Our Transportation System is in Crisis – 320

Some people have asked my view on the causes of severe traffic congestion in the morning northbound on the Solomon Hochoy Highway and the Uriah Butler Highway. There are several factors, including the most obvious – the number of lanes, but also the percentage of heavy vehicles in the traffic mix, the number of vehicles per hour per lane, the lane width and shoulder width, the highway slopes (upgrade and downgrades), and the spacing between accesses to and from the highway. It is this last factor that I want to discuss today.

An important aspect of traffic flow is the interaction of vehicles as they join, leave, or cross a traffic stream. Merging is the process by which a vehicle in one traffic stream joins another traffic stream moving in the same direction, such as an access ramp vehicle joining a highway stream. Diverging is the process by which a vehicle in a traffic stream leaves that traffic stream, such as a vehicle leaving the outside lane of the highway. Weaving is the process by which a vehicle first merges into a stream of traffic, obliquely crosses that stream, and then merges into a second stream moving in the same direction; for example, the manoeuvre required for an access ramp vehicle to join the far side stream of flow on the highway.

According to the US Highway Capacity Manual (HCM), the ideal highway interchange spacing is 3.2 km or more (0.31 interchanges per km). The latter is known the Interchange Density. The minimum average interchange spacing is 0.80 mi (1 interchanges per km). When the number of interchanges per kilometre increases, there is a corresponding decrease in free-flow speed.

Highway traffic capacity analysis requires an adjustment for Interchange Density in the case of freeways, or Access-Point Density in the case of multilane highways. Multilane highways differ from freeways by virtue of the degree of access. They span the range between freeway-like conditions of limited access to urban street conditions with frequent traffic-controlled intersections.

Quite a number of vehicles are using the highway interchange ramps on a morning, at Claxton Bay, Couva, Freeport, Carlsen Field, Chaguanas, Munroe Road and Caroni Bird Sanctuary. These ramps were constructed as part of a low-volume (meaning fewer than 500 vehicles per hour) diamond-shaped interchange type. In other words, these ramps were never meant to carry the volumes now being demanded. In fact , the ramps were designed as 5 m wide with one lane and a wide shoulder – the full width is now being used as two lanes.

In addition, there are several legal and illegal accesses onto the highway, such as (a) between Couva interchange and the Calcutta Road Overpass (illegal); (b) between Carlsen Field interchange and Chaguanas Flyover, at Mid-Centre Mall (legal); (c) between the closed Endeavour interchange and Munroe Road interchange (there are several: at Chan Ramlal Road (legal), at Biljah Road (legal), at John Peter Road (legal), at Adjodha Road (legal)); (d) between Munroe Road and Caroni Bird Sanctuary interchanges there are several: at Warner Village Road (legal), and several individual accesses in the Guayamare area (do these have permission?).

Notice that I have not distinguished between entry accesses and exit accesses. This is because both merging and diverging manoeuvres cause delays, the merging vehicle causes the highway traffic to slow down and the diverging vehicle actually slows down to exit and so causes the highway traffic to be delayed. Therefore, can you imagine what level of delays would occur with such high numbers of these movements?

There is need for access management. The goal of an access management programme is to successfully balance the roadway operation needs with the land development needs. The main benefits of an access management plan are the preservation of safety and service. The US Federal Highway Administration's official definition of access management is "the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding system in terms of safety, capacity, and speed." In practical terms this process requires the regulation of vehicular access to public highways from adjoining property in order to limit the number of access points to a roadway, and, therefore; to reduce the number of potential conflict points among the users of the roadway.

Proper access management assists in protecting the substantial public investment in transportation by preserving roadway efficiency and enhancing traffic safety, thus reducing the need for expensive improvements. Furthermore, access management can significantly reduce traffic accidents, personal injury, and property damage.

The long-term planning objective for major corridors is to develop a system of side streets, parallel roads, and traffic control features to support existing and planned development. Main components of such a system are frontage or reverse access roads, which together with inter- parcel connections provide alternative routes for short local trips; thereby, helping reduce local traffic on the arterial.

Frontage roads are typically constructed adjacent to the main corridor highway, but outside the highway right-of-way, and provide access to properties fronting the highway, funnelling local traffic to a common point gaining access to the highway. Reverse access roads or backage roads are also paralleling the highway but are offset from the right-of-way to provide site access at the back of the property rather than the highway side. Both concepts help to provide access to local properties while preserving the safety and capacity of the highway.

e-mail: info@ccost.org