

JANUARY 2024

DLR B92 Mileage Control Phase II

Business Case and Equalities Impact Assessment
(EqIA) Pack

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EVERY JOURNEY MATTERS

Purpose of Document

- This document seeks to outline the service planning exercise undertaken to mitigate the impact of a) delays to the entry-to-service of the B23 fleet on the DLR and b) mileage limits on the B92 fleet on the DLR (and limited ability to undertake further exams).
- This document sets out the rationale for change, options for service changes and the business case for the recommended option.
- This document will be distributed to relevant stakeholders for approval.
- Due to the time-critical nature of the decision, and the lack of alternative options, a full Rail Service Change Process approach has not been followed, but this document and an Equalities Impact Assessment have been produced to document the decision-making.





Problem

- B23 entry into service has been delayed
 - The first B23 into service was initially expected on or around 1 April 2024.
 - Train testing has identified issues that will take more time to resolve than this programme allowed for, resulting in a delay to this date.
 - The revised date is uncertain, but we are making contingency plans based on 1 October 2024 to allow us some resilience
- However, the B92s have now reached life expiry based on their mileage
 - Major overhaul exams (H&I) would be required to extend their life, but this is only feasible for a few vehicles as it takes up depot space required for B23 commissioning
 - At current service levels, we would need to start withdrawing B92s from service in late March 2024.
- We are already reducing B92 mileage in order to extend their life as far as possible until the B23s replace them, with a first phase of mileage control measures involving:
 - Reducing Stratford International – Woolwich Arsenal train lengths from 3-car (full length) to 2-car (short formations) on Mondays and Fridays, from 15 Dec 2023
 - 2-car operations between 19 Dec 2023 and 1 Jan 2024 on all routes
- Now, a greater intervention is required to extend their life and avoid ‘cliff-edge’ service reductions
 - B92 operation would need to be reduced by roughly 300,000 vehicle km to keep the fleet going until October – or approximately 11,000km per week depending on the start date, or 3.7% of service



Summary of options considered

Do nothing

[0] Normal service (Optimisation II)

No service restrictions
Not viable but used as the comparator for appraisal purposes

Do minimum

[1] STI-WOA short formations Mon & Fri

Current limited restrictions continue (B92s start to be withdrawn from service from mid-April onwards)

Option

[3] Withdraw BEC shuttles

Cancel the Canning Town – Beckton shuttle service, leaving Beckton branch with 6tph 2-car service
[a] only after 1930 every day
[b] at all times outside the peaks

Option

[2] STI-WOA short formations all week

Reduce Stratford Woolwich services to 2-car length all week, not just Mon and Fri

Option

[4] Short-form STI-WOA and withdraw BEC shuttles

Combination of the two main options to save more mileage

Discounted

- Temporarily extend the life of the B92s through investment and maintenance

Untested

BAN-LEW short formations at weekends

All weekend services become 2-car

What is our do-minimum?

Our do-minimum scenario is as follows:

Vehicle lengths remain as per phase I mileage control

B92s and B07s are used to provide service until the deployment of the first B23 train into service. B92 trains are used up until their mileage limits, at which point they are scrapped in line with the scrappage programme.

From mid-April, B92 vehicles start to be removed from passenger service

Once each vehicle reaches its mileage limit, it will be withdrawn from service. This affects 1-5 vehicles per month.

Timeline	Impact
Now until mid-April	Limited impact
Mid-April until end of May	Unplanned short formations and cancellations, probably on STI-WOA and CAT-BEC services
End of May to October	Up to 16 vehicles short; widespread unplanned cancellations and/or planned short formations across STI-WOA and planned cancellations on CAT-BEC and STR-LEW

For our option appraisal, we use Optimisation II as the ‘do nothing’ baseline and compare all the options to this, including the do-minimum. This demonstrates the passenger and revenue impact of the train shortening instruction delivered in December 2023.

