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TACKLING THE GLOBAL PULSE EVENT: "LEARNING BY DOING"

Short outline
In this paper, concerns about "pulsar effects" fall into 5 main categories:
1) The speed and scale of the global shift from rural to city dweller is enormous. How are we going to handle this global pulse event and who should take the lead?
2) By coping with pulsar effects, the key to sustainable development will fall into our hands;
3) As innovations double every 2 years, the opportunities to change urban and regional situations are numerous.
4) As individual transport systems are inter-linked, the opportunities for doing more with less increase greatly;
5) To make ideas happen, just start up pilots and learn by doing. The outcome of these pilots is set to influence political will more efficiently.

The global pulse event
Estimates of the future spread of urbanisation are based on the observation that in Europe, and in North and South America, the urban share of the total population has stabilised at 75-85%. If the rest of the world follows this path it is expected that in the next decade an extra 100 million people will join the cities of Africa and 340 million the cities of Asia. The equivalent of a new Bangkok every two months. By 2030 nearly two-thirds of the world's population will be urban. If there is one thing that everybody agrees on, it is that this process – as soon as economic growth allows -will follow the pattern of the industrialised countries.
(the economist may 2002)

The magnitude of the economic growth that is hoped for in coming decades, makes it seem inevitable that the clashes between mankind and nature will grow worse.

It took the rich countries 80% of the resources of our planet to achieve their prosperity, yet they contain only 25 % of the world's population.
Consequently ecosystems in future will be less able than in the past, to deliver the goods and services upon which human life depends.
The conclusion seems unavoidable: we do not have generations, we only have years in which to attempt to turn things around.
Who are we? Clearly, the wealthy nations. If these nations really care about sustainable development, they should make many changes and utilise their ability and capacity to innovate. In this respect the congress theme: "Coping with Pulsar effects" is indeed of eminent importance. Because technological innovation is on our side we will be able to do more with fewer resources and less land consumption.
The key to successful coping with the ongoing global shift from rural to city dweller is primarily in the hands of the western countries.

How does Europe cope with pulse events?
Let us take a closer look at the subject. What is the true state of the existing services, facilities and infrastructure in Europe.? To keep it simple, let us have a closer look at the state of affairs in Holland and see what happened to the intentions of the Dutch government two decades ago to develop of an efficient and cost-effective transport network. All this, under the best possible environmental , social, and energy consumption conditions.

So, what has happened, so far? Many plans have been made, yet the Netherlands suffer from an almost permanent traffic infarction due to a continuous flow of pulse events such as commuter -, commercial - and recreational movements. The Netherlands is one huge network of road infrastructure connecting a vast sprawl of urban nodes. This large-scale network is exploding. Traffic jams in between the built up areas have become a permanent crisis. Some facts and figures:

- 40% of the urban fabric is designated for (auto) mobility;
- car ownership equals 1 car per 2,6 inhabitants;
- average car use equals 35 minutes per 24 hours. In other words most cars are only used for driving during 3 to 5% of their lifetime;
- 25% of journeys by car are for less than 1 km and 50% for less than 3 km;

Motor vehicles themselves have a far reaching negative effect on the environment, including:
- emissions of potentially harmful or damaging CO_2, NOX, particulates, CO;
- noise pollution – motorways and busy trunk roads destroy urban and rural tranquillity and undermine public health;
- visual intrusion – motor vehicles cause detriment in towns and rural areas by literally "spoiling the view";

Little headway has been made with mobility problems. Citizens are reluctant to use public transport services. Politicians reflect the views of the people who elect them. Consequently, politicians are reluctant to commit large investments to public transport, knowing that their electorate is more satisfied with the quality of private transport. People have almost no choice, other than to use private cars. And the Dutch government enjoys a regular income through drastic taxation.

Ideas galore
In Holland's "polder model" environment, nothing appears to be more valuable than producing ideas and plans. Yet many leaders, civil servants and entrepreneurs are frustrated by how their organisation's plans remain unrealised. In other words many organisations are able to identify the right ideas, yet they often lack the ability to convert ideas into reality. They keep on getting entangled in coalitions, cartels and monopolies.

