



# PARRY news



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## JPA's LIQUIDATOR REMOVED BY HIGH COURT Four Year Involvement Stops Unexpectedly During Legal Action

PPM the Company attended Dudley County Court on October 12th for 'Directions' over the case relating to PPM's former licensor and technical services provider JPM Parry & Associates Ltd. JPA had been wound up on 8th July 2013 and placed in the hands of a Liquidator, John David Travers.

Shortly after taking office in 2013, the Liquidator had visited JPA's premises in Cradley Heath and seemed surprised to discover a business (PPM) still in being. In a subsequent email he said "Your continued occupation (of that site) is hampering the liquidation" confirming the fact that from the outset he never appreciated that the People Movers venture was a separately owned firm. He also did not recognise that PPM's continued occupation and goodwill payments to the site landlords, as rent, conferred normal tenant's rights. Destruction of buildings and equipment in August 2016 was halted after the intervention of West Midlands Police who recorded the action as criminal damage. It is not clear to what extent, if any, the Liquidator colluded with others in the site invasion, but despite 'inheriting' over 175,000 PPM shares on behalf of the JPA creditors, his actions have been consistently unhelpful, and dismissive of the importance of PPM's achievements in rail transportation and its right to be present on that site.

In October 2017 the Travers firm began vacating its premises in Stourbridge, without indicating any on-



January 2018, a sunny winters day in the centre of the small Black Country Town of Wednesbury.

going domain. Companies House issued a 'WU 14' notification No. 8230 of 2017 by the Chancery Division of the High Court of Justice. This ordered that John David Travers be Removed from Office in respect to the compulsory liquidation of JPM Parry & Associates Ltd. End of a dark chapter, but the story is unlikely to be over completely with other people becoming involved.

## CENTRAL GOVT INTEREST IN PROPOSED WEDNESBURY LIGHT TRAMWAY PROJECT

Changing attitudes regarding Government's interest in promoting innovation to improve the nation's urban transport scene has at last led to the prospect of smaller scale tram systems being promoted for towns with problems to solve in their central zones. Examples include where a railway station or metro stop is an awkward distance from the centre. In the Metropolitan Borough of Sandwell there are several instances of town centres which are deprived of the benefit of rail connectivity. Wednesbury is one of these. **Revival of Technology Foresight to lead to light tramway progress. (see Page 6)**



Bristol Railbus (PPM Car 10) leaves Cradley Heath on 6th December. The Railbus was loaded up for transport to Trailways in Bloxwich to begin refit

### ALSO IN THIS ISSUE

PPM's Class 139 railcars continue operations in new Midlands Railway Franchise. Design proposal to stretch length to accommodate 90 passengers P5

Range-extension capability using compresses air offers full day running with battery traction for street tramway operation. P8

'All the Stations' Stourbridge Episode attracts over 136,000 You-Tube 'hits' P7

Low Carbon Brickmaking P6



**Comment by John Parry MBE Founder and Chairman of PPM and previously of JPA.**

**The Wrong Kind of Cleverness**

Many young people who have been told that they are clever when advised about their future careers; first to go through University and then seek to join one of the Professions; e.g. accountancy, law, consultancy or the civil service. In the time of the Industrial Revolution in the 18th and 19th Centuries there was greater scope and more prestige in doing practical things - to do with manufacturing or building canals, roads and railways. There was no lack of cleverness, brilliance, even, at that time, considering the skill and creativity of Telford, Brunel, Cadbury, Wedgwood, Faraday and the Stephensons, all highly practical people, who had as much if not more impact on the world as Shakespeare, Charles Dickens, Jane Austen and WS Gilbert, who also got by without much formal education. We can be grateful these did not go into the Civil Service, Accountancy or the Law!

Socially and culturally the industrious world-changers, many of whom became very rich, were far closer to their fellow countrymen and women who toiled in 'the dark satanic mills' which is possibly why such a lot of their wealth was redistributed to create schools, hospitals, public parks and other public amenities to benefit those less fortunate than they had been. Nowadays many wealthy people think first of personal possessions, yachts, second homes in warmer climates or, like one of the senior executives of 'Parry Associates' former bank, flying to Las Vegas for the weekend to watch a boxing match.

