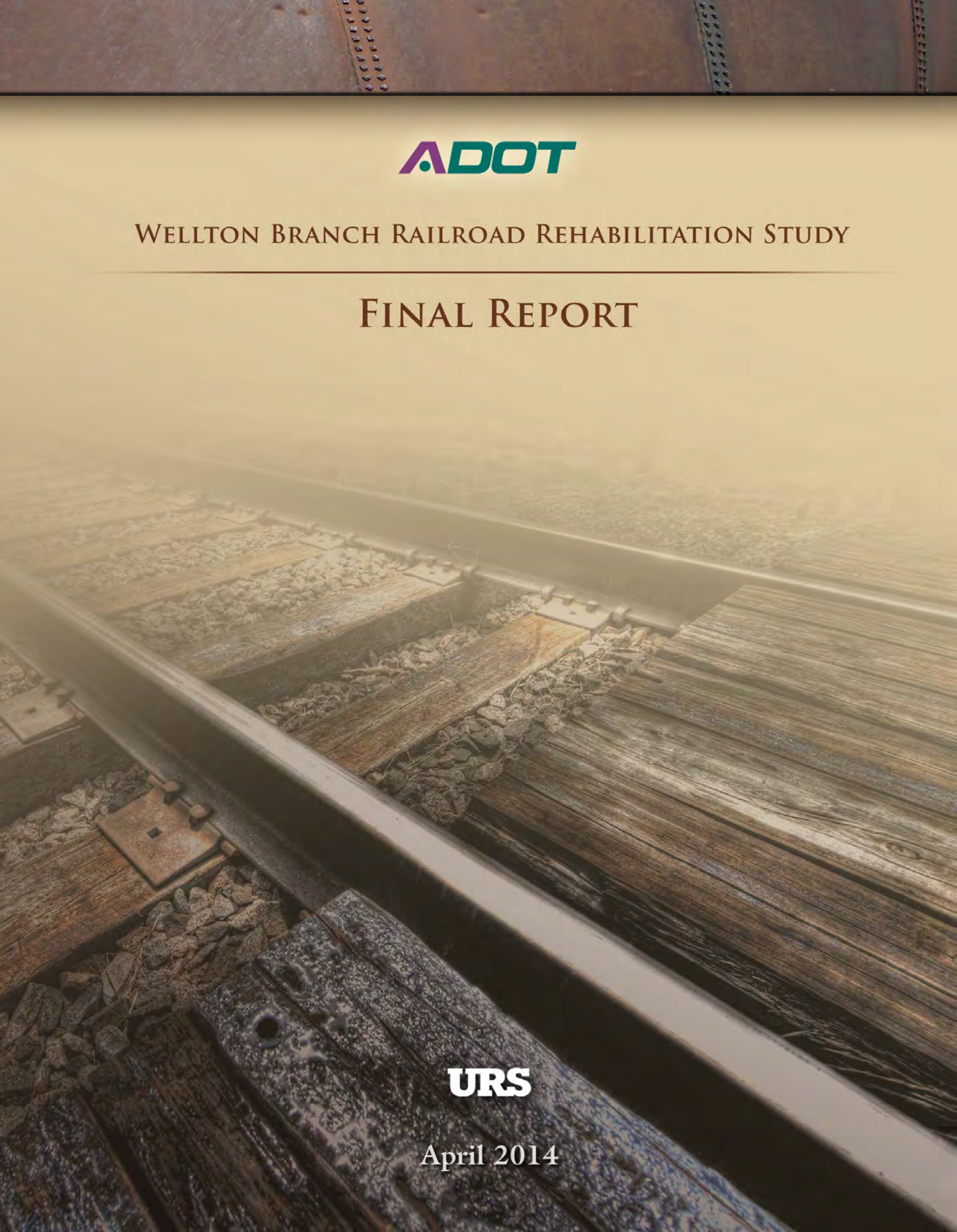

ADOT

Wellton Branch Railroad Rehabilitation Study

Final Report

URS

April 2014

Wellton Branch Railroad Rehabilitation Study

Final Report

Prepared for:

Arizona Department of Transportation

Prepared by:

URS

DATE: APRIL 2014

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1.0 INTRODUCTION

The Wellton Branch Railroad Rehabilitation Study was conducted in an effort to understand the existing conditions of the Union Pacific Railroad's (UPRR) Wellton Branch and to develop improvement scenarios and capital cost estimates for freight and passenger rail service between Arlington and Wellton, Arizona. The reestablishment of railroad service on the Wellton Branch would provide a direct rail connection from Los Angeles to Phoenix. This study was completed considering applicable Federal and State regulations including those established through the Federal Railroad Administration (FRA) as well as UPRR design standards and practices.

Established statewide goals identified in the State Rail Plan include examining the possibility of improving statewide connectivity that increases the support of economic development objectives. This study will help toward further understanding the viability of offering passenger rail service along existing rail corridors which is contingent upon the preservation of existing commercial freight corridors.

This Final Report for the Wellton Branch Railroad Rehabilitation Study summarizes the results and recommendations identified in each of the three Working Papers that were prepared throughout the course of the study. The three key Working Papers incorporated into this report are:

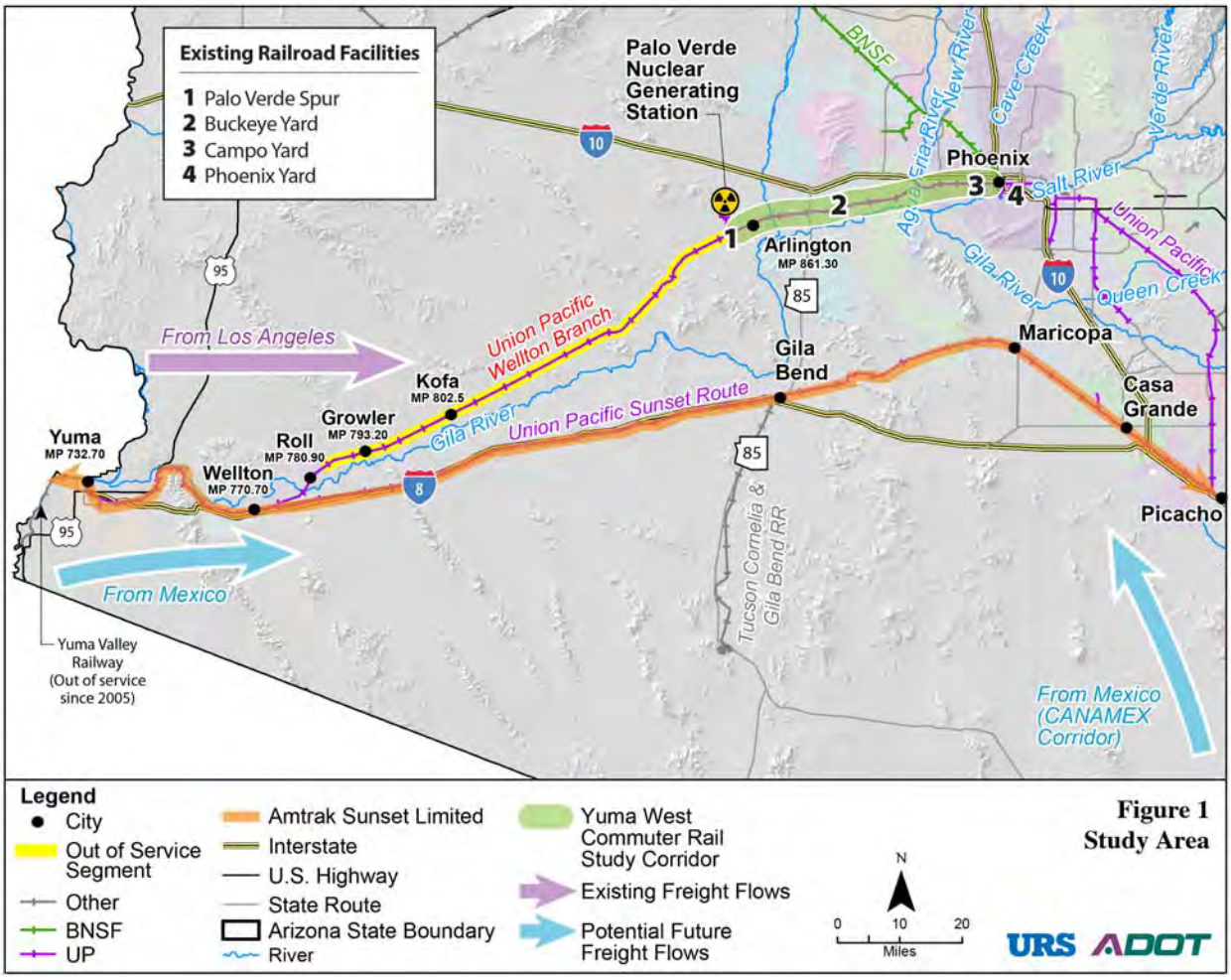
- Working Paper #1, Analysis of Existing Conditions
- Working Paper #2, Scenario Development Options
- Working Paper #3, Cost Analysis

It should be noted that the physical inventory of the Wellton Branch was conducted entirely from public right-of-way. This inventory was conducted in August, 2012. Additional information and details, such as the track charts for the Wellton Branch, were provided by the Arizona Department of Transportation (ADOT).

1.1 Background of the Wellton Branch

The Wellton Branch is a segment of the UPRR Phoenix Subdivision that extends between downtown Phoenix and Wellton, Arizona. The 45-mile portion between Phoenix and Arlington and the 11.6-mile portion between Roll and Wellton are currently the only portions of the branch still in service. The westernmost 11.6 miles from Roll to Wellton is part of a segment known as the Roll Industrial Lead. The purpose of this study was to analyze the existing conditions of the out of service portion of the Wellton Branch, develop scenarios under which service can be restored, and provide a cost estimate for those scenarios. The study area and study area characteristics identified for the Wellton Branch Railroad Rehabilitation Study are shown in Figure 1.

Figure 1 Study Area



2.0 EXISTING CONDITIONS

A total of 76.6 miles of the 90.8 miles between Wellton and Arlington were removed from service in 1997. The Automatic Block Signal (ABS) system, which helps to direct train movements, was abandoned in 2005 with FRA conditional approval.

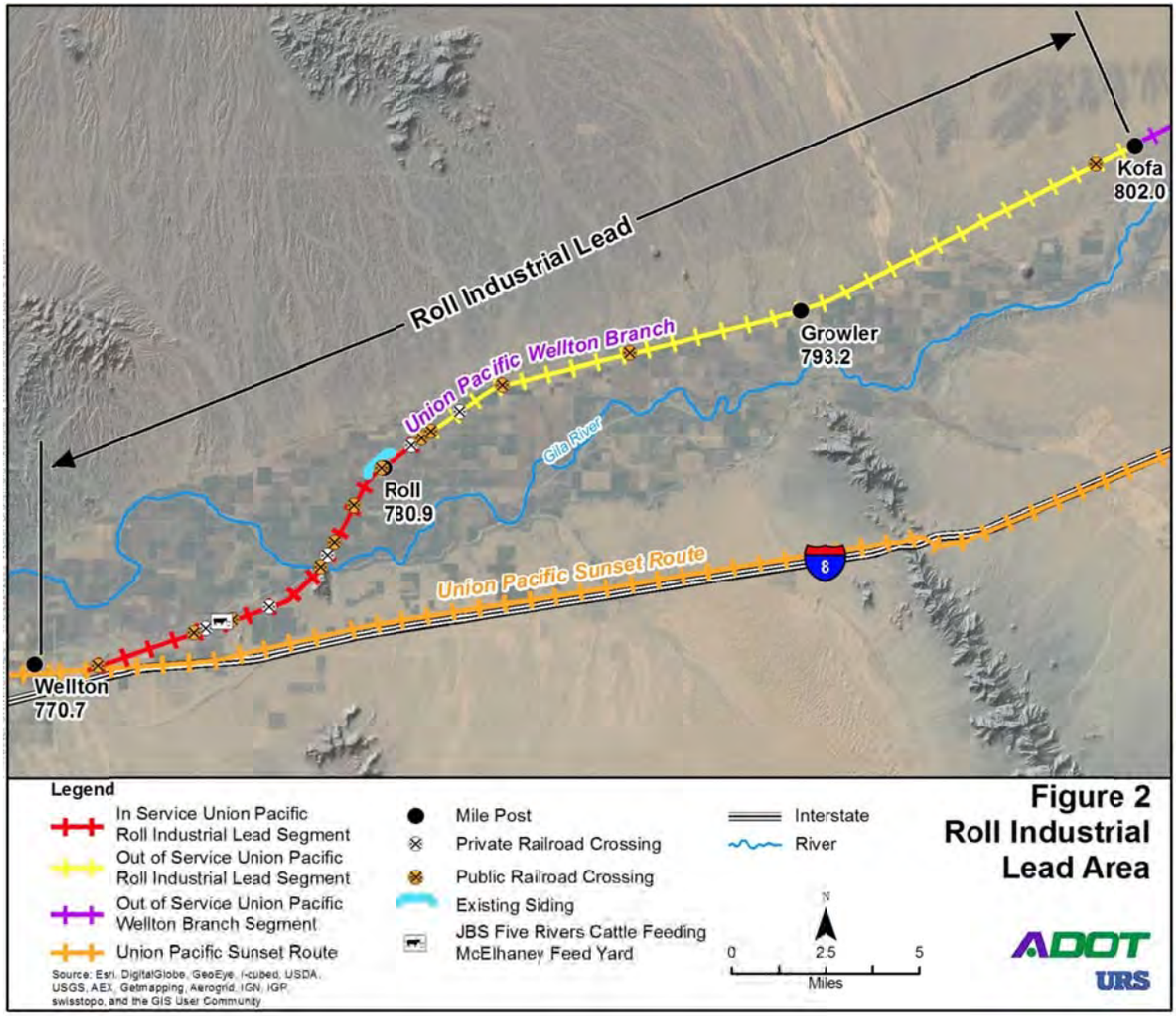
Traffic over the UPRR Gila Subdivision, or Sunset Route, currently consists of approximately 50 freight trains per day and the tri-weekly Amtrak Sunset Limited in each direction.

