



ARIZONA DIVIDE WINSLOW-WILLIAMS



Milepost
Simulations

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Introduction

The route features the Atchison, Topeka & Santa Fe's mainline, the Seligman Subdivision from Winslow, Arizona to Williams Junction and a small portion of the Phoenix Subdivision from Williams Junction to Williams. The route crosses the Arizona Divide reaching an elevation of 7,322ft.

The route is set around 1993 in the final years of the Atchison, Topeka & Santa Fe before the merger to create the BNSF.

History

In 1859 the Atchison, Topeka & Santa Fe Railway (AT&SF) was founded by Cyrus Holliday to construct a railway from Atchison and Topeka in the eastern portion of the state of Kansas south west to Santa Fe in the state of New Mexico along the route of the Santa Fe Trail. Construction was delayed by the civil war eventually starting at Topeka in 1868 reaching La Junta, Colorado in February 1876.

Construction continued westwards over Raton and Glorieta Pass reaching Albuquerque in 1880. A branch left the mainline at Lamy to Santa Fe as it was decided the terrain was too difficult to put Santa Fe on the mainline. From Albuquerque the AT&SF originally headed south towards the Mexican border and a Mexican subsidiary built to the Pacific at Guaymas on the Gulf of California. Traffic on the Mexican subsidiary never developed as intended and was soon sold and the AT&SF turned its attention to California.

The St. Louis & San Francisco Railway (StL&SF) was building a railway from St Louis to San Francisco and this was seen as the best route for the AT&SF. In 1879 an agreement was reached where the StL&SF and AT&SF would jointly build and control a railway called the Atlantic and Pacific from Isleta, New Mexico (a junction on the AT&SF line south of Albuquerque) to Needles, California where it would meet the Southern Pacific (SP).

Construction started on the Atlantic and Pacific in 1880 across the deserts of New Mexico and Arizona reaching Winslow in 1882. Around 30 miles west of Winslow a large bridge had to build over Canyon Diablo. During 1882 construction continued westwards founding the towns of Flagstaff and Williams along the way. West of Flagstaff the line crossed the Arizona Divide at an elevation of 7,322ft the highest point on the Atlantic and Pacific Railway. Much of this line between Winslow and Williams was built on a 1.4% (1in70) grade.

In August 1883 the Atlantic and Pacific met the SP at Needles completing the transcontinental railway. The AT&SF soon gained control of the SP line to Needles and built lines to Los Angeles, San Diego and San Francisco. By 1887 through a series of acquisitions and new track the AT&SF had completed a line to the American railroad center of Chicago, which completed a line from Chicago to the multiple

points on the Pacific in California. During the Silver Panic of 1893 the AT&SF and the StL&SF both entered receivership. When the railways recovered the AT&SF took full control of the Atlantic and Pacific. The StL&SF never built their connection to meet the Atlantic and Pacific.

In 1901 Williams became a junction when the AT&SF constructed a line from Williams to the South Rim of the Grand Canyon.

In 1912 the AT&SF acquired the Santa Fe, Prescott and Phoenix Railway which had constructed a line from Ash Fork (around 20 miles west of Williams) to give the AT&SF a route into Phoenix.

