Welcome to the DARPA Urban Challenge!

The Urban Challenge is designed to accelerate the development of autonomous ground vehicle technology for operations in traffic. DARPA is offering three prizes—$2 million, $1 million, and $500,000—to the top three vehicles that complete a complex 60-mile urban course with live traffic in less than 6 hours. Speed is not the only factor, vehicles must meet the same standards required to pass the California DMV road test.

From the time the robotic vehicle leaves the start chute and begins the course it is entirely under the control of its onboard mission computer—human observers may intervene only for purposes of safety. In the Nov 3rd Urban Challenge Event, the 20 finalists will operate on the course roads along with approximately 50 human-driven traffic vehicles. They will interact with each other just as vehicles in urban areas across America are on the road together, each traveling to a different destination. To be competitive for the prizes, the robotic vehicles must demonstrate they can complete the 60 mile course in less than six hours while driving safely and obeying all California traffic laws. The vehicles will face driving challenges including traffic circles, merges, four-way intersections, blocked roads, parking in a crowded lot, passing parked cars on narrow streets, and keeping up with the traffic flow on two and four lane roads.

National Qualification Event
Southern California Logistics Airport
Victorville, CA

Robotic vehicles able to perform safely in a dynamic urban environment represent a significant leap in technology advancement. Nothing like the Urban Challenge has ever been attempted. You have a front row seat to a very exciting event.

DARPA
The Defense Advanced Research Projects Agency (DARPA) is the central research and development organization for the Department of Defense. The Agency manages and directs basic and applied research and development projects and pursues research and technology where both the risk and payoff are very high and where success may provide dramatic advances for traditional military roles and missions.

Schedule

National Qualification Event

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, October 26</td>
<td>7:00am-7:30am</td>
<td>Opening Ceremony</td>
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<tr>
<td></td>
<td>7:30am-12:00pm</td>
<td>E-Stop and Vehicle Inspections</td>
</tr>
<tr>
<td></td>
<td>12:20pm-5:00pm</td>
<td>Vehicle Testing</td>
</tr>
<tr>
<td>Saturday, October 27 – Wednesday, October 31</td>
<td>7:30am-5:10pm</td>
<td>Vehicle Testing</td>
</tr>
</tbody>
</table>

Urban Challenge Final Event

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, November 1</td>
<td>TBA</td>
<td>Announcement of Finalists</td>
</tr>
<tr>
<td>Friday, November 2</td>
<td>5:00pm-8:00pm</td>
<td>Urban Challenge Barbecue*</td>
</tr>
<tr>
<td>Saturday, November 3</td>
<td>4:30am-8:00am</td>
<td>Event Day Breakfast*</td>
</tr>
<tr>
<td></td>
<td>6:30am-7:00am</td>
<td>Opening Ceremony</td>
</tr>
<tr>
<td></td>
<td>7:00am</td>
<td>Vehicles launched</td>
</tr>
<tr>
<td>Sunday, November 4</td>
<td>10:00am</td>
<td>Awards Ceremony</td>
</tr>
</tbody>
</table>

*Tickets are available on a limited basis and can be purchased at the Information Tent.
Urban Challenge Teams

#1 Mojávaton
White Knight
Grand Junction, CO

Mojávaton is a team of professionals with over 150 years of combined experience in custom machine design, electronic controls, and vision system solutions.


#2 Team Caltech
Alice
Pasadena, CA

The team from the California Institute of Technology consists of undergraduates and graduate students, working with faculty, post doctorates, and industry partners.


#3 Stanford Racing Team
Junior
Stanford, CA

The team is drawn from faculty and students at Stanford’s School of Engineering and sponsoring corporate partners.


#6 Team Jefferson
Tommy Jr.
Crozet, VA

Perrone Robotics and University of Virginia form Team Jefferson. Luminary professionals in the robotics and engineering industry provide guidance and support.


#8 Gator Nation
Urban NaviGATOR
Gainesville, FL

Gator Nation combines academic knowledge from the University of Florida with industry experience from Smiths Aerospace and Eigenpoint Company.

Sponsors: Air Force Research Labs, Animatics, CIMAR, Digi Key, Eaton VORAD, Gatorland Toyota, NavCom Technologies, NHRA, SICK Sensor Intelligence, Smiths Aerospace, Triad EDM, University of Florida, and Woodhead.

