

# ITS BENEFITS IN SOUTH AFRICA'S POOR COMMUNITIES

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## ABSTRACT

The field of Intelligent Transport Systems (ITS) has matured greatly over the past decade, and has started delivering real benefits in most major countries. In southern Africa, the emphasis is very different from that in developed markets. Instead of the space, productivity and environmental benefits emphasised in other countries, we need to think about issues in line with our stated national priorities. These priorities are improved safety, cost savings and the promotion of public transport.

Public transport can be greatly assisted by ITS. Public transport vehicles can be given priority, funds can be generated for subsidies and gradual changes in driver behaviour patterns can be encouraged. Selective enforcement also allows more efficient use of existing enforcement manpower, potentially leading to a substantial improvement in road safety.

Imported equipment is in many cases unaffordable and inappropriate. Only if we can foster a local industry that can provide relevant and affordable solutions will we be able to roll out solutions on a sufficiently widespread scale.

Finally, the South African electronics industry has all the skills to be able to produce ITS, not only for local consumption but also for the export market. Markets similar to ours exist in the rest of Africa, and in Asia and South America. Once we have appropriate solutions for our own problems, a substantial export market waits.

After a brief introduction, this paper covers the question of benefits in public transport and in job creation, both of which are stated national priorities and both of which stand to benefit significantly from ITS.

## 1. INTRODUCTION

The term Intelligent Transport Systems (ITS) is used to describe a wide variety of applications. Broadly speaking, ITS involves the application of information technology in transport, both in vehicles and on the road infrastructure, to improve the operations of the transport system. The technology in question might be as simple as a variable-message sign, or as complex as real-time auctioning of spare capacity on reserved car pool lanes.

The benefits have been widely published (Mitretek, 2002), and include the following:

- *Road safety*: Considerable improvements have been demonstrated in a number of countries, as restrictions and enforcement can be adapted to actual conditions at any given moment.
- *Increased productivity*: Delays are reduced, and travel times are made more predictable.
- *Increased road capacity*: Vehicle spacing can be controlled more effectively, and vehicles spend less time on the road.
- *Cost savings*: Vehicles and staff become more productive.

- *Satisfaction levels*: System users spend less time in transit.
- *Environmental impact*: Less fuel is burned, and idling is reduced.

These benefits are applicable universally, and obviously apply to South Africa too. However, South Africa has realities that differ from those of Europe, the USA and Japan. In our environment, the benefits need to be weighed against stated national objectives.

Perhaps the single most important difference in emphasis is the needs of our poor. ITS rollouts in South Africa will have to provide tangible benefits to the poor, or they will be seen to be out of line with national priorities.

The published literature has generally originated in densely-populated countries, and emphasises the productivity and capacity benefits. More recently, the environmental benefits have also received some attention. In line with these priorities, systems originating from there are generally extremely complex and subject to stringent levels of quality assurance.

South Africa, on the other hand, has different priorities. We should emphasise road safety benefits, cost savings and benefits to public transport, in line with our national transport priorities. We also need to deal with other realities, such as equipment “disappearing”, vandalism and physical affordability, to a greater extent than they would.

Perhaps an assessment of the benefits of ITS in the southern African context should commence with a discussion on two issues:

- public transport, and the
- creation or retention of jobs.

## **2. PUBLIC TRANSPORT**

The development of public transport is a stated priority of the South African national government. In a series of transport-related policy documents, the South African government has stated its belief that the existing public transport system is inappropriate, as it had evolved under a set of assumptions and conditions that are no longer valid.

The imperatives of NEPAD and SADC must encourage our decision-makers to adopt a broader focus than just South Africa, but the requirements and constraints are not fundamentally different for our neighbouring countries. For this reason, and because South Africa is by far the major component of SADC and a major player within NEPAD, only South African government policy is discussed. However, it is taken as given that the benefits from ITS must spread beyond our borders, in the wake of South Africa’s increasing participation in the countries of the sub-continent and even further afield.

Clearly, public transport is extremely important to the poor. Transport is perhaps the single biggest expense for many, and many spend hours per day commuting to and from work. Even a modest improvement in speed and cost would make a major impact on many individuals.

ITS can improve public transport in four important ways:

- *Priority in traffic*: If vehicles can be identified while on the move, priority can be given to public transport vehicles. In cities such as Chicago, traffic lights can already change phase as a bus approaches, reducing bus delays to a minimum.
- *Subsidies*: In California, spare capacity on a carpool lane is auctioned in real time. The system depends on ITS to assess capacity and allocate spare room to drivers willing to pay a toll premium.