Summary of appraisal

Option I: Do Minimum

The “Do Minimum” scenario means that the current service pattern would be maintained and vehicle lengths in operation at the time of writing are maintained until the deployment of the first B23 into passenger service.

This option reduces vehicle mileage by 1.9%. There is a net financial saving but the customer disbenefits equal this.

DCSR: 1.0 to 1 (disbenefits equal savings)

In reality, this option cannot be sustained beyond April/May, once more B92s start to be withdrawn from service. By the end of May, we expect impacts in line with Option 4 in this appraisal.



<i>values are per period</i>	Do Nothing (Optimisation II)	Do Minimum (B05D)	Option 1 compared to Do Nothing
Passenger Hours	2,365,840	2,368,928	+3,088
Customer benefit (£k)			-33.9
Revenue (£k)			-9.5
Train-km	498,005	498,005	+0
Vehicle-km	1,192,582	1,169,640	-22,942
Opex (£k)	-3,647	-3,604	+43.0
Capacity-km	18,509,179	15,546,168	-2,963,011
NFE (£k)			+33.5
DCSR			1.0 to 1

Summary of appraisal

Option 2: Stratford Int'l to Woolwich Arsenal short formation all week

Option 2 maintains the current service pattern. The remaining 3-car services on STI-WOA are reduced to 2-car services on Tuesdays, Wednesdays and Thursdays, in addition to the current short-forming on Mondays and Fridays.

This option reduces vehicle mileage by 4.8%. There is a net financial saving but the customer disbenefits outweigh this.

DCSR: 1.2 to 1 (disbenefits outweigh savings)

<i>values are per period</i>	Do Nothing (Optimisation II)	Option 2	Option 2 compared to Do Nothing
Passenger Hours	2,365,840	2,373,200	+7,360
Customer benefit (£k)			-80.9
Revenue (£k)			-22.6
Train-km	498,005	498,005	+0
Vehicle-km	1,192,582	1,135,222	-57,360
Opex (£k)	-3,675	-3,584	+91
Capacity-km	18,509,179	17,702,419	-806,760
NFE (£k)			+68.4
DCSR			1.2 to 1



Summary of appraisal

Option 3a: Withdrawal of evening Canning Town to Beckton shuttle

Option 3a maintains two-car running on STI-WOA on Mondays and Fridays. Additionally, the CAT-BEC shuttle will be withdrawn during the evenings.

This option reduces vehicle mileage by 3.0%. This isn't enough to last until October, meaning **additional savings would need to be found** before then. This offsets the additional mileage saving and better DCSR than Option 2.

Notionally, this option saves more opex than Option 2, and has a better DCSR, but some of the opex change relates to train crew and it is unlikely to be possible to realise such savings on a temporary basis.

DCSR: 1.0 to 1 (disbenefits equal savings)

This DCSR does not account for the further mileage savings which would need to be delivered.

<i>values are per period</i>	Do Nothing (Optimisation II)	Option 3a	Option 3a compared to Do Nothing
Passenger Hours	2,365,840	2,373,440	+7,600
Customer benefit (£k)	X	X	-83.5
Revenue (£k)	X	X	-23.4
Train-km	498,005	491,239	-6,766
Vehicle-km	1,192,582	1,156,262	-36,320
Opex (£k)	-3,675	-3,572	+103.5
Capacity-km	18,509,179	17,769,487	-739,692
NFE (£k)			+80.1
DCSR			1.0 to 1

Summary of appraisal

Option 3b: Withdrawal of all off peak Canning Town to Beckton shuttles

Option 3b means that the current service pattern would be maintained with two-car running on STI-WOA on Mondays and Fridays, but withdraws the CAT-BEC shuttle in all off peak hours, all week (including weekends).

This option reduces vehicle mileage by 11.3%. However, there are significant customer disbenefits and the OpEx reduction is likely overstated as explained for Option 3a.

