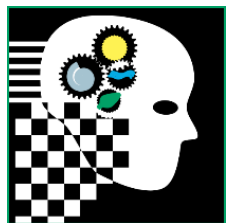


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RAYCE LOGISTICS

MAR 21, 2015

# THE QUESTION...

How do you **prepare** to take

a **team of people** (and an Observer)

with a **solar car**

accompanied by a **fleet of vehicles**

on a **2+ week trip**

...and not to mention, stay **on budget** ?



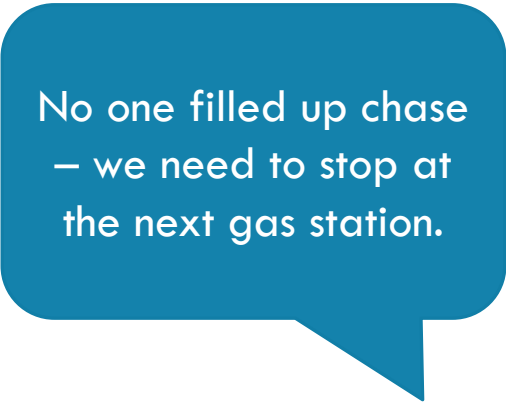


# THE REALITY...

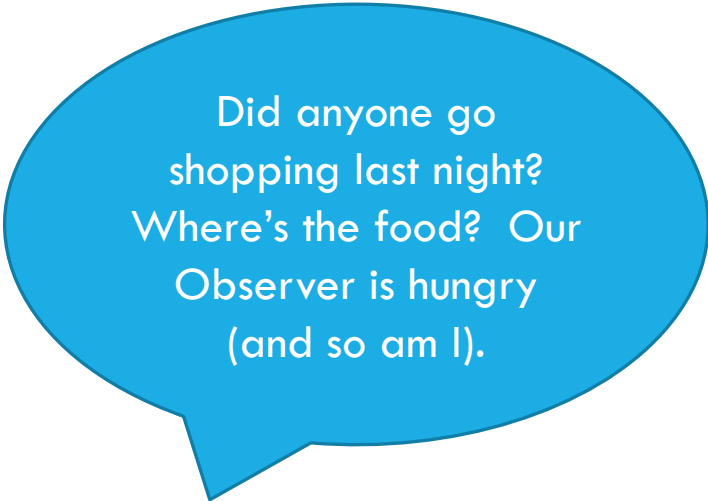
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While most of the team is focused on the solar car, your Logistics Personnel needs to be focused on taking care of the crew, vehicles, and equipment.

Logistics issues can be just as problematic as solar car issues.



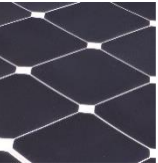
No one filled up chase  
– we need to stop at  
the next gas station.



Did anyone go  
shopping last night?  
Where's the food? Our  
Observer is hungry  
(and so am I).



Where is that  
tool? We  
had it  
yesterday.  
Did it get  
packed last  
night?



# TODAY'S TOPICS

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Plan for the trip

Determine your race crew

Create a race budget (and stick to it)

- Entry fee
- Transportation
- Lodging
- Food
- Miscellaneous

Prep

- Mock drive
- Support inspection

Appendix – checklist suggestions



# DAYS ON THE ROAD

Activity	Days
Home to Scrutineering	1+
On-site Registration/Scrutineering	3-4
Formula Sun Grand Prix/Qualifier	3
“Rest Day” (travel to start line, display, team meeting, prep)	1
American Solar Challenge	7-8
Finish Line to Home	1+

## Travel To Event

- Preview parts of the route
- Sponsor visits/PR opportunities
- Overseas travel

## Travel Home

- Sightseeing after the event
- Sponsor visits/PR opportunities
- Overseas travel



# CREW SIZE

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## Minimum Crew

- 2-4 solar car drivers
- Lead driver
- Chase driver
- Truck/trailer driver
- Navigator/radio comms lead
- Radio communications chase
- Strategist
- ME Lead
- EE Lead
- Team Leader
- Safety Officer
- Observer\*

**Note: the same person may be able to fulfill more than one role**

## Other Roles to Consider

- ME/EE assistants
- Logistics lead
- Scout driver
- Weather person
- Drivers/assistants for other vehicles
- PR/media/website updates
- Observer manager
- Cook/laundry

## Key considerations

- Reduce knowledge lost: bring younger team members to learn
- Rotate people through multiple roles and train for the future
- Make sure there are enough seats in the vehicles

