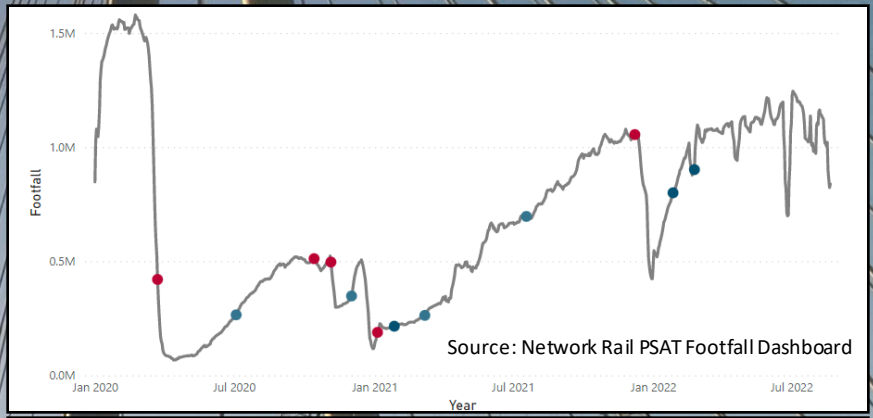
# South London & Thameslink Service Improvement

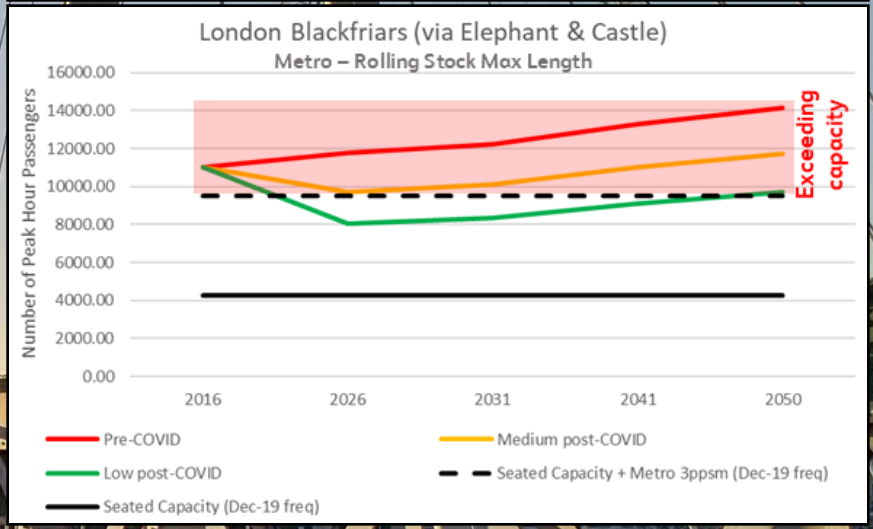
## Long Term Strategic Study
## Summer 2022

