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**Globalization, Mega
Transport Projects and
Private Finance**

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Bio:

Harry Dimitriou is Bartlett Professor of Planning Studies at University College London (UCL) and sometime Head of the Bartlett School of Planning. He is Director of the OMEGA Centre at UCL – an international centre of excellence for the study of mega projects in transport and development funded by the Volvo Research and Education Foundations (see www.omegacentre.bartlett.ucl.ac.uk) - undertaking an international study of decision-making in the planning, appraisal and evaluation of 32 mega transport projects in Europe, Asia and USA.

Harry holds a Diploma in Town and Regional Planning from the Leeds School of Town Planning (1969), a MSc. in Urban Science from the University of Birmingham (1970) and a Ph.D. in Transport and Urban Development from the University of Wales (1990). Apart from his teaching at the Bartlett School of Planning in UCL, he has previously taught and undertaken research at Aalborg University, the University of Hong Kong, Sheffield University and the Development Planning Unit (DPU) at UCL. He has also worked in British local government and extensively in international consultancy practice.

His principal areas of research and teaching lie in the fields of urban land-use/transport interaction and planning, urban transport policy and sustainable development, mega transport infrastructure appraisal and planning, strategic and regional Planning and institution-building for urban development and transport. Much of his work has concentrated on cities and regions in the Developing World.

Professor Dimitriou is member of the Royal Town Planning Institute and Fellow of the Royal Society of Arts in UK. He was one time Director of Training and Development Consultants (TDC) S.A, Switzerland, of Renaissance London Ltd. and of the International Institute for Energy Conservation (IIEC) in USA. He has been a member of the Transport Working Group for the Inter-governmental Panel on Climate Change (IPCC); several committees of the US the Transportation Research Board (TRB) of US National Research Council (NRC); the Foresight Built Environment and Transport Panel of Office of Science and Technology (OST) of UK.

He has held numerous advisory and consultancy positions, including for the

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Summary

This paper attempts to examine some of the shifting sands of global infrastructure investment practices at the close of the twentieth century and the opening years of the twenty-first, when MTP infrastructure investments were seen as a “hot investment area” leading many international bankers/investors salivating at the prospects ahead, particularly in the emerging economies. The author foresees that much financial risk in international infrastructure development will be transferred from the private sector *back to* the public sector as international banks and other global infrastructure investors increasingly encounter major credit liquidity problems.

With the public sector world-wide now much less confident on what can be expected of the private sector in financing MTPs, the paper argues the case for examining lessons learned from past global MTP infrastructure investment practices, together with outcomes of emerging practices that might be better understood through scenario planning. The author suggests that these are more likely to better inform future MTP planning, including any planning initiatives associated with proclaimed intentions to employ ‘New Deal’ type approaches to infrastructure investment as a means of re-igniting national economies and global economic growth.

Mega Transport Projects and Globalization

Underlying working hypothesis

The underlying working hypothesis of this paper is based on the author's presentation to TRB in 2005 (Dimitriou, 2005) which suggests that the corporate global economy has been using major infrastructure investments (in particular MTPs) to construct its global nodes and links reflecting more its own interests than those of the territories it traverses and serves. To facilitate this, it is argued, elements of corporate global business pressurise the similarly globally oriented elites within each national polity to subsidise this process, using various arguments to support such developments, including the case that MTPs help avoid urban 'gridlock' and thereby improve the global competition of cities and regions; stimulate regional development and support geo-military and political strategic interests.

The author argues that the forces and dynamics of globalization increasingly make it *essential* for uncertainty to be placed in the *milieu* of the policy-making and planning of such projects. Drawing from the work on globalization by Castells (1991, 1996, 1998 and 2004), Held et al (1999) and Mitchell (2000), and more recently Henderson (2008) and Tiffany (2008), the author ponders on a number of challenges ahead for MTP planning, including fears of:

- a global 'infrastructural collapse' as articulated by Graham and Marvin (2001);
- the demise of the formal planning process as argued by Sandercock (1998) and others; and
- the uncertain future of the nation-state and local governance as expressed by Castells (1996) and Palast (2002) and the world-wide decline in local governments' capacity to adequately respond to globalization forces.

Features of mega transport projects

MTPs often link local networks with global and are frequently perceived as national icons of development that are critical to the delivery of national and regional development strategies. As well as being differentiated in terms of the predominant transport mode they rely on (road, rail, air or some combination of these) they may also be categorised in terms of whether they are primarily:

- domestic and address local transportation needs;
- domestic but also play a significant role in making a place globally more competitive;
- international in both function and character.

The discussion which ensues principally refers to the latter two categories of MTPs.

There are several potential explanations offered to explain the growth of such projects. According to SMEC (2001: 2), these include the prevalence of:

- **The ‘big fix’ mentality**, where development planners and political leaders alike are attracted to projects which offer a single solution to massive problems.
- **The continued need for symbols of national development**, where such projects are interpreted as tangible expressions of national aspirations for economic and social development.
- **Technological advancements** that have facilitated the implementation of projects that previous technology could not before deliver.
- **An enhanced global institutional capacity** developed by global corporations affecting the attitudes of government decision-makers as to the size of projects, encouraging larger projects to be built.
- **An increased inter-dependency of mega projects** where they form part of an economic and technological system whose optimum efficiency is deemed achievable *only* if complimented by other mega project investment.
- **An enhanced global financial network** of banks and entrepreneurs, facilitated by global IT arrangements capable of moving funds from one part of the earth to another, literally in an instant, enabling the commercial involvement in infrastructure projects of world-wide sources of (private) capital making the financing of certain mega projects possible where before they were not.

An analysis of MTP experiences suggests that they are associated with a number of common features. Paraphrasing SMEC (2001:3), these include:

- **The irrevocable character of the ‘green light’ decision**, given that it is extremely difficult, politically, to cancel a large project once its construction has commenced. An incomplete project represents a huge waste of human and financial resources and political capital with the result that a ‘green light’ given by governments typically represents ‘a point of no return,’ even in the context of escalating costs.
- **The rising demand for more comprehensive feasibility analysis** by both private project sponsors and governments as a basis upon which to give the ‘go ahead’ to such projects. This contributes to project delivery delays, makes better known project risks and uncertainties, and accounts for an increasing unwelcome proportion of project costs.
- **The increase in public controversies** brought about as a result of the highly visible nature of MTPs and the differential in benefits enjoyed by the project sponsors and the communities they affect. There is a growing feeling among many local communities that they are made to carry more than their fair share of the project’s social, environmental and even economic costs.
- **The ‘converging factor’ phenomena** where a MTP may have been on the drawing board for years, even decades, until such time a favourable set of circumstances converge that make the project’s implementation politically, economically, socially and environmentally acceptable and even an imperative.
- **The ‘project champion’ phenomena** where the project is championed by a powerful politician or set of very influential parties over a sustained period. Support of this kind is rare, because such persons/parties need to

possess a unique combination of vision and political 'know-how'. However, where and when the champion phenomena does materialise, it opens doors "as if by magic".

