

Transportministeriet

Analysis of the Organisational Set-up of Public Transportation
in the Greater Copenhagen Area

– Project Report –

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Executive Summary

- The Danish government follows a "green transport policy" which aims to increase the modal share of public transport.
- Thus, the Danish Ministry of Transport (TRM) initiated this project to analyse the organisational set-up of public transportation in the Greater Copenhagen Area (Hovedstaden Region).
- The project is divided into two parts:
 - Part 1 analyses the current bus funding model and suggests changes for improvement
 - Part 2 looks into the organisational set-up of public transport in Greater Copenhagen and delivers high-level recommendations for alternative set-ups
- The project was kicked off December 21st 2009, the final presentation took place on February 3rd 2010, so the entire project only lasted about one month.

Part 1: Bus funding model

- For the bus funding model we conducted six interviews with Movia, the Municipality of Copenhagen, KL, Vestegnssamarbejdet, the Hovedstaden Region and Danske Regioner.
- The problem areas we identified for the current bus funding model were the large number of stakeholders, the lack of transparency, the lack of customer orientation and the lack of realistic commuting data.
- The current bus funding model has led to several problem cases, e. g. the Avedøre Holme case.
- The interviewees agreed on fairness, simplicity, transparency and target-orientation being the requirements for an improved bus funding model.
- We have identified ten options for improving the bus funding model of which nine can be combined with an intensifying effect upon one another.
- Implementing these options would solve or at least mitigate the effects of the special cases.
- Any final recommendation on the bus funding model depends on the "higher-level" decision about an umbrella organisation which is to be discussed in part 2.
- Yet, in any case we recommend implementing option 1 to 9. If a "political" option is favoured, option 10 might be applied.

Part 2: Organisational set-up of public transport in Greater Copenhagen Area

- For the interplay between transport modes we conducted two interviews with Movia and Trafikstyrelsen.
- The transport companies Movia, Metroselskabet, DSB Regional Train, DSB S-Train and DSB First make up the "Direktørsamarbejde" which is supposed to coordinate and integrate the different transport modes, but has no formal power by itself. The coordination of "Direktørsamarbejde" is one of the many tasks of Trafikstyrelsen, yet again Trafikstyrelsen has not been empowered in any regard.
- Trafikstyrelsen also administers the up to now only element of integration, the revenue sharing agreement.
- The problem areas we identified for the current interplay between modes were the lack of cooperation in the "Direktørsamarbejde", the lack of integration of all transport modes, the lack of customer orientation and the lack of incentivisation of bus feeder services to the Metro in the revenue sharing agreement.
- The interviewees agreed on integrated approach and customer focus as being the essential requirements for an improved organisational set-up for public transport in the Greater Copenhagen Area.
- We have identified two options for an alternative organisational set-up of public transport in the Greater Copenhagen Area:
 1. Implementing "Transport of Greater Copenhagen" (TGC) as an umbrella organisation in a light version
 2. Implementing "Transport of Greater Copenhagen" (TGC) as an umbrella organisation in a full version
- In the light version TGC is an umbrella for the three organisations Movia, Metro and Trafikstyrelsen on the coordination level, in the full version TGC would be the only organisation on the coordination level.

Outlook

- Before moving on with setting up an alternative structure for the public transport in the Greater Copenhagen Area political decisions on the quantified objectives of the "green policy" and the desired levels of local responsibility, common welfare and cost proportionality need to be taken.
- Establishing an umbrella organisation would require an in-depth analysis covering the elements strategy, organisation, financing, decision making and legal design.

1. Objective and project approach

The Danish government follows a "green transport policy" which aims to increase the modal share of public transport. In order to reach this goal the attractiveness of public transport needs to be strengthened while making the best use of the public money put into the system. It is commonly agreed that a better cooperation between the transport companies is also vital to support this endeavour. Thus, the Danish Ministry of Transport (TRM) initiated this project to analyse the organisational set-up of public transportation in the Greater Copenhagen Area (Hovedstaden Region).

The project is divided into two parts:

- Part 1 analyses the current bus funding model and suggests changes for improvement
- Part 2 looks into the organisational set-up of public transport in Greater Copenhagen and delivers high-level recommendations for alternative set-ups

The following figure 1 gives an overview of the project schedule.

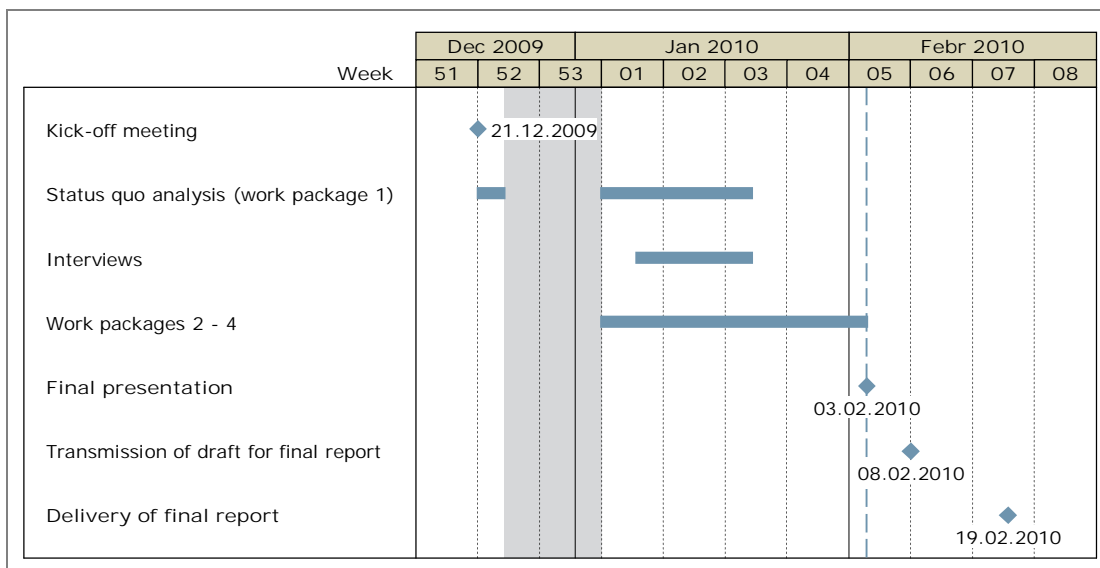


Figure 1: Project schedule

The project was kicked off December 21st 2009, the final presentation took place on February 3rd 2010, so the entire project was completed in only one month. This final report is based on the final presentation and follows the same structure.

2. Part 1: Bus funding model

Part 1 of the project was designed in a four-step approach:

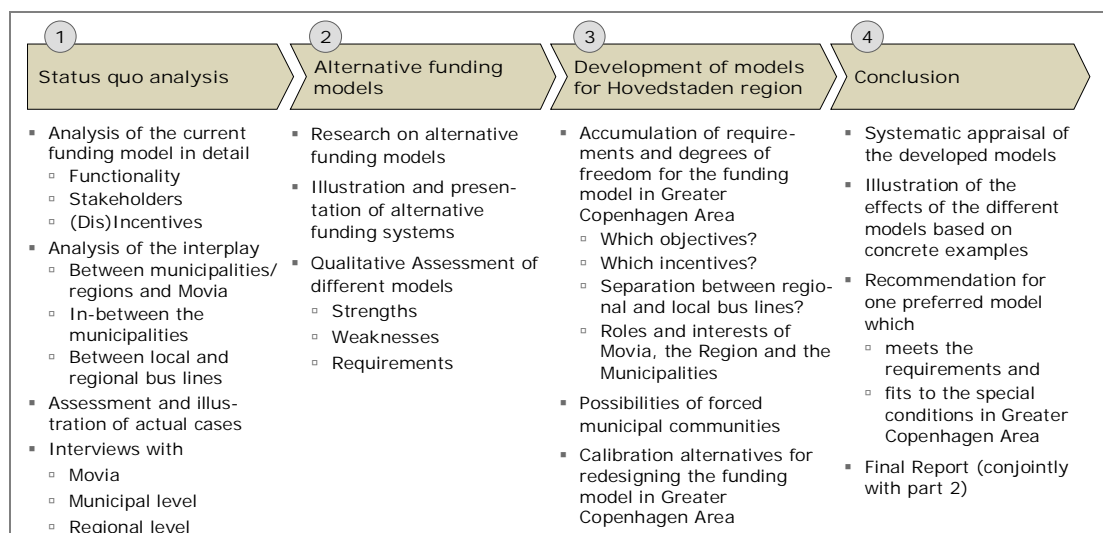


Figure 2: Project approach part 1 – Bus funding model

In the first phase of part 1 we analysed the status quo of the bus funding model that is applied to cover the deficit incurred by the municipal bus services. Starting with a firm understanding of the quantitative bus funding model itself we then went on to map out the interplay between the organisations involved in the process: Movia, municipalities and regions. To clearly illustrate the effects of the current model we documented actual cases with specific challenges, the so-called special solutions. For information gathering purposes we conducted interviews with six organisations. This data pool has been the main source for all further analysis and recommendations.

The second phase and third phase of part 1 was conducted conjointly. To start with, we identified ten options along the process of bus service provision between the municipalities / regions and Movia that we could use to improve the current model. Each of these options was described in detail and measured against the qualitative requirements distilled from the interviewees' responses.

In the fourth and last phase of part 4 we then analysed whether and how these options could be combined with one another. To illustrate the effects of these options we applied them to the special cases identified in the first phase. The project finished with the final recommendation for improving the bus funding model.

2.1 Status quo analysis

For the bus funding model we conducted six interviews on January 18th and 19th:

1. Movia (coordination level)
2. Municipality of Copenhagen (municipal level)
3. KL – Association of Municipalities (municipal level)
4. Vestegnssamarbejdet (municipal level)
5. Hovedstaden Region (regional level)
6. Danske Regioner (regional level)

Movia is at the centre of the bus funding model as it serves as the central planning and coordinating unit for all 45 municipalities and the 2 regions making up the Greater Copenhagen Area. There are six regional bus lines in this area, all the rest are local lines. Neither the municipalities nor the regions have transport planning competencies of their own in-house and thus have to rely on Movia's services for planning and coordinating their bus services. The administrative cost of Movia are born by the regions Hovedstaden and Sjælland.

The process of bus service provision has got seven steps shown in the following figure 3:

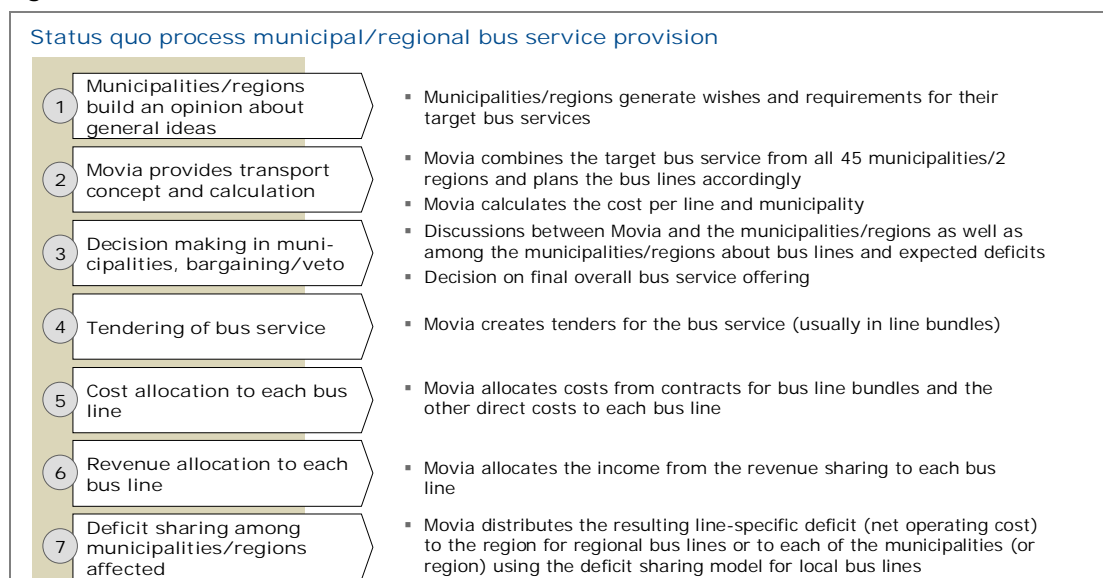


Figure 3: Status quo process municipal / regional bus service provision

The process starts with building general ideas in each of the municipalities and the regions about the targeted bus service. Next, Movia combines all these wishes and requirements in a first draft of the overall bus service offer and calculates the

respective deficit shares for the municipalities and the regions. Usually this is followed by a period of discussing and decision making between the municipalities / regions and a top-down / bottom-up calculating changes between the municipalities / regions and Movia. This step finishes with the agreed bus service offering for that planning period. This planning process takes place on a yearly basis plus five updates in the meantime. Movia converts the final bus service offering into line bundles that are consequently tendered out to bus operators.

The cost incurred from these contracts as well as other direct cost from Movia itself (e. g. radio and IT-equipment on the buses that are owned by Movia) then need to be distributed to the bus lines contained in each of the line bundles. Once the gross cost per line have been calculated the revenue stemming from the revenue sharing procedure (to be described in part 2 of this project later on) is deducted which results in the net operating cost per bus line – equivalent to the line specific deficit. The latter gets distributed either directly to the region as a total for all regional bus lines or – for the remaining local lines – allocated to each of the municipalities affected using the bus funding model – or how it should be called more correctly – the deficit sharing model.

The deficit sharing model uses two parameters to calculate the shares for the municipalities:

1. Bus hours per municipality
2. Commuting ratio between the municipalities affected

The performance-oriented parameter bus hours is taken directly from the operating data, the usage-oriented commuting ratio is based on the official statistic on commuting between municipalities by the Danish Statistical Bureau. The commuting ratio describes the relation between the number of commuters leaving a municipality and the sum of commuters leaving from and coming into a municipality. So, if this value is higher than 0.5 that community is out-commuting, if it is lower than 0.5 it is in-commuting.

Firstly, the bus hours of each bus lines are split up by the hours spent in each of the municipalities crossed by that bus line. Then, the bus hours of all municipalities – with the exception of the one with the highest number of bus hours – are doubled and afterwards multiplied with the commuting ratio. For out-commuting municipalities (factor $> 1.0 = 0.5 \times 2$) this results in a higher number of bus hours than before, for in-commuting municipalities (factor $< 1 = 0.5 \times 2$) in a lower number than before. These numbers are then deducted from the total of bus hours and the residual bus hours are allocated to the municipality with the highest number of bus hours in the start. The logic behind this procedure is that out-commuting municipalities should share a greater part of the bus deficit, as their inhabitants create relatively more traffic than in-commuting municipalities and vice versa.

One major problem that is produced by this deficit sharing model is the cross subsidisation between municipalities. As the model uses an average deficit throughout the routing of a bus line, the actual cost differences between lower passenger numbers in one municipality resulting in higher specific cost and higher passenger numbers in another municipality resulting in lower specific cost are not reflected within the model. When the bus service is cut down by the municipality with higher passenger numbers (municipality 2 in the following example), the average cost go up and the municipality with lower passenger numbers (municipality 1 in the following example) ends up paying more for an unaltered bus service in their municipality. This mechanism is illustrated in the following figure 4.

