SER Appendix 5 Phase Two Engagement Arrivals Material

Phase Two Engagement Arrivals Material

Stage 2 Develop and Assess



Appendix 5 outlines the arrivals materials shared during the phase two stakeholder engagement.

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LONDON STANSTED AIRPORT FUTURE AIRSPACE

Stage 2 – Develop and Assess Phase two engagement - Route options discussion **Arrivals**



November 2021





London Stansted

London Stansted Airport – Airspace change timeline

		We are here					
2020		2021/2022	2022/ 2023	2023	Early 2024	Late 2024	2025 onwards
Stage 1 Define		Stage 2 Develop and assess	Stage 3 Full public consultation	Stage 4 Update and submission of proposals	Stage 5 Decision	Stage 6 Implementation	Stage 7 Post- implementation review
Step 1A In December 2018 we sent the CAA our Statement of Need, which was approved and provisionally classed as a Level 1 change. 1	Step 1B We gathered views on Design Principles during early 2020. Our Stage 1 work was approved by the CAA in the summer of 2020.	Using the Design Principles produced during Stage 1 as a framework to evaluate different design options, we will develop and assess options for any airspace change. We will send details of the process followed to create those design options to the CAA for approval in Spring 2022.	We will prepare to consult the public on these options. Once we have approval from the CAA to proceed, a formal consultation will take place in 2022/ 2023.	We will update our airspace change proposal, taking stakeholders' feedback into account, before sending it to the CAA in 2023.	We expect the CAA's decision on whether to approve any airspace change in early 2024.	If approved, any airspace changes could be put in place in late 2024.	The CAP1616 process gives the CAA and airports 12 months to review any change that has been made to airspace.

¹ Level 1 changes are high impact changes to notified airspace design which have the potential to alter traffic patterns below 7,000ft

All future dates are provisional pending CAA approval and alignment with the wider Airspace Modernisation Strategy



Stage 2 process – gathering views



principles, for feedback

and input.

Airport

submitted to the CAA for

assessment.

Arrivals – phase one recap



The concepts we shared in phase one

For arrivals, this airspace change considers changes to:

- Where we will receive aircraft at 7,000ft and how that might be impacted by air traffic management at higher altitudes
 - We will talk about this today and use your feedback to influence our designs and in our conversations with NATS
- How aircraft will route from 7,000ft to the runway
 - Vectoring by air traffic control will mostly be replaced by the use of a single or multiple
 Performance Based Navigation (PBN) routes.
- The degree of dispersion that is experienced
 - The transition to modern ways of flying (PBN) will result in less dispersion of aircraft tracks.
 Arrivals will follow tracks more consistently and more accurately than currently.



Initial design envelopes: North Westerly arrivals options



Initial design envelopes: South Easterly arrivals options



Initial design envelopes: Central arrivals options



WHAT WE WILL BE ASKING?

- Is the process we have followed to identify route options for arrivals clear and logical?
- Is it clear how feedback from our earlier stakeholder discussion sessions in June have influenced the development of the route options?
- Is it clear how the route options align with the design principles?
- Do you have any initial thoughts on changes that could deliver additional benefits that you feel we haven't included? If so, please explain.
- Aside from those already mentioned, are there any additional local factors we should be aware of when evaluating these route options?