Prerequisites of effective planning of mega transport projects

The preparation of MTPs requires careful attention to the effective use of methodologies for forecasting, planning, appraising and costing (see Priemus, Flyvbjerg and van Wee, 2008). Such projects thrive in an atmosphere of certainty, involving ten-year, 20 or even 50 year commitments and billions of dollars, as well as thousand of person-years project work. They are typically planned and constructed with a professional culture of 'closed systems' thinking which has a tendency to minimise the uncertainties and risks associated with the context(s) and working environments of the project. Without this certainty, Bott (1998) argues that mega projects can easily become white elephants.

The paradox, however, is that we today live in increasingly more uncertain times (see Beck, 1992 and 1999; Lash et al, 1996), re-confirmed by recent developments associated with the increasingly inter-dependent multi-dimensional global crises unfolding before us. These include: the longstanding crisis of world poverty (see Hollander, 2003), the growing food production crisis (The Observer, 2008a; 2008b), the declining availability of global energy resources (see Hollok, 2005; Pfeiffer, 2007), climate change induced global warming (see Hansen, 2003; Stern, 2007), and the global finance liquidity crisis (Porter, 2005; The Economist, 2009). All represent on-going determinants that can fundamentally change the context(s) of future MTP developments that make the search for certainty far more difficult as they interact and evolve over time and place.

The case presented here is that an understanding of these developments is *critical* in judging what constitutes a 'successful' MTP and what does not (and in whose eyes these judgements are made) since the declaration of who and where are, the intended principal benefactors of such projects is of paramount importance. This understanding needs to be accompanied by the task of critically assessing the levels of confidence that exist in successfully overcoming the opposition and uncertainties associated with the actualisation of such projects - which is when/where the politics of risk becomes highly relevant (see Mythen, 2004), alongside the risks and uncertainties associated with the cultural and institutional contexts of MTP infrastructure finance, delivery and regulation.

Making sense of the new order and context

Globalization is the new (and constantly changing) economic, political and cultural order we live in. It is the backdrop for many MTPs and in many cases their very *raison d'être*. We have been advised by some that today's world is one where nation states no longer represent meaningful economic units (see Ohme, 1990; 1995), and where consumer tastes and cultures are homogenized and standardized by global products created by global

corporations with no allegiance to place or community (Dicken, 1999: 1). What is less frequently pointed out by such parties, however, is that it is these very 'stateless interests' that frequently rely on national economic units to guarantee the finance, even subsidize (sometimes by default), the construction and operation of many MTPs developed in a way that make selected places more conducive to capturing globalized benefits and generating globalized traffic.

The arrival of the global credit crisis, combined with the major shift eastward of the global economic centre of gravity as a result of recent developments in Asia (particularly India and China), is believed by many to hail a point of transition from a situation where globalization was previously primarily driven by the American Business Model (ABM) to a new form of globalization yet to fully crystallize. Tiffany (2008) postulates this future to be propelled very much more by Asian forces and the bamboo network. While acknowledging this greater influence of Asia in what he refers to as the forthcoming Global-Asian Era (GAE), Henderson (2008) postulates a transition to a more multi-clustered model of globalization where the leadership of the USA gives way to multiple centres of globalization in which Asia's role is greatly enhanced and competes with other major centres in USA, Europe and elsewhere.

What also can be speculated to be in transition is the ideology *presumed* to underlie the forces of globalization. With the global credit crunch, the ABM competition driven model of globalization, favoured and promoted so much by Anglo-Saxon neo-liberal economists, looks to being replaced as the propeller of globalization by a more collaborative and regulated approach with a set of at least three competing emerging ideological models: one drawn from Keynesianism principles; another associated with control-and-command type led market economies and a third based on the family business values of the global Asian business bamboo network. While these have yet to fully mature/develop, they are seen to fair the global economic storm better than the ABM.

Infrastructure nodes and landscapes

Reflecting Castells' presentation of the rise of the 'Network Society' (Castells, 1996), Graham and Marvin (2001: 10) invite us to view world cities and major urban regions as strategic nodes of global circulation and production and primary centres of trans-national exchange and distribution of products whose territories are superimposed over time by interconnecting "infrastructural landscapes". They see (ibid, 2001: 10-12):

- **Cities as a socio-technical process** - acting as 'mediators' through which nature is transformed into city (Kaika and Swyngedouw, 2000:1).
- **Urban infrastructure networks as 'congealed social interests** - sustaining what might be called the 'socio-technical geometries of power' (see Massey, 1993) and 'congealing social interests' in time and space (Bijker, 1993).
- **Infrastructure networks as embedded geopolitics** - representing capital that is literally 'sunk' and embedded in cities, translating into long-term

accumulations of finance, technology, know-how, and organizational and geopolitical power (Harvey, 1985:149).

- **Infrastructure networks and cultures of urban modernity and mobility** - that have tended to reflect the aspirations and visions of planners, reformers, modernizers and social activists in defining the ideal city (see Friedman, 2000).

Each of these infrastructure landscapes potentially offers challenging perspectives with which to re-appraise and re-evaluate the impacts of future MTPs in much broader terms.

Changing ideological premises

Transport, utility and communications infrastructure networks have all been traditionally seen as agents that bind cities, regions and nations together, planned and operated with the underlying premise that they are 'public local goods' generally available to all individuals at equal cost within particular local government or administrative areas (Pinch, 1985: 10). Influenced by forces of globalization, however, recent developments have actively encouraged a departure from this ideology, leading to a whole range of infrastructure facilities being dramatically 'opened-up' to the private sector. Up until the global credit crunch this made the infrastructure sector "one of the most lucrative targets of global flows of finance, capital, technology and expertise, as international infrastructure firms roam the world in search of high rates of return from niche infrastructure markets or franchises" (Graham and Marvin, 2001: 14).

Actively supporting this shift, the World Bank and IMF frequently incorporate conditions on the loans they offer and structural reforms they promote that oblige national and local governments to privatize previously monopolistic provisions of infrastructure and infrastructure services (see Palast, 2002: 67-72). These ABM ideologically driven actions have been supported by the World Trade Organisation (WTO), the Group of Eight, the EC and the other regional economic blocks (McGowan, 1999). The implications of this, up until recently unchallenged development, could prove fateful for certain kinds of MTPs in light of current problems of global financial liquidity.

