Train At Crossing

Safety Enhancements

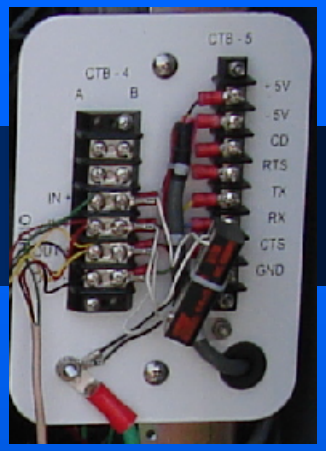
- Pre-signals were installed to prevent motorists from waiting on tracks
- Advance Preemption provides full pedestrian clearance time before preemption
- Gate down hold circuit prevents early termination of track clear green phases

Safety Enhancements, continued

- Limited service operation during preempt keeps traffic moving and provides right of way control
- Blank-out turn restriction signs prohibit turns towards the crossing during preemption
- Supervised two-way serial exchange of information between traffic signal and railroad equipment

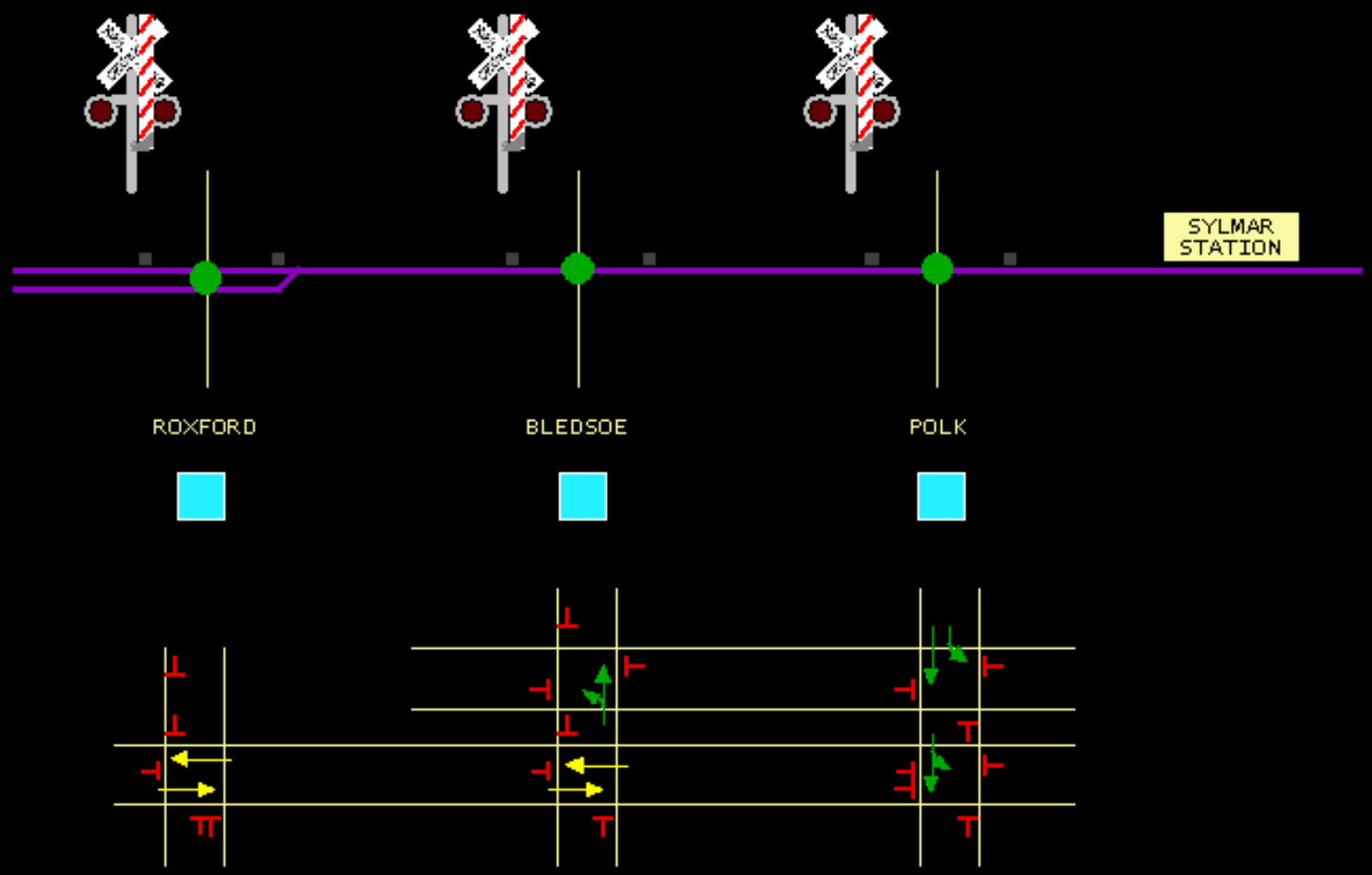
Preemption Turn Restrictions

Project ITS Enhancements



- IEEE 1570 communications allows for complete monitoring of crossing status from traffic control center
- Logging of all train move provides operational analysis of rail traffic
- Recording of traffic signal operation is used to verify proper preempt sequence by railroad maintainers

