Recommendations for Users

As you consider or begin working with Mosaic, here are some recommendations and information to keep in mind. Some of these points are covered in more detail elsewhere in the User Guide, but are worth mentioning again, in order to enhance your successful application of Mosaic.

It is important to note that Mosaic may not be appropriate for all transportation planning processes. Mosaic is not currently set up to evaluate individual projects and is not appropriate for project prioritization. Additionally, Mosaic does not dictate decisions or provide conclusive answers regarding the value of transportation investments; instead it provides information to consider and helping to illuminate tradeoffs and expected or unexpected impacts. Mosaic may also be inappropriate if choices are limited in scale (i.e., only a few projects are evaluated) or insufficient resources are available to use Mosaic.

In rural areas, Mosaic may be beneficial if planning efforts are complex or controversial. However, if a community is only reviewing a limited number of possible investments or project impacts can be readily identified, Mosaic may not provide value to the process.

Use of Mosaic is all about transparency and helping stakeholders and decision-makers understand tradeoffs. It is therefore essential to have stakeholders involved at every step of the planning process: during goal setting, engagement in the MODA process, consideration of inputs, and discussion of outputs/results.

Required Skills

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

- A broad understanding of travel behavior and how it responds to changes in networks, policies, and programs
- For those places where travel models exist, the ability to use existing models to generate travel forecasts
- Familiarity with geographic information system software and with the data layers available in the study area
- The ability to estimate planning-level costs of transportation improvements
- Familiarity with socioeconomic data (e.g., population, household, employment) commonly used in transportation planning
- Familiarity with the terminology of travel behavior, spatial data, and economic analysis
- Experience in using Microsoft Excel-based analytic tools
- 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. Nevertheless, to embark on a first-time use of Mosaic, planners will likely need assistance with the details of using the tool and managing the Mosaic process. 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, as well as coaching the first-time user in how to use the information for decision-making.

Key Issues

Study Area Definition

Typically, this issue is moot; system plans are defined by jurisdictional boundaries, for example. However for special studies such as corridors, the study area definition should be large enough to capture the vast majority of affected travel behavior, but not so large that differences are difficult to measure. At a minimum this means the area needs to be larger than the facility itself; how much larger should be determined by regional expert knowledge. Mosaic is not for project level analysis.

Bundles

Bundles will be uniquely tailored to the study area; bundles represent planning scenarios to evaluate. Many users will be developing multimodal investment strategies. Some may wish to vary the level of investment across bundles. Some may choose to build bundles with different geographic emphases. Some may use Mosaic in a visioning process in which land use and modal investment strategies are key variables. Others may choose to emphasize roadway pricing strategies. Still others may use Mosaic for decisions about a complex travel corridor in which there are multiple segments at issue, and multiple treatments available for each. This is an incomplete list of possibilities. Mosaic can accommodate any of the above. Data limitations or stakeholder preferences may affect the methods used to measures the indicators; but in all cases, the tool itself should not be a limitation. Ultimately, however, Mosaic does not direct actual choices. Decision makers will remain responsible for weighing and evaluating bundles, with community input.

There are a variety of considerations when forming bundles, such as resources available (staff time and modelling capabilities, for example adjustments to bundles may require re-modeling the results), the number of bundles, and the budget and time available for analysis. When creating the bundles themselves, it is important to be clear in the purpose or intent of the bundle, e.g., ask: why did we create this bundle? Bundles should be created with intention, and not represent arbitrary collections of projects and programs.

Trip Capture

Every study area not only contains trips that have origins and/or destination inside it, but also through trips. Planners need to determine whether through travel is substantial enough to be included in the analysis and/or to be affected by programs or investments being studied.

Travel Model Availability

The Portland region has developed several enhancements to its models not otherwise available in Oregon, such as the ability to forecast bicycle and pedestrian travel and freight (commercial vehicle) movement. Other regions may not have equivalent tools available, nor will all places have a transit mode choice model at their disposal. The Mosaic tool includes several sketch tools for estimating non-motorized demand. Mosaic's use does not require a travel model, though without a travel model,

more indicators will need to be evaluated in MODA with quantitative or qualitative measures rather than with BCA.

Aggregate vs. Disaggregate Travel Data

Mosaic offers analysts two options for importing travel data into the tool. The modeler either can export trip and travel time data by bundle, mode, origin/destination pair and time of day (disaggregated), or intermediate results estimated within the travel demand model and loaded directly into Mosaic (aggregated). Consult with your travel modeling staff about which of these is best for your application.

Use of Sketch Models

The consultant team recommends using the models included in the Mosaic tool. If the sketch models are employed, it is appropriate to acknowledge the uncertainty associated with their statistical estimation techniques.

Evaluation of Programmatic Actions

The Programs Guide is a core component of Mosaic and vital to achieving the intent behind Mosaic to fairly evaluate many different kinds of transportation investments. The guide includes costs and ranges of estimates for the effectiveness of these programs on a number of key indicators. Specific sources for these conclusions are included. However, the literature is not extensive on many of the programs (many are studies of one or two locations). Professional judgment is required to identify appropriate inputs to Mosaic. Users of the guide will want to take care in applying these estimates to their geography by noting the extent to which the places studied resemble their own. Users should select an estimate that best suits their local conditions from those available and described in the Programs Guide where appropriate.

The Programs Guide includes this explicit direction. If used, the estimates of impacts should be expressed as a range, to incorporate the effects of uncertainty.

Travel Model Data

Travel model data is integral to Mosaic, especially the Mobility indicators. It is important to note that Mosaic outputs are therefore dependent on the assumptions and outputs from travel models. Mosaic users are advised to work closely with modelling staff to ensure that travel model assumptions are agreed upon and documented. In addition, the Mosaic tool often displays *averages* with respect to intermediate calculations and indicator estimation (e.g., average cost per trip). Because these averages take into account thousands or millions of trips from a travel demand model, the difference between bundles on an average basis may be very small. However, the difference for some individual trips – which Mosaic is not equipped to display easily, but could be extracted from the raw travel model data itself – may be much larger (e.g., user costs for many trips may stay the same across bundles, while some trips may experience large increases or decreases, depending on the location of bundle projects).

Inputs and Outputs

The professional judgment of qualified staff is key to successful use of Mosaic. Staff members need to be clear in the decisions they make (e.g., what discount rate to use) so that the impacts of these decisions can be understood. Communication with travel model staff, for instance, is very important to ensure that the assumptions used in travel modelling are clear and reasonable.

If outputs or results from Mosaic are surprising, users are advised to examine key inputs (like travel model data) and revisit how indicators were scored (especially for qualitative indicators which require a high degree of staff judgment). Users can consult the Mosaic Tool Documentation for detailed answers about how a particular indicator is estimated. The robust sensitivity testing capabilities of the Mosaic tool and allow users to test other possible factors that may result in surprising Mosaic outputs. Weights can be analyzed to determine if they are causing an outsize influence on certain indicators (which would spur further discussion with stakeholders on the weighting exercise results). In the same vein, sensitivity testing can be conducted on the model parameters, like the value of time or discount rate, to determine if Mosaic results are particularly sensitive to some parameters. The Mosaic "Control Panel" worksheet shows users whether the value of a parameter is within recommended range or outside it, adding a further level of information to consider.

Context

Mosaic results provide information about *sources of value*. The results need to be accompanied by a complete list of indicators and how they are measured, in addition to information about key model parameters that may be valuable for the discussion, like the value of time, cost of carbon dioxide emissions, or the discount rate. Results must also be considered in the context of the goals and values that stakeholders identified at the beginning of the planning process. Finally, technical support from planners experienced in decision making processes will help place Mosaic outputs in context.

Major lessons from the 2013-2014 Mosaic Test

The table below contains some additional findings and tips to consider once the decision has been made to use Mosaic.

Test Committee: Some Lessons Learned

MODA and Weighting

Stakeholder values are an important element of weighting and should be made explicit at the beginning of a planning process (before initiating use of Mosaic).

MODA weighting should take place after enough data have been developed to define indicator "endpoint" values. Once Mosaic outputs are available later in the process, stakeholders should review weights and adjust them as a group in light of previously articulated values and preferences.

Skilled facilitation of the weighting process is essential.

Indicators

Users need a clear understanding of each indicator and how it is measured. There is a document available on the Mosaic website which contains this information.

Decision Making

Graphical display is essential to understanding tool outputs and bundle comparisons. The tool contains templates; you may identify other ways that meet your needs.

The reasons behind the measured values must be clearly explained to stakeholders. This requires an understanding of local conditions and the characteristics and composition of your bundles, combined with good professional judgment.

The comparison of monetized results to non-monetized results (one of Mosaic's distinguishing features) helps users gain a deeper understanding of "value." Plan on spending sufficient time exploring what this comparison shows, and identifying the reasons behind it.

Some results may be surprising and may challenge stakeholders' prior assumptions or preferences. Allow for discussion of these results. Provide examples of input data or assumptions that may contribute to surprising results, also explore how indicators or transportation impacts may interact, also contributing to surprises.