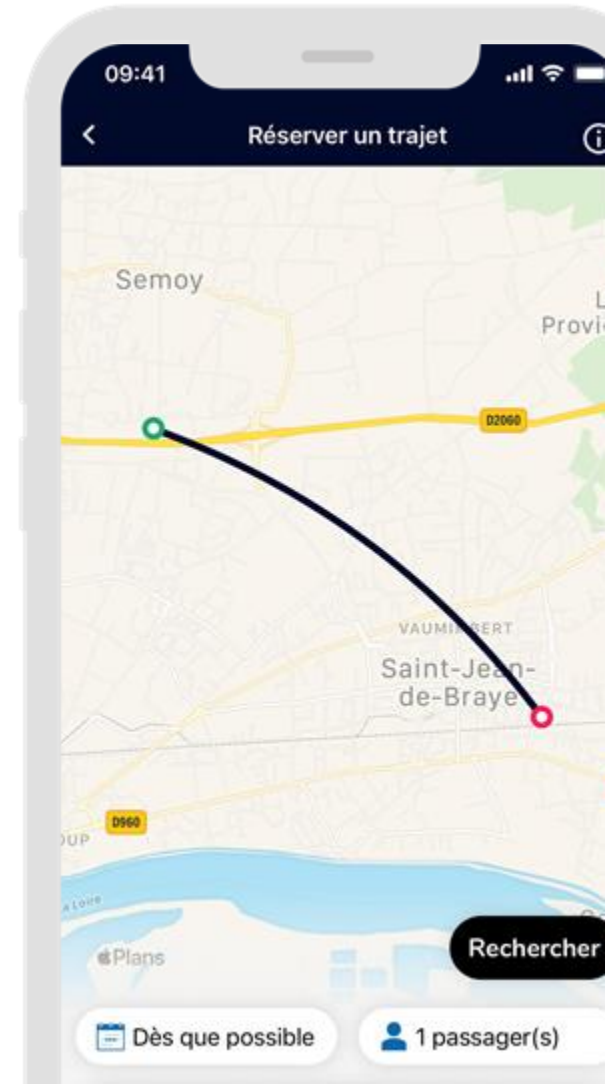




## Frequency is Freedom, but is On-Demand Better?

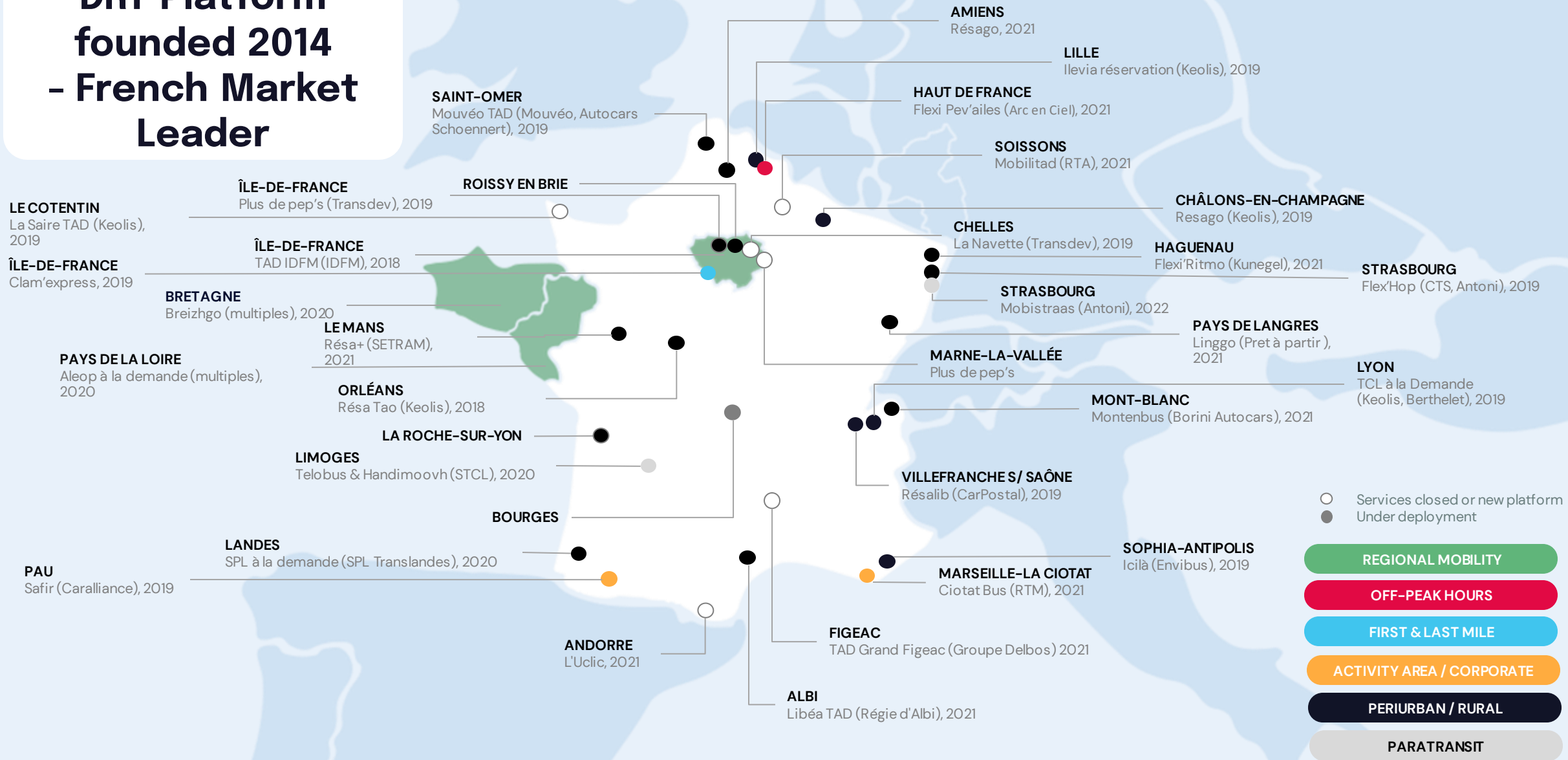
11 July  
Rural Transport Round Table



# Who are Padam?

## DRT Platform founded 2014

### - French Market Leader



# Currently active in +130 territories who deploy our solutions

- **CHESHIRE WEST AND CHESHIRE**  
2023
- **GLOUCESTERSHIRE**  
The Robin, 2022
- **HERTFORDSHIRE**  
HertsLynx (Uno Bus), 2021
- **LINCOLNSHIRE COUNTY**  
Call Connect (Lincolnshire county council), 2021
- **SURREY COUNTY**  
(Surrey County Council), 2021
- **LEICESTERSHIRE**  
New Lubbesthorpe (Vectare) 2022
- **SOLENT TRANSPORT**  
Southampton and Isle of Wight 2022
- **SOMERSET**  
(Somerton) 2023
- **HEATHROW AIRPORT**  
(Reading Buses) 2023

UK

- **MADRID**  
Celering Shuttle (Celering), 2020
