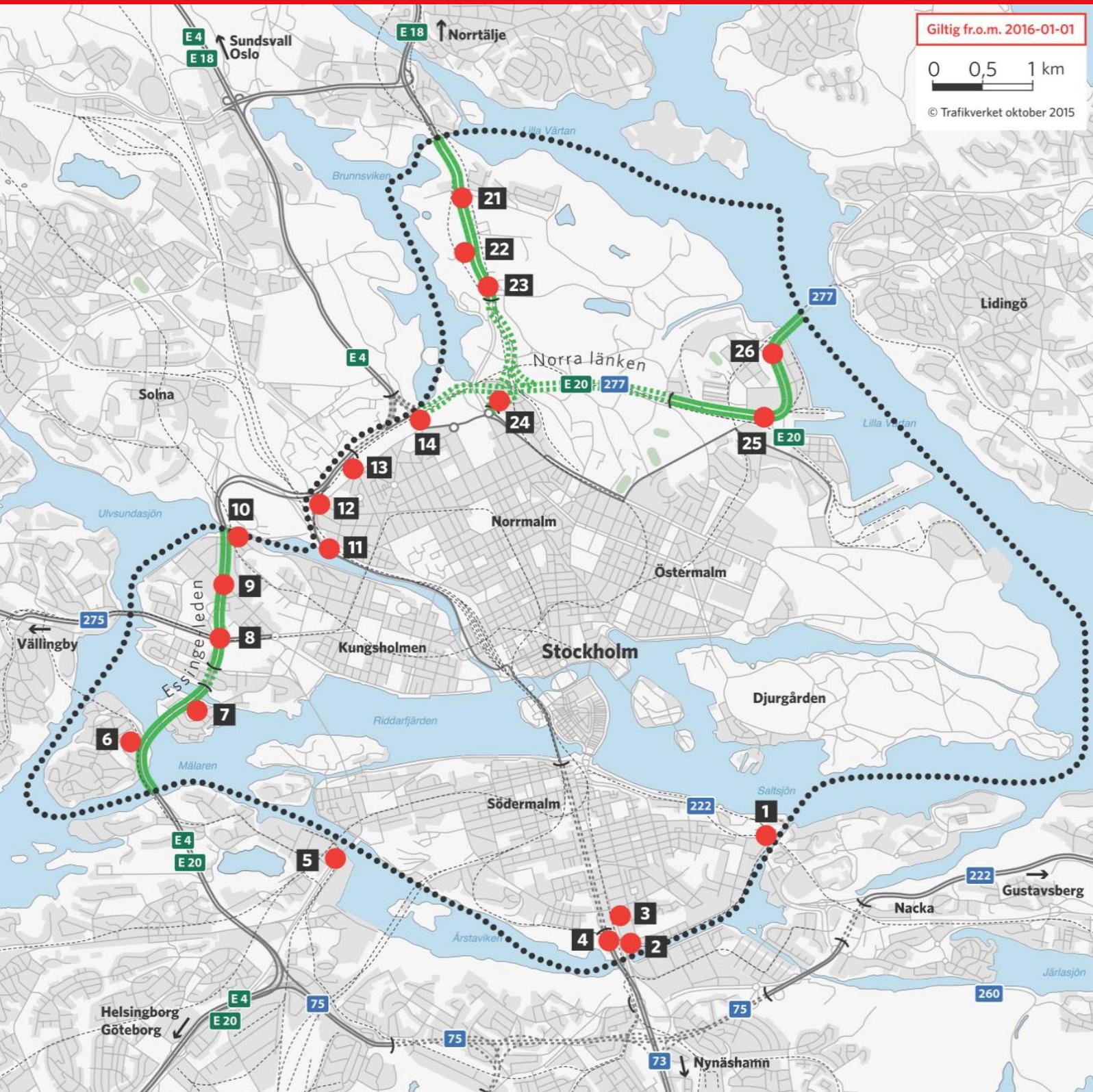


# Congestion Tax Change in Stockholm

January 1, 2016

What effects did the change have?



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Document title: Congestion Tax Change in Stockholm, January 1, 2016: What effects did the change have?