SAN FERNANDO ROAD CROSSING STATUS



Preemption Log File

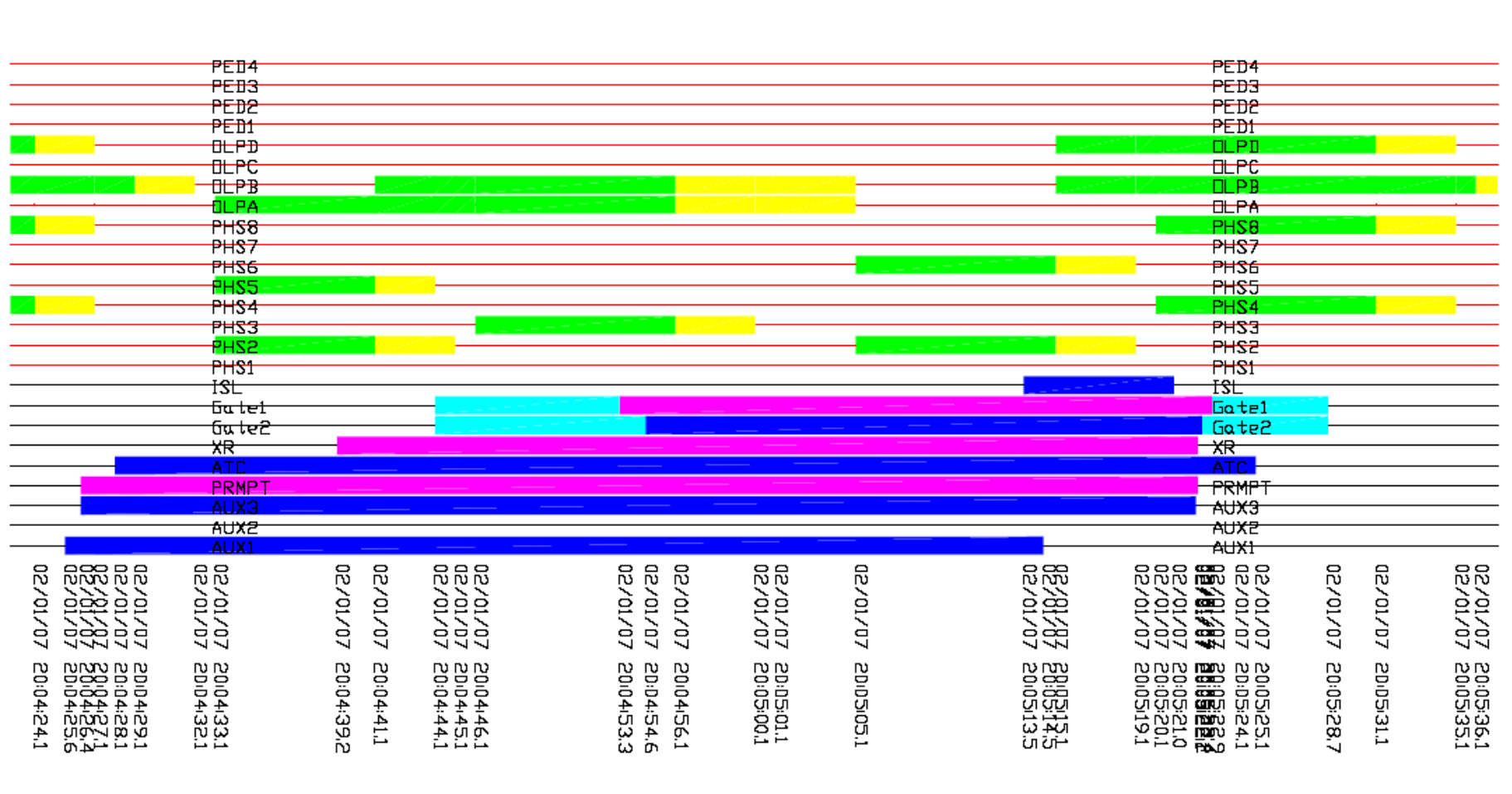
Provides data for each train move

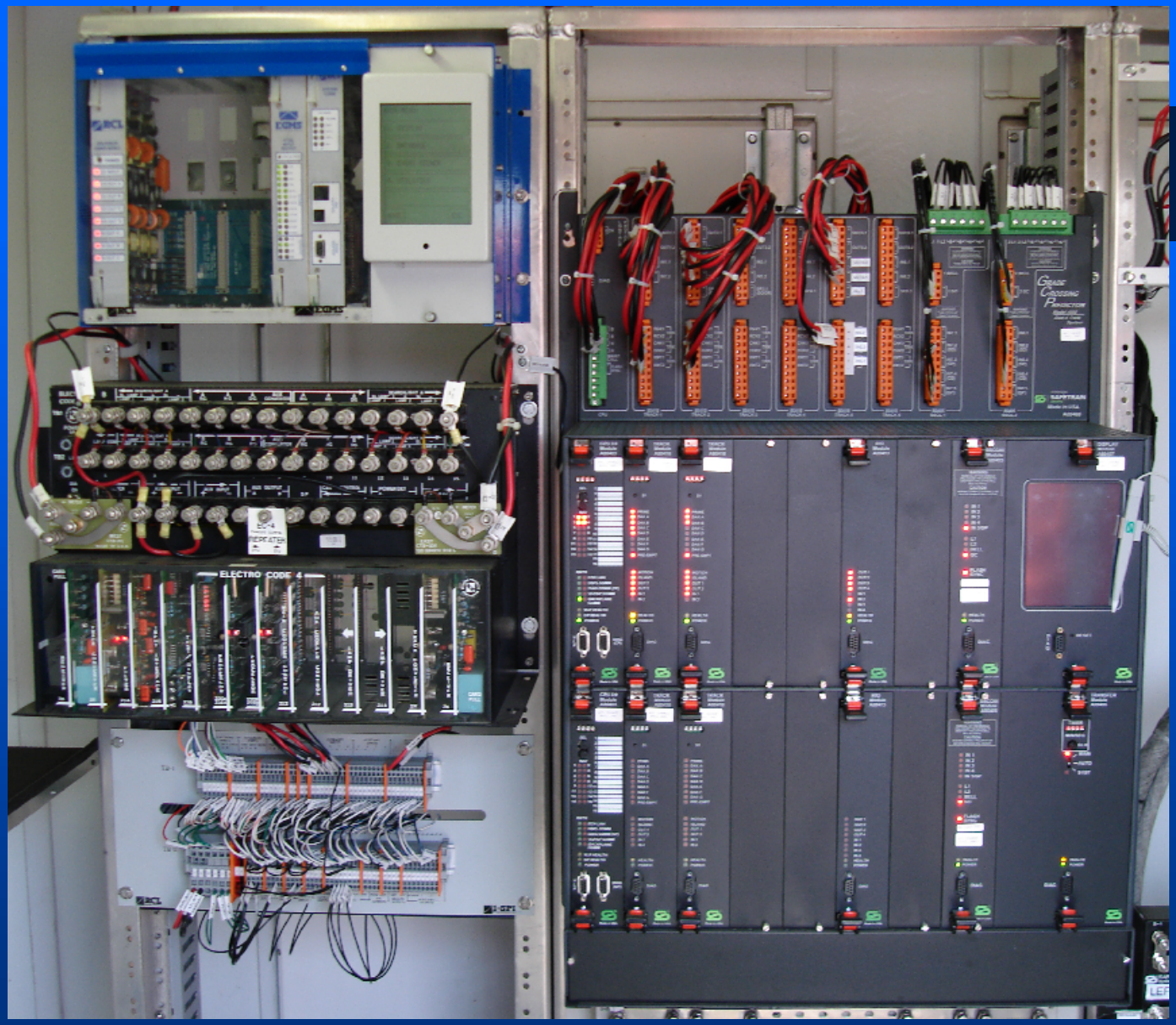
- **Advance Preempt**
- **Warning Time**
- **Island Occupancy**
- **Direction**

And a summary of all train moves

```
---------------------------------
12:53:14 Event = 9
Direction = E
PEA to WSA = 24 sec
WSA to TCO = 42 sec
TCO length = 8 sec
WSA length - 52 sec
---------------------------------
15:20:23 Event = 10
Direction = W
PEA to WSA = 24 sec
WSA to ICO = 40 sec
ICO length = 9 sec
WSA length - 53 sec
---------------------------------
16:52:00 Event = 11
Direction = E
PEA to WSA = 15 sec
WSA to ICO = 38 sec
ICO length = 8 sec
WSA length = 48 sec
---------------------------------
18:32:50 Event = 12
Direction = W
PEA to WSA = 19 sec
WSA to TCO = 41 sec
ICO length - 12 sec
WSA length - 55 sec
---------------------------------
20:48:59 Event = 13
Direction = W
PEA to WSA = 24 sec
WSA to ICO = 49 sec
ICO length - 79 sec
WSA length - 129 sec
=====================================================================
Direction:      -- Eastbound --     -- Westbound --     --- Unknown ---
Summary:        Min   Avg   Max     Min   Avg   Max     Min   Avg   Max
PEA to WSA       15    20    24      19    22    25       0     0     0
WSA to ICO       38    40    43      40    45    52       0     0     0
ICO length        8     9    12       8    31    94       0     0     0
Event Count            5                  7                  0
---------------------------------------------------------------------
PEA to WSA        0     0     0       0     0     0       0     0     0
WSA length        0     0     0       0     0     0       0     0     0
Event Count            0                  0                  0
---------------------------------------------------------------------
PEA length        0     0     0       1     1     1       0     0     0
Event Count            0                  1                  0
---------------------------------------------------------------------
```

