Rapidis

Fynbus

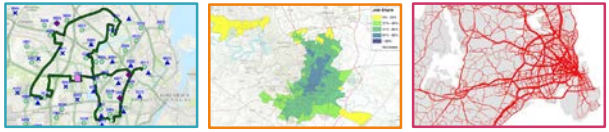
Optimized Scheduling in Demand Responsive Transport

About Rapidis

Software and tools for Transportation and Logistics

Esri Business Partner since 2003

All products and solutions are based on ArcGIS



1. Traffic Analyst provides tools for transport forecasting models and transit planning
2. Rapidis Logistics Planner for ArcGIS. 3 editions for Postal Routing, **Demand Responsive Transport** and Service Visits and Goods Distribution
3. Logistics Planner for ArcGIS are extensions for ArcGIS Desktop and Enterprise

Rapidis

Fynbus

1. Regional Transit Authority
2. Demand Responsive Transport; School busses, Medical trips, Paratransit….
3. 25.000 DRT orders per month
4. Competetive market – service level decided by municipalities

Disclaimer:
Fynbus data and screenshots of the administrative user interface are confidential.
To illustrate this case we have created a set of anonymous data and an interface based on ESRI map services.
The core planning software used in this case is the same as used by Fynbus.

Fynbus experience

Efficiency

- Total drive time
- Number of busses
- Time spent on planning
- Test more scenarios
- KM and CO2
- Adapt to demand change

