

The DARPA

Grand Challenge

and

The OSU team !



A challenge in robotics, transportation and autonomous systems





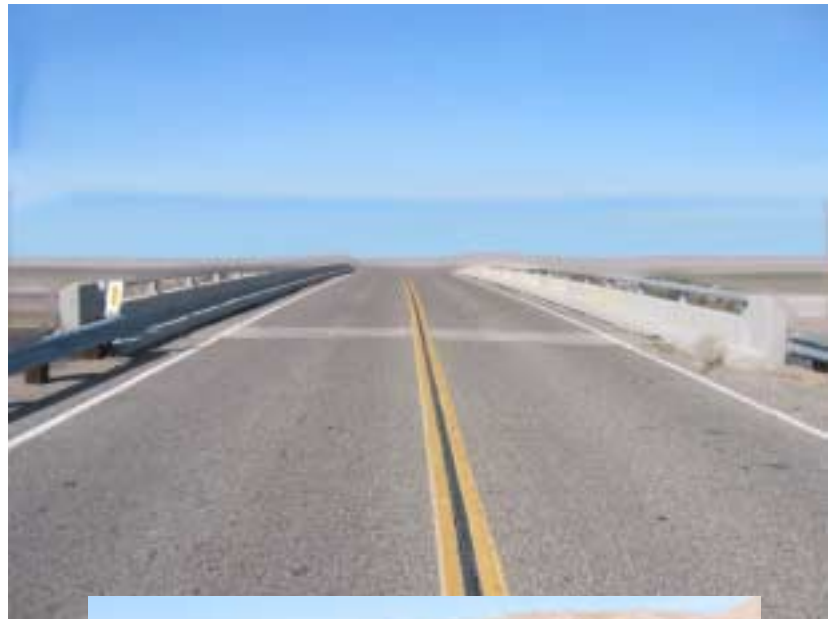
DARPA intends to conduct a challenge of autonomous ground vehicles between Los Angeles and Las Vegas in March of 2004. A cash award of \$1 million will be granted to the team that fields the first vehicle to complete the designated route within a specified time limit. The purpose of the challenge is to leverage American ingenuity to accelerate the development of autonomous vehicle technologies that can be applied to military requirements. Many of the details of the event are still being developed. See:

<http://www.darpa.mil/grandchallenge/>



The DARPA Grand Challenge:

- **Totally autonomous vehicle**
- DARPA following (helicopters, etc.) with “big red button”
- About 250 miles on and off-road
- About 10 hrs (maximum)
- 1000 way-pts to be given 2 hrs before race
- \$1,000,000 prize
- 400 participants at announcement meeting in LA
- A lot of PR!





Barstow to Las Vegas.....





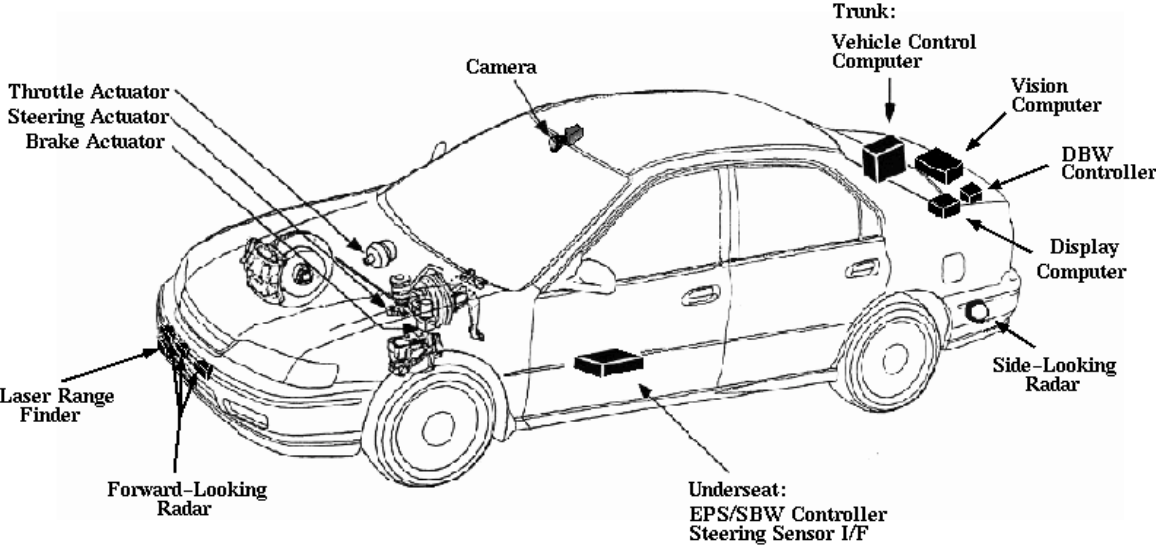
Needed:

- Sturdy, big competition vehicle with good suspension
- Drive-by-wire technology for competition vehicle
- Stable instrument platform
- GPS, maps and various sensors
- Computers
- Software
- Algorithms

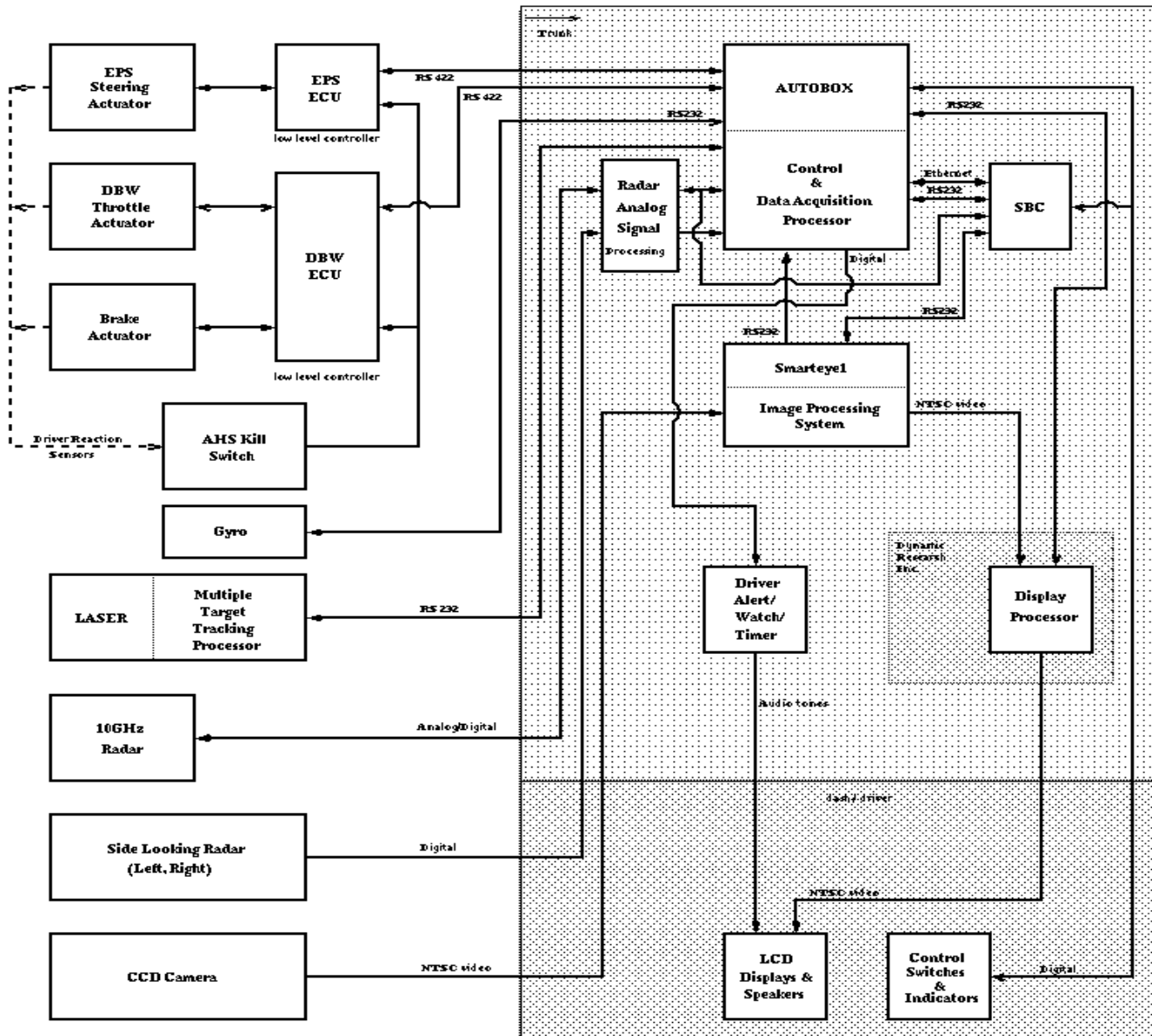
What we have...