Signal Operation During Preemption

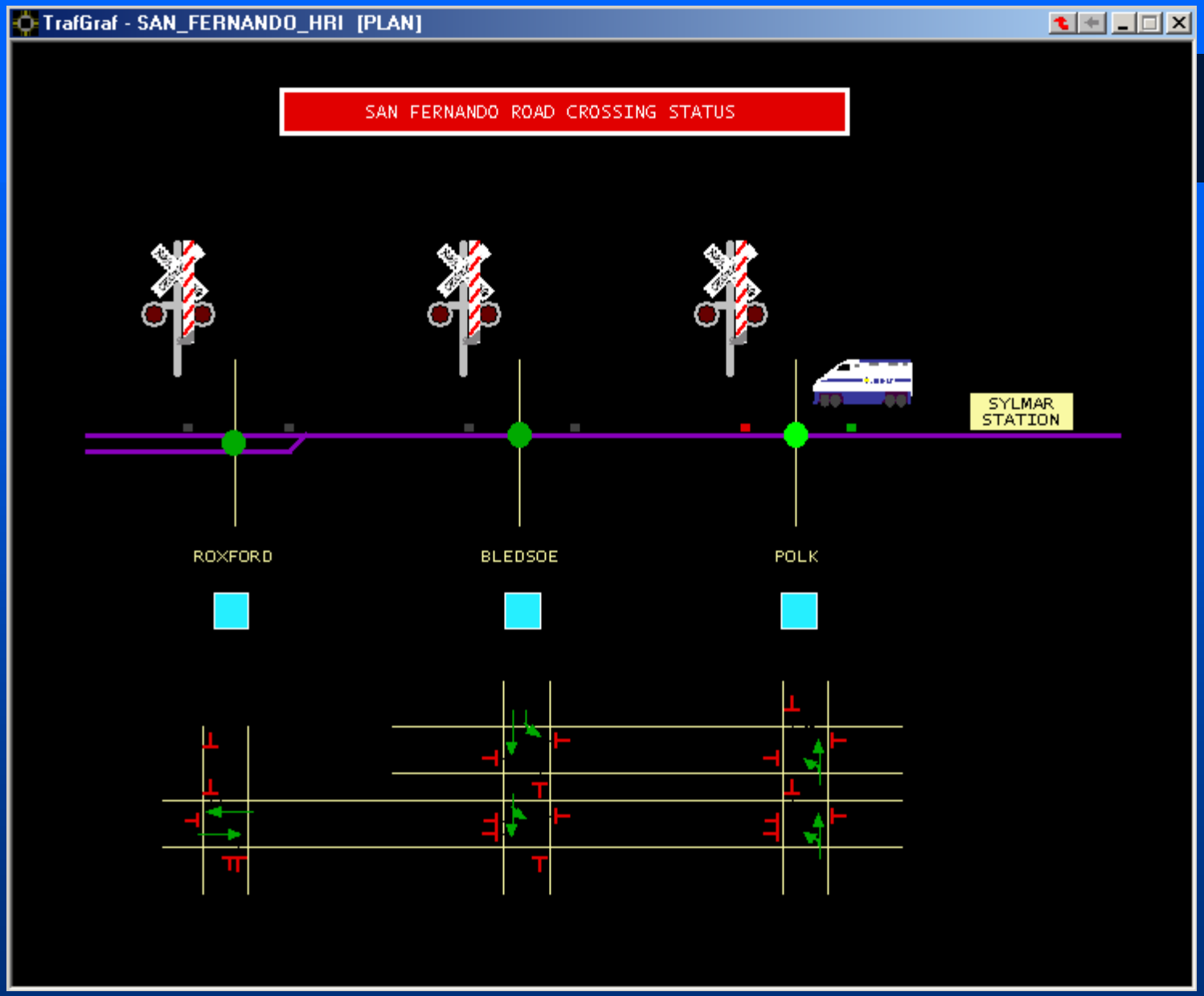


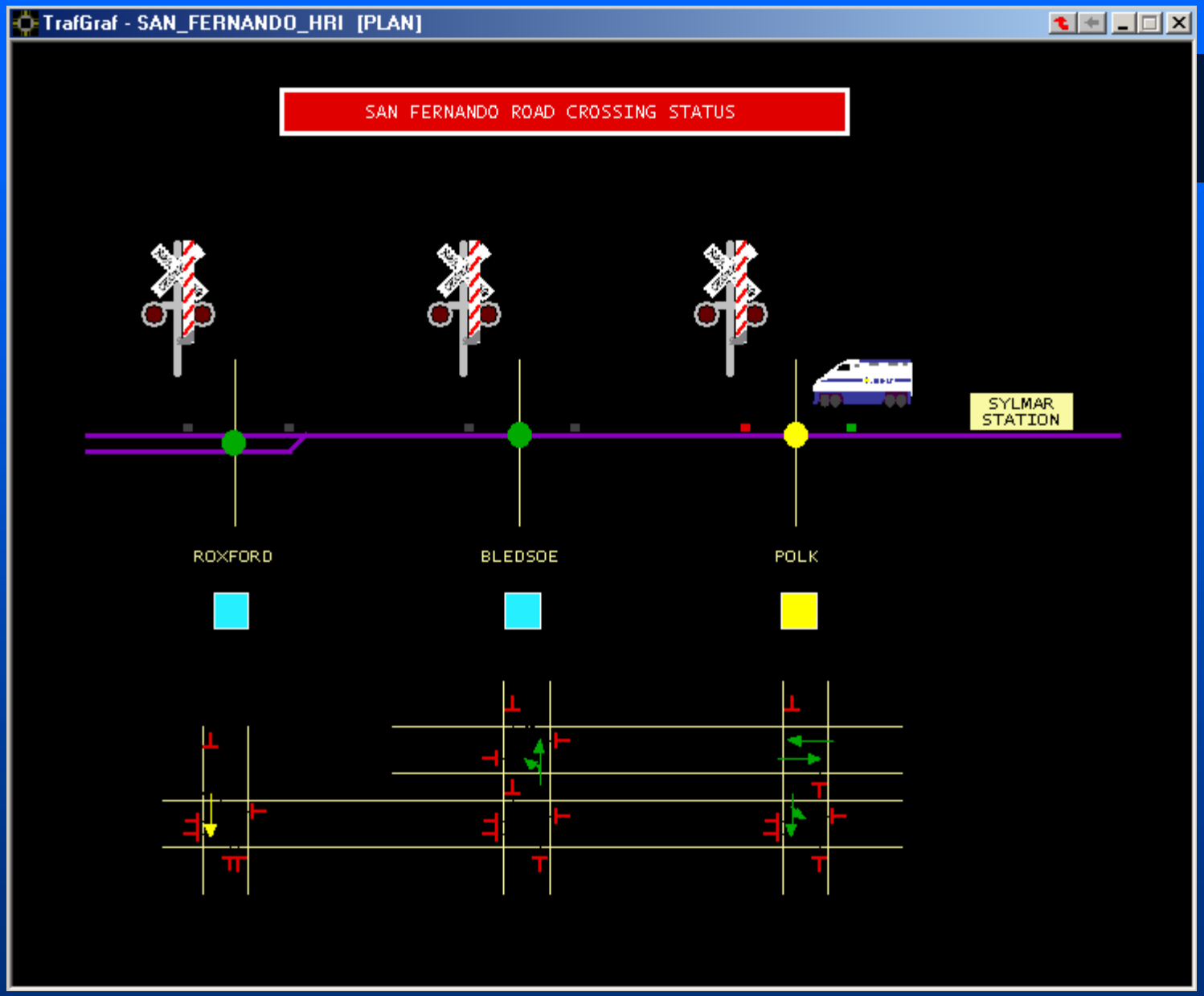


I-SPI & GCP 4000 Crossing Controller

Example Train Move

- Westbound train leaves station and proceeds through the three project crossings
- Pictures are screen captures from the traffic control system
- Railroad equipment status is sent to the traffic signal via the IEEE 1570 serial communication link