Mega transport projects and the making of places

Globalization dangers of marginalizing people and places

Echoing to a degree the early work Meier in his seminal book *A Communications Theory of Urban Growth* (1962), Graham and Marvin (2001: 15) see cities and urban regions as possessing "new, highly polarised urban landscapes where 'premium' infrastructure networks selectively connect together the most favoured users and places, both within and between cities".

These networks and their nodes, often incorporating MTPs, occupy valued spaces and are increasingly defined by their 'fast-track' connections with elsewhere, simultaneously by-passing less favoured intervening places, and what Castells calls 'redundant users'. Graham and Marvin (2001: 15-16) point out that many such market-driven developments *can* undermine the traditional notion of infrastructure networks as binding and connecting agents of territorial cohesion, and oblige us to confront how space and scale are/can be dramatically re-fashioned in new ways that change the configuration of infrastructure networks and urban spaces beyond the recent limited practices (see Jensen and Richardson, 2004; Bertolini, 2005).

Such infrastructure developments can be seen to reinforce the intractable divisions in the world identified by Sachs (2000) among those areas which account for most of the global technology innovations (with some 15 per cent of the earth's population), those able to adopt these technologies in production and consumption locally (containing half of the world's population), and those remaining areas which he cites as "technologically disconnected" that are neither technologically innovating nor significantly adopt exogenous technologies. What should be noted are that many parts of the last of these three areas – the "technologically-excluded" – have large proportions of their population caught in a poverty trap which desperately require infrastructure support and developments far beyond their means. Many of these areas are typically of limited interest to private infrastructure investors in the absence of significant agricultural and/or natural resource extraction potentials and are thus very heavily dependent on government and/or international development subsidies and aid.

Investment neglect and fears of infrastructure collapse

Infrastructure investment neglect is not confined to the "technologically disconnected" as the above discussion may imply. Several principal post industrialised countries and their cities have experienced long term investment neglect in infrastructure investment during the latter part of the twentieth century, especially major urban transport infrastructure. These include the USA and UK, and cities such as New York and London. The renewed interest in MTPs in urban areas is in part a response to the need for such countries/cities to remain competitive both globally and locally. It is also, however, a reflection of recent concerted decisions by national governments to use newly proposed major infrastructure investment programmes to re-ignite their failing national economies and contributions to world economic growth (see Uchitelle, 2009 and Beeston, 2009). A characteristic of many MTPs, however, is that they not only take on strategic global functions but also often provide new local iconic urban landmarks (Kaika and Swyngedouw, 2000).

Experiences of infrastructure neglect, previously thought to be primarily confined to cities of the developing world, are now far more common (as already implied) in many parts of the 'so called' developed world. According to Pawley (1997: 162), infrastructure failures arise because much of

contemporary urban life is so highly dependent on a huge range of interdependent and extremely fragile, computerised infrastructure networks that are themselves prone to fail. This calls for a better understanding (and use) by policy-makers and planners of notions offered by Complexity Theory (see Arthur, 1993; Kurtze and Snowden, 2003; Batty, 2005) and a critical review of past responses to these failures employing some of the insights offered by this theory. Responses to such infrastructure failures have been criticized by Perry (1995: 2) as typically “too reactive” and insufficiently sustained, systematic or proactive. This is a sobering set of observations for governments and corporate stakeholders who all too readily see new MTP developments as ‘saviours’ from imminent infrastructure dysfunctionality or collapse.

Reflecting past calls for a broader based approach to transport infrastructure planning (see Dimitriou, 1992; 1998), Graham and Marvin (2001: 32-33) argue that to deliver enhanced mobility and supporting infrastructure urban networks more effectively “we need to develop a more robust, cross-cutting, international, critical, dynamic and trans-disciplinary approach to understanding the changing relations between contemporary cities, infrastructure networks and technological mobilities”. Such a shift, however, requires a much broader conceptualisation of the relations between infrastructure services and the development of cities and their land use that is conceptually closer to the analytical and planning approaches advocated by the pioneers of urban land use/transport planning in USA, including: Mitchell and Rapkin (1954) and Meier (1962).

Demise of the formal planning process

Large-scale transport infrastructure projects have often been negatively associated with ‘failed’ attempts at achieving urban ‘progress.’ Graham and Marvin claim this is because modern infrastructure grids, especially highway networks, were perceived as “destroyers” of valuable social and urban environments, seen to contribute to “the forced retreat of urban planning from the notion of comprehensive urban and infrastructure planning, effectively ditching the idea that the development of cities could be somehow orchestrated and shaped as a whole” (2001: 111-12). Fillion (1996: 164) suggests that neo-liberal driven globalization developments have obliged many planners to accept that their cities are merely “collages of fragmented spaces” defined by multiple identities and aspirations, with inevitable colliding visions.

Past planning processes are now being replaced, it is contended, by new ones that are seen to be driven much more by the entrepreneurial imperatives of making specific spaces ‘competitive’ (Jessop, 1998: 81), *as opposed to* collaborative, employing planning processes that view the city (and their regions) “as a series of unconnected fragments rather than as a practical and theoretical synthesis of planning thought and action” (Beauregard, 1989: 382). What is intriguing is how new MTPs (and their related networks) are increasingly taking on implicit or explicit strategic roles in providing new focal points for the clustering of these ‘would-be’ fragmented developments,

thereby suggesting a new process in the making of re-structuring rather than fragmentation.

Sandercock (1998:2) worries that “the profession of planning is becoming increasingly irrelevant except in its role of facilitating global economic integration”. In support of her fears she points to the fact that many governments have short-circuited or are seeking to short-circuit established planning processes, and in some cases, have even removed them from public scrutiny and democratic politics (ibid 1998: 28). On this basis, one could argue that not only is the physical and technical fabric of urban infrastructure splintering into many urban regions, but so too is the fabric of urban governance and planning (Fillion, 1996: 164). Graham and Marvin (2001: 113) are concerned that this fragmented urban governance is increasingly strengthening special-purpose governance agencies to become more actively involved in customising networked infrastructure to the precise needs of targeted (privatized) users and spaces.

Mega transport projects, globalization and private -finance

Introduction

The arguments posed above are primarily based when ABM driven globalization was unchallenged and championed on many fronts internationally and in many influential quarters in academia, politics, industry and in the world of global finance. They were presented prior to the global banking crisis and its dramatic effect on the restructuring of the world’s financial landscape taking place at the time of writing this paper which saw the decimation of the capital reserves of most major international banks and investment houses (see Figure 1).

