

Stratford Additional Platforms

Summary of Route Study and Capacity Analysis undertaken

Introduction

The purpose of this paper is to summarise the findings of the analysis undertaken for both the Stratford additional platform scheme and the Anglia Route Study.

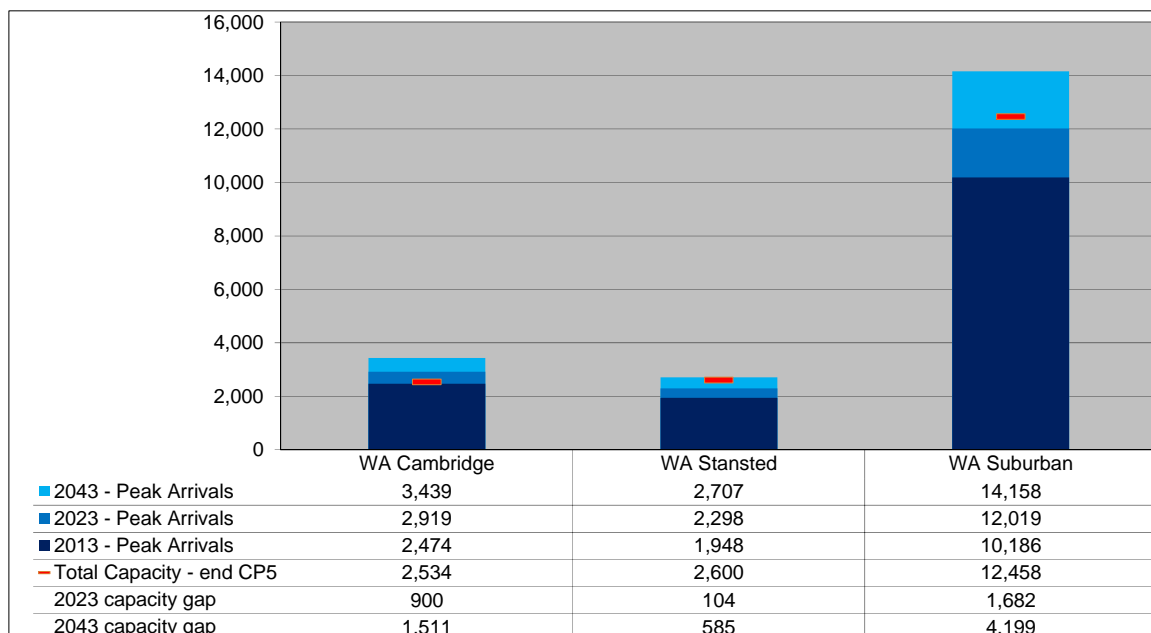
The requirements for additional platform capacity at Stratford cannot be examined in isolation and therefore need to be considered alongside the train service output and wider capacity constraints.

Demand Analysis (source Anglia Route Study)

See diagrams with build-up of demand in Appendix A. It should be noted that the primary demand driver on West Anglia services is London, with very little build up to Stratford. The services to Stratford are currently 4-car and the proposal for additional platforms is being developed based on 12-car platform specifications.

The analysis of the build-up shows that with an average load factor to total capacity of 85%, there will be a reasonable level of crowding over all peak hour services. Capacity is needed in peak hours for a further 1,000 passengers by 2023 and 2,100 passengers by 2043 on the Cambridge and Stansted Airport services. On suburban services capacity a further 1,700 passengers by 2023 and 4,200 passengers by 2043 will be required.

West Anglia passenger Growth



As noted in the Anglia Route Study, the demand projections on this corridor are not as high as some of the other corridors. Unlocking of housing and jobs on the corridor is the predominant driver for improved services.