TrafGraf - SAN_FERNANDO_HRI [PLAN]
SAN FERNANDO ROAD CROSSING STATUS
SYLMAR STATION
ROXFORD
BLEDSOE
POLK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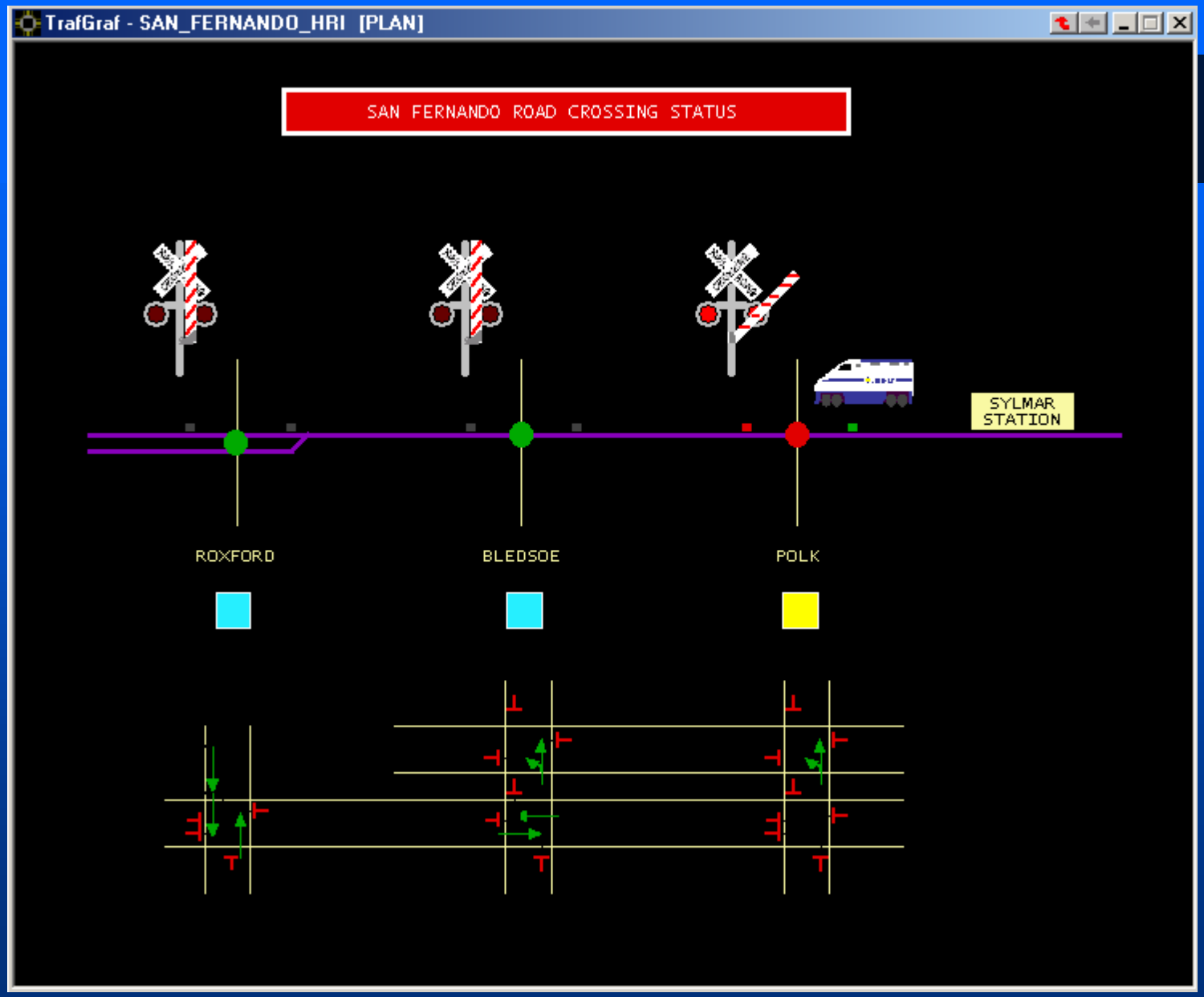
SYLMAR STATION