Exhibit 2 contains a summary of the physical features of the track, at-grade crossings, bridges, culverts, and other pertinent information for the entire length of the Wellton Branch. Exhibit 3 contains the ADOT crossing inventory, and Exhibit 4 contains a list of the bridges located throughout the study area. Study exhibits are located at the end of this report following Section 6.

2.1 Roll Industrial Lead

The Roll Industrial Lead extends eastward from a connection with the UPRR Gila Subdivision (also known as the Sunset Route) at Wellton, Milepost 770.70, to Kofa at Milepost 802.00, a distance of 31.3 miles. Only the first 11.6 miles of the Roll Industrial Lead are in service, leaving the remaining 19.7 miles out of service. At Kofa, the Roll Industrial Lead meets the Phoenix Subdivision and at this location both lines are out of service. With a maximum grade of 0.5%, the out of service portion of the Roll Industrial Lead includes one 3,453-foot siding and is being used to store freight cars. It was observed in the field visit conducted on August 1, 2012 that many of the stored cars were being removed. Figure 2 provides a detail of the Roll Industrial Lead.

Figure 2 Roll Industrial Lead



The track on the Roll Industrial Lead is considered FRA Class 2 track which allows a maximum speed of 25 miles per hour (mph) for freight trains and 30 mph for passenger trains. However, in the track charts, the current maximum operating speed over the Roll Industrial Lead is only 20 mph for all trains. At the time of the August 2012 field inspection, most of the ballast was fouled with sand, dirt, and other fines. The rail is mostly jointed 113# section and was rolled between 1942 and 1948. It is likely to be brittle and could break easily due to its age. While there was some end batter, the rail head contour was good with very little metal flow. The joint bars appeared to be in good condition and no broken joiners were seen during the field visit. Based upon the ties that could be seen, most of them were not holding spikes due to splitting and age or were broken at the tie plates or between the rails. There were also clusters of bad and poor ties. Tie plates were double shoulder type with cut spikes and rail anchors used at crossings.

There are 13 public crossings and 5 private crossings on the Roll Industrial Lead. The at-grade crossings had wood plank, asphalt, or gravel crossing surfaces and most would require rebuilding or replacement. Some public crossings were observed with active warning devices including lights, bells, and gates and others had passive cross-buck signs. Exhibit 3 contains a list from the ADOT Crossing Inventory of each at-grade crossing in the study area.

Of the bridges that could be seen from public right-of-way, most appeared to be in fair to good condition and capable of accommodating at least 286,000 pound gross freight car weights when in the line was in operation. There are 23 bridges totaling 3,414 linear feet of length on the Roll Industrial Lead according to the UPRR Track Charts. All of the bridges are ballasted deck and many have timber stringers while a few are timber trestles.

Photo 1 is of the timber trestle bridge at the west end of the JBS Five Rivers Cattle Feeding – McElhaney Feed Yard. There is also a 12 span steel truss bridge that crosses the Gila River and is 1,836 feet in length. Many of the bridges had a considerable amount of vegetation piled against them. There are also 11 culverts ranging from 30-inch to 54-inch diameter along the Roll Industrial Lead. The condition of the culverts is unknown.

2.2 Wellton Branch: Western Portion of the Phoenix Line

This portion of the Wellton Branch is part of the Phoenix Subdivision that extends between Kofa, Milepost 802.00, to a point just west of the Palo Verde Nuclear Generating Station at Milepost 858.85, a distance of approximately 56.9 miles. This entire section plus 19.7 miles of the Roll Industrial Lead total some 76.6 miles of track that is currently out of service. There are two sidings on the Wellton Branch. One at Hyder, Milepost 822.30 that is 3,688 feet in length and a 3,661-foot long spur at Gillespie, Milepost 851.1. The maximum grade on this portion of the Wellton Branch is 1.0% in each direction between Milepost 843 and Milepost 849 which are west of Gillespie. All other sections of this portion of the Phoenix Line are less than 1% grade.

The track on the Wellton Branch was operated as FRA Class 3 track which allows a maximum speed of 40 mph for freight trains and 60 mph for passenger trains. The maximum operating speed for all trains operating along this portion of the Wellton Branch was 40 mph before it was removed from service. At the time of the August 2012 field inspection, most of the ballast was fouled with sand, dirt, and other fines. The observed rail was mostly jointed 113# section rolled between 1942 and 1949. While there was some end batter, the rail head contour was good with very little metal flow. The joint bars appeared to be in good condition and no broken joiners were seen. Based upon the ties that could be seen, most of them were not holding spikes due to splitting and age or were broken at the tie plates or between the rails. There were also clusters of bad and poor ties. Tie plates were double shoulder type with cut spikes and rail anchors used at crossings.

There are 10 public crossings and 6 private crossings in this segment of the Wellton Branch. The at-grade crossings had wood plank, asphalt, or gravel crossing surfaces and most would require rebuilding or replacement. Some public crossings were observed with active warning devices with lights, bells, and gates and others had passive cross-buck signs. Photo 2 is of the private crossing at Milepost 813.30. Exhibit 3 contains a list from the ADOT Crossing Inventory of each at-grade crossing in the study area.

Photo 3: Washout at Milepost 842.75 (Photo provided by UPRR)

Most of the bridges that could be seen from public right-of-way appeared to be in fair to good condition. There are 129 bridges totaling 9,938 linear feet of length on this portion of the Wellton Branch according to the UPRR Track Charts. Most of the bridges have timber stringers and some have concrete abutments. Five of the bridges are deck plate girder bridges. Many of the observed bridges also had a considerable amount of vegetation piled against them. As shown in Photo 3, one bridge at Milepost 842.75 experienced a washout. There is also one 48-inch corrugated metal pipe culvert on the line. The condition of the culvert is unknown.

The level of rehabilitation required for the infrastructure of the Wellton Branch is dependent on the class of track desired for railroad operations and those scenarios are discussed in greater detail in Chapter 3 of this report.

2.3 Phoenix Line

The Phoenix Line is the in-service portion of UPRR Phoenix Subdivision located between Picacho and Arlington, Arizona. The 2.6 miles of track between the beginning of the out of service section of track at Milepost 858.85 and Arlington at Milepost 861.30 is active and serves the Palo Verde Nuclear Generating Station located at Milepost 859.30. The track is FRA Class 3 with a maximum operating speed of 40 mph for all trains. The maximum grade over this segment is 0.5%.

There is one private at-grade crossing with an asphalt surface. There are 2 bridges with timber stringers that total 75 feet in length. The track is jointed and was in good condition at the time of the August 2012 field visit. The rail is 113# rolled in 1949 but one area at the west end of Arlington siding has 112# rail that was rolled in 1936. Arlington siding is 3,628 feet in length.

The track between Arlington and downtown Phoenix was the subject of the MAG Yuma West Corridor Study conducted in 2009 and early 2010.

2.4 Summary of Features

Based on field reconnaissance, conducted from public right-of-way and considering the desert environment, the following conclusions were made relative to the existing condition of the both the Roll Industrial Lead and the Wellton Branch.

2.4.1 Track

The existing condition of the ballast, rail, and ties warrants replacement if these sections of track are to be operated in the future. The level of upgrades necessary will be dependent upon which Class of track are recommended. Depending on alternative recommendations improvements would include rail replacement, tie replacement, ballast cleaning/ replacement, and siding rebuilding and/or extension to accommodate longer freight trains in the future.

The siding at JBS Five Rivers Cattle Feeding – McElhaney Feed Yard is too short in its current condition to accommodate unit train lengths of 125 cars as proposed by the cattle ranch and UPRR. The siding would need to be extended to accommodate the increased freight train length. Industry users with railroad facilities that accommodate a unit train can qualify for lower shipping rates and typically the industry pays for the expansion, however the situation is handled on a case by case basis by the railroad. Future improvements will need to consider "cutting the crossing" (uncoupling the cars so the crossing would not be blocked) when 125-car trains are being unloaded.

2.4.2 Railroad Signal System

The automatic block signal system was abandoned in 2005 with FRA conditional approval. Depending on traffic volumes, commodities handled, and FRA requirements, Centralized Traffic Control (CTC), Positive Train Control (PTC), or Track Warrant Control (TWC) may be necessary. CTC allows a Dispatcher to control switches and signals from a remote location. Train crews must obey the Dispatchers' instructions and signals. PTC is similar to CTC except that if a train passes a red signal, it is automatically stopped. TWC is a method of a Dispatcher giving verbal instructions over the train radio. The crew repeats the verbal instructions and then follows them.

2.4.3 At-Grade Crossings

Based on field reconnaissance conducted from public right-of-way, all of the at-grade crossings would need to be replaced with the latest technology including new lights/bells/ gates (active warning devices) and constant warning predictors. The existing technology at these crossings does not meet current design standards. Crossings with cross-bucks may require lights/bells/gates or new crossbucks and road signs (passive warning devices)

depending upon train and automobile traffic volumes. All of the crossing surfaces would also require concrete panels rather than the current wood plank or asphalt.

2.4.4 Bridges

Assuming that no recent bridge inspection reports are available, all of the bridges will need to be inspected in accordance with 49 CFR Part 237, Bridge Safety Standards. Some bridges may only require safety walkways and handrails while others may also require some timber repair or replacement. A few bridges may require more extensive work such as the replacement of some of the piles. Any bridges with vegetation or other debris piled against them should have the vegetation removed. Photo 4 is a typical timber bridge along the Phoenix Line. Some cosmetic repair is required as well as the addition of safety walkways and handrails.

A more thorough field investigation/inspection of the bridges was not completed prior to issuance of this report, but should be conducted at a later date in order to further refine the bridge cost estimates.

2.4.5 Culverts

Given that all of the culverts are either concrete pipe or corrugated metal pipe, no repairs would likely be necessary but any vegetation or other blockage should be removed. Further inspection is needed to determine if any improvements are necessary.

3.0 ALTERNATIVE SCENARIOS

In order to restore train service to the Wellton Branch, alternatives were developed and evaluated. The range of alternatives considered in this study included both freight rail only and freight rail plus passenger rail options. The necessary rail and train control upgrades required for each alternative are discussed in this section. As the alternatives were evaluated, it was also important to consider the standards and requirements of the UPRR, the host railroad of the Wellton Branch.

3.1 Alternative Scenarios

The following alternative scenarios were identified for the Wellton Branch Railroad Rehabilitation Study to provide a range of opportunities:

1. Wellton Branch rehabilitation for through freight service only (FRA Class 2 Track), allowing a maximum speed of 25 mph for freight trains.
2. Wellton Branch rehabilitation for through freight and basic Amtrak service (FRA Class 3 Track), allowing a maximum operating speed of 40 mph for freight trains and 60 mph for passenger trains depending upon the signaling system. Method of train control would be TWC.

2A. Wellton Line rehabilitation for through freight and basic Amtrak service (FRA Class 3 Track). Allows maximum operating speed of 40 mph for freight trains and 60 mph for passenger trains depending upon the signaling system. Method of train control would be PTC.

3. Wellton Branch rehabilitation for through freight and higher speed passenger service (FRA Class 4 Track), allowing a maximum operating speed of 60 mph for freight trains and 80 mph (actually 79 mph) for passenger trains depending upon the type of signaling system.

The only difference between Alternatives #2 and #2A in terms of project cost is the type of train control (i.e., TWC vs. PTC) utilized.

3.2 Railroad Requirements and Plans

Before each of the alternative scenarios and the infrastructure improvements were defined, the requirements and plans of the UPRR and needs of Amtrak were identified. Discussions with the UPRR and Amtrak provided the following information.

3.2.1 Union Pacific Railroad

The UPRR is currently upgrading the active portions of the Phoenix Subdivision between Arlington and Picacho to allow more efficient operations at speeds between 20 mph and 60 mph. According to the UPRR, there is a daily average of 13 trains per day, and with many of UPRR customers located west of Phoenix, most of the freight activity is in that area.

Currently, there are no plans by UPRR to re-activate the Wellton Branch as there is no demand for service over the line. UPRR would consider re-activating the line in phases should demand warrant the service.

3.2.2 Amtrak

Amtrak currently operates the Sunset Limited over the Sunset Route on a tri-weekly schedule in each direction. Amtrak's long term vision includes daily service for the Sunset Limited.

3.3 Scenario 1: Through Freight Service Only

This scenario involves rehabilitating the Wellton Line to UPRR Class 2 track standards for the operation of freight trains only. FRA Class 2 track standards allow maximum operating speeds of 30 mph for passenger trains and 25 mph for freight trains. This will allow UPRR to move traffic directly between the west (Los Angeles) and Phoenix should it be advantageous. The method of train control would continue to be TWC. TWC is a method where a Dispatcher gives verbal instructions to a train crew over the train radio. The train crew repeats the verbal instructions and then follows them once it is agreed that they have copied them correctly.