- **EXTREMADURA**  
TAD Extremadura (Damas, Solis Autocares), 2021

Spain

- **PADUA**  
QuiBus ex NightBus (Busitalia Veneto), 2019
- **ROVIGO**  
(Busitalia)
- **BOLOGNA**  
Colbus (SRM), 2021
- **VENICE**  
(AVM Holding)

Italy

● **GATINEAU, CANADA**  
STO à la demande  
(Taxi Loyal), 2021

○ **KARLSTAD, SWEDEN**  
Karlstadsbuss Nära  
(Keolis), 2021

● **ODSHERRED, DANEMARK**  
Movia Trafik, simulation, 2020

○ **AVIAPOLIS, FINLAND**  
HSL, simulation

○ **BRUXELLES, BELGIUM**  
Sam-e on demand (STIB), 2019

- **BADEN-WUERTTEMBERG**  
ZF Friedrichshafen, 2022
- **RHÉNANIE-PALATINAT**  
WDW NOW (DB Regio), 2020
- **HÜRTH**  
Hüpper (SWH), 2021
- **HÖXTER**  
Holibri (NPH), 2021
- **PAFFENHOFEN**  
Stadtbus Pfaffenhofen (Stadtbus Pfaffenhofen, GmbH), 2022
- **INGOLSTADT**  
VGI Flexi (Hengl Reisen), 2022