- Intelligent Vehicle technology demonstrated in 1997 and 1999, and later developments
 - Autonomy/control development expertise
 - Vision, radar, laser system use
 - GPS and map based driving
 - Large demo experience
- TRC test-track at Marysville
- A major partner: Oshkosh

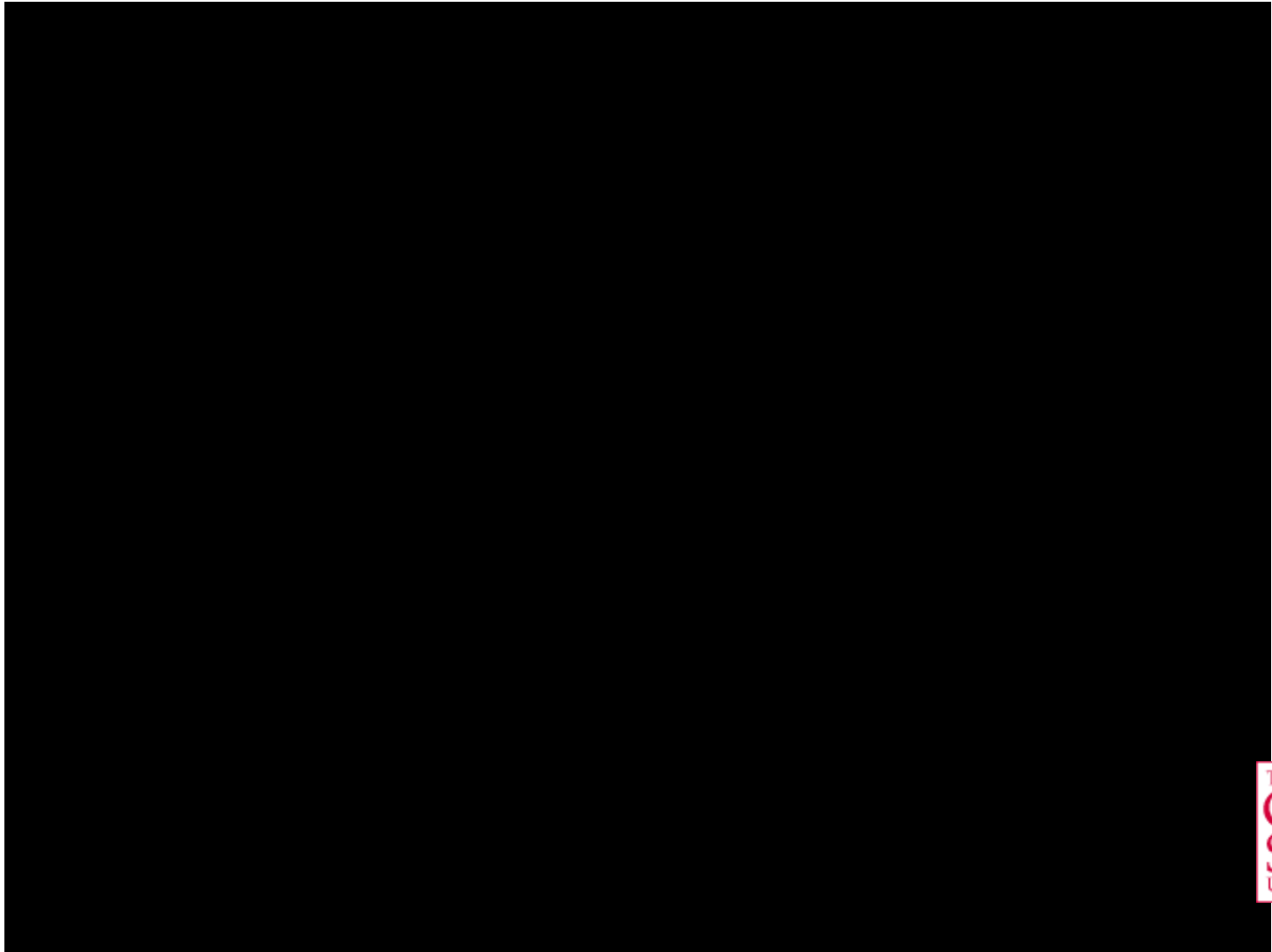
Demo '97



OSU '97 Demo Vehicle Block Diagram



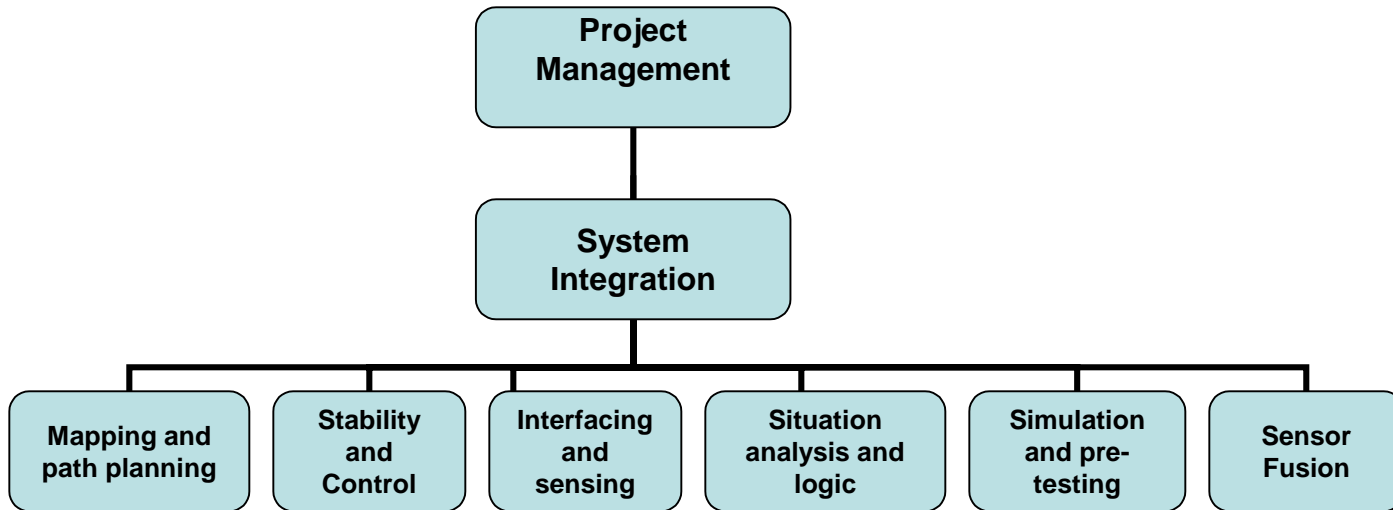
Demo'99