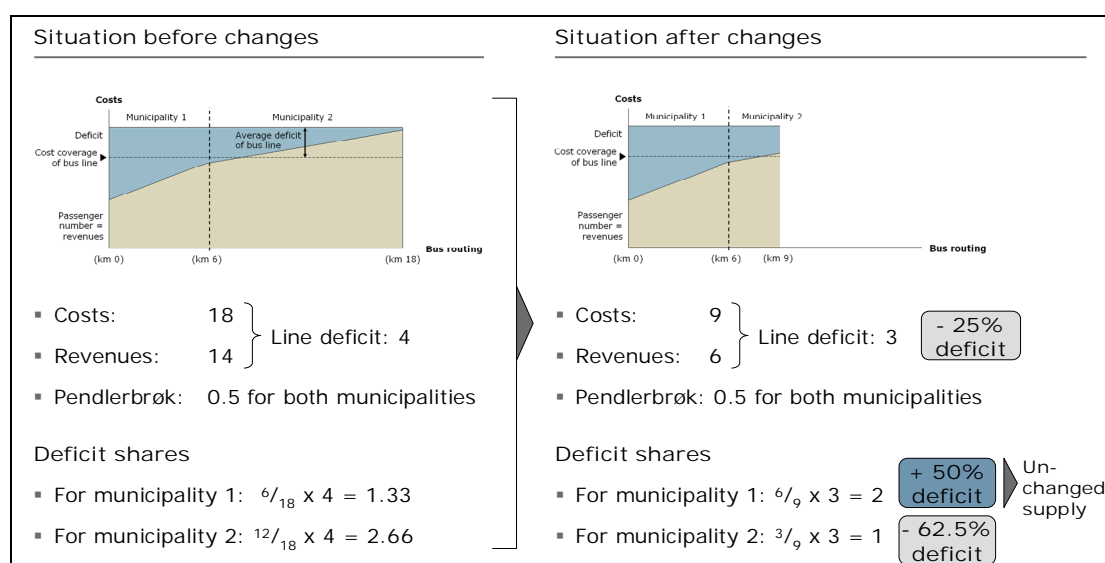


Figure 4: Example of cross-subsidisation before and after change of bus service

If municipality 1 decreased the service in their share of the bus line, average cost would go down, resulting in lower deficit shares for both municipalities which would still be unfair from a cost proportionality perspective, but wouldn't cause any disagreement among the two municipalities. If either municipalities 1 or 2 increased the service in their respective municipality the average cost would go down as well which should – in principle – also result in a lower deficit shares for both communities (at least for the service level before the change).

The importance of the problem described above is based on the fact that most local bus lines are not intra-municipal, but inter-municipal (between two municipalities) or even cross-municipal (between three and more municipalities). In the case of the municipality of Copenhagen with its 72 bus lines in total, only 21 are intra-municipal (plus a major part of these are special services for elderly people and harbour ferries), but 51 bus lines are shared with up to 8 municipalities each. In total, the bus lines running in Copenhagen reach out to 31 municipalities, representing two thirds of the 45 municipalities in the Greater Copenhagen Area.

Another, yet minor challenge with the present set-up is the lack of clear characteristics for differentiating between local and regional bus lines. None of the interviewees could state defined characteristics by which the bus lines were differentiated in 2007 during the municipal reform. The number of regional bus lines has stayed at 6 since then. As the local lines are to be financed by the municipalities whereas the regional lines get financed by the region, the difference is not an academic one, but decides the financial flows for funding the bus lines in the Greater Copenhagen Area. In some cases, municipalities have benefitted from the establishment of regional lines, as their local transport needs are covered by those regional lines without any funding from the municipality itself.

To be fair it needs to be noted that there is a seamless transition between local and regional traffic, so the cut-off line between the two cannot be drawn easily from "natural" characteristics of the actual traffic flows itself, but requires an unambiguous definition.

To sum up, we have identified four major problem areas with the present set-up of the bus funding model in the Greater Copenhagen Area:

1. Large number of stakeholder involved
2. Lack of transparency
3. Lack of customer orientation
4. Lack of realistic commuting data

It became apparent that the large number of stakeholders has led to a deadlock of the model, which is illustrated by the fact that very few changes have taken place since its introduction. Plus, the bus funding model does not reflect customers' actual transport needs, as it lacks transparency, customer orientation and a realistic data base when looking at commuting data.

The following two figures 5 and 6 describe these problem areas in more detail.

| Problem areas | Explanation |
|--|---|
| <div style="border: 1px solid black; padding: 5px; display: inline-block;"> Large number of involved stakeholders </div> | <ul style="list-style-type: none"> ▪ In the Hovedstaden Region 45 municipalities are responsible for the funding of bus routes. A large number of bus routes is shared by more than one municipality ▪ Each change of an cross-municipal bus lines (routing, number of stops, frequency etc.) has influence on the mutual funding. The consequences of each change for the municipalities involved have to be calculated by Movia and the municipalities have to agree to the changes ▪ Decision processes including the municipalities usually take up 6 months, as Movia's board has no formal power ▪ It is difficult for the municipalities to understand that their share of funding changes after improvements of a bus line in another municipality ▪ No autonomous changes in bus transport are possible for a municipality for cross-municipal bus services ▪ As a consequence the transport supply is nearly unchanged since the introduction of the new funding system in 2007. No new bus lines were introduced since then (except service buses) |

Figure 5: Problem areas with current bus funding model 1 of 2

| Problem areas | Explanation |
|----------------------------------|---|
| Lack of transparency | <ul style="list-style-type: none"> ▪ The current bus funding model is not easily understood by the municipalities. The clarification was perceived as a new version of it ▪ The planning cost of Movia are not visible to municipalities ▪ Only Movia possesses planning resources |
| Lack of customer orientation | <ul style="list-style-type: none"> ▪ Due to the absence of an incentive to change the cross-municipal bus supply customer needs are neglected ▪ The model creates an incentive to establish intra-municipal bus lines which might not meet customer needs (traffic flows are generally crossing municipality borders) |
| Lack of realistic commuting data | <ul style="list-style-type: none"> ▪ Statistical data from the Danish Statistical Bureau showing where people live and work are used in the consideration of commuting relations. These numbers do not reflect the actual use of different transport modes (e. g. bus lines) |

Figure 6: Problem areas with current bus funding model 2 of 2

The present set-up has led to several special solutions of which we will describe the following five in detail:

1. Avedøre Holme
2. Bus line 382E
3. Bus lines 308 and 309E
4. Bus line between Frederikssund and Allerød
5. Bus line serving Dragør

1. Avedøre Holme

The Avedøre Holme case illustrates mostly for the problem area of the large number of stakeholders as it took a two year long discussion to come up with a by-pass-solution to get the industrial area Avedøre Holme connected to the bus service as shown in figure 7:

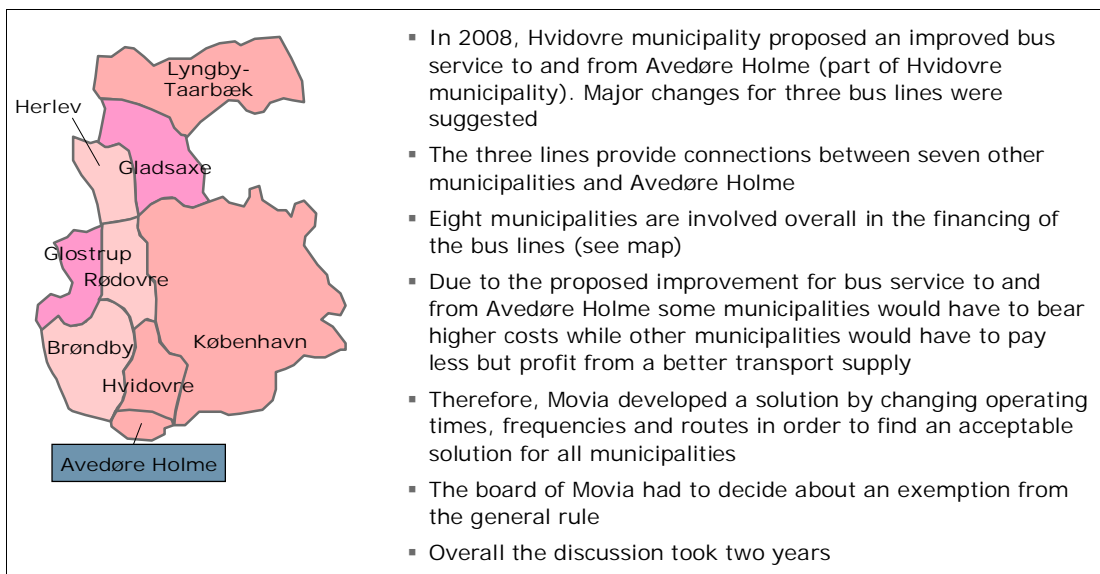


Figure 7: Avedøre Holme Case

2. Bus line 382E

This bus line connects the two municipalities Hillerød and Rungsted Kyst by crossing the municipality Fredensborg without stopping there. As Fredensborg does not receive any bus service, yet gets to pay a share of the cost of this bus line using the current bus funding model, they decided to stop financing it as shown in the following figure 8:

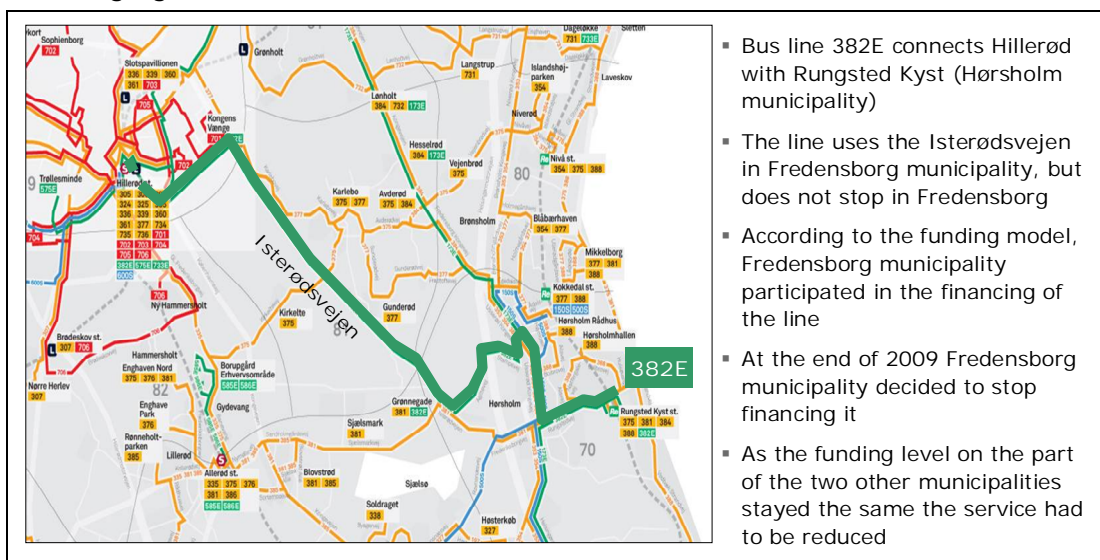


Figure 8: Bus line 382E

3. Bus lines 308 and 309E

In this case the same bus routing is considered a local line and a regional line based on the time of the day. Peak-hour traffic is local, off-peak is regional as shown in figure 9:

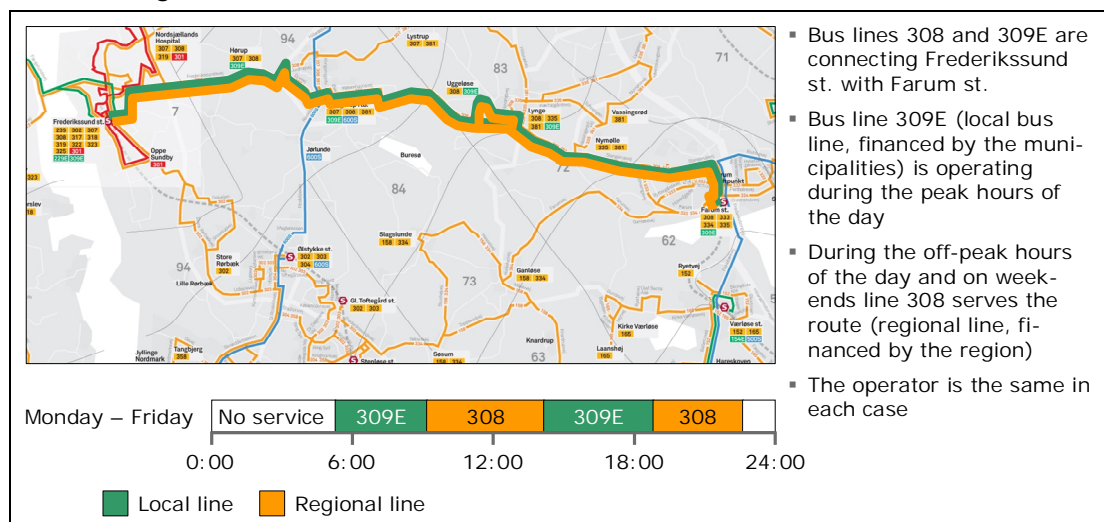


Figure 9: Bus lines 308 and 309E

4. Bus line between Frederikssund and Allerød

This bus line almost exclusively transports passengers from Frederikssund to Allerød (mostly school children). Yet, according to the present bus funding model, Allerød is to finance its share of the cost.

5. Bus lines serving Dragør

As Dragør finds itself in the outskirts of the Greater Copenhagen Area, only connected to its neighbouring municipality Tårnby, all changes of bus supply depend on the approval of Tårnby. In one case, a bus routing was "broken" into two segments to cater to differing needs of these two municipalities.

Special cases 4. and 5. are depicted in the following figure 10:

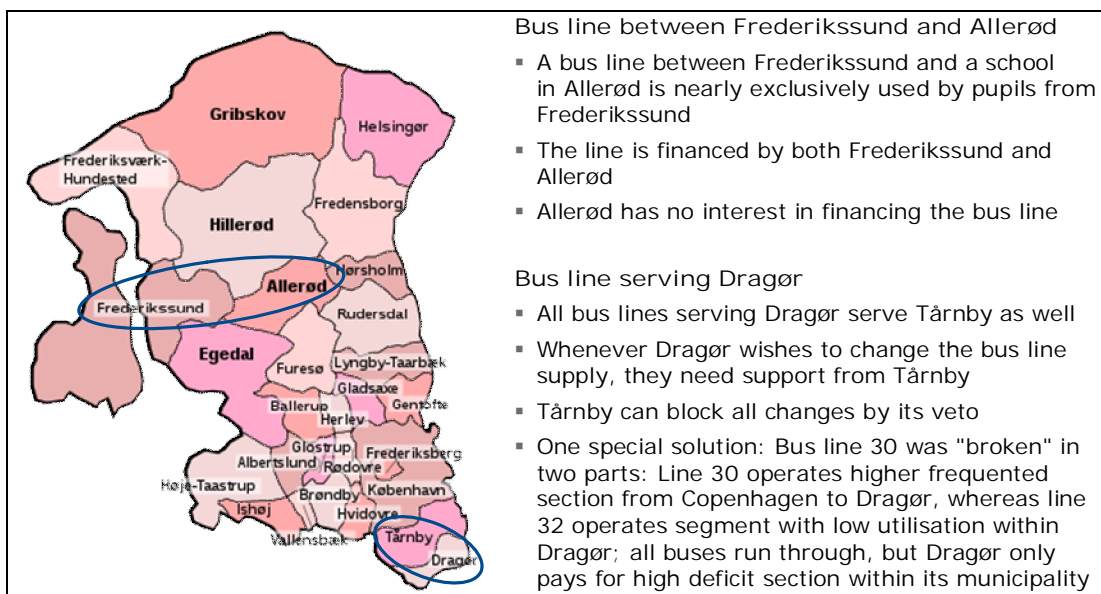


Figure 10: Bus line between Frederikssund and Allerød/Bus lines serving Dragør

Besides the problems already existent with the current bus funding model there are more challenges foreseeable for the future, as it seems doubtful whether the major bus service changes required by the ring metro in 2018 can be achieved with the current model.

