Light Rail (UK).

A

Short proposal presentation by

Jim Harkins FCILT MTPS

Light Rail UK Group,

Chairman,

Light Rail Transit Association.

TramForward,

Lightweight Community Transport

Director,

All Party Parliamentary Light Rail Group

Technical Advisor.

Feb 2022

South Harbour, Aberdeen

Light Rail(UK).

(A not for profit company)

An association of :-

Light Rail Consultants, Transport Engineers
Politicians, Academics
Environmentalists
And Others

.

Commercial specialists in low cost,
affordable & sustainable tramways

www.applrguk.co.uk

E-mail Jimh@jimmyharkins.com
Auchenshuggle Junction, Beechmore, Moore,
Warrington, Cheshire,
United Kingdom
01925 740060 or 07721378223

Urban Transport Corridor Pollution

Non-Exhaust Emissions (NEE)

Each time a tyre rotates, it loses a layer of rubber about a billionth of a metre thick.

This works out to about four million million, million carbon atoms lost with each rotation.

A busy road with 25,000 vehicles travelling on it each day will generate around nine kilograms of tyre dust alone per kilometre.

Urban Transport Corridor Pollution

Non-Exhaust Emissions (NEE)

Vehicle tyres, brakes, air suspensions and road surface wear are now bigger contributor to particulate matter (PM's) in the air than vehicle exhaust systems

NEE PM10 have increased from 29% in 2000 to 73% in 2016, (2.75% per annum)

NEE PM2.5 have increased from 26% in 2000 to 60% in 2016 (2.125% per annum)

NEE PMs Road Dust Suspension and downwind plume not included

Affects roadside buildings inside up to 25 miles

There are no minimum safe amounts

Data from the UK national Atmospheric Emissions Inventory (NAEI)

Urban Transport Corridor Pollution

Non-Exhaust Emissions (NEE)

Health Costs

153,000 respiratory deaths, mainly young & old *British Thoracic Report*

Figures show between 25% - 40% of deaths due to "Tail Pipe emissions" (38,250 – 61,100 deaths) UK Government

Trams & TramTrain will help prevent
Death on the Pavement
"Oslo Effect"

To burn carbon and road grind is to pollute. Is this where it will all end?

Urban Transport Corridor Pollution

AIR QUALITY EXPERT GROUP

Non-Exhaust Emissions (NEE) from Road Traffic

Prepared for:

Department for Environment, Food and Rural Affairs;

Scottish Government; Welsh Government;

Department of the Environment in Northern Ireland

July 2019

Urban Transport Corridor Pollution

There are two main Transport Corridor Pollutants (UTC).

Tailpipe emissions

Road, Tyre & Brake Dust (NEE)
(Often Known as the "Oslo Effect)

Why Trams?

mg PM_{10} / km		Tyre	Brake
Cars	Urban	8.7	11.7
	Rural	6.8	5.5
	Motorway	5.8	1.4
LGVs	Urban	13.8	18.2
	Rural	10.7	8.6
	Motorway	9.2	2.1
Rigid HGVs	Urban	20.7	51.0
	Rural	17.4	27.1
	Motorway	14.0	8.4
Artic HGVs	Urban	47.1	51.0
	Rural	38.2	27.1
	Motorway	31.5	8.4
Buses	Urban	21.2	53.6
	Rural	17.4	27.1
	Motorway	14.0	8.4
Motorcycles	Urban	3.7	5.8
	Rural	2.9	2.8
	Motorway	2.5	0.7

+

mg PM_{10} / km	Road abrasion
Cars	7.5
LGVs	7.5
HGVs	38.0
Buses	38.0
Motorcycles	3.0

+

Vehicle Aggregate types	Total urban PM10/Kms
Cars (urban)	27.9
Trucks	127.1
Buses	112.8
M/cycle	12.5

=

There are no minimum safe amounts

Why Trams ?

Environmental Air Quality improvements.

In the period just before Covid – 19, Manchester Metrolink carried 67.5 million pax on 120 vehicles with a modal switch of 28% removing approximately 89,780 journeys

A growing and more productive city and inter urban economy.

Economic development and regeneration.

Modal switch & traffic reduction, current lines are failing significantly

Integrated transport across Glasgow and District.

Better value for the "Public Purse"

Why Trams ?

Bringing more measurable benefits to rail passengers;

Achieving wider economic and social objectives of regeneration, employment, inclusion, and accessibility in the communities served by tram rails;

Tram stop and linear growth rather than station only growth

Ensuring that all steel on steel rail contributes to a sustainable development across the common transport corridors

Why Trams ?

The Tram Network:-

- Be fully accessible to all residents and visitors including those with reduced mobility to all Tram and shared Bus stops, Public Transport Pathways (PTP)

Be mindful that we have an ageing population and the network will be fully accessible, easy to understand and use

Successfully supply the last/first mile door to door connectivity to planned Rail upgrades

Why Trams ?

