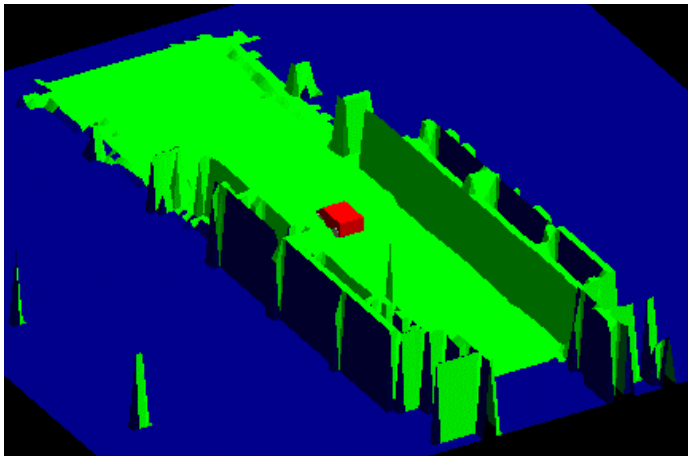


NIST Industrial Autonomous Vehicle Project



*Intelligent Systems Division
Manufacturing Engineering
Laboratory
National Institute of Standards and
Technology
Technology Administration
Department of Commerce*

Transferring Technology

Intelligent Control of Mobility Systems Program



Military: Demo III Project (Army)



Transportation: Department of Transportation Project

Manufacturing: Industrial Autonomous Vehicles Project



Project efforts in:

- standards,
- measurements,

and transfer of:

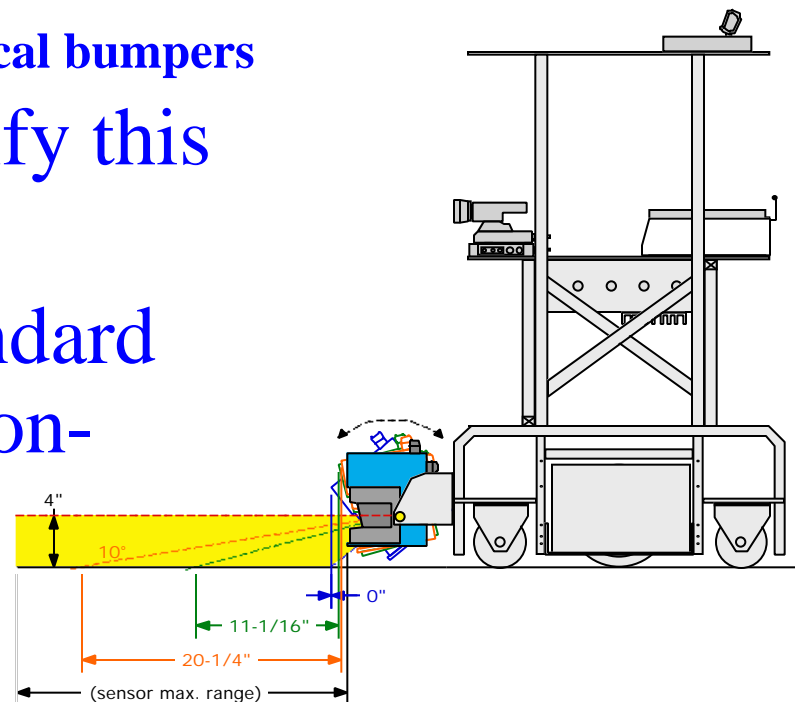
- advanced navigation technology



Advancing Standards: ASME B56.5

Automated Guided Vehicle Bumpers

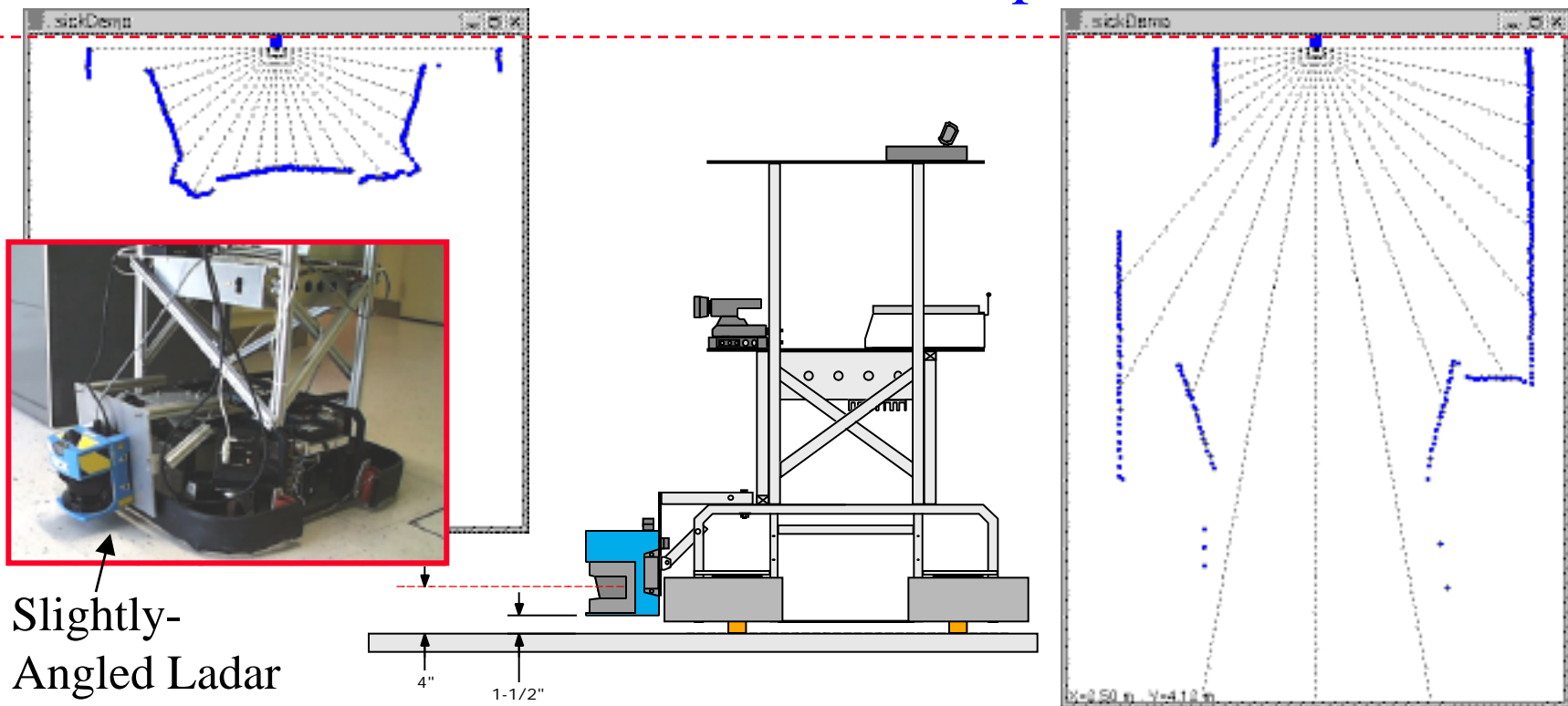
- ASME B56.5a-1994 is confusing to AGV vendors and users ...do AGV's require a contact bumper?
 - “Mandatory emergency control functions and devices shall include ... sensing device or combination of devices to prevent contact of the object sensed with the vehicle structure in the direction of travel.”
 - Yet, specifically defines mechanical bumpers
- NIST is working to clarify this standard
- And, to advance the standard to allow for the use of non-contact bumpers, (eg., laser ranging)



