

T3/Rhôneexpress : a shared line between streetcar and LRT systems

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Key Presentation Take-Aways

- 3 kinds of servicing on one railway
- A challenge : a rapid link to the airport with a tramway
- An innovative management of junctions
- A commercial success and a safe system
- Some new challenges : new junctions and an increased servicing

Contents of the presentation

- Description (localization, layout, operation)
- History (initial aim, geographical context)
- The expected travel time
- The means to reach it
- Institutional set-up and actors
- Results and perspectives

Lyon T3 and Rhôneexpress

- an express light rail shuttle

Lyon's city centre ↔ Saint Exupéry airport

- a rapid tramway line

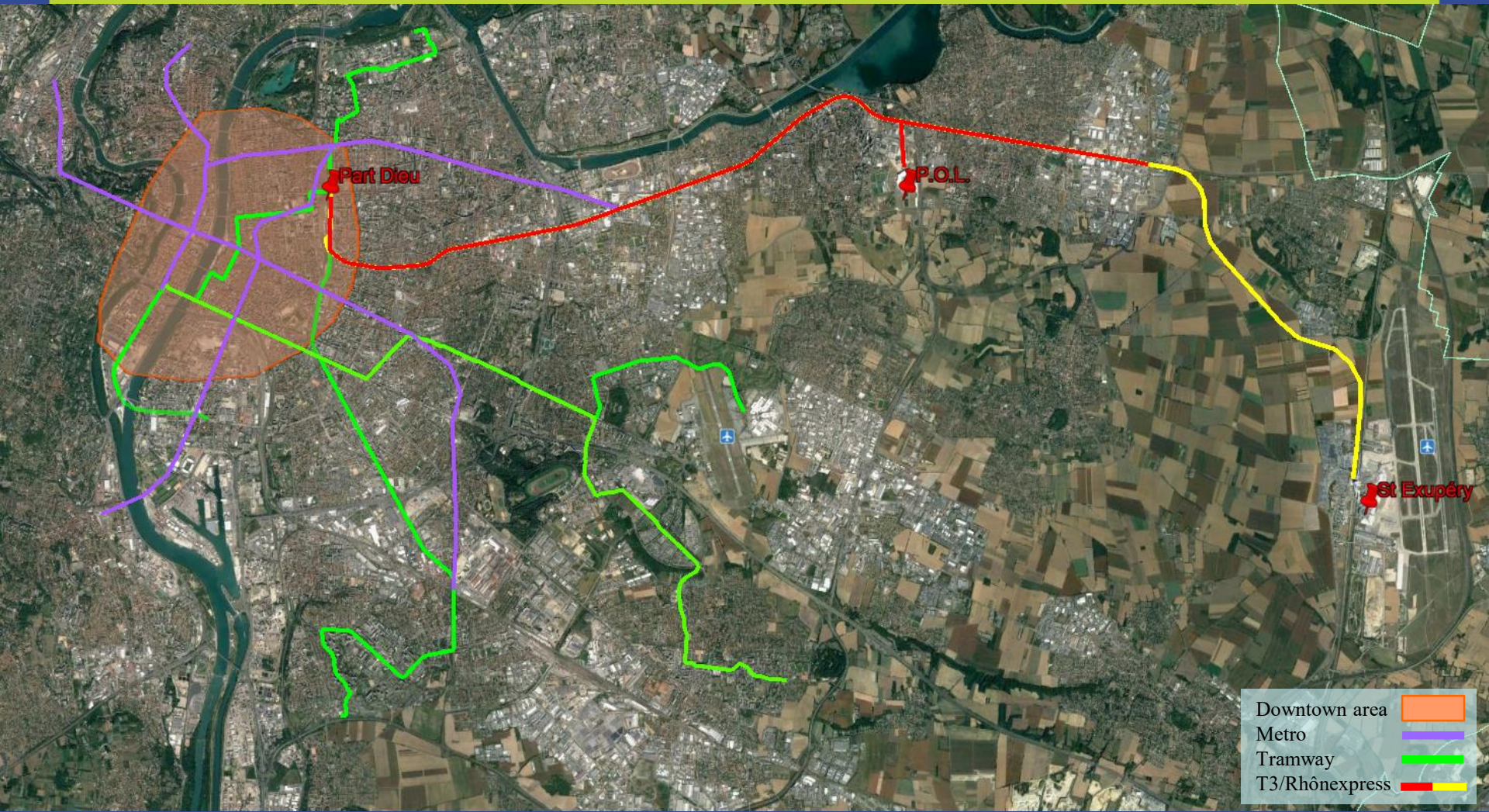
dense residential areas, business and industrial parks
in the eastern part of Lyon urban area

- some factual servicings

« Parc Olympique Lyonnais » (a large stadium,
hosting sports and entertainment events)