UPRR is currently rehabilitating active portions of the Phoenix Subdivision to allow increased freight train speeds.

The following would be required to restore the single track main and the passing sidings between Wellton and Arlington for freight rail service only.

The active (in service) portion of the Roll Industrial Lead (11.6 miles) would require:

- Clean and replace fouled ballast to achieve 8 inches of sub-ballast and 8 inches of ballast.
- Improve drainage and culverts including removal of debris and vegetation.
- Replace bad ties (assume 30%).
- Weld and grind rail end batter (11.6 miles main track and 0.65 mile siding).
- Weld and grind switch points, and turnout frogs.
- Extend siding at McElhaney Feed Yard by 2,900 feet (0.55 mile) in each direction to accommodate 125-car trains. The siding extension would also include:
    - 2 new #10 turnouts with 115# rail (remove existing siding turnouts)
    - 1 new 120-foot bridge over private road (Private Road at Milepost 774.2)
    - 1 public at-grade crossing (Avenue 33E at Milepost 773.87) with new active warning devices and concrete crossing panels
    - 1 new 36-inch concrete pipe culvert (Milepost 773.7)
    - 1 new 90-foot bridge (west end at Milepost 775.18)

  - The existing siding is assumed to be extended equally by 2,900 feet in each direction. If necessary, the siding can be centered on the load-out during the design of the extension.

(See Exhibit 5 for a schematic drawing of the site.)

- Make minor repairs to bridges and handrails for 6 bridges totaling 2,240 feet in length.
- Replace active warning devices at 5 at-grade public crossings.
- Replace passive cross-bucks and railroad crossing signs at 1 public crossing (Avenue 37E) and 1 private crossing.
- Replace crossing surfaces with concrete panels at 6 public crossings and 3 private crossings.

The rehabilitation requirements for the inactive portion of the Roll Industrial Lead are included with the Wellton Branch portion that is currently out of service. The rehabilitation plan would be to upgrade the single track and passing sidings to UPRR Class 2 standards. The proposed method of train control would be TWC as used currently on the active portion of the Roll Industrial Lead.

The rehabilitation of the out-of-service portions of the Roll Industrial Lead (19.7 miles) and the Wellton Branch (56.9 miles) would require:

- Clean and replace fouled ballast.
- Improve drainage and culverts including removal of debris and vegetation.
- Replace bad ties (assume 60%).
- Replace bad rail (assume 20%) with new or re-lay 115# rail and weld and grind rail end batter (76.6 miles main track and 1.39 miles for 2 sidings).
- Replace turnout at east end of Gillespie spur with a new #10 turnout with 115# rail on wood ties.
- Weld and grind switch points, and turnout frogs.
- Make minor repairs to bridges and handrails for 115 bridges totaling an estimated 7,989 feet in length.
- Make major repairs to 8 bridges totaling 671 feet in length (5% of the total of 146 bridges totaling 11,102 feet on the out-of-service track).
- Replace 50% of the 42 existing bridges that are 10 feet to 30 feet in length (21 bridges and 360 feet in length total) with concrete box culverts.

- Replace 1 or more bridges totaling 195 feet in length (equivalent to the bridge at Milepost 482.75 where the washout occurred).
- Replace active warning devices at 5 at-grade public crossings including lights, bells, gates, and constant warning predictors.
- Replace passive cross-bucks and railroad crossing signs at 10 public crossings.
- Replace crossing surfaces with concrete panels at 15 public crossings and 7 private crossings.

3.4 Scenario 2: Through Freight Service and Basic Amtrak Service

The rehabilitation of the Wellton Line to UPRR Class 3 track standards would allow maximum operating speeds of 60 mph for passenger trains and 40 mph for freight trains. These maximum speeds are consistent with UPRR's planned rehabilitation of the active portion of the Phoenix Line.

The preferred method of train control for the entire alignment would be TWC (Alternative 2) as is used currently on the active portion of the Roll Industrial Lead. Current FRA regulations may require PTC train control (see Section 3.6) be added to this corridor due to the proposed mixed freight and passenger rail service (Alternative 2A).

Given the current condition (at the time of the 2012 inspection) of the Roll Industrial Lead and the Wellton Branch, it is recommended that the track be replaced with Class 3 track. The Class 3 track would be constructed to UPRR standards and practices. The rehabilitation of the Roll Industrial Lead and the Wellton Branch between Wellton and Arlington would include the following components:

- Remove rail, ties, and ballast for 90.8 miles of main track and 2.73 miles of passing sidings and grade roadbed.
- Improve drainage and culverts including removal of debris and vegetation along 90.8 miles of main track.
- Install 10 inches of sub-ballast and 10 inches of crushed rock ballast, new wood ties, new 115# continuous welded rail (CWR), and other track material (OTM) including new double shoulder tie plates, rail clips, and rail anchors for 90.8 miles of main track and 6.8 miles of passing sidings. The length of the 4 existing passing sidings would be increased to 9,000 feet each. Consideration would be given to the reuse of 20% of the existing 113# rail as a potential cost saving measure.

- Install 8 new #20 turnouts with 115# rail and wood ties at four sidings and replace maximum of 7 new #10 turnouts with new or re-lay 115# rail and wood ties located in the main track at industrial tracks.
- Construct 8 new bridges totaling 290 feet in length to allow sidings to be lengthened. New bridges would either be concrete or steel girder of UPRR design. A new bridge is a result of either an existing bridge that needs to be replaced due to structural issues or is needed because of a track extension such as a siding such as the McElhaney Feed Yard extension.
- Make minor repairs to bridges and handrails for 124 bridges totaling an estimated 12,201 feet in length.
- Make major repairs to 8 bridges totaling 671 feet in length (5% of the total of 146 bridges totaling 11,102 feet on the out-of-service track).
- Replace 50% of the 42 existing bridges that are 10 feet to 30 feet in length (21 bridges and 360 feet in length total) with concrete box culverts.
- Replace 1 or more bridges totaling 195 feet in length (equivalent to the bridge at Milepost 482.75 where the washout occurred).
- Replace active warning devices at 10 existing at-grade public crossings and at 5 additional crossings that currently have passive warning devices. Active crossing warning devices would include flashing lights, bells, gates, medians or quad gates, and constant warning predictors.
- Replace passive cross-bucks and railroad crossing signs at 6 public crossings.
- Replace crossing surfaces with concrete panels at 21 public crossings and 10 private crossings.
- The preferred method of train control for the entire alignment would be TWC as is used currently on the active portion of the Roll Industrial Lead. The addition of passenger rail service in this corridor may require PTC for this corridor (see discussion of Federal Requirement for PTC in Section 3.6), unless an exception is obtained from the FRA.

Scenario 2A

Scenario 2A includes all the same rehabilitation elements as Scenario 2. However, instead of TWC, the method of train control for this scenario would be PTC. All other rehabilitation components would remain the same as Scenario 2.

3.5 Scenario 3: Through Freight Service and Higher Speed Passenger Service

The rehabilitation of the Wellton Line to UPRR Class 4 track standards would allow maximum operating speeds of 80 mph (actually 79 mph) for passenger trains and 60 mph for freight trains. These maximum speeds are typically higher than UPRR's planned rehabilitation of the active portions of the Phoenix Line, which is typically Class 3 track and some portions of Class 4 track.

Given the current condition (at the time of the 2012 inspection) of the Roll Industrial Lead and the Wellton Branch, it is recommended that the track be replaced with Class 4 track just as described for Class 3 track. Besides maximum speed, the major difference between Class 3 and Class 4 track is the tolerances to which the track is constructed and maintained. The Class 4 track would be constructed to UPRR standards and practices. The rehabilitation of the Roll Industrial Lead and the Wellton Branch between Wellton and Arlington would include the following components:

- Remove rail, ties, and ballast for 90.8 miles of main track and 2.73 miles of passing sidings and grade roadbed.
- Improve drainage and culverts including removal of debris and vegetation along 90.8 miles of main track.
- Install 12 inches of sub-ballast and 12 inches of crushed rock ballast, new concrete ties, new 136# CWR, and OTM including new double shoulder tie plates, rail clips, and rail anchors for 90.8 miles of main track and 10.2 miles of passing sidings. The length of the 4 existing passing sidings would be increased to 9,000 feet each and 2 new sidings would be needed for the maximum operational flexibility.
- Install 12 new #20 turnouts with 136# rail and wood ties at six sidings and replace maximum of 7 new #10 turnouts with 136# rail and wood ties located in the main track at industrial tracks.
- Construct 12 new bridges totaling 600 feet in length to allow sidings to be lengthened and new sidings to be constructed. New bridges would either be concrete or steel girder of UPRR design. A new bridge is a result of either an existing bridge that needs to be replaced due to structural issues or is needed because of a track extension such as a siding such as the McElhaney Feed Yard extension.
- Make minor repairs to bridges and handrails for 123 bridges totaling an estimated 12,124 feet in length.
- Make major repairs to 8 bridges totaling 671 feet in length (5% of the total of 146 bridges totaling 11,102 feet on the out of service track).

- Replace 50% of the 42 existing bridges that are 10 feet to 30 feet in length (21 bridges and 360 feet in length total) with concrete box culverts.
- Replace 2 or more bridges totaling 272 feet in length (equivalent to the bridge at Milepost 482.75 where the washout occurred plus the average of 77 feet per bridge).
- Replace 6 talking detectors that were on the line. A talking detector is a wayside device that senses a "hotbox" (overheated journal bearing on an axle) or sometimes dragging equipment. The unit has a taped message which warns a train crew and dispatcher that a hotbox or dragging equipment has been detected.
- Replace active warning devices at 10 existing at-grade public crossings and at the 11 remaining public crossings that currently have passive warning devices so that all public crossings have active warning devices. Active crossing warning devices will include flashing lights, bells, gates, medians or quad gates, and constant warning predictors.
- Replace passive cross-bucks and railroad crossing signs at 10 private crossings in accordance with the latest standards.
- Replace crossing surfaces with concrete panels at 21 public crossings and 10 private crossings.
- Install new railroad signaling system consisting of 90.8 route miles of PTC (see discussion of Federal Requirement for PTC below).

3.6 Positive Train Control

The Rail Safety Improvement Act of 2008 mandates that PTC be installed on railroad lines handling certain hazardous materials and those handling passengers by December 31, 2015. The original rulemaking was modified to use proposed 2015 hazardous material traffic patterns rather than 2008 hazmat traffic patterns. The rulemaking mandates PTC on main line rail routes that handle intercity and commuter rail passengers and poison or toxic-by-inhalation hazardous materials of 5 million or more gross tons of total traffic annually.

Positive Train Control is defined as “a system designed to prevent train-to-train collisions, over-speed derailments, incursions into established work zone limits, and the movement of a train through a switch left in the wrong position.” Since the enactment of the Rail Safety Improvement Act of 2008, the railroad industry and signaling suppliers have been diligently working to develop systems that meet the PTC mandate that also provide interoperability over the National Railroad Network. Thus far, the systems under development represent an overlay on existing CTC systems. The proposed PTC systems

involve signaling and communications equipment on board locomotives and non-powered cab control cars, at wayside control and interlocking points and switch point monitoring, and dispatch offices and right-of-way locations.

The FRA regulations for railroad signaling are contained in 49 CFR Part 236, Subpart I, Section 236.1011. In addition to other requirements, the railroads are required to file a PTC Implementation Plan describing in detail how PTC would be implemented over their lines. The PTC Implementation Plan documentation has within it the exception clauses for relief from PTC. The following excerpt from the PTC Implementation Plan documentation specifies the exception requirements for PTC:

> Accordingly, in paragraph (c) (3) FRA has provided a further narrow exception for Class I lines carrying no more than four intercity or commuter passenger trains per day and cumulative annual tonnage of less than 15 million gross tons (mgt), subject to FRA review. The limit of four trains takes into consideration that it is much less burdensome to equip the wayside of a Class I rail line than to install a full PTC system on a railroad that would not otherwise require one. Again, the exception is not automatic, and FRA's approval of a particular line segment would be discretionary. Any Class I line carrying both 5 mgt and poisonous-by-inhalation (PIH) traffic would, of course, not be eligible for consideration.

The new paragraph (d) makes clear that FRA will carefully review each proposed main track exception and may require that it be supported by appropriate hazard analysis and mitigations. FRA has previously vetted through the Railroad Safety Advisory Committee (RSAC) a Collision Hazard Analysis Guide that can be useful for this purpose. If FRA determines that freight operations are not "limited" as a matter of safety exposure or that proposed safety mitigations are inadequate, FRA will deny the exception.

Paragraph (e) (formerly paragraph (d) in the proposed rule) provides the definition of temporal separation with respect to paragraph (c)(2). The temporal separation approach is currently used under the FRA-Federal Transit Administration Joint Policy on Shared Use, which permits coexistence of light rail passenger services (during the day) and local freight service (during the nighttime). See Joint Statement of Agency Policy Concerning Shared Use of the Tracks of the General Railroad System by Conventional Railroads and Light Rail Transit Systems, 65 FR. 42,526 (July 10, 2000); FRA Statement of Agency Policy Concerning Jurisdiction Over the Safety of Railroad Passenger Operations and Waivers Related to Shared Use of the Tracks of the General Railroad System by Light Rail and Conventional Equipment, 65 FR 42,529 (July 10, 2000).

