



# KVU OSLO- NAVET

## Inconsistencies

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**Prosjekt:** KVU Oslo-Navet

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**Vedlegg til:** Delrapport 4, Konseptanalyse

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### Sammendrag:

Dette notatet tar for seg de utenlandske ekspertene Kuehn og Nielsens vurderinger av inkonsekvenser mellom forskjellige scenarier, transportmodellberegninger og rapporter i KVU Oslo-Navet.

## Introduction

Axel Kuehn and Bernt Nielsen have been asked in early 2014 by Jernbaneverket to accompany the KVVU Oslo-Navet as independent experts.

As part of their activities they have delivered a number of reports and presentations which are summarised in their final statement of 29<sup>th</sup> April 2015 (“Anbefalinger fra Kuehn og Nielsen”).

The experts have pointed out a reservation in their final statement with regard to having looked only into specific excerpts of the total documentation. Still the comparison of different products has raised certain **concerns with regard to consistency in specific reports and /or between different reports**. The experts strongly recommended to check the complete documentation carefully in this regard and promised to furnish a specific memo describing some inconsistencies spotted by the experts.

The report presented here summarises the “experts’ thoughts” mentioned above and can be seen as an annex to the recommendations delivered already.

## Inconsistencies

The experts would like to distinguish different categories in this regard:

- inconsistencies which result from a different treatment of network features in different KVVU-scenarios,
- inconsistencies within the transport model,
- inconsistencies between different reports.

The three categories are described in more detail below.

As mentioned in the final statement, it wasn't the expert's task to perform a complete content related "quality control" for the whole KVVU documentation

Therefore the comments made are far from giving a complete listing of inconsistencies and may be influenced by a specific focus of the experts. They may cover just a limited amount of such and there may be more and others which are not mentioned here.

Sometimes a clear categorization may be difficult; means there are issues which touch several categories.

### Inconsistencies which result from a different treatment of network features in different KVVU-scenarios

Understandably there are differences between the four KVVU-scenarios which are resulting from the different focus and measures which they are representing. These could be called immanent or "natural" differences and they are certainly not meant here. There is a necessity involved in the KVVU-approach to ensure that results for the different scenarios are representing defined outputs of the specific focus and measures – means measures and related effects should be linkable to each other and overlapping influences reduced to a minimum. However, there is also a need that the PT-networks within the different scenarios represent "complete, optimized" networks which are shaped in accordance with the "optimum roles" of different modes.

The experts have made the comment in their final statement in regard of a lacking "optimization phase". It is felt that the inconsistencies which the experts have identified and which are described here, to some extent are linked to the missing optimization.

The experts' comments here are mainly targeting on the differences between the tramway and bus measures which are part of the K1-scenario on one side and K2-K4 scenarios on the other.

The K1-scenario certainly is to be seen as kind of a test in order to evaluate whether the "zero growth" target could also be managed by just "cheaper" measures within surface-PT. With such target and the need to compensate for the lack of metro and/or railway measures, the amount of tramway and bus measures in K1 automatically will be higher than in K2-K4 which all foresee major infrastructure measures in the metro and railway sector.

However, the experts feel that the K2-K4 scenarios, or at least the favoured scenario, should/could incorporate more of the tramway measures developed (and tested!) in K1 without resulting in a loss of identifiable, dedicated K2, K3 or K4 effects.

In other words: it is felt that the scenarios have been forced too much to remain on a "raw" level in regard of the KVVU-requirements. At the same time the experts' view of establishing kind of an Oslo PT-masterplan based on the KVVU result(s) demands for more sophisticated, optimized networks.

When comparing the 4 scenarios in regard of the respective modelling results for 2030 for the 3 modes railway, metro and tramway (see next pages; bus omitted here) there is an initial observation to be

made by the experts in regard of the (positive) urban development impact of the networks of the three modes. Such is seen positive when the total accessibility to a mode is improved for the city.

