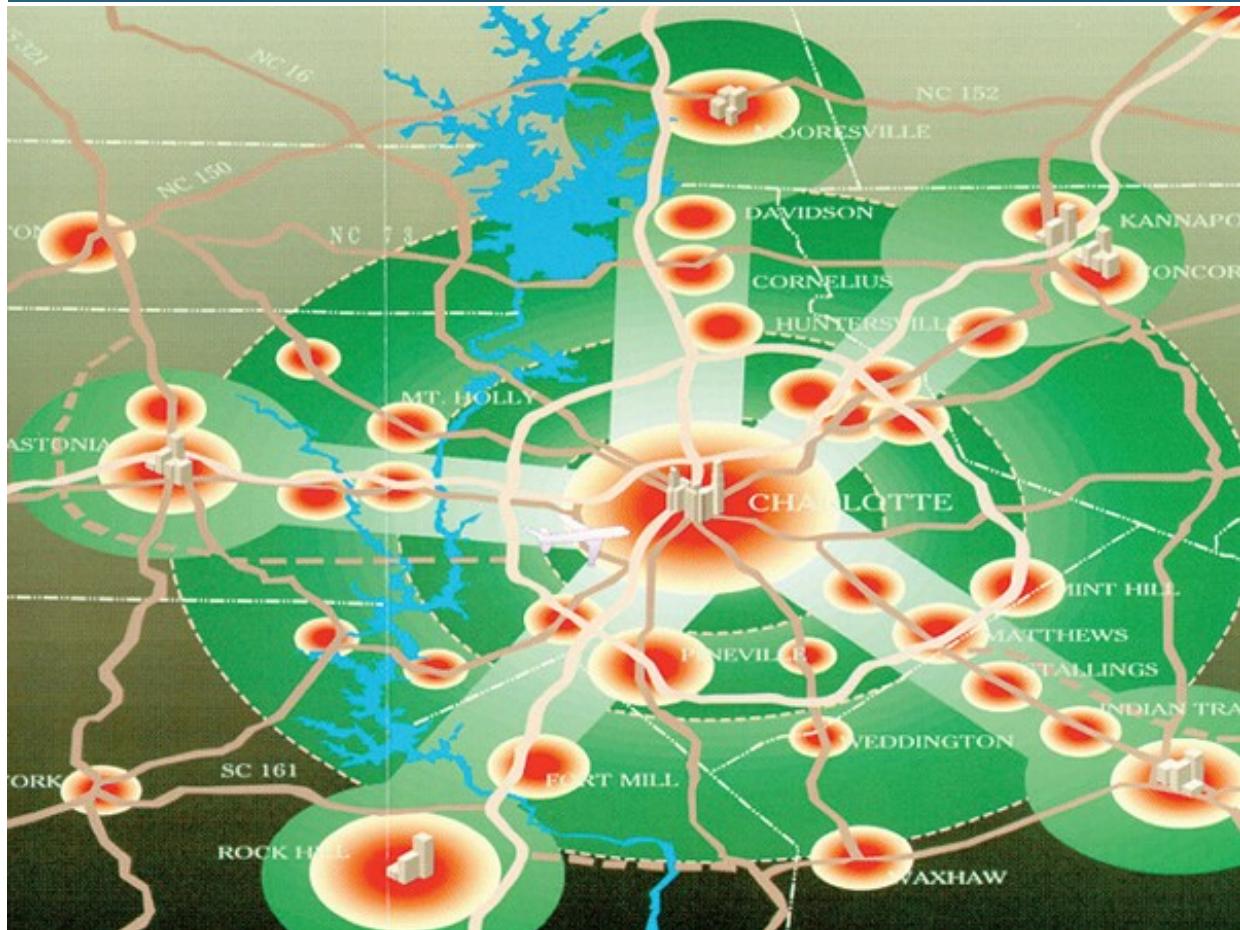


ECONOMIC AND PRIVATE SECTOR PROFESSIONAL EVIDENCE AND APPLIED KNOWLEDGE SERVICES

TOPIC GUIDE



Development Corridors

Albie Hope & John Cox

Coffey International Development

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About Topic Guides

Welcome to the EPS PEAKS series of Topic Guides. The guides are being produced for Economic and Private Sector Advisers in the UK Department for International Development (DFID).

The purpose of the Topic Guide is to provide resources to support professional development. Each Topic Guide is written by an expert in the field. Topic Guides:

- provide an overview of a topic
- present the issues and arguments relating to a topic
- are illustrated with examples and case studies
- stimulate thinking and questioning
- provide links to current 'best reads' in an annotated reading list
- provide signposts to detailed evidence and further information
- provide a glossary of terms for a topic

Topic Guides are intended to get you started on a subject with which you are not familiar. If you already know about a topic then you may still find it useful to take a look. Authors and editors of the guides have put together the best of current thinking and the main issues of debate.

Topic Guides are, above all, designed to be useful to development professionals. You may want to get up to speed on a particular topic in preparation for taking up a new position, or you may want to learn about a topic that has cropped up in your work. Whether you are a DFID Climate, Environment, Infrastructure or Livelihoods Adviser, an adviser in another professional group, a member of a development agency or non-governmental organisation, a student or researcher, we hope that you will find Topic Guides useful.

Abbreviations and Acronyms

| | |
|---------|---|
| ADB | Asian Development Bank |
| AfDB | African Development Bank |
| BAGC | Beira Agricultural Growth Corridor |
| CAREC | Central Asia Regional Economic Cooperation Programme |
| CIS | Commonwealth of Independent States |
| CMI | Corridor management institution |
| CTO | Corridor Transport Observatory |
| DC | Development Corridor |
| DFC | Dedicated Freight Corridor |
| DFID | Department for International Development |
| DMIC | Delhi-Mumbai Industrial Corridor |
| EI | Extractive Industries |
| ESACDI | Eastern and Southern Africa Corridor Development Initiative |
| GMS | Greater Mekong Subregion |
| MCC | Maputo Corridor Company |
| MDC | Maputo Development Corridor |
| MPC | Mesoamerican Pacific Corridor |
| NCTTCA | Northern Corridor Transit Transport Coordination Authority |
| NEPAD | New Partnership for Africa's Development |
| PIDG | Private Infrastructure Development Group |
| PMAESA | Port Management Association of Eastern and Southern Africa |
| PPP | Public-Private Partnership |
| RSDIP | Regional Spatial Development Initiative Programme |
| SADC | Southern Africa Development Community |
| SDI | Spatial Development Initiative |
| SSATP | Sub-Saharan Africa Transport Policy Programme |
| TEN-T | Trans-European Network – Transport |
| TRACECA | Transport Corridor Europe-Caucasus-Asia |
| TTFSE | Trade and Transport Facilitation in Southeast Europe |
| WEF | World Economic Forum |

Summary

On the face of it, development corridors appear to be straightforward. They are transport routes that evolve to facilitate an increasing range of social and economic development activities. They may evolve to an extent that enhances only the flow of goods and people (a transport corridor), or to an extent that supports trade (a trade corridor), or development of a particular sector of the economy (e.g. an agricultural corridor). They might evolve to an extent that supports wider social development and economic growth of a subnational region or cross-border region (i.e. a fully-fledged economic corridor). However, on closer inspection, development corridors are complex. Because they evolve, there is rarely a clear demarcation to determine that a corridor has progressed from one stage of evolution to the next. There is no universal terminology for development corridors. In this Topic Guide, the term “development corridor” is used in the general sense to refer to a corridor at any stage of evolution from a basic transport route through to an economic corridor. The terminology used in various parts of the world appears to be led primarily by the multi-lateral development banks that have invested in corridors and carried out many studies into the planning, design, implementation, and measurement of the operational effectiveness of corridors. Section 1 of this guide attempts to define types of development corridor and their evolutionary processes in a linear manner that is common to all corridors, regardless of their location or the primary source of donor support.

The linear process considers corridors commencing as transport routes with one or more modes of transport being developed through provision of hard infrastructure to become a transport corridor. The next stage of evolution requires improvements to the so-called “soft infrastructure” of transport services and transport logistics. But evolution into a fully-fledged economic corridor requires broader investments in the area served by the corridor. As Srivastava (2011) states: “For corridors to be viable they must make economic sense through encompassing actual or potential economic growth. Corridor development does not create economic strength so much as it channels, focuses, and amplifies the potential for economic growth. Thus, a corridor from nowhere to nowhere through nowhere would not be very meaningful. Similarly, a corridor linking two substantive nodes but with no potential for growth in between (because of adverse geography) is also of limited interest.”

Each corridor tends to have more than one development objective and the objectives will be different for each stage of the corridor’s evolution. The stakeholders are different for each stage and they, too, have their own objectives. The range of corridor typology and objectives further exacerbates the complexity of development corridors. Section 2 provides a number of examples of types of corridor and their main development objectives.

Some corridors are planned as economic corridors and the objective from the start is to achieve a combination of hard infrastructure, transport and logistics services, institutional instruments, and community involvement that results in broad-based development of unrealised economic potential. The first deliberate attempt to do this was devised by the South African government in the mid-1990s. It brought together the public and private sectors and community-level stakeholders in a structured manner coordinated via a spatial planning approach. The approach was called a spatial development initiative (SDI) and it was first applied to the Maputo Development Corridor (MDC) from 1996. The approach was broadly successful and was adopted by the New Partnership for Africa’s Development (NEPAD) for replication throughout Africa. A brief discussion of corridor planning using the SDI approach is provided in Section 3, along with notes regarding the coordination difficulties associated with transnational corridors, and considerations of climate change.

The appropriate interventions for corridor development will depend on the type of corridor, and the stage of evolution and range of stakeholders involved at any particular stage of evolution. The criteria for identifying suitable interventions are similarly dependent on these factors. Whereas in Africa the dominant approach to corridor planning has been SDIs, in Asia the majority of corridors have been planned using a strategic framework approach. Section 4 summarises research from a large number of reports to highlight the

more important criteria to be considered at the planning stages of corridor development. While these focus on the commencement of corridors, many of the criteria may be used when considering interventions at later stages in a corridor's development. The criteria should extend beyond consideration of the infrastructure, investments, politics, and trade facilitation. Social development should be at the core of every corridor development initiative, whether adopting a SDI or strategic framework approach. A number of studies have highlighted the failure of corridor planners to give adequate consideration to the social factors from the very commencement of corridor planning through to and including each operational stage.

The World Bank and the Asian Development Bank have both produced documents on corridor management. The latter concedes that the term "corridor management" may be misleading because this implies a certain amount of control, but the variety of demand for transport and other logistics services and the large number of providers of these services limits the opportunities for exerting any form of control. However, it is important to create a single point of coordination for all corridor development and operations. This should comprise a public-private partnership to address a wide range of problems associated with investment in infrastructure, regulation of transport and trade, and improvements in transport services and logistics. Section 5 discusses the importance of corridor managers achieving an appropriate balance between competition and coordination within the corridor. The additional challenges of managing transnational corridors include achieving balanced cross-border agreements that enable all parties to benefit equally and to have an equal interest in ensuring the success of the corridor. Monitoring provides data to enable corridor managers to focus on the key issues that will achieve the corridor objectives. Section 5 describes three layers of monitoring and who should be responsible for monitoring.

Although a project may be perceived as a single initiative, it is not a single project. It is a complex combination of hard and soft infrastructure projects of different durations, often overlapping and interacting, at various stages throughout the evolution of the corridor. The typical sources of financing these projects are: sole private sector investments, public-private partnerships, government and donor funds. There is no one-size-fits-all solution. The two major challenges, in addition to coordinating the financing of all the projects at each stage of corridor development, are (i) the overall magnitude of financing required, and (ii) the capacity to spend the money fast enough while also achieving value for money. Section 6 provides an overview of the main sources of financing for development corridors. It also briefly discusses new ideas of "turning the billions into trillions" in terms of infrastructure financing, as proposed for the post-2015 Sustainable Development Goals. Corridor management institutions (CMIs) require separate, sustainable and reliable sources of income. This should be achieved on a user-pays basis. Effective and efficient CMIs should achieve greater benefits (savings) to corridor users than the charges imposed via the user levy.

There are many parties interested in a development corridor. Stakeholders include national governments interested in a corridor's ability to facilitate development of unrealised economic potential in a region of their country, as well as fostering regional integration with neighbouring countries. Stakeholders also include financial institutions that are investing in, or plan to invest in, a corridor, port and customs authorities, transport logistics and shippers, and local consumers, communities and businesses. The combination of stakeholders varies throughout the evolution of a corridor; some stakeholders are present throughout, whereas others are involved only at certain stages. The primary stakeholders and their main interests are discussed in Section 7, along with particular consideration of the poor (as often-overlooked stakeholders) and how corridor benefits to the poor can be increased.

Notwithstanding the complexities of planning, implementing and managing corridors at each stage of their development, lessons can be extracted from the very many studies that have examined corridors, particularly in Africa, and South and Southeast Asia. These

are summarised in Section 8, including the role of development corridors, impediments to corridor development, and spatial development initiatives.

Best practice is difficult to define for a subject as broad as development corridors. There are many good studies on various aspects of development corridors. The difficulty, again, is that there is no single agreed typology for corridors. Some texts have focused on transport and trade corridors and developed definitions for sub-types of corridor (e.g. domestic trade corridor, transit trade corridors and foreign trade corridors). Other texts have focused on particular characteristics of corridors and described them with respect to their spatial influence. Srivastava (2011) attempted to consider the evolutionary stages of corridor development by grouping them into four “zones”, where the zones refer to four quadrants on a chart, not geographical zones. Nevertheless, using this approach, Srivastava provides a useful framework to assess the components for development of corridors and their interrelations. These best practices are outlined in Section 9.

Section 10 draws together the key messages from throughout the Topic Guide in an attempt to guide DFID advisers in their deliberations regarding the design of interventions in each stage of a corridor’s evolution. The African Development Bank’s four stages of corridor development have been used as the basis for this section because it avoids using the any particular corridor typology and instead describes the three stages of broad development, and one stage of cross-cutting issues. However, for continuity, the section concludes by tying these four stages into the evolutionary stages that have been referred to throughout the Topic Guide.

Glossary

Definitions provided here are based on terminology used in the primary references provided at the end of this Topic Guide. The source is mentioned at the end of the definition in italics. It is important to note that the development corridor literature from multilateral donors, governments and academic institutions do not use consistent terminology, and sometimes terms are used loosely. The definitions provided here and in Section 2 are broadly consistent with the major texts and provide a model of corridor evolution used in this Topic Guide to describe and compare all development corridors. Spatial development initiatives, in particular, are confusing and are elaborated here before the reader proceeds further into the Topic Guide.

corridor transport observatory A corridor transport observatory is primarily an analytical tool that analyses corridor performance in its multiple dimensions. It can be developed as a permanent mechanism anchored to corridor management institutions, or specialised agencies or national or regional institutions for regular monitoring of corridor performance. It is a means by which corridor institutions can effectively identify areas of under-performance and arrange for appropriate investigations and remedial actions. It can also guide focused investigation into specific challenges during preparation of interventions on an existing corridor. (*SSATP Working Paper No. 98*)

development corridor In this Topic Guide the term “development corridor” is used as a collective noun to include all corridors each any stage of evolution from a basic transport route through to a fully-fledged economic corridor. In some texts, “development corridor” is used to define a particular type of corridor. (*authors*)

domestic trade corridor A designated route within a national transport network that is used to distribute goods within the country. It includes links and nodes for the various modes as well as nodes that connect different modes and different service areas, e.g. interurban and interurban transport. These corridors usually cross over provincial borders and are established through national legislation. (*World Bank*)

foreign trade corridors Foreign trade corridors are used to transport the imports and exports of a country. As such, they have an endpoint at either a border crossing or international gateway. The corridors are determined by the locations where production of exports and consumption of imports are concentrated and by national legislation that stipulates the locations where foreign trade may enter and exit the country. The corridor may be defined more precisely by regulations that allow the movement of cargo under customs bond between a border crossing/gateway and an internal facility for clearing cargo. (*World Bank*)

spatial development initiative (SDI) A spatial development initiative is an investment strategy with the objective of generating economic growth in under-developed areas. It also refers to the whole range of activities comprising a corridor project planned on this basis.

- A typical SDI has the following components:
- *core transport infrastructure and freight logistics*
 - *institutional frameworks and procedures*
 - *anchor projects and cluster projects*
 - *inclusion of local communities and small businesses*

SDIs are characterised by:

- being designed and implemented based on specific geographic linkages (*USAID*)
- constituting a cluster of mutually reinforcing development projects established to help a geographic area thrive, as opposed to stand-alone initiatives (*Du Pisanie*)
- being embedded in an institutional framework to facilitate their design, implementation and monitoring (*ibid*)
- linking infrastructure and large-scale economic sectoral investments in defined geographic areas (*Thomas*)

spatial development planning

A tool used in the planning of development corridors that considers the spatial aspects of the corridor, including areas of unrealised economic potential. It also enables inclusion of settlements, agricultural and industrial areas beyond the catchment area of the main corridor infrastructure, sensitive environmental areas, etc.

(derived from various sources)

transboundary corridor

This term may be misleading to those readers new to development corridors. It is sometimes used interchangeably with "**transnational corridor**", but a transboundary corridor usually refers to paths used by wildlife such as the movement of animals along their traditional migratory or predatory routes that cross national borders. The confusion is greater when a transboundary corridor is mentioned in the context of a region containing development corridors, such as:

<http://www.gms-eoc.org/resources/caobang-guangxi-bci-pilot-site>

(adapted from material by the World Wildlife Fund)

transit trade corridor

Transit trade corridors are used to transport the cargo of other countries. They are bounded by a border crossing at one end and an international gateway or border crossing at the other. While these routes are determined by national legislation, this legislation governing movement of transit goods is often coordinated with adjoining countries through bilateral agreements or, in a few cases, regional agreements. These agreements stipulate the procedures to be followed at the end points. (*World Bank*)

transnational corridor

A development corridor that spans national borders. (*World Bank*)

1 Introduction to development corridors

1.1 The origin of development corridors

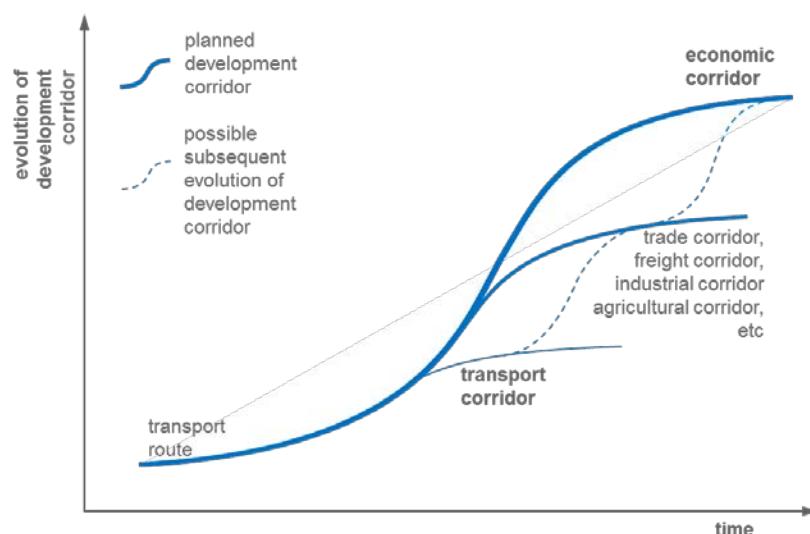
Transport corridors have been around for a long time. Trans-Saharan trade routes across the Wadi Hammamat can be traced back to at least 4000BC from the Nile to the Red Sea. Around 200BC, Hammamat became an important part of the Silk Route (Silk Road). The Silk Route was a network of trade and cultural transmission routes that were central to cultural interaction through regions of the Asian continent connecting the West to the East by linking traders, merchants, nomads and urban dwellers from China and India to the Mediterranean Sea. Extending some four thousand miles, the Silk Road derived its name from the lucrative trade in Chinese silk. Trade on the Silk Road was significant in the development of the civilisations of China, the Indian sub-continent, Persia, Europe and Arabia, opening up long-distance political, economic and social interaction between civilisations. Although silk was the main trade item from China, many other goods were traded in both directions along the route, religions were expanded and technologies transferred and developed. The transport route evolved into a development corridor.

