

CASE STUDY



Melbourne's Streets are Safer with AutoTURN

In Australia, there are more deadly creatures than almost anywhere else on earth, from box jellyfish to great white sharks. When Australians go to the beach, there is a lifeguard there to protect them. In a way, traffic engineers are like lifeguards; they protect us from unsafe roads. Instead of a whistle and a float board, they use the latest geometric design software. While traffic engineers like Evan Boloutis won't pull you out of the surf when you are swimming, he ensures that when his fellow Australians get behind the wheel, they have confidence that the roads they drive on are safe.

Evan Boloutis has been a traffic engineer in Melbourne for 30 years. He's seen the city grow to its current size of 4.5 million people and worked on projects to expand the network of roads to handle increased traffic demands. During his career, he has worked with both State and local governments in Australia and in early 2014 he started his own traffic engineering firm EB Traffic Solutions.

According to their website, EB Traffic Solutions Ltd has extensive experience in providing swept path analysis diagrams using AutoTURN™ computer software. They use the software to assess the turning implications of a wide variety of vehicle types on design layouts in the early stages of the design process. They use that assessment to inform the design process and deliver a fast and cost efficient method of determining alternative car park and loading dock layouts, intersections and other design layouts for

their clients.

EB Traffic Solutions is a one-man show (with consultants hired as needed) and Boloutis was looking for software that would do two things for his company: 1) simulate virtually any traffic/vehicle scenario with a high level of accuracy and 2) software that could save him time and money.

On any given project, he might need to show how a truck could turn into and out of a loading dock. It might seem simple, but designers need to account for variables like slope and height and they need to know what kinds of trucks can access the loading dock. Sometimes trucks can tip over if they approach the dock from an odd angle. For Boloutis, traffic engineering was always about solving problems.

“When I started out, I was always interested in the traffic engineering requirements to provide swept paths to establish whether cars and trucks could maneuver into/out of access points, parking spaces and loading bays,” he said.

As Boloutis launched EB Traffic Solutions, he started seeing vehicle swept path reports created with AutoTURN associated with projects with the local governments and through private consultants. He thought the software had potential to help his company achieve similar results. “to help his company achieve similar results, since purchasing the software in 2014.” he said.

AutoTURN® is the vehicle swept path analysis software of

choice for transportation engineers, architects, and planners worldwide. Trusted in over 120 countries and available in 7 languages, AutoTURN is used to analyze road and site design projects including intersections, roundabouts, bus terminals, loading bays, parking lots or any on/off-street assignments involving vehicle access checks, clearances, and swept path maneuvers.

As the designers and engineers at EB Traffic Solutions have discovered, AutoTURN is built on tried and true engineering principles and an understanding of what happens where the rubber meets the road. Engineers can design with confidence knowing that they can depend on AutoTURN to produce accurate results and generate a clear picture of whether a vehicle can manoeuvre a specific turn.

Boloutis was hired by an architecture firm in Sydney to help them design underground parking for a multi-level residential development. He had to show the Bankstown Council that cars could safely navigate the turns along the internal ramp system and in the parking area. He developed a traffic report for the architecture firm that included an analysis of the swept paths for several types of vehicles.

The Bankstown project presented several traffic and turning scenarios that EB Traffic Solutions had to simulate to ensure the safety of the vehicles. Boloutis had to work within strict geometric parameters of the existing car park layout and the clearances were small for some of the designs.

“Basement car parks are often challenging given the constraints of ramps widths, lengths, columns, headroom clearance, ramp systems and trying to accommodate as many parking spaces as possible in a constrained environment,” said Boloutis. “I was able to demonstrate that simulating different vehicle types would assist in providing an improved design which accorded with Council’s requirements,” he said.

An important feature within AutoTURN is the vehicle libraries, built by Transoft Solutions Product Management team. Designers often want to test the “worst case” scenario and for part of the project, Boloutis was able to use the B99 car, which was already in the library. By using this particular vehicle, he was able to show the architects where their design needed tweaking.

