

Bench Mark Study for Traffic Counts for Bandra Worli Sea Link Before Start up of the Link

Bandra Worli Sea link is a land mark project in the history of Modern Mumbai. It has taken 9 years and its cost as on day is estimated to be Rs. 1634 crores. Dar Consultants have provided following basic numbers in their study submitted to MSRDC in 2006.

Findings/ Forecast of Dar Consultants

(On page 156)

Estimate for total PCUs using the sea link per day in 2009- 79335

Estimate for total PCUs using the sea link in 2011- 120331

They have also mentioned that peak hr utilization should be equal to 6.73% of the total day. (5908 PCUs) and this peak would be northwards between 7 pm to 8 pm (and between 8 am to 9 am southwards). They also estimated that traffic would be about 5000 PCUs /hr between 10.00 am to 6 pm and between 8.00 pm to 8.00 pm at Pass port office, Worli. (Page 181)

As can be seen from annexure I – which gives some key findings from Dar Consultants’ report such as value of fuel savings and time savings and collection of toll based on their estimate of traffic and avg toll rates (@ Rs. 29 /33 per crossing based on daily and monthly rates)

PI see annexure I which gives summary of their findings not only on the vehicle count but also the value of savings to the users (it amounts to Rs. 54 Per trip in saving of fuel cost and Rs. 177 per trip for total vehicle operating cost and estimated time value based cost of the occupants of the cars and taxis.

Our latest count in Week Ended June 29, 2009 (i.e. just before opening of sea link)

We have conducted video graphic counts during on sat/sun as well as mon/Tuesday on mornings and evenings at Mahim Causeway (between the Mahim Flyover and Mahim Church) We have covered traffic streams from S V Rd and Western Express Highway southwards in the morning and also both the streams separately from Savarkar Marg as well as L.J.Rd to Mahim Causeway northwards in the evening (two hour each). In addition, we have done some shorter counts in the afternoon just to verify and corroborate our finding on the morning and evening counts. We find that the traffic volume during afternoon is not much less than in the morning. (PI see enclosed maps showing the locations where we conducted traffic counts)

We have separately worked out the breakdown of vehicles into BEST buses, other buses, goods vehicles, two wheelers, cars and taxis. Further, we have also worked out the no of passengers by multiplying the no of vehicles by the occupancy factors.

Breakdown of vehicles and estimation of passengers is something very important and has not been done – to our best knowledge - in earlier studies.

Breakdown of vehicles between taxis, cars and buses

Breakdown of vehicles into taxis, buses and cars is important because behavior of taxis will be different to toll amount. While the no of taxis in Mumbai is about one tenth to that of cars, they are about one third in the usage of commuter artery at Mahim and it would be interesting to see the response of taxis separately from cars.

Our count includes all the potential vehicles which can use the sea link. Obviously, some of the vehicles currently on Mahim causeway, will not go beyond Shivaji Park (they may go to East via Tilak bridge; some will go via Prabha Devi again to east. Some vehicles will obviously terminate their journeys at Mahim. Dadar, Prabha Devi and Worli. But they cant be replaced by vehicles joining the southern stream from all these points of origin south of Mahim flyover. Hence, **no of eligible vehicles** – i.e. trucks, vans, buses, cars and taxis (3 wheelers and two wheelers to be excluded) **on the Mahim cause way will be the max potential**. Out of this, the vehicles not going south of Worli will be automatically out of purview. Further, vehicles not opting to pay toll will also be using the existing road even after the sea link starts.

In fact, we expect that a no of vehicles – perhaps a larger proportion of taxis –to remain on the existing road expecting a lot of other vehicles to shift to sea link providing more space for them to travel without paying toll.