The Tram Network will :-

Improve non car access and connectivity to the two main East – West transport poverty corridors

Provide a greater service frequency i.e. 4-8 trams per hour,

Relieve pressure on the “heavy rail corridors” thus providing significant savings

Provide a third low cost flexible “Rail” corridor initiative across Glasgow and a low cost affordable & sustainable airport link.

Why Trams ?

The Tram Network will provide access to :-

Employment including industrial and logistics sites

New housing developments including denser housing without parking spaces.

Provision of cleaner air to schools and hospitals

Sports & leisure including several stadia

Heritage and tourism.

A " Rochdale Pattern" of transit behaviour, "Hop on, Hop Off" supporting the 15 minute neighbourhood concept.

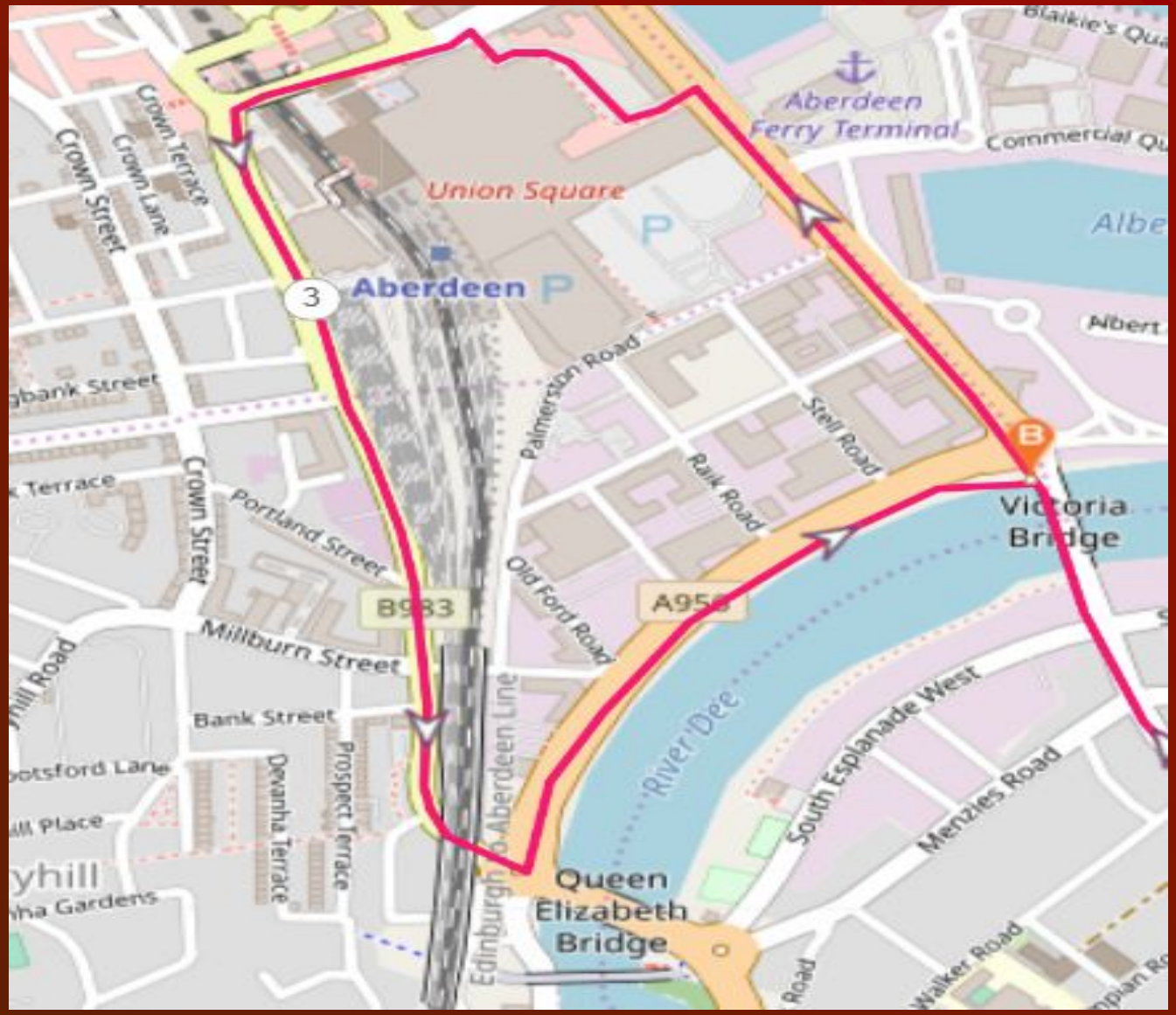
The Route 3.80m/6.12 KM

Map 1 Aberdeen South Harbour Railway Station Via Bus Station 3.80 miles/6.12 Km

The Route: Seaward Leg

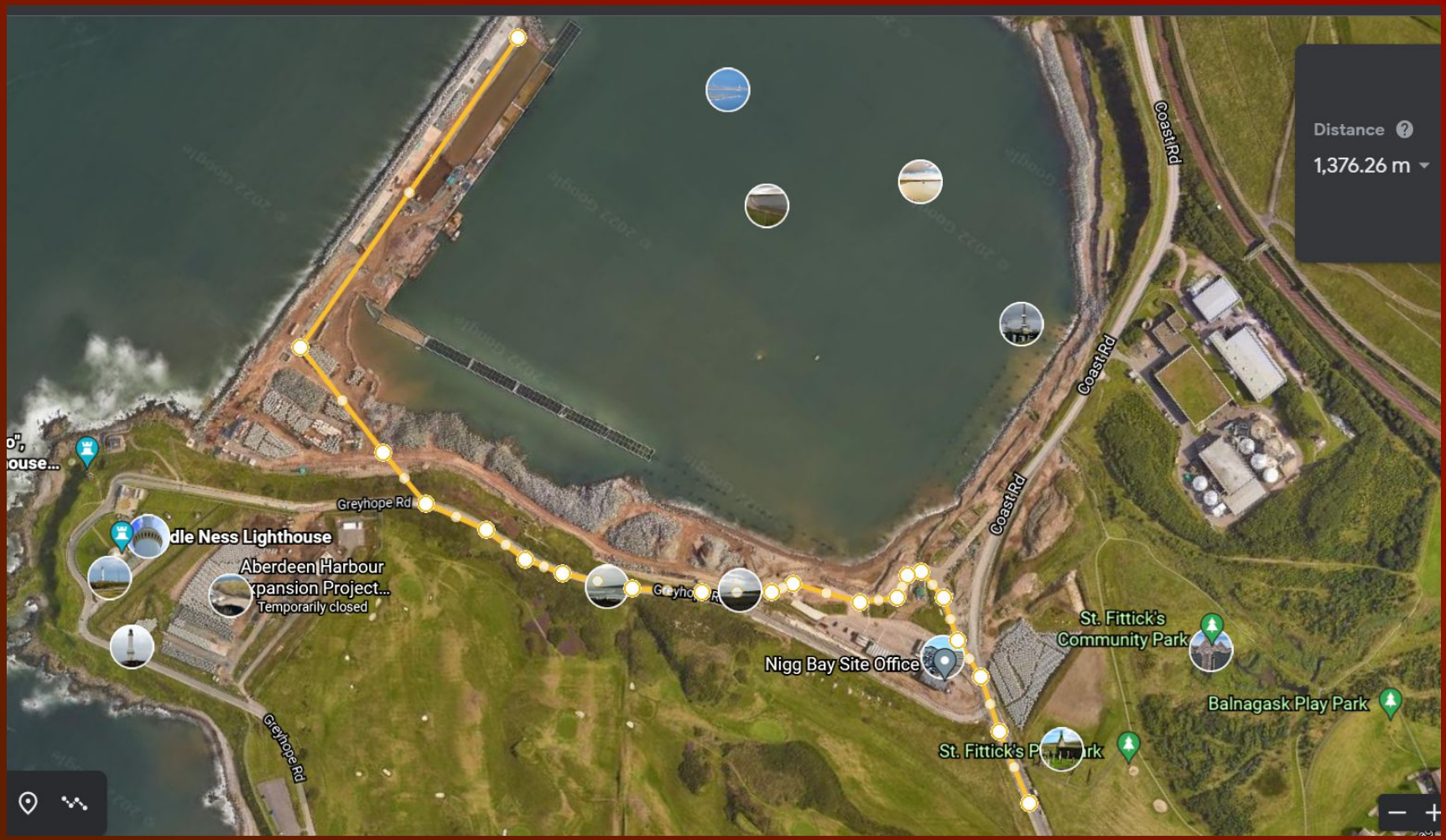
Map 2 Quay side to Victoria Bridge

The Route: Town Loop



Map 3 Central Loop To Victoria Bridge via Bus Station Loop to Victoria Bridge

The Route : South Harbour:



Map 4 Quay side to Coastal Road St Fittocks City direction double tracked

The Route : Harbour Entrance

Map 5 Proposed Quay Entrance/exit. May vary as under construction at time of photograph

The Route: Possible Depot Site

Map 6 Possible Depot site if available, adjacent to Nigg Golf Club

The Route : City Bound

Map 7 203 Victoria Rd High density flats, Commuters, which direction?