#10 OSU-ACT
ACT
Columbus, OH

Students, faculty, and staff from Ohio State University form the OSU Autonomous City Transport (ACT) team with the support of other universities and organizations.

Sponsors: Advanced Motion Controls, Eskieshir Osmangazi University, Honda, Istanbul Technical University, MobiEye, National Instruments, Ohio State University, Sabanci University, Transportation Research Center, and University of Pisa.

#13 Team UCF
Knight Rider
Orlando, FL

Students and faculty from the School of Engineering and Computer Science at the University of Central Florida have joined with industry partners to form a team with the key technical expertise and management experience to meet the Urban Challenge.

Sponsors: Coleman Technologies.

#14 Insight Racing
Lone Wolf
Cary, NC

Insight Racing brings together a mixture of North Carolina State University alumni and local engineers with over 150 years experience in technology research and development.

Sponsors: Advanced Vehicle Research Center, Ascot Technologies, Control, Insight Technologies, Lotus, NC State University, NCCAR, Northrop Grumman, SAS, SICK, Smith Anderson, and TEKELEC.

#15 Intelligent Vehicle Systems
XAV-250
Troy, MI

The team is comprised of employees from Delphi, Ford, and Honeywell. Members from the 2005 IVS team have returned to contribute their experience and skills.

Sponsors: Delphi, Ford, and Honeywell.
#18 The Golem Group
Golem 3
Santa Monica, CA

Building on a tight knit core of engineers and scientists, The Golem Group of students, scientists, and engineers has joined with an industry professionals to attempt the Urban Challenge.

Sponsors: BEI Technologies, GrammaTech, Intel Corporation, MobilEye, NovAtel, OmniSTAR, SICK, and UCLA.

#19 Tartan Racing
Bass
Pittsburgh, PA

Carnegie Mellon University’s Robotics Institute has come together with General Motors to form Tartan Racing. Team members are employees of the Robotics Institute, and other departments within Carnegie Mellon University and General Motors.


#20 SciAutonics/Auburn Engineering
RED RASCAL
Thousand Oaks, CA

SciAutonics LLC partnered with Auburn University to form a team comprised of scientists, engineers, and consultants bringing together various backgrounds and expertise.

Sponsors: Auburn University, Austrian Research Center, ESRI, and Phoenix International (parent of ATV Corporation).

#21 Team Oshkosh Truck
TerraMax
Oshkosh, WI

Team Oshkosh, formerly Team TerraMax in the 2005 Grand Challenge, has partnered with a new group of industry professionals and universities to take on the new challenge.

Sponsors: Auburn University, Caterpillar, IBEO, Teledyne Scientific (formerly Rockwell Scientific), and University of Parma.

#22 Tartan Racing
Carnegie Mellon University’s Robotics Institute has come together with General Motors to form Tartan Racing. Team members are employees of the Robotics Institute, and other departments within Carnegie Mellon University and General Motors.


#23 Axion Racing
Spirit
Westlake Village, CA

Axion is a private research and development group dedicated to building autonomous vehicles. Axion Racing team members come from many different education and industry backgrounds providing a wide range of experience. Students from various California universities have also contributed to the effort.

Sponsors: Axion, LLC.

#24 Team CajunBot
Cajunbot-II
Lafayette, LA

University of Louisiana faculty, students, alumni, and friends have joined together their diverse education backgrounds and industry experience to create Team CajunBot.

Sponsors: C&C Technologies, Center for Advanced Computer Studies, Firefly, IBEO, Iteris, Lafayette Motors, MEDExpress Companies, and University of Louisiana Lafayette.

#25 Axion Racing
Spirit
Westlake Village, CA

Axion is a private research and development group dedicated to building autonomous vehicles. Axion Racing team members come from many different education and industry backgrounds providing a wide range of experience. Students from various California universities have also contributed to the effort.

Sponsors: Axion, LLC.

#26 Team Cornell
Skynet
Ithaca, NY

Team Cornell is comprised of students from Cornell University studying subjects ranging from mechanical engineering to computer science. Faculty members at Cornell University oversee these students and provide guidance and real world experience.