Let us have no illusions. Taking effective action to tackle pulsar problems, the mobilisation of political rethinking, co-operation and sacrifice is mandatory. All that matters is not how many ideas you have, it is how many you actually make happen.

Opportunities
We should take advantage of the technical innovations which the 20th century has brought. The new economic order will increasingly obey the logic of networks. Development of networks has been going on for decades, but recently our ability to connect has accelerated. The silicon chip and glass fiber have emerged with incredible speed. Understanding how networks work will be the key to understanding how the urban economy and ecology works. Any network has two ingredients: nodes/clusters and connections. These two physical realms need reconsideration: the nodes/clusters need capacity for interchanges with existing and new transport modes, while the quality and quantity of connections need multi - modal transformation

There is another factor to consider. The emergence of the micro car. (SMART/THINK). The car's fuel consumption is limited and thanks to its small size, parking-surface pressure reduces by 45%. Car substitution – for instance by 20% micro cars - would yield useful public space for urban quality.
Municipal authorities could stimulate the use of the micro car by creating <3M parking places, offering micro car drivers a discount in conventional car parks, tolerating 2 micro cars per conventional parking place and other incentives. It is obvious that substantial advantages would be achieved if the micro car is introduced in the form of a City Car system to complement public transport. The remaining space could be converted into space for inter-modal facilities.

Furthermore, the introduction of the micro car paves the way for fuel cell / electrically driven city cars.

Fuel cells directly convert the chemical energy in a fuel, such as hydrogen or methanol, into electricity. The power generation produces no emissions except water vapour. The fuel cells can deliver more energy per volume and weight than batteries, even when including the volume and weight of the stored fuel. An advanced version of the fuel cell, which would use methanol as a fuel to provide far greater energy storage capability, is under development. Cars of the near future are likely to operate on fuel cells alone, or with a hybrid system using both batteries and fuel cells in which the battery provides power for acceleration and speed and the fuel cell provides energy for longer distances before refuelling. All major automotive manufacturers are now developing fuel cells as replacements for internal combustion engines that emit heat trapping CO_2 gases.

Integration of traffic modes.

In the past Europe has planned largely using separate strategies and systems for road, rail, bus, cycling, walking, water, sewer, telecommunications, land use, etc. All that is needed is the integration of major infrastructure and traffic modes. This enables choice. Choice between traffic modes is the key issue when it comes to coping with pulse events. Inter-modality facilitates choice. It is an intelligent way to shift demand to other modes where transport infrastructure could be used more efficiently. In this respect communication is vital. Communication is the foundation of urban systems. This is why networks are so important. The more interconnected transport modes are, the more opportunities they spawn for coping with the demand of infrastructure.

The Dutch Ministry of Transport recognises that solutions must be developed to improve the current position by inter-linking mobility chains. Alongside the development of the long term infrastructure, the Ministry is pressing for measures which make more effective use of existing modes, infrastructure, systems integration and ICT. The solution is to create new products and services including for:

- complementing conventional public transport through a city car system;
- using public space more efficiently;

City Link's solution is driven by a sophisticated application of ICT. It involves the integration of a series of measures at technological , financial and organisational levels. More precisely: it integrates a fully automatic reservation-, registration-, tracing and tracking system (car module / server / database), the application of a mobility smart card together with the implementation of an innovative parking strategy. It manifests itself as a *Public City Car* system for Individual Transport, a system which appears to be a missing link within Holland's diffuse sprawl of urban nodes. The conceived system is based on a regular public service. It integrates public and private transport.

The city car and car sharing, what is the difference?

Car sharing, developed in Europe, is becoming a significant form of mobility. Shared cars are picked up and returned to neighbourhood stations. Members of the car sharing organisation pay a flat fee and an additional fee per hour and km. Car sharing concepts are based on the premise that households do not need to own or long-term lease cars.