Lyon urban area and network

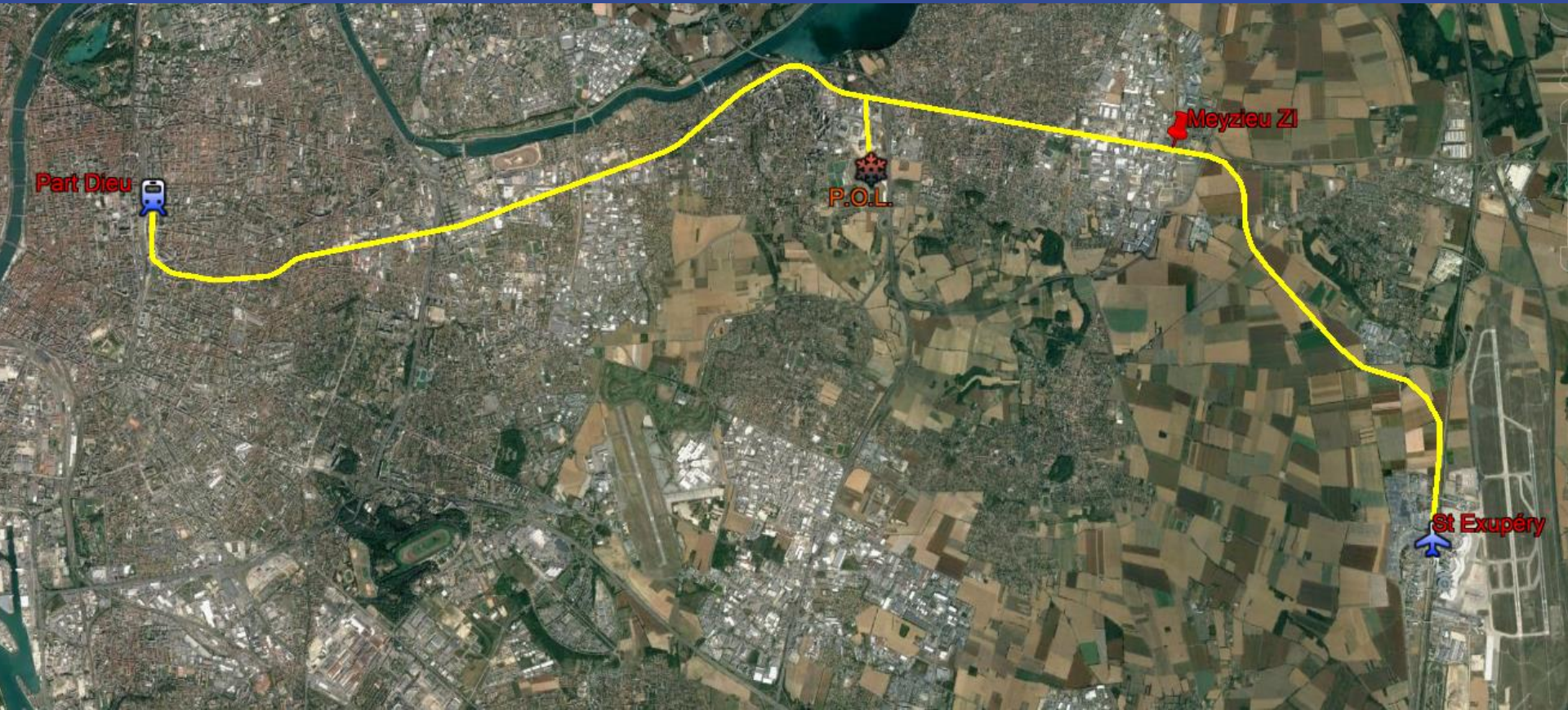


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The T3/Rhôneexpress line

- A 22 km railway, 2 lanes, shared on 15 km between Part Dieu and Meyzieu ZI



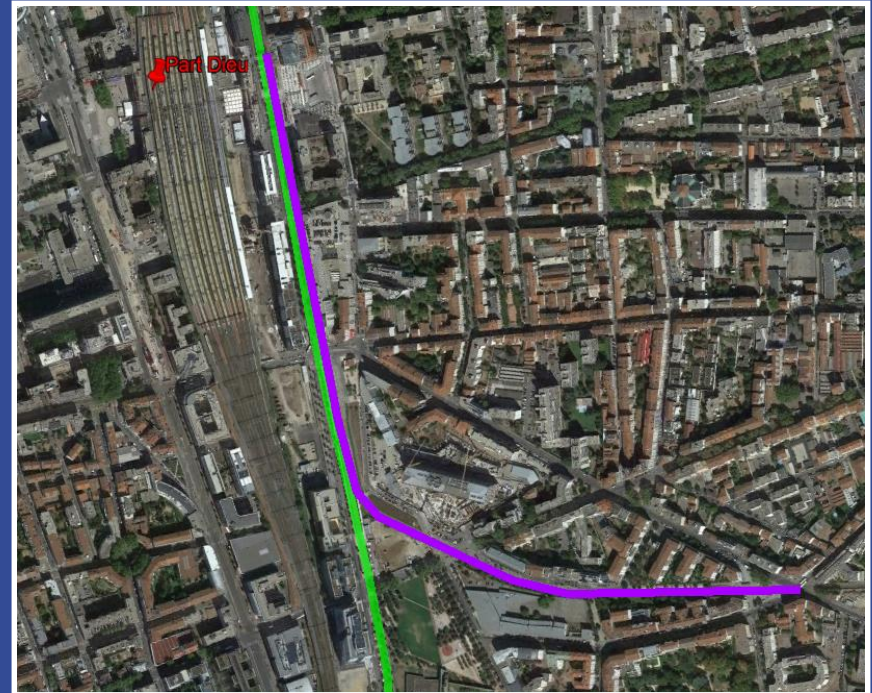
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 - junctions with traffic lights,
 - « on-sight driving », 50 km/h max



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- 1 (rapid) light rail section, shared T3/Rhx
 - junctions with gates and flashing lights
 - « assisted on-sight » driving, 70 km/h max



