



Pilning Station Footbridge Cost Benefit Analysis

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Introduction

The Friends of Suburban Bristol Railways (FOSBR) have requested that a cost benefit analysis be completed to support their case for the installation of a new footbridge at Pilning station in South Gloucestershire, to the north west of the city of Bristol. The case is being made to the GWR Franchise consultation that closes on 21 February 2018. The original footbridge was removed in 2016 as part of Network Rail’s electrification programme¹ and it was deemed not cost effective to replace it due to the low number of passengers using the station, with just 230 people using the station in 2016/17². The low number of passengers, up from 46 in 2015/16, is due to the fact that the station is served by just two trains a week, at 0834 and 1534 on a Saturday. Network Rail has estimated that the installation of an equalities compliant bridge at the station will cost £2 million and FOSBR have requested that the installation of this bridge be included within the next stage of the GWR franchise after 2020.

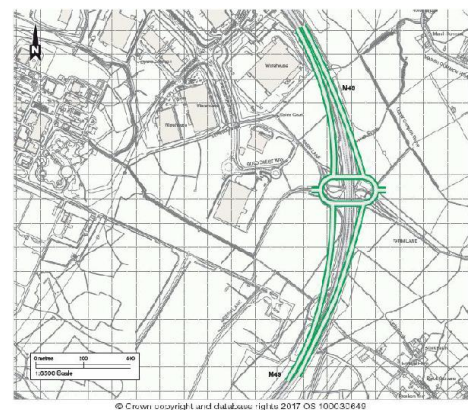
Feasibility

Since Network Rail’s decision not to replace the footbridge in 2016 there have been several changes to transportation within the Greater Bristol area surrounding Pilning Station. Highways England has announced plans to construct a new junction on the M49 motorway that would provide greater access to the station. This new junction provides Bristol City Council with the opportunity to develop a Park and Rail site at the station, reducing trips into Bristol city centre. This is important as Bristol City Council is currently developing options for installing a Clean Air Zone (CAZ) within the city centre to comply air quality standards³. Developing Park and Rail facilities at Pilning station, through the construction of a pedestrian bridge and surface level car parking would provide a relatively low cost option compared to the construction of a new Park and Ride site served by buses. The new junction is expected to cost between £25m and £50m, but as yet no date has been set for its construction.

The second change to transportation in the Greater Bristol area is the proposed expansion of *The Mall* at Cribbs Causeway and the associated additional traffic this will have. Pilning railway station is situated 4.8km away from The Mall site. The Transport Review Group for the development’s travel plan have stated to FOSBR that if more frequent services were reintroduced to Pilning Station they would consider running a shuttle bus to/from the station to serve their customers who wished to travel by train, rather than car.

The final change comes from the businesses to the south of Pilning Station based at Severnside. SevernNet, a consortia of businesses on at Severnside, are interested in running shuttle buses for their staff to/from the station providing the services meet fit with current shift patterns. All three of these changes suggest that the re-installation of a footbridge at Pilning station should be considered as part of the next GWR franchise as they would provide benefits for

PROPOSED M49 AVONMOUTH JUNCTION⁴



¹ Sims, A. (2016) http://www.gazetteseries.co.uk/news/14587196.Rail_platform_and_footbridge_set_for_closure_in_Pilning/
² ORR (2018) <http://orr.gov.uk/statistics/published-stats/station-usage-estimates>
³ BBC (2017) <http://www.bbc.co.uk/news/uk-england-bristol-40865101>
⁴ Highways England (2017) <http://roads/highways.gov.uk>



travel within the Greater Bristol area.

Cost Benefit Analysis (CBA)

The Department for Transport's Web-based Transport Analysis Guidance (WebTAG) provides advice on transport modelling and appraisal for highways and public transport interventions. This is based on HM Treasury's Green Book to explore a wide range of impacts from a transport intervention. Rail interventions are based on the same approach. For the purposes of this analysis three scenarios will be tested to demonstrate the benefits of installing the bridge. This will be based on the Carbon Dioxide (CO₂) and Nitrogen Oxide (NO_x) reductions from people travelling by train compared to driving within the Greater Bristol area. It is not possible to capture the wider economic benefits or social benefits of this scheme due to the lack of available data. The analysis is therefore designed to demonstrate the benefits in one area, emissions, with the request that WECA conduct a full CBA as part of the Joint Local Transport Plan for the implementation of the bridge in line with its inclusion in the next GWR franchise period.