- positive impact of the railway measures remain limited to scenarios 3 (big) and 4 (some).
- positive impact of the metro measures remain limited to scenarios 3 (big), 2 and 4 (both some).
- positive impact of the tramway measures remain limited to scenario 1 (big).

This is summarized in the following table:

	K1	K2	K3	K4
Railway			✓	(✓)
Metro		(✓)	✓	(✓)
Tramway	✓	(✓)	(✓)	(✓)

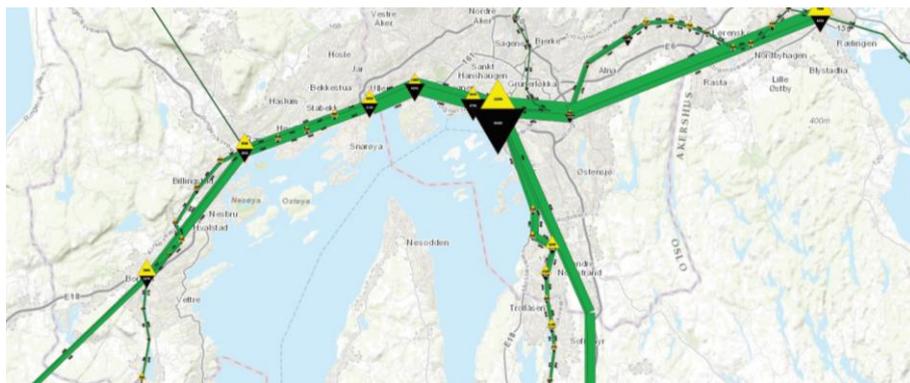
The experts are of the opinion that there is no real reason not to use the tramway network with its full capabilities also in scenario K2 and K4 where the “new catchment function” of both metro and railway appears limited. Only in K3 there appears to be a good reason for limiting tramway scope in the centre as both metro and railway offer new underground corridors with already much better catchment spread.

Making this reservation for K3, however, touches mainly on the tramway cross-link in W Thranes gate - Sannergate which is not required here due to the new railway (S-Bahn) corridor.

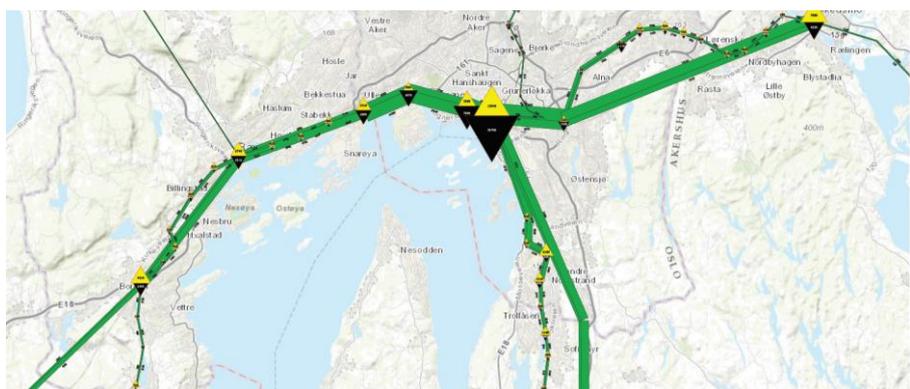
Other features of K1 should and could without any problem be integrated into K2-K4 scenarios, especially Sporveisgata as a vital link.

The Fredriks gate link seems to be missing in all alternatives?

