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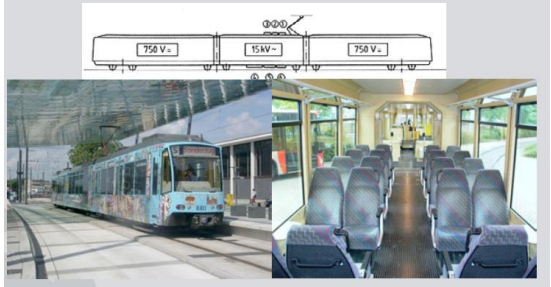
HYBRID PT MODE INTEROPERABILITY AND SUSTAINABILITY (TÓPIC MG 5.5 – 2015 – CSA, 12 a 18 M€; RIA 2 a 4 M€)

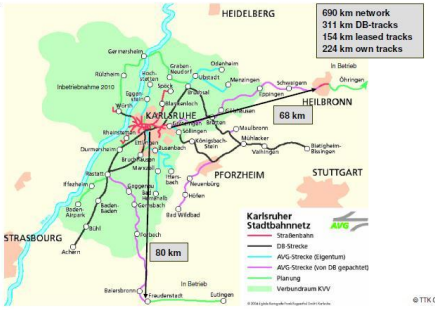
The dual mode vehicle



Length above coupling	37,61 m	Max. acceleration	1,0 m/s²
Width	2,65 m	Seating	100
Height	3,31 m	Standings	123 (4 Pers./m²)
Max. speed	100 km/h	Voltage	15kV AC und 750 V DC

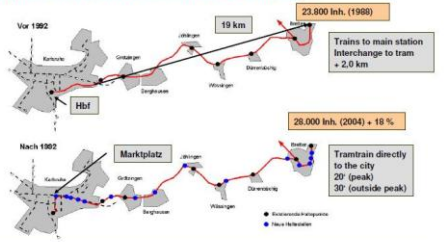
Tram-train technologies: concepts and comparisons

The network



Tram-train technologies: concepts and comparisons

Why Karlsruhe started tramtrain, the Bretten story…



Interchange-free and regular connections until late at night with additional stops are the pre-condition to motivate car-users to change to PT

Tram-train technologies: concepts and comparisons

Operations

Long hours of operation
> 05:00 - 01:00 / 02:00

Continuous, scheduled operation
> Fixed intervals, same recurring minutes

Interconnected timetables (bus ↔ rail)
> Buses as feeder services

Comfortable Vehicles
> A/C
> Bistro
> panorama windows

Legally a tram in the city and a train in the region
→ **passengers don't care!**

Tram-train technologies: concepts and comparisons

Tramtrain in Europe – Mulhouse
Real tramtrain – dual voltage – tracksharing with heavy rail

Tramtrain in Europe

- German development becomes more and more difficult
- France is a dynamic market under the SNCF/Alstom umbrella
- CAF and Vossloh supplied vehicles for the first (smaller) Spanish tramtrain projects
- UK tramtrain trial is progressing

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PROJECT_IDEA: HYBRID PT INTEROPERABILITY IN METROPOLITAN AERAS 2015-2020

OBJECTIV: SUSTAINABILITY OF URBAN, SUBURBAN AND REGIONAL MOBILITY;
ENERGETIC EFICIENCY;
ORDERING AND PLANING OF URBAN REQUALIFICATION;
OPTIMIZATION OF SUSTAINABLE URBAN MOBILITY PLANS;
OVERCOMING AUTOMOBILE DEPENDANCE

ENTITIES: UNIVERSITIES, INDUSTRY, AUTHORITIES AND PUBLIC OPERATORS

UNIVERSITIES: IST, UNL, KARLSRUHE, LEEDS, IFSTAR, LET, CDV, ISQ

INDUSTRY: AIP, EMEF, ISQ, EFACEC, (THALES, BOMBARDIER, SIEMENS, ALSTOM, SKODA)

AUTHORITIES: AMTL, AMTP; GEMPT; K V V; CTRM; CIM COIMBRA , A'URBA , ADEUS, EMTA , ATM , PRAHA

OPERATORS: CCFL/ML; METRO OF PORTO; MST; MMONDEGO; CP; AVG, TM, RATP, SBB, DPP, UITP; VDV

PRESENTATION OF PROJECT: **RIA part –** 31/03/2015 ; **CSA part** – 27/08/2015 (see pages 68 and 69)

CITIES: LISBOA; PORTO; COIMBRA; MANCHESTER; KARLSRUHE; BORDEAUX; MULHOUSE; SHEFFIELD; STUTTGART; MADRID; LEEDS, PRAGA, PARIS, STRASBOURG

COUNTRIES: PORTUGAL, FRANÇA, ESPANHA, ALEMANHA, INGLATERRA, REPÚBLICA CHECA

DURATION: 4 OR 5 YEARS

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SUB-PROJECTS, RESPONSIBLES

SUB-PROJECT: (UNIVERSITIES)

EVALUATION OF TCSP CORRIDORS / NETWORK AND FARE SYSTEM (IST, LET);

TECHNOLOGICAL INNOVATION ON ROLLING STOCK/CONVERSORS (IST; UNL; IFSTAR);

DECISION MODELS (LEEDS, IST, LET, CDV)

SUB-PROJECT: (INDUSTRY)

ROLLING STOCK/CONVERSORS (EMEF, EFACEC; BOMBARDIER/SIEMENS/ALSTOM);

INFRASTRUCTURE /GAUGE/ TRACTION NETWORK (REFER, EFACEC; SBB);

INDUSTRY IMPACTS (AIP; ISQ; UITP)

SUB-PROJECT: (AUTHORITIES)

FARE SYSTEM INTEGRATION (AMTL;AMTP; EMTA; RATP; CRTM)

TICKET SYSTEM AND INFORMATION (AMTL; AMTP; K V V; CTRM);

INTEGRATION AND DEVELOPMENT OF URBAN RAIL STRATEGY (K V V; GEMPT; AMTP; AMTL;EMTA)

SUB-PROJECT: (OPERATORS)

INNOVATION AND OPERATION/EXPLORATION COSTS IMPACTS (AVG; CCFL/ML; MP;SBB; RATP)

TIMETABLE SYNCHRONIZATION (ONE TIMETABLE) (CCFL/ML; MP; MST; CP; AVG; DPP; VDV)

1ST PHASE (2015/6): SoA + EVALUATION(PORTUGAL, INGLATERRA, FRANÇA, ALEMANHA, ESPANHA, REP.CHECA)

2ST PHASE (2016/18): RESEARCH (TECHNOLOGICAL PROJECTS; MODELS; PLANS AND DECISION) – RIA part

3ST PHASE (2018/9): DISSEMINATION WITH PROGRAM – PROJECTS AND SUB-PROJECTS – CSA part

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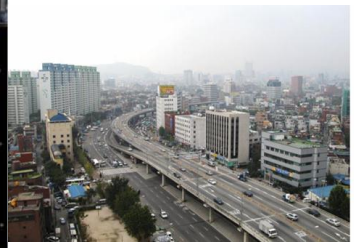
OUT-PUTS: DEMAND MODEL AND SOCIOECONOMIC IMPACT EVALUATION PROVISION MODEL WITH "DOOR TO DOOR" SERVICE WITH RAIL/ROAD HYBRID MODE TICKET SYSTEM INNOVATION TIMETABLE SYNCHRONIZATION MODELS CONVERSORS TECHNOLOGICAL INNOVATION INTEROPERABILITY OF URBAN RAIL HYBRID MODE IMPACTS INNOVATION OF THE TECHNOLOGIC SIGNALISATION SYSTEM AND RAIL INFRASTRUCTURE SUMPs AND DECISION-MAKING MODELS HYBRID MODES IMPLEMENTATION METHODOLOGICAL GUIDEBOOK (SAFETY) HYBRID MODES TECHNICAL REFERENCES FOR TENDERS

THANKS FOR YOUR ATENTION

carlos.gaivoto@carris.pt

LRT: Stuttgart



BHLS: Paris

FCT Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

ANA Aeroportos de Portugal