INTELLIGENT TRANSPORT SYSTEMS (ITS): CAN THE IDP AFFORD THEM?

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ABSTRACT

The emergence of the new dispensation in South Africa has elicited a changing role of Local Government, which is now the heart of the development process in South Africa. Integrated planning helps local government transcend its traditional service delivery functions (where in the past planning was focussed on the promotion of apartheid objectives of racially segregated spatial, social and economic development) to cope with its current requirement to play an active developmental role. As such, every municipality in South Africa is required to produce an Integrated Development Plan (IDP), which is the principal strategic instrument guiding all planning, management, investment, development and implementation decisions in the medium-term, taking into account input from all stakeholders.

This strategy process imposed on municipalities is however not peculiar to South Africa and the principles of an IDP range from the provision of basic governance to the Tibetan Refugee Community of 130,000 (in settlements in India and Nepal) to a business plan for Johannesburg, whose 3,200,000 population contribute almost 16% to the national economy.

Transport contributes to poverty reduction by enabling the productive activities that create effective economic growth, and by providing poor people with access to economic opportunities and social services, and a means of participating fully in society. Although much of the prosperity we have enjoyed in the 20th century can be attributed to roads and vehicles, transport related social issues such as an increasing number of traffic accidents, congestion, and other environmental problems are now plaguing most countries.

Intelligent Transportation Systems (ITS) apply a broad range of diverse technologies (including computers, information processing, communications, control, and electronics) to improve the effectiveness of transport systems and maximise the use of the existing road infrastructure.

This paper investigates whether the operational objectives of transportation, and in particular ITS, have strategic significance in terms of the IDP prioritisation process which allocates annual municipal budgets.

1. INTRODUCTION: WHAT A FINE MESS WE ARE IN

Apartheid had an enormous effect on commuting throughout the country. The wide disparity in the life chances and lifestyles of white and black populations, representing 1st and 3rd world conditions respectively, has resulted in:

- low and middle income outlying areas relying on expensive long-distance public transport.
- high income outlying areas with private transport, contributing to congestion within the city
- suburbs on the fringes of the city with rapidly increasing car ownership

A legacy of the past racial segregation of South Africa's population is a mismatch between workers and employment which is reflected in high levels of commuting between home and work, especially for the poor. For example eThekwini, like all other municipalities is racially structured, highly fragmented, sprawling and poorly integrated, functionally. Although much has been achieved in extending services to historically under-invested areas, the lowest levels of socio-economic well-being and access to services still occur in the periphery of the city and reflect the racial structure of the city. In this respect, 43% of the population in the eThekwini area live north of the Umgeni River and less than 10% of employment opportunities are found in this region. Just over half of these commuter trips in eThekwini are made by an inefficient public transport system, due largely to low thresholds resulting from low densities in core areas and outward sprawl that makes it difficult to provide affordable effective commuter transport systems[1].

Social change is occurring at a more rapid pace than ever before and for the first time black people have the opportunity to live, work and recreate in the city centre. The dramatic emphasis placed on social upliftment in the post-apartheid era has, in effect, contributed to the enormous pressure inflicted on the road network. On the one hand the redistribution of wealth to the masses has led to an increase in car ownership and traffic, while strict financial policies have curtailed new road projects.

The emergence of the new dispensation in South Africa has elicited a changing role of Local Government, which is now the heart of the development process in South Africa. Integrated planning helps local government transcend its traditional service delivery functions (where in the past planning was focussed on the promotion of apartheid objectives of racially segregated spatial, social and economic development) to cope with its current requirement to play an active developmental role.

As such, every municipality in South Africa is required to produce an Integrated Development Plan (IDP), which is the principal strategic instrument guiding all management, investment, development and implementation decisions in the medium-term, taking into account input from all stakeholders. This strategy process imposed on municipalities is however not peculiar to South Africa and the principles of an IDP range from the provision of basic governance to theTibetan Refugee Community of 130,000 (in settlements in India and Nepal)[2] to a business plan for Johannesburg, whose 3,200,000 population contribute almost 16% to the national economy[3].

This paper investigates the critical role transportation is playing in the whole of the South African economy and whether there is a role for Intelligent Transport Systems (ITS), in promoting safer and more efficient transportation through the appropriate use of technology, within the provisions of the IDP prioritisation process which allocates annual municipal budgets. Reference is made to Ethekwini Municipality's experience with the IDP process.