The discussion which follows foresees uncharted waters ahead for major transport infrastructure investments as global capital markets become increasingly severely constrained and yet new public sector infrastructure investment programmes are launched world wide by the major economies of the world.

The discussion here begins with the period when the private sector was seen by many national governments and international development agencies alike to be better placed to take on the risks and uncertainties that major infrastructure investments posed. Fears of an infrastructure collapse was at the time so widespread and the need for investment seen to be so great that the public sector appeared in (too) many cases prepared to handover the baton of strategic infrastructure decision-making to global players on the grounds that they had the required funding, expertise and overview that the public sector lacked; a greatly misplaced premise as hindsight now teaches us.

Figure 1: Market Value Changes of Major International Banks and Investment Houses



Source: J.P. Morgan (2009)

While fears of the beginnings of the global credit crunch and infrastructure investment bubble were voiced by a few prior to their materialisation, the momentum of consumer-driven globalization, fuelled both by visions of global hypermobility (see Adams, 2008) and diluted regulatory practices, was such that the global infrastructure investment world seemed to have nothing but an extraordinary promising future ahead between 1996 and 2006. Infrastructure investments (especially MTPs) had the added marketing advantage of representing major landmark projects often seen to symbolise the economic virility of national/city economies thereby seen as priority projects by many politicians eager to impress global investors.

Estimates in 2006 indicate that the annual value of infrastructure deals world-wide increased to US\$ 145 billion, representing a 180 per cent increase on 2000, when, at the height of the mergers and acquisitions boom the total value was *only* \$52bn (Thompson Financial, 2006). This high level of investment activity was maintained until the impacts of the 'credit crunch' began to take effect in 2008, and the call for new regulative frameworks for international banking and investment practices reached the crescendo it has today. In the UK, these changed circumstances led to financial sponsors attempting four infrastructure deals together worth just \$121m (£61m) during

the first quarter of 2008, compared to four with a combined value of *only* \$11.3bn in the fourth quarter 2007 (The Telegraph, 2008).

It is important to understand how the above described earlier bonanza of global infrastructure investment developed. The following explanation is offered by Bell (2007):

- Firstly, by the 1990s a historic underinvestment in the infrastructure sector globally had developed, especially in transport. This in part can be attributed to past constraints on global capital availability which considerably improved in the 1990s, up until mid 2008, during which time there was more money available to invest than viable projects to invest in (Fraher and Kennedy, 2006).
- Secondly, a common belief spread internationally (very much promoted by the IMF and World Bank) that the private sector was better placed to extract higher investment and operational delivery returns in infrastructure than the public sector.
- Thirdly, infrastructure came to be seen as havens for long term investment for global investors who were at the time looking for long term, stable and inflation-proof returns.
- Fourthly, the financial markets became awash with new and more innovative financing models that made such investments appear attractive. The jury is out, incidentally, on the extent that these models contributed to the current malaise of toxic loans.
- Finally, the increased forces and acceptance of globalisation attracted many more investment entrants into the market than had ever been seen before.

The global infrastructure investment area grew so rapidly between 1996 and 2006, spawning such handsome rates of return, that a representative of the Standard & Poor Infrastructure Group at the Infrastructure Asset Finance & Investment Summit held in London in 2007 expressed concern that the sector was becoming overheated. This party was especially alarmed by the fact that the amount of equity in such projects was diminishing to such dangerous levels that he foresaw a bubble about to burst (Wilkens, 2007).

Others expressed different but potentially equally significant reservations regarding the then dramatic growth in infrastructure investment (including MTP investments). These include a claim by Paine (2007) that the public sector world-wide had been selling-off infrastructure assets at levels that were far too low: first on account that longer term benefits had *not* been correctly assessed prior to their sale; and second, in light of the fact that the scarcity of such infrastructure assets had been largely ignored in these assessments

Further concerns have been voiced regarding MTPs financed by Private Finance Initiatives (PFIs). Often masquerading as Private Public Partnerships (PPPs), where the “partnership” component is more bound-up in rhetoric than reality and where the value for money of this type of project has been increasingly questioned (see The Guardian, 2005b), not least because they often contribute to the mushrooming of public debt in a non-transparent way as the loans they incur typically do *not* feature in the public accounts as debts.

By way of illustration, UK Government debt as of 2007 attributable to PFIs was in the region of £91 billion (HM Treasury, 2007). This is approximately six per cent of the country's GDP (£1.42 trillion).¹ With the onset of the construction of projects related to the 2012 Olympic Games, this is set to spiral.

Problems and opportunities ahead

Notwithstanding the growth in global infrastructure investment that had taken place between 1996 and 2006, investors were confronted with a number of major challenges *even before the* global credit crisis materialised. This was because some banks became more interested in bonds than long term infrastructure investment. By 'doing nothing' they could earn a minimum of five per cent per annum for 20 years *without* exposing themselves to the kind of risks involved in the infrastructure investment field. This obliged annual rates of return for shorter investment periods to be far greater than this (at a minimum level of 12-15 per cent). This in turn led to expectations of excessively high returns in infrastructure investments (as high as 20 even 30 per cent). In some projects, these expectations were achieved, in *most* others however, they were not (Abraira, 2007)

Since 2006, a body of global investors (in the form of private equity investors) have emerged who are more interested in re-cycling finance within a five year cycle by buying and selling-off infrastructure assets within the short run, rather than making more socially responsible long-term investments (see Paine, 2007; The Economist, 2007a; Financial Times, 2007). These developments are contrary to the preferences of most governments and city mayors, and also pose major sustainability concerns. They can ultimately undermine the sustainability of many infrastructure projects as ownerships are transferred from one owner to another over the years for financial gain, each time generating reduced incentives to meet maintenance costs, ultimately leading to the run-down of the project. These private equity investors represented only two per cent of global investors in early 2000, whereas in 2007, they reportedly accounted for up to 50 per cent (Wilkens, 2007). These developments not only pose transparency challenges but can also lead to conflict with political and legislative practices. They, furthermore, attract charges that such parties escape local tax obligations (see The Financial Times, 2007; The Economist, 2007b).

