Capacity Analysis for Planning of Junctions (CAP-X) Tool

The Federal Highway Administration (FHWA) Office of Operations Research and Development (R&D) has developed an extensive new tool that expands on the previous release of the Alternative Intersection Selection tool in 2009. The Capacity Analysis for Planning of Junctions (CAP-X), as the name suggests, is a tool that can be used to evaluate selected types of innovative junction designs (eight intersections, five interchanges, three roundabouts and two mini-roundabouts) using given peak flow volumes.

The intersections and interchanges are evaluated using the method of critical lane volume summation to provide planning capacity assessment at each crossing. The roundabouts are evaluated using the equations in the Highway Capacity Manual (HCM) 2010 to determine lane capacities, except the three-lane roundabout.

The entire CAP-X tool has been developed using Microsoft Excel; basic knowledge of Excel is necessary to use CAP-X. This workbook is designed to be very simple with only volume counts and number of lanes needed to be entered into the tool. The Excel workbook has 32 spreadsheets that analyze 17 different types of innovative junctions. Some of the key junctions in CAP-X include: displaced left turn, three-lane roundabout, double crossover diamond, and the single point interchange. CAP-X is a simple and cost-effective sketch-planning tool that will help users focus on more effective intersection and interchange designs prior to conducting more demanding traffic simulations.

Users

Traffic Operations Engineers, Highway Design Engineers, Safety Engineers, Traffic Planners, Researchers

Contacts

Taylor Lochrane, Office of Operations R&D, Taylor.Lochrane@dot.gov

Joe Bared, Office of Operations R&D, Joe.Bared@dot.gov

System requirements

9MB hard disk space; Microsoft® Windows® Operating System (XP, 7, or 8); Microsoft Excel® 2010.

Microsoft Excel Viewer

If you do not have Microsoft Excel, download the viewer for free.
License Agreement

Disclaimer

The Capacity Analysis for Planning of Junctions (CAP-X) software product is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its content or use thereof. This software product does not constitute a standard, specification, or regulation.

The United States Government does not endorse products or manufacturers. Trade and manufacturers' names may appear in this software product only because they are considered essential to the objective of the software product.

Limited Warranty and Limitations of Remedies

This software product is provided “as-is,” without warranty of any kind, either expressed or implied (but not limited to the implied warranties of merchantability and fitness for a particular purpose). The Federal Highway Administration (FHWA) and distributor do not warrant that the functions contained in the software will meet the end-user’s requirements or that the operation of the software will be uninterrupted and error-free. Under no circumstances will the FHWA or the distributor be liable to the end user for any damages or claimed lost profits, lost savings, or other incidental or consequential damages arising from the use or inability to use the software (even if these organizations have been advised of the possibility of such damages), or for any claim by any other party.

Notice

The use and testing of the CAP-X software is being done strictly on a voluntary basis. In exchange for the provision of CAP-X software, the user agrees that the Federal Highway Administration, U.S. Department of Transportation, any other agency of the Federal Government or distributor shall not be responsible for any errors, damage, or other liability that may result from any and all use of the software, including installation and testing of the software. The user further agrees to hold the FHWA, the Federal Government, and distributor harmless from any resulting liability. The user agrees that this hold harmless provision shall flow to any person to whom or any entity to which the user provides the CAP-X software. It is the user’s full responsibility to inform any person to whom or any entity to which it provides the CAP-X software of this hold harmless provision.

The origin of this CAP-X software must not be misrepresented; there shall be no claim that this software is the product of or written by any individual, company or organization other than the Federal Government. An acknowledgement would be appreciated in any product in which this CAP-X software is included or referenced. Altered versions of this CAP-X software shall be plainly marked as ‘altered’ and must not be misrepresented as being the original CAP-X software. This notice may not be removed or altered from any distribution, recording, copy, or use of this CAP-X software.