ROXFORD
BLEDSOE
POLK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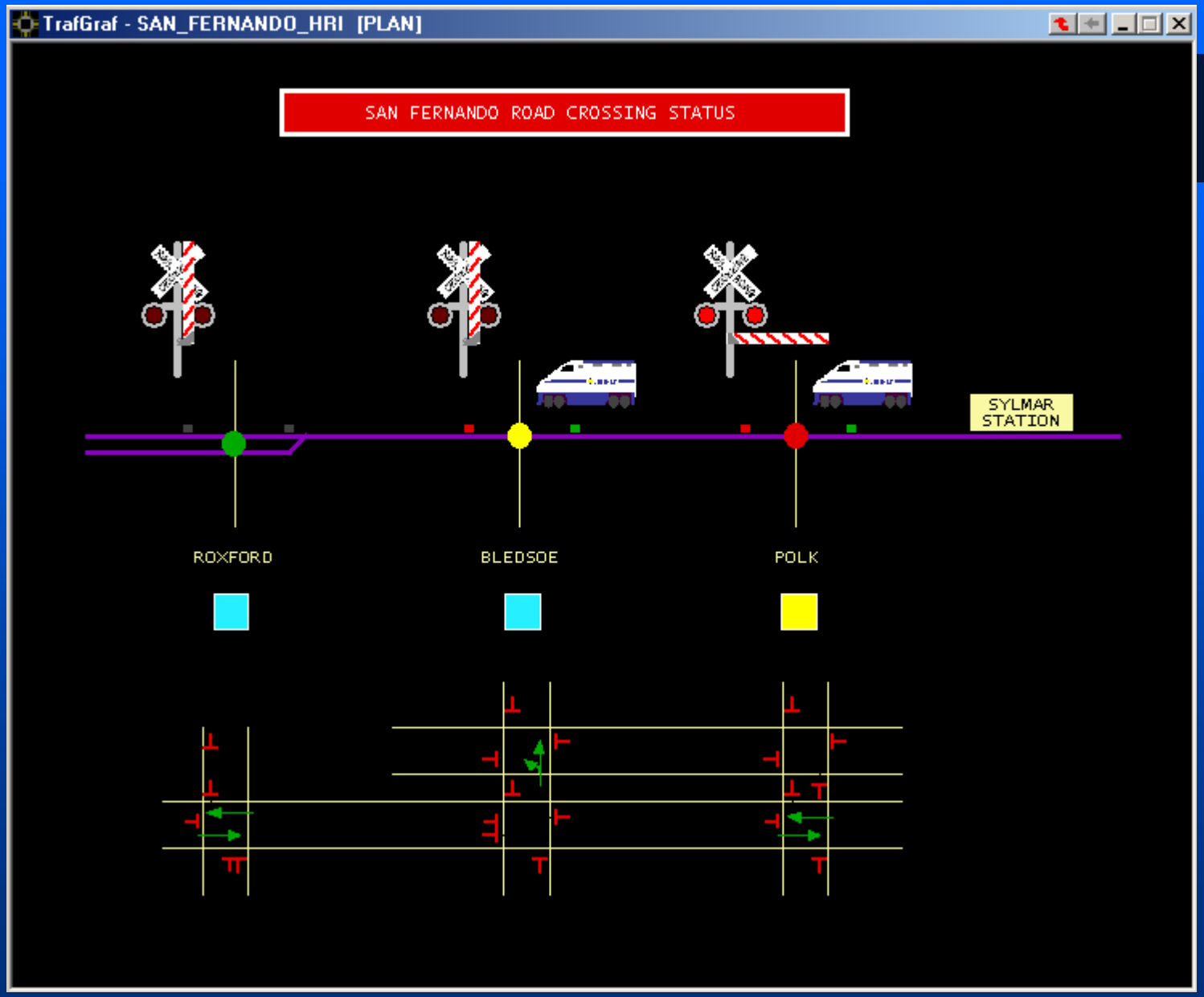
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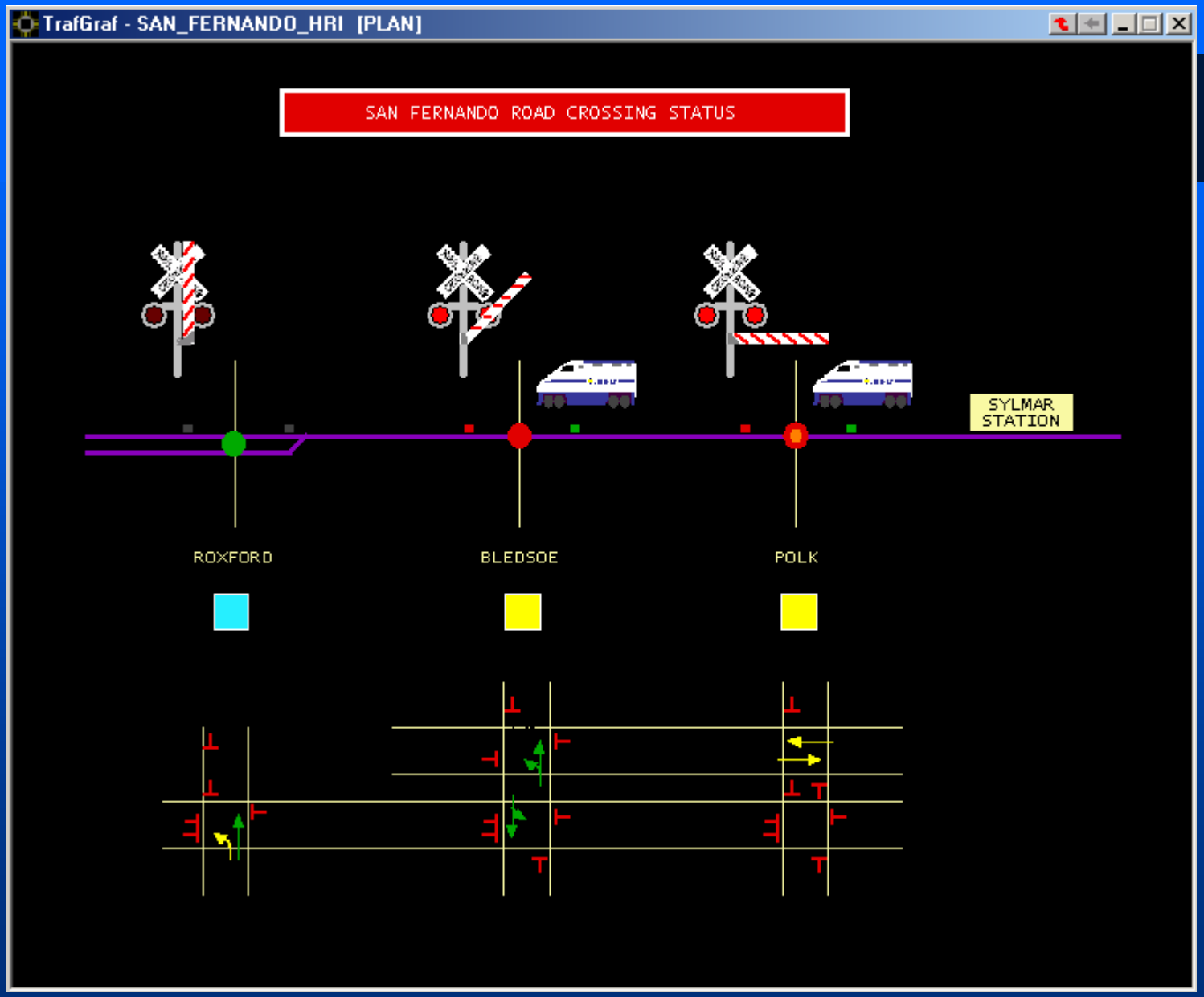