1.2 Types of development corridor

Today, the planning and implementation of development corridors has become a complex task in order to ensure that development corridors deliver what is intended, be it social and economic development via trade facilitation, reductions in the cost of transporting freight, or linking landlocked countries to global markets.

Despite the long history of corridors, there is still a lack of coherent guidance on how to plan, design, and analyse the likely impact of corridor projects. Part of the difficulty is that there are several types of development corridor and often no clear distinction between each type of corridor. Figure 1 illustrates the different names typically assigned to corridors as they evolve from simple transport routes through to fully-fledged economic corridors. Not all corridors are intended to become economic corridors, but intermediate corridors (trade, freight, industrial, agricultural, etc.) also contribute to increased economic activity.

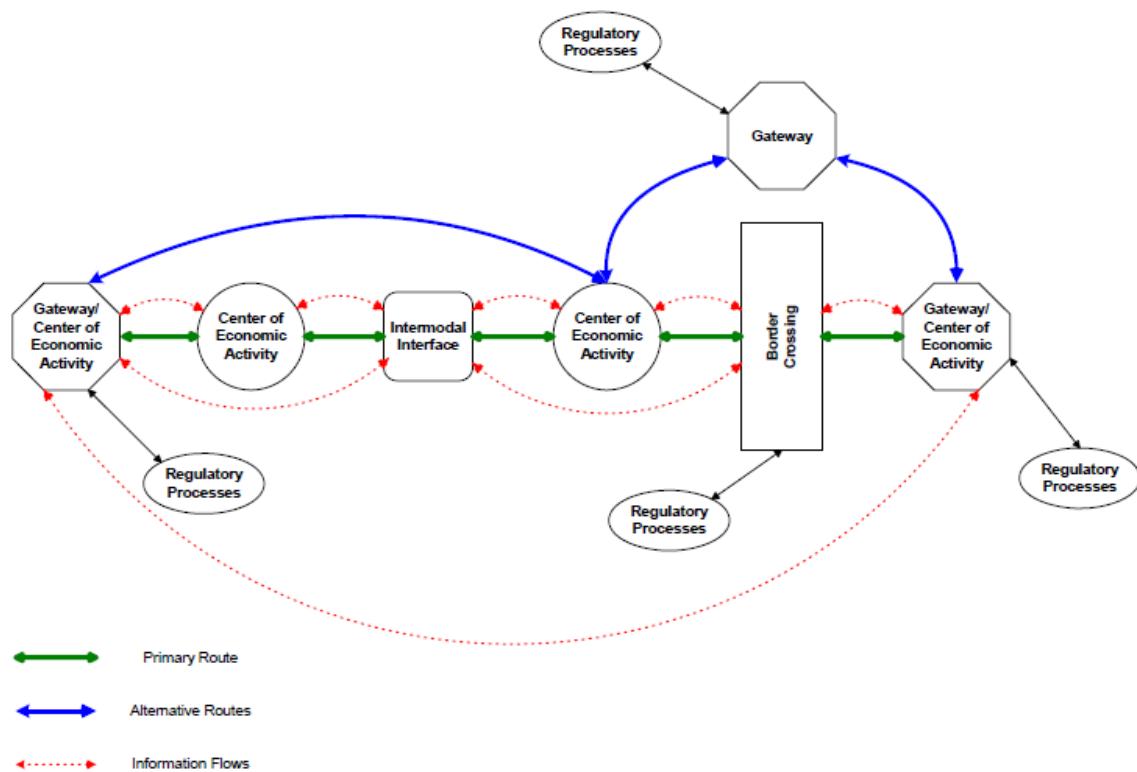
Figure 1: Types of development corridor (source: authors)



1.3 Defining development corridors

The World Bank states that the concept "transport corridor" lacks a precise definition. It has both a physical and functional dimension. In terms of physical components, a corridor includes one or more transport routes that connect centres of economic activity. These routes will have different alignments but with common transfer points and connected to the same end nodes. The routes are composed of links over which the transport services travel and the nodes that interconnect the transport services. The end nodes are gateways that allow traffic with sources or destinations outside the corridor (and its immediate hinterland) to enter or exit the corridor. Figure 2 shows the components of a transport corridor as defined by the World Bank. The World Bank generally does not use the term economic corridor. Instead, it refers to transport and trade corridors, sometimes freight corridors, all of which contribute toward economic development. Other donors define economic corridors as a further stage of corridor evolution compared to transport or freight corridors.

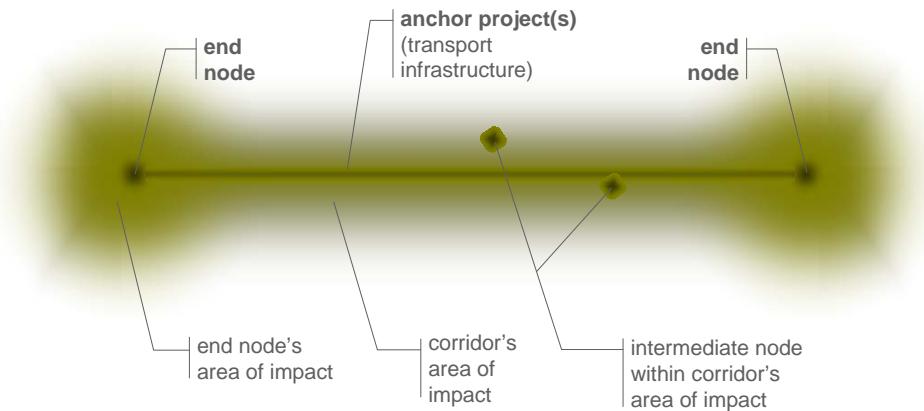
Figure 2: Components of a transport corridor (source: World Bank)



The Asian Development Bank (ADB) defines an economic corridor as connecting economic agents along a defined geography. The African Development Bank (AfDB) concurs with this definition. As a corridor evolves, it increasingly supports social and economic development. A basic transport corridor will typically impact only the immediate area adjacent to the corridor. As the facilities, border crossings, industrial areas and urban areas develop along and adjacent to the corridor, and extend out from the corridor, so the impact of the corridor widens. Economic activity can flow from the outer areas into the corridor and then along the corridor, or in the reverse direction. Both directions result in increased trade and social development. Social development and economic growth are best fostered if the corridor links areas of economic potential called economic "end nodes" (what the World Bank refers to as gateways for a transport corridor) where supply and demand create the impetus for trade. The "supply" end of the corridor and the "demand" end of the corridor may well be in different countries (transnational corridors). Figure 3

illustrates the key features of an economic corridor derived from definitions used by the ADB and the AfDB.

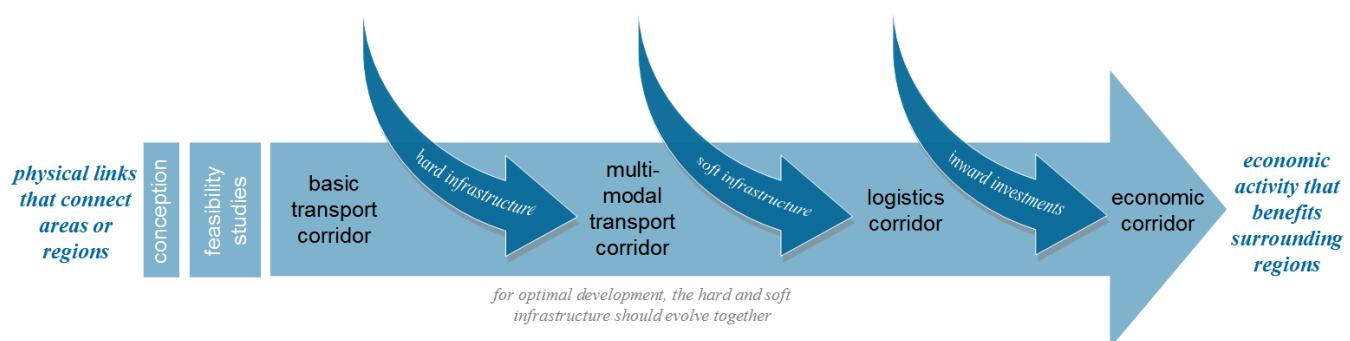
Figure 3: Components of an economic corridor (source: authors, derived from ADB and AfDB)



1.4 Evolutionary stages of development corridors

Ultimately, development of a corridor is driven by economics. The economic potential of a basic transport route is confirmed via feasibility studies and the hard infrastructures of one or more transport modes is developed into a transport corridor. As more freight and people move along the corridor, the soft infrastructure (logistics and institutions) also needs to improve in order to maintain, or increase, efficiency. Efficient corridor operations encourage further economic activity that leads to further investment and, ultimately, the corridor evolves into an “economic corridor”. This is summarised in Figure 4.

Figure 4: Evolution of a development corridor



Moving freight along a corridor may involve crossing national borders. Cross-border checkpoints are frequently a bottleneck in transport corridors. Facilitating efficient movements across borders requires significant soft infrastructure improvements, including harmonisation of policies, legislation and efficient customs procedures. Efficient border crossings are a vital component of development corridors.

2 Objectives of development corridors

2.1 Development corridor objectives

In a study for the World Bank on best practices for managing corridors, Arnold (2007) defined trade corridor typology in terms of whether the trade objective is national, bilateral, or multilateral. Arnold also defined specific objectives for three sub-types of trade corridor; see Table 1.

Table 1: Objectives of different types of trade corridor

| Type of corridor | Domestic trade corridor | Foreign trade corridor | Transit trade corridor |
|--------------------|--|---|--|
| Corridor objective | to promote internal trade and economic growth along the corridor | to promote economic growth of the country through increased trade and competitiveness | to promote regional integration and economic cooperation between neighbouring states |

Adapted from Arnold (2005)

Arnold further noted that the development objectives of trade corridors that link one or more countries are further complicated by the fact that both international and domestic traffic compete for capacity on the same routes and this can result in competing objectives.

While examining impact evaluation methods for trade corridors, Kunaka and Carruthers (2014) disaggregated the general corridor development objective into four sub-objectives:

- reduce average times and costs of transport
- reduce variability of times and costs of transport
- increase trade
- other aspects of national economy

A different approach to considering corridor objectives is proposed by Sequeira (2014) who links the objectives of a corridor to the objectives of the corridor's stakeholders and states that the stakeholders will vary depending on the stage of evolution of the corridor. Sequeira considers that corridor evolution passes through a *development cycle* (when the hard infrastructure is provided) and an *operational efficiency cycle* (when the soft infrastructure institutions are addressed) and that these cycles may alternate and sometimes overlap. Table 2 summarises Sequeira's view of different stakeholder objectives at various stages of a corridor's evolution (based on the SDI approach).

Table 2: Stakeholder objectives during evolution of a corridor

| Stage of evolution | Development cycle | Operational cycle |
|--------------------------|---|--|
| Stakeholders' objectives | Promote private sector investment in transport and economic anchor projects | Remove obstacles to trade to enhance corridor efficiency |

Adapted from Sequeira et alia (2014)

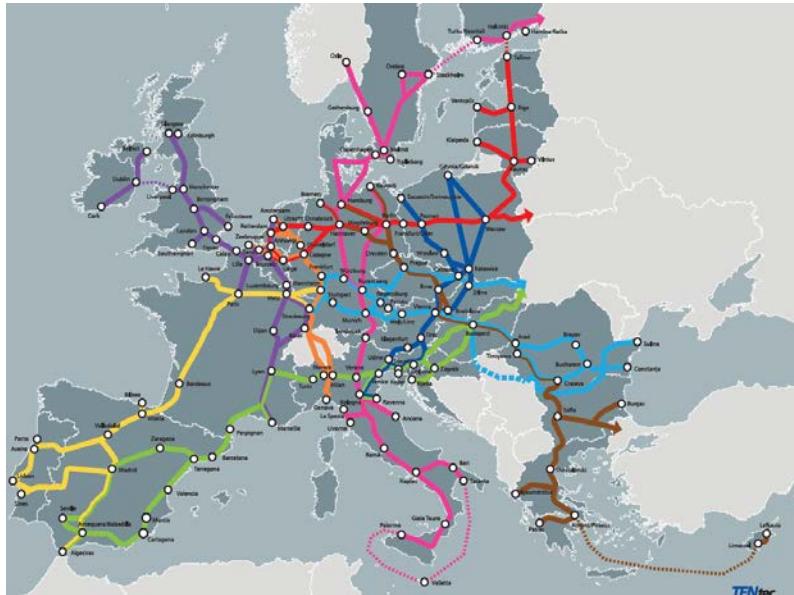
The multiplicity of objectives for each corridor is best illustrated by examples.

2.2 Transport and trade corridor objectives

Corridor Name: Trans-European Transport Network (TEN-T), Map 1

Main objective: Enhancing integration, competitiveness and employment in the EU

TEN-T is a policy-led initiative aimed at providing the so-called "missing links" in road and rail routes to support the free movement of passengers and goods within the European Union. It is a multi-modal network so that users can choose the most appropriate mode for their specific purpose. This includes the concept of 'motorways of the sea' to provide better connections for peripheral states that are both viable and cost effective alternatives to saturated overland corridors. The initiative also includes significant information technology advances, such as the Galileo project for satellite radio-navigation for route planning.



Corridor Name: Trade and Transport Facilitation in Southeastern Europe (TTFSE), Map 2

Main objective: Regional development and trade competitiveness

A significant feature of this corridor initiative is the carrot of EU membership. Nevertheless, the remarkable improvements in cross border issues show what can be achieved by way of regional cooperation and integration. The original TTFSE programme included efficiency improvements to customs procedures at crossing and inland terminals as well as physical infrastructure enhancements. The programme incorporates trade

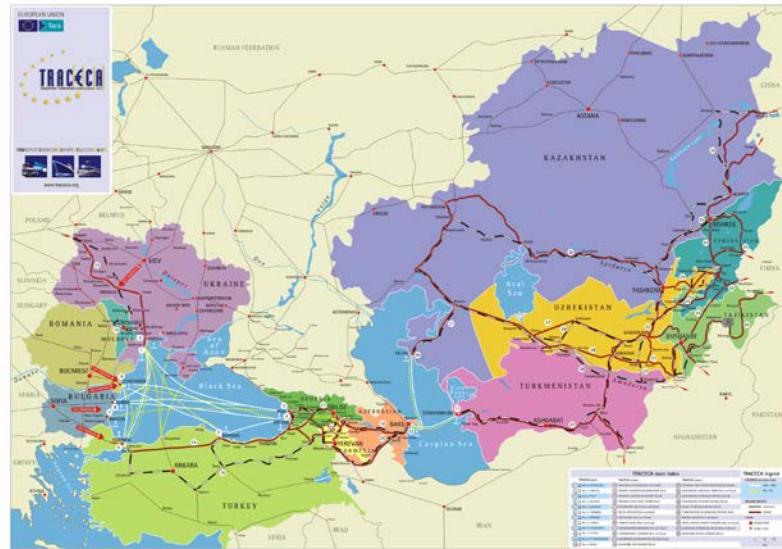


facilitation by ensuring effective collaboration between all agencies active at border crossings (customs, road administrations, border police, phytosanitary and veterinary controls, etc.). The objective is to increase trade competitiveness in the region through improving the availability of adequate logistics services connecting the region with its neighbours, as well as regional and global markets, through supporting infrastructure and technical assistance, while strengthening the capacity of the private sector to provide logistics services

Corridor Name: Transport Corridor Europe-Caucasus-Asia (TRACECA), Map 3

Main objective: Support member states in transition to market-oriented economies

The TRACECA initiative is a multimodal transport cooperation programme that includes all modes of transport (air, rail, road, inland waterway, sea, and pipelines), involving the European Union and 14 member states of Eastern Europe, the Caucasus and Central Asia. TRACECA commenced as a multi-modal transport corridor project and comprised about a decade and a half of hard and soft infrastructure improvements to progress towards its objective of helping member states of the Commonwealth of Independent States (CIS) region in their transition to democratic market-oriented economies. The programme included improvements to the physical transport infrastructure along identified corridor routes, and harmonisation of transport policies/legislation and border controls. At its western end, TRACECA connects to the TEN-T and TTFSE corridors in Europe, and at its eastern end it connects to the CAREC corridors in Central Asia, effectively creating a corridor network that stretches from Europe to the Chinese border, earning itself the title of the Silk Road of the 21st Century.



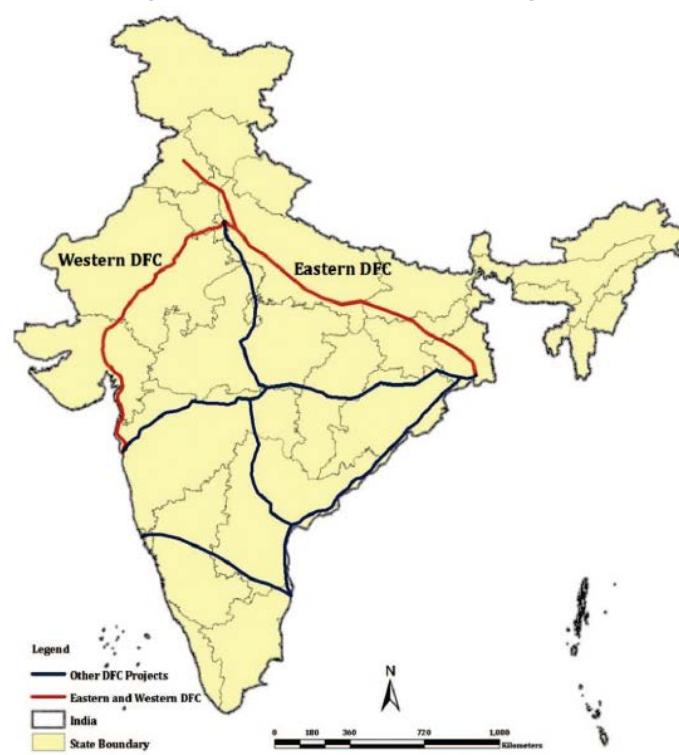
2.3 Freight and industrial corridor objectives

Corridor Name: India's Dedicated Freight Corridors (DFCs), Map 4

Main objective: Cost-effective, low-carbon long-distance movement of freight

India is planning what it refers to as "dedicated freight corridors", which comprise long-distance corridors planned in response to the recognition that transport infrastructure is likely to become a major bottleneck to India's continued economic growth. Large sections of these routes have already been upgraded from national highways to expressways, but the dedicated freight corridors will focus on rail as a cost-effective and low-carbon transport mode for the long-distance movement of freight. Additional objectives are to:

- reduce the unit costs of transportation
- create rail infrastructure to carry a higher throughput per train
- offer customers guaranteed faster transit at an economic tariff



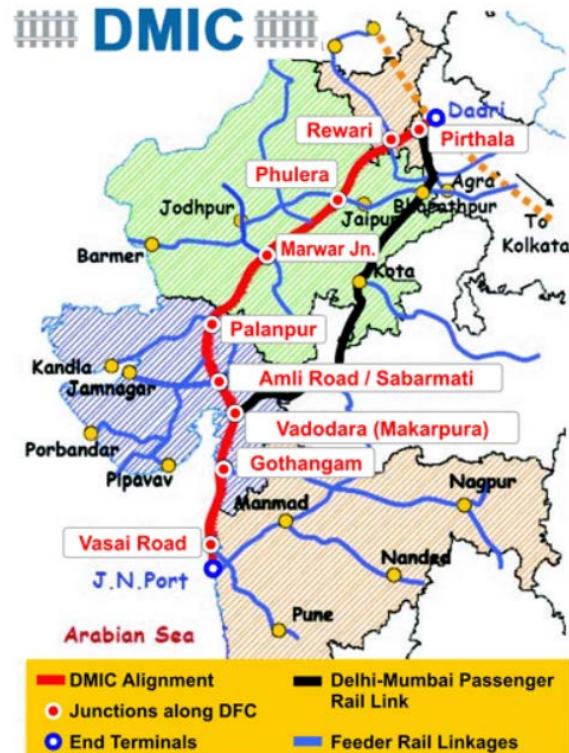
- increase Indian Railways' share of the freight market
- improve overall transport efficiency of the national rail network.

