URBAN CABLE CARS

MARKET OVERVIEW AND APPLICABILITY TO OXFORD

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DECK OBJECTIVES

1. **Provide overview of the cable-car market**
2. Outline potential application in Oxford
3. Propose key next steps
4. Appendix of further information

CABLE CARS ARE INCREASINGLY BEING USED IN URBAN TRANSIT

"Once regarded as little more than a tourist attraction, **cable cars are now proving to be an environmentally friendly method of commuting**"

– BBC, 2019

"**Aerial cable cars are coming into increasing use in urban transit systems** in large cities as a way of connecting up nearby locations"

- World Bank, 2020

"The global cable car market **will develop at an alarming rate** in the coming years"

- Verified Market Reports, 2022

THEY OFFER ENVIRONMENTAL AND SOCIAL BENEFITS

"The greatest benefits accrue around the symbolic value of cable-car systems. These highly visible infrastructures and the aesthetic experience they afford to both residents and visitors **create a feeling of inclusion and integration into the 'modern' city**, help develop local pride and promote individual self-esteem."

- UCL development planning unit

"**83% of respondents viewed urban cable cars positively**"

- Drees & Sommer

"This electricity-powered mode also **doesn't add to air pollution or climate emissions**"

- Bloomberg, 2022

THERE ARE A NUMBER OF TYPES OF CABLE CAR / ROPEWAY, BUT MOST MODERN URBAN SOLUTIONS ARE GONDOLA BASED

Cable cars

Top supported

Gondolas

Medellin Metro, Columbia

- Gondolas are most common form of modern urban cable transit
- Available in 1, 2 and 3 cable forms which provide different levels of wind-speed stability and speed
- Carrying capacity usually 6-40 people; spacing between cabins varies
- Transit times are predictable and constant
- Must travel in straight lines but intermediate stations can turn up to 90 degrees

Focus of remainder of presentation

Aerial tram

Roosevelt Island, New York, USA

- Aerial trams tend to be used in high elevation cases with relatively low passenger volumes
- Two trams run simultaneously in opposite directions
- Carrying capacity 20-100 passengers
- Unable to turn or have intermediate stations

Bottom supported

Bilbao funicular, Spain

- Funiculars / mini-metros / inclined elevators
- Cabins run on rails and are attached to cables in the ground
- Tend to support journeys up sharp inclines
- Tourist-based, historically used in mines etc, some 'personal' funiculars now popular e.g. in Wellington, New Zealand

ORIGINALLY VIEWED AS TOURIST TRANSPORT, OVER 50 CITIES HAVE NOW LAUNCHED GONDOLAS; THE MARKET IS GROWING AT 12% CAGR*

1900-2000: gondolas as a tourist attraction

Barcelona, 1938

Llandudno, 1969

Singapore, 1974

Ski resorts, 1908

2000 onwards: gondolas as integrated transport

Medellin, 2004

London, 2012

Toulouse, 2022

Paris, 2025

*Source: Xcellent Insights, Global Cable Car & Ropeways market, Jan 2022 (current market size USD 280m growing at 12% CAGR)

GONDOLAS ARE QUICK AND CHEAP TO DEPLOY, AND USEFUL IN HIGH DENSITY RESTRICTED SPACE ENVIRONMENTS

Advantages

Social

- Access to marginalized areas of the city and improve feelings of connectivity and pride
- Barrier-free access easy for wheelchairs and buggies
- Run constantly so no waiting time for passengers or 'lumpy' loading and unloading time for short trips;
- Significantly safer vs cars (x50) or busses, trams, trains (x3)

Environment

- Run on electricity so minimal emissions, no battery required, can support solar panels for in-cab tech
- Reduces car use, can keep them outside centre
- Low structural footprint & impact of tower base

Financial

- Cheap to build compared to road, rail, tram; Quick to construct: less than 1 year; easy to remove
- Commuter & tourist transport dovetail at different times of the day; differential pricing possible
- No 'dead' time where drivers shuttle vehicles to start and finish

Factors to consider in implementation

Build

- Need to be in a straight line – max +/- 2 degrees lateral turn
- In the UK, 'fly over' land fees paid to landowner a legal obligation and fixed
- Components last 25-30 years, similar to trains and > buses, towers are generally 50+ years

Operate

- Visibility can be enhanced by glass floors, or reduced by 'adaptive' glass for flying near residential areas
- Can have seats to be raised to increase capacity during peak hours, space for bike racks, luggage
- Can be built with extra 'prongs' on the towers in case later additional capacity is required
- Require ongoing maintenance, from stations

