PORTISHEAD BRANCH LINE PRELIMINARY ENVIRONMENTAL INFORMATION REPORT
VOLUME 2

CHAPTER 3

Scheme Development and Alternatives Considered

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travelwest
Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire Councils working together to improve your local transport

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CHAPTER 3

Scheme Development and Alternatives Considered

3.1 Introduction

3.1.1 This chapter describes how the Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme ("the DCO Scheme") was identified, the development of the design, and the alternatives considered for elements of the DCO Scheme.

3.1.2 A detailed description of the DCO Scheme is presented in Chapter 4 Description of the Works.

3.2 Background to the Development of the DCO Scheme

The MetroWest Programme

3.2.1 The West of England ("WoE") councils are progressing plans to invest in the local rail network over the next ten years through the MetroWest programme. The MetroWest programme comprises:

- The MetroWest Phase 1 project;
- The MetroWest Phase 2 project;
- A range of station re-opening / new station projects; and
- Smaller scale enhancements projects for the WoE local rail network.

3.2.2 These projects range from relatively large major schemes, entailing both infrastructure and service enhancement, to smaller scale projects.

3.2.3 MetroWest is being jointly promoted and developed by the four WoE councils; Bath & North East Somerset Council ("B&NES"), Bristol City Council ("BCC"), North Somerset District Council ("NSDC") and South Gloucestershire Council ("SGC"). The MetroWest programme will address the core issue of transport network resilience, through targeted investment to increase both the capacity and accessibility of the local rail network. The MetroWest concept is to deliver an enhanced local rail offer for the sub-region comprising:

- improvements to existing rail corridors feeding into Bristol and reopening the disused line between Portishead and Pill;
- increased service frequency;
- cross-Bristol service patterns (eg Bath to Severn Beach); and
- a Metro-type service appropriate for a city region with a population which exceeded 1 million in 2016.

3.2.4 The MetroWest Phase 1 project comprises the delivery of infrastructure and passenger train operations to provide:

- a half hourly service for the Severn Beach line (hourly for St. Andrews Road station and Severn Beach station);

- a half hourly service for Keynsham and Oldfield Park stations on the Bath Spa to Bristol line; and
- an hourly service (or an hourly service plus) for a reopened Portishead Branch Line with stations at Portishead and Pill (and also serving existing stations at Parson Street, Bedminster and Bristol Temple Meads).

Brief History of the Project

3.2.5 A brief history of policy development, studies and actions to re-open the Portishead Branch Line as part of MetroWest Phase 1 is provided in Table 3-1.

Table 3-1: Brief history of the project

Year	Actions and policies
1964	Portishead Branch Line was closed to passenger services as part of the Beeching cuts.
1981	The Portishead Branch Line was closed to freight. The railway was not dismantled or formally mothballed.
1991	The Bristol Integrated Transport and Environmental Study ("BRITES") looked at the possibility of Light Rail Transit ("LRT") along the Portishead line.
1992	Guided Light Transit ("GLT"), a type of guided bus system, was considered as an alternative to LRT along the Portishead line in GLT BRITES.
1998	The Transport and Development Modelling Study, Bristol North East and South West Sectors looked at a possible park and ride at Portbury.
1999	The Portishead to Bristol Corridor Study Stage 1 looked at light and heavy rail options for the route
2001	The Portishead to Bristol Corridor Study Stage 2 examined three heavy rail options versus a light rail option and five bus options.
2002	Part of the Portishead Branch Line (as far as Pill) was re-opened for freight trains, along with a new half kilometre section of railway from Pill to Royal Portbury Dock.
2004	Quays Avenue in Portishead was built across the safeguarded rail alignment on the presumption that a rail level crossing would be acceptable and deliverable, should the railway scheme be taken forward. Quays Avenue was built to provide access for new housing developments off Phoenix Way to the external facing A369 corridor without going along Harbour Road and the town centre via Cabstand.
2005	Portishead Quays Masterplan identified a new location for Portishead station at the rear of Waitrose supermarket off Harbour Road.
2006	Joint Local Transport Plan 2 provided a policy basis and stakeholder support for taking forward the project to open the Portishead Branch Line.
2007	The North Somerset Adopted Replacement Local Plan Policy T/1 safeguarded the disused railway alignment between Portishead and Pill while T/3 safeguarded a site for Portishead station at the rear of Waitrose, close to the former station site in 1964.
2008	North Somerset Council purchases the track-bed from Portishead to Portbury to safeguard the alignment for a transportation corridor.
2008	Project feasibility study by consultants Halcrow Group Ltd.

