PLANNING SUSTAINABLE PLACES:

EVALUATION OF THE PROGRAM PERFORMANCE

AT THE MID-AMERICA REGIONAL COUNCIL

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ABSTRACT

PLANNING SUSTAINABLE PLACES: EVALUATION OF THE PROGRAM PERFORMANCE AT THE MID-AMERICA REGIONAL COUNCIL

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Planning Sustainable Places is a program running since 2012 by the Mid-America Regional Council (MARC) and provides grant funds for planning activities within the bi-state Greater Kansas City metropolitan area. Evaluation of the program performance was needed after several rounds of successful funding of planning projects across the region. Reporting to the community is a crucial part of the MARC communication with the public. Reporting the program can also improve people's involvement in planning activities and implementation actions.

Performance evaluation criteria for The Planning Sustainable Places program projects, which based on granting the selection process of the program, were discussed in this practicum report. This practicum shows potential measurements related to travel selection criteria for the program. The changes in public transport ridership, urban trails, and sidewalk system within the project areas, obtained from a spatial analysis of MARC's internal and partner's data, became a core for reporting to the public when using ESRI Story Map visualization tools, an efficient method for delivering information to a general audience. The research made also concluded that there is a big challenge when evaluating all projects at once. The future comprehensive evaluation can maintain and use proposed measurements.

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Chapter 1 - Introduction

Objectives

This practicum was undertaken to aid The Mid-America Regional Council (MARC) to evaluate program performance of Planning Sustainable Places (PSP) initiative for 2013, 2015, and 2017 rounds. Because of social-economical nature of the program, it is essential to present the impact of this initiative to the local community and keep the citizens updated about its performance. The purpose of this practicum is to find possible evaluation measurements for the PSP program. Proposed criteria were resulted from program performance evaluation and visualization of those changes for the Greater Kansas City citizens by using ESRI Story Map.

Background

MARC is a nonprofit association of city and county governments and the metropolitan planning organization for the bi-state Kansas City region of Missouri and Kansas. The Mid-America Regional Council serves the nine-county Kansas City metro area, including Cass, Clay, Jackson, Platte and Ray Counties in Missouri and Johnson, Leavenworth, Miami and Wyandotte counties in Kansas, which includes 119 separate city governments (see figure 1). The MARC promotes regional cooperation and develops innovative solutions through leadership, planning, and action. MARC encourages interaction and collaboration on issues that extend beyond the jurisdiction of a single city, county or state. These issues include

transportation, child care, aging, emergency services, environmental issues, and other regional issues.

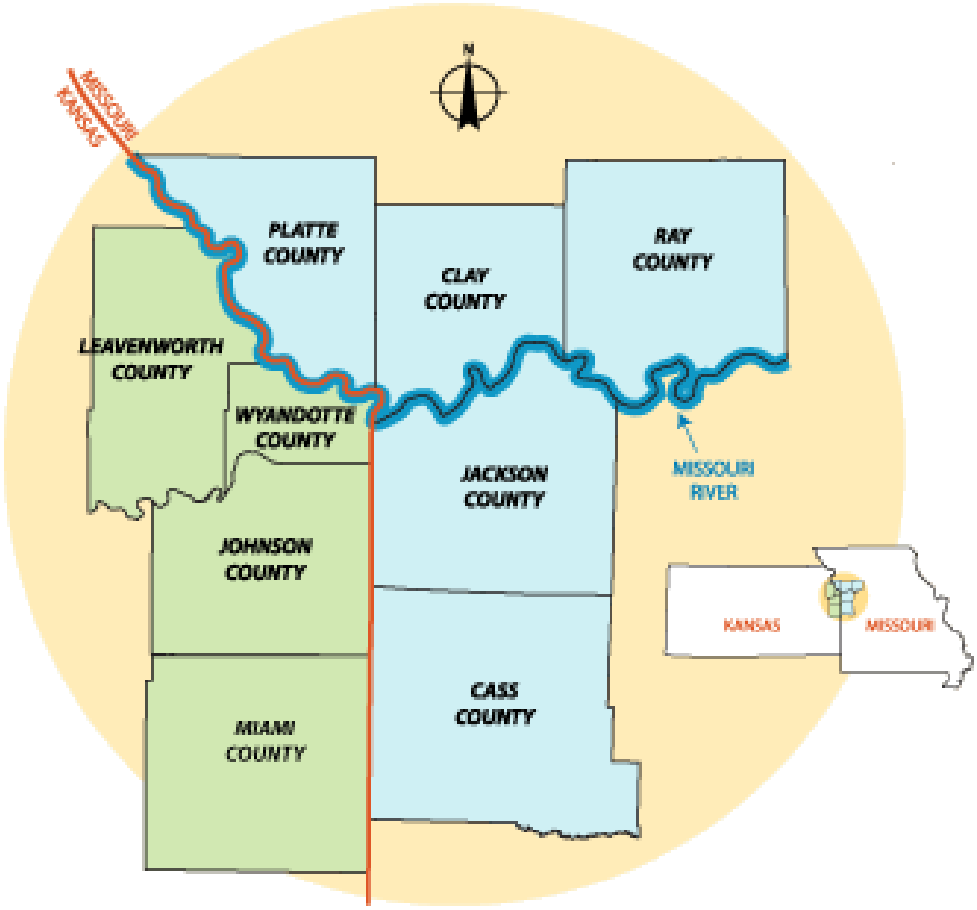


Figure 1 - MARC functional area (source: marc.org).

The Planning Sustainable Places program acts on behalf of regional Creating Sustainable Places initiative, the region's long-range plan, and Transportation Outlook 2040. The PSP program promotes concepts consistent with sustainable communities and the advancement of site-specific or project-specific activities. The PSP program provides grant funds for both planning and implementation activities, using transportation centers and corridors framework. The PSP program

also promotes concepts for more livable and sustainable communities — vibrant places that offer a mix of housing, employment and other uses; connected places with a variety of transportation choices; and green places that support healthy living and a natural environment. The PSP program could also be promoted as planning placemaking initiative, because the livable, vibrant, connected and green places are also described by concept of planned placemaking by Lew (2017).

There are already 54 projects selected for funding through the PSP program during three funding rounds. Nineteen projects were chosen for the round of 2012-2013. Thirteen projects were selected for the round of 2015-2016. And twenty-five local projects were picked up during 2016-2017 funding round.

The state-allocated Surface Transportation Program of Livable Communities funds was available for all three previous rounds of PSP projects. Cooperation between the Department of Transportation, the Department of Housing and Urban Developing, and the Environmental Protection Agency supported the Livable Communities funds. That fund aimed to improve access to affordable housing, provide more transportation options and lower transportation costs while protecting the environment in communities nationwide. The Sustainable Places Policy Committee and the Total Transportation Policy Committee is reviewing projects, previously graded according to selection criteria by MARC Department of Transportation. The MARC Board of Directors is considering and approving submitted by mentioned prior committees projects for funding according to recommendations. As described by Lew (2017), the PSP program can be defined

as top-down placemaking within the place making continuum, because of aforementioned selection process and master planned influence on the initiatives.

Research Statement, Purpose, Questions and Goals

The purpose of the practicum was to determine the most valuable measurements for PSP project's progress assessed. The measures were categorized and liable for continuous monitoring of changes within project areas. Moreover, the visualization approach for sharing those changes to the public was presented as a final report.

Research Questions:

1. What are the criteria for the PSP performance evaluation?
2. How to present the PSP program performance for the local community?

In order to achieve the goals, the following tasks need to be accomplished:

- to learn a similar practice from peer metropolitan planning organization;
- to review old and new maps for PSP project borders;
- to determine the long-list of criteria for evaluation;
- to explore available sources within MARC and peer organizations for continuous data for assessment;
- to establish a short-list of criteria for evaluation based on availability;
- to analyze the performance of different criteria within the project's areas;
- to recommend a tool for result's visualization for the public;
- to display the report on PSP program performance evaluation based on the chosen visualization approach.

Chapter 2 - Practicum Methods and Implementation

Contacting MARC

MARC was contacted initially as an internship opportunity for the Planning Sustainable Places project during March 2018. First, a Skype-interview was held with the participation of Nancy Weitzel-Burry, Human Resources Program Director, and Kathy McNemee, Human Resources Coordinator. References were provided on the company request. The Edmund S. Muskie Internship Program, administered by Cultural Vistas, solved the legal issues related to my exchange visitor's employment status. The second Skype interview, with the participation of Martin Rivarola, Assistant Director of Transportation and Land Use Planning, and Ron Achelpohl, Director of Transportation and Environment, was held for discussing the internship outlines and goals. Shortly after, the internship was confirmed based on a considered plan previously. Beth Dawson, senior land use planner and the PSP program manager, was appointed as my internship supervisor because of my interest mainly in the program she is administering.

Workflow

The internship started at the end of May 2018. During the first week, my supervisor Beth Dawson suggested a three-month plan for our work. The first month was dedicated to reviewing the PSP program and mapping projects from the previous years. It also included taking part in scoring process for the PSP 2019, where

the applications were evaluated on the criteria according to scoring master: Travel Choices, Sustainable Land Use, Environmental Stewardship, Resiliency, Defined Redevelopment Area, Activity Center, and Environmental Justice. This part allowed familiarizing with the PSP projects itself and criteria of evaluating for granting. The second month determined for defining metrics for evaluation of the PSP program performance, searching for the data and making the data analysis. The third month determined for visualization of the findings and reporting with StoryMap to internship supervisor, Assistant Director of Transportation and Land Use Planning, and Director of Transportation and Environment.

In work, there was a weekly meeting on reporting findings and sharing ideas with the supervisor; the frequency increased during the last month of the internship depends on variabilities with data. All data was requested from internal MARC sources or partners organizations in the area. Spatial data analysis was processed in ArcGIS Desktop 10.5. The PSP projects boundaries were created in a new polygon shapefile according to projects' descriptions, and some existed figures of the projects and clarification of some boundaries with local project's managers, based on ESRI basemap. Data obtained from partners organizations were distributed in a .xls format with coordinates, that was used for geo-referencing and making shapefile with spatial data. Data, obtained from internal MARC sources, were distributed in shapefiles, layers of geodatabases and were already easily accessible for spatial analysis. Statistical spatial analysis was made based on the PSP projects boundaries with a buffer zone. The most common algorithm was to use the clip, spatial joint,

and summarizing tools. Microsoft Excel used for creating charts of summarized data in ArcGIS. All spatial data, graphs and a written report were displayed in the form of StoryMap, created at https://marc-gis.maps.arcgis.com and shared with the staff for internal use.

The practicum report has quantitative nature and based on changes and correlation between variabilities, that were selection criteria for project funding. The subject of research is the trends in the area's development. A variety of data sets, obtained from Census, CoStar, internal MARC sources, and requested from local NGOs or local governments, were used for statistical analysis of territories belonging to the funded projects. Block and point data are the most appropriate data for the study because it allows collecting more accurate data for each project area. ArcGIS used for mapping collected and analyzed data.

Chapter 3 - Literature review

The Planning Sustainable Places program considers a three top-bottom level of planning projects: Sustainable Places Plans, Project Development, and Implementation Activities (Submission Guidebook, 2019). The separation for different categories made due to the long-term nature of the program. Those levels are different in their scope, requirements for project proposal before accepting as a part of the program and required planning elements. Each of those categories can be actions additional or detailed to previous local or regional planning initiative, as well as circumstances to another Planning Sustainable Places program project. Because of a variety of projects' intent, and pre-requirements and required planning elements, the evaluation of the program as one piece is complicated by its heterogeneity.

Despite the existence of various elements in the program, there is one representative list of evaluation criteria of ranking in the project selection process. Intent, location, partnership, and implementation are a general category of evaluation criteria which are applied to all three levels of projects, according to Submission Guidebook (2019). The impact of each indicator is different for different project types. The evaluation process is based mainly on transportation-related issues, such as improving travel choices, promoting sustainable land use patterns, advancing environmental stewardship, increasing of housing options, improving public health, supporting investment in areas with existing infrastructure, improving

economic growth, promoting resiliency, and applying innovation in project development. Location criteria analyze proposed projects compared to defined redevelopment areas, regional activity centers, planned transit corridors or mobility hubs, and environmental justice tracts. The last measure has either a technical purpose of identifying territories struggling with social and economic problems, then the direct influence of the project on the issue itself. The partnership criteria are related to the local and regional partnership options for implementing a project. The implementation criteria show the effort by the initiator of the project toward realization.

Evaluation is a complex process of identifying criteria related to the performance and effectiveness of a project. The practicum aimed to make an ongoing evaluation based on benefits, according to Pandey (2008) classification for the basics of evaluation. A framework for such monitoring and assessment comprises the selection of measurements, a case study with two periods of variables and no control group. Pandey (2008) also provides a summary of existing significant evaluation models, such as CIPP (content, input, process, and product), discrepancy and preceding models. The assessment model based on benefits was implemented in the practicum because the company expected to focus on the achievements of the program. The formative and summative evaluations are the sub-types of the previous model. The first sub-type beneficial for implementers, and the second one more useful for consumers, and summative assessment aimed to present generalized conclusions to formative evaluation with showing the effect of the program in general

and the impact made. The choose of this model for evaluation was sufficiently related to goals set by the company.

An evaluating process usually can be described in three steps: preparing to evaluation, conducting the assessment, and preparing the report with recommendations. Performing of assessment should include an arrangement of evaluation worksheet with defined measurements and data collected. The second step should be interpreted as progress analysis of the data based on effectiveness, efficiency, relevance, continuing validity, unanticipated effects, casualty, and identification of alternatives. An evaluation is customarily closing by making overall conclusions, recommendations, and revision, due to the continuing nature of an evaluating program. Proposed by Pandey (2008) structure will be the skeleton for evaluation in this practicum.

The Check-list of Criteria approach from Lochfield et al. (1975) can be the basis of progress analysis. This approach will allow using pre-program evaluation criteria for analyzing relation to changed values. This approach also compatible with the spatial arrangement of land-use activities. Using the check-list could be the most efficient approach because it is more likely to be resistant to the various problems, due to the complexity of project types, locations, projects' scope, and different objectives.

Tyson and Cochrane (1981) defined two problems in comprehensive evaluation based on a case study about urban transport. Those issues are related to a conflict of objectives. First, is when projects can differently contribute to all purposes, or even

positively to one target and negatively to another. The matrix of project-aim relations became multi dimensional when there are a few types of projects. 'Trade-off' concept as a theoretical economics approach recommended for maintaining such kind of problems. Nijkamp et al. (1990) also provide alternative methods to trade-off concepts, such as rating, ranking, a verbal statement on weights, paired comparisons, formulating scenarios, concluding remarks and indirect measurement of importance, which could be applied for different criteria of the program evaluation. Second, complex evaluation can cause the problem when criteria would not provide a mean of directly related to performing a project to efforts made by planning actions. Unified performance measurement would be needed to avoid this problem. The case study by Tyson and Cochrane (1981) can be considered in this practicum to prevent the possibility or manage the difficulties because the Planning Sustainable Projects program is based on transportation effort and has a multi-dimensional nature of objectives.

In addition, a multi-objective planning evaluation model from Nijkamp et al. (1990) can be considered as an alternative, because it applies to regional economic-environment-energy interactions, which has similarities with the program objectives. An operational triple-layer approach can include three modules with few measurements for each: environmental, economic, and employment or transportation. Such an alternative method can be able to cover the important goals of the program and present a complexed picture of the program performance, but it requires getting a combined weight to all measurements.