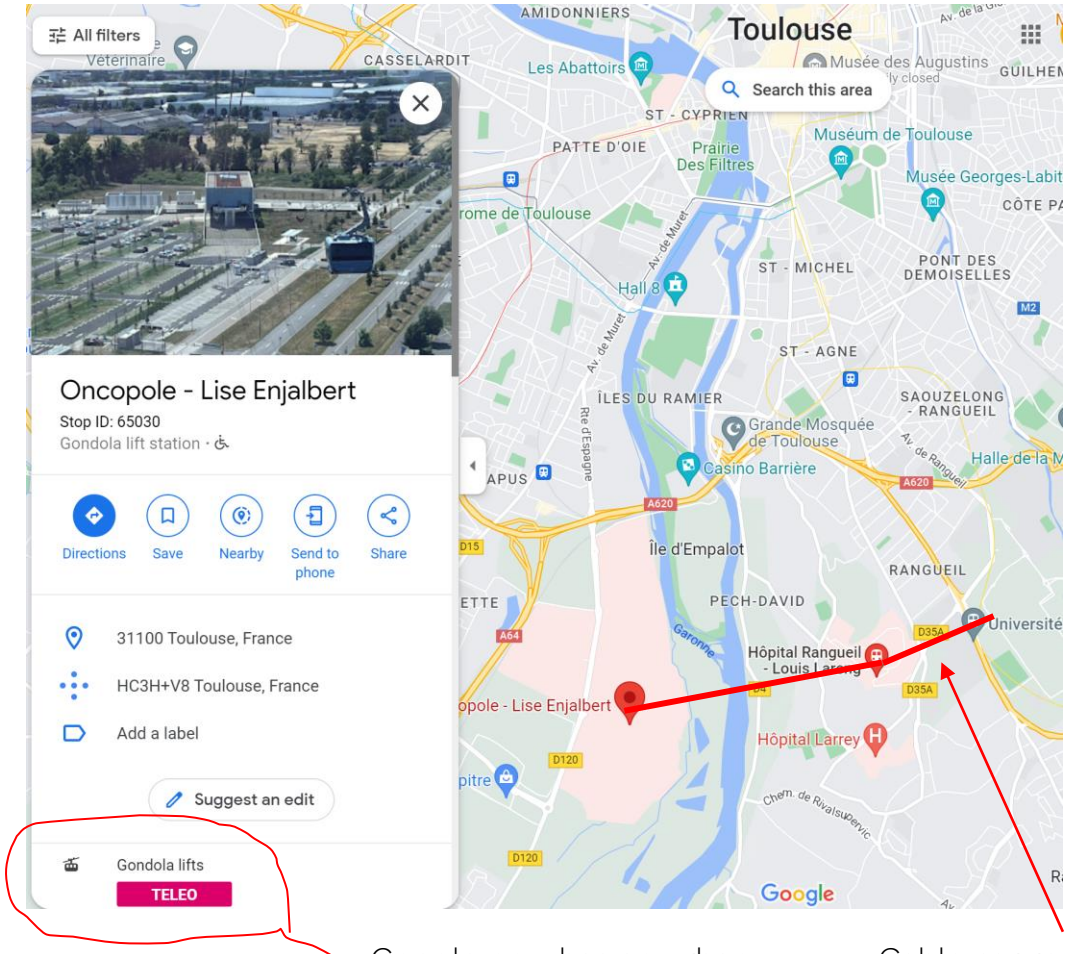
3 EXAMPLES OF MODERN URBAN CABLE CARS: LONDON, ANKARA, TOULOUSE

		Emirates, London, UK	Yeminhalle, Ankara, Turkey	Teleo, Toulouse, France
Financial	**Launch date**	2012	2014	May 2022
	Capital, $m, 2020	£60m (£36m Emirates)	$30m	$90m
	Purpose	Urban/ Tourism	Urban	Urban
	Model	Public (w/ sponsor)	Public capital, private ops	Private capital and ops
	Built by	Doppelmayr	Leitner	Poma
	Operated by	TFL	Ankara Bus Co	Poma
Operational	**Passengers / day**	3.6k	8.2k	8k
	Passengers / year	1.3m	3m	2-3m
	Hourly capacity	2.5k	2.4k	1.5k
	Travel time	10 min	9 min	10 min
	Length in km	1.1km	3.3km	3km
	Fare	£3-5	$0.3	£1.50
Details		• Built as part of the flagship 2012 Olympic village to carry athletes across the river, Emirates is now largely a tourist attraction • Partly integrated into TFL's fare systems, but with a significant extra charge, it is no longer viewed as a predominantly urban solution • Operating profit despite fact that it's widely considered to go to and from nowhere	• Links hillside suburb of 650k people with the rest of the Ankara's public transport system • Passes over residential areas • Traffic and emissions in Yemimahalle have significantly improved since launch	• Links a hospital, cancer research centre, and university total 50k employees • Will cut travel time from 30 mins to 10, and offer sustainable transport for employees and hospital visitors

Source: World Bank, *Urban aerial cable cars as mass transit systems*

TOULOUSE MAY 2022: THE CABLE CAR CONNECTS GENUINE DESTINATIONS OF UNIVERSITY, HOSPITAL AND INTERCHANGE

Toulouse Cable Car: popular on social media and is on google maps as integrated transport



Google now has an urban cable car icon

Cable car route – 3 stations

3km Téléo service opened in **Toulouse May 2022**, two years later than scheduled because of Covid-19. **20,000 riders took it on its first day**

It links the Oncopole, on one side of the Garonne, and the l'université des sciences et de médecine Paul-Sabatier, on the other.

It is expected to **carry at least 8,000 passengers a day**, up to 1,500 an hour in each direction. Journeys will take 10 minutes, and the 14 cars which can accommodate 35 people will run every 90 seconds at peak times.

In comparison, travel between the two sites can take as long as 30 minutes on the roads in rush hour. Even during quieter periods, journey times in cars is 11 minutes.

The project cost €82.4 million, more than had been anticipated because of objections to the original route. Due to the three-cable system, the service can operate even in high winds.

EMIRATES CABLE CAR 2012: WIDELY CONSIDERED TO BE A FAILURE AT DELIVERING A SERIOUS TRAVEL PROJECT (BUT FUN FOR TOURISTS)

The Emirates is considered a vanity project due to going to and from nowhere useful

"The Emirates cable car is an underused vanity project and should act as a warning to Oxford of how not to do it."

- Academic, LSE Cities

- On announcing construction, Boris Johnson claimed the Emirates would create thousands of jobs and be used by thousands of commuters – an FOI revealed **the true number was four regular commuters.**
- It attracts some tourist traffic, but is also **significantly off the tourist trail which limits ridership**
- Emirates paid £36m of the £60m construction fee – but in Feb 2022, TfL was unable to find another sponsor
- However, it still attracts 1.3m tourists a year and **generates an operating profit** (according to Tfl, numbers not given)

Useful Urban cable cars have a number of factors in common which Emirates does not

"By integrating the design with other forms of mass transit and improving access for pedestrians, it's possible to put urban mobility at the heart of equity"

- Smart Cities Live

To be a useful urban cable car, rather than a tourist attraction, **three things need to be true:**

- Connects two or more actual neighbourhoods or business districts
- Has a station at a well used public transport station or stop
- Has an integrated fare system

THERE ARE ~40 CABLE CARS OPERATING CLOBALLY, WITH NEW CITIES PLANNING TO LAUNCH OR IN ADVANCE ASSESSMENT

Paris: construction started, launch in 2025

- Will connect neighbourhoods divided by a TGV line
- 5-station 4.5km telepherique, cost of £120m

- *Notable, as per Toulouse it will connect with university / hospital / science parks*

Other cities in advance stages

- Gothenburg, Sweden
- Marseille, France
- Jerusalem, Israel
- Bonn, Germany
- Vancouver, Canada
- Lima, Peru
- Geneva, Switzerland
- Bordeaux, France
- Lyon, France
- Nantes, France
- Rouen, France
- Hamburg, Germany
- Mombasa, Kenya
- Lagos, Nigeria
- Da Nang, Vietnam
- Grenoble, France

UNLIKE MUCH OF THE REST OF THE WORLD, BRITAIN HAS HISTORICALLY NOT SEEN CABLE CARS AS A SERIOUS URBAN TRANSPORT SOLUTION

Cable Cars are considered a legitimate urban transport mode globally – just not in the UK

The misconception that cable cars are not urban transport came about because the UK lags behind the rest of the world in many areas, with huge swathes of the population believing there's nothing worth learning from anywhere outside the UK. In fact, ***cable cars came down from their traditional mountain homes years ago and into cities around the world****.*

- The Beauty of Transport

Academic research (Neumann et al) demonstrates that transit professionals are suspicious of cable technology largely due to a lack of understanding on the subject – and that ***the more they know about it, the more positive they are.***