The Route: City Bound

Map 8 390 Victoria road City Bound twin track, centre road running

The Route: City Bound

Map 9 356 Victoria Road

City Bound Road, Twin tracked, utilities appear to be under pavements or parking Marine Scotland, a major traffic generator?

The Route: City Bound

Map 10 Victoria Bridge City Bound Twin Track Gutter Running

The Route: City Bound

Map 11 Victoria Street City bound Central reservation running

The Route: Central Business Area

Map 12 A956 Central reservation Running

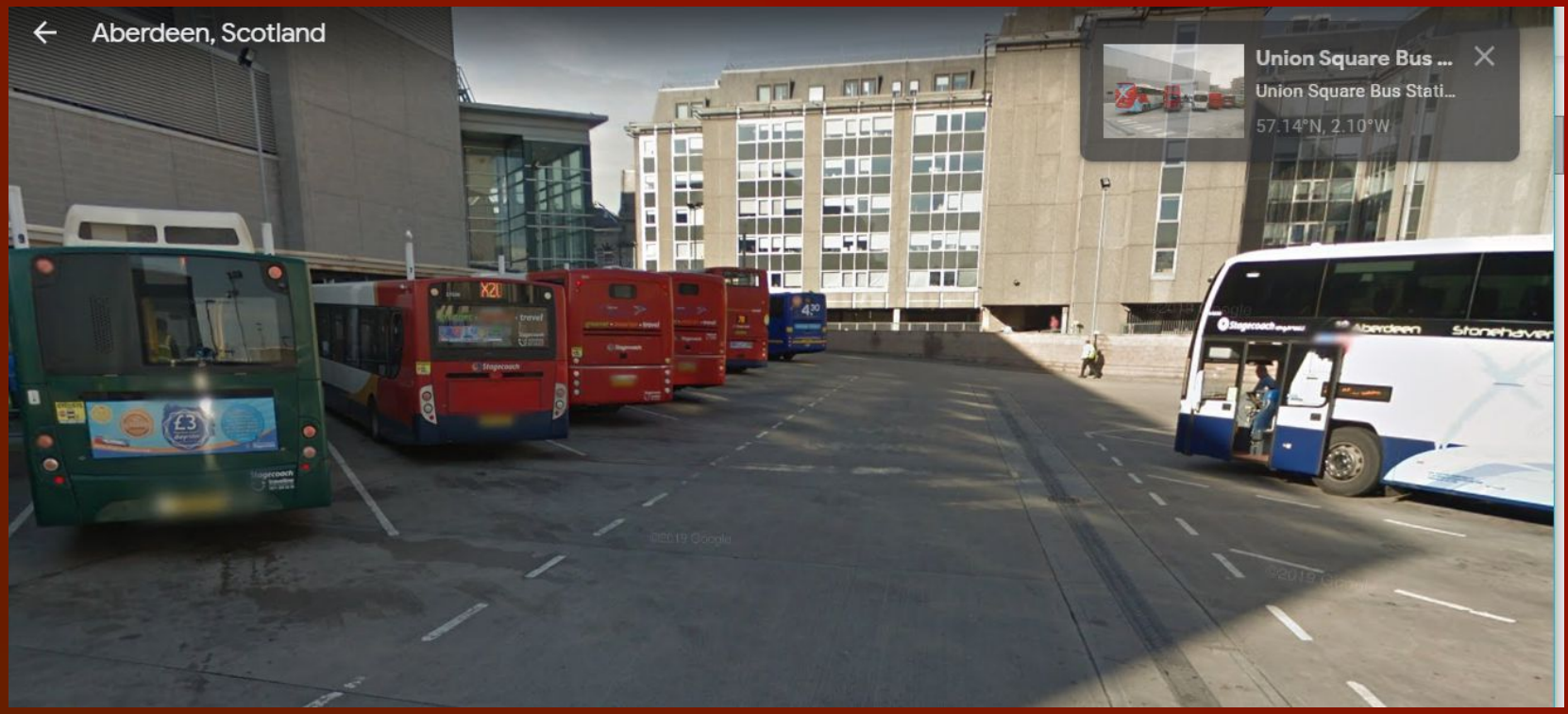
The Route: Central Business Area

Map 13 Multi Storey & Surface Car Parks (P+R).

The Route: Central Business Area

Map 14 Bus Station Entrance Double Track

The Route: Central Business Area



Map 15… Union Square Bus Station Line of Sight.