Chapter 4 - Results and Findings

Measurements

In order to provide a spatial analysis of any available data in reference to the project, it is necessary to map the PSP borders. The PSP projects borders have been created in ArcMap as polygon shapefiles for each round of projects, after reviewing the grant applications from the past project's rounds, and by contacting the responsible managers to clarify the details. The quarter-mile buffer zone was suggested to use for future spatial analysis of the project impact, as those planning activities can influence areas next to claimed borders but limited to a comfortable walking distance. There were already projects with applied buffers either the same as a quarter-mile or less, so no buffer or shorter buffer has been used to such projects. Trails Nexus Study and Ordinance projects even were excluded from spatial analysis due to extended boundaries that cover almost the whole MARC planning area and can't be sufficiently represented by adjusting all data to that one project. The final decision on using the buffer zone for each project can be found in Appendix A.

The possible measurement for evaluating the PSP program and those indicators, which is based on the granting criteria in the past, should be considered for the future grantees. Improving granting measures with those which can be maintained for assessment can enhance monitoring of the program performance. Also, it is complicated to evaluate the program as entirely one project, and not the granted projects separately, because even the program has three different categories for projects. The financial part of these projects was the only one visible

common ground for all diversity of planning activities funded by the PSP program. Searching for different measurements and exploring the availability of data for such analysis became the primary purpose of the internship. The searched data should be available for any interpolation on the projects, so ideally it must be point data or at least block level data. Another requirement while searching for the data was the availability of data with an appropriate yearly updates frequency, so the changes, related to the beginning of projects implementation, can be detected prior, during and after the project activity. The Check-list of Criteria (see table1) has been created after exploring available and potentially available data from partners.

Table 1. The Check-list of Criteria

Type	Measurements		
POPULATION PROFILE	*census block data*		
REDEVELOPMENT AREA	*property value*	*land use*	*vacancy*
	vacancy	*presence of mixed use*	
TRAVEL CHOICES	*sidewalk inventory*	*bus stops*	*ridership*
	bike facilities	*trails*	*street repair*
BUSINESSES	*change in number*	*sales tax*	
PUBLIC HEALTH	*bikewalk data (tracking)*	*transit use- ozone alert days*	*diseases indicators*
HOUSING	*existing housing*	*types of housing*	*rent*
	new construction	*affordable housing*	
ACCESSIBILITY	*destinations*	*proximity*	
ACTIVITY CENTER	*change in level*	*walkability*	
MOBILITY HUB	*use of services*		
SAFETY	*crashes*	*ozone alert days*	
	fatalities	*proportion with partnership*	
PARTNERSHIP	*injuries*	*funding/local match*	
ENVIRONMENTAL JUSTICE	*environmental justice tracts*		
IMPLEMENTATION	*project specific*		
INNOVATION	*impact*		

This practicum is discussing part of the measures from the long check-list. Travel Choices category of evaluation criteria is one of the core element of the PSP selection process. The most complete data, which relevant to prior mentioned category, is available from several sources. Additionally. That data already available and can be easily maintained for outgoing monitoring of the program progress. Those data sets are describing public transport use, trail systems, sidewalks, etc.

Public transport ridership

Public transit ridership is one of the travel option indicators. Usage of public transportation can also describe how the system developed. Increase of ridership can signal increased activities within project areas. The PSP program is aimed at increasing the attractiveness of the project area, and numbers of public transport usage can be one of the secondary characteristics of the project's performance. Moreover, mass transit is one of the alternative modes of transportation and can be seen as catalysts for placemaking because it encourages economic activity. The Kansas City Area Transportation Authority (KCATA) is a public agency that operates transit services within the metropolitan area. There are buses and streetcar services available for public transit in both states under KCATA operating.

Data on the ridership has been requested from KCATA. The required data has been delivered in a table of .xls format for each year from 2012 to 2018. Provided information comprised unique stop identification numbers, stop names, average

on/off/total passengers, latitude, and longitude of stops. The total number of passengers was calculated as the daily average value for weekdays from January to June, so the data for 2018 can be fully comparable to previous years.

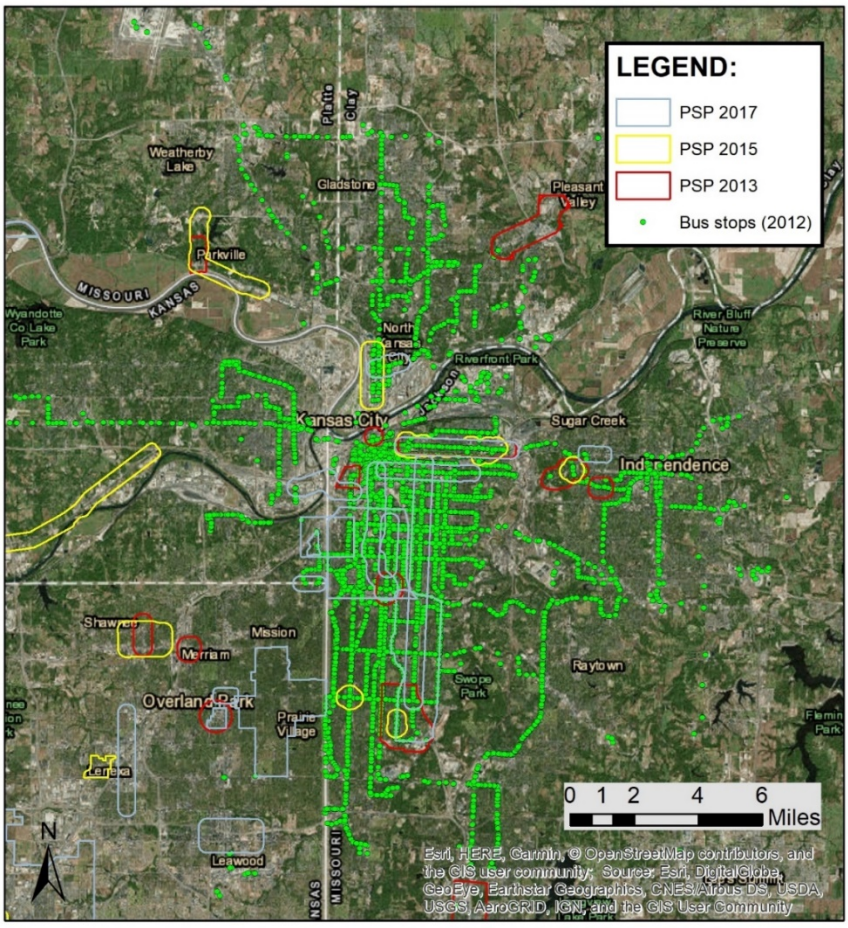


Figure 2 - Example of ridership data points features.

The method of counting passengers by KCATA is not perfect, because onboard automatic counting systems are not present on all vehicles. The limitation of the counting method was the reason for the slight difference between on and off data. The .xls format table was converted into a .cvs format for further import to ArcGIS (see figure 2). Only longitude values have been changed from positive to negative

values, as they represent the Western hemisphere and those values were used for georeferencing point shapefile of public stops ridership. Seven shapefiles were created with bus stop locations, and ridership usage of each stops for 2012-2018 years.

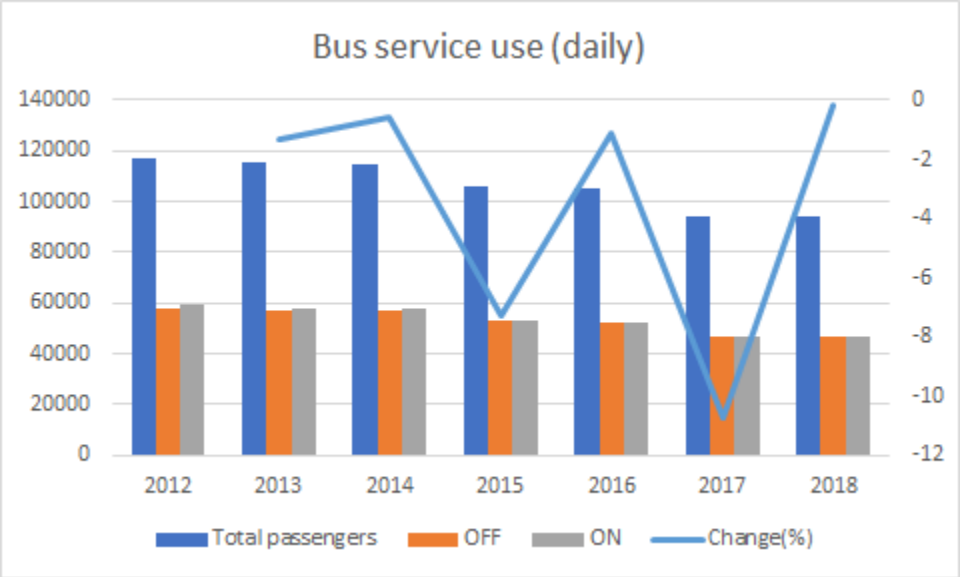


Figure 3 - Total Kansas City metropolitan area ridership.

The spatial analysis of ridership for each PSP project was needed for the statistical analysis of transit usage. First, the shapefile with ridership data has been spatially joined to polygons of the PSP projects, where each polygon contains the values that fall into its area. As a result, a table was generated with the project names, numbers of stops and the total amount of passengers. Second, a table was created for 2012 - 2018 by join attributes from different tables based on a project name (see Appendix B). This table is contained a number of stops and the sum of average daily ridership on/off/total within a project area and whole program area (see figure 3).

The PSP 2013 project's area showed a definite increase in ridership while implementing the program (see figure 4). Compared to the metro area, the area of the PSP 2013 projects is characterized by a more prominent decrease of public transit passengers during the first three years compared to the metropolitan area; however, there is less decrease than average in 2017, an increase of ridership detected for the 2018 year. Only a few projects were characterized by intensive public transport ridership, while there are some projects almost not used for transit purpose even the projects' area covering vast territories.

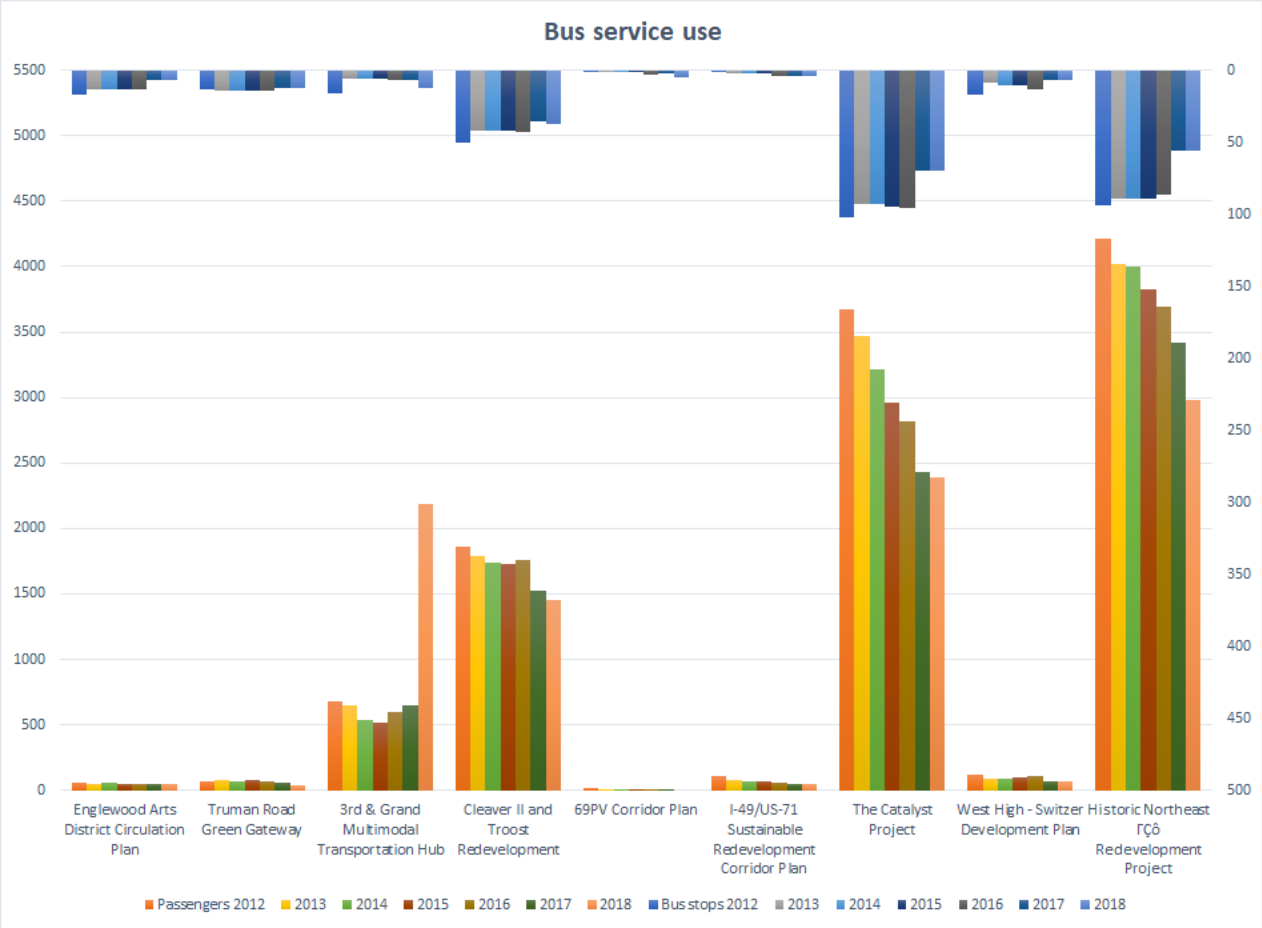


Figure 4 - Ridership within the PSP 2013 projects.

The most significant increase in public transportation throughout the years shown is in the River market area transportation hub (see figure 5), which connects buses with streetcar and downtown. Nonetheless, the streetcar began operating only in May 2016, so its influence on ridership is limited to 2017, 2018 and only partially to 2016. Despite the general trend, there is one project from the 2013 funding cycle which shows a vast level of decline in ridership percentage, but it is due to a low number of passengers using those areas from the very beginning, and it can be disregarded. Additionally, the total share of daily ridership within the PSP 2013 project increased from 9.2% to 9.8% of total riders within the metropolitan area.