Assumptions

As with any model a set of assumptions will be included. These will be outlined below.

The CBA will be based on the assumption that additional train services will be provided to/from Pilning Station by Great Western Railways as part of their next franchise to meet the demands of Severnside businesses and The Mall's customers. The table below includes the proposed services which would include 10 services a day in each direction. This number of services has been used for the CBA as it would provide services to serve shift patterns at Severnside and the majority of the weekend trips to The Mall.

The second assumption is based on the type of car that will be taken off the road. For this scenario the findings are based on a 1.6ltr Diesel Ford Focus, the most popular car in Britain. The Ford Focus emits 114 grams of CO₂ per kilometre⁵ and between 0.5 and 0.75 grams of NO_x per kilometre⁶. The cost of these emissions to the environment is approximately £0.05/kilometre⁷.

The CBA will test the three scenarios.

⁵ EU (2015) <https://www.energy.eu/car-co2-emissions/ford.php>

⁶ Emissions Analytics (2018) <http://equaindex.com/equa-air-quality-index/>

⁷ MyClimate.org (2016) https://co2.myclimate.org/en/portfolios?calculation_id=1045204&localized_currency=GBP



Scenario 1 – 10 passengers will use Pilning Station/train

Scenario 2 – 20 passengers will use Pilning station/train

Scenario 3 – 40 passengers will use Pilning Station/train

An assumption has been made that each of these passengers would travel 40km by car if they were not travelling by train.

The trains currently running this line run on diesel and therefore emit CO₂ and NO_x. These trains will be running on this line whether they stop at Pilning or not. The level of emissions per service is therefore negligible and has been discounted for the purposes of this analysis. Further research would need to incorporate these figures.

DAY	DIRECTION	APPROX TIME	PURPOSE
MON-FRI	Bristol to Pilning	0530	Serving Businesses at Severnside
MON-FRI	Bristol to Pilning	0630	Serving Businesses at Severnside
MON-FRI	Bristol to Pilning	0730	Serving Businesses at Severnside
MON-FRI	Bristol to Pilning	0750	Serving Businesses at Severnside
MON-FRI	Bristol to Pilning	0830	Serving Businesses at Severnside
MON-FRI	Bristol to Pilning	1330	Serving Businesses at Severnside
MON-FRI	Bristol to Pilning	1430	Serving Businesses at Severnside
MON-FRI	Bristol to Pilning	1600	Serving Businesses at Severnside
MON-FRI	Bristol to Pilning	1930	Serving Businesses at Severnside
MON-FRI	Bristol to Pilning	2030	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	0530	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	0630	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	0730	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	0750	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	0830	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	1330	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	1430	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	1600	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	1930	Serving Businesses at Severnside
MON-FRI	Newport to Pilning	2030	Serving Businesses at Severnside
SAT-SUN	Bristol to Pilning	0930	Serving the Mall
SAT-SUN	Bristol to Pilning	1030	Serving the Mall