Germany

- **WIL**  
BOS (Bus Ostschweiz), 2022
- **GENEVA**  
TPG Flex, 2021

Switzerland

- Closed services
- Services currently in deployment

REGIONAL MOBILITY

OFF-PEAK HOURS

FIRST & LAST MILE

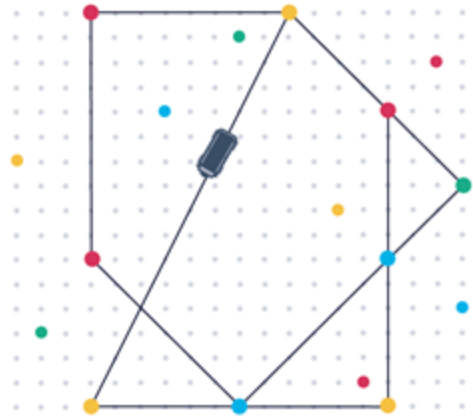
ACTIVITY AREAS / CORPORATE

PERIURBAN / RURAL

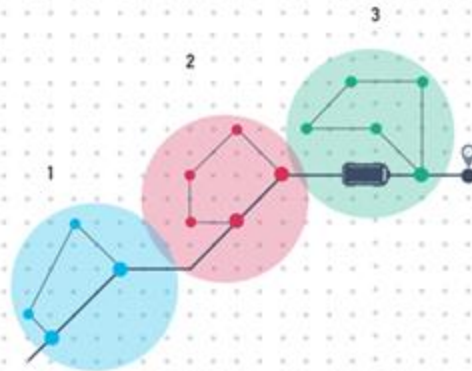
PARATRANSIT

# Types of DRT service designs

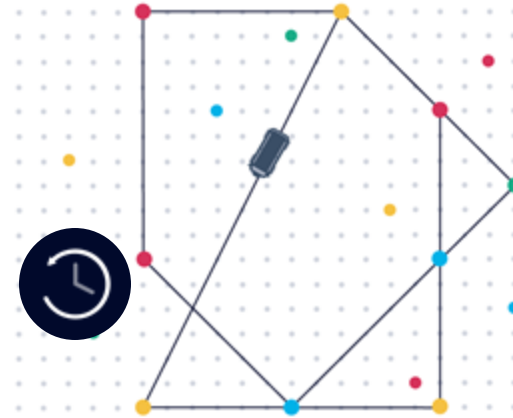
Zonal - Free Floating



Zonal - Semi Flexible



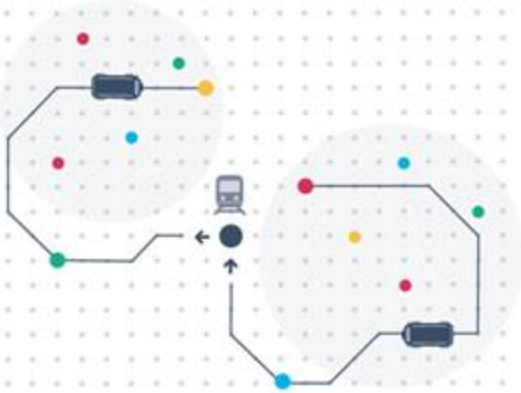
Zonal - Scheduled free-floating



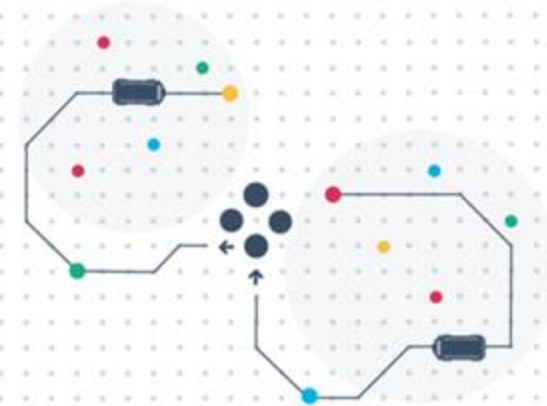
Fixed line



Zonal - Feeder



Zonal - Multi-feeder



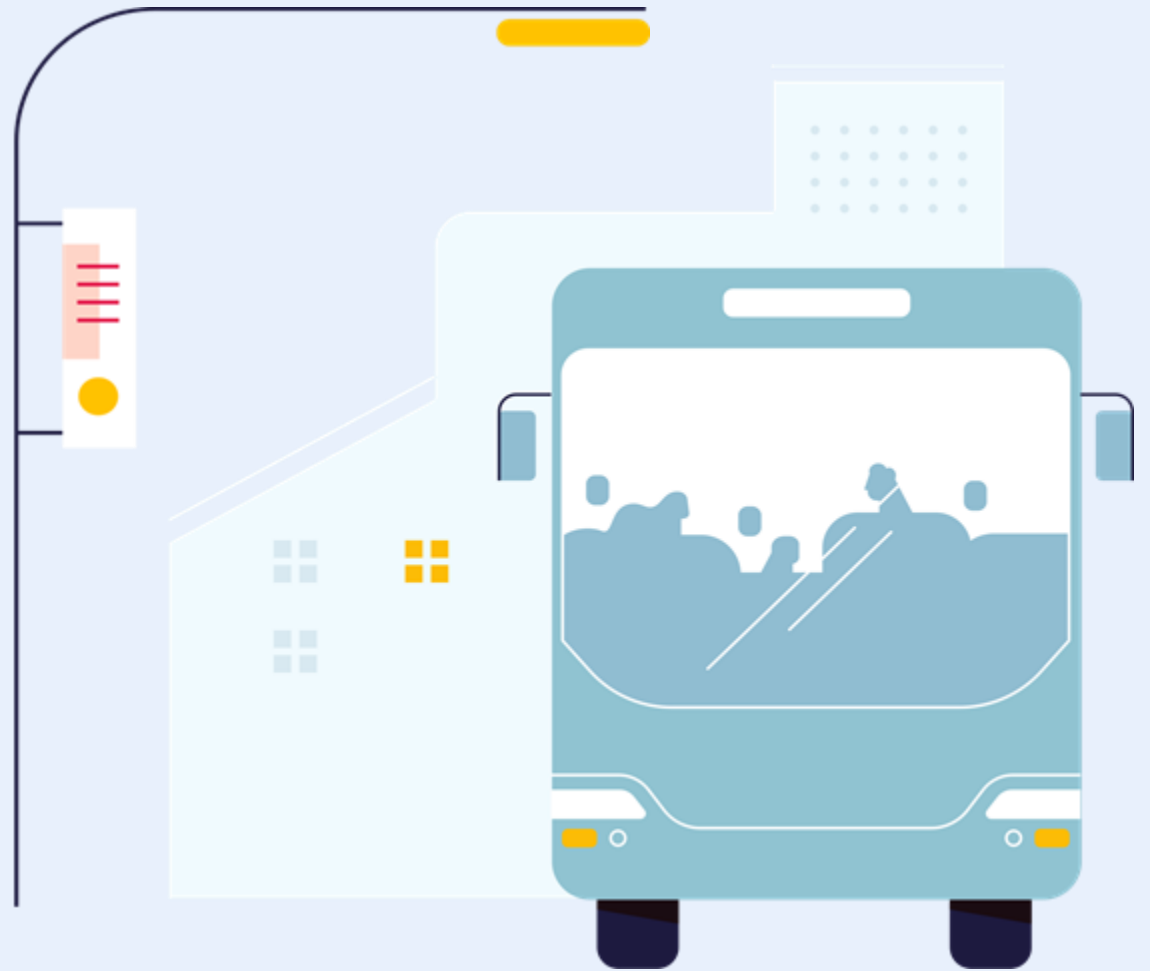
Divergent



Virtual line



# Comparing DRT and Fixed Line - What metrics can we use?



# 4 Suggested Metrics



## Numbers of people served

- Walking distance to service stops
- And by level of service



## Speed of service

- How long the journey takes



## Frequency and Span of service

- The first and last service of the day – when can people realistically expect to travel
- How often the service runs is an indicator of how useful it is
- **Frequency is freedom = every 15 minutes**