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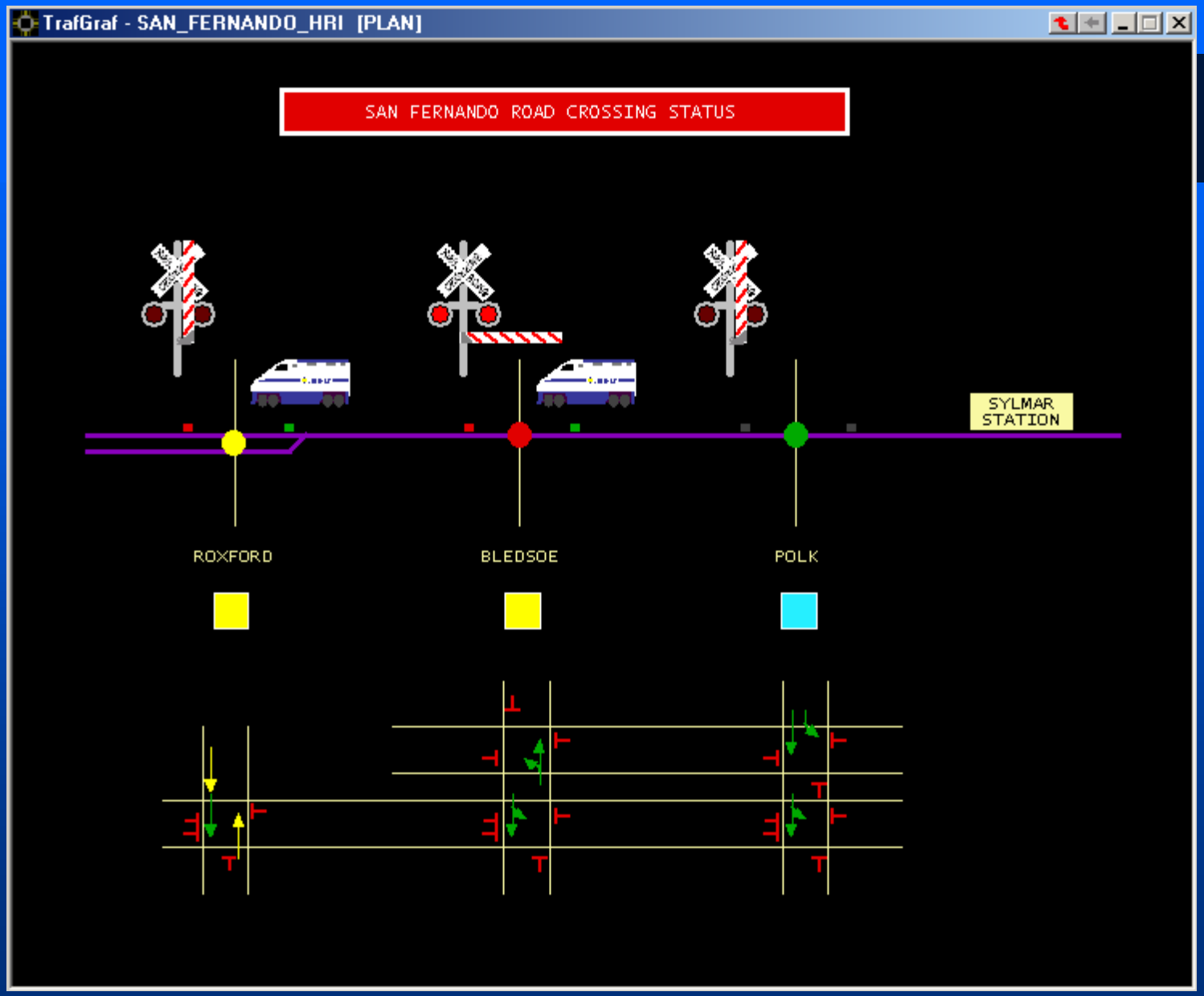
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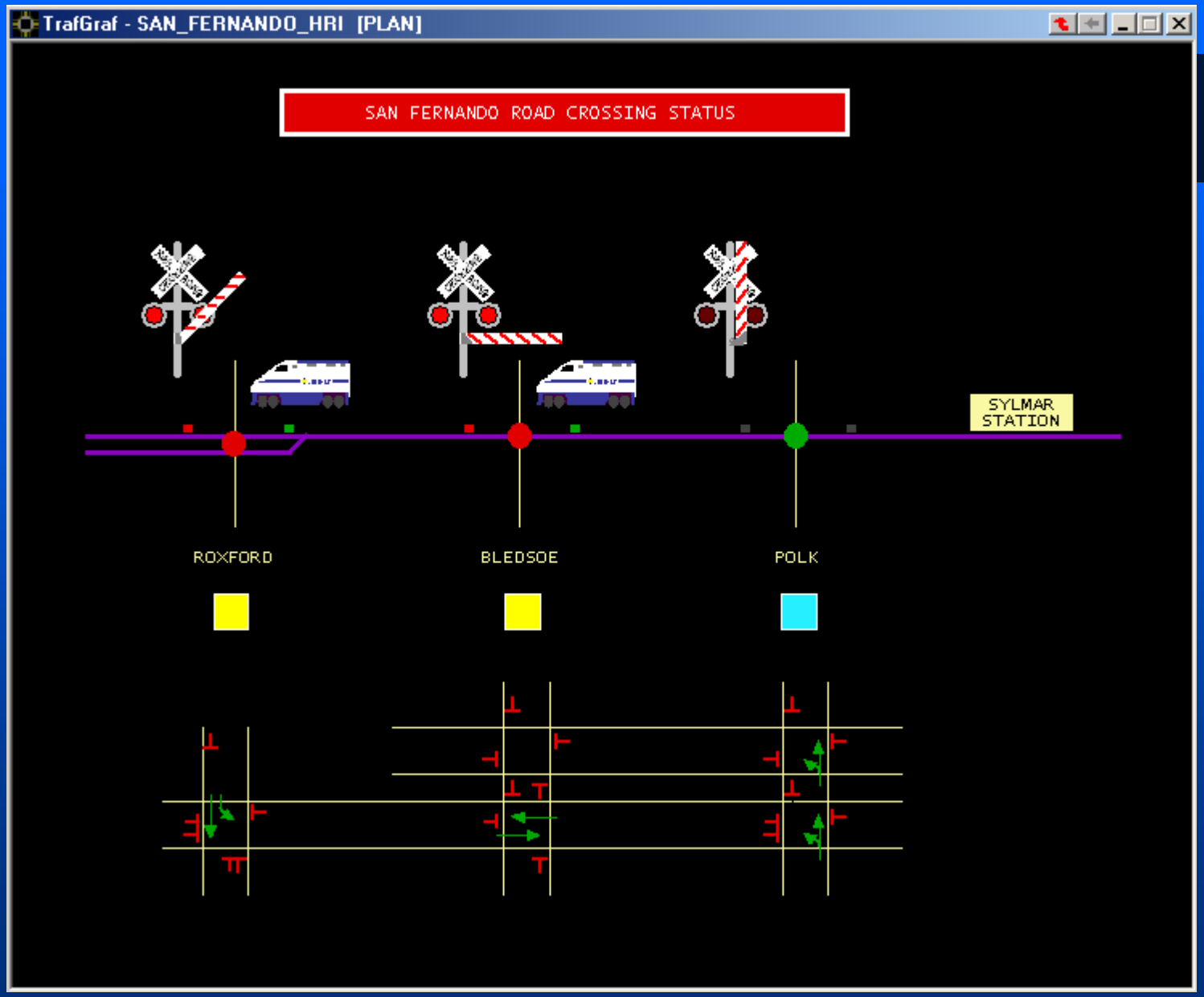