2. INTELLIGENT TRANSPORT SYSTEMS (ITS)

2.1 What is ITS?

ITS refers to Intelligent Transport Systems that apply computer and communication technology to improve the operation of transport systems generally. ITS simply addresses the need to monitor and react to traffic conditions or to relay traffic related information from the street to the motoring public or traffic authorities.

Particular areas of ITS influence are[4]:

- Advanced Traffic Management applications for urban networks, including adaptive traffic control systems, to provide priority for road-based public transport vehicles
- Electronic tolling systems
- Smart card systems such as electronic fare collection and integrated ticketing for public transport, to promote seamless travel for commuters between different transport modes

- Supply chain management of goods using smart tags for asset tracking
- Road and rail route planning by providing traveller information to facilitate trip planning
- Air and rail traffic systems management
- Traveller Information Systems to improve efficiency of use of public transport systems
- Vehicle tracking systems, to reduce theft, improve efficiency of freight movement and improve PT operations
- In-vehicle navigation and information systems to assist drivers to reduce unnecessary travel
- Freeway management and information systems to reduce delays due to traffic incidents
- Cross Border Operations for more efficient monitoring and processing of freight
- Travel Demand Management, to ensure efficient journeys for the community as a whole

2.2 Background of ITS Deployment in South Africa

ITS has evolved extensively over the past 15 years or so, particularly in the field of UTC (Urban Traffic Control) systems. In some parts of the world, monitoring road conditions through CCTV, responding to events by changing variable speed and message signs or even updating motorists via in-vehicle monitors have become just a subset of management functions undertaken in today's UTC systems.

We have come a long way with ITS in South Africa and current ITS projects include:

- KwaZulu Natal Department of Transport installed intelligent road studs on a rural road
- Cape Town have recently implemented their public transport tracking system, incident management control centre, multi-modal smart card applications for parking and inner-city public transport and a metro transport information call centre
- The Gautrain Rapid Rail Link, which will connect Johannesburg, Pretoria and the International Airport with Sandton in 2007, is another initiative which will change the face of sustainable public transport in South Africa.
- One of the key ITS focus areas in South Africa is Electronic Toll Collection (ETC)with drive through lanes for tag holders being rolled out in the Gauteng province and local consulting engineers also undertaking $multi-million ETC projects overseas, such as in Greece with freeway management deployment in preparation for the forthcoming Olympic games.
- Heavy vehicle control centre in Heidelberg using weigh-in-motion technology.
- Metrorail has released 25 000 Smart Cards for sale to daily train commuters using the rail service between Cape Town and Mitchells Plain.

2.3 Society for ITS in South Africa (SASITS)

The SA Society for Intelligent Transport Systems (SASITS) was founded as a Section 21 Company (not for gain) on 20th March 2001 with 8 elected Board Directors representing the Public, Private & Tertiary Education sectors. By providing an independent forum SASITS is dedicated to promoting safer and more efficient transport in South Africa through technology applications, by providing an independent forum where members can exchange information and ideas on issues of mutual concern. SASITS represents the ITS industry and serves as an honest broker to promote open standards based on a national architecture that will ensure interoperability and encourages a holistic approach to an inter-modal transport system. Towards this end SASITS endeavours to be needs-driven rather than technology-driven.

3. TRANSPORTATION

3.1 The Role of Transportation in the South African Economy

In his opening speech at the PIARC World Road Congress at the Durban ICC in October 2003 Deputy President Jacob Zuma emphasised the role of transportation in providing access to essential services like health and education and mobility. The role of transport in poverty reduction is sometimes overlooked because it is so integrated within the services and production processes it serves. At first glance we see only the manifestations of transport, such as roads and vehicles, and not ITS underlying

influence on economic and social activities. Transport contributes to poverty reduction by enabling the productive activities that create effective economic growth, and by providing poor people with access to economic opportunities and social services, and a means of participating fully in society. The extent of this contribution is affected by the overall economic, social and governance administered in the country and by the framework of transport sector policies, institutions and governance arrangements (such as the IDP) in place.

National Transport Policy has identified that transport plays a significant role in the social and economic development of South Africa. Public transport, traffic safety, traffic management and maintenance of infrastructure, have therefore been targeted as key areas in the development of an effective transport system aimed at improving mobility for all sectors of the community. However, in spite of this focus, measures of transport service are following a downward trend since, in general, the metropolitan areas in South Africa are in transition and budget priorities dictate the diversion of funds towards social arenas such as housing, education and health. Consequently roads authorities have to look at methods of improving the efficiency and effectiveness of service delivery in order to compensate for the lack of resources and funding.