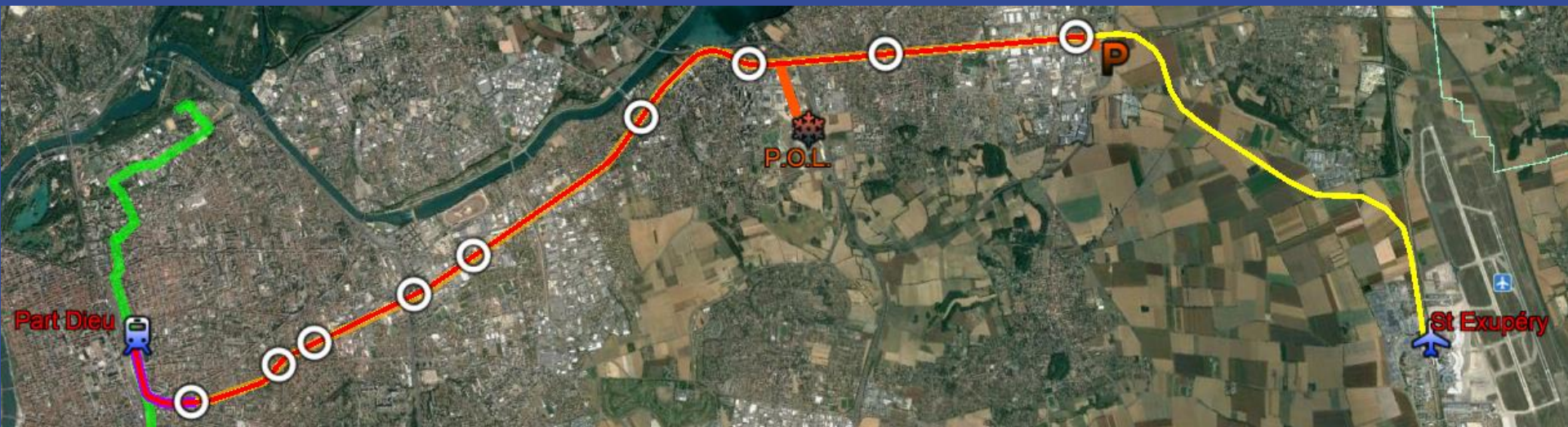
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- 1 rail section, dedicated to Rhx
 - grade separated crossings
 - « free-way » driving, max speed 100 km/h



The T3/Rhôneexpress line

- 13 stations
 - 1 complex terminus in Part Dieu
 - 9 stations the shared line
 - 1 access to the stadium
 - 1 airport terminus (Rhx)
 - 1 dedicated terminus with P+R (T3)



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The T3/Rhôneexpress line

- various types of junctions
 - 4 road junctions with traffic lights
 - 27 junctions with gates
 - A few pedestrians and cyclists junctions



The T3/Rhôneexpress line

- 2 connections with metro
- 1 connection with T4
- Several Park & Ride
- 1 cycle path all along the shared section



The T3/Rhôneexpress line

- 3 Rolling stocks
 - Citadis 302 (33m) & 402 (43m) on T3 *streetcar*
 - Stadler Tango (27m) on Rhx « *tram-train* »
- 14 mn interval (7 in Peak hour) on T3
- 15 mn interval on RHx
- Servicing adapted to demand on « POL » link



The initial goals and opportunities

⇒ a link to the airport and Part Dieu district

(< 30 mn, steady , to replace non reliable bus shuttles)

⇒ enhance the servicing of the eastern part of Lyon area

- new developments,
- connection with metro

<= an opportunity :

the old disused « CFEL » railway



* A shared decision to merge the 2 projects in one (*Sytral & Rhône*)

The expected travel time :a challenge

- ⇒ stay under 30mn to travel 15km through a urban area, while using an at grade light rail system
- ⇒ get a steady servicing (no alea due to congestion)
- ⇒ set-up a safe system (in « STPG » context)