DCSR: 6.9 to 1 (disbenefits significantly outweigh benefits).

<i>values are per period</i>	Do Nothing (Optimisation II)	Option 3b	Option 3b compared to Do Nothing
Passenger Hours	2,365,840	2,408,472	+42,632
Customer benefit (£k)			-468.5
Revenue (£k)			-131.2
Train-km	498,005	478,110	-55,146
Vehicle-km	1,192,582	1,126,552	-134,656
Opex (£k)	-3,675	-3,477	+198.3
Capacity-km	18,509,179	17,614,584	-894,595
NFE (£k)			+67.1
DCSR			6.9 to 1



Summary of appraisal

Option 4: STI-WOA short form all week and withdrawal of all CAT-BEC services

Option 4 combines other options, by short-forming STI-WOA services all week compared to just Mondays and Fridays. Additionally, all CAT-BEC shuttles are withdrawn.

This has the greatest mileage saving of all options (10.6%). However, this is not a viable option as the DCSR is so high.

DCSR: 11.0 to 1 (disbenefits greatly outweigh benefits)

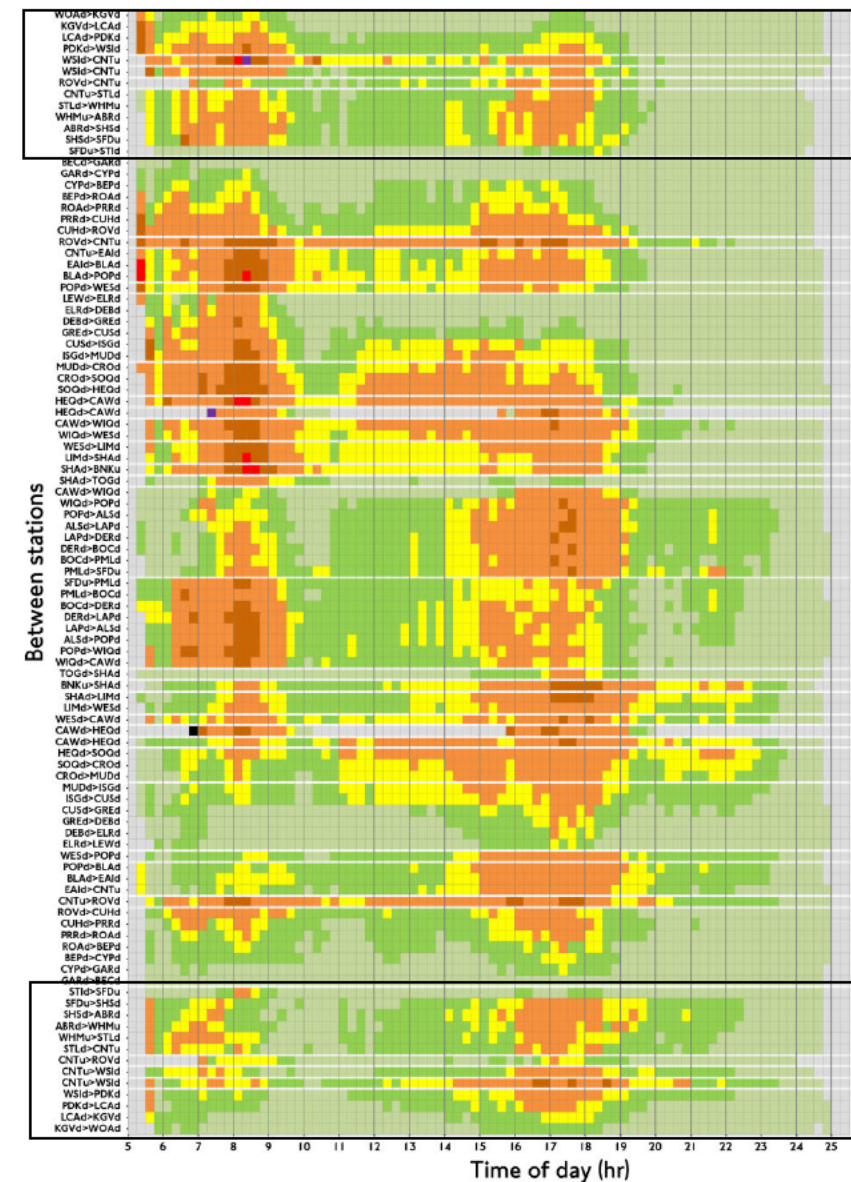
Note that once B92s start to be withdrawn from service, this is the most likely alternative service pattern given the number of withdrawals needed in the absence of sufficient mileage control.



