

Solving the CPIER growth puzzle

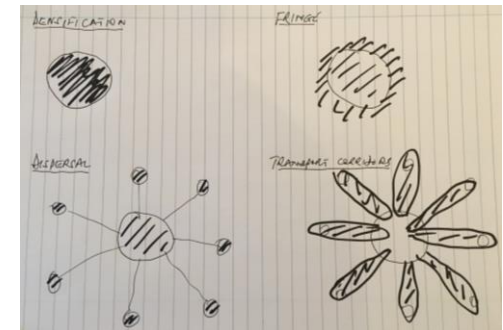
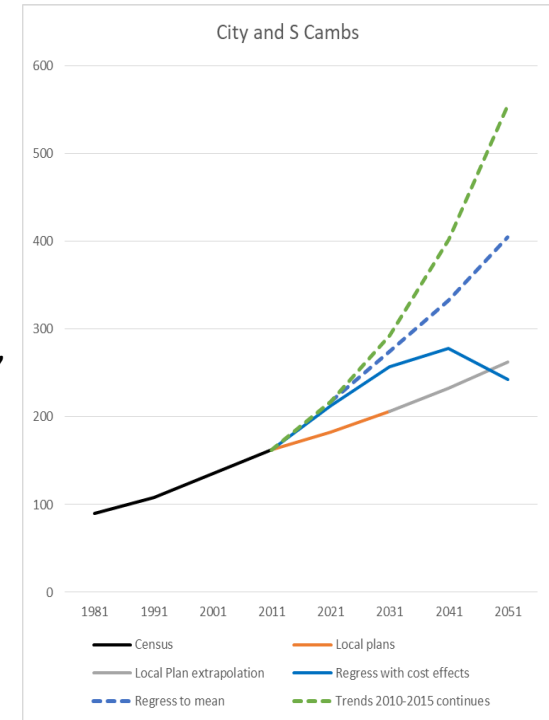
How to accommodate sustained high growth
while keeping Cambridge special?

A suggestive outline sketch

Cambridge Ahead Growth Project/CF3 to 2051 Presentation
to Cambridge City/South Cambs Leaders
on Local Plan
February 2020

CPIER spatial scenarios - background

- Previous work looked at where we are now and how we got here
 - ONS and EEFM employment growth rates vs Cambridge Ahead data
 - Despite high rates of housing growth, employment growth higher than thought
 - Technology agglomeration adding to pressures
 - Housing and infrastructure deficit widening annually: house prices, rents, occupancy, congestion and wages under growing pressure
- Projected forward, risk of Cambridge growth stalling in 2020's
- Pure spatial/infrastructure options to sustain future growth reviewed
 - Densification
 - Fringe development
 - Dispersal
 - Transport corridors
- Wide range of public presentations in last 12 months
- Feedback that environmental/quality of life measures needed to be added

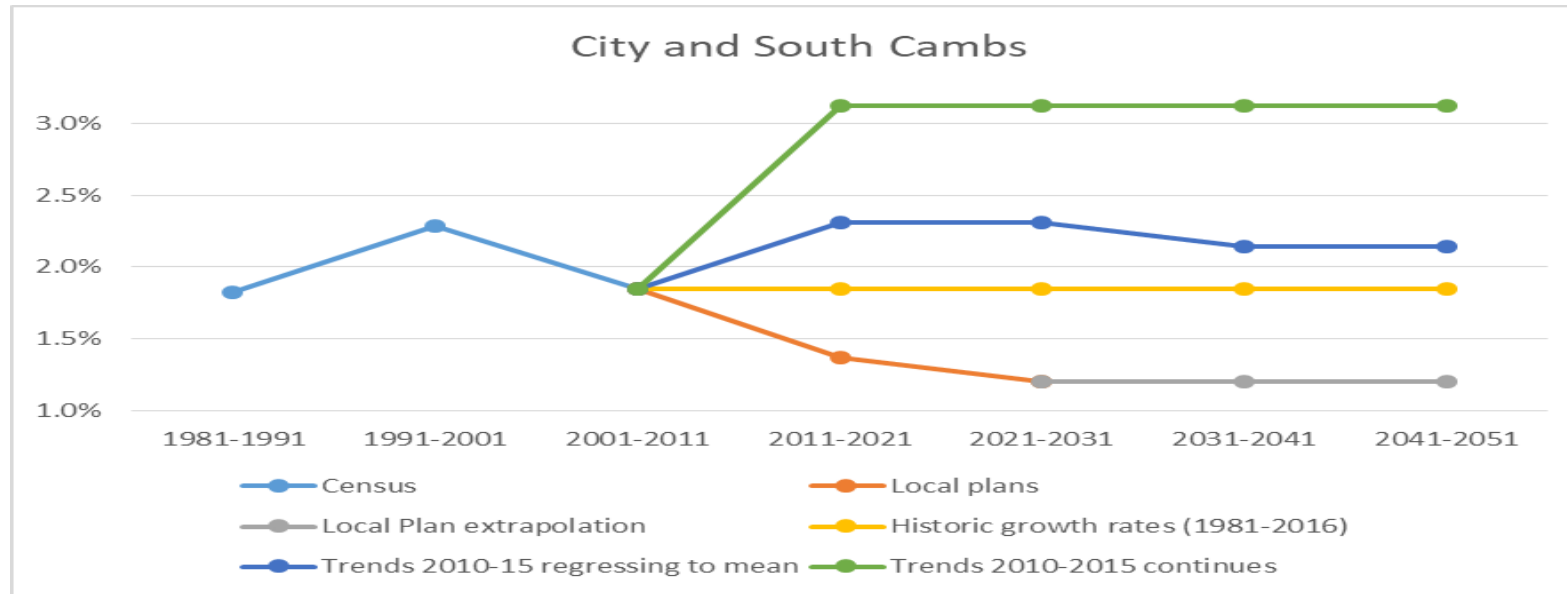


CPIER Recommendation: a blended spatial strategy

- “Looking at this in the round, some densification, particularly in Cambridge, is needed, though this should happen away from the historic centre, and more on the edges, as and where new development sites come forward. There should be some scope for expanding development around the city boundary, but intelligently planned transport links will be needed to avoid a worsening of congestion. In Cambridge specifically, though there are limitations to the growth of the city in other directions, the east side of the city offers significant scope for housing and commercial development. Such development would have the advantage of being close to the principal centres of employment and the existing rail infrastructure whilst opening up opportunities for new transport links to connect the main centres of employment more effectively. Most significantly, it includes land which has previously been safeguarded for development, and is within the boundaries of the existing urban area so would provide opportunities in line with the existing spatial strategy.” Page 42, CPIER.
- A range of possible blended options: proposing one coherent solution, amongst others, to be considered in the democratic process

CPIER employment growth rate assumptions

- The projection we used in the CPIER scenarios is the blue line named *Higher Growth*, based on evidence of high recent growth seen in the last 6 years, dropping back to closer to the longer term trend by 2031.
- The green line shows recent high employment growth rates continuing unchanged to 2051; the yellow which shows ONS historic trends; the orange/grey line shows extended EEFM projection
- Previous plan forecasts have been wide of mark; we propose using the “blue line” again, supported by annual updates of data



Last CPIER data supports higher trajectory

- Last combined CBR/ONS employment growth data 2017/18 shows growth in GCP of ~3% pa

		Annual growth rates 2017/18															
		CBR Estimates								BRES estimates							
Employment in Cambridge & S Cambs		1yr	1yr	1yr	1yr	1yr	1yr	3yrs	6yrs	1yr	1yr	1yr	1yr	1yr	1yr	3yrs	6yrs
		12-13	13-14	14-15	15-16	16-17	17-18	15-18	12-18	12-13	13-14	14-15	15-16	16-17	17-18	15-18	12-18
Overall growth rate - CBR data																	
Using CBR weights		4.3%	5.7%	5.2%	6.2%	7.0%	6.2%	6.4%	5.6%	0.3%	5.7%	8.1%	3.3%	2.2%	5.2%	3.3%	3.8%
Using BRES/CBR combined weights		4.9%	5.6%	7.1%	10.6%	8.6%	6.5%	8.2%	6.8%	0.3%	2.5%	7.9%	1.4%	2.8%	3.5%	2.4%	2.6%
Overall growth rate - CBR/BRES data*																	
Using CBR weights		0.5%	6.7%	6.2%	2.3%	4.2%	5.1%	3.8%	4.0%								
Using BRES/CBR combined weights		0.1%	5.2%	6.9%	1.2%	3.8%	4.1%	2.9%	3.2%								

* Using CBR growth for first ten (commercial and non-corporate research) sectors and BRES growth for remaining ten (public and other) sectors

- Latest BRES 2018/19 data suggests 3.1% growth in Cambridge City, but negative growth of -1.3% in South Cambs and -2.1% in East Cambs; CBR discussions ongoing with ONS

Implications of “blue line” employment

Workplace employment population (000)	2011	2031	2051	2051	2051	2051	2051
	Census Workplace Population (excl. full time students)	Assumptions implied in existing Local Plans	Extrapolation of existing Local Plan Trends	Densification	Fringe Development	Dispersal	Transport corridors
Cambridge	89	111	138	263	125	125	148
S Cambs	73	95	124	110	247	110	152
E Cambs	31	37	44	40	40	123	85
Hunts	76	87	100	94	94	179	126
Greater Cambridge Partnership Area	162	206	262	372	372	234	301
All four local authorities above	268	330	406	506	506	535	513
GCGP Combined Authority	405	491	597	791	791	791	753
GCGP LEP	758	904	1072	1266	1266	1266	1266

Local Plans expected 206K employment by 2031
 CBR/BRES estimated 197k already employed by 2017

A wide range of alternative growth possibilities for 2051, depending on spatial spread given the same total in Combined Authority

Housing implications of “blue line” employment

Total dwelling units (000)	2011	2031	2051	2051	2051	2051	2051
	Census Number of Dwellings	Existing Local Plans	Extrapolation of existing Local Plan Trends	Densification	Fringe Development	Dispersal	Transport corridors
Cambridge	49	63	81	126	81	81	91
S Cambs	62	81	107	107	207	107	128
E Cambs	36	47	61	61	61	111	122
Hunts	71	87	107	107	117	157	119
Greater Cambridge Partnership Area	111	144	188	233	288	188	219
All four local authorities above	218	278	356	401	466	456	460
GCGP Combined Authority	337	429	548	623	698	698	698
GCGP LEP	688	864	1081	1156	1231	1231	1231

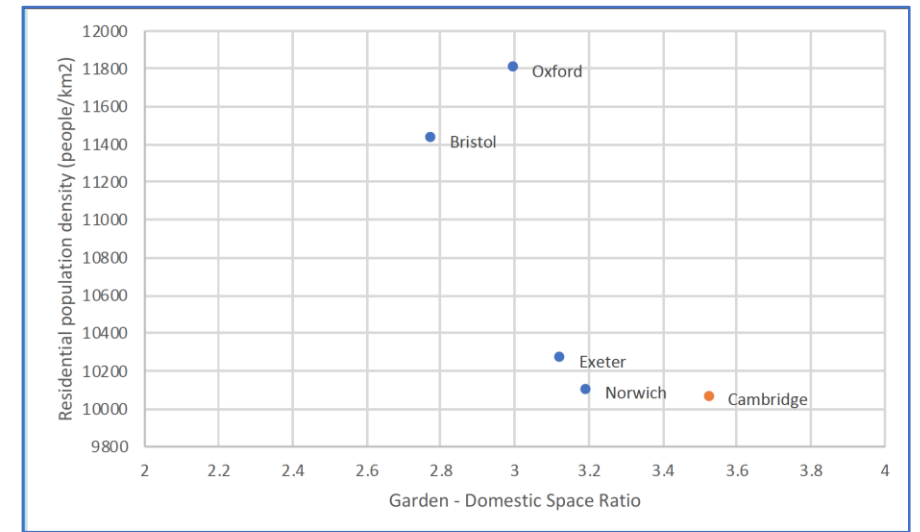
A range of housing requirements depending on Employment growth assumptions

Parameters

- Continuing employment growth, following the “blue line” projection
- Tech agglomeration adding to congestion and cost pressures
- Housing and infrastructure deficit still to be addressed, despite good progress recently

- Low average density of existing city development relative to cities of a similar size
- Conservation of the historic centre
- Large green belt, with strong historic support
- Space to grow beyond the green belt

- Highly articulate older householders
- Rising population of younger renters



Objectives

- Avoid the “doomsday” scenario of “overheating” and going ex-growth in mid 2020’s
- Employment site led shape of growth in the city region
- Create progressively expandable employment sites that can adapt flexibly
- Housing capacity for growth, coordinated with employment sites, and with the capacity to connect to the emerging 5G networks
- Mixture of high and low urban densities, consistent with Letwin Review recommendations, to include a diverse type, size and tenure mix of houses
- Efficient linkages to neighbouring cities and towns
- Protect historic centre
- Plans for expansion of green spaces that people can positively enjoy
- Contribution to enhanced biodiversity and climate change mitigation

