

LONG TERM MANAGEMENT OF URBAN TRANSPORT NETWORKS



NLRA
Webinars



TODAY'S SPEAKERS FROM EGIS



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€1.07 Billion TURNOVER
INTERNATIONAL **62%**

23%
Operation and
mobility services



77%
Consulting and
engineering

ENR 22nd
ENGINEERING NEWS-RECORD
GLOBAL RANKING

1st IN FRANCE

10th IN EUROPE

5th GOVERNMENT OFFICES

5th HIGHWAYS

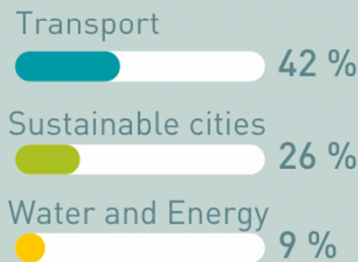
8th MASS TRANSIT AND RAIL

2020

€27 Million

DISTRIBUTABLE
NET PROFIT

Engineering
TURNOVER
BREAKDOWN



Urban **43**
parking lots in
France

17 Airports

Road **28**
operating
companies

16,000
employees
in the world

58%
Consulting and
engineering
42%
Operation and
mobility services

KEY FIGURES



€ 267 M
turnover



68%
urban transport



2150
employees



54%
international



32%
railways



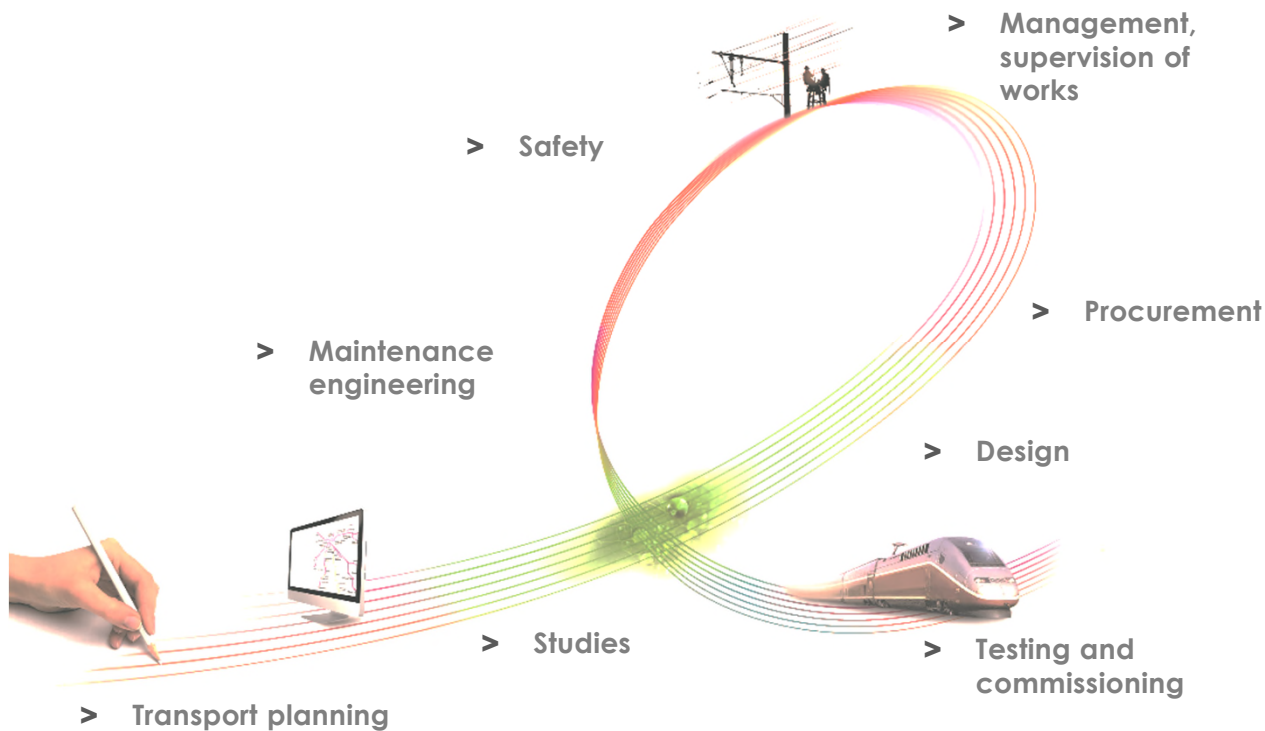
+50 years
of expertise

 *egis Business Unit Rail*

- Operational presence in **75** countries
- + **300** major projects commissioned
- Involved in **2/3** of LRT projects throughout the world

