

Autonomous Snowplow Competition



**ION North Star Section
Outreach Program**

Autonomous Snowplow Committee



**Final Presentation Information & Outline
2016-17 Competitors**

January 2017

Final Presentation Rules

- Final Presentation slides must follow the provided outline
 - Standardize judging for all Teams
- ASC Committee hints:
 - Judge's scoring form follows the outline exactly
 - Slide titles should match outline titles
 - Address each section of the outline using at least one separate slide
 - Teams will not score points if sections of the given outline are not addressed
 - Example: presentations that do not address "Vehicle Design Challenges" will receive 0 points for that Section
 - **Use Figures and Tables to convey requirements, strategy, designs, and costs**



Final Presentation Rules

- Final Presentation slides (initial draft) submission deadline
 - 23 January 2017
 - Time: 12 pm (noon) Central
 - Email submission: vibhor.bageshwar@honeywell.com
 - Please submit a PDF version of the Presentation to minimize file size
- Final Presentation Day: 26 January 2017 (Thursday)
 - Final Presentation Venue: Science Museum, Saint Paul, MN
 - Final version of the Final Presentation slides must be delivered to Vibhor by 4:30pm on January 26 at the Science Museum
 - Final presentations will be hosted using the Science Museum's A/V equipment and Vibhor's Laptop
 - Supported media: standard Microsoft applications or Adobe Acrobat format

Final Presentation Rules

- Final Presentation time: each Team is allotted 18 min, 30 sec
 - Team presentation order will be determined by random draw at 4:30 pm on January 26 at the Final Presentation Venue
 - First Team Presentation begins at 5:20 pm on January 26
 - Presentation time: 15 minutes maximum
 - Q&A time: 3 min, 30 sec maximum
 - During the next 1 min, 30 sec, Judges will finalize their scores and the next Team will be introduced
- Team scoring
 - Final Presentation counts 15% toward the final Competition score
 - Team standings will be updated by 28 January 2017
 - ASC Scoring Board at the Competition Venue

Final Presentation Outline

Slide Title	Suggested Format**	Minimum # of Slides
Team Slide*		1
Objectives & Team Composition		1
Top-Level Requirements	Table	1
Plowing Strategy	Figure	1
Snowplow Vehicle Design	Figure	1
Navigation System Design	Figure	1
Guidance System Design	Figure	1
Safety Systems	Figure	1
Failure Modes & Recovery Actions	Table	1
Overall Risk Assessment Summary	Table	1
Design Challenges	Table	1
Commercialization	Table	1
Implementation	Figure/Table	1

()*: title slide; ()**: include additional text outside figure/table as necessary

Final Presentation Outline

- Title Slide (1 slide)
 - Team university/name/logo
- Objectives & Team Composition (1 slide)
 - Team objectives
 - Team composition
- Top-Level Requirements (1 slide)
 - Hint: a requirement is a number that indicates when a design satisfies an objective
 - Hint: during the presentation, the Team doesn't need to go through every requirement; instead highlight the important requirements for the Judges
- Snowplow vehicle plowing strategy (minimum 1 slide)
 - Single “I”; Triple “I”
 - Hint: address vehicle strategy to plow snow, minimize plowing time, maximize snow removal, avoid obstacles, and return to garage

Final Presentation Outline

- Snowplow Vehicle Design (minimum 1 slide)
 - Snowplow vehicle and blade designs
 - Hint: include physical dimensions (size and weight)
 - Hint: consider the amount of snow that needs to be plowed at any time and consider the vehicle design required to plow (at least) that amount of snow
 - Sensor & processor component housing
 - Hint: address temperature control
- Navigation System Design (minimum 1 slide)
 - Concept and sensors
 - Navigation augmentation system
 - Placement of navigation aids in competition field
- Guidance system design (minimum 1 slide)
 - Way-point selection concept
 - Hint: describe the procedure through which the snowplow vehicle will generate its plowing path, avoid obstacles, and perform its functions

Final Presentation Outline

- Safety Systems (1 slide)
 - System description
 - Emergency shut-off options (physical and remote)
 - Stopping distance from maximum speed (identify surface)
 - Hint: figure should clearly demonstrate how power is cut off to the vehicle
- Failure Modes and Recovery Actions (1 slide)
 - Identify failure mode and recovery actions
 - Hint: consider operational problems and how the vehicle/Team would recover
- Overall Risk Assessment Summary (1 slide)
 - Evaluate major subsystems
 - Hint: identify the risk of subsystem issues on snowplow vehicle performance
- Design Challenges
 - Highlight vehicle or system design changes from the existing designs
 - Indicate whether the vehicle or its systems are pre-existing or newly designed
 - Highlight the design challenges the Team will face adapting the vehicle and its systems to this year's Competition and weather conditions
 - Hint: first year Teams should identify major design decisions
 - Hint: returning Teams should highlight the design challenges the Team faced adapting the vehicle and its systems to this year's competition

Final Presentation Outline

- Commercialization (1 slide)
 - Identify components and their cost
 - Identify snowplow vehicle and navigation aid cost for sale to the general consumer
 - Hint: convey cost to a consumer buying the product at the local hardware store
 - Hint: companies charge more for products than material + labor cost + cost of operating the facilities + shipping vehicles to retailers (ex: Home Depot)
 - Hint: think about how many snowplow vehicles could be sold across Northern U.S. States (and Canada) every year
 - Hint: suppose a customer bought the snowplow vehicle at Home Depot, think about how a snowplow manufacturer and Home Depot make money (profit)
- Implementation (1 slide)
 - Identify steps consumers would follow to set-up the snowplow vehicle and navigation aids in an operating environment
 - Operating environment example: garage and driveway
 - Identify time to set-up the snowplow vehicle and navigation aids in an operating environment
 - Hint: convey the ease or difficulty the consumer would encounter setting up the snowplow vehicle and navigation aids

Final Presentation Scoring

- Final Presentation scoring: 15% of the total Competition score

Category	Scoring
Technical and Quality of Presentation	200
Ability to Engage Audience	50
Total Points	250

FP Summary: Team Actions

Date	Actions
23 January 2017	Email preliminary version of FP to Vibhor
26 January 2017	Give Vibhor final version of FP on a USB: 4:30 pm
26 January 2017	Final Presentations begins with Introductions: 5:00 pm
26 January 2017	First Team Presentation: 5:20 pm
26 January 2017	Wrap-Up with Suneel and Vibhor (including Q&A with Teams): 9:30 pm
28 January 2017	Competition scoreboard updated with FP scores