Phase one feedback – general themes

	Feedback	Response
Respite	Creating routes that could provide options for respite for areas that are overflown is important as a means of minimising local noise impacts.	For arrivals, we have created options that provide different joining points which could create a level of relief. Today, we will also outline three possible alternative concepts, which offer different ways to provide noise relief. We will explain these as part of our presentation to you today, for your feedback. Design principle link N2.
Community noise impacts	Managing potential noise impacts on overflown communities is a key concern. Stakeholders raised concerns about overflying highly populated areas and specific locations that due to their proximity to the airport, are included in all the envelopes.	Route options that take account of areas that are more highly populated have been included by applying design principles N1, N2, and C. Options to provide noise relief have also been included and as we refine the design options, we will also be considering areas of future housing growth. Design principles link N1, N2 and C.
Environment	Options should demonstrate environmental benefit. Further detail on how this will be achieved should be provided.	As part of our design principles evaluation, in line with our 'Balance' principle, each route option will be assessed to understand the fuel burnt and emissions generated. This will be compared to the baseline scenarios to provide a clear picture of the comparative environmental impact of each option. Design principles link B and T.
Technology	Stakeholders noted the limitations of the current structure and were mostly supportive of ensuring that our arrivals designs facilitate Continuous Descent Approaches (CDA) to both runway ends. However some asked if there were alternatives that could better address noise impacts.	All of the arrival options we will present facilitate CDAs to both ends of the runway. We will explain later in our presentation how options that do not facilitate this have been categorised as part of the initial options development process. In addition we have considered route designs at different angles of descent. Design principle link T and P.
Sensitive areas	Green spaces, cultural and historic buildings are important. The location of AONBs, SSSIs and other sensitive sites and buildings should be considered.	The location of sensitive areas have been included in our route options maps to provide clarity for stakeholders. Options have been provided that take account of these areas and this will be assessed as part of Design Principle Noise N3.
Efficiency	The opportunity to create a more efficient route structure is welcomed. More detail is required on how Stansted's options will align with other airports airspace change programmes and the NATS network changes.	The process requires alignment with the network and our Design Principle Policy (P) provides assurance that each option must meet this requirement. Further detail will arise as other sponsors ACPs progress. For arrivals, the NATS changes will be particularly relevant to the development of our options. Today, we will discuss some possible concepts, your feedback on these will help inform our discussions with NATS. Design principles link P, E, T, A.

THE PHASE TWO DESIGN PROCESS

Andy Sampson





The phase two design process





The route options development process – our Design Principles

C | Change

Where we choose routes that fly over new areas there will have to be a clear and objective benefit in doing so.

T | Technology

Routes should be designed to make use of the latest widely available aircraft navigation technology and facilitate continuous climb and descent to/from both ends of the runway.

Noise

- N1 In order to address the effects of aircraft noise, each route should seek to minimise the number of people averflown.
- N2 The use of multiple routes and/or other forms of respite, such as different time periods and balanced runway mode when operationally viable, will be considered.
- N3 Where practical, our route designs should avoid, or minimise effects upon, noise sensitive receptors. These may include designated sites and landscapes (such as SSSI and AONB), cultural or historic assets, and sites providing care.

B | Balance

Our designs will consider both noise and emissions, and seek to strike the best balance. In so doing, we will take account of the Government's altitude-based priorities, which emphasise minimising noise below 7,000 feet.

E | Efficiency

We will seek to minimise the amount of controlled airspace that we require, and our future route designs should ensure an efficient and systemised operation at Stansted, minimising interactions with other airports and maintaining priority access for emergency services.

A | Alternatives

Where the adoption of modern navigation standards and/or flight profiles mean that some aircraft cannot fly the new routes, we will seek to minimise the environmental impacts from those aircraft.

London Stansted Airport To create arrival options we looked at ways to route from 7,000ft to the runway.

This created a comprehensive list of options. Not all of the options which we considered are viable when assessed against our design principles, specifically the three design principles that we determined all of our options *must* meet. So we have therefore adopted a staged approach to refine these.

The result is a range of viable departure route options which we are engaging with you upon.

S Safety Safety is our highest priority; our routes must be safe for airspace users and communities on the ground, and must comply with national and international industry standards and regulations. P Policy Any changes must be consistent with the CAA's Airspace Modernisation Strategy and the FASI-S programme, taking into account the needs of other change sponsors and airspace users. D Demand

The airspace design must provide for the utilisation of aircraft movements permitted by planning permissions and within statutory limits in force at the airport.

London Stansted Airport Future Airspace - Stage 2, Develop and Assess

Phase two design development – viable and unviable options

Design Rules

Options that cannot meet PANS OPS 8168 criteria (or have an approved safety justification) are considered 'unviable' and discounted.

These include options that would not allow an aircraft to safely stabilise on final approach or those that descend a a gradient above the recommended maximum

Unviable

London Stansted

"Must have" Design Principles

All route options 'must' comply with the design Principle on Safety, Policy and Demand.

This will exclude options that conflict with safety constraints or complex airspace.

