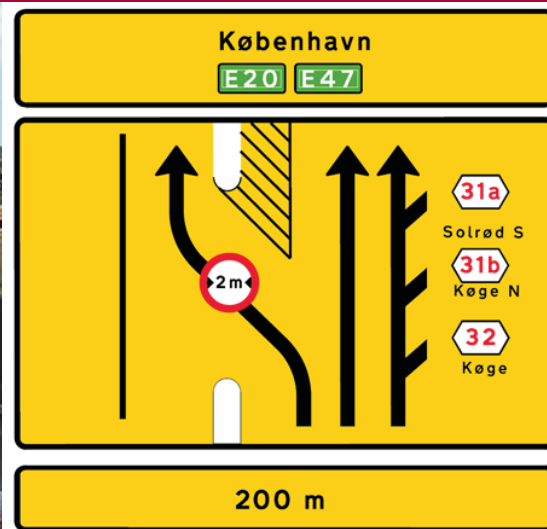


M10 / E20 COPENHAGEN, DENMARK

ROAD ZIPPER FOR CONSTRUCTION
CROSSOVER CONTRAFLOW LANES



M10 / E20 COPENHAGEN, DENMARK

MOVEABLE BARRIER MITIGATES CONGESTION IN DANISH WORK ZONE

In 2013, a major construction project was initiated on the M10 near Copenhagen, Denmark to widen the road by adding a fourth lane to each side of the highway. From May, 2017 to August, 2017, the Road Zipper System was used to create contraflow lanes to mitigate the traffic congestion that had plagued commuters driving in and out of Copenhagen during the previous construction season. For the final stage of construction, 3.5 miles (5.6 km) of moveable barrier was used in two stages on both sides of the highway for a total of 14 miles (22.4 km) of construction.

During May and June, the moveable barrier was installed on the southbound side of the freeway to separate opposing lanes of traffic, with two lanes crossing over and running northbound during the morning commute. In the afternoon, one of the contraflow lanes was returned to southbound drivers for congestion relief during the evening commute. During July and August, the Road Zipper System was moved to the northbound side of the freeway. The moveable barrier provided more traffic lanes while offering the protection of positive concrete separation.

** Source: Reversible Lanes on the M10: Summary of Experience. Trafitec, 2018*

In 2018, the Danish Road Directorate commissioned a report to investigate the benefits of the Road Zipper System during the project. The study found that the average commuter saved 13 minutes over construction conditions in 2016. Maximum flow with the reversible lanes increased up to 30%, even while overall traffic increased 10% compared to 2016 traffic counts. The Road Zipper System saved drivers 1,150,000 hours, resulting in user delay cost savings of 290 million DDK (US \$45 million) with a B/C ratio of 28:1. The report claims that there were no disadvantages or significant problems with the use of the reversible lanes.

Road users who responded to an online survey agreed. Interestingly, only 77% of motorists noticed that a moveable barrier was in use, but of those who did notice, 90% stated that the moveable barrier worked "well or very well." Of all road users, 75% of drivers felt "safe or very safe" when driving through the managed lanes. The report also claims that "many respondents found the solution brilliant." No personal injury accidents were recorded for this stretch of highway while the Road Zipper was deployed.*

Project Highlights:

- Managing Agency: Danish Road Directorate
- 3.5 miles (5.6 km) of barrier moved in 4 stages
- Average commuters saved 13 minutes
- Maximum traffic flow increased up to 30%
- User delay cost savings of US \$45 million
- Benefit to Cost Ratio of 28:1
- Many users found the Road Zipper solution "brilliant"
- No injury accidents through the managed lanes