A blend of 3 elements

1. **Densification**

2. **Transport Corridors**

3. **Green Infrastructure**

- An outline sketch of the spatial lay out for the city region, not a plan
- Does not attempt to paint in all the details or sites
- Does give a range of outcomes that will accommodate the anticipated growth and improve the quality of life and environment of its citizens

1. Densification

- Based on transport nodes
- Greater densities and heights
- Careful master planning and management of sight lines and site infrastructure
- Careful mixture of commercial, research, retail and residential development and green spaces



King's Cross in numbers

67 acres
50 new buildings
1,900 new homes
20 new streets
10 new public parks and squares
26 acres of open space
30,000 people by 2016



What does 20,000 jobs look like in Cambridge? - the Biomedical Campus



2019:	17,250
Expected	
by 2020	21,000
by 2021	23,000
by 2031	30,000
by 2041	38-40,000

(Source: Cambridge University Health Partners)

Cambridge South station
and Cam Metro links

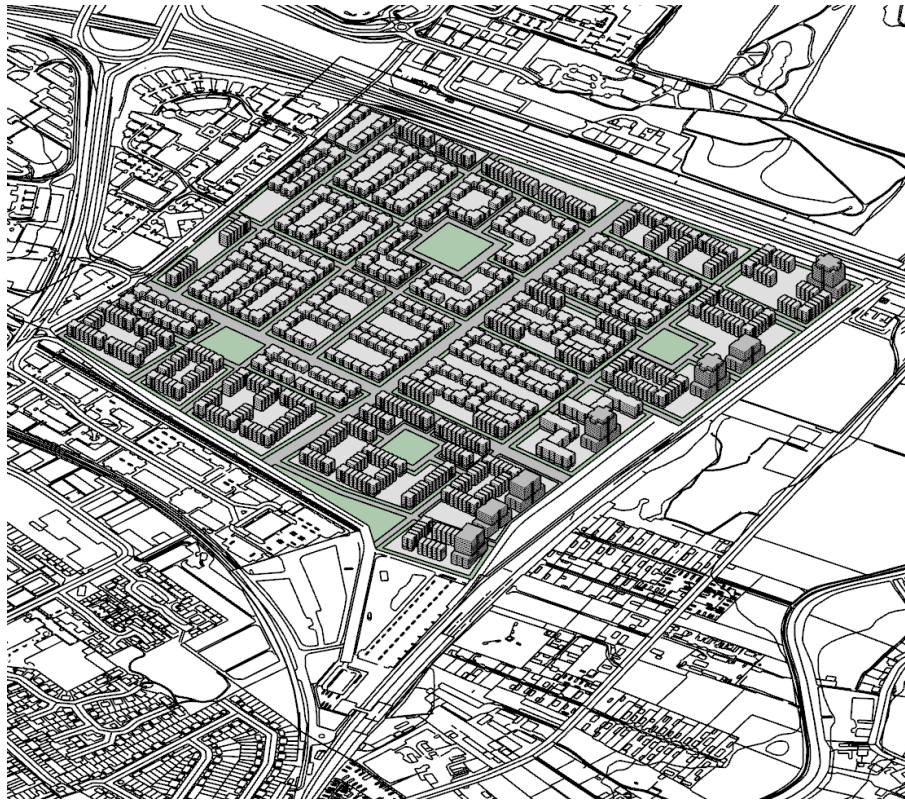
To reach 40,000 will
require redevelopment of
Addenbrooke's Hospital

Densification – CB1/Station Road



- Currently 400,000 sq ft, for 3,500 employees and 350 dwellings and 1,000 student rooms
- Rising to 4,500 employees when current plans fully built out
- Wider area CBD with higher total density of 10,000?

Example: densification ranges considered in the CPIER modelling work at the Cambridge North East Site



The CPIER 'Transport Corridors' scenario:
14,300 new jobs and
7,000 new dwellings
by 2051

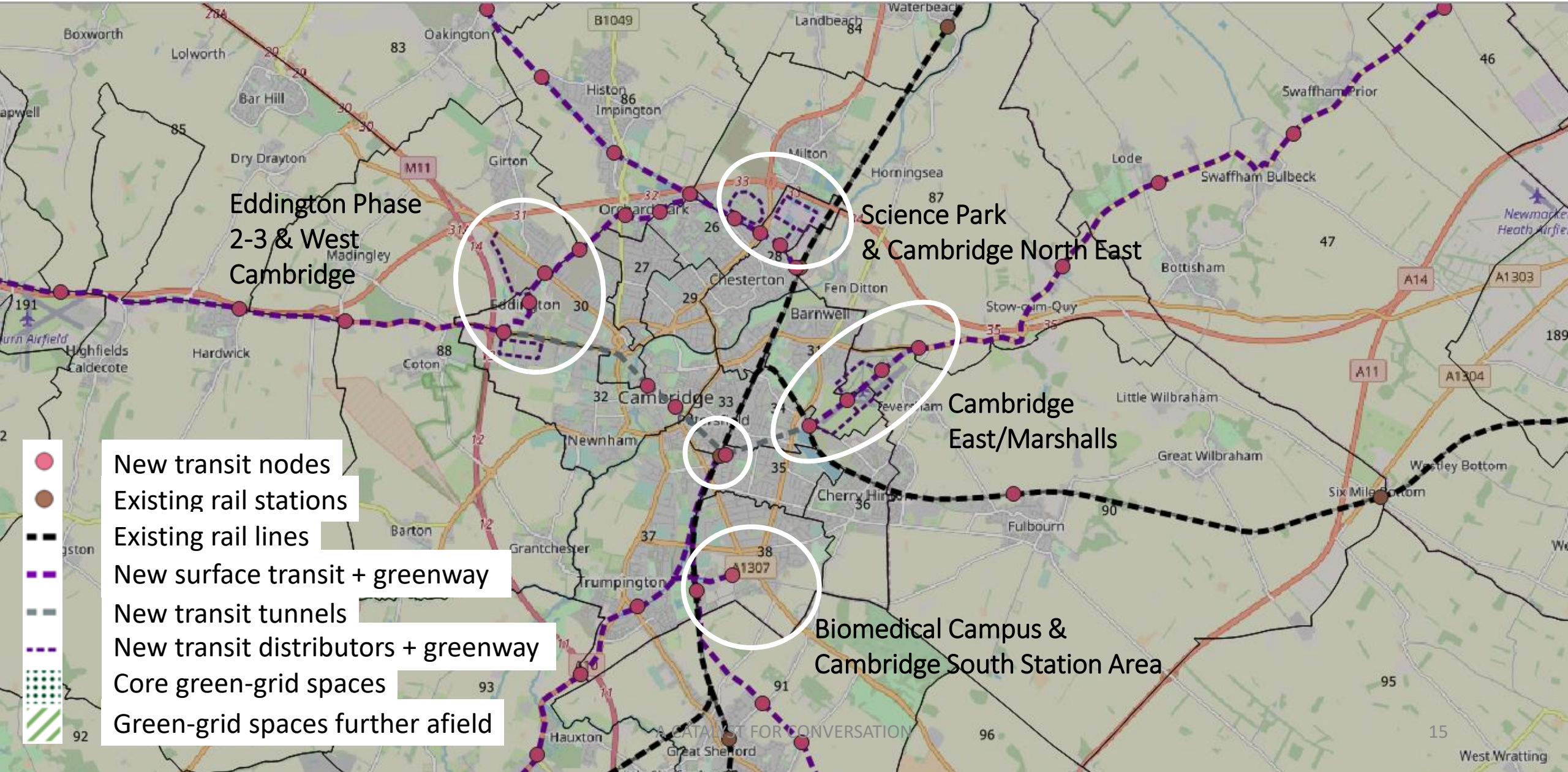


The CPIER 'Densification' scenario:
55,800 new jobs and
19,000 new dwellings
by 2051

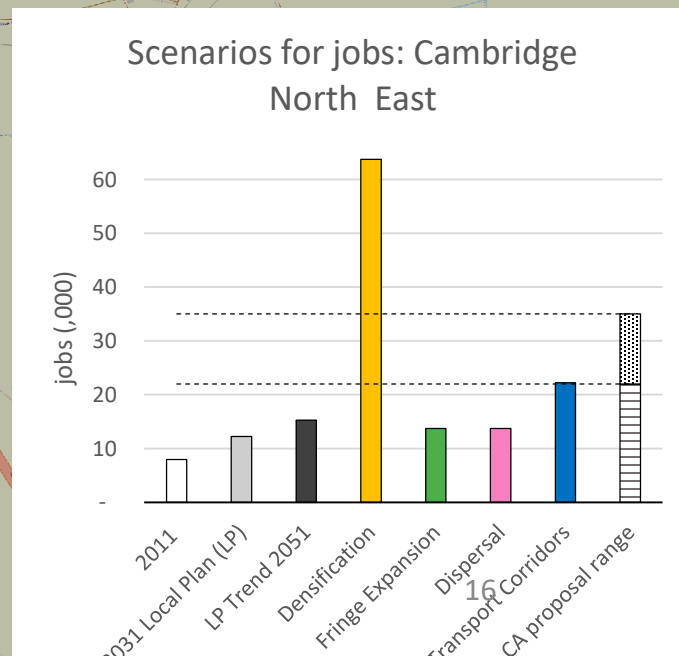
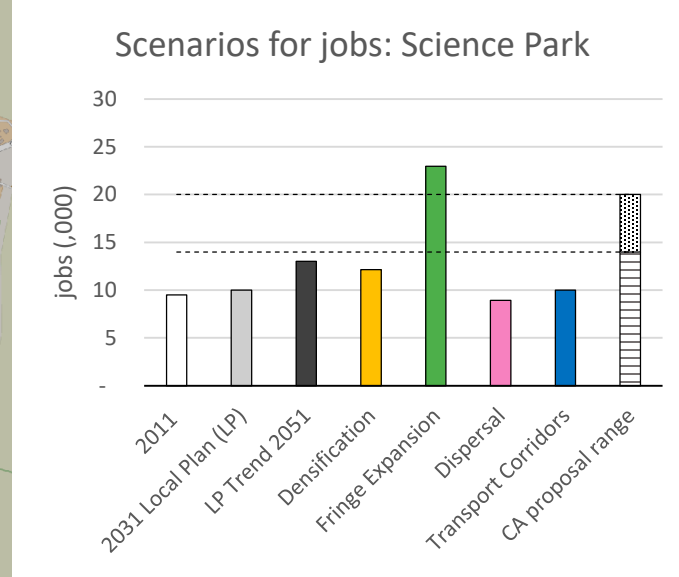
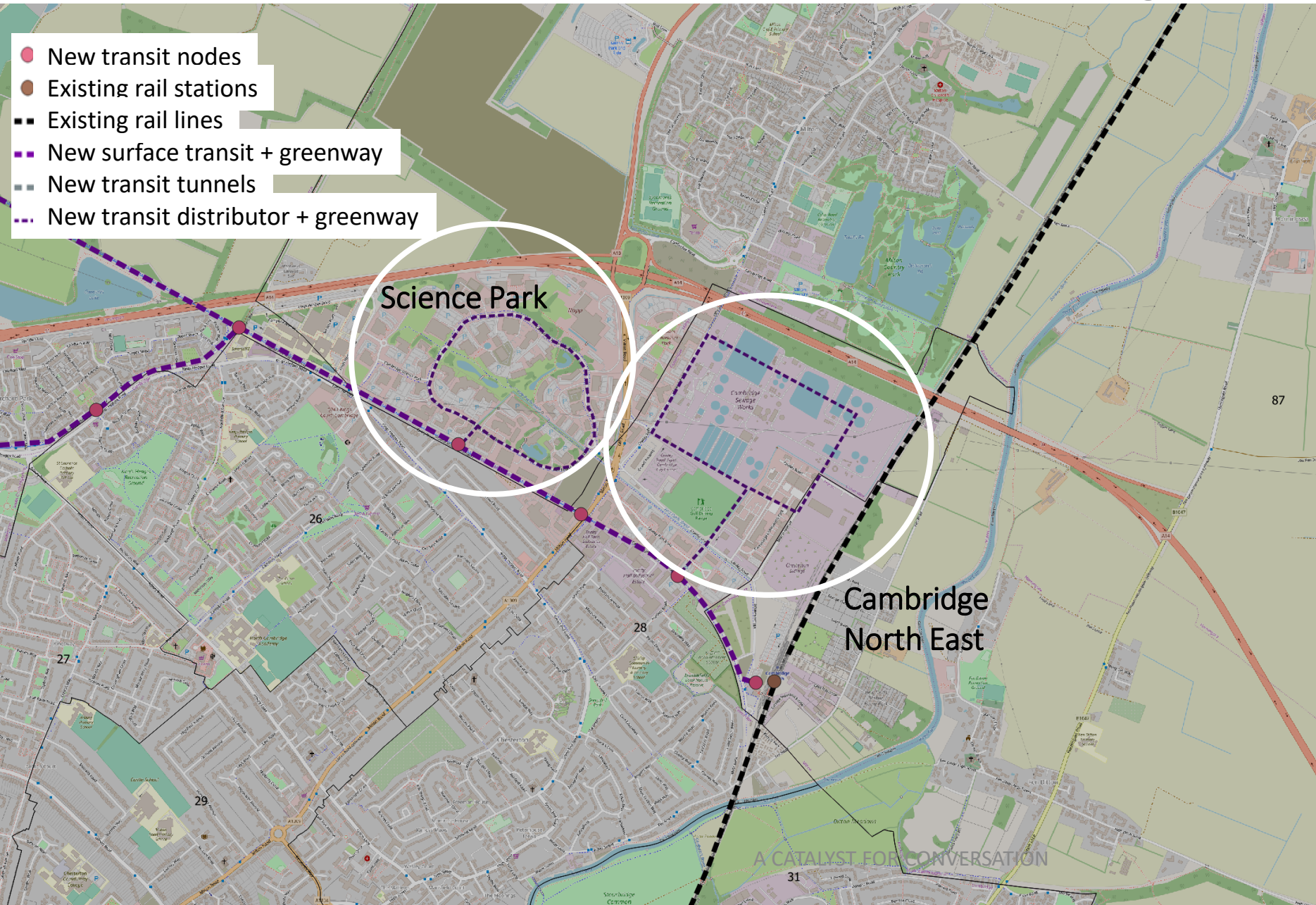
A CATALYST FOR CONVERSATION