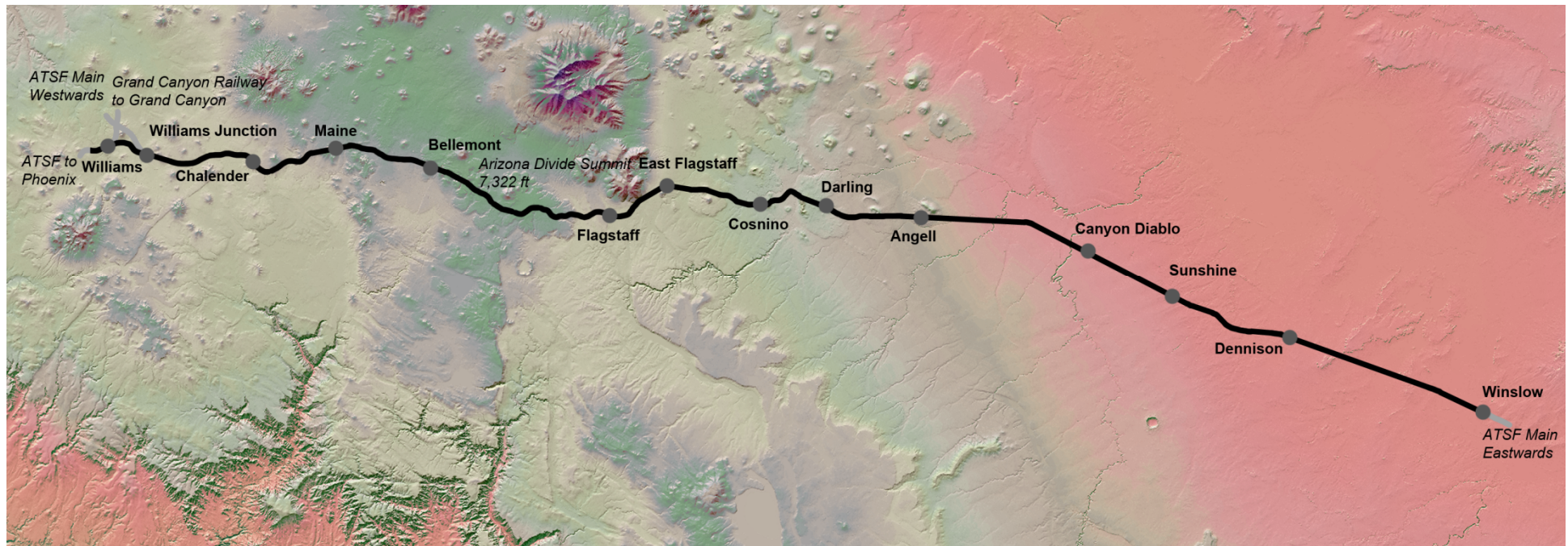
As heavy traffic continued to grow on the AT&SF many improvements to the transcontinental route were made including bypassing Raton Pass in 1907 with the Belen Cutoff. The entire route of the former Atlantic and Pacific was double tracked in 1923 apart from the two major bridges including the Canyon Diablo bridge which remained single until a new bridge was constructed in 1947.

In 1937 the AT&SF launched the "Super Chief" passenger train from Chicago to Los Angeles. This was the first diesel-powered, all-Pullman sleeping car train in America covering the 2,227 miles in 36 hours and 49 minutes averaging 60mph reaching speeds of 100mph in places. In 1971 Amtrak took over passenger operations from most railroads in the country and the train was renamed the Southwest Chief which still runs to this day.

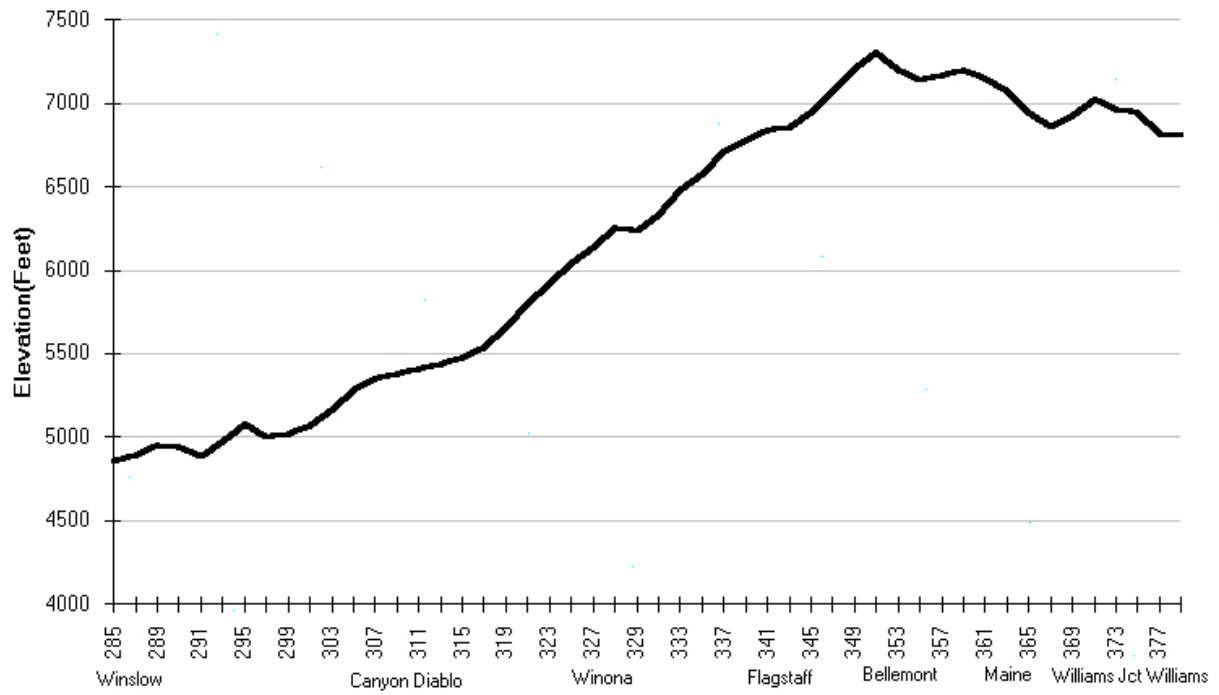
In August 1959 the AT&SF started construction of a new 44 mile route west from Williams Junction (around 4 miles east of Williams) to Crookton to avoid some of the steep grades and curves on this section. This new line was completed in December 1960 cutting Williams off the mainline. However the line from Williams Junction to Ash Fork through Williams remained in use for trains to Phoenix.