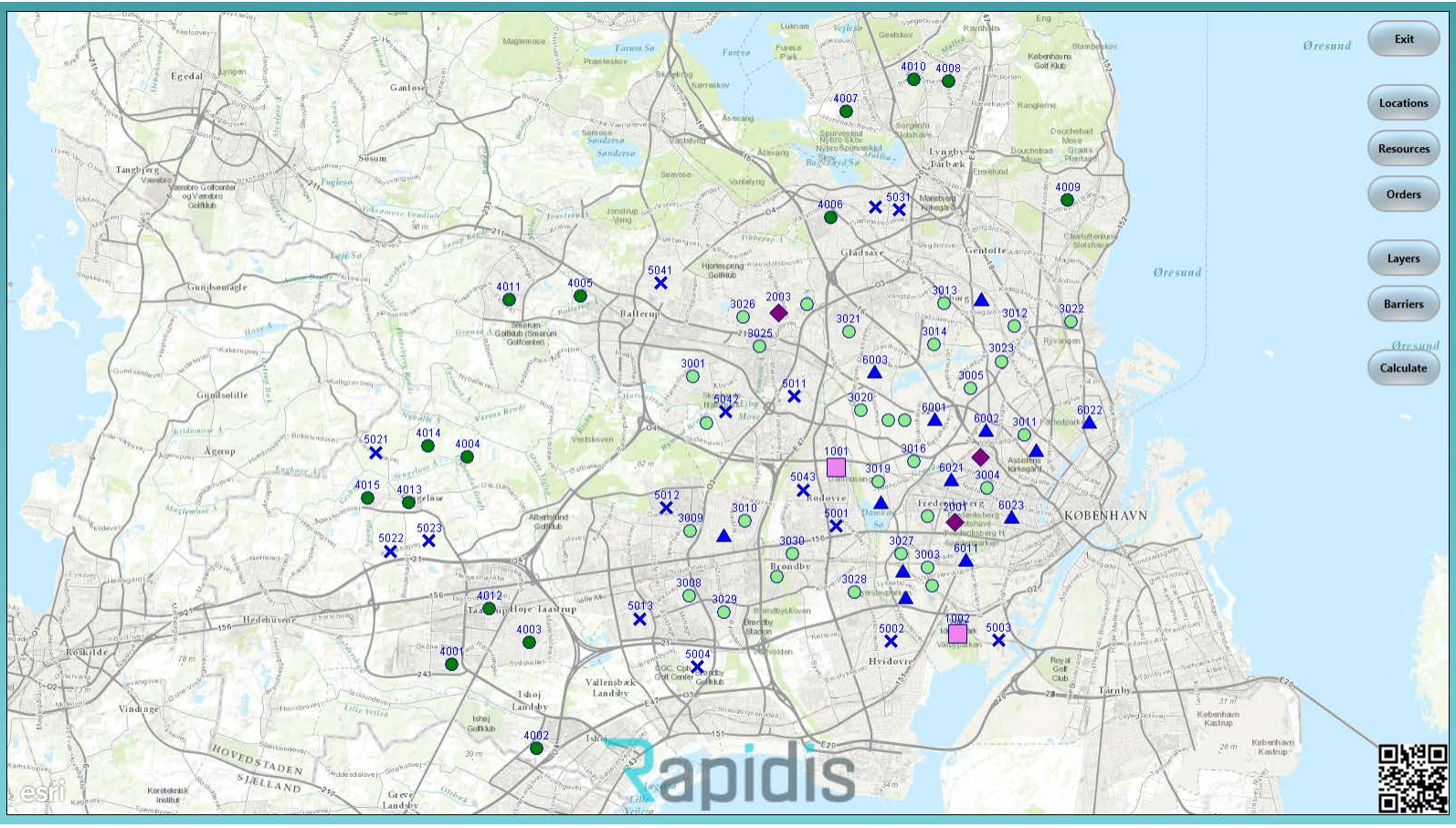
Restrictions and constraints

- Time windows
- Preferred driver
- Who can travel together?
- Maximum travel time

Passenger convenience

- Less individual travel time
- Service goals
- Late delivery option
- Early pickup option

DRT Scenario



Rapidis

Objective

The **best overall plan** for a fleet of vehicles

That is the plan that:

- Minimizes operational costs
- Meet all restrictions and constraints

Rapidis

Minimizing operational cost

Cost elements:

- Drive time between pickups and deliveries
- **Travel time for individual passengers**
- Start costs for additional busses
- Wait time for the resources
- **Pickup or delivery outside time window (if allowed)**
- **Exceeding max travel time (if allowed)**
- **Using resource outside preferred resource group (if allowed)**

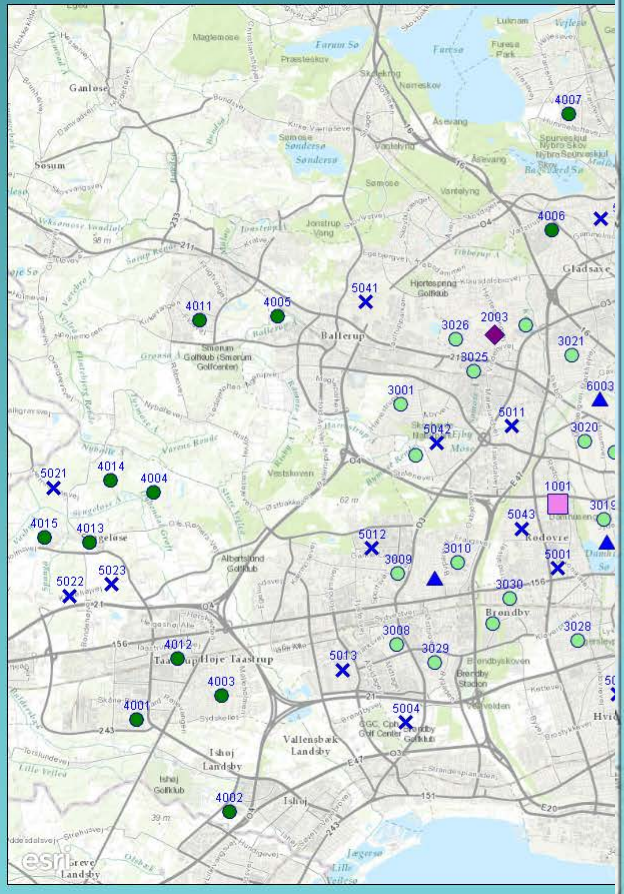
Rapidis

Restrictions and constraints

- Max. travel time for individual passengers
- Advanced use of Time Windows; begin task
- Late delivery or early pickup is optional
- Capacity and load; busses can have individual and multiple capacities for passengers, wheelchairs etc.
- Siblings, passengers with identical needs for transportation are identified and served with the same bus
- Order groups; when passengers may, may not or must travel together
- Qualifications, ensure that the bus/driver has the required qualifications
- Multiple pickups/deliveries; tools to make total service time realistic

Rapidis

Describing the busses as input



Resources

Resources used by demo.