A wide range of options were tested in the model: from a more modest plan under the 'Transport Corridors' scenario (far left) to a mini Canary Wharf under 'Densification' (left)

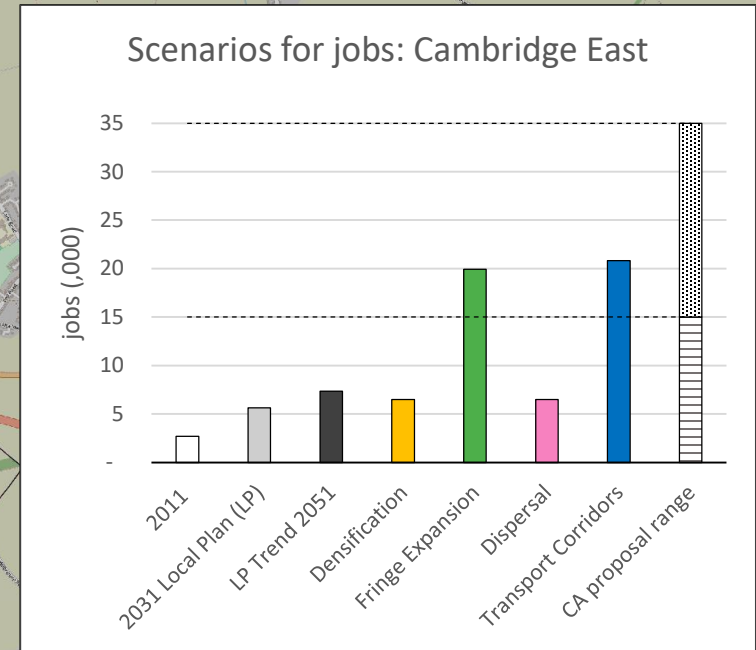
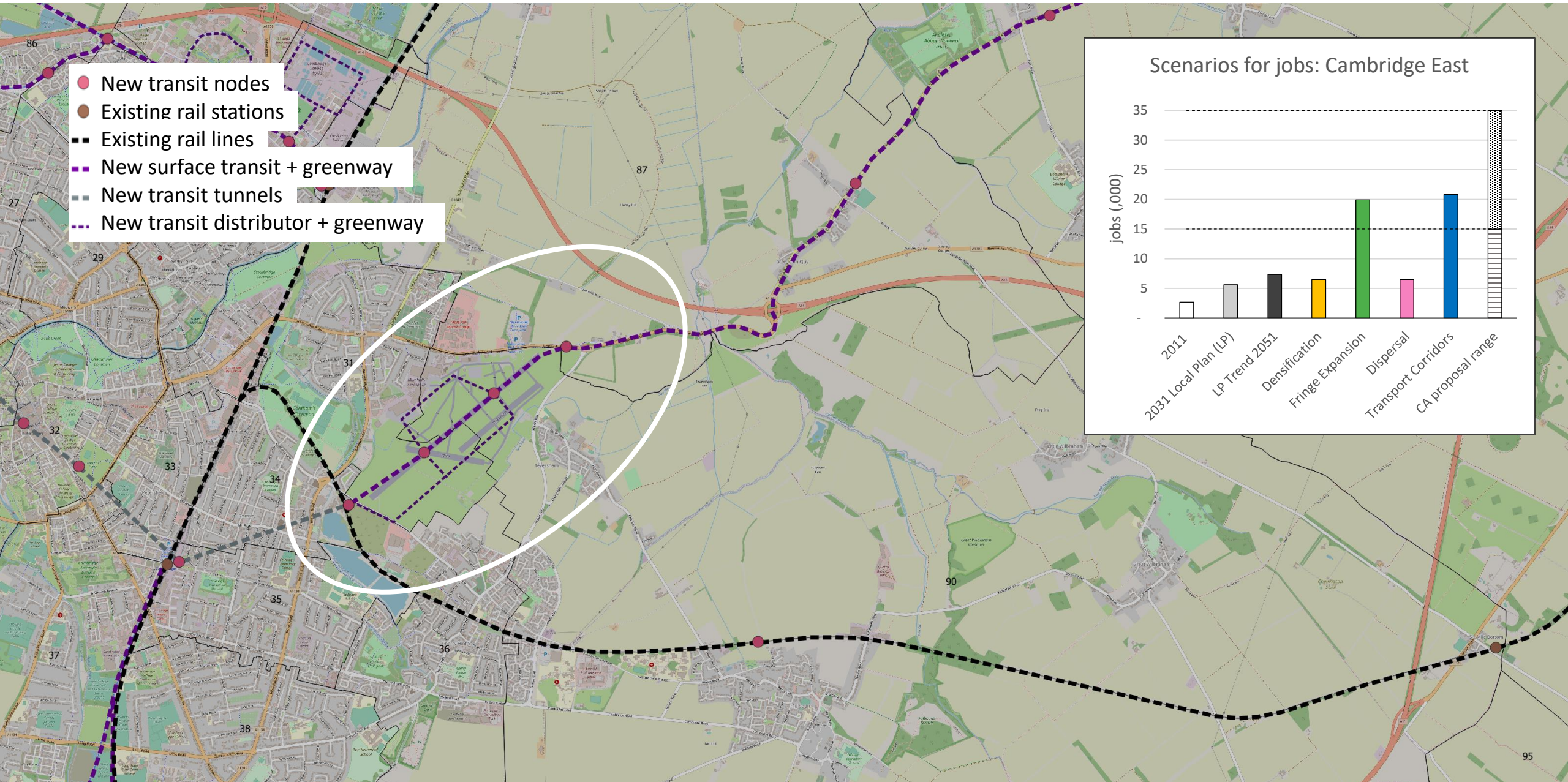
Densification - Key sites in Cambridge on transport nodes