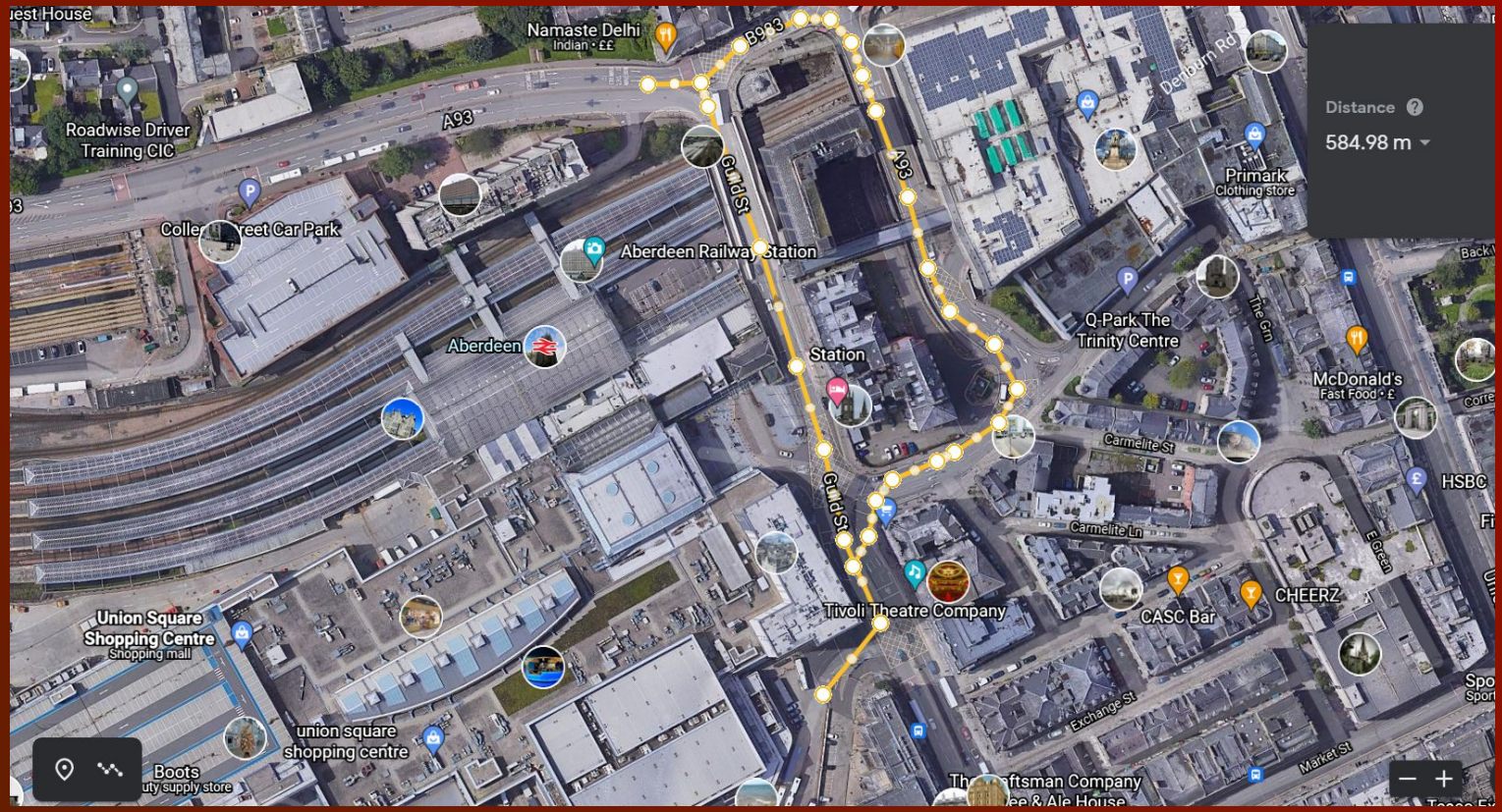
The Route: Central Business Area

Map 16 Possible Interlaced track, Line of sight, Enforcement of Hatch Box Required

The Route: Central Business Area

Map 17 Public Transport Exit/Entrance Guild Street. CP other side of wall

The Route: Central Business Area



Map 18 Central turning loop, possible Carousel for proposed Mass Transit System

Route 2: Central Business Area return

Map 19 A93 returning, Victoria Bridge Direction

Route 2: Central Business Area return

Map 20 College Street Car Park

Route 2: Central Business Area return

Map 21 Circular line Joining from Left (Palmerston Place). Central Reservation Traffic Lights controlled

Route 2: Central Business Area return

Map 22 Possible Peak Hour sidings, North Esplanade

Route 2: Central Business Area return

Map 23 Victoria Bridge South Bound, Re-join twin track gutter running.

T Hydrogen Tram Urban Transport Corridor Solution

Non-Exhaust Emissions (NEE)

Because of the high dust detritus with animal transport,
many first generation tramways had a nocturnal "Water Tram".
This washed away the suspension material created into the sewers
Part of a Public Health Program

There are no minimum safe amounts!

