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The impact of road improvements on road safety and related characteristics☆

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ABSTRACT

This paper presents the historical and cultural background relating to road improvement and road safety characteristics in Kenya, a developing country in East Africa. Some who come from low-developed areas of developing countries often take time to comprehend the modern transportation infrastructure, especially roads, and have difficulty assimilating and customizing the same to their culturally tailored modes.

This paper discusses two case studies: one on the socio-economic impact following improvements to a 50-km, high-class, high-traffic-volume road and the other on the monitoring and evaluation of road safety aspects along the Northern Corridor in Kenya also following major road improvements.

The road improvements to the Nairobi-Thika Highway (a trunk road) have attracted many investors along the highway corridor. The high-speed road has also brought with it the unfortunate consequence of speeding vehicles colliding with pedestrians crossing the road at undesignated locations.

The Northern Corridor, the transportation corridor that links the Great Lakes Countries of the Democratic Republic of Congo, Burundi, Rwanda, and Uganda from the port of Mombasa in Kenya, has had high accident rates for a considerable amount of time. The results of monitoring and evaluation exercises on the Northern Corridor have shown that drivers are the major contributors in causing accidents, with a component ratio of 49.4%; pedestrians are next at 21.7%. Data also shows that 24% of the accidents along the Northern Corridor are fatal, which is of major concern. The study additionally indicated that the majority of road users have not been exposed to education or training on road safety.

This paper presents a number of recommendations arising from the road safety study regarding possible improvements in aspects of road safety along the corridor and potential applications of those changes to other roads in general. For example, there are recommendations related to the geometric design of the road, driver training and behavior, vehicle maintenance, and the need to enhance road safety through the utilization of road safety parks where road users can undergo training and drills on road safety aspects.

In conclusion, we argue that the rehabilitation of the Northern Corridor from Mombasa on the Kenyan coast to the border with Uganda has led to significant road safety improvement.

1. Introduction

The famous historical saying goes, "All roads led to Rome." In that era, Rome was the "center of gravity" of world power; there was need for neighborhoods to have links with "Rome" in order to tap power from the source at the center and thereby enjoy the same for purposes of socio-economic development. In this context, the links were the products of the road network in a neighborhood and the artery connecting it to the "center of power" in Rome. In those days, apart from sea transportation along the oceans, seas, and rivers, roads provided the dominant mode of transportation, considering that railway and air transportation had yet to be developed. It then followed that neighborhoods that had strong connections with the "center of power" enjoyed more socio-economic development. Accordingly, roads were considered a major catalyst to socio-economic development.

The same correlation—the connection between neighborhoods with effective road networks and efficient arterial links to centers of economic power—holds true today. Neighborhoods enjoy relatively higher socio-economic development if they are closer to a center of power, such as a capital city. This is particularly true for countries such as those in East Africa, where underdeveloped areas tend to lack efficient road transportation systems in addition to other infrastructure.

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Accordingly, such areas fail to attract investors who normally give priority to areas that have efficient and reliable infrastructure.

To many inhabitants who grew up in these types of neighborhoods in the developing world, where the main form of transportation might be walking, riding on a donkey or camel, or, if well endowed, riding a bicycle, assimilating to and adapting the idea of vehicle transportation takes time. Quite often, it is not until one experiences the pain that results from an unfortunate road accident that one realizes that when the living is good, the vehicle as a form of transportation is enjoyable, but when an accident occurs, sometimes due to carelessness, the result can be traumatic and devastating. Many of those who have witnessed the traumatic scenarios of vehicles being involved in accidents tend to develop and widen their scope of cultural values and better understand the need to take extra care—regardless of whether one is a pedestrian, a cyclist, a passenger, or indeed a driver of a vehicle—when using a road. This is generally reflected in the context of cultural values, which are considered to be among the major variables that contribute to road accidents.

This paper presents two case studies. One examines how a road improvement project can lead to socio-economic development along the road corridor, and the other shows the results of a study of road safety and related characteristics along the Northern Corridor in Kenya.

2. Road improvement on the Nairobi-Thika Highway

The Nairobi-Thika Road is a trunk road (A2) that links the Kenyan capital, Nairobi, to Somalia to the East and Ethiopia to the North. Thika, an industrial town, can be considered a "neighborhood" with a link to Nairobi (i.e. the center of power) which is about 50 km southwest of Thika. The Nairobi-Thika Highway has benefited from national road improvement funding over the years, and the most recent improvement, which was financed by a loan from the African Development Bank, brought with it a high-class highway with a dual carriageway, multi-grade intersections, and service roads on either side of the carriageway. There are several pedestrian footbridge crossings on the road, which was designed for a speed of 100 kmh. The high-quality highway has led to the attraction of many investors along its corridor; as a result, there are many forms of development and expansion projects underway along the corridor, notably industries, shopping malls, high-class housing estates, and universities. All these developments have led to the expected high traffic flow along the highway. Additionally, as a result of the improvement of the Nairobi-Thika Highway, Thika has attracted many investors who have brought about dramatic physical and socio-economic development in the town.