Additionally it will exclude options that fail to comply with the UK Government Airspace Modernisation Strategy, the FASI S programme and those that fail to allow for the permitted growth of

Viable but poor fit

Route Options

Options that would be expected to meet the three "must" design principles are 'viable' routes and are the subject of our discussions todays

These will be fully designed and evaluated against all of the design Principles.

Viable and good fit

Step 1 - Unviable arrival options

PANS-OPS 8168 (Procedures for Air Navigation Services – Aircraft Operations) sets out criteria such as when an aircraft can turn onto final approach, how tightly and at what speed.

Applying these rules creates a hatched area within which it is 'unviable' to design an arrival procedure. This is defined by a combination of the turn radius, speed and the minimum height for final approach.

The minimum height for aircraft to be established on final approach is 2,000ft above sea level. At Stansted this equates to just over 5 miles from the runway threshold.





Step 2 – Applying Safety and Demand 'viable but poor fit'

The Design Principle **Safety (S)** requires us to comply with international standards and regulations and makes safety our highest priority.

This covers PANS OPS 8168 but also the rules that relate to:

- Danger areas and restricted airspace
- Route spacing
- ATC procedures for safely managing aircraft

Any options that would fail to meet these criteria are classified as 'viable but poor fit'.

Our designs have a safety process running in parallel that ensures these factors have been accounted for. The Design Principle **Demand (D)** requires us to design to the aircraft movements permitted by planning permissions and within statutory limits in force at the airport.

Those planning permission equate to 55 movements per hour.

To achieve this will require routes that operate effectively as a system and in conjunction with other airports.

However, at this stage there is uncertainty on

- The route options at other airports within the London area.
- The position of the NATS arrival structure above 7,000ft

Until there is more certainty on these aspects we will not have groups of interdependent route options to assess.

We therefore cannot evaluate whether a route meets the demand design principle at this stage and we propose to delay this until a later stage.



Step 2 – Applying Policy 'viable but poor fit'

The Design Principle **Policy (P)** requires us to consider the CAP1711 Airspace Modernisation Strategy (AMS)

By reference to this and CAP1616 we also need to consider:

- The Transport Act 2000.
- The Air Navigation Guidance 2017 (ANG)

Both the ANG and the AMS highlight the use of Continuous Descent Approaches/Operations as a means to achieving the objectives in the policy.

Our arrivals designs must therefore provide continuous descents to both runway ends to meet the Design Principle Policy (P).

Any route option that does not becomes 'viable but poor fit' as it fails to meet the requirements of the design principle.





What are Continuous Descent Approaches?

Continuous Descent Approaches (CDA) or Continuous Descent Operations (CDO) involve arriving aircraft using minimum thrust and avoiding prolonged level flight.

The objective of a CDA is to reduce the environmental impact of the arrival by:

Minimising engine thrust and noise (Design Principle Noise 1 (N1))

- Maintaining a fuel optimal profile and minimising CO₂ emissions (Design Principle Balance (B))
- Minimising airframe noise such as deploying air brakes (Design Principle Noise 1 (N1))

There is a range of descent gradients for a CDA which will provide the benefits above.

- Our new design envelopes for runway 22 are within this range
- However for runway 04 some are outside of the range that would provide a benefit.
- Current operations for runway 04 often fail to achieve a CDA due to the distance of the ABBOT hold from the runway.

Current definition of CDA used by CAA

The arrivals code of practice measures an arrival as a CDA if it contains

- no level flight; or
- one phase of level flight not longer than 2.5 miles.





What does the CDA range look like?







Step 3 – The viable design area

The dark green area shows where CDAs are theoretically possible to both runway ends to meet the Design Principle Policy (P).

As with departures we have then applied the design principles to create route options from 7,000ft.

The options take account of:

- The need to create a CDA (design principles Policy (P), Noise 1 (N1) and Balance (B))
- Avoiding overflight where possible (Design Principle Noise 1 (N1)
- Opportunities for noise relief (Design Principle Noise 2 (N2)
- The PANS OPS rules on aircraft turns, stabilisation and final approach segments.





QUESTIONS





London Stansted Airport Future Airspace - Stage 2, Develop and Asses

How we are going to describe the arrivals options – an example



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Step 3 – West route options for Runway 22 'viable and good fit'

This shows the West options within the 'viable and good fit' design envelope for Runway 22.