- The Gondola Project

UK has 4 gondolas, but all (arguably) for tourists

Llandudno Cable Car, Wales

- Runs summer only, return route
- £12 return trip

Nevis Range Gondola, Scotland

- Acts as a ski pass in winter, mountain scenic view in summer
- £30+ to ride

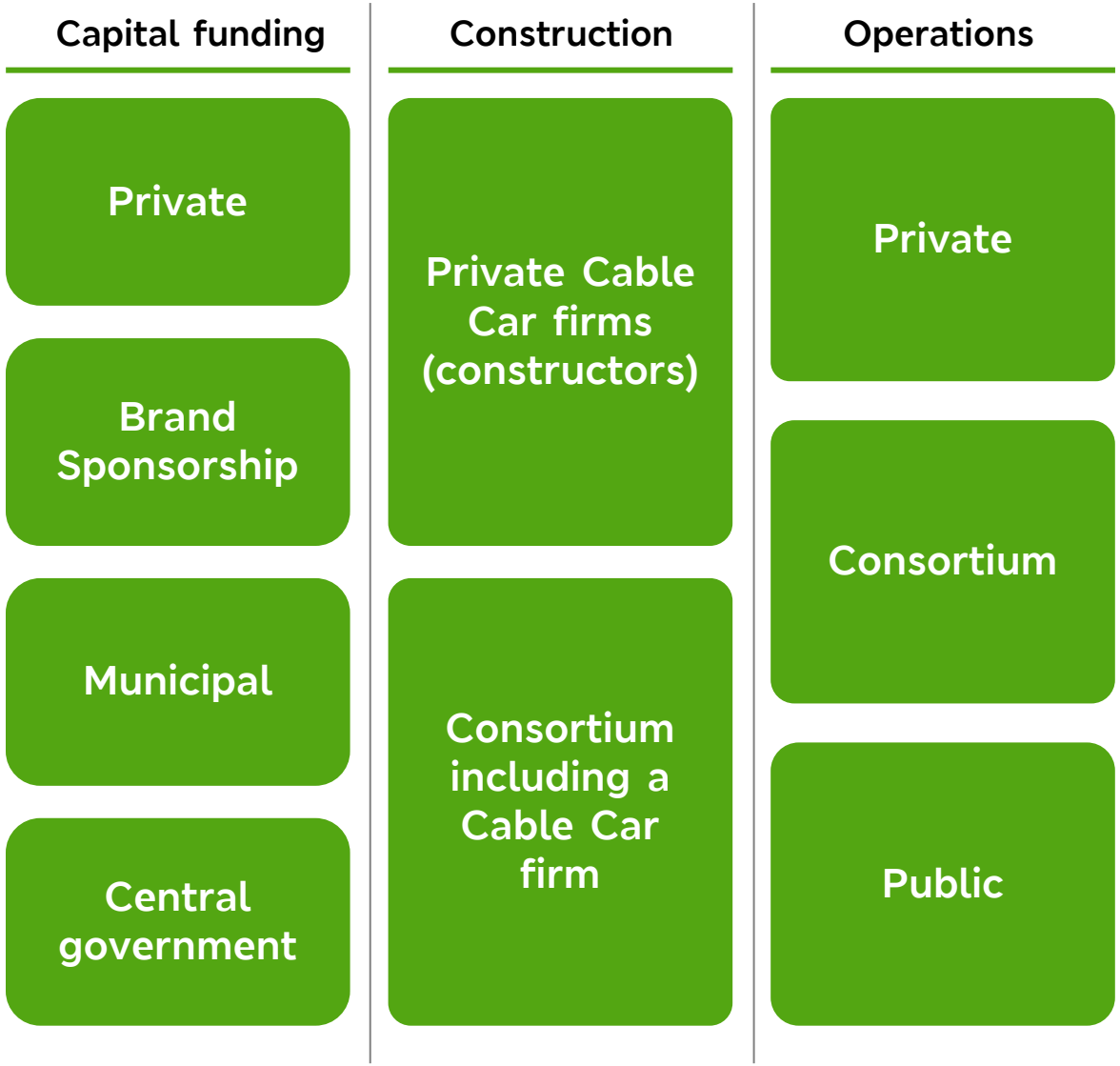
Heights of Abraham, Peak District

- Summer only
- £23 return trip

Emirates, London

- 1.3m visitors per year
- £4 to ride

THERE ARE SEVERAL BUSINESS MODEL OPTIONS – PUBLIC / PRIVATE CONSORTIA LED BY A CONSTRUCTOR IS COMMON



There are a number of different models for cable car funding, construction and operations

- **Capital funding:** some tourist cable cars are purely privately funded (and then tend to be privately operated), most urban cars are funded from a combination of sources: e.g. Emirates was 40% funded by sponsorship, 60% by government. Toulouse is 15% central gov't, 85% local gov't.
- **Construction:** usually one of the big global firms, either acting alone or as a consortium set up for build and/ or operations. E.g. Bogota had consortium 50% Doppelmayr, and 25% for each of two local construction & operators. Santiago Chile has a consortium which is 45% city owned, 10% Doppelmayr owned, and remainder local operators.
- **Operators:** tend to be either local public services companies, or most commonly consortia. E.g. Ankara Bus operates the Yenimahalle cable car (which was paid for publicly). Algiers is run by a Poma-led consortium, where Poma own 49%, and two separate gov't transport agencies split the remaining 51%. Roosevelt island, by contrast, licenses their operations to Leitner-Poma as a private operator

Source: World Bank, *Urban aerial cable cars as mass transit systems*

THERE ARE FOUR KEY GLOBAL FIRMS WHO HAVE CONSTRUCTED CABLE CARS (AND SOME OTHER SMALLER REGIONAL PLAYERS)

	POMA	Doppelmayr	LEITNER ropeways	BARTHOLET BMF Group
Company details	• French • 8k systems worldwide • Strategic partnership with Leitner	• Swiss / Austrian • as built 15k systems in 90 countries	• Italy (Tyrol) • Installations in 50 countries	• Swiss • 300 installations in 50 countries
Urban cable way constructions completed as of May 2022	• Medellin, Columbia • Santiago 2, Chile • Quayaquil, Ecuador • Caracas, Venezuela • Santo Domingo, Dominican Republic • Amazonas, Peru (consortium) • Algiers, Algeria (4/5 lines) • Toulouse, France	• La Paz, Bolivia • Bogota (plus 2 local players for consortium), Columbia • Santiago, Chile • Caracas, Venezuela • Emirates, London, UK • Algiers, Algeria (1/5 lines) • Rio 2, Brazil	• Mexico City • Caldas, Colombia • Ankara, Turkey • Cali, Colombia	• Brest, France • Rio, Brazil

Source: World Bank, *Urban aerial cable cars as mass transit systems*

DECK OBJECTIVES

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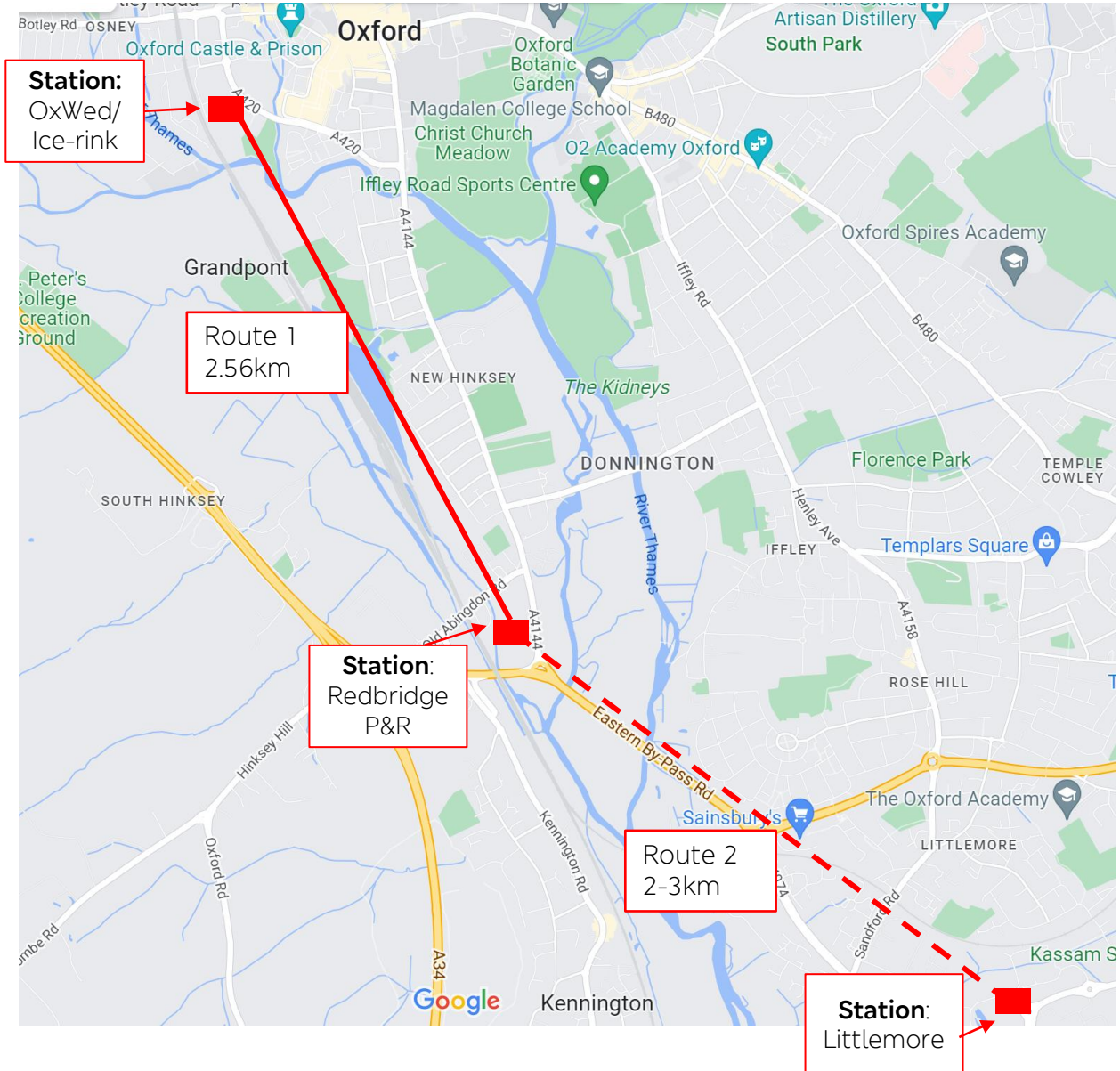
OXFORD CABLE CAR: THERE ARE A NUMBER OF POTENTIAL ROUTES BUT THE FIRST TO CONSIDER WOULD BE REDBRIDGE TO CITY CENTRE