“The ramp and parking bays adjacent to the base of the ramp were required to be modified to accommodate the B99 car movements,” said Boloutis. The underground parking garage featured two-way traffic and there had to be sufficient clearance for two cars to pass and turn safely.

AutoTURN proved invaluable for EB Traffic Solutions to simulate several kinds of vehicle types during the course of

the Bankstown project. In addition to simulating cars turning into and out of parking bays in surface and basement car parks, Boloutis evaluated vehicles turning into and out of access points including access ramps, checking for conflict areas.

He was also asked to simulate different types of trucks entering and exiting loading dock facilities in industrial estates. Another important question he was asked: Could a 9.5 metre truck make the turn into and out of the construction site? Would the trucks make the turn at the beginning of the construction process and at the end? Keeping people and motorists safe was a top priority.

This software is now applied to numerous construction projects in Melbourne and Sydney, testing the ability for a range of trucks from small vans to large 25 m long

mobile cranes to turn safely into and out of construction sites.

When AutoTURN was created in 1991, engineering controls were in place from the beginning to give road engineers confidence that their designs were safe. For the Bankstown project, safety was an important consideration. “I needed AutoTURN to be very precise and in this case literally within centimeters,” said Boloutis.

It’s because of the extensive testing that Transoft does in the field that traffic engineers like Boloutis can trust the software to produce results within centimeters. For example, in 2012 Transoft worked with two clients to test the accuracy of the software. A driving course was built to replicate a specific geometry of a planned access road. GPS receivers were placed at key points on a truck and trailer to record the location of the vehicle as it traversed the course.

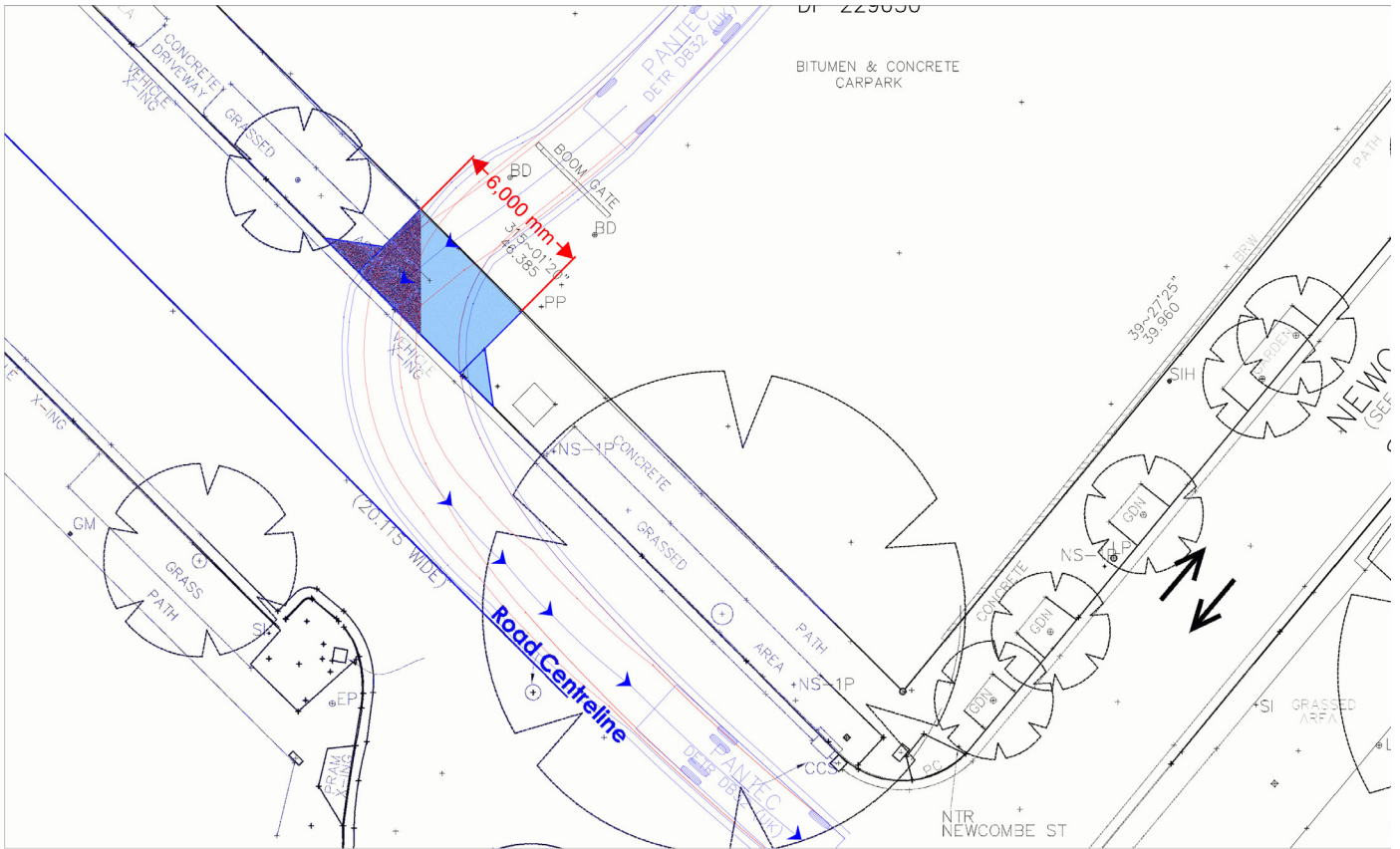
Using AutoTURN and CAD software, the swept path of the simulated vehicle was matched against the recorded position of the field test vehicle. The results showed that the software produced accurate results – the maximum differences being 7 inches, which was deemed accurate enough for the scale of the project.