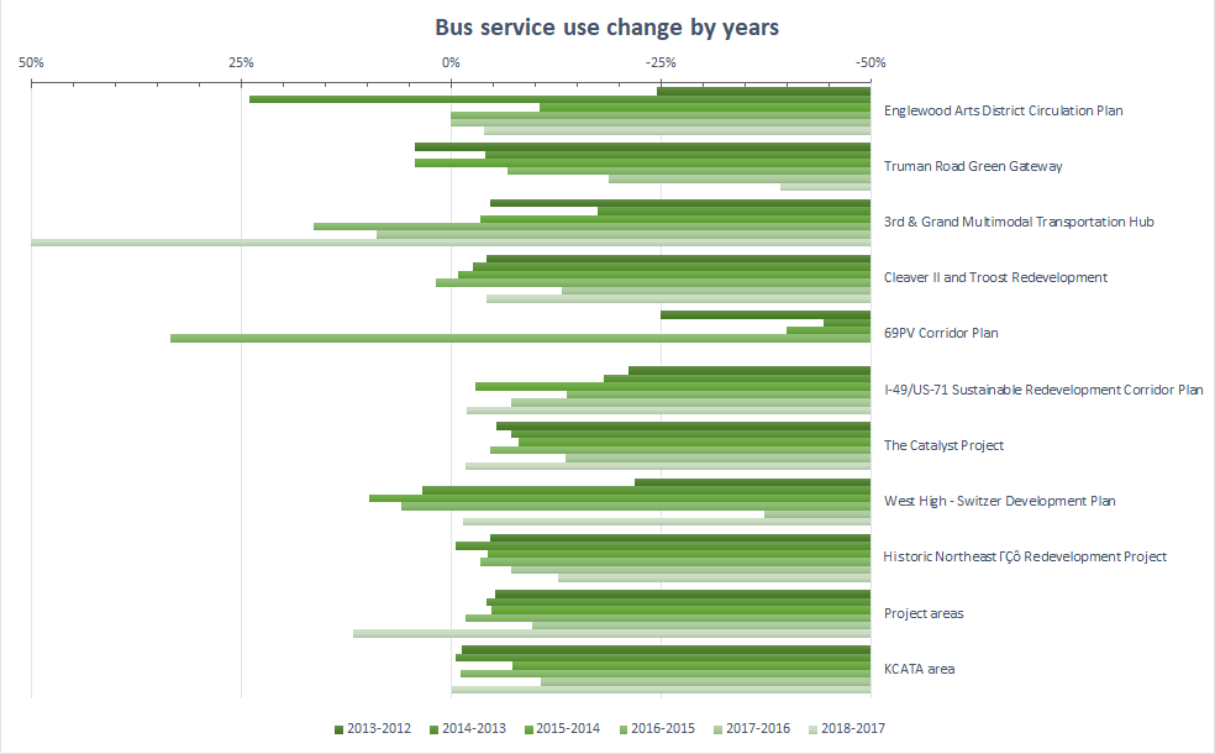
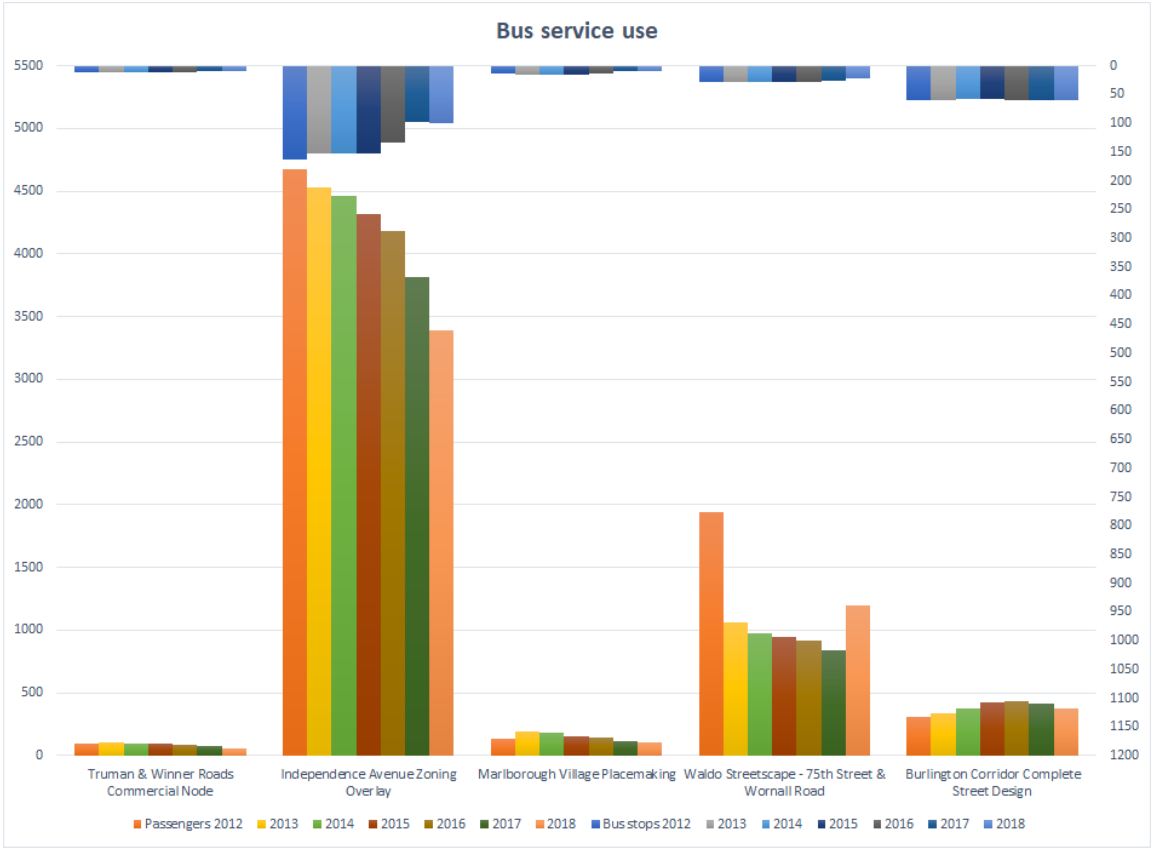


Figure 5 - Ridership within the PSP 2013 projects (change by years).



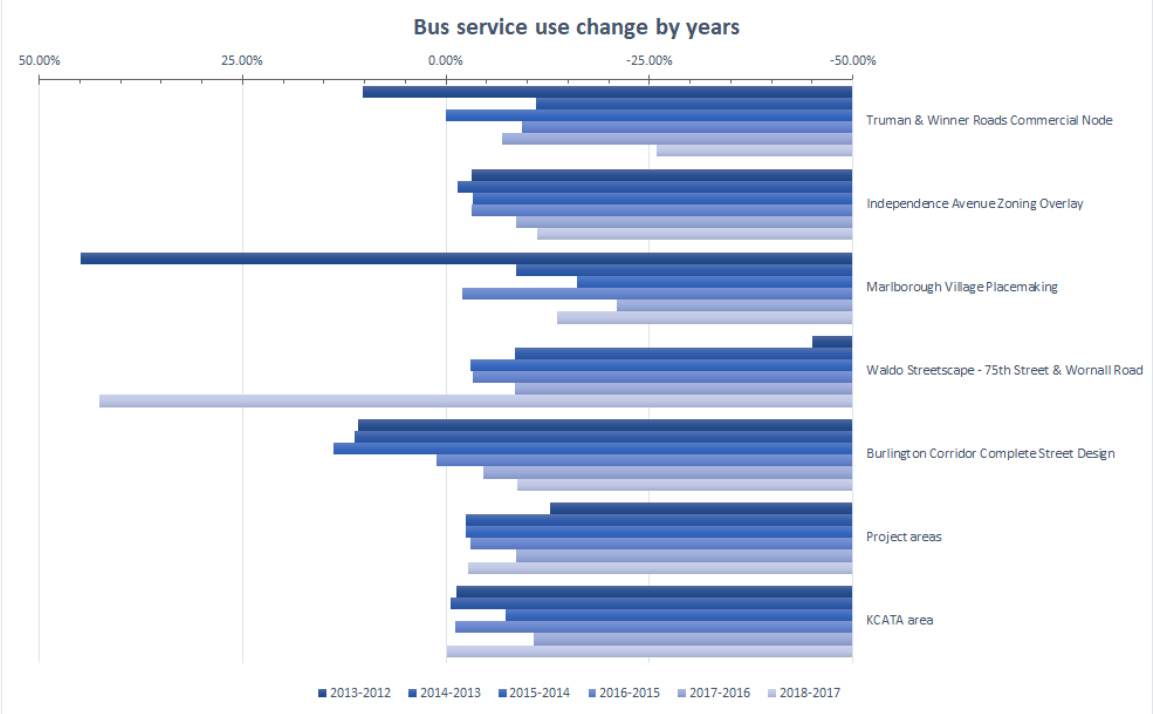


Figure 6 - Ridership within the PSP 2015 projects and change by years.

The PSP 2015 project's area showed an increase in ridership while implementing the program (see figure 6). The most successful results shown by Waldo Streetscape project, that aimed the road reconstruction and sidewalks improvements, when the bus passengers increased by about 23% compared to a pre-project year. Moreover, the statistic shows that the area improvements started in 2014, as it was the project with the worst ridership among the PSP 2015 projects. The results might support the conclusion, that the PSP program is helping to areas in crisis. In contrast, there is a project along the Independence Avenue that has almost 1000 daily passengers decline in ridership. Such a substantial daily decline might have a connection to closed and optimized bus stops, which were located on each block previously. It is possible that lots of passengers decided to use another nearest bus route #9, instead of #24 with fewer stops. But despite it, the PSP 2015 project areas showed an increasing share of ridership from 5.3% in 2014 to 5.5% in 2018.

The PSP 2018 project's area shows mostly a decline in ridership while implementing the program (see figure 7). Three projects have the highest values of ridership: Gillham Road, Troost, and Prospect, Midtown Corridor. All of them characterized by high demand with over 10,000 daily passengers of public transit. All three showed a decline, but Gillham Road project has almost no change. The numbers of bus stops were declined radically on over 33%, but they could keep the drop in ridership by about 16%. Those projects related to the main public transit corridors from suburbs to the downtown area. Despite the typical decline, the PSP 2018 project areas showed an increase of ridership share within the whole system

from 43.3% in 2016 to 44.2% in 2018, while there is background with the decline of total ridership.

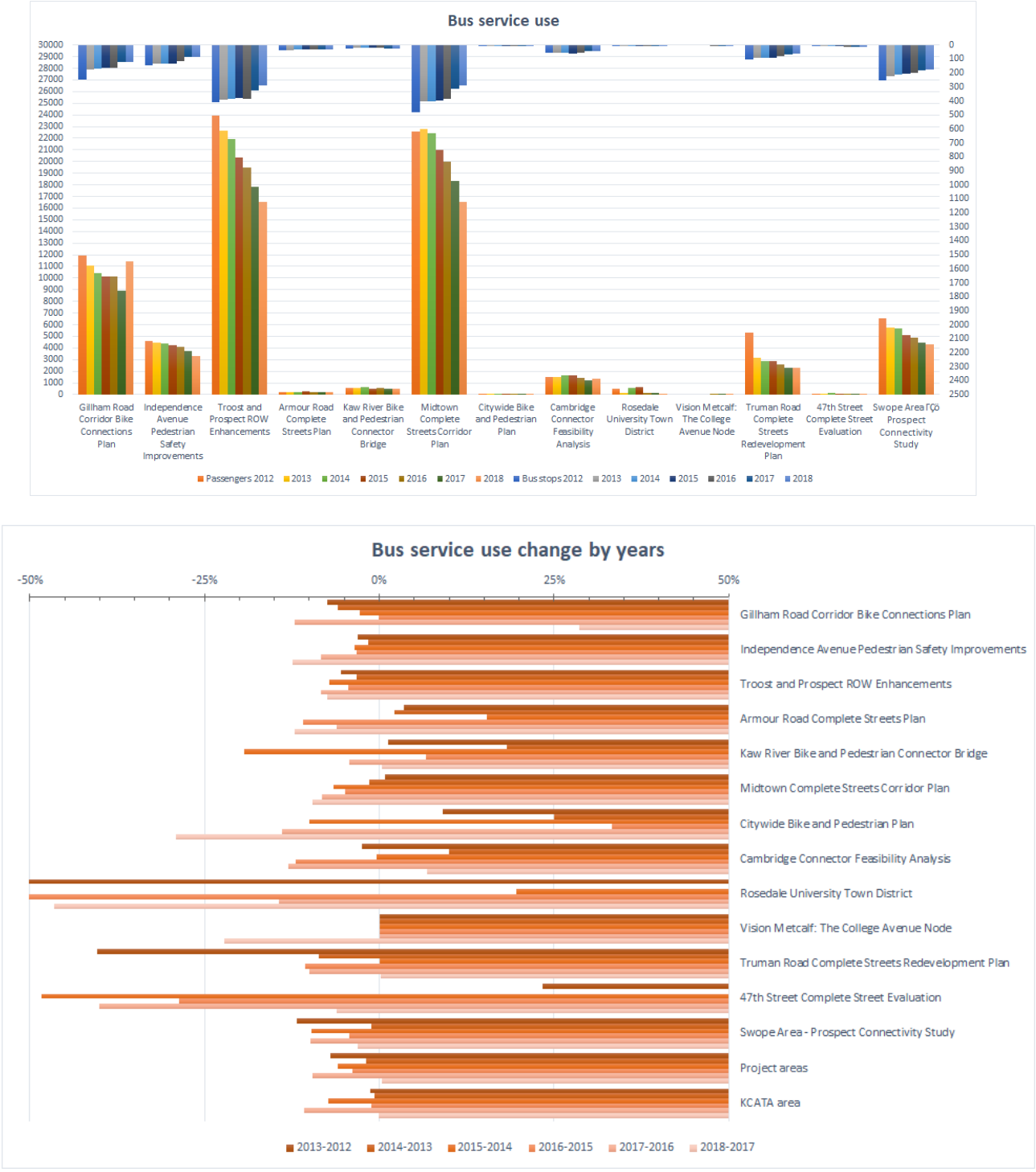


Figure 7 - Ridership within the PSP 2018 projects and change by years.

In general, the public ridership analysis shows that the PSP projects directed to areas with a mostly higher decline rate of ridership than the metropolitan area average. Moreover, all the PSP 2013, 2015 and 2017 projects areas performed better than KCATA serving area in general, if compared 2018 and pre-project year values. The PSP 2013 projects' area has ridership change about -14.6%, which is 5.2% less than the total for the metropolitan area. The PSP 2015 projects' area is characterized by 2.5% ahead of the average. The PSP 2017 projects' area has 1.7% better results while covering almost half of all serving area. The PSP projects are characterized by a lower decline in ridership compared to the metro area usage of transit.

There are few patterns influenced on the ridership. The decline in total ridership was partially caused by the optimization of bus stops within PSP project areas. The optimization of bus stops is identified on around 36% for the PSP 2016 area, on around 32% for the PSP 2015 area, and on about 21% for the PSP 2017 area. The free streetcar's introducing to the city public transportation option has increased ridership for the project within downtown from River market to Union station area. The projects, that aimed at road and sidewalks improvements, have shown the best result with ridership trends. In the same time, the worst effects were demonstrated by the projects with redevelopment, recreational and sustainable development purpose. The comparing doesn't mean that those projects are failures, just because citizens could decide to use other traveling modes, for instance, bicycling or walking which can reflect the aims of the projects aims different from road reconstructions.

Trails

Walking is another traveling mode that encourages sustainable development and health at the same time. This mode of traveling depends on both the desire to walk and infrastructure for walking, which are interdependent of each other. Developing a trail network with safe and attractive paths can motivate people to move around more by feet, rather than using a vehicle. Such human behavior can be actual if the destination within a quarter mile for walking, but not limited by this distance if the environment itself became a goal of such a trip. Establishing new and maintaining existing trails leads to an increase in walking. There are few projects within the PSP program which are specially oriented on a trail system development, but also other placemaking projects consider trails as an essential part of the development activity.

Data for analyzing trails within the PSP area was obtained from MARC's internal sources as a shapefile of existing trails. That original trail system shapefile has been clipped by the PSP projects borders separately, and three new shapefiles with trails within each round PSP project were created (see figure 8). Summary by trail type for round-based PSP project has been generated by using summarizing option for trail type and length. The summary table was used for a general description of the trail for PSP projects area (see Appendix C). The shapefile, with total trails length by each project, was generated via a joint spatial option for each project's round.