Route options have been created using one or more of the design principles to provide a demonstrable benefit.

- Options 17 and 18 align to Noise N1 and are at the edges of the designable area.
- Option 5 and 12 most closely align to the position of the current Lorel hold
- Option 9 avoids Saffron Walden in line with Noise N1 and provides a more fuel efficient route for Runway 22 (Balance).
- Option 14 provides a shorter track to minimise fuel burn for Runway 22 in line with Balance.
- Options 4 and 13 are optimally placed for both runway ends in line with Balance.





Step 3 – West route options for Runway 04 'viable and good fit'

This shows the West options within the 'viable and good fit' design envelope for Runway 04.

- The start points at 7,000ft are the same as for Runway 22.
- Options 17 and 18 align to Noise N1 and are at the edges of the designable area.
- Option 5 and 12 most closely align to the position of the current Lorel hold to the North East of the runway.
- Option 9 aligns to Noise N1 by avoiding towns.
- Option 14 aligns to Noise N1 by avoiding towns, but is less fuel efficient for this runway.
- Options 4 and 13 are optimally placed for both runway ends and align with both Noise N1 and Balance.



Cambridge GVS 17 16 12 Constraint traffic) St Elizabeth's Centre Viable and good fit design area

Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Step 3 – East route options for Runway 22 'viable and good fit'

This shows the East options within the 'viable and good fit' design envelope for Runway 22.

All the route options in this envelope are different to how we fly today. This is because any routes from the existing Abbot hold are outside of the viable and good fit design area, shown here. A CDA cannot therefore be achieved to both runway ends.

- Option 23 aligns to our Noise N1 design principle as it avoids Chelmsford.
- Options 21 and 22 apply a fuel efficient preference to Runway 22 in line with the Balance design principle.
- Options 8, 19 and 20 apply N1 on noise by remaining north east of Chelmsford.
- Options 1 and 10 are optimally placed to provide a CDA to both runway ends and align with both N1 on noise and Balance.



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Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Step 3 – East route options for Runway 04 'viable and good fit'

This shows the East options within the 'viable and good fit' design envelope for Runway 04

All the route options in this envelope are different to how we fly today. This is because any routes from the existing Abbot hold are outside of the viable and good fit design area, shown here. A CDA cannot therefore be achieved to both runway ends.

- Options 23 aligns to Noise N1 and is at the edge of the designable area.
- Options 21 and 22 aligns to Noise N1 by avoiding Braintree, but are less fuel efficient for this runway.
- Options 8, 19 and 20 apply N1 on noise by remaining north east of Chelmsford.
- Options 1 and 10 are optimally placed to provide a CDA to both runway ends and align with both design principle Noise N1 and Balance.



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.



Step 3 – Centre West options 'viable and good fit'

This shows the centre options for both runway ends originating from the North West.

- The traffic flow to Runway 22 is represented by the light blue aircraft.
- The traffic flow to Runway 04 is represented by the orange aircraft.
- Both options have identical fuel burn to each other in line with the Balance design principle.
- Noise relief, (design principle Noise N2) has been included via variable joining points for final approach



Options shown are for illustration only and are subject to change as we progress through the CAP1616 process.

Step 3 – Centre East options 'viable and good fit'

This shows the centre options for both runway ends originating from the South East.

- The traffic flow to Runway 04 is represented by the light blue aircraft.
- The traffic flow to Runway 22 is represented by the orange aircraft.
- Both options have identical fuel burn to each other in line with the Balance design principle.
- Noise relief (design principle Noise N2) has been included via variable joining points for final approach



Options shown are for illustration only and do not represent the final designs. All are subject to change as we progress through the CAP1616 process.

QUESTIONS & FEEDBACK

- Is the process we have followed to identify route options for arrivals clear and logical?
- Is it clear how feedback from our earlier stakeholder discussion sessions in June have influenced the development of the route options?
- Is it clear how the route options align with the design principles?
- Do you have any initial thoughts on changes that could deliver additional benefits that you feel we haven't included? If so, please explain.
- Aside from those already mentioned, are there any additional local factors we should be aware of when evaluating these route options?