# Railway



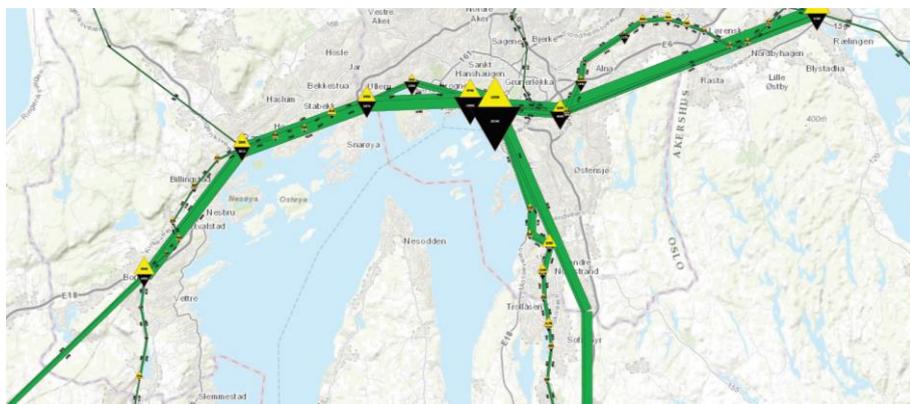
K1



K2



K3



K4

# Metro



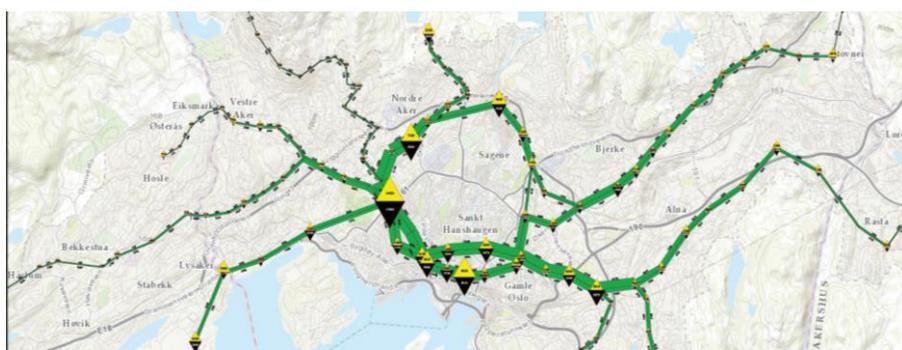
K1



K2

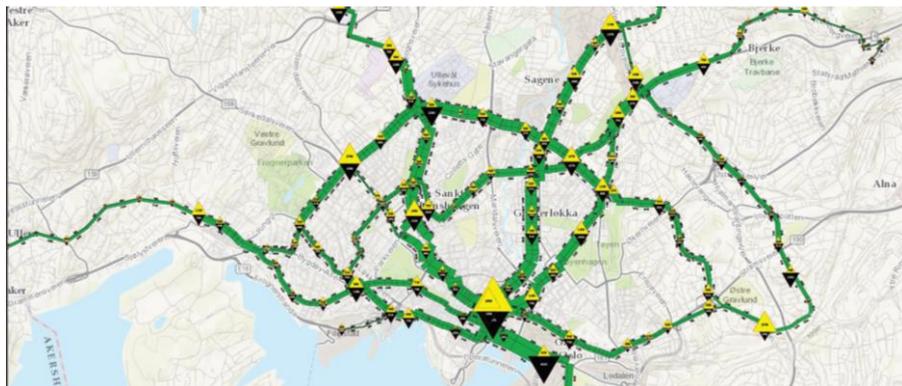


K3



K4

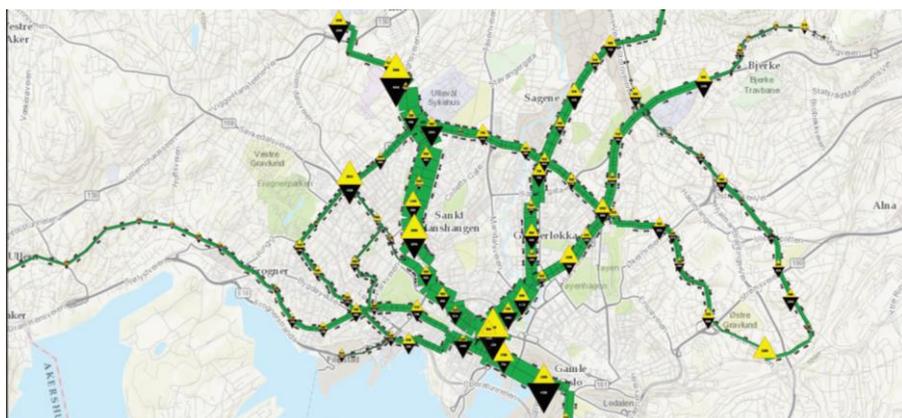
# Tramway



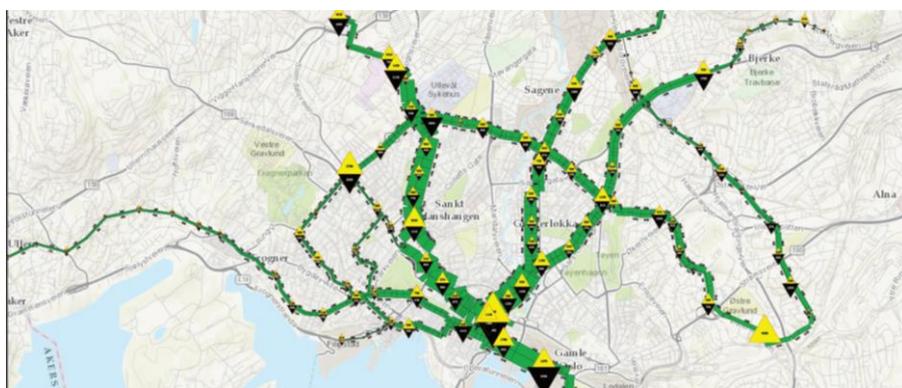
K1



