**ITEM IV**

# COMMUNITIES IN MOTION
# REGIONAL LONG-RANGE TRANSPORTATION PLAN 2030

## DOCUMENT #3B:
## EVALUATION APPROACH FRAMEWORK:
## PERFORMANCE MEASURES

# DRAFT

**November 2, 2004**

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# PERFORMANCE MEASURES

# DRAFT

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## BACKGROUND

Task 4 of our scope of work requires us to develop an *evaluation approach*. At our meeting with the PCT on 5 October 2004, we described our proposed approach in a technical memorandum entitled "Document #3: Evaluation Approach Framework."

Though the PCT generally accepted the approach, there were clearly revisions to be made and details to be added, especially regarding the *performance measures* suggested by the approach. The consulting team did additional work on the approach and measures, and met via videoconference with members of the PCT on 22 October. This memorandum first summarizes the agreements reached during the videoconference, and then adds more detail about the approach and the measures.

### Agreements Regarding the Evaluation Approach and Performance Measures

Agreements from the PCT meeting on 5 October were reviewed as a preface to the discussion:

- In concept, the approach is a comparison of alternatives (combinations of future land development patterns and transportation improvements, called *scenarios*) on important *impacts.* The impacts of concern are effectively *evaluation criteria*, and the details of the performance of each scenario on each criterion are called *performance measures.* For the purposes of this study, we are using the term "criteria" to mean broad categories of performance measures.
- A comparison of scenarios on criteria implies a matrix, where each cell contains the facts about the performance of a particular scenario on a particular criterion. Pages 6-9 of Document 3 describe, in concept, how such a matrix would work.
- Consistent with the previous point, we agreed that however many measures we have, eventually we must be able to roll them up into four to eight categories of criteria.
- We have some good ideas about the categories of criteria, but we do not yet have final agreement on the exact categories.

The consultants and PCT then discussed the performance measures in more detail. The consultants provide a four-page list of possible measures (Appendix A). That discussion led to additional points of agreement:

- The evaluation framework has three different purposes. The measurements to inform those purposes overlap substantially, but they are not identical. Thus, when we discuss measures, we have to be clear about which of the three purposes the measure will be used for. The three purposes are:
    - Evaluation of *Long-Run Scenarios for Regional Transportation and Land Development.* That evaluation should lead to the development selection of a preferred scenario, which will become the LRTP.
    - Evaluation of *Transportation Projects* after the LRTP has been adopted. Those projects should be consistent with the Plan, but may need to introduce and emphasize considerations and measures that were not part of the Plan evaluation.
    - *Monitoring of the Transportation Projects.* Once projects are selected they have to be implemented (built). There are two types of measures here: those relating to how efficiently the project was moved from concept to operation

(implementation), and those relating to how well it performs (meets its stated purposes) after it is operational.

- The consultants have to be thinking about all three of these purposes as they *develop* the criteria and evaluation approach. In this project, however, they will *apply* the approach only to the first purpose: evaluation of scenarios.
- Regarding categories of evaluation criteria:
    - The consultants' list had five main categories: land use, transportation, economic development, community livability, and environment.
    - The consultants should consider adding categories for equity and implementation.
    - We collectively rejected the idea of rolling up everything into the three broad categories of prosperity, livability, and sustainability.

The consulting team met for an hour after the meeting and came to some additional agreements about what needed to be in this technical memorandum due on 2 November to the PCT:

- The development and evaluation of the "bookend scenarios" can be a test of our ability not only to create useful scenarios, but also to create useful performance measurements. We expect to refine or add to the measurements based on what we learn in December when we evaluate the bookend scenarios.
- Thus, we do not need to have (and should not have) a final set of measurements in November.
- To keep making progress, however, we need to have a clear framework and some specific measures in November.
- The four-page list of measures that we developed for the meeting on 22 October is too long. Many of the measures are different ways of measuring the same thing.
- Given all these points, we agreed that we should try to develop three to five measures for each of the four to eight categories of criteria. We should aim at showing all the measures on one page. The measures should be the ones that, in our experience, have tended to make the most sense to the public and decisionmakers on previous projects.
- A clarification on scenarios. All the scenarios will accommodate the same number of people, households, and employees (by industrial sector). The differences in the scenarios will be in the allocation of households and employment to development types and subareas.
- Given the previous points, the category of "economic development" is largely redundant and unmeasurable for the scenario evaluation (but not for the project evaluation). Ultimately, the spatial issue comes down to assumptions about the efficiency of services and the quality of the natural and built environment (the center and right column of the diagram I prepared for the evaluation memo). If our planning is efficient, it will deliver these quality-of-life variables in more abundance, at lower cost, or both. If it does that, then businesses will be attracted to the area. If, however, in trying to do so, the planning makes land, labor, and business operation very expensive without commensurate value, business growth and economic development will be less than it would be otherwise. The state of the art is that the economic development arguments with respect to spatial patterns are primarily theoretical. The best empirical arguments come not from modeling, but by looking backward: have comparable regions adopted spatial strategies like the ones being considered in this project, and have those regions continued to perform well economically?

**Recommendations for Criteria Categories and Performance Measurements for Evaluation of *Scenarios***

As noted above, these are recommendations for *preliminary* criteria categories and measurements. These are the ones we recommend to get us through the evaluation of the bookend scenarios. That evaluation process is likely to suggest some changes to the measurements, and perhaps to the criteria categories.

***Impacts on Land Use Pattern***

Several characteristics of the land use pattern represented in each scenario can be reported as a basic set of indicators. These include such characteristics as acres of newly developed land (by households and by jobs), acres of agricultural lands consumed for development, acres of sensitive lands impacted by new development, and households and jobs accommodated through infill development. Described below are measures that utilize these indicators or relate directly to them.

*Acres of developed land (urbanized area)*

*Acres of developed land* is an indicator of the efficiency of development in each scenario. Each scenario assumes a unique mix of development types and results in specific amount of land consumption. This indicator illustrates the impact of the variation in development densities.

This measure also can be further differentiated among scenarios by the amount of *acres of farmland consumed by development* and the amount of *development through infill and redevelopment of land*.

*Regional Density*

*Regional density* is a measure of the number of people per urbanized acre or square mile in each scenario. Similar to the measurement of "urbanized area," regional density provides an indicator of how much land is consumed in each scenario. This measure becomes more meaningful at the subarea level, when comparing densities across scenarios for specific areas within the region (county, city, subregion).

*Jobs and Households by development type and subarea*

The development types represent a range of ways in which jobs and housing can be accommodated. Each community can examine the effects of development types on the surrounding transportation system and certain quality of life characteristics, such as amount of new growth within their city, proximity and/or access to daily activities, and potential congestion on major arterials and highways.

***Impacts on Transportation***

The COMPASS travel demand model produces many indicators regarding the quantity, quality, and utilization characteristics of the transportation system that result from the land use pattern represented in a scenario. These include such indicators as lane-miles of roadway, vehicle-miles

traveled, hours of delay, demand versus supply (volume-to-capacity ratio), lane-miles of congested roadways, and travel time (by corridor). Described below are measures that utilize these and other indicators produced by the model.

*Vehicle miles traveled per capita (truck miles traveled)*

This measure relates the indicator of vehicle miles traveled to the population served by the transportation system. Since, population is held as a constant across all scenarios, the measure will only vary based on the vehicle miles traveled. The measure is expressed in terms understood by technicians, decisionmakers, and the general public. The measure can be related back to the average trip length under existing conditions, as well as in comparison across scenarios.

A related measure is the amount of truck miles traveled. With the number and type of jobs being fixed across all scenarios, this measure will reveal differences resulting from the location of jobs and their proximity to direct truck routes.

*Travel time by origin - destination pairing and on key corridors*

Average travel time for the average trip length can be derived; however, a more meaningful indicator, especially for the public, is to associate travel time between key locations (Emmett to Boise, Payette to Nampa, Caldwell to Meridian, and so forth) and on specific corridors. Comparing the travel times for a variety of corridors (I-84, Hwy 55, US 95, Hwy 52, Hwy 44, Hwy 21, etc.) across the various scenarios begins to illustrate the effect of certain development patterns and transportation options.