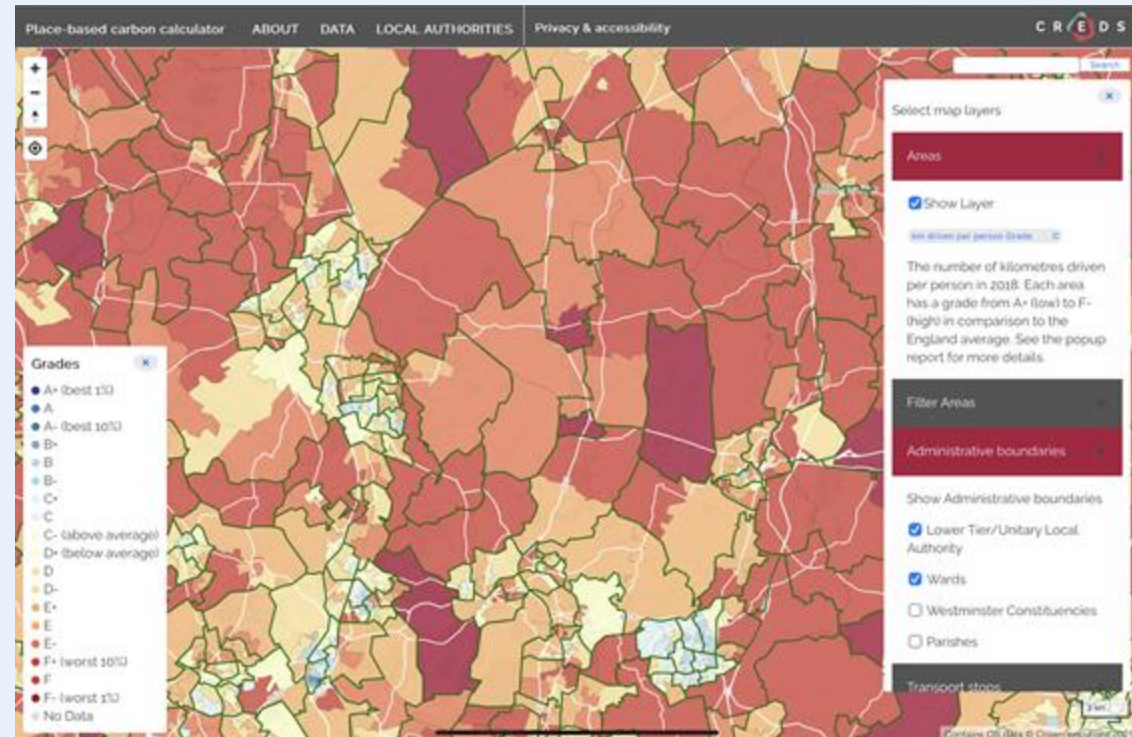
## Relative cost of provision

- Vehicles
- Service hours
- Fuel

# Area studied - North East Hertfordshire



Low population density but still around 50,000 people total population



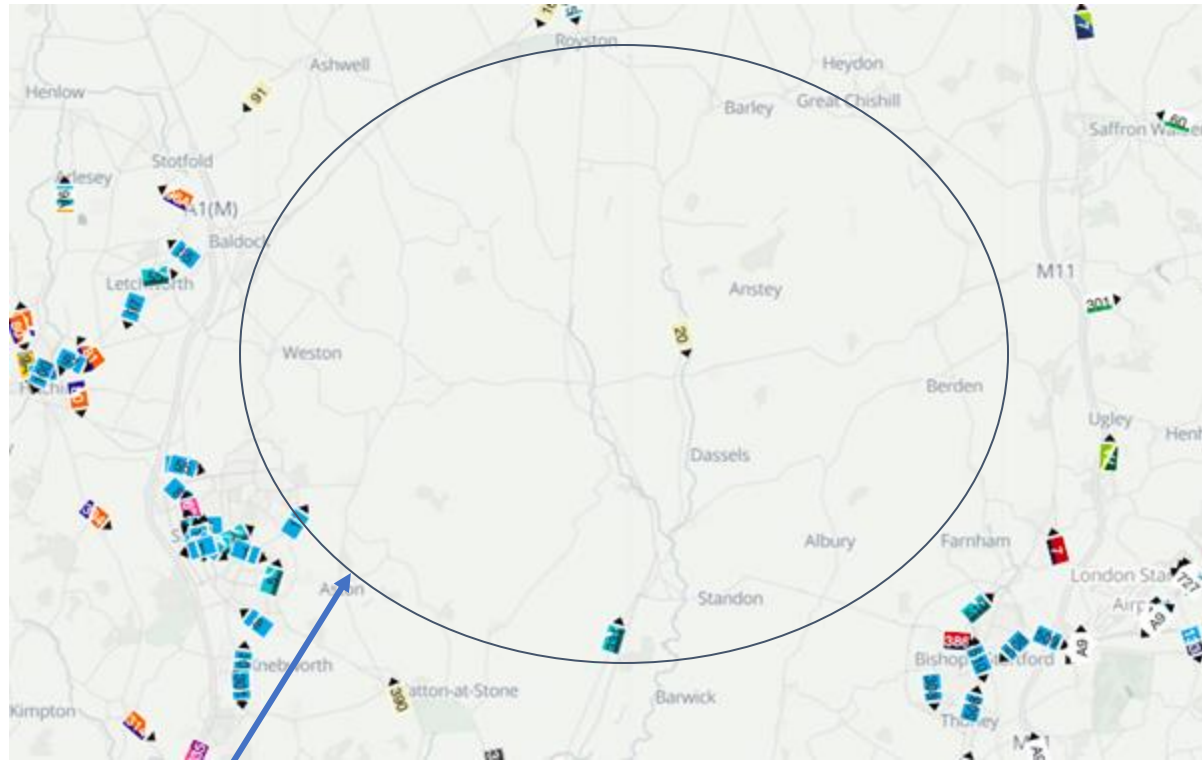
Highly car dependent – The area is among the highest emitting 10% for England and Wales, with some parts amongst the top 1%