Another relatively "new gang" on the block are the Sovereign Wealth Funds (SWFs) which have proliferated in recent years in certain countries as a result of high oil prices and dramatically increasing Asian exports. Although according to The Economist (2008a) they hold merely two per cent of the asset traded throughout the world, they are growing fast and are at least as big as the global hedge fund industry. OECD estimates that such funds had approximately US\$ 3 trillion in assets in 2007 and invested US\$ 69 billion on recapitalising the world's biggest investment banks (Shankar, 2008). In early

¹ This figure of the GDP for 2007/2008 was taken from the HM Treasury [online] available: www.hm-treasury.gov.uk/ [accessed in November 2008]

2008, a US\$21 billion lifeline, sourced from SWFs from the governments of Singapore, Kuwait and South Korea, was given to Citigroup and Merrill Lynch *alone* (The Economist, 2008a). While it is unclear to date how much of such funding has been passed onto infrastructure investment, what one can assume, given the rising popularity of infrastructure investment, is that such funds are finding themselves either directly or indirectly to be significant new investors in infrastructure development world-wide.

There are a number of widely held concerns with this new source of funds. Unlike hedge funds and private equity parties, SWFs are *not* necessarily driven by profit and loss motives, and mostly do *not* reveal their aims, let alone their investments. Nor are they managed in a manner whereby they are accountable to regulators/shareholders/voters. There are, as a result, major worries in many quarters as to the driving intentions of (at least some) SWFs. Some critics claim SWFs have the potential to stifle competition, protect national champions, and even support geopolitical ambitions of the country controlling the sovereign fund (The Economist, 2008a).

Critics of SWFs argue that this lack of transparency becomes particularly worrying when such funds are invested in strategic infrastructure such as MTPs. Furthermore, as international credit becomes more difficult to acquire there is a distinct possibility that SWFs may become far more influential than ever before. This is already transpiring in some quarters as the global squeeze on credit is changing political leaders' perceptions of the once demonized funds. For instance, in June 2008 the UK government invited a Saudi SWF to invest in the next generation of Britain's Nuclear Power Stations (The Daily Telegraph, 2008), and at the time of writing this paper, the UK government are seeking money for an IMF bailout from a range of potential Saudi investors including SWFs (Time Magazine, 2008).

Times of crisis as times of opportunity

Notwithstanding the infrastructure investment concerns raised above, the Chinese saying that times of crisis offer times of opportunity is highly relevant to current circumstances. This is so as one could argue that the global credit crisis offers the international community - both in the public and private realms - the opportunity to critically re-assess past infrastructure investment practices much more broadly in a manner that takes on board *not only* the global challenges of climate-change, emissions, energy consumption, poverty alleviation etc. but *also* the very sustainability of the global infrastructure investment practices themselves.

Advocates of this position claim that the time has finally arrived for concepts of Corporate Social Responsibility (CSR) and Sustainability to be more sincerely employed by those sections of the international banking and investment communities that have in the past excessively indulged in rhetoric regarding these areas and been pre-occupied with short-term perspectives on development, employing low valuations of risks in areas that in reality require long term perspectives. This call to take on longer run views of the future, while simultaneously addressing short term concerns, was flagged up in a

CRS study undertaken by the management consultants McKinsey and Company (see Baghai et al, 1999) which sought to alert the corporate world of the strategic need to link short-term investment gains *much* more closely with long run benefits (and costs) to survive the challenges of globalization. The authors of this study advocated the use of a ‘three horizons of growth strategy’ which pays attention to long term goals *simultaneous* to meeting short term ends, relying on mid-term actions that strategically link the short term with the long run.

The world-wide bail-out of international investment houses and banks by national governments and international agencies has now made the public at large acutely aware of the myth of the superior efficiency of the private sector over the public sector as a generic claim; both types of institutions have (and long had) critical limitations. The financial crisis has also alerted us to the realisation that we need a strong and solvent public sector to facilitate the development of a more efficient and sustainable private sector, and that there is an urgent need for major public sector capacity building programmes if it is to provide effective leadership, strategic intervention and regulative frameworks for the future (see The Economist, 2005).

Two things are already apparent from the global collaborative efforts underway to resolve the world’s credit crisis and climate change challenges. First, that much greater emphasis needs hereon to be placed on “collaboration” (and co-ordination) rather than competition as the principal driving force of globalization (Dimitriou and Thompson, 2007). Second, that *no longer* can governments and communities alike rely on de-regulated markets outside of well thought out sustainable public policy strategies to forge our future. This is a conclusion which is particularly pertinent for MTPs in both the developed and developing world, but especially significant for the latter which typically is less well resourced to absorb the impacts of the global challenges before them.

Appraisal criteria employed by global infrastructure investors

Checklist for investigating investment opportunities

In the past, global investors in major infrastructure projects (including MTPs) operating on a commercial basis have typically posed the following type of questions when considering investment opportunities - whether in the developed or developing world (after Chatas, 2007):

- Do they (the potential infrastructure investments) offer monopolistic or oligarchy opportunities?
- Do they provide sustainable revenues?
- Is the long term revenue generation of such investments both stable and predictable?
- Does the regulatory framework for investment provide adequate investment security?
- Are there opportunities to go back and re-negotiate contracts?

Monopolistic or oligarchy opportunities

Whereas, from the private sector's point of view, in 'stable' economic and political circumstances, monopolistic or oligarchic opportunities and the tying-in of government to joint-venture partnerships as guarantors of "last resort" are generally the hallmark of potentially attractive investments, in uncertain times, investors seek much greater public sector commitment. This is especially the case where projects are initiated by governments. Investors in such circumstances would be looking toward offers of collateral, even guarantees, to shore-up the perceived risks that uncertain times pose.

Both the global banking crisis and previous MTP development experiences (where major cost over-runs were encountered due to other dramatic changes in circumstances) suggest now more than ever that it is *essential* to seriously examine 'disaster scenarios' in investment appraisal exercises so as to evaluate the worst of eventualities. This is so because these eventualities may be so great as to ultimately *even* overshadow any monopolistic or oligarchic advantage a private sector investor may acquire.

Sustainable revenues

Ensuring sustainable revenues from a MTP is clearly not only dependent on whether the infrastructure and its service users will generate sufficient revenues over the short and long run. It is also dependent upon the financial health and sustainability of the major joint venture partners as businesses and institutions. Sustainability of revenues are, furthermore, reliant on how conducive the political, economic and regulative environments are to generating adequate revenues that cover costs *and* produce acceptable profit margins, *simultaneous* to meeting any non-economic/fiscal objectives set for the project.