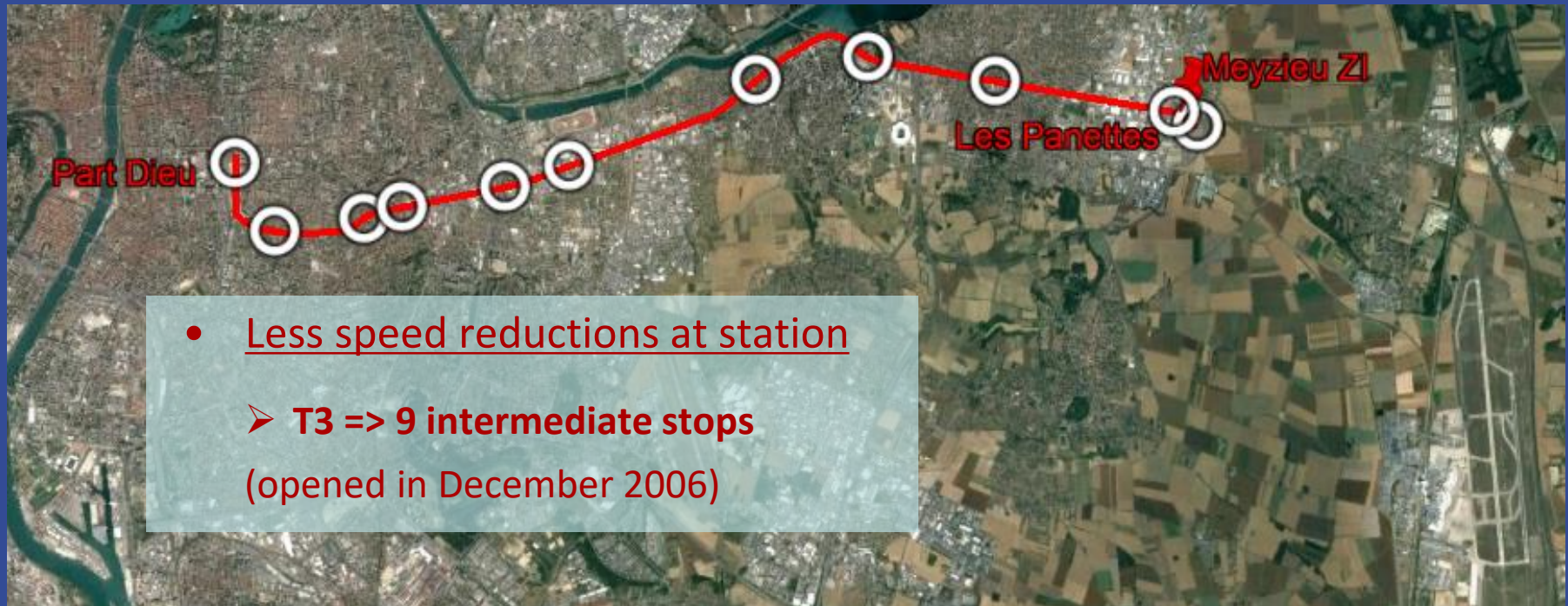
To reduce timeloss,

- A limited number of stops (longer interval, less stopping time)
- A limited number number of junctions and their equipment with automated gates (less speed reduction, less risk) on the light rail section