3.7 Additional Downstream Improvements

When a railroad corridor is improved or reopened, as is the case with the Wellton Branch, there is sometimes a need to provide additional downstream improvements on either side of the improved corridor in order to maintain quality railroad operations. Examples of downstream improvements may include additional yard tracks, modifications to existing tracks, siding tracks, engine servicing and maintenance facilities and crew facilities. At this time, no additional downstream improvements were identified during the study that would be necessary in the Phoenix and Yuma areas if freight and passenger traffic were to be increased over the Wellton Branch. Additional study and the use of a train simulation program would be required in order to identify any specific downstream improvements related to passenger stations and other UPRR and Amtrak fixed plant improvements.

Through discussions with Amtrak, coordination with the Sunset Limited route and freight schedules would be necessary in the future. In addition, a better understanding of how to junction from the Phoenix Subdivision to the Sunset Route would be necessary as well as an understanding of the pros and cons for coordinated UPRR operations.

4.0 COST ANALYSIS

The purpose of this section is to develop planning-level capital cost estimates for each of the alternative scenarios for upgrading the Wellton Branch. The results from the Existing Conditions and Alternative Scenario sections of this report served as the starting point for the development of the capital cost estimates.

4.1 Alternative Scenarios

The cost estimates include capital cost estimates for each of the following alternative scenarios:

1. Wellton Line rehabilitation for through freight service only (FRA Class 2 Track). Allows maximum speed of 25 mph for freight trains only, no passenger traffic.
2. Wellton Line rehabilitation for through freight and basic Amtrak service (FRA Class 3 Track). Allows maximum operating speed of 40 mph for freight trains and 60 mph for passenger trains depending upon the signaling system. Method of train control would be TWC.

2A. Wellton Line rehabilitation for through freight and basic Amtrak service (FRA Class 3 Track). Allows maximum operating speed of 40 mph for freight trains and 60 mph for passenger trains depending upon the signaling system. Method of train control would be PTC.

3. Wellton Line rehabilitation for through freight and higher speed passenger service (FRA Class 4 Track). Allows maximum operating speed of 60 mph for freight trains and 80 mph (actually 79 mph) for passenger trains depending upon the type of signaling system.

The only difference between Alternatives #2 and #2A in terms of project cost is the type of train control (i.e., TWC vs. PTC) utilized.

4.2 Cost Methodology

The methodology utilized for developing the capital cost estimates for the Wellton Branch Railroad Rehabilitation Study included incorporating the existing conditions described in Section 2 of this report and the alternative scenarios identified in Section 3 to identify the major cost categories for estimating the capital costs for each alternative scenario. Realizing that the existing conditions inventory had to be conducted from public right-of-way, the cost estimates were developed at a high planning level with a minimum amount of detail.

The unit costs were developed from several sources including experience with UPRR and other Class 1 railroads. Other sources included estimates from ADOT for crossing improvements, other current rail projects, and separate rough order of magnitude estimates based upon the characteristics of the 90-mile Wellton Branch.

Unit costs were identified for the units of measure for the major cost categories and applied to the quantities identified or calculated for each alternative.

The cost estimates for each alternative scenario are independent of each other. Each estimate is based upon the existing conditions rehabilitated to each alternative scenario's requirements and does not build upon any other alternatives cost estimate.

The cost estimates are based upon accomplishing the rehabilitation work in accordance with current Federal, State, and UPRR standards. It should also be noted that track and other fixed plant elements are consistently designed to higher standards when passenger service is to be operated. The current UPRR standards and practices are approved by the FRA and are of higher quality than the minimum track safety standards in the FRA regulations (49 CFR Part 213). When Amtrak operates on a host Class 1 railroad they operate on the standards of the host railroad.

4.3 Cost Estimate Assumptions

This study represents a planning level exercise due to the lack of a complete inventory, field inspection, and design drawings; therefore, several assumptions were made in order to develop the planning level capital cost estimates. The assumptions are as follows:

A. General Assumptions

1. The cost estimates are presented in current 2013 U.S. dollars.
2. A contingency allowance of 40% of the construction cost for each alternative is included due to the planning level of the study. This amount of contingency is provided due to the level of the study and considering the fact that the rehabilitation work covers every mile of the Wellton Branch rather than just a percentage of the line which increases the potential for unidentified costs. The contingency would be reduced as engineering progresses but at a planning level, the contingency covers unknown costs and quantities, fluctuation in unit prices of rail, ties, ballast, active crossing warning devices, etc., additional bridge repairs, drainage improvements based upon hydrology and hydraulic studies, unidentified environmental mitigation cost, community and local issues, and unforeseen costs that cannot be identified at this time.
3. Right-of-way costs are not included in the estimates. Some initial level of engineering would be required in order to determine if any additional right-of-way would be needed for Alternative #3 with the 80 mph (actually 79 mph) maximum passenger operating speed.
4. For Alternative Scenarios #2 and #3, passenger station and rolling stock costs are not included in the estimates.
5. Allowances for environmental mitigation at 3%, utilities (including commercial power) at 5%, and professional services (design, construction management, mobilization, etc.) at 4% of construction cost are included.
6. The cost estimates for all three alternatives assume that UPRR forces would perform the track rehabilitation work.
7. Operational performance and reliability are not considered in the cost estimates as such data are not currently available.
8. No costs are included for potential “downstream” effects due to the rehabilitation of the Wellton Branch.

B. Construction Assumptions

1. Solar power would not be allowed; only commercial power would be used for signaling and at-grade crossings.
2. Drainage improvements include side ditching, cross drainage, and vegetation removal at $120,000 per route mile. This does not include cost for bridges and/or culverts.
3. Track upgrades for Alternative Scenario #1, Class 2 track, are based upon:
    - Replacing 30% of the ties in the active portion at $500,000 per mile
    - Replacing 20% of the rail and 60% of the ties for the out of service portion at $800,000 per mile
    - Cleaning and replacing ballast for both active and out of service portions
    - Welding and grinding rail ends and switch points and frogs
    - Extending the McElhaney Feed Yard siding by 2,900 feet in each direction to accommodate 125-car trains. Covered hopper cars are each approximately 70 feet in length with a gross rail weight of 315,000 pounds. The existing siding is assumed to be extended equally by 2,900 feet in each direction. If necessary, the siding can be centered on the load-out during the design of the extension.
4. For Alternative Scenario #2 the track would be replaced in total with new 115# rail on wood ties. Class 3 track would have 10 inches of sub-ballast and 10 inches of ballast under the ties. As a potential cost savings option, the re-use of approximately 20% of the existing 113# rail is also considered. The potential cost savings would include consideration for the amount and cost of providing the 20% equivalent of new 115# rail. The re-use of the existing rail would be subject to thorough internal rail inspection and UPRR's current standards and practices.
5. For Alternative Scenario #3, the track would be replaced in total with new 136# CWR on concrete ties. Class 4 track would have 12 inches of sub-ballast and 12 inches of ballast under the ties.
6. For main track sidings, #20 turnouts with 115# rail and wood ties are used for Alternative Scenario #2. Turnouts off the main track for industrial tracks are #10 turnouts with 115# rail with wood ties. The locations of new sidings or the directions of siding extensions are approximate and are subject to change based upon the results of train simulation. Exhibit 6 contains the location and mileposts for the proposed siding improvements, and Exhibit 7 provides a schematic with the potential siding locations.

7. For main track sidings, #20 turnouts with 136# rail and wood ties are used for Alternative Scenario #3. Turnouts off the main track for industrial tracks are #10 turnouts with 136# rail and wood ties. The locations of new sidings or the directions of siding extensions are approximate and are subject to change based upon the results of train simulation. Exhibit 6 contains the location and mileposts for the proposed siding improvements, and Exhibit 7 provides a schematic with the potential siding locations.
8. Minor bridge repairs include cosmetic work, repair of handrails and walkways, bridge ties, stringers, and other non-structural work. An estimate of $450 per lineal foot is based upon estimated costs from bridge engineers. The cost represents an average per bridge as some bridges would need more work than other bridges.
9. Major bridge repairs include replacing structural members such as bents, piles, abutments, etc. An average of $1,600 per lineal foot per bridge is included for 5% of the 154 bridges totaling 13,427 linear feet in length. The linear foot estimate is based upon an estimate of $160,000 for a 100-foot long bridge.
10. New bridges are required where an existing bridge is no longer serviceable due to heavy structural damage or is needed due to the extension of a siding. New bridges in main track are assumed to be at least as long as the bridge at the washout at Milepost 882.75 with an additional bridge, or bridges, at the average of 77 feet per bridge. An estimate of $8,000 per lineal foot is based upon the average for the two most common railroad bridge types (i.e., pre-stressed concrete bridges at $6,000 per lineal foot and steel girder bridges at $9,900 per lineal foot).
11. It is more cost effective to replace some short bridge structures with concrete box culverts than it is to perform major bridge work or replace the entire bridge for aging timber structures. For all of the alternative scenarios, it is assumed that 50% of the 42 bridges in the 10-foot to 30-foot lengths would be replaced with concrete box culverts. Bridges at 10-foot would be replaced with a single 6 x 6 box (9 bridges at 90 linear feet total), bridges at 15-foot would be replaced with a double cell 6 x 6 box (6 bridges at 90 linear feet), and bridges at 30-foot would be replaced with a quad cell 6 x 6 box structure (6 bridges at 180 linear feet).
12. The estimate for the installation of PTC is based upon costs from recent rail projects in the Midwest that was extrapolated for the 90.8-mile Wellton Branch. The unit cost for PTC is estimated to be $500,000 per route mile based upon the recent rail projects. The PTC estimate excludes rolling stock on-board equipment and commercial power. At this time, PTC is assumed only for Alternative Scenario #3 with the higher operating speeds and for Alternative #2A where an

exception is not granted by FRA. Alternative Scenarios #1 and #2 assume that TWC would be utilized. TWC is a method of train control that uses train radio and copied forms to provide instructions to train crews. No wayside signals or other equipment is necessary for TWC. No costs for TWC are included in these cost estimates. For illustrative purposes, the cost of adding PTC to Alternative Scenario #2 has been calculated and is included in Exhibit 9.

13. The cost of the "talking Detectors" (hotbox or journal and dragging equipment detectors) includes the replacement of the six detectors that were on the line when it was an active through railroad. Each detector is estimated to be $65,750 and are only included in the estimate for Alternative Scenario #3.

14. Active at-grade crossing costs are based upon estimates for crossing improvements provided by ADOT. The average "high" cost of $352,000 per crossing is used for replacing active devices including flashing lights, bells, gates with cantilevers, and constant warning predictor. Replacement of the crossing surface with concrete panels is based upon the average of $1,690 per track foot for public crossings. Concrete crossing surfaces for private crossings is based upon an average of $1,200 per track foot for the replacement of just the crossing surface at three public crossings from the ADOT data. The replacement of passive signage at public crossings is based upon recent estimates and includes yield signs and other improvements in compliance with railroad standards and the Manual on Uniform Traffic Control Devices (MUTCD). For the quantity of concrete crossing panels, a public road is assumed to be 40 feet wide (34 feet plus 3 feet of shoulder on each side) and a private road is assumed to be 16 feet wide.

    A summary of the rehabilitation work for each alternative scenario is provided in Table 1.

Table 1 Summary of Proposed Rehabilitation Work

Rehabilitation Work	Alternative #1 Class 2 Track	Alternatives #2/2A Class 3 Track	Alternative #3 Class 4 Track
Maximum Operating Speed – Freight	25 mph	40 mph	60 mph
Maximum Operating Speed – Passenger	30 mph	59 mph	79 mph
Total Route Miles of Main Track	90.8	90.8	90.8
Miles of Main Track Out of Service	76.6	76.6	76.6
Number/Miles of Siding Track	4 / 2.04	4 / 6.8	6 / 10.2

Rehabilitation Work	Alternative #1 Class 2 Track	Alternatives #2/2A Class 3 Track	Alternative #3 Class 4 Track
Drainage & Vegetation	Improve side ditches and cross drainage. Remove vegetation from bridges and culverts.	Improve side ditches and cross drainage. Remove vegetation from bridges and culverts.	Improve side ditches and cross drainage. Remove vegetation from bridges and culverts.
Upgrade Main Track – Ballast	Clean existing ballast and add new ballast to achieve 8 inches of sub-ballast and 8 inches of ballast.	Replace ballast with 10 inches of new sub-ballast and 10inches of new ballast.	Replace ballast with 12 inches of new sub-ballast and 12 inches of new ballast.
Upgrade Track – Rail	Repair existing rail and replace bad rail (20%) on inactive track with new or relay 115# jointed rail.	Replace rail with new 115# CWR rail. Consider re-use 20% of existing 113# rail as cost savings.	Replace rail with new 136# CWR rail.
Upgrade Track – Ties	Replace bad ties (30% on active track, 60% on inactive track) with new wood ties.	Replace ties with new wood ties.	Replace ties with new concrete ties.
Upgrade Siding Track	Replace bad rail, ties, and add ballast.	Replace rail (new or relay 115#), wood ties, and add ballast and extend 3 of 4 existing sidings to 9,000 feet	Replace rail (new 136#), concrete ties, and add ballast and extend 4 existing sidings to 9,000 feet and add 2 new sidings at 9,000 feet.
Upgrade Turnouts	Weld and grind existing rail and replace bad wood ties.	Replace turnouts with new #20 turnouts at sidings and #10 turnouts at industrial tracks with new or relay 115# rail and wood ties.	Replace turnouts with new #20 turnouts at sidings and new #10 turnouts at industrial tracks with 136# rail and wood ties.
Lengthen Siding at McElhaney Feed Yard	Lengthen siding by 2,900 feet in each direction.	Lengthen siding by 2,900 feet in each direction.	Lengthen siding by 2,900 feet in each direction.
Bridges – Number / Length (track feet)	154 / 13,427 TF	154 / 13,427 TF	154 / 13,427 TF
Minor Repair	124 / 12,201 TF	124 / 12,201 TF	123 / 12,124 TF
Major Repair	Major repairs to 8 bridges totaling 671 TF (5% of total).	Major repairs to 8 bridges totaling 671 TF (5% of total).	Major repairs to 8 bridges totaling 671 TF (5% of total).