2.2 Requirements and challenges

The interviewees predominantly agreed on the requirements for an alternative bus funding model. First and foremost, the model needs to be fair. Fairness in this sense is defined by a proportional relation between the services delivered and the deficit shares needed for their funding. Then, municipalities and region are looking for a simpler system allowing faster decisions with lower administrative effort for the many stakeholders involved. The model also needs to be transparent, covering on the hand the mechanics of the model itself, but as well its predictability and long-term stability as budgetary concerns were very prominent among the municipalities. Lastly, the models needs to support the goals of the public transport system: improving public transport with a higher degree of customer-orientation while maintaining a healthy efficiency level. Figure 11 shows the requirements at a glance.

| Requirements | Description |
|-----------------|--|
| Fairness | <ul style="list-style-type: none"> ▪ Proportionality between transport services provided and cost ▪ Allocation of administrative cost to bus lines ▪ Use of reliable data |
| Simplicity | <ul style="list-style-type: none"> ▪ Faster decisions ▪ Reduced number of decision makers ▪ Low administrative effort |
| Transparency | <ul style="list-style-type: none"> ▪ Easy to understand system ▪ Predictable/foreseeable results ▪ Long-range stability |
| Target-oriented | <ul style="list-style-type: none"> ▪ Improving public transport ▪ Incentives for customer-orientation ▪ Economic efficiency |

Figure 11: Requirements for model from interviews

When striving for an improved bus funding model we also need to have a thorough understanding of the underlying conflict between creating common welfare or overall service level in public transport on the one hand and cost proportionality at the other hand. Generally speaking, if you opt for common welfare more than anything else you wouldn't spend too much effort in creating cost proportionality at the same time. Vice versa, if cost proportionality is your main goal, you cannot assume the selected solutions will create common welfare at the same time. So from our point of view the target area will neither be 100 percent common welfare nor 100 percent cost proportionality, but a reasonable mix of the two. In the end, this is a political decision to be taken. This general conflict is depicted in the following figure 12.

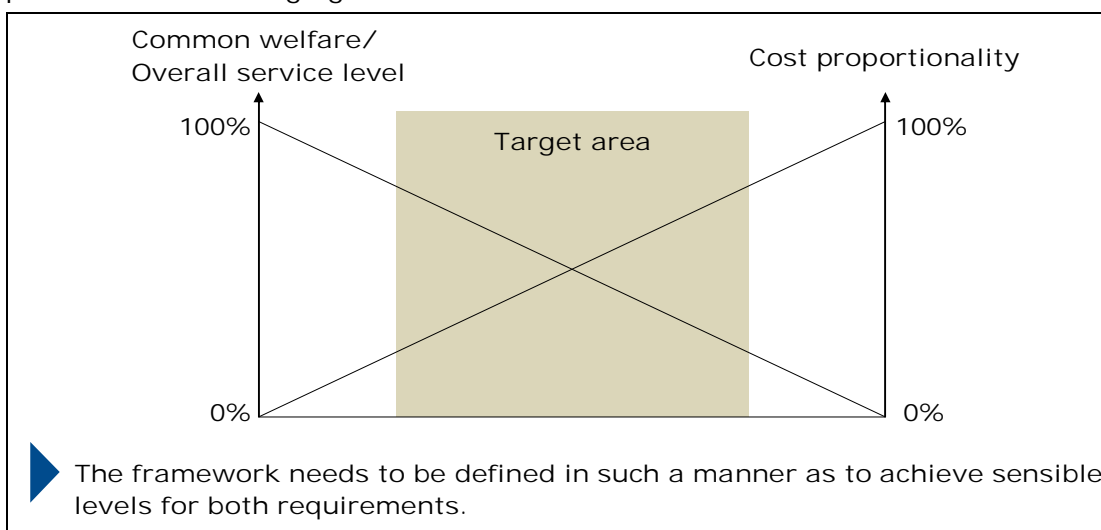


Figure 12: General conflict between common welfare and cost proportionality

2.3 Alternative funding models

After careful analysis of the status quo of the bus funding model we have identified ten options to improve the current set-up:

1. Clear definition of local and regional lines
2. Reallocation of local feeders with regional benefits
3. "No stop no pay"
4. New voting rights for stakeholders involved
5. Municipal cooperations
6. Reallocation of line bundle costs
7. Line segment costing
8. Allocation of administrative costs (Movia)
9. New deficit sharing scheme
10. Central funding of additional traffic

These options are structured along the process of bus service provision already described in chapter 2.1 Status quo analysis as shown in the following figure 13:

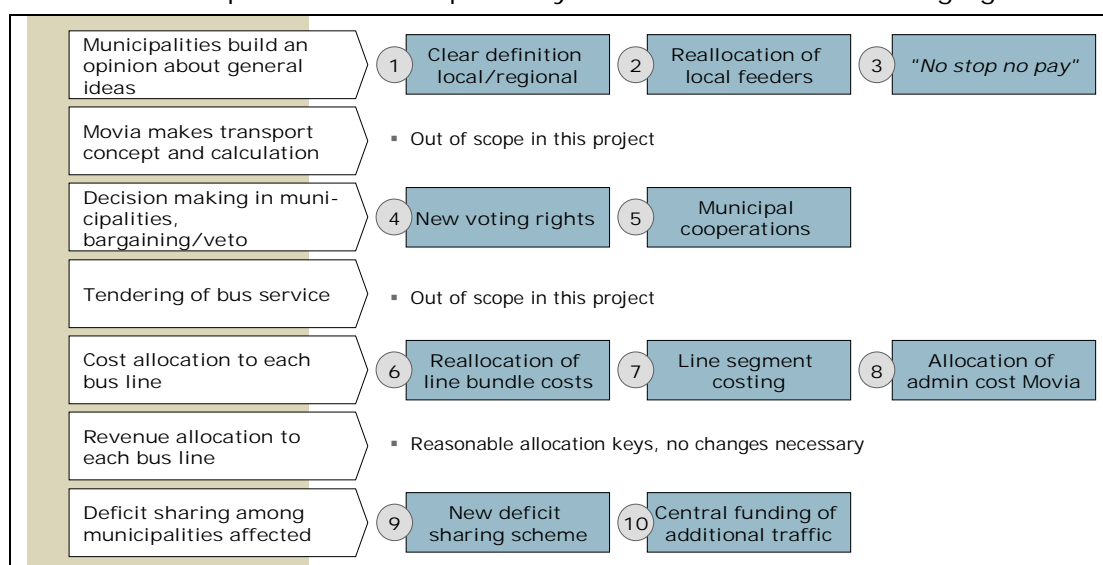


Figure 13: Options for improving the current bus funding model

As you can see there are no improvement options for steps 2, 4 and 6 of the bus provision process. Steps 2 and 4 were out of scope for the project at hand, whereas we found the revenue allocation to each bus line reasonable when looking at the allocation keys used and did not identify a need for change at this point.

In the following the ten improvement options are described in detail.