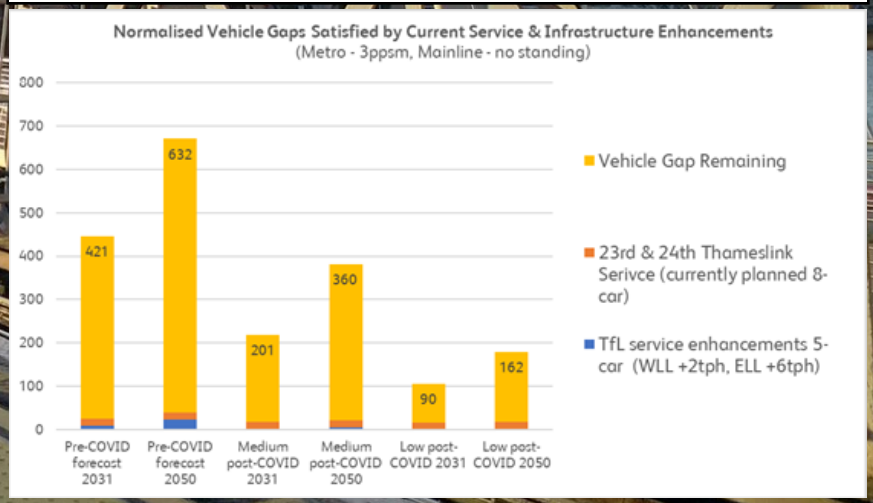
## Summary Document

# 1) Prosperity for rail post-COVID in South London

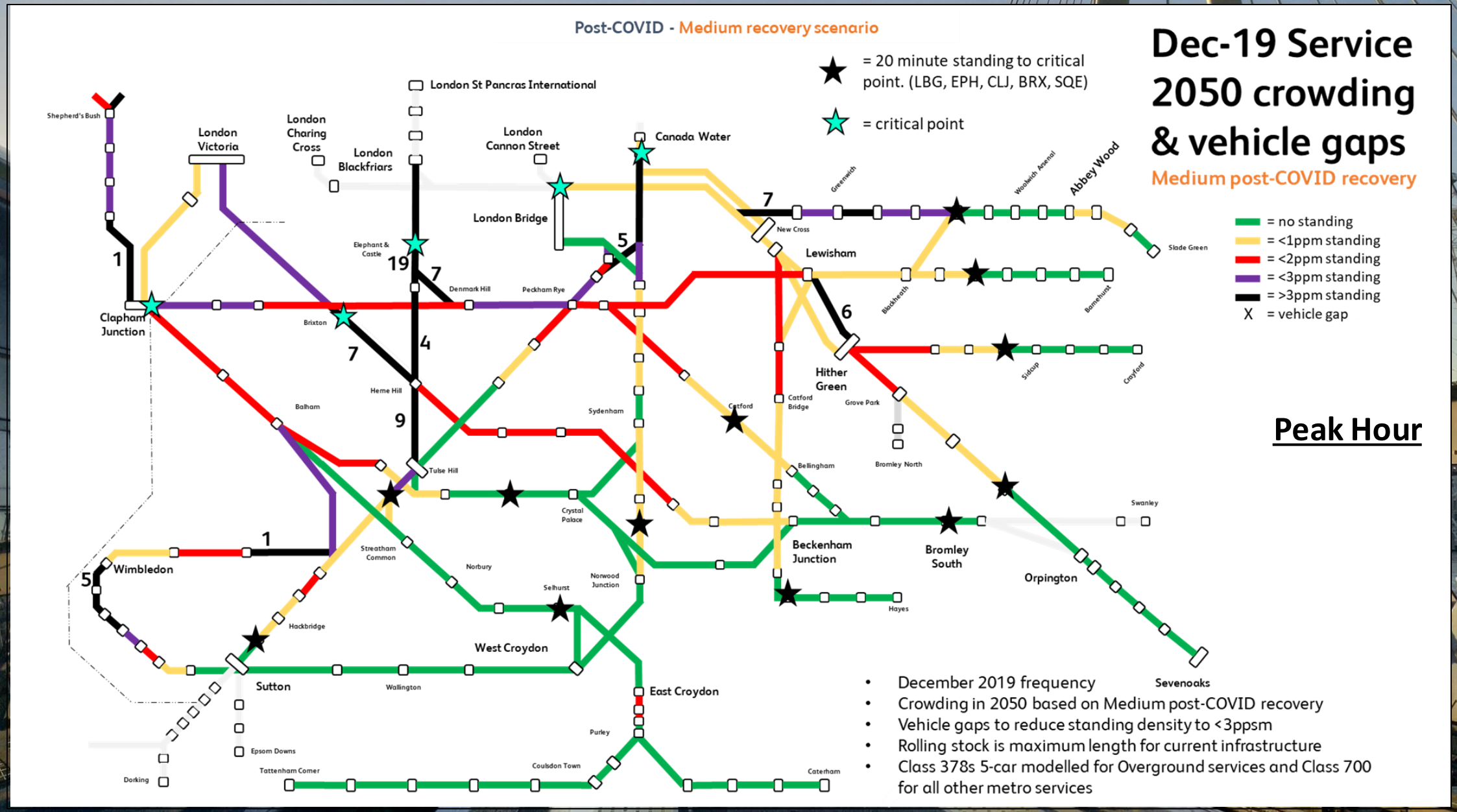
- The COVID pandemic caused passenger numbers **to drop around 93% in May 2020**. Now, in May 2022, rail revenue **has recovered to, on average, around 75%**. (This is shown in the top graph).
- As such, there is **significantly less money available for enhancing the network**.
- Nevertheless, this **study has explored future demand** to 2050 based on pre-COVID recovery, medium recovery (83% of pre-COVID), and low recovery (68% of pre-COVID) to prepare the industry for what might come next.
- **Crowding will likely return in the medium term and become an issue on many routes** in the peak, such as the Greenwich Line, Blackfriars via Elephant & Castle, and Kent & Sussex mainline services (including Thameslink). This is shown on the map on the next page.
- For example, the middle graph shows that with the Dec-19 service, standing on the Blackfriars via Elephant & Castle route will exceed acceptable densities under medium post-COVID recovery in the peak hour. It will also likely return to be an issue by the late 2040s with low post-COVID recovery.
- The bottom graph shows the 'vehicle gap' – the number of additional carriages need to reduce crowding to acceptable levels. It shows that even **in the early 2030s with low post-COVID recovery a 'vehicle gap' exists**. This will require lengthened rolling stock and potentially additional services.
- **Any service recovery post-COVID must be reactive to the evolving market**. This may change the ratio of metro/mainline services, but will make best use of existing infrastructure and rolling stock.



# 1) Prosperity for rail post-COVID in South London



# 2) Opportunities to improve connectivity

**Improved frequency:**

- There are opportunities on many routes in south London, but services of particular note:
  - **TfL Overground** enhancements to 6tph on the South London Line and Sydenham Corridor routes. Additional shuttle services between Clapham Junction and Shepherd's Bush.
  - Target to operate 4tph in both directions around the **Wimbledon Loop**, forming 8tph between Streatham and Blackfriars.
  - Target to operate 4tph between **Victoria and Lewisham** to enhance orbital connectivity.
  - Frequencies could be enhanced on the Epsom Downs branch to improve access to the London Cancer Hub at Belmont. This may require infrastructure enhancements on the single-line branch.

**New stations / new station calls:**

- A new station at **Camberwell** could have an improved economic case should train frequencies be increased through the area. However, it will likely still be a challenge to demonstrate value for money.
- A new '**Brockley Interchange**' station could facilitate interchange between the Sydenham Corridor and services to Lewisham and could have a good economic case.
- New rolling stock could allow Lewisham-Victoria services to call at **Clapham High Street**, reconnecting the station to Victoria.

# 3) Recommendations – Primary

**Services:**

- **R1: Reactive service recovery post-COVID:** Post-COVID recovery should be monitored closely with service reinstatements and enhancements proportionate and reflect the level of recovery.
- **R2: Wimbledon Loop Even Interval 4tph:** Further explore options to improve connectivity and capacity with a service which is potentially financially positive. This should include performance analysis.
- **R3: Clapham High Street Connectivity:** Add a Clapham High Street call to Lewisham-Victoria services following introduction of new rolling stock and safety assessment of selective door opening.
- **R4: Later departing services from central London:** Opportunities to improve late night departures should be further developed, considering its economics and interfaces with railway maintenance requirements.
- **R5: Improved off-peak & Sunday frequencies:** Opportunities for enhanced off-peak frequencies should be further developed through economic analysis, reflecting impact to leisure market, as well as considering the interface with capacity, operations and freight.