<i>values are per period</i>	Do Nothing (Optimisation II)	Option 4	Option 4 compared to Do Nothing
Passenger Hours	2,365,840	2,447,940	+82,100
Customer Disbenefit (£k)			-902.3
Revenue Impact (£k)			-252.6
Train-km	498,005	465,141	-32,864
Vehicle-km	1,192,582	1,066,133	-126,449
Opex (£k)	-3,675	-3,341	+334.3
Capacity-km	18,509,179	16,876,836	-1,632,343
NFE (£k)			+81.7
DCSR			11.0 to 1

Crowding impacts

- Aside from first services, crowding is currently highest around Poplar, Canary Wharf and Bank – and on 2 car Woolwich-Bank services into Canning Town
- The proposed mileage control aims to impact less crowded sections of the network whilst still delivering sufficient mileage savings and avoiding significant crowding later on when further service changes are (potentially) required
- [additional analysis to follow]



Discounted options

One option which was not considered beyond the optioneering stage was to extend the life of B92 vehicles.

There is no capacity for further overhaul exams

For the overhaul exams, space is required in the depot as well as rolling stock engineering capacity. This is confirmed to not be available and additional H&I exams have already been ordered for 6 vehicles. Additionally, the need for depot space to test and assemble B23s – which is not available in large capacity due to the works at Beckton Depot – means there is not the physical depot capacity required.

If there were capacity, these exams are very costly

The exams themselves are expensive and cause disruption and revenue loss as vehicles would need to be removed from service for a period of time.

The 'Do Minimum' looks, based on DCSRs, as the best option, but...

The finances are not accurately presenting the problem

The 'Do Minimum' scenario forecasts revenue loss of £9.5k and an OpEx saving of £43.5k per period. In reality, OpEx savings would be less (as there are some committed costs, such as for PSAs) and revenue loss would, relatively quickly, increase as vehicles have to be removed from service.

Unplanned cancellations have a large financial and customer disbenefit

Cancelling just four trains per day per period leads to an estimated £525,000 revenue loss per period and an additional 2 minutes to journey time per passenger. The extent of future cancellations is shown in the Appendix.





Conclusions from appraisal

- Although the DCSRs suggest the Do Minimum is the best scenario, this is not feasible for very long.
- **The financial estimates do not account for the revenue and OpEx impact of unplanned cancellations into the autumn which are outlined further in the Appendix.**
- Whilst the DCSR for Option 3a does appear better than that of Option 2, the greatest mileage savings are for Option 2, and the potential unplanned service changes which may occur before October are not fully accounted for.
- **Therefore, Option 2 is the recommended option, as it saves the greatest amount of mileage whilst having a better DCSR than Options 3b and 4.** This option also ensures that the least crowded services of the network are impacted first by any mileage control, mitigating some customer impact. The DCSR of 1.2:1 is still, comparatively, a good saving.



Recommendations

The recommended option in comparison to the Do Nothing scenario is presented below.