K2



K3



K4

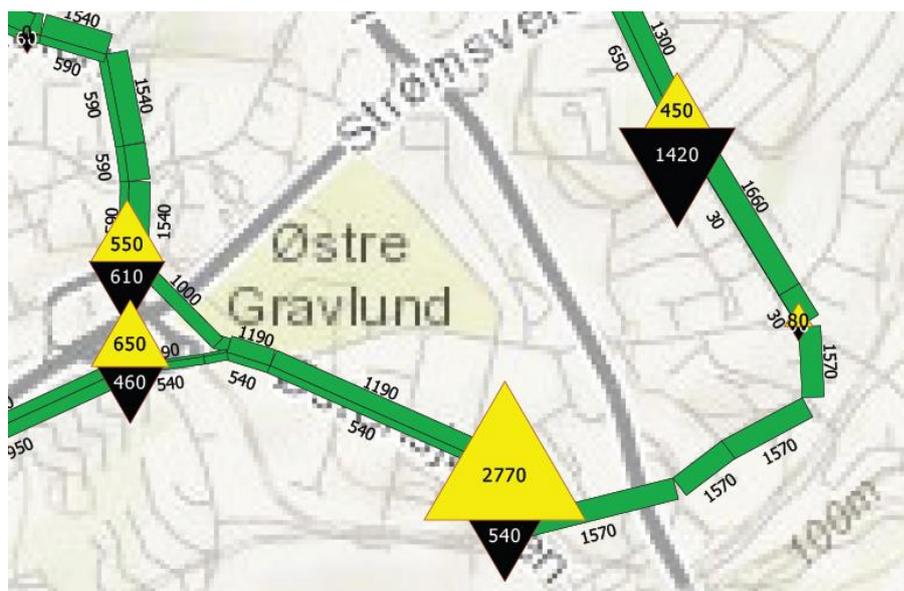
## Inconsistencies within the transport model

The experts have spotted a number of details in the modelling plots as made available by KVVU-staben as a basis for review in preparation for the Gothenburg meeting end of March 2015.