\* Not part of the crew, but team is responsible for transportation, lodging, food, and water



# CREW PLACEMENT

Think through where each person will actually ride

Lead	Chase	Truck & Trailer	Scout
Driver	Driver	Driver	Driver
Navigator	Radio Comms	Navigator	Navigator
	Observer		

Between Lead & Chase
Safety Officer
Strategist
Spare Solar Car Driver
4 Body Holders
ME & EE Leads/Assistants



# TRANSPORTATION BUDGET

## Vehicles

- Lead
- Chase
- Truck & trailer
- Others (scout, weather van, RV, etc)

## Fuel

- Determine an average fuel price
- Home to Track to Start Line
- Start to Finish Line
- Finish Line to Home
- Misc (add at least 10-20%)

## Misc

- Insurance coverage
- Flights for those coming later/leaving early
- Overseas travel

## Planning Tips

- Vans or large SUVs are recommended for lead and chase to hold people and gear
- If you own your own vehicles, budget for any needed maintenance and oil changes
- See if you can get sponsorship/ borrow vehicles (university, local dealership, etc)
- Most vehicle rentals to people under age 25 incur additional fees; ask before you sign
- If you are thinking about using one-way rentals, ask about one-way rental fees



# LODGING BUDGET



## Hotel

- Expected # of nights
- # of people and # per room
- Cost per night per room

## Campground

- Expected # of nights
- Cost per night per person or per site
- Extra charges for extra vehicles

## Alumni, family, friends

- Free!
- University Alumni Office may have contacts to help arrange options

## Large Parking Lot

- Free!
- Ask first to make sure it is ok

## Planning Tips

- Make arrangements in advance for the track and stage points (you know where they are and when you will be there)
- Determine your game plan for nights you are in between stage points
- See if alumni, family, or friends want to house the team for a night
- Try to use the same hotel chain and take advantage of reward programs
- Look for hotels that offer other items you are needing
  - Free breakfast
  - Internet
  - Laundry facilities



# FOOD BUDGET



## Food Bill

- Headcount x days x estimated cost

## Breakfast

- Free, if included with hotel
- Eat during morning charge time

## Lunch

- Eat on the go (in the vehicle)
- Sandwiches, fruit, chips work well

## Dinner

- Eat during evening charge time
- Cook a meal
- Eat at restaurant, if available

## Drinks and Snacks

- Plenty of water, Gatorade, juice
- Pretzels, chips, cookies to munch on

## Planning Tips

- Individual sized servings are easier to distribute, but cost more
- Look for sponsorship/donations
- Consider food-related items
  - Coolers (1 per vehicle)
  - Ziploc bags (great for sandwiches)
  - Sharpie marker (label bags & bottles)
  - Cooking equipment (Coleman stove, utensils, etc)
  - Napkins, paper towels
  - Dishwashing soap, wash cloth, towel
- Have a menu that includes items other than peanut butter and jelly
- Minimize caffeine to prevent dehydration
- Be careful of items that may spoil in the heat
- Don't forget to feed your Observer!



# MISCELLANEOUS BUDGET

## Team Uniforms

- Shirts (required)
- Hats, jackets, etc (optional)

## Support Vehicle Graphics

- Name/number (required)
- Sponsors (optional)

## Laundry

- Change for using machines
- Detergent

## PR

- Brochures/handouts

## Contingency for the Unexpected

- Set aside money to handle the “what if” scenarios
- Adequate Get-Home budget (don't push too hard for lack of funds)

## Planning Tips

- Many teams have several T-shirts and a polo shirt for the start, finish, and awards
- Get laundry bags for each crew member for those hard to sort items (socks and undergarments)
- Leverage existing cell phone plans among team members
  - Check on same service and/or multi-line benefits
  - Upgrade plan for one month (increase minutes, add data plan)
- Consider having each person pay for (or raise money to cover) their uniform and a portion of other expenses
- Keep an envelope in each vehicle for collecting receipts



# PLAN A MOCK DRIVE

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Note: you should have already done significant testing and practice time before this!

## Goals

- Simulate a real event
- Get people comfortable with their roles and used to traveling together
- Workout issues before the real event

## What to include

- Full race crew
- Simulated conditions (set hours, checkpoints, driver changes, flat tires, etc)
- At least one overnight (test out any camping gear)
- Use part of the actual event route (if possible)

Don't forget to include the mock drive (and other practice) in your budget!

# PREP FOR SUPPORT INSPECTION

## Signage & Equipment

- Read the regulations!