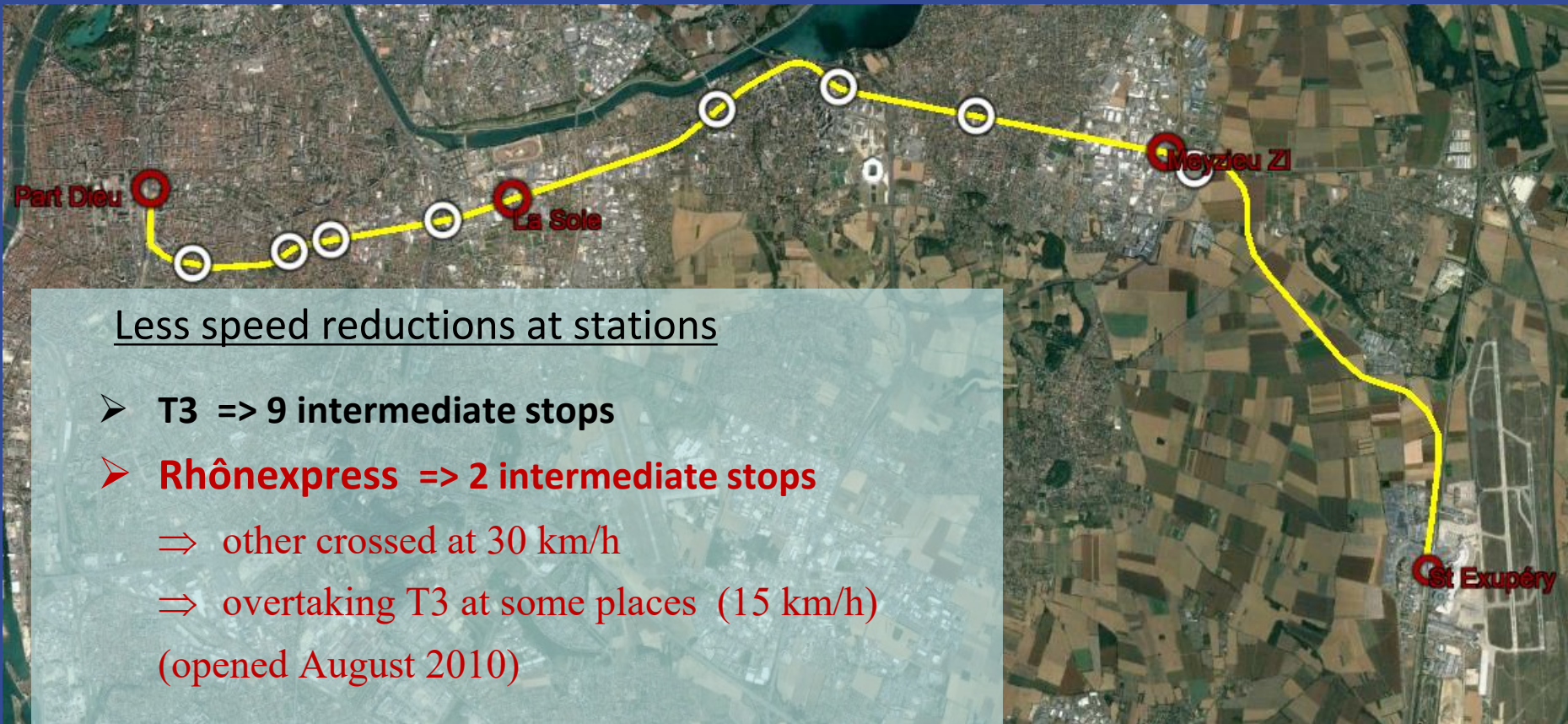


The means to reach the travel time

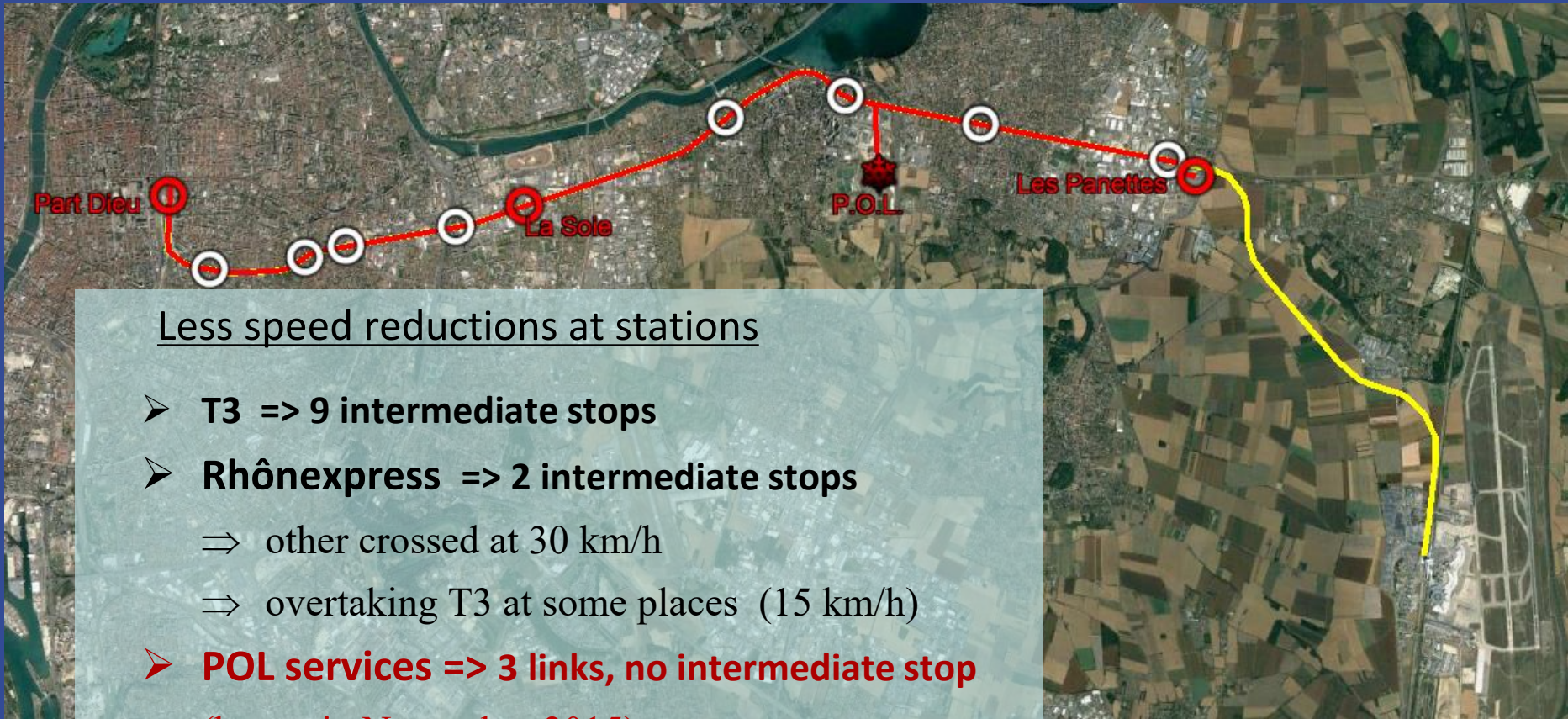
- A low number of stations : average interval 1,6 km
=> increase max speed becomes interesting



The means to reach the travel time



The means to reach the travel time



Less speed reductions at stations

- **T3 => 9 intermediate stops**
- **Rhôneexpress => 2 intermediate stops**
 - ⇒ other crossed at 30 km/h
 - ⇒ overtaking T3 at some places (15 km/h)
- **POL services => 3 links, no intermediate stop**
(began in November 2015)

The means to reach the travel time

Design and management of junctions

- urban section (50 km/h) => *normal junctions*
- rail section (100 km/h) => *no at grade crossing*
- light rail section (70 km/h, larger intervals) => ***junctions with gates***
 - ⇒ relevant to limit speed reduction for operation
 - ⇒ keep the same level of safety

risk ⇔ occurrence X severity
accept more severe accidents
if less occur
=> Crash at 40 km/h acceptable



Max speed at junctions
50 to 60 km/h, depending
on mutual visibility

The means to reach the travel time

Design and management of junctions

Functioning almost as level-crossing, but no full priority in case of dysfunction



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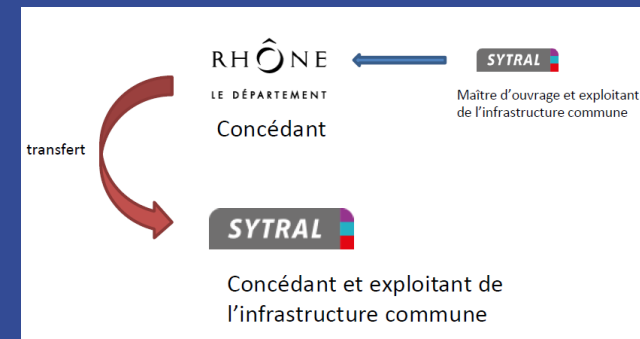
Institutional set-up and actors

At the beginning of the project*

- 2 PT authorities (Sytral and Rhône district)
- 2 kinds of contract / 2 operators
 - T3 integrated into TCL network, under public service delegation / Keolis
 - Rhx led as a PPP (30 years) / Transdev

* nowadays, due to institutional changes (Lyon metropole)

- transfer from Rhône district to Sytral (01 Jan. 2015)
- Still 2 operators and 2 contracts