Table 3-1: Brief history of the project

Year	Actions and policies
2009	Engineering feasibility by Network Rail through GRIP1 stages 1 Output Definition and 2 Feasibility Studies.
2010	Further engineering feasibility by Network Rail through GRIP stage 3 Option Selection (note this was an early, less detailed GRIP stage 3, not the GRIP 3 for Approval in Principle design which was undertaken in 2015-2017).
2011	Joint Local Transport Plan 3 provided a policy basis, programme prioritisation and stakeholder support for taking project forward. Sub-regional rail conference – Portishead Branch Line re-opening project was selected by over 70 delegates as the 2nd highest rail priority for delivery. Sub-regional rail study recommends combining Portishead Branch Line re-opening project into the Greater Bristol Metro project with delivery through a phased approach. Greater Bristol Metro Phase 1 was to be taken forward first including train service enhancements for the Severn Beach and Bath to Bristol line and re-opening the Portishead Branch Line.
2012	Joint Transport Executive Committee endorsement including the Portishead Branch Line re-opening in the Greater Bristol Metro Phase 1 and the Committee endorsed a response to the Department for Transport ("DfT") on the Great Western Franchise calling for the project to be included in franchise specification as a priced option. DfT confirmed the inclusion of Greater Bristol Metro Phase 1 as a priced option in the Great Western Franchise.
2013	Joint Transport Executive Committee endorsed proposals by the four councils to allocate resources to fully mobilise the Greater Bristol Metro Phase 1 project. The project is briefly renamed 'Great West Phase 1' project, then changing to 'MetroWest Phase 1'. In February 2013, public consultation was undertaken on NSDC's Sites and Policies Development Plan Document (Consultation Version) which included three options for the site of Portishead station.
2014	Public consultation was undertaken on the location for Portishead rail station. GRIP stages 1 and 2 were completed alongside the Preliminary Business Case and reported to the Joint Transport Board (comprising both the Joint Transport Executive Committee and the Local Transport Body Board). Portishead Station Options Appraisal Report was submitted to the Office of Rail Regulation. Environmental baseline studies of the proposed Scheme.
2015	Office of Rail Regulation letter states they would not contemplate a level crossing on Quays Avenue. Public consultation undertaken on MetroWest Phase 1 project. A letter submitted to The Planning Inspectorate in June 2015 notifying them of North Somerset's intention to submit an Environmental Statement on the DCO Scheme and requesting a Scoping Opinion, together with copies of the Environmental Scoping Report and Baseline Report. The Planning Inspectorate provided a Scoping Opinion in August 2015.

[1] The management and control process used by Network Rail for delivering projects to enhance or renew the operational railway is called Governance for Railway Investment Projects ("GRIP"). This is an eight stage process from project identification, through several design stages to construction, commissioning and hand over.

Table 3-1: Brief history of the project

Year	Actions and policies
2015-2017	GRIP 3 design for Approval in Principle (2 trains per hour scheme) for the railway. Highways design and transportation modelling for Portishead, Pill and Ashton Vale Industrial Estate alternative access. Environmental Impact Assessment of the emerging DCO Scheme.
2016	Micro consultation undertaken on Pill station and Ashton Vale Road highway access. Further round of micro consultation undertaken on Ashton Vale Road highway access. Strategic parcels of land are acquired.
2017	The capital cost of the half hourly Portishead Branch Line scheme based on the GRIP 3 (2 trains per hour) raised affordability challenges. Value engineering was undertaken to test the design and associated costs. A revised scheme for an hourly or "hourly plus" service was developed, which kept the proposed design for the disused section of the railway and the associated works between Portishead and Pill coupled with minimal works along the operational railway for the existing line speed of 30 mph through the Avon Gorge.