Corridor Name: Delhi-Mumbai Industrial Corridor (DMIC), Map 5

Main objective: Enhancement of export-oriented industries and manufacturing

The Delhi-Mumbai Industrial Corridor (DMIC) comprises nine industrial zones, a high-speed rail freight line (under the DFC programme), three ports, six airports, a six-lane (intersection-free) expressway, industrial estates and clusters, and other infrastructure. The development corridor will be supported by an array of other infrastructure, such as power stations, with the objective of serving up to 14 percent of the country's population. Having no international border crossings along the route, the soft infrastructure is more concerned with the cooperation between state and federal-level governments, as well as the institutions needed to attract the desired levels of investment. It is intended that the addition of effective soft infrastructure will attract private sector investment in support of India's economic development.

The DMIC approach to corridor development takes advantage of the existence of proven, underutilised economic development potential within the area of influence. In this respect, the planning of the DMIC is not unlike the spatial development initiatives used across Africa for economic corridors.



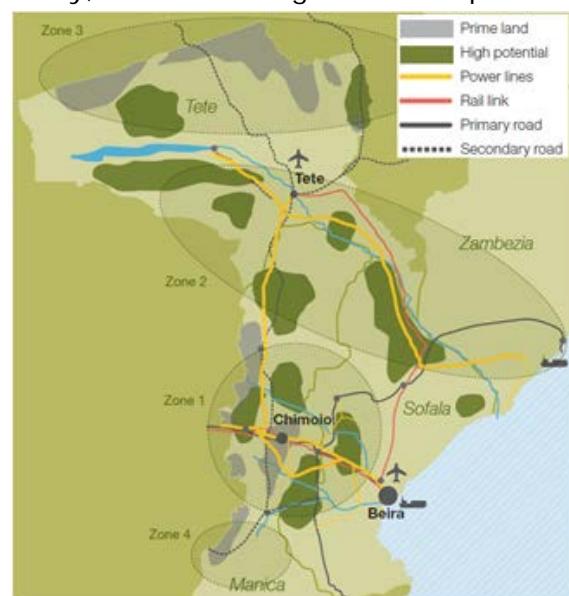
2.4 Agricultural corridor objectives

Corridor Name: Beira Agricultural Growth Corridor (BAGC), Map 6

Main objective: Enhancing agricultural productivity, sustainable regional development

The BAGC adopts a SDI approach to fast tracking the development of Mozambique's agricultural sector, by developing existing infrastructure networks and encouraging beneficial clusters of agricultural businesses to develop. It brings together the public and private sectors, local communities, and the donor community in a coherent, planned manner.

While the primary objective of the BAGC is stated as agricultural development, the corridor infrastructure and transport services will clearly enhance producers' abilities to sell their goods, so there are related transport and trade objectives to the corridor's development.



2.5 Economic corridor objectives

Corridor Name: Maputo Development Corridor (MDC), Map 7

Main objective: Generating economic growth in areas of unrealised potential

The MDC's objectives extend beyond transport and trade. It is defined as a fully-fledged economic corridor. The development was launched in 1996 using a new investment strategy devised by the South African Government, which became known as the strategic development initiative. The MDC was promoted with four key development objectives:

- rehabilitating primary infrastructure along the corridor (road, rail, port, border posts);
- maximising investment in inherent corridor potential with facilitated global capital, regional markets and regional economic integration;
- maximising social development, employment opportunities and increased participation of the historically disadvantaged communities; and
- ensuring sustainability by developing policy, strategies and frameworks that ensured a holistic, participatory and environmentally sustainable approach to development.

However, Rogerson states the *formal* objectives of the MDC include:

- improvements to basic infrastructure (such as roads, water, electricity, and telecommunications) in the region;
- promotion of investment from the private sector;
- environmental sustainability; and, importantly,
- the empowerment of previously disadvantaged social groups and entrepreneurs.



Corridor Name: The Northern Corridor (East and Central Africa), Map 8**Main objective:** Enhanced physical access to markets, trade and competitiveness

The Northern Corridor is the busiest transport corridor in East and Central Africa, linking the Kenya sea port of Mombasa with Uganda, Rwanda, Burundi, the Democratic Republic of Congo and Southern Sudan. It is a multi-modal transport corridor. The main objectives of this corridor are to:

- facilitate trade, the movement of people, vehicles and goods in domestic, regional and international transport
- stimulate economic and social development of associated countries
- transform the corridor from a transport corridor into an economic development corridor which, in addition to offering safe, fast and competitive transport and transit services that secure regional trade, will stimulate investments, encourage sustainable development and poverty reduction
- enable strategies for accelerating economic and social growth along the corridor, whilst ensuring environmental sustainability.

**Corridor Name:** Nacala Corridor, Map 9**Main objective:** Provide development stimulus and foster regional integration

The Nacala Corridor is one of seventeen corridors identified under the New Programme for Africa's Development (NEPAD). Each corridor aims to drive development within its zone of influence. The Nacala Corridor is intended to unlock the development potential of the hinterland of the Nacala Port; Malawi and Zambia, and promote competitiveness to allow economies of scale. The specific objectives are to:



- provide Malawi, Zambia and the interior of Mozambique with a land transport linkage to the port of Nacala and improve transport services through reduction in transport and delay costs at border crossings
- improve sustainability of road investments by controlling axle loads
- improve accessibility of the communities in the zone of influence to markets and social services and contribute to the reduction of poverty

Corridor Name: Greater Mekong Subregion (GMS) Economic Corridors, Map 10

Main objective: Promote economic cooperation and facilitate trade

The corridors of the Greater Mekong Subregion were originally designed as transport corridors. It was recognised that corridors evolve and that the specific objectives change as the corridors evolve. The plan was to initially provide the hard infrastructure to develop intra-regional transport routes into transport corridors, then to provide soft infrastructure to achieve logistics corridors. These actions would lead to enhanced trade, expanded investment opportunities, and synergies through clustering of projects to achieve economic corridors.



2.6 Conclusion

In general, corridor development objectives tend to become broader as the evolutionary stage of a corridor advances from a transport corridor towards an economic corridor. In the early stages of a **transport corridor's** evolution, the focus is on investment in transport infrastructure with the objective of increasing efficiency of transporting people and goods while reducing transport costs. For **trade and logistics corridors**, the objectives evolve to focus on trade facilitation with the focus of interventions ranging from reduction in trade barriers to improvements in logistics services with increasing competitiveness. Arnold (2005) summarises objectives for sub-types of trade corridors depending on whether they are defined as domestic, foreign or transit trade corridors. The primary objective for domestic trade corridors is to promote internal trade and economic growth along the corridor. For foreign trade corridors, the primary objective is to promote economic growth of the country through increased trade and competitiveness; and, for a transit trade corridor, the primary objective is to promote regional integration and economic cooperation between neighbouring states. For **economic corridors**, the overall objectives are broad-based increases in economic activity throughout the corridor and regional integration.

Social development, the reduction of poverty and increased employment are key aims of many development corridors, but poor attention has been given to these objectives. Complex outcomes mean that it is unclear to what extent these aims have been achieved. However, recent research carried out by Tate (2015) on the Maputo Development Corridor shows that there are a number of significant benefits that corridors can bring to communities, but a more strategic approach must be taken if these benefits are to be enhanced.

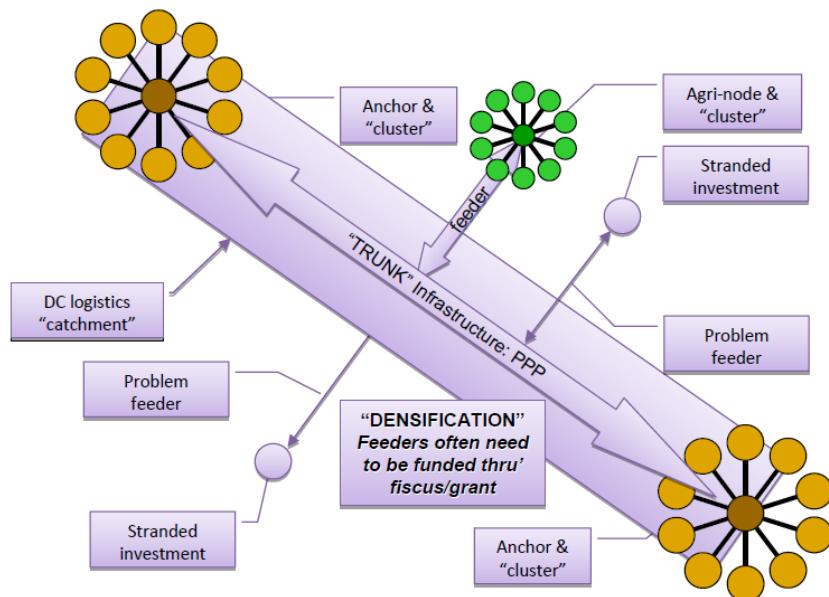
The conclusion is that development corridors typically have more than one objective at each stage of their evolution, and the typology of corridor (transport, freight, industrial, agricultural, economic) does not easily reflect the range of development objectives. Nonetheless, the *specific* development objectives of each corridor are important in terms of managing the corridor; this will be discussed further in Section 5.

3 Considerations for the planning and design of development corridors

3.1 Spatial development initiatives

A SDI brings together spatial planning and development projects to include areas of unrealised economic potential, thereby enhancing the development potential of the corridor. Figure 5 illustrates the SDI approach and its primary components. The aim of a SDI is to achieve balanced development with the inclusion of communities and smaller businesses (cluster projects) alongside larger investments (anchor projects). The term "spatial planning initiative" can be confusing as it is used both to describe the approach to corridor development and types of spatial development.

Figure 5: Summary illustration of a SDI (source: Jourdan, 2008)



Much of the literature on SDIs refers to the Maputo Development Corridor, which was launched in 1996 as the first spatial development initiative. This often leads to a mistaken interpretation that there is just one type of SDI. Nogales (2014) has identified several types of SDI, see Table 3. Nogales considers SDIs as the "ultimate expression" of spatial planning and each type of SDI places emphasis on different issues.

3.2 Key features of SDI approaches

Thomas (2009) notes that at the regional level a SDI encourages integrated development within a given space defined by its economic potential rather than political boundaries. SDIs were promoted Africa-wide by the New Partnership for Africa's Development (NEPAD) following a desk-top study carried out for the NEPAD Secretariat in 2006 by South Africa's Regional SDI Programme (RSDIP) and Mintek.

Table 3: Types of Spatial Development Initiative

| Prominent Features | | | | |
|-----------------------|---|---|--------------------------------|---|
| Type of SDI | Overall purpose | Geographic scope | Sectoral / Industry scope | Emphasised feature |
| Economic corridor | Integrated planning | Supranational (might encompass smaller SDIs); linear agglomeration spanning hundreds or thousands of km | Multi-dimensional | Coupling infrastructure investments with trade and regulatory policy reforms and sectoral development plans |
| Agro-based cluster | Network linkages | Regional or provincial agglomeration (revolving around production area); from hundreds to thousands of hectares | Single sector | Benefits of agglomeration economies and promotion of collective action |
| Agro-industrial park | Value addition by processing | Urban (accessible distance from a production area); a few hectares | Single sector / multi-sectoral | Common infrastructure and logistics facilities |
| Technopole | Innovation | | | Park + academic and research institutions |
| Special economic zone | Export and promotion of foreign direct investment | Urban (possibly near to a port area if it is an export promotion zone); a few hectares | Single sector / multi-sectoral | Advantageous economic and regulatory frameworks |

Source: Nogales (2014)

Thomas identified the following key principles of SDIs:

- there must be real economic potential
- as far as possible private sector resources should be mobilised
- scarce public sector resources should be applied where they will have the most impact
- the benefits of economic growth should be shared with previously excluded groups

The primary features of a SDI include:

- crowding-in and coordination of both public and private sector investments

- ensuring political support, commitment and buy-in from the highest levels of government in order to facilitate fast and focused planning
- the use of well-planned and publicised opportunities to promote the SDI
- project opportunities must be well-identified and packaged, and bankable

3.3 Using GIS to support SDIs

Geographic information systems (GIS) are an integrative information technology that include database management, spatial analysis, and map display capabilities to portray geospatial relationships in map form. Recent advances in GIS technologies strengthen social interactions based on comments on online maps that have the potential to improve Public Participation GIS (PPGIS) practices.

Spatial planning related to development corridors typically involves multiple stakeholders. GIS enables groups of stakeholders to work on different data (mapping) layers within the software. Each group is responsible for their respective data layers, while other groups are permitted to display on screen the data from other groups but not to edit those data. In this way, a GIS allows contributions from all stakeholders to be fully integrated and for knowledge to be shared such that all stakeholders are equally well-informed. However, inequalities can still exist for stakeholders who are not party to the planning process but are potentially affected by it (such as landowners, local communities, etc.). Access to the needed hardware, software, data and expertise remains a barrier to full participation by smaller and/or remote stakeholders.

A prototype of a web-based PPGIS application has recently been launched in Canela (Brazil) for urban planning that is free and easy to use and the results showed that it is a valuable approach for engaging the public. It is able to promote communications between users in a more interactive and straightforward way. Continuous development of readily accessible, user friendly GIS applications will enable wider and more meaningful stakeholder participation in the planning, design and implementation of future development corridors. This is of particular relevance for corridors being planned using the SDI approach where participation by communities and small businesses is to be encouraged.

For the BAGC corridor, GIS is being used to investigate the optimum crop-growing areas in micro-climate regions inland from Beira. For the Nacala corridor, GIS is being used for spatial planning that helps integrate cluster projects and for planning the city extension of Nacala and the developments around the port end of the corridor.

3.4 Concerns regarding SDI approaches

Following on from the general success of the MDC, there has been widespread promotion of the SDI approach across Africa for the planning of development corridors. In large part, this has been due to the promotion of the SDI approach by NEPAD. The impression is given that an SDI adequately brings together the appropriate range of criteria at the planning stage of a corridor to result in successful corridor implementation and that other SDI projects can easily replicate the success of the MDC. This has led to many analyses of the MDC from which lessons have been learned, in particular regarding the approach to SDIs.

Thomas identified that while the SDI approach makes sense from several standpoints, there are several concerns that need to be addressed if it is to be adopted more widely as a mainstream corridor planning tool. The most significant is that, apart from the MDC which is argued as a one-of-a-kind project resulting from unprecedented collaboration between two heads of state, few other cross-border SDIs had made any real progress. Thomas notes that SDIs are supposed to kick-start broad-based economic growth, and their preparation has been supported by detailed assessments of economic potential in a

region. But actual implementation has often been strongly transaction-driven and not sufficiently focused on developing the links between infrastructure and planning, broad-based employment opportunities and spatial development. Thomas further notes that often the anchor projects have occurred without firstly developing the local linkages.

Other authors share Thomas' view. Jourdan and Rogerson have both noted that the MDC SDI focused attention on a certain part of the country (South Africa) that had strong potential for economic growth. Their separate researches, and those of others, have identified that the MDC did not initially give sufficient attention to communities and small enterprises. Attention was refocused later in order to deliberately bring benefits to these smaller stakeholders. Tate (2015) found that communities have indeed benefited from greater employment with consequent reductions in poverty, increased life expectancy, and increased attendance at school. At the same time, the increased trade among larger stakeholders also created opportunities for small-scale entrepreneurship. Rogerson concludes that the success of SDIs cannot be measured simply in terms of their effects for changing the geographical patterns of economic activities. Of central importance is the move away from a protected and isolated approach to economic development towards one in which competitiveness, regional cooperation and a more diversified ownership base is paramount.

Kepe (2001) highlighted other failures, or over expectations of the SDI approach, including:

- (i) SDIs raise expectations over land value and lead to conflicts
- (ii) SDIs have made huge assumptions about local beneficiaries but failed to take time to fully understand the local realities and competing agendas
- (iii) underlying assumptions about small public investments leveraging large private investments is wrong, and
- (iv) the SDI led to much disruption to rich and poor communities who speculated on future developments that took much longer to realise, if realised at all.

3.5 Challenges that prevent the full benefits of corridors from being realised

In terms of identifying the challenges that prevent the full benefits of corridors being realised it is worth noting the overarching environmental back drop that contributes to these challenges.

A range of technical, economic, institutional, and political issues have slowed or curtailed progress toward regional economic integration in Africa and elsewhere. One problem is countries' overlapping membership in Regional Economic Communities (REC). A significant problem for many of the RECs is lack of implementation of commitments, attributable to, in various instances, lack of political will and lack of technical capacity. In addition, a plethora of trade barriers remain, and a number of smaller countries have been unwilling to eliminate customs duties, arguing a need to service revenue requirements.

Regional economic integration can help tackle such development challenges through reducing barriers to trade for imports and exports, agricultural and manufactured goods, as well as services. But implementing a regional economic agenda is challenging and takes time. COMESA and SADC, and other RECs, after years of working to deepen economic integration have made clear progress in many areas; yet, they have only achieved partial integration. COMESA, EAC and SADC (known as the Tripartite) have determined that transport inefficiencies and prohibitively high transport costs are among the biggest impediments to realising their vision of regional prosperity.

The Northern and Central Transport Corridors connect the people of Burundi, Kenya, Rwanda, Tanzania and Uganda and also provide port access to the people of the Democratic Republic of Congo and South Sudan. Trade along the corridors has had a positive impact on the region and many initiatives have been undertaken to improve corridor efficiency. However, corridor performance is still hampered by high transport costs, degraded physical infrastructure and national policies that are incompatible with regional goals. Key challenges relate to improving systems, procedures and processes, which currently hinder the unlocking of infrastructure investments and trade improvements. AfDB is working with ICA Members, the Regional Economic Communities, Regional Member Countries and Trademark East Africa to increase investments in regional infrastructure, as well as work on accompanying trade facilitation measures such as single window information portals, one-stop border posts and improving operational efficiency of key corridor choke points (for example, Mombasa and Dar es Salam Ports). Work is also ongoing to build capacity for certification and accreditation of freight forwarders and customs clearing agents.

The MDC has been cited as a successful development corridor. Amongst other things the success to date has been primarily due to having in place an effective and efficient development corridor Project Manager. Without an effective Project Manager, it is likely that corridors facing these challenges will have difficulty in achieving their intended objectives.

3.6 Long-term development asset or short-term tool for extraction?

The need for Asset Management

Notwithstanding that there are a number of contributing factors for a development corridor to evolve into a long-term development asset rather than a short-term tool for the extraction industries, this cannot be achieved unless the corridor's physical assets are kept in good order, which has rarely been the case.

Since the Second World War huge investments have been made in the construction of various forms of infrastructure in underdeveloped countries. These have been constructed as part of the process to increase economic activity - national, regional and international. Most of the financing for the infrastructure has been provided on the basis of grants and loans from the major donor agencies.

The majority of loan agreements between donors and recipient governments are on the basis of: funding for construction (capital works) being wholly provided by donors or a combination of donor funding supported by government counterpart funding; and recipient governments being responsible for providing all downstream recurrent funding of scheduled routine and period maintenance interventions during the operational life of the infrastructure.

Unfortunately, although loan agreements for infrastructure projects have been signed on this premise, history has shown that a large majority of recipient governments do not commit or provide sufficient funds to maintain in good order these donor funded infrastructure initiatives. As a result, predicted whole life cycle benefits are not achieved. Most developing countries lack sufficient funds for maintaining their full infrastructure networks and therefore have to prioritise allocation of these scarce resources.

Often, newly constructed infrastructure are perceived by government as not in need of maintenance funding, due to its being new. So scarce available maintenance funding is instead allocated to what are seen as more deserving causes. In time, however, and due to lack of adequate maintenance, newly constructed infrastructure will deteriorate and become a liability rather than an asset and the intended benefits of the facility are not realised.

As a result of lack of maintenance, a number of donor-funded infrastructure projects have deteriorated to such an extent that further funding has been sought by recipient governments for their rehabilitation (for example, the Tanzam Highway, Tanzania).

Examples of Asset Management

During the planning of development corridors there is a need, therefore, to ensure that the question of infrastructure asset management is thoroughly addressed and managed and not left to chance. The planners will need to ask the question, how will downstream maintenance funding be provided: as, in the case of the N4 road, in the Maputo corridor, via tolls paid by the users; in the case of the Mumbai-Delhi DFC, through freight handling charges; and, in the case of the Maputo Port, through docking, loading and unloading charges. For privately operated infrastructure, some of the generated revenue will be earmarked for maintenance activities; whereas, in the case of government operated infrastructure, there may be a need to establish a dedicated fund derived from end users. In such cases, these funds should be dedicated to maintain the infrastructure from which the funds are derived, rather than put into governments' general revenue for allocation to other sectors.