In buoyant markets, sustainable revenues can be threatened by competition and newcomers entering into the same market. In major economic downturns, however, governments will inevitably increasingly introduce tighter regulative frameworks that offer protection against such competition to ensure investors of sustained revenues. While ideological heresy for neo-liberal economists, this is an approach common to the directed economies such as China and Russia, and is likely to be welcomed by those parties privileged to receive such protection in other countries too given recent developments.

Stability and predictability

The matter of the stability and predictability of long term revenue generation for MTPs is all important, especially if such projects are to be *entirely* financed by the private sector and where projects are primarily seen to deliver commercial rather than broader social development outcomes for which public subsidies may be required. The growing realisation (despite the rhetoric) that many MTPs are ultimately *not* commercially viable without subsidies of some kind or other has over the years reinforced the case for the need to match project revenue expectations (over different time periods) with a broader set of

project returns/outcomes. These can be based, for example, on such measures as those generated by the millennium development goals and/or a pre-agreed set of prioritised sustainable development criteria from a government policy document.

Because the priority of these goals/criteria may change over time and/or economic context, scenario planning as an analytical forecasting methodology becomes an invaluable if not essential tool. Such exercises (see Shell International, 2003) could model different development priorities that may emerge or decline over time/place/space as well as provide invaluable insights for all concerned into how well/awkwardly these broader criteria might sit against more commercial aims and traditional criteria. Research in this field commissioned by the UK Institution of Civil Engineers has recently commenced at the OMEGA Centre at UCL (see www.omegacentre.bartlett.ucl.ac.uk).

Regulatory frameworks

The question of regulatory frameworks has *always* been important for the financial world of investment, as well as MTP developments. Efforts to regulate uncertainty generates additional costs (as well as benefits). The nature, extent and ideological underpinnings of regulation, however, look to soon being *drastically* overhauled *if* discussions by governments and international development agencies regarding challenges posed by the global crisis are anything to go by. For although stringent regulative frameworks have been accused of suffocating and stifling innovation, excessively loose and unregulated frameworks have without doubt contributed much to the financial malaise confronted.

The ideological premise which assumes infrastructure (particularly MTPs) should be seen as a means that offers competitive advantage in a globalized economy *rather than* link territories and communities together in a manner that offers greater security and sustainability (see Dimitriou, 2005), looks to being re-appraised if the emerging dissatisfactions take root of many of the short-term perspectives supporting this premise. Uncertainty of how to integrate financial/economic concerns with those of social and environmental development, however, clearly pose greater uncertainties (at least in the short run) – especially for the private sector. Uncertainty, could though, perversely, bring with it greater commercial opportunities, innovations and even security *if* financial/economic considerations are linked/coupled more explicitly to environmental and wider development concerns as advocated by Stern (2007) and others. The challenge here is to research, set-up and design new more rigorous multi-criteria appraisal frameworks that take more holistic views into account that go well beyond traditional cost benefit analysis.

Opportunities to re-negotiate contracts

If lessons are to be effectively learnt from the past, the opportunities for global infrastructure investors to go back and re-negotiate contracts (to their advantage) with public sector project sponsors carrying the cost of this *should*

become far more difficult in the future if present reactions by the public to government bail-outs of the international banking and investment communities are anything to go by. These re-negotiating tactics - a common occurrence in MTP financing - will need to be far more closely scrutinised in the future. Where contracts are re-negotiated and public sector subsidies are provided or where increased public sector contributions are requested/pleaded and the public sector is subsequently obliged to take larger stakes in such infrastructure projects it is essential that a greater say in the nature and prioritisation of their outcomes go well beyond the short-term financial/economic concerns of the investors.

This new form of new partnership requires a *much* enhanced public sector capability to effectively engage, participate and direct such projects. Interestingly, only until very recently there was a general consensus in the infrastructure investment world that the problem for global investors in the infrastructure field was *not* global capital but the availability of asset management skills/capacities in the private sector. Today it is both - in the public *and* private sector.

These circumstances call for an urgent, speedy and comprehensive critical examination of current international infrastructure investment planning and appraisal practices that go well beyond the silo thinking of the infrastructure economists and the *realpolitik* of many of those that govern us. As already advocated in Part 1, these new circumstances call for new infrastructure planning, appraisal and evaluation approaches that embrace more constructively the social, environmental and broader development aims that major infrastructure projects should contribute to as *strategic agents of change* and development. Among other things this entails extracting past lessons from (but not necessarily duplicating) the infrastructure development practices of the 'New Deal' and examining the contribution that projects of this kind can make to the achievement of the Millennium Development Goals (UN, 2008). It also calls for an urgent international overhaul of major infrastructure education and training, drawing from the positive and negatives experiences and perspectives of *both* public and private sectors that place risk, uncertainty, complexity and the importance of context at the milieu of decision-making.

Dilemmas confronted by global investors

The need for broader appraisal frameworks

There have always been infrastructure investments that made no sense to investors as stand-alone projects but which could be justified *if* wider development investments are taken into account. This is a particularly common occurrence for MTPs and was until recently the basis of the appraisal of many/most TGV infrastructure projects in France. Given the uncertainties accompanying recent global developments, it is anticipated that this broader view will be required and more frequently employed in the future for infrastructure development programme – with the jury still out on what the most appropriate framework(s) for such appraisals and evaluations should be.

This need to broaden the appraisal framework resonates with today's MTP planning and appraisal needs - not only because of the financial constraints brought about by the global credit crisis - but also due to the rapid rise in priority among international development and government agencies of policies seeking to tackle the major global challenges of climate change, biodiversity, emissions and energy, simultaneous to addressing infrastructure needs necessary to meet social development, poverty alleviation and food production priorities locally.

Importance of context

The *mantra* that 'context is everything' applies in today's uncertain times perhaps more than most (see Dimitriou, 2006). Important questions that need to be asked by infrastructure investors in circumstances where the appraisal net is thrown over a larger area of development concerns than those covered by traditional appraisal criteria, include:

- In which context and circumstances are such broader investment appraisal practices to be applied and why/how are they justified?
- What risks and opportunities do the technological aspects of the project pose, particularly when relying on new technology?
- What is the 'downside scenario', how likely will it transpire and how does it sit against the most likely scenario?

Here it must be appreciated that the realisation that investment returns are *not* achievable from a project in a 'stand-alone' capacity is in fact an implicit acknowledgement that the risks and uncertainties within the project *may* be offset by the opportunities and benefits generated from developments spawned *outside* it. This brings into focus the critical importance of the declared boundaries of the project by the various stakeholders, and the characteristics and dynamics of the context of this bounded area. It especially requires of investors a critical examination of the permeability of this broader bounded definition of the project to outside influences and forces.