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Document date: 2017-10-17

Case number: TRV 2014/62050

Publication number: 2017:241

Version: 1.0

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# Summary

The purpose of this PM is to summarize the findings in the Swedish Transport Administration's (Trafikverket's) report 2017:123.

## Challenges in Stockholm's traffic

The population in Stockholm County has increased by 1-2 percent per year in recent decades, corresponding to an annual growth rate of 30,000-40,000 inhabitants. With increased population follows increased demand for travel and transport, which may result in increased congestion and reduced accessibility. The central parts of Stockholm's traffic network are heavily constrained, especially during morning and afternoon peak hours.

Thus, there is a high demand for traveling in central Stockholm, and it is neither possible nor desirable to further build up demand. Congestion tax is a measure to reduce traffic demand, thereby improving accessibility.

## Changes to the congestion tax system

Since the implementation of a congestion tax system in August 2007, vehicles travelling in and out of Stockholm's inner city have been charged with congestion tax on weekdays between 6:30 and 18:30. In March of 2014, the parliament voted favorably for the Government's proposition 2013/14: 76 regarding changed congestion tax and infrastructure initiatives in Stockholm. The purpose of the change was to improve the environment and accessibility in Stockholm as well as financially contribute to expanding the subway system. On January 1, 2016, Stockholm's congestion tax was changed as follows:

- Increased congestion tax in the inner city, raised from 20 to 35 SEK during peak-periods, and 10 to 11 SEK during the off-peak-period.
- Introduced congestion tax on Essingeleden with a maximum of 30 SEK per passage during peak-periods, and 11 SEK during the off-peak-period.
- Increased daily maximum charge, raised from 60 to 105 SEK per day.

## Purpose and conditions

The purpose of the Swedish Transport Administration's report 2017:123 (available in Swedish) was to describe the effects on traffic that occurred as a result of the congestion tax change that went into effect on January 1, 2016. The analyses were based on data from traffic measurements carried out with the same methodology before and after the change was implemented. Measurements were primarily taken during a pre-period (October 2015) and two post-implementation periods (March and October 2016).

During 2015 and 2016, major changes were made in parts of Stockholm's traffic system, while at the same time population, car ownership and economic development have changed. The number of residents and number of registered passenger cars in Stockholm County increased by almost 2 percent between 2015 and 2016. The overall assessment was that the factors that increase traffic (ex. increased population and economic development) affected significantly more than those that dampen demand for traffic (ex. higher gasoline prices).

Three major infrastructure changes that influenced how congestion tax affected Stockholm's traffic included the Slussen redevelopment, the roadwork near Western Bridge (Västerbron) and the link between Essingeleden and the Northern Link (Norra länken). These changes were believed to have mainly influenced northbound traffic on Essingeleden both by changing route choices and increasing capacity.

## Better accessibility in Stockholm after congestion tax

A main purpose of congestion tax is to improve accessibility, that is, reduce travel time and travel time uncertainty. Accessibility was analyzed using several different measurements on a number of road distances. The overall takeaway was that accessibility is better in both post-implementation investigations than at the beginning of October 2015. The greatest improvement in accessibility emerged in what can be perceived as the tail of the queues that occur on the Essingeleden: southbound from Bredäng to Nyboda during the morning hours, and northbound between Hjulsta and Haga in the afternoon. On both of these routes, travel times fell by 40-50 percent during the most heavily-charged peak time period, which means that the travel times along these routes reduced by 5 to 10 minutes from travel times in October 2015. Travel time also improved on several other routes; however, the changes are often relatively small in comparison to the normal variation between different journeys and days. Another indicator that accessibility improved was that most routes have fewer hours of congestion per day in the post-implementation investigations than they had during the preliminary investigation. The time per day with severe congestion<sup>1</sup> decreased by an average of 40 minutes on routes where measured.

For the Southern Link (Södra länken), queues and closures halved during the first quarter of 2016 compared to the corresponding period in 2015. However, the number of closures and queues in the Southern link increased in autumn 2016 compared with previous years. This was believed to be due to traffic congestion at Slussen that increased the number of vehicles travelling through the Southern Link, thus increasing congestion.