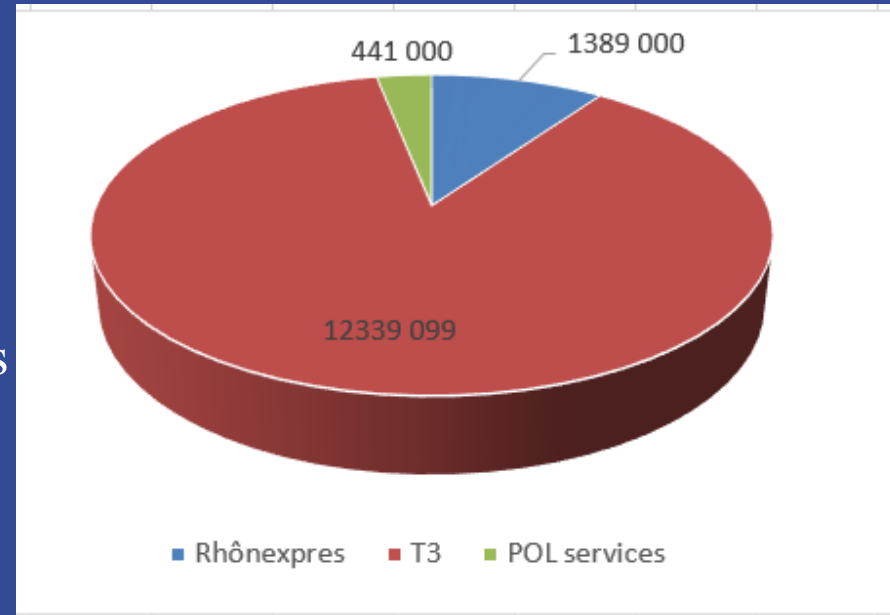


Results and perspectives

A commercial success

- More people transported than expected on both T3 and Rhônexpress
- A continuous increase*
- For the Year 2017 :
 - 1 389 000 travels on Rhonexpress
 - 12 339 099 travels on T3
 - 441 000 travels on POL services

** despite the operation had often been affected by disruptions (works, ...)!*



Results and perspectives

A commercial success

➤ Rhônexpress figures

➤ + 10,7 % in 2016

➤ + 8,3 % in 2017

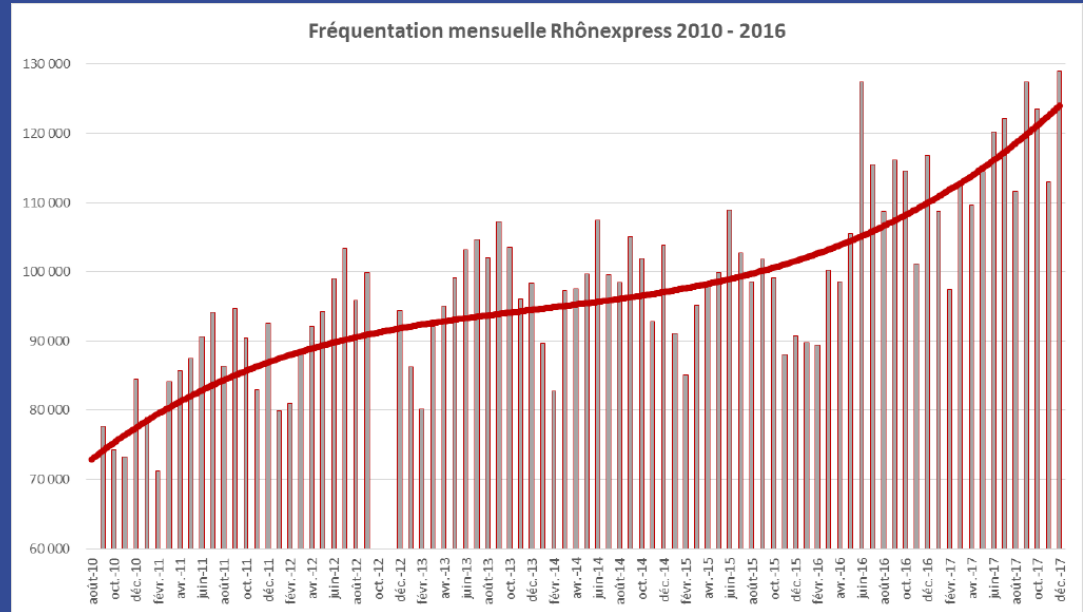
➤ 3 500 travels / day

➤ 1 200 000 km

➤ 92 % satisfied people

➤ 11% of passengers are workers of the airport area

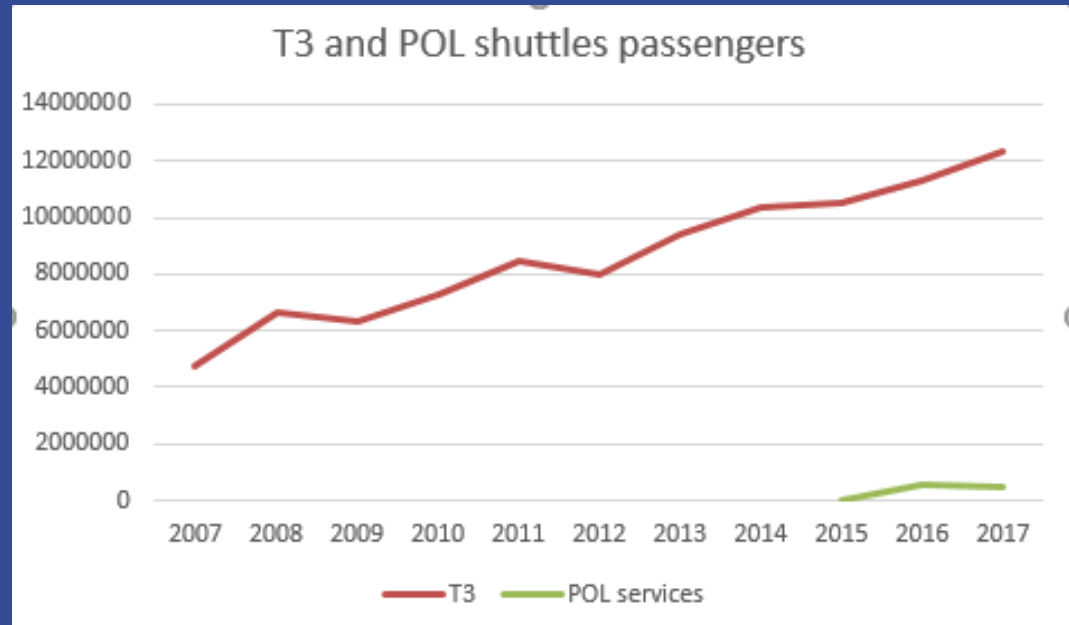
➤ Others are travellers from the airport and the (high speed train) station