Name	Optimisation II	B05D (Do Minimum) (Optimisation II with short- form M/F on STI-WOA)	Option 2 (Recommended): STI- WOA all week short formation <i>all compared to Do Nothing</i>
Period start	P2 23/24	Current pattern	Imminent – no later than P12 23/24
Description (full details in Appendix)	As appended. Service pattern and train lengths until December 2023	Optimisation II with short formation on	As today, with 2-car running on STI-WOA all week
NFE (£k)	Baseline service pattern	+33.5	+68.4
Revenue (£k)	Baseline	-9.5	-22.6
OpEx estimate	Baseline	+43.0	+91.0
Train-km	498k (Baseline)	+–0	+–0
Vehicle-km	1.19m (Baseline)	-22.9k	-57.4k

All values are per period unless stated otherwise.

Equalities Impacts

- The proposed service change involves a reduction in train lengths on Tuesdays, Wednesdays and Thursdays on STI-WOA services, in addition to the reduction already introduced on STI-WOA services on Mondays and Fridays.
- The primary equalities impacts identified are the reduction in available space and seats on board trains which increase crowding levels, and may impact customers who have reduced mobility, require wheelchair or pushchair space or priority seating.
- A full Equalities Impacts Assessment (EqIA) has been written and accompanies this business case pack.





Approval

Tom Page (General Manager of Docklands Light Railway Limited)

Approval

Date

Comments

Geoff Hobbs (Director of TfL Public Transport Service Planning)