Schweizerdalstien 57, 2610, Rødovre, DNK

1 Bus 1

Start Depot:	1001	Schweizerdalstien 57, 2610, Rødovre, DNK
End Depot:	1001	Schweizerdalstien 57, 2610, Rødovre, DNK
Seating Capacities:	8 3	
Qualifications:	A B	
Resource Groups:		
Max Work Time:	10:00:00	
Start Time:	6:00 AM	
End Time:	8:00 PM	

Advanced Settings

Start Cost:	0
Traveltime Scale:	1
Ignore First Wait:	1
Ignore Drive From Depot:	0
Ignore Drive To Depot:	0
Include Last Wait:	0
Scale Cost:	0
Duration Scale:	0
Duration Adjustment:	0

Break Settings

Exit

Locations

Resources

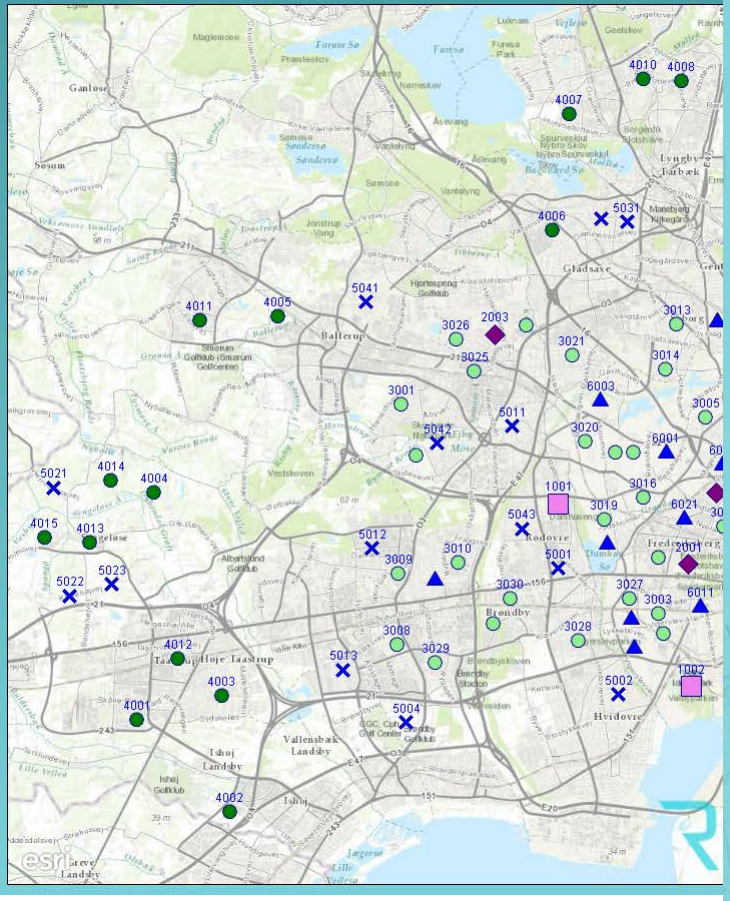
Orders

Layers

Barriers

Calculate

Orders and Tasks as input



Orders

Driving requests.