**Modelling:**

- **R6: 2050 Timetable**: To further confirm infrastructure requirements and net economic benefits and disbenefits.
- **R7: Power Modelling:** Launch a route-wide power modelling study to establish future third rail power capability requirements.

At the time of publication (Summer 2022), the **funding situation for rail enhancements is extremely tight** due to the substantial subsidy of rail services throughout the COVID pandemic.

It should be noted that the recommendations identified in this study will likely **not be funded immediately** and will benefit from increasing certainty over future COVID recovery.

It is still important to set a vision for the South London network to be able to plan for the long-term.

# 3) Recommendations – Primary

**Infrastructure Development & Rolling Stock:**

(All recommendations are subject to future demand projections)

- **R8: Croydon Area Bottleneck Relief:** Sussex Mainline crowding is likely to return by the late 2030s even under low post-COVID recovery. Relieving the 'Croydon Bottleneck', allowing service frequency increases and improved performance remains a long term aim.
- **R9: Victoria Capability Improvement:** Development work should continue to seize opportunities to enhance terminal capability as part of renewals.
- **R10: Clapham Junction Capability Improvement:** Development work should continue on identifying future options to allow for enhanced Metro (including London Overground), Mainline and freight services.
- **R11: New Rolling Stock:** Replacement of ageing Metro rolling stock with Class 700 style units to reduce crowding, improve passenger experience and improve train length flexibility.
- **R12: South London Line Enhanced Flexibility:** Develop options to increase timetable flexibility and offer some Overground services during engineering.
- **R13: Station Capacity Relief Business Cases:** Develop enhancements to improve capacity at priority stations, including: Peckham Rye, Clapham Junction, Lewisham, Bromley South, Brixton and Balham.
- **R14: London Bridge Area Capability:** After +4tph (above Dec-19) in the peak hour, London Bridge, Cannon Street and Charing Cross are considered full. Opportunities to identify additional capability require further development.
- **R15: Hither Green Area Capacity:** Develop options to increase the capability of the 'Kent Metro' area and the approach into London Bridge.
- **R16: Signalling Enhancements:** Continue the Digital Rail programme and develop signal enhancements on the Kent Metro to allow for more 12-car operation.

# 3) Recommendations – Secondary

**Secondary:**

- **R17: Sussex Metro Platform Extensions:** Develop options to explore tactical opportunities to extend more platforms to at least 10-car, aligned to future rolling stock decisions.
- **R18: New stations/interchange:** Continue supporting London Borough aspirations for new and improved connectivity.
- **R19: Chatham Mainline Enhancement:** Develop proposals to increase both Metro and Mainline frequencies between Bromley South and Victoria.
- **R20: Herne Hill Small Layout Enhancement:** Depending on future services, development of track remodelling options may be required at Herne Hill.
- **R21: Herne Hill Small Layout Enhancement: Headway Reduction:** Subject to signalling renewal timelines, options to enhance the signalling and reduce headways will need to be developed. (Linked with other developments, such as R8, R9, R10 and R14)

# 4) London Victoria – Sussex

**Rolling stock:**

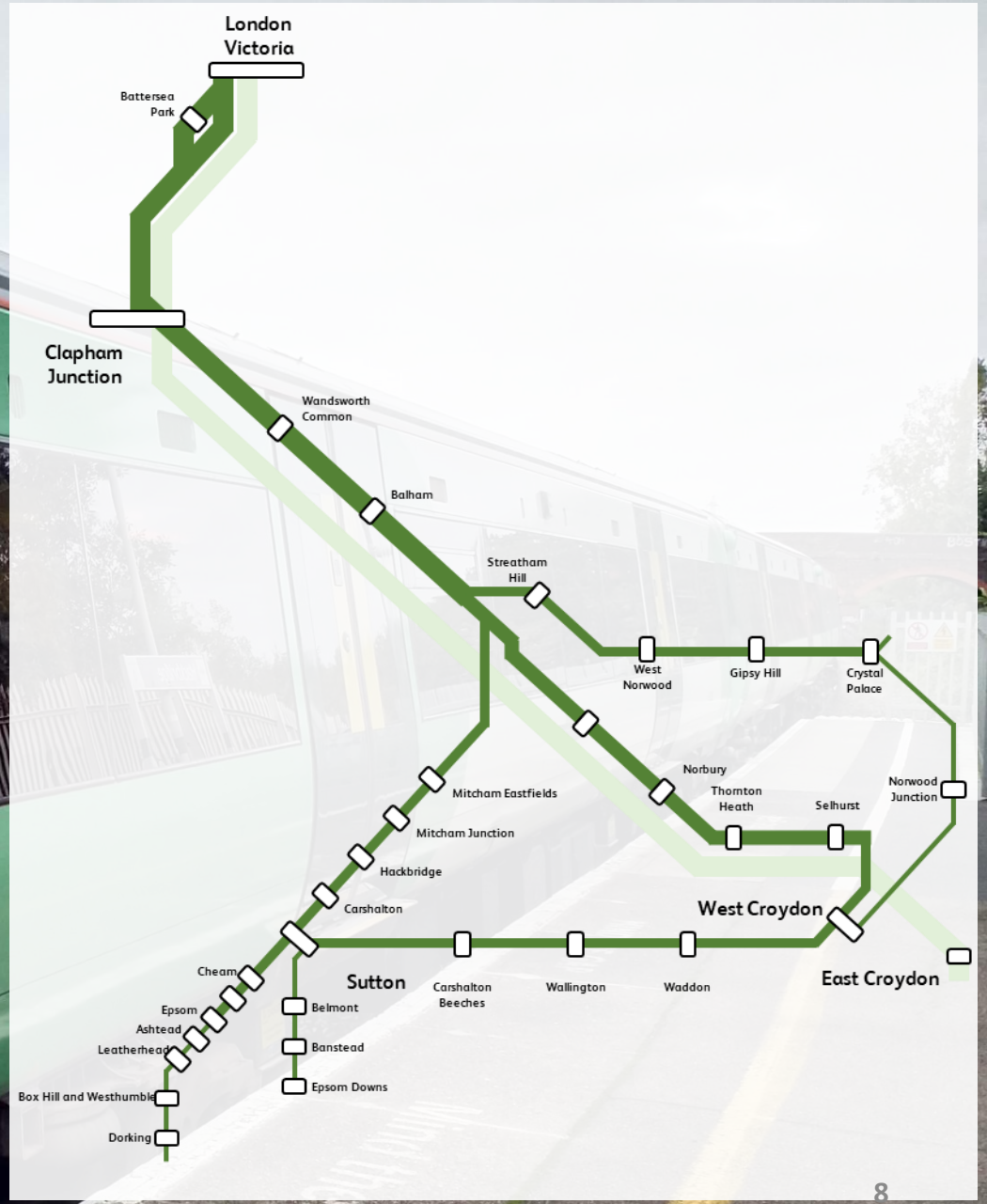
- Rolling stock should operate at maximum lengths for the current infrastructure. This is 10-car on Metro services and generally 12-car on Mainline services (10-car on Caterham/Tattenham Corner).
- Older Metro rolling stock should be replaced with 4-car & 6-car Class 700 style Metro stock (to form 8-,10-,12-car services). Mainline rolling stock used on Metro routes should also be replaced.