# Overview of the service today



## Map of fixed buses in Hertfordshire



**Transport Desert** with no public transport for rural area to connect to market towns. **4,000 residents with no access to a bus service**

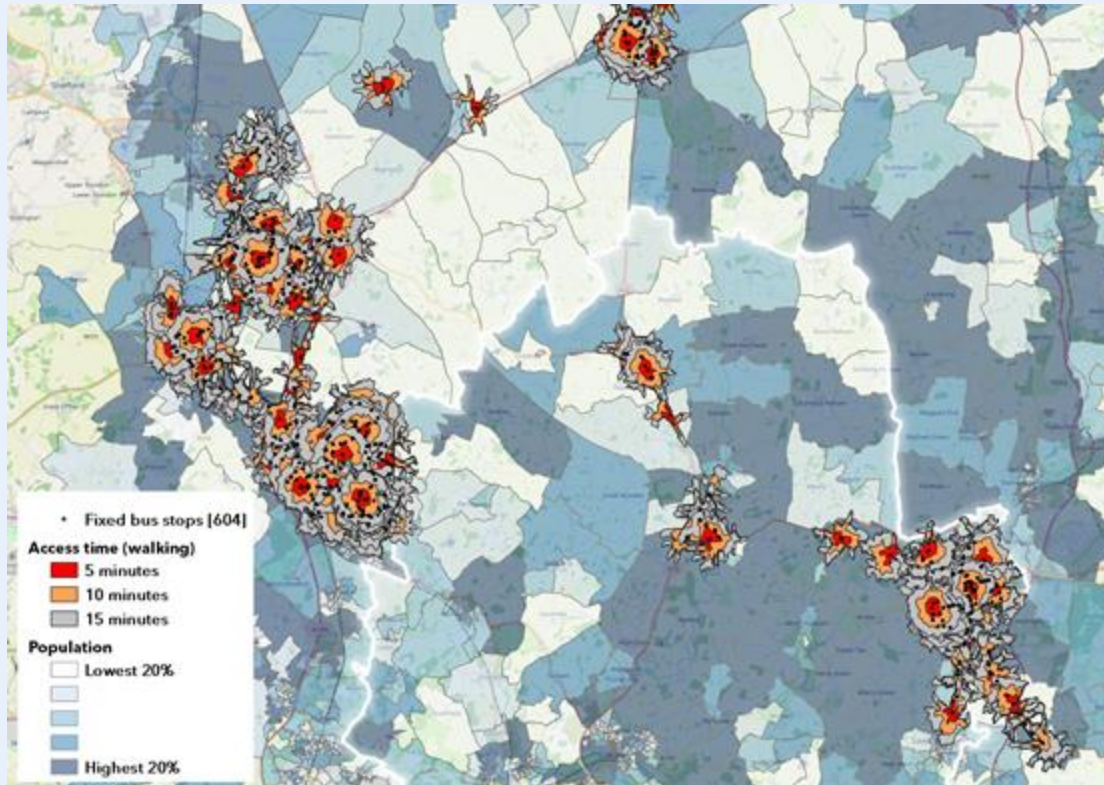
## HertsLynx DRT Operation



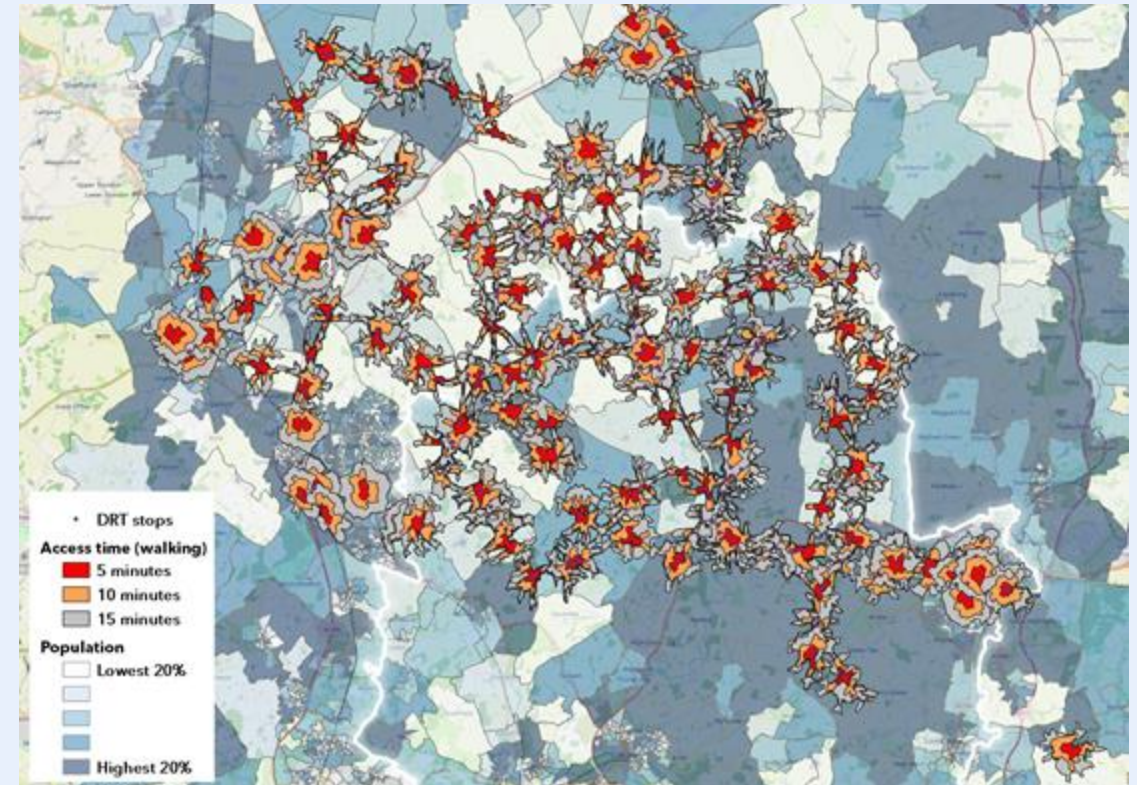
Free floating zone with 3-4 DRT vehicles serving 6 key hub towns outside of the zone. **This will transform how people travel in this region as they previously had no choice but a car.**



# Metric 1: Numbers of people served



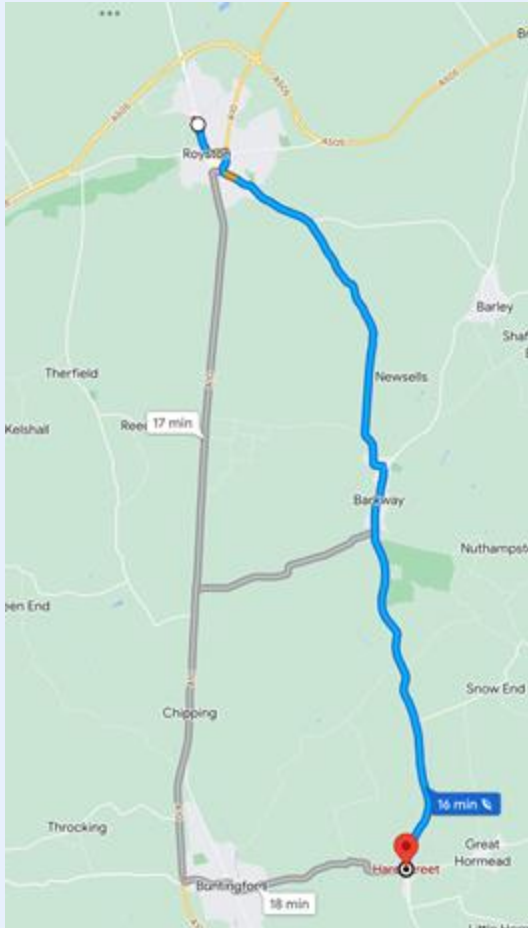
Fixed line: Our estimate is that only up to 10,000 people within the zone have access to an hourly or better service.