Proposed routes

Route 1 – detailed scoping already undertaken

- Redbridge P&R to Ice Rink / OxWed development
- 2.56km / 7-9 min transit

Route 2 - potential extension

- Redbridge P&R to Littlemore Science Park, supporting commuter traffic plus 3,000 new houses in Grenoble Rd being built by Magdalen
- Time & Distance TBD ~10min

Future routes?

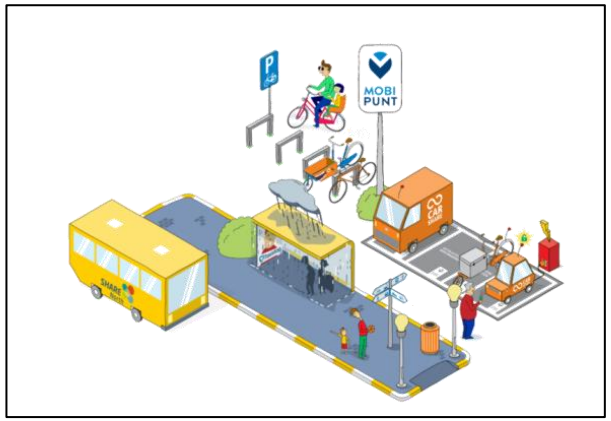
- Barton via Headington Hill to City Centre
- Thornhill: P&R to Churchill, John Radcliffe

REDBRIDGE TO OXWED: POTENTIAL FUTURE INNOVATION AND MOBILITY HUBS + CABLE CAR STATION

OxWed future development area

- OxWed development will be mixed-use and aims to support re-use of buildings and materials. It will have activity hubs and supports for local firms and businesses and cultural activities – as well as businesses, hotels, and student accommodation. It is intended to be a hub of innovation.
- The plan for the area is planned to be landscape-driven and fit in well with the local landscape
- A cable car could provide an innovative transport solution which fits with the OxWed aims of providing an innovative and pleasant public space – and it would significantly reduce motor traffic

Redbridge P&R as a future mobility hub and 'park & fly'



- Redbridge is already starting along the path to be a serious mobility hub, with superfast EV charging, and plans for a cafe – now we need to add better shared & public transport – escooters, mobility scooters, bike hire
- A cable car from Redbridge would be a low carbon option to convey commuters (during peak hours) and tourists (daytime) into the City Centre, a 3 min walk from Westgate and into the OxWed development.
- Cable car could also assist with freight consolidation – as well as transport for construction workers at OxWed – as it carries same people as 5-10 trains per hour with a lower interchange cost (you don't have to wait for them)

LIKE OTHER RECENT URBAN CABLE CARS, THE OXFORD CABLE CAR WOULD SERVE A DUAL PURPOSE

Remove central Oxford traffic (Route 1)

- **Keep tourist buses out of Central Oxford**
- **Provide a good alternative to commuters, especially with new amenities**
- **Encourage destination parking to drive shopping visitors away from central parking**
- **Sustainable transport for OxWed dev't**
- **Facilitate Abingdon Rd bus gates, relieve pressure on Botley Rd following installation and the OxWed development, support ZEZ**

Initial leg would additionally generate significant tourist revenue directly and through P&R; could support subsidy on second leg of urban connection to deprived areas

Provide better urban connection (Route 2+)

- **Provide access to Littlemore, giving the community a reliable, accessible sub-20 minute route to City Centre**
- **Could link through to Science Park, providing a non-car commuter route**
- **Further connections possible if required**

Second leg could solve access for a community which has long felt excluded, as well as giving it self-esteem and something to be proud of

Comparable City Cable Cars

- Medellin
- Santiago
- Algiers
- Brest

IT IS LIKELY TO BE RELATIVELY EASY TO BUILD PUBLIC AND POLITICAL SUPPORT FOR A REDBRIDGE CABLE CAR

*"People either **love the cable car, or they think it's unworkable. No one hates it.** Last year when we spoke to people on the doorstep, they generally thought it was unworkable, but this year, since Paris announced their cable car system launching in 2025, almost every response has been favourable"*

- Member, ACT for Oxford (Cable Car advocacy group)

*"**Attitudes to the concept have changed in the last few years as the traffic situation has become increasingly severe in many places.** Cable cars save commuters a lot of time they would otherwise be stuck in traffic; they are extremely environmentally friendly; they can be constructed in a short time and are much less expensive to build than subways or suburban railways. **A cable car link can also enhance development of districts that have not previously been connected to public transport.**"*

- Drees & Sommer

There is latent public support for cable cars, and clear messaging and rationale is required