#27 Team Case
Dexter
Cleveland, OH

Students, faculty, and alumni of Case Western Reserve University are building on the experience base from the former Team ENSCO and other supporting companies.

Sponsors: Argon ST, Bendix, Case Western Reserve University, Enasco, Glossier, Goodyear, National Instruments, NovAtel, Parker, QNX, and Ridge Road Auto Parts.

#28 Team Case
Dexter
Cleveland, OH

Students, faculty, and alumni of Case Western Reserve University are building on the experience base from the former Team ENSCO and other supporting companies.

Sponsors: Argon ST, Bendix, Case Western Reserve University, Enasco, Glossier, Goodyear, National Instruments, NovAtel, Parker, QNX, and Ridge Road Auto Parts.

#29 Team Case
Dexter
Cleveland, OH

Students, faculty, and alumni of Case Western Reserve University are building on the experience base from the former Team ENSCO and other supporting companies.

Sponsors: Argon ST, Bendix, Case Western Reserve University, Enasco, Glossier, Goodyear, National Instruments, NovAtel, Parker, QNX, and Ridge Road Auto Parts.

#30 Team Gray
Plan B
Metairie, LA

Team Gray consists of employees from GrayMatter, Inc., The Gray Insurance Company, and other subsidiaries from Gray & Company, Inc. as well as students from Tulane University and others from the general community. Their approach to the Urban Challenge builds upon the design policies that made them successful in 2005.

### Urban Challenge Teams

| #31 | Team Juggernaut  
| --- | ---  
| The Urban Juggernaut  
| Sandy, UT  
| Team Juggernaut is comprised of experienced embedded systems and software developers with the support of independent professionals working to combine rugged systems design with cutting edge technology.  
| **Sponsors:** Bonneville Seabase, Castle Studios, CommStudio, DesignJug, FeatureCam, IronCAD, Kairois Autonomi, NovAtel, OmniSTAR, State of Utah Department of Transportation, VPI Engineering, and WestCAMP.  

| #32 | Team Autonomous Solutions  
| --- | ---  
| Ted Petersboro, UT  
| Autonomous Solutions, Inc., Sarnoff Corporation, and DeVivo AST, Inc. have come together to form Team Autonomous Solutions, each combining their domain knowledge and expertise.  
| **Sponsors:** Applanix, Batelle, Freeport-McMoRan, OmniSTAR, Phytec, and SICK.  

| #34 | Team Cybernet  
| --- | ---  
| Cybervan  
| Ann Arbor, MI  
| Led by Cybernet Systems Corporation, the team has joined with many companies and their employees to bring together a variety of perspectives and knowledge.  
| **Sponsors:** Applied Research Associates, Chrysler, Ford, Ideal Auto Restyling, Lawrence Technological Institute, Michigan Tech, Saar Technology, Spartan Corporation, Stewart and Stevenson, TARDEC, University of Detroit Mercy, and University of Michigan.  

| #41 | Princeton  
| --- | ---  
| Prospect Eleven  
| Princeton, NJ  
| Princeton undergraduates studying a variety of engineering disciplines make up the majority of this team. Assisting the young team are graduate students and faculty members.  

| #42 | Team Juggernaut  
| --- | ---  
| The Austin Robot Technology team brings together highly experienced programmers, engineers, scientists, and researchers. The team has partnered with the University of Texas at Austin students and faculty.  
| **Sponsors:** Advanced Micro Devices, Applanix, Arens, Auto Group, Endine, Graftek Imaging, NavCom Technologies, SICK, Tyan, Ultramation, and University of Texas at Austin.  

| #43 | Team Autonomous Solutions  
| --- | ---  
| Ted Petersboro, UT  
| Autonomous Solutions, Inc., Sarnoff Corporation, and DeVivo AST, Inc. have come together to form Team Autonomous Solutions, each combining their domain knowledge and expertise.  
| **Sponsors:** Applanix, Batelle, Freeport-McMoRan, OmniSTAR, Phytec, and SICK.  

| #46 | University of Utah  
| --- | ---  
| Ugo the Red Rover  
| Salt Lake City, UT  
| Led by four professors from the University of Utah, the team brings together both graduate and undergraduate engineering students.  
| **Sponsors:** Cavati, NovAtel, and the University of Utah.  