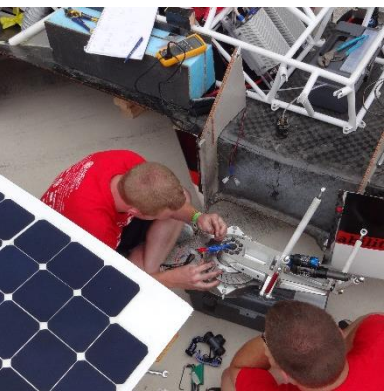
## Discussion with Safety Officer

- Bring proof of first aid & CPR training

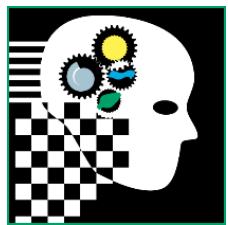
## Demonstration of Roadside Procedures

- Placement of cones, flaggers, etc
- Communication between flaggers
- Exiting vehicles opposite traffic where possible





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# LOGISTICS CHECKLISTS

APPENDIX



# BEFORE YOU GO...

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## Vehicles

- Check driver requirements: age restrictions, CDL, defensive driving course, etc
- Check insurance coverage
- Complete regular maintenance/oil change before trip (and an oil change on/after trip)
- Check expiration date on license plates
- Get lead/chase early enough to practice driving in convoy and build tables/shelves as necessary
- Make a list of vehicle make, model, color, and license plate (hotels typically ask for this information at check-in)
- Make and distribute extra sets of keys

## Race Crew

- Safety Officer First aid/CPR certification (at least one member)

## Drivers

- Check drivers license expiration date
- Practice driving and parking the vehicles, especially the truck & trailer
- Practice lead, solar car, and chase convoy driving
- Get plenty of sleep

## Paperwork

- Proof of insurance for solar car
- Copies of all forms and documentation submitted to HQ



# DON'T FORGET REQUIRED ITEMS

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## **Safety Gear**

- Amber lights
- Warning flags
- Orange cones
- Safety vests
- Battery spill kit
- Fire extinguishers
- First aid kit
- Safety glasses

## **Communications**

- CB Radio in every support vehicle
- Two-way radio communication w/solar car (and chargers)
- GPS for chase vehicle

## **Battery Impound Box**

- Consider adding handles and wheels for easier movement to the impound location

## **Team Uniforms**

- Must be worn during event hours

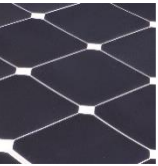
## **Driver Equipment**

- Ballast
- Helmet
- Container for 1-liter of water/fluids

## **Support Vehicle Graphics**

- Team number signs
- Team name/institution signs
- Bring extras in case you need to swap out vehicles





# TEAM PACKING TIPS

## Before You Go

- Make a list of what goes in each vehicle
- Label toolboxes/tools

## Items to Consider Bringing

- Work lights, flashlights
- Tarps
- Paper towels, wet wipes
- Extension cords
- Trash bags
- Tables and chairs

## Loading the Trailer

- Keep weight distributed
- Properly secure all items
- Include a spare tire, jack, and any other tools you may need

## On the Road

- Leave room in chase for the observer's luggage
- Keep critical items easily accessible
  - Safety gear
  - Tire change and quick fix tools
  - Water spray bottle for array
  - Coolers with food and water
- Don't bury the luggage, cooking equipment, or camping gear
- Keep a trash bag/container in each support vehicle
- Restock supplies each night
- Consider carrying fuel cans to refuel lead and chase vehicles (keeps lead/chase from leaving checkpoint to find fuel)



# PERSONAL PACKING LIST

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## Clothing

- Uniform shirts
- Casual shirts for travel days
- Shorts/pants
- Socks, undergarments
- Shoes/sandals (include extra pair in case your primary pair gets soaked)
- Clothes to sleep in
- Jacket/rain gear
- Hat

## Personal Care Items

- Toothbrush, toothpaste, floss
- Deodorant
- Soap & shampoo
- Razor
- Brush/comb
- Eyeglass/contact lenses solution

## Other

- Drivers license
- Insurance card
- Money/credit cards
- Cell phone (and charger)
- Laptop (and charger)
- Camera (and charger)
- Watch, alarm clock
- Any medications
- Sunglasses
- Sunscreen & chap stick
- Notebook & pen
- Flashlight
- Laundry bag, detergent, quarters
- Camping gear (tent, sleeping bag, pillow, towel, etc)