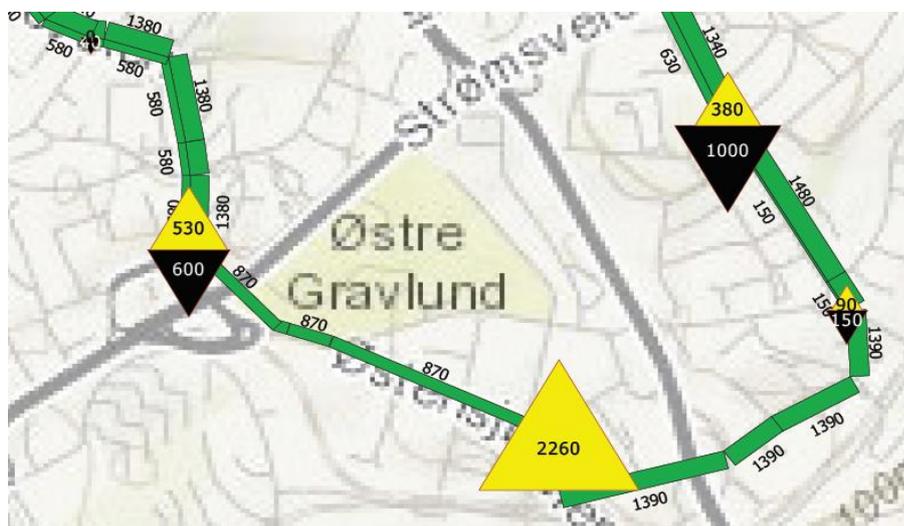
### Bryn

There seems to exist some coding error in the Bryn area where the plots for different scenarios show only values for one travel direction respectively only boarding passengers. The results seem also to be inconsistent between scenarios – compare K1 and K3 for 2030.

Looking at the important network function foreseen for Bryn as the major interchange node in the East of Oslo centre this can't represent a realistic modelling result?



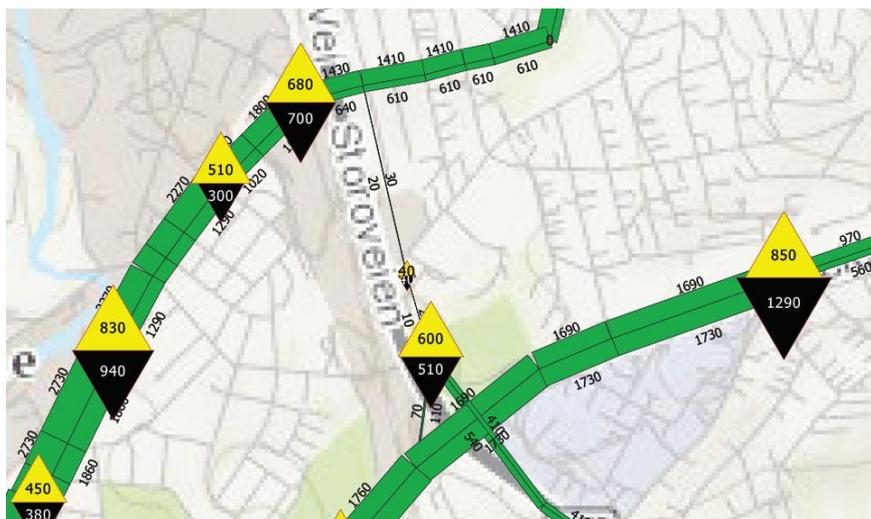
K1



K3

### Storoveien

Another inconsistency seems to exist in the Storoveien link in picture below.



K3

Values of 20/30 passengers within a 3h peak are difficult to understand when looking at the network structure in this area.



2010 tram

Such low numbers seem to represent tramway line 17 up to Grefsen which appears already with very low numbers in the 2010 plots.