Road user behavior has, however, unfortunately come with negative effects. Some road users, such as pedestrians who take risks by crossing the high-speed road at undesignated locations, are hit by vehicles traveling at high speeds. Several casualties have been reported in this respect.

3. Northern Corridor road safety study

The Northern Corridor, shown in Fig. 1, is the transport corridor linking the Great Lakes Countries of the Democratic Republic of Congo, Burundi, Rwanda, and Uganda from the port of Mombasa in Kenya. The Corridor, which is over 2000 km long, also serves Northern Tanzania, Southern Sudan, and Ethiopia. The Northern Corridor is basically a transit highway that allows for the mobility of transit goods from the port of Mombasa in Kenya to other countries. The Kenyan segment of the Northern Corridor starts from Mombasa and passes through Nairobi, Nakuru, and Kisumu to the Busia border post with Uganda. The alternative route from Nakuru passes through Eldoret to the Malaba border post with Uganda. Corridor operations have maintained high accident rates, high traffic levels, and high truck composition over the years.

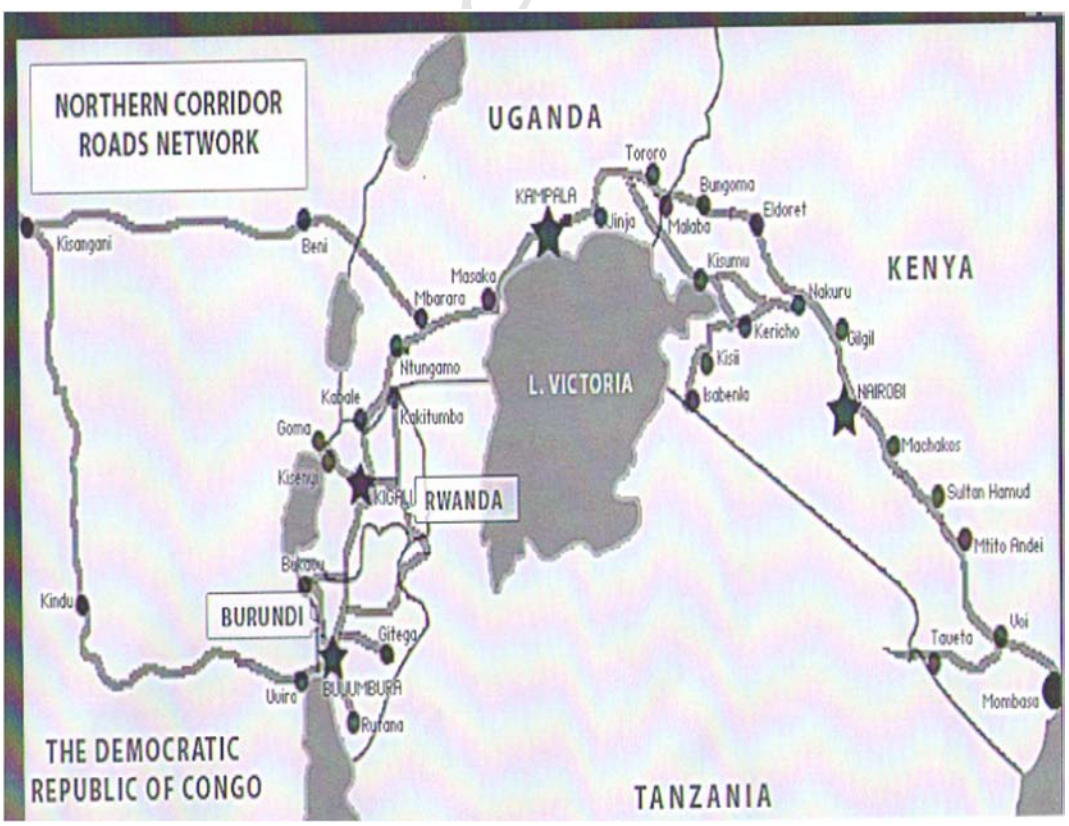

Fig. 1. The Northern Corridor.

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