In 1996 the Burlington Northern merged with the AT&SF to form the Burlington Northern Santa Fe (BNSF). Traffic has continued to grow on the route making it the busiest transcontinental railway in the country. After a period of disuse the Grand Canyon Railway is now open again as a tourist railway taking people from Williams to the Grand Canyon.

Route Map



Elevation Profile



Locomotives

SD40-2



Introduced between 1972 and 1986, General Motors Electro-Motive Diesel (EMD) produced the SD40-2 as a 3,000 horsepower model as an upgrade from the SD40. Although not as powerful as some rival locomotives in the same Class, the SD40-2 features modular electronic control systems, making it significantly more reliable and economical than its competitors.

With over 4,000 units built for 29 Railroad companies, the SD40-2 is one of the best selling locomotives of all time. The British Class 59 is even derived from the processes and experience learned from the SD40-2.

The SD40-2 shares the same basic superstructure as the SD38-2 as it uses the same 16-645E3 engine (with turbo charging modifications). The Dash 2's (-2) also have longer front and rear 'porches' than other models, making for distinguishing features when comparing locomotives. Another alteration from previous designs is the three radiator grilles mounted on the roof, where previously there were only two.

The Santa Fe operated one of the largest fleets of SD40-2 locomotives with a total of 187 units.

Technical Data

Total Built: 4291

Weight: 177t

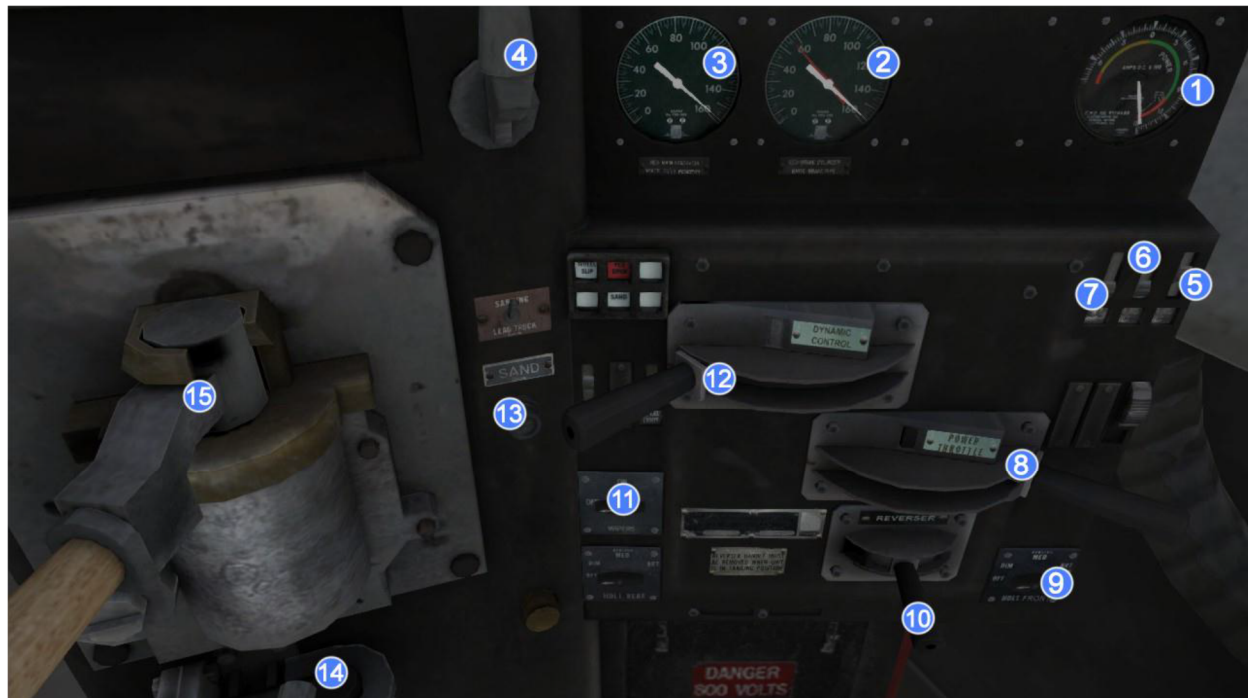
Length: 67'10" (20.73m)

Engine Power: 3,000Hp (2,240kW)

Max Speed: 65-82Mph (105-132Kph)

Fuel Capacity: 4,000gal (18,184L)

SD40-2 Cab Controls



| | | | |
|---|-------------------|----|---------------|
| 1 | Ammeter | 9 | Headlights |
| 2 | Cyl/Pipe Brake | 10 | Reverser |
| 3 | Main/EQ Reservoir | 11 | Wipers |
| 4 | Horn | 12 | Dynamic Brake |
| 5 | Step Light | 13 | Sander |
| 6 | Instrument Lights | 14 | IND Brake |
| 7 | Number Lights | 15 | Train Brake |
| 8 | Throttle | 16 | Cab Light |

F45



The EMD F45 is a Co-Co cowled diesel-electric locomotive built by General Motors Electro-Motive Division between 1968 and 1971. Power was provided by an EMD 645E3 20-cylinder engine which generated 3,600 hp (2,680 kW).

After sponsoring the development of the FP45 passenger locomotive, the Santa Fe requested a similar freight locomotive from Electro-Motive. Whereas the FP45 was an SDP45 wrapped in a full-width cowl carbody, the new F45 was essentially an SD45 given the same treatment. Where the Santa Fe requested a full-width carbody for aesthetics, the Great Northern saw an opportunity to protect crews from the dangers of winter operation in northern climates.

The Santa Fe operated one of the largest fleets of F45 locomotives having a total of 40 out of the 86 produced.

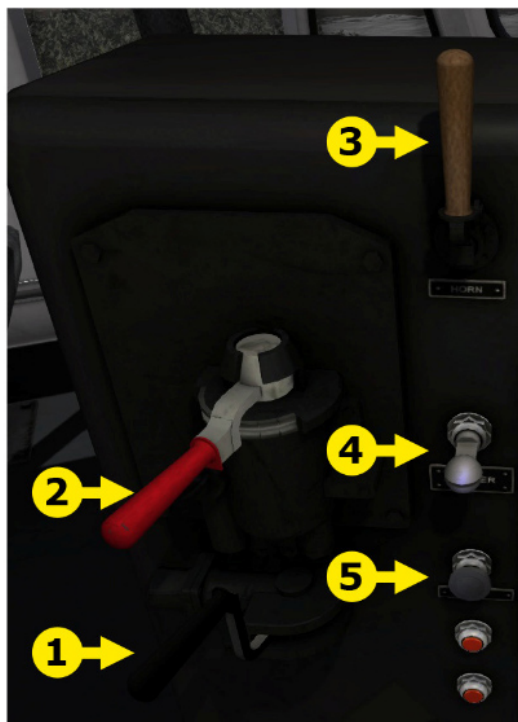
Technical Data

Total Built: 86

Engine Power: 3,600Hp (2,680kW)

