

An Event-B Specification of ChangeLight  
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**MACHINE** ChangeLight

**SEES** TrafficLights\_ctx

**VARIABLES**

*lights*

**INVARIANTS**

*inv1* :  $lights \in DIRECTION \rightarrow \{Red, Green\}$

*inv2* :  $\forall d \cdot d \in DIRECTION \wedge lights(d) = Green$   
 $\Rightarrow lights[CONFLICT[\{d\}]] \subseteq \{Red\}$

Safety

**EVENTS**

**Initialisation**

**begin**

*act1* :  $lights : |lights' \in DIRECTION \rightarrow \{Red, Green\}$   
 $\wedge (\forall d \cdot d \in DIRECTION \wedge lights'(d) = Green$   
 $\Rightarrow lights'[CONFLICT[\{d\}]] \subseteq \{Red\})$

**end**

**Event** ToGreen  $\hat{=}$

**any**

*gdir*

**where**

*grd1* :  $gdir \in DIRECTION$

**then**

*act1* :  $lights := lights \Leftarrow (CONFLICT[\{gdir\}] \times \{Red\}) \Leftarrow \{gdir \mapsto Green\}$

**end**

**Event** ToRed  $\hat{=}$

**any**

*rdir*

**where**

*grd1* :  $rdir \in DIRECTION$

**then**

*act1* :  $lights(rdir) := Red$

**end**

**END**