*Hours of delay per capita*

This measure expresses the outcome in personal terms; the change an individual can expect if this scenario were to develop. Again, the measure affords the opportunity to compare to existing conditions, as well as across scenarios.

*Lane-miles of roadway exceeding capacity (percentage of travel in congestion)*

This is a simple measure of system utilization, but also a comparative measure of the adequacy of the system, based on the land use scenario being considered. The measure can be expressed as a real number or a percentage of the system that is congested.

A related measure is the amount or percentage of travel that is congested. This measure is applicable in comparing scenarios, as well as evaluating historical performance. The results of the measure answer the question, “Is the amount of travel in congestion increasing at the same rate as the amount of travel?”

***Impacts on Environmental Quality***

*Acres of new impervious surface*

The number of *acres of impervious surface* in a region identifies a potential threat to the health of the region’s streams. Instead of soaking and filtering through the soil, rainwater runs off impervious surfaces, collecting polluting substances along the way. Impervious surface also increases the potential for storm water runoff and flooding that – without mitigation measures – may likely cause damage to property and resources.

*Acres of sensitive lands consumed (forests, wetlands)*

This measure looks at the amount of land developed in each scenario that is either built directly on sensitive lands or adjacent to them. Buffers of an approved distance will be developed around the sensitive lands to allow measurement of the adjacent development in these areas.

*Air quality*

The travel demand model can report levels of pollution created by the vehicular travel demand it forecasts for each scenario.

***Impacts on Amenity***

*Households and employees within ¼ mile of bus route, within ½ mile of rail transit*

These are indicators of how many people live and/or work within walking distance of a transit option. These are particularly good measures for transit, when the travel demand model does not explicitly forecast transit demand.

*Intersection density* or *connectivity*

*Intersection density* measures the connectivity of the street system. A well-connected street system implies multiple routes to the same destination. In addition, a well-connected street system allows more direct routes from origin to destination, which can be a proxy measure for evaluating the propensity for taking trips by walking or biking, and suggests opportunities for shorter automobile trips.

*Housing units by type of structure*

*Housing units by type of structure* indicates whether the housing in an area is single-family detached, townhouse, duplex, or apartments. It also indicates the size of the apartment buildings. This measure can be a proxy for measuring the distribution of owner and renter households and also affordability, by subarea.

*Households within ¼ mile of neighborhood center (accessibility to a neighborhood center)*

The *number of new households within ¼ mile of a neighborhood center* is a measure of the accessibility to a neighborhood gathering "place" or location that defines an area's "sense of place." If such a location is near households, combined with street connectivity (or is assumed to be within walking distance), then the place becomes accessible to almost all segments of the population.

*Households within ¼ mile of open space*

The *number of new households within ¼ mile of open space* is a measure of the accessibility to open space. If open space is within close proximity to households, then it becomes accessible to a broader range of the population.

*Open space per capita*

The existence of open space in a region is often associated with quality of life. The number of acres of open space per person is one way to get a sense of a region's quality of life. As the region grows, the ratio of open space per person will decrease unless more open space is

set aside. This measure helps to determine how many acres will likely be needed to maintain the current – and even the preferred – amount of open space to population ratio.

### *Impacts on the Net Cost of Urban Facilities and Services*

*Construction, operating and maintenance costs of new urban facilities, infrastructure, and services*

Different types of development can have different impacts on the cost of local infrastructure. Lane-miles of roadway and miles of water and sewer line are infrastructure costs that can be estimated for each scenario, based on the type and location of development.

### *Distributional impacts*

*Tax base generation on a subregional level*

Estimates of tax base can be ascertained from the type and level of development for subareas in each scenario. This indicator proves particularly helpful for agencies seeking to balance infrastructure needs and revenues and highlighting key differences in certain scenarios (i.e. residential scenario versus mixed-use scenario). Examination of this measure will show the variety of concentrations of particular development types in different places; it may provide a framework for discussing a more balanced and equitable distribution of potential tax revenues.