Having made adequate provision for the hard infrastructure for these assets to be maintained in an efficient and cost effective manner, this will require having dedicated organisations with well-trained and experienced human resources in place. This may involve institutional strengthening of existing agencies or setting up bespoke organisations both private and public.

The provision of well maintained efficient and affordable infrastructure will give the necessary confidence for governments, communities and the private sector to continue to invest in economic activities whose growth is dependent on the hard infrastructure. It will also offer the platform for donors to lend the necessary support to assisting agricultural and manufacturing development that will lead to job creation and reduction in levels of poverty.

3.7 Supporting climate change and green growth

There are a number of ways that development corridors can help contribute to the reduction of greenhouse gas (GHG) emissions, from the planning stage to construction, and the operation and maintenance stages.

Political Buy-in, Planning and Design

The most important contributor to reducing the environmental impact of any new or upgraded infrastructure is the need to have in place political buy-in to a low carbon strategy and the will and the capability to implement and enforce it. At the planning stage, location of the proposed corridor is important in that, if possible, it should avoid the removal of large numbers of trees and, if unavoidable, re-planting schemes should be put in place as soon as possible.

Due consideration needs to be given in designing road corridors with minimal gradients and curvature that will provide reduction in Vehicle Operating Costs (VOCs) i.e. less fuel, lower emissions, fewer spare parts etc. Where possible, overtaking lanes should be provided on steep road sections, to allow passing of slower vehicles. Upgrading of the N4 toll road between Pretoria and Maputo and, in particular, the section between Nelspruit and Maputo greatly improved the vertical and horizontal alignment as well as providing either dual carriageways or overtaking lanes.

India's Low Carbon Initiative

Improved rail corridors for increasing freight-carrying capacity will not only provide lower emissions from the rolling stock but encourage a move from road to rail i.e. 'Shift of freight from road to the low-carbon intensive mode of rail transport', for the transportation of large volume goods. Described below, the Delhi-Mumbai Dedicated Freight Corridor is an example of how implementing the strategy for "Promoting Low-Carbon Transport in India" can help reduce GHG by providing a more efficient rail system.

"Promoting Low-Carbon Transport in India" is a major initiative of the United Nations Environment Programme (UNEP), referred to as the Low Carbon Transport (LCT) project. The overall context in which the LCT project has been undertaken is the critical role of the transport sector in reducing greenhouse gas (GHG) emissions. India is currently the fourth largest GHG emitter in the world, although its per capita emissions are less than half of the world's average. Opportunities exist to make India's transport growth more sustainable by aligning development and climate change agendas. India's National Action Plan for Climate Change (NAPCC) recognises that GHG emissions from transport can be reduced by adopting a sustainability approach through a combination of measures such as increased use of public transport, higher penetration of bio-fuels, and enhanced energy efficiency of transport vehicles.

The main objectives of the DFC are to achieve the twin goals of sustainable development and low-carbon growth. The main goals of sustainable development are economic efficiency, sustainable growth (conserving resources, energy security, and energy efficiency) and inclusiveness. The major goal for low-carbon growth is to reduce GHG emissions in order to achieve global targets for minimising threats of climate change.

The decision by the Government of India to undertake this ambitious DFC project was primarily based on the rapidly rising demand for freight transport and the inability of the existing rail network to meet this demand. It was assumed that the DFCs would lead to higher economic efficiency, enhanced energy security and significant environmental benefits compared to the situation without the DFC project.

Reducing Green House Gases during construction and maintenance

It is important to recognise that the emissions of GHG will occur during the construction, operations and maintenance phases of any development corridor. However, the emissions during the construction phase are short-term in nature and may be quickly compensated for by the reduction in GHG during the operation phase. It is possible to achieve reductions in GHG emissions related to the construction stage by using alternative construction materials instead of conventional materials.

The California Department of Transportation (Caltrans) is presently researching ways of utilising alternative materials in an effort to reduce GHG emissions in both its construction and maintenance activities. Caltrans is responsible for planning, designing, maintaining, and operating more than 50,000 roadway lane-miles that make up the State Highway System, as well as planning for other transportation modes, including public transit, aviation, bicycling, and walking. As public and scientific concern over climate change has grown, California has adopted policies to reduce energy use and GHG emissions, including state-wide targets and specific requirements for state agencies.

Examples of Caltrans research into and use of alternative materials that produce fewer life-cycle GHG emissions include:

1. Amending **concrete specifications**, to allow contractors to use greater amounts of less GHG-intensive alternatives to Portland cement, the traditional primary binding agent in concrete when building roads and bridges. State-wide, Caltrans used more than 130,000 tons of fly ash and more than 56,000 tons of other Portland cement alternatives, including blast furnace slag, on the State Highway

System in 2010. These alternatives reduced GHG emissions by more than 47,000 tons, the equivalent of taking more than 9,100 vehicles off the road for a year. These actions also spurred a similar shift among other transportation agencies that reduced additional state-wide concrete-related GHG emissions.

2. Using **alternative asphalt pavements** that contain recycled rubber, recycled pavements, or binding agents that allow pavement to be mixed and laid at lower temperatures. These changes reduce GHG emissions associated with manufacturing materials and with construction fuel use. In total, Caltrans reduced pavement-related GHG emissions by more than 61,000 tons in 2011, which is roughly equal to the yearly emissions produced by 11,800 passenger vehicles.

In addition, more than a decade ago, Caltrans began replacing 76,000 incandescent traffic signals with light-emitting diode (LED) fixtures, which reduced the associated energy costs by 80 percent. Caltrans then replaced pedestrian signals, changeable message signs, and a substantial share of sign lighting with more efficient fixtures, and is currently working to replace roadway lighting with LED fixtures. The lighting efficiency efforts undertaken to date reduce GHG emissions by almost 39,000 tons per year. This is roughly equal to the annual emissions produced by 7,500 cars.

4 Criteria for identifying suitable interventions in development corridors

4.1 Planning criteria for development corridors

The criteria for developing some corridors are fairly clear, particularly corridors that have well-defined objectives. The Poverty Reduction and Alleviation Project in Peru is a specific example of where 24 economic corridors were mapped out and ranked according to two criteria: economic potential, and the prevalence of extreme or moderate poverty.

In a study for the ADB on economic corridor development, Brunner (2013) concluded that no one economic corridor matches exactly the characteristics of another. As a corridor evolves the specific objectives change, and so do the criteria for intervening in the next stage of its evolution. Sequeira similarly made the case that the specific objectives of each corridor are related to the specific objectives of its stakeholders and these are different for each corridor and the stage of their evolution. If, as Sequeira suggests, corridors evolve through cycles of development and operational efficiency, then the criteria for identifying whether to invest in each new cycle will be different.

In an attempt to provide some guidance on development criteria, a range of reports has been studied to derive a general set of criteria for identifying suitable corridors for development. The following list will need to be tailored to each specific case, but the general criteria include:

- does the initiative have active support of heads of state from all involved countries; this is absolutely necessary for continued momentum of the corridor initiatives, especially soft infrastructure initiatives, and for the commitment of resources by national and regional agencies
- is there a sound regulatory framework in place to govern the movement of goods and people across borders and the capacity to implement and enforce this framework
- does the proposed corridor have a one or more suitable economic anchor projects (in SDI terminology) to provide a primary source of funding for the transport infrastructure
- alternatives (or supplements) to anchor projects could be long-term commitment from multilateral development banks and/or public-private partnerships (PPPs), or strong economic supply-demand conditions
- upgrades of transport routes must satisfy commercial criteria, that is to say they must be financially and economically viable (i.e. hard infrastructure projects must be capable of realising positive financial and socio-economic returns on investment)
- non-transport infrastructure, such as power and telecommunications, can assist in making the corridors viable particularly in the absence of large SDI-type anchor projects
- formal trade liberalisation agreements must be in place before investing in the hard infrastructure
- the political economy must be conducive to implementing other soft infrastructure (harmonisation of policies, legislation, regulations and procedures) in a timely manner to complement regional hard infrastructure projects
- minimisation or elimination of informal institutions (corruption, tardy performance, etc.) along routes, at borders and at ports, must be achievable if the full benefits of the corridor are to be realised

- additional criteria will include a satisfactory outcome from risk analyses that, inter alia, take into account the impact of cost and time overruns on hard infrastructure projects with respect to returns on investment to private investors

In his review of SDIs, Thomas (2008) identified several criteria, any one or more of which could impact negatively on the likelihood of successfully implementing the SDI. These criteria are likely to vary at different stages of corridor development:

- (i) political instability of the region
- (ii) poor political buy-in
- (iii) lack of capacity of the officials in participating countries to effectively develop and manage the process
- (iv) weak investment climate and poor regulatory environment at commencement
- (v) limitations of a weak (or absent) domestic private sector, incapable of seizing opportunities created by foreign investors and participating in investment opportunities where they occur
- (vi) premature marketing of a corridor for investment before projects are properly scoped or analysed and ready for banking
- (vii) the interests of donors engaged in the corridor may be too specific or narrowly focused, such as for example, where they are concerned only with trade facilitation but not in productivity enhancement and trade development or in the development of feeders to facilitate densification

4.2 Social development criteria

An important criterion arises from Wiemer's detailed study (2009) for the ADB of the Greater Mekong Subregion:

- whether the essential role of grass roots businesses and community organisations has been fully considered in bringing a corridor to life.

Wiemer also noted that the lack of local community-level involvement in South Eastern Europe had been a hurdle in the development of the Pan-European Corridor VIII. Several papers by Söderbaum and Taylor, Jourdan, Rogerson, Tate, and others, regarding the Maputo Development Corridor, underline the importance of this criterion to the improvement of social policy in the MDC. Further, according to Tate (2015), the mandates given to governmental and non-governmental bodies working within development corridors must include the ability to sanction and execute projects alongside civil society organisations. Currently, this is not the case but if implemented it would help to maximise social development benefits at grass roots levels. Poverty reduction is not always identified in the literature as a specific criterion. However, poverty alleviation is often subsumed within the broader planning criteria such as reduction in transport costs and enhancement of trade. Governments must play their part in ensuring that the benefits from corridors reach the poor, including enforcement of a fair and transparent regulatory framework, and cross-modal transport subsidies within the corridor to achieve affordability for both passengers and freight services. Equally, governments must protect the vulnerable, such as programmes aimed at minimising the risks associated with increased traffic facilitated by a corridor (i.e. where long-distance truck drivers increase the risk of transmitting HIV/AIDs and other diseases, or where weak border checks fail to discourage human trafficking). The poor, as stakeholders in corridor development, are considered further in Section 7.

4.3 Economic diversification criteria

Where economic corridors are intended to support economic diversification the criteria for corridor selection become more complex. Governments must consider the balance of investment required from each sector and the extent to which the economic corridor would facilitate development and economic growth compared to alternative (non-corridor) initiatives. Filtering sector benefits in this way may lead to a decision to focus the corridor development on supporting a specific economic sector, such as agriculture, mineral extraction, industry, leading respectively to decisions to develop an agricultural corridor, industrial corridor, etc., or perhaps more than one specific sector, leading to some form of economic corridor. These criteria may also affect the routing of the corridor.

4.4 Criteria for donor interventions

Donors will provide their own criteria as conditions for their support to development corridor projects. These should not be seen as corridor planning criteria *per se*, but conditions related to the donor's own lending policies. The role of donors should be to support a corridor initiative that has already been identified by a national government or more than one regional government and which has already been assessed against each a range of planning criteria, such as those listed in Section 4.1. The ADB Charter gives priority to those regional, subregional, and national projects and programmes that contribute effectively to the harmonious growth of the Asia region as a whole. In 2006, ADB formalised a Regional Cooperation and Integration (RCI) Strategy with four priorities:

- (i) improve cross-border physical connectivity
- (ii) increase international trade and investment with regional and non-regional economies
- (iii) contribute to regional macroeconomic and financial stability and financial market development
- (iv) improve regional environments and social conditions.

Regional integration here refers to a process through which economies in a region become more interconnected. Such economic interconnectivity can result from market-led and private sector-driven actions and/or government-led policies and collective initiatives in the region. The collective policies and initiatives by governments could be either formally embodied in an inter-government treaty or informally agreed upon by the participating countries in regional cooperation.

4.5 Examples of criteria used in major development corridors

Greater Mekong Subregion (GMS)

The agreement signed between the six countries participating in the Greater Mekong Subregional programme suggests that the stakeholders' initial intentions were aligned to development of transport corridors to enhance intra-regional trade. The objectives stated in the agreement include: (a) to facilitate the cross-border transport of goods, (b) to simplify and harmonise legislation, regulations, procedures and requirements related to cross-border transport of goods, and (c) to promote multimodal transport. More recently the intention is to develop the GMS transport corridors into economic corridors; indeed, they are already referred to as economic corridors even though the stakeholders acknowledge the evolutionary process has some way to go. The development of institutions for the GMS corridors began in 1992 focusing on trade facilitation and only in 2008 was the first "Economic Corridors Forum" convened.

The criteria for developing the GMS corridors were to respond to high demand for goods across the subregion and the potential for intraregional supply. Additional criteria were concerned with the feasibility of eliminating hard and soft infrastructure bottlenecks. Hard

infrastructure bottlenecks included, for example, providing a bridge at the Thai-Lao border to replace the ferry crossing, thereby expediting cross-border flows. Soft infrastructure included the harmonisation of policies, legislation, regulations and procedures, without which the benefits of hard infrastructure border-crossings would be severely diminished.

Maputo Development Corridor (MDC)

The initial criteria for deciding to develop the Maputo Development Corridor reflected the geo-political and economic conditions at its inception. The corridor had historically been a major trade route for South African overseas trade, but due to apartheid in South Africa and civil war in Mozambique the corridor's trade volumes had severely declined and trade shifted to other routes. The demand-side criteria for the MDC were therefore not so clear. The MDC was developed by taking into consideration the unrealised economic potential of the region. Since trade had shifted to other routes the immediate demand did not exist that would satisfy the criteria for huge infrastructure investments, so economic "anchor projects" had to be identified. These were initially found in the extraction industries and later enhanced via interest from various productive industries. The extractive and productive stakeholders needed to be brought together with the transport infrastructure (road, rail and port) stakeholders, and the higher-level institutional stakeholders who would be responsible for streamlining border crossing formalities. The stakeholders, objectives and decision criteria were brought together by using an approach that became known as the Spatial Development Initiative (SDI). Swaziland was included in the initial SDI, thus benefiting this landlocked corridor.

The MDC is generally considered a major success in terms of economic corridor development, generating a number of notable achievements. The corridor has accounted for over US\$5 billion in private sector investments through PPPs and further in natural resources exploitation and beneficiation as well as industrial and regional infrastructure development. In addition, the corridor attracted further investments to the value of \$600 million and created 8,000 new permanent jobs together with 15,000 new construction temporary jobs. The MDC confirms that transport efficiency for increasing imports and exports is not the only value of development corridors. Well-planned, designed and implemented, corridors can also enhance local and regional economies. These successes did not happen by chance and are linked to the extensive work that was undertaken in ensuring that implementation of the MDC was based on sound knowledge and information, combined and analysed using the SDI approach. To demonstrate the volume, nature and complexity of the elements of work undertaken, these are listed below.

- the scoping of the development corridor area as a means to achieving consensus amongst stakeholders on a conceptual business case in which a broad development objective and the main economic drivers were identified;
- the identification and profiling (project packaging) of viable resource anchor project/s and associated infrastructure (SDI trunk infrastructure);
- an intensive appraisal of existing economic activity on a sectoral basis;
- a scan for other viable investment opportunities (realisable through the trunk infrastructure) and the identification and profiling of requisite feeder infrastructure (to link potential development areas adjacent to the trunk infrastructure) and sectoral economic projects (densification);
- the identification and removal of infrastructural, policy and regulatory, bureaucratic, or institutional constraints to investment as well as those steps required to overcome them ("de-bottlenecking");
- the carrying out of project appraisals to develop a portfolio of investment projects that could be tested for feasibility and for which appropriate funding models can be developed; and
- engagement with and mobilisation of private sector interest through the development of concession (PPP) documents and appropriate investment marketing strategies.

As mentioned earlier, there are some areas of planning and operational management of the MDC that could have been better executed. Packaging of major investment projects to maximise the backward and forward linkages (local supplier industries and beneficiation/value addition) was not carried out. This is why social benefits and employment creation have not been as good as was expected. They were packaged, but no planned linkages were implemented. This resulted in the social benefits being less deliberate but, as Tate (2015) has discovered, the MDC has nevertheless brought significant social benefits to communities living within the MDC's catchment area.

5 Management and performance monitoring of development corridors

5.1 The need for effective corridor management

Each evolutionary stage of a corridor's development has specific objectives. Effective management of resources and activities is required in order to achieve these objectives. There is a multiplicity of stakeholders at each stage, each with their own interests and objectives that have to be coordinated. Arnold (2005) states that it is important to create a single point of coordination, particularly in view of the many government agencies involved in various aspects of corridor development and operations, some of which will be in different countries. Coordination requires a public-private partnership to address the wide range of problems associated with investment in infrastructure, regulation of transport and trade, and improvements in transport services and logistics. Arnold acknowledges the difficulties associated with creating the single point of coordination and states that the appropriate structure for corridor management depends on the nature of the corridor and the specific functions to be managed.

The World Bank and the Asian Development Bank have both produced documents on corridor management, respectively "Transport and Trade Corridor Management Toolkit" (Kanuka and Carruthers, 2014) and "Best Practices in Corridor Management" (Arnold, 2005). Arnold concedes that his title may be misleading because the term management implies a certain amount of control, but the variety of demand for transport and other logistics services and the large number of providers of these services limits the opportunities for exerting any form of control.

While a corridor may be considered a single initiative, its development is not a single project that can be managed as a one-off exercise. Corridor management includes *inter alia* planning, financing, legislation, regulation, operation, monitoring and promotion. These activities have to be coordinated in addition to coordination with the provision of physical infrastructure and development of national-level and regional-level institutions. Throughout the life of a corridor, there must be a combination of managing activities aimed at achieving the development stage objectives while coordinating with the stakeholders who do not have direct responsibility for delivery but nevertheless have a keen interest in how the objectives will be achieved. These stakeholders include government departments and agencies, investors, and local communities and businesses.

5.2 Managing for competition or cooperation?

Conventional economic thinking states that increased competition leads to greater efficiencies, new technologies, comparative advantage, and overall economic growth and social advancement. Du Pisani (2002) argues that in some cases of regional development corridors voluntary cooperation might lead to greater economic welfare than competition. In his consideration of SADC's regional development corridors, du Pisani was concerned not just with the competition that arises from each country managing the section of a development corridor in its territory. He was also concerned about the transfer of various SDI projects from central to provincial governments and the additional competition that this would create; would this increased competition lead to greater social development?

Competitiveness requires that domestic producers are able to sell the goods and services demanded by customers at a rate equal to, or better than those from imported sources. This requires domestic suppliers to be effective and efficient. However, effectiveness and efficiency are required not just of the domestic industry, but of the whole value chain from

product conception to delivery and eventual disposal. Transport activities and development corridors are clearly a part of this chain.

Competition between corridors may enhance their performance, but such competition would require passengers and freight agents to have a choice of corridors. This is generally not the case. At most, there might be a choice of transport service providers and/or transport modes, but not a choice of corridor without undertaking a significant detour. This is to be expected because the purpose of development corridors is to focus investment along a certain defined route to achieve improvements in economic activity. Where a choice of corridor does exist, if users are dissatisfied they would switch to another corridor, thus encouraging the managers of the poorer performing corridor to improve their service and/or costs. Where there is not a choice of corridor, but there is a choice of transport mode within the given corridor, then users would switch to another mode provided that there is a cost, time and/or reliability advantage to be gained. Du Pisani points out that inter-corridor competition between parallel sections of different transport modes is likely to be effective, but intra-corridor competition between consecutive sections of a corridor is unlikely to achieve full potential.