3.3 Alternatives Considered for the Portishead Branch Line

3.3.1 In terms of the route for the provision of a railway between Portishead and Pill, which forms the Nationally Significant Infrastructure Project ("NSIP") to which the application for a Development Consent Order will relate, there is little purpose in considering alternative alignments. This is because

- NSDC and NRIL between them own the land forming the former railway corridor;
- all the principal structures required for the railway are already in place;
- the railway is on a relatively straight alignment between Portishead and the connection to the existing rail network at Portbury Dock Junction; and
- the corridor has been reserved for transport proposals in the relevant planning policy documents.

3.3.2 Consideration of alternatives was therefore largely restricted to specific elements of the NSIP and its associated development and to the options for service provision.

3.3.3 Two strategic options were considered for MetroWest Phase 1:

- an all day, half hourly service to Portishead and Pill; and
- a lower cost option to reopen the railway to passengers, with a less frequent service pattern.

3.3.4 Options for service frequencies were assessed in the Preliminary Business Case[2] (West of England Partnership, September 2014). At that time, half hourly and hourly services for the reopened Portishead Branch Line were under consideration. The economic assessment based on the GRIP 2 costs found that an hourly off peak service frequency provided lower value for money than a half hourly option. Consequently this option was

[2] https://travelwest.info/project/metrowest-phase-1-preliminary-business-case

not taken further at that time due to the perception that there would be additional costs associated with a later upgrade as well as the associated disruption to rail users.

3.3.5 However following the completion of the scheme's outline design including GRIP 3 (Option Selection) for two trains per hour in March 2017, along with an updated scheme capital cost estimate, the amount of works required for a half hourly hour service were considerably higher than estimates made at the feasibility design stage (GRIP 2). This makes the half hourly scheme presently unaffordable.

3.3.6 The key drivers for the cost increasing were:

- the amount of works required through the Avon Gorge in order to meet modern safety standards to deliver the necessary line speeds to achieve the two trains per hour aspiration, compounded by the poor access in the Gorge, reducing construction productivity;
- the impact on the Ashton Vale Level crossing of two passenger trains per hour all day alongside existing freight services ,resulting in the need to consider an alternative highway access from the A370 to the rear of the Ashton Vale Road industrial estate;
- the consequential impact from the above on the amount of land, DCO (planning) requirements and environmental mitigation needed for the scheme; and
- the increased risks associated with the project following the expanded works and their constraints.

3.3.7 As a result the four WoE councils determined to take a staged approach to the delivery of the MetroWest Phase 1 project:

- The proposals for the Severn Beach Line and Bath Spa to Bristol Line remain unchanged i.e. half hourly services and associated infrastructure.
- The proposals for the Portishead Branch Line are to be delivered in two stages:
  - The initial stage is to deliver infrastructure to operate an hourly service with an option for a second service to be added during peak times (referred to as an hourly plus service) providing an approximate 45 minute frequency. This would minimise the amount of infrastructure required.
  - It is envisaged that a second stage will be promoted separately at some point after the delivery of the initial stage, to upgrade the infrastructure to operate a half hourly passenger train service. This second stage will require separate statutory processes, business case and funding package and will not be progressed until after the delivery of the initial stage. There is currently no estimated opening date for the second stage.

3.3.8 The Preliminary Business Case (September 2014) also considered at a high level a lower cost option. The option would comprise rebuilding a short section of the disused line from Pill to the M5 Junction 19 where a park and ride station could be built rather than rebuilding the dis-used line all the way to Portishead. The advantages of this option mainly lie in cost savings. The disadvantage of the option is that it does not fully address the scheme objectives[3]. The scheme would not connect Portishead town directly to the national rail network, thus not providing direct access to the rail network for an additional 30,000 people. This would mean that the full range of social and economic advantages afforded by a direct rail connection for the residents, businesses and visitors of Portishead would not be realised. The vast majority of users would effectively have to inter-change at the park and ride station as the residential walking catchment in the vicinity of J19 of the M5 would be almost non-existent. Access to the station at Junction 19 would be limited to car users and possibly feeder bus services. The scheme would also result in some undesirable social distributional impacts. Given these fundamental dis-advantages this lower cost option was not developed further.

3.4 Alternatives for Specific Elements of the DCO Scheme

3.4.1 The Portishead Branch Line (MetroWest Phase 1) DCO Scheme will re-use the existing railway corridor which was first laid out in the 1860s. This approach minimises the need for land-take. There are no realistic options for alternative routes for the railway outside the existing railway corridor, which in any event is safeguarded in NSDC's Local Plan.