| #47 | Team-LUX  
| --- | ---  
| LUX (the lynx)  
| Woodstock, MD  
| Team-LUX is a small team of mostly Ibeo employees who are working with their parent company SICK. The team has partnered with Bishop Consulting, known for its expertise in intelligent vehicles.  
| **Sponsors:** Bishop Consulting, Ibeo Automobile Sensor, OmniSTAR, SICK, and Wildpark Schwarze Berge.  

| #48 | Team Autonomous Solutions  
| --- | ---  
| Ted Petersboro, UT  
| Autonomous Solutions, Inc., Sarnoff Corporation, and DeVivo AST, Inc. have come together to form Team Autonomous Solutions, each combining their domain knowledge and expertise.  
| **Sponsors:** Applanix, Batelle, Freeport-McMoRan, OmniSTAR, Phytec, and SICK.  

| #49 | Team Cybernet  
| --- | ---  
| Cybervan  
| Ann Arbor, MI  
| Led by Cybernet Systems Corporation, the team has joined with many companies and their employees to bring together a variety of perspectives and knowledge.  
| **Sponsors:** Applied Research Associates, Chrysler, Ford, Ideal Auto Restyling, Lawrence Technological Institute, Michigan Tech, Saar Technology, Spartan Corporation, Stewart and Stevenson, TARDEC, University of Detroit Mercy, and University of Michigan.  

| #50 | Georgia Tech/SAIC Sting Racing  
| --- | ---  
| Sting  
| Atlanta, GA  
| Students and researchers with multiple disciplines and backgrounds from Georgia Tech have joined with the experience of SAIC to form Sting Racing.  
| **Sponsors:** Duke University, Horizon Hobby, Jim Ellis Porsche, Mobile Intelligence, Robotics and Intelligent Machines, Seven Oaks Facilities, Sun Microsystems, and Telcordia.  

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### Urban Challenge Teams

#### #54
**Team AnnieWay**  
| AnnieWAY | Palo Alto, CA |

A group of professionals from several universities in Germany have joined to form Team AnnieWay, a spin-off from the Collaborative Research Center on Cognitive Automobiles.

**Sponsors:** Fraunhofer IITB, Ohio State University, Technische Universitat Munchen, Universitat det Bundeswehr (Munich), and Universitat Karlsruhe (TH).

#### #55
**Ody-Era**  
| Ody-Era | Kokomo, IN |

The dedicated team of Ody-Era combines experience in critical applications for defense vehicles and all-terrain vehicle design and fabrication with software and state of the art expertise.

**Sponsors:** Addco, AGR, Converse, CSI Electronics, Delphi, Lowe Racing Engines, Mac’s Shop, Moton Suspension Technology, Papa’s Italian Bistro, RoboteQ, Staeller Automation, and US Digital.

#### #62
**CarOLO**  
| Caroline | New York, NY |

Students, faculty, and employees of five different Institutes of the Braunschweig University of Technology have joined their knowledge, skill, and expertise to form CarOLO.

**Sponsors:** IAV GmbH, Ibeo, Innovations Gesellschaft Technische Universitat Braunschweig, OmniSTAR, Phoenix Contact, SMS GmbH, Zentrum fur Mechatronik.

#### #65
**AvantGuardium**  
| RONIN | Fort Worth, TX |

The AvantGuardium team is formed by United States and Israeli defense technology groups for the development of unmanned ground vehicles. Group members bring highly experienced professionals in the areas of robotics, control, computer vision, artificial intelligence, and systems engineering.

**Sponsors:** EFW, Inc., part of Elbit Systems of America Company.

#### #71
**Team Berlin**  
| RUFUS | Houston, TX |

Team Berlin’s core members are undergraduate and graduate students and researchers from Freie Universitat Berlin. They have partnered with the Fraunhofer Society, Rice University, and the Universidad de Monterrey.

**Sponsors:** Applanix, Basler, Berlin Sciences, Beye, Faulhaber Motoren, JVC, Ibeo, IBM Deutschland, and Micro-Epsilon.

#### #74
**Ben Franklin Racing Team**  
| Ben | Philadelphia, PA |

Students and faculty from University of Pennsylvania and Lehigh University have paired their education and knowledge with the skills and expertise of Lockheed Martin employees.

