



**Nomad Digital**

# Proposal : An Intelligent IP Transport Infrastructure for Rail

to improve the relative attractiveness of public transportation

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## Nomad Digital

- ❑ A European high-tech start-up with global leadership in a new and rapidly expanding market (provision of high bandwidth IP data connectivity solutions to moving vehicles)
- ❑ Founded in 2002 and now profitable. >50 employees with offices in UK, Canada, US, Dubai, China and India
- ❑ National roll-outs in Norway and Holland using Nomad
- ❑ The market for IP communication to trains will grow to €1-2bn/annum within 5 years (non-safety critical only - and connectivity only )





# Used the world over

**Utah Transit Authority**  
Provision of WiFi on passenger commuter trains involving dedicated 5GHz WIMAX network with cellular backup in regions

**Virgin West Coast Main Line**  
Passenger WiFi for entire fleet, with support from Nomad's service desk Agreement with Virgin Trains held through a Concession Model

**Norges Statsbaner (NSB)**  
Fleetwide rollout for passenger WiFi & entertainment applications, as well as operational applications using FM software

**Wuhan Metro (Trial)**  
WIMAX tunnel on metro train

**Rotem Maglev (Trial)**  
WiFi & live CCTV streaming

**Storstockholm Lokaltrafik (Trial)**  
Passenger WiFi & operational apps

**CCJPA (Trial)**  
WiFi & CCTV from crossing to driver

**Caltrain (Trial)**  
WIMAX, CCTV & passenger WiFi

**Heathrow Express**  
WIMAX solution for passenger & operational applications (WiFi and real time ticketing), as well as trials involving door monitoring in progress

**Nederlandse Spoorwegen (NS)**  
Won through public tender for full fleet Rollout planned Q1-10. Passenger WiFi, real time PIS system & other operational applications

**Zylog (Trial)**  
WiFi & FM demo on two trains

**Dubai Metro Red & Green Lines**  
Fully integrated passenger WiFi solution for seamless roaming between train & shore

**Amtrak Acela**  
Aggregated passenger WiFi solution using multiple cellular channels - possibility for added applications i.e. CCTV

**Southern Express**  
Flagship project on London to Brighton route, involving partnership with T-Mobile for passenger WiFi & trial involving real time CCTV download

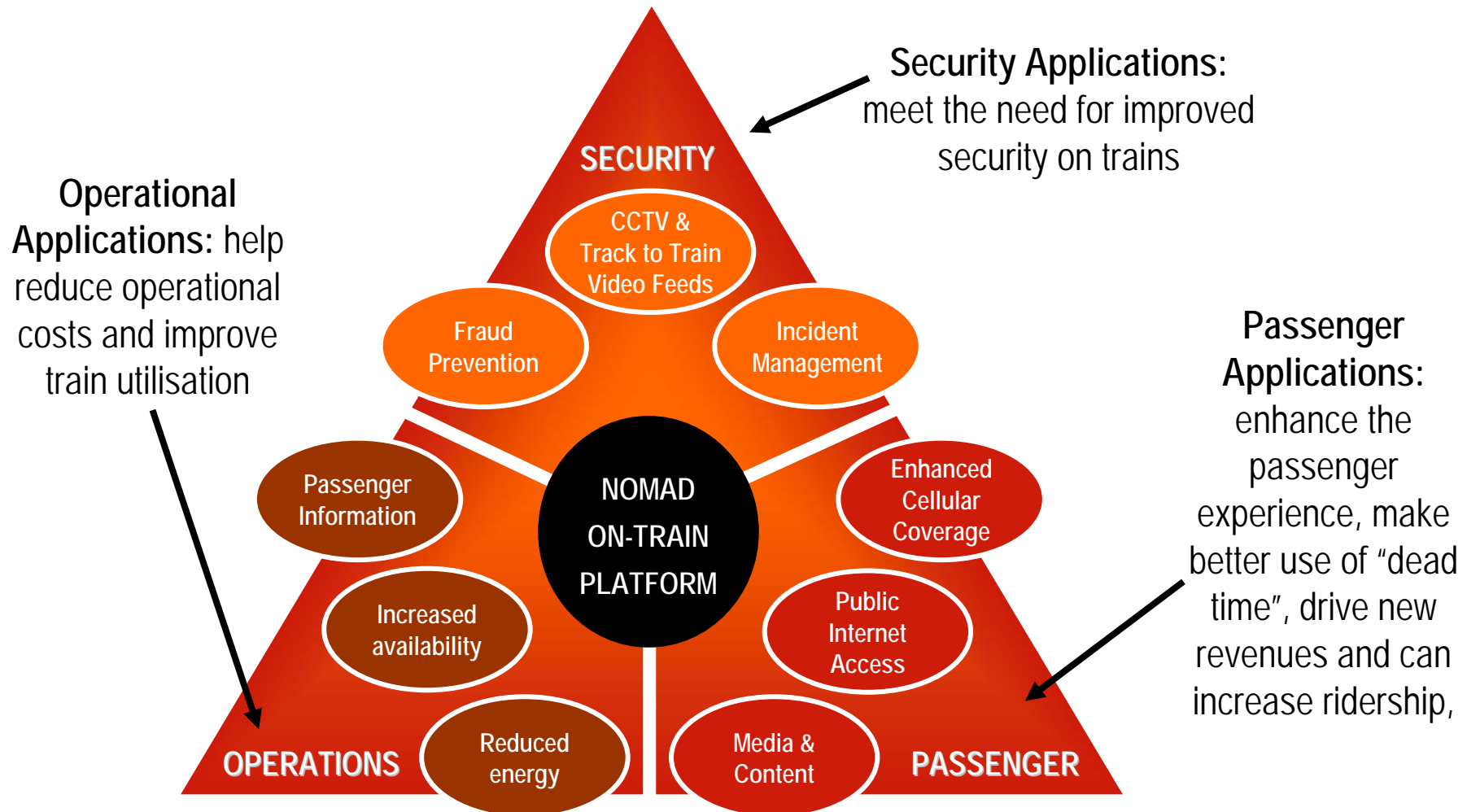
**Metrarail (Trial)**  
WiFi & FM demo on one train