DRT: Substantially more people within the zone are within a 15 minute walk of a bus service.

# Metric 2: Journey times

Royston Station to Hare St Buntingford



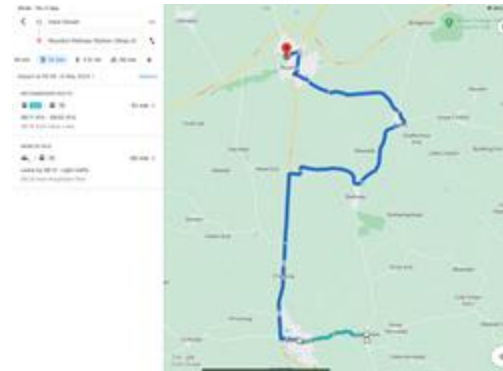
**Car**

- 16 minutes



**Fixed line**

- 84 minutes



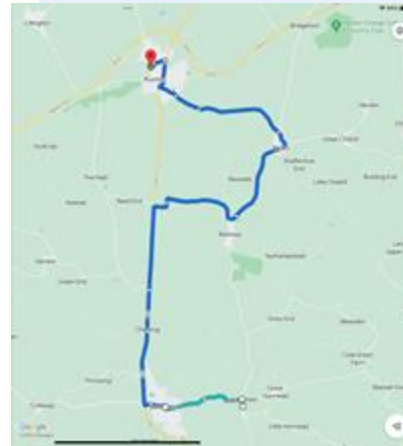
**On-demand**

- 32 minutes

# Metric 3: Frequency

## Fixed line frequency: Royston station to Hare Street Buntingford

- Bus service 18 every 2-3 hours (5 services per day)
- **Required Bus Connection**
- Bus service 331 every 1-3 hours (8 services per day)
- Span: from 0749 to 1757 (10 hrs 8 mins)



How can we compare frequency for fixed line transport with DRT?