**Metro:**

- Expected to require an additional 2 peak services to the Hackbridge Line and Sutton under most post-COVID recovery in the medium term.
- Would benefit from Hackbridge Line headway reductions and performance improvement on the Balham-Victoria corridor.

**Mainline:**

- With Medium post-COVID recovery, likely an additional +2tph services required via East Croydon in 2030s & 2040s.
- Further additional Mainline services could help to reduce growth pressure on the London Bridge area.
- Strategic requirement for the Croydon Bottleneck to be relieved and likely wider Sussex network enhancements.



# 5) London Victoria – Kent

**Rolling stock:**

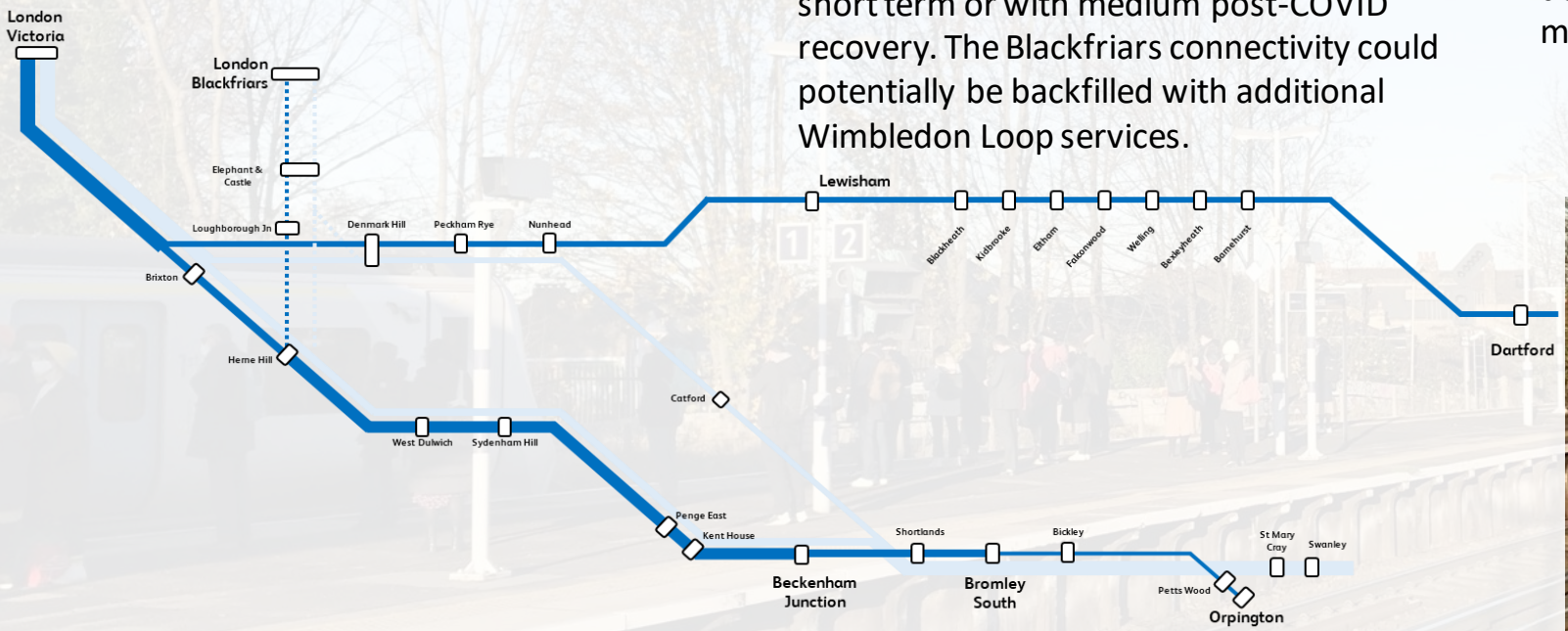
- Due to complexity and cost in extending platforms, 8-car Metro rolling stock will likely remain on Victoria Kent Metro.
- Older Metro rolling stock should be replaced with 4-car & 6-car Class 700 style Metro stock (to form 8-,10-,12-car services).
- Mainline services should be maximum length, so 12-car for Medway services and 8-car for Maidstone services.