One of AutoTURN’s greatest strengths is the software’s ability to dynamically show how changing one variable can affect the entire design. Vehicle paths can be fine-tuned quickly and easily through the interface by selecting a point, clicking and dragging and the software re-calculates all the swept path information.

The relationship between speed and turning radius is a key concept that is considered in AutoTURN and the software allows engineers like Boloutis to simulate multiple vehicle types to achieve the desired results. He likes the iterative aspect of the software and when he first started using it, he enjoyed “experimenting with different vehicle types and

“AutoTURN provides me with a high level of confidence.”

Evan Boloutis - EB Traffic Solutions Pty Ltd



testing the different settings to gauge the difference in the resultant swept paths.”

The software produces vehicle simulations quickly and the interface is intuitive, so evaluating different vehicles in a short period of time is easy. AutoTURN’s interface and editing tools dramatically reduces the amount of frustrating trial and error efforts. For Boloutis, “It would have been too onerous and time-consuming to undertake the calculations manually,” on this project.

Before Boloutis found AutoTURN, he was using manual templates published by Austroads, the association of Australasian road transport and traffic agencies. The vehicle libraries in AutoTURN were created to ensure they match the dimensions and turning characteristics of the standard vehicles for regulatory organizations like Austroads, AASHTO ‘Green Book’ and many other leading regulatory bodies. The vehicle simulation tools incorporate other elements like speed, super-elevation and friction that influence turning movements.

As any engineer will tell you, manual templates leave too much room for error. There are many variables to account for and mistakes could happen if the calculations are incorrect, resulting in projects not meeting the design standards.

At its core, AutoTURN gives engineers and designers confidence. The geometric calculations are built in to the software based on the real-world experience of Transoft engineers and designers. He said, “AutoTURN provides me

with a high level of confidence.”

With successful projects like the Bankstown residential complex in recent months, EB Traffic Solutions has the tools to bid on many different types of traffic engineering work. Within Victoria and New South Wales, Boloutis is developing an expanding client base of local government council’s and Planning consultants, Architects, Construction companies, Developers and Lawyers.

“At Transoft, one of our most important design philosophies is to provide design and analysis tools that enable the designer to make their designs safer and more efficient,” said Peter McIntyre, Vice President, Asia Pacific at Transoft Solutions. “Architecture firms and construction companies have to maximize the space they have and we’re always pleased to see our software put to the test and pass with flying colours.”