Capacity Analysis

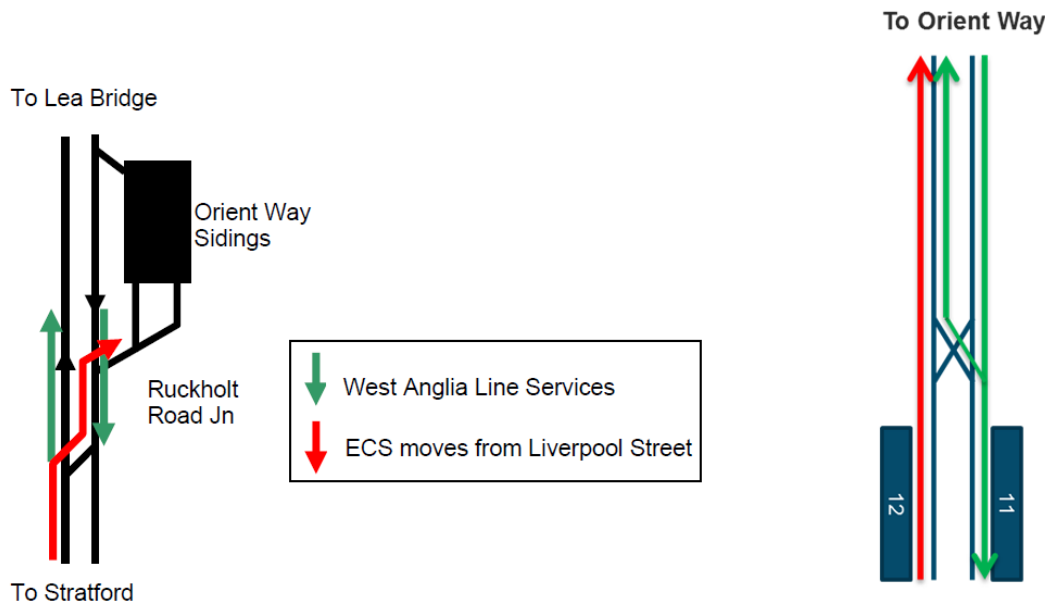
The following section details the capacity analysis undertaken, which has been included in Appendix B.

1. Existing operation at Stratford (2015)

2tph from West Anglia terminating at Stratford

Service is constrained to 2tph due to:

- Capacity on Lea Valley – no additional services can be operated on the two-track section between Tottenham Hale and Broxbourne. Therefore to increase train service frequency to Stratford would require the diversion of services currently terminating at Liverpool Street to Stratford.
- Interaction of passenger services with ECS moves from GEML services to/from Orient Way sidings, both at Ruckholt Road Junction and Stratford station.



The station currently operates with West Anglia services terminating in Platform 11, with ECS movements running through Platform 12.

Stratford Platform requirement: no additional

2. What happens following West Anglia Main Line Capacity scheme (STAR) – 2018

4tph from West Anglia terminating at Stratford

The third track between Angel Road and Coppermill Junction supports an additional 2tph from West Anglia to Stratford.

These can be achieved alongside the ECS for Orient Way as long as the service between Angel Road and Stratford is interworked with the Bishop Stortford – Stratford service. Therefore the passenger services are still only using Platform 11, with ECS movements through Platform 12.

Service is constrained to 4tph between West Anglia and Stratford due to:

- Capacity on Lea Valley – no additional services can be operated without four-tracking on the Lea Valley
- Interaction of passenger services with ECS moves from GEML services to/from Orient Way sidings, both at Ruckholt Road Junction and Stratford station.

Stratford Platform requirement: no additional

3. Is there a potential increase pre-Crossrail 2 – CP6/7?

6tph from West Anglia terminating at Stratford

Four-tracking of the Lea Valley prior to Crossrail 2 allows an increase in service on the West Anglia Main Line, although these services cannot access either Liverpool Street or Stratford, as there is insufficient platform capacity at both stations and ECS movements would still be required to run through Platform 12 at Stratford.

To unlock the next element of capacity at Stratford would therefore require one additional platform and a third track between Stratford and Ruckholt Road Junction to segregate ECS movements and passenger services.

This would support 6tph from West Anglia to Stratford.



Stratford Platform requirement: one additional

4. What about with Crossrail 2 – 2030?

4tph from West Anglia terminating at Stratford

The service pattern post Crossrail 2 with four-tracking of the Lea Valley is based on the plan to operate the majority of slow line services (calling all stations) to the Crossrail 2 tunnel south of Tottenham Hale. Connectivity from the West Anglia Main Line to Stratford is proposed to be retained with at least 4 services from West Anglia to Stratford (unlike the STAR scenario, whereby the additional 2tph is from Angel Road to Stratford and need to be interworked with the Bishops Stortford services to avoid triggering the need for additional platforms).