Max Speed: 65-82Mph (105-132Kph)

F45 Cab Controls



- 1 | Independent brake
- 2 | Train brake
- 3 | Horn
- 4 | Sander
- 5 | Bell
- 6 | Dynamic brake
- 7 | Beacon Light

- 8 | Power handle
- 9 | Reverser
- 10 | Headlights
- 11 | Instrument lights
- 12 | Wipers
- 13 | Engine start/stop
- 14 | Cablight

B40-8W



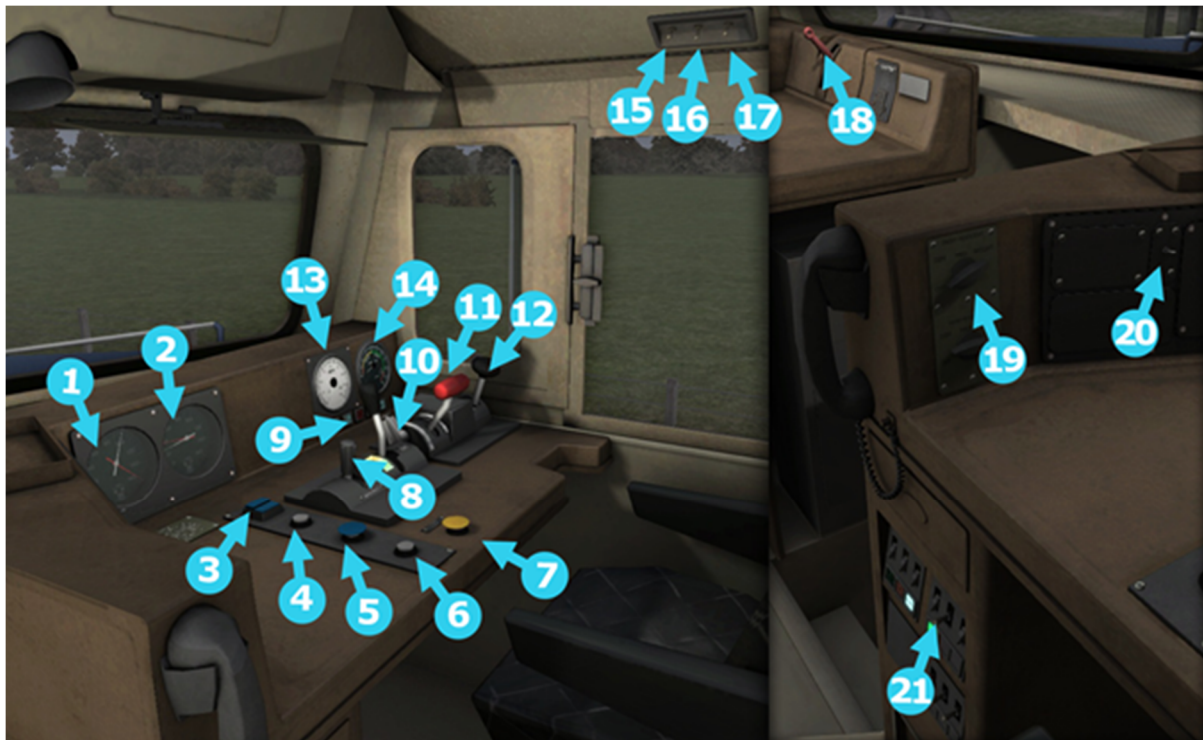
The Dash 8-40BW is a 4-axle diesel-electric locomotive built by GE Transportation Systems from 1990 to 1994. It was the only GE 4-axle GE with a wide cab. The Atchison, Topeka and Santa Fe Railway were the only customer to buy the locomotives. The locomotives were well suited to the fast intermodal trains operated by the ATSF.

Some of the locomotives have now been sold to other railroads but some have been retained by BNSF.

