Bridge Controller: Guards of "old" Events 1st Refinement



States, Invariants, Events: Abstract vs. Concrete



Bridge Controller: Abstract vs. Concrete State Transitions



Before-After Predicates of Event Actions: 1st Refinement



PO Rule of **Invariant** Preservation in **Refinement**: Components



v and v': **abstract** variables in pre-/post-states G(c, v): an **abstract** event's guards w and w': **concrete** variables in pre-/post-states H(c, w): a **concrete** event's guards

I(c, v): list of **abstract** invariants J(c, v, w): list of **concrete** invariants E(c, v): an **abstract** event's effect F(c, w): a **concrete** event's effect

PO/VC Rule of Guard Strengthening: Sequents



Q. How many PO/VC rules for model m1?