This would therefore require one additional platform at Stratford to segregate ECS movements (from the GEML) and WAML passenger services.

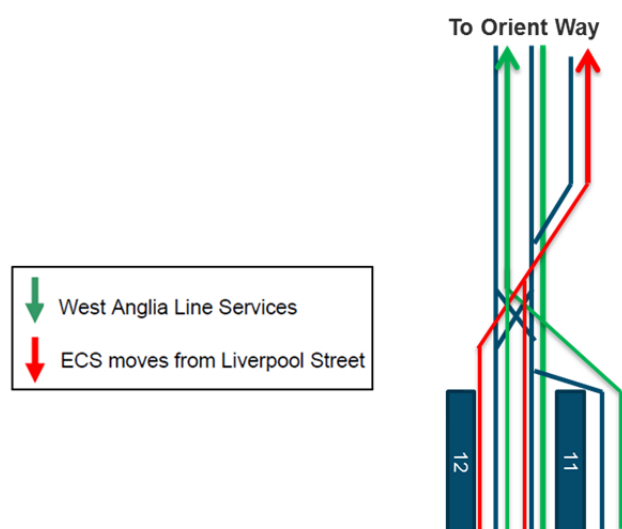
The requirements for additional capacity for Crossrail 2 services during times of perturbation are being developed at Tottenham Hale. It is assumed these will preclude the need to provide dedicated facilities at Stratford solely for perturbation.

Stratford Platform requirement: one additional

5. What about during construction of Crossrail 2?

Planning for construction phasing for Crossrail 2 has yet to commence.

Providing additional platform capacity at Stratford to support construction trains could be beneficial to free up through-platform running at Platform 12. While such movements might be constrained by ECS flows to/from Orient Way, this will depend on the time of day the construction trains are operating, not all of which will be during shoulder peak hours. This would limit the number of services from West Anglia to Stratford to 6tph, assuming one additional platform and the third track between Ruckholt Road and Stratford are operational.



Stratford Platform requirement: one additional

6. What about in a longer term non-Crossrail 2 scenario?

12tph from West Anglia terminating at Stratford

In a non-Crossrail 2 scenario, there will be a requirement for an increase in services based on demand. This demand is to London, therefore providing this capacity to Stratford will increase interchange to the Victoria Line at Tottenham Hale and Crossrail at Stratford. No work has been undertaken to examine the demand flows and impact on other routes into London.

Examining the capacity, an increase in services from West Anglia to Stratford (above 6tph) would require:

- Four-tracking of the WAML (including appropriate turnback capability)
- Removal of the constraint at Orient Way for ECS moves – this would be a very significant change such as finding an alternative location for the sidings for GEML services.

Timetable analysis has shown that if the above infrastructure is provided then up to 12 services could be operated to Stratford from West Anglia with three platforms. A second additional platform (totalling 4) is required to achieve above 12tph from West Anglia to Stratford. However, there is no demand data in the horizon examined up to 2043 to support a requirement for this level of service to Stratford.

7. What about other services aside from West Anglia?

Platforms 11 and 12 at Stratford are currently only used for West Anglia services. To fully understand whether an alternative use could drive the need for additional platform capacity, the following options have been considered. These have only been considered at a high level as are not part of any long term strategy.

- Through services from West Anglia Main Line via Stratford to Liverpool Street

This option is unlikely to increase the need for additional platforms at Stratford as it would remove some of the need to turnback services in Platforms 11 and 12, therefore reducing the platform capacity needed

- Platform 11 and 12 used by NLL services

This option would only occur if the train services on the North London Line passenger service increased above 10tph (the turnback capacity that can be achieved on the current 2 platform layout at Stratford for NLL services) or there was a future requirement to link NLL services with West Anglia Main Line services.

Increasing the train service above 10tph seems very unlikely due to the requirement for freight operation via London for some flows that cannot be diverted cross-country. There would also be significant constraints at both Clapham and Richmond to achieve a higher service level. Therefore train lengthening would seem more realistic option before increasing above 10tph.