**Fish Against Water**

The urge to be a practical 'doer' faded often in a generation. 'I made sure my sons/daughters wouldn't have to endure the kind of life that I had' are words which everyone will have heard spoken. It was as if it had become fashionable among fish to decide they were 'anti-water'. Worse than that, much of the education in the expanding secondary schools and colleges, far from encouraging take up of practical skills, started propagating anti-practical attitudes. This was part of an aim to become a 'Post Industrial Society' (having a sea like the Caspian, with beaches, harbours, ships, but no water).

I have been asked many times why a firm that had been responsible for numerous bright ideas and practical achievements, (JPA) finished up in the sights of 'The Gang of Four' as they might be called. This formidable alliance of banker, civil servant, lawyer and liquidator collectively have a Licence to Kill.

**TO LIQUIDATE OR LAY WASTE?**

The JPA company's destruction was initially brought about by a sudden change in attitude by its bank. Instead of nurturing the venture on the grounds of being close to a major breakthrough, the bank switched its concerns to its own exposure to losses should the venture fail. Alongside the bank, HMRC as part of the UK government, seemed to have a split personality. On the one hand it encouraged R&D, vital for the Nation's future, which by its nature is often long term, on the other hand demanding its immediate 'pound of flesh'. This in JPA's case inflicted fatal injury on a company which had been following a long term strategy but had suddenly been drained of credit. The third member of the 'gang', the Office of the Official Receiver, instead of recognising JPA's talents, capability and track record as an international development specialist, passed the firm over to be broken up by a Liquidator who apparently had no familiarity with R&D in either rail transport or international development and set about dismemberment.

The Liquidator gave scant regard to the fact that the activities at the Cradley Heath site comprised a credible, coordinated approach to the complex problem of improving the urban areas of tropical developing nations. This became apparent when he refused to allow us to demonstrate to a high level delegation from the Peoples Republic of China how the flywheel-powered rail vehicles could run without CO<sup>2</sup> emissions on a track in a Works area (which was now under the Liquidator's control). That was when he mentioned in the same email that PPM's continued presence on the site was 'hampering the liquidation' revealing his lack of inclination to do anything to assist the recovery of the PPM company following the loss of its engineering and management services provider. Eventually when the demolition gang invaded the site and began systematic destruction, he declined to intervene and so the police stepped in, but too late to stop the railway being made inoperable and important reference structures demolished.

**AFTER THE 'GANG OF FOUR' HAD DONE THEIR WORK**

**Narrow Gauge Railway**



*600mm gauge line with 70v charging points for flywheel - powered rail vehicles blocked*

**Experimental Equipment for Lightweight Bricks**



*New technology incorporating particles of expanded polystyrene waste into concrete to produce lightweight bricks terminated because equipment scrapped*

**Flood Refuge Test Structure**



*Flood Refuge Building in Mozambique Village near the Limpopo river.*

*After the Mozambique flood disaster a new high & dry technology for flood refuges was tested in Cradley Heath then introduced in the field. Reference structure demolished*

**Clean 'Latrine' Structure**



*For a programme in Uganda, Tanzania and India supported by the Gates Foundation a Shanty Upgrading low-cost Latrine design developed and under testing at Cradley Heath scrapped by demolishers*



*One of several carefully made models, housed in an outbuilding on the Cradley Heath site was destroyed when the building was demolished*

## INTERNATIONALLY SIGNIFICANT REFERENCE STRUCTURE DEMOLISHED

Failure to appreciate the importance of technical development work on behalf of low income people by financially obsessed professionals results in wholesale destruction of intermediate technology assets. A low cost house prototype dwelling built with sustainable low carbon technologies was destroyed during an illegal site entry which also made the narrow gauge railway inoperable.