While competition is required to achieve effectiveness and efficiencies in each transport mode and at each point along a development corridor, cooperation is needed end-to-end throughout a corridor, including smooth transhipment arrangements, coordination of transport service schedules, and border controls. Cooperation will minimise delays to the benefit of both passengers and freight forwarders regardless of whether they represent local communities and domestic industry or suppliers from outside the region. As a general rule, development corridors should be managed by different management units in *competition* with each other. However, *cooperation* between different transport modes on consecutive sections of a corridor is necessary to achieve optimal corridor performance.

5.3 Who should manage development corridors?

For competition within a corridor to be effective, the different transport modes must be managed by different entities, leading to optimisation of cost and time for each mode. Du Pisani states that there is a precondition to be fulfilled before competition will have the desired effect. The manager of the corridor must have a personal stake in the corridor's performance. This is an important motive for the privatisation of transport infrastructure and services. However, provided that this link between business performance and personal interest can be suitably established there is no reason why a public sector organisation could not be equally successful in managing a corridor.

Breaking up the management of a corridor into (for example, provincial) sections will result in a need for greater coordination and make cooperation between consecutive sections of a corridor more difficult, especially at provincial and international border posts, and at points of transhipment. It would be more effective to have a single management unit responsible for the whole corridor, appointed by way of an international agreement that ensures the managers have a direct interest in the success of the corridors. This requires that the agreement is compiled such that all parties to the agreement stand to benefit equally from the successful management of the corridor. The single management unit will be responsible for ensuring coordination throughout the length of the corridor, while also encouraging competition between different providers of transport and logistics services.

5.4 Management of transnational corridors

Increasingly, political leaders around the world share a common vision of regional integration to open up regional markets, link production clusters in different countries, facilitate the free movement of goods, services and people, and foster political stability and peace. A common ambition is to promote transnational infrastructure as a physical

backbone of this regional integration, and initiatives are underway to give greater priority to cross-border programmes. Landlocked countries, in particular, stand to gain from these arrangements.

In Africa, for example, the Priority Action Plan of the Programme for Infrastructure Development in Africa (PIDA PAP) encompasses 51 programmes of regional importance in the transport, water, energy, and information and communications technology (ICT) sectors, with an investment need of \$68 billion. The aim has been to get these programmes implemented by 2020, but the realisation of that aim is hampered by the tremendous challenges the programmes face, often because more than one country is involved.

Although these challenges might arise in any region, they are particularly severe in Africa. The continent is so heterogeneous, with a plethora of languages and monetary currencies, and great variation in the financial capacities of individual countries. This makes the harmonisation of trade and transport policies, legislation, regulations and procedures a huge challenge. The challenge is not insurmountable, as has been demonstrated by the corridor programmes in Europe (TEN-T), Central Asia (TRACECA and CAREC) and South-East Asia (GMS). The primary solution to the challenge is the commitment of heads of state from both sides of an international border. However, the maturity of public institutions remains inadequate, and serious shortcomings persist in the capacity for managing transnational infrastructure programmes as well as the operational phase of corridors.

One key characteristic of transnational infrastructure programmes is that the costs and benefits – both monetary and as externalities – occur in more than one country and are often distributed unequally. For example, a development corridor might connect industrial centres in country A with a port in country C, while country B serves mainly as a transit country without receiving major benefits. The challenge is to quantify the direct pecuniary costs and benefits and to put a value on the externalities, as well as to devise a scheme for distributing them fairly across the countries involved. In the meantime, as countries often remain concerned about not getting a fair share, or about providing a subsidy to a neighbouring country, the potential of many transnational projects remains unrealised.

Transnational infrastructure programmes can be broadly classified into three different types, according to the degree of transnational collaboration needed, namely (i) transnational planning/ policy coordination; (ii) transnational infrastructure network; and (iii) cross-border physical infrastructure. The management of a transnational infrastructure programme faces many of the same difficulties as managing any large infrastructure programme. Requirements for meeting the budget, quality standards and schedule include capital expenditure needs to be minimised; the design of the programme should aim to optimise value; rigorous risk management must be applied; contracting strategy and procurement need to be refined; and scarce resources must be secured and used optimally. Some challenges are specific to transnational programmes or, at least, are aggravated by transnational aspects.

In a June 2015 publication, the World Economic Forum (WEF) considered how to accelerate infrastructure development for Africa and grouped the challenges of transnational infrastructure programmes as: financial, technical, regulatory, personnel/cultural, governance. It concluded that groups of challenges are not independent of each other (any one can strongly affect another) and the relevance of each may well differ from country to country even for the same programme. The intensity of challenges will vary during different stages of a programme, typically being at their most intense in the preparation phases during feasibility studies, technical design, financing and procurement. The study concluded that legal and regulatory issues remain too complex and too large in scope for the acceleration to try to resolve. This underlines the difficulties of managing transnational corridors.

In an earlier report by the WEF (2014) on Managing Transnational Infrastructure Programmes in Africa – Challenges and Best Practices, it pointed out the additional difficulties of managing transnational programmes in the absence of a pervasive sovereign jurisdiction (such as the EC in Europe) to align the differing interests of countries involved in the programme and to reduce transaction costs. Institutionalising cross-border collaboration will not only facilitate alignment across all programme phases, it will also limit the risk of any single country making unilateral changes. It distinguishes three levels of cross-border collaboration according to their degree of sophistication: separate planning without coordination between countries, separate planning with coordination, and institutionally integrated planning, as summarised in Table 4.

Table 4: Coordination of transnational corridors

| | Separate planning without coordination | Separate planning with coordination | Institutionally integrated planning |
|-------------|---|--|---|
| Description | | | |
| Bodies | <ul style="list-style-type: none"> - Each country has an individual planning process - No alignment and coordination exist across countries | <ul style="list-style-type: none"> - Each country has an individual planning process - The planning is coordinated between the different countries | <ul style="list-style-type: none"> - Countries delegate the planning to a dedicated programme unit - Countries give up part of their national sovereignty |
| Example | <ul style="list-style-type: none"> - No additional governance bodies | <ul style="list-style-type: none"> - Some kind of coordination body exists, e.g. interministerial secretariat or technical alignment forum - Alternatively, supranational authority (e.g. RECs) could assume coordinating role | <ul style="list-style-type: none"> - Programme planning and implementation unit with special decision rights - Alternatively, transfer of planning process to supranational authority (e.g. RECs) |
| Assessment | <ul style="list-style-type: none"> - North-South Multimodal Corridor¹ | <ul style="list-style-type: none"> - Maputo Corridor Logistics Initiative | <ul style="list-style-type: none"> - West African Power Pool (WAPP) |
| | <ul style="list-style-type: none"> - Not desirable, since programme is not managed as such - Programme-level benefits are not realized | <ul style="list-style-type: none"> - Minimum requirement for reaping some programme-level benefits - Risk of unilateral deviation from coordinated planning | <ul style="list-style-type: none"> - Potential to manage transnational infrastructure as a real programme - Hard to realize, since national sovereignty is curtailed |

¹ The Memorandum of Understanding, which is between all participating countries of the North-South Corridor and would provide an operational framework, is still pending signature. However, progress has been made in implementing individual projects.

Source: Wong et alia (2014)

5.5 Why monitor corridor performance?

An old adage states that one cannot manage what which cannot be measured. Measuring corridor performance enables the corridor management unit to identify areas of under-performance where efficiencies and/or effectiveness can be improved. The overall purpose of measuring corridor performance is to assess the extent to which the corridor is fulfilling its specific objectives. Srivastava (2011) pointed out that monitoring corridor performance solely through the time/distance cost methodology or time release surveys implicitly incorporates a narrow view of the corridor, namely the specific transport route between two points; this does not capture the broader context of a development corridor. Emphasising some measures at the expense of others, results in an incomplete and unbalanced view of a corridor's performance. In order to compare corridors, a

benchmarking methodology must take into account the different types of corridor, as well as their differing stages of development.

5.6 What performance criteria should be monitored?

Hartmann (2013) suggests there are several layers in corridor performance monitoring. The first layer is to consider whether the corridor is performing sufficiently well to fulfil its overall transport, trade, economic, or other objectives. The criteria for this must have been agreed upon beforehand, while conceptualising the corridor and that it is possible to measure performance according to these criteria.

Once it has been determined that the first layer provides a negative answer, the second layer is to examine the causes for under-performance. This is not straightforward. If, for example, the first layer identifies that transport costs remain high, the second layer may discover that there are several contributory factors to the high costs. A parallel layer of investigation is required to quantify the separate impact of each causal item.

The third layer is the monitoring of the effectiveness of the solutions, by comparing performance over time.

Hartmann proposes a framework of corridor monitoring that comprises four dimensions:

- volumes
- time and uncertainties
- prices and costs
- services and infrastructures

Hartmann provides a detailed guide to the establishment of "corridor transport observatories" (CTOs) that are the practical complement of the performance monitoring framework. CTOs constitute the toolbox of instruments that collect, process and combine the data required for the calculation of performance indicators. Hartmann's framework very much reflects the key features of trade corridors and is a very useful tool for such corridors, but is too narrow for monitoring more complex corridors.

Srivastava cautions against taking too limited a view of corridor performance. Many attempts at performance monitoring are based on the view that a corridor is a route between two points. This view may, in some cases, be useful and practical, but narrow compared to the development objectives of a corridor. A simple transport route from one point to another is considered to be "narrow" in that the influence of the route on areas either side of the route is minimal. If a corridor significantly influences travel and/or development patterns either side of the route then the corridor is said to be "broad". Monitoring performance in terms of time and costs, and possibly volumes of traffic, in a linear perspective may be appropriate for narrow transport corridors, but as the corridor becomes broader other measures need to be monitored.

The efficiency of a trade corridor can be measured in the linear time cost manner, but the effectiveness, in terms of increasing trade, should include measures of the amount of trade and, depending on the corridor objectives, whether trade is being expanded to include areas further away from the core corridor route. Tate (2015) has found that communities living within 50 km of the Maputo Development Corridor have indeed benefited from greater employment with consequent reductions in poverty, increased life expectancy, and increased attendance at school. Tate's work shows some valuable results and reveals that there are substantial demographic benefits as well as greater equality of opportunity for those people that live within the jurisdiction of an economic corridor. Tate suggests that extending the mandate of the overall managing body to include a greater level of liaison with civil society will further enhance the social benefits of corridors (Tate 2015).

Similarly, for agricultural or industrial corridors, the CTO should be monitoring at the micro-scale in terms of the impact of the corridor on small-scale farmers, local markets, etc., and at the macro-scale in terms of the corridor's impact on the respective sectors of the economy.

The framework for monitoring corridor performance should take into consideration the full breadth of stakeholders and be transparent in terms of its methods of assessment and its reporting.

5.7 Who should measure corridor performance?

For transport and trade corridors, Hartmann states that designing and managing CMIs requires expertise and resources. Accordingly, CMIs need to be anchored to an institution such as a transport and trade corridor coordination authority, consisting of the stakeholders from public agencies (customs, port, and regulatory agencies) and from private sector representatives (providers of transport and logistics services).

If a corridor is managed by a single management unit, then this unit would be the appropriate entity for monitoring the corridor's performance. It should monitor criteria that help it manage the competition and cooperation objectives, as well as the overall developmental objectives of the corridor.

6 Financing considerations for corridor development

6.1 Introduction

Corridor development is not a single project. It is a complex combination of hard and soft infrastructure projects with different durations, often overlapping and interacting, throughout the stages of a corridor's evolution (reference Figure 4). Few, if any, of these projects will last the full course from corridor conception to completion. Distinct projects comprise planning, infrastructure design and construction, development of transport services and logistics, trade facilitation, and so on. There is no one size fits all financing solution. Financing solutions must be tailored for each set of circumstances during the corridor's evolution, taking into consideration the capacity of the host government(s) to enter into financing agreements with donor agencies, private investors, and specific combinations of debt and equity. Financial risks will be particular to each corridor and the allocation of risk between the public and private sector parties should be determined according to each party's ability to manage the associated risks. As the corridor evolves and increasingly supports economic activity, its successes are likely to reduce the perceived risks, enabling the corridor managers to attract further investments and evolve the corridor further, perhaps expanding its area of influence to support additional local businesses and communities.

6.2 Corridor financing via private investor anchor projects

Hard infrastructure anchor projects are the start of transport corridors. The anchor projects might initially be funded just by the national government, or with assistance from development partners. But to develop the transport corridor into an economic corridor the viability of the initiative must be demonstrated by active involvement of the private sector. If the private sector is not interested in the corridor, it likely means that they do not anticipate commercial success of the corridor, or that projects risks are too high or not bankable. The viability of the initiative will be demonstrated by the response of the private sector. Government must be the primary sponsor of a corridor in terms of political leadership and commitment to the corridor objectives. This leadership must be demonstrated via its own actions that will attract the private sector. This suggests that a transport corridor, in which the public sector is the main or only player, is unlikely to evolve into an economic corridor unless there is adequate private sector interest. Intermediate stages of corridor development (for example, an agriculture corridor) could be achieved without private sector involvement, but the extent of trade that this facilitates is likely to be limited in the absence of private sector activity.

The evolution of transport corridors into economic corridors usually depends on having hard infrastructure "anchor projects" in place, which may be a transport corridor comprising of one or more modes of transportation. Such anchor projects require major capital investment to bring them to the required standard that will provide an efficient and cost effective transport facility that provides the basis for unlocking economic potential along and at each end of the corridor. In the absence of sufficient in-house finance, governments have to obtain donor funding to supplement their own funds. For example, the Government of Kenya had to borrow some \$380 million, from the World Bank to upgrade rural and inter-urban roads and highways, aviation and railway infrastructure, as part of the Northern Corridor Transport Improvement Project. There are four components to the project, the first component being rehabilitation and improvement of roads, roadside facilities and road safety interventions. The second component is institutional strengthening and capacity building in the transport sector. The third and fourth

components respectively provide support to the Kenya Airports Authority (KAA) and to the Kenya Civil Aviation Authority (KCAA).

Development corridor "anchor projects" in themselves do not guarantee social and economic development, but they act as catalysts for other investments in transport infrastructure and in business opportunities that support economic growth leading to social development. In order to take advantage of opportunities provided by the development corridor, other forms of investment are required from both public and private sectors. When planning development corridors, it is important to promote private sector investment by involving these key stakeholders early in the planning process to ensure that the development corridor does in fact meet their short, medium and long-term investment goals and stimulates or increases levels of investment from local, regional and foreign resources.

In the case of the Maputo Development Corridor, the highway linking South Africa and Southern Mozambique was upgraded into a modern toll road at a cost of \$250 million. Additionally, the Maputo Port was rehabilitated, telecommunication and electricity links were upgraded, and rail links between Maputo and South Africa were upgraded. These key anchor projects provided the hard infrastructure to enable the potential local, regional and international potential economic opportunities to be unlocked. However, the success of the MDC evolving into a substantial and sustainable economic corridor was due to the investment of \$50 billion by the private sector. The involvement, of Public Private Partnerships, for both the N4 Toll Road and the Maputo Port concessions has played a major role in ensuring the success of this corridor.

6.3 Corridor financing via Public-Private Partnerships (PPPs)

The WEF has produced a document called *Infrastructure Investment Policy Blueprint* (February 2014), which is intended as guidance for policy-makers "in an era when investors are global shoppers for infrastructure and compare a potential investment to those in other countries and asset classes. The Blueprint provides recommendations that are grouped into three categories:

infrastructure strategic vision

- a credible pipeline of infrastructure projects
- a viable role for investors
- a communication strategy

policy and regulatory enablers

- re-negotiation risk
- procurement processes
- permitting processes
- tax policies

investor value proposition

- financial returns from the investors' perspective
- risk allocation
- market sounding

Together, these considerations provide a framework that can be tailored to meet each country's specific needs in view of its stage of development in terms of private infrastructure financing.

The WEF publication discusses various sources of private finance, including corporations and longer-term investors such as pension funds, insurers, and similar, and indicates the typical types of equity and debt for each financing source. The document describes two primary options for private sector financing:

private infrastructure funds:

Investors can be limited partners in a dedicated fund that invests directly in infrastructure. While an attractive source of financing for many investors and governments, this option has some shortcomings: private equity funds generally have a lifespan of five to ten years, which is not supportive of projects with longer durations, such as typical corridor infrastructure projects.

direct investment:

Investors can buy equity directly in a specific project, which can give them greater control and visibility over an asset. This option requires substantial outlay in internal staffing and specific in-house governance and protocols. This can be a challenge, especially for smaller players.

Risk mitigation is essential for private investors. Chief among the risks for many investors is political risk. This may take many forms, from macro-economic instability, risk of armed conflict and/or terrorism, to possible changes in policies and regulations by governments subsequent to the signing of investment agreements. Countries can engage with multilateral development banks (MDBs) to mitigate political and regulatory risks. Both governments and investors benefit from MDBs. MDBs provide funding, political risk insurance, and professional advice for projects. Another area of investor risk is *demand risk*. MDBs also provide advice on how to address demand risk for each transport infrastructure project.

The Private Infrastructure Development Group (PIDG) mobilises private sector investment to assist developing countries in providing infrastructure. It is prepared to provide investment in areas where most sources of funding would not be available. Through a group of subsidiary companies, PIDG offers financing and project development expertise. A particularly attractive feature of PIDG for developing countries is that their support is designed to deliver not just the physical project and a return on investment for the shareholders of the respective subsidiary company, but also to deliver specific development objectives aimed at poverty reduction and economic growth.

A huge amount of literature exists on the Internet regarding PPP projects. The World Bank-supported website Public-Private Infrastructure Advisory Facility (PPIAF) provides three types of technical assistance for governments of low- and middle-income countries. The primary area of support provided by PPIAF is in *developing enabling environments* that facilitate private investment in infrastructure by: preparing and reviewing policy frameworks, designing and strengthening new institutions to support private investment, and translating the enabling legislation, regulations and policies into infrastructure-specific transactions.

A second area of support is project cycle-related assistance to address lack of capacity and ensure bankable projects to attract private investment. This includes preparation of financial models, contracts and bidding documents, and advisory support after financial closure. The third area is capacity and awareness building by sharing knowledge, publishing best practice and so on.

The WEF has produced a good publication on PPP best practice: "Steps to Prepare and Accelerate Public-Private Partnerships". Four best practice areas are contained in the report:

- managing a rigorous project preparation process
- conducting a bankable feasibility study
- structuring a balanced risk allocation and regulation
- creating a conducive enabling environment

It is surely no coincidence that the World Bank (via its PPIAF initiative) and the WEF have provided advice on the same areas of undertaking PPPs. The WEF document cautions that PPPs should not be seen as the only financing option. Governments should consider the three basic options of public, public-private, and private. Selection of the appropriate option should be determined from a value-for-money analysis. A PPP option will deliver value-for-money if it provides a net positive economic gain greater than that of any alternative procurement route.

6.4 Corridor financing via governments and donors

This financial support is often provided as grant monies or loans at soft rates from such organisations as the World Bank, AfDB, ADB the European Union. Increasingly, China is becoming involved in the financial support for large-scale infrastructure projects that could facilitate corridor development and is establishing a new infrastructure investment bank that will operate on similar lines to the ADB.

The magnitude of investments that donors and recipient countries are making in development corridors reflects the important role development corridors have in the future economic and social development of the world. One major development corridor programme that demonstrates this is the Greater Mekong Subregion plan to develop its transport corridors into economic corridors. In 2013, member countries of the Greater Mekong Subregion (GMS) agreed to draw up a \$50 billion pipeline of potential projects under a new Regional Investment Framework (RIF), including investments in non-traditional areas like railways and multi-sector projects to be implemented over the next decade to 2022. To meet the sizeable financing requirements, member countries and their development partners intend to mobilise funds from the private sector. The subregion, bound together by the Mekong River, covers an area about the size of Western Europe and has a combined population larger than that of the United States.