Densification - Science Park and Cambridge North East

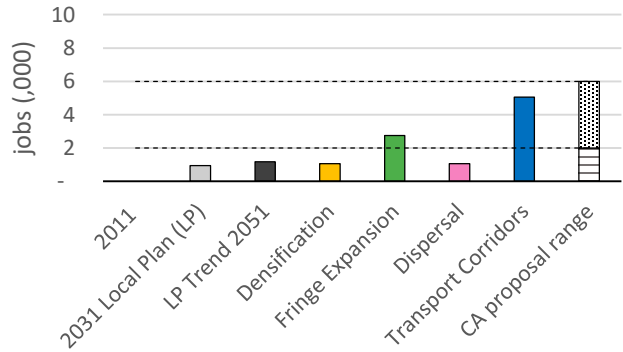


Densification - Cambridge East/Marshall's Airfield site

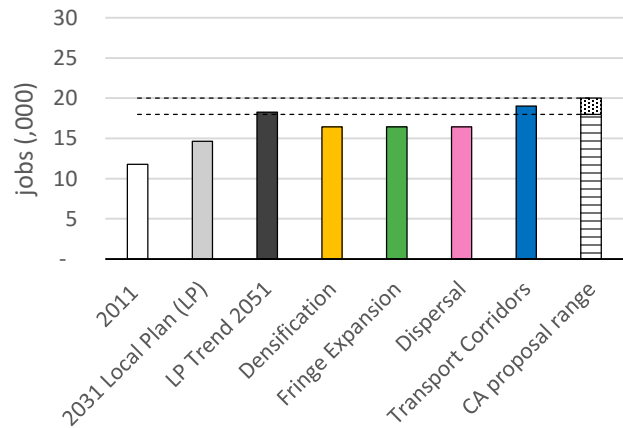


Densification – Eddington and West Cambridge

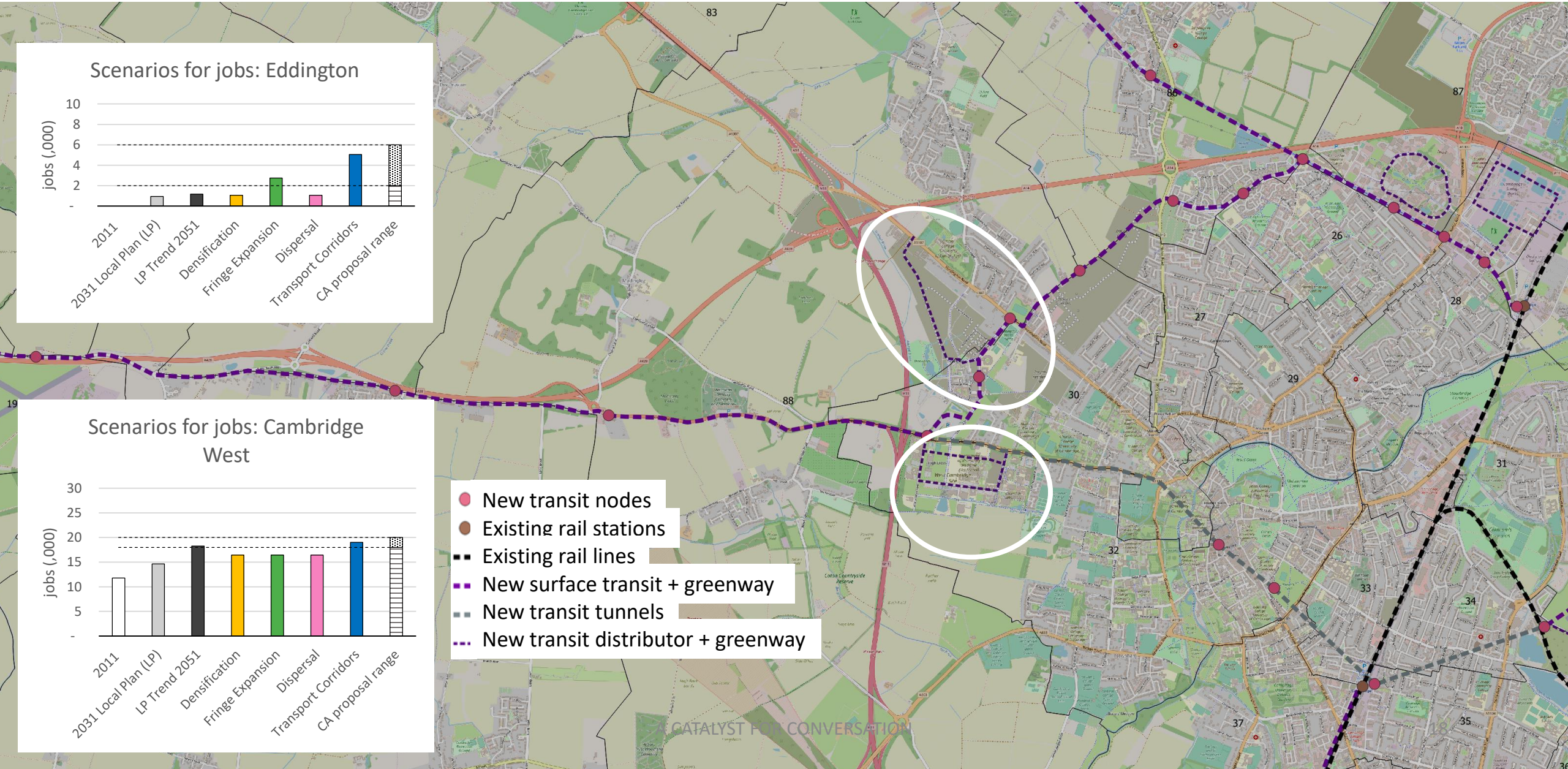
Scenarios for jobs: Eddington



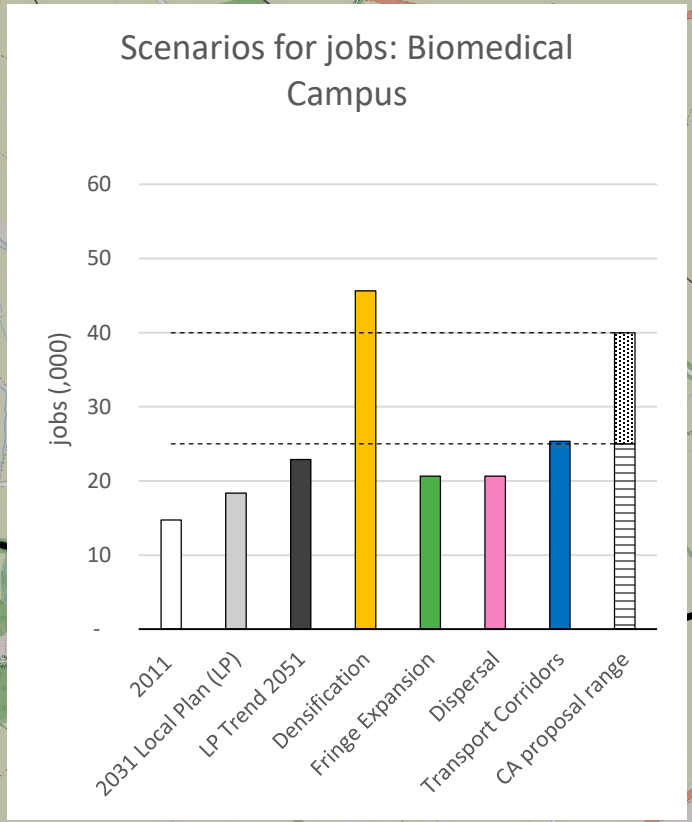
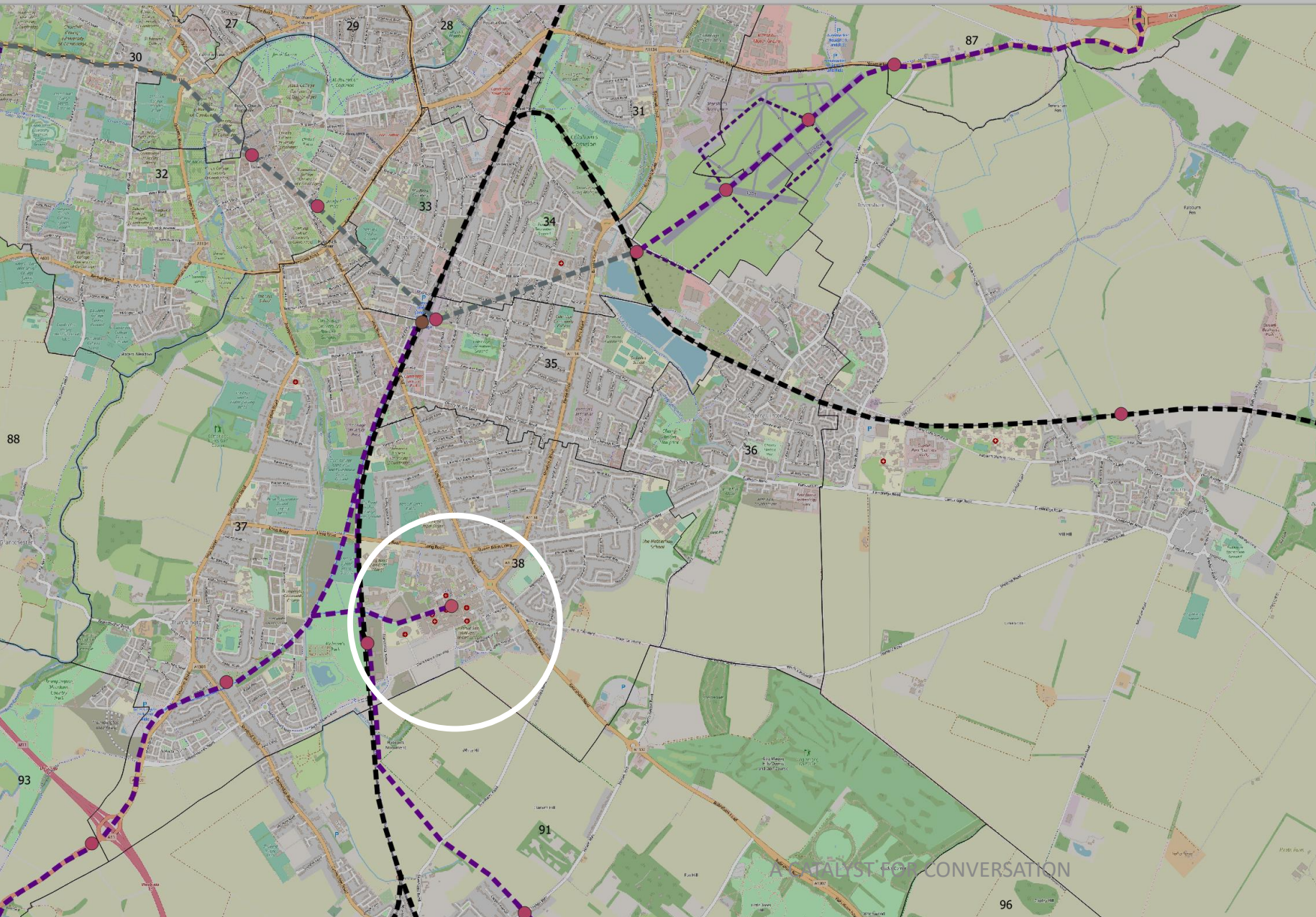
Scenarios for jobs: Cambridge West



- New transit nodes
- Existing rail stations
- Existing rail lines
- New surface transit + greenway
- New transit tunnels
- New transit distributor + greenway



Densification - Biomedical Campus



- New transit nodes
- Existing rail stations
- - - Existing rail lines
- - - New surface transit + greenway
- - - New transit tunnels
- - - New transit distributor + greenway

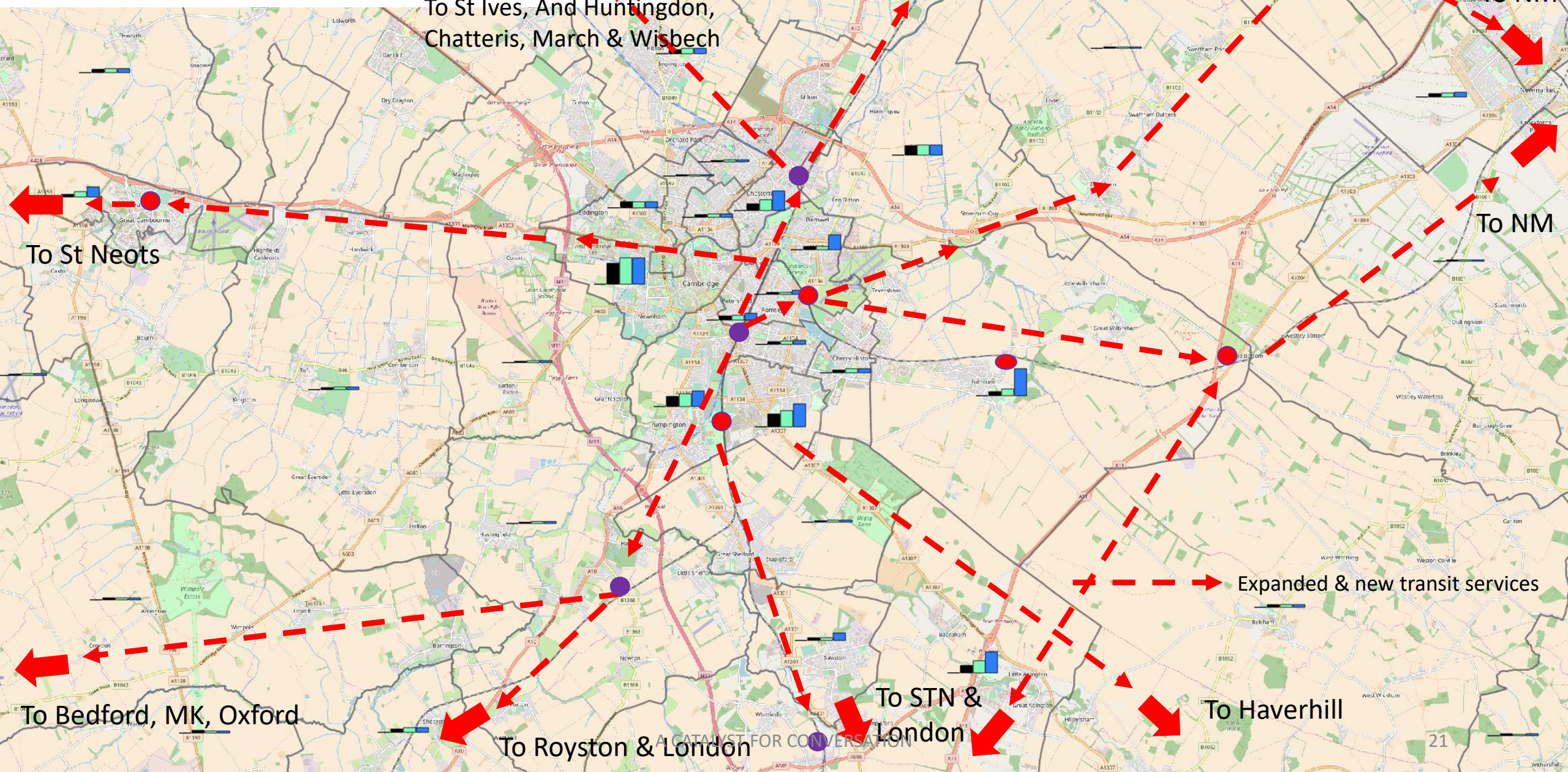
2. Transport corridors



- High capacity fast transit creating channels through green belt for extending agglomeration/clusters
- Key elements of concept is that jobs grow out along existing and planned transit corridors
- Housing disperses along the transport routes
- Reinforce existing and past routes for rail, CAM, buses, stations and junctions
- Enabling green and inclusive transport solutions in dense areas



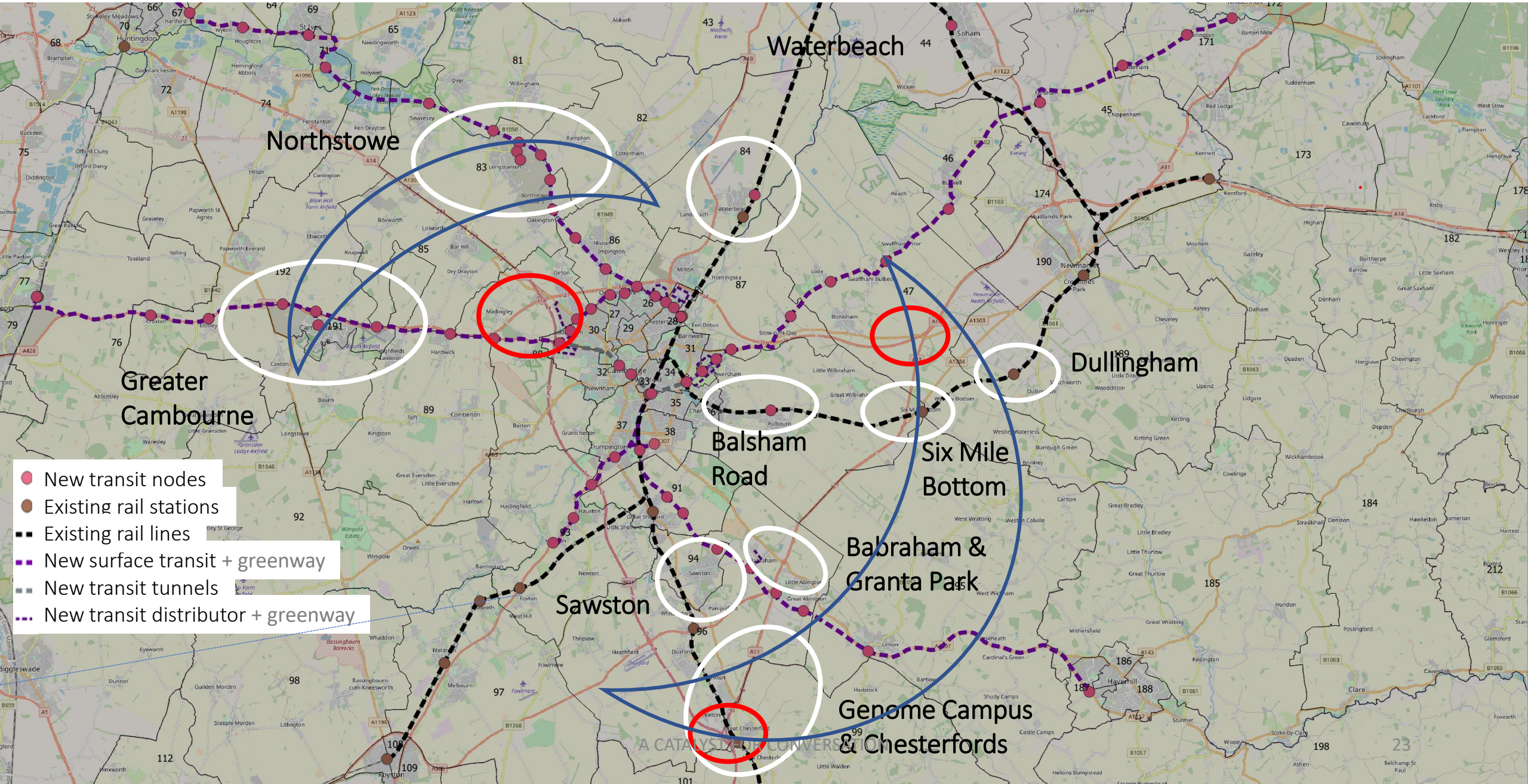
Cambridge's Existing Transport Corridors