## Total journey time penalty score

*Add a constraint (start at/arrive by) in the journey planning and calculate how long the total journey takes*

# Journey time penalty scores

For someone arriving at Royston station on the following trains, we looked at the real journey times

- 0846
- 1018
- 1828

For each we calculated the earliest possible arrival using timetables. For DRT we booked the trip one day, 1 week and 2 weeks ahead to account for different user behaviours (real trip requests were made and the DRT trips offered noted).

How does Fixed line match up to DRT in these situations?



## 08:48

Fixed: **112 minutes**  
DRT: **117/78/61 minutes**

## 10:18

Fixed: **163 minutes**  
DRT: **25/12/12 minutes**

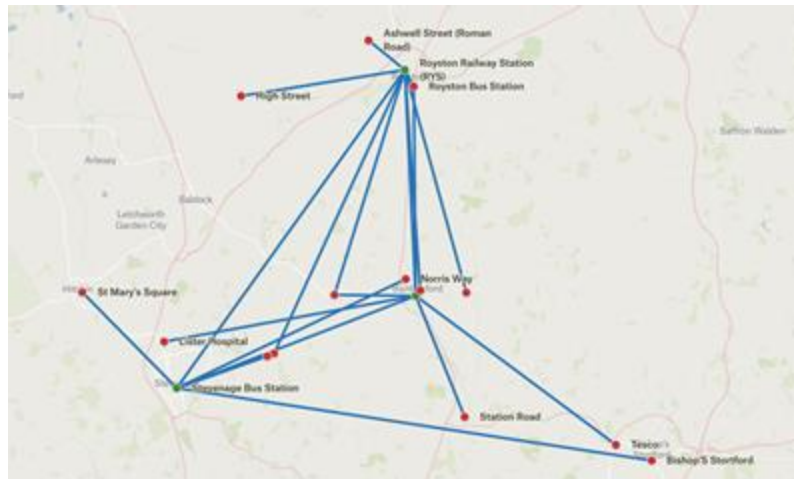
## 18:38

Fixed: **Not possible**  
DRT: **65/52/12 minutes**

# Metric 4: Resources

## DRT

- 4 buses cover 150 square miles

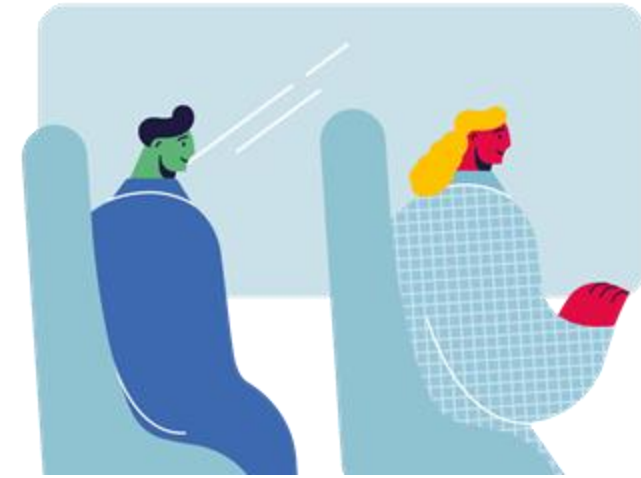


## Fixed line

- Make Bus Route No.18 more direct (a new service would be required for Barkway) +1-2 vehicles, double frequency & increase span by 2 hours
- Increase frequency of 331 bus and span by about 25%
- This would improve just **one** of the many different trips made by DRT

# Conclusions – What have we seen?

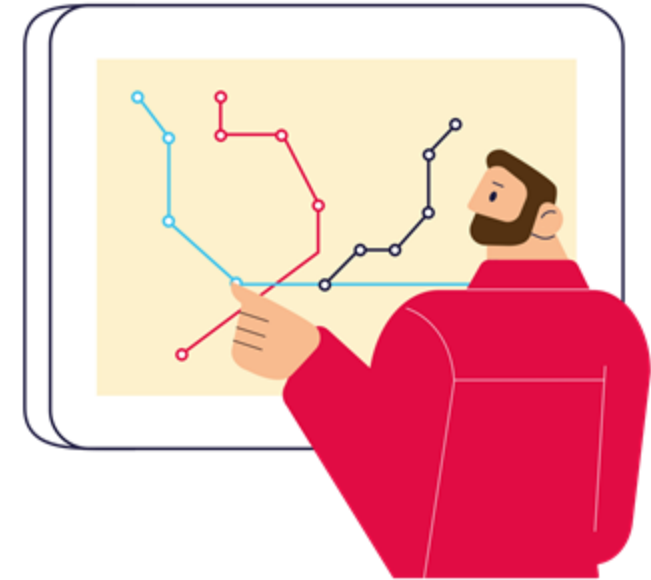
- DRT has enabled a large increase in PT Accessibility across Hertfordshire
- This has enabled journeys to be made that previously were impossible or required connections
- A frequent service, provided by DRT can minimise the “journey time penalty” and can be influenced by the booking window
- DRT and its associated resource can directly influence this penalty
- Evidence shows that to replicate the same benefit via fixed lined services, a larger economic cost would be required given the upscaling of additional vehicles and higher frequency routes
- Overall the results of the HertsLynx DRT has shown how 4,000 people who previously had no access to PT, can now be served with a new, innovative service and substantially improved access to PT for up to 40,000 more