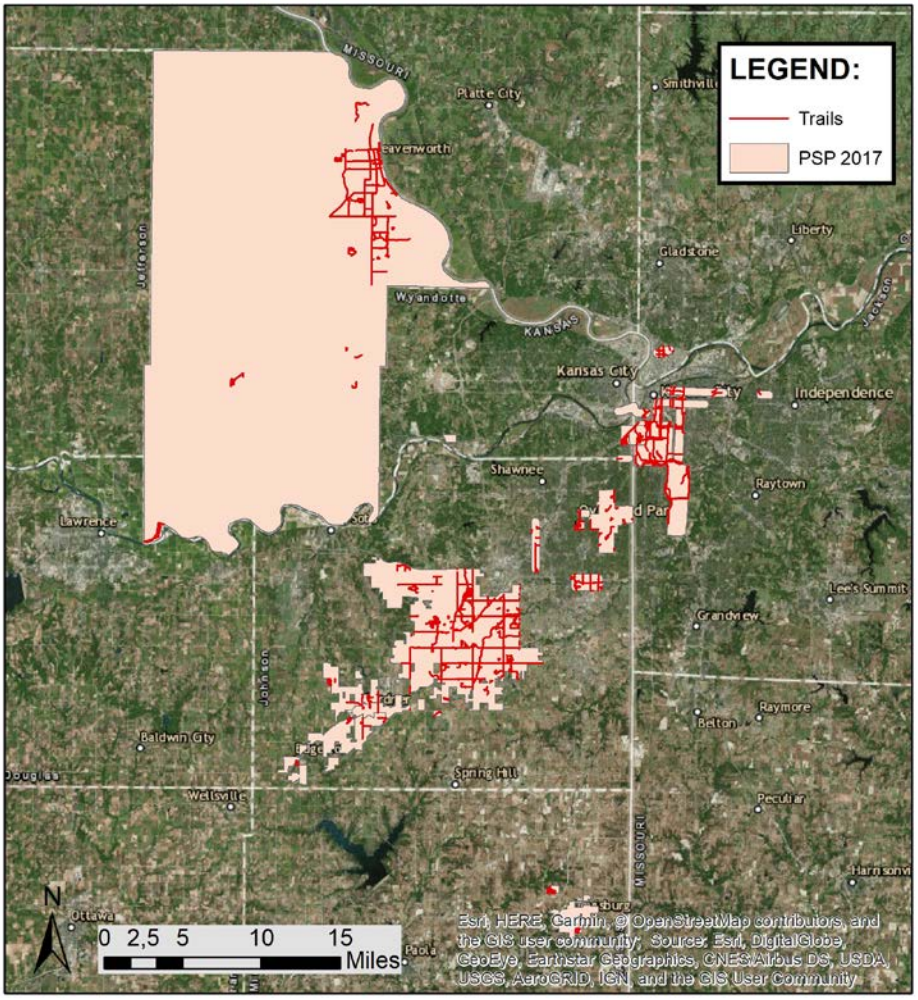


Figure 8 - Example of the clipped trail system on the PSP 2017 projects.

The PSP 2017 projects have the most intense trail system compared to the other two rounds (see figure 9). They are leading with about 430 km trails within their borders, compared to 50 km of trails within the PSP 2013 projects and 37 km of trails within the PSP 2015 projects. Such a vast difference can be justified due to the types and content of the funded project from 2017 when the placemaking and sustainable development planning actions dominated. There are lots of the funded PSP 2017 projects have a connection to streets, parks, and transit corridors

redevelopment purpose with the critical role of developing trails. The "Get Active Bike Share Implementation Strategy" project presented by 132 km of different trails type. Nonetheless, "Leavenworth Transit Plan" project is characterized by 83 km of the trail system due to county level actions, but the project has no ties to the trail system improvement goals. Despite that example, the PSP 2017 area is characterized by saturated trail network, even excluding the previously mentioned project.

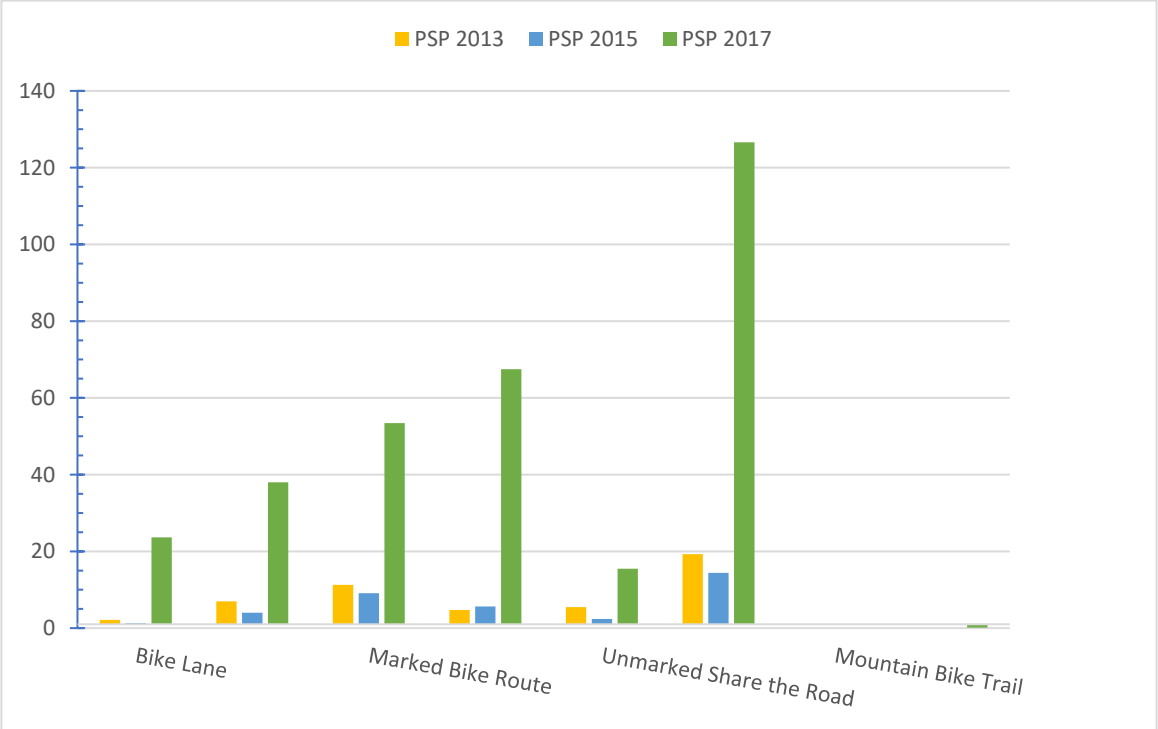


Figure 9 - Total trails length by type for PSP 2013, 2015 and 2017 in km.

The distribution of different trail types can tell about the most popular trails within funded project areas. Shared Use Path, Marked Share the Road and Marked Bike Route is the most common type of trails despite the round of projects.

The development of bicycle paths has become one criterion for financing projects from 2017. Updated criteria have increased demand on different pathways included in the planning activity applied for the grant. I could suggest that a lot of applicants used relatively cheaper options of trail types for incorporating them into their plan of development. Also, those types of trails might have already existed before the PSP project activity. Moreover, a Shared Use Path trail type can be the most efficient for new trails development, as cyclists and pedestrians can use them in the same time, which also decrease costs for construction if it were needed to build two different trails.

Sidewalks

Walking is also improving by a sidewalk comfort for pedestrians. Data for analyzing sidewalks within the PSP area was obtained from MARC's internal sources as a shapefile of existing paths (see figure 10), their length, conditions, width, street type and material they build. The whole round area statistic data with the condition of a sidewalk and the final statistic by each project with a length of the sidewalk have been obtained by applying spatial joint and summarizing data based on polylines (see Appendix D). The same operations have been made with the internal point's data on the sidewalk ramps. Those ramps include any types or sidewalk ramps or curved ramps etc. adjusted to the existing pavement.

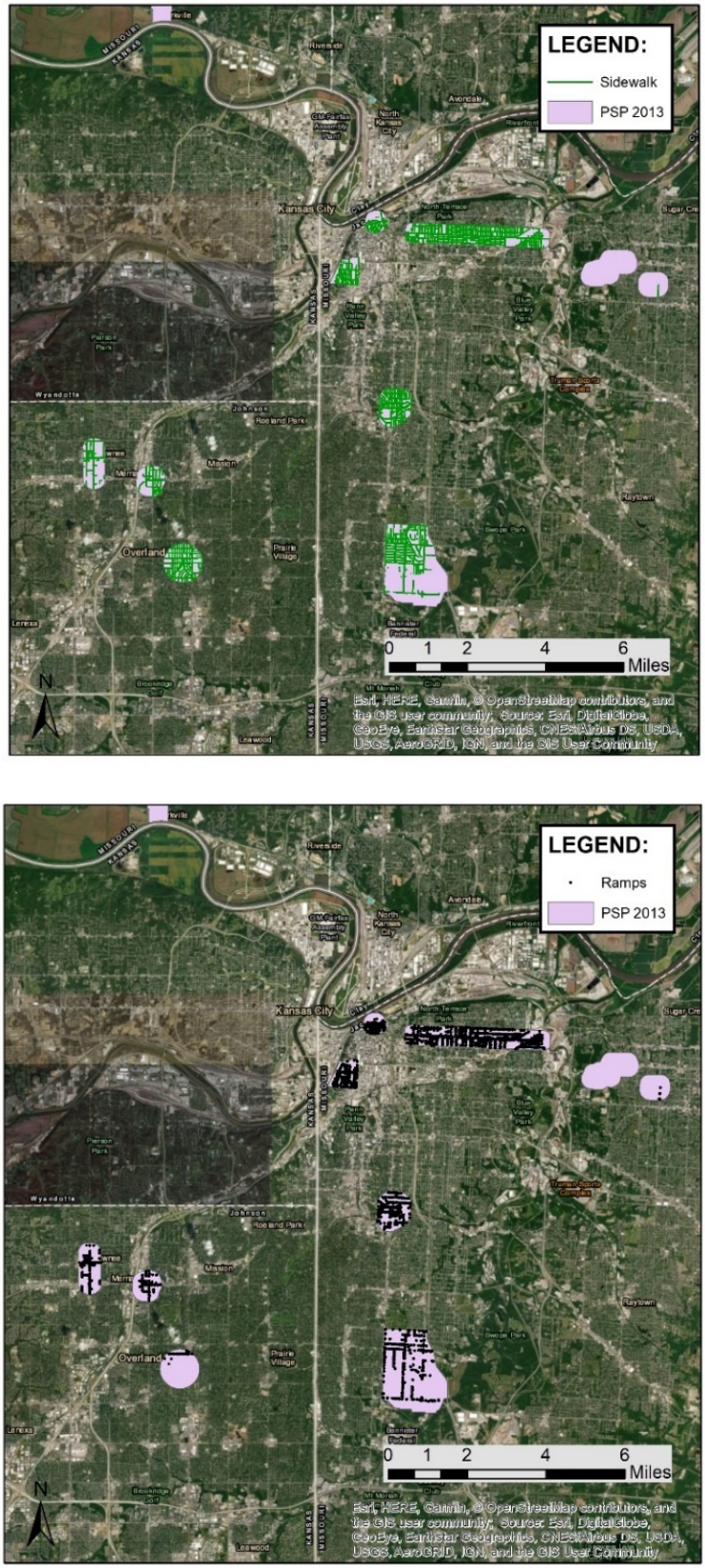


Figure 10 - Sidewalk and ramp network for the PSP 2013 projects.

Both sidewalks and ramps statistic data showed only under 5% of each in poor conditions. The ramps within the PSP projects have a high rate of ramps in good condition, which over two-thirds of all slopes. The sidewalks within the PSP project has almost the same percentage of pavement in good and fair condition, which is about one-third of all sidewalks in each type. Meanwhile, around 20% of ramps were not classified by their circumstances, and from 36 to 55% of sidewalks are also falling into the unknown status. It is necessary to mention that some projects that located outside Kansas City and directly adjusted to suburbs have no data on those features.

Kansas City BCycle also provided data on bike stations and daily bike usage. The bike stations are located mainly within the downtown area. The conducted spatial joint of bike data was showed that none of the projects have spatial relations to any of the PSP projects. That is the reason why bicycle using was not presented in this travel choices data analysis.

Visualization

The efforts of community planning actions are aimed to meet the needs of the local community members. It is evident that the community has a desire to review the results of such activities when the locals have hope for improving their living environment and have provided resources to implement the actions towards it. Reporting to the community is a critical element in building trust, which is necessary for any public planning organization. Supporting the connection could also make

more efficient demonstrating of the effectiveness of the planning program and the impact on welfare, which could increase the interest of local citizens in the program itself. The connection can also promote further support by local authorities, which has resources for its implementation.

One of the main aims of any public organization or initiative is to get on the radar of an ordinary person to make them associates. Public relations are also an essential part of MARC's activities and the PSP program implementation. Presenting the report, which includes a mid-term performance and the PSP impact on local communities five years after the program launched, is a priority for the PSP management and the organization. The organization aims to efficiently present the results of the program to each member of the community. The competent local authorities or ordinary residents must have access to such information and understand it. Communication with a citizen could be advanced via visualized data of the report. At this stage of the PSP program, the visualization of the report is crucial for effective communication with people.

Public planning practice in a democratic society requires involving informed citizens into making empowered decisions, according to Hemmersam et al. (2016). Sharing data only, even if it is full and detailed, is not enough way to educate citizens. Different social groups or organization must have easy access to useable data on planning. Several visualization techniques are allowing enabling citizen participation, in a case to make public information more accessible. Visualizing the data via images has become traditional for planning, and nowadays it

has improved by using computers and net technologies, real-time and open data. New tools are allowing using data dissemination, analysis, and visualization itself by a much more extensive range of people besides professionals. Some strategies for data displaying can cause presenting structured by intent and agency data with a direct message based on the data, interpreted by a presenter. Another approach can produce situated visualization which is allowing immediate feedback through exploring the data elements by inhabitants and generating own conclusions based on the observations.

Visual information can make common ground in transmitting data for overcoming racial, social, or language barriers. Visual information is preferred by humans perception and converting of a data into something visual can reduce the risk of confusion of receiving that data. Visualization provides a common language for technical and nontechnical recipients, which increase target group scale and effect of the information, as a communication of ideas offered by visual representation is as important as the facts and information itself. Related visual images data is actively complemented by spatial data visualization, which increased the level of audience engagement. Digital tools are rapidly transforming public participation. Al-Kodmany (2002) suggests digital tools may lack the ability to draw people into meaningful interaction with the data and each other if used alone, while traditional tools could enhance education environment for the audience.

Human's visual processing centers in a brain are helping synthesize data more efficiently, memorize the information, and reminisce it later. French (2019)

suggesting that data storytelling is one of the sufficient tools when the audience connects to an information by finding a story and bringing the data into the account. There is so much valuable information in any reports that potentially might be interesting to people but could not fit into one story. Storytelling technique introduces content and helps understand insights mean of the data.

The ESRI Story Maps is a net-based tool that combines interactive maps, images, statistics, various documents, infographics, videos for a reporting in order to deliver a report message efficiently while relaying that information to the public and key stakeholders. This tool widely used in planning project because of the capability to combine lots of maps and data for helping with the decision-making process. The Story Map toolkit allows putting various stand-alone maps and data of a typical detailed report, into an interactive form with context without requirements of familiarity with the topic or listening to a presenter's instructions. This tool provides an opportunity to explain the importance of the issue, the details of the reporting data, use the new terminology, and tell about the critical points while focusing on complex problems. Use of these features can increase the level of accessibility to the public and stakeholders from different backgrounds which do not require specialized knowledge on a complex topic of the report. The ESRI storytelling tool has high efficiency in synthesizing multiple data types for public presentation and opportunity to place online for general public consumption. The Story Map has been used for displaying evaluation findings to share the report data with public stakeholder.