In the latter option where NLL services are linked with West Anglia Main Line services this is very unlikely to drive need for additional platform capacity at Stratford as this would be through services rather than terminating capacity.

Summary

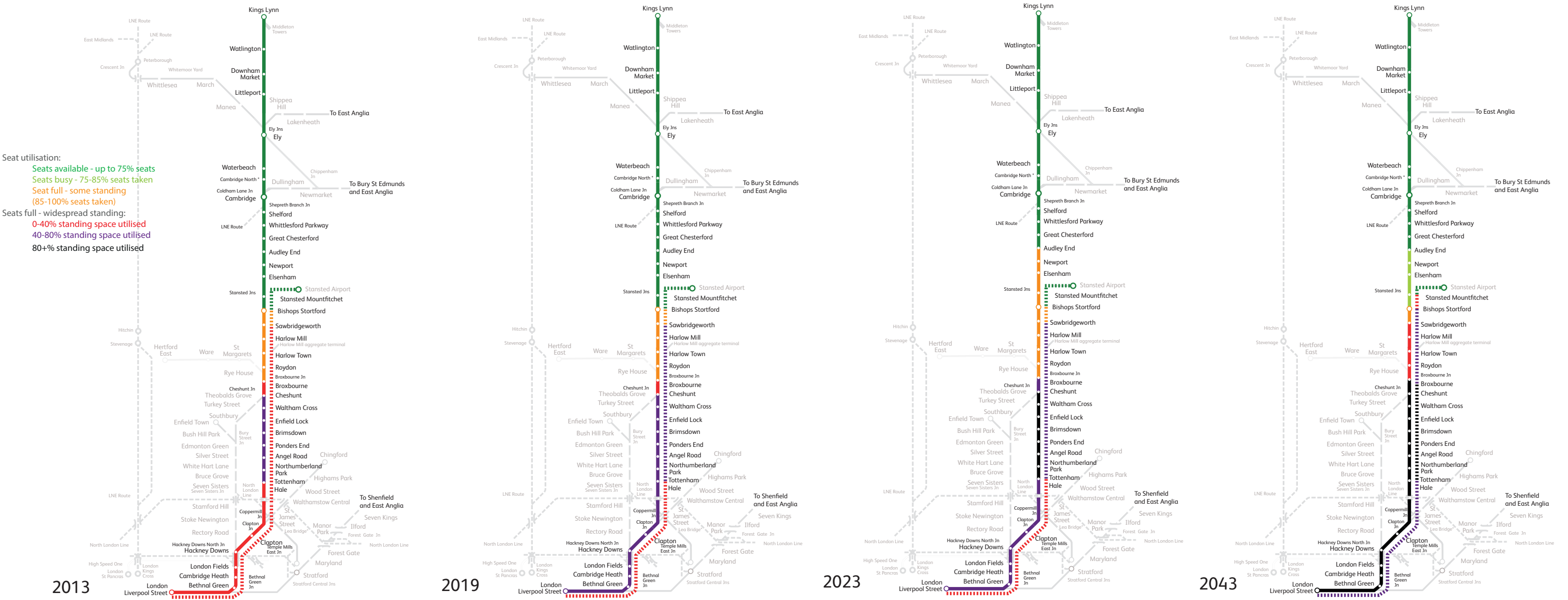
None of the demand or capacity analysis scenarios considered lead to the need for 2 additional platforms at Stratford.

Appendix

A – Demand build up 2013 to 2043

B - Stratford Platforming spreadsheet which details the timetable analysis

APPENDIX A -Average load factor of all West Anglia Main Line outer services into London Liverpool Street between 08:00 and 08:59 in 2013, 2019, 2023 and 2043.