*Prototype of a new low cost dwelling for the slum upgrading project at Kirulapona shanty in Sri Lanka originally constructed for US Save the Children in 1980 at JPA's Cradley Heath site.*



*The same design of dwelling was then adopted by development workers and formed the basis of new healthier dwellings for the slum dwellers who themselves participated in the manufacture of the building materials applying Parry technology.*

*It had been expected that the original prototype dwelling would remain in place in the UK for reference by the development experts. The building remained in good condition until it fell into the hands of the Parry Associates Liquidator who declined to intervene when it was threatened with destruction in Aug 2016.*

*The upgrading of the Kirulapona shanty was seen as a significant advance in development technology by experts in this field and was written about in a book compiled by Dr Geoffrey K Payne from the Oxford Centre for Urban Design published by John Wiley & Sons in 1984. The new technologies applied included surface protection of unfired brick walling and hand made roofing tiles using 'Parry' methods.*



*An important example of Intermediate Technology innovation reduced to rubble while also rendering inoperable the narrow gauge railway.*



*A new town under construction in Kajiado district central Kenya constructed almost entirely with Parry technology. This project like many others around the world has depended on Parry innovation and knowledge.*

### **CONDEMNED AS HAVING NO VALUE**

Once under the control of the Liquidator a wide ranging array of trial and prototype structures were valued by his agent as if for sale to businesses or individuals in the general market and assessed as valueless. No approaches appear to have been made to the international development community despite the pathfinding R&D achievements involved. These were of interest to ongoing projects and programmes in the Sudan, Tanzania, Kenya, Philippines, Mozambique, Sri Lanka, Peru, Zambia and Sierra Leone. By not recognising the value of the technical work of the former JPM Parry & Associates and its Intermediate Technology Workshops, the OOR and its contractors have caused damage to the international development effort. A large store of irreplaceable knowledge is lost and R&D equipment wasted. There's enough malicious destruction going on in the World by vandals and terrorists without this being officially encouraged by banks, lawyers, public officials and insolvency specialist accountants.

# FUTURE OF TRAMTRAIN MODE IN UK CLOUDED BY TRIAL SETBACKS

## Initiative Proposed Involving an Alternative Approach for the Tramtrain Concept in Britain

**Recent concerns raised in Parliament about the cost escalation and delays in commissioning a Tramtrain Trial in South Yorkshire following a report for the Public Accounts Committee may cloud the future prospects for the tramtrain concept in the UK. In a separate exercise in the West Midlands an alternative much more modest form of light railcar operation within the Heavy Rail network has been running effectively. The case exists to build on the successful Midlands exercise, using a modified vehicle configuration, stretched from 60 to 90 passenger capacity with on-street suitability using track compatible with standard rail network clearances. The result will be a 'Compact Tramtrain' making the mode more widely applicable**

### Stations in the Wrong Place

Trains are not like buses or trams which can stop and start every few hundred metres at simple bus stops. Terminus train stations in particular take up a great deal more room and for historic reasons have often ended up being situated some distance away from the main centres of employment and commerce in a town.

The 'last mile' of the journey in these cases is performed by other means; taxis, buses, occasionally trams, or on foot. In inter-war America it was quite common to have adjacent towns connected by 'inter-urban' streetcar lines - effectively these were the first tramtrains, as once in town, they could stop frequently anywhere. By the late 1940s these had been swept away by universal ownership of automobiles and so the concept of the tramtrain disappeared for over half a century until the mid 1990s when a project was introduced in Saarbrücken, Germany, and is still in service.

Tramtrain services have since been introduced in mainland Europe, including Karlsruhe, Kassel and Mulhouse. All are successful.

### Tramtrains in Britain?

Always quick to catch on (after 10 years) the UK government worked out a way for operating European-style tramtrains on the rail network in Yorkshire which could then enter the supertram network at Meadowhall, close to the M1 and continue into Sheffield.

The aims were very laudable:-

1. Beginning the processing of 'Lightweighting' reducing rolling stock weight, energy costs and keeping maintenance costs down at 'tram' levels rather than needing to use traincare facilities situated on the rail network.

2. Assumptions (which are less valid now) that clean operation inevitably required full electrification of the track infrastructure.

Early ambitions to commence the 'rural' railway part of this service miles away, taking in Penistone and other towns and villages were abandoned leaving the one railway extension just to link to Rotherham on the East side of the M1.

