

Every Generation Needs a Design Revolution

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TORUS is advanced CAD-based software for the design of modern roundabouts. Powered by the trusted AutoTURN engine, TORUS takes the **innovative, patent pending approach of generating roundabout geometries using vehicle swept path movements**. This method minimizes iteration cycles in the design process while also incorporating speed, design vehicle and sight distance checks. And with dynamic editing features and immediate feedback on fastest path and sight lines, engineers and transportation specialists can use TORUS to produce optimal roundabout designs much more efficiently and reliably.



» TORUS now features the ability to import and synchronize vehicle capacity data from SIDRA INTERSECTION that can be used to update geometric points within the roundabout design helping to create new workflow efficiencies.

» CAPACITY ANALYSIS LINK WITH SIDRA INTERSECTION

TORUS now features integration with SIDRA INTERSECTION enhancing the workflow process. Key SIDRA vehicle capacity data can be imported and synchronized with the current TORUS roundabout, updating its geometry to fit the conditions. As well, essential capacity analysis information such as fuel consumption, emissions, costs, delay, capacity, speed, volume, and queue can be displayed in the CAD drawing with different colors and line styles.

» FASTEST PATH ANALYSIS

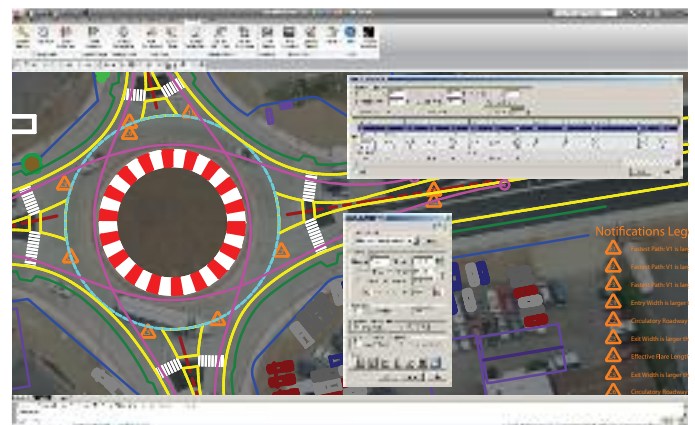
Use TORUS to evaluate the fastest path a design vehicle can maneuver through the roundabout for capacity and safety analysis. User-defined parameters for superelevation, acceleration, and critical offsets can also be applied for calculations. Additionally, fastest path results and speed differentials can be reviewed during roundabout placement and can even be generated for roundabouts created outside of TORUS!

» DYNAMIC ROUNDBABOUT DESIGN

Accelerate the design of roundabouts with a full complement of intuitive features. Generate single lane and multilane roundabouts based on design vehicle movements and clearance offsets. Specify inscribed circle and central island diameters, truck apron, and approach leg points. Modify the geometry of circulatory widths, splitter island envelopes, crosswalks and pedestrian refuges. Drag and rotate roadway legs around the central island. And any change to a design element or geometric parameter automatically updates all other design values in the entire roundabout layout!

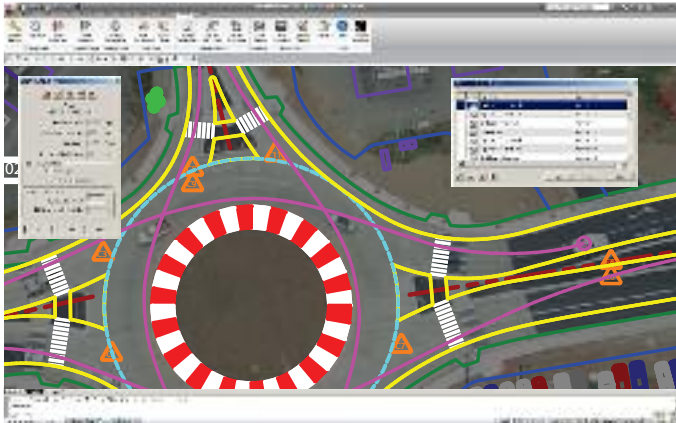
» INNOVATIVE ROAD GRADING

Instantly generate roundabout grading with contours lines, crown alignments, and cross slopes to review drainage patterns in 3D. Ensure approach roads enter and exit the roundabout at optimal grades and that the roundabout plateau does not exceed stipulated cross slopes affecting vehicle stability. Grading models can be exported into LandXML format to be used in different vertical CAD platforms.