School Local

301 Mike Smith

		StartTW	EndTW	Service	Address
From:	3001			00:02:00	Hasselvej 50, 2740, Skovlunde, DNK
To:	2001	7:45 AM	8:00 AM	00:02:00	Frederiksvej 25, 2000, Frederiksberg, DN

Required Seatings:	1
Qualifications:	
Resource Groups:	
Order Groups:	School Local
Max Time:	01:00:00

Advanced Settings

Single Ride:	0
Resource ID:	-1
Fixed Time:	-1
Prioritized:	0
MaxTime Tolerance:	-1
Weight MaxTime Tolerance:	-1
Outside Groups Penalty:	-1
Fixed Distance:	0
Time Since Last Break:	-1
Add Direct Time:	0
Sibling ID:	0

Advanced Pickup Settings

Advanced Drop-off Settings

Exit

Locations

Resources

Orders

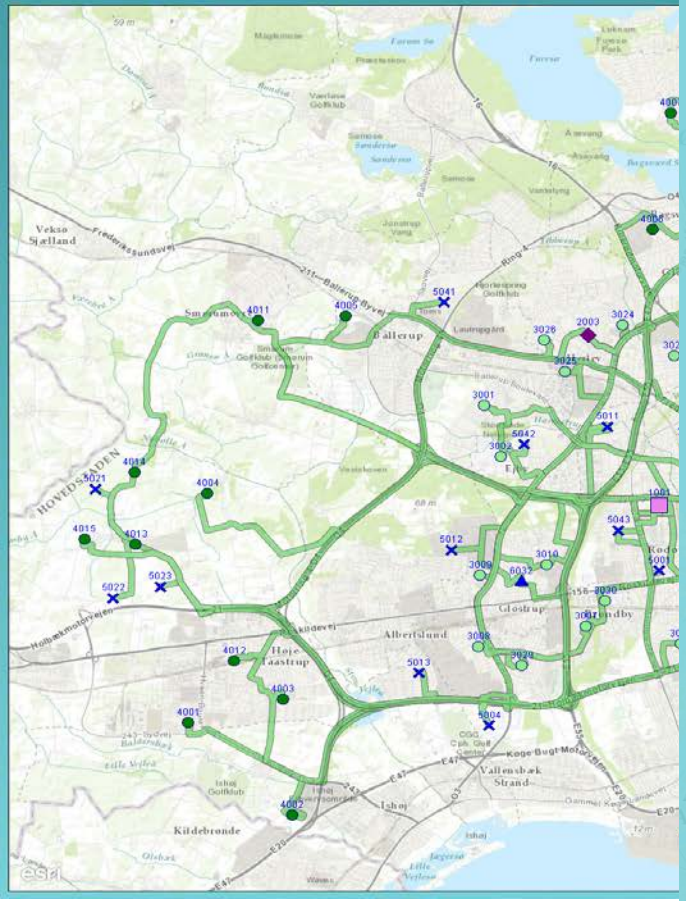
Layers

Barriers

Calculate

dis

The initial plan



Resource Schedules

Calculated resource schedules.

1 6:37:35 AM - 9:36:37 AM Bus 1

Detailed Schedule

Highlight

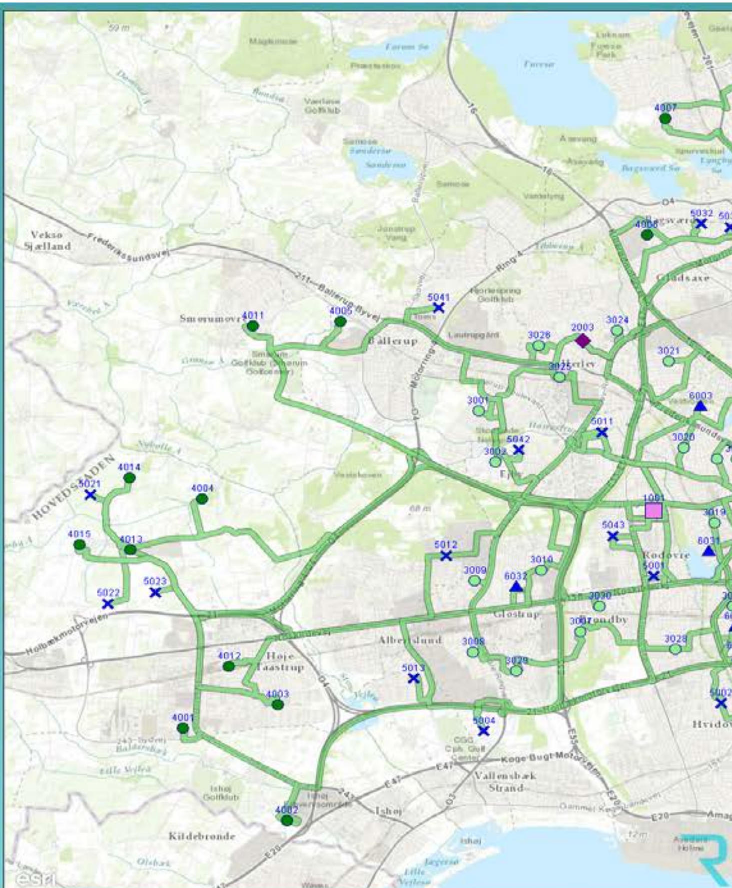
Resource schedule stops and details.