Measurement Toward Vehicle Standards

Ladar Data from Bumper Height Mounting

- Fixed-Horizontal *or* Slightly Angled Ladar Mounting
- Info. is limited at this sensor mount height but, can be dual-used as bumper.



Advancing Technology

Lane Following Using Vision

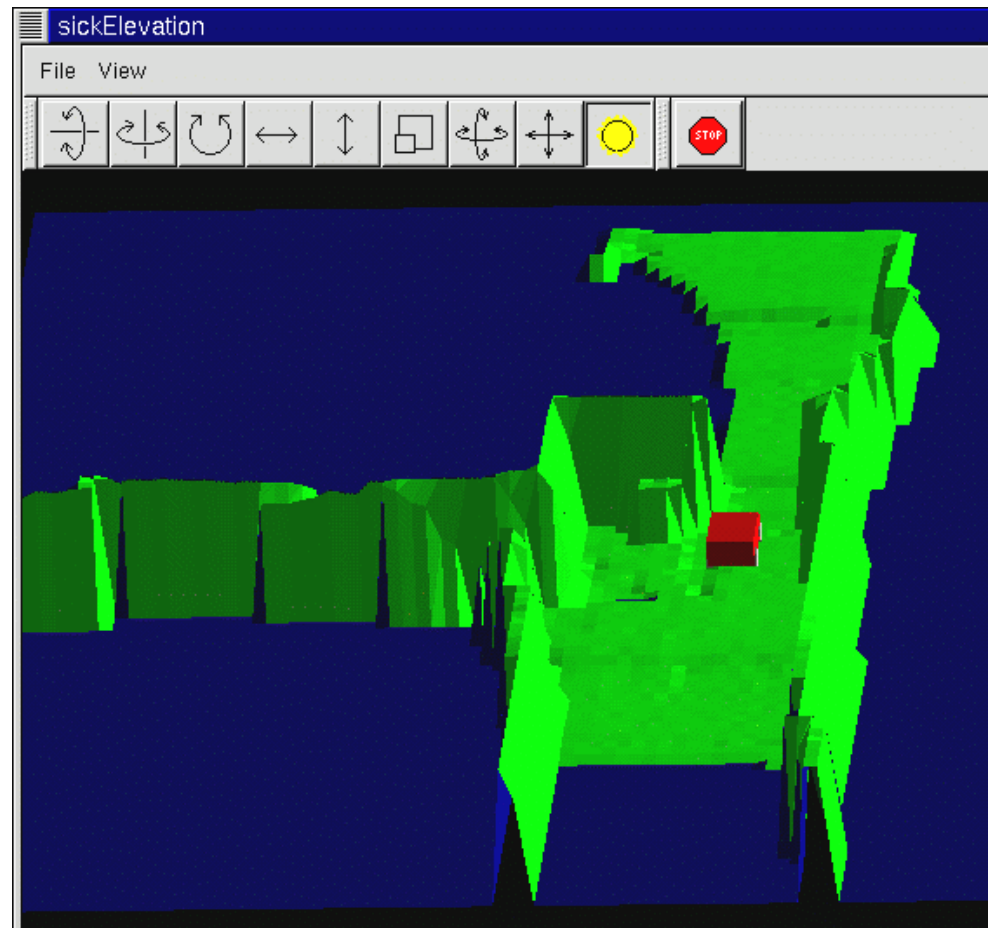
Vision-based, lane following toward autonomous vehicle adaptation to large, industrial facilities



Advancing Technology

Facility Mapping Using Ladar (laser ranging)

- Fixed-Angle Ladar mounted at 45° on vehicle top
- Data then used to build map
- Toward autonomous navigation in facilities



For More Information Contact:

Roger Bostelman, IAV Project Manager

Intelligent Systems Division

National Institute of Standards and Technology

Gaithersburg, MD 20899

301-975-3426

roger.bostelman@nist.gov