**Metro:**

- Likely an additional 2 metro services in the peak hour via Herne Hill – ideally at least as far as Beckenham Junction. This is likely required with Medium post-COVID recovery from late 2020s.
- Another possible option could be for these to 'turn south' at Herne Hill and supplement the Sussex Metro (this would likely require a new parallel move at Herne Hill).
- There is also the option to divert the Beckenham Junction – Blackfriars service to Victoria to provide additional capacity in the short term or with medium post-COVID recovery. The Blackfriars connectivity could potentially be backfilled with additional Wimbledon Loop services.

**Mainline:**

- Forecast demand does not explicitly require additional Mainline services. A new Metro service structure may facilitate Mainline service frequency to increase albeit with longer journey times, unless overtaking infrastructure is provided.
- Mainline services to Blackfriars can remain, but capacity in the Blackfriars Bay platforms may become constrained with potential additional Metro services from Lewisham and Wimbledon Loop frequency uplifts. Capacity allocation will need to be strategically determined when future recovery becomes more certain.




# 6) London Bridge – Sussex

**Rolling stock:**

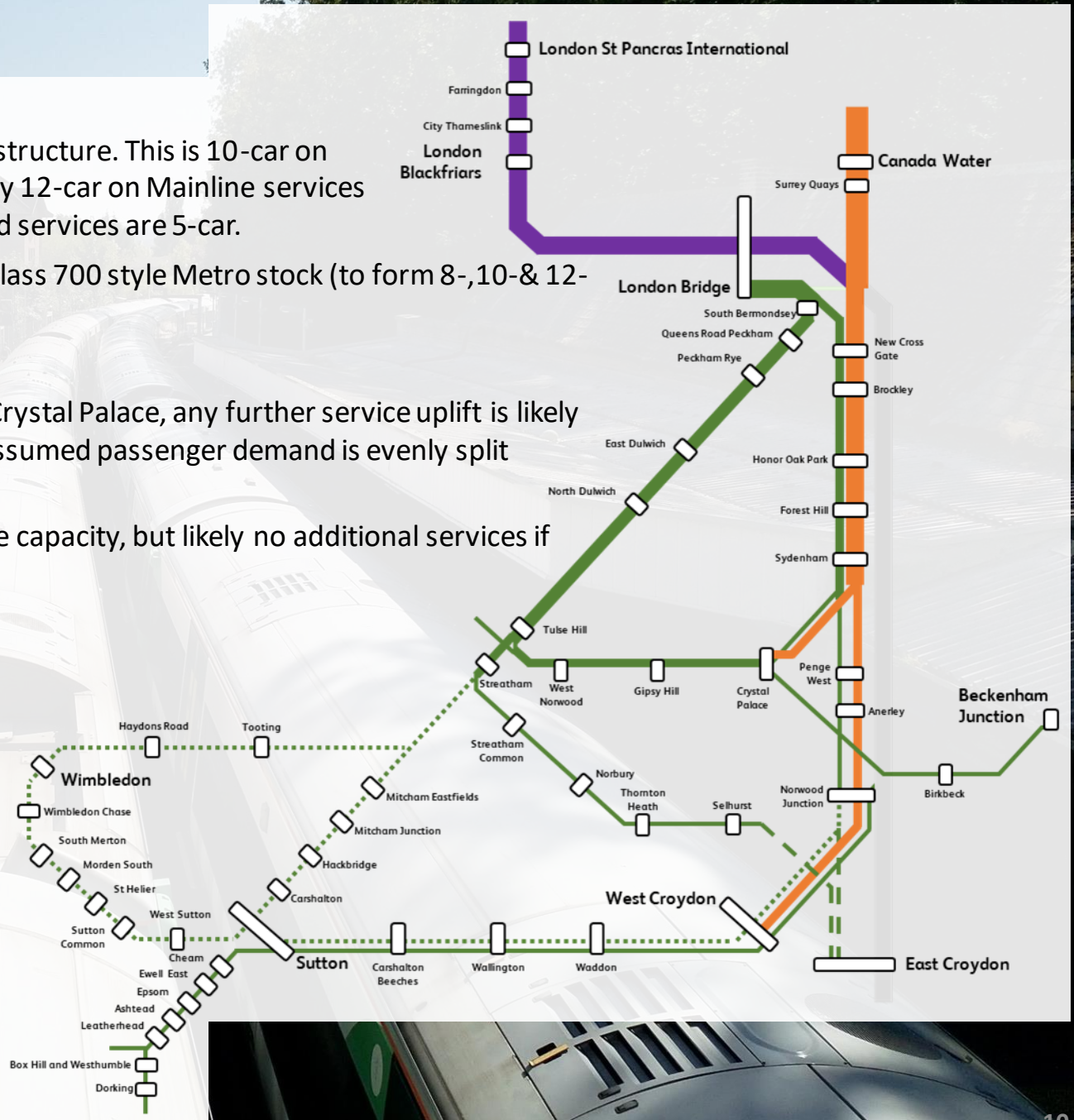
- Rolling stock should operate at maximum lengths for the current infrastructure. This is 10-car on Metro services via Sydenham Corridor, 8-car via Tulse Hill and generally 12-car on Mainline services (10-car on Caterham/Tattenham Corner and Sutton Fasts). Overground services are 5-car.
- Older Metro rolling stock should be replaced with 4-car & 6-car 20m Class 700 style Metro stock (to form 8-,10-& 12-car services).