Rehabilitation Work	Alternative #1 Class 2 Track	Alternatives #2/2A Class 3 Track	Alternative #3 Class 4 Track
Replace Bridge with Concrete Box Culvert (6 x 6 with 1, 2, or 4 boxes)	21 / 360 TF (50% of 42 bridges 10 feet to 30 feet in length)	21 / 360 TF (50% of 42 bridges 10 feet to 30 feet in length)	21 / 360 TF (50% of 42 bridges 10 feet to 30 feet in length)
Replace with New Bridge	1 to 2 / 195 TF	1 to 2 / 195 TF	2 to 3 / 272 TF
Install New Bridge for Siding Extension	2 / 210 TF (incl McElhaney)	10 / 500 TF (incl McElhaney)	14 / 810 TF (incl McElhaney)
At-Grade Crossings – Total Number	31	31	31
Public with Active Warning Devices	Replace active devices at 10 existing crossings with new standard devices.	Replace active devices at 10 existing and 5 additional crossings with new standard devices.	Replace active devices at 10 existing and 11 additional crossings with new standard devices.
Public with Passive Warning Devices	Repair/replace bad signage and markings at 11 crossings.	Repair/replace bad signage and markings at 6 crossings.	All passive devices replaced with active devices at all public crossings.
Private with Passive Warning Devices	Repair/replace bad signage and markings at 10 crossings with new standards.	Repair/replace bad signage and markings at 10 crossings with new standards.	Repair/replace bad signage and markings at 10 crossings with new standards.
Crossing Surface	Replace surface with new concrete panels at 10 public crossings and repair existing surface at 11 public and 10 private crossings.	Replace surface with new concrete panels at 15 public crossings and repair existing surface at 6 public and 10 private crossings.	Replace surface with new concrete panels at 21 public crossings and 10 private crossings.
Railroad Signaling	Dispatch without wayside signals using Track Warrant Control (TWC).	Dispatch without wayside signals using TWC [(a)].	Install PTC and replace 6 talking hotbox/dragging equipment detectors.
Environmental Mitigation (% construction cost)	3%	3%	3%
Utility Allowance (% construction cost)	5%	5%	5%
Professional Services (% construction cost)	4%	4%	4%
Project Contingency (% construction cost)	40%	40%	40%

[(a)] Railroad Signaling: Alternative #2 will utilize TWC and Alternative #2A will use PTC. The only difference between Alternatives #2 and #2A in terms of project cost is the type of train control (i.e., TWC vs. PTC) utilized.

4.4 Capital Cost Estimate

The estimated capital costs for each of the alternative scenarios are summarized as follows:

Alternative Scenario	Total Estimated Cost	Average Cost/Route Mile
#1 – Class 2 Track	$165.4 million	$1.8 million
#2 – Class 3 Track	$194.8 million	$2.1 million
#2A – Class 3 with PTC	$266.0 million	$2.9 million
#3 – Class 4 Track	$420.3 million	$4.6 million

The cost estimate details are provided in Exhibits 8, 9, and 10 for the respective alternative scenarios.

5.0 CONCLUSION

The Wellton Branch Railroad Rehabilitation Study analyzed the required improvements for four scenarios and developed planning level cost estimates for each scenario. These options provide an understanding of the magnitude of cost associated with each type of freight and/or passenger rail operation. In addition, the coordination with UPRR and Amtrak provided existing and future plans for the Wellton Branch Railroad corridor.

At this time, the current freight demand along the active portion of the Wellton Branch and Phoenix Subdivision does not warrant the rehabilitation of the out-of-service segment of the Wellton Branch. In addition, as freight demand increases along the corridor, the rail line could be rehabilitated by phases or in increments as needed. In regard to passenger rail operations, Amtrak envisions a daily train in each direction along the Sunset Limited route that operates on UPRR corridors in Arizona.

After analyzing the cost estimates and plans for freight and passenger rail operations along the Wellton Branch Railroad, the study findings indicate a need to increase freight demand to develop a cost effective investment on the out-of-service rail line. At this time, reopening this corridor solely for passenger service would be cost prohibitive. The rehabilitation of the Wellton Branch for both freight and passenger rail operations support the statewide vision for railroad operations in the State.

6.0 NEXT STEPS

The cost estimates developed in the Wellton Branch Railroad Rehabilitation Study provide a range of costs for freight and passenger rail operations. Given the study findings, no further analysis is identified at this time. As freight demand and operations develop and warrants the rehabilitation of segments of the entire Wellton Branch Railroad line, it is recommended that the following steps are taken with regard to operating future freight and passenger service:

1. Obtain access to the UPRR right-of-way and conduct a detailed inventory of the line including track, bridges, culverts, and at-grade crossings.
2. Conduct detailed bridge inventory and document the existing condition of each bridge. Also identify the specific bridges that are 10-foot to 30-foot length that could be replaced with concrete box culverts. Conduct hydrology studies if necessary.
3. Conduct a detailed inventory of each at-grade crossing and identify the specific improvements necessary at each crossing in order to meet current Federal and State requirements.
4. Coordinate with UPRR and Amtrak to identify potential train and traffic volume and flow. Conduct train simulation if necessary. Identify any necessary revisions to the previous assumptions used in the study including those associated with the operation of passenger trains over the Wellton Branch.
5. Coordinate with UPRR to confirm the standards and requirements to be used for the rehabilitation work involving track, crossings, bridges, and culverts.
6. Revise the cost estimates as necessary based upon the new detailed information.
7. Continue to identify and develop freight opportunities.

EXHIBIT 1

HISTORY OF THE WELLTON BRANCH

Wellton Branch Railroad Line

Request: Work in partnership with the federal government, the regional business community, the State of Arizona, and the Union Pacific Railroad to put the Wellton Branch line back in service, or develop an alternative line, to facilitate freight movement and Amtrak service to the Valley.

Regional Issue

The Wellton Branch is a segment of the Union Pacific Railroad (UPRR) Phoenix Subdivision through west central Arizona. A forty-five mile segment of the Wellton Branch between Phoenix and Buckeye/Arlington has significant industrial development along its right-of-way and is currently in service. The McElhaney Cattle Company has trackage rights on more than six miles of the branch east of Wellton and handles about 11,000 carloads of grain annually. However, approximately 80 miles of track is out of service between the communities of Arlington and Roll. This segment is used for railroad car storage. The entire line would require rehabilitation in order to be reactivated *(see Figure 1)*.

WELLTON BRANCH REHAB AREA

Figure 1: ADOT State Rail Plan/BQAZ.

Background

- The Wellton Branch was built by the Southern Pacific Railroad between 1923-1926 and opened for through passenger service to Phoenix in 1927.
- The branch has been owned by Union Pacific Railroad since 1996.
- The final Amtrak Sunset Limited passenger train service was in June 1996.
- It was closed to through freight in 1997 after all Phoenix-Yuma traffic was rerouted east through Picacho Jct.
- An 80-mile portion between Arlington and Roll is used for surplus railcar storage.
- Potential for reactivation will contribute direct benefits to the CANAMEX Corridor and Amtrak.

Continued on back

WELLTON BRANCH LINE

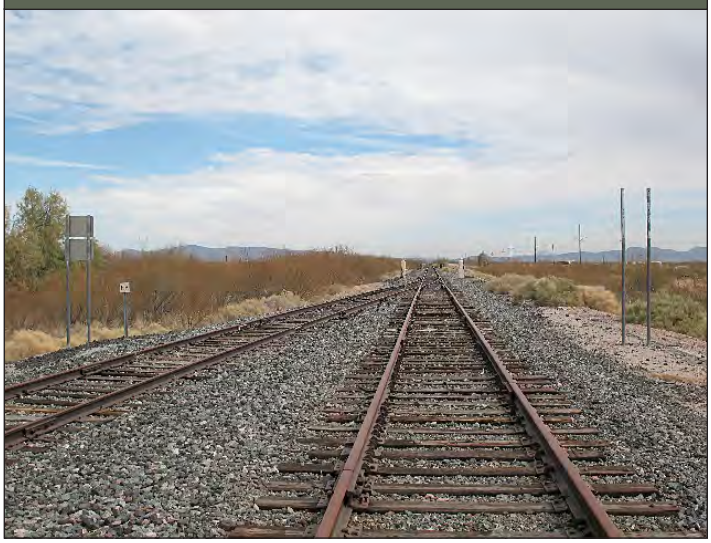


Figure 2: Out of service Welton Branch near Hyder, Arizona (ADOT/M. Pearsall.)

Wellton Branch Railroad Line (continued)

Benefits

Improvements to key rail branch lines of the Union Pacific Railroad will improve freight movements within Arizona and the MAG Region by providing better connections to Southern California and Mexico. This will also help commodity distribution and manufacturing throughout the state.

Reestablishing service on the UPRR Wellton Branch to Phoenix from the west to the UPRR Sunset Route, as well as reconnecting Phoenix to Amtrak's national passenger rail network will help create a comprehensive and well connected railroad system in Arizona. This will also help alleviate the need for current Union Pacific Railroad freight trains from having to make the unnecessary, extra-miles-detour between Yuma, Picacho Jct. (Eloy)/Tucson, Coolidge and the East Valley to reach Phoenix and the West Valley.

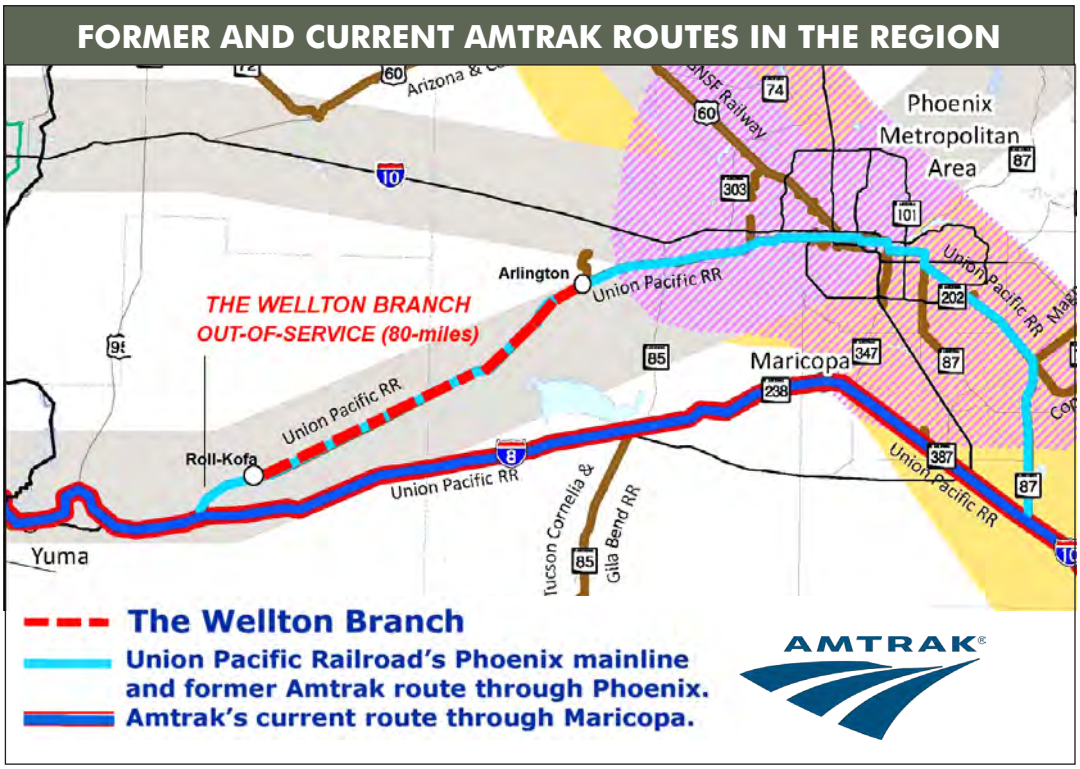


Figure 3: Welton Branch Map. (MAG)

The potential of a new thirty-mile long railroad line connecting the communities of Buckeye and Gila Bend would also contribute to the development of an enhanced CANAMEX transportation alternative for the Hassayampa Valley and the SR-85 corridors.