The resulting effect is that transport infrastructure is having to be developed and maintained with significantly less funds than were previously available, despite significant increases in travel demand. Measures of transport performance highlight the increasing distress on our transport systems. The responsibility for extracting maximum efficiency from the existing road traffic infrastructure rests on the shoulders of the Metropolitan Councils and national transport authorities, SANRAL and NDOT.

3.1.1 Road Infrastructure

As the country attempts to create an effectively co-ordinated response to global market challenges in order to reach parity with the developing regions of the world, both in terms of economic welfare and social inclusion, transportation must focus on market access, mobility and systems integration. Key to this is the establishment of a road transport infrastructure in South Africa that would facilitate business opportunities, and thus economic upliftment, and will sustain growth throughout Africa. This is in line with one of the main aims of the New Partnership for Africa's Development (Nepad), to accelerate efforts to alleviate poverty on the continent and promote external assistance, technology transfer and foreign investment in business opportunities.

Bottlenecks at ports and border posts and deteriorating roads and railways are the reason for a proposed multibillion-rand infrastructure investment plan by the government as it tries to remove obstacles to export-led growth. SASITS is campaigning that the planned infrastructure upgrades should include ITS technology applications from the initial planning stage to positively leverage the impact of the investments.

3.1.2 Alleviating Poverty

Transport can contribute to reducing poverty mainly by increasing economic efficiency – by lowering the cost of travel and thus enhancing employment and social opportunities. In most developing countries the poor travel by public transport, walk and cycle so the objective of any measures to assist poverty reduction must improve travel for people and not necessarily for vehicles. Bus priority measures, therefore, not only promote efficiency but are entirely consistent with a policy of poverty alleviation as bus systems are used by the poor.

3.1.3 Integration of Transport and Land Use

As travel demand is dependent on land use disposition, it should theoretically be possible to reduce overall demand for travel through control of land use development. It can be argued that much of the increase in the use of cars is a direct result of policies which have permitted, even encouraged, the dispersion of major activity centres to the fringes of urban areas and beyond. Many of these locations

are not readily accessible by public transport and, with concentration into larger units for retail, education, healthcare and recreation, few people live near enough to access them by foot or bicycle. Cities like Curitiba have demonstrated the benefits of linking land use development and transport, reducing travel demand with shorter, lower cost, journeys.

3.2 Public Transport

The eThekwini Municipality has a large and flexible public transport system incorporating buses, mini-bus taxis and trains. eThekwini's public transport system provides for over half (57%) of the trips taken within the city, however, it does not operate efficiently, resulting in the duplication of services and under-utilisation of vehicles. This in turn has resulted in a very high subsidy (in excess of R400 million per annum), which supports the operation of buses and trains that are on average more than half empty. Customers also receive a poor service - the average public transport trip length of 20 Km takes an average travel time of 48 minutes. In order to meet the vision, the gap of an estimated 13% of residents, or just under 400 000 people, who are unable to afford and/or to access public transport needs to be addressed[1].

Traffic management should seek to improve travel conditions for *people* not *vehicles* and thus measures such as bus priority and road safety have great relevance and should be a fundamental element of any road traffic strategy. Buses are efficient users of scarce road space (they carry 30-40 times more passengers than a car in only 3 times the road space) so bus priority is one of the most effective traffic management techniques to improve transport system efficiency and to assist demand management (by providing an alternative to car use).

3.3 The Role of ITS in Transportation

The merits of ITS have been proven worldwide and as a developing country South Africa has numerous transport related problems that are ideal candidates for ITS solutions. With many road networks reaching capacity and little space to build more roads, concerted efforts are being made to get the maximum possible from existing infrastructure. The ever increasing demand for limited road space requires innovative measures to maximise the use of existing infrastructure and manage demand more pro-actively, where it is clear that capacity has been reached. ITS doesn't create new capacity but rather makes more effective use of existing capacity. It encourages one to travel at more appropriate times along better selected routes using more efficient modes of transport.