APPLYING THE DESIGN PRINCIPLES ON NOISE

Scenarios for feedback





Applying the design principles on noise

In our initial designs we have applied noise design principles in the following way:

- Design Principle Noise 1 (N1) we have sought to design routes that avoid major towns where this is possible
- Design Principle Noise 2 (N2) (relief and respite) we have designed options using multiple joining points

However we would like you gain your input on alternative ways to design in relief and respite for our next design iteration.

We have 3 scenarios on the coming pages and would appreciate your comment as to which you would prefer.

These are only concepts at this stage and may not be operationally possible in all cases.



Applying the design principles on noise Single 7,000ft point, single route

This concept uses a single 7000ft with a single route

- Concentrates flights in one small area
- May reduce the total number of people overflown
- Simple to design and operate





Applying the design principles on noise Single 7,000ft point, dual routes

This concept uses a single 7000ft with a two routes

- Routes diverge after 7000ft but would need to converge at or before final approach
- Disperses noise
- May impact more people
- Increases complexity and interaction with departing flights





Applying design principles on noise

Two 7,000ft points

This concept uses a two 7000ft points with a single route for each

- May be used at the same time (similar to today's operation) or alternated.
- Spreads noise most widely
- May impact more people but less frequently
- Increases complexity and interaction with departing flights





QUESTIONS AND FEEDBACK

- Is it clear how each of these three scenarios could deliver respite or relief?
- Do you have a preferred option?
- Which do you think best aligns with our design principles?





Next steps





Presentation, Q&A and feedback survey circulated Feedback deadline – Friday 26th November 2021

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London Stansted Airport Future Airspace

Stage 2 – Develop and Assess Phase two engagement



October 2021



London Stansted Airport Future Airspace

Thank you for taking part in our discussions about the future of airspace at London Stansted Airport. As we develop our plans, the feedback we receive from stakeholders (the people and organisations who can affect, or be affected by, any changes to airspace) will influence the decisions we make.

This document provides useful background information for the upcoming discussion session(s) which follow on from the sessions we held in June 2021. Sources of further information are provided in this document and there will also be the opportunity to ask any questions on the information provided here, at our discussion sessions.

STAGE 2 – DEVELOP AND ASSESS

This stage focuses on developing route options that address the statement of need and align with the design principles that were established through stakeholder engagement at Stage 1. There are two steps within Stage 2. At Step 2A, a comprehensive list of route options is developed, refined and assessed against the design principles. In Step 2B, the options are more closely assessed to understand their likely effects, both positive and negative.

Once we have completed this further evaluation, details of the work carried out at Stage 2 will then be submitted to the CAA for assessment at the end of February 2022¹. Subject to the CAA's approval, the airport will then proceed to Stage 3 of the airspace change process where the refined options will be subject to full public consultation.

GATHERING VIEWS AT STAGE 2

At Step 2A we are undertaking two phases of stakeholder engagement. The first phase took place in June 2021 and in these sessions, we explained the process our route designers followed to identify the broad areas where it would be possible to place departure and arrival routes that align with our statement of need and the design principles developed through stakeholder engagement at Step 1B. We then sought stakeholders' views on this work and the broad areas identified. Taking those views on board, a second stage of design work has now been completed to identify potential routes. In our forthcoming engagement sessions, we will explain the changes we made as a result of stakeholder feedback received in June 2021, and present specific route options that align with the design principles and take account of stakeholder views.

Following feedback from these sessions, the specific route options will be further refined and will then be fully assessed to see how well they meet the design principles. This will complete the requirements of Step 2A. The session you will shortly be attending will cover **arrival route options only**.

In Step 2B, the options will be subject to an initial assessment to understand their likely effects, both positive and negative.

¹ This date is currently still to be confirmed by the CAA

DESIGN PRINCIPLES

The design principles established at Step 1B continue to guide the development of our route options. After this next phase of engagement, each of the refined options will be formally assessed against each of these design principles.

