# Scope/Mission

- Using input from sensing and mission modules, generate spatial/temporal path through environment.
  - Must avoid collisions
  - Obey traffic rules
  - Complete local missions as quickly as safely possible

Summer 2006

- Two concurrent efforts: SURF projects and system architecture evaluation
- Summer team:
  - Joel Burdick, Mark Milam (NGC), Rich Petras (JPL), Ziad Fares, Melvin Flores, Noel duToit
  - SURFs: Jessica Gonzalez, Martin Larson, Dave Knowles, Morlan Liu, Jose Torres
  - Aaron Abugaber (high schooler)

Summer 2006
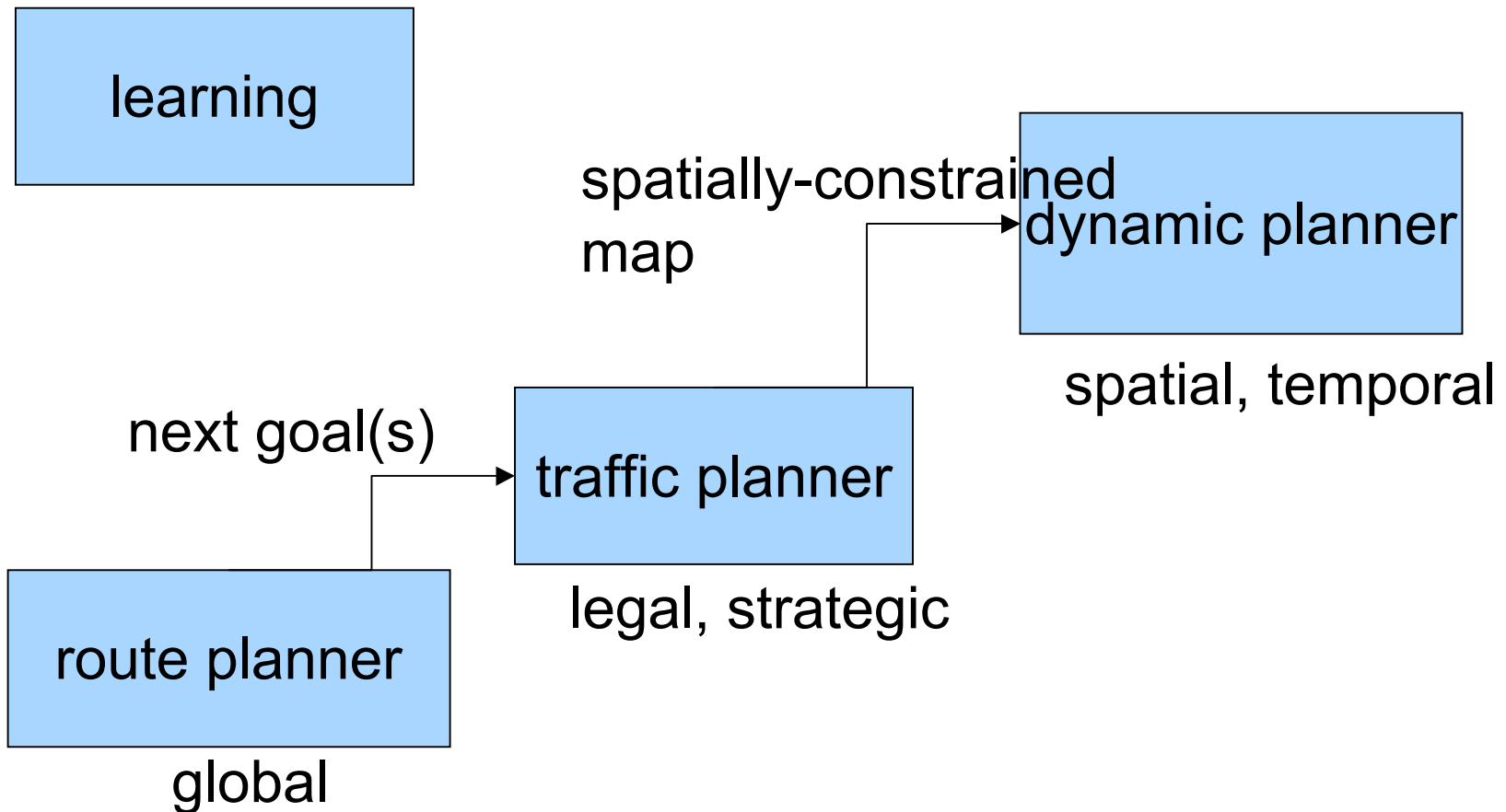
Summer 2006

- **SURF projects**
  - **Route planner and RNDF parser: Morlan Liu**
    - **Module that converts RNDF file into useable structure**
    - **A basic route planner based on Dijkstra's Algorithm**
    - **Now in mission team domain**
  - **Traffic planner: Jessica Gonzalez**
    - **Account for traffic rules & strategy by spatially constraining map**
    - **Can handle basic traffic and some advanced**
  - **dplanner: Dave Knowles and Martin Larson**
    - **Attempted the extension of the previous trajectory planner (for desert challenge) to dynamic environments.**
    - **Evaluated suitability of stage 1 and 2 planners for urban challenge. (spatial and temporal)**