The aim of the GMS programme is to transform transport corridors into fully-fledged economic corridors to boost cross-border trade and investment, and to stimulate jobs and growth. Along with developing urban and logistics centres, it will try to create a subregional power market. The programme also emphasises the need for investments to help member countries build resilience to climate change, to enhance agricultural competitiveness, and to promote food safety and security. Efforts will continue to extend and expand the exchange of traffic rights among member countries, and to promote region-wide tourism opportunities. **This example demonstrates how major investment from partnering countries, associated international lending agencies, and the private sector can lead to enhanced trade and business opportunities and job creation.**

In Kenya, the cost of transport infrastructure projects that were proposed for consideration for the Central and Northern Corridors, for improvement and construction, was estimated at US\$ 4.2 billion. Projects include those for upgrading the ports facilities at Mombasa, Dar es Salaam and Lamu, road upgrading and new road construction, lake transport projects on Lake Victoria and Lake Tanganyika, together with the construction of One Stop Boarder Post Facilities. It is anticipated that 22 of the 28 projects could be implemented under a PPP arrangement with varying degrees of private sector participation. **This is an example of the possibility of risk sharing between public and private investors.**

In its Regional Integration Brief issued in April 2013, the AfDB stated that in recognising the cardinal role that regional corridors play in fostering regional integration and development, the AfDB has been supporting the development of regional transport (transit) corridors in Africa. The Bank's support for corridors, aims to stimulate intra-regional and global trade and foster market integration and that for some land-locked countries, the corridors are a new opportunity to participate in global trade. This is in line with the principles of the AfDB's Regional Integration Policy and Strategy (RIPoS) approach to regional corridors, for the period 2014-2023, that covers both the hard and the soft

infrastructure components of development. This encompasses construction, maintenance and rehabilitation projects, as well as trade facilitation measures and trade capacity-building programmes as well as providing for the crosscutting issues of economic, social and environmental sustainability. **This is an example of the importance donors are giving to the financing of development corridors, particularly on the African continent in achieving economic and social development goals.**

The success of the MDC has led to the spawning of other initiatives for generating funds for future development corridors. One very recent example of this is the setting up of newly-registered Gauteng Infrastructure Financing Agency¹ that will "solicit partnerships" to fund the province's five economic corridors over the next three years. The five corridors are Johannesburg, Pretoria, Ekurhuleni, Sedibeng and the West Rand. The agency will enable the provincial government to enter into partnerships with the private sector to fund hard infrastructure. Gauteng faces the twin challenges of rapid migration into its cities from neighbouring provinces and countries and a R1.3bn decrease in national government transfers to Gauteng in the next three years. The provincial government proposes to leverage the fiscal strength of its three metropolitan municipalities and foster ties with the private sector in order to succeed in funding this ambitious revitalisation programme. It is anticipated that a third of the financial requirement will be provided by the provincial government and because the provincial government has a limited revenue stream it will have to attract other sources of funding. The agency will need to establish partnerships with private investors and so that banks and equity groups are able to participate.

In conclusion, substantial funds are available for development corridors. In Africa the extractive industries are potentially the largest source of funding for anchor projects to kick-start development corridors. Further funding from private sector stakeholders (such as productive industries), national governments and donors can provide additional amounts that, along with the necessary soft infrastructure, can transform transport corridors into trade or economic corridors. In Asia, the role of extractive industries is not as significant as in Africa. Funding for intra-regional economic corridors comes largely from member states, with donors providing funds for some of the hard infrastructure. Private sector investments tend to be more in the various economic sectors that generate the trade, hence traffic flows, from which returns on transport infrastructure investment are derived.

A related and important consideration is funding for corridor management organisations. The SSATP Working Paper No.86 (2007) provides some ideas based on corridor experiences in Sub-Saharan Africa.

6.5 China and Infrastructure Financing

During the past decade China has become a major player in providing financing for large infrastructure projects to developing countries. Often this is associated with making inroads into countries that require financial support in achieving their development goals. Funding for rail, road and port projects has helped create corridors from points of raw material extraction to points of export.

As an example of this form of support from China: in April 2015, a US\$46 billion infrastructure spending plan was announced for Pakistan. The plan is known as the China-Pakistan Economic Corridor and, if realised, it will be China's largest economic development initiative to date in another country.

¹ Gauteng Province is located in North East South Africa, in the Highveld. It includes the cities of Johannesburg and Pretoria and is the country's economic powerhouse accounting for a third of its gross domestic product.

China is increasingly providing funds to countries - particularly in Africa - offering apparently attractive loan repayment schedules and levels of interest. However, such funding is often tied to conditions: such as, all services are to be provided by Chinese government-owned companies. Typically, all equipment and labour are brought from China to undertake the project. Although the recipient countries benefit from the completed infrastructure, it is at a cost to developing local skills and capacity. A recent study for the AfDB revealed that in the last 10 years works contracts awarded to Chinese contractors in financial terms has increased from around 6 percent to 45 percent which has had a major negative impact on the development of the domestic construction sector in many African countries.

As a potential alternative to traditional donor funding, where there may not be the same strategic interest and motive for funding development projects, there could be downstream disbenefits in agreeing to funding from the Chinese government, whose motives may be more to do with China's development rather than development of the recipient country.

6.6 New infrastructure financing initiatives

Corridor initiatives are large in scope and in terms of overall investment requirements. The challenge in finding the large sums of money is not too unlike the challenge associated with the post-2015 Sustainable Development Goals (SDGs). The international financing institutions are working together to "turn the billions into trillions". Financing from these institutions can be grouped into four broad categories:

Adding, pooling and enabling: This category of financing solutions covers new flows, such as taxes or fees, as well as policy-driven "flows" that are not traditional finance instruments or investments but generate economic or financial value. Policy guidance and lending help strengthen the domestic policy, legal, tax, regulatory and institutional environment, which can increase a country's available resources and creditworthiness, enhance development impact, and encourage and attract private investment.

Debt-based/right-timing instruments: These instruments help provide a steady, predictable stream for development programmes. These initiatives make public funds available earlier for development via the issuance of bonds on international capital markets.

Financial risk management mechanisms: These initiatives leverage public funds to create investment incentives for the private sector through mechanisms that correct market failures, reduce sovereign risk and/or macroeconomic and climate-driven vulnerabilities. Examples of risk management approaches include guarantees, derivatives, blended finance, pooled vehicles and project preparations facilities. These mechanisms provide insurance protection for risk sharing or full risk transfer.

Results-based financing: Results-based financing provides funding when desired results are delivered. One benefit of this approach is transferring the risk of success or failure to the entities conducting the work, which helps promote greater accountability and ownership, improved management, and effectiveness of service providers. It also improves the chances to crowd in multiple times the funding toward the development objective.

A detailed discussion of project financing options and associated risks is beyond the scope of this guide, but a brief discussion is provided below. A more detailed treatment of infrastructure investment options is provided by Wyman (2014) in a publication for the World Economic Forum: "Infrastructure Investment Policy Blueprint".

6.7 Capacity to spend

A further consideration with respect to the financing of projects is the ability to spend. When corridors are managed by national government bodies, the capacity to spend is often limited. Government staff is involved in other new capital projects in addition to managing ongoing maintenance commitments of existing infrastructure. Procurement may be impeded by national procurement laws and regulations that are inappropriate for the very large scale of projects associated with corridor infrastructure. A better solution is for a specific corridor management entity, established with its own procurement procedures, to undertake the coordination, procurement and oversight of the many projects comprising development (and operation) of the corridor. A single management entity is also best placed to ensure that the scope and timing of projects is appropriate and that there are no implementation "gaps", duplication, or excess. Srivastava (2011) warns of the dangers of "transport and trade facilitation for transport and trade facilitation sake". By appropriately embedding each project within the broader context of the corridor's development, the management entity can ensure a balance is achieved in allocating limited resources between making the most of the existing stage of a corridor's development and preparing expansion to attract investments for future expansion.

6.8 Financing corridor management institutions

In 2008, a study was carried out for the SSATP aimed at identifying characteristics and key factors for a sustainable corridor management funding regime and to design a generic model for funding a corridor management institution (CMI), in particular for the Maputo Corridor Logistics Initiative (MCLI), on a user-pays principle. The study was carried out by the Southern Africa Global Competitiveness Hub. The main findings of the study were:

- Corridors with CMIs are better able to monitor corridor performance and address non-tariff barriers in a proactive manner, through strategies for continued performance improvement within the corridor. The coordination role requires a public-private partnership model to address the wide range of issues, including investment in infrastructure, regulation of transport and trade, and to facilitate private sector participation and professionalism in the logistics industry.
- The overarching goal of a CMI is to reduce the costs of doing business along the corridor in such a way that the cost of sustaining the CMI is less than the cost benefits it provides to corridor users. The CMI achieves these benefits through implementation of strategies and making interventions that reduce transit times and cost of shipment through the corridor, and improve the quality of service and infrastructure throughout the corridor.
- However, at inception it is unlikely that the cost-benefit ration of a CMI would be positive and that is the reason why donor funding is usually required at this stage. In the absence of a donor, the CMI would be funded by national government funding (or via all governments party to a transnational corridor), or volunteers who are "corridor champions", such as port authorities, or major users of the corridor. These arrangements are unfortunately not sustainable because donors and governments have other priorities and volunteer contributions are unreliable.
- For effectiveness and efficiency, CMIs need a reliable and sustainable source of income to enable them to plan and carry out improvements to corridor performance. The authors found that the Northern Corridor (NCTTCA) had overcome this problem. From the NCTTCA's experience, it appeared that the only solution is a user-pays mechanism for funding a CMI. The tonnage levy imposed in the Northern Corridor, although not a perfect mechanism, had provided sustainable funding for the NCTTCA.
- A tonnage-distance based levy would ensure sustainable income for the CMI. At the same time, if those who pay have influence over the CMI, it would provide a means of

maintaining pressure on the CMI to continue delivering benefits for the corridor users. The tonnage-distance levy would be collected at national borders and ports and transferred to the CMI.

- The user-pays principle must be authorised by the concerned governments and there must be understanding and acceptance by the shippers of the user-pays principle. The resultant charges must be seen to be lower than the benefits provided by the CMI. In order for shippers and CMIs to assess costs and benefits there must be an effective corridor performance monitoring system in place. The CMI funders must have a say in what the CMI does and how it spends the money.
- The timing of introducing the user pays mechanism is crucial for acceptance by governments and other stakeholders. The levy should be introduced as soon as practicable.

6.9 Financing corridors to deliver national benefits

There is concern that, if large businesses fund corridor anchor projects, only these businesses would benefit from the corridor. This would be true if the corridor comprised, for example, a railway line linking a mining location with a port and provided no access to other potential users of the rail link. In such a case, the general population would not benefit and might even suffer if the rail line cuts across land and severs links between communities and social facilities (school, hospitals, towns, markets, places of employment etc.). The nation could still benefit to some extent if the deal between government and the mining company is properly constructed. A wide range of taxes would be collected on the mining activities, the trains would use fuel that is also taxed, and people employed in the mining activities would be taxed, but their net incomes would lead to spending and saving, hence further taxes. But the "closed" nature of such a corridor means that the nation only benefits in indirect ways such as taxation, beyond the initial construction period.

By developing more than one mode of transport in the corridor, and including feeder lines or roads, many more people can benefit directly from the corridor, including local communities and businesses that would otherwise be relatively isolated. Financing corridors to enable this to happen could include public-private partnerships (PPPs) that involve specific transport infrastructure investors. There is a variety of PPP models. The road could be tolled with access controlled to specific points at each end and along the route.

A private investor would be interested in large volume traffic flows because that would result in greater return on his investment. In order for the corridor to also serve smaller, isolated communities, there would be a need to build (or possibly upgrade existing) feeder roads; similarly to connect agricultural areas or industrial developments to the corridor. These will probably have to be financed by the government, perhaps with donor support. Financing a corridor via this hybrid funding model would result in a combination of both localised and national benefits, as well as benefits to the anchor project investor.

6.10 Sharing experiences between corridor management institutions

As with all hard infrastructure projects, there is often a risk that insufficient funding is given to the less-costly items and this results in huge time and/or cost overruns on the most costly items. It is essential to ensure that capable planners and other consultants are retained in the early stages of corridor development, also at the design and design-review stages. Adequate project preparation is essential and cannot be done cheaply. Mistakes made during procurement can result in poor quality plans or designs that lead to huge claims at construction stage. The later in an infrastructure project that mistakes are encountered, the greater the costs will be. Feasibility studies and contract design typically

cost 1-4 percent of the total project investment. Preparation costs are around 1-2 percent for large projects (>US\$500 million); 2-3 percent for medium-sized projects (>US\$100 million); and 3-4 percent for smaller projects (<US\$100 million).

Lesson learning can lead to standardisation that has many benefits for corridor developers. By standardising the procedures for project preparation, PPP promoters can minimise the risk of mistakes and reduce the associated costs. Standardisation will help with selecting advisers for feasibility studies, drafting concession agreements, developing technical specification manuals, and procurement practices.

There is strong case for an association of corridor developers/managers in order to provide a forum for sharing lessons learned at all stages in corridor development, including optimal arrangements for the financing of different types and sizes soft and hard projects. NEPAD's initiative to promote SDIs could have been the start of such an association. It is an institution with wide reach across Africa and which addresses the range of issues where lesson learning could be shared between countries and between corridor management entities.

7

Stakeholders in corridor development

7.1 Stakeholders and their main interests

Corridor development encompasses a broad spectrum of activities and stakeholders may include non-investment sponsors, such as regional trade bodies, and primary investors, through to special interest groups. Stakeholders include national and regional governments, development partners (donors), private sector investors, corridor development agencies and operational management companies, community groups, NGO's and the populations and businesses that will be affected positively and negatively during evolution of the corridor. Table 5 summarises the main interests of the stakeholders involved in, or affected by, development corridors.

Table 5: Typical corridor stakeholders and their main interests

| Stakeholder | Main interests |
|--------------------------------|--|
| Shippers | Move consignment in shortest possible time and at minimum cost Reduction of shipping costs Safe transportation and handling |
| Transporters | Reduction in turn-around time Optimisation of beneficial margins |
| Clearing and forwarding agents | Reduction in operating costs Increased volumes of cargo handled Fast clearance process Reduction in cross-border charges Simplification and harmonisation of documentation |
| Port authorities | Increased port utilisation Improved cargo throughput Enhancing port competitiveness |
| Customs authorities | Increased customs duty collection Harmonisation of customs documentation Improvement of overall economic development |
| Road authorities | Preservation through axle-load enforcement Infrastructure cost recovery Improving road safety |
| Security services | Control of illegal movement Control of illegal goods and substances Management of plants and animals |
| Health authorities | Control and management of diseases associated with mobile populations (HIV/AIDS, STDs, etc.) |
| Development partners | Increased trade Regional integration Poverty alleviation |

| | |
|-------------------------|----------------------------------|
| Consumers | Reduction in cost of goods |
| Local businesses | Business growth opportunities |
| Local communities, NGOs | Social development opportunities |
| | Poverty alleviation |

Adapted from: SSATP Working Paper No.86

7.2 Stakeholders' challenges

As Sequeira points out, the stakeholders will vary depending on the stage of evolution of the corridor. They will be different during the development and operational stages because the focus of development and the challenges to be addressed are different at each stage. Table 6 summarises Sequeira's view of the key challenges facing stakeholders at the hard and soft infrastructure stages of a corridor's evolution.

Table 6: Primary stakeholders during evolution of a corridor

| | Development cycle (hard infrastructure stages) | Operational cycle (soft infrastructure stages) |
|--------------|--|---|
| Focus | Investment projects focus | Problem / issues focus |
| Stakeholders | Line ministries for trade, industry, transport and finance | Transport and trade public regulatory and control agencies |
| | Investment promotion agencies | Logistics operators |
| | Local governments and authorities | Transport network and facilities operators |
| | Financial institutions | Shippers |
| Challenges | Establish an adequate political and legal framework | Knowing what is wrong and why, then lobby to fix what needs to be fixed |

Adapted from Sequeira et alia (2014)

7.3 Coordination of stakeholders

The coordination of stakeholders remains a major weakness for the planning, design and management of corridors. On a subregional basis, organisations similar to MCLI, with the aim of bringing together national governments, economic communities, private sector and civic society, include TradeMark East Africa (TMEA) and the former TradeMark Southern Africa. While MCLI and TMEA continue to bring together stakeholders from within their subregion, there remains no adequate overarching forum for sharing experiences and for lesson learning on a continental or global basis. Various players have provided support in some areas, but there is no cohesive forum that spans and coordinates stakeholders from all stages of corridor development. Civil Society is still largely excluded from the process (Tate 2015).

In 2010 the Port Management Association of Eastern and Southern Africa (PMAESA) proposed the establishment of a regional corridor working group for the PMAESA region. A study was carried out and terms of reference were prepared for what could be called the Eastern and Southern Africa Corridor Development Initiative (ESACDI). The Working Group was never established and this still appears to be a vital role for broadening and accelerating success in the large number of corridor initiatives across Africa. A similar

initiative is required in other regions of the world and the ADB is actively promoting regional cooperation and lesson sharing in Asia. Donor support is critical for institutional strengthening and capacity building of corridor managers, governments and other agencies involved in the planning, design and management of development corridors.

7.4 For which group of stakeholders are corridors intended?

The principle of the MDC was that development of infrastructure was pivotal to ensuring economic growth and regional integration. The development corridor was planned as an economic development initiative primarily, but with freight transport acting as the catalyst for growth and development. The concept of the SDI programme, which was to crowd investment into major industrial developments, uses transport corridors as the key to ensuring that the industrial developments are sustainable.

Community benefits were eventually realised as being extremely diverse and probably most realistically available to communities 50 km on either side of the corridor and along its length. There has been a good deal of academic time spent on trying to differentiate between transport, development and economic corridors. Some practitioners would say there has possibly been too much overlap in these to make any differentiation meaningful.

The linkages between corridors and benefits to communities need to be thoroughly researched and understood so that the impacts can be monitored and measured for each type of existing corridor, and then properly planned and designed for future corridors. A start in this direction has been made by Tate (2015), whose comparative national and provincial research of the MDC has identified some distinct community benefits from the corridor. Tate found that in the Mozambique part of the corridor, where living standards started at a lower level than the South African part of the corridor, life expectancy has been advanced substantially just by living within the corridor catchment area. This applies for men and women in both urban and rural areas, ranging from at least three years for men in urban areas up to 13 years for women in rural areas. The impact is a far less dramatic on the South African side of the corridor, where increases in life expectancy appear to be no more than two years.

Tate noted that the corporate social responsibility programmes funded by major anchor projects had led to community improvements. Educational infrastructure had been improved and poorer families had been supported in terms of books, school equipment and school uniforms. These programmes have helped increase school attendances by children from impoverished families that could not otherwise afford to send their children to school. On the Mozambique side of the border, corporate social responsibility programmes have also had a positive impact on health issues, such as an initiative to reduce deaths due to malaria. However, on the South African side Tate found that the incidence of HIV/AIDs is higher in the corridor area, particularly in the vicinity of the border where populations are more transient. This has been exacerbated by the South African Government's poor management of the epidemic and this has had a negative impact on the secondary infection of TB.

Tate also noted that the MDC has had a positive effect on employment, but unemployment remains unacceptably high, possibly due to a lack at the outset of promoting the forward and backward linkages of anchor projects that could have helped create more employment opportunities.

The African Union and the RECs have focussed on corridors as the conduit for ensuring all of mentioned above, because of their ability to bring all of these elements together in a coordinated way, and that this is the basis of increasing infrastructure development, intra-African trade, regional integration, and sustainable economic growth and societal improvements.

7.5 Increasing corridor benefits to the poor

The SDI approach can be used in more positive ways to develop a corridor programme that suitably incorporates small communities and small businesses alongside the larger corridor investors and, where applicable, the anchor project(s). The Beira Agricultural Growth Corridor is a good example of this. The BAGC Initiative (BAGCI) has three pillars in addition to the implicit strengthening and expansion of the Beira Transport Corridor. The first pillar deals with institutional strengthening and corridor governance.

The second pillar supports agri-business with inclusive business models to invest in prioritised clusters of high agricultural potential with good existing backbone infrastructure. This facilitates commercial opportunities for national firms, but also for global companies that can catalyse the upgrade of agricultural supply chains in the corridor. The intention is that once a critical mass of agri-investors and efficient supply chain has been achieved that this will encourage further agri-investors to expand the successes. This will lead to local business opportunities and to jobs that will benefit the poor. The third pillar encompasses promotion of policy dialogue and improvements to the business environment.

Increased trade along the route also improves the lot of communities in a positive manner/ This is important as it promotes food security, and equality of opportunity. Access to services such as health and education are substantially improved by economic corridors (Tate 2015). In communities adjacent to the MDC, substantial benefits accrue from corporate social responsibility (CSR) programmes, particularly those relating to anchor projects and other large businesses within the corridor. This improves educational attainment and other opportunities for families. There are some excellent CSR programmes, but an overall strategic approach would help to provide outcomes that are more systematic; for example, civil society and CSR projects could work alongside corridor management bodies. Civil society groups to be considered full stakeholders in the process, but this would entail broadening the mandate of the management bodies.

