



URBAN CHALLENGE

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What is the Urban Challenge?

The DARPA Urban Challenge is an autonomous vehicle research and development program with the goal of developing technology that will keep warfighters off the battlefield and out of harm's way. The Urban Challenge features autonomous ground vehicles maneuvering in a mock city environment, executing simulated military supply missions while merging into moving traffic, navigating traffic circles, negotiating busy intersections, and avoiding obstacles.



The program is conducted as a series of qualification steps leading to a competitive final event, scheduled to take place on November 3, 2007, in Victorville, California. DARPA is offering \$2M for the fastest qualifying vehicle, and \$1M and \$500,000 for second and third place.

This program is an outgrowth of two previous DARPA Grand Challenge autonomous vehicle competitions. The first Grand Challenge event was held in March 2004 and featured a 142-mile desert course. Fifteen autonomous ground vehicles attempted the course and no vehicle finished. In the 2005 Grand Challenge, four autonomous vehicles successfully completed a 132-mile desert route under the required 10-hour limit, and DARPA awarded a \$2 million prize to "Stanley" from Stanford University.

[Grand Challenge 2004 Website](#)

[Grand Challenge 2005 Website](#)

[Grand Challenge 2005 Tracking Site](#)

[Grand Challenge 2005 Report to Congress](#)

[Urban Challenge 2007 Prize Report](#)

What is an autonomous ground vehicle?

An autonomous ground vehicle is a vehicle that navigates and drives entirely on its own with no human driver and no remote control. Through the use of various sensors and positioning systems, the vehicle determines all the characteristics of its environment required to enable it to carry out the task it has been assigned.

Why develop autonomous vehicles?

The National Defense Authorization Act for Fiscal Year 2001, Public Law 106-398, Congress mandated in Section 220 that "It shall be a goal of the Armed Forces to achieve the fielding of unmanned, remotely controlled technology such that... by 2015, one-third of the operational ground combat vehicles are unmanned." DARPA conducts the Urban Challenge program in support of this Congressional mandate. Every "dull, dirty, or dangerous" task that can be carried out using a machine instead of a human protects our warfighters and allows valuable human resources to be used more effectively.

Who are the teams?

The Urban Challenge teams come from across the United States and around the world, and share a passion for the advancement of robotic technology and machine intelligence. This diverse group includes teams from both academia and the robotics, automotive, and defense industries. Some teams are affiliated with organizations, others are groups of volunteers who have come together specifically for the challenge. Each is working to develop a vehicle to complete the 60-mile urban course in less than six hours. Please visit the [Teams](#) page for more information.

What are Tracks A and B?

When the Urban Challenge kicked off, DARPA announced an opportunity for teams to receive funding in amounts up to \$1M to develop their autonomous vehicle. Sixty-five proposals were reviewed and evaluated, and 11 recipients were announced. "Track A" refers to the teams that were selected to receive funding. All teams compete on an equal footing to participate in the Urban Challenge.

How does a team apply to participate in the Urban Challenge?

The application period closed in October 2006.

Team leaders applied to participate more than one year before the event by providing DARPA with basic information on their teams and vehicles. From this point, teams underwent a rigorous evaluation and qualification process: demonstration videos were due in April 2007, technical papers were due in June 2007, and site visit tests were conducted in July 2007. Teams that were successful were invited to participate in the National Qualification Event on October 26-31 2007, where they competed for the chance to participate in the Urban Challenge Final Event on November 3, 2007.

Eleven of the 89 teams participating, the "Track A" teams, applied for and received seed funding for development of their vehicle. The 78 "Track B" teams are entirely self-supported.

More Information

[Building the Best Driverless Robot Car](#)

"Time Magazine," November 15, 2007

[No Drivers, but a Lot of Drive](#)

"The New York Times," November 11, 2007

[Robots Meet Reality](#)

"Forbes.com," November 11, 2007

[SUV with mind of its own wins robot car race](#)

"Reuters," November 4, 2007

[Move Over, the Robot's Driving](#)

"ABC News," November 6, 2007

[Carnegie Mellon Robotized SUV Wins DARPA Urban Challenge](#)

"ScienceDaily," November 6, 2007

[DARPA Grand Challenge Wikipedia entry](#)