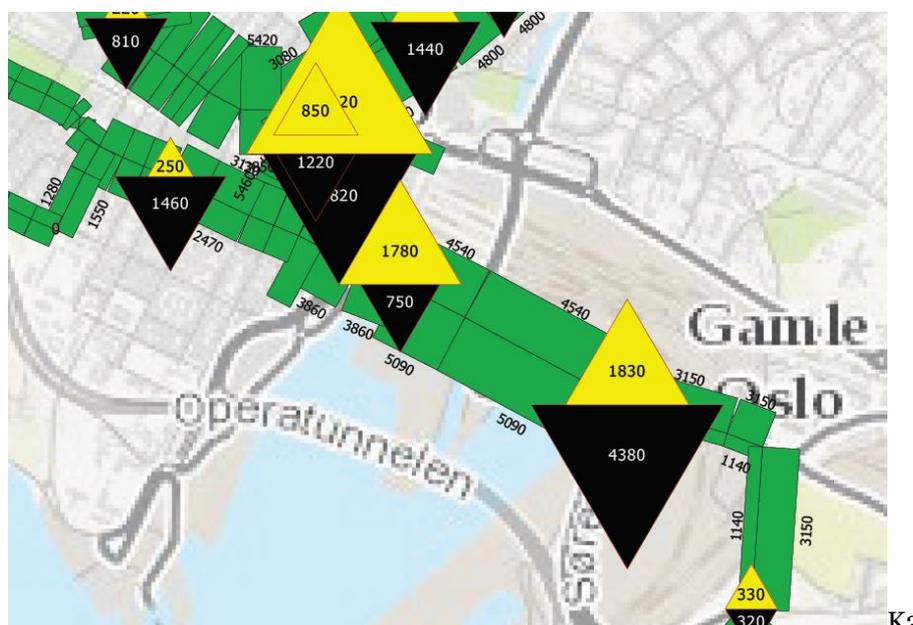
The experts have problems to believe that these numbers represent the reality of today!

And it appears not consistent if such numbers remain more or less identical in a 2030 and 2060 scenario? Shouldn't the link of line 17 up to Grefsen station disappear completely with an extension to Tonsenhagen/Bjerke?

The discussion here is clearly also linked to the "general" Tonsenhagen problem described further below.

## Wider Oslo S area

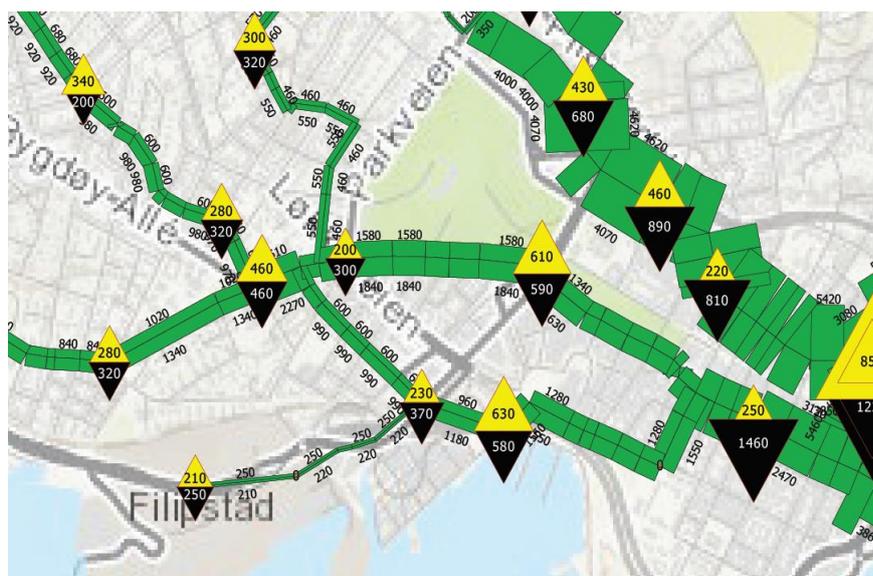
The boarding/de-boarding patterns for the tramway stops in the wider Oslo S area appear slightly inconsistent. Some stops show a significant dominance of de-boarding passengers while others show opposite characteristics? The experts acknowledge that a morning peak period may generate significantly more boarding or de-boarding passengers depending whether a stop is located in an area where traffic originates or is destined to. But it is questioned whether such patterns are realistic within a rather central area?