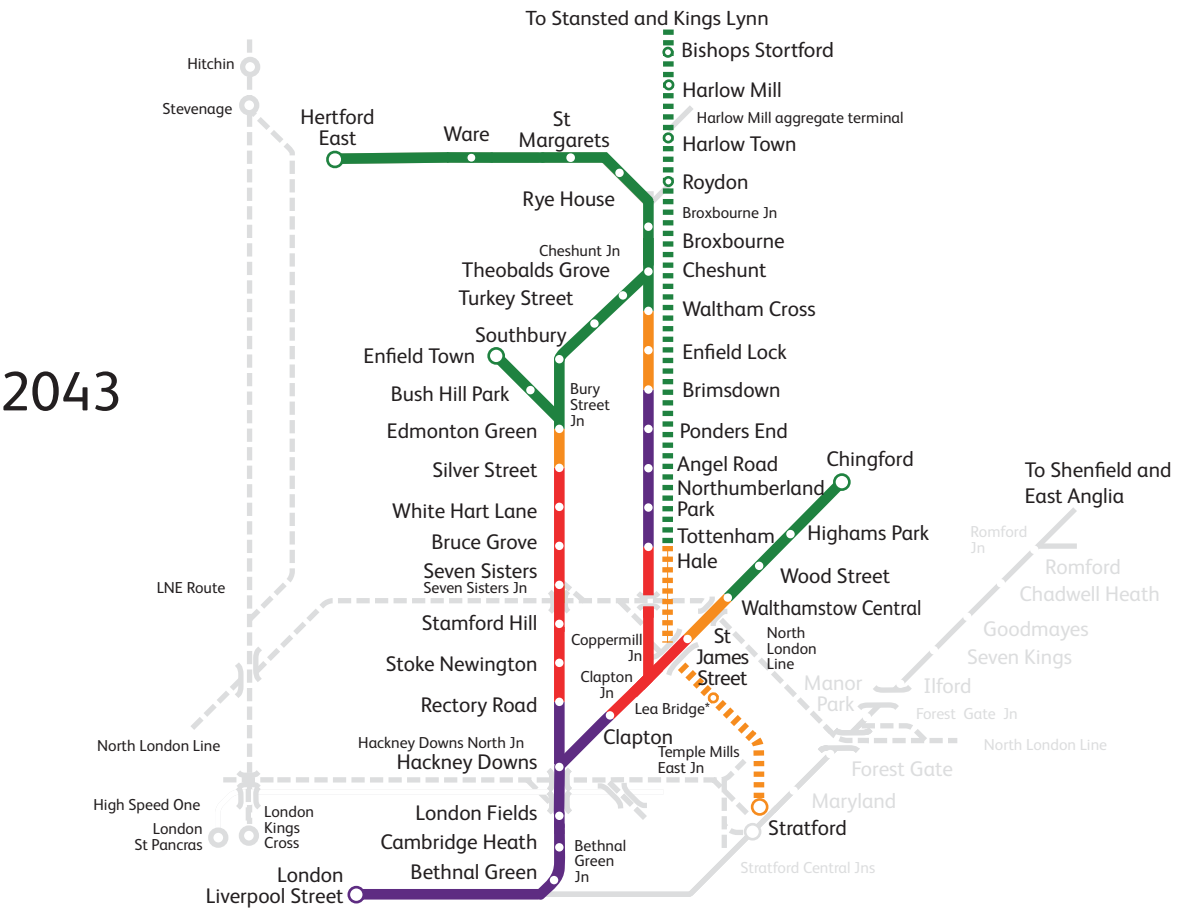
Average load factor of all West Anglia Main Line suburban services into London Liverpool Street between 08:00 and 08:59 in 2013, 2019, 2023 and 2043.

Seat utilisation:

- Seats available - up to 75% seats
- Seats busy - 75-85% seats taken
- Seat full - some standing (85-100% seats taken)

Seats full - widespread standing:

- 0-40% standing space utilised
- 40-80% standing space utilised
- 80+% standing space utilised



APPENDIX B

OVERVIEW

Stratford Platforming diagrams for a morning peak hour with varying levels of WAML service.

Scope area is Stratford to Olympic park Junction only; Where ECS paths are indicated to be able to be achieved via the DTM lines
it has not be confirmed that ECS from Liverpool Street could present at Stratford at the times indicated or that the appropriate crossing moves could then be made at Ruckholt Road Junction.