**Metro:**

- Following the introduction of the proposed additional TfL services to Crystal Palace, any further service uplift is likely only required to boost connectivity on the Sydenham Corridor. (This assumed passenger demand is evenly split between Overground and Southern Metro services).
- The Tulse Hill corridor would benefit from new rolling stock to increase capacity, but likely no additional services if Wimbledon Loop flows were all directed to Blackfriars in the future.

**Mainline:**

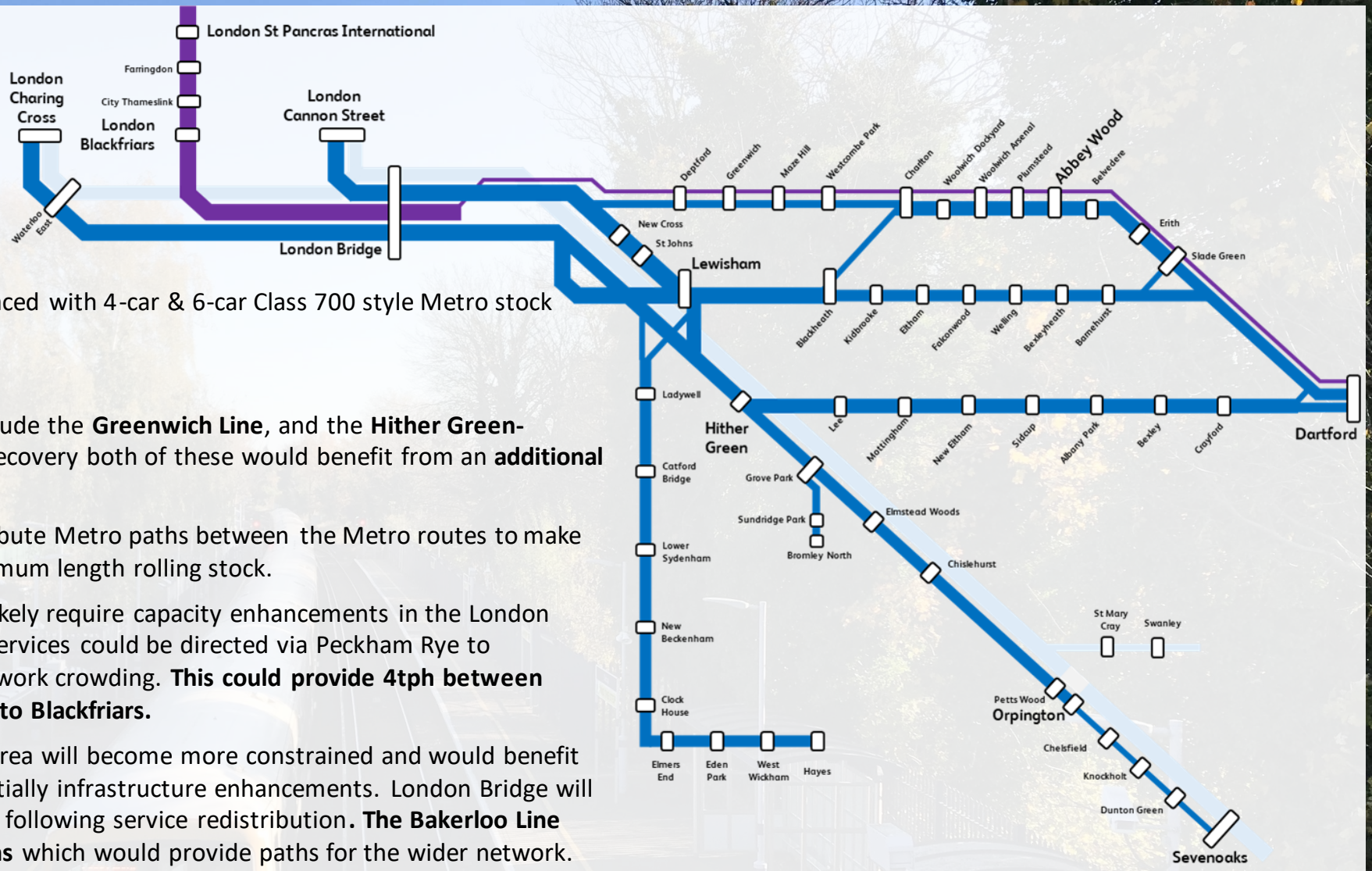
- Pre-COVID forecasts called for potentially up to +8tph on Sussex Mainline services into London Bridge by 2050.
- With Medium post-COVID recovery likely an additional +6tph services via East Croydon in 2030s & 2040s. With Low post-COVID recovery, expected to require +4tph in 2040s and 2050.
- This would allow for greater connectivity along the Brighton Mainline. It could also provide the opportunity to operate more fast services to Sutton & Leatherhead with signal enhancements on the Wallington Line.
- Future service frequency uplift would require the Croydon Bottleneck to be relieved and likely wider Sussex network enhancements.