Highlights of our findings: (all findings on an avg/hr basis)

1. Peak hour PCUs on Saturday were observed to be at 4011 whereas on Sunday, this figure went down to 2703 when we observed that traffic was in a relaxed mode.
2. Monday/Tuesday morning traffic south bound (i.e. peak direction) at 4340 and 4113 is not much higher especially as compared to Saturday. Our visual observation clearly indicates that the traffic on Saturday moved faster and hence there is a relatively higher count of throughput. *It does indicate that lesser volume can improve the traffic throughput at a disproportionately higher rate. This also indicates the improvement in traffic flows that can be achieved thru better disciplined use of existing limited space.*
3. Traffic in the evening hours northbound (between 6 pm and 8 pm) is not much different than the morning hours. Our belief is sea link will be friendlier to the traffic going from south to North – particularly to WEH (and not to S V Rd or suburbs to the west of Western Rly.) Hence we expect higher use of sea link for this kind of traffic (i.e. going from south Mumbai to WEH – not to S V Rd or western parts of suburbs)
4. Taxis account for between 33% - 40% of cars before sea link and it is interesting to see how they respond to tolls. (higher proportion on Sundays)
5. After introduction of sizeable number of buses on the sea link, total traffic pattern may change. Current figures can be used as bench mark.

6. These numbers of traffic volume – especially in peak hour peak direction provide valuable bench marks for estimating the traffic that will use the sea link and the traffic that will use the existing road . The ratio will vary depend upon the perceived level of congestion by the motorists at the entry point of the sea link as well the experience he has accumulated over previous experiences and the conclusion that he draws about a trade off between paying toll and getting value. We believe that the range of traffic opting to use sea link will vary between 20% to 50% of the total traffic.
7. It is also important to note the total vehicular traffic levels before the sea link as over the period , we will identify the incremental growth (if any) due to the sea link.
8. Buses account for 5% to 8% of space use (only on Sunday , they cross 9% mark- perhaps, because the no of commuting cars is lower on sundays) In terms of passenger throughput ,however, their share ranges between 32% to 48% Hence keeping buses off the sea link will not be traffic friendly. In fact, if we can increase the share of buses by even 5% in terms of PCUs cam make a major difference to overall congestion levels – particularly at the beginning and the end of sea link.
9. Our observation for avg peak hour peak direction PCUs (excl buses) on week days works out to 3697 and incl buses, it works out to 4036 . This represents 6654 persons (without buses) and incl buses, it works out to 12316 persons. Now if we assume , half the vehicles – 50% cars and 10% taxies (excl buses) use sea link, it means 1377 PCUs and if we add 57 buses (50% of pre link total volume) the total no of PCUs – which is well within the capacity of 2400 of two lane Sea Link on peak hour. If we reduce the taxies substantially – say 90% of all taxies ,) the utilization level for peak hour will go down from 3697 to about 1377.

Use of BEST Buses on Sea Link is Vital

While we do not wish to get into debate as to who should bear the cost of toll for buses , it is imperative that buses should not only be tolerated on the sea link but positively encouraged on the sea link. Our belief is that use of buses will not make the sea link crowded but , on the other hand, the use of buses of sea link will reduce the congestion at the both ends of sea link to some extent and it will contribute a lot to the use of priority lane for buses at Haji Ali (in fact, it may make a great sense to extend the same to Pedder Rd in the peak hours - at least on experimental basis to improve commuting for many more people)

We believe there would be enough idle capacity on the sea link which can be partly filled up by buses. To begin with , the toll that the buses should pay can be contributed by the state govt as a part of viability gap funding. In fact, for last several years, RTO has not been able to correct the anomaly whereby buses pay ***much more tax than cars*** and not charging toll to BEST buses would be a minor correction of this distorted tax regime that should be urgently undertaken. We should find out whether extensive use of sea link by buses (supported by some bus lanes such as on road from Lotus to Haji Ali and possibly thru Pedder Rd) can improve the person thrupt substantially and whether this

can increase their share of passengers within a lower space use. This is one way to mitigate the criticism that sea link is car centric which is contrary to National Urban Transport Policy. BEST buses occupy approx 7% of space and carry 38 % passengers on the conventional route . Other buses occupy 2% of space and carry 10% passengers. We believe that our objective for BEST should be to achieve 44% of passengers while occupying 8% of space on Sea Link (and improve on the congestion at the entry and exit of the sea link) Besides this can be a demonstrative pre cursor for bus priority lanes. In fact, the extension of sea link(together with one way grid) can provide good relief while we debate and build a flyover /tunnel for Pedder Rd bottleneck.