Infrastructure assumptions:

- Additional Bay Platform at Stratford
- Additional ECS 3rd Line to Orient Way - Starting at Olympic Park Junction
- Access to both Platform 11 & 12 for ECS via Bow Junction and an additional cross over in advance of Platforms

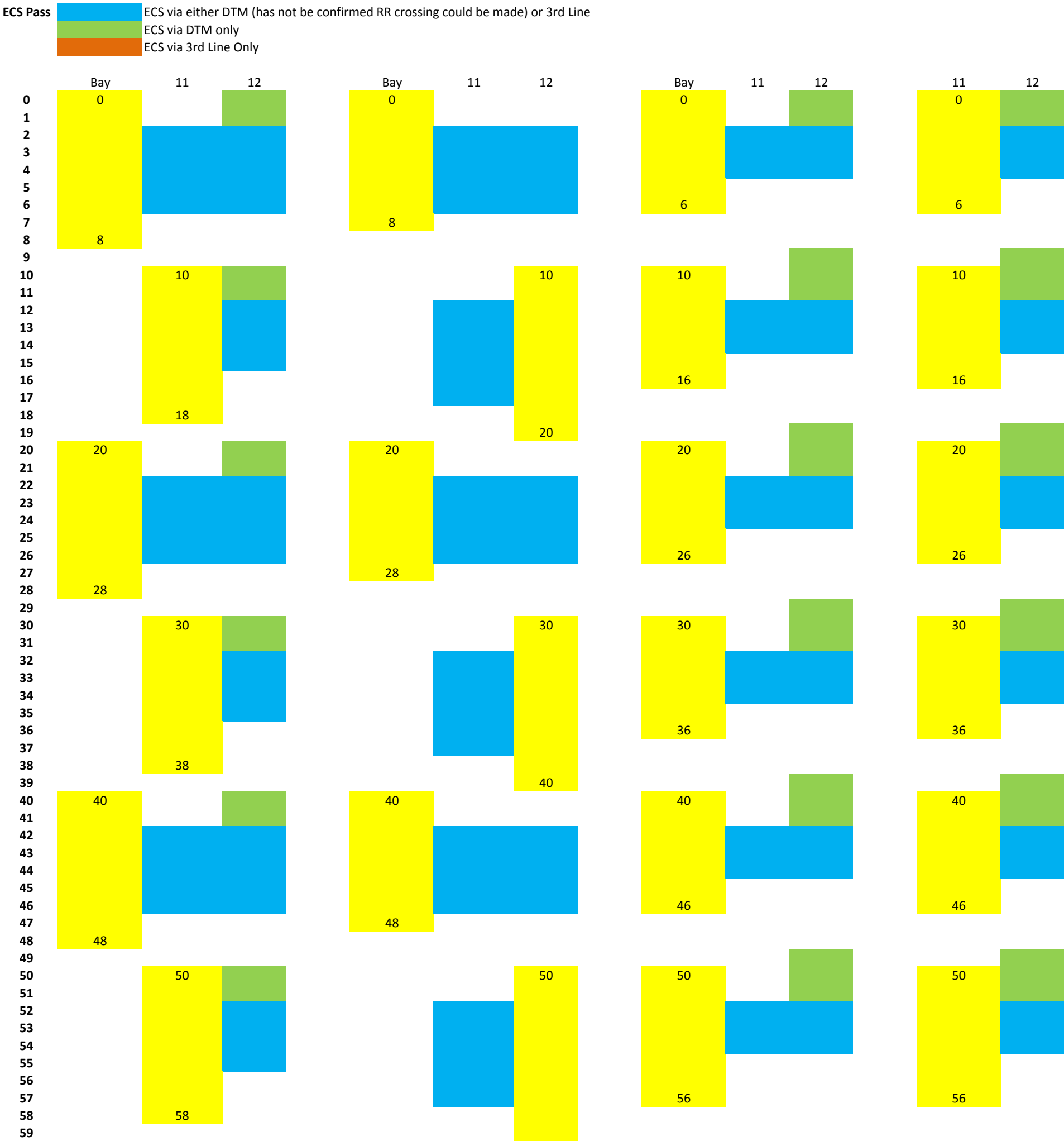
Timetabling assumptions:

- Headway 3 minutes
- Minimim Turnround 6mins (8-car)
- Minimum Platform reoccupation 3mins
- Minimum Junction Margin 2mins (given the area you could potentially allow for an departure to DTM 1min after an arrival from UTM, this is not assumed but should be explored)

6TPH

Service could be accommodated on current platforms, however it would require all service on minimum turnarounds, or minimum reoccupation. ECS paths could be accommodated within this scope area, but it would require 2 consecutive movements. Highly performance risk and would need to dictate timetabling on the WAML.