The use of ITS to facilitate driver information, traffic management, road user charging and enforcement can aid traffic engineers in improving the efficiency of the road network. The bottom line is less frustration, delay, pollution, fewer accidents and most important improved road capacity - all because ITS enables smarter travel. However, ITS is not a solution for all our transport problems and ITS solutions should be applied selectively, after due consideration. Taken to the extreme, one could conclude that all we need to resolve our existing congestion problems is to implement ITS everywhere. Unfortunately using ITS is rather like taking vitamins - they are effective up to a certain point and thereafter any more is just a waste of money. ITS may give the equivalent of adding an additional lane to an existing freeway but will not double the capacity of a 4-lane freeway or fully remedy a roadway with inherently unsafe geometrics.

It is important to note that basic transport infrastructure requirements still need to be met by building roads and other facilities, however, the possibility of achieving reductions in overall facility costs by incorporating ITS as a component of any new project should not be overlooked. In a developing country such as South Africa, the primary justification for new ITS projects is the proven cost effectiveness of ITS solutions, which improve the efficiency of existing transport infrastructure through management measures rather than the traditional course of expanding infrastructure, is.

3.4 The Role of Municipalities in ITS

ITS is well established in the USA, Europe, Asia and Australia and, while the concept has been widely accepted in South Africa for a few years now, only recently have we seen any ITS projects implemented in this country (ie. Electronic Tolls, Dynamic Message signs, Electronic Fare Payment, CCTV for traffic control & security and Intelligent Database Management).

One of the difficulties in implementing ITS projects in this country is co-ordinating all the role players involved (different traffic engineering aspects, feasibility study, funding etc) whereas the respective National Departments of Transport (NDoT) manage this role in those countries with a successful ITS infrastructure. Unfortunately, while our NDoT fully supports ITS, it chooses not to participate in the management and co-ordination of ITS in SA so it is up to the Municipalities to provide for this in their transportation planning and work closely with SASITS in implementing ITS projects. In essence, the importance of ITS in the metropolitan public transport environment should be recognised and the responsibility for ITS planning, funding and implementation consolidated under one roof. ITS should also not be confused with IT – (granted that computers provide the intelligence but the implementation of more efficient transport projects is the main focus of ITS).

Municipalities have a huge role to play in contributing to the establishment of a transportation infrastructure that will sustain growth throughout South Africa and transport is one of 4 key sectors in the IDP (along with Economic, Housing, Services & Environment), aiming to[1]:

1. Ensure efficient and safe public transport
2. Provide efficient and safe road network
3. Promote efficient movement of freight
4. Develop key transport nodes to service the urban periphery
5. Maximise access to rural transport

4. INTEGRATED DEVELOPMENT PLAN (IDP)

4.1 What is an Integrated Development Plan?

The Municipal Systems Act (Act 32 of 2000) requires every municipality in South Africa to draw up an Integrated Development Plan, in which the city's future is mapped over the short, medium and long term, to be compatible with national and provincial development plans and planning requirements. The plan should be aligned with the municipality's resources and capacity, forming the policy framework on which annual budgets are based, with key performance indicators to measure the success of projects. The IDP also describes the spatial development framework (SDF) which provides a blueprint for a city that is sustainable, accessible and efficient in dealing with the shape of the city, its roads, its settlement patterns, its need for commercial nodes.

4.2 Role of Municipalities

The IDP integrates the municipality with other service providers and residents. For example, eThekwini Municipality covers an area of 2300 Km² and has a population of 2.8M. Natural assets include 4000Km of rivers and 98Km of coastline with a further 63,000 ha of open space. eThekwini is a highly urbanised metropole in terms of its economic output, residential lifestyles / areas but has a large rural component (60% of the land use is rural in nature). The municipality currently has an estimated population of just over 3 million with the African community making up the largest sector (65%) of the population followed by the Indian community (21%). Currently less than half (43%) of Durban residents are satisfied with their lives with 12% being very dissatisfied[1].

eThekwini is South Africa's major port city with a diverse and vibrant local economy. It is South Africa's second largest industrial hub (after Gauteng) and has a large concentration of manufacturing activity, directly and indirectly linked to its status as a port city. This port also makes eThekwini South Africa's key trading gateway - the main entry and exit point for imports and exports, with its access to

important trading routes to the east, and its proximity to the Gauteng mineral-industrial complex. With the four major sectors of the economy being manufacturing, tourism, finance and transport, eThekwini has a strong presence in 'advanced' sectors of the economy.