# 7) London Bridge – Kent

**Rolling stock:**

- Rolling stock should operate at maximum lengths for the current infrastructure. This is 12-car on most Metro services.
- Older Metro rolling stock should be replaced with 4-car & 6-car Class 700 style Metro stock (to form 8-,10-,12-car services).




**Metro:**

- Routes likely to suffer from crowding include the **Greenwich Line**, and the **Hither Green-Lewisham link**. In Medium post-COVID recovery both of these would benefit from an **additional 2tph** in the peak in the late 2020s.
- There may be the opportunity to redistribute Metro paths between the Metro routes to make better use of existing capacity with maximum length rolling stock.
- A net increase in Metro services would likely require capacity enhancements in the London Bridge area, or alternatively, additional services could be directed via Peckham Rye to Victoria/Blackfriars to support wider network crowding. **This could provide 4tph between Lewisham and Victoria, and a new 2tph to Blackfriars.**
- With higher recovery, the Hither Green area will become more constrained and would benefit from a new timetable structure or potentially infrastructure enhancements. London Bridge will also likely require capacity enhancement following service redistribution**. The Bakerloo Line Extension to Hayes would release 6 paths** which would provide paths for the wider network.

**Mainline:**

- Under Medium post-COVID recovery, a total of +3tph is likely required in late 2020s, and a further +2tph in the 2040s. In Low post-COVID recovery this reduces to just +2tph in the 2040s.
- There is the aspiration to operate additional London Bridge to Medway services, but this would likely require junction enhancements in the St Mary Cray area.
- There is the option some of these additional services to London Bridge could instead route to Victoria where the capacity constraints may be less.

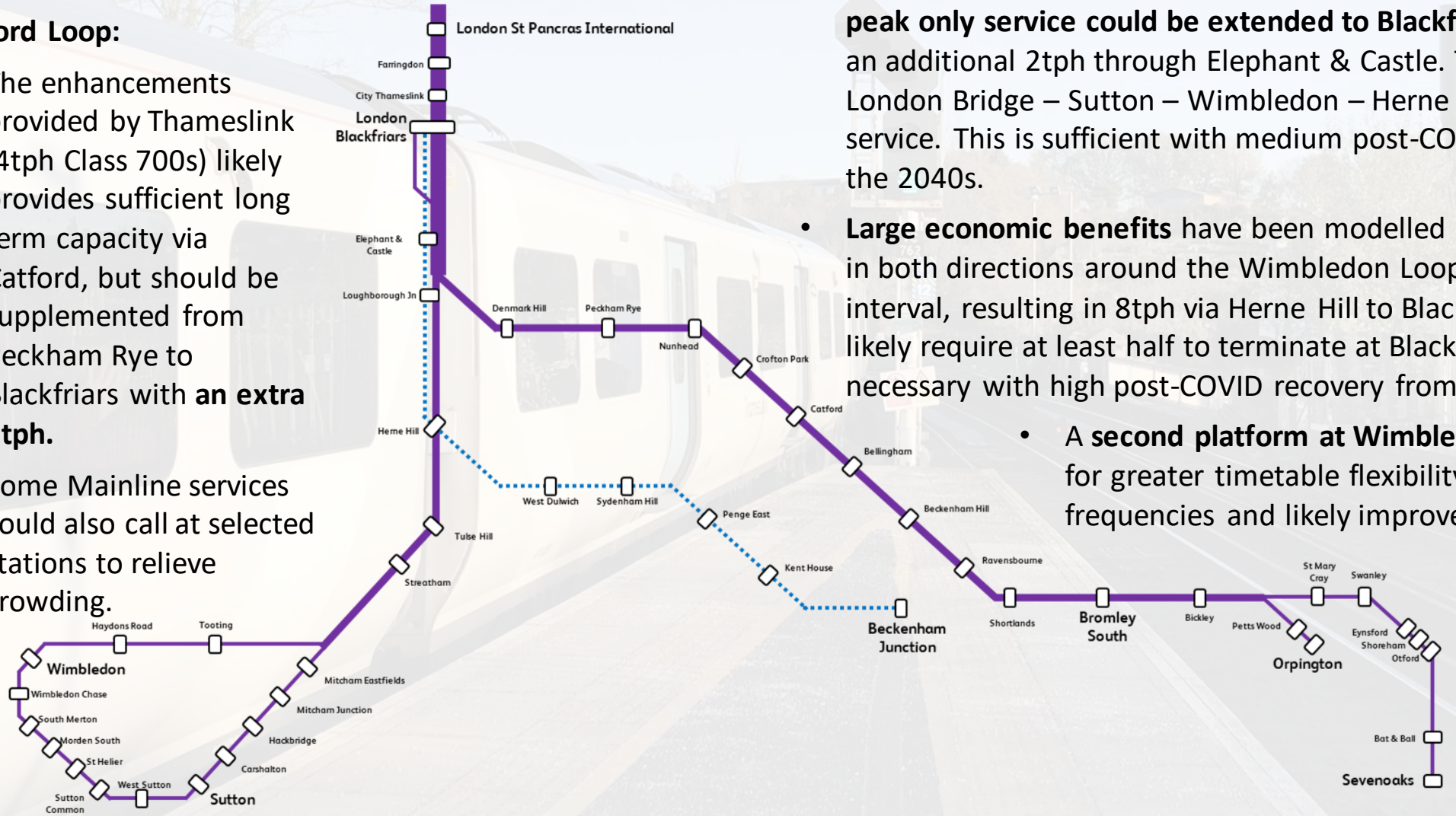
# 8) Blackfriars Metro (via Elephant & Castle)

**Rolling stock:**

- Rolling stock should operate at maximum lengths for the current infrastructure. This is 8-car on services via Elephant & Castle.