A further 10 years have gone by and a great deal of money has been spent including on the purchase of 7 tramtrains, each weighing, unladen, 66 tonnes and measuring 37.2 metres in length. But snag after snag emerged and tramtrain services from Sheffield to Rotherham are now only due to commence at the end of 2018 with a budget having risen from £15 million to £75 million.

*'Corgi' model of the 1930s American PCC Streetcar, 5000 of which were manufactured, many of which were used in inter-urban services. The first Tramtrain*



*High quality transit along inter-urban and suburban routes in the 1930s US pioneered today's commuter railways*



*European-style tramtrain delivered to Yorkshire for the Sheffield to Rotherham trial service (courtesy Wikipedia)*

### Lessons Learned

Engineers and planners involved in the project speak of 'the valuable lessons that have been learned' and indeed the exercise was always planned as a *trial*. Cities such as Manchester, Cardiff and Glasgow are interested in the concept of suburban rail lines being extended onto street to provide a quicker and cheaper method of installing light rail systems than building complete new ones. Much will no doubt be investigated by the people responsible and in direct touch with the technical issues that have arisen which has made the Yorkshire exercise neither quick nor cheap, even though it may achieve eventual success.

### Light Rail Vehicles Already in Service on a Heavy Rail Branch Line

The same period of time has passed since the modest scale two car fleet of Class 139 tram-type vehicles began testing and then entered service at Stourbridge in May 2009.

The 1 km long Stourbridge line comprises normal railway structures with just a short 30m long section of tramway type embedded track inside and adjacent to the depot building. 4 million passenger journeys provided there is a great deal of experience from Stourbridge to draw on in planning new systems.



### DIFFICULT BUT NOT IMPOSSIBLE

In the period between 2001 and 2006 under a programme requiring design, construction and running of a prototype railcar, procedures were agreed to introduce the light rail style service onto a branch of the UK Rail network. Scheduled services began in 2009, still running today.



Now allocated British Railway designation 'Class 139s', PPM light railcars have provided all journeys for the last 8 years from Stourbridge Junction to Town and the present with great economy and reliability.

Design work in progress. Stretching the Class 139 design to include bogie running gear to provide a low floor central section (one sixth scale model under construction by Paul Davis, PPM's Head of Design).

The 60 passenger vehicles are bus-sized and the design adaptable for low platform boarding. If stretched from 10 to 14 metres in length with bogie running gear, the Class 139 light railcar could become a 90 passenger compact Tramtrain. Having delivered good service during the 2009-2017 Franchise period, the Class 139 units have been selected to continue to operate the Stourbridge Shuttle by West Midlands Railway who have taken over the new Franchise.

#### Reopening Mothballed and Dismantled Lines

In November 2017 the UK Department for Transport's Secretary of State, Chris Grayling, announced that after years of denial the government would now actively be seeking opportunities to restart passenger services on lines which were closed by British Railways in the 1960s. Most of these are properly surveyed former rail routes, some having carried steam trains for over a century. Intact structures will generally be still useable. From being worthless these have suddenly become valuable assets. However some sections have been converted to roads or subsequent development has taken place making it impossible for a heavy train to pass through. But not necessarily a bus-sized tramtrain which, running on a section of embedded track could share the alignment with road traffic. The existence of a 14m long hybrid tramtrain product in compact form will increase the opportunities for reopening many more former branches.

#### Try Again? But, Make it Simpler Next Time

The personnel closely associated with the planning, operation and maintenance of the Class 139 fleet have accumulated considerable technical and financial knowledge as well as becoming familiarised with the rules and procedures of the national railway network. The Stourbridge Branch service has proved to be economic, reliable and popular. Putting all of this knowledge together with other experience in managing Metro and bus services in the West Midlands, the resources exist to make a detailed assessment of how affordable tramtrain technology can be introduced quickly and cost effectively into the transport industry.