	OrderID	Task	Arrival Time	Service Time	Max Time
		Route Start	6:37:35 AM	00:00:00	
	309	Pickup	6:46:02 AM	00:02:00	01:00:00
	303	Pickup	6:59:04 AM	00:02:00	01:00:00
	318	Pickup	7:06:47 AM	00:02:00	01:00:00
	315	Pickup	7:14:03 AM	00:02:00	01:00:00
	306	Pickup	7:18:06 AM	00:02:00	01:00:00
	312	Pickup	7:27:02 AM	00:02:00	01:00:00
	321	Pickup	7:37:31 AM	00:02:00	01:00:00
	309	Drop-off	7:45:00 AM	00:02:00	01:00:00
	321	Drop-off	7:47:00 AM	00:00:00	01:00:00
	318	Drop-off	7:47:00 AM	00:00:00	01:00:00
	315	Drop-off	7:47:00 AM	00:00:00	01:00:00
	312	Drop-off	7:47:00 AM	00:00:00	01:00:00
	306	Drop-off	7:47:00 AM	00:00:00	01:00:00
	303	Drop-off	7:47:00 AM	00:00:00	01:00:00
	324	Pickup	7:49:37 AM	00:02:00	01:00:00
	324	Drop-off	7:54:21 AM	00:02:00	01:00:00
	532	Pickup	8:16:14 AM	00:02:00	01:00:00
	532	Drop-off	8:30:00 AM	00:02:00	01:00:00
	512	Pickup	8:38:23 AM	00:02:00	01:00:00
	511	Pickup	8:47:43 AM	00:02:00	01:00:00
	513	Pickup	9:04:56 AM	00:02:00	01:00:00
	512	Drop-off	9:15:00 AM	00:02:00	01:00:00
	513	Drop-off	9:19:34 AM	00:02:00	01:00:00
	511	Drop-off	9:25:42 AM	00:02:00	01:00:00
		Route End	9:36:37 AM	00:00:00	

2 6:37:07 AM - 8:06:19 AM Bus 2

Exit
Locations
Resources
Orders
Layers
Barriers
Schedule
Statistics
Calculate

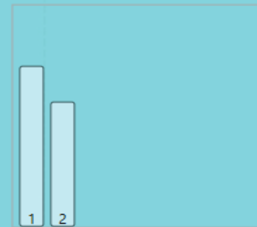
Same scenario



Resources Used

Number of resources scheduled.

12 Resources

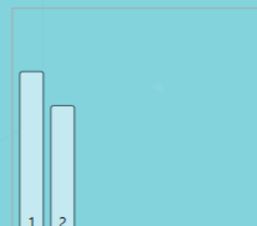


Calculation	Resources
1	9
2	7

Total Schedule Time

Total time used on all resource schedules.

1600 Minutes

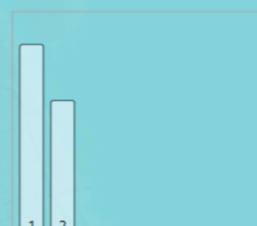


Calculation	Planning Time
1	1187.8
2	934.03

Total Travel Distance

Total travel distance used on all resource schedules.