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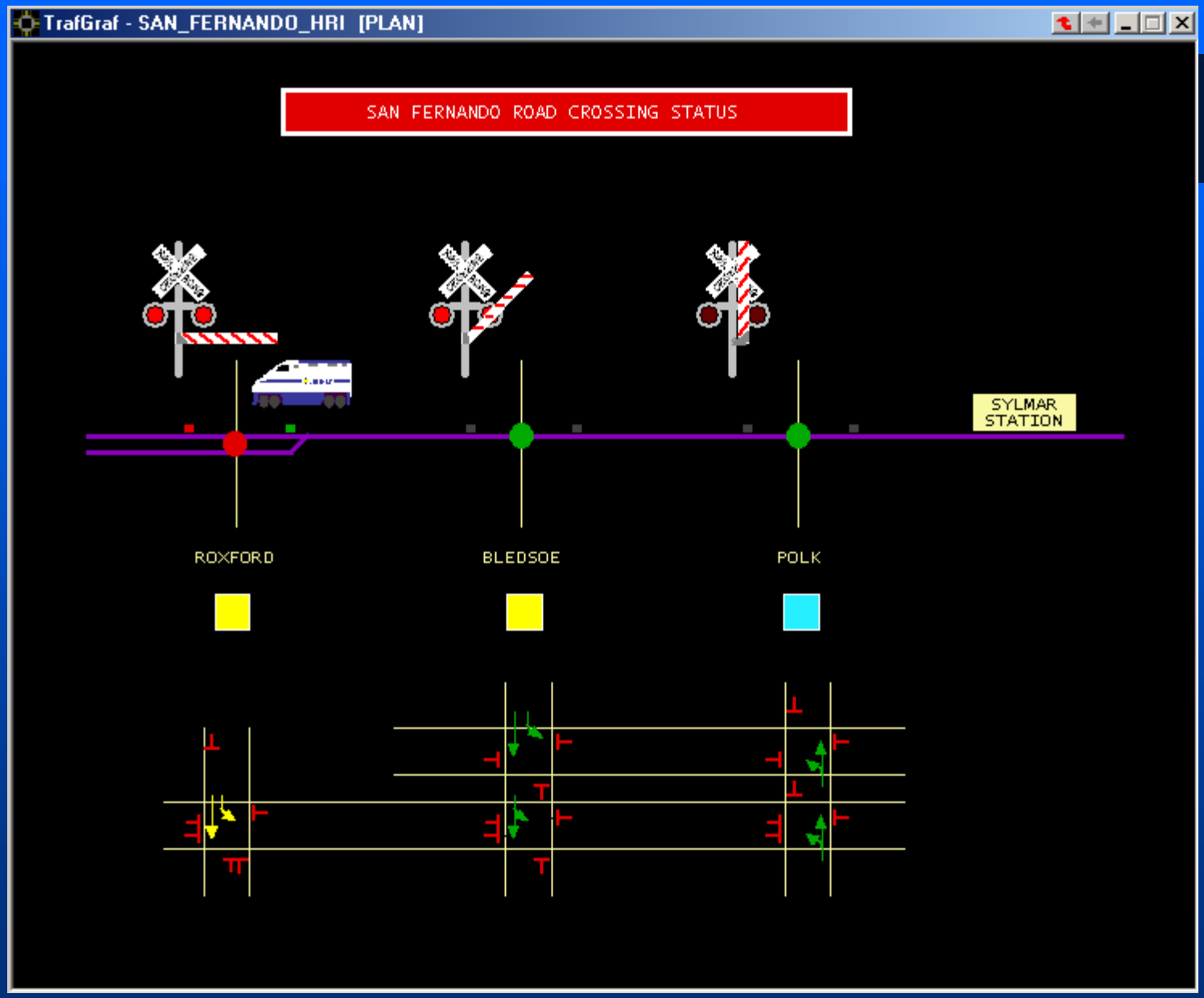
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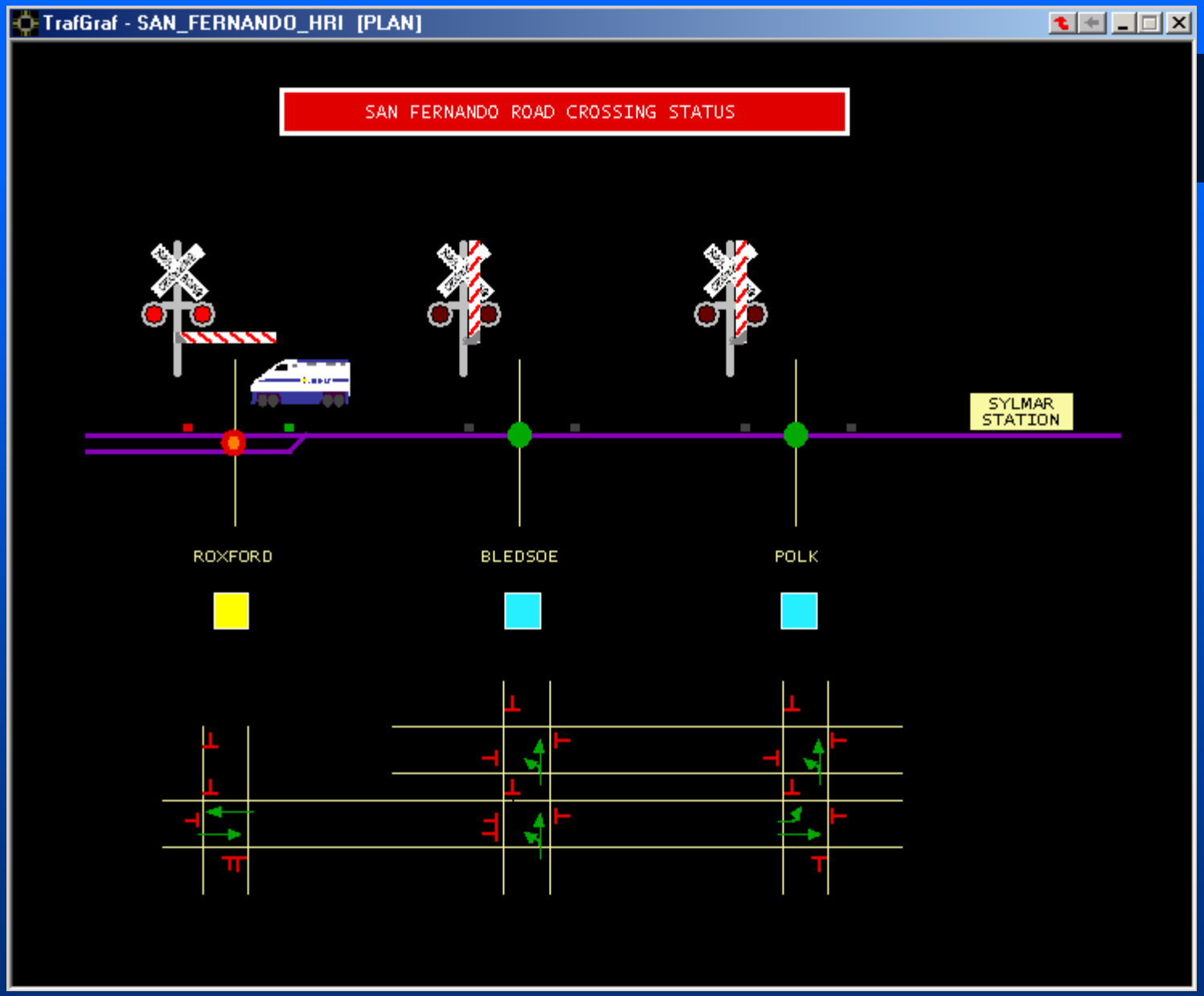
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