#### Foresight Engineering Project

An appropriate way is proposed for undertaking a rapid assessment in response to the Yorkshire Tramtrain Trial set back so that positive measures can emerge a lot more quickly. This is to convene a panel of specialists covering the various aspects of the *alternative* approach that is suggested in this article. Birmingham City University is joining forces with PPM's embryo engineering services unit, Light Rail Partners Ltd, in what in effect will be a new phase of the Technology Foresight programme of the 1990s. A series of Foresight Engineering Projects ('FEPs') are being formulated to handle investigations and oversee practical projects. Alternative tramtrains can become a high priority FEP, being relevant to local interest in affordable light rail services throughout the length and breadth of Britain.

#### Energy Supply Technology

Important enabling activity will include an energy supply technology based on compressed gases of alternative types including:-

1. Compressed Natural Gas (CNG) which could be 'biogas' - methane from organic waste. This fuel can be considered as 'carbon-neutral' because the feedstock when just left to rot gives off methane into the atmosphere anyway.

2. Hydrogen as feedstock for electricity generation by fuel cells - or
3. Compressed air which is produced and stored trackside using low or zero carbon compressors. (The vehicles on board supply will need replenishing at 2 hourly intervals in a procedure taking about 2 minutes).

#### Street Track to Suit Rail Profile Wheels

Providing embedded track which can be run on by vehicles with wheels which also work on ordinary railways will result in a wider than conventional slot in the road surface. Several ideas are being promoted and trialled for providing inserts to make good the gap when no rail vehicle is present.

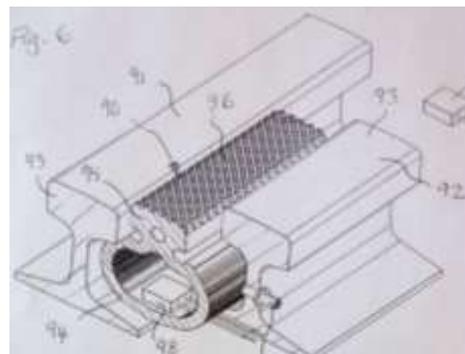


Diagram extracted from a current Parry patent application illustrates a pneumatic resilient, gap-filling component.

# MATERIALS, ENERGY AND TRANSPORT ALL FEATURE IN JOINT INITIATIVE WITH UNIVERSITY ACADEMICS BEGINNING A FRESH PHASE OF TECHNOLOGY FORESIGHT

## LOW CARBON BRICKMAKING

Since the summer of 2017 following the election of the first Mayor of the West Midlands Combined Authority, PPM and its associate firms have begun building links with universities actively engaged in technical research and development. The themes covered include methods for reducing the process temperature needed to stabilise common soils in the manufacture of bricks - The arrangement is at present pre-contract so the name of the Institution cannot yet be mentioned.

On the industrial and professional side Parry Building Products Ltd have supplied intermediate technology brickmaking equipment to assist the University's practical experimental work and John Parry has been dusting off his comprehensive technical library of information concerning tropical soils so as to be able to define the exploitation route based on common soil types.



Using a soil penetrometer in order to assess the 'green' strength of a low carbon brick made with the new type of binder using manufacturing equipment supplied by Parry Building Products.

## MIDLANDS ENGINE

While many economic journalists are wringing their hands over the possibility of the UK's economic ties with European nations loosening after BREXIT, there are some brighter opinions being expressed about the worldwide prospects for the engineering industry, much of it is concentrated in the Midlands. In design and quality of complex and sophisticated automotive or aerospace products, Midlands producers are world leaders. However it has to be recognised that world markets mainly comprise nations with the majority of their populations struggling to break out of poverty. This will not happen without changes in the tools and materials people use. The research and development needed will not come from the designers of Formula 1 Race Cars or Range Rovers. This is where Intermediate Technology is applicable, a sector which requires knowledge and skill but prioritises the productive use of labour with a greatly reduced proportion of electronics and advanced materials, and sometimes a subtle mixture of both.

Low carbon brick-making is just one of many.