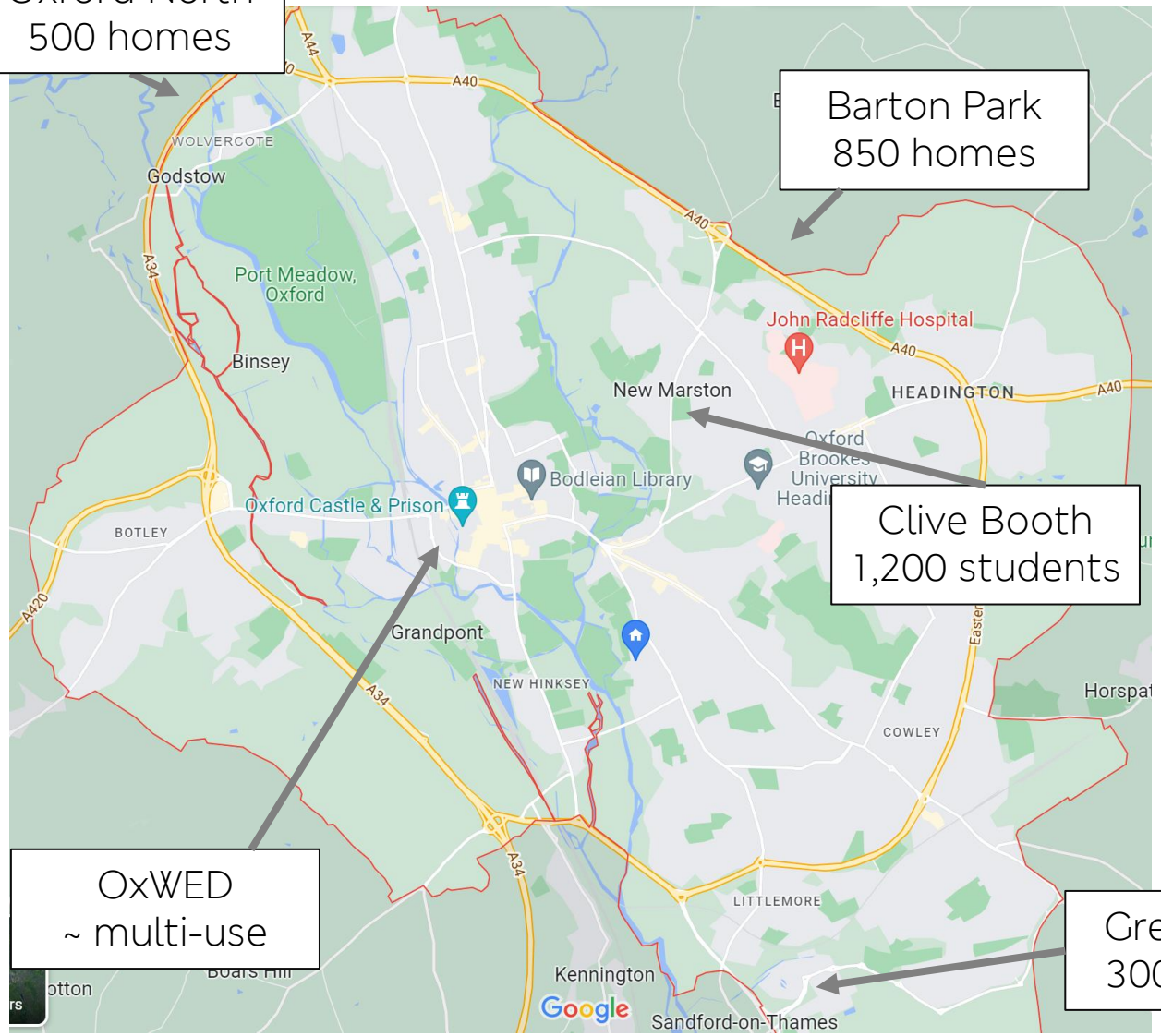
- Recent survey in Stuttgart Germany said **83% of people viewed urban cable cars positively**
- Unlike other traffic reduction measures, **there is very limited political opposition to cable cars per se,** only a lack of understanding and a challenge around their potential usefulness (as seen with Emirates)
- Cable cars are an **interesting and innovative form of transport**, and many people enjoy going on them, so support is high (high support on social media too). Learnings from LatAm show that **local residents view them affectionately** and as 'their' cable car
- Support is likely to be particularly high in the New Hinksey / Hinksey area due to the Abingdon Rd carrying a high volume of motor traffic to the city centre, as well as areas which currently see significant tourist parking

*Constructionindex.co.uk survey by Drees & Sommer

ADDITIONAL CONSIDERATIONS FOR REDBRIDGE SITE

Demand peak	Likely to be manageable demand peaks as commuting hours would be offset by mostly daytime and evening tourist trips
Land ownership	Almost all of the land is owned by the City Council (see appendix), other than a very narrow strip which is County. It does not fly close to any residential windows, often source of objection
Flooding	Limited impact as cable car does not touch the ground, towers have a relatively small base – 2-3m square
Ecology	Limited impact >> Queensland has glass-bottomed cable car which takes visitors over highly protected rainforest to avoid human impact on the environment
Additional traffic	Whilst the cable car might bring additional tourists, its location at the P&R by definition will keep tourist car traffic out of the city centre.
Heritage impact	Whilst the cable car might be visible from the view cone of Boars Hill, the towers would be lower than the existing pylons and less impactful, additionally there is precedent where UNESCO world heritage sites such as Koblenz have got cable cars (indeed Jerusalem is considering one). The cable cars would probably be invisible from Christ Church Meadow and City Centre
Ongoing maintenance	Access to the ground below a cable car is commonly impossible / impractical, so maintenance takes place from the stations
Impact on other transport modes	Cowley branch line involves major alterations to the track at Kennington, but this is 600m south of Redbridge and would not interfere with it. Cable car extension is possible to Science Park without crossing high-voltage power lines

BEYOND REDBRIDGE: CONNECTING OXFORD'S NEW HOMES IN A LOW-CARBON AND HIGHLY EFFICIENT WAY



- Oxford is building thousands of new houses on the outside of the ring-road
- We need to be able to connect other bits of the city to the centre without the need for cars, and on a regular and highly manageable schedule
- Whilst Urban cable cars are not necessarily the best solution in all cases, they should be evaluated as a serious urban transit solution

VERY HIGH-LEVEL TOP-DOWN BUSINESS CASE FOR ROUTE 1 INCLUDING ASSUMPTIONS

REVENUE			Assumptions				
DAILY USERS		**People**	**% who might use CC**	**Number of daily users**	**Return ticket price**	**Daily revenue**	**Annual revenue**
Tourists							
*Daily tourist visitors by coach**	*OCC report, 2019*	*11,250*	25%	2,813	5	14,063	5,132,813
Daily non-coach tourist visitors		*7,750*	10%	775	5	3,875	1,414,375
Daily tourist visitors to Oxford	**Oxford Uni**	**19,000**					
Commuters							
Westgate workers	*BBC news*	*3,000*	5%	150	2	300	109,500
Non-westgate commuters		*42,842*	5%	2,142	2	4,284	1,563,733
Daily commuters into Oxford	**2011 Census**	**45,842**					
Daily commuters out of Oxford	**2011 Census**	**14,470**					
		Total		5,880		22,522	8,220,421
ANNUAL USERS			**Annual cc visits**		**Return ticket price**		
Residents							
Oxford Uni students	*Oxford Uni*	*25,820*	80%	57	5	283	103,280
Oxford Brookes studetns	*Oxford Brookes*	*16,900*	80%	37	5	185	67,600
School children	*Count of OCC data*	*21,200*	80%	46	2	93	33,920
Language students	*Estimate*	*3,000*	80%	7	5	33	12,000
Other adults	*Sum of others*	*95,180*	30%	78	5	391	142,770
Total population	**Oxford City C, 201**	**162,100**					
		Total		225		985	359,570
	Grand Total						8,579,991