» Get instant visual feedback for fastest path assessment. Review roundabout geometries based on the fastest path of a vehicle moving through the design.

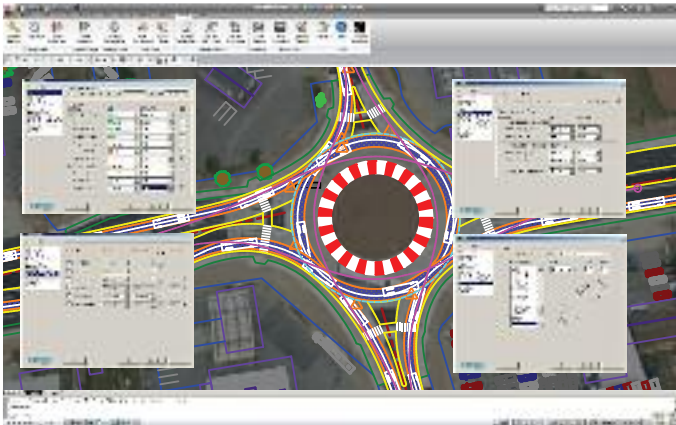
EXPAND YOUR CIRCLE OF PRODUCTIVITY



» Generate various types of sight lines in the drawing. Existing sight lines can also be edited and removed. Sight line analysis is important for determining safety constraints in a roundabout.

REFINE ROUNDABOUT GEOMETRY

Initial theoretical outer edges of bypass lanes, turning lanes, and inscribed circle geometry of the roundabout based on the vehicle's swept path movements (clothoid spirals) can be created and refined to produce ideal line and arc geometry as well as curve tables for construction and survey purposes.



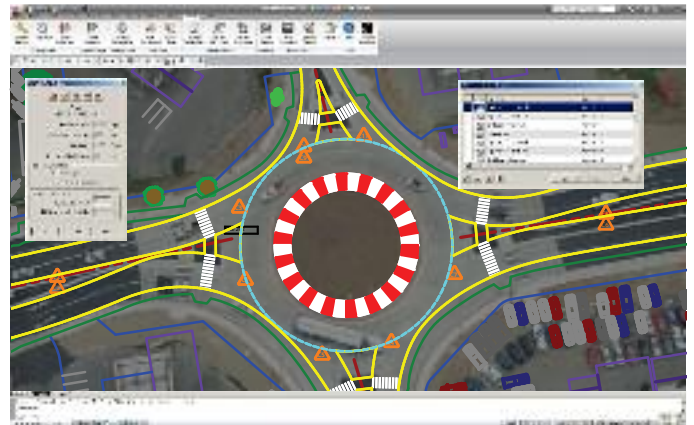
» Select and view different roundabout iterations from your saved files for project decision making and client review. Each roundabout design can have its own design symbol and independent set of iterations.

EFFICIENT DESIGN EDITING

Easily create new roundabout iterations by editing previously generated roundabouts to check different placement positions and design parameters. You can quickly see how changes in the geometry affect operational safety and performance. TORUS editing features all the same controls and abilities found in the Generate Roundabout tool.