The BAGCI corresponds to an agro-based cluster form of SDI that typically could benefit the poor through the creation of jobs at farms. The glossary also makes mention of agro-industrial parks as another form of SDI. These are usually located closer to urban areas and would provide job opportunities for the urban poor.

7.6 Who are the winners and losers?

For most development corridors there exists a wide range of public and private sector actors with different interests in corridor development including donors, governments, international and national companies, commercial farmers, logistics companies, input suppliers, traders, informal traders, storage providers, transporters and infrastructure providers, smallholder producers, and others. Trade unions, specialised NGOs, business associations, civil society organisations, research institutes may also take up roles. However, their precise role and focus depends on the breadth of scope of the corridor in question - the broader the scope, the harder it is to identify winners and losers and build common interest coalitions to push for reforms or hold governments to account. By the same token, the broader the scope the more diluted efforts may be to fully implement the agenda, thus running up against, if not active resistance, at least passive resistance to change.

One example of winners and losers is the N4 toll road that links Maputo with Pretoria. Whilst providing a vastly improved transport facility for private sector transport companies many potential users remain too poor to pay tolls, and local communities that could be benefiting from this corridor road and its users are excluded from the benefits. "There is a strong emphasis on commercial viability but very few concrete measures for a people-

centred development path" (Söderbaum and Taylor, 2008). Söderbaum refers to the high degree of social and economic informal trading networks along the corridor, and the complex interplay between these informal processes and the formal arrangements in place. Some of the informal traders (primarily women) tried to set up shop along the N4 toll road, but were prevented from doing so. According to Söderbaum and Taylor, the "MDC project is geared towards strengthening ties between state and a small number of big business actors, with the result that the informal economy is seen as a problem." This oversight or 'teething problem' was later remedied by TRAC who built some permanent roadside stalls in a lay-by for these traders. Notwithstanding the great importance of an efficient transport system for a country like Angola where poor and scattered communities extend over great distances, the Lobito Transport Corridor Development has not fulfilled its potential for generating domestic linkages or multiplier effects through wage employment of Angolans. The effects of the road and rail corridor reconstruction has been experienced in very different ways by different actors. Despite the creation of employment and other income-earning opportunities, they have had limited impact in that communities still lack the financial capacity to make use of the transport network.

In the case of the transport corridors for the Greater Mekong Subregion (GMS), due to the lack of spatial development planning, following the physical infrastructure being put into place, it became clear that the main winners were those involved in the transportation of goods and people. Due to the lack of linkages to these improved facilities, grass roots businesses and communities along the corridors did not benefit at the same pace. As a result of this inequality between winners and losers, further investment is being made into creating a supportive environment that will be able to unlock the social and economic potential of the corridors thus creating more winners.

7.7 Managing the political economy and aligning with competing strategies

The political economy of neighbouring countries sharing a corridor initiative can best be aligned if the countries have shared development interests and shared strategies at least for the areas served by the corridor. Throughout Africa, corridor initiatives are seen as a means of fostering regional integration, which is seen by donor agencies as key to addressing Africa's vast infrastructure gap. It is also necessary to have in place the agreement of participating governments on unlocking cross-border bottlenecks between adjoining countries. For example, South Africans no longer require visas to enter Mozambique. Putting such agreements in place requires strong political ownership of the corridor objectives and commitment to the development process. Without this the economic growth and social development objectives are jeopardised. Government parties not involved in the earlier conception stages, protocol agreements and memoranda of understanding may not accept those previous commitments, which can lead to a slowing of the development corridor implementation.

The MDC came about by the alignment of development objectives of the then-heads of state of Mozambique and South Africa. For Mozambique, there was a need to kick-start the economy after fifteen years of civil war; for South Africa the impetus was to give opportunity to areas whose economic development had been suppressed during years of apartheid. Swaziland soon recognised the benefits of a corridor that would link this landlocked country to a major coastal port. While the reasons to kick-start social and economic development differed, the objectives and strategies were shared. The high level of cooperation between the two neighbouring states helped accelerate the pace of corridor development.

Development of the MDC was coordinated via the spatial development initiative, which was intended to target cluster projects in isolated locations with unrealised economic potential. But these clusters would not alone make the corridor viable. Larger anchor

projects were identified and the size and momentum of these overtook the original objective of developing the clusters. The original corridor manager (MCC) had such a wide-ranging brief that, notwithstanding the inclusion of new housing, distracted it from development of the cluster projects. It was not until later, with the benefit of hindsight, that the mistakes were acknowledged and the MCC was replaced with the current MCLI. MCLI represents a much broader spectrum of stakeholders and attention has since been given to addressing the challenges of smaller corridor stakeholders. There is still poor overall representation of civil society groups in the MDC.

MCLI has a membership of around 170 stakeholders, but most of its funding comes from the two largest members. This needs to be broadened, but under the current leadership MCLI has effectively taken over where the higher-level politics has waned. This is not to say that political leadership no longer has an interest. The MDC has reached an advanced stage of development and the MCLI is active in balancing the interests of all stakeholders to ensure that, as the operational phase progresses, the smaller stakeholder interests are not smothered by the interests of the larger stakeholders.

MCLI provides a model for stakeholder representation for other corridors. There is a difference between its role and that of organisations like TradeMark Southern or East Africa, and agencies that are established to coordinate the planning, design and development of corridors. MCLI concentrates on stakeholder coordination. While the political-level players are key in initiating corridors and promoting the harmonisation of policies and procedures, MCLI strives to balance the interests of a wide range of operational-phase stakeholders from cargo-owners, shippers, logistics companies, port operators, border officials, through to national interests represented by the respective governments.

8 Lessons Learned

8.1 The role of development corridors

The focus on developing isolated growth poles and growth triangles has been replaced since the 1990s by a realisation that trade and economic opportunities are better enhanced by corridors that link areas of supply and demand. Development of economic corridors, as opposed to development of growth centres, recognises the wider economic trends of regionalism and globalism. The evolution of a transport route into a transport corridor, thence a trade corridor, and eventually an economic corridor involves cycles of improving hard and soft infrastructure. Throughout the developing world, difficulties exist in managing transport infrastructure, including proper planning, efficient operations, and adequate maintenance. These problems should not be ignored for development corridors and must be addressed in order for a transport route to evolve into an efficient development corridor.

8.2 Impediments to corridor development

A report prepared by the World Bank, entitled Africa Infrastructure Report (Teravaninthorn and Raballand 2008), provided analysis of a number of transport corridors. The lessons learned indicated that, whatever the mode of transport, the most serious impediments to corridor development are administrative. For road transport, the regulation and market structures of the road freight industry, rather than the quality of road infrastructure, are the binding constraints on international corridors. Third-party logistics, which have played such a large role in increasing production and distribution efficiency in industrialised countries, are still poorly developed in Africa. Customs and trans-shipment improvements are also central to corridor improvement. These are all part of trade facilitation and are essential for a transport corridor to evolve into a trade corridor. Trade facilitation also includes reforms in complex areas of policy and legislation. Bilateral and multilateral donors can play key roles, but trade facilitation extends far beyond development corridor management. Trade facilitation subsumes activities that require sufficient political will to induce change.

Development of economic corridors requires a much more holistic approach. Interventions and cooperation between the six countries of the GMS have enabled the transport corridors of the region to develop into trade corridors, but it was recognised that these were not benefiting all parts of society evenly. Urban centres, linked via the corridors, were growing rapidly while rural populations (particularly in remote areas) remained largely disconnected from this progress. To counteract this increasing disparity, and to realise its goal of a poverty-free and environmentally rich GMS, the ADB developed an economic corridor model. The model began with transnational roads between major economic centres. The roads are aligned through remote and impoverished areas to establish connectivity with the economic hubs and end nodes at either end of the corridors, and markets along the corridors. The next step in the model is development of sector plans identifying options for sector investments and further connectivity enhancements (feeder roads, rail and river, etc.). This will turn transport corridors into economic corridors.

Perceived risk is a significant impediment to private sector investment. MDBs have a key role in encouraging private sector investment by supporting governments in mitigating these risks.

8.3 Spatial development initiatives

Economic corridors in Africa are often planned using the spatial development initiative approach, which from the outset attempts to address the very problems associated with remote areas of economic potential. The SDI model aims to bring hard infrastructure investors and soft infrastructure institutions together with civic society organisations to ensure that the interests of undeveloped communities and small businesses are addressed from the outset. The SDI approach recognises that these small businesses will not provide the level of trade flows and economic activity to make viable the huge investment in transport infrastructure. Large anchor projects, such as those associated with extractive and/or productive industries, provide the higher level of activities that make the whole corridor initiative feasible. But the focus of the larger anchor projects can draw attention away from the smaller cluster projects at community and small-business levels.

The MDC corridor is widely referred to as the flagship SDI project and an example for other corridor managers to follow. Consequently, the MDC has been extensively studied and analysed, and lessons have been learned. It is not disputed that the MDC was successful in reviving an old trade route. During apartheid in South Africa and civil war in Mozambique trade had shifted to other routes. The identification of huge anchor projects, funding for adequate transport infrastructure, and exemplary cooperation between the new governments of the two countries made the SDI possible. Trade along the corridor grew rapidly, which led to population increases along the route and in the major towns and cities served by the corridor. Border controls were harmonised and streamlined, and were opened on a 24-hours-per-day basis to facilitate maximum throughput. The economic activity within the corridor and between the inland supply nodes and international demand nodes spiralled. But the rush to support the larger projects failed to include local communities and businesses until a change in corridor management took place. The SDI approach is intended to address unrealised economic potential and this must be directed as much at integrating smaller businesses into the regional and global markets as for the larger (anchor) businesses.

Some studies of the MDC have stated that the success of the SDI approach is as much to do with the fact that it sought to integrate communities that were previously isolated under apartheid. Thus, the success of SDI is as much to do with geopolitics as with economics and corridor management.

In 2012, the University of Witwatersrand carried out case studies of the ongoing and proposed development corridors being implemented under the Regional Spatial Development Initiative Programme (RSDIP).

- The MDC was launched in 1996 as the first SDI corridor developed in South Africa which provided the experience for development of other corridors in the region. The major weakness was the methodology of fast-tracking its development to remove bottlenecks and, as such, it did not take communities into consideration. In this respect, it did not allow adequate time for capacity building for communities to participate in the corridor development.
- Experiences from Zambezi Valley Development Corridor (ZVDC) indicate strong political commitment by benchmarking corridor development within the economic development framework of the country. There is a vibrant private sector interest that can be mobilised for the development of the corridor. The corridor has the necessary ingredients for a successful corridor once implemented.
- The Central Development Corridor (CDC) is still at a Phase 1 scoping stage. There are a number of issues that need to be addressed, the key one being the lack of an attractive anchor project.

- The Mtwara Corridor does not have the required ingredients for a successful corridor, the most important being an anchor project that will require major infrastructure development. There also appears to be a lack of political support.
- The Bas Congo Development Corridor Programme is still at scoping level, so it is too early to undertake a full analysis. However some key issues have been identified such as lack of political will and poor infrastructure.

8.4 Primary factors for successful development corridors

In compiling lessons learned from these corridors, the authors of the EI Source Book reviewed the major characteristics they considered need to be in place for a successful corridor to achieve its objectives. The EI Source Book only discusses corridors linked to extractive industries, but it is worthwhile mentioning these characteristics: the natural resources that could be exploited; the status and condition of the transport infrastructure; the level of private sector involvement; the strength of the business case and anchor projects; the strength of the policy and regulating environment; the strength of political support; the status and strength of the corridor authority; the level of stakeholder participation; the linkages both forward and sideways; cross border arrangements; and the availability of skills and technical capacity.

The major lessons from analysis of the five corridors given in the EI Source Book are provided in Text Box 1.

Text Box 1: Lessons Learned from case studies of five DCs (EI Source Book)

Primary Lessons:

- Promotion and marketing of the corridor depends upon the attractiveness of the packaged projects
- The DC anchor projects are large-scale, which would require deliberate action to create opportunities for SMEs
- Cross-border DCs are initiated based on bilateral (or multilateral) agreements
- There has to be a long-term commitment to the success of a DC

Conclusions:

- The Maputo DC has been the most successful initiative
- The role of government is seminal in facilitating development corridors
- The role of competent project manager (and subordinate managers) is pivotal
- Early involvement of SOEs, private sector, NGOs, CBOs in DC is crucial for its success

From the five case studies, it was concluded that the experiences of the Maputo Development Corridor provide very useful lessons for emulation and refinement for replication to other potential corridor areas. In their 2012 publication, "Implementing Development Corridors", Cayley Bowland and Lisa Otto concluded that the MDC has been by far the largest and most successful development corridor thus far in the Southern Africa Development Community (SADC) and, while not perfect, provides lessons that will not only benefit the future of the MDC but can be used as a basis for all existing and future development corridors, in particular those in the Africa context. Text Box 2 records additional lessons from the MDC regarding stakeholder coordination and funding of hard infrastructure.

Some landlocked countries already have bonded warehouses at ports in West Africa and concessionaires are also improving speed of transit, such as through the Sitarail intermodal terminal proposal in Ouagadougou, the Zambia Rail company customs bond at Victoria Falls, and the planned Madarail bonded container terminal near Antananarivo. There is, however, scope for a regional programme on trade facilitation similar to the successful effort of the TTFSE in South-eastern Europe, which was catalysed by the prospect of entry into the European Union. Further information on the TTFSE programme may be found via the references at the back of this Topic Guide.

Text Box 2: The Maputo Development Corridor

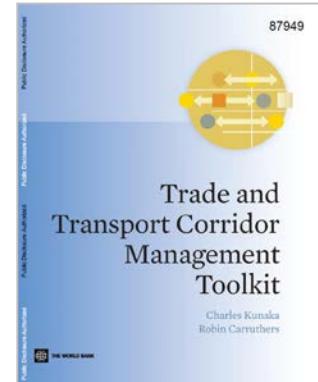
"The Maputo Development Corridor has been one of the most successful development corridor initiatives in the SADC region to date, and has become a model for future initiatives. Several lessons can be drawn, from both its achievements and the challenges it has encountered. Crucially, the involvement of the MCLI, as well as the PPPs that financed the corridor infrastructure, has ensured that its efficacy continues to increase through effective management and by lobbying against outstanding issues. The successful use of PPPs to finance the Maputo Corridor has proved that this mechanism is effective for financing the transport infrastructure sector. This is a positive development, as it demonstrates that fiscally-constrained countries can successfully harness PPPs in this way to achieve similar initiatives in the future. The Maputo Corridor can be seen as part of the wider vision of regional integration within the SADC. For this vision to be fully realised, a long-term strategy is thus essential for SADC in implementing other corridors in the region."

8.5 Summary of lessons learned to date in corridor development

- Each development corridor has its own unique characteristics and development objectives defined by the social and economic conditions of the region prior to development of the corridor and the intended social and economic conditions upon attainment of the corridor development objectives.
- There is often no clear distinction between transport corridors, trade corridors, and economic corridors; transport corridors facilitate trade and this will bring about some increase involvement in corridor development in economic activity.
- Strong political commitment is required to achieve a corridor development agreement, and strong political support will be required to see the corridor through to its full potential and to continue to optimise benefits from the corridor during the operational phase.
- Anchor infrastructure projects are catalysts for corridor development; they are pivotal to ensuring economic growth and regional integration, which are essential for evolution into a full economic corridor.
- If properly planned, using a SDI approach, economic corridors can have a positive developmental impact up to fifty kilometres either side of the main corridor route.
- The most serious impediments to corridor success are administrative (institutional), including regulation, logistics, cross-border management, etc.
- Institutional strengthening usually includes trade facilitation.
- Regional programmes can deliver good results, but require ownership from participating partners; there needs to be clear delineation between national and regional institutions and accountable governance arrangements.
- Long-term commitment from the public and private sectors is essential for the success of development corridors.

9 Best Practice

Despite the long history of corridors, there is still a lack of guidance on how to plan and design development corridors, and how to analyse their likely impact. In recognition of the lack of available guidance material to its Task Managers on how to address corridor projects, the World Bank in 2014 published a "Trade and Transport Management Toolkit". Based on analysis of a large number of trade and transport corridors worldwide, the Toolkit provides a comprehensive and holistic compilation of approaches and techniques on corridor diagnostics, performance assessment, management, operations improvement and impact evaluation.



The Toolkit is designed for national and international public sector agencies and the private sector actors involved in the design, development, or management of a trade or transport corridor. It provides tools to answer four main questions:

- What are the approaches to identifying the main issues and constraints to movement of trade and transport along a corridor?
- How well is the corridor performing, and where are the weaknesses?
- What are the options for improving the performance of the corridor?
- What are the likely impacts of investments or improvements to the corridor?

The Toolkit was prepared in collaboration with the African Development Bank, as well as practitioners involved in development corridors. As a result of this association, sharing information on which approaches do and do not work, the Toolkit provides guidance based on lessons learned, resulting in identifying and quantifying best practice for use in development corridors. But it is to be noted that the Toolkit is intended for trade and transport corridors. As discussed in Section 2 of this Topic Guide, these fall short of the broader objectives of an economic corridor.

The AfDB has provided a briefing document aimed at providing a rationale for its participation in transforming transport corridors into economic corridors across Africa. Although concise, the document raises a number of issues that should be considered best practice to guide other donors who are considering involvement in corridor development.

- The aim of providing support to corridors should be to stimulate intra-regional and global trade and foster market integration.
- Support should include both the hard and soft infrastructure components of corridor development; this should encompass design, construction, maintenance and rehabilitation projects, as well as trade facilitation measures and trade capacity building programmes.
- Support should also provide for the cross-cutting issues of economic, social and environmental sustainability.
- To capture the full benefits of development corridors, two aspects should be considered: (i) poverty and social dynamics (projects must honour these realities and cater to the needs of the inhabitants of areas surrounding established and designated corridors), (ii) corridors must be viewed as engines of regional development in themselves and not only as conduits to growth and regional integration.



A particularly interesting feature of the briefing document is that, in addition to the three evolutionary stages of hard infrastructure, logistics development, and economic and social development, the AfDB identifies a fourth stage of integrating cross-cutting measures. This clarity of key issues and evolutionary stages in the development of an economic corridor is not found in other donor literature.

The ADB has produced a number of documents that act as guidance on best practice, including a discussion on what is economic corridor development and a modelling approach to economic corridors. The first document offers guidance on benchmarking case studies based on a set of indicator characteristics for economic corridors. These include: structural characteristics, network and geographic cohesion characteristics, and accessibility characteristics. The ADB suggests that economic corridors are best defined by these characteristics and it is through these characteristics that their performance can be determined and monitored.



these characteristics

The ADB's modelling approach discusses how to make economic corridors work and suggests that, supported by a data framework, this helps to prioritise a set of economic investments and policies that yield the highest economic benefits in geographically balanced distribution.

The ADB provides a host of other standard documentation to assist national governments in progressing their soft infrastructure, including items such as templates for a Cross-Border Transport Facilitation Agreement.

Although not formalised into a widely available methodology², the SDI approach has been adopted by NEPAD as a set of guidelines for the planning and design of other development corridors throughout the Southern African region. At the 4th Annual Meeting of the Infrastructure Consortium for Africa (ICA), held in Tokyo in March 2008, representatives of several development agencies endorsed the SDI concept in principle. The meeting concluded that "The African SDI approach is compelling for many donors and regional African organisations, largely because it represents an understandable and reasonably objective way to prioritize regional infrastructure projects, stimulate investments into productive capacity and achieve economic densification". Its value is in its ability to:

- address the need for effective investment prioritisation;
 - provide linkages to and synchronize private sector economic investment project opportunities with key infrastructure projects;
 - promote wider development potential (through densification strategies and clustering) catalysed by infrastructure provision and anchor investments; and
 - provide a spatial focus to optimise regional economic development and integration.
- However, the meeting also noted that, with the possible exception of the MDC, SDIs in Africa have rarely been able to translate transport infrastructure development into broad-based growth that contributes to poverty reduction and employment creation. These are weaknesses that need to be addressed, but they do not negate the appropriateness of the SDI approach and strategy. The weaknesses cited were:

- (i) political instability of the region;

² The one paper that is cited as having spelled out the SDI as a clear methodology (by Söderbaum and Taylor, 2003) is difficult to access outside specialist academic websites.