Technical Data

| | |
|---------------|----------------------|
| Total Built | 84 |
| Length | 60'0" (18.29m) |
| Engine Power | 4,000Hp (3,000kW) |
| Max Speed | 70mph (113Km/h) |
| Fuel Capacity | 3,050USgal (11,545L) |

B40-8W Cab Controls



| | | | |
|----|------------------------------------|----|---------------------|
| 1 | Main/EQ Reservoir | 12 | Independent Brake |
| 2 | Loco Brake Cylinder/Air Brake Pipe | 13 | Speedometer |
| 3 | Lead Axle Sand | 14 | Ammeter |
| 4 | Sander | 15 | Wiper Control |
| 5 | Horn | 16 | Cab light Control |
| 6 | Bell | 17 | Number board Lights |
| 7 | Acknowledge | 18 | Emergency Brake |
| 8 | Reverser | 19 | Headlights |
| 9 | Power Handle | 20 | Ditch Lights |
| 10 | Parking Brake | 21 | Dial Lights |
| 11 | Auto Brake | | |

Rolling Stock

Some of the rolling stock is in a variety of colours with different loads.

Box Car 50 Foot



Bulk Head Flat Car



Centerbeam Car



Low Gondola



Coil Steel Car



Hopper 2-Bay Cement Car



Hopper 3-Bay Car



Plain Double Door Box Car



Spine Car



Double Stack Car



Tank Car



Scenarios

The route includes career scenarios as well as being set up for Quick Drive starting at all significant places along the route. A selection of consists are available for quick drive. The route also includes a Free Roam scenario starting at Winslow.

Career Scenarios

Eastbound Manifest Part I

Locomotive: F45 Time: 60minutes Difficulty: Easy
Take train #757 Phoenix-Belen manifest from Williams to Flagstaff.

Phoenix Intermodal Part II

Locomotive: F45 Time: 80minutes Difficulty: Easy
Take train #757 Winslow-Phoenix manifest from Darling to Williams.

Loaded Grain Part I

Locomotive: SD40-2 Time: 85minutes Difficulty: Easy
Take a loaded grain train west from Winslow to Flagstaff.

Loaded Grain Part II

Locomotive: SD40-2 Time: 85 minutes Difficulty: Easy
Take a loaded grain train west from Flagstaff to Williams Junction.

Local Part I

Locomotive: SD40-2 Time: 75 minutes Difficulty: Medium
Take the local freight from Williams Junction to Flagstaff.

Local Part II

Locomotive: SD40-2 Time: 75 minutes Difficulty: Medium
Take the local freight from Flagstaff to Winslow.

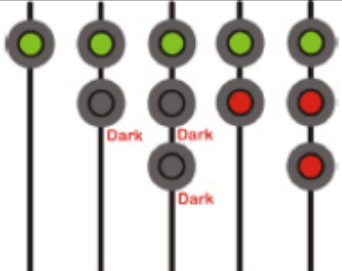
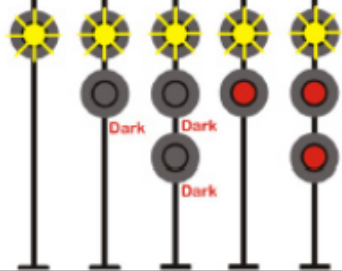
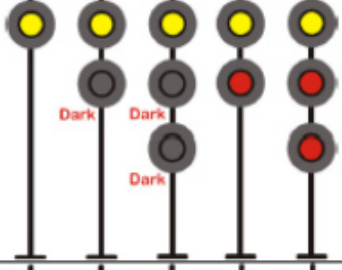
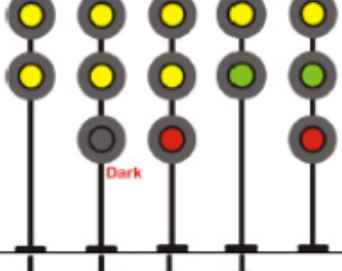
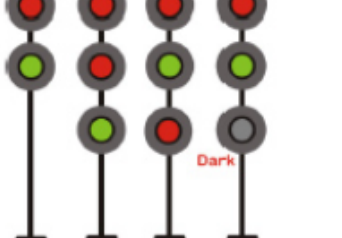
Phoenix Intermodal Part I