## Decreased traffic to and from the inner city

The table below shows that traffic to and from the inner city's congestion tax zone decreased by approximately 5 percent since the congestion tax change went into effect in Stockholm in January 2016. The reduction was basically the same in both post-implementation periods to which the comparison was made, and the change was largest during the afternoon peak-period.

A concern that existed before the change in congestion tax was that congestion tax on Essingeleden would increase through-traffic in the inner city. However, this phenomena has not happened. Results instead showed that through-traffic in the inner city<sup>2</sup> was less in both post-implementation measurements compared to October 2015.

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<sup>1</sup> Defined as at least a 75% extension of travel time.

<sup>2</sup> Through-traffic is defined here as the traffic that is within a half-hour of exiting the inner city zone from a different part of the city than where it entered.

Table 1. Changed flows to and from the inner city during weekdays compared with October 2015.

Inner city	October 2015	Δ Traffic flows March 2016		Δ Traffic flows October 2016	
24-hour day (00:00-23:59)	435 400	-13 500	-3%	-15 200	-3%
Congestion tax period (06:30-18:29)	331 500	-16 100	-5%	-14 400	-4%
Morning peak-period (07:00-08:59)	59 800	-1 700	-3%	-3 200	-5%
Afternoon peak-period (15:30-17:59)	79 300	-5 400	-7%	-4 900	-6%

## Difficulty determining the effects on Essingeleden

In March 2016, the number of passengers on Essingeleden, measured at the Fredhäll tunnel, decreased by 4-5 percent compared to October 2015, as shown in Table 2. In October 2016, however, an increase of 2-5 percent was observed compared to October 2015. Despite the wide availability of data, it was not possible to completely isolate the impact of congestion tax on the flows on Essingeleden because of several changes to Stockholm's traffic system that largely affected traffic on Essingeleden between the study periods. Nonetheless, the lane adjustments at Essingeleden's connection to the Northern Link meant that the northbound capacity of Essingeleden increased. This means that in October 2016, it was possible for more vehicles to pass on Essingeleden during the peak-period than in October 2015 and March 2016. The conclusion was that March 2016 provides a better picture of how traffic on Essingeleden was affected by the imposed congestion tax, even if the long-term effects are not fully captured in the early measurement.

Table 2. Changed flows on Essingeleden during weekdays compared with October 2015.

ESSINGELEDEN	October 2015	Δ Traffic flows March 2016		Δ Traffic flows October 2016	
24-hour day (00:00-23:59)	156 900	-6 400	-4%	+4 500	+3%
Congestion tax period (06:30-18:29)	119 400	-5 400	-5%	+2 300	+2%
Morning peak-period (07:00-08:59)	20 400	-800	-4%	+1 000	+5%
Afternoon peak-period (15:30-17:59)	26 200	-1 100	-4%	+600	+2%

## Large difference between various road user groups

The above tables show that the traffic changes for the inner city and on Essingeleden were quite small. In a deeper analysis of different road user groups, major changes were observed. The number of passenger cars owned by private individuals decreased in the inner city, while the number of business-owned cars (passenger cars registered in legal personality) increased slightly. For Essingeleden, there was even a clearer difference between private and business-owned cars than in the inner city. This effect was further reinforced in the second study period (October 2016), indicating that not all motorists had adapted to the new congestion tax by March 2016.

There was also a big difference in how various road user groups were affected by the congestion tax. This was partly because private travelers with a low valuation of travel time avoid congestion tax, thus providing space for travelers with high time values, such as business travelers, to travel. It may also be due to an increase of total private trips made by

company cars where the tax is paid by companies instead of the private drivers. In this evaluation, an attempt was made to analyze the extent to which this affected traffic flows, but no firm conclusions were drawn.

### Public transport effects

Some changes to public transport were noted; however, these changes were concluded to result from effects other than the changed congestion tax.

### Environmental effects

One of the stated objectives of the Government's proposition was that the congestion tax change will contribute to improving the environment in Stockholm. Traffic, and thus emissions, was estimated to have decreased by a small percentage within the inner city.



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