- (ii) poor political buy-in;
- (iii) lack of capacity of the officials in participating countries to effectively develop and manage the process;
- (iv) weak investment climate and poor regulatory environment to begin with;
- (v) the limitations of a weak (or absent) domestic private sector, incapable of seizing upon opportunities created by foreign investors and participating in investment opportunities where these occur, for a variety of reasons including lack of capital;
- (vi) premature marketing of a corridor for investment when projects are not even ready for banking, let alone scoped and analysed; and
- (vii) the interests of donors engaged in these corridors may be too specific or narrowly focused, such as for example where they are concerned only with trade facilitation (i.e. supporting improvements to road transport and customs and border facilities) but not in productivity enhancement and trade development or in the development of secondary feeder roads to facilitate densification.

Although the SDI approach has the potential to successfully deliver development corridors, as in the case of the MDC, and hence could be considered as best practice, its effectiveness can only be realised if the weaknesses at each stage of development are eliminated or reduced to have minimal detrimental impact. There is therefore a need to formalise the SDI approach and to document the preconditions for its successful implementation. An SDI user manual is recommended that can be understood by all stakeholders involved in development corridors, in particular with respect to their planning and design stages.

In the conclusions given in its Regional Integration Brief, issued in April 2013, the AfDB stated the following:

"Transport corridors can accomplish much more than linking point A to point B. With an economic corridor concept, Africa's transport corridors can not only facilitate regional integration and trade but can also reduce poverty, particularly in catchment regions. Planners can achieve this by carefully coordinating the social, economic and physical development of the corridors and their surroundings. Strategic planning tools are essential to this process, as is close cooperation among the countries concerned, which must harmonize their policies and their social and economic strategies and address other common issues." In order to validate this statement by the AfDB, it is essential to place greater emphasis on measuring the success of the MDC in the area of poverty reduction. This has recently been achieved by Tate (2015) and the results appear to be very promising.

It also stated that the AfDB now places increased emphasis on enhancing trade and industrial development in order to create jobs and foster inclusive growth. It also places more focus on "soft" infrastructure issues such as trade facilitation, policy reforms and regional harmonisation of policies and regulations related to infrastructure, trade and investment.

AfDB President Donald Kaberuka noted that investments in these "soft" infrastructure issues require fewer resources, but they can make regional infrastructure more efficient, thus enhancing integration, promoting economic growth and improving development outcomes.

This demonstrates that aid agencies, such as the AfDB that has traditionally been more associated with capital works projects, are now putting greater emphasis and investment into the greater social and economic development potential of transport corridors.

In summary, there are two sets of best practice for the planning and design of corridors:

- (1) For "economic corridors", where it is intended to maximise the social and economic potential of a region, a spatial planning approach is recommended. The widely-

recognised best practice is the SDI approach, but this approach needs to be documented into a comprehensive methodology. SDIs are not widely implemented outside Africa. The GMS, for example, used a "strategic framework" approach.

- (2) For "transport corridors", where the focus of development is on improving the cost-efficiency of the transport route, then a spatial planning approach is not necessary. The "Trade and Transport Corridor Management Toolkit" prepared by the World Bank and African Development Bank Toolkit provides best practices in terms of a comprehensive and holistic compilation of approaches and techniques on corridor diagnostics, performance assessment, management, operations improvement and impact evaluation.

For corridors whose development objectives lie somewhere between those of a transport corridor and those of an economic corridor, the decision as to when a SDI approach is appropriate is not clear cut. Trade corridors, industrial corridors, and the like, that are intended to transport goods between one end node of the corridor and the other, with no specific socio-economic development between these nodes, may be considered to be essentially transport corridors. However, where the corridor is intended to result in socio-economic development (including localised communities) between the end nodes there is a spatial perspective and a spatial planning approach is appropriate. For the Greater Mekong Subregion, the original intention was to develop trade corridors and the planning did not fully consider the potential benefits that the various GMS corridors could bring to poorer regions near the corridors. This was realised later and the overall objective changed from transport corridors to economic corridors. Had the potential been realised during the original planning, a spatial planning approach could have brought benefits earlier to these communities.

There is now a wealth of literature available addressing various aspects of corridors. No single document provides comprehensive best practice throughout the full evolutionary stages and operational stages of development corridors. In addition to the documents discussed above, the following documents are useful in terms of covering the areas of corridor management noted against each one.

Infrastructure investment policy



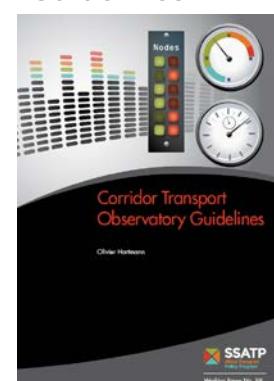
Accelerating infrastructure development



Monitoring corridor performance



Corridor Transport Observatory Guidelines



10 Key Messages to DFID advisers

The Topic Guide has provided information to enable DFID Advisers to obtain a broad understanding of the complex nature of development corridors, the rationale behind them, what they are and how they are identified, the choice of objectives, and what investment and stakeholders are needed to plan, design, implement and manage development corridors. This section builds on that understanding by providing key messages to DFID Advisers to assist them in identifying points of entry for providing continued support to existing development corridors and future pipeline development corridor programmes.

The AfDB's Regional Integration Brief (April 2013) sets out for four stages of corridor evolution: (I) Physical Development, (II) Logistical Development, (III) Economic and Social Development, and (IV) Integration of Crosscutting issues. Text Box 3 summarises the key features of these four stages. The Brief also identifies possible entry points where the AfDB could get involved in economic corridor development. In short, these include:

Research

Supporting the development of economic corridors through regional technical assistance for trade and transport studies and the formulation of strategies.

Capacity Building

Building the capacity of institutions and developing the skills of regional economic communities.

Cooperation

In conjunction with regional economic communities, offering support and fostering bilateral and trilateral initiatives for the implementation and management of economic corridors by building and cementing focused partnerships.

Advocacy and Policy Dialogue

Helping to mobilise political will while promoting measures to avoid political intervention.

Technical Assistance

Providing technical assistance that helps to produce feasibility and engineering studies, identify required regulations, and construct a framework for possible public-private partnerships.

Resource Mobilisation

Helping to mobilise funds using both the traditional way as well as exploring new forms and using innovative development finance approaches.

These entry points for the AfDB are, by and large, suitable entry points for DFID.

Text Box 3 and Table 5 summarise the AfDB's definition of four stages of corridor development and the areas of support that DFID could provide at each stage. The areas of support are not intended to be exhaustive, but provide an indication of areas that are consistent with DFID's primary areas of policy interest and expertise.

Text Box 3: Stages of corridor development

I. Physical development

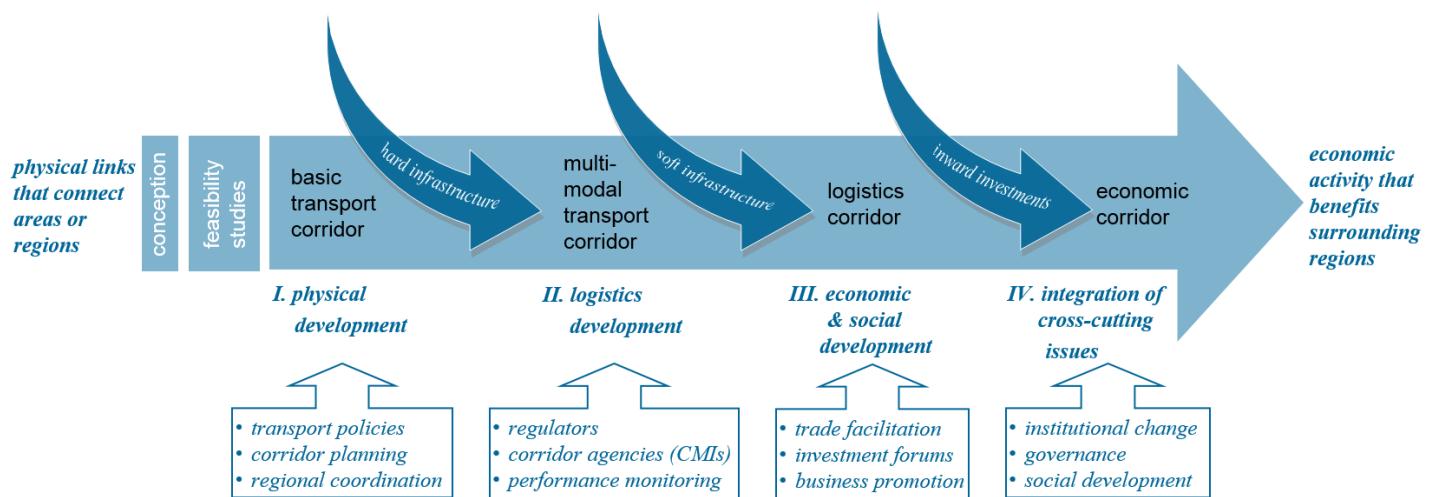
This stage comprises the development of initial hard infrastructure for a transport corridor and the multimodal corridor stages of development. It involves strengthening

Table 7: Possible areas for DFID intervention in corridor development

| Stage of corridor development | Possible area of DFID intervention |
|---|---|
| I. Physical development | <ul style="list-style-type: none"> ▪ development of transport policies ▪ support to corridor planning |
| II. Logistical development | <ul style="list-style-type: none"> ▪ support to regulators ▪ support to corridor agencies |
| III. Economic and social development | <ul style="list-style-type: none"> ▪ trade facilitation ▪ arranging investment forums and market business opportunities |
| IV. Integration of cross-cutting issues | <ul style="list-style-type: none"> ▪ institutional development of governments and corridor agencies ▪ strengthened governance arrangements ▪ social development, working with communities to maximise the benefits from economic corridors |

DFID interventions need not be carried out alone. In fact, there is considerable benefit to be gained from joining with other donors and working with organisations such as MCLI and TMEA, and regional economic communities. By supporting these types of organisations, DFID can enhance its trade facilitation role and reach out to a wider base of stakeholders.

Figure 6 illustrates how the AfDB's four stages of corridor development and areas of DFID support are linked to the evolution of development corridors discussed in Section 1 of this Topic Guide. The areas of possible DFID support in development corridors are consistent with its wider development policies, including free trade, economic growth, governance, and cross-cutting issues of gender and socio-environmental safeguards.

Figure 6: Stages of corridor development and possible areas for DFID intervention

In addition to the possibility for DFID to get involved in specific corridors at various stages of their evolution, the SDI approach needs to be developed into a clear documentation of best practice and this is something that DFID could very usefully support as a research project, either alone or in cooperation with one or more development partners. In so doing, consideration could be given to the fact that the overview of the SDI approach in the EI Source Book refers to extraction industries and a more widely applicable SDI methodology should be developed and documented.

11 Annotated reading list

1. EI Source Book Resources Corridors: Experiences, Economics and Engagement; a Typology of Sub-Saharan African Corridors. Contributors: Hudson Mtegha, Paseka Leeuw, Sodhie Naicker, Mapadi Molepo 2012

This report is aimed at the following:

- Analysing previous experiences in terms of resource corridor evolution;
- Understanding the drivers of economic development and diversification where it has occurred; and
- Examining the role of government and reinforcing actions from the donor community, multilaterals and Development Finance Institutions (DFIs) in facilitating robust resource corridors.

The first part of the report provides a description of the concept and methodology of the SDIs, hence resource corridor development, that put into perspective the various roles, which include the following:

- Human Capital Development/Capacity Building;
- Institutions;
- Financial Systems;
- Infrastructure;
- Economic Linkages and Enterprise Development; and
- Policy Space.

The second part provides an overview of the African continent with much focus placed on natural and mineral resources, high level politics, skills and human development and collaboration between African countries. The third part includes discussions on selected corridors in Southern Africa. The fourth part contains analysis of results, knitting threads of practices and successes and making recommendations forming some guidelines or framework for successful resource corridor development, especially where practices can be replicated.

This is essential initial reading since the Topic Guide stems from this work.

2. Trade and Transport Corridor Management Toolkit. World Bank, Charles Kunaka and Robin Carruthers, 2014.

The Toolkit is designed to help project managers in public and private sector agencies address the challenges associated with the design of corridor projects. Despite the volume of work on corridors, little guidance material is available on how to approach corridor projects. Task managers spend considerable time looking for the best available tools. They often find it difficult to ascertain what already exists and where to find it. Studies have been duplicated, because previous work is not always widely disseminated or easily discoverable. In addition, the lack of consistency in approaches makes it difficult to ensure that task managers are getting consistent advice even within individual organisations. Providing a comprehensive guide to tools and techniques for corridor projects is important, as the volume of such projects is likely to increase.

The Toolkit provides a comprehensive and holistic compilation of approaches and techniques on corridor diagnostics, performance assessment, management, operations

improvement, and impact evaluation. It addresses many of the requests from task managers at international agencies for more holistic advice on corridor management. It brings together and updates existing knowledge and fills in gaps. It can be used for both international and national trade corridors. It also addresses capacity-building needs for corridor management and identifies the legal and trade agreements that determine the trade context within which a corridor functions.

The toolkit provides the non-SDI Approach and focuses on corridors in Africa

3. ADB Working Paper Series on Regional Economic Integration: What is Economic Corridor Development and What Can It Achieve in Asia's Sub-regions? Hans-Peter Brunner August 2013

Economic corridors connect economic agents along a defined geography. They provide important connections between economic nodes or hubs that are usually centered in urban landscapes. They do not stand alone, as their role in regional economic development can be comprehended only in terms of the network effects that they induce. As the case studies in this paper show, there is no standard picture of what economic corridor development is and what it can achieve. What economic corridors can achieve for regional economic integration depends first on what characteristics the specific existing economic networks in which the economic corridors are embedded personify, and second on which characteristics corridor development are intended to introduce or strengthen. Corridor characteristics interact dynamically to create patterns of regional economic development. Models that make this interaction explicit have combined elements of the New Economic Geography (nonlinear and General Equilibrium elements). The Asian Development Bank (ADB) has a significant stake in the successful application of corridor development approaches with an annual investment of \$2 billion or more in regional cooperation and integration.

This document provides the ADB perspective on development corridors in Asia

4. Institutional Arrangements for Transport Corridor Management in Sub-Saharan Africa. SSATP. Yao Adzigbey, Charles Kunaka, Tesfamichael Nahusenay Mitiku. October 2007

Corridor efficiency is important to the competitiveness of most African economies, especially those that are landlocked. Corridors can be defined as a collection of routes linking several economic centres, countries and ports. While some are only road transport corridors, most of them include more than one mode of transport.

This Working Paper builds on the outcomes of SSATP activities and on a consultative process that involved key transit corridor stakeholders, including Regional Economic Communities, existing corridor management institutions, transport operators, road and port administration agencies and customs. It is aimed at facilitating the establishment of efficient and sustainable corridor management arrangements in Sub-Saharan Africa.

The paper reviews current corridor management practices and experiences in Sub-Saharan Africa as well as emerging corridor management initiatives. It also takes into consideration subregional proposals on corridor institutions that have been developed by the Common Market for Eastern and Southern Africa (COMESA), Southern African Development Community (SADC) and Economic Community of West African States (ECOWAS). The reviews and assessment are used to propose several corridor management institutional legal arrangements to enhance transport and trade facilitation along transit corridors.

This very important document sets out the institutional arrangements and informs how

DFID could play a significant role in this aspect of corridor development

5. Southern Africa: Case Studies of Corridor Development: MDC and NSC Corridors. DFID Mozambique and DFID Southern Africa September 2011

This power point presentation is based on case studies of two important corridors in the Southern African context and attempts to answer the question "**What drives physical infrastructure development (in Sub-Saharan Africa)?**" It also compares these development corridors with development corridors experience in East Asia

Useful DFID perspectives on development corridors in Africa and Asia

6. AU/NEPAD Spatial Development Program Presented to SSATP Annual Meeting: Godwin Punungwe, NEPAD Transport Infrastructure Adviser, Mali, Bamako, 12-18 Nov. 2005

The presentation is based on the sharing of best practice in Southern Africa's SDIs and Development Corridors. It provides the key aspects of the SDI Methodology such as: Inherent economic potential; Configuration of investments to ensure infrastructure viability through sustainable revenue streams; Crowding-in of investment; PPPs: public-private-partnerships; Political commitment; Rapid planning and delivery (momentum) used for investment prioritisation.

The presentation also provides details of the Basic SDI Methodology that consists of: Identifying & scoping the potential area; Formulating the compelling business case; Obtaining & formalizing buy-in from participating governments & REC's; Appointing a project manager & establishing in-country team(s); Preparing detailed business plan for implementation; Undertaking techno-economic investigations; Undertaking pre-feasibilities & feasibilities on selected projects; Packaging, introducing and promoting projects to market for public and private sector investment.

7. Economic Corridors for the Greater Mekong Subregion. Calla Wiemer. September 2009

This paper provides considerable insight into the complex nature of economic corridors within the Greater Mekong Subregion and notwithstanding the huge investment in hard infrastructure it emphasises the importance of soft infrastructure interventions if the corridors are to develop from transport corridors into fully-fledged economic corridors. This provides an example of the development of economic corridors that did not use an SDI approach in particular at the conceptual stage of the process.

An example of non-SDI development corridors and lessons learned

8. ADB Economics Working Paper Series: Regional Corridors Development in Regional Cooperation. Pradeep Srivastava. May 2011

Regional corridors are popular components of regional cooperation initiatives and have been in use for several years. Yet discussion about development of these corridors tends to be relatively general in scope and difficult to pin down in terms of content and implications. This paper elaborates on a simple framework for regional corridors development in the context of regional cooperation, anchored on two dimensions of these corridors: the extent to which they are national or regional and the area of their utilisation. The framework is subsequently applied to the Greater Mekong Subregion (GMS) regional cooperation programme, yielding several implications for its future. The GMS program

needs to redefine what constitutes a regional project and to formulate a regional master plan for further development of GMS regional corridors. The framework is also applied toward identifying an appropriate methodology for monitoring performance of regional corridors.

Provides good insight of DCs in the context of Regional Cooperation.

9. AfDB Regional Integration Brief. NEPAD, Regional Integration and Trade Department. April, 2013

Recognising the cardinal role that regional corridors play in fostering regional integration and development, the African Development Bank (AfDB), has been supporting the development of regional transport corridors in Africa. The Bank's support aims to stimulate intra-regional and global trade and foster market integration. For some land-locked countries, the corridors are a new opportunity to participate in global trade.

In line with the principles of The Bank's Regional Integration Strategy, the AfDB's approach to regional corridors covers both the hard and the soft infrastructure components of development. This encompasses construction, maintenance and rehabilitation projects, as well as trade facilitation measures and trade capacity-building programmes. It also provides for the crosscutting issues of economic, social and environmental sustainability.

The purpose of this Brief is to provide the rationale for transforming Africa's potential regional transport corridors into economic corridors and to discuss the role of the AfDB in this process.

A well written paper that provides the AfDB's perspective that compliments the WB Toolkit

10. Trade Corridors: The Emerging Regional Development Planning Unit in Latin America Stephen O. Bender, Principal Specialist. Unit for Sustainable Development and Environment, Organization of American States

In the modern era of development in Latin America, beginning roughly with the Alliance for Progress in the early 1960s, occupation of physical space and shaping that space to meet development needs has been a predominant activity. One of the most dominant manifestations of this phenomenon in Latin American economic development and regional cooperation in the past three decades has been the steady emergence of trade corridors.

This document provides an interesting insight into development corridors in Latin America

12 References

Development corridor websites, multilateral donor websites, academic sources and "grey material" were searched for and collated in order to identify relevant material for the compilation of this Topic Guide. Although previous studies provided some information on the key issues and strategies for planning and implementing development corridors, it was found that there exists a knowledge gap and a demand for further research and more coherent (and comparative cross-regional) investigations and analyses. The experience base is huge, but the sharing of experiences remains limited. There is a clear need for fieldwork based studies to provide clear evidence based conclusions and recommendations on the applicability of the spatial development initiative and alternative methods for planning and coordinating corridor development.

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