

## **The Jamdex Performance Measure**

The Jamdex measure is an experimental performance measure used to describe several congestion aspects in a single value. There are several performance measures in general use that provide a method to quantify one or two aspects of mobility challenges, but no all-encompassing performance measure has been developed. The ability to communicate the problem to non-technical audiences is dependent on having good measures. It is also related to having a relatively simple and easy to understand summary of the situation, and it is this particular need that the Jamdex is designed to satisfy. The single measure incorporates measures of both average congestion levels and day-to-day variation in travel conditions as well as the extent of congestion, population and economic variables.

Conceptually the Jamdex is similar to a stock market index—it has no intrinsic meaning, it is only used in a context where the change in value is the communication mechanism. Over the near or long term a value such as 13,000 on the Dow Jones Index has a meaning that relates to the current value (up or down from current value) and that relationship says something about the value in the stocks included in the Index.

So the Jamdex is a compilation of several measures that represent congestion problems facing urban America. It is a congestion measure—higher values mean more congestion, a lower Jamdex is better—but can use data expressed in person movement terms to illustrate multimodal travel conditions. The current formulation of the Jamdex has equal weighting applied to each of the factor categories; as more experience is gained with the measure, the data and the uses, this approach may change.

The general categories of measures and the specific components are described below. Exhibit 1 is an illustration of the Jamdex concept as a three dimensional box with the fourth dimension being the variation in the box volume over a short time (e.g., day-to-day).

### **Intensity of congestion (25% weight)**

- Travel Time Index – ratio of peak to free-flow travel time
- Annual delay per traveler – extra travel hours each year for the average person traveling in the peak period

### **Magnitude of congestion (25% weight)**

- Total annual travel delay – total extra travel time for the region
- Gross metropolitan product – economic value of the goods and services produced in the region (large regions typically have greater congestion challenges)
- Population of region

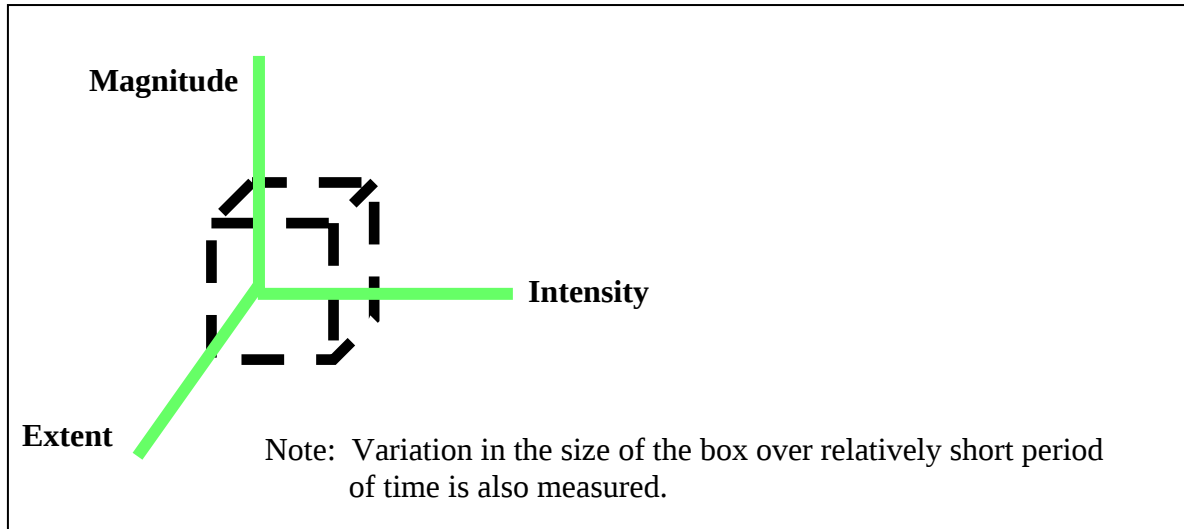
### **Extent of congestion (25% weight)**

- Percent of the day when congestion might be encountered – describes the amount of the day affected by congestion (and therefore the effort that regional travelers must exert to plan around congestion)
- Percent of trips on the system that might encounter congestion each day – describes the extent of congestion across the region

Variation of congestion from day-to-day (25% weight)

- Buffer Index – percent of extra travel time that must be allowed above the average in order to arrive on time for 95 percent of the trips.

### Exhibit 1. Illustration of Jamdex Measure



### Use of the Jamdex

Initial implementation could be accomplished at the regional level for use in evaluating alternative future investment strategies and long-range urban plans. This might take the form of both an annual plan, as well as a performance measure used in communication with decision-makers and the general public. The Jamdex might also be used in real-time or as a peak period or daily summary value that would quickly convey the level of problem faced by travelers and freight shippers.

### Calculation of the Jamdex

Each of the four categories will be weighted equally, but the measures consist of several orders of magnitude (millions of people and Indices with values near 1.0). The measures will be brought into closer alignment using the normalizing factors as shown in Exhibit 2.

### Exhibit 2. Normalizing Factors Used to Create Similar Values for Jamdex Performance Measures

| Performance Measure and Typical Units        | Normalizing Procedure                     |
|----------------------------------------------|-------------------------------------------|
| Travel Time Index                            | Value                                     |
| Annual delay per traveler (hours)            | Value divided by 40 hours                 |
| Total annual travel delay (million hours)    | Value divided by 100 million person hours |
| Gross metropolitan product (billion dollars) | Value divided by 1 billion dollars        |
| Population (million)                         | Value divided by 10 million persons       |
| Percent of day                               | Value divided by 30%                      |
| Percent of trips                             | Value divided by 30%                      |
| Buffer Index (percent)                       | Value divided by 20%                      |