Project is underway

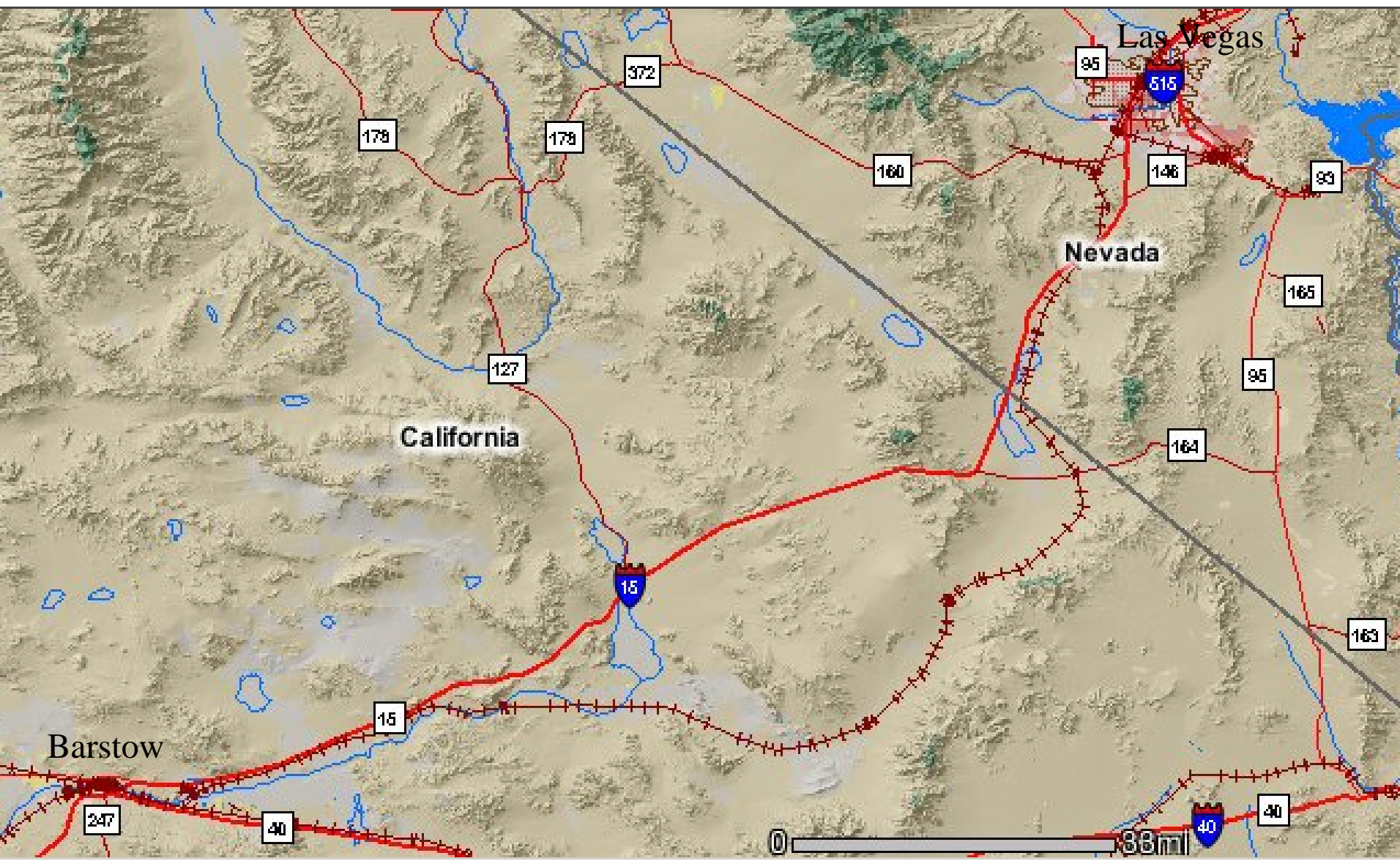
- Mapping and route planning
- Vehicle development
- Sensor selection
- General architecture
-

Project personnel – OSU team



Working on maps.....