S Safety Safety is our highest priority; our routes must be safe for airspace users and communities on the ground, and must comply with national and international industry standards and regulations. Ρ Policy Any changes must be consistent with the CAA's Airspace Modernisation Strategy and the FASI-S programme, taking into account the needs of other change sponsors and airspace users. Demand D The airspace design must provide for the utilisation of aircraft movements permitted by planning permissions and within statutory limits in force at the airport. Change Where we choose routes that fly over new areas there will have to be a clear and objective benefit in doing so. Т Technology Routes should be designed to make use of the latest widely available aircraft navigation technology and facilitate continuous climb and descent to/from both ends of the runway. Noise In order to address the effects of aircraft noise, each route should seek to minimise the number N1 of people overflown. The use of multiple routes and/or other forms of respite, such as different time periods and N2 balanced runway mode when operationally viable, will be considered. Where practical, our route designs should avoid, or minimise effects upon, noise sensitive receptors. N3 These may include designated sites and landscapes (such as SSSI and AONB), cultural or historic assets, and sites providing care. Balance B Our designs will consider both noise and emissions, and seek to strike the best balance. In so doing, we will take account of the Government's altitude-based priorities, which emphasise minimising noise below 7,000 feet. Efficiency E We will seek to minimise the amount of controlled airspace that we require, and our future route designs should ensure an efficient and systemised operation at Stansted, minimising interactions with other airports and maintaining priority access for emergency services. Alternatives Α

Where the adoption of modern navigation standards and/or flight profiles mean that some aircraft cannot fly the new routes, we will seek to minimise the environmental impacts from those aircraft.



WHAT TO EXPECT FROM THE DISCUSSION SESSION

If you are attending the online discussion session, this will be held on Microsoft Teams and is expected to run for one and a half hours. You will be sent a link to the session in advance.

If you are attending our face-to-face discussion session, venue details and timings will have been provided to you with your invite.

Each session will consist of a presentation from the airport team and a Q&A session. There will be opportunity to ask questions and offer comments on the information shown throughout. Copies of the materials presented will be provided to you after the session with a feedback survey to enable you to absorb the content before sharing your views.

Please note that the sessions will be recorded so feedback can be analysed.

If you have any questions or concerns before the session, or if there is anything we can do to help you take part, please let us know by contacting <u>future.airspace@stanstedairport.com</u>

FURTHER INFORMATION

Full details of the work London Stansted completed at Stage 1 can be found on the CAA's airspace change portal at <u>www.airspacechange.caa.co.uk</u>

The CAA's Airspace Modernisation Strategy can be found here <u>www.caa.co.uk</u>

CAP1616 (the regulatory process for airspace change that we are required to follow) can be found here <u>www.caa.co.uk</u>

If you did not attend our earlier discussion sessions in June, please let us know and we will send you copies of the materials presented for your information.



London Stansted Airport Future Airspace Arrivals feedback

Arrvials route options survey

* Required

Welcome

We are very grateful to you for completing this feedback survey!

1

What is your name? *

2

What organisation are you representing? *

Please add N/A if this is not applicable

Stage 2 process



3

Based on the information we shared at the workshop and the materials we have provided, is the process we have followed to identify route options clear and logical? *

\bigcirc	Yes	
\bigcirc	No	

4

5

Is it clear how feedback from our earlier stakeholder discussion sessions in June have influenced the development of the route options? *

◯ Yes

🔿 No

🔘 Don't know

6

Route options envelope for Arrivals



7

Have we clearly explained how the route options for arrivals have been developed? $\,\,^{\ast}$

🔵 Yes

🔘 No

8

9

Are there any improvements you think we should consider to the route options shown? *

◯ Yes

🔘 No

10

Please explain your answer *

11

Is it clear that we have taken account of the design principles in developing the route options? *

🔵 Yes

🔵 No

12

Please explain your answer *

14

Are there any further options that could deliver additional benefits that you feel we haven't included? *

O Yes

🔵 No

15

Please explain your answer *

16

Aside from those already mentioned, are there any additional local factors we should be aware of when evaluating these route options? *

🔵 Yes

🔵 No

Please explain your answer *

18

Do you have any further feedback on the initial route options presented? *

Applying the noise 2 design principle



19

Is it clear how each of these three scenarios could deliver respite or relief? *

🔘 Yes

🔵 No

20

21

Do you have a preferred option?

Option 1

Option 2

Option 3

22

Which do you think best aligns with our design principles?

- Option 1
- Option 2
- Option 3



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