Cambridge's Proposed Transport Corridors

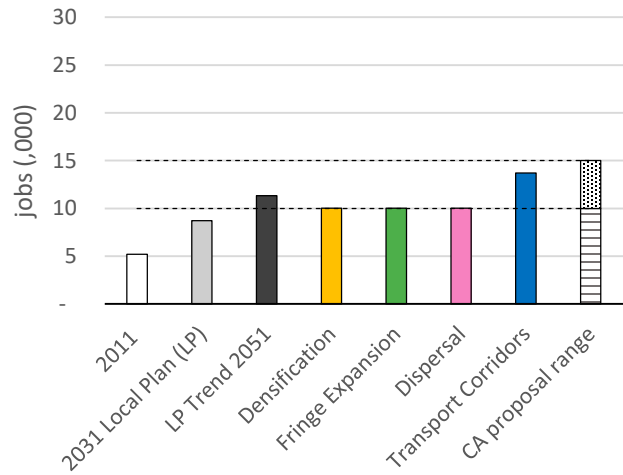
Employment spines	Related housing
Trinity Science Park/ NE Cambridge/A 10/Ely line	Waterbeach
Biomedical Campus/ Sanger/A 1301/Audley End line	Whittlesford, Sawston, Great Chesterford
Melbourn Science Park/ A 10/Royston line/East-West Railway	Foxton, Meldreth, Melbourn
ARM/Balsham Road/Newmarket line	Fulbourn, Six Mile Bottom
Babraham/Granta Park/ A 1307/CAM	Sawston, Pampisford, Linton
Marshalls/ Newmarket Road/CAM	Cambridge New East, Wing, Quy, Teversham
UoC West Cambridge/ A 14/Guided busway/CAM	Northstowe
UoC West Cambridge/ A 428/CAM	Cambourne
Sanger/ A11 Ridge	Six Mile Bottom, Great Chesterford
<u>New Stations</u>	<u>Multiway Junctions</u>
CAM transit stations	
Cambridge South	M 11/A 11 Junction 9
Cambridge East	A 11/A 14
Fulbourn	A 14/A428
Six Mile Bottom (+P&R)	

Transport corridors - key sites in Greater Cambridge

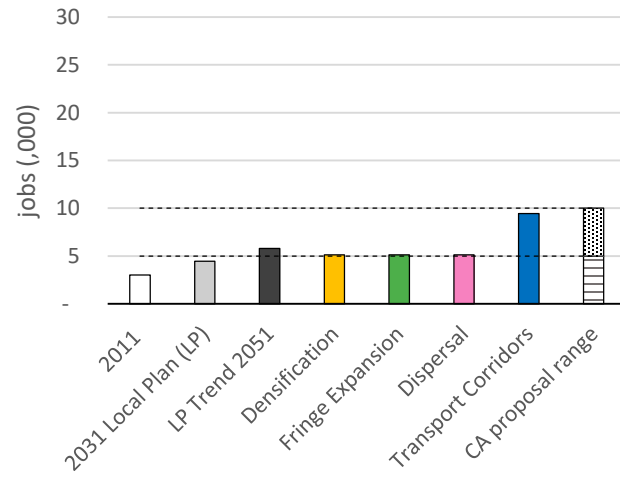


Transport corridors - Cambourne and Northstowe

Scenarios for jobs: Cambourne



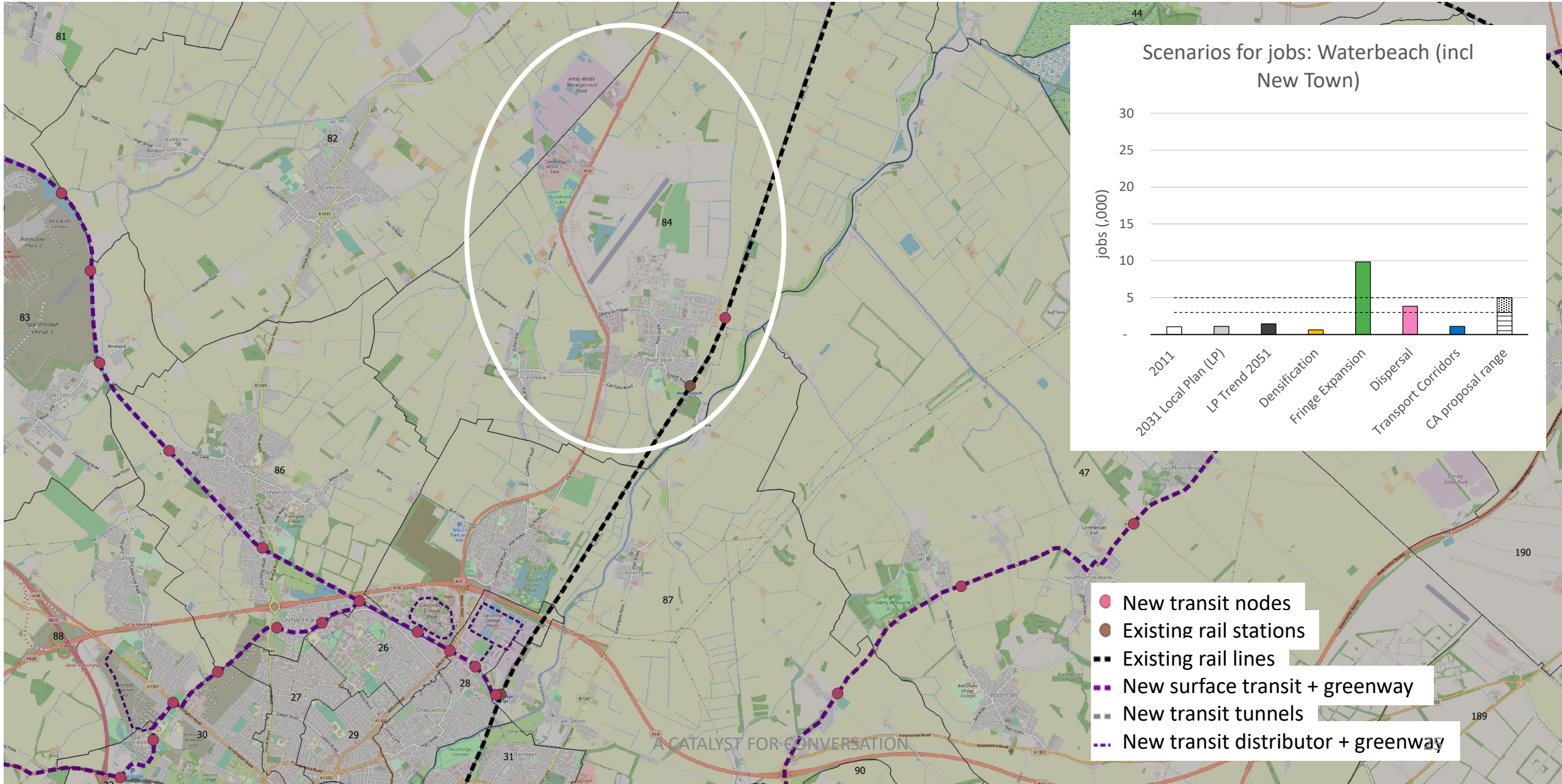
Scenarios for jobs: Northstowe



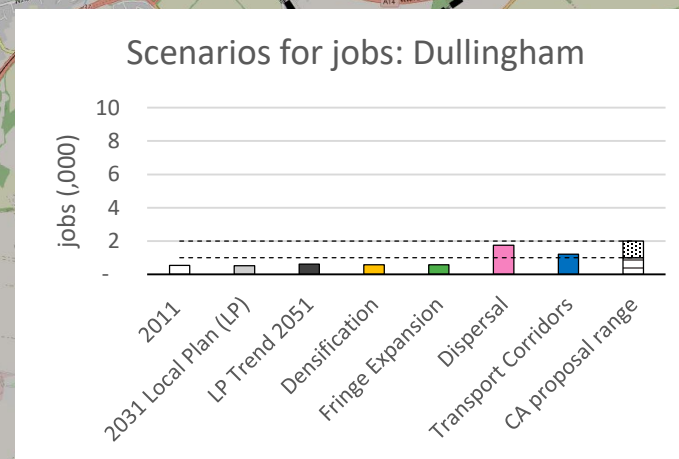
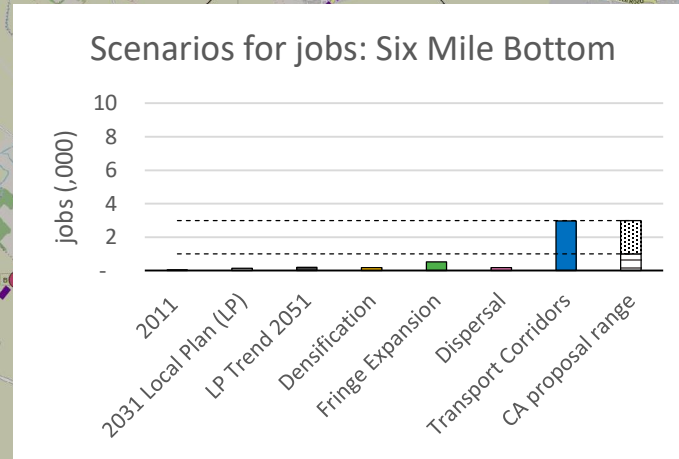
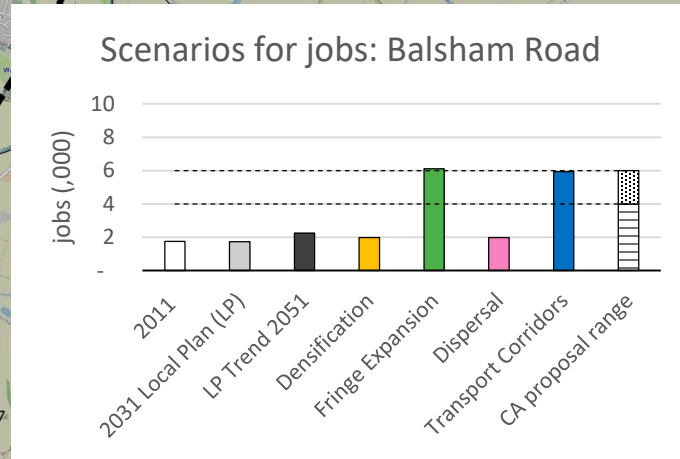
- New transit nodes
- Existing rail stations
- Existing rail lines
- New surface transit + greenway
- New transit tunnels
- New transit distributor + greenway