Observations on Toll Free Days:

We did traffic counts even for days when toll free use of the sea link was allowed to private cars and taxis. As we all know, there was a heavy rush of a lot of vehicles due to the “novelty value” of a one time free tourist attraction and the most unusual traffic jams that we witnessed should not be taken too seriously. However, this does point out the pressure at entry and exit (i.e. at worli and Bandra end – where we have prevented non sea link traffic from using the Mahim flyover and have asked this traffic to turn right thru traffic light cycles .

We counted vehicles on peak hours with heavy back log on Friday /Sunday (during toll free use) and found out that heavy congestion led to slow moving traffic and without any time loss for paying tolls, the total no of cars and taxis were only 1980 per hour in one direction. We believe if the traffic moves smoothly and without congestion, two lanes in one direction can handle volumes upto 2400 or even more. This needs to be verified after the tolling is stabilized.

Use of Such Count

We feel that such counts should be conducted after the tolls have stabilized. We should find out whether the total traffic is unchanged or increased due to easier access thru sea link. We also suggest that there should be time study which will identify comparative time requirement of time for a total journey from WEH to Pedder Rd and back and Lucky Jn at Bandra to Pedder Rd and back during peak and off peak hours for journey via sea link and conventional road. This will tell educate us better in making a decision regarding the extension of sea link upto Haji Ali and also beyond on Pedder Rd.

Time and Distances via sea link vs old route

Annexure IV gives actual comparison of time and distance for travel before the sea link and after the sea link was commissioned. The latter provides two alternatives – one via conventional road and one via sea link. We had four sets of observations for three cases

- via conventional road before,
- via conventional road after sea link (first three days after tolling)
- and via sea link itself (first three days after tolling)

our observations from these counts – although they have limitations of smaller sample and conducting count on first three days (it would take about two weeks before traffic

pattern stabilizes) However , the reliability of base line or bench mark data is quite good and the observations after the sea link should be considered indicative at this stage. We trust there will be extensive counts for several hours on several days which should validate our findings.

1. Distance for a round trip by sea link is **more by 3.6 km as compared to conventional route**. And net saving of fuel due to congestion and idling needs to be substantial to overcome this extra distance if we want fuel saving to be an important reason for the use of sea link. Subject to the limitation of the sample, we find that the saving on south bound traffic are less as compared to northbound traffic .
2. we don't find much variation between directions and between hours from 8.30 am to 9.30 pm. Our observations for south bound traffic are between 5.15 pm to 6 pm and for northbound (i.e. from Jaslok to Lucky jn at Bandra stn in the north) from 6.10 pm onwards .
3. We did not observe much difference in time before the sea link, between peak and off peak direction (40 minutes vs 39 min)
4. sea link increases the difference between peak and off peak direction especially northbound from 33 min to 23 min If we compare this to time required before the sea link , the saving becomes even more (33 min to 28 min)
5. Northbound traffic especially via WEH will offer more time saving and convenience and we expect more use in this direction.

Concluding Remarks

We feel that a major land mark project like sea link which has already cost Rs. 1634 cr and 10 years requires constant monitoring with regard to its usage and how far it is serving the stated objectives of reducing congestion and travel time for vehicles substantially. We need to establish an in built mechanism for all projects to be monitored in terms of what we aimed at and what we achieved . This should be in public domain and subsequent projects should clearly use this information to improve their value.

Annex I - The Forecast on Use, Benefits and Revenue Generation by Dar Consultants in 2005

Annex II - Hourly Traffic on Mahim Causeway by Type of Vehicles before sea link

Annex III – Hourly Traffic on Mahim Causeway by type on week ends

Annex IV - Comparative time and distances for cars using Sea Link and old road

Annex V - Map of the area and locations where videography was carried out

Video tape used for precise vehicle count can be shown if required .