Research currently undertaken by the OMEGA Centre at UCL is examining these very issues. Findings so far suggest that in uncertain times there is a critical need for investors to more actively sense-make *not only* the uncertainties and complexities of the project itself but also those of its immediate and broader context(s) (see Hall, 1980 and Friend and Hickling, 2005) and then better understand how the two sets interact. Of course, the larger the project is, the greater the complexities and potentially the more numerous the uncertainties and investment risks posed. Similarly, the larger the project boundary adopted, the greater the complexities and potentially the more numerous the uncertainties and investment risks posed. UCL case study findings to date suggest that this bigger picture *can* actually offer new opportunities and spin-offs - spawned over time and space, and in different sectors - *if* assessed against a broader appraisal and evaluation framework that, for example, incorporates the millennium development goals. This same research also suggests that unrealistic closed-systems thinking that employ

MTP boundaries that are too tightly configured can itself be a significant source of risk and uncertainty.

The discussion immediately above has principally pertained to different spatial, temporal and sectoral contexts. In the case of project finance, there is clearly a wider context to take into account than the realms of the project itself. Viewing access to MTP funds as purely a local/national matter in today's financially turbulent world is clearly neither prudent nor realistic, especially given that local/national funds are all too often tied to international sources. Similarly, viewing and appraising projects *merely* in terms of yesterday or even today's policy priorities can also be unwise – with the result that scenario building of future likely policy changes and priorities also ideally need to be modelled wherever possible. This is so because fast changing policy priorities can place lower values on finance in certain contexts rather than others.

Social unrest may, for example, arise from a past failure to invest in critically needed infrastructure improvements for the poor which if not addressed can pose political dangers more damaging than the cost of the overruns. Developments that seek to urgently address concerns regarding energy consumption, transport emissions, climate change, food shortages and poverty alleviation all look to dramatically alter international and local policy landscapes for future MTPs and therefore may make past appraisals redundant. Sense-making and understanding these different policy landscapes as they impact on the project in question can only begin to happen effectively with the assistance of scenario planning (see de Geus, 1999 and Schwartz, 1998).

A major defining contextual issue is, of course, whether the project is in the developing or developed world and the amount of effective intervention, regulation and enforcement government can *effectively* offer to deliver to 'correct' undesirable outcomes. Up until recently, governments in developed countries were considered more risk averse in infrastructure investment than those in the developing world. The recent financial turbulence, however, may point to serious deviations to this premise in the future.

Use and promotion of new technologies

Among other considerations in the planning and appraisal of large scale transportation projects is the important question as to the extent MTPs *should* employ, rely on and promote, new technologies, and become strategic agents of innovation, change *and* development? Unfortunately, in the past, such new technologies were too commonly perceived by many infrastructure investors to pose more technical and financial risks than already 'successfully' tested technologies. The problem here is that with the advent of sustainability as the vision for future development, the 20th Century appraisal criteria of economic growth based "success" are being seriously challenged in the 21st Century as they have demonstrated to be far too limiting in too many cases.

Increasingly, as a result, calls are being made to urgently review and amend these criteria. We are increasingly seeing calls from a rising number of

quarters for 'big bet moves' (see Courtney et al, 1999) - whether it be in banking, infrastructure development and/or climate change responses - which will require technology developments that themselves are likely to entail 'big gambles'. The consequences of getting this (these) right can be immensely beneficial; conversely, the consequences of getting them wrong can push us into further malaise.

The case against taking on new technology risks for MTPs is then that they *could* add to the other known risks already associated with large-scale complex projects. This risk-averse position is reinforced by path dependency practices (see Arthur, 1993) that have in the past brought with them economies of scale and manufacturing vested interests that have often reduced costs in the planning, building and operation of projects. This position generates an imbedded and often longstanding bias against new technology *unless* adequate support/safeguards/guarantees are offered by government, international development agencies and/or industrial/commercial innovation funds (of which there are too few) that are prepared to absorb/share in this additional risk.

A particular problem with past infrastructure and related transport hardware investment practices that are path dependent is that they contribute to (and often exasperate) many of the critical global strategic problems currently confronting us, such as increasing the reliance on oil based energy or contributing to unacceptable levels of green house emissions. This dilemma highlights the need for greater innovation on multiple fronts - obliging both transport infrastructure and hardware investors (with governments) to take "big gambles" that can potentially offer the quantum leaps needed to address the major infrastructure and movement problems confronting us. This in turn requires new and strong leadership, supported by research into new intellectual and financial frameworks and public/private international partnership arrangements that go well beyond old planning and appraisal frameworks and investment practices.

The international banking crisis has (should have) taught us that where the public sector takes on the major burden of risk (or substantial portions of it), it is *imperative* that it (i.e. the public sector) *should* have a stake in any positive spin-offs generated rather than have these left to trickle-down to the public or be amassed by the private sector. For MTP investments, a much more conducive approach that would embrace such principles is one that is much more collaborative and open to 'real' partnership arrangements rather than one that has the public sector take on the bulk of the losses and allow the private sector to privatise the gains. There is though, to repeat a point earlier made, a serious public sector capacity building implication for this proposal to work effectively for there is *not* at present adequate expertise in the public sector to execute such an approach, particularly in emerging markets. Some would argue that there is *also* a scarcity of such expertise in the private sector too and that on this basis capacity-building must take place in both sectors for any significant advances to be made.

The downside scenario

When the going is good and welcoming trends look to continue, no one benefiting from these trends wishes to think of a future being any different, *only* better. This is analogous to a Turkey which, on examination of its past history of being fed every day, may see no reason why this should not continue, and leads it to overlook the potential downside effects Christmas may bring (Taleb, 2007). The caveat that the continuation of these 'good times' are in reality dependent upon a number of provisos is too often conveniently ignored, while those that caution that the extrapolation of favourable short-term trends into the future have dire consequences are seen as pessimists or even doom mongers.

The longevity of MTPs makes it *essential* that downside scenarios are *always* examined when looking at long term infrastructure investments. The question is *not* whether downturns will transpire in project life cycles but how many of them will occur, how long might they last, and the overall impact of these downturns on the ultimate 'success' of the project? An understanding of historical trends helps in appraising the future of MTPs, but this in itself is *insufficient* to provide a basis for future plans. Current talk in the UK and elsewhere of resorting to an expanded programme of major projects to counter fears of recession (and even depression) brings with it memories of the Roosevelt era in the USA in the 1930s and the "New Deal" which promoted public works projects as vehicles for restoring public confidence, seen at the time as essential to economic recovery.