Contact:

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MAG Transportation Division
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For more information visit:
azmag.gov/transportation

Figure 4: Wellton Branch meets UPRR Sunset Route Mainline at Wellton Jct., Arizona. (ADOT/M. Pearsall)

EXHIBIT 2

SUMMARY OF PHYSICAL FEATURES

Exhibit 2: Wellton Branch Railroad Rehabilitation Study – Summary of Physical Features

	Roll	Wellton	Phoenix Line	Totals
Physical Feature	Industrial Lead	Out of Service	In Service	
Route Miles (Total Wellton to Arlington)	31.3	56.9	2.6	90.8
Out of Service Route Miles	19.7	56.9	0	76.6
Number of Sidings	1	2	1	4
Number of Customers	3	0	2	5
Rail	Jointed	Jointed	Jointed	
Rail Weight	113#	113#	112# / 113#	
Rail Rolled Dates	1942 to 1948	1942 to 1949	1936 / 1949	
Crossties	Wood	Wood	Wood	
Current Maximum Operating Speed Limit	20 mph	0 mph	40 mph	
Number of Public Crossings	11	10	0	21
Number of Private Crossings	3	6	1	10
Crossings with Active Warning Devices	7	3	0	10
Crossings with Passive Warning Devices	7	13	1	21
Number of Bridges	23	129	2	154
Linear Feet of Bridges	3,414	9,938	75	13,427
Number of Culverts	11	1	0	12

EXHIBIT 3

ADOT CROSSING INVENTORY

Exhibit 3: Wellton Branch Railroad Rehabilitation Study – ADOT Crossing Inventory

Crossing ID	Milepost	Street	City Name	Crossing Type	Crossing Position	Train Detection	Active/Passive Crossing Signals	Traffic Signs or Signals	Crossbucks (#)	Stop Signs (#)	Traffic Lanes (#)	Crossing Surface	Functional Classification	Estimated AADT Year	Estimated AADT
742074R	771.12	US 80 (Over)	Wellton	Public	RR Under			No	None	None	2	Unconsolidated	R. Major Collector	2010	3798
741735D	773.87	Ave 33E	Wellton	Public	At Grade	Constant Warning Time	Yes – Gates	Yes	0	0	2	Timber	R. Local	1988	361
741736K	774.2	Private	Wellton	Private	RR Over			No				RR Over		1970	
741737S	774.94	Ave 34E	Wellton	Public	At Grade	Constant Warning Time	Yes – Gates	Yes	2	1	2	Timber	R. Local	1988	690
741738Y	775.97	Irrigation	Tacna	Private	At Grade			No				Asphalt		1970	
741739F	777.78	8th St (Under)	Roll	Public	RR Over			No			2	Unconsolidated	R. Major Collector	2010	844
741740A	778.15	Private	Roll	Private	RR Over			No				RR Over		1970	
741741G	778.54	Ave 37E	Roll	Public	At Grade	None	No	Yes	2	3	2	Timber	R. Local	1988	28
741742N	779.65	6th St	Roll	Public	At Grade	None	Yes – Gates	Yes	0	0	2	Concrete	R. Local	1988	165
741743V	780.92	5th St	Roll	Public	At Grade	Constant Warning Time	Yes – Gates	Yes	0	0	2	Wood	R. Local	1988	510
741744C	781.95	Private	Roll	Private	At Grade			No						1970	
741745J	782.28	Ave 39E	Roll	Public	At Grade	None	Yes – Gates	Yes	0	0	2	Timber	R. Local	2010	3684
741746R	782.59	4th St	Roll	Public	At Grade	None	Yes – Gates	Yes	0	0	2	Timber	R. Local	2010	3684
741747X	783.5	4th St	Roll	Public	At Grade	None	Yes – Gates	Yes	0	0	2	Timber	R. Local	2010	595
741748E	784.82	Ave 40E	Roll	Private	At Grade			No				Asphalt		1970	
741749L	788.36	Dept of Int	Roll	Public	At Grade	None	No	Yes	2	0	2	Timber	R. Local	1988	2
741750F	792.95	Ave 45E	Dateland	Public	At Grade	None	No	Yes	1	0	2	Timber	R. Local	1988	3
741751M	801.08	Public	Dateland	Public	At Grade	None	No	No			2	Timber	R. Local	1988	5
741752U	808.35	Public	Dateland	Public	At Grade	None	Yes	No	0		1	Asphalt	R. Local	1988	3
742083P	810.17	Public	Dateland	Public	At Grade	None	Yes	Yes	2		2	Asphalt	R. Local	1988	7
742084W	811.93	Public	Dateland	Public	At Grade	None	Yes	Yes	2		2	Timber	R. Local	1988	15
742085D	812.80	White Wing	Dateland	Public	At Grade				2		1	Sectional			15
742086K	813.38	BC Systems	Dateland	Private	At Grade			No				Asphalt		1970	
742087S	814.22	Ave 68E	Dateland	Public	At Grade	Constant Warning Time	Yes – Gates	Yes	2		2	Timber	R. Local	1988	4
748776G	816.62	PVT Railroad	Yuma	Private	At Grade			No				Asphalt		1981	
742088Y	821.31	Ave 74E	Dateland	Public	At Grade	None	Yes	Yes	2	2	2	Timber	R. Local	1988	104
742089F	823.19	Private	Dateland	Private	At Grade	RR Advance		No						1970	
741753B	825.5	County Rd	Gila Bend	Public	At Grade	DC/AFO	Yes – Gates	Yes	2		2	Timber	R. Local	1988	110
741754H	827.7	555th Ave	Gila Bend	Public	At Grade	DC/AFO	Yes - Gates	Yes	0	0	2	Timber	R. Local	1988	50
741755P	831.74	Rocky Point	Gila Bend	Public	At Grade				2		2	Sectional			60
741756W	841.27	Private	Arlington	Private	At Grade			No				Asphalt		1970	
741757D	843.78	Private	Arlington	Private	At Grade			No				Asphalt		1970	
741758K	845.9	Private	Arlington	Public	RR Over			No						1970	
741759S	854.06	Agua Caliente	Arlington	Public	At Grade	None	Yes	Yes	1	0	2	Asphalt	R. Local	1988	42
741760L	856	EPNG	Arlington	Private	At Grade			No				Asphalt		1970	
741762A	860.25	Youngsters	Arlington	Private	At Grade			No				Asphalt		1970	

EXHIBIT 4

LIST OF BRIDGES

Exhibit 4: Wellton Branch Railroad Rehabilitation Study – List of Bridges

Milepost	Bridge Structure	Length (ft)	Bridge Over	Notes
772.49	Ballasted Deck	60		Roll Industrial Lead
774.20	Timber Trestle, BD	120	Private Road	West end McElhaney
775.18	Timber Trestle, BD	90		East end McElhany
775.68	Timber Trestle, BD	90		
777.78	Ballasted Deck	44	8th Street	
777.81	Steel Truss, 12 span, BD	1,836	Gila River	
788.89	Ballasted Deck	10		
790.73	Ballasted Deck	60		
791.55	Ballasted Deck	108		
792.67	Ballasted Deck	196		West end Growler
793.51	Ballasted Deck	60		East end Growler
793.88	Ballasted Deck	60		
794.29	Ballasted Deck	60		
795.01	Ballasted Deck	105		
795.43	Ballasted Deck	105		
795.97	Ballasted Deck	45		
796.36	Timber Trestle, BD	105		
797.13	Ballasted Deck	75		
798.89	Ballasted Deck	10		
799.44	Ballasted Deck	40		
800.32	Ballasted Deck	30		
801.45	Ballasted Deck	30		
801.97	Ballasted Deck	75		End of Roll Ind. Lead
Subtotal – Roll Industrial Lead		**3,414**	**23 bridges**	
803.04	Timber Stringers, 5 span	75		Wellton Branch, Kofa
804.27	Timber Stringers, 8 span	40		
804.91	Timber Stringers, 4 span	40		
805.63	Timber Stringers, 4 span	40		
806.26	Timber Stringers, 7 span	70		
807.15	Timber Stringers, 4 span	40		
808.22	Timber Stringers, 4 span	40		
808.72	Timber Stringers, 2 span	20		
808.87	Timber Stringers, 1 span	10		
809.15	Timber Stringers, 4 span	40		
809.57	Timber Stringers, 2 span	20		
809.99	Timber Stringers, 6 span	60		
810.39	Timber Stringers, 5 span	75		
810.59	Timber Stringers, 11 span	165	American Wash	
810.93	Timber Stringers, 10 span	150		Damaged?
811.74	Timber Stringers, 1 span	10		
812.15	Timber Stringers, 3 span	45		

Milepost	Bridge Structure	Length (ft)	Bridge Over	Notes
812.63	Timber Stringers, 3 span	30		
813.09	Timber Stringers, 3 span	45		West of Horn
813.77	Timber Stringers, 1 span	10		East of Horn
814.03	Timber Stringers, 2 span	30		
814.43	Timber Stringers, 21 span	316		
814.93	Timber Stringers, 4 span	60		
815.81	Timber Stringers, 5 span	75	West Wash	Some damage?
816.32	Timber Stringers, 4 span	60	Smith Wash	Some damage?
816.58	Timber Stringers, 3 span	45	Decarlo Wash	
816.94	Timber Stringers, 7 span	105	Bridge Wash	
817.30	Timber Stringers, 2 span	30		
817.61	Timber Stringers, 5 span	75	Baragan Wash	
818.10	Timber Stringers, 5 span	75	Ramsey Wash	Some damage?
818.58	Timber Stringers, Conc, 9 span	135	Clanton Wash	
819.16	Timber Stringers, Conc, 7 span	105	Slayton Wash	
820.06	Timber Stringers, Conc, 3 span	45		
820.81	Timber Stringers, Conc, 6 span	90	Nine Mile Wash	
821.56	Timber Stringers, Conc, 3 span	45		
821.95	Timber Stringers, 2 span	30		West of Hyder
822.85	Timber Stringers, 2 span	30		East of Hyder
823.68	Timber Stringers, Conc, 2 span	30		
824.18	Timber Stringers, Conc, 5 span	75		
824.41	Timber Stringers, Conc, 5 span	75		
824.96	Timber Stringers, Conc, 3 span	45		
825.77	Timber Stringers, Conc, 3 span	45		
826.53	Timber Stringers, Conc, 6 span	90	Columbus Wash	
827.39	Timber Stringers, Conc, 2 span	90		
827.78	Timber Stringers, Conc, 4 span	40		
828.16	Timber Stringers, Conc, 4 span	40		
828.47	Timber Stringers, Conc, 4 span	40		
828.92	Timber Stringers, Conc, 4 span	40		
829.35	Timber Stringers, 10 span	150	Copper Wash	
829.75	Timber Stringers, Conc, 4 span	60		
830.23	Timber Stringers, Conc, 3 span	45		
830.62	Timber Stringers, Conc, 4 span	60		
831.55	Timber Stringers, 6 span	90		
831.88	Timber Stringers, 3 span	46		
832.06	Timber Stringers, Conc, 4 span	60		
832.29	Timber Stringers, Conc, 4 span	41		
832.57	Timber Stringers, Conc, 6 span	58		
833.14	Timber Stringers, 4 span	40		
834.98	Timber Stringers, 1 span	15		
835.35	Timber Stringers, 3 span	45		
835.81	Timber Stringers, 11 span	135		