REVENUE			Assumptions				
DAILY USERS		**People**	**% who might use CC**	**Number of daily users**	**Return ticket price**	**Daily revenue**	**Annual revenue**
Tourists							
*Daily tourist visitors by coach**	*OCC report, 2019*	*11,250*	40%	4,500	6	27,000	9,855,000
Daily non-coach tourist visitors		*7,750*	15%	1,163	6	6,975	2,545,875
Daily tourist visitors to Oxford	**Oxford Uni**	**19,000**					
Commuters							
Westgate workers	*BBC news*	*3,000*	5%	150	3	450	164,250
Non-westgate commuters		*42,842*	5%	2,142	3	6,426	2,345,600
Daily commuters into Oxford	**2011 Census**	**45,842**					
Daily commuters out of Oxford	**2011 Census**	**14,470**					
		Total		7,955		40,851	14,910,725
ANNUAL USERS			**Annual cc visits**		**Return ticket price**		
Residents							
Oxford Uni students	*Oxford Uni*	*25,820*	80%	57	4.5	255	92,952
Oxford Brookes studetns	*Oxford Brookes*	*16,900*	80%	37	4.5	167	60,840
School children	*Count of OCC data*	*21,200*	80%	46	2	93	33,920
Language students	*Estimate*	*3,000*	150%	12	4.5	55	20,250
Other adults	*Sum of others*	*95,180*	30%	78	4.5	352	128,493
Total population	**Oxford City C, 201**	**162,100**					
		Total		231		922	336,455
	Grand Total						15,247,180

	Scenario 1	**Scenario 2**
Annual Revenue	8,579,999	15,247,180
Cost base (50% of Emirates)	2,500,000	2,500,000
Operating profit (PBT)	6,079,999	12,747,180
PTP	4,863,999	10,197,744
Capital investment	£50m	£50m
Payback time	~10 years	~5 years

- High-level and top down business case indicates capital payback would be 5-10 years but much more detailed work and inputs would be required based on conversations with experienced operators

DECK OBJECTIVES

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POTENTIAL NEXT STEPS

As we have seen, cable cars are a rapidly growing low-carbon form of urban transport

- Cable cars are seen as valid forms of public transport in many cities across the world, including France and Germany, but the UK has not yet caught up – the issue is one of public communication and education
- Cable cars might not be the solution to Oxford's traffic, but there is a significant chance they can help and we should do a reasonable assessment of them as an integrated form of low-carbon transport

Suggested next steps

1. High-level feasibility study, including potential business model options and comparison against other low-carbon forms of public transport
2. Consider whether to include in LTCP part ii – potentially as part of a light rail section including trams etc
3. Assess potential sources of funding from central govt to public / private partnerships

APPENDIX

APPENDIX: SOURCES USED IN CREATING THIS PRESENTATION

Policy / academic articles

- Urban aerial cable cars as mass transit systems, World Bank / IBRD (2020)
- Mobility innovation at the Urban Margins, Brand & Davlia, UCL (2011)
- Metropolitan Medellin: Integrating Ten Municipalities into One Metropolis, World Bank (2013)
- Urban Mobility & poverty, Lessons from Medllin & Soacha, Davila (2015)
- Cable Car Confidential, The Gondola Project (2013)
- Xcellent insights, Global Cable Car & Ropeways market (2022)
- Emirates Cable Car business case (2014)

Press articles / blogs

- The Beauty of Transport
- The Gondola Project
- bbc.com/future/article/20190103-the-rise-of-the-urban-cable-car
- bloomberg.com/news/articles/2022-02-04/by-2025-parisians-could-commute-by-gondola.
- planete-energies.com/en/medias/close/transportation-french-cities-opting-cable-cars
- britsinkenya.com/cable-cars-market-insights/
- londonreconnections.com/2020/the-incredible-lightness-of-being-cable-cars-a-legitimate-urban-transport-mode-but-not-in-the-uk/
- Boris Johnson's Emirates Air Line cable car fails to find new sponsor | London | The Guardian

APPENDIX: SELECTED URBAN CABLE CARS (FURTHER DETAILS AVAILABLE IN FULL WORLD BANK REPORT)

Summary Table

Aerial Cable Car	Location	Purpose	Model	Stage	Entry into Operation	Capital Costs (millions of U.S. dollars, 2020)	Number of Cars	Capacity (passengers/ unit)	Speed (m/s)	Travel Time (min)	Demand (passengers/day)	Capacity (passengers/ hour/ direction)	Number of Stations	Length (km)	Fare integration	Number of lines
1. Mexicable	Mexico State, Mexico	U	A	In operation	2016	97.4	185	10	6.0	19.00	17,000	3,000	7	4.80	Yes	1
2. Metrocable	Medellín, Colombia	U/T	B	In operation	2004	204	468	8 - 10	5.0	8.60	38,689	11,500	16	11.82	Yes	5
3. Mi Teleférico	La Paz, Bolivia	U	B	In operation	2014	831	1,400	10	5.0	12.37	163,161	29,000	36	30.50	No	10
4. TransMiCable	Bogotá, Colombia	U	C	In operation	2018	73.7	163	10	6.0	12.00	21,000	3,600	4	3.30	Yes	1
5. Cable Aéreo	Manizales, Colombia	U	B	In operation	2009	49.7	87	10	5.0	4.75	8,500	1,400	5	2.58	No	2
6. Teleférico Bicentenario	Santiago, Chile	U/T	A	Concession awarded	2022	80	126	10	6.0	12.00	—	3,000	4	3.33	No	1
7. Parque Metropolitano	Santiago, Chile	U	C	In operation	2016	10.3	47	6	5.0	7.00	—	1,000	3	2.05	Yes	1
8. Aerovía de Guayaquil	Guayaquil, Ecuador	U/T	A	Under construction	2020	134	154	10	5.0	20.00	40,000	2,600	4	4.10	No	1
9. Metro Cable	Caracas, Venezuela	U	B	In operation	2010	1079	353	10	5.0	12.67	23,744	8,000	10	10.20	Yes	3
10. Line 1 Santo Domingo	Dominican Republic	U	B	In operation	2018	69.2	215	10	5.0	17.42	19,495	3,000	4	5.16	Yes	1
11. Line 2 Santo Domingo	Dominican Republic	U	A	At bidding stage	2021	207	—	—	7.0	39.00	—	4,500	8	12.8	Yes	1
12. Telecabinas de Kuélap	Amazonas, Peru	T	A	In operation	2017	18.9	26	8 - 10	6.0	20.00	274	1,000	2	4.03	No	1
13. Emirates Air Line	London, United Kingdom	U/T	B	In operation	2012	87.3	34	10	6.0	3.17	3,609	2,500	2	1.10	Yes	1
14. Yenimahalle	Ankara, Turkey	U	B	In operation	2014	30.4	106	10	6.0	9.20	8,219	2,400	4	3.28	Yes	1
15. Roosevelt Island	New York, United States	U	C	In operation	1976	—	2	110	8.0	2.83	4,110	1,200	2	0.96	Yes	1
16. Téléphériques d'Alger	Algeria	U/T	B	In operation	1956	—	131	10 - 35	5.7	4.33	—	9,455	14	6.10	Yes	6
17. Téléphérique des Capucins	Brest, France	U	C	In operation	2018	22.7	2	60	7.5	1.50	1,781	1,200	2	0.42	Yes	1
18. Téléo	Toulouse, France	U	A	Under construction	2021	90.8	15	34	5.5	10.00	—	1,500	3	3.00	Yes	1
19. MioCable	Cali, Colombia	U	B	In operation	2015	35	90	10	5.0	10.00	6,000	3,000	3	2.79	Yes	1
20. Teleférico do Complexo do Alemão	Brazil	U	C	Out of service	2011	161.9	152	10	5.0	17.00	10,000	2,800	6	3.46	No	1
21. Teleférico da Providência	Brazil	U	C	Out of service	2014	37.4	16	10	5.0	3.50	—	1,000	4	0.721	Yes	1

Purpose: Urban (U), tourism (T), or both (U/T)
Model: (A) Construction, operation and maintenance under private concession; (B) Public works run by public operators; and (C) Design, construction, and start-up by public agencies but run by private operators.