T1 & 2 Urban Transport Corridor Solution

Benefit of Trams

Tram & TramTrain ticks all the boxes

No tail pipe emissions
Reduces the immediate pollution

Reduces death on the pavement, No "Oslo Effect"

Year on year savings to health costs

Release funding for other health projects etc.,

Increases the ambience of the city streets

Improves liveability of the immediate & surrounding area

Attracts plus footfalls

T Hydrogen Tram Urban Transport Corridor Solution

What can it do for Growth & Regeneration?

Small tram systems does increase the amount of development in an area and makes the linear development much more effective.

We have identified areas that the T Hydrogen Tram Project will open up and access land

Areas along the line of route lend themselves to high density housing, offering a mix of commercial and residential uses.

Gives developers the chance to build efficiently with fewer parking spaces needed.

The T Hydrogen Tram Project will enable connectivity to be shared by everyone and not just those near the railway station

T Hydrogen Tram Urban Transport Corridor Solution

Why a Hydrogen Tramcar?

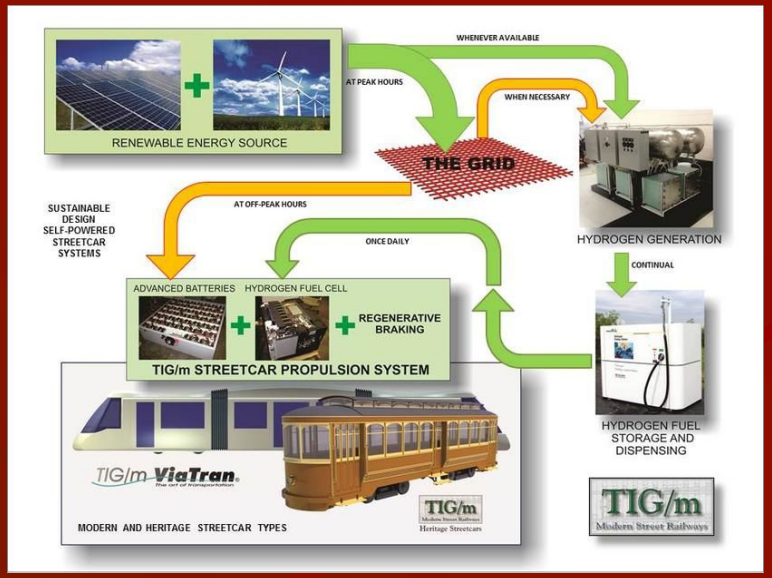
On-site hydrogen generation.
Hydrogen compression and storage.

Supplies local in Ayrshire

Hydrogen fuel dispensing, trams & trucks

On-board fuel cell generators that charge the batteries while the streetcar is in passenger service.

Energy required for up to a full 20hr. service day is carried on-board each vehicle



T Hydrogen Tram Urban Transport Corridor Solution

https://www.tig-m.com/videos.html

T Hydrogen Tram Urban Transport Corridor Solution

The Hydrogen Tramcar, no overhead

In the typical light rail project, up to 50% of the capital cost of infrastructure construction is spent on power distribution systems.

Furthermore, up to 60% of the life cost of system maintenance is spent on maintenance of wayside power systems;
all of theses costs are eliminated from the project with this system

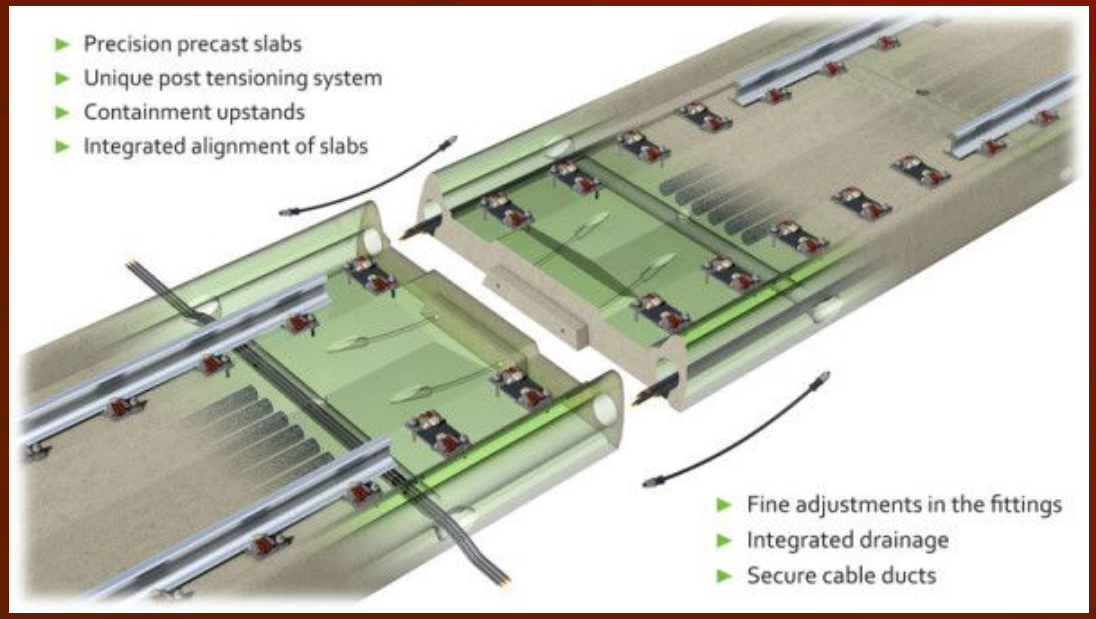
T Hydrogen Tram Urban Transport Corridor Solution