1. Clear definition of local and regional lines

As outlined in 2.1 Status quo analysis one of the challenges of the current bus funding model is the lack of clear characteristics for differentiating between a local bus line from a regional bus line. Our suggestion for this clear definition entails four requirements for a regional bus line:

1. Bus lines of regional (= cross-municipal) interest
2. Major part of passengers (e.g. > 50%) travels between 3 or more municipalities
3. Focus on interconnections of municipalities which are not connected by rail services
4. No parallel traffic to railway lines

The starting point here is the idea that regional transport by its very definition needs to cater for cross-municipal services only. This excludes using regional lines for local purposes only. If a regional line serves local and regional purposes at the same time - which will represent a major share of all regional bus lines - the municipalities should co-found the intra-municipal part of those lines.

Inter-municipal service that is between only two municipalities is deliberately not comprised by this definition as neighbouring traffic is not regarded as of regional importance.

The new network design of regional bus lines would be based on the current Movia network. The region would then identify key opportunities for better connections between central areas within the region not yet served by rail. The funding of additional regional bus lines could be financed by reallocating the administrative cost of bus service provision (that is Movia's administrative cost) to the bus lines and there to the municipalities themselves (also see option 8 – Allocation of administrative costs).

Alternatively, the funding of additional regional bus lines (minus the local funding share) could come from increased budgets from the regions.

The function of organising and funding of an integrated regional (= cross municipal) bus network in Greater Copenhagen area could in the future also be transferred from the regions to an organisational umbrella (to be described in part 2).

2. Reallocation of local feeders with regional benefits

Currently a local bus feeder to a rail transport mode is to be financed by the municipality it runs through only. This situation neglects the question whether this local bus feeder serves regional interests at the same time. We therefore suggest to change from the technically-oriented perspective of where the service takes place to the customer-oriented perspective of who benefits from the feeder service provided. So, if regional interests exist, this originally local feeder would be redefined as a regional bus lines financed by the region with again the exception

of the intra-municipal segments which – as described in option 1 – would be co-financed by the municipalities serviced.

3. "No stop no pay"

Municipalities that are only crossed, yet not serviced by a bus line should not have to bear any of that bus line. The current bus funding model does not follow the basic equivalence principle between services rendered and services to be financed. Applying this simple, yet rather relevant approach would lead to higher cost proportionality for all municipalities affected and eliminate the need for creating special bypass solutions (e. g. in the Avedøre Holme case). Disadvantages might be seen in the likely resistance from the municipalities that will have to pay more than before which might also result in a potential decrease of the bus service level.

4. New voting rights for stakeholders involved

One of the major problem areas of the current bus funding model is to be seen in the large number of stakeholders. In order to allow for faster decision making we are opting for leaner decision structures by establishing new voting rights. These would apply only to bus lines crossing at least three municipalities and that are not considered regional lines. Intra-municipal service does not require any voting rights and inter-municipal bus service should be left to discuss between the municipalities affected. The recommended alternative is a 66 % majority vote applicable from 3 municipalities. A 50 % majority vote does not necessarily reflect the common welfare of the municipalities affected, a 75 % majority vote is still rather close to the 100 % majority vote as it exists right now. This option would lead to faster decision making as no change can be blocked by one (or a few) municipalities only. Counterargument might be the likely resistance among the municipalities who have to give up their veto right.

5. Municipal cooperations

Another way of tackling the problem of the large number of stakeholders is the establishment of municipal cooperations. Ideally these would be built around common transport interests with as few interconnections between the cooperations as possible. Our suggestion would be to identify 7 to 10 municipal cooperations replacing the 45 municipalities as stakeholders. As option 4, this would lead to faster decision making while putting a stronger focus on the common welfare. The risks involved include a lower degree of responsibility on the local level potentially creating resistance from the municipalities.

6. Reallocation of line bundle costs

Currently, the line bundle costs are allocated to the single bus lines using the bus hours only as a distribution key. To raise the level of cost proportionality we suggest a more differentiated approach. The contracts with bus operators tendered out by Movia contain three cost elements:

1. Fixed depot cost (per contract)
2. Semi-variable costs (per vehicle)
3. Variable cost (per bus hour)

The main principle behind our suggestion is to use the cost proportionality created by the tender structure itself for the cost reallocation of the contract cost later on. Thus, half of the depot costs we would allocate using the bus hours (as before), the other half would then be allocated using the number of vehicles used for that specific bus line. This mix seems appropriate looking at the intransparent bid design of the different bus operators. The semi-variable cost should be allocated as in the tender itself using the number of vehicles used. The fully variable cost would be allocated as before using the bus hours themselves, again as in the tender itself. The advantage of this option lies quite clearly in the increased cost proportionality while increasing the administrative allocation effort only slightly.

The difference this changed approach can make is described in the following figure 14. Here a line bundle of two lines is regarded demonstrating that the current bus funding model results in cross-subsidisation between bus lines which contort the actual cost of these bus lines. While currently the cost between bus line A and B are split using the bus hours resulting in equal shares, our approach would put 2/3 of the vehicle cost on bus line A and only 1/3 on bus line B resulting in quite a different share of costs in comparison to the current model.

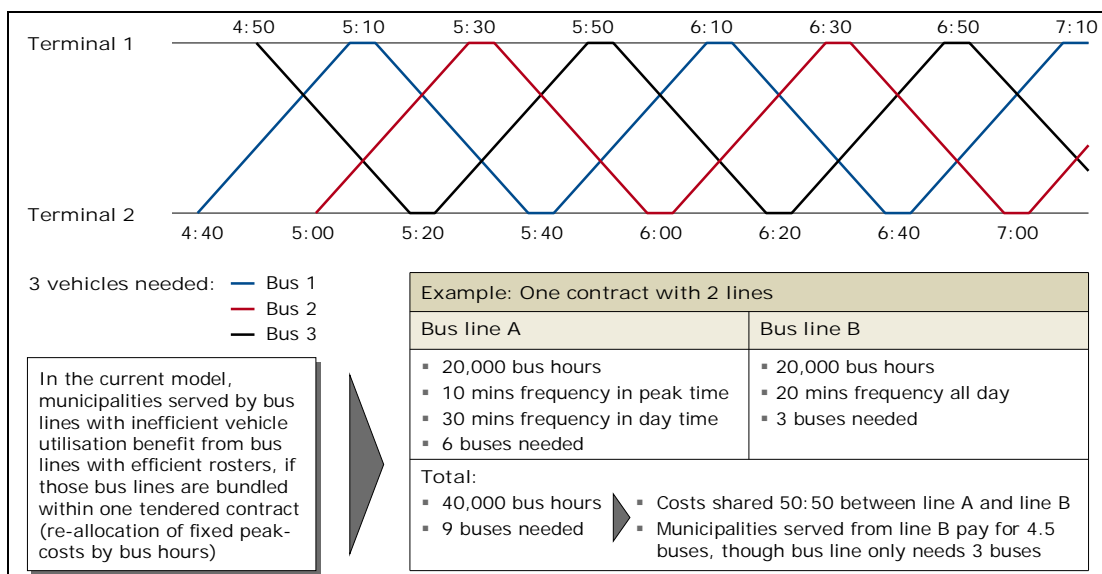


Figure 14: Example of sharing line bundle costs

7. Line segment costing

The current bus funding model uses the entire bus line as the object for deficit sharing, thereby averaging out cost differences between line segments. In contrast, we suggest to establish line segment costing which will cut bus lines into line segments using the municipal borders as cut-off points. This will allow line segment specific cost calculation resulting in higher cost proportionality for the municipalities. This option admittedly increases the calculation considerably as the calculation needs to take place on the line segment level instead of the entire bus line as before. Another risk lies within the potential cutting of services for those line segments which will have to carry higher deficits than before. We nevertheless consider this a feasible and desirable option taking into account the by far more accurate cost information about the bus line segments. This is also true for the case that this information is generated, yet not used for deficit sharing.