ADVANCED SIGHT LINE EVALUATION

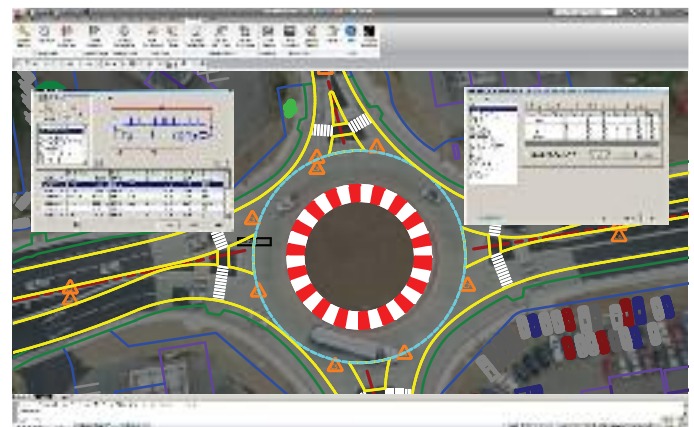
Evaluate critical sight lines between approach legs or for circuitry vehicle movements to ensure adequate stopping, merging, and driver decision distances. Sight line assessments include Approach to Crosswalk, Approach to Yield Line, Yield to Crosswalk, Intersection and Circulatory based on criteria for approach speed, perception-brake time, deceleration, and critical gap.



» Produce all required roundabout geometries including the inscribed circle diameter, the diameter of the central island, circulatory roadway, and much more.

MANAGE AND REPORT YOUR ROUNDABOUTS

The TORUS Design Manager provides a one-of-a-kind ability to manage multiple iterations of roundabout placements and varying design criteria within a single CAD drawing. All key parameters can be saved, recalled, and reported on for comparison between different roundabout iterations to aid in the selection of the optimal preliminary layouts to move on to the final design stage.



» The roundabout design is instantly updated when edits are made to different elements such as approach lanes and exit radius.

» ROUNDABOUT DESIGN FEATURES

- Modify the approach leg reference geometry (e.g. lines, arcs, polylines/complex chains) using grip-points to test vehicle entry deflection and the corresponding effects on fastest path, entry angle, and sight lines
- Generate single or multilane roundabouts based on design vehicle paths and clearance offsets
- Control roundabout size using the inscribed circle or central island diameter
- Drag and position roundabouts in the design to assess optimal locations
- Specify design parameters for approach legs (offsets, widths, bypass lanes, entry/exit lanes, crosswalk sizes, splitter islands, and taper angles)
- Edit leg properties such as crosswalk location, taper angle, and entry/intermediate/exit path radius
- Modify inscribed circle diameter, central island diameter, and circulatory width
- Calculate and draw truck apron width based on design vehicle movements or user-defined specifications
- Set offset geometry for inscribed circle diameter, circulating roadway, footprint, and bypass lanes
- Calculate the vehicle drive paths for path overlap analysis and draw the entry and exit paths

» ROUNDABOUT SURFACE GRADING

- Draw grading model to represent crown alignments and cross slopes
- Ensure drainage patterns work within the roundabout layout (e.g. slope away from the central island)
- Check grading values for: Maximum Cross-Slope percentage; Minimum Alignment Slope percentage; and Contour Line Resolution value
- Add vertical curves to an alignment by K-Value with the Edit Vertical Profile Tool
- Add VPI (Vertical Point of Interest) to alignments
- Export grading model as LandXML to be imported into vertical CAD platforms

» ADVANCED GEOMETRIC CONTROL

- Use polylines and complex chains as reference alignment geometry in the design of complex approach legs defined by curvilinear geometry
- Employ vehicle speed reduction treatment using successive curves on approaches
- Generate edges based on design vehicle tire tracks, offsets and radii as specified in the design guidelines
- Refine complex edge geometry into lines and arcs, then output survey data to a curve table
- Replace TORUS refined edges with user-defined polylines/complex chains

» FASTEST PATH EVALUATION

- Generate a vehicle's fastest path through a roundabout for design analysis and checking purposes
- Calculate and display fastest paths based on theoretical edges and refined edges of a TORUS generated roundabout
- Apply fastest path design values for leg and circulatory superelevation, speed differences and offsets from central island, median, and edges