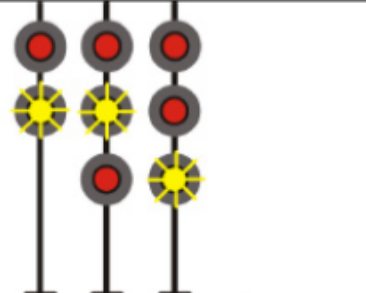
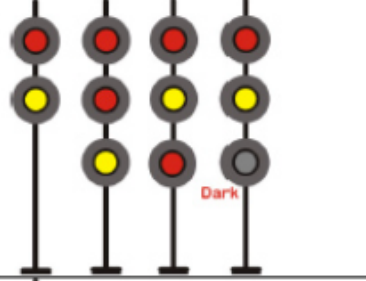


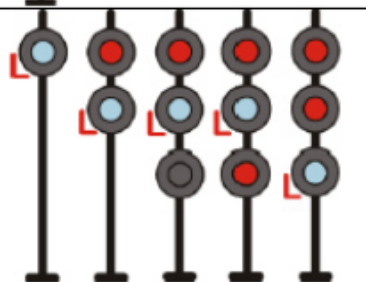
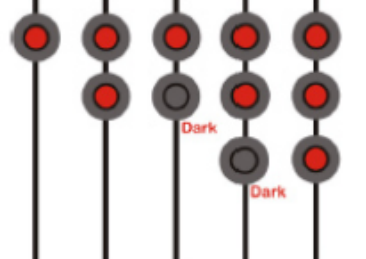
Locomotive: SD40-2 Time: 60 minutes Difficulty: Medium
Take train #787 Winslow-Phoenix from Winslow to Darling with a pickup at Canyon Diablo.

Phoenix Intermodal Part II

Locomotive: SD40-2 Time: 80 minutes Difficulty: Medium
Take train #757 Winslow-Phoenix from Darling to Williams.

Signals

| Signal Aspect | Description | Instruction to Driver |
|---|--------------------|---|
|  | Clear | Proceed, at the maximum allowed line speed. |
|  | Advance Approach | Proceed: be prepared to stop after the next signal. |
|  | Approach | Proceed: be prepared to stop at the next signal. |
|  | Approach Diverging | Proceed: be prepared to take a diverging track after the next signal. |
|  | Diverging Clear | Proceed on diverging track at prescribed speed for junction. |

| | | |
|---|------------------------------|---|
|  | Diverging Advance Approach | Proceed on diverging track at prescribed speed for junction. Be prepared to stop after the next signal. |
|  | Diverging Approach | Proceed on diverging track at prescribed speed for junction. Be prepared to stop at the next signal. |
|  | Diverging Approach Diverging | Proceed on diverging track at prescribed speed for junction. Be prepared to take a diverging track after the next signal. |
|  | Approach Restricting | Proceed: be prepared to pass next signal at restricted speed. |
|  | Restricting | Proceed at restricted speed. |
|  | Stop | Stop. |

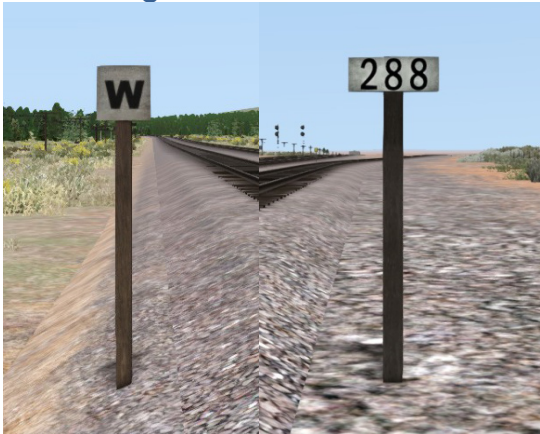
Signs

Speed Signs



The upper speed limit is for passenger and the lower speed limit is for freight. The green sign indicates end of speed restriction, 70mph for freight and 90mph for passenger

Other Signs



The left sign is a whistle post normally placed a quarter of a mile from a grade crossing. The right sign is a milepost indicating the mileage from the start of the former Atlantic and Pacific at Isleta, New Mexico.

Credits

Route created by Jonathan Lewis and Mike Durdan using some assets provided by Dovetail Games. Thanks goes to Simon Sauntson and David Walker at Dovetail Games for their help with the project and all beta testers.