8. Allocation of administrative costs (Movia)

Another measure for increasing cost proportionality is the allocation of the administrative costs of Movia to the bus lines themselves. This would for the first time show the entire bus line cost including the overhead needed to provide these services creating a closer connection between administrative services asked for by the municipalities and funds to be paid to Movia for those services. As in the present the administrative cost are covered by the region, there is a potential for either shifting these funds to the municipalities (or municipal cooperations) or alternatively using these funds for financing more regional lines. The direct relation between planning effort and costs inflicted might lead to a planning deadlock as municipalities could abandon changing bus services altogether. In this case, the coverage of the residual cost at Movia would need to be taken care of.

9. New deficit sharing scheme

We have identified two alternatives to using the commuting data to reflect the actual usage:

Alternative I

Discontinue using passenger numbers (of any kind) altogether and sharing the deficit solely on the bus hours used in each municipality ("The more bus services you get, the more you pay."). This alternative is simple and transparent, yet neglects the differences between intra-municipal and cross-municipal services.

Alternative II

Replacing the commuting data with actual passenger related numbers (number of boarding and/or passenger kilometres), yet staying with the bus hours as the first and principle allocation key. As a result, municipali-

ties with high passenger numbers get to bear lower deficit shares whereas those with low passenger numbers bear higher deficit shares. This alternative is fair according to the main factor causing deficits (which is the passenger numbers) and might lead to an increase of service level in the municipalities with already high passenger numbers as these get to pay lower deficit shares than before. On the other hand, this alternative might lead to service cancellation in those municipalities which would have to bear a higher share of the costs.

10. Central funding of additional traffic

Assuming the status quo as a satisfying solution for the level of bus services, the current deficit sharing could be frozen and remain unchanged. Only additional services would require new funding schemes. Ideally these would be funded centrally in order to avoid new discussions with and among the municipalities. This option is clearly a "political" option and requires the willingness to invest more funds by the central government. It would definitely decrease alignment efforts and abolish the deadlock of the current system, yet require clear criteria for the new services.

When looking at the ten options we then investigated whether and which of these could be combined. The answer to this question is rather short: except the "political" option 10 all other nine options can be independently combined, but they intensify their effects when being combined. Only one remark is to be made: when applying option 4 – New voting rights the option 3 – "No stop no pay" is a prerequisite. Otherwise the 66 % majority vote could overrule option 3.

To complete the alternative funding models we measured the ten identified options against the requirements of the interviewees. The result is shown in the following figure 15.

| | | Fairness | Transparency | Simplicity | Target orientation | | |
|----|------------------------------------|----------|--------------|------------|----------------------|----------------------------|-------------------------------------|
| | | | | | Increased efficiency | Improving public transport | Incentives for customer orientation |
| 1 | Clear definition local/regional | + | + | 0 | + | + | + |
| 2 | Reallocation of local feeders | + | + | - | + | + | + |
| 3 | "No stop no pay" | + | + | + | 0 | 0 | 0 |
| 4 | New voting rights | - | + | + | + | 0 | 0 |
| 5 | Municipal cooperations | 0 | 0 | + | + | + | + |
| 6 | Reallocation of line bundle costs | + | + | 0 | + | 0 | + |
| 7 | Line segment costing | + | + | - | + | 0 | 0 |
| 8 | Allocation of admin cost | + | + | - | + | 0 | + |
| 9 | New deficit sharing scheme | + | + | + / 0 | + | 0 | + |
| 10 | Central funding additional traffic | 0 | - | + | 0 | + | + |

Figure 15: Evaluation of options with interviewees' requirements

The options presented here prove to be helpful when looking at the special cases. The following figures 16 and 17 describe in detail which options could be applied to solve or at least mitigate the special cases.

| Special case | Helpful options | Remarks |
|---------------|---|--|
| Avedøre Holme | <ul style="list-style-type: none"> ▪ Clear definition local/regional ▪ Reallocation of local feeders ▪ New voting rights ▪ Municipal cooperations ▪ Line segment costing ▪ Allocation of admin cost ▪ New deficit sharing scheme ▪ Central funding additional traffic | <ul style="list-style-type: none"> ▪ Instant solution if line were defined as regional ▪ When feeder service of regional importance ▪ Faster and easier decision-making ▪ Instant solution, when area is a municipal cooperation¹⁾ ▪ When service extension is of only local importance ▪ Cost consciousness might reduce discussions needed ▪ Might lead to different results depending on specific shares ▪ In future cases |
| Bus line 382E | <ul style="list-style-type: none"> ▪ Clear definition local/regional ▪ "No stop no pay" ▪ Municipal cooperations ▪ Line segment costing ▪ New deficit sharing scheme | <ul style="list-style-type: none"> ▪ Instant solution if line were defined as regional ▪ Instant solution ▪ Instant solution, when area is a municipal cooperation¹⁾ ▪ When no/low deficit is allocated to middle line segment ▪ When no/low deficit is allocated to middle line segment |

1) Otherwise at least faster and easier decision-making

Figure 16: Effects of identified options on special cases – 1 of 2

| Special case | Helpful options | Remarks |
|-------------------------|---|---|
| Bus lines 308 / 309 | <ul style="list-style-type: none"> ▪ Clear definition local/regional ▪ Central funding additional traffic | <ul style="list-style-type: none"> ▪ Instant solution if line were defined as entirely regional or local ▪ In future cases |
| Dragør | <ul style="list-style-type: none"> ▪ Clear definition local/regional ▪ Municipal cooperations ▪ Line segment costing ▪ Central funding additional traffic | <ul style="list-style-type: none"> ▪ Instant solution, if line were defined as regional ▪ Instant solution, if Tarnby and Dragør part of one municipal cooperation ▪ Lower deficit allocated to middle line segment in Tarnby ▪ In future cases |
| Frederikssund – Allerød | <ul style="list-style-type: none"> ▪ Municipal cooperations ▪ Line segment costing ▪ Central funding additional traffic | <ul style="list-style-type: none"> ▪ Instant solution, if Frederikssund and Allerød are part of one municipal cooperation ▪ Lower deficit for Allerød ▪ In future cases |

1) Otherwise at least faster and easier decision-making

Figure 17: Effects of identified options on special cases – 2 of 2

2.4 Evaluation and recommendation

First of all, we need to emphasize that any optimisation of the bus funding model depends on the "higher-level" decision about an umbrella organisation which is to be discussed in part 2.

Yet, in any case we recommend implementing option 1 to 9. If a "political" option is favoured, option 10 might be applied.

If the goal is to achieve a higher level of common welfare / service level of public transport and a higher level of cost proportionality at the same time, the only solution is to be found in an umbrella organisation as these two goals are conflicting with one another as described before.

3. Part 2: Interplay between modes

The project was designed in a three-step approach:

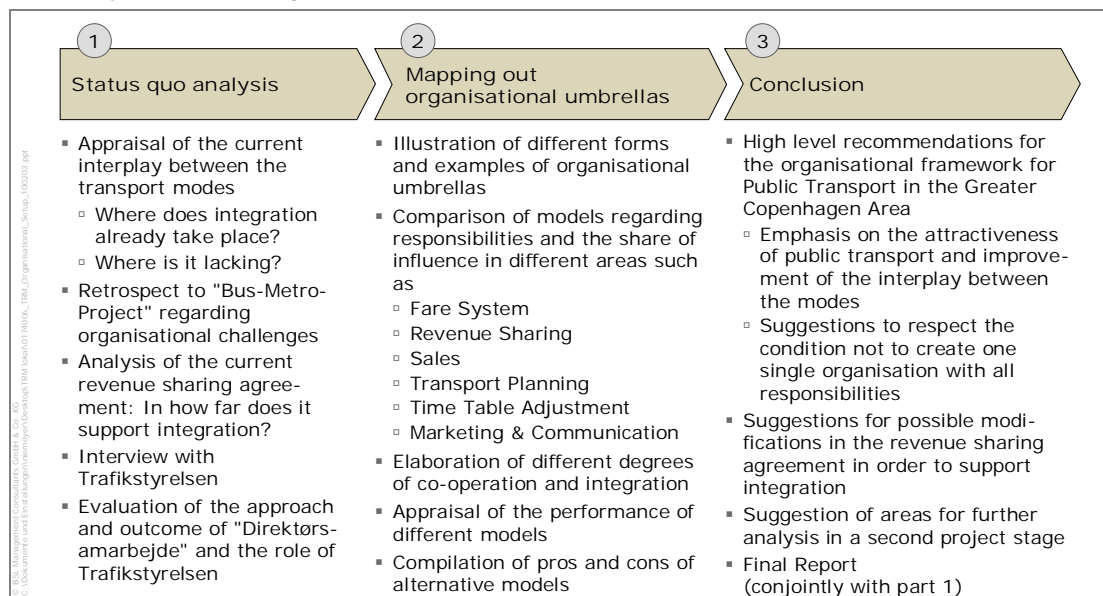


Figure 18: Project approach part 1 – Interplay between transport modes

In the first phase we analysed the present organisational set-up of the interplay between transport modes in the Greater Copenhagen area. The focus was to find out where integration already take places and where it is lacking. To find out about the degree of cooperation we had a look at the work of the "Direktørsamarbejde" and Trafikstyrelsen's role in it. We conducted two interviews, one with Trafikstyrelsen as the coordinating unit within the "Direktørsamarbejde" and one with Movia as representative of one of the transport modes. Another goal was to analyse the current revenue sharing agreement, also administered by Trafikstyrelsen.

The second phase served the purpose of illustrating different forms of organisational umbrella for public transport and elaborating the respective degrees of co-operation and integration as well as their pros and cons.

The third and final phase intended to come up with high level recommendations for an organisational framework for public transport in the Greater Copenhagen Area under the condition not to create one single entity chartered with all tasks at the same time. In addition, we were to look out for possible points of improvement for the current revenue sharing agreement. The last task was a list of suggestions for further analysis in a second stage project as the time frame of this project was too short for an in-depth analysis.

3.1 Status quo analysis

For the interplay between modes we conducted two interviews on January 20th:

1. Trafikstyrelsen
2. Movia

So we only spoke to some of the players relevant for providing and coordinating public transport in the Greater Copenhagen Area which are combined in the so-called "Direktørsamarbejde". We would have liked to also have interviews with the other members Metroselskabet, DSB Regional Train and DSB S-Train, but in order to stick to the ambitious schedule weren't able to do so.

The members of "Direktørsamarbejde" stem from different levels in the public transport structure, the levels being the political level, coordination level and operation level. Whereas Movia is clearly solely active on the coordination level as coordinating unit for bus services, Trafikstyrelsen is somewhere between the political level in their function as public transport authority and coordinating unit. Metroselskabet, DSB Regional Train and DSB S-Train also have operative tasks (to a slightly different degree) so they are situated between coordination and operation level. The present organisational set-up is shown in figure 19:

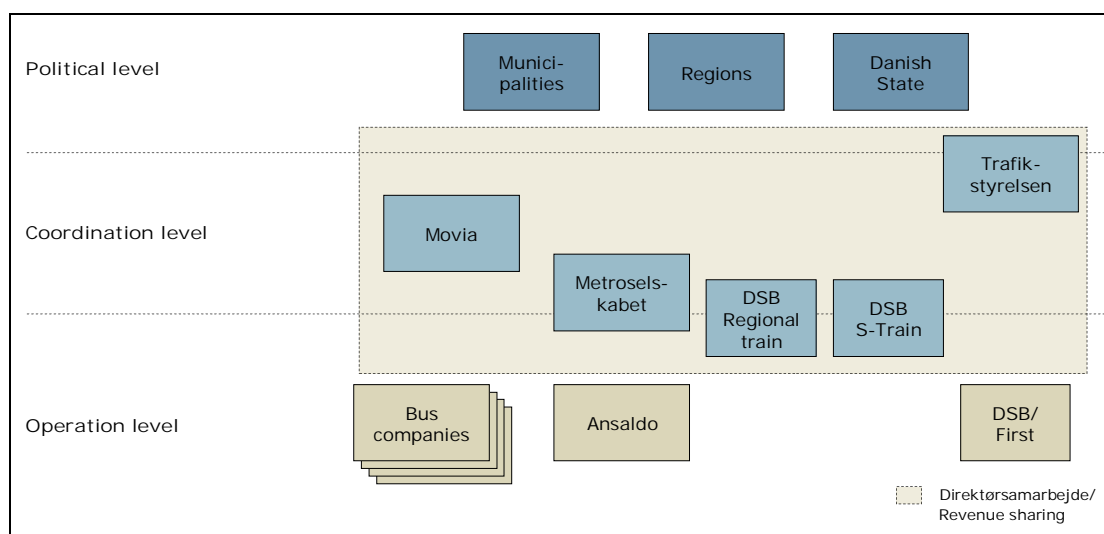


Figure 19: Overview public transport structure

The "Direktørsamarbejde" is coordinated by Trafikstyrelsen who is at the same time responsible for the administration of the common revenue sharing agreements between the members of the "Direktørsamarbejde". Yet, these two tasks are only two of the many tasks that Trafikstyrelsen is chartered with (see figure 20):

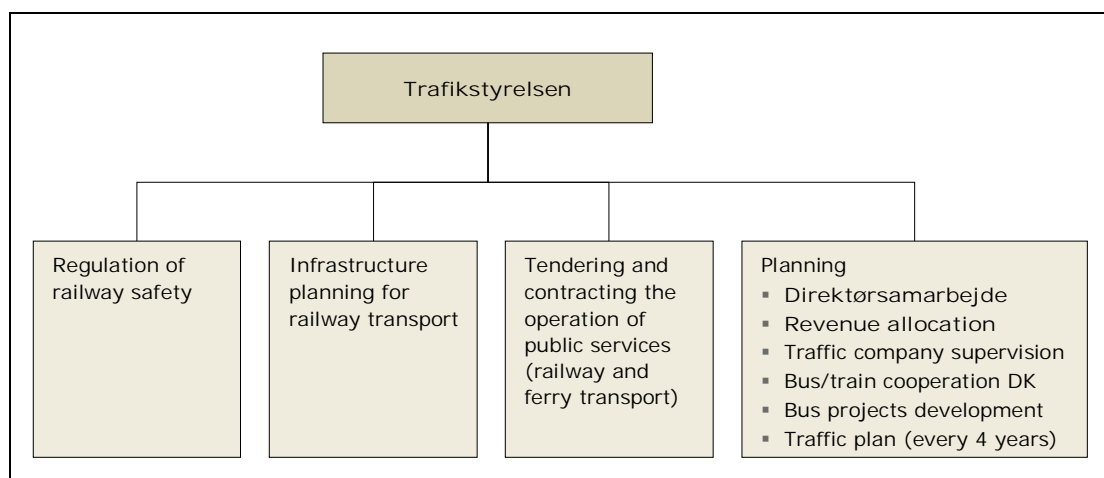


Figure 20: Overview tasks Trafikstyrelsen

Trafikstyrelsen has not been assigned with any formal power for the coordination of the "Direktørsamarbejde", so alignment can only be achieved by unanimity. The administration of the revenue sharing agreement on the other hand is entirely done by Trafikstyrelsen on behalf of all members of "Direktørsamarbejde".

The revenue sharing model calculates the trip revenue for 35 different transport combinations. All the fare box revenues are shared using this mechanism. There are two main data sources for it:

1. Passenger countings
2. Travel survey

The passenger countings are done by the different members themselves and are transformed by Trafikstyrelsen into revenue generating journeys by deducting children, fare dodgers, staff travels and travels beginning outside of the Greater Copenhagen Area.

The travel survey is done