4.3 Strategic Impact

The strategies for achieving desired economic, quality of life and people development outcomes (in terms of the IDP) focus on:

- unwinding the legacy and correcting the wrongs of the past
- building on current strengths
- creating the new (now) while investing for the future.

4.3.1 Transparency and Good Governance

Good governance remains critical to proper service delivery and there is a need for clear division of responsibilities, accountability and transparency in the transport sector. Municipalities must:

- ensure planning and prioritisation of infrastructure is responsive to the needs of the poor
- consider the initiatives to be taken to ensure their respective transport systems respond to population needs that are in synch with sustainable socio-economic development objectives.

4.3.2 Safety

Traffic accidents in eThekwini are unacceptably high with over 52 000 traffic incidents during 1997 and 28 road deaths per 100,000 population, which is a higher rate than Greece (21), USA (16) and Germany (16). This fatality rate would need to be reduced to 15 deaths per 10,000 vehicles for South Africa to be in the 50 top countries for road safety[5]. While Traffic Engineers see safety as one of the few areas of influence for transportation, realistically the "safer city" referred to in the IDP has nothing to do with road traffic safety, public transport or the reduction of accidents but rather the insecurity resulting from the rampant crime rate.

The IDP encourages improving the efficiency and safety of the public transport system by:

- fundamental restructuring the public transport system to achieve efficiency
- promoting better alignment of land use and public transport (reducing the need to travel)
- vertical integration of the transport function between the various spheres of government
- targeting transport subsidies to the poor.

4.3.3 Sustainable Development

There has to be a balance between the need to redistribute resources and opportunities to the previously disadvantaged on the one hand to the need to grow and regenerate the economy as well as maintain existing infrastructure and services, while still keeping the annual rates increase municipal charges at a rate below that of inflation. The emphasis is on the needs of the community, giving all citizens access to basic services and affordable housing. However, this alone won't achieve a sustained improvement in quality of life. So it is vital to generate income and jobs through building on the inherent strengths of the economy. Likewise, in order to become a globally competitive city serious efforts must be made to upgrade the technology and human resource skills to become "smart" municipalities in touch with their citizens, neighbours and the world.

- Quality of life and Community needs

In terms of quality of life, the strategy seeks to ensure that all residents of eThekwini live in a safe and secure environment, receive the services required to meet their basic needs, and have access to a range of cultural, recreational and social activities. Poverty (23% of the eThekwini's population suffers from extreme poverty, earning less than R300 per month per adult person) and HIV / AIDS are the biggest challenge to providing a better quality of life.

Results of the eThekwini Quality of Life survey[1] ranked the community needs assessment as:

1. Housing and services	2. Safety and security	3. Jobs
4. Community infrastructure	5. Health services	6. Governance issues
7. Transport	8. Education	9. Social issues

- Economic growth

Building increased prosperity, sustainable job creation and better distribution of wealth is THE challenge. Economic strategy is focussed on restructuring and upgrading the economic base of the city, while strengthening the economy in relation to export-focused manufacturing, domestic and international tourism and logistics. This includes providing high quality infrastructure to strengthen the linkages between business in eThekwini and the rest of the country and the world. Other core issues include improving business environment, implementing flagship projects and developing a sustainable financial strategy.

- Technology and building people skills

Ben Ngubane, Minister of Science & Technology, sees technology as being the country's fundamental engine for sustainable development and eradication of poverty[6]. Cell phone technology, for example, has been instrumental in providing a means of affordable communication to rural communities and will also play an important role in the success of future ITS implementation. Minister of Transport, Dullah Omar has also expressed the need to explore the latest technical skills on how to manage our roads and ensure that the number of deaths is decreased[7]. In terms of people development, the strategy seeks to increase the effectiveness of life and vocational skills training to provide people with access to jobs and developmental opportunities, to strengthen civil society to provide people access to local governance and to support the growth of arts and cultural activities. Other core issues include ensuring accessible and accountable Local Government, e-Governance and implementing Information Communication & Technology.

Although much of the prosperity we have enjoyed in the 20th century can be attributed to roads and vehicles, transport related social issues such as an increasing number of traffic accidents, congestion, and other environmental problems are now plaguing most countries. ITS can address these issues through the application of modern computer and communication technologies to all transport systems.

4.3.4 Infrastructure

The success of all the above strategies requires a well serviced city with an established, well maintained infrastructure based on an extensive road network with efficient traffic management.