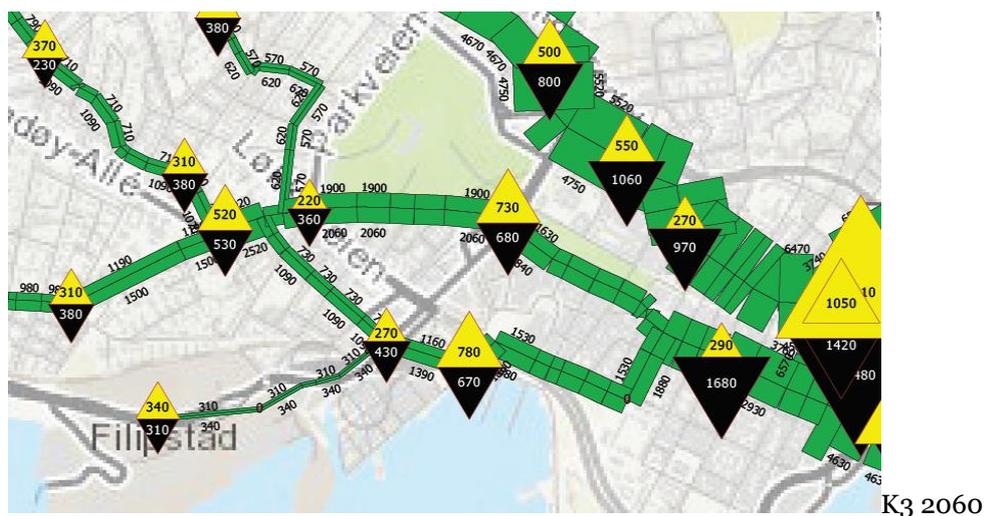
K3

## Filipstad tramway link

The experts have noticed with surprise the very low passenger numbers given as modelling results for the Filipstad link. These numbers justify the question whether the future function of Filipstad which is described as a “big development area” has been properly featured in the traffic model? Even more surprising that there is nearly now further increase up to the year 2060?



K3 2030



### Tonsenhagen/Bjerke tram line

The experts had mentioned the low patronage for the new tram line to Tonsenhagen/Bjerke in their “minimum demand” report. This appears to be a result of buses still being operated in parallel to the tramway extension which the experts see as a clear inconsistency.



### Inconsistencies between different reports

#### Accounting of infrastructure costs for tramway/bus in K2-K4

The experts have noticed cost information for scenarios K2-K4 in the preliminary and final “Samfunnsøkonomisk analyse” reports which indicates that no infrastructure costs for tramway respectively bus measures have been accounted for. This appears not consistent with the infrastructure which seems to have been used as a modelling basis? The experts believe that all new network parts in different scenarios which are modelled need also to be costed.

According to the information in the same report scenario K1 (tram and bus) is more expensive in infrastructure cost than scenario K2 (T-bane). This appears contradictory against what could be expected and has to be explained.

Tabell 1-1: Samfunnsøkonomisk lønnsomhet, oppsummering

[Mill. 2014 kr i 2022]	K1	K2	K3	K4
Investeringskostnader	-31 948	-24 838	-47 697	-42 387
Brutto nåverdi	22 298	57 312	79 189	77 638
Netto nåverdi	-9 650	32 473	31 492	35 250
Netto nytte per budsjettkrone (NNB)	-0,21	0,79	0,46	0,55
Netto nytte per investert krone (NNK)	-0,30	1,31	0,66	0,83

The investment costs given for K1 and K2 indicate that bus measures in K1 are considerably higher than tramway measures and that bus measures are even more expensive than a new metro tunnel?

Tabell 4-4: Utbyggingskostnader Konsept K1. Mill. 2014-kroner (eks. mva)

K1 Trikk- og busskonseptet		
Trikk	Trikketraseer (minus basis)	5 580
T-bane	Tilsvingertiltak Volvat og Ensjø	1 100
Buss	Lysaker-Skøyen	1 500
	Gjelleråsen-Sinsen	4 600
	Hvam/Ahus-Alna	5 800
Tog	Bussterminalen-Mastemyr	4 300
	Plattformforlengelser i vest	2 400
	Stasjonsforlengelser Kongsvingerbanen	600
Sum		25 880

Tabell 4-5: Utbyggingskostnader Konsept K2. Mill. 2014-kroner (eks. mva)