Results and perspectives

A commercial success

- T3 figures
 - average increase of 11 % since 2010 on the T3 line
 - POL services operated since end of 2015 :



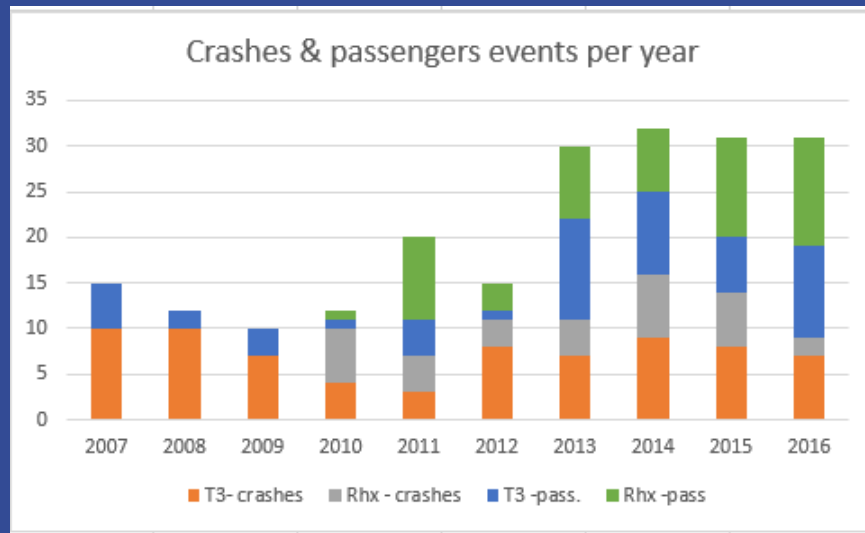
- More passengers in 2016 due to European soccer championship