More recently, leading up to the political transition of Hong Kong to its Special Administrative status of the Peoples Republic of China, MTPs were relied upon to (successfully) boost the economy and counter the perceived negatives associated at the time with imminent change and the unknown future of the territory under new political management. We need to carefully review such experiences (together perhaps with those of Japan) so as to better understand the benefits and shortcomings of "New Deal-like" infrastructure programmes/approaches as they re-appear on the horizon of an increasing number of countries.

The dramatic transition from an upside to a downside scenario is especially painful and awkward to manage for MTPs, as current circumstances confirm if one examines the history and prospects of the CTRL project and the future possible outcomes of developments in the Thames Gateway in UK. These experiences not only provide a rude awakening to a new set of realities, they demand a careful examination and modelling of downside scenarios as very real possibilities. Such circumstances may even require the need to look at the downside of the downside scenario. This *could* undermine confidence and also call for yet more big gambles. On the other hand, it could also possibly expose new opportunities and breakthroughs. This is the context of today's infrastructure investment future - so different from just a few years go.

Conclusions

Many of the key arguments forwarded in this paper have been presented as working hypotheses or propositions rather than evidence based findings. This requires of the reader a scenario thinking state of mind to appreciate the emerging set of developments and related concerns envisaged by the author. This mind-set of considering possible futures very different from the past is more valued of late given the uncertainties associated with the global credit crisis.

What emerges from the discussion is the overarching conclusion that past practices of MTP appraisal and evaluation are not fit for purpose in the new unfolding contexts of the 21st Century. They are seen to be inadequate on several fronts: in terms of the physical boundaries they often employ, in terms of the development paradigm/vision against which they are ultimately assessed; in terms of the financial premises for project funding they employ; in terms of the local impacts they are anticipated to have, and in terms of their assumptions as to where the critical risks and uncertainties they confront lay.

The above suggests that there is a clear and urgent need to undertake systematic international research to establish the extent MTP developments increasingly benefit global (corporate) interests *more than* local, and the frequency with (and circumstances in) which the public sector has met the lion-share of a project's costs and risks over time. A primary aim of such research should be to better understand how MTPs restructure the territories and places they traverse, and how to develop planning frameworks to better assess future MTP developments. The fact that the global networks and nodes to which many MTPs contribute often by-pass less favoured intervening places (and communities) make it *imperative* that such projects are evaluated in terms of their propensity to marginalise as well connect.

Further research also needs to be conducted into how governments, private sector interests and community groups better *jointly* understand what it takes for MTPs to be 'successful' in local *as well as* global terms to help arrive at more appropriate criteria by which they are judged. The evidence that rapid globalization brings with it increasing uncertainties and risks, as well as new opportunities, and that these all impact on MTP developments, reinforces the call for placing uncertainty in the *milieu* of planning and policy-making for such projects. How this can be best achieved also warrants research.

In light of the financial liquidity problems of global markets and banks and with the infrastructure sector transformed from one of the most lucrative targets of private sector global investment, to one targeted by governments relying on 'New Deal' Keynesian principles - premised on more collaborative and regulated efforts to deliver social, economic and environmental benefits - there is now a need more than ever to critically re-examine the role and contribution of the private sector to infrastructure development. Research needs to be especially undertaken that seeks to establish a new reality for MTP investments that build mutually reinforcing linkages among policies of competitiveness, collaboration and sustainability in infrastructure development

in what should be seen as newly defined PPP arrangements that abandon past neo-liberal economic approaches and rhetoric on public sector participation and environmental sustainability.

In tandem with the above, a critical, independent and systematic examination is also needed of the motives of private equity and SWF global investors in infrastructure development, and the potential consequences of their increased activity in MTPs. Earlier discussions here make it quite clear that national and regional policy makers, planners and community leaders alike can ill afford to be indifferent to these concerns, especially with regard to the lack of transparency typically associated with such investors and the propensity of new MTP investments to lead to an increased reliance on such sources of finance as others dwindle.

The decline of autonomous planning processes for MTPs is anticipated to accelerate as public sector led infrastructure development programmes look to a more co-ordinated approach to stimulating national economies that deliver more local employment, social development and hopefully environmental benefits. It remains to be seen whether these efforts will build on the spatial planning approaches introduced earlier in Europe and elsewhere as part of strategic trans-national and regional trade and development agreements or whether these efforts will fall victim to more parochial and nationalistic concerns. Either way, it is opportune to conduct research into the implications of both this scenario and the earlier scenario. This is most important since there is a growing concern among many planners that past globalization developments increasingly led to the formation of fragmented spaces and territories, driven by entrepreneurial rather than social imperatives, that made the survivability of local areas increasingly dependent upon their contribution to globally competitive forces meanwhile ignoring most others.

Given the increased uncertainties of our times, and the increased risks and complex choices they generate, an obvious and basic conclusion to the discussion must be that for planning (and planners) to offer a better insight into the strategic role that MTPs can/should play in providing new focal points for future sustainable development, they need to become competent in strategic thinking. They also must become *au fait* with broader context-sensitive project appraisal exercises that places risk, uncertainty and complexity at their *milieu*. These skills and techniques, however, still require much research and development. The failure by planners and MTP promoters to speedily develop and acquire them robs stakeholders of such projects of the strategic guidance and assistance they so urgently need.

Accompanying the above recommended research, there is finally, a critical need for central and local governments, together with local community groups and NGOs, to build a more informed *modus operandi* to develop a more central role in organizing the social control of places that are capable of protecting themselves from the naked functional logic of competitive based neo-liberal globalization where it occurs. This can *only* be achieved with a more informed knowledge base and understanding of the outcomes (both

positive and negative) of the global forces exerting on MTP developments and generated by them, and by subsequently imposing pressure on local, national and international economic and political organizations to restore the meaning of local society and national priorities.

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1. Private Participation in Transport Infrastructure. Infrastructures can be funded, implying that the public sector provides capital from general funds or taxation and that this capital is not expected to be recovered. Infrastructures can also be financed, mostly by private sources, and in this case capital recovery is expected. Like many civil engineering sectors, the private sector can be involved in transportation project delivery, which can include design and construction, project management such as maintenance and operations and project financing, namely raising capital. Contemporary transportation infrastructure financing is facing the following challenges Globalization, Mega Transport Projects and Private Finance. May 2009. Harry Dimitriou. View full-text. Article. Transport: A Roadblock to Climate Change Mitigation? November 2015 Science. Felix Creutzig. Global scenario studies, specifically those produced by integrated assessment models (IAMs), communicate aggregate mitigation potentials by sectors in IPCC reports.