## TRANSPORT TECHNOLOGY FORESIGHT

In the mid 1990s the UK Office of Science and Technology Foresight reports which related to the many months of consultations involving scientists, technicians and administrators working in government, academia and industry Britain's recent history is not short of tales of innovation colliding with parsimony or more puzzling by established technical authorities resisting the disruptive impact of new ideas. Trevithick and IK Brunel wasted months of their talented lives in debtors' prisons and Frank Whittle, who in 1935 could not persuade his employers to renew his patent of the jet engine, at one time had to sleep in his workshop, having no other roof over his head.

Very few officials, academics or industrialists at the time sat up and took notice of the words in the Technology Transport Report..

*"There appears to be an unaddressed need in the light rail market; "The capital cost of conventional Metro/Supertram systems limits them to urban areas which have large populations and high density movement corridors. A new lighter, cheaper mode is needed for all those towns which cannot meet the requirements for a supertram but which still have problems to solve in their centres".*

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Finally 20 years later in 2017 Secretary of State for Transport has announced funding

to reduce the barriers to innovation and advance technology in rail transport including tramways.

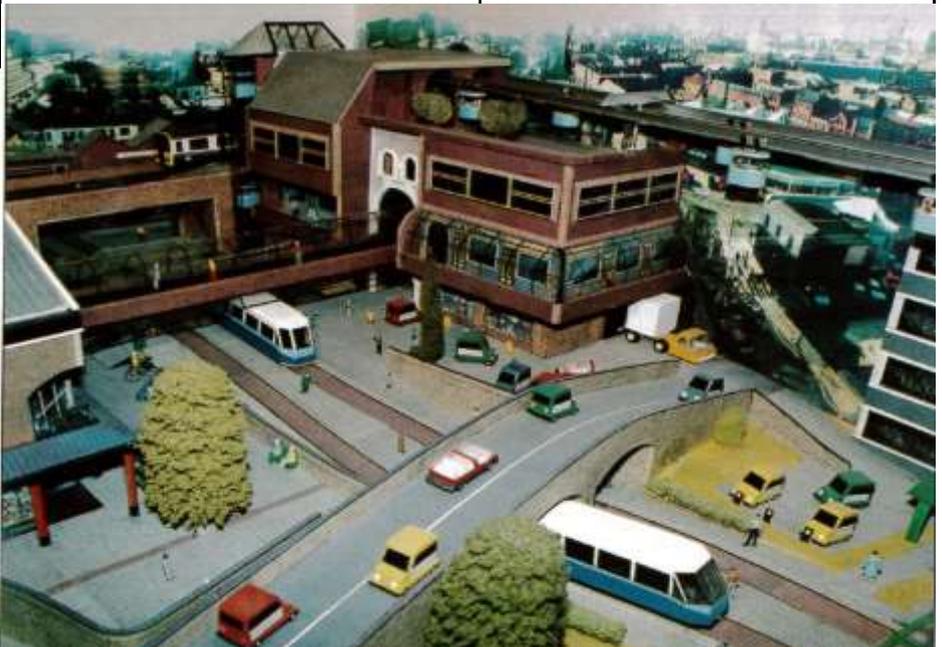
## INTERMEDIATE PUBLIC TRANSPORT

Urbanisation is happening in both rich and poor nations but in each case the activity has to be fertilized by a perceptible enhancement of economic value - e.g. Transit Oriented Development which, to be effective, demands that the mode should be physically guided - steel wheel on steel rail for optimum connectivity, but not necessarily electrified.

There being three main surface-based forms of land-based public transport, bus, train and tram, all with their own advantages and disadvantages, the unmet need, identified in the mid 1990s by the Technology Foresight Transport Panel draws from the best aspects of:-

1. Economy of construction of coachwork - from bus industry.
2. Physical guidance (wheel-rail) - from railway practice.
3. Quiet, clean, low maintenance traction - from light rail.

Rolling stock is only part of the prescription of a new **intermediate mode** of public transport. Attention must be applied to achieve an acceptable solution plaguing tram-track construction in modern times, achieving agreement that buried utilities can remain in place.



A special model was designed and built for the 1990s Technology Foresight Transport Panel to illustrate the concept of a pollution free, Clean Air Zone established in the central area of a Town or City. The model comprises various means by which workers and visitors can move around in nil emission mode. Technologies include small 'pod'-type vehicles, electric vans and a small tramway connecting the station at the top left of the model with other locations in the town.