** Despite the system had quite never been yet in normal conditions of operation on a long period!*

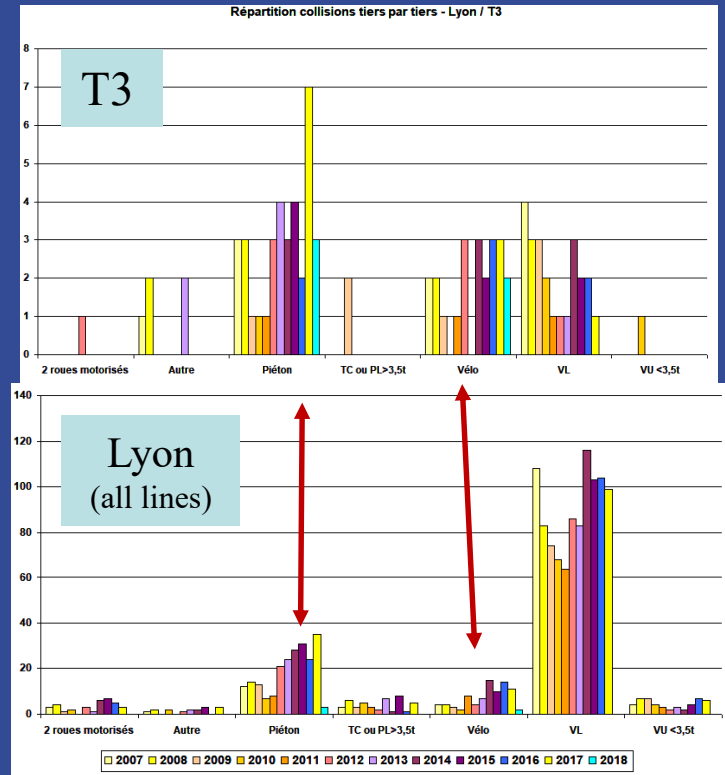
Results and perspectives

Regarding safety,
a rather steady number of events

➤ *Rhx not in operation before 2010*



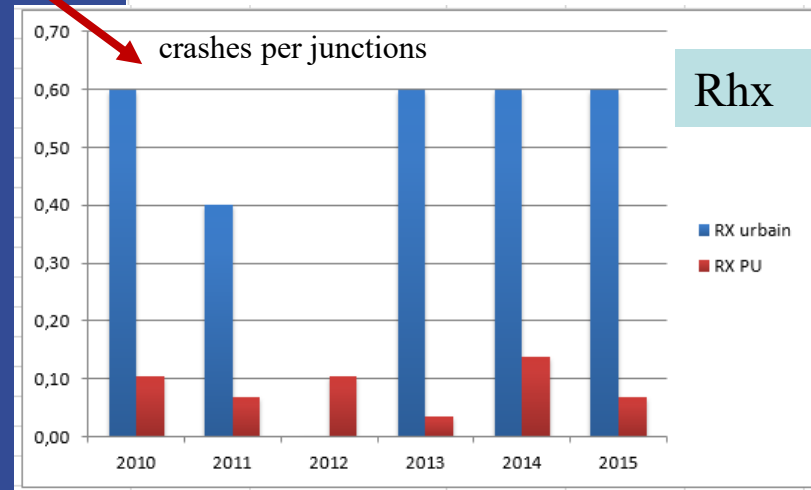
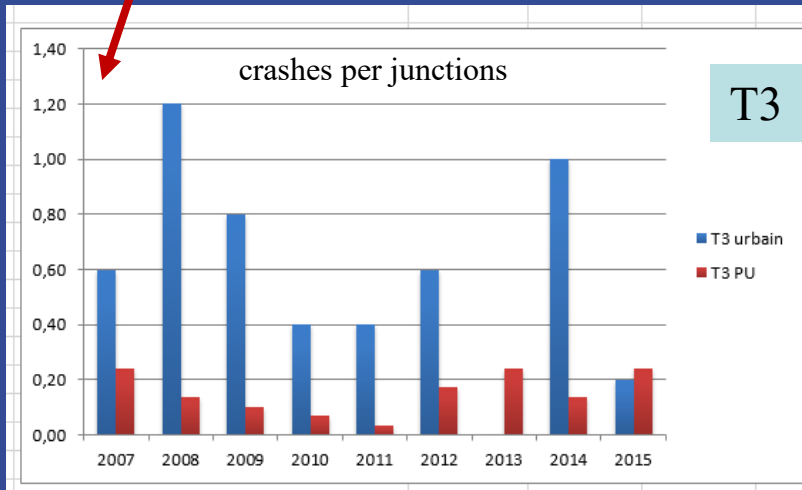
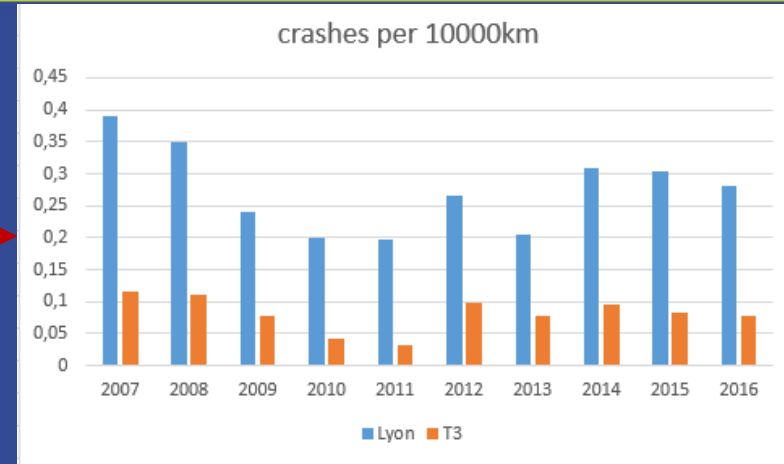
On T3 : a higher part of pedestrians and bicycles involved / all Lyon lines



Results and perspectives

As expected, a rather safe line...

- nb of crashes lower on T3 than whole Lyon network
- A big difference between urban and light rail sections



Results and perspectives

An intense rise of urbanization and activities all along the line

- Transformation of old industrial zones in residential areas
- Increase of housing density
- New business and service area
- In the meantime,
T3 and Rhx benefit from some urban projects
 - Part Dieu : trade, business, housing
 - P.O.L. (stadium) : business, entertainment
 - StEx airport : travels, related activities, business



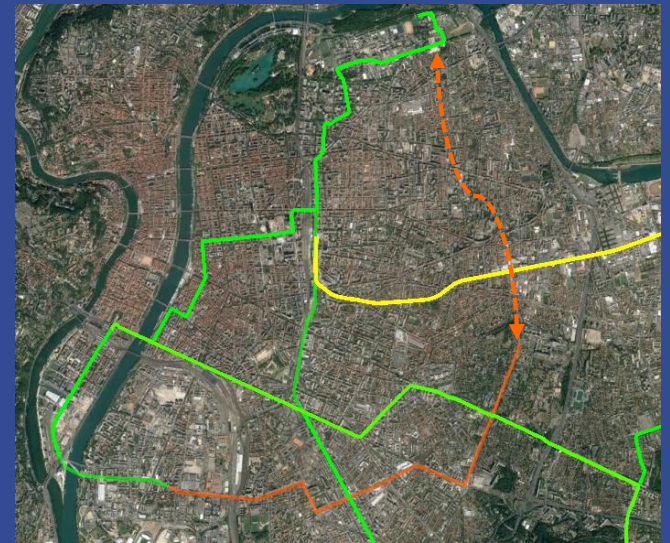
Some remaining issues and new challenges

- Difficult to keep the aimed travel time for Rhx during events at the stadium
- Safety issue with pedestrians and cyclists, not protected by the gates in junctions
- Car traffic still increasing in the area
- Saturation of P+R, of platforms & of rolling stocks at peak hours
- Disruptions due to works alongside the line



Some remaining issues and new challenges

- 3 new junctions to be implemented in the light rail section
- Servicing of the P.O.L. to become permanent all day long (15 mn interval)
- Increase of T3 frequency (5 mn) at peak hours
- The shared railway to be crossed by the new T6 tramway line



Thanks for your listening



Prepared with the contribution of Baptiste CORDHOMME (ENTPE)

Thanks for provided information and agreement for communication to



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