The Public City Car concept is being developed through a series of field tests sponsored by mobility providers and the Ministry of Transport. As a business to business service, it is conceived for commuters and business people with a national and regional span of control. They are car owners, yet travelling by public transport – thus avoiding traffic jams – and using the City Car for business/private visits within a distinct designated region. The City Car system has several cars parked at central locations such as offices of the participating companies, transit and railway stations, business and college campuses, conventions centres, etc. The City Cars are small (micro car), ideally electric vehicles.

Both systems require similar reservation -, billing -, fleet management -, and vehicle access systems.

The idea behind all this is fewer cars through smart administration and car management. The vehicles should be used most extensively and returned to the pool immediately after every trip. The central commodity will be the chipcard. Every card is coded individually and serves as ID and as car key. Smart card technology is sufficiently developed. The cars are connected online to the vehicle management centre and allow for the necessary real time data exchange such as drivers access rights, vehicle availability, usage statistics, etc.

Objectives and targets

There are two broad future prospects. Either we continue on with current trends, which stands for non intervention or we set a new agenda. Based on the latter objective the most pressing objectives in terms of transportation are:

- control/reduce greenhouse gas emissions;
- control/reduce land consumption for auto-mobility;
- control/reduce energy consumption;
- control/reduce traffic congestion;

The conceived Public City Car system, as part of a smoothly operated public transport system, would contribute - among other measures - to achieving some long term targets:

- diminish traffic jams by 15 to 20 %;
- shift car traffic (in situations where it is feasible) to public transport, ridesharing, bicycle use and walking;
- reduce volume of movement;

- reduce parking pressure near offices by 15 to 20%;
- yield at least 400 ha by 20% substitution of micro cars in the deltametropolis. This allows for the development of interchange areas .

Management experts often emphasise that "you can't manage what you can't measure". What is measured, how it is measured and how data are presented affects how problems are defined and what solutions are selected. Which indicators are selected and how they are weighed and presented implicitly defines the value placed on the objectives and targets. Since a City Car System supports and should be supported by inter-modal strategies measurements should be made covering a wide range criteria effecting an increase in consumer travel choices. These choices are interrelated with the quality and capacity of commuter transit, business transit, shuttle services, vanpooling and other forms of ridesharing, cycling, walking , land use management strategies such as public transport oriented development, location efficient development, inner city calming measures, car free housing, taxi deregulation, cluster transport management programmes, parking management policies, etc.

Local, regional and governmental authorities and organisations would be well placed to help establish the City Car stakeholders and support the implementation of complementary inter-modal strategies. The conceived integral approach does not exist yet. Therefore the information listed below should be considered as a provisional impact summary.

CITY CAR TRAVEL IMPACT

Objective Target	Rate	Comments
Reduces total traffic	2	30% per capita
Reduces peak period traffic	2	50% per capita
Shifts peak to off-peaks	0	
Shifts car travel to PT.	2	15% per capita
Improves access.	1	Mixed land use
Increase pooling, cycling, walk	2	Encourages alt.
Reduces parking pressure	3	Replaces 6 cars
Yields public space	3	8m2 per car

Rating from 3 (very beneficial) to -3 (harmful)

It goes without saying that, the effect of City Car systems and other car sharing programmes reduces pollution and energy consumption. For instance a study commissioned by a Swiss office for energy affairs shows that former car owners (the ultimate result of car sharing) reduces their energy consumption for transport by 50%. Regarding the phasing of the City Car scheme, the project will initially provide city cars in a business to business formula, followed later by a business to consumer concept.

Phasing at quarterly intervals

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PILOT       ──────────▶
B TO B            ─────────────▶
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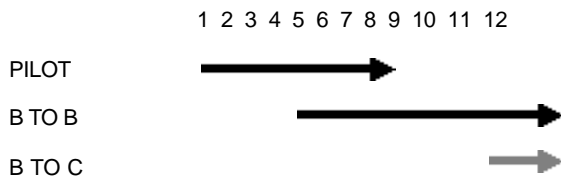
Pilot

In 2002 City Link, together with KPN Telecom and the Ministry of Transport as "launching customers", will be conducting a pilot in the deltametropolis.
The area referred to measures some 60x80 km and has approximately 5 million inhabitants, 2,2 million jobs, 2,5 million cars, containing < 1000 inhabitants per sq. km. and is considered to be a low density city. As a consequence, in many dispersed areas of this city, the transport demand is too diffuse. This means that public transport operators conduct their services –except during commuter peak periods - on a low frequency and performance level. For this and other reasons, the car remains in 70% of the cases more attractive than public transport.