https://www.youtube.com/watch?v=v5wgxJA_d0I

T Hydrogen Tram Urban Transport Corridor Solution

Track - keep it simple and quick

PCAT (Pre Cast Advanced Track)



Most utilities left in situ

T Hydrogen Tram Urban Transport Corridor Solution

For the current price of the Warrington Western Link Road

at (2018) estimate of £212 Million, this could have bought approximately, (excluding the indirect health and social costs)

*21.2km of tram in Warrington

***(From £10 Million per Track Kilometre Inc. depot etc., UKTram)**

T Hydrogen Tram Urban Transport Corridor Solution

Requirements

A Statesman rather than a Politician

A Cross Party willingness to achieve goals

Cooperate to improve Air Quality in

Greater Glasgow and District

Reduce the UTC pollution related deaths per year, 730 in Glasgow alone in 2016

Improve town regeneration and connectivity between East & West in both corridors.

T Hydrogen Tram Urban Transport Corridor Solution

Next Step

A Pre Feasibility study

The above can be used as a specification document

Quotes from Tram Vehicle Manufactures, Track Suppliers

Provost to Champion project?

T Hydrogen Tram Urban Transport Corridor Solution

Funding ?

Hydrogen Economy Draft Action Plan
Transport Scotland & Rail, Climate Change
+ Community Infrastructure Levy,
Tax Incremental Financing
Grant from UK Government via
Transport Development Fund
Developer Contributions (Section 75)
Regional Growth Fund CA, LEPs
Funding for Sustainable Transport (UK Govt)
Workplace Parking Levy, Green Investment Bank
Pollution Charge, PM Town fund

A range of Private Investors and Pension Funds

This not an exhaustive list and will change
as schemes are introduced, ended, replaced etc.,

Thank You for Listening

Any Questions ?

Support documents

Our Outline proposals often meet with this response

Sadly Leaders of the Authority XXX, Cllrs XXX are too busy!
(Often, they are fighting transport pollution with a NEE based solution by promoting a TramBus type which will kill many Citizens, young and old and is recorded for posterity on this site, instead of being Statesmen.
This site is store in the National Tram Archives as part of the UK Tram story.

T Hydrogen Tram Urban Transport Corridor Solution

ULR Vehicles

3rd Generation ULR Vehicles ***are not*** like the big light rail cars used in Manchester, Croydon Edinburgh or Sheffield

They would be smaller units suitable for their role of circulating passengers amongst the three town locations without dominating the city

They would stop every 75 metres or use existing 'bus stops to give short walking distances and they operate safely in pedestrian areas and in mixed traffic.

Portland

T Hydrogen Tram Urban Transport Corridor Solution

Purpose & Requirements

Stop Road Traffic "Rat Running" (Signage)

A re allocation of road space, Green Wave traffic lights at junctions

Re routing and integrating of some bus services

Multiple P + R at termini and line of route

Hydrogen Cars,

Urban Transport Corridor Pollution

Non-Exhaust Emissions (NEE)

An urban car produces 8.7 mg of PM10 per km from tyres and 11.7 mg of PM from **Brakes,** total 20.4mg per km (approx.)

20.4mg x 10000 cars produces 2.04 tonnes per km (approx.)

An LGV produces 47.1 mg of PM10 per km from **Tyres** and 51.0 mg of PM from **Brakes** total 98.1mg (approx.)

98.1mg x 10000 LGV produces 9.10 tonnes per km (approx.)

All this PM material contributes to the air suspension swirl

There are no minimum safe amounts

Urban Transport Corridor Pollution

Non-Exhaust Emissions (NEE)

A PCV produces 21.2mg of PM10 per km from tyres and 51.0 mg of PM from **Brakes,** total 72.2mg (approx.)

72.2mg x 10000 PCV produces 7.22 tonnes per km (approx.)