## Implementation Considerations

To the extent that a development scenario (or project alternative) does well on the criteria and measures listed above, it should be easier to implement. But there are other considerations not directly addressed above that could affect implementation.

### *Legal Authority*

By definition, any public action required by any scenario could not be illegal. But some scenarios may suggest actions that would require legislative changes at the state or local level. Clearly, the need for legislative action and change does not make a scenario impossible. It could, however, make implementation more difficult and be a consideration that would distinguish one alternative from another.

### *Funding*

All alternatives will require public investment in infrastructure and transportation. The *cost* of that infrastructure is already considered above, under a separate criterion. This sub-category is limited to an evaluation of funding sources *that would be different* across scenarios. Two issues come into play. The first is the dependence on outside (non-local) funding sources needed to accomplish the project or plan, which can have a significant impact on the timing of implementation. The second is the eligibility of a plan or project for outside funding and what level of competition there is for that funding. A comparison of plans could reveal that one

plan/project has an overall lower cost, but relies more heavily on local funding. The other plan/project could be more expensive, but have greater eligibility for outside funding.

***Public Acceptance***

If a scenario or project were legal and fundable, the most efficient, and the fairest, why would it not also be acceptable to the public and decisionmakers? The reason is that different people and groups bring different perspectives and varying abilities to affect the outcome of the public decisionmaking process. Sometimes the best technical alternative (e.g., toll roads) lacks political support. A typical way to handle this consideration is to let a decisionmaking body comment on the relative political merits of different scenarios or projects after all the other criteria have been quantified and discussed.

**Recommendations for Criteria Categories and Performance Measurements for Evaluation of *Projects* and for *Monitoring***

Many of the measures described above for the evaluation of scenarios would also work for the *evaluation and monitoring of projects.* But not all of them would. The evaluation methods and, to a lesser extent, the evaluation measures change as one moves from the evaluation of long-run, large-scale system performance to an evaluation of the performance of a specific project.

Doing an evaluation of development scenarios over a 20-to-50-year period for a six-county area does not lend itself to evaluation by a narrowly defined version of benefit-cost analysis. But the evaluation of a single transportation project can be substantially improved by such an evaluation.

Monitoring is different yet. While an evaluation of development scenarios and projects is about "doing the right thing," monitoring is concerned with "doing things right." The unique aspects of monitoring agency performance include timeliness of implementation, budget adherence, customer satisfaction, incident response time, incident clearance time, and so on. The overlap with scenario and project evaluation is in such areas as funding (availability), consistency (in the local plan and ready for implementation), and compliance (meets all federal, state, and local requirements).

APPENDIX A: LIST OF POTENTIAL PERFORMANCE MEASURES

**LAND USE**

1. Efficient Growth
    a. Urbanized area (excluding open space & natural features)
    b. Net regional density (excluding open space & natural features) (persons/acre)
    c. Regional density (persons/sq mile)
2. Land Use Integration
    a. Jobs by development type
    b. Land used for jobs
    c. Households by development type
    d. Land used for households
    e. Amount of open space
    f. Percent of mixed use areas (areas achieving target jobs/housing ratio)
    g. Regional jobs/housing ratio
3. Compliance with Plans and Policies
    a. To follow

**TRANSPORTATION**

1. Mobility Efficiency
    a. Households within ¼ mile of transit
    b. Jobs within ¼ mile of transit
    c. Households within 5 miles of park & ride lots
    d. Households within ½ mile of transit stations/nodes/hubs/centers
    e. Jobs within ½ mile of transit stations/nodes/hubs/centers
    f. Percent of commute trips < than 1/3/8/12 miles
    g. Number of street & transit intersections
    h. Street & transit intersections per urbanized 100 acres
    i. Encourages new connections or interconnectivity within disconnected areas
2. Quantity
    a. Person & Vehicle Trips by Type
        i. Ridership
        ii. AUTO TRIPS
        iii. Carpool/Vanpool
        iv. Bike
        v. Ped
        vi. Other
    b. Person Miles Traveled
    c. Vehicle Miles Traveled
    d. VMT per Capita
    e. Truck Miles Traveled
    f. Vehicle Hours Traveled
    g. Number of Vehicle trips by Type per Link
    h. Number of Trips between Selected O-D Pairs
3. Quality

a. Average Travel Speed
b. Vehicle Hours of Delay
c. Hours of delay due to congestion (min/person/day)
d. Average Travel Time
e. Average Trip Time by Mode
f. Reliability
g. Maneuverability
h. % of good or better roads on pavement management index system