The central objective of the pilot is "learning by doing". To learn from customers in order to be able to take their views into account in the planning, design, operation and maintenance of the system.

Quality perceived by customers is difficult to identify. It covers a mix of different factors, including travel time, comfort, reliability, information systems, inter-modality, number of interchanges, friendliness of its structure, image, security, etc.

The pilot is to start by the end of 2002 and will last at least 2 years. The effectiveness and credibility of the results will be measured by dividing the area of intervention into:

A) physical measures;
B) system integration;
C) marketing;
D) organisational measures;

A) physical measures
- establish parking lots at railway stations;
- establish parking lots near the offices of the "launching customers";
- establish free street parking for city link cars;

B) system integration
- establish webserver / database based on LINUX;
- establish car computer including GPS and GSM interface;
- establish for the automotive M&E adjustments, allowing controlled access;

C) marketing
- select participants of launching customers;
- establish user observation programme;
- establish adequate PR;

D) organisational measures
- establish internet reservation module and call centre;
- establish a joint venture for day to day operations;
- establish co-operation with public transport companies;
- budgeting and budget control;

Almost all activities have been completed. The assembly of the server/database is in progress and the quick scans are being conducted.

The conceptualisation of the project, together with the preparative actions have been co-financed by MOVE, the Dutch Ministry of Transport's mobility agency.

The results so far.

The preparative actions should be considered not just as the activity which takes place prior to the birth of a new system, but also as the activity that should monitor every significant aspect that might influence the implementation. Let us firstly recall the key issue of the global pulse event.

We concluded that if the economies of the developing countries were transformed into clones of the wealthy nations, an ecological nightmare could arise. If the whole of the developing world were to adopt a western lifestyle tomorrow, land consumption would dramatically increase and cause further environmental decay. So, there is cause for concern. We also concluded that it is the rich world which has caused the environmental problem in the first place and which must therefore lead the way in solving it. We all know that 'la matière grise" in the rich world is able to identify the right ideas, yet it often lacks the ability to convert ideas into reality. This is regrettable, bearing in mind that the opportunities to organise new planning and operational arrangements are at hand.

For instance, if China were to have Europe's mobility, it would not have today's cars, but the cleaner and smaller cars of tomorrow, together with the inter-modality solutions. The problem is that consumers in developing countries want to drive cars not tomorrow but today. This point stresses that action is urgently needed . Why don't we – the wealthy nations – provide those cars and systems now.

We also concluded that technology is on our side. The question is when will prevailing technologies be displaced by tomorrow's smarter ones. The answer relates among others to the institutional capacities, legal standards and financial resources. In this respect the most important underlying factor is the political will. Setting up pilots is useful, but governmental and local policy still matter. What is our experience so far?

Politicians and the Dutch public regard traffic problems as a very important and urgent issue. There is a continuous search for solutions. However, it is remarkable that in the last two decades no serious measures have been taken to beat the devastating congestion problems. For instance road pricing has been perceived as an effective solution. Despite a strong resistance , the Dutch government decided two years ago to implement a road pricing programme, including the provision for road infrastructure. However, a few months ago, due to political reform, the decision was put back. A typical example of a chicken and egg situation. Another important aspect which underlines this situation of inaction is the diminishing span of control of the Dutch government over the public transport companies. This is because these companies have been privatised. For instance the debate about how the railways should be run has been brought into sharp focus by the dramatic deterioration of the capacity, quality and reliability of the train services. In fact railways are a monopoly and privatising a monopoly will leave the company in a position to exploit customers, whilst the government loses control.