Source: IDOM-SEM SA

Source: World Bank, *Urban aerial cable cars as mass transit systems*

APPENDIX: MEDELLIN METROCABLE HAS TRANSFORMED THE CITY, CONNECTING LOW-INCOME NEIGHBOURHOODS PHYSICALLY AND EMOTIONALLY

Medellin Metrocable

- Medellin launched **first truly urban cable car system in 2004**, with lines 1-4 as urban lines, and line 5 as a tourist connection to a nature reserve
- Crucially, it is **part of an integrated transport system across the city**; operated by the local city transport company – effectively, publicly owned
- Launched as part of a wider initiative involving urban upgrading through a **strategy of mobility, environment, housing and public-space creation in economically depressed areas**
- **Locals are passionate about their cable car line,** and vigorously defend it – fare prices are set deliberately low to target people from low-income areas
- **In LatAm, see gender-specific benefits, due to women being significantly less likely to have access to a car** (if families owned one) and also due to machismo control restrictions being placed on females travelling on crowded buses
- Metrocable **was constructed using a significant number of local workers** – after the Mayor realised that only 1% of local infrastructure spend went towards individuals from the poorest communities

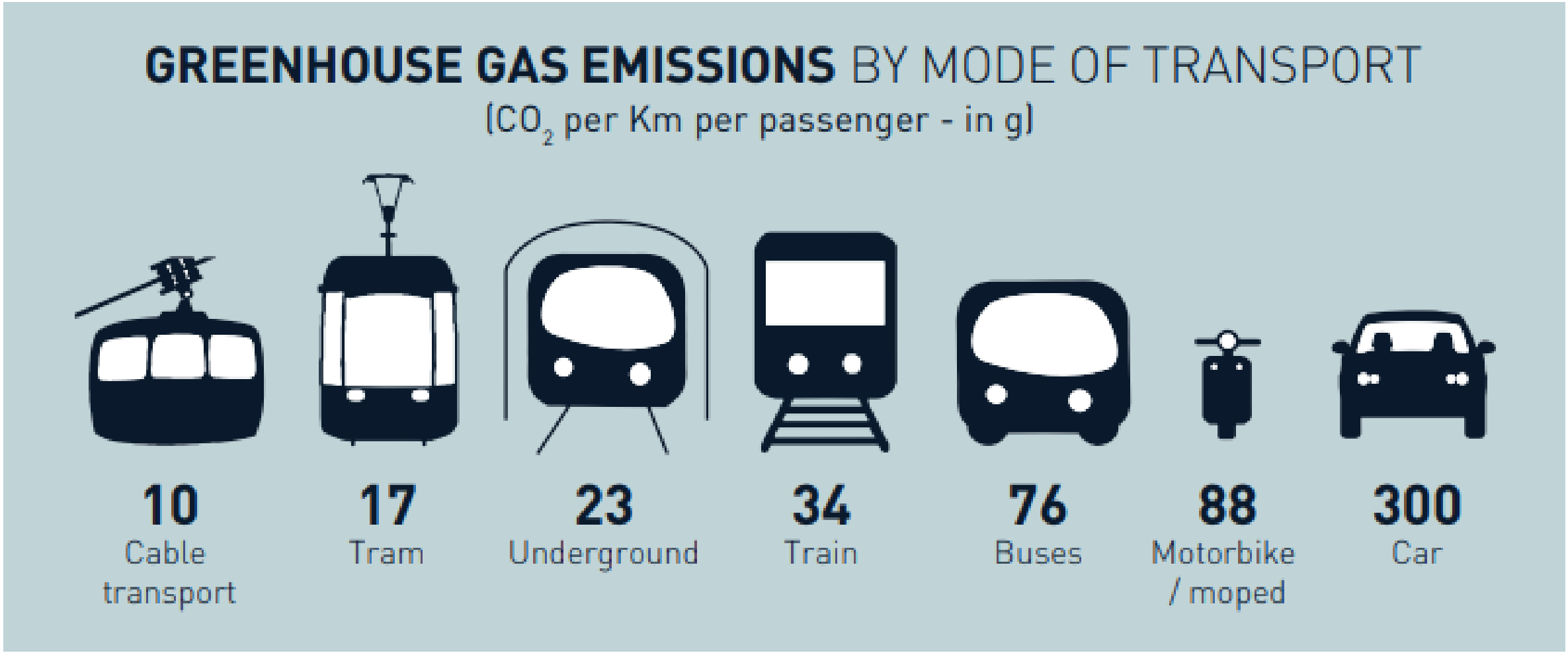
In Medellin, the impact of the resourceful application of ski-slope technology to high-gradient low-income urban areas has been considerable as a relatively ***cheap, quick and highly visible response to urban transport problems***

Along Line K, there is ***evidence of increased community self-esteem and a sense of inclusion*** *brought about by the cable-car system and the associated urban upgrading. The great majority of residents seem proud of what has happened in their communities and welcome visitors and tourists;* ***once stigmatised, they now feel part of the city.***

In contrast to the modest impacts in terms of increased mobility and material wellbeing, ***the cable-car systems can be seen as having an enormous symbolic significance.***

- Davila et al, 2013 (World Bank)

