



# **DARPA Grand Challenge 2005**

## Site Visit Instructions

February 15, 2005



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The DARPA Grand Challenge site visit is a mandatory part of the selection process for all teams competing in DARPA Grand Challenge 2005. The evaluation conducted at the site visit determines the participants at the National Qualification Event (NQE). DARPA will send two representatives to each site to observe the specific capabilities of each vehicle.

The site visit location is specified in advance by the team and is conveyed to DARPA as part 5A of the Grand Challenge application, due March 11, 2005. The site visit location must be within the United States. Part 5B of the application, also due March 11, requires each team leader to acknowledge that the responsibility for the safe conduct of the site visit demonstration lies solely with his/her respective team. On April 4, 2005, site visit notifications will be sent to the team leaders at the email address on file with DARPA.

Site visit time slots will be scheduled by DARPA to occur May 2–13, 2005, although DARPA reserves the right to use the period May 16–20 as required. Exact scheduling will be coordinated with the team leader after the site visit notification. Teams should plan around this time slot assignment, as the complexity of conducting a large number of site visits makes rescheduling very unlikely. If, for any reason, DARPA indicates that a site visit should be rescheduled, a date and time will be arranged with the team leader.

Attendance of the team leader on site for the duration of the demonstration is mandatory. The team leader must provide proof of identity and U.S. citizenship. Proof of U.S. citizenship can be a current or expired U.S. passport, a certified (original) birth certificate, Certificate of Naturalization, Certificate of Citizenship, or Report of Birth Abroad of a Citizen of the United States. To prove identity, a valid driver's license or other government identification card with photograph are acceptable.

### **Safety Guidelines and Site Requirements**

The key to a successful site visit is careful planning to ensure that contingencies are anticipated and steps are taken for a safe and well-controlled demonstration. Although the primary responsibility for safety resides with each team and its team leader, DARPA may choose to terminate the demonstration or visit at any time should concerns arise.

Demonstration safety procedures that include provisions for protection of personnel and property are required for the site visit. Adequate barriers should be in place to ensure safe separation of the operating vehicle from people, other vehicles, and anything else that could be damaged. The team must comply with Federal, state, and local regulations and all environmental and permitting requirements applicable at the demonstration site.

To demonstrate the vehicle's ability to follow waypoints and avoid obstacles, the site visit location should be large enough to accommodate a demonstration course of

approximately 200m in total travel distance between the start and end lines with a nominal 8m total width. The demonstration course should be defined by at least 5, but no more than 10, waypoints that enable the vehicle to display the ability to follow waypoints and maneuver both left and right turns of at least 30 degrees. The course should be presurveyed, and markings of each waypoint must be clearly visible. Teams will place one set of visible vertical markers (such as flags or traffic cones) on the course boundaries at both sides of each waypoint and one set of visible vertical markers on the course boundaries at the midpoint between waypoints. DARPA will use the visible vertical markers placed by the team to determine whether the vehicle is inside or outside the course boundaries. An example course layout is shown in the following figure.

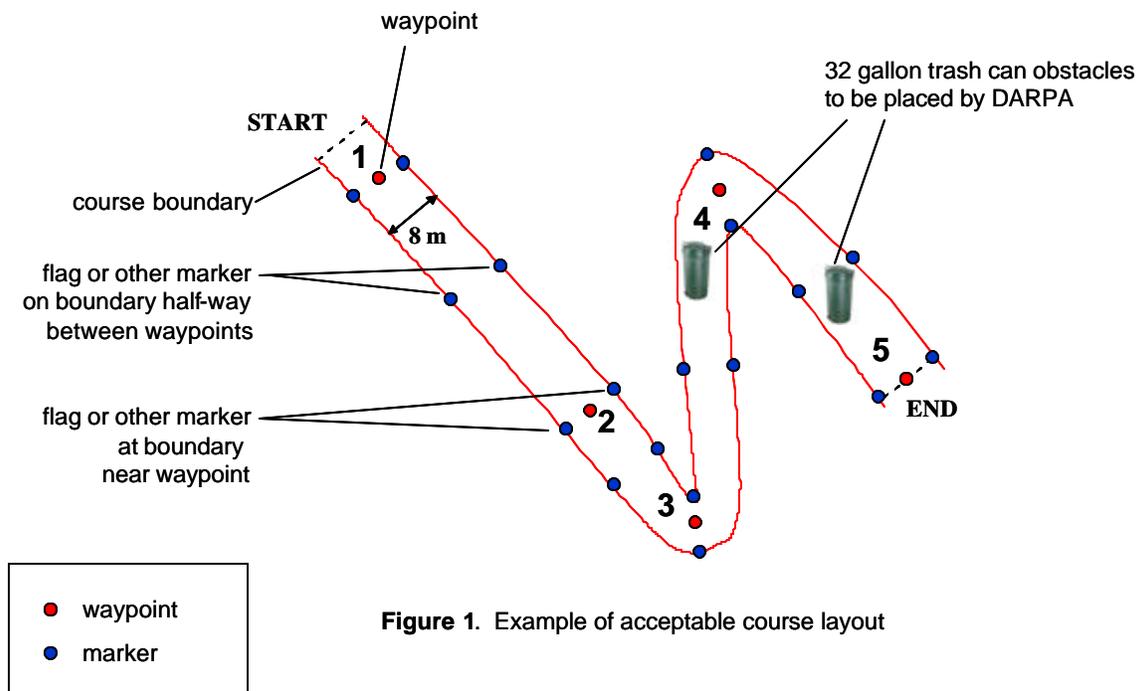


Figure 1. Example of acceptable course layout

## Conduct of the Site Visit

The site visit should be completed within 2½ hours. The team should be organized and prepared to carry out the following steps:

1. *Certification* The DARPA team will review the evidence of identity and U.S. citizenship of the team leader.
2. *Stationary Assessment* The team will conduct a tour of the vehicle that shows in detail the vehicle navigation system, vehicle perception system, onboard processing capability, level of vehicle integration, and provisions for integration

of an Estop safety radio. The team should be prepared to discuss the integration and testing plan that will enable the vehicle to compete at the NQE. The team should discuss any variation from the Vehicle Specification Sheet submitted with its application.

3. *Dynamic Assessment* The team will show its vehicle's capability to operate over the demonstration course. The team must provide DARPA with a safety briefing prior to running the vehicle. The team should provide a scaled diagram of the course layout and CD with waypoint file in the RDDF format described in the Grand Challenge 2005 rules. The team must provide two empty standard 32-gallon trash cans that will be placed by DARPA along the defined course before each run to test the vehicle's obstacle avoidance capabilities.

The team will perform three runs over the 200m course. DARPA will observe and evaluate the ability of the vehicle to follow waypoints and stay within the course boundaries, to detect and avoid obstacles, and to operate at a speed that would enable a realistic Grand Challenge attempt. Each 200m run will be restricted to approximately 10 minutes. Under no circumstances will teams be allowed to operate at speeds in excess of 25 mph during the site visit demonstration.

Teams that are able to demonstrate more advanced capabilities and operate over longer distances or more complex routes may do so in an optional fourth run over a team-specified course, provided the entire demonstration can be completed within the allotted time.