900 kilometers

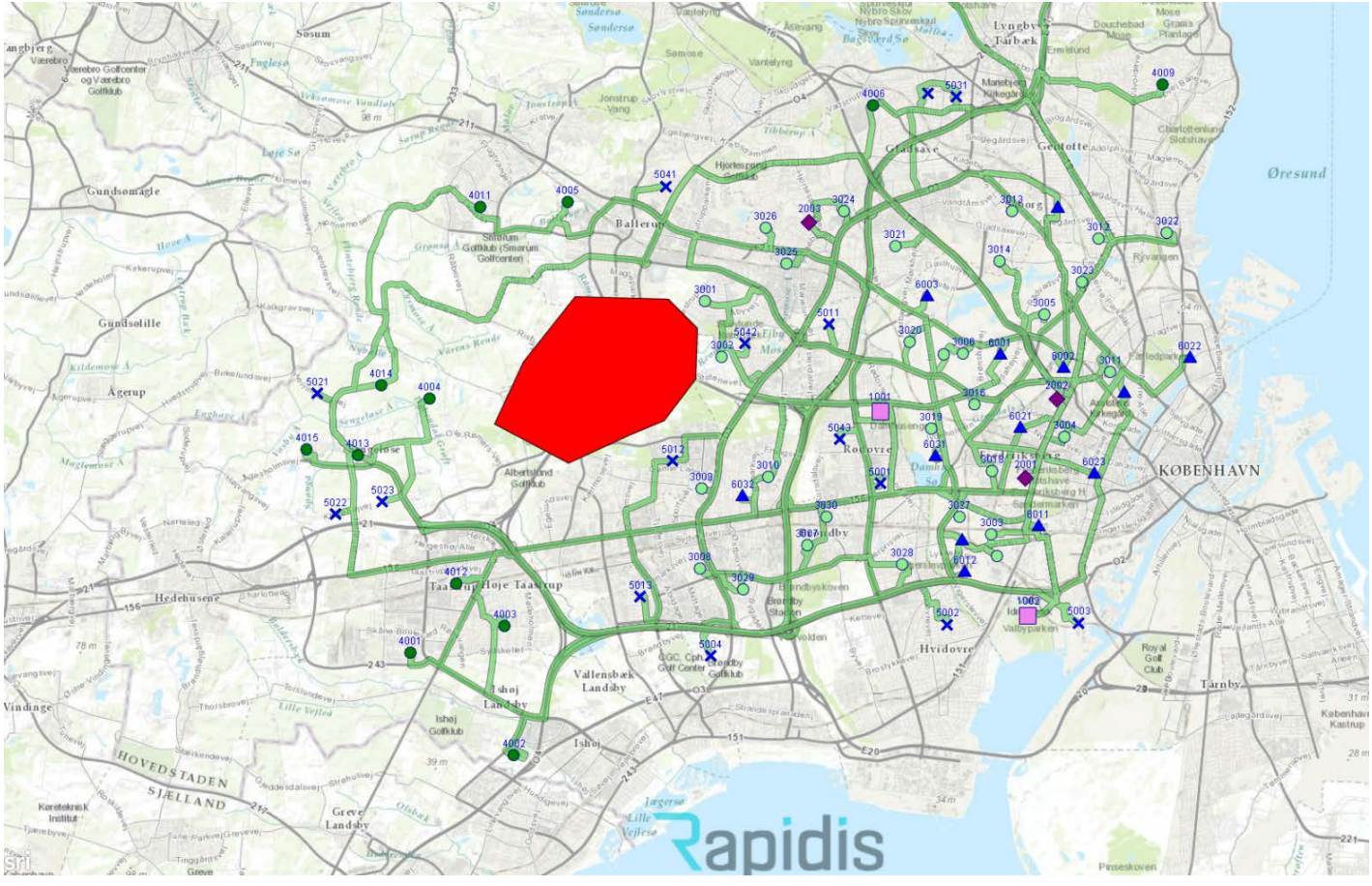


Calculation	Distance
1	808.08258
2	569.71296

Exit
Locations
Resources
Orders
Layers
Barriers
Schedule
Statistics
Calculate

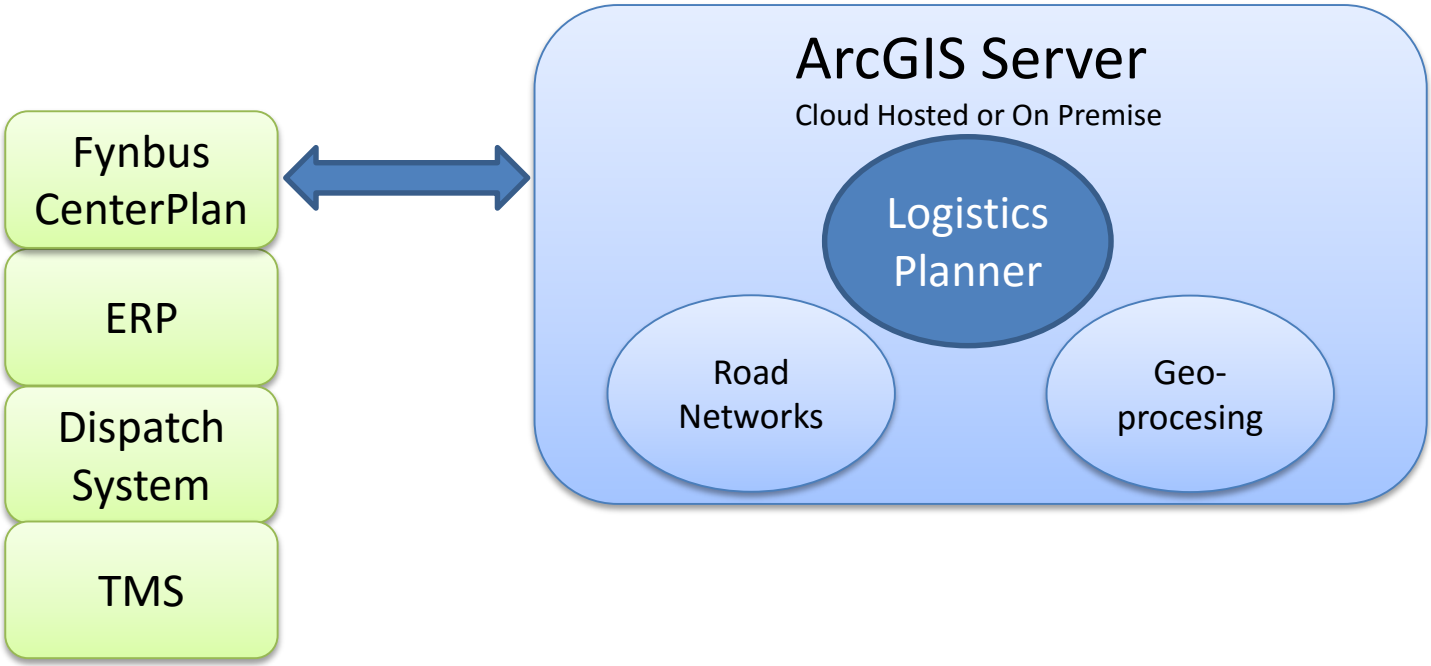
S

Zones and barriers



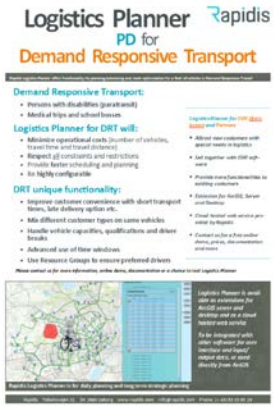
Rapidis

Fynbus Architecture



Materials available

Product Flyers

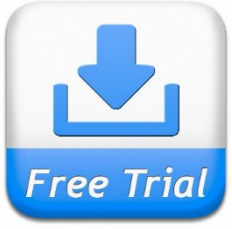


User case stories

Documentation

”Getting started guides”

Trials



Booth 606

Rapidis

www.rapidis.com

Rapidis

Tobaksvejen 21
DK – 2860 Soeborg
Denmark
Tel: +45 22 92 99 19
Email: ldp@rapidis.com

linkedinid