Approval

Date

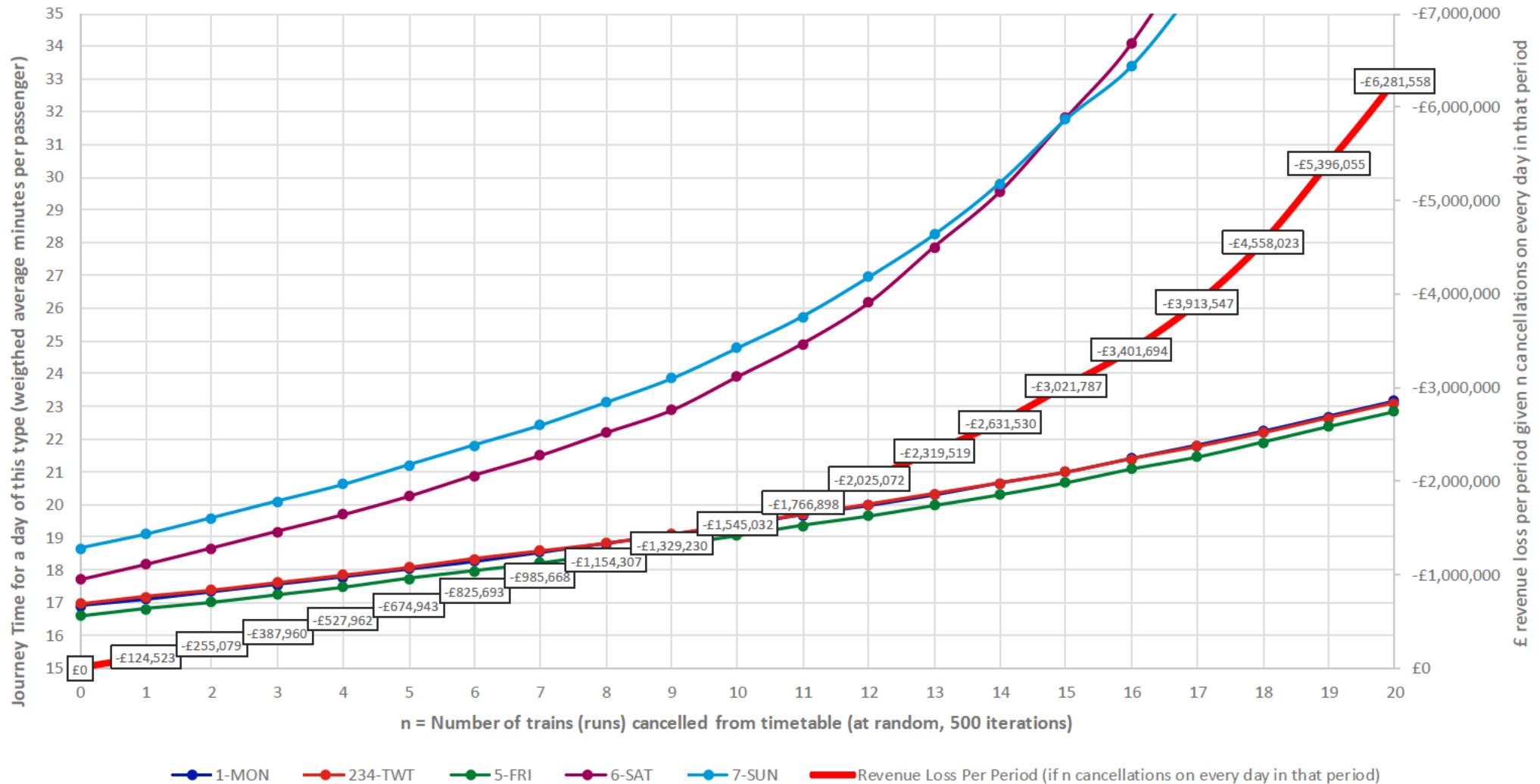
Comments

Appendix



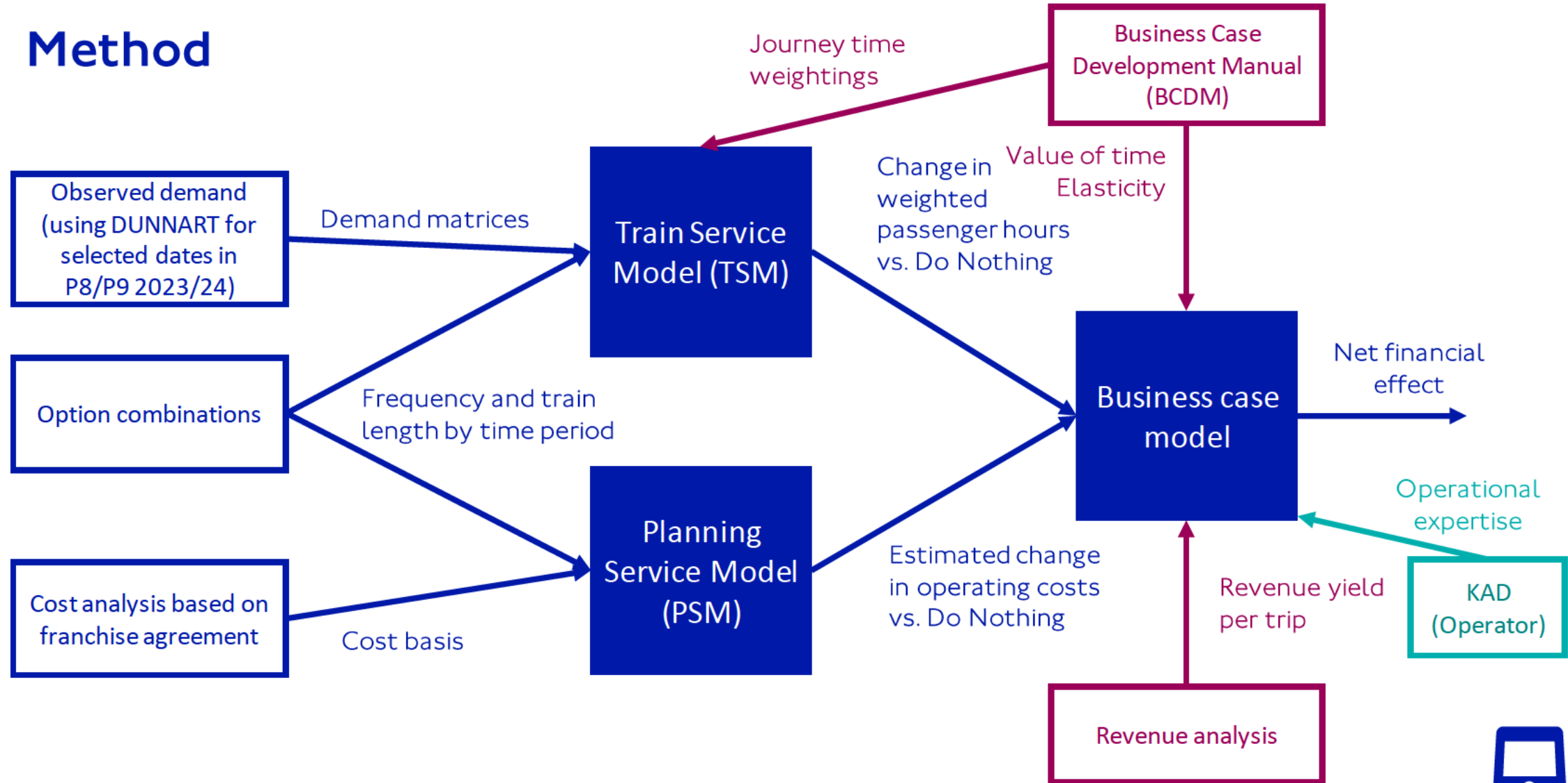
Impact of cancellations (vs. Do Minimum scenario)