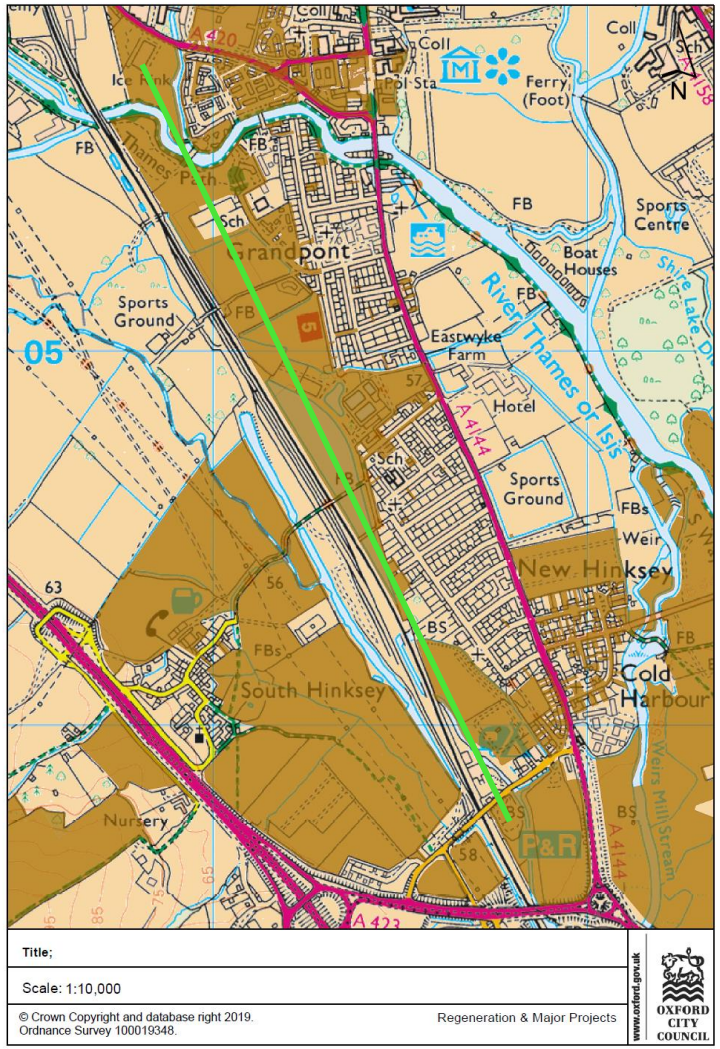
APPENDIX: GHGS BY MODE OF TRANSPORT



Source: Egis

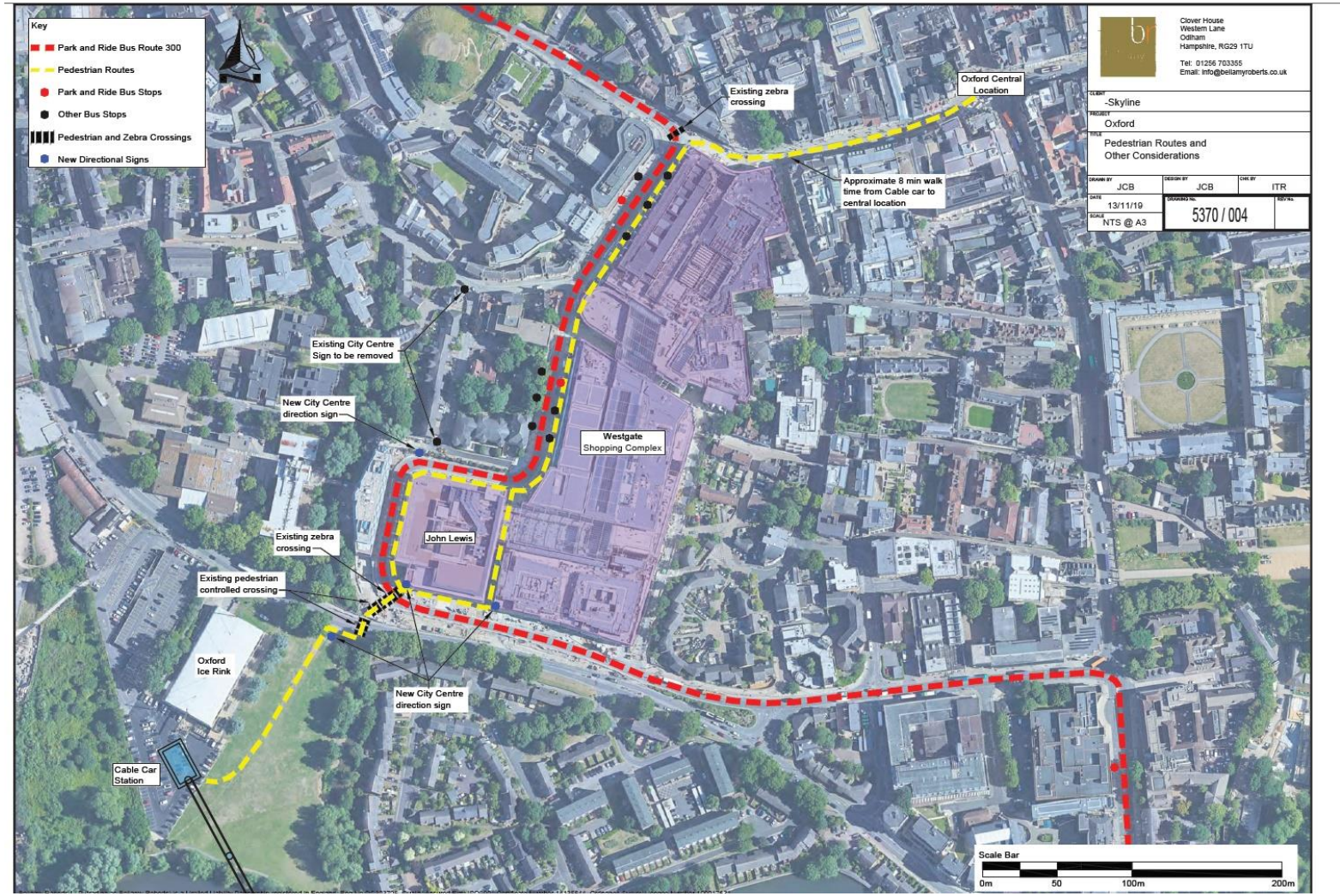
APPENDIX: OXFORD LAND OWNERSHIP AND PEDESTRIAN ROUTES

City Council land ownership (brown)



Cableway route

Central Oxford station: existing and new pedestrian routes to city centre



APPENDIX OXWED LLP: NEW OFFICES, STUDENTS, HOUSING AND HOTELS IN THE CITY CENTRE – CONVENIENTLY NEXT TO THE PROPOSED CABLE CAR

OxWED LLP is a joint venture between OCC and Nuffield College, which is developing Oxpens. Oxpens will be a "new quarter" of Oxford, between Oxpens Rd and the river/the train station and the ice rink, where currently there is a car park, some buildings and scrubland.

Largely, Oxpens will not be housing- there will be student accommodation, office/lab space, hotels, hospitality and a new bridge across the river.

This is part of a wider redevelopment of the West End and Osney Island area, which includes redeveloping the train station, Nuffield College's work on buildings near Park End Street, and later the Osney Mead industrial estate.

APPENDIX: DISTANCE FROM CABLE WAY DROP OFF TO KEY TOURIST ATTRACTIONS IS THE SAME AS COACH DROP OFF

1. Christ Church
2. Oxford Castle
3. Ashmolean
4. Carfax Tower
5. Bodleian

APPENDIX: SUMMARY OF FINANCIAL ASSUMPTIONS MADE BY SKYLINE, WHO PRESENTED TO OXFORDSHIRE CC AND OXFORD CC

SKYLINE
Skyline is a trading name of Capitol London

Oxford High-level Financials*

Criteria needed for viability = Private Funding no public money needed

*subject to further feasibility study

Capital Cost	£49 million
Annual Running Costs	£2.4 million
Buses Per Day	114 from 228 total estimated (50%)
Yearly Co2 saved	482 Tonnes (or the same amount removed by 570 acres of forest)
Price per trip buses	£150 approx. £3 per passenger
Park and Ride	275 cars per day
Cost park and ride	£6.80 as current price
Sponsorship	£500,000 per year
Ridership	1.8m from 7.5 million visitors per year (24%)
EBITDA Year 5	**£6 million**
Equity IRR	**20%**

Additional income generated from

- Café Concessions
- Souvenir Shop
- Sponsorship
- Wi-Fi Data and 5G
- Carbon Credits

- Work with council to ban private tour buses in city centre as in Bath
- Buses redirected to site
- **Share profits with Council**
- Operational partnership with local bus company

PASSENGER RIDERSHIP NUMBERS?

From Oxford official tourist website
Annual Visitor Numbers

Total 7,548,000

Based on Porto's experience Oxford's ridership numbers would be 3.5million plus local users 3x that used in our models. This would lead to Equity IRRs of 72%+

Comparison with the cable car in Porto
2 stations – 550m – purely tourism
€9 return (£7.75) return.
Passenger numbers = 750,000 pa
Annual Visitor Numbers to Porto = 1.6million

46.8% of visitors to Porto take the cable car