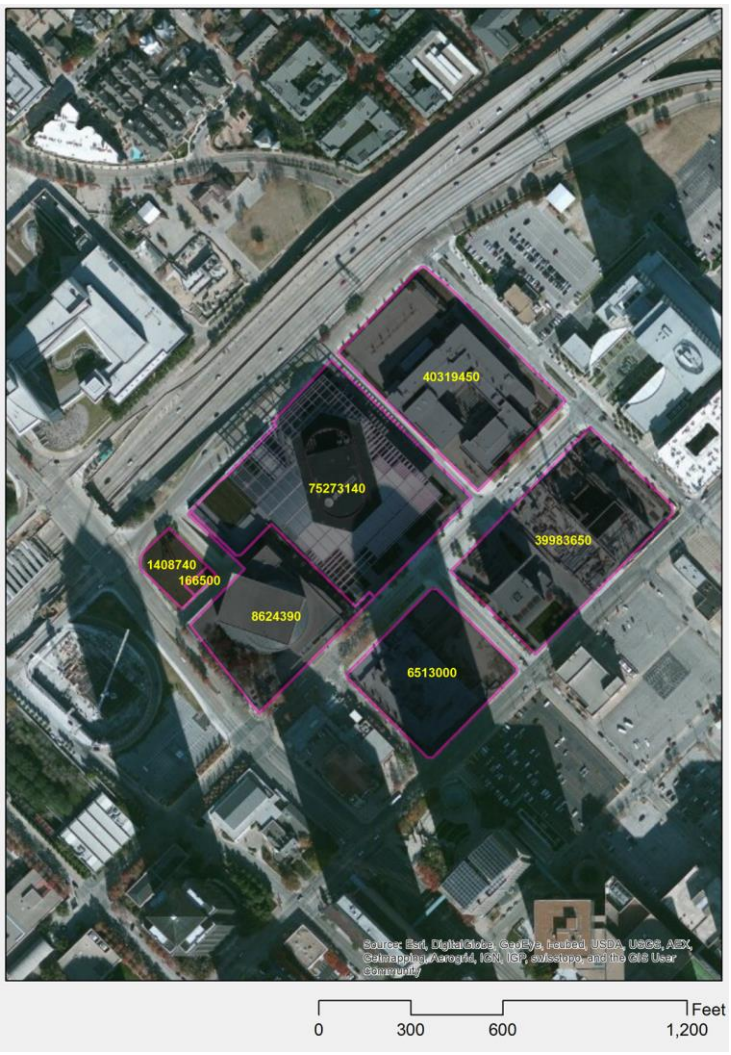



**Figure 7: Properties Studied for Market Value, 2013 (Source:** Dallas Central Appraisal District, 2014)

**Performance Indicator.9:**

- *Helped stimulate the start or completion of four major real estate developments in the Dallas Arts District, which added a total of 392 residential units, 500,000 sf of office space, and 20,000 sf of retail space.*

The park helped stimulate the start and/or the completion of four new major real estate developments in Dallas Arts District since its inception in 2009. The new developments add a total of 392 residential units (sizes ranging anywhere from 610 to 9154 sq. ft.), 500,000 sq. ft. of office space, and 20,000 sq. ft. of retail space adjacent to or within 600 feet walking distance from the park.

**Methods:** Primary data sourced from the Dallas Central Appraisal District (DCAD) and websites for the individual real estate projects occurring in the Dallas Arts District. Projects were chosen for their location within the Arts District and the significant (commercial & residential) leasable units that they contain.

**Limitations:** All four developments (Museum Tower, Hall Arts Complex (excluding proposed residential tower), Flora Lofts, and The Arts Apartments) reviewed and summarized here are approved for development, under construction, and/or completed. Although the details of these developments are collected and confirmed from multiple reliable sources such as local newspapers, real estate reviews, and/or development websites, there were found to be slight variations. The numbers above represent minimum totals from the references. Also, the reader must be aware that the understanding of the economic impact of a project like Sammons Park in an urban environment is a complex task. Although this bullet takes into account very promising real estate activity within the adjacencies and walking distance proximity to the park, it is not reviewing some of the larger economic trends within the greater district and city. As such, it must be viewed as indirect.


**Figure 6:** Map of the Arts District and surround Districts.

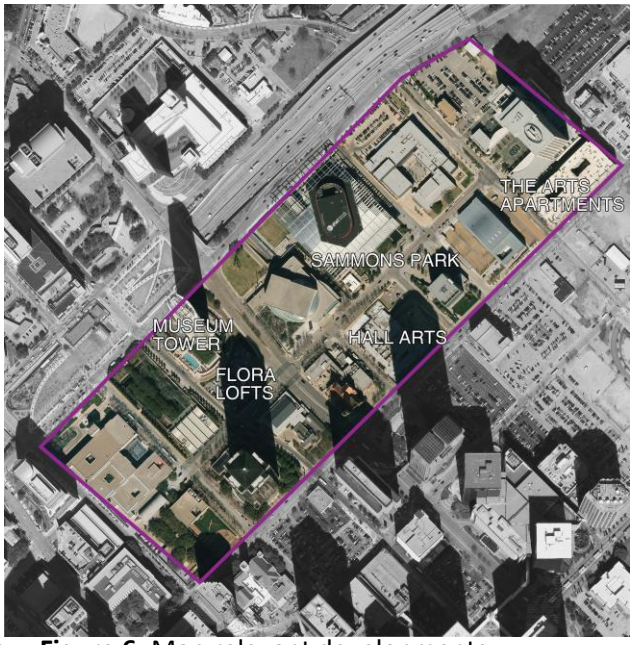



**Figure 6:** Map relevant developments

**Performance Indicator.10:**

- *Generated $1,040,419 in revenue and attracted an estimated 22,000 visitors during the 2013 fiscal year through ticketed events and private rentals of the park's Strauss Square outdoor performance venue.*

**Methods**: Data sourced from a systematic review of archival data and literature from the AT&T Performing Arts Center, 2014.

**Limitations:** Given that the data was collected from secondary sources, there may be inherent errors and/or omissions to such data beyond the researchers' control.

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