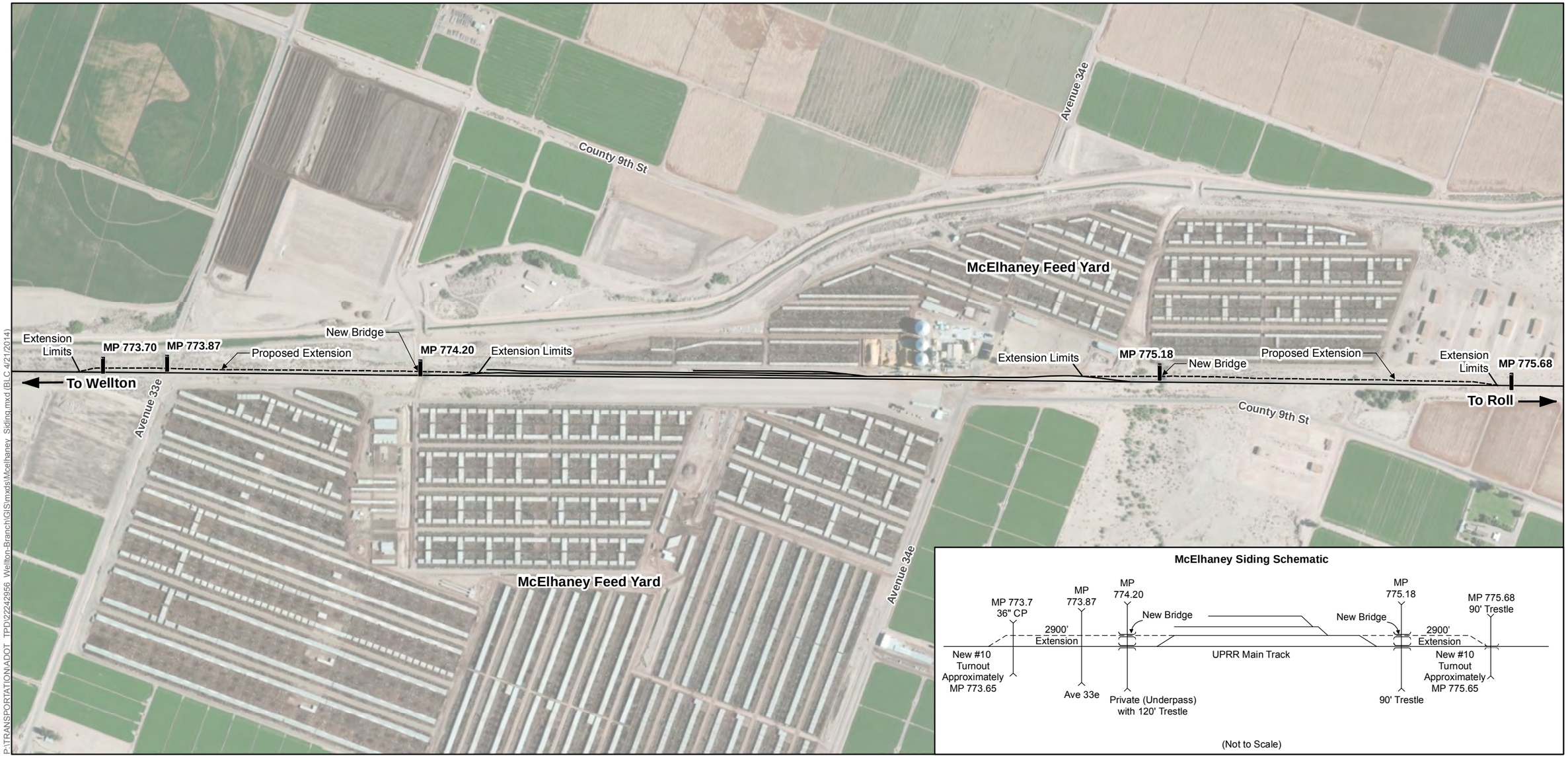
Milepost	Bridge Structure	Length (ft)	Bridge Over	Notes
836.36	Timber Stringers, 8 span	90		
836.81	Timber Stringers, 1 span	10		
837.05	Timber Stringers, 5 span	33		
837.26	Timber Stringers, 9 span	102		
837.66	Timber Stringers, 7 span	75		
838.12	Timber Stringers, 5 span	75		
838.36	Timber Stringers, 14 span	210	Buffalo Well	
838.63	Timber Stringers, 2 span	30		
838.88	Timber Stringers, 3 span	45		
839.25	Timber Stringers, 3 span	45		
839.58	Timber Stringers, 14 span	210		
839.86	Timber Stringers, 12 span	150		
840.04	Timber Stringers, 1 span	10		
840.22	Timber Stringers, 2 span	30		
840.4	Timber Stringers, 1 span	10		
840.57	Timber Stringers, 9 span	136		
840.72	Timber Stringers, 7 span	105		
840.87	Timber Stringers, 8 span	120		
841.30	Timber Stringers, 19 span	285		
841.38	Timber Stringers, 10 span	150		
841.92	Timber Stringers, 2 span	30		
842.06	Timber Stringers, 7 span	105		
842.67	Timber Stringers, 2 span	30		
842.75	Timber Stringers, 13 span	195		Washout
843.19	Timber Stringers, 14 span	210		
843.55	Timber Stringers, 2 span	30		
843.88	Timber Stringers, 1 span	15		
844.43	Timber Stringers, 1 span	10		
844.90	Timber Stringers, 6 span	90		
845.31	Timber Stringers, 3 span	150	Quail Sprgs Wash	
845.89	Timber Stringers, 3 span	180	Quail Sprgs Wash	
846.09	Timber Stringers, 3 span	180	Quail Sprgs Wash	
846.28	Timber Stringers, 1 span	10		
846.34	Deck Plate Girder, 3 span	180	Quail Sprgs Wash	
846.79	Deck Plate Girder, 3 span	180	Quail Sprgs Wash	Amtrak derailment
847.00	Timber Stringers, 5 span	75		
847.15	Timber Stringers, 3 span	45		
847.43	Timber Stringers, 10 span	150		
847.68	Timber Stringers, 3 span	45		
847.86	Timber Stringers, 1 span	15		
847.94	Timber Stringers, 10 span	150		
848.20	Timber Stringers, 1 span	15		
848.29	Timber Stringers, 1 span	5		
848.42	Timber Stringers, 1 span	15		

Milepost	Bridge Structure	Length (ft)	Bridge Over	Notes
848.83	Timber Stringers, 1 span	10		
848.94	Timber Stringers, 1 span	15		
849.04	Timber Stringers, Conc, 1 span	15		
849.49	Timber Stringers, 3 span	30		
849.58	Timber Stringers, Conc, 3 span	30		
849.70	Timber Stringers, Conc, 2 span	30		
850.01	Timber Stringers, 6 span	60		
850.44	Timber Stringers, 5 span	75		
850.55	Timber Stringers, 6 span	60		
851.08	Timber Stringers, 3 span	45		
851.31	Timber Stringers, Conc, 2 span	30		
851.65	Timber Stringers, Conc, 1 span	15		
851.99	Timber Stringers, Conc, 1 span	15		
852.27	Timber Stringers, Conc, 2 span	30		
852.44	Timber Stringers, 4 span	60		
852.89	Timber Stringers, 4 span	45		
853.35	Timber Stringers, 5 span	75		
853.97	Timber Stringers, 5 span	75		
855.47	Timber Stringers, 5 span	75		
856.01	Timber Stringers, 5 span	75		
857.56	Timber Stringers, 20 span	300		
858.01	Timber Stringers, 20 span	300		
858.45	Timber Stringers, 20 span	301		
858.85	Timber Stringers, 20 span	300		End out of service track
				West of Palo Verde
Subtotal Wellton Branch		**9,928**	**129 bridges**	
859.37	Timber Stringers, 3 span	45		In service Phoenix Line
860.72	Timber Stringers, 2 span	30		West of Arlington
	Subtotal – In service Phoenix Line	75	2 bridges	
Total Roll Lead & Wellton Branch		**13,417**	**154 bridges**	

ABBREVATIONS: BD = Ballasted Deck, Conc = Concrete Abutment and/or footing

EXHIBIT 5

CONCEPT FOR THE EXTENSION OF THE McELHANEY FEED YARD SIDING



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Legend

——— Existing UPRR Track

------ Proposed UPRR Track

0 700 1,400

Feet

Exhibit 5

McElhaney Siding

Wellton Branch Railroad Rehabilitation Study

URS

ADOT

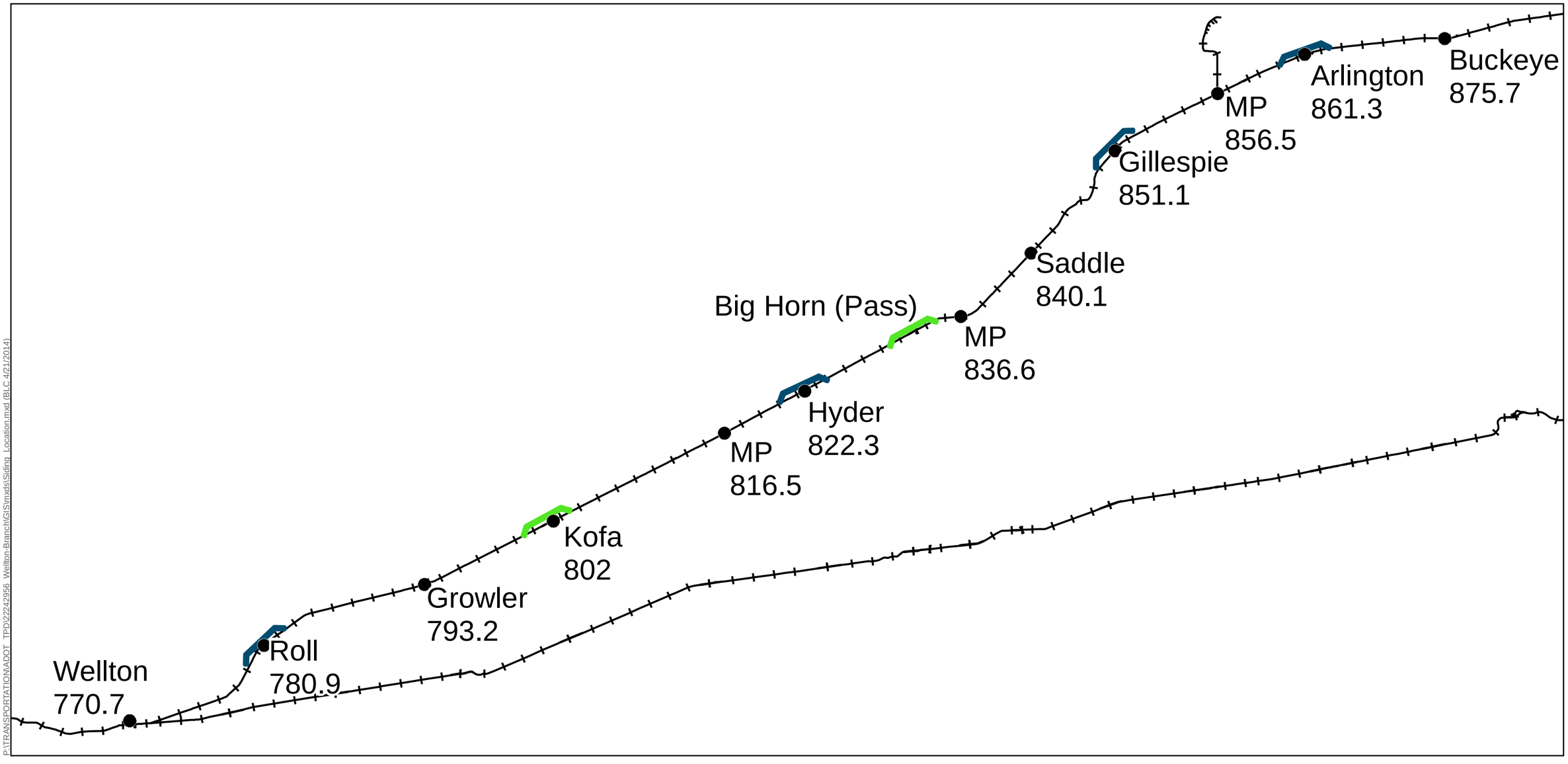
EXHIBIT 6

SIDING LOCATIONS AND LENGTHS

Exhibit 6	Wellton Branch Railroad Rehabilitation Study							
	Siding Locations and Lengths (Assumed)							
Siding Location	Existing:		Length		Proposed :		Length	Applies To
(Approximate)	From MP	To MP	(feet)		From MP	To MP	(feet)	Alternative
Existing Sidings:								
McElhaney Feed Yard	774.2	775.1	4,750		773.65	775.65	10,550	All
Roll	780.65	781.3	3,450		780.1	781.8	9,000	#2 and #3
Hyder	822.0	822.7	3,685		821.6	823.3	9,000	#2 and #3
Gillespie (existing spur)	850.7	851.4	3,660		850.2	851.9	9,000	#3 Only
Arlington	860.7	861.4	3,625		860.5	862.2	9,000	#2 and #3
New Sidings:								
Kofa	N/A	N/A	N/A		802.2	803.9	9,000	#3 Only
Big Horn (Pass)	N/A	N/A	N/A		833.6	835.3	9,000	#3 Only
NOTE: Siding locations are subject to change pending results of train simulation.								

EXHIBIT 7

SIDING LOCATION SCHEMATIC



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Legend

- Mile Post
- Existing Siding
- New Siding
- Union Pacific Railroad

Note: New siding locations are subject to change pending results of train simulation

URS

N

Not to Scale

Exhibit 7

Siding Location Schematic

Wellton Branch Railroad Rehabilitation Study

Sources
Federal Railroad Administration (FRA), URS

ADOT

EXHIBIT 8

ALTERNATIVE SCENARIO #1
CLASS 2 TRACK

WELLTON BRANCH RAILROAD REHABILITATION STUDY - CAPITAL COST ESTIMATES					
ALTERNATIVE: #1	**CLASS 2 TRACK - Freight Service Only**				
	Unit of		Unit	Total	
Cost Category	Measure	Quantity	Cost	Cost	Remarks
Active Roll Industrial Lead (Wellton MP770.70 to East of Roll MP782.3 = 11.6 Miles):					
Improve Drainage	Mile	11.6	$120,000	$1,392,000	Incl. Remove vegetation
Upgrade Track, Class 2	Mile	12.25	$500,000	$6,125,000	11.6 = main, .65 = siding
Minor Bridge Repairs	LF	2,240	$450	$1,008,000	6 bridges
Replace Active Crossing Devices	Each	5	$352,000	$1,760,000	Public crossings
Replace Passive Crossing Signs	Each	2	$18,000	$36,000	Avenue 37E and private
Replace Xing Surface w/Concrete	TF	240	$1,690	$405,600	6 public
Replace Xing Surface w/Concrete	TF	48	$1,200	$57,600	3 private
Subtotal				$10,784,200	
EXTEND McElhaney Feed Yard Siding:					
Extend Track (2900 feet)	Mile	1.10	$600,000	$660,000	115# rail, wood ties
New #10 Turnouts	Each	2	$90,000	$180,000	Incl. removal of 2 existing
New Bridge, Steel, Ballasted Deck	LF	210	$8,000	$1,680,000	2 bridges, 1 = 120', 1 = 90'
New Culvert, Concrete Pipe, 36"	LF	50	$250	$12,500	MP 773.7
Replace Active Warning Devices	Each	1	$352,000	$352,000	Avenue 33E
Replace Xing Surface w/Concrete	TF	40	$1,690	$67,600	Avenue 33E
Subtotal				$2,952,100	
Cost for Active Roll Industrial Lead				$13,736,300	
NOTE: Cost Estimate EXCLUDES Right-of-Way Costs.					

