MOSAIC
Value and Cost Informed Planning

Mosaic is a new methodology for use in transportation planning developed by the Oregon Department of Transportation in collaboration with local, regional, and statewide stakeholders. The approach offers planners and decision-makers an effective and efficient way to evaluate the social, environmental, and economic costs and benefits of transportation actions and investments. The approach can be adapted to fit the needs of many different communities.

The Mosaic tool offers a common set of measures by which to evaluate options. It assists decision makers in selecting more cost-effective actions and investments. Mosaic's approach offers the unique advantage of providing a clear, traceable, and transparent record of the evaluation process, analysis, and decision-making for transportation actions and investments.

Mosaic is designed for planning level analysis and not for project level analysis or project prioritization or selection. Mosaic compares groups of investments (bundles) to one another, but does not work at a fine enough resolution to evaluate individual projects.

What does Mosaic do for transportation planning?

Making transportation decisions that meet the many needs of a community is challenging. The social, environmental and economic costs and benefits of different options have traditionally been hard to evaluate. The Mosaic approach enables the benefits and costs of transportation options and investments to be weighed on a common scale.
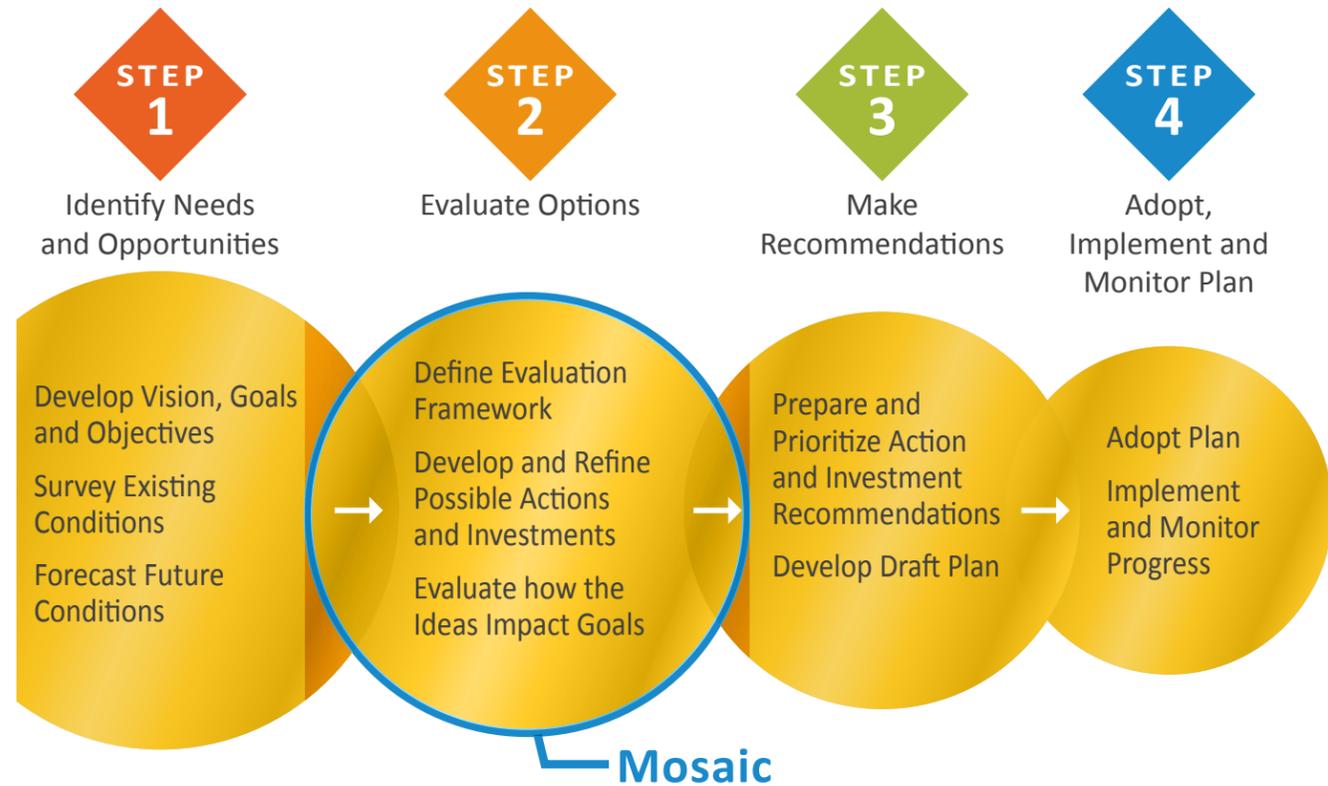
Mosaic supports transportation planning activities during the middle stages of a typical planning process—specifically, the evaluation and refinement of bundles of actions and investments.

PLANNING ACTIVITY	MOSAIC ROLE
Define evaluation framework	Offers researched set of categories and indicators
	Identifies required data
Refine possible bundles of investments and actions	Compares possible investment bundles against indicators and one another
	Programs Guide helps identify other possible actions
Evaluate actions and investment bundles	Calculates monetized and non-monetized impacts
	Accounts for environmental, social, and economic effects
	Measures value
	Highlights tradeoffs
	Accounts for risk and uncertainty

Things to know...

PRECISION. Mosaic is designed to inform transportation decision-making at the system level. Many impacts are estimated with a range of uncertainty best suited to high-level analysis. It is not intended to evaluate direct and indirect impacts of specific projects with the detail necessary for project-level analysis. Mosaic is a gauge, but not a microscope.