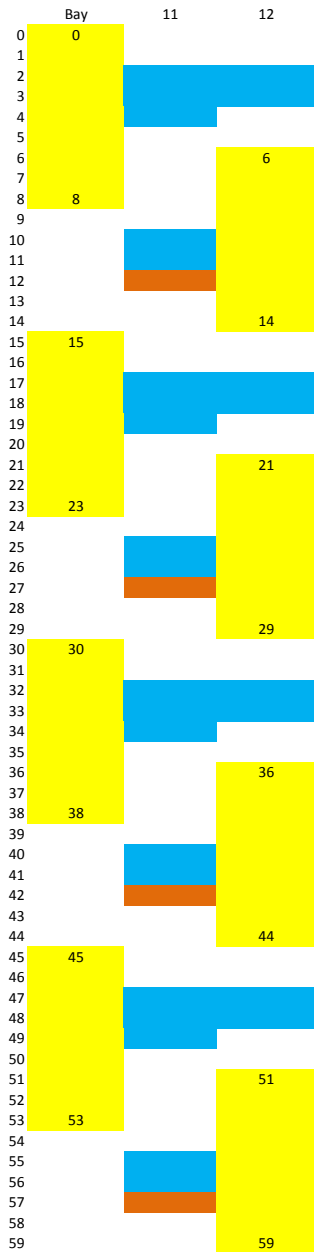
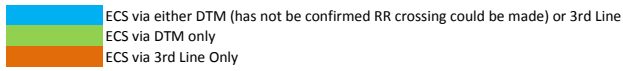
Findings: The addition of an additional platform allows for more robust turnrounds for passenger services. Options for ECS are increased though the use of both Platforms 11 and 12. The addition of a 3rd track to Orient way will remove the constraint of Ruckholt Road junction from these paths. It will also allow for the option to time ECS through both 11 and 12 in Parallel in order to optimise the options for removing ECS from Liverpool Street in a 2min patterning as today.



8TPH

The addition of an additional platform allows for more passenger services. Options for ECS are increased though the use of both Platforms 11 and 12. The addition of a 3rd track to Orient way will remove the constraint of Ruckholt Road Junction from these paths. It will also allow for the option to time ECS through both 11 and 12 in Parallel in order to optimise the options for removing ECS from Liverpool Street in a 2min patterning as today. Increasing from 6tpH - 8tpH while physically achievable in the area decreases the timeslots available for ECS and would require serious consideration and would require a larger scope area to confirm the implications for this service level. Potentially achievable.