WELLTON BRANCH RAILROAD REHABILITATION STUDY - CAPITAL COST ESTIMATES					
ALTERNATIVE: #1	**CLASS 2 TRACK - Freight Service Only**				
Cost Category	Unit of Measure	Quantity	Unit Cost	Total Cost	Remarks
Out of Service Roll Industrial Lead & Wellton Branch (MP782.3 to MP 858.85 = 76.6 Miles):					
Improve Drainage	Mile	76.6	$120,000	$9,192,000	Incl. Remove vegetation
Upgrade Track, Class 2	Mile	77.99	$800,000	$62,392,000	76.6 main + 1.39 sidings
Replace Turnout at East Gillespie	Each	1	$99,000	$99,000	#10, 115# rail, wood ties
Minor Bridge Repairs	LF	7,989	$450	$3,595,050	115 bridges
Major Bridge Repairs	LF	671	$1,600	$1,073,600	8 bridges (5% of total)
Replace Bridge	LF	195	$8,000	$1,560,000	1 or more bridges
Replace Bridge with Box Culvert	Each	9	$325,000	$2,925,000	Single box at 10' bridges
Replace Bridge with Box Culvert	Each	6	$435,000	$2,610,000	Double box at 15' bridges
Replace Bridge with Box Culvert	Each	6	$865,000	$5,190,000	Quad box at 30' bridges
Replace Active Crossing Devices	Each	5	$352,000	$1,760,000	Public crossings
Replace Passive Crossing Signs	Each	10	$18,000	$180,000	Public crossings
Replace Xing Surface w/Concrete	TF	600	$1,690	$1,014,000	15 public crossings
Replace Xing Surface w/Concrete	TF	112	$1,200	$134,400	7 private crossings
Subtotal for Out of Service Roll Industrial Lead & Wellton Branch				$91,725,050	
Total Construction Cost for Class 2 Track				**$105,461,350**	
Environmental Mitigation	% Const.	3%	$105,461,350	$3,163,841	
Utility Allowance	% Const.	5%	$105,461,350	$5,273,068	
Professional Services	% Const.	4%	$105,461,350	$4,218,454	
Subtotal				$12,655,362	
Contingency (40%)	% Project	0.40	$118,116,712	$47,246,685	
TOTAL COST FOR CLASS 2 TRACK				**$165,363,397**	
Average Cost per Route Mile		$1,821,183			
NOTE: Cost Estimate EXCLUDES Right-of-Way Costs.					

EXHIBIT 9

ALTERNATIVE SCENARIO #2
and
ALTERNATIVE SCENARIO #2A
CLASS 3 TRACK

WELLTON BRANCH RAILROAD REHABILITATION STUDY - CAPITAL COST ESTIMATES					
ALTERNATIVE: #2	**CLASS 3 TRACK - Freight Service and Basic Amtrak Service**				
Cost Category	Unit of Measure	Quantity	Unit Cost	Total Cost	Remarks
Wellton to Arlington (MP770.70 to MP 861.3 = 90.8 Miles):					
Improve Drainage	Mile	90.8	$120,000	$10,896,000	Incl. Remove vegetation
General Grading, Roadbed	Mile	97.6	$130,000	$12,688,000	
Replace Main Track	Mile	90.8	$703,000	$63,832,400	115# rail, CWR, wood ties
Replace and Extend Sidings	Mile	6.8	$600,000	$4,080,000	115# rail, CWR, wood ties
New Turnouts, #20	Each	8	$175,000	$1,400,000	115# rail, wood ties (4 sdgs)
Replace Turnouts, #10	Each	7	$90,000	$630,000	115# rail, wood ties
Minor Bridge Repairs	LF	12,201	$450	$5,490,450	124 bridges
Major Bridge Repairs	LF	671	$1,600	$1,073,600	8 bridges (5% of total)
Replace Bridge	LF	195	$8,000	$1,560,000	1 or more bridges
New Bridge for Siding Extension	LF	290	$8,000	$2,320,000	8 bridges
Replace Bridge with Box Culvert	Each	9	$325,000	$2,925,000	Single box at 10' bridges
Replace Bridge with Box Culvert	Each	6	$435,000	$2,610,000	Double box at 15' bridges
Replace Bridge with Box Culvert	Each	6	$865,000	$5,190,000	Quad box at 30' bridges
Install PTC Signal System	Mile	0	$500,000	$0	Excludes rolling stock
Replace Talking Detector	Each	0	$65,750	$0	Hotbox or dragging equip.
Replace/New Active Xing Devices	Each	14	$352,000	$4,928,000	10 existg. + 5 addtnl public
Replace Passive Crossing Signs	Each	6	$18,000	$108,000	Public crossings
Replace Xing Surface w/Concrete	TF	800	$1,690	$1,352,000	20 public crossings
Replace Xing Surface w/Concrete	TF	160	$1,200	$192,000	10 private crossings
EXTEND McElhaney Feed Yard Siding:					
Extend Track (2900 feet)	Mile	1.10	$600,000	$660,000	115# rail, wood ties
New #10 Turnouts	Each	2	$90,000	$180,000	Incl. removal of 2 existing
New Bridge, Steel, Ballasted Deck	LF	210	$8,000	$1,680,000	2 bridges, 1 = 120', 1 = 90'
New Culvert, Concrete Pipe, 36"	LF	50	$250	$12,500	MP 773.7
Replace Active Warning Devices	Each	1	$352,000	$352,000	Avenue 33E
Replace Xing Surface w/Concrete	TF	40	$1,690	$67,600	Avenue 33E
Total Construction Cost for Class 3 Track				**$124,227,550**	
Environmental Mitigation	% Const.	3%	$124,227,550	$3,726,827	
Utility Allowance	% Const.	5%	$124,227,550	$6,211,378	
Professional Services	% Const.	4%	$124,227,550	$4,969,102	
Subtotal				$14,907,306	
Contingency (40%)	% Project	0.40	$139,134,856	$55,653,942	
TOTAL COST FOR CLASS 3 TRACK				**$194,788,798**	
Average Cost per Route Mile		$2,145,251			
Cost for Class 3 Track with re-use of 20% existing 113# rail				**$190,398,742**	
(18 miles of new 115# rail = 202.4 tons/mile at $1205/ton = $4,390,056)					
NOTE: Cost Estimate EXCLUDES Right-of-Way Costs or passenger station costs.					

WELLTON BRANCH RAILROAD REHABILITATION STUDY - CAPITAL COST ESTIMATES					
ALTERNATIVE: #2A	**CLASS 3 TRACK - Freight Service and Basic Amtrak Service & PTC Signal System**				
Cost Category	Unit of Measure	Quantity	Unit Cost	Total Cost	Remarks
Wellton to Arlington (MP770.70 to MP 861.3 = 90.8 Miles):					
Improve Drainage	Mile	90.8	$120,000	$10,896,000	Incl. Remove vegetation
General Grading, Roadbed	Mile	97.6	$130,000	$12,688,000	
Replace Main Track	Mile	90.8	$703,000	$63,832,400	115# rail, CWR, wood ties
Replace and Extend Sidings	Mile	6.8	$600,000	$4,080,000	115# rail, CWR, wood ties
New Turnouts, #20	Each	8	$175,000	$1,400,000	115# rail, wood ties (4 sdgs)
Replace Turnouts, #10	Each	7	$90,000	$630,000	115# rail, wood ties
Minor Bridge Repairs	LF	12,201	$450	$5,490,450	124 bridges
Major Bridge Repairs	LF	671	$1,600	$1,073,600	8 bridges (5% of total)
Replace Bridge	LF	195	$8,000	$1,560,000	1 or more bridges
New Bridge for Siding Extension	LF	290	$8,000	$2,320,000	8 bridges
Replace Bridge with Box Culvert	Each	9	$325,000	$2,925,000	Single box at 10' bridges
Replace Bridge with Box Culvert	Each	6	$435,000	$2,610,000	Double box at 15' bridges
Replace Bridge with Box Culvert	Each	6	$865,000	$5,190,000	Quad box at 30' bridges
Install PTC Signal System	Mile	90.8	$500,000	$45,400,000	Excludes rolling stock
Replace Talking Detector	Each	0	$65,750	$0	Hotbox or dragging equip.
Replace/New Active Xing Devices	Each	14	$352,000	$4,928,000	10 existg. + 5 addtnl public
Replace Passive Crossing Signs	Each	6	$18,000	$108,000	Public crossings
Replace Xing Surface w/Concrete	TF	800	$1,690	$1,352,000	20 public crossings
Replace Xing Surface w/Concrete	TF	160	$1,200	$192,000	10 private crossings
EXTEND McElhaney Feed Yard Siding:					
Extend Track (2900 feet)	Mile	1.10	$600,000	$660,000	115# rail, wood ties
New #10 Turnouts	Each	2	$90,000	$180,000	Incl. removal of 2 existing
New Bridge, Steel, Ballasted Deck	LF	210	$8,000	$1,680,000	2 bridges, 1 = 120', 1 = 90'
New Culvert, Concrete Pipe, 36"	LF	50	$250	$12,500	MP 773.7
Replace Active Warning Devices	Each	1	$352,000	$352,000	Avenue 33E
Replace Xing Surface w/Concrete	TF	40	$1,690	$67,600	Avenue 33E
Total Construction Cost for Class 3 Track				**$169,627,550**	
Environmental Mitigation	% Const.	3%	$169,627,550	$5,088,827	
Utility Allowance	% Const.	5%	$169,627,550	$8,481,378	
Professional Services	% Const.	4%	$169,627,550	$6,785,102	
Subtotal				$20,355,306	
Contingency (40%)	% Project	0.40	$189,982,856	$75,993,142	
TOTAL COST FOR CLASS 3 TRACK & PTC Signal System				**$265,975,998**	
Average Cost per Route Mile		$2,929,251			
Cost for Class 3 Track with re-use of 20% existing 113# rail				**$261,585,942**	
(18 miles of new 115# rail = 202.4 tons/mile at $1205/ton = $4,390,056)					
NOTE: Cost Estimate EXCLUDES Right-of-Way Costs or passenger station costs.					

EXHIBIT 10

ALTERNATIVE SCENARIO #3
CLASS 4 TRACK

WELLTON BRANCH RAILROAD REHABILITATION STUDY - CAPITAL COST ESTIMATES					
ALTERNATIVE: #3	**CLASS 4 TRACK - Freight Service and Higher Speed Passenger Service**				
Cost Category	Unit of Measure	Quantity	Unit Cost	Total Cost	Remarks
Wellton to Arlington (MP770.70 to MP 861.3 = 90.8 Miles):					
Improve Drainage	Mile	90.8	$120,000	$10,896,000	Incl. Remove vegetation
General Grading, Roadbed	Mile	101	$150,000	$15,150,000	
Replace Main Track	Mile	90.8	$1,600,000	$145,280,000	136# rail, CWR, conc. ties
Replace and Extend Sidings	Mile	10.2	$1,200,000	$12,240,000	136# rail, CWR, conc. ties
New Turnouts, #20	Each	12	$188,000	$2,256,000	136# rail, wood ties (6 sdgs)
Replace Turnouts, #10	Each	7	$99,000	$693,000	136# rail, wood ties
Minor Bridge Repairs	LF	12,124	$450	$5,455,800	123 bridges
Major Bridge Repairs	LF	671	$1,600	$1,073,600	8 bridges (5% of total)
Replace Bridge	LF	272	$8,000	$2,176,000	2 or more bridges
New Bridge for Siding Extension	LF	600	$8,000	$4,800,000	12 bridges
Replace Bridge with Box Culvert	Each	9	$325,000	$2,925,000	Single box at 10' bridges
Replace Bridge with Box Culvert	Each	6	$435,000	$2,610,000	Double box at 15' bridges
Replace Bridge with Box Culvert	Each	6	$865,000	$5,190,000	Quad box at 30' bridges
Install PTC Signal System	Mile	90.8	$500,000	$45,400,000	Excludes rolling stock
Replace Talking Detector	Each	6	$65,750	$394,500	Hotbox or dragging equip.
Replace/New Active Xing Devices	Each	20	$352,000	$7,040,000	All public crossings
Replace Xing Surface w/Concrete	TF	800	$1,690	$1,352,000	20 public crossings
Replace Xing Surface w/Concrete	TF	160	$1,200	$192,000	10 private crossings
EXTEND McElhaney Feed Yard Siding:					
Extend Track (2900 feet)	Mile	1.10	$600,000	$660,000	115# rail, wood ties
New #10 Turnouts	Each	2	$90,000	$180,000	Incl. removal of 2 existing
New Bridge, Steel, Ballasted Deck	LF	210	$8,000	$1,680,000	2 bridges, 1 = 120', 1 = 90'
New Culvert, Concrete Pipe, 36"	LF	50	$250	$12,500	MP 773.7
Replace Active Warning Devices	Each	1	$352,000	$352,000	Avenue 33E
Replace Xing Surface w/Concrete	TF	40	$1,690	$67,600	Avenue 33E
Total Construction Cost for Class 4 Track				**$268,076,000**	
Environmental Mitigation	% Const.	3%	$268,076,000	$8,042,280	
Utility Allowance	% Const.	5%	$268,076,000	$13,403,800	
Professional Services	% Const.	4%	$268,076,000	$10,723,040	
Subtotal				$32,169,120	
Contingency (40%)	% Project	0.40	$300,245,120	$120,098,048	
TOTAL COST FOR CLASS 4 TRACK				**$420,343,168**	
Average Cost per Route Mile		$4,629,330			
NOTE: Cost Estimate EXCLUDES Right-of-Way Costs or passenger station costs.					