4.4 Statutory Regulations[8]

Today's planning process is very different from the practices of the apartheid era, when it was a purely technical process, carried out by government officials with little or no participation from other important role players. All too often planning was focussed on the promotion of apartheid objectives: racially segregated spatial, social and economic development. The result was a budget that was understood by few citizens and characterised by a skewed distribution of resources.

In 1994, a new political system was born, based on the democratic values of human rights, development and reconstruction and in 2000 the Municipal Systems Act fundamentally changed the status, functions and responsibilities of municipalities, refining provisions in the Constitution of 1996. Today, local government has a new developmental role and is committed to working with citizens and groups within the community to find sustainable ways to meet their social, economic and material needs and improve the quality of their lives.

The Integrated Development Plan should also be seen in the context of the three most important national policy frameworks, the South African Constitution (Act 108 of 1996), the Reconstruction and Development Programme (RDP) and the Growth, Employment and Redistribution Strategy (GEAR) as well as the White Paper on Local Government, Municipal Systems Act, (No. 32 of 2000), Development Facilitation Act and NEPAD.

5. IDP BUDGET PROCESS : ITS VS COMMUNITY UPLIFTMENT

Local Authorities are expected to get new financial management legislation in the form of the Municipal Finance Management Act.

5.1 Resources and Budget

Given that there will always be too few resources to match need, resources need to be coordinated and used to maximise value and benefit. The efficient and effective use of resources can only be achieved if they are directed towards a particular vision and purpose. In absence of the big picture and agreed purpose, there is always a risk of using resources in an ad-hoc manner that meets narrow objectives and has a limited impact in delivering the outcomes identified for the municipalities. In summary, resource allocation must be linked to projects that are linked to programmes, which are linked to strategies and priority outcomes. Critically, if the IDP is to be successfully implemented it has to be linked to, and inform, the budgeting process. The capital and operating budgets have to be realigned to the programmes and projects of the IDP the allocation of resource must reflect the strategic focus of the IDP.

In competing for a slice of the ever diminishing financial pie pertinent questions are always asked of transportation, such as :

- how can transport best contribute to poverty reduction ?
- how large are the impacts ?
- which transport activities offer greatest poverty reduction and under what conditions ?

Past studies have had surprisingly little success in answering such questions but at least there is now greater recognition of the conceptual and empirical difficulties involved. These arise because most of the impacts are indirect, since transport makes other activities possible that improve poor people's livelihoods and well-being. The impacts are often widely dispersed among the population, and take place though multiple rounds of effects over many years.

5.2 Proven Effectiveness of ITS Projects

The international trend of increasing deployment of ITS related projects has resulted in a growing multi-billion dollar worldwide industry. The basic principles of ITS are not new, only the emerging applications and the way in which they are being marketed. An indication of the likely benefits of implementing ITS in a freeway management role can be obtained by reviewing international experiences. Table 1 (below) quantifies the measured benefits of implementing freeway management systems in the USA.

The implementation of ITS applications to obtain capacity, safety, environmental and financial benefits can be cost-effective, in particular circumstances, when compared with traditional methods of "building" capacity. Using average benefits described in Table 1 a simple comparison, to illustrate the relative scale of benefits gives an additional 15% increase in freeway capacity using ITS management measures may cost in the order of R0,5 million per kilometre, while a 33% increase in freeway capacity [assuming the expansion from three to four lanes – per direction] may cost in excess of R5 million per kilometre. The benefit to cost ratios, for the softer ITS solutions, are significantly greater. The purpose of this statement is to show that alternative solutions to building capacity are feasible, in broad terms, when applied in the appropriate context.

Table 1. Freeway Management System benefits[9].

Travel Time	Decreased by 13% - 48%
Travel Speed	Increased by 16% - 62%
Freeway Capacity	Increased by 8% - 25%
Total Accidents	Decreased by 24% - 50%
Fuel Consumption	Decreased fuel used in congestion by 41%
Pollution (Detroit Study)	Decreased CO^2 emissions by 122,000 tons annually Decreased HC emissions by 1,400 tons annually Decreased NO^2 emissions by 1,200 tons annually

Studies in the USA showed the life cycle cost of a new road to be 35% less by including ITS, compared to building roads without ITS. Benefit / cost ratios of selected ITS applications in a number of countries have been reported to be in the order of 2 to 8, with the higher figures relating to urban scenarios. A UK study in 1996 concluded with the benefit / cost figures shown in table 2 below :

Table 2. Benefit / Cost[9].