ECS Pass



10TPH

Findings

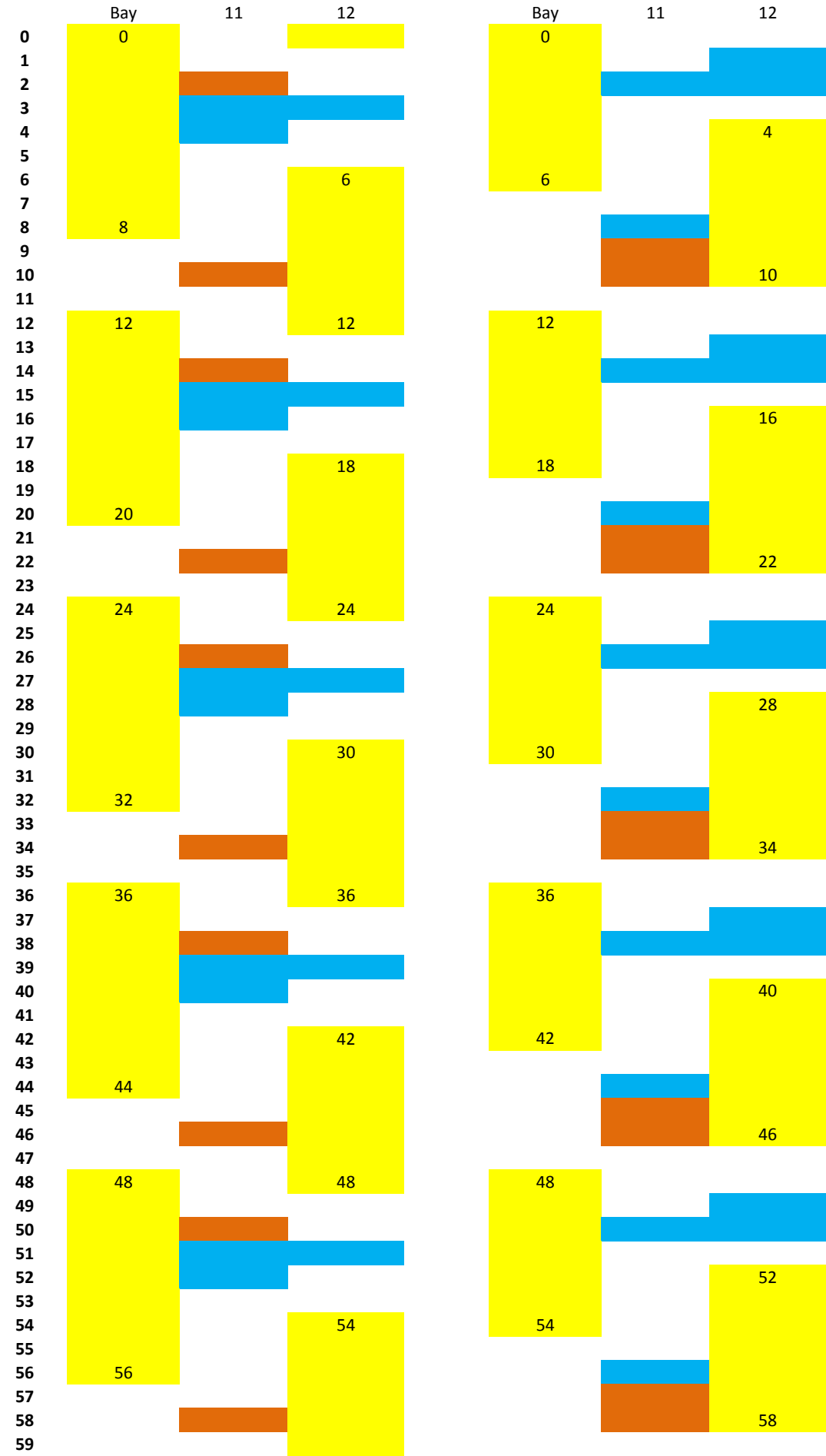
Options for ECS are increased though the use of both Platforms 11 and 12. The addition of a 3rd track to Orient way will remove the constraint of Ruckholt Road Junction from these paths. It will also allow for the option to time ECS through both 11 and 12 in Parallel in order to optimise the options for removing ECS from Liverpool Street in a 2min patterning as today. Increasing to 10ph while physically achievable in the area further decreases the timeslots available for ECS and would require serious consideration, it would require a larger scope area to confirm the implications for this service level. It is unlikely that all ECS paths below would be viable and therefore this level of service could not be accommodated alongside the ECS requirements.

ECS Pass

ECS via either DTM (has not be confirmed RR crossing could be made) or 3rd Line

ECS via DTM only

ECS via 3rd Line Only



12TPH

With an even 5 minute service patterning for the passenger services a timetable will be unable to accommodate ECS movements through the Stratford region. This is due to the required crossing moves at Olympic Park Junction, therefore an additional bay platform is unable to remove this constraint.

Findings: Options to allow for 12tph would need to include:
Headway ammendments, improvements to junction margins
Moving of Orient Way Sidings
Additional Crossovers/Flyovers in the area to allow for parallel movements

ECS Pass	
	ECS via either DTM (has not be confirmed RR crossing could be made) or 3rd Line
	ECS via DTM only
	ECS via 3rd Line Only