An enterprising young couple Geoff Marshall and Vicki Pipe decided to visit every one of over 2,500 stations on the British Railway Network. Their short films taken by an accompanying camera team appear on the 'You tube' social media outlet. Their lively, witty commentary has attracted thousands of 'hits!' Of the people viewing the individual episodes lasting about 5-10 minutes each, most of these have attracted between 20,000 to 30,000 viewings which is impressive, but one episode really stands out - Stourbridge Junction to Stourbridge Town.

Sampling the more popular episodes of 'All the Stations, revealed the number of viewings up to Nov 2nd 2017:-

Manchester Metro Link	28,296
Liverpool—Manchester	25,446
St Pancras – Skegness	38,671
Cardiff—Swansea	30,275
Stratford on Avon	31,071
Leeds – Carnforth	26,846
Maidenhead – Marylebone	38,230
Hereford – Bristol	32,875
London – Hereford	36,581

**Stourbridge Junction -Town 91,000**

Prior to arrival at Stourbridge having started out from Snow Hill station in Birmingham, Geoff, who is obviously someone with a lot of railway knowledge was trying to describe to Vicki what they were going to see on the Stourbridge Town branch. She asks "Is it a sort of car or a bus?" he replies "it is absolutely bizarre, there is nothing like it anywhere else on the network".

On arrival he continues to describe the PPM vehicle as a weird oddity but Vicki comes running down the platform shouting "it's the cutest train I've ever seen!" After interviewing the crew Geoff has come round saying "well done London Midland" and Vicki says "it's brilliant, absolutely brilliant. It should be used on many more lines".

The latest count of hits on the film showing Geoff and Vicki's ride on the PPM railcar had by January 2018 risen to over 136,000, typically three times as many viewings of most of the other episodes of the 'All the Stations'.

...they may seriously mislead clients

A fairy tale was recently included in a professional document which was intended to explain to a local authority client why they would not be able to use PPM technology for their proposed new tramway. The tale was told by a firm (A), to a city (B) with in normal circumstances, the need for care (C) in checking facts. The moral of the tale is that without C, A and B lack credibility. In their recent report A failed to observe C by stating the following:-

'Disadvantages:

- ◇ *It operates on the conventional rail network and would be incompatible with operation on the road network.*
- ◇ *Simple bus style construction passenger experience low (reminiscent of the Pacer vehicles).*
- ◇ *Incompatible with a low floor design which requires equipment to be roof mounted and therefore requires a much more rigid/strong structure.*
- ◇ *Requires elevated platforms - a challenge for street operation in mixed traffic.*
- ◇ *Limited passenger carrying capacity and passenger access - 130 compared to Bombardier Flexity of 295 passengers'.*

All five of the stated disadvantages are incorrect and therefore misleading. The following 5 points are correct. PPM vehicles are:-

**1. Approved for Street Running**

Early versions ran tram style demonstration services in Birmingham, Barking, Brighton and Swansea. The railcar design for Stourbridge was an *adaptation*, fitted with space frames to raise the floor so as to enable passengers to board at normal railway platforms.

**2. Provide Positive Passenger Experience**

There are a few complaints, about the bumpiness of the ancient track with old style fish-plate joints, but the vehicles themselves are well liked.

**3. Both high and low floor PPM vehicles have their traction equipment below floor.**

(never in the roof)

**4. The street tram versions are compliant with tramway regulations**

50,000 passengers used the Bristol service. (see picture below)

**5. Sized to meet passenger demand**

Conventional Supertrams are far too big for most of the 200 towns and cities which once had trams. It is a main positive feature of the PPM design to be economical to operate in smaller conurbations where smaller capacity vehicles are more appropriate.

The Consultants 'A' advising City 'B' should now **Check** their facts so their report no longer misleads.



PPM 'Car 10' (the same vehicle now undergoing a refit - see page 1) performed a tram-style demonstration service in Bristol between 1998 and 2000. The exercise, promoted and arranged by James Skinner's Sustraco company, was an important pathfinder showing how in the Harbourside area (which is accessible to normal road traffic and pedestrians) the PPM tram could run safely and conveniently in a street environment.