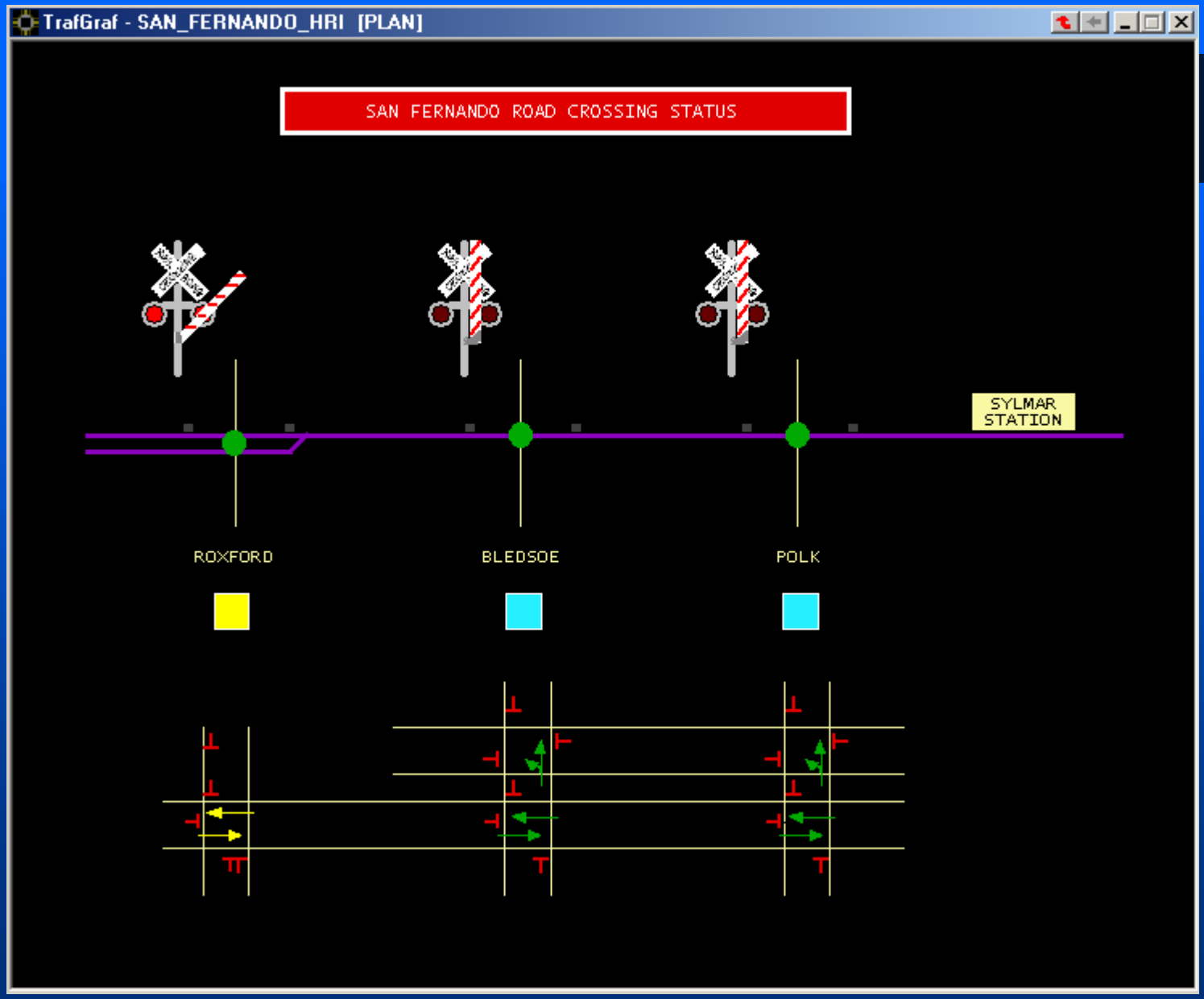
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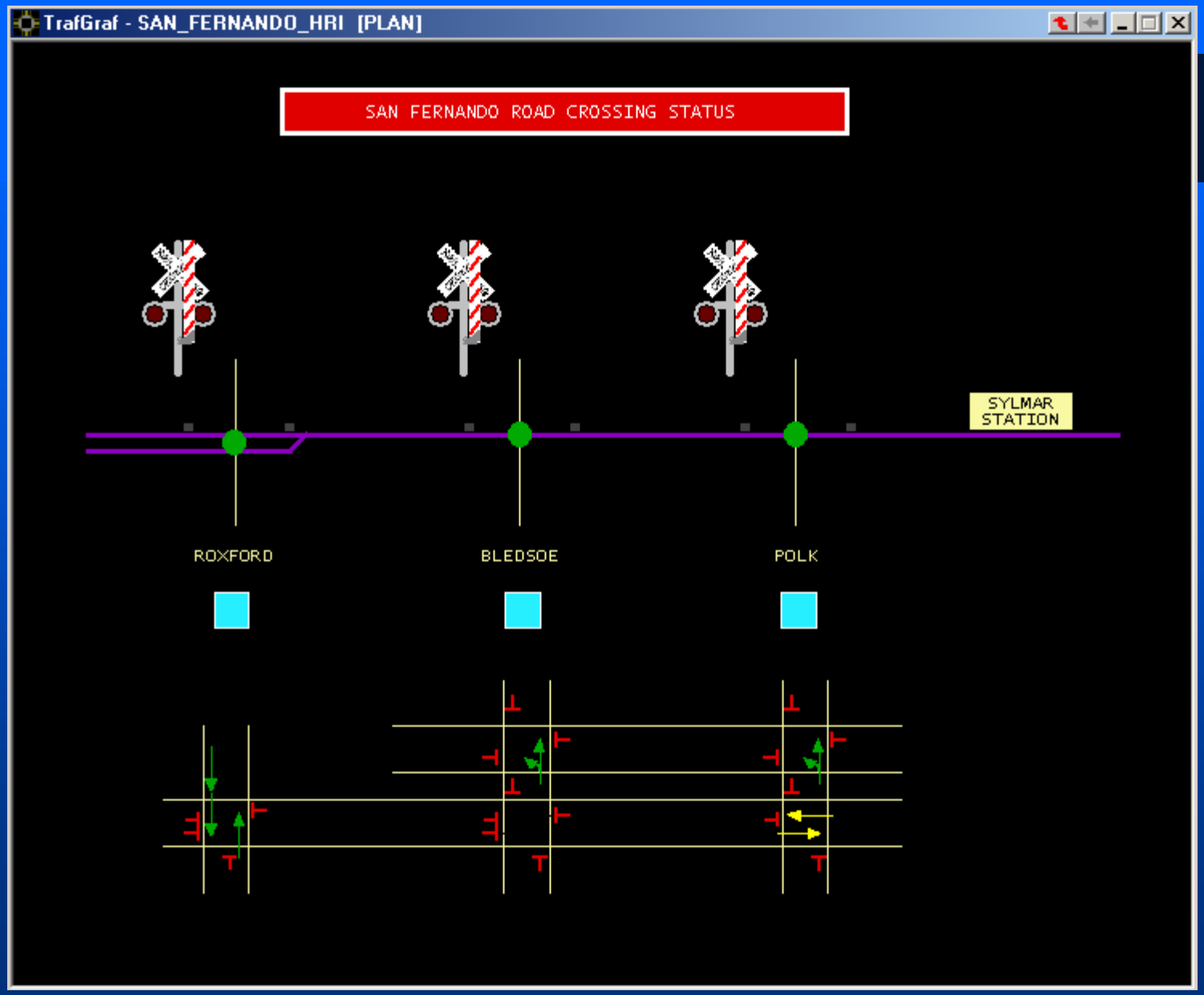
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