3.4.2 Alternatives have been considered for the location and layout of features associated with the DCO Scheme and its operation. A summary of alternatives considered for specific elements of the DCO Scheme is presented in Table 3-2 below.

[3] The MetroWest Phase 1 principal business objectives are:

• To support economic growth, through enhancing the transport links to the TQEZ and into and across Bristol city centre, from the Portishead, Bath and Avonmouth and Severn Beach arterial corridors.

• To deliver a more resilient transport offer, providing more attractive and guaranteed (future-proofed) journey times for commuters, business and residents into and across Bristol, through better utilisation of strategic heavy rail corridors from Portishead, Bath and Avonmouth, and Severn Beach.

• To improve accessibility to the rail network with new and reopened rail stations and reduce the cost (generalised cost) of travel for commuters, business and residents.

• To make a positive contribution to social well-being, life opportunities and improving quality of life, across the three arterial corridors.

The MetroWest Phase 1 supporting objectives are:

• To contribute to reducing traffic congestion on the Portishead, Bath and Avonmouth, and Severn Beach arterial corridors.

• To contribute to enhancing the capacity of the local rail network, in terms of seats per hour in the AM and PM peak.

• To contribute to reducing the overall environmental impact of the transport network.

Table 3-2: Summary of alternatives considered for specific scheme elements

Option Description	Option Consideration	Outcome
Portishead station location and level crossing at Quays Avenue	The area of search for a new station in Portishead was limited to sites along the safeguarded route from its western extent to the edge of town. Three options for the site of Portishead Station were presented in the Council's Sites and Policies Development Plan Document ("DPD") (Consultation Version) 2013. Option 1 – a town centre location on Harbour Road and the site safeguarded in the 2007 Replacement Local Plan. Option 2 – a peripheral town centre location immediately east of Quays Avenue. Option 3 – an edge of town location on land north of Moor Farm. Six sub-options were taken forward for further appraisal. Option 1A (previously Option 1) Option 1B – site west of Portbury Drain Option 2A (previously Option 2) Option 2B – site straddling Quays Avenue Option 2C – site immediately west of Quays Avenue Option 3.	During public consultations on the DPD in 2013, Options 1 and 2 received support and objections, with Option 1 receiving most support, and there was no support for Option 3. There were also suggestions to look at alternative sites. Following the appraisal of the six sub-options, Options 1A and 1B were discounted due the Office of Rail Regulation's refusal to allow a level crossing and the engineering, financial and economic implications to build a bridge on Quays Avenue over the railway. Option 3 was discounted due to the lack of support. Options 2A, 2B and 2C were taken forward for public consultation in 2014. Over 400 responses were received, with Option 2B being the most popular followed by Options 2A and 2C. The Office of Rail Regulation confirmed that they would not contemplate a level crossing at Quays Avenue. NSC decided to proceed with station location option 2B (no level crossing) on 17 March 2015. Further discussion of the station options is provided in the Scoping Report (CH2M, 2015).[4]
Portishead and Pill station platform length	The initial design brief was for a 105 metre (4 train carriages) platform. Following technical engagement during the outline design (GRIP 3) in 2016 it was decided it would be appropriate to make provision for 5 coach trains and the platform length needed to be 130 metres to accommodate them.	The outline (GRIP 3) design brief in 2016 was amended to include 130 metre (5 train carriages) platforms. This will be retained for the revised proposals for the one train per hour service.

[4] This report is publically available and can be downloaded from The Planning Inspectorate's website at https://infrastructure.planninginspectorate.gov.uk/projects/south-west/portishead-branch-line-metrowest-phase-1/?ipcsection=docs