During the internship, I developed two ESRI applications for the MARC staff, as an example of visualization of the PSP evaluation and sharing with the public. First applications have been made by using ESRI Web AppBuilder for ArcGIS using the corporate license for the ArcGIS Online. The web application is contained maps from the analysis as separate layers. The widgets for the web application allowed users to choose an interesting layer and discover by themselves. The layer, the legend, the chart, and the attribute table widgets were allowed for use in the web application. The layer and the legend widgets are allowing to choose information to display. The attribute table widget is allowing to explore data related to spatial objects: projects, bus stops, trails, sidewalks. The chart widget enables to visualize attribute data into charts. The purpose of using Web AppBuilder was to provide a self-exploring option for the public. The application was proposed to locate on the PSP projects page on the MARC website, as it is using by other metropolitan planning organizations in the country.

The Story-Map application has been made by using the MARC corporate subscription options. This option is allowed to use big-data as row material and visualize spatial analysis online. Using the MARC corporate account for creating the Story-Map is secured following maintaining the data by the staff after finishing the internship. It also simplified usage of a variety of the organizational maps and data already available in ArcGIS for the MARC staff. For instance, big-data on thousands of bus stops and sidewalks were available in the subscription account, so users were able to explore each object and data related to it. The original Story

Map has also included other evaluation layers than which are presented in the practicum, such as environmental justice tracts, housing, and activity centers.

The Story Map developed for the practicum was made by using a free ESRI account. The Cascade type has been chosen for the storytelling. The Story Map Cascade contains the narrative and the immersive sections. The narrative sections supposed to introduce viewers to the issue and to provide basic information about the following content. This section using media in the form of background pictures, made by myself during the internship. The immersive sections contain interactive maps, imported from the shapefiles after data analysis in ArcGIS Desktop. Compared to the web application, the story map has limited information displayed, after configuring pop-ups and enabling only related to the story data. Because the story map has the connection to a story of presentation, it is important to provide enough information in the case to support that story, but not to overinform the audience. Mixing the narrative and immersive sections are providing the opportunity to make the transition between maps with different data, and also to enjoy Kansas City views. The Story Map built for the report is available on the following link https://arcg.is/01Heay, and some screenshots of the story map can be seen in Appendix E.

Chapter 5 - Conclusions and Recommendations

The Planning Sustainable Places program is granting tool for local planning initiatives that can fit into the program requirements and make actions toward sustainable development combined with transportation improvements. The best and the simplest way to find the universal measurement for such a diverse program could be a quantitative analysis of funding spent, and spending shared with other funds, numbers of grantees, etc. But such the analysis could not show the performance of the projects' implementation. Qualitative analysis of the PSP program performance is mostly limited because of data availability for comparing current conditions with pre-program one. Nonetheless, the limited data for qualitative analysis can provide the best results for limited numbers of projects that fit into such data.

Public transport ridership data is the most advanced among travel options category analyzed in the report. KCATA has maintained information for each of PSP year, so it is a significant advantage to available data for the analysis. Anyway, there is the question on the methodology for counting riders on/off by KCATA, because a gap in total ridership presents. The ridership gap is less than 2% so it was neglected for the report as a statistical error. This measure has another problem raised because only about half of the projects can be evaluated with using this it. A lot of projects cannot be assessed by the ridership because there is no public transport development within them. The role of public transportation on local economic development is significant, and growth along free Kansas City streetcar line proved that statement. Public transportation and regional development have interconnection in case of

increase. Transit corridors can be adjusted with a preference to contain attractive places, with the purpose to involve more riders to those destinations. A place attractiveness, improved in the result of implementing the PSP program, can increase visitors to that area and stimulate the economy. Additionally, such data can help in the future optimization of bus service within some projects or will confirm false suspending of bus stops in other areas.

The trail system is essential for commuting travel or travel to a destination nearby home or work, as well as it is an element of recreation and health improvement. Trail network growth can benefit to several goals of the PSP program. A lot of the PSP projects can be evaluated by the trail's data. But there are some projects which have the aims to improve trails and to use it for development, while other projects only using existing infrastructure with no objective to improve the system. Currently, there are no comparable yearly data, and it contains only the current trail network. It is necessary to monitor changes in the system, which should allow making a comprehensive analysis of the trail's influence on the planning project areas. Additionally, monitoring future changes in the network could enable detecting areas for connecting independent trails into a robust regional system.

Sidewalks data presented in the report can also be used for the same purpose as trails, but with a deeper connection with local economic. Sidewalks are more used in business purpose and commuting to a job (from home, from lunch, etc.). Data that shows sidewalk condition can be used for detecting places needed in renovations. The sidewalk data have a lot of missed information, such as undefined conditions of

sidewalks that located outside the primary metropolitan core. That is why all the projects cannot be efficiently analyzed with this measurement. In the same time, new ramp and curves data can give information on the sidewalk accessibility to people with special needs, and the sidewalks which can be easily accessed from the intermittent lines by bike.

A significant number of complicated charts and tables can be produced using the mentioned measurements for travel options. The StoryMap is an efficient and easily accessible tool for sufficient sharing such amount of data. While the story slides can display the main idea of the report, an independent user can access additional information on an issue by interacting with the web-based map. Using the tool is allowing to fill the gaps in information by requested by a user data after receiving planned by a presenter message. This tool is useful also for a presenter, as all information can be published, and not visible during a general presentation, but easily explored by few actions during the speech. Moreover, visualization combined with interacting can rapidly increase public participatory in the activity promoted by an organization. Additionally, web-based presentation or application may be supplemented with additional information in the future without the need for creating new access to the public.

The limited data is available for one standardized evaluation of all the PSP projects, and the problem here mostly in the project differences than in a lack of data. It is probably unnecessary to find one measurement that will fit all the projects. The full data for some measures is already available and can be efficiently applied to

some project's performance evaluation. This report's analysis example and other analysis during the internship can be used for the next round of the PSP program granting process. Also, it is vital to understand which measurements can be used for evaluation for further maintaining a suitable database. For instance, detecting trends can be allowed by comparing future datasets with the sidewalk and the trails data, that was generated during the internship. And the company knows that they need some information and will try to develop data for comparing and analyzing. That is why, even the influence of data presented on the projects is indirect, there are important takeaways for the program management team for future scoring the new grantees, as well as the kind of roadmap what to look and maintain for a future full evaluation of the program performance with all data available.

Lessons Learned

Networking as a tool for searching for an opportunity

As a student funded by the Fulbright Program, I have a certain limitation with a job or paid internship in the US during my funded study. That limitation related to both legal and economic issues. But as a Fulbright scholar from post-Soviet countries, I am eligible for designated internship opportunities provided by the US Department of State. I used such an opportunity, and in late January, I was awarded by the scholarship from the Edmund S. Muskie Internship Program for summer 2018 internship in the US. The Internship Program provided administration and legal support to my possible American real-work experience, according to the

submitted proposal during the selection process. I searched for published internship positions across the country related to rural or regional planning, and elements of sustainable planning. I am also extended the search criteria for planning intern positions in rural areas. Unfortunately, the recruitment terms weren't flexible, and the Internship program has required to confirm internship place due to end of the May, so I started to reach some local planning departments with questions about available intern's position for the summer. Basically, I finished with a couple of possible places in urban villages within the Chicago metropolitan area, but the described duties were related to community planning only partially. I am also got confirmation from the Planning Department of Pennington County, South Dakota, with the proposition to assist in public hearings on new Pennington County Comprehensive Plan view to 2040. I did have an interest in comprehensive planning for a rural county, but after an interview with the department's director, it was clear that the comprehensive plan already is done and only some revisions might be in work during my summer internship. I still wasn't satisfied by possible internship assignments, and I have been keeping on searching for a combination of regional planning, sustainable initiatives, and rural locations.

For the purpose of securing the best possible internship site for summer 2018, I used diaspora networking resources. I have reached Ms. Gala Korniyenko, who is the previous Fulbrighter at the master program on urban development and planning at the University of Kansas and participant of the Edmund S. Muskie Program in 2015. She has experience in planning activities for NGO's in the region in central

Ukraine, and currently a Ph.D. candidate at the Ohio State University. Regardless of the difference in urban-rural planning interests, she is well known about Ukrainian realities for regional planning, and we found common ground during determining what I am looking for from the internship. She recommended exploring regional programs at Mid-America Regional Council, as she knew that metropolitan planning organization from her master studies and that region pretty much can be described as rural by Ukrainians. I did get excited about the Planning Sustainable Places program and tried to reach the company via e-mails. I used provided by Ms. Korniyenko contact with one of the planners from the MARC staff to ask about internship positions because there was no recruitment at that moment. It resulted in direct communication with the Transportation and Environment Department's director and the following internship at the MARC, that included involvement in ongoing planning initiatives for the serving region.

Networking during the internship

For the purpose of a better understanding of local development initiatives and understating the local governments view on the PSP program, I have had several meeting with local leaders organized by my internship supervisor. I met with Ms. Janet McRae, the director of the department of economic development for Miami County, Kansas. We have discussed rural tourism development in the county, and how it supported by the county government, and what the impact of farm tourism on the economy of the county. I had a meeting with Ms. Molly McGovern, the city manager for the city of Excelsior Springs, Missouri. I was wondered how such small

towns could develop in the proximity to giant Kansas City, without being just a sleeping place. Ms. McGovern also has shared her experience in communication with citizens and involving them into city initiatives using internet resources. I have also had a meeting with Ms. Trese Robinson, the program officer for Greater Kansas City Local Initiative Support Corporation. I learned about this private initiative on developing local communities leadership for transforming the environment into sustainable communities.

Additionally, I got almost the lecture during a meeting with Ms. Kristin Riot, the executive director for NGO Bridging the Gap, that aimed to create more sustainable Kansas City communities. Ms. Riot personally is an active supporter of environmentalist movements, and she proved it by improving environmental impact by inks used in Hallmark cards when she served for the famous corporation based in Kansas City, Missouri. She also told about the NGO environmentalist activities on agriculture, waste management, water conservation, green business support, energy efficiency, wildland protections, and planting trees for fighting climate changes. During each meeting, I asked about feedback on the PSP program and how their organizations benefit from it because all of them participated with some project in the PSP program. I got only positive feedbacks and inspirations, as the PSP project was seen by them as a tool for implementing some local planning initiative which was not able to fund by local agencies themselves.

Moreover, I had a meeting with Mr. Jeffrey Williams, the director for City Planning and Development, Kansas City, Missouri. I discussed general planning

question that is facing the city planning department, as well as how the Kansas City, Missouri can benefit from participating in the PSP initiative and share funds with more than hundred other local authorities when they have own resources for small planning projects. As the answer, I heard about feeling like one regional community that helps each other. I heard about depending on workers for Kansas City which are living in other communities, so the city responsible for satellites, because people who are living there creating an economy for the city. Basically, those meetings bring me an understanding of mentality for cooperation in the region, interdependency, and togetherness. Nonetheless, I can claim that the PSP program is the mixed type of placemaking (Lew, 2017), where the organic local place-making initiatives trying to be implemented within the top-down master planned placemaking.

Sustainable Places

After a three-month internship with the program on sustainable places, I probably have a more new question about sustainability than answers. But definitely, I learned on practice how a sustainable development perceived by Americans. I did have some of US point of view on sustainability from my NAU classes on sustainability, and I already realized that it is more environmentalist than economy-oriented sustainability, with which I am familiar from Ukrainian school. I do understand, that for a much more economically developed nation as the US, economic issues are not so urgent, as for Ukraine for instance. Actually, economic problems just an excuse for a full picture of the sustainability approach, in my opinion. That is why the NAU classes already changed my perception of sustainability. But the internship

brought a new important element of sustainability – social component. I would suggest, because of organic local initiatives the PSP program aimed to create diverse, friendly, interactive, welcoming, accessible, walkable, safe, cooperative and attractive places. It is the same important for sustainability, especially in the case of creating sustainable places. Placemaking is about creating places for people with respecting sustainability goals, but those goals will not be reached without making places for people better, so all of mentioned above elements should be considered during planning for sustainable development. Therefore, I would define sustainable development as improving people's space of living, without harming to that space and with securing future conditions of such places.

The measurement of sustainability can and should be locally oriented. Based on my internship I could conclude that there are different places with different community goals, which all can be defined as sustainable. There are a lot of economic indicators, which could be used for local communities while evaluating sustainable development. Most of those measurements already exist in statistics but with some higher spatial structure than some specific community. I do believe, that monitoring of local economic parameters, such as businesses opened/closed, revenues, sales, taxes, employment rate, property value, rent rates, etc. could be used for evaluating sustainability for even small community. Environmental data also must be considered during evaluating sustainability in a community. Monitoring the quality of environments can be made through analyzing emissions by businesses, industries, individuals (car, homes, etc.) numbers and the square of green spaces available for

the people, biodiversity, etc. The most important section for measurements, which I would like to recommend if I would have the opportunity to manage to monitor on them, is the social section. Because this section related to human activity, there is a long list of possible measurements: crimes, health conditions, building and amenities conditions, sanitation, transit usage, pedestrian accessibility, mode choice, traffic data, visitors for places, volunteerism, diversity of businesses, gender and age pyramids, etc. That measurement will be transformed from place to place; for instance, transit usage has not such a significant impact on US communities as traffic data. In the same time, traffic data will not be so crucial for poor communities where people using mostly public transit for traveling around. But improving economic conditions in poor communities will probably lead to an increase in individual vehicle usage in the future, so the importance of measurements could change through time. It supports my thought that all of those elements of sustainable communities are interconnected and interdependent.

The internship and NAU courses inspired me for taking an active role in transforming communities when I will come back home to Ukraine. NAU classes equipped me with a knowledge of sustainability, which could be a purposeful factor in my future career. The internship in MARC showed to me that even top-down institution could serve the purpose for sustainable placemaking. Currently, I do see my future career more in the professional field where I can share the commitment, togetherness, cooperation values in regional planning for building better and more sustainable communities for people in Ukraine.

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APPENDIX A: List of Planning Sustainable Places projects.

Project name	Round	Buffer zone
135th Street Community Plan	2013	NO
3rd & Grand Multimodal Transportation Hub	2013	1\4 mile
69PV Corridor Plan	2013	1\4 mile
Cleaver II and Troost Redevelopment	2013	1\4 mile
Community Connections - Nieman Road	2013	1\4 mile
Englewood Arts District Circulation Plan	2013	1\4 mile
Historic Northeast Redevelopment Project	2013	500 foot
I-49/US-71 Sustainable Redevelopment Corridor Plan	2013	NO
Implementing Structured Parking in Downtown	2013	NO
Parkville Downtown Master Plan	2013	NO
Plan for Revitalization Implementation (PRIDe)	2013	1\4 mile
Shawnee Mission Parkway: Antioch to Eby	2013	1\4 mile
South Buckner-Tarsney (Main Street) Improvements	2013	1\4 mile
South Cedar Creek Corridor Sustainability Plan	2013	NO
Sustainable Development Planning Project	2013	1\4 mile
The Catalyst Project	2013	NO
Truman Road Green Gateway	2013	1\4 mile
West High - Switzer Development Plan	2013	NO
135th Street Community Implementation Plan	2015	1\4 mile
Burlington Corridor Complete Street Design	2015	1\4 mile
Connect Downtown Olathe	2015	1\4 mile
Downtown Broadway Complete Street, Green St. Plan	2015	1\4 mile
Highway 92 Corridor Study	2015	500 foot
Independence Avenue Zoning Overlay	2015	1\4 mile
Linking Historic Shawnee	2015	1\4 mile
Marlborough Village Placemaking	2015	1\4 mile
Old Town Lenexa	2015	1\4 mile
Route 9 Corridor	2015	1\4 mile
Tri-City Multimodal Redevelopment Plan	2015	500 foot
Truman & Winner Roads Commercial Node	2015	1\4 mile
Waldo Streetscape & 75th Street & Wornall Road	2015	1\4 mile
24 Highway Farimount Business District Plan	2017	500 foot

47th Street Complete Street Evaluation	2017	200 foot
75th & Metcalf Transit and Pedestrian Access Plan	2017	700 foot
Armour Road Complete Streets Plan	2017	1\4 mile
Cambridge Connector Feasibility Analysis	2017	NO
Citywide Bike and Pedestrian Plan	2017	NO
Connecting Edwardsville	2017	NO
Downtown Edgerton Plan	2017	1\4 mile
Event & Transportation Hub for Overland Park	2017	NO
Gardner Main Street Corridor Plan	2017	NO
Get Active Bike Share Implementation Strategy	2017	NO
Gillham Road Corridor Bike Connections Plan	2017	1\4 mile
Independence Avenue Pedestrian Safety Improvements	2017	1\4 mile
Kaw River Bike and Pedestrian Connector Bridge	2017	1\4 mile
Leavenworth Transit Plan	2017	NO
Master Trail Plan	2017	NO
Midtown Complete Streets Corridor Plan	2017	NO
Quivira Road Corridor Plan	2017	1\4 mile
Rosedale University Town District	2017	NO
Southwest Johnson County Transit Plan	2017	1\4 mile
Swope Area & Prospect Connectivity Study	2017	NO
Troost and Prospect ROW Enhancements	2017	1\4 mile
Truman Road Complete Streets Redevelopment Plan	2017	300 foot
Vision Metcalf: The College Avenue Node	2017	1\4 mile
Trails Nexus Study and Ordinance	2017	Excluded

APPENDIX B: Ridership data statistics.

Table 1. The Kansas City metropolitan area daily ridership

	2012	2013	2014	2015	2016	2017	2018
Total passengers	116914	115395	114689	106345	105166	93890	93755
OFF	57741	57152	57044	52995	52516	46884	46941
ON	59044	58095	57522	53231	52549	46851	46696
Bus stops	4604	4603	4603	4603	4603	4603	4603
Total		-1,3	-0,6	-7,3	-1,1	-10,7	-0,1
Change (%)							

Table 2. The PSP 2013 projects area daily ridership

Project name	BS	P	BS	P	BS	P	BS	P	BS	P	BS	P	BS	P	Change 18/12	
	2012		2013		2014		2015		2016		2017		2018		%	Class
Englewood Arts District Circulation Plan	17	61	13	46	13	57	13	51	13	51	7	51	7	49	-19,67%	average
Truman Road Green Gateway	13	71	14	74	14	71	14	74	14	69	12	56	12	34	-52,11%	below average
3rd & Grand Multimodal Transportation Hub	16	678	6	646	6	533	6	514	7	598	7	651	12	2183	221,98%	positive
Cleaver II and Troost Redevelopment	50	1863	42	1784	42	1738	42	1723	43	1754	35	1521	37	1457	-21,79%	average
69PV Corridor Plan	1	12	1	9	1	5	1	3	3	4	2	1	5	0	-100,00%	below average
I-49/US-71 Sustainable Redevelopment Corridor Plan	1	104	2	82	2	67	2	65	4	56	4	52	4	51	-50,96%	below average
The Catalyst Project	102	3673	93	3471	93	3219	95	2959	96	2821	70	2434	70	2391	-34,90%	below average
West High - Switzer Development Plan	17	114	9	89	10	92	10	101	13	107	7	67	7	66	-42,11%	below average
Historic Northeast Redevelopment Project	94	4217	89	4020	89	3999	89	3823	86	3689	56	3424	56	2985	-29,22%	below average
Total	311	10793	269	10221	270	9781	272	9313	279	9149	200	8257	210	9216	-14,61%	
Passengers KCATA	116914		115395		114689		106345		105166		93890		93755		-19,81%	
Share PSP 2013	9,2%		8,9%		8,5%		8,8%		8,7%		8,8%		9,8%			

*BS – # bus stops; P – passengers total.

Table 3. The PSP 2013 projects area daily ridership change

	2013-2012	2014-2013	2015-2014	2016-2015	2017-2016	2018-2017
Englewood Arts District Circulation Plan	-25%	24%	-11%	0%	0%	-4%
Truman Road Green Gateway	4%	-4%	4%	-7%	-19%	-39%
3rd & Grand Multimodal Transportation Hub	-5%	-17%	-4%	16%	9%	50%
Cleaver II and Troost Redevelopment	-4%	-3%	-1%	2%	-13%	-4%
69PV Corridor Plan	-25%	-44%	-40%	33%	-75%	-100%
I-49/US-71 Sustainable Redevelopment Corridor Plan	-21%	-18%	-3%	-14%	-7%	-2%
The Catalyst Project	-5%	-7%	-8%	-5%	-14%	-2%
West High - Switzer Development Plan	-22%	3%	10%	6%	-37%	-1%
Historic Northeast Redevelopment Project	-5%	-1%	-4%	-4%	-7%	-13%
Project areas	-5%	-4%	-5%	-2%	-10%	12%
KCATA area	-1%	-1%	-7%	-1%	-11%	0%

Table 4. The PSP 2015 projects area daily ridership

Project name	BS	P	BS	P	BS	P	BS	P	BS	P	BS	P	BS	P	Change 18/14	
	2012		2013		2014		2015		2016		2017		2018		%	Class
Truman & Winner Roads Commercial Node	12	98	12	108	12	96	12	96	12	87	10	81	10	60	-37,50%	below average
Independence Avenue Zoning Overlay	162	4674	153	4529	153	4462	152	4317	133	4179	98	3819	99	3394	-23,94%	below average
Marlborough Village Placemaking	14	136	15	197	15	180	15	151	14	148	10	117	10	101	-43,89%	below average
Waldo Streetscape - 75th Street & Wornall Road	29	1938	27	1066	27	976	27	947	27	916	25	839	22	1196	22,54%	positive
Burlington Corridor Complete Street Design	59	305	59	338	57	376	58	428	59	433	59	413	59	377	0,27%	average
Total	276	7151	266	6238	264	6090	264	5939	245	5763	202	5269	200	5128	-15,80%	
Passengers KCATA	116914		115395		114689		106345		105166		93890		93755		-18,25%	
Share PSP 2015	6,1%		5,4%		5,3%		5,6%		5,5%		5,6%		5,5%			

Table 5. The PSP 2017 projects area daily ridership

Project name	BS	P	BS	P	BS	P	BS	P	BS	P	BS	P	BS	P	Change 18/16	
	2012		2013		2014		2015		2016		2017		2018		%	Class
Gillham Road Corridor Bike Connections Plan	246	11948	174	11067	169	10407	161	10121	166	10110	123	8883	119	11425	0,13%	positive
Independence Avenue Pedestrian Safety Improvements	145	4593	135	4449	135	4380	134	4224	117	4085	86	3747	85	3285	-19,58%	below average
Troost and Prospect ROW Enhancements	412	23965	393	22663	386	21917	377	20341	387	19452	325	17831	290	16512	-15,11%	below average
Armour Road Complete Streets Plan	37	227	37	235	33	240	34	277	34	247	34	232	34	204	-17,41%	below average
Kaw River Bike and Pedestrian Connector Bridge	24	539	21	546	21	646	21	521	21	556	24	532	23	534	-3,96%	above average
Midtown Complete Streets Corridor Plan	481	22582	402	22776	405	22443	397	20976	386	19957	313	18315	290	16560	-17,02%	below average
Citywide Bike and Pedestrian Plan	4	22	4	24	4	30	4	27	4	36	3	31	3	22	-38,89%	below average
Cambridge Connector Feasibility Analysis	56	1519	55	1481	55	1628	59	1623	53	1430	41	1245	42	1330	-6,99%	above average
Rosedale University Town District	8	482	7	134	8	542	10	648	9	153	8	131	7	70	-54,25%	below average
Vision Metcalf: The College Avenue Node	0	0	0	0	0	0	0	0	1	2	3	9	3	7	250,00%	positive
Truman Road Complete Streets Redevelopment Plan	104	5286	89	3150	90	2878	89	2878	77	2572	65	2316	62	2322	-9,72%	average
47th Street Complete Street Evaluation	5	47	5	58	5	149	6	77	12	55	11	33	11	31	-43,64%	below average
Swope Area ΓÇö Prospect Connectivity Study	256	6519	224	5753	214	5688	206	5139	202	4922	179	4439	173	4305	-12,54%	below average
Total	1384	55309	1200	51410	1182	50470	1161	47442	1129	45588	941	41267	889	41416	-9,15%	
Area		116914		115395		114689		106345		105166		93890		93755	-10,85%	
Share of area		47,3%		44,6%		44,0%		44,6%		43,3%		44,0%		44,2%		

*BS – bus stops, P – passengers in total.

Table 6. The PSP 2015 projects area daily ridership change

Project name	2013-2012	2014-2013	2015-2014	2016-2015	2017-2016	2018-2017
Truman & Winner Roads Commercial Node	10,20%	-11,11%	0,00%	-9,38%	-6,90%	-25,93%
Independence Avenue Zoning Overlay	-3,10%	-1,48%	-3,25%	-3,20%	-8,61%	-11,13%
Marlborough Village Placemaking	44,85%	-8,63%	-16,11%	-1,99%	-20,95%	-13,68%
Waldo Streetscape - 75th Street & Wornall Road	-44,99%	-8,44%	-2,97%	-3,27%	-8,41%	42,55%
Burlington Corridor Complete Street Design	10,82%	11,24%	13,83%	1,17%	-4,62%	-8,72%
Project areas	-12,77%	-2,37%	-2,48%	-2,96%	-8,57%	-2,68%
KCATA area	-1,30%	-0,61%	-7,28%	-1,11%	-10,72%	-0,14%

Table 7. The PSP 2017 projects area daily ridership change

Project name	2013-2012	2014-2013	2015-2014	2016-2015	2017-2016	2018-2017
Gillham Road Corridor Bike Connections Plan	-7%	-6%	-3%	0%	-12%	29%
Independence Avenue Pedestrian Safety Improvements	-3%	-2%	-4%	-3%	-8%	-12%
Troost and Prospect ROW Enhancements	-5%	-3%	-7%	-4%	-8%	-7%
Armour Road Complete Streets Plan	4%	2%	15%	-11%	-6%	-12%
Kaw River Bike and Pedestrian Connector Bridge	1%	18%	-19%	7%	-4%	0%
Midtown Complete Streets Corridor Plan	1%	-1%	-7%	-5%	-8%	-10%
Citywide Bike and Pedestrian Plan	9%	25%	-10%	33%	-14%	-29%
Cambridge Connector Feasibility Analysis	-3%	10%	0%	-12%	-13%	7%
Rosedale University Town District	-72%	50%	20%	-76%	-14%	-47%
Vision Metcalf: The College Avenue Node	0%	0%	0%	0%	0%	-22%
Truman Road Complete Streets Redevelopment Plan	-40%	-9%	0%	-11%	-10%	0%
47th Street Complete Street Evaluation	23%	50%	-48%	-29%	-40%	-6%
Swope Area - Prospect Connectivity Study	-12%	-1%	-10%	-4%	-10%	-3%
Project areas	-7%	-2%	-6%	-4%	-9%	0%
KCATA area	-1%	-1%	-7%	-1%	-11%	0%

APPENDIX C: Trail system data statistics.

Tab. 1. PSP 2013 trail system (length in km).

Facility_T	Cnt_Facili	Min_Length	Max_Length	Ave_Length	Sum_Length
Bike Lane	5	0,02	1,32	0,43	2,16
Mountain Bike Trail	1	0,20	0,20	0,20	0,20
Pedestrian Hike Trail	31	0,01	0,94	0,23	6,98
Marked Bike Route	38	0,02	1,02	0,30	11,26
Marked Share the Road	11	0,02	1,28	0,43	4,74
Unmarked Share the Road	26	0,02	0,53	0,21	5,49
Shared Use Path	40	0,01	2,85	0,48	19,29

Tab. 2. PSP 2015 trail system (length in km).

Facility_T	Cnt_Facili	Min_Length	Max_Length	Ave_Length	Sum_Length
Bike Lane	1	1,32	1,32	1,32	1,32
Pedestrian Hike Trail	19	0,01	1,03	0,21	4,03
Marked Bike Route	27	0,02	1,26	0,34	9,10
Marked Share the Road	12	0,06	1,19	0,47	5,66
Unmarked Share the Road	17	0,01	0,42	0,14	2,39
Shared Use Path	51	0,01	2,61	0,28	14,41

Tab. 3. PSP 2017 trail system (length in km).

Facility_T	Cnt_Facili	Min_Length	Max_Length	Ave_Length	Sum_Length
Bike Lane	25	0,01	3,59	0,95	23,64
Cycle Track	1	0,15	0,15	0,15	0,15
Mountain Bike Trail	23	0,05	2,69	0,62	14,34
Pedestrian Hike Trail	82	0,01	2,79	0,46	38,00
Marked Bike Route	111	0,01	2,63	0,48	53,44
Marked Share the Road	55	0,03	5,88	1,23	67,49
Unmarked Share the Road	51	0,01	2,78	0,30	15,50
Shared Use Path	295	0,01	7,68	0,43	126,62

Tab. 4. PSP 2013 projects trail system.

Project name	Count	Sum_Length, km
135th Street Community Plan	13	2,96
3rd & Grand Multimodal Transportation Hub	9	2,42
69PV Corridor Plan	2	0,46
Cleaver II and Troost Redevelopment	10	5,85
Community Connections - Nieman Road	8	2,17
Englewood Arts District Circulation Plan	0	0,00
Historic Northeast Redevelopment Project	15	3,96
I-49/US-71 Sustainable Redevelopment Corridor Plan	6	1,34
Implementing Structured Parking in Downtown	20	4,92
Parkville Downtown Master Plan	10	3,61
Plan for Revitalization Implementation (PRIDe)	0	0,00
Shawnee Mission Parkway: Antioch to Eby	20	2,86
South Buckner-Tarsney (Main Street) Improvements	2	1,41
South Cedar Creek Corridor Sustainability Plan	16	11,92
Sustainable Development Planning Project	6	1,54
The Catalyst Project	4	2,68
Truman Road Green Gateway	0	0,00
West High - Switzer Development Plan	13	2,46
	TOTAL	***50,57***

Tab. 5. PSP 2015 projects trail system.

Project name	Count	Sum_Length, km
135th Street Community Implementation Plan	13	3,09
Burlington Corridor Complete Street Design	8	3,22
Connect Downtown Olathe	48	12,54
Downtown Broadway Complete Street, Green St. Plan	0	0,00
Highway 92 Corridor Study	7	0,72
Independence Avenue Zoning Overlay	19	6,06
Linking Historic Shawnee	9	2,60
Marlborough Village Placemaking	2	0,43
Old Town Lenexa	1	0,01
Route 9 Corridor	15	7,14
Tri-City Multimodal Redevelopment Plan	2	0,12
Truman & Winner Roads Commercial Node	0	0,00
Waldo Streetscape & 75th Street & Wornall Road	3	1,00
	TOTAL	***36,92***

Tab. 6. PSP 2017 projects trail system.

Project name	Count	Sum_Length, km
24 Highway Farimount Business District Plan	1	0,26
47th Street Complete Street Evaluation	1	0,31
75th & Metcalf Transit and Pedestrian Access Plan	3	0,84
Armour Road Complete Streets Plan	9	3,45
Cambridge Connector Feasibility Analysis	27	15,82
Citywide Bike and Pedestrian Plan	34	8,01
Connecting Edwardsville	0	0,00
Downtown Edgerton Plan	0	0,00
Event & Transportation Hub for Overland Park	15	3,09
Gardner Main Street Corridor Plan	6	4,38
Get Active Bike Share Implementation Strategy	247	132,09
Gillham Road Corridor Bike Connections Plan	26	29,95
Independence Avenue Pedestrian Safety Improvements	16	5,30
Kaw River Bike and Pedestrian Connector Bridge	6	2,58
Leavenworth Transit Plan	136	82,32
Master Trail Plan	2	4,44
Midtown Complete Streets Corridor Plan	71	50,79
Quivira Road Corridor Plan	7	3,38
Rosedale University Town District	7	3,50
Southwest Johnson County Transit Plan	22	13,34
Swope Area & Prospect Connectivity Study	37	21,75
Troost and Prospect ROW Enhancements	34	30,50
Truman Road Complete Streets Redevelopment Plan	10	7,07
Vision Metcalf: The College Avenue Node	16	8,12
	TOTAL	***431,30***

APPENDIX D: Sidewalk's data statistics.

Tab. 1. Sidewalks and ramps conditions by the PSP round project's areas.

	Sidewalk ramps, count					Sidewalks, foot					
	Good	Fair	Poor	Undefined	Total	Good	Fair	Poor	Undefined	Total	
2013	2849	418	147	695	4109	408765	344449	64204	493178	1310596	2013
	69,34%	10,17%	3,58%	16,91%		31,19%	26,28%	4,90%	37,63%		
2015	2430	331	56	781	3598	305079	347340	25365	387947	1065731	2015
	67,54%	9,20%	1,56%	21,71%		28,63%	32,59%	2,38%	36,40%		
2017	12497	1780	625	2495	17397	1662286	1692358	362440	4463776	8180860	2017
	71,83%	10,23%	3,59%	14,34%		20,32%	20,69%	4,43%	54,56%		

Tab. 2. Sidewalks and ramps, PSP 2013.

Project name	Ramps, count	Sidewalks, foot
135th Street Community Plan	6	66834
3rd & Grand Multimodal Transportation Hub	325	36529
69PV Corridor Plan	8	1979
Cleaver II and Troost Redevelopment	522	117144
Community Connections - Nieman Road	214	39059
Englewood Arts District Circulation Plan	8	2356
Historic Northeast Redevelopment Project	1710	340223
I-49/US-71 Sustainable Redevelopment Corridor Plan	175	123631
Implementing Structured Parking in Downtown	38	92289
Parkville Downtown Master Plan	0	0
Plan for Revitalization Implementation (PRIDe)	0	0
Shawnee Mission Parkway: Antioch to Eby	151	37990
South Buckner-Tarsney (Main Street) Improvements	0	0
South Cedar Creek Corridor Sustainability Plan	0	208329
Sustainable Development Planning Project	0	0
The Catalyst Project	496	183577
Truman Road Green Gateway	0	0
West High - Switzer Development Plan	456	60656
TOTAL	**4109**	**1310596**

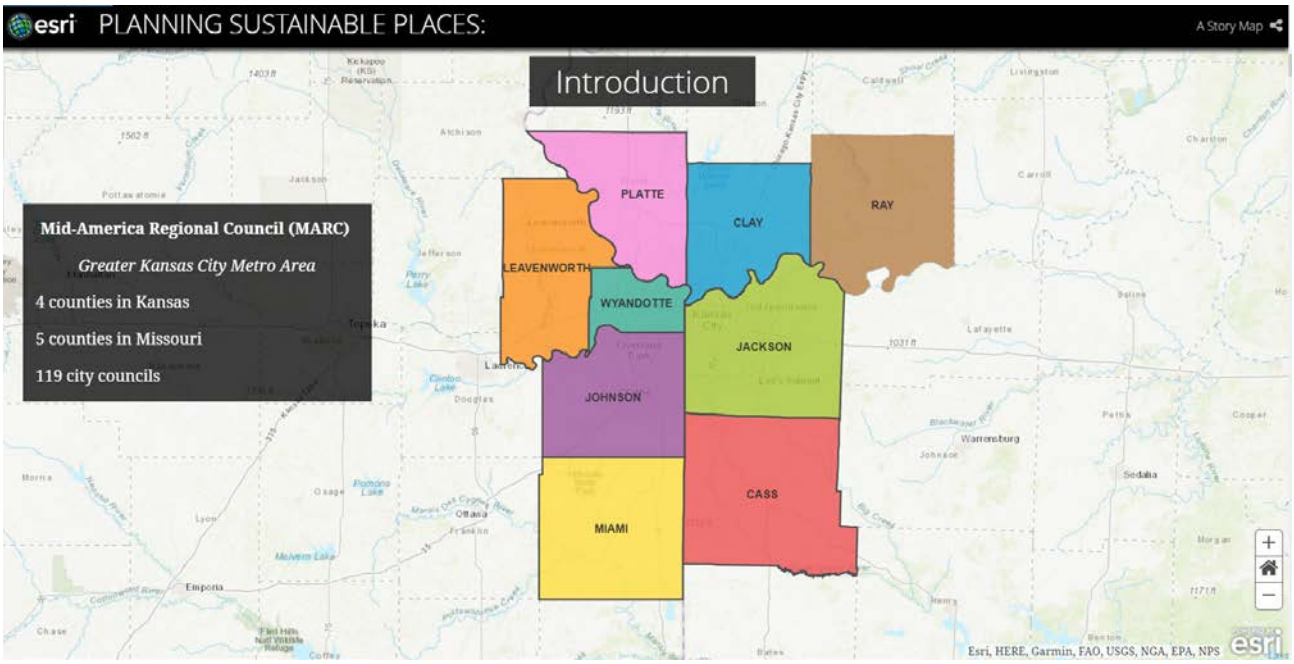
Tab. 3. Sidewalks and ramps, PSP 2015.

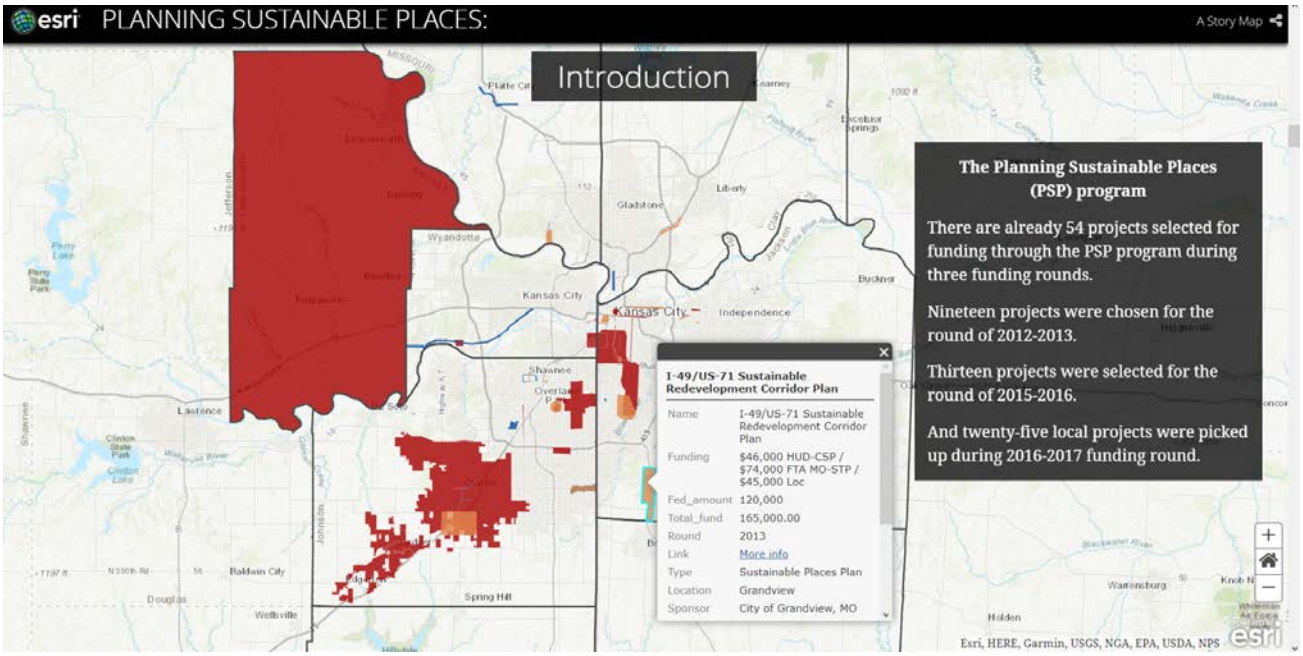
Project name	Ramps, count	Sidewalks, foot
135th Street Community Implementation Plan	6	6
Burlington Corridor Complete Street Design	430	430
Connect Downtown Olathe	338	338
Downtown Broadway Complete Street, Green St. Plan	0	0
Highway 92 Corridor Study	0	0
Independence Avenue Zoning Overlay	2113	2113
Linking Historic Shawnee	281	281
Marlborough Village Placemaking	70	70
Old Town Lenexa	98	98
Route 9 Corridor	0	0
Tri-City Multimodal Redevelopment Plan	0	0
Truman & Winner Roads Commercial Node	0	0
Waldo Streetscape & 75th Street & Wornall Road	262	262
TOTAL	**3598**	**3598**

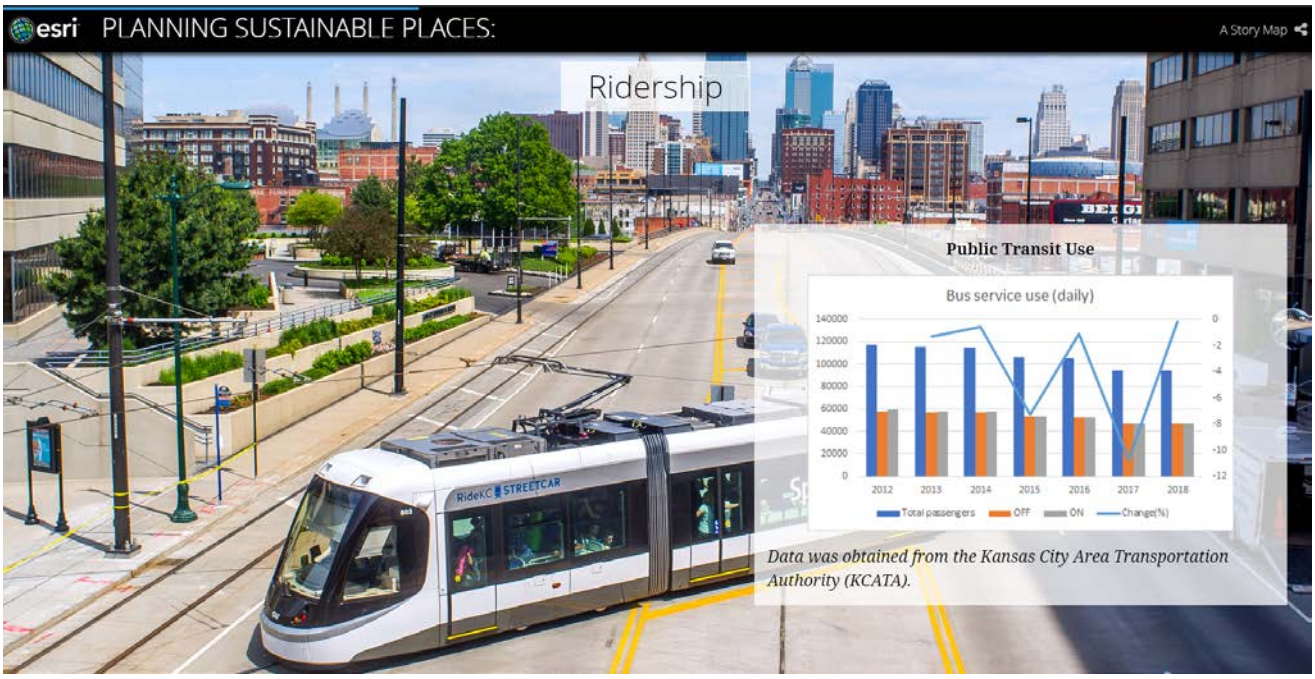
Tab. 4. Sidewalks and ramps, PSP 2017.

Project name	Ramps, count	Sidewalks, foot
24 Highway Farimount Business District Plan	0	0
47th Street Complete Street Evaluation	0	0
75th & Metcalf Transit and Pedestrian Access Plan	176	176
Armour Road Complete Streets Plan	482	482
Cambridge Connector Feasibility Analysis	761	761
Citywide Bike and Pedestrian Plan	602	602
Connecting Edwardsville	0	0
Downtown Edgerton Plan	0	0
Event & Transportation Hub for Overland Park	0	0
Gardner Main Street Corridor Plan	0	0
Get Active Bike Share Implementation Strategy	635	635
Gillham Road Corridor Bike Connections Plan	3016	3016
Independence Avenue Pedestrian Safety Improvements	1934	1934
Kaw River Bike and Pedestrian Connector Bridge	623	623
Leavenworth Transit Plan	0	0
Master Trail Plan	0	0
Midtown Complete Streets Corridor Plan	6094	6094
Quivira Road Corridor Plan	364	364
Rosedale University Town District	58	58
Southwest Johnson County Transit Plan	0	0
Swope Area & Prospect Connectivity Study	2055	2055
Troost and Prospect ROW Enhancements	3680	3680
Truman Road Complete Streets Redevelopment Plan	1437	1437
Vision Metcalf: The College Avenue Node	177	177
TOTAL	**22094**	**22094**

APPENDIX E: Screenshots from the ESRI Story-Map.



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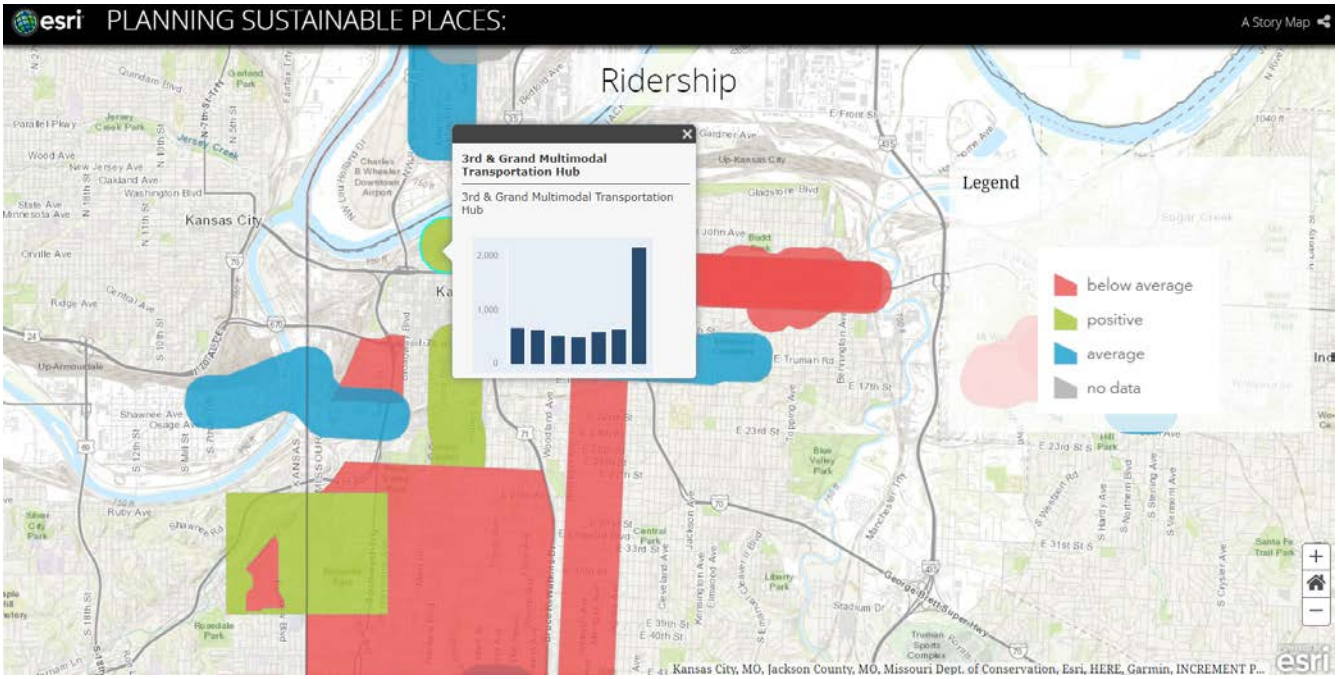
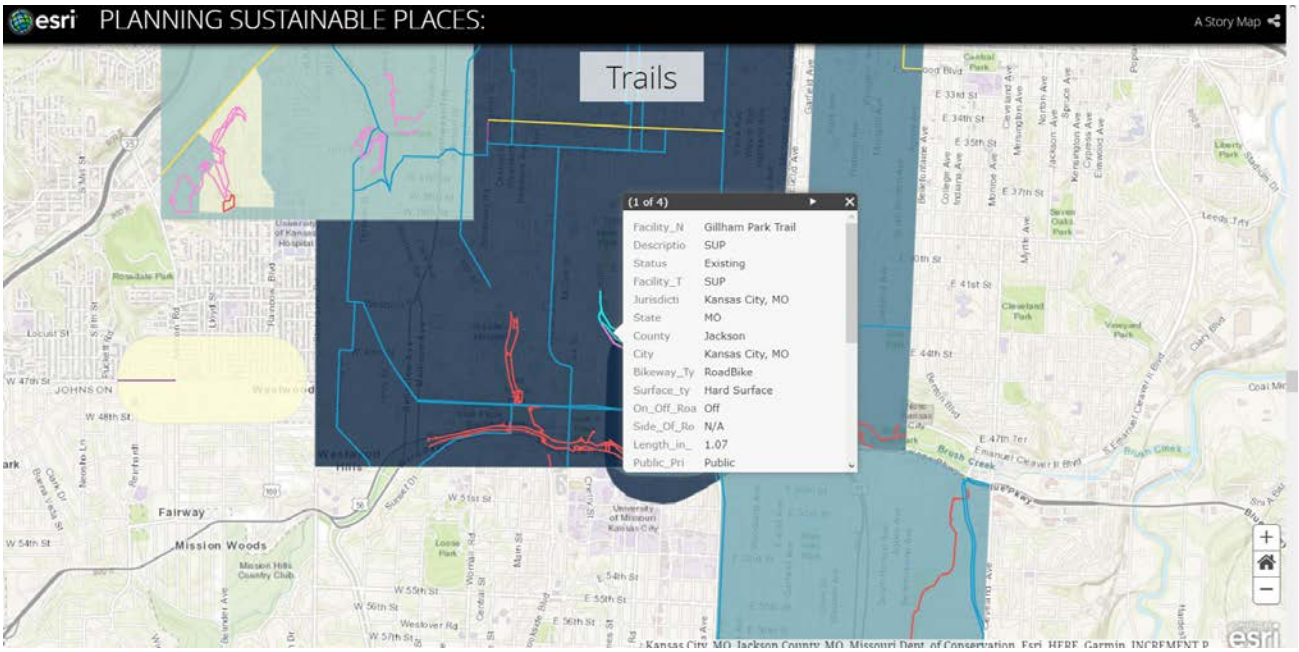
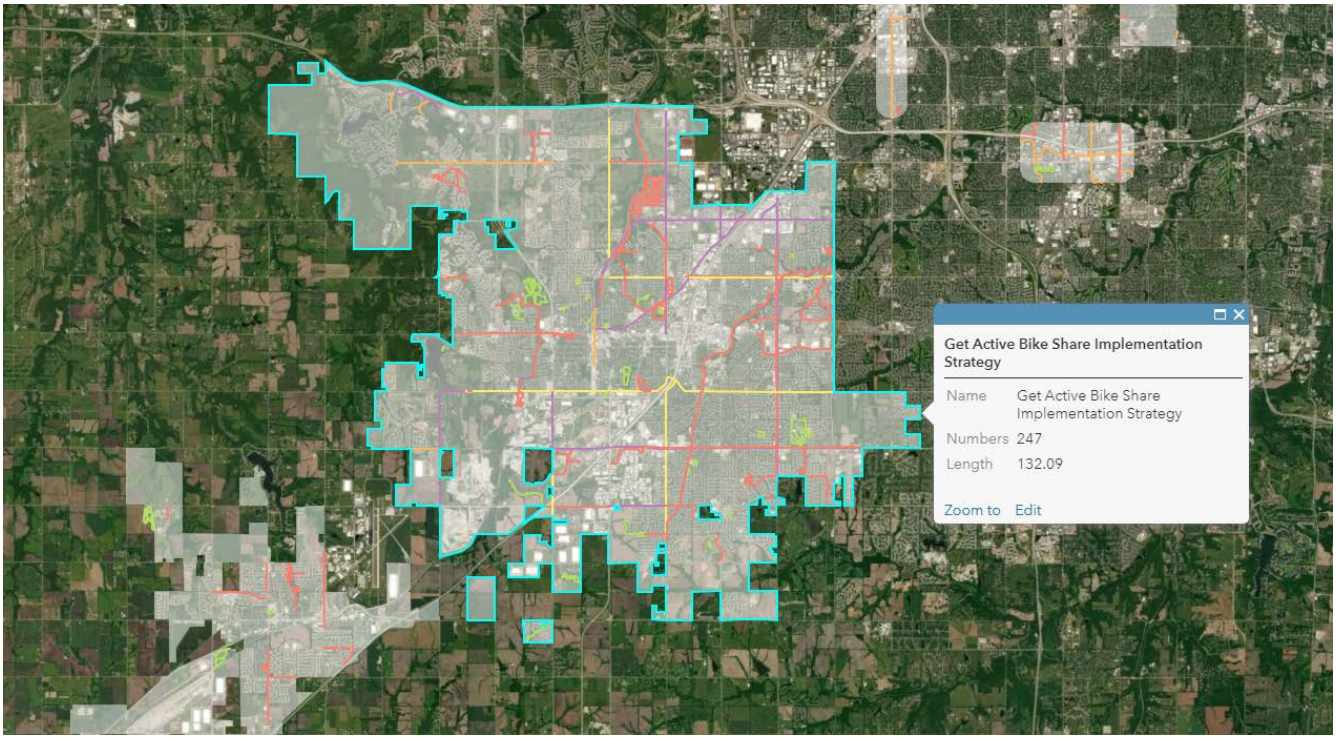
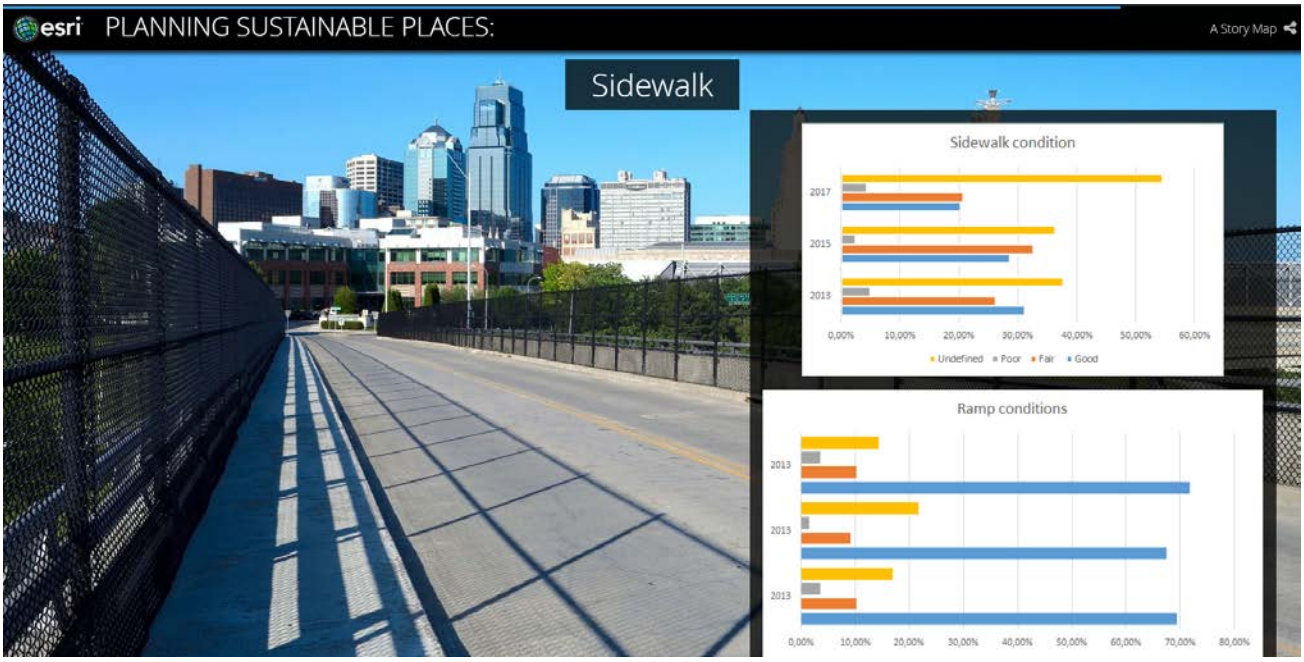
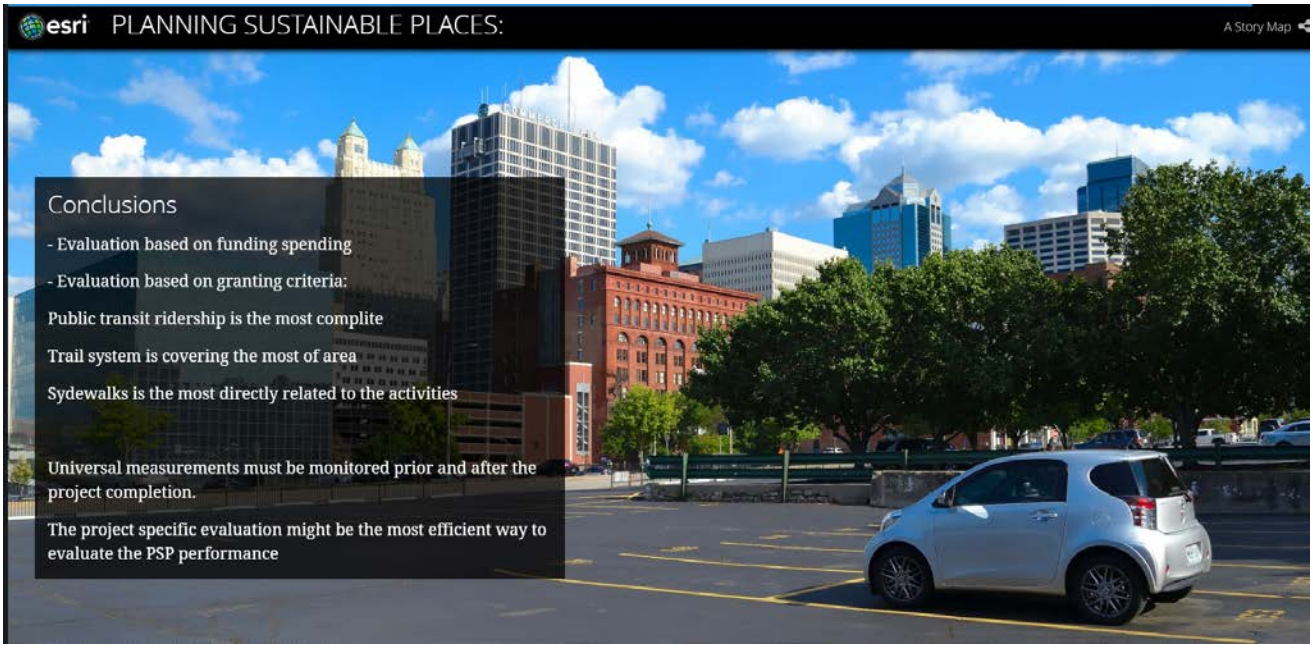
A Story Map
Ridership
Public Transit Use
Bus service use (daily)
140000
120000
100000
80000
60000
40000
20000
0
0
-2
-4
-6
-8
-10
-12
2012
2013
2014
2015
2016
2017
2018
Total passengers
OFF
ON
Change(%)
Data was obtained from the Kansas City Area Transportation Authority (KCATA).


esri PLANNING SUSTAINABLE PLACES:
A Story Map
Ridership
3rd & Grand Multimodal Transportation Hub
3rd & Grand Multimodal Transportation Hub
2,000
1,000
0
Legend
below average
positive
average
no data
Kansas City
Kansas City, MO, Jackson County, MO, Missouri Dept. of Conservation, Esri, HERE, Garmin, INCREMENT P...
esri


esri PLANNING SUSTAINABLE PLACES:
A Story Map
Trails
(1 of 4)
Facility_N Gillham Park Trail
Descriptio SUP
Status Existing
Facility_T SUP
Jurisdicti Kansas City, MO
State MO
County Jackson
City Kansas City, MO
Bikeway_Ty RoadBike
Surface_ty Hard Surface
On_Off_Roa Off
Side_Of_Ro N/A
Length_in_ 1.07
Public_Pri Public
Fairway
Mission Woods
JOHNSON
esri


Get Active Bike Share Implementation Strategy
Name Get Active Bike Share Implementation Strategy
Numbers 247
Length 132.09
Zoom to Edit


esri PLANNING SUSTAINABLE PLACES:
A Story Map
Sidewalk
Sidewalk condition
2017
2015
2013
0,00% 10,00% 20,00% 30,00% 40,00% 50,00% 60,00%
Undefined Poor Fair Good
Ramp conditions
2013
2013
2013
0,00% 10,00% 20,00% 30,00% 40,00% 50,00% 60,00% 70,00% 80,00%


esri PLANNING SUSTAINABLE PLACES:
A Story Map
Conclusions
- Evaluation based on funding spending
- Evaluation based on granting criteria:
Public transit ridership is the most complite
Trail system is covering the most of area
Sydewalks is the most directly related to the activities
Universal measurements must be monitored prior and after the project completion.
The project specific evaluation might be the most efficient way to evaluate the PSP performance