DAY	DIRECTION	APPROX TIME	PURPOSE
SAT-SUN	Bristol to Pilning	1130	Serving the Mall
SAT-SUN	Bristol to Pilning	1230	Serving the Mall
SAT-SUN	Bristol to Pilning	1330	Serving the Mall
SAT-SUN	Bristol to Pilning	1430	Serving the Mall
SAT-SUN	Bristol to Pilning	1530	Serving the Mall
SAT-SUN	Bristol to Pilning	1630	Serving the Mall
SAT-SUN	Bristol to Pilning	1730	Serving the Mall
SAT-SUN	Bristol to Pilning	1830	Serving the Mall
SAT-SUN	Newport to Pilning	0930	Serving the Mall
SAT-SUN	Newport to Pilning	1030	Serving the Mall
SAT-SUN	Newport to Pilning	1130	Serving the Mall
SAT-SUN	Newport to Pilning	1230	Serving the Mall
SAT-SUN	Newport to Pilning	1330	Serving the Mall
SAT-SUN	Newport to Pilning	1430	Serving the Mall
SAT-SUN	Newport to Pilning	1530	Serving the Mall
SAT-SUN	Newport to Pilning	1630	Serving the Mall
SAT-SUN	Newport to Pilning	1730	Serving the Mall
SAT-SUN	Newport to Pilning	1830	Serving the Mall

Calculation

The calculations are based on the use of the station for 363 days of the year, with each person saving 40km of travel by car. The first table shows the financial benefits per day of the three scenarios. With scenario 1 an average of 10 passengers per train there is a £4,000 financial benefit for the local environment due to the emissions saved, with this increasing to £16,000 if there were 40 passengers alighting per train.

NO. TRAIN SERVICES/ DAY	NO. PASSENGERS/ TRAIN	TOTAL PASSENGER S/ DAY	DISTANCE BY CAR SAVED (40KM/ PASSENGER)	CO ₂ EMISSIONS SAVED/DAY (114G/KM)	NO _x EMISSIONS SAVED/DAY (0.625G/KM)	ENVIRONMENTAL SAVING/DAY (£)
20	10	200	8,000km	912kg CO ₂	5kg	£4,000
20	20	400	16,000km	1,824kg CO ₂	10kg	£8,000
20	40	800	32,000km	3,648kg CO ₂	20kg	£16,000

For the year the figures demonstrate that for Scenario 1, 10 passengers per train the environmental benefits would be £1.4m per year, with this increasing to £5.8m for Scenario 3, with 40 passengers per train.



NO. TRAIN SERVICES/ YEAR	NO. PASSENGERS/ TRAIN	TOTAL PASSENGER S/ YEAR	DISTANCE BY CAR SAVED (40KM/ PASSENGER)	CO ₂ EMISSIONS SAVED/ YEAR (114G/KM)	NO _x EMISSIONS SAVED/ YEAR (0.625G/KM)	ENVIRONMENTAL SAVING/YEAR (£)
7260	10	72,600	2,904,000km	331,056 kg CO ₂	1,815 kg	£1,452,000
7260	20	145,200	5,808,000km	662,112 kg CO ₂	3,630 kg	£2,904,000
7260	40	290,400	11,616,000km	1,324,224 kg CO ₂	7,260 kg	£5,808,000

Summary

The results show that if GWR were to provide 10 services a day to Pilning station and that if each train had 10 passengers either alight or board the service the environmental savings for the West of England area of installing the footbridge at Pilning at the cost of £2m would be paid back in under 18 months. In the most optimistic scenario (Scenario 3) this would be paid back in just under four months, in terms of environmental benefits for the Greater Bristol area.

The findings do not include any calculations of economic or social benefits of implementing this scheme, that would be added to this equation to demonstrate the full benefits.

This report concludes that providing GWR were prepared to run these services and work together with SevernNet and The Mall's transport plan team, it would be possible to provide these services and help reduce emissions CO₂ and NO_x in the Greater Bristol area.

Next Steps

The results of this analysis show that the provision of services and a new footbridge at Pilning station have the potential to provide an environmental benefit to the Greater Bristol area in terms of emissions reduction. Therefore this report recommends that the installation of a bridge and the introduction of services be considered for the next GWR franchise period by the Department for Transport.

The installation of the footbridge, additional trains, new junction for the M49 linking to Pilning station and a Park and Rail site to be delivered at the station should also be included for consideration at Pilning as part of the West of England Combined Authority's Joint Local Transport Plan. Once the scheme is included in both these plans it will be possible to conduct a full cost benefit analysis of the schemes to demonstrate the wider benefits the enhancement of this station can provide to the Greater Bristol area moving forward.