**Catford Loop:**

- The enhancements provided by Thameslink (4tph Class 700s) likely provides sufficient long term capacity via Catford, but should be supplemented from Peckham Rye to Blackfriars with **an extra 2tph.**
- Some Mainline services could also call at selected stations to relieve crowding.




**Wimbledon Loop:**

- There is the assumption that the Beckenham Junction – Blackfriars 2tph service operates during the peak hour.
- From the late 2020s the Dec-19 **London Bridge – Wimbledon peak only service could be extended to Blackfriars** to provide an additional 2tph through Elephant & Castle. This would form a London Bridge – Sutton – Wimbledon – Herne Hill – Blackfriars service. This is sufficient with medium post-COVID recovery to the 2040s.
- **Large economic benefits** have been modelled by operating 4tph in both directions around the Wimbledon Loop with even interval, resulting in 8tph via Herne Hill to Blackfriars. This would likely require at least half to terminate at Blackfriars. This is more necessary with high post-COVID recovery from the 2040s.
- A **second platform at Wimbledon** would allow for greater timetable flexibility with higher frequencies and likely improved performance.

# 9) Orbital

**Rolling stock:**

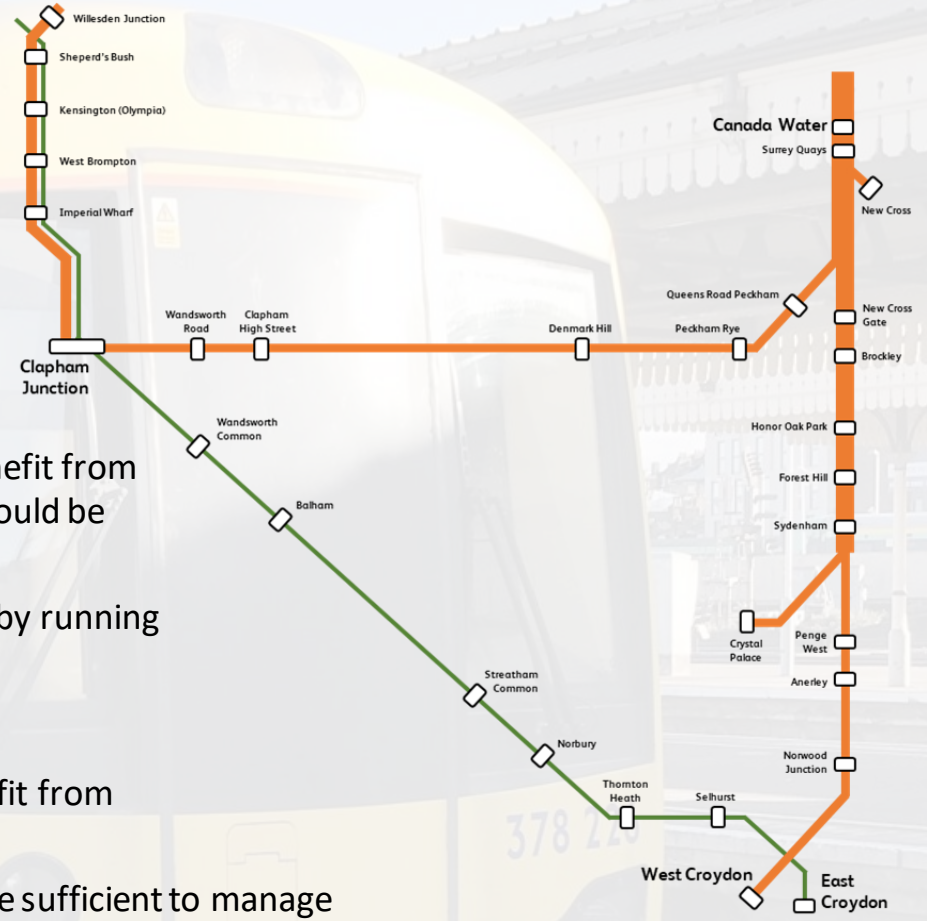
- TfL Overground services via Canada Water are limited to 5-car in length, as are services via the North London Line. 'Southern' services via the West London Line can be up to 8-car in length.
- Class 700 style stock would benefit 'Southern' services during crowded periods along the West London Line.

**Sydenham Corridor:**

- TfL aspire for +2tph to Crystal Palace, plus a further +2tph to West Croydon which would benefit from improvements to allow greater throughput over junctions in the Croydon area. This uplift should be sufficient to manage crowding even with pre-COVID forecasts.
- West Croydon may require additional terminating capability which could be accommodated by running other services through to Sutton or a new turnback at Wallington.

**South London Line:**

- TfL aspire for +2tph to provide 6tph via Canada Water to Clapham Junction. This would benefit from improvements to Clapham Junction to provide more terminating flexibility and capacity.
- Along with an additional Lewisham-Blackfriars and Lewisham-Victoria services, this should be sufficient to manage crowding under medium post-COVID recovery from the late 2020s.




**West London Line:**

- TfL plan to operate a shuttle service between Shepherd's Bush and Clapham Junction. In the future, this would ideally be extended to Willesden Junction to relieve crowding north of Shepherd's Bush. This may require some capacity or turnback enhancements.
- 'Southern' services would also ideally be increased in frequency from 2tph to 3-4tph but as this service travels through numerous network constraints, it is likely that network enhancements will be necessary. This frequency enhancement is more necessary with pre-COVID forecasts.
- The route is also a significant freight artery, and the London Rail Freight Strategy has identified a number of enhancements to improve capability of the West London Line, including shortened signalling headways.