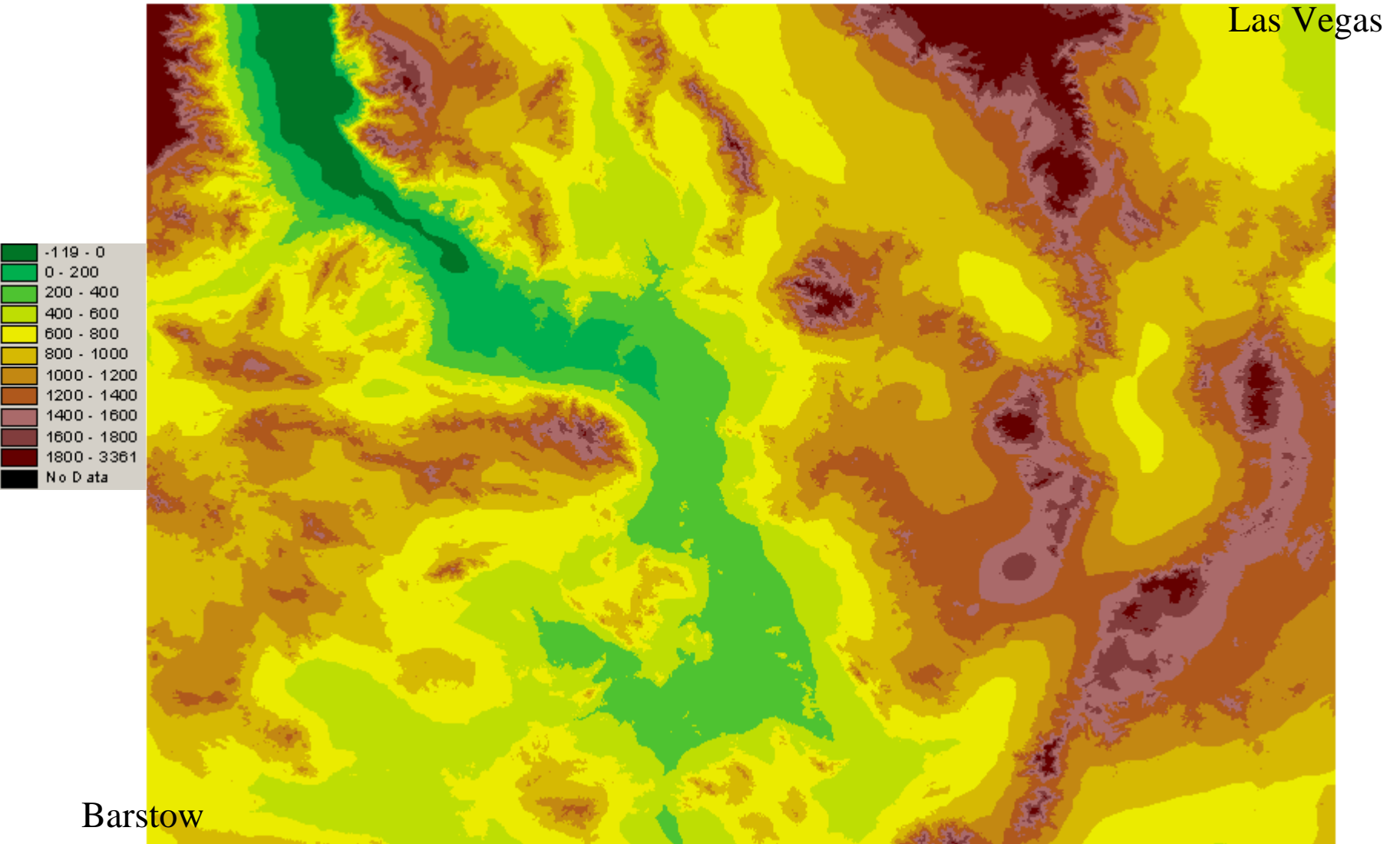




USGS Data

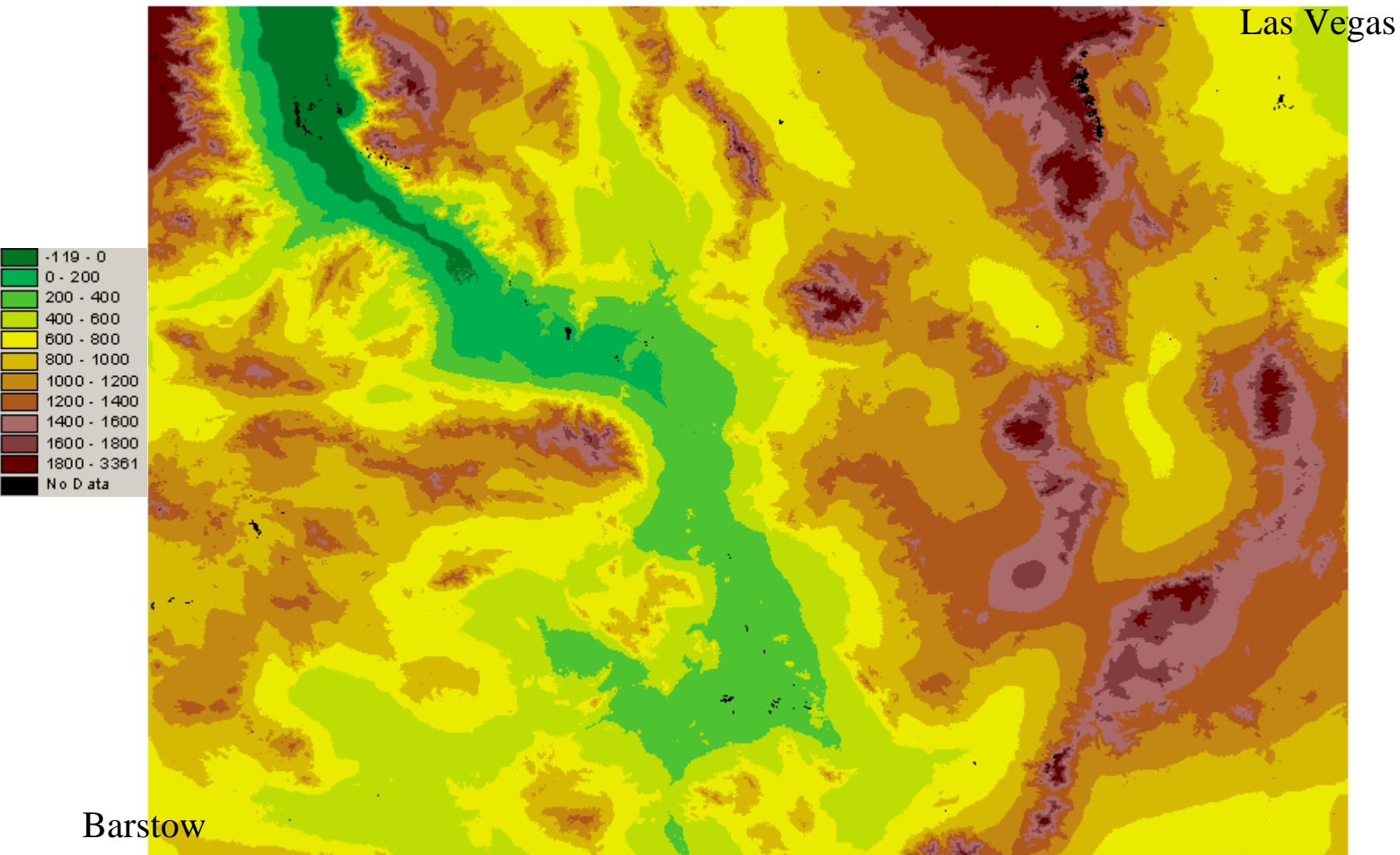
Shuttle Radar Topography Mission (SRTM)

1 arc second (~30m) resolution



National Elevation Dataset (NED)

1 arc second (~30m) resolution



Checking our vehicle.....



Planning sensor placement...



Our Partners/Supporters:

- Oshkosh Truck Company
- Univ. of Parma (Italy)
- TRC
- Bendix
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