## 'WRONG TIME' AND OTHER FREE ENERGY - WHY LOSE IT IF YOU CAN USE IT?

### You Don't 'alf Need Brakes at Stourbridge!

Brakes have always been rather important on the steep gradient of the Stourbridge Town branch. In by-gone years a variety of steam and diesel trains failed to stop and crashed through the wall at the Town end of the line.

### Regenerative Braking



*1960's dmu makes unscheduled visit to Stourbridge Town Bus Station.*

As PPM Class 139 railcars descend the steep gradient at the approach to Stourbridge Town station the drivers keep their hands on the brake lever but do not actually apply the brakes to slow down. Instead they use a second lever which controls the vehicles hydrostatic transmission which slows down and halts the railcar entirely by using its gearing. The 10 tonne railcars accelerate down the steep 1 in 60 gradient of this branch even with the engine idling they accumulate kinetic energy. On other types of rolling stock brake friction turns into heat which is dissipated. The Class 139s however have one metre diameter flywheels which recover the kinetic energy by increasing their rotation. The same kinetic energy is then available giving the vehicle extra acceleration as its sets off on its return journey. This saves fuel and makes it possible to operate with an engine half the size that it would normally need to be.

Regenerative braking is 'free' and it is astonishing how little attention has been given to it over the years as a means of saving fuel. Meanwhile energy in the form of heat is sometimes not only free but present in such large quantities that money needs to be spent on refrigeration and air conditioning to get rid of it. This is a problem for underground metros.

Other forms of 'free' energy derive from renewables such as solar, wind, wave sources which are intermittent and partially unpredictable, and tidal energy which like solar can be predicted.

The vast resources of free and wrong time energy in windy and sunny areas of the World cries out for means of storing them - and not by investing in 'walls' of lithium ion batteries. Something a lot cheaper and simpler is needed. The PPM company has been taking a long hard look at Compressed Air.

Compressed air has been described as the '4th Utility' after water, gas and electricity. It could also be called 'the forgotten utility' as in a previous era, networks distributing air as a source of power were common in many cities and complexes. There can be a new role for compressed air providing the one missing item for people wishing to generate their own clean energy but having no means of storing it during periods of ample supply. Selling surplus electric power back to the less-than-enthusiastic national grid suppliers has never been a good approach to self-sufficiency. An environmentally driven household would much rather have their own means of storing the energy they have generated, especially if it could be converted into a propellant for the family car. The conventional wisdom is that the future will be all batteries. Wrong. Compressed air technology can make such storage possible by, for instance, providing a range-extending facility for battery-powered trams.

The fresh realisation is that even in the same location, energy does not have the same value. At its highest value is when everyone wants it at the same time. At its worst "wrong time energy", it keeps being generated in for greater quantities than is being used.

In transport systems the air in some underground Metros becomes uncomfortably hot as a result of the heat caused by trains applying their brakes.

At midday in the tropics the sun's heat pours down on houses which are unoccupied with no need for lights, cooking or even air conditioning.

How to store it when you can't use it?

Mr Elon Musk the South African innovator whose massive commitment to battery power sees householders installing *walls* of Lithium-ion cells which can take in solar or wind power surplus to current demand.

But this has a cost, not just the original investment but later on when the batteries come to the end of their working life after a given number of charging cycles. 'Power walls' will not be affordable in low income communities.

### **COMPRESSED AIR PROPULSION**

There has been a considerable history of the use of compressed air in propelling rail vehicles. In France two major cities, Paris and Nante had fleets of compressed air trams which ran successfully up until the start of the First World War.



*Preserved tram in Nante museum.*

Locomotives powered by compressed air have been widely used in the mining industries of the United States, Canada and several Eastern European countries

### **AMERICAN LOCOMOTIVE POWERED BY COMPRESSED AIR**



*For much of the previous century the mining and tunnelling industry in the United States used compressed air locomotives for hauling iron ore trains underground.*