Table 3-2: Summary of alternatives considered for specific scheme elements

Option Description	Option Consideration	Outcome
Portishead station design development	The layout for Portishead station is largely determined by the available footprint, with the station on the north side of the platform, with a small car park immediately to the north and a larger car park along the disused corridor to the west of a re-aligned Quays Avenue and south of Harbour Road. The arrangement of the north car park was modified to improve the circulation of buses, pick up and drop off points, taxi ranks and car parking spaces. The elevation of the station was modified to avoid stepped access. The design of the public realm was developed to minimise conflicting movements between pedestrians and vehicles. The form and appearance of the station buildings evolved to reach a balance between affordability and good design.	The layout of the station encourages multi-modal connections for users of public and private transport as well as pedestrians and cyclists. The design has considered people with mobility restrictions.
Trinity Primary School Footbridge	It will be necessary to close the existing permissive pedestrian/cycle crossing for safety reasons. Given the substantial usage of the crossing, by parents, children and residents, a replacement crossing is required. An underpass at this location is not feasible given the ground conditions and proximity of the lake on the southern side. The options for a footbridge are constrained by technical factors including the location of the existing waterway and culvert. During outline design (GRIP 3) the visual impact of the bridge has been softened using earth bunds on the northern side along with landscaping on both sides of the railway.	Overall there was support for the footbridge, with some localised opposition from consultation undertaken in 2015.
Sheepway Gate Farm – closure of accommodation crossings	The two existing accommodation crossings used by the farm to access their land to the south of the railway will have to be closed for safety reasons. A private overbridge for the farm was discussed with the farm owner, however the owner did not want a bridge due its considerable footprint and visual impact. The Applicant will seek powers to make alterations to, improve the existing access to the southern field from Sheepway.	The option for a private overbridge was dropped as a result of the engagement with the farm owner.

Table 3-2: Summary of alternatives considered for specific scheme elements

Option Description	Option Consideration	Outcome
National Cycle Network ("NCN") & bridleway Portishead to Pill	The existing NCN26 links using the railway underbridges at Royal Portbury Dock Road, Marsh Lane and M5 Railway underbridge, are to be retained as permissive paths, as there is sufficient width under the bridges for both the railway and the path. In addition the following enhancement is proposed. An extension to the existing bridleway routed between the eastern perimeter of Bristol Port, and the western side of the M5. The bridleway extension will provide a link under the M5 bridge (main span) and connect onto NCN 41 west of Pill village. The extension will provide a route for horses and other bridleway users away from the railway, as well as the more direct permissive pedestrian and cycle path alongside the railway under the M5.	Powers to extend the bridleway will be sought.
Pill station	The feasibility design (GRIP 2) for Pill station initially entailed a footbridge over the railway with a pedestrian entrance on Monmouth Road. During the outline design (GRIP 3) an alternative option came to light entailing the acquisition and demolition of No 7 Station Road, Pill. The alternative option provided space for a station forecourt and did not require a footbridge. A micro consultation was undertaken in March 2016 on four options.	There was very strong support for option 4 via the micro consultation; the option to demolish Pill station house and create a station forecourt with highway access entering via Sambourne Lane and existing via Station Road. The site has now been purchased by NSDC.
Location of the Principal Supply Point ("PSP") building	A PSP building is located in the vicinity of Pill. The 2016 GRIP 3 process anticipated the PSP being located at the Pill Tunnel Eastern Portal Compound. However that location is in the Green Belt. For planning and construction reasons the site of Pill Station Car Park is now being considered as a location for the PSP.	Both options are included in the current consultation. It is anticipated only one will be constructed.
Pill Tunnel Eastern Portal Compound	The initial design for this temporary construction compound and permanent access and maintenance compound, located the compound on the southern side of the railway. Following further technical assessment it became apparent that locating the compound on the northern side would provide a less constrained access for large vehicles. This location was used in 2001/02 for the work to re-open Portbury Freight Line.	Following engagement with the land owner, the compound design has been taken forward on land north of the railway.