The system reduces congestion by removing vehicles from the other traffic lanes, and provides a revenue stream of US\$ 2 million p.a. that is used to subsidise a bus service along the same route.

- *Behaviour change*: Law enforcement can be made more efficient, by identifying likely offenders and concentrating scrutiny on them. In due course, *bona fide* road users are inconvenienced less and habitual offenders spend more and more time and money on inspections and penalties. This situation provides a powerful incentive to behave! Passengers will benefit by increased safety and a greater uniformity of standards.
- *Selective treatment of passengers*: ITS can enable differential fares without introducing an increased risk of fraud. Pensioners, scholars and the unemployed can be treated preferentially, and such privileges can be policed to prevent abuse.

Clearly, improved public transport offers significant benefits to the poor, and ITS can facilitate such improvements.

### **3. JOB CREATION**

Imported ITS equipment is generally designed for conditions in its country of origin. These conditions might include compliance with inordinately tight quality requirements and protection against unusually severe weather conditions. Such requirements lead to equipment that is unnecessarily expensive for our environment.

There are also local requirements that might not be met by the imported equipment. Perhaps the most obvious demand that is not applicable to the most populous countries is the requirement for strong protection against vandalism. Immunity against theft of power supply and telecommunications cables is also a strong requirement. Unfortunately, these are realities of life that have to be taken into account when designing equipment for South African conditions.

Affordability has a double impact on the poor. On the one hand, ITS can only provide its full benefits if it is ubiquitous. On the other, if the equipment is expensive, it is less likely to be installed in poorer areas. Both ways, the poor lose.

Clearly, therefore, South African design and manufacture is not only desirable but necessary. We can replace expensive and inappropriate imported equipment with affordable tailored solutions. ITS products are as sophisticated as vehicles. Manufacturing of ITS products can be as labour intensive as the lucrative automotive manufacturing industry.

South Africa has a proud history of innovative design and engineering. Few countries offer the same combination of engineering expertise and low infrastructure costs. It follows that we are in an excellent position to compete on the global ITS stage. As South African companies have proved in other fields, we can provide excellent solutions at competitive prices, while presenting a grasp of third-world realities that mainstream supplies cannot match. Africa and the Pacific Rim offer wonderful export opportunities. South America presents another potentially lucrative market for companies that can overcome the language barrier. The poor and upcoming communities in South Africa can share in the potential of this new industry.

The ITS market is huge. Figures claimed run into tens of billions of US dollars annually. Even if only a small fraction of that market share is available for the taking, it still represents a lucrative opportunity for South African exports. A market share of only 1% in a world market of US\$ 72 billion annually will generate around 50 000 jobs.

#### **4. QUO VADIS?**

Where do we go next?

We have seen that ITS can provide real benefits. Apart from the well-known benefits advertised world-wide, we have unique benefits that are in line with national priorities.

A few practical steps must follow if we want to avail ourselves of these benefits.

To start with, there must be the will to implement ITS projects, beginning in urban areas. The business case is very real, and many international precedents show that the benefits can be reaped here and now.

The solutions chosen must be appropriate and affordable. Many local companies have the right skills in the information technology arena, and need only be introduced to industry-specific issues in transport to enable them to produce world-class solutions. It should be a matter of policy for the stakeholders to provide preference contracting and employment to local companies.

There will be teething problems. However, as in any other industry, our suppliers will overcome those problems and learn the lessons that need to be learned. Some form of guidance can be provided to reduce the learning time, using existing skills in industry and parastatal institutions.

A formal policy to support development efforts would go some way towards speeding up the process and encouraging participation. Such a policy would have to spell out the incentives for industry, as well as the extent and nature of support provided to industry. Existing parastatal institutions with an existing base of knowledge can play an important role in this regard.

Community acceptance is a key prerequisite. On the one hand, only when the community starts using the guidance provided by ITS can the improved efficiencies be kick-started. On the other, public funding is highly dependant on popular support. Programmes to build community understanding and acceptance must be an integral part of the process.

Only if that atmosphere is provided can we hope to reap the benefits of ITS and see a vibrant export industry come into existence.

#### **5. REFERENCES**

Mitretek, 2002, ITS Benefits (compiled on behalf of the US Department of Transportation), [http://www.mitretek.org/its/benecost.nsf/images/Reports/\\$File/deskref.pdf](http://www.mitretek.org/its/benecost.nsf/images/Reports/$File/deskref.pdf)