STUDY AREA. Mosaic can be used at any large geographic scale—city, county, or region, as well as for special studies such as complex corridors. It is not intended for project-level analysis.

TRAVEL MODEL AVAILABILITY. Mosaic does not require a travel model. However, its accuracy is greatly increased by using travel model data. Since larger cities or metropolitan areas are likely to have travel models available, they are more likely to benefit from Mosaic's full suite of indicators and tools. Without travel model data, Mosaic users have more indicators measured on the MODA weighted values scale and fewer in the benefit-cost portion of Mosaic.

BUNDLES. At the heart of Mosaic analysis are bundles containing all kinds of infrastructure projects and program investments. Mosaic enables you to test different ways of achieving the vision and goals defined by your planning process. For example, you can compare and evaluate particular mode or multimodal investment strategies and/or vary the level of investment across bundles. Mosaic shows their components of value and enables you to compare each bundle's overall results.

PROGRAMS. Mosaic measures the costs and benefits of programs as well as projects. Mosaic includes a list of transportation programmatic actions that have proven effective in reducing or managing vehicular demand. This enables users to select, evaluate, and incorporate the programs best suited to local conditions. The guide includes costs and ranges of estimates for the effectiveness of programs designed to reduce vehicular demand. Professional judgment is always required in identifying appropriate program inputs.

Time and effort.

Mosaic is not a quick exercise. It takes time and data. A considerable amount of the necessary data is likely to be developed routinely as part of your transportation planning process. Mosaic requires some additional data and provides a structure for identifying data needed and tracking and storing much of it. Mosaic results may be surprising — users will need to take time to understand results and interpret findings in light of the quality of data used and stakeholder expectations.

https://www.oregon.gov/ODOT/Planning/Pages/Mosaic.aspx

MOSAIC'S ROLE IN TRANSPORTATION PLANNING

How Mosaic Nests Within the Typical Oregon Planning Process

STEP 1 Identify Needs and Opportunities

STEP 2 Evaluate Options

STEP 3 Make Recommendations

STEP 4 Adopt, Implement and Monitor Plan

Develop Vision, Goals and Objectives

Survey Existing Conditions

Forecast Future Conditions

Define Evaluation Framework

Develop and Refine Possible Actions and Investments

Evaluate how the Ideas Impact Goals

Prepare and Prioritize Action and Investment Recommendations

Develop Draft Plan

Adopt Plan

Implement and Monitor Progress

Mosaic

Mosaic informs decision-making

Mosaic informs, but does not dictate decisions. Mosaic will not show you the "right" decision; it will show you information about the impacts, benefits, and costs of different possible actions and investments that must be considered to arrive at a decision. Some results may be surprising and may challenge assumptions or preferences. Discussion of the results is at the core of Mosaic — Mosaic provides new and varied information that adds depth to the conversation about transportation investments.

Mosaic, like any model of its kind, relies on the skills and expertise of agency staff for data inputs and other background assumptions. With their participation, all of the inputs, assumptions, and background calculations can be readily reviewed and discussed by stakeholders.

Mosaic measures value

Mosaic measures nine distinct "categories" of value that result from transportation investments and programs. Within each category, Mosaic contains a small number of "indicators". These are specific metrics, for example, estimates of travel time, jobs, or air quality. The categories are selected to reflect goals and policies of the Oregon Transportation Plan. Indicators represent unique aspects of value. Thus, as a group they avoid double-counting.

Mosaic offers two different methods for measuring value. The first method is a measurement in dollars. Mosaic incorporates the latest research on the monetized value of transportation actions and includes more than previous methods. The second is a scoring and weighting framework, or "multi-objective decision analysis (MODA)." This second method of measuring value allows for estimation of indicators where there is not sufficient research to support monetization. Decision makers apply weights to impacts that cannot be measured in dollars to generate an aggregate score or ranking for the alternatives being evaluated. By using weighting, a community can express its values in Mosaic analysis.

ACCESSIBILITY **ECONOMIC VITALITY** **ENVIRONMENTAL STEWARDSHIP**

EQUITY **FUNDING THE TRANSPORTATION SYSTEM/FINANCE** **LAND USE AND GROWTH MANAGEMENT**

MOBILITY **QUALITY OF LIFE AND LIVABILITY** **SAFETY & SECURITY**

What skills are necessary to use Mosaic?

The following skills, already present in the training and experience of Oregon's planning professionals, are necessary for the application of Mosaic:

1. A broad understanding of travel behavior and how it responds to changes in networks, policies and programs

2. For those places where travel models exist, the ability to use existing models to generate travel forecasts

3. Familiarity with Geographic Information System (GIS) software and with the layers of data available in the study area

4. The ability to estimate planning-level costs of transportation improvements

5. Familiarity with socio-economic data (e.g., population, household income, employment) commonly used in transportation planning

6. Familiarity with the terminology of travel behavior, spatial data and economic analysis

7. Experience in using Excel-based analytic tools

8. Above all, a desire to increase the value we receive from transportation investments

With these skills, a planning professional is able to understand the intent and content of Mosaic. However, a planner will likely need training or assistance with the details of using the analysis tool and ensuring an effective process for using Mosaic in planning.

In addition to these areas of experience and information available on Mosaic's websites, first time Mosaic users will need access to other professionals who can offer technical assistance, answer questions, and support the work of populating the workbook with data.