Transport Corridors - Waterbeach

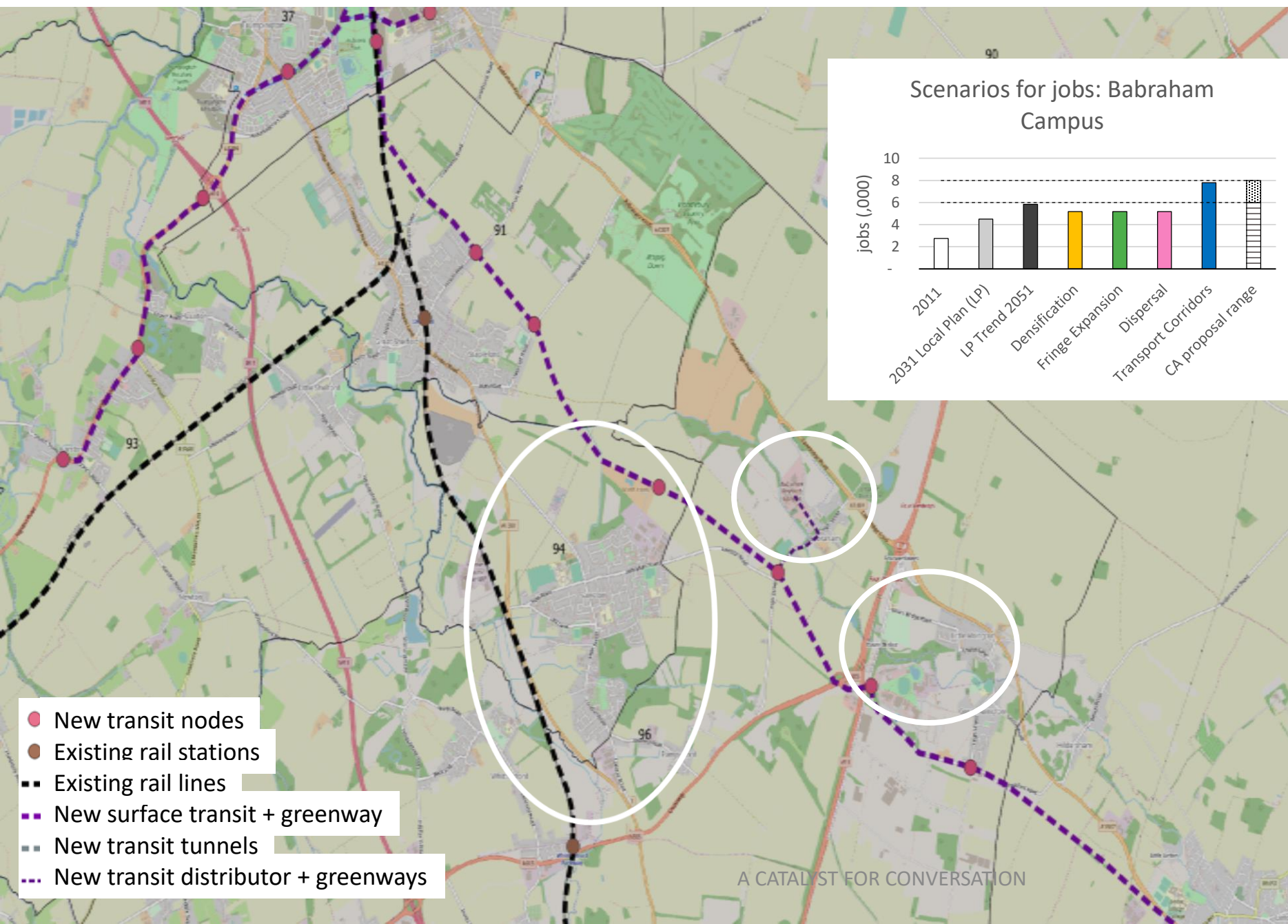


Transport Corridors - Balsham Road, Six Mile Bottom and Dullingham

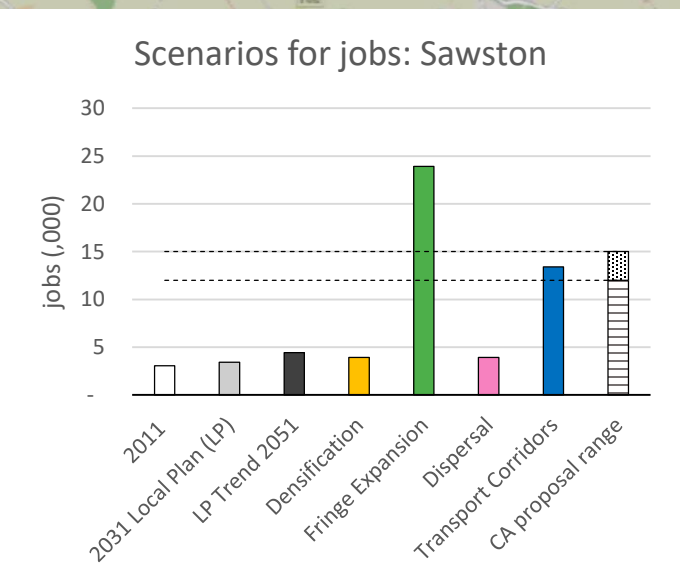
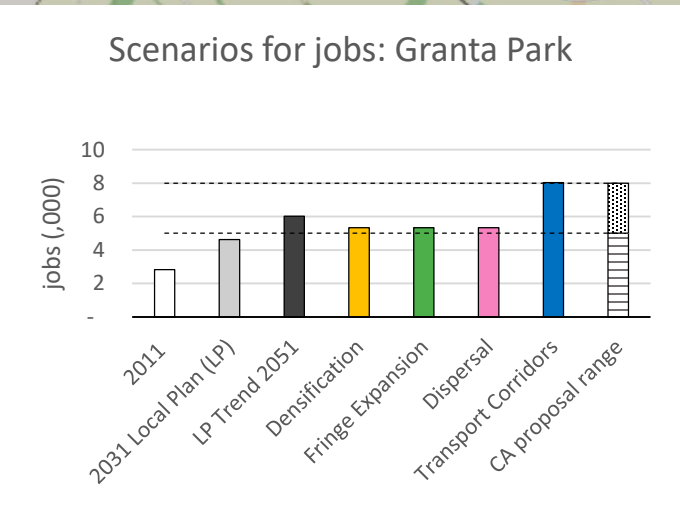
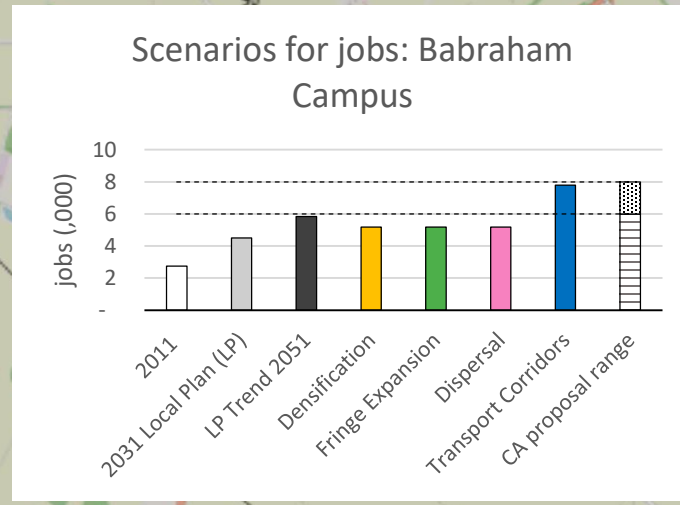


- New transit nodes
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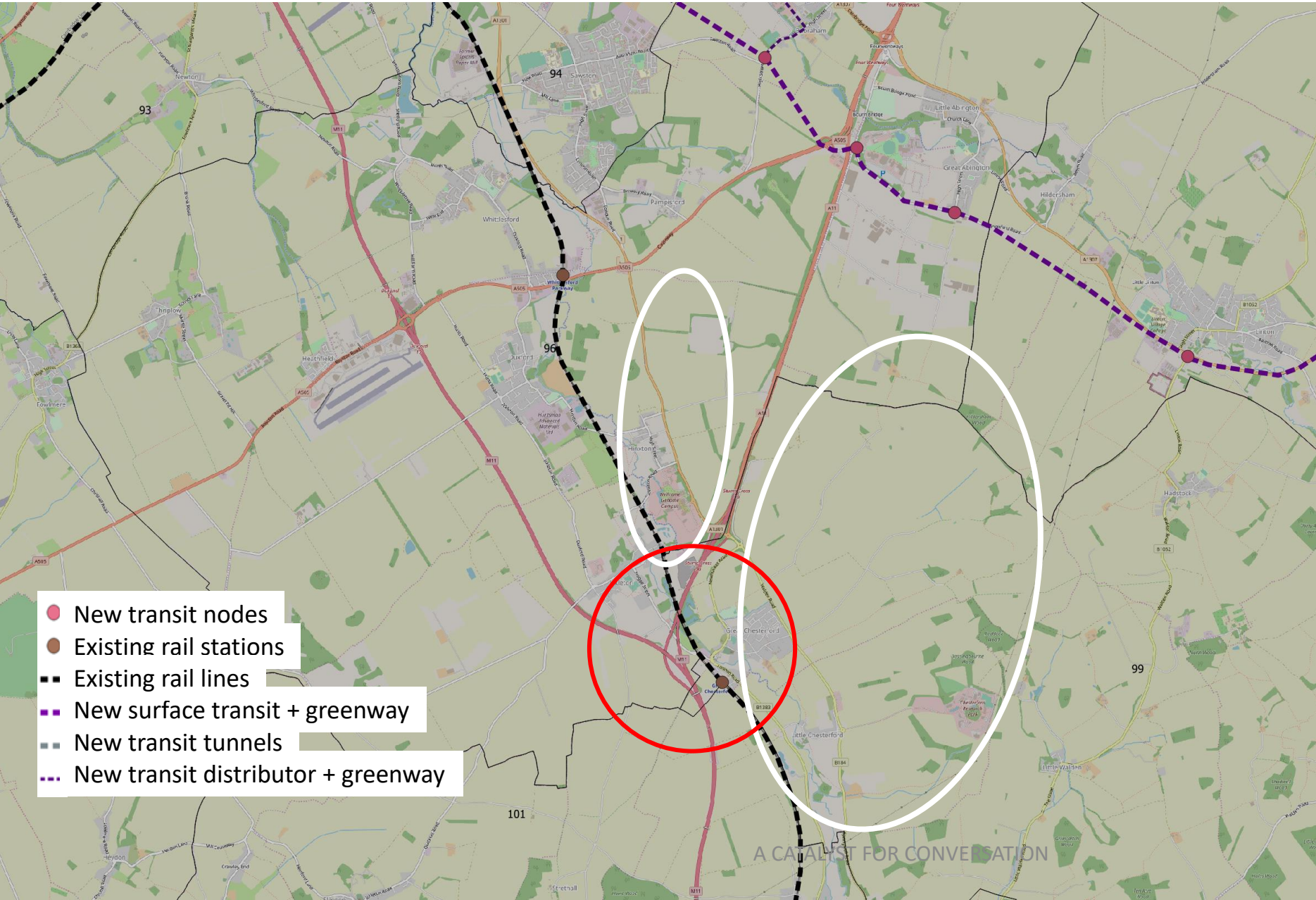
Transport Corridors - Babraham, Granta Park, and Sawston



- New transit nodes
- Existing rail stations
- Existing rail lines
- New surface transit + greenway
- New transit tunnels
- New transit distributor + greenways

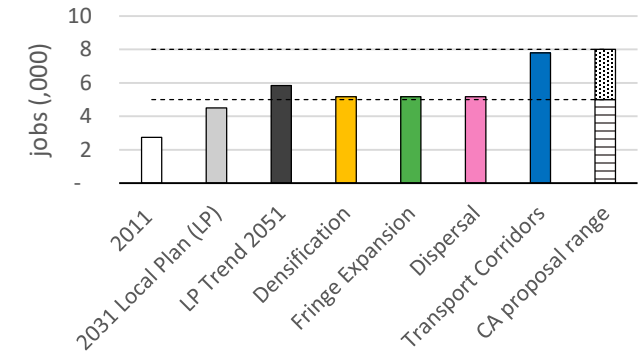


Transport Corridor - Genome Campus and Chesterfords

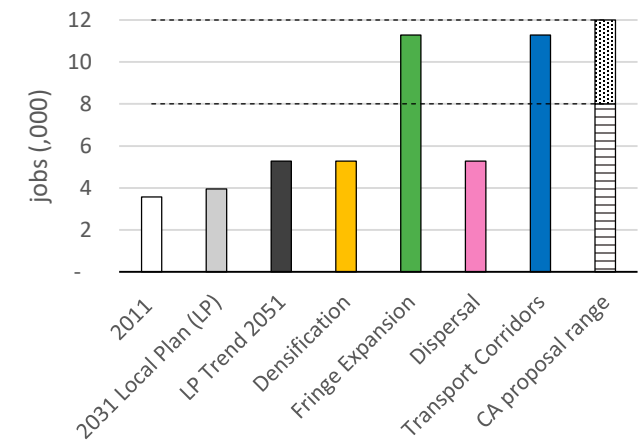


- New transit nodes
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Scenarios for jobs: Genome Campus