**Sponsors:** Lehigh University, Lockheed Martin, Oxts, Thales, and the University of Pennsylvania.

#### #78
**Team Urbanator**  
| Rocky | Littleton, CO |

Team Urbanator, made up of employees from PercepTek, is integrating and refining the enabling technologies which will allow any vehicle to operate autonomously. PercepTek is leveraging its overall software perception, planning and control architecture for autonomous road driving. PercepTek also brings its previous Grand Challenge 2 and Mobile Autonomous Robotic Software (MARS) 2020 project experience.

**Sponsors:** Perceptek Robotics.

#### #79
**MIT**  
| Talas | Cambridge, MA |

Students and faculty from MIT have joined with undergraduates from Olin college and engineers from Draper Laboratory to take on the Challenge. The team will exploit its strengths in perception, planning, navigation, and control.

**Sponsors:** Acumentrics, Advanced Circuits, Applanix, BAE Systems, Charles Stark Draper Laboratory, Delphi, Drew Technologies, Ford, MIT, Mobileye, Nokia Research Center, Olin College, and Quanta Computer.
National Qualification Event

The National Qualification Event (NQE) is the final qualification round. The 35 teams are each given an opportunity to demonstrate the capabilities of their vehicle at three Test Areas. Spectators are welcome to observe the testing process and follow the progress of the vehicles as they operate in moving traffic, make decisions at intersections, and demonstrate many of the skills required of human drivers. The testing schedule is posted each day in the Information Tent. The final results of this evaluation will be announced on November 1 in the Event Tent.

Testing

Vehicles will be tested at Areas A, B, and C, shown on the map above. Approximately seven robotic vehicles will be tested in each area during a morning or an afternoon block. The order of the teams competing in each area is available in the Information Tent.

At Test Area A, vehicles will be evaluated on their ability to operate with live traffic. Vehicles attempt to make a safe left turn across moving traffic, and to pull out at a T-intersection with cars arriving from both directions. At Area B, vehicles are tested for speed on a course that includes narrow winding roads with parked cars and obstructions that they have to navigate safely. Vehicles must also perform a parking maneuver into a designated parking spot. At Area C, vehicles are tested on their ability to operate correctly at 4-way intersections and to find another way to their destination when the road in front of them is blocked.

In all areas, vehicles are given a computerized map of the course and checkpoints they must pass to complete their test.

Traffic Vehicles

There are human-operated traffic vehicles on the course. The traffic vehicles are specially equipped with safety seats and crash cages.
Spectator Information

The event is free and open to the public. During NQE, spectators may view Area A testing activities from outside the perimeter fence and behind the safety barriers. The grandstands near the Start Area are ideal for viewing vehicle starts for Area B. Spectators may also view the vehicles from around the traffic circle as they head onto the course. Limited viewing opportunities exist at Area C, including vehicle performance at a 4-way stop.

During the Urban Challenge event on November 3rd, the grandstands are the ideal location to view autonomous vehicles starting the course, conducting a mission, then returning to start a new mission. On George Boulevard autonomous vehicles will merge into traffic and attempt to pass one another. There will be live video from the course on big screens in the Event Tent where spectators can follow the progress of the vehicles.

Team Pits

The team pits will be open for limited hours during NQE to enable spectators to view the robotic teams up close as the teams prepare for competition.

101: Team Caltech
102: Austin Robot Technology
103: Stanford Racing Team
104: Georgia Tech/SAIC Sting Racing
105: Team Cybernet
106: Team Case
107: Team Berlin
108: Team-LUX
201: Gator Nation
202: SciAutonics/Auburn Engineering
203: OdyEra
204: AvantGuardium
205: Team Gray
206: Team CajunBot
207: Axion Racing
208: University of Utah
209: Insight Racing

110: OSU-ACT
301: Team Oshkosh Truck
302: Team Autonomous Solutions
303: VictorTango
304: MIT
305: Ben Franklin Racing Team
306: Tartan Racing
401: Princeton University
402: Team UCF
403: Team Juggernaut
404: Honeywell/IVS Team
405: Team Urbanator
406: Team Cornell
407: The Golem Group
408: Majávaton
409: Team Jefferson
410: Team AnnieWay
411: CarOLO