ITS project	B/C	Comment
Incident detection	3.8	repaying investment in a year
Intersection signal control	34	repaying investment in a few months
Area Traffic Control	7.6	extending existing technology to adjacent towns
Parking management	1.7	even for standalone applications
Emergency vehicles priority	0	no cost saving but faster response time (golden hour) meant fewer people requiring major treatment
Weigh in Motion	1.8	time saving for heavy vehicles

6. CONCLUSION

Transportation plays a critical role in the whole of the South African economy and ITS can be a key factor in promoting safer and more efficient transportation through the appropriate use of technology to promote best possible utilization of existing transportation infrastructure given the limited resources to expand infrastructure. South Africa has the best infrastructure in Africa - best roads, best seaports, best airports. In a nutshell we have the best connections to the outside world and we should use this advantage not only for our benefit but for the benefit of the entire SADC region.

6.1 Sacrifice

President Thabo Mbekhi has referred to the need for sacrifices to right the wrongs of the past but resentment of enforced sacrifice makes a poor starting point for nation building, which results in looking backward with regret and longing rather than looking forward with energy and optimism. The quandary for government is that access to all resources for all is essential to fulfill the promise of a more equitable dispensation - but if total access spreads resources so thinly that no significant benefit is felt anywhere within the system then nobody will derive any benefit at all. Not even the poor. In fact the reverse is true. There is the risk of a downward spiral where resources are not so much redistributed but rather fritted away and dispersed.

6.2 Redistribution

The redistribution syndrome has its roots in a fallacy that wealth creates poverty - when in fact the opposite is true and the opportunity to acquire wealth can actually help to eradicate poverty. A badly implemented black empowerment and affirmative action process often discourages the pursuit of excellence by attacking the very centres of excellence and one should heed Abraham Lincoln's wise advice in that "You cannot strengthen the weak by weakening the strong" [10]. The analogy of handicaps for horseracing and golfing helps to put this issue into perspective.

In horse racing the handicapper increases the weight carried by the fancied runner to hold it back and deliberately makes life more difficult for the exceptional performer. With golf, extra shots are not added to the score of the better golfer but the handicap system rather rewards the less skilled golfer for an improved performance. Life is not made more difficult for the stronger player but rather made a little easier for the weaker player to put in a competitive performance. So the lesson is not to make it more difficult for good companies to make good profits and sustain jobs; nor to make it more difficult for good schools to produce good results and deliver excellent students; nor to make it more difficult for good health schemes to make a contribution to the health system; nor to make it more difficult for entrepreneurs to start small businesses and create new jobs.

Rather than calling for sacrifices, provide encouragement for renewed effort and greater contributions to the sustainability of the country's economy. Addressing disparities by handicapping those that are productive is a futile exercise in negativity which the country can ill afford. A positive approach would be to look at ways of replicating the success stories. Centres of excellence should be role models not targets for criticism or envy and there is nothing positive to be gained from penalising individuals and institutions that are achieving success. The emphasis should be on addition, not subtraction.

We have to throw off the backward, begging bowl image that Africa has assumed and create our own opportunities by using and applying new technologies, such as access to electronic data facilities.

6.3 Bottom Line

The bottom line is that the IDP cannot afford ITS.

Only basic transportation needs are adequately addressed in the IDP, so ITS can only be funded indirectly through other guises (such as safety and efficiency issues) to achieve the required priority rating. Application of technology is unfortunately limited to e-Business or e-Government, where it is justified in terms of ensuring accountability and transparency of local government, but Intelligent Transport Systems are branded as a luxury item in our 3rd World context.

Since ITS is not recognised in its own right by the IDP process, a national strategy to secure funding and effective administration of South Africa's transport infrastructure is required in order to facilitate the wide scale application of ITS technologies.

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Various eThekwini Council committees

Presentations:

SATC 2000 : A Review of South African Urban Traffic Control Systems
6th World ITS Congress; Toronto 2000 : Emergence of ITS in South Africa
SARF 50th Anniversary Conference 2000 : New Road Construction : The ITS Option
SATC 2001 : Expanding Infrastructure : The ITS Option
8th World ITS Congress; Sydney 2001 : Internet CCTV : Live Traffic Broadcast
SATC 2002 : Integrated Data Management (TIDE)
2nd SASITS International Conference (Sandton 2003) : Vandalism vs ITS