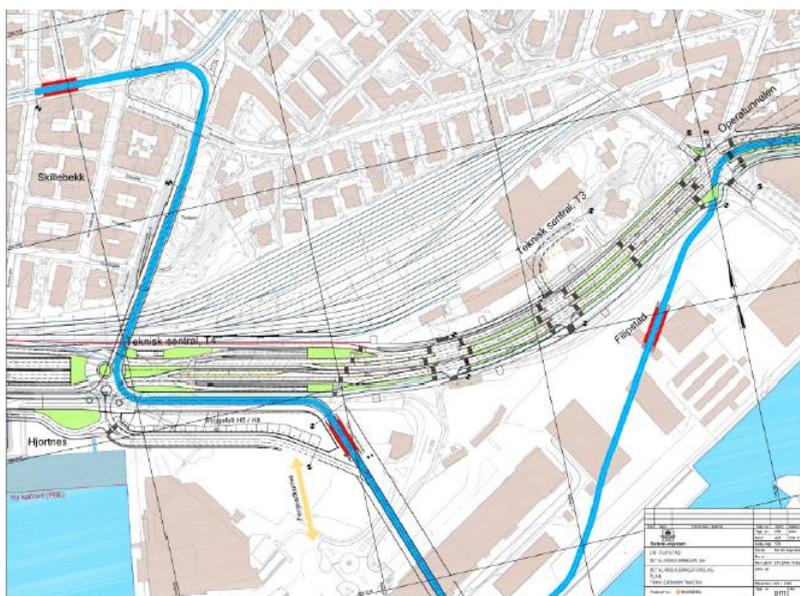
K2 T-banekonseptet		
T-bane	Majorstua-Riddervolds pl.-Nationalth.-St. Olavs pl.-Tøyen-Ensjø	12 500
	Øvrige tiltak på t-banenettet	2 100
Tog	Plattformforlengelser i vest	2 400
	Stasjonsforlengelser Kongsvingerbanen	600
Sum		17 600

### Filipstad layout / network function?

The experts have stated in chapter above that they are rather surprised about the very low patronage increase in a 30 year period from 2030 to 2060. The new tramway link into Filipstad raises, however, concerns beyond modelling reactivity. Across all scenarios the Filipstad line seems to have been assumed terminating in the Filipstad area. Other reports as eg the “Teknisk-Økonomisk Report” speak, however, of a continuation and linking to existing infrastructure, however, more as a future, long-term

perspective. Such continuation would certainly give this line more of a network function. The experts wonder why such function hasn't been integrated in the model from the beginning?

It must be stated very clearly that the patronage values resulting for Filipstad from the model are far below any threshold for justifying tramway infrastructure and such evaluation should have been taken forward in the KVVU instead of just proposing new network bits without controlling their effectivity or optimizing those after an identification of "problems". This could be seen as another example for the experts' concerns stated in the annex 1 in regard of missing "minimum demand" considerations respectively a missing "optimization phase" as mentioned in the final report.



Figur 21: Mulig trasé for trikk gjennom Filipstad (Kilde: Statens vegvesen Region øst)

## Conclusion and recommendation

The experts conclude and recommend the following:

- The general model reactivity needs to be checked (small changes from 2030-2060).
- Take a careful look at the plausibility of model results for all modes and make cross-comparisons.
- Ensure that modelling is based on integrated PT-networks and check for interaction/competition between modes (Tonsenhagen example!)
- Some tram links are missing (generally or in scenarios K2.K4). Other tram links have astonishing low patronage which either can be a result of modelling errors, the model's capability to assign correctly between parallel links (modes) or competition between modes where there should be none.
- Eliminate obvious model errors (Bryn area example).
- A number of important interchange nodes should be made more transparent by describing the interchange flows in so-called "spider diagrams" (eg Bislett!).
- The handling of tramway/bus costs in K2-K4 needs to be checked.
- Bus infrastructure costs in K1 appear over-dimensioned.

The focus of the experts in regard of inconsistency checks was on surface modes.

As mentioned before the comments made here are the result of the experts' reading of (some) documents and shall not be considered as a total quality control.

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