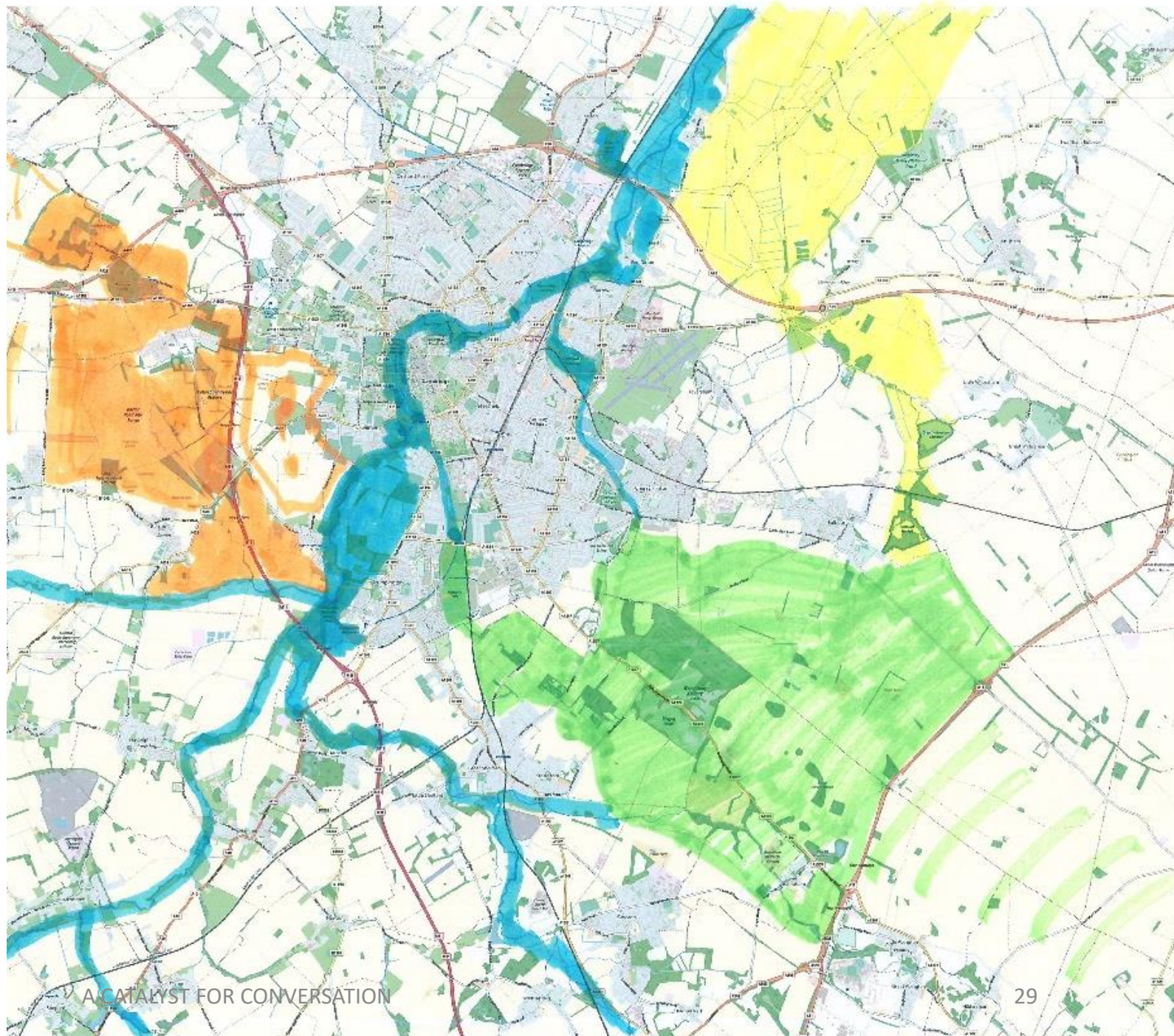


Scenarios for jobs: Chesterfords



3. Green Infrastructure

- An extensive spatial commitment to underpin Cambridge's special landscapes, quality of life and to achieve biodiversity and climate change goals
- Green Infrastructure of 4 new inter-connected wildlife parks, as proposed by CPPF, Wildlife Trusts and National Trust
- Green Belt maintained, but in new curated wildlife parks for the future city
 - Gog Magog Hills (Green)
 - Fulbourn and Wilbraham Fens, joining to Wicken Fen and Anglesey Abbey (Yellow)
 - Cam Valley (Blue)
 - West Cambridge Landscape: Quarter-to-Six-Quadrant (Orange)

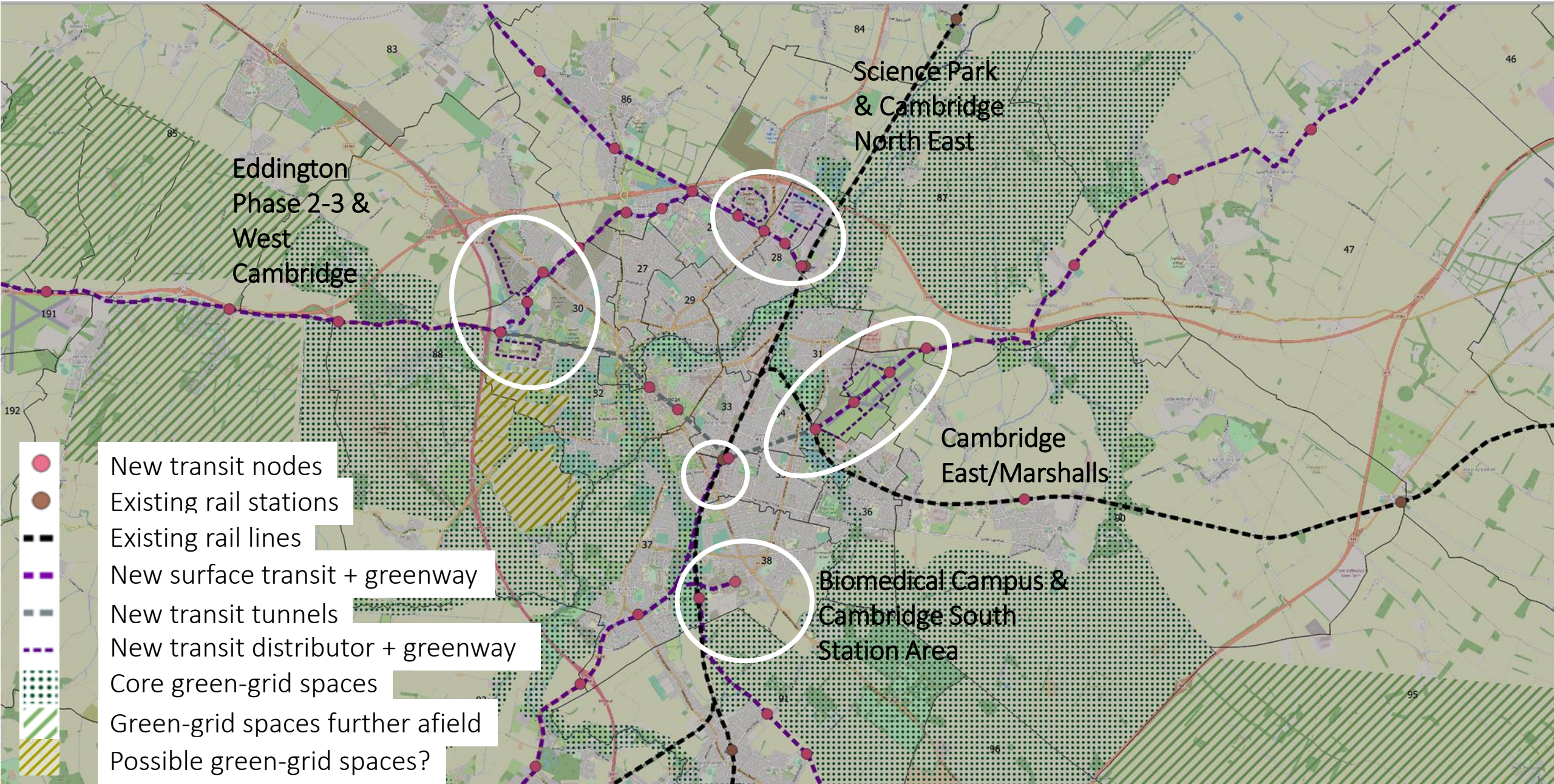


Green Infrastructure

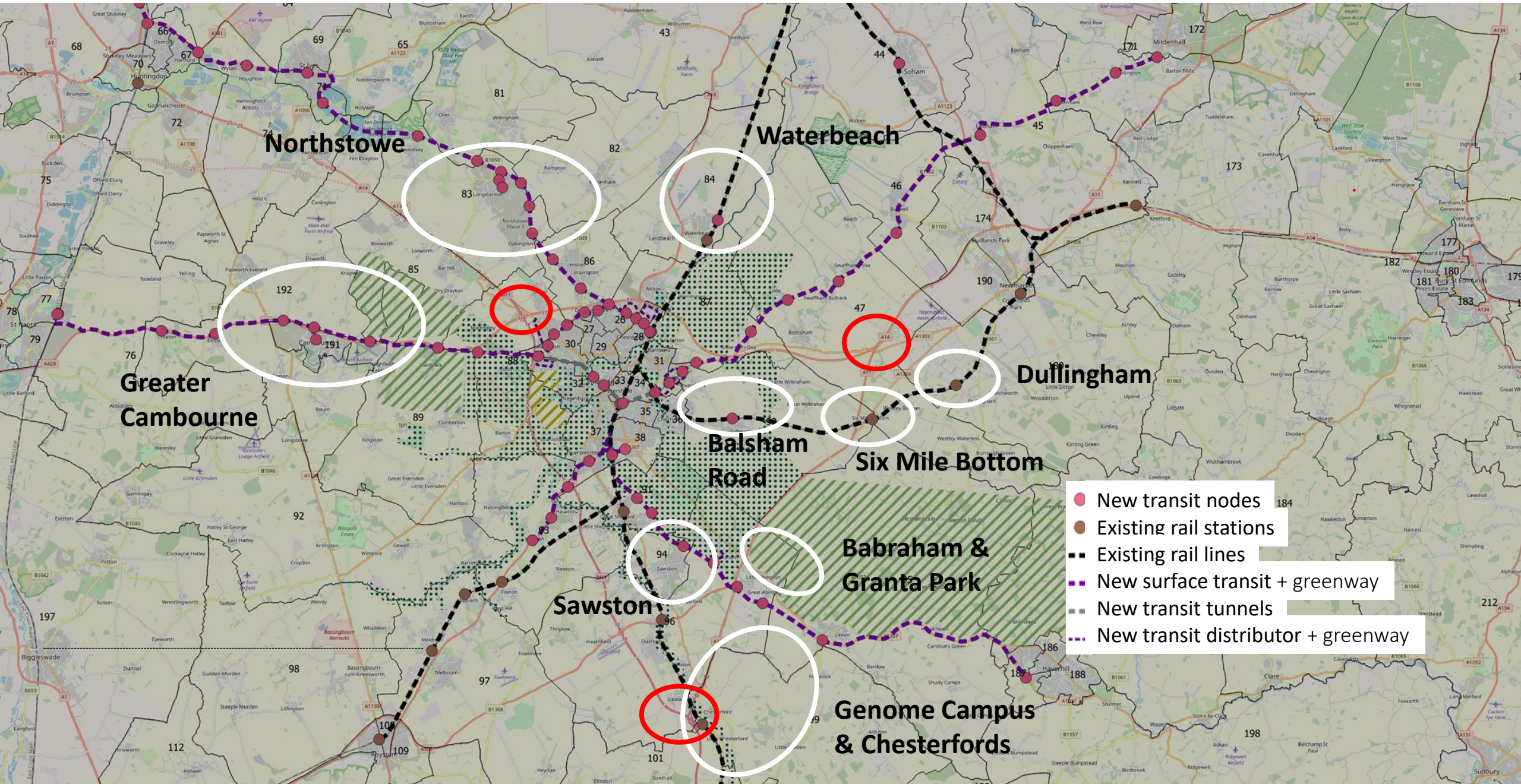
- Create a vision for future parks for the city
- Maintain spacious and low density feel of city, and progressively make positive use of Green Belt
- Direct contribution to biodiversity goals and indirectly to climate change mitigation
- Engage citizens and companies in these objectives
- Importance of sustainability - environmental and financial
- Key quality of life balance to Densification and Transport Corridors
- Remarkably, fits around Densification and Transport Corridor sites “like a glove”
- “Ride our luck!”
- Within reach of consensus about how our community can grow?



