

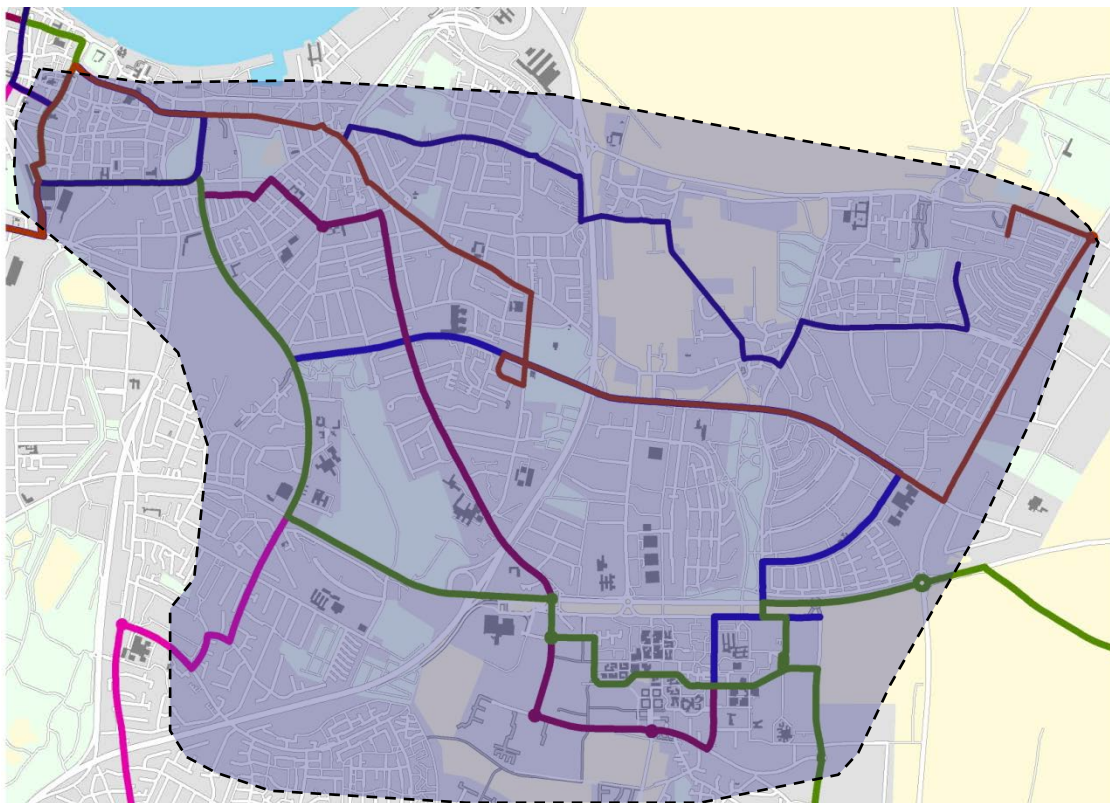
## ARCHIMEDES corridor - Number of passengers from 2009 to 2011

For the part of the ARCHIMEDES corridor in the region of the University the modal split impact of ARCHIMEDES is expected to be: 2-4% less use of car among the students and employee reference groups; 1% annual increase in public transport use; and a 5% increase in cycling.

In order to investigate these objectives two counts of bus passengers have been completed. This document will summarize the results of these counts and across measures conclude on the effects of ARCHIMEDES on the use of public transport.

### Methodoly

The passenger counts have been carried out before and after all measures were implemented. The first counting was made in the period 26 October to 8 November 2009 while the second counting was made in the period 9 November to 20 November 2011. All passengers entering and exiting the buses were counted manually at every bus stop for every second or third departure during daytime.



The following bus lines are included in this analysis: Bus line 2, 11, 12, 14, 15 and 17. On the map the counting area within the ARCHIMEDES corridor is marked together with the bus lines going through the corridor.

The operational level has been almost the same throughout the period apart from the number of extra buses used.

## Results

The overall result shows that there has been an increase of 6.2 % in the number of passengers from 2009 to 2011.

There has been an increase in the number of passengers on all bus lines except bus line 2. An explanation for this might be that during rush hour there was a larger number of extra busses in 2011 than in 2009 and therefore the number of passengers that use the normal buses are spread out to more buses. We have not counted the number of passengers using the extra buses, but based on experiences a plausible estimate is that the number of passengers in average is 30 pr. extra bus. When including this number of passengers from the number of extra buses in both periods there have been an increase of 6.2 % in the number of passengers in the corridor.

	2009	2011	Change in %
<b>Line 2</b>	15,483	13,624	-13.6
<b>Ekstra buses</b>	1,200	3,450	
<b>Line 11</b>	5,258	5,469	3.9
<b>Line 12</b>	7,455	7,766	4.0
<b>Line 14</b>	5,996	6,513	7.9
<b>Line 15</b>	4,727	4,809	1.7
<b>Line 17</b>	5,464	6,767	19.3
<b>Total</b>	45,584	48,399	6.2

## Appraisal of Evaluation Method

The counts include both entering and exiting passengers, in order to make sure that all passengers are counted. This could be a source of error if there had been a significant change in the way the passengers travel in or across the corridor from 2009 to 2011. We have no indication of such a change.

Counting passengers is a resource demanding task if you do not have an automated system. As we do not have unlimited resources, we had to limit the number of trips and the period of time that we counted. We have counted every second or third trip and calculated the total number from these. The passengers are not necessarily evenly distributed between the different trips, and this could also be a source of error. As the counted trips are randomly chosen based on which trips the counters could reach, there should be no such systematic error.

The two periods in which we have counted are not exactly the same, but they are so close that we don't think this has a significant influence on the result.

In addition to these sources of errors there are a number of externalities that also could influence the result.

The weather is an important factor in Denmark, because a lot of the bus passengers choose to walk or ride their bike when the weather is fine, but when the weather is cold or rainy they use the bus. We have only counted the passengers over a relatively short period of time, and if there have been more cold or rainy days one year than the other, this will affect the result. If we should compensate for that it would require a lot more counting.

---

One of the other measures in the corridor is improved bicycle lanes from the city centre to the university. This can also affect the number of passengers that use the bus, if they choose to ride bicycle instead of the bus. This is of course a good thing, but it will affect the number of passengers that use the buses.

### **Establishing a baseline for comparison**

The only passenger counting system we have in Aalborg is an old, simple automatic system that only detect entering passengers but not where, when or on which bus line. Counting from this system indicates that there has been an increase in the total number of passengers in the buses on 7.5% for the whole network. The results of the passenger count in the ARCHIMEDES corridor and this number is not comparable since they are made in two very different ways and with different purpose, but they can give an indication of a positive development in the whole city.

The Public Transport related measures that have been implemented on the bus lines in the corridor have later been extended outside the corridor by the PT authorities, and is supposed to have same positive effect outside the corridor as in the ARCHIMEDES corridor. Therefore it is not possible to establish a genuine 'business as usual situation' for documenting the positive effect in the corridor.

### **Conclusion**

Compared to the number of passengers in 2011 to 2009 the numbers have risen by 6.2% or 3.1% a year. This is well above the goal of 1% a year.

Trying to use the numbers of passengers on the rest of the network as a 'business as usual' is not possible, partly due to differences in the counting methods, partly due to the fact that the ARCHIMEDES improvements done in the corridor, later is extended to the rest of the system.