The political process towards implementation of the conceived City Car System is also proving to be difficult. Fear of losing control of business as usual make politicians and public transport companies reluctant to experiment with inter-modality, for

instance the introduction of a universal credit card for all transport modes. In summary it is a challenge to break through the observed deadlocks and to seek for fresh approaches to governance, urban planning and mobility management.

How to break through the deadlocks? What must be done in the Netherlands to cope with "pulse" events?

In conclusion, and based on the above analysis, the following policy principles are proposed:

1. Rail network needs to be increased and improved.

- No public transport system can provide a sufficiently dense network to offer direct a route for every journey. It is essential to seek optimisation by providing maximum accessibility through a network adapted to integrate other transport modes;
- Bearing in mind that the rail operators suffer from under capacity, the rail networks need to be expanded as well as improved to meet today's demand (light rail systems, etc);
- The implementation of transport policies such as road pricing, pedestrian inner cities projects and parking charges will further increase the demand for rail networks;
- The quality, capacity and frequency of rail services need a drastic upgrading;
- Relocate offices in situations with rail transport links;
- Promote and implement a universal mobility credit card;

2. Inter-modality

- Inter-modality is not just a fancy word, but – through its absence - a reality for commuters and visitors every day. The total door to door

trip should be taken into consideration from beginning to end;
- First of all corporation and co-ordination between public and non private mobility providers is mandatory;
- The distribution of stations should be optimised allowing for a maximum catchment and more importantly, allowing for space for well designed highly visible stations ;
- Additional space should be reserved and designated for P&R, K&R, buses, on-demand minibuses, van services, taxi's, bicycles and City Car transfer points;
- Improve transfer facilities for passengers, luggage and goods;
- Create multi-modal traffic information systems;
- Organise interfaces for long distance transport separately from interfaces for public transport with individual transport;
- Form a company with the major transport operators to co-ordinate the design and purchase of a smart card ticketing system which would be used by all operators. For customer convenience allow for a system which uses one card only.
- Conduct Taxi and Van service improvements. Taxi services are often regulated with restrictions on market entry and pricing. It is a necessity that communities are shifting to more competitive markets through regulatory reform.

3. Public City Car programme

- Identify key stakeholders and establish whether or not they support the introduction of the Public City Car programme. Most important stakeholders: public transport companies, municipalities, automotive industry, environmental organisations, interest groups, chambers of commerce, health sector, financial

institutions, public services, retail, leisure/tourist organisations, service industry, etc.

- Implement an identical standard for all regions;
- Promote Micro Car technology (lightweight materials, fuel cell – electric propulsion, 0 emission, GPS, etc)
- Introduce <3M parking;

4. Productive fiscal systems to enhance multi-modality

- Promote full cost accounting and pricing mechanisms allowing for accurate information on real costs of transportation. This facilitates the development of choices;
- A coherent government role is essential for creating an integrated, multi-modal national transportation system. Promote a tax strategy that is carefully detailed, in line with multi-modality;

5. Replace low density car dominant housing development by a concept of self supporting transit oriented housing clusters

- Promote partial work at home through ICT;
- Make use of satellite business centres;
- Promote office to office teleconferencing;
- Give rise to dispersed "virtual corporations" and the proliferation of local small businesses ;
- Conduct pedestrian and cycling improvements. Pedestrian and bicycle access is an most important factor in the utilisation of transport modes and all other activities.

6. Enhance communication

- Convince politicians that investments would have to be made without a clear picture of the return of investment at the short term. In this respect political acceptability can only be expected if politicians have a general confidence in the effectiveness and fairness of a new approach.
- One precondition to support confidence is continuous transparency.
- Explain that it is much easier to stifle measures that could help to tackle congestion problems than finding ways to encourage them.
- Communicate that uncertainty surrounding a problem is no excuse for inaction, even more if inaction inhibits innovation and degrades rather than enhances the environment.

Conclusion

Just start pilots. This is learning by doing and the most effective way to influence political will. For the rest try to keep it simple.

Breda, 26 july 2002. Gérard van Waesberghe.