Table 3-2: Summary of alternatives considered for specific scheme elements

Option Description	Option Consideration	Outcome
Avon Gorge Line Speed	Initial technical work identified a need for the line speed through the Avon Gorge to be increased from the existing 30 mph to 55 mph, in order to provide sufficient capacity to operate the half hourly passenger train service and accommodate the existing freight train operations. During GRIP 3 more detailed technical work identified that a lower line speed increase to 50 mph would be sufficient. Following the value engineering of the DCO Scheme in 2017, it has been decided to keep the speed to 30 mph, which results in the need for less engineering and hence lower costs.	The GRIP 3 and 4 engineering design drawings and deliverables will be based on a 30 mph line speed through the Avon Gorge possibly with some localised improvements in the alignment of the railway.
Ashton Vale Road highway access	During the development of the Transport Assessment of the half hourly services for the Portishead Branch Line, it became apparent that the traffic impact of the increased operation of the Ashton Vale Road highway level crossing would be severe, with the barriers being down for up to 20 minutes each hour. In March 2016 the project undertook a micro consultation entailing six alternative highway options; one option to improve the existing access and five options to provide an alternative highway access into the industrial estate. Further technical work identified a further option and ruled out some of the original options. A further round of micro consultation was undertaken in November 2016, entailing three options, comprising two of the previous options consulted upon, plus a new option that had not previously been consulted upon. Early in 2017, the revised costs for the half hourly scheme raised challenges on the affordability of the DCO scheme, leading to a revision of the project. The level crossing barriers will be down over the highway for up to approximately 12 ½ minutes per hour in total. For the 45-minute interval rail service the crossing barrier will be down from between approximately 14 to 20 minutes. With some modifications to the turning lane on Winterstoke Road and changes in the timing of the highway traffic lights, it is now no longer considered necessary to close the level crossing or subsequently provide alternative highway access.	The Ashton Vale Road (Ashton Junction) level crossing will remain operational, no alterations will be undertaken to the level crossing itself. The following works are proposed to reduce the highway traffic impact from the increased use of the level crossing: • extension of the left turn flare lane on Winterstoke Road; • optimisation of the Ashton Vale Road signals, and upgrade of those signals to Microprocessor Optimised Vehicle Actuation ("MOVA"); • provision of a pedestrian/cycle ramp to the north of the level crossing to connect pedestrians and cyclists from Ashton Vale Road to Ashton Road; and • the proposed pedestrian and cycle ramp from Ashton Vale Road to Ashton Road will provide an alternative crossing when the barriers on the Ashton Vale level crossing are down.

3.5 References

Halcrow Group Ltd, 2008. Portishead Rail Line Study.

High Level Options Report, GRIP Stage 2, 111797, Portishead Reopening, Network Rail, August 2009. GRIP 1 and 2.

Portishead Quays Masterplan 2001 and revised in 2006

North Somerset Council, 2007. Replacement Local Plan. Adopted. https://www.n-somerset.gov.uk/wp-content/uploads/2015/12/SD-17-North-Somerset-replacement-local-plan.pdf

North Somerset Council, 2013. Site and Policies Development Plan Document (Consultation Version). http://consult-ldf.n-somerset.gov.uk/consult.ti/spdraft/consultationHome

North Somerset Council, 2014. MetroWest Phase 1. Portishead Station Options Appraisal Report. https://www.n-somerset.gov.uk/wp-content/uploads/2015/10/Portishead-station-options-appraisal-report.pdf

West of England Partnership, 2006. Joint Local Transport Plan 2. 2006-2011. http://www.westofengland.org/transport/joint-local-transport-plan/final-joint-local-transport-plan-200607-201011

West of England Partnership, March 2011. Joint Local Transport Plan 3. 2011-2026. https://travelwest.info/projects/joint-local-transport-plan

West of England Partnership, 2014. MetroWest Phase 1. Preliminary (Strategic Outline) Business Case. https://s3-eu-west-1.amazonaws.com/travelwest/wp-content/uploads/2015/03/metrowest-phase-1-preliminary-business-case-3-september-2014.pdf

3.6 Abbreviations

AVTM	Ashton Vale to Temple Meads MetroBus
B&NES	Bath and North East Somerset Council
BCC	Bristol City Council
BRITES	Bristol Integrated Transport and Environmental Study
DCO	Development Consent Order
Dft	Department for Transport
DPD	Development Plan Document
GLT	Guided Light Transit
GRIP	Governance for Railway Investment Projects
LRT	Light Rail Transit
MOVA	Microprocessor Optimised Vehicle Actuation
NCN	National Cycle Network
NSDC	North Somerset District Council
NSIP	Nationally Significant Infrastructure Project
PRoW	Public rights of way
PSP	Principal Supply Point (for signalling equipment)
s	section (refers to the paragraph in the legislation)
SGC	South Gloucestershire Council
TPH	Trains per hour
WoE	West of England

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