Trajectory Conversion Algorithm-Aimsun (TCA-A)

# Content for Application Page

## Tab 1: Summary

The Trajectory Conversion Algorithm (TCA) Software is designed to test different strategies for producing, transmitting, and storing Connected Vehicle information. The Aimsun 8.1 add-on (TCA-A) uses the Aimsun API to gather real-time simulation vehicle information, Roadside Equipment (RSE) and/or ITS Spot Unit location information, cellular region information, event region information, and strategy information to produce a series of snapshots that the vehicle would produce.

## Tab 2: Description

The Trajectory Conversion Algorithm (TCA) Software is designed to test different strategies for producing, transmitting, and storing Connected Vehicle information. The Aimsun 8.1 add-on (TCA-A) uses the Aimsun API to gather real-time simulation vehicle information, Roadside Equipment (RSE) and/or ITS Spot Unit location information, cellular region information, event region information, and strategy information to produce a series of snapshots that the vehicle would produce. Vehicles can be equipped to generate and transmit Probe Data Messages (PDMs), Basic Safety Messages (BSMs), ITS Spot messages, and/or European Cooperative Awareness Messages (CAM) which can be transmitted by either Dedicated Short Range Communication (DSRC), cellular or both.

The TCA program Version 2 Build 3 or 2.3 assumes perfect communication between vehicles and RSEs or cellular ranges unless the user defines a latency or loss rate in the input files. As soon as a vehicle equipped to transmit via DSRC is in range of a RSE, it will download all of its messages directly. Similarly, if the vehicle is equipped to transmit via cellular, it will download all its snapshot information directly. In either transmission, snapshots might be lost or delayed due to user-defined loss rate and latency.

Please Note:

* This is the most updated version of the TCA-A
* This version is intended to be used in conjunction with the Aimsun 8.1 traffic simulation software
* A standalone version of the [TCA 2.3.3](https://www.itsforge.net/index.php/community/explore-applications/for-search-results#/38/67) is also available

## Tab 2: Release Notes:

### License

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### Installation and Removal Instructions

The TCA-A requires the installation of Aimsun 8.1 and a license of Aimsun API. To run the TCA-A you must have Python version 2.7.10 installed on your computer.

The TCA also relies on the following external Python libraries:

* Pandas
* Numpy
* Dateutil
* SciPy

To run the TCA-A, connected vehicles must be *equipped*. This means setting the *Equipped Vehicles* parameter of the vehicle type to 100%. Then the vehicle type IDs must be specified in the Control file either by modifying the TCAinput.xml or by creating a new file. Note that if a new Control file is created, the c2x.py file must be modified to find the correct input by replacing “TCAinput.xml” with the new file name. The c2x.py file must be added to the Aimsun API tab of the Dynamic Scenario.

To remove the software, simply delete the folder that contains all .py files.

### Operating requirements

* Microautobox: dSpace Microautobox II computer
* Secondary processor:
  + Minimum memory: 2 GB
  + Processing power: Intel Core I3 @ 1.6 GHz or equivalent
  + Connectivity: Ethernet
  + Operating systems supported: Ubuntu 14.04
* Server:
  + Minimum memory: 2 GB
  + Processing power: Intel Core I3 @ 1.6 GHz or equivalent
* Connectivity: Ethernet
* Operating systems supported: Windows 7 or Windows Server 2008

### Related web sites

The software is distributed through the USDOT's JPO Open Source Application Development Portal (OSADP), <http://itsforge.net/>

## Tab 3: Documentation

* Trajectory Conversion Algorithm-Aimsun software 2.3 User manual (in the .zip file)

## Tab 4: Discussion

* Main discussion (link)
* Issue discussion (link)

## Tab 5: Related Applications

* List of all applications with same categorization