Impact of DLR train cancellations on Customer Journey Time



Note: Baseline is Do Minimum rather than Do Nothing, i.e. B05D, e.g. Optimisation II plus 2-car operation on STI-WOA on Mondays and Fridays. Calculated using Train Service Model.

Method





Assumptions

Base and options:

- Baseline for revenue/benefits is B05D (Optimisation II with STI-WOA 2-car running on Mon and Fri). For illustrative purposes only, the impact compared to Optimisation II has also been highlighted, even though this is not currently the pattern in operation.
- All viable options have been tested
- In all scenarios the first B23 into deployment cannot be any later than 8 November 2024, the proposed cascade date of vehicle V03I, at which point further changes will need to be implemented
- All options are tested all week and do not account for proposed weekend closures
- Options will be implemented from w/c 5th February 2024

Demand:

- Demand has been estimated using DUNNART4 for Period 8 and 9 2023/24
- The dates selected to provide demand are appended to this document; they were selected to avoid strikes, planned or unplanned service disruption
- As the change is not to go beyond P8 24/25 forecast demand has not been included in this model

Benefits/revenue/change in demand:

- Calculated using change in passenger hours from Train Service Model (TSM) runs, weighted as per the BCDM (Business Case Development Manual). Converted to change in economic benefits using the Underground Passenger value of time (£10.99) from BCDM (2023 prices).
- Elasticity from BCDM used to derive revenue. Revenue elasticity has been estimated at -0.28.

Costs/resources:

- Costs/PSAs/kms estimated using DLR Planning Service Model based on primarily franchise agreement costs (2021 prices).
- Where options may require a change in PSA rostering this is noted in the summary slide

Inflation:

- Due to the short timeframe and imminent implementation inflationary figures are not included