EGIS DESIGNS, ENGINEERS, BUILT AND SUPPORT MAINTENANCE OF RAIL ASSETS AROUND THE WORLD

Whole life cycle of a project



Tramway



850 Km

Metro



750 Km

Conventional railways



12 000 Km

High-speed lines



Depots / Stations



MAIN PROJECTS

 LRT

 MRT

 Railway

 CABLE CAR

FRANCE

- GRAND PARIS EXPRESS
 - Systems EPCM on lines 16,17 & 18 + 15 south
 - EPCM of civil engineering structures and infrastructures works for line 16
 - Coordination of the construction on lines 14, 16,17 & 15 south
- Lille MRT
- Lyon MRT - Lines A, B, C, D & extensions
- Marseille MRT
- RER EOLE Paris
- Rennes MRT
- CDG Express
- Grenoble LRT
- Lyon LRT - Lines 1, 2, 3 & T6 North
- Mantpellier LRT - Lines 1, 2, 3 & 4
- Nantes LRT - Development of new tram lines
- Nice LRT - Lines 2, 3 & 4
- Paris LRT - Lines 3 & 6
- Ile-de-France Rail city Link T11 Express
- Brittany - Pays de Loire HSL
- South Europe Atlantic HSL
- Rhine - Rhone HSL
- Grenoble Cable Car
- Paris Cable Car A

EUROPE

- Birmingham LRT
- Dublin LRT - Lines 1 & 2
- Luxembourg LRT
- Porto LRT
- Kista Stockholm LRT
- Lausanne MRT
- Belgrade MRT
- Rail Baltica - HSL Vangazi - Salaspils - Misa section in Latvia
- Rail Baltica - Riga Station
- Poland - Creation of 2 lines between Podleze - Tymbark & Szczyruc - Mszana
- Poland - Modernization of the line Chabowka / Nowy
- Irish National Network - Modernization of the signalization
- Design framework services for Network rail

AFRICA & MIDDLE EAST

- Alexandrie LRT
- Alger LRT - Line 1
- Casablanca LRT - Lines 3 & 4
- Jerusalem LRT
- Tel Aviv LRT
- Rabat LRT
- Sidi bel Abbès LRT - Line 1
- Cairo - People Mover
- Cairo MRT - modernization Line 2
- Doha MRT - Lines 1, 2 & 3
- Dubai MRT
- Jeddah MRT
- Madinah MRT
- Riyadh MRT - Lines 1, 2 & 3
- Downtown Nairobi - airport Jomo Kenyatta - Line Dugo Selo - Noska
- GCC Railway
- Kenitra Tangiers - HSL

ASIA - OCEANIA

- Macao LRT
- Manila LRT - Line 1
- Palembang LRT
- Surabaya LRT & Monrail
- Paramatta LRT
- Putrajaya LRT
- Phuket LRT
- Bangkok MRT - Lines blue, orange, pink & green
- Calcutta MRT
- Chennai MRT - Lines 1 & 2
- Mumbai MRT - Line 3
- Nagpur MRT - Lines 1 & 2
- Singapore MRT - Line North South
- Auckland City Rail Link
- Delhi - Merrut
- Java Railway
- Don Mueang-Suvarnabhumi-U-Tapao HSR
- Ulan-Bator Cable Car

NORTH AMERICA

- New York MRT - Canarsie Line
- Las Vegas LRT studies
- Montreal REM

SOUTH AMERICA

- Regiotram de Occidente LRT
- Guadalajara MRT - Line 3
- Medellin MRT - Line Patio - Talleres
- Santiago MRT - Line 3 & extension 4, 7
- Brasilia - Goiania - Passenger train
- Via Ferrea de Carajas - Freight
- National Railway of Colombia
- Rail network national of Chile
- Paso de los toros - Uruguay Freight
- Vitoria - Minas - Ferrovias Mixta
- Tren maya - tramo 4 & 5 south

SOME EXAMPLES OF OUR EMBLEMATIC ACHIEVEMENTS (LRT)



Luxembourg light rail line © Egis – Andrea Pagano

Lyon MRT & LRT 90 % of the Lyon's network realised

EPCM lines A, B, C, D and EPCM extension for lines T1, T2 and T6 Nord RhonExpress : engineering for construction consortium



©Midland Metro Alliance – Transport for West Midlands

Nice LRT Project filled with technological innovations

Nice LRT lines 2 and 3. Egis is the lead firm in the ESSIA programme management consortium.



©Métropole NCA – Didier Quillon

Birmingham Design of 6 line extensions for a large-scale light rail transit project in the UK

54.1km, 80 tram-stops
The Midland Metro Alliance consists of the WMCA, which owns the West Midland Metro, a consortium of design experts and a rail construction specialist



Luxembourg EPCM for the first LRT line in Luxembourg, between Luxembourg airport and Cloche d'Or

Since 2015, Egis has been the lead contractor in the comprehensive EPCM consortium for the Luxembourg light rail line
The first 5.4 km of line display several innovations which have given the project a distinctly technical aspect (SCIE system, ORTEC ...)

LONG TERM MANAGEMENT OF URBAN TRANSPORT NETWORKS



évolution

Compliance
Environment
Brand Cost Quality
service Maintenance
Availability quality
Asset image
Safety Service
Condition workers
travellers



A NETWORK-WIDE APPROACH FOR TRANSPORT AUTHORITIES

Network-wide level

Asset Management strategy and policy

Planning and cross-asset management processes



Asset Management Technical Assistance

Asset classes level

Life Cycle Management

Rolling stock

- Trams
- Metros
- Buses

Systems

- High voltage power
- Signaling
- Passenger information
- ...

Infrastructure

- Civil works
- Track bed
- Track
- Stations
- ...

Buildings

- Maintenance depots
- Park & Ride facilities
- ...



Asset Condition surveys

Asset Investment Planning

Works supervision

Asset Management Information Systems



IT assistance

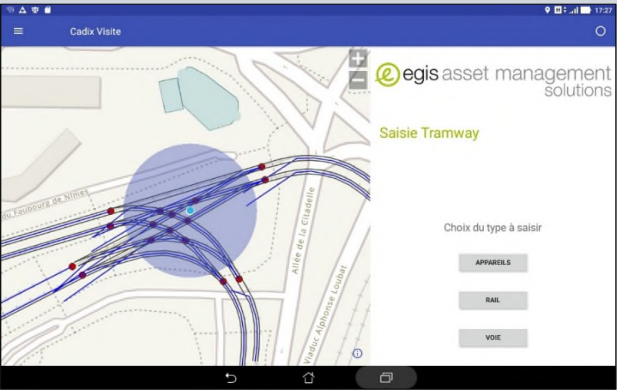
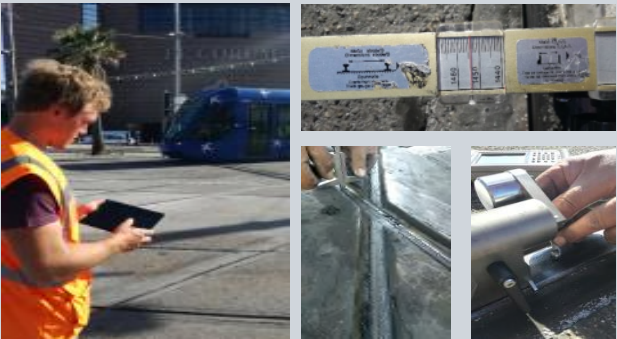
LIGHT RAIL TRACK – A SPECIFIC APPROACH FOR ASSET MANAGEMENT



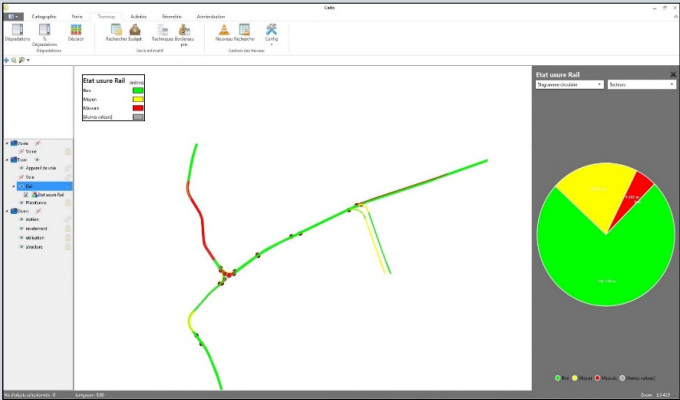
Implementing an AM approach for light rail track requires to take into account contextual, technical and organisational issues

EGIS IS DEVELOPPING IN-HOUSE SOLUTION FOR LIGHT RAIL TRACK ASSET MANAGEMENT

Mobile Asset Condition Surveys



Desktop AM solution



Asset condition synthesis

Maintenance and renewal scenario analysis



Visualization of results on GIS or communication supports



A STRONG NEED OF ENGINEERING CAPABILITIES FOR TRACK ASSET MANAGEMENT

- Asset condition surveys
 - Documentation and inputs analysis
 - On-site investigation and measures
- Asset Investment and Maintenance Planning
 - Definition of the maintenance strategy
 - Technical and financial trade-off
- Works supervision

Main objective is to find the best balance between :

- **heavy maintenance planning,**
- **renewal planning**
- **and risks reduction,**

but not to delay works.

TRACK MAINTENANCE OPERATIONS

Routine Maintenance



Heavy Maintenance



Renewal



GRENOBLE LIGHT RAIL NETWORK CASE STUDY

- Egis has been working for many years for Grenoble Transport Authority (the SMMAG) for the planning of and renewal of Light Rail Tracks
- On-going contract since 2018 with a partner, Egis being in charge of Light Rail Track
- Historically, maintenance operation covered in these contract have been :
 - Rail replacement (mainly in curves)
 - Switches and crossings replacement and upgrade
 - Track reinforcement

INTEGRATING HEAVY MAINTENANCE IN THE SCOPE OF RENEWAL CONTRACTS : AN ADDITIONAL TOOL FOR THE TRANSPORT AUTHORITY

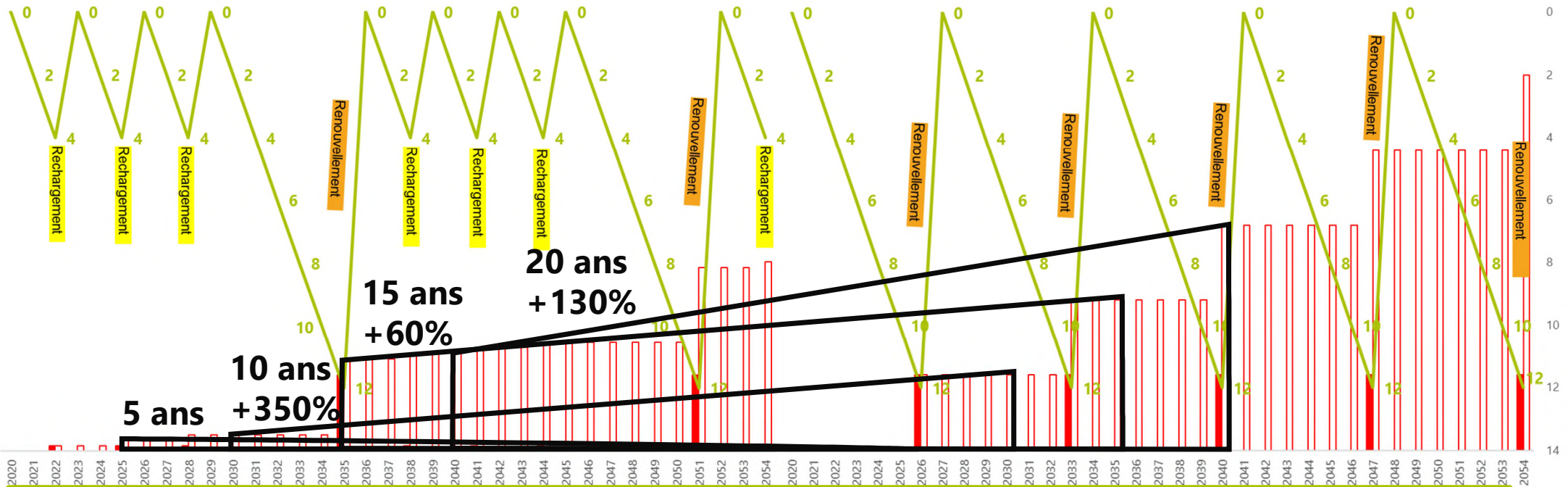
- In 2019, a switch replacement has been delayed, because of its strong impact on lines operations
- Additional analysis allowed to demonstrate that, by performing heavy maintenance on this switch, its renewal could be delayed with a limited risk on operation
- To allow the required responsiveness, heavy maintenance has been managed within the existing renewal contract
- The operation being a real success, Egis recommended to sustain this approach and extend it to grooved rail in curves



ILLUSTRATION OF THE BENEFITS OF THE APPROACH

Cycle de vie avec rechargements de rail avant renouvellement

Cycle de vie sans rechargement avant renouvellement



Integrating heavy maintenance in the multi-year asset investment planning allowed an enhanced vision of the track lifecycle, providing the asset manager an help to implement optimal asset management scenario



THANKS FOR YOUR ATTENTION



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