Summer 2006

- **SURF projects (cont'd)**
  - Learning: Jose Tores
    - Investigated what info would be useful to store (such as traversed road geometry) for mission planning.
    - Now in the Sensing/mission domain (global static map)

- **Navigation module architecture development**
  - Develop and evaluate different module architectures through analysis of scenarios
  - Develop set of unit tests and primitives for urban driving
  - The resulting architecture is what we are starting with now.

Fall 2006

- **cplanner**
  - Receives: plan (mplanner), static map (symbolic); vehicle tracking data
  - Function: mask off regions illegal regions, intersection navigation
  - Outputs: allowable corridor to dplanner, error signal to mplanner
- **dplanner**
  - Receives: corridor (cplanner), vehicle tracking data, elevation map
  - Function: plan the "optimal" trajectory through corridor
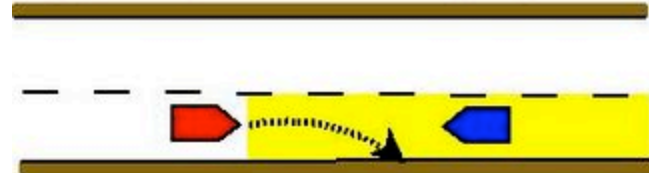 - Outputs: trajectory to follow, error signal to cplanner

Sensing

Static map (symbolic)

vehicleTracker

Static map (elevation)

mplanner

cplanner

dplanner

Navigation Team

follow
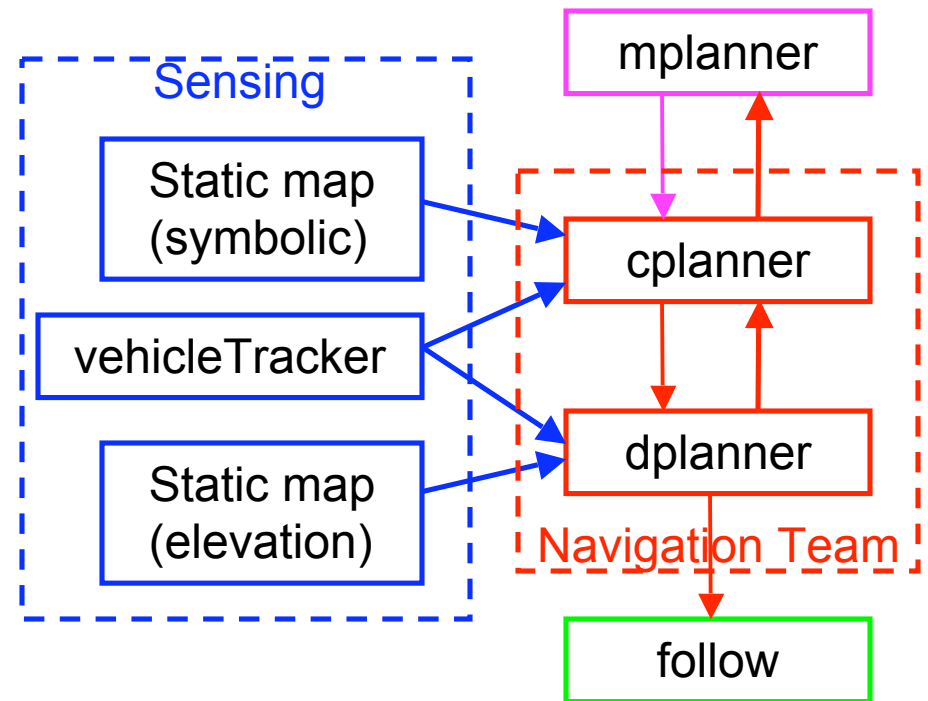
Example:

1.
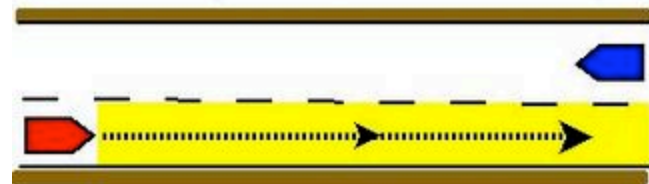
2.

Activities/List of Projects

CHECK PROJECTS PAGE

- Linked course projects
  - CDS 110 (controls and trajectory generation)
  - ME/CS 131/132 (planning – second/third terms)
- Small projects (building something)
  - RNDF generator utility
  - Transfer current simulator (JPL) to gc computers
- Design studies
  - Literature survey/background info for trade study
    - e.g., is optimization based planning the way to go?
- Other ideas? Let me know…