» SIGHT LINE ANALYSIS

- Evaluate critical sight lines between approach legs and roundabout features.
- Insert sight lines assessments for: Approach to Crosswalk; Approach to Yield Line; Yield to Crosswalk; Intersection; Circulatory; Angle of Visibility
- Add a new sight line assessment into an existing roundabout design
- Define sight line design values for speed, approaches and driver's eye location

» VEHICLE MOVEMENT FEATURES

- Generate standard design vehicle path movements between approaches
- Review and display previously generated vehicle movements and adjust entry/exit approach leg, driving lane, and standard design vehicle
- Vehicle movements updated dynamically when design edits are applied to a roundabout

» VEHICLE CAPACITY ANALYSIS FEATURES

- Import roundabout capacity analysis data from SIDRA INTERSECTION 5.1 (sold separately) into the current roundabout design
- Link SIDRA INTERSECTION data values to any of the TORUS geometric design methods (i.e. Vehicle Envelope or Regional Design Methods)
- Make geometric design changes to the roundabout layout and instantly evaluate the resulting impacts on traffic capacity
- Export the synchronized capacity data from TORUS Roundabouts for further study in SIDRA INTERSECTION
- Select which elements (Fuel Consumption, Emissions, Cost, Delay, Capacity, Speed, Volume, and Queue) to draw and adjust color and line style

» PRESENTATION FEATURES

- Manage vehicle animations with Transoft Solutions' presentation software, **InVision**, to create timed and sequenced events. Files can be exported into selected video formats for playback on any PC with popular video players

» REPORTING FEATURES

- **Area Estimation Report** - Generate a report that shows the approximate land area and perimeter used by a selected roundabout
- **Summary Report** - Create a report with all required design information. Data can be exported to text and CSV formats
- **Fastest Path Results** - Generate a table containing vehicle speed and radii values

» VEHICLE LIBRARIES

- Vehicle libraries of national design vehicle standards including: US (AASHTO), Canada (TAC), Australia (Austroads), UK, France, Germany, Italy, Netherlands, New Zealand, Norway, Sweden, Switzerland, South Africa, and more
- View and sort the library database to display vehicles by region, type, number of parts, class, and recently used vehicles

» COMPATIBILITY

- Requires installation of AutoTURN 8.0 or AutoTURN PRO 3D on the same workstation or network (sold separately)
- AutoCAD® 2007 – 2012 series of products (except AutoCAD LT)
- MicroStation® XM, V8i
- Full support for 64 bit operating systems
- **System requirements:**
Workstation: Windows® XP, Vista, Windows® 7
Network: Windows® Server 2000, 2003, 2008

For more information on **TORUS** visit our website at www.transoftsolutions.com

USHER IN A NEW ERA OF SAFETY AND EFFICIENCY

Modern roundabouts have become an effective means of controlling traffic at intersections and are fast becoming a regular choice in transportation infrastructure design. With an impressive record of traffic operations and safety, roundabouts impart a number of benefits to the public including:

- Eliminating high velocity, head-on vehicle collisions
- Improving traffic flow resulting in better air quality
- Reducing traffic congestion for less fuel consumption
- Providing more pedestrian friendly crossing
- Enhancing aesthetically pleasing landscapes
- Decreasing vehicle delays and lineups
- Effectively controlling vehicle speeds

TORUS: NO DOUBT FOR ROUNDABOUTS

DRIVE PRODUCTIVITY FORWARD

TORUS offers a flexible method of designing roundabouts using vehicle movements and speeds as guidelines instead of just checks.

STOP WORKING IN CIRCLES

Reduce the number of iterations needed for your roundabout projects. TORUS generates immediate fastest path and sight line results as you design.

COMPREHENSIVE SOLUTION

With TORUS, all your design parameters and geometry are dynamically updated as you make changes to the roundabout layout.

SEE IT AS IT HAPPENS

Evaluate roundabout placement positions while reviewing impact to the design using real-time, visual feedback.

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