These figures do not include road surface wear and are estimated at between + 30% especially where there are pot holes (grinding effect)

All this material contributes to the air suspension swirl

<u>There are no minimum safe amounts</u>

T Hydrogen Tram Urban Transport Corridor Solution

Get Good Advisors – challenge them, stick with them!

Start public consultation early

Get a well-kent local Public Face for the project

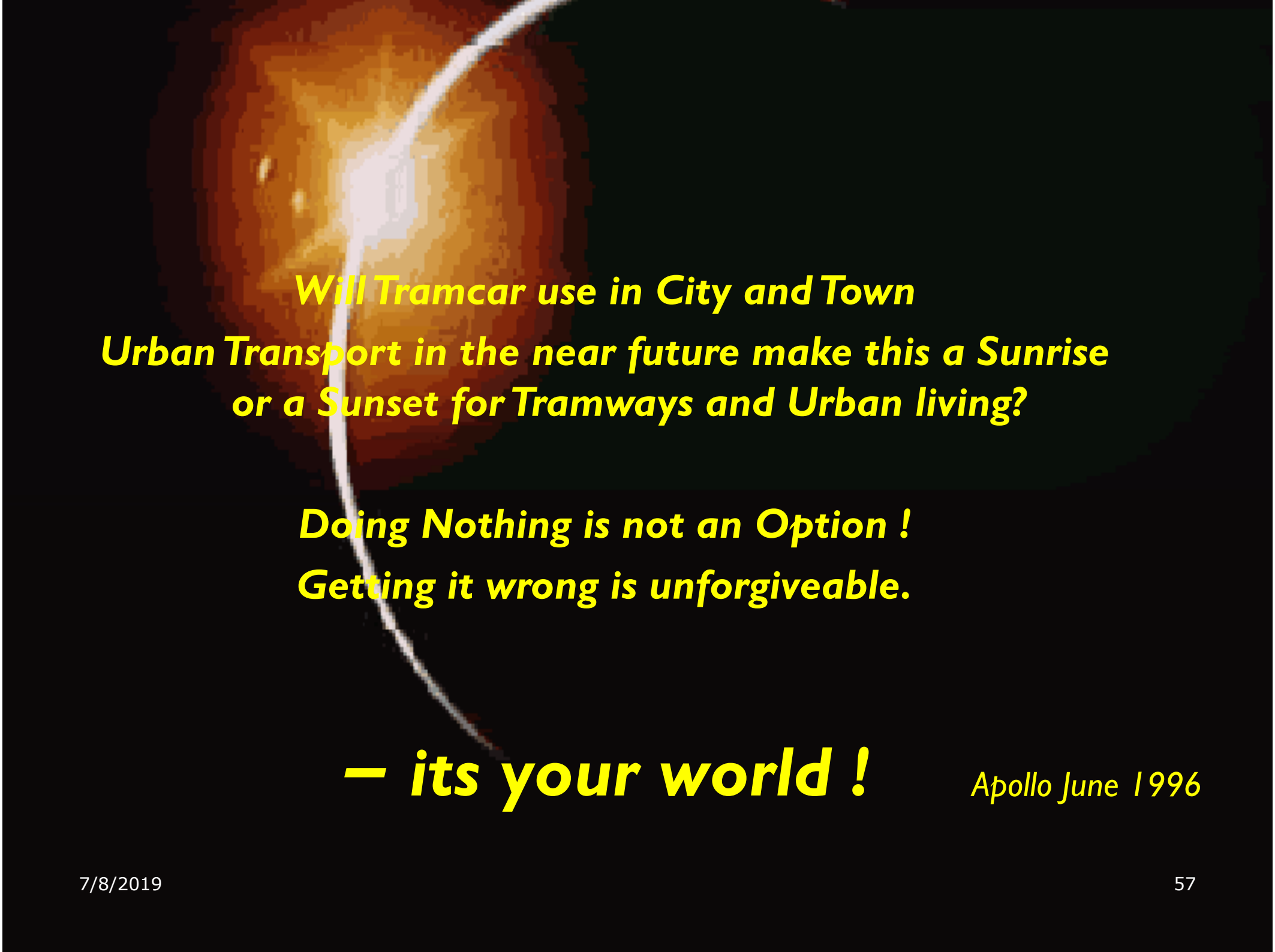
Be willing to revise the route to support developments

Get the bus, rail and highway authorities on side

T Hydrogen Tram, Think of it as a 'Starter Line'

Inexpensive does not have to mean cheap-and-nasty

Think of the added "X" factor for subsequent "UK City of Culture" type bids



Will Tramcar use in City and Town

Urban Transport in the near future make this a Sunrise
or a Sunset for Tramways and Urban living?

Doing Nothing is not an Option !

Getting it wrong is unforgiveable.

– its your world !

Apollo June 1996