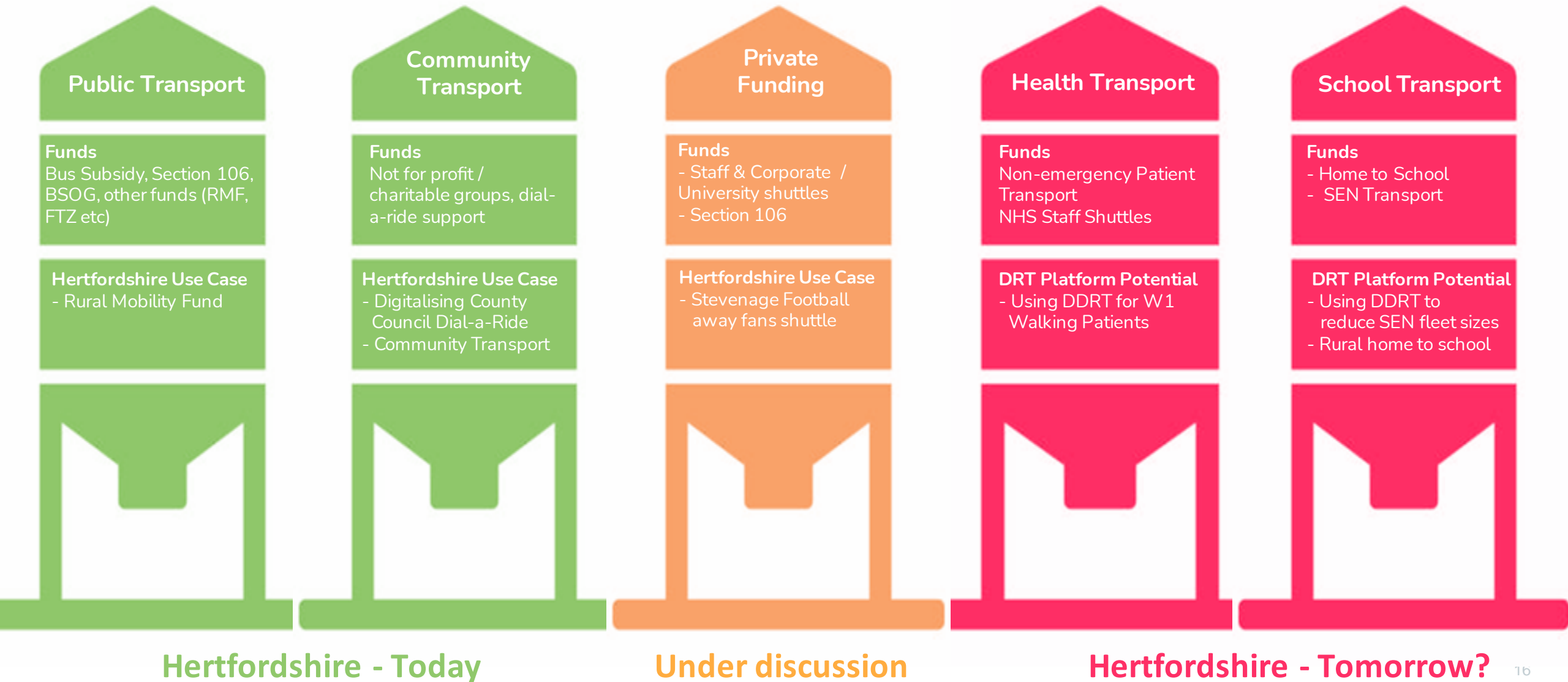
# Conclusions – What has HertsLynx Achieved?

**Hertslynx to-date has shown that behavioural change and modal shift can take place, in turn driving the success of the service**

- 2,600 trips per month, c.30,000 trips across a rolling 12-month period
- 34% of all journeys are feeding/collecting from Train Stations
- 75% of users from the service previously had access to car
- 74% of trips are shared with other users
- 89% of all journeys are booked through the app, 9% Website, 2% Call centre
- Up to 1 in 80 residents across the service area have used the service in the last month (600+ unique customers in the past month / 1,300 unique customers in the past 12 months) in an area that has historically had very poor public transport
- Trips are averaging 8.5 miles and around 20 minutes in duration □ Reflective of the service area



# Total Transport - Using Digital DRT solutions





# Key Factors and Metrics

DRT demand & service design depends on several factors

- demography
- geography
- existing public transport
- economical & political situation
  
- Ensure that the **service design matches the geography** of the region i.e. often feeder services or semi-flexible have stronger groupings and patronage than free floating. *E.g. we have 4 semi-flexible services with 95% grouping / 11 feeder services with over 90% groupings*
  
- Also, a great way to **reduce the cost per passenger** is to blend different forms of transport together – school, health, dial-a-ride etc. *E.g. Lincolnshire have done this with great success by cross funding call connect with school journeys.*
  
- **Be realistic with business cases. I.e., for a free floating DRT in a territory of 80K – 120k people, 100 – 200 square miles, estimate the following:**
  - a) 3 – 5 minibuses required to ensure good coverage of the zone*
  - b) 2 000 – 4 000 passengers / month after 2 years*
  
- If you only have funding for 1 – 2 minibuses, potentially focus on a specific problem such as a feeder service or semi-flexible





**PADAM**  
M O B I L I T Y

jack@padam.io  
+44 7772703276

