

STRAW User's Guide  
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I. Introduction

By now, you should have read the STRAW project Web page, downloaded the code and used the installation instructions to install STRAW. The purpose of this guide is to explain some of the more important features of STRAW and how to use them in your simulations. This is **not** intended to be a complete description of STRAW, or anything close. For implementation details, see the associated technical report and read the source, which I've done my best to comment well.

II. Configuration

STRAW currently supports nine configuration parameters that can be set at runtime using the StreetMobility constructor. The intent was to provide runtime configurations for the most commonly changed elements and to leave the rest as part of the compilation unit. In this section, I'll describe the runtime configuration parameters and the important static ones. We currently use XML files to configure runtime parameters for simulations, as demonstrated in the GenericDriver class. Although there can be many approaches to simulation configuration, I'll only discuss how to use the XML files; usage for other techniques can be inferred from the discussion.

A. Runtime Configurations

All StreetMobility classes must at least provide the following arguments to the constructor:

<i>Argument</i>	<i>Description</i>	<i>XML file property name</i>
<b>segment file location</b>	location of file containing road segment information	segmentFile
<b>street file location</b>	location of file containing street names	streetFile
<b>shape file location</b>	location of file containing intermediate shapes for road segments	shapeFile
<b>degree</b>	Number of levels for quad tree of segments	degree
<b>tr (top right)</b>	Location of top right corner of map to use	maxLong (maximum longitude) maxLat (maximum latitude)
<b>bl (bottom left)</b>	Location of bottom left corner of map to use	minLong (minimum longitude) minLat (minimum latitude)
<b>random object</b>	The random object to use (for repeatability)	N/A

The StreetMobilityRandom class takes one additional argument:

<i>Argument</i>	<i>Description</i>	<i>XML file property name</i>
<b>probability</b>	the probability that a node will turn at an intersection	probability

Others:

<i>Variable</i>	<i>Description</i>	<i>XML file property name</i>
<b>penetration ratio</b>	the percentage of vehicles equipped with radios	penetrationRatio
<b>driver speeds standard deviation</b>	the standard deviation for each driver's speed above or below the speed limit for the road	driverStdDev
<b>step time</b>	the time that elapses between each vehicle position update	stepTime

A. Static Configurations

Besides the obvious static configuration constants, such as DEBUG, the following variables can be set statically:

<i>Class</i>	<i>Constant/Variable</i>	<i>Description</i>
<b>StreetMobility</b>	<b>INTERSECTION_RESOLUTION</b>	maximum distance between two RoadSegments to be considered part of the same intersection.
<b>StreetMobility</b>	<b>LANE_WIDTH</b>	the width of a lane
<b>StreetMobilityOD</b>	<b>threshold</b>	the maximum distance between an origin and destination. This reduces runtime overhead.
<b>StreetPlacementRandom</b>	<b>threshold</b>	See above
<b>RoadSegment</b>	<b>CAR_LENGTH</b>	Average vehicle length.
<b>StreetMobilityInfo</b>	<b>spacingBeta</b>	Coefficient for reaction time
<b>StreetMobilityInfo</b>	<b>spacingGamma</b>	reciprocal of twice the maximum average deceleration (units: $s^2/m$ )