

General

- 1) ALL RED 5s (no traffic allowed)
 - 2) NS green, peds white, EW RED
↓
3) 24s, * and 15s early if EW sensor is active
 - 4) NS peds flashing, car lights green, 6s
 - 5) NS car lights yellow, peds flashing 4s
 - 6) NS peds red, NS car lights yellow, 1s
 - 7) ALL RED, 2s
 - 8) Repeat steps 2-8 in orthogonal direction
- NOT responsible for resetting sensors after allowing traffic
- ↳ TLC connected to 2 sensors: NS & EW
↳ represented by a single bit (y/n waiting cars/peds) for total 2 bits
- If current direction yellow/flashing, then sensors have no effect

- * (car traffic only in 1 direction (accidents)), pedestrian traffic may be allowed in same direction (???) (24s + 6s max)
- * Car traffic should not be green in a direction for more than 30 seconds at a time (fairness)
- * Green cycle → shortened if cars/pedestrians waiting, must last at least 15 seconds
- * After green cycle → lights yellow 5s before turning red
- * Whenever traffic finishes one cycle, all lights red before new cycle
- * Peds cross in direction where car traffic is green
- * Peds CAN'T cross on last second of car yellow cycle
- * Ped lights blink 10s before turning red

States

"leads" = value are timer-init & loaded via timer-load on entry*

(0) S_ALL_RED_START

Leads → S_s

Cars → NS = LIGHT_RED, EW = LIGHT_RED

Peds → PEDS_NS_AMBER_EW_AMBER (both don't walk)

Sensors used → name

Exit → all → S_NS_MIN_GREEN

(7) S_EW_MEN_GREEN

Leads → 1S (not cuttable)

Cars → NS = LIGHT_RED, EW = LIGHT_GREEN

Peds → PEDS_NS_AMBER_EW_WHITE (NS walk, EW walk)

Sensors used → car_ns sampled when t0 becomes 1

Exit → at 0 { If car_ns == 1 → skip EKT & go straight to S_EW_PED_FLASH
Else → go to S_EW_EXT_GREEN for optional extension

(8) S_EW_EKT_GREEN

Leads → 9S (cuttable)

Cars → NS = LIGHT_RED, EW = LIGHT_GREEN

Peds → PEDS_NS_AMBER_EW_WHITE

Sensors used → car_ns is checked every tick

Exit → If car_ns == 1 at any tick → next tick go to S_EW_PED_FLASH (early cut)
Else → when t0 → S_EW_PED_FLASH

(1) S_NS_MEN_GREEN

Leads → 1S (not cuttable)

Cars → NS = LIGHT_GREEN, EW = LIGHT_RED

Peds → PEDS_NS_WHITE_EW_AMBER (NS walk, EW don't walk)

Sensors used → car_ns sampled when t0 becomes 1

Exit → at 0 { If car_ns == 1 → skip EKT & go straight to S_NS_PED_FLASH
Else → go to S_NS_EXT_GREEN for optional extension

(2) S_NS_EKT_GREEN

Leads → 9S (cuttable)

Cars → NS = LIGHT_GREEN, EW = LIGHT_RED

Peds → PEDS_NS_WHITE_EW_AMBER

Sensors used → car_ns is checked every tick slows in this state

Exit → If car_ns == 1 at any tick → next tick go to S_NS_PED_FLASH (early cut)
Else → when t0 → S_NS_PED_FLASH

(3) S_NS_PED_FLASH

Leads → 6S

Cars → NS = LIGHT_GREEN, EW = LIGHT_RED

Peds → PEDS_NS_ORANGE_EW_AMBER (NS "flashing", EW don't walk)

Sensors used → name

Exit → all → S_NS_YELLOW

(4) S_NS_YELLOW

Leads → 4S

Cars → NS = LIGHT_YELLOW, EW = LIGHT_RED

Peds → PEDS_NS_ORANGE_EW_AMBER

Sensors used → name

Exit → all → S_NS_PED_RED

(5) S_NS_PED_RED

Leads → 1S

Cars → NS = LIGHT_YELLOW, EW = LIGHT_RED

Peds → PEDS_NS_AMBER_EW_AMBER

Sensors used → name

Exit → onto t0 → S_ALLRED_EW2NS

(6) S_ALLRED_NS2EW

Leads → 2S

Cars → NS = LIGHT_RED, EW = LIGHT_RED

Peds → PEDS_NS_AMBER_EW_AMBER (both don't walk)

Sensors used → name

Exit → all → S_EW_MIN_GREEN

(8) S_EW_EKT_GREEN

Leads → 9S (cuttable)

Cars → NS = LIGHT_RED, EW = LIGHT_GREEN

Peds → PEDS_NS_AMBER_EW_WHITE

Sensors used → car_ns is checked every tick

Exit → If car_ns == 1 at any tick → next tick go to S_EW_PED_FLASH (early cut)
Else → when t0 → S_EW_PED_FLASH

(9) S_EW_PED_FLASH

Leads → 6S

Cars → NS = LIGHT_RED, EW = LIGHT_GREEN

Peds → PEDS_NS_AMBER_EW_ORANGE

Sensors used → name

Exit → all → S_EW_YELLOW

(10) S_EW_YELLOW

Leads → 4S

Cars → NS = LIGHT_RED, EW = LIGHT_YELLOW

Peds → PEDS_NS_AMBER_EW_ORANGE

Sensors used → name

Exit → all → S_EW_PED_RED

(11) S_EW_PED_RED

Leads → 1S

Cars → NS = LIGHT_RED, EW = LIGHT_YELLOW

Peds → PEDS_NS_AMBER_EW_AMBER

Sensors used → name

Exit → onto t0 → S_ALLRED_EW2NS

S_ALLRED_EW2NS

Leads → 2S

Cars → NS = LIGHT_RED, EW = LIGHT_RED

Peds → PEDS_NS_AMBER_EW_AMBER (both don't walk)

Sensors used → name

Exit → all → S_NS_MIN_GREEN

States



Circuit Schematics of TLC