Green infrastructure – fit around key densified sites in Cambridge City



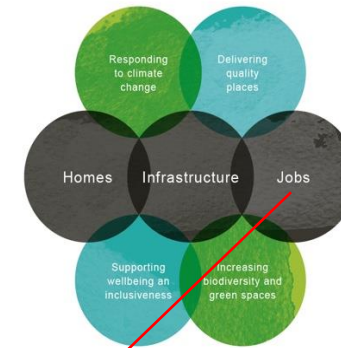
Green Infrastructure – fit around transport corridors in Greater Cambridge



Relating blended proposals to GCP Plan Priorities



Summary of estimated **jobs** in 2051 by site



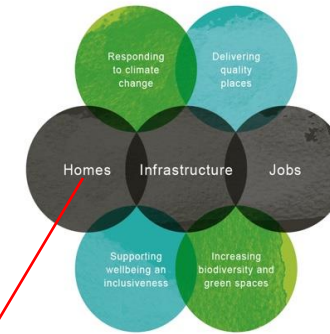
Jobs (,000)
(Defined as workplace employed population)

	2011 Census	2031 Local Plan (CF3 estimate; to confirm)	CA proposal (2051)	
			Lower bound	Higher bound
Cambridge North Fringe East	7.9	12.2	22.0	35.0
Science Park	9.5	10.0	14.0	20.0
Cambridge East (incl Marshalls)	2.7	5.6	15.0	35.0
Biomedical Campus	14.7	18.4	25.0	40.0
Eddington	0.9	1.2	2.0	6.0
West Cambridge	11.8	14.6	18.0	20.0
Subtotal	47.5	62.0	96.0	156.0
Waterbeach	1.1	1.1	3.0	5.0
Balsham Road	1.8	1.7	4.0	6.0
Six Miles Bottom	0.0	0.2	1.0	3.0
Dullingham	0.5	0.5	1.0	2.0
Babraham	2.7	4.5	6.0	8.0
Granta Park	2.8	4.6	5.0	8.0
Genome Campus	2.7	4.5	5.0	8.0
Sawston	3.1	3.4	12.0	15.0
Chesterfords	3.6	4.0	8.0	12.0
Greater Cambourne	5.2	8.7	10.0	15.0
Northstowe	3.0	4.4	5.0	10.0
Subtotal	26.5	37.6	60.0	92.0
All sites above	74.0	99.6	156.0	248.0
Net change from 2011		25.6	82.0	174.0
All GCP	162.0	206.0	342 (if following 'Blue Line')	
Net change from 2011		44.0	180 (if following 'Blue Line')	

- If the necessary transport infrastructure were in place, the blended option would allow for sustainable employment growth of 82k - 174k jobs by 2051 on the sites shown in the maps/table
- The growth in jobs on these sites could account for between 46% to 97% of the total 180k net rise of jobs in GCP by 2051, as implied by the blue line
- The remainder of the growth in jobs would spread in the rest of GCP

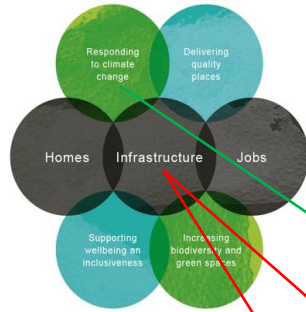
Summary of estimated growth in dwellings in 2051 by site

Dwellings (,000 units)	2011	2031 Local Plan (CF3 estimate; to confirm)	CA proposal (2051)	
	Census		Lower bound	Higher bound
All building types				
Cambridge North Fringe East	4.2	4.3	8.0	12.0
Science Park	0.0	0.0	0.1	0.5
Cambridge East (incl Marshalls)	0.0	0.0	10.0	15.0
Biomedical Campus	4.2	4.3	5.5	8.0
Eddington	0.0	3.6	8.0	12.0
West Cambridge	0.2	0.2	0.3	1.0
Subtotal	8.6	12.5	31.9	48.5
Waterbeach	2.7	4.1	6.0	10.0
Balsham Road	3.6	4.4	8.0	11.0
Six Miles Bottom	0.0	0.0	1.0	3.0
Dullingham	0.8	1.0	2.0	3.0
Babraham	0.2	0.2	0.3	0.4
Granta Park	0.2	0.2	0.3	0.4
Genome Campus	0.0	0.6	1.0	2.0
Sawston	3.0	3.5	7.0	12.0
Chesterfords	2.8	3.3	4.0	5.0
Greater Cambourne	4.4	8.2	10.0	12.0
Northstowe	2.8	6.6	7.5	11.0
Subtotal	20.5	32.0	47.1	69.8
All sites above	29.1	44.5	79.0	118.3
Net change from 2011		15.4	49.8	89.2
All GCP	111.0	144.0	223 (if following 'Blue Line')	
Net change from 2011		33.0	112 (if following 'Blue Line')	



- If the necessary transport infrastructure were in place, the blended option would allow for sustainable dwellings growth of 79k - 118k dwellings by 2051 on the sites shown in the maps/table
- The growth in dwellings on these sites could account for between 28% to 50% of the total 223k net rise in dwellings by 2051 for the GCP area, as implied by the blue line
- The remainder of the growth in dwellings would spread in the rest of GCP and beyond

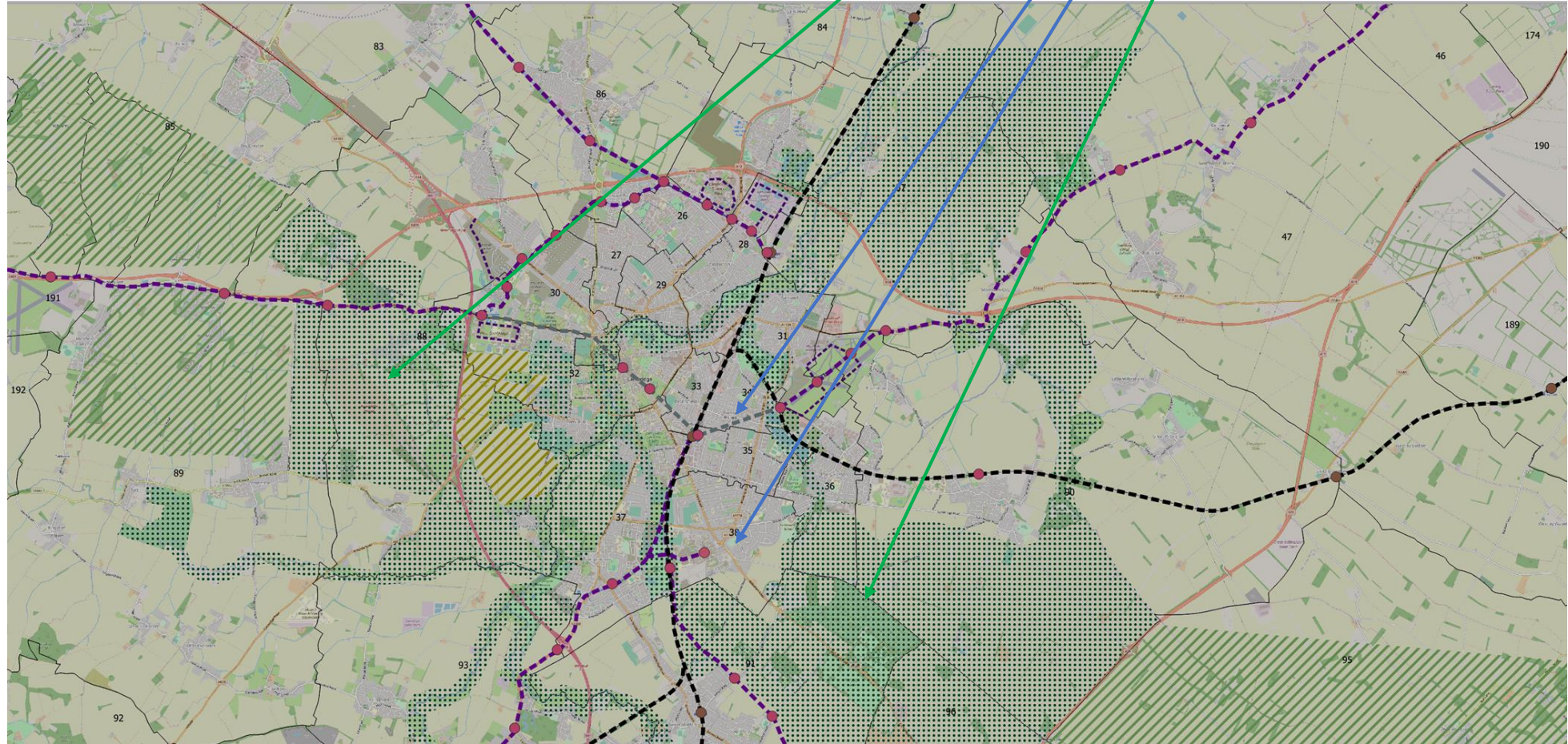
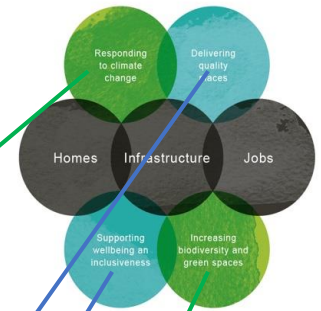
Blended option supports lower car usage and more sustainable travel



% share by means of transport - Commuting journey-kms

	Car	Bus	Rail	Cycle	Walk	All
2011 (Census data)	72%	6%	11%	7%	4%	100%
2031 Local Plan	73%	6%	11%	7%	4%	100%
2051 LP extrapolation	73%	6%	11%	7%	4%	100%
2051 Densification	38%	26%	30%	4%	2%	100%
2051 Fringe Growth	70%	7%	10%	11%	3%	100%
2051 Dispersal	73%	6%	11%	6%	3%	100%
2051 Transport Corridors	62%	11%	19%	5%	3%	100%

Green infrastructure



Blended spatial summary – needs investment from Whitehall

Investment needed	Scenario					
	Higher Growth Base	Densification	Fringe Growth	Dispersal	Transport Corridors	Digital Transformation
Trunk roads	***		***	*****	**	**
Major road junctions	***		*****	***	**	**
Rail tracks	**			*	***	***
Rail stations	**	*****		**	*	*
Road-based transit routes	**	*	**	**	*****	*****
Urban storm water	*	****			**	**
Water and sewerage	*	****			**	**
Land remediation	*	****			**	**
Digital infrastructure	***	*	**	****	***	*****

Message to Whitehall: “if the city region is going to achieve this rate of growth, the deal has to be that the infrastructure goes in **before and as** we grow, not afterwards”

Quality of life: direct (✓) and indirect (✓) benefits

• Community

- Affordable and diverse housing provision ✓
- Community involvement ✓
- Community cohesion ✓
- Changes in needs and lifestyles ✓
- Management of their communities ✓
- Social and digital infrastructure ✓
- Formal and informal green spaces ✓
- Community development support ✓
- Managing communal spaces ✓
- Community buildings ✓
- Local shops and services ✓

• Climate

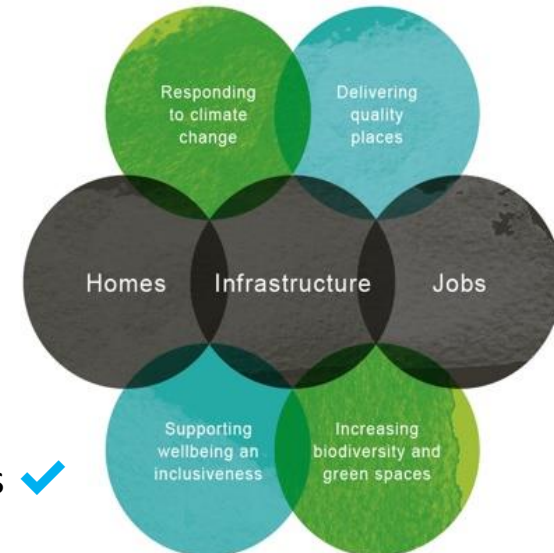
- Sustainable lifestyles ✓
- Environmental targets ✓
- Flooding risk management ✓
- Sustainable waste management ✓
- Energy and water conservation ✓
- Sustainable urban drainage ✓
- Trees and planting ✓
- Carbon sequestration ✓

• Connectivity

- Public transport in place ✓
- Integrated public transport ✓
- Linkage with employment opportunities ✓
- Road user hierarchy priority to walking, cycling and community transport ✓
- Easy mobility ✓
- Bus stops ✓
- Parking management ✓
- Road design ✓
- Ability to connect to emerging 5G networks ✓

• Character

- Existing landform ✓
- Overriding masterplanning ✓
- Maintained vision ✓
- Full range of house types ✓
- Simple designs ✓
- Open space requirements ✓
- Good landscapes ✓
- Flexible and adaptable buildings ✓
- Car and cycle parking ✓



CPIER blended spatial summary – initial assessment

Housing rents	Housing occupancy	Wage costs	Production costs	Cluster benefits	Transport user benefits/congestion	GVA impacts	Social mix of neighbourhoods	Quality of built environment	Quality of natural environment	Investment costs	Speed/ease of delivery
✓	□	✓	✓	✓✓	✓✓	✓□	✓	✓	✓✓	✓✓	✓✓

- A coordinated proposal for jobs, housing and transport
- Other blends possible at site level, but need to become a good fit
- A good contribution to biodiversity, climate change mitigation and quality of life
- Good deliverability: known sites and (mostly) existing transport routes
- Within touching distance of consensus about how our community might grow
- Creates a clear, compelling case to Whitehall

*More precise estimates of the impacts are best done after more complete iteration with new Local Plan data