Optimisation II timetable details

Optimisation II timetable (from May 2023)																									
Headway (minutes)		Weekday							Sat							Sun									
From	To	05:30	06:30	10:00	16:00	19:30	21:00	23:30	00:30	05:30	08:30	10:30	17:00	19:30	22:00	23:30	00:30	07:00	10:30	12:00	19:00	19:30	21:00	22:30	23:30
BAN	LEW	10.0	4.0	5.0	4.0	5.0	5.0	10.0		10.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0	5.0	5.0	5.0	10.0	10.0	10.0	
BAN	WOA	10.0	8.0	10.0	8.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	
TOG	BEC	10.0	8.0	10.0	8.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	
STR	LEW		8.0		8.0																				
STR	CAW	10.0	8.0	5.0	8.0	5.0	8.0	10.0		10.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0	5.0	5.0	5.0	10.0	10.0	10.0	
STI	BEC																								
STI	WOA	10.0	8.0	10.0	8.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	
CAT	BEC		8.0	10.0	8.0	10.0	10.0				10.0	10.0	10.0	10.0					10.0	10.0	10.0				
Train length (vehicles)		Weekday							Sat							Sun									
BAN	LEW	3							3							3									
BAN	WOA	2							2							2									
TOG	BEC	2							2							2									
STR	LEW	2							2							2									
STR	CAW	2							2							2									
STI	BEC	2							2							2									
STI	WOA	3							2							2									
CAT	BEC	2							2							2									

B05D (Mileage Control Phase I) timetable details

Optimisation II timetable(with short-running) (from 15 Dec 2023)																										
Headway (minutes)		Weekday							Sat							Sun										
From	To	05:30	06:30	10:00	16:00	19:30	21:00	23:30	00:30	05:30	08:30	10:30	17:00	19:30	22:00	23:30	00:30	07:00	10:30	12:00	19:00	19:30	21:00	22:30	23:30	
BAN	LEW	10.0	4.0	5.0	4.0	5.0	5.0	10.0		10.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0	5.0	5.0	5.0	10.0	10.0	10.0		
BAN	WOA	10.0	8.0	10.0	8.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
TOG	BEC	10.0	8.0	10.0	8.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
STR	LEW		8.0		8.0																					
STR	CAW	10.0	8.0	5.0	8.0	5.0	8.0	10.0		10.0	5.0	5.0	5.0	5.0	5.0	10.0		10.0	10.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0
STI	BEC																									
STI	WOA	10.0	8.0	10.0	8.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
CAT	BEC		8.0	10.0	8.0	10.0	10.0					10.0	10.0	10.0	10.0						10.0	10.0	10.0			
Train length (vehicles)		Weekday							Sat							Sun										
BAN	LEW	3							3							3										
BAN	WOA	2							2							2										
TOG	BEC	2							2							2										
STR	LEW	2							2							2										
STR	CAW	2							2							2										
STI	BEC	2							2							2										
STI	WOA	3 (2 on Mon and Fri)							2							2										
CAT	BEC	2							2							2										

B05E (Mileage Control Phase II) recommended option timetable details

Optimisation II timetable(with short-running) (from 15 Dec 2023)																									
Headway (minutes)		Weekday							Sat							Sun									
From	To	05:30	06:30	10:00	16:00	19:30	21:00	23:30	00:30	05:30	08:30	10:30	17:00	19:30	22:00	23:30	00:30	07:00	10:30	12:00	19:00	19:30	21:00	22:30	23:30
BAN	LEW	10.0	4.0	5.0	4.0	5.0	5.0	10.0		10.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0	5.0	5.0	5.0	10.0	10.0	10.0	
BAN	WOA	10.0	8.0	10.0	8.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	
TOG	BEC	10.0	8.0	10.0	8.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	
STR	LEW		8.0		8.0																				
STR	CAW	10.0	8.0	5.0	8.0	5.0	8.0	10.0		10.0	5.0	5.0	5.0	5.0	10.0	10.0		10.0	5.0	5.0	5.0	10.0	10.0	10.0	
STI	BEC																								
STI	WOA	10.0	8.0	10.0	8.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	
CAT	BEC		8.0	10.0	8.0	10.0	10.0				10.0	10.0	10.0	10.0					10.0	10.0	10.0				
Train length (vehicles)		Weekday							Sat							Sun									
BAN	LEW	3							3							3									
BAN	WOA	2							2							2									
TOG	BEC	2							2							2									
STR	LEW	2							2							2									
STR	CAW	2							2							2									
STI	BEC	2							2							2									
STI	WOA	2							2							2									
CAT	BEC	2							2							2									



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