4. Accessibility
    a. Miles of roadway
    b. Connectivity to Intermodal Facilities
    c. Dwelling Unit Proximity
    d. Employment Proximity
    e. Industrial Facility Proximity
    f. % Miles Bicycle Facilities
    g. % Miles Pedestrian Facilities
    h. Average Trip Length
    i. % Intrazonal vs. Interzonal Trips
    j. Open vs. closed bridges
5. Utilization
    a. % System Miles Congested
    b. % Travel Congested
    c. Vehicles per Lane per Mile
    d. % Vehicle Hours of Delay
6. Transit (Not currently available through the model)
    a. Auto/Transit Travel Time Ratio
    b. Reliability
    c. Coverage
    d. Frequency
    e. Span
    f. Load Factor
7. Cost
    a. Cost of implementing new modes of transportation (development and maintenance)
    b. Right-of-way acquisition
    c. Cost of transportation system
8. Agency Delivery Performance
    a. Project completion rate
    b. Fiscal accountability
        i. $ per lane mile added and # lane miles added
        ii. $ per fixed guideway mile added and # miles added
        iii. $ per bus route mile or $/passenger and # miles added
        iv. $ per sidewalk foot and # sidewalk feet added
        v. $ per bikelane added and # bikelanes added
9. Safety
    a. Cyclists

i. Bike lane miles per TAZ within XX distance of schools
ii. Separated path lane miles per TAZ within XX distance of schools/community centers

b. Sidewalks
   i. miles of sidewalk per TAZ within XX distance of schools
   ii. sidewalk miles per employment density

c. Vehicles
   i. road form matches desired functionality

d. Exposure
   i. VMT per capita
   ii. Minimum distance between OD's
   iii. Minimum VHT travel
   iv. Minimum average travel distances
   v. Housing and employment per TAZ (indicates the degree of mixed use)
   vi. Mode of Travel
      1. Increase in non-auto transportation
   vii. Urban density – population per square mile, higher= safer, can have more transit and less auto usage

e. Probability
   i. Do routes cross barriers – high volume roadways, high-speed roads, rail crossings

f. Consequence
   i. For arterials - Travel speed/miles of sidewalk according to speed categories
   ii. Minimize situations where local trips on through roads or vice-versa – network connectivity and functionality
      1. Number of access points per roadway function
         a. Through roads the least access points, local roads the most access points

**ECONOMIC DEVELOPMENT (seen as constants across all scenarios)**

1. Effect on land values
2. Jobs – total annual wages
3. Value of developed land
4. Assessed value per household
5. Public investment efficiency
   a. Cost of public works facilities
   b. Opportunity for phasing
   c. Opportunity to serve future phases

**COMMUNITY LIVABILITY**

1. Housing Choice & Affordability
   a. Percent of total units by type (SF, TH, MF)
   b. Percent ownership
      i. Owner households
      ii. Renter households

2. Shared Prosperity
    a. Households in concentrated low-income areas
    b. Employees in concentrated low-income areas
    c. Households in low-income areas
    d. Employees in low-income areas
3. Creates a sense of place, a point of arrival, a place of interest within the region
4. Amenity
    a. Anticipated park and open space acquisition (SW)
    b. Household proximity to open space (1/4 mile)
    c. Household proximity to village center (1/4 mile)
    d. Employee proximity to open space (1/4 mile)
    e. Employee proximity to village center (1/4 mile)

**ENVIRONMENT**

1. Environmental Stewardship
    a. Air quality
    b. Water quality
    c. Acres of impervious surface
    d. Acres of sensitive lands impacted
    e. Acres of land consumed
    f. Number of new miles of sewer installed divided by the number of acres of lost agricultural land
    g. Number of new stream crossings required
    h. Mile of roadway within protected stream buffer