**New Mexico Rail Runner**  
Passenger WiFi solution involving fixed wireless networks operating in 3.65GHz and 900MHz

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# Connected, intelligent rail transportation





# Intelligent Transport Infrastructure for Rail

- ❑ Objectives: Design, finance and build a coherent IP infrastructure for train communications which will, for example:
  - ❑ Reduce energy usage by 10% through improved driver feedback/training
  - ❑ Improve train availability and reliability through remote monitoring and maintenance (10% less trains)
  - ❑ Transform the passenger experience allowing full connectivity (No more “I’m on the train”)

**Energy Reduction**

**Transportation**

**Networked Media**





# Consortium building:

- We have a proven business model and financial intuitions willing to finance infrastructure roll-out
- We have a solid technology road-map and partners who can help us deliver
- We have a short (but good) FI track record – Chianti – Disruption Tolerant Networking for Trains
- Existing Partners:

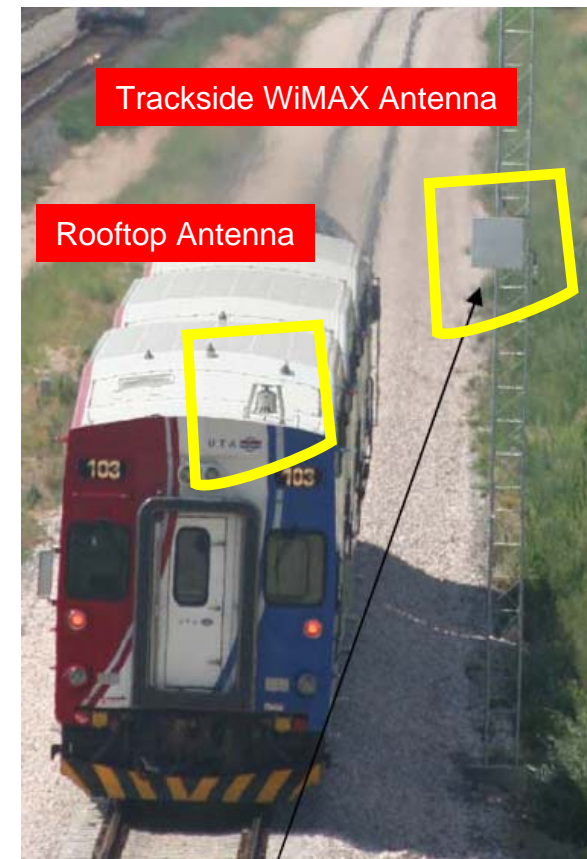


- Requirements for the consortium
  - More innovation from SMEs?
  - Applications from rail infrastructure owners and train operators
  - Financial institutions?
  - Standards bodies and governments – Spectrum and Rail? \_\_\_\_\_



## Potential traps: We want to do this before the next ice age.

- ❑ The rail industry is very conservative with long time horizons. Technology changes need to be woven into this environment.
- ❑ Government funding can distort the market (egs: national focus; ESA).
- ❑ Spectrum issues are frequently very slow. “Harmonisation” is a fearful word.





## Eyes on the prize – and beyond:

- ❑ European world leadership in IP to moving vehicles.
- ❑ Trains – every European train should move in a ‘tunnel’ of high speed wireless connectivity within 8 years.
- ❑ Other vehicle fleets – first responder, bus, military.

