



Memorandum

TO: City of Rochester
FROM: McKenna
SUBJECT: Sustainable Rochester: Methodology
DATE: February 22, 2018

Introduction

Measuring multiple dimensions of quality of life is indispensable when determining long term sustainability of intensive development within the City of Rochester. Sustainable Rochester, the City's development evaluation framework provides a holistic, objective, and outcome-based measurement of development projects within the City and a longer-term benchmarking system for understanding how quality of life is affected by development.

This report describes the methodology used to establish the evaluation framework and to calculate baseline sustainability indicators. We provide an overview of the process for selecting indicators and their respective targets. Then we provide a description of specific indicator data sources, assumptions, and calculations.


Process

In 2014 the City adopted the Rochester Master Plan 2025. In that plan the City laid out clear policies regarding community character, residential development, and Downtown development. Since that time, the City of Rochester has experienced increasing development pressure in and around their Downtown. In order to ensure that development meets the policies of the Master Plan, the project team developed a method for assessing the impacts of development.

Specifically, the purpose of the evaluation framework is to provide for continued quality of life for residents and businesses in Rochester through sustainable development decisions that minimize unplanned impacts to the built and natural environment. The project team identified the following evaluation framework to provide decision-makers the information to access 1) what trends will influence development; 2) what local decisions the City can make; and 3) how to evaluate projects based on established policies.

The project process included five phases, as outlined below:

- **Phase 1: Project Initiation**
The project management team gathered and analyzed a wide range of data, reviewed prior studies, and researched similar indicator projects from across the country. The project management team referred to city staff to understand existing community issues and opportunities related to development within Rochester.
- **Phase 2: Steering Committee**



McKenna organized and coordinated two steering committee meetings to serve as the City's primary source for input and feedback. Members of the Steering Committee included key administration members, department heads, and members of Downtown Development Authority (DDA), Planning Commission, City Council, and local stakeholders. The Steering Committee served in an advisory capacity and provided feedback the evaluation framework including indicator selection, target setting, and the scoring system.

The Steering Committee met in December 2017 and January 2018. The Committee provided additional feedback on the project through three online surveys. The project team shared all presentation materials electronically with the Steering Committee.

- **Phase 3: Baseline Indicator Report**
Using the information provided from city staff and the Steering Committee, McKenna conducted an analysis of existing conditions to establish baseline indicators. The following section details the process for indicator selection.
- **Phase 4: Sustainability Targets**
McKenna worked closely with city staff and the Steering Committee to develop specific targets for each indicator to evaluate future development based on its ability to move the City towards these targets.
- **Phase 5: Strategic Action Plan**
The Strategic Action Plan details the scoring system for project evaluation and actions pertaining to targeting infrastructure projects, network improvements, policies, and administration duties as a means to improve evaluation scores. The purpose of the Strategic Action Plan is to provide a concise list of implementation-ready projects that the City and developers can pursue to ensure long term sustainability.

Indicator Selection

At the foundation of the Sustainable Rochester Development Framework are multiple outcome-based measures ("indicators") related to each Development Component and Sustainability Value. Indicators that capture sustainability can be diverse and change over time. However, when grouped together by components, they define and measure specific aspects of Sustainability.

The process for selecting initial indicators was iterative, where the project team sought to identify measures that were accurate representations of the specific sustainability value, publicly available, and measured at the appropriate geographic coverage.

Once the initial indicators were selected, the project team presented the draft indicators to the Steering Committee for feedback and refinement. During this collaborative process, additional indicators were added to the framework including indicators for Watershed Health, Public Services, and Housing Mix.

Along with the 20 Development Components, there are 20 Regional and 20 Local Indicators. Each indicator has a baseline measure, calculated using publicly available data sources and can be updated overtime. We discuss these data in greater detail in the next section.





Target Setting

A key aspect of the framework is to evaluate development on its potential to move the City closer to its adopted goals. To accurately assess development, each indicator must have a baseline and a target. Using the baseline measures, the project team consulted regional trends and worked with City staff and the Steering Committee to set directional and numerical targets for each indicator.

Since the City of Rochester has less control over its ability to change Regional Indicators, only directional targets (grow, maintain, reduce) were set for these indicators. Directional and numerical targets were set for local indicators based on its baseline measurement (i.e. grow the baseline by 10%). The value was set by analyzing regional trends, comparing the City to national benchmarks and/or averages, and by consulting the Steering Committee.

The Steering Committee helped to set the targets for local indicators through their completion of two online surveys. In the first online survey, committee members were asked to set a directional target (grow, maintain, reduce) for each indicator. The project team used the degree of consensus to set a value for each indicator; the more consensus for an indicator the higher the value was set. The project team synthesized the feedback and selected draft targets for each indicator. McKenna presented these targets to the Steering Committee during the January meeting. As follow up to the meeting, the project team asked the committee to complete a survey in which they gave final approval on a scale of 1 to 5, with 5 being complete approval, of each indicator and target (see appendix A for survey results). McKenna confirmed or adjusted targets according to the survey results.

Indicator Measurement Assumptions and Calculations

Rochester's Sustainability Indicators are drawn from numerous organizations and have been modified to best represent the impact of development on the City's sustainability values and associated development components. Data sources range from very large institutions like the US Census and the Environmental Protection Agency to local organizations like SEMCOG and Oakland County. They also include data collected internally from the City of Rochester or the Rochester DDA. The sources for each indicator are summarized in Table 1. Some of the selected indicators simply represent percentages or counts from easily accessible and widely cited data sources. While the following indicators have specific assumptions and/or require unique calculations:


- **Parks & Open Space/1,000 residents**

The baseline score for this indicator is captured from the City of Rochester's 5-year parks and recreation master plan. The Master Plan sums the total parks and open space acreage within the City of Rochester including municipal parks, school playgrounds, and private open space located in subdivisions. To obtain the baseline value, the project team divided the City's acreage of open space by the City's 2016 ACS population estimate. This answer was then multiplied by 1,000 to represent the amount of open space within the City per 1,000 residents. The National Recreation and Parks Association collects this data annually for municipalities throughout the US to calculate the national average, 9.6 acres per 1,000 residents. This indicator can be compared regionally and nationally, as well as overtime. This indicator can also show how a specific development will add population and/or open space/park acreage to the community on a development by development basis.

- **National Walkability Index**

The National Walkability Index is a calculation designed to show the relative walkability of a specific area. Walkability is measured on a scale from 1 to 20 with 20 being the most walkable. The index is calculated by





the US Environmental Protection Agency (EPA) for all Census Block Groups across the country. The index accounts for many EPA identified indicators such as the employment mix, employment and occupied housing mix, street intersection density, and the predicted commute mode split. Data for this index is included as part of the EPA Smart Location Mapping database. For this indicator, the project team took the EPA indexes for the ten Census Block Groups located in the City of Rochester and compared it to communities surrounding the City (Rochester Hills, Oakland Township, etc.) and to peer communities (Plymouth, Birmingham, etc.). This index can be measured overtime as the EPA updates the dataset.

- **Intersection Density**

Street intersection density is measured as the number of pedestrian-oriented intersections located within the census block group per square mile. This number is a component of the National Walkability Index and is available through the US Environmental Protection Agency (EPA) for all Census Block Groups across the country. This indicator can be measured overtime within a region and also calculated on a per development basis by dividing the number of pedestrian intersections/connections by the square footage of a development.

- **Trip Generation**

The Institute of Transportation Engineers (ITE) publishes the Trip Generation Manual on a regular basis. The Trip Generation Manual gathers data and calculates estimates standardized by square footage or number of units about how many trips are generated for specific land uses. These trip generation calculations take into account different factors such as time of day, urban, suburban, or rural character, and others. The baseline indicator measurement is calculated by averaging the ITE trip generation estimates of the proposed development site's surrounding parcels.

- **Intersection Delay**

Delay at signalized intersection is computed as the difference in the departure time and the arrival time of a vehicle. Specifically, the delay is measured as the difference in time it takes for an vehicle to pass through an intersection because of traffic or signal timing versus if it was an empty intersection.

- **Rochester Tax Revenue Per Acre**

Tax revenue per acre is calculated by dividing the total tax revenue a municipality collects (available from Oakland County Department of Equalization) by the municipality's total acreage. This calculation standardizes the measurement in order to compare how much value is in a region across municipalities that may generate more overall tax revenue simply because its larger geographic size. This measure can be compared overtime as taxable value and revenue increases or decreases in a municipality.

- **Increase in Taxable Value Per Acre**

Taxable Value per acre can also be measure on site specific level. This indicator is calculated by dividing the Stated Equalized Value for a given property by its acreage. This number shows how valuable the development and use are in terms of the amount of space the parcel takes up. This indicator can also be measured in terms on its expected increase or decrease due to use changes or construction. As a new site is proposed for development, the City can evaluate how much the proposed development will add to the taxable value per acre. The developer will provide the expected property value per acre after improvements to the



site. The difference between the value of developed property per acre and the current value of the property per acre shows the expected change in taxable value per acre. Using the per acre measurement standardizes the value so that it can be compared across developments to show the tax efficiency of a property. Tax efficiency is defined as highest value on the least amount of land.

- **Cost of Living Index**

The Cost of Living Index measures relative price levels for consumer goods and services. The average for all participating places, both metropolitan and nonmetropolitan, equals 100, and each participant's index is read as a percentage of the average for all places. This measure shows how specific elements of life (Groceries, Health, Housing, Utilities, Transportation, and Miscellaneous) compare to other cities and how the expense of those elements relates to the national average. Cost of living data is derived from various sources including the US Census, Bureau of Labor Statistics – Consumer Price Index, Consumer Expenditure Survey, and National Association of Realtors and is available through Sperling's BestPlaces datasets. Sperling's BestPlaces is a website created and maintained by the author and researcher Bert Sperling and is used as a source in numerous studies analyzing quality of life.

- **Housing Units Per Acre**

Housing units per acre is a common measurement to capture density of an area. Using the American Community Survey 2016 estimates the project team was able to calculate the housing units per acre of a block group by dividing the total housing units within the block group by the acreage of the block group. By dividing by acreage, the measurement is standardized so that it can be compared across block groups. This number can also be calculated on a development bias by dividing the number of proposed units by the acreage of the site.

- **Municipal Water and Sewer Expenditures Per Capita**

This indicator is calculated by dividing a City's annual expenditures on Sewer and Water by its population. The annual expenditures on Sewer and Water is identified in each municipality's annual budget. The baseline data for this indicator is from the City of Rochester's Fiscal Year 2017 annual budget and the American Community Survey 2016 population estimates. This indicator can be compared regionally and overtime as municipalities grow and or/allocate more funds towards utility spending.

- **Linear Feet of Pipe**

The City of Rochester underwent a comprehensive Sewer and Water asset management planning process in 2017. As part of the process the number and length of sewer and water mains within the City were quantified. This indicator sums the total length of pipes within the system and illustrates if new development will add more piping to the system.

- **Age of Water and Sanitary System (Year of Incorporation)**

Since asset management data is not readily available for all City of Rochester's peer communities, the year a City or Village incorporated is a proxy for measuring the age of the infrastructure system. The first pipes either sewer or water were added to the utility system as the City or Village incorporated.





- **Percent of Deficient/Critical Pipes**

Asset condition of a pipe is reported as a single score by combining both the criticality (consequence of failure) and condition (probability of failure) of the water and sewer system. Each inspected pipe is given a criticality ranking/Business Evaluation Risk (BRE) score of critical/intolerable risk, high risk, medium risk, or low risk based off of its assessed criticality and condition. This indicator measures the percentage of inspected sewer pipes that are identified as Critical or High Risk and/or are considered deficient because of their size.

- **Crime Index**

The crime index is measured similar to the Cost of Living Index where crime rates in participating municipalities are indexed from 1 to 100 with 1 being low crime and 100 the most crime. The crime index is measured separately for Violent Crime and Property Crime. Violent Crime includes four offenses: murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault. The US average index for violent crime is 31.1. The offenses included for property crime are burglary, larceny-theft, motor vehicle theft, and arson, where the object of the theft-type offenses is the taking of money or property with no force or threat against victims. The US average index for property crime is 38.1.

- **Emergency Response Time Coverage**

The National Fire Protection Association standard emergency response time for municipal services is 9 minutes. This indicator is represented as the areas within the City that emergency vehicles can reach within the standard 9-minute response time. Fire Chief Cieslik reports that the current volunteer fire fighters must live within 5 miles of the City of Rochester and on average live 3 miles away. Using these estimates, the project team was able to generate a baseline coverage map. The baseline emergency coverage map illustrates a nine-minute response time if it will take the average volunteer firefighter 5.14 minutes to drive to the station (1.71 minutes per mile travel time at 35 miles per hour) and then the distance the emergency vehicle could travel from the station in the remaining 3.86 minutes (assuming the above speed calculation). This indicator is used when evaluating development by assessing whether the development can be reached within the existing 9-minute response time. The coverage area could change overtime if the average distance the firefighter lives from the station changes.

- **Mixed-Use Percentage within the DDA**

The mixed-use percentage within the DDA measures the proportion of commercial, industrial, and residential uses within the Downtown Development Authority (DDA) District. The baseline percentage for this data measures the percent of commercial uses found within the DDA district. This indicator is measured using the tax accessor data available from the Oakland County Department of Equalization for the properties found within the DDA district. The tax accessor data indicates if the property is either residential, industrial, and commercial. This data can be compared overtime by looking at the mix of property types as whole in the DDA. This indicator can also be measured during development by finding the percentage of the property dedicated to commercial, industrial, or residential use.





Conclusion

Sustainable Rochester provides a framework by which the City of Rochester can evaluate a development project in terms of how it advances the City's Sustainability Values. The indicator, baseline measures, and targets, found in the main report, give decision-makers the tools to understand regional growth trends and a common language to discuss progress towards sustainability. The framework is not a model that computes whether a development should be approved. Instead, Sustainable Rochester is the standardization, synthesis, and fact-based comparison of various data sources that allows decision-makers to weigh all tradeoffs associated with development to minimize unplanned impacts to the built and natural environment.



Table 1 Indicator Data Sources

Value Measure	Indicator Name	Primary Source	
Sustainability Value #1: Environmental Health			
Development Balance	1.R Regional	Percent of Land Use Impervious	SEMCOG, 2010
	1.L Local	Parks & Open Space Acres/ 1000 Residents	City of Rochester Parks and Recreation Plan, American Community Survey, 2016
Natural Features Protection	2.R Regional	Percent of Land Use Tree Canopy	SEMCOG, 2010
	2.L Local	Net Tree Change	-
Watershed Health	3.R Regional	Beneficial Use Impairments (BUI) of the Clinton River Watershed	U.S. Environmental Protection Agency, 2018
	3.L Local	Development within Flood Hazard Zones	Federal Emergency Management Agency, 2018
Sustainability Value #2: Mobility			
Walkability	4.R Regional	National Walkability Index	U.S. Environmental Protection Agency, 2018
	4.L Local	Intersection Density	U.S. Environmental Protection Agency, 2018
Traffic	5.R Regional	Overall Traffic Counts	SEMCOG, 2017
	5.L Local	Trip Generation	Institute of Transportation Engineers Trip Generation Manual
Travel Time	6.R Regional	Average Commute Time	American Community Survey, 2016
	6.L Local	Intersection Delay	Synchro Software
Nonmotorized Infrastructure	7.R Regional	Regional Nonmotorized Infrastructure	SEMCOG, 2017
	7.L Local	Non-Motorized Transportation Infrastructure	SEMCOG, 2017
Sustainability Value #3: Fiscal Strength			
Tax Base Growth	8.R Regional	Rochester Tax Revenue Per Acre	Oakland County Department of Equalization, 2017
	8.L Local	Increase in Taxable Value Per Acre	Oakland County Department of Equalization, 2017
Development Impact	9.R Regional	Cost of Living Index	Sperling's BestPlaces, 2017
	9.L Local	Housing Units per Acre	American Community Survey, 2016
Sustainability Value #4: Public Services			
Public Utilities	10.R Regional	Municipal Water and Sewer Expenditures Per Capita	City Budgets, 2016/2017
	10.L Local	Linear Feet of Pipe	City of Rochester Water and Sewer Asset Management Plans
	11.R	Age of Water and Sanitary System	History of Oakland County, Michigan (Thaddeus D. Seeley) 1912
	11.L Local	Percent of Deficient/Critical Pipes	City of Rochester Water and Sewer Asset Management Plans
	12.R Regional	US Census Urbanized Area	US Census, 2010
	12.L Local	Net Change in REU	Oakland County Schedule of Units
School Impact	13.R Regional	Overall School District Enrollment	Michigan Department of Education, 2017
	13.L Local	Tax Generated by School District	Oakland County Department of Equalization, 2017
Public Safety	14.R Regional	Crime Index	Sperling's BestPlaces, 2017
	14.L Local	Emergency Response Time Coverage	Esri Business Analyst



Value Measure	Indicator Name		Primary Source
Sustainability Value #5: Strong Neighborhoods			
Housing Mix	15.R Regional	Housing Tenure & Type	American Community Survey, 2016
	15.L Local	Number of multifamily units	American Community Survey, 2016
Housing Affordability	16.R Regional	Percent of households with housing cost burden	American Community Survey, 2016
	16.L Local	Average Unit Price	American Community Survey, 2016
Sustainability Value #6: Downtown Viability			
Workforce Development	17.R Regional	Number of Jobs	American Community Survey, 2016
	17.L Local	Mixed use percentage	Oakland County Department of Equalization
Historic Preservation	18.R Regional	Percentage of housing structures over 50 years old	American Community Survey, 2016
	18.L Local	Compliance with sight lines	City of Rochester
Business Attraction	19.R Regional	Number of new businesses within DDA district	City of Rochester DDA
	19.L Local	Proportion of businesses in DDA district	Oakland County Department of Equalization
Parking Efficiency	20.R Regional	Number of Event Days	City of Rochester DDA
	20.L Local	Public Parking Provided	City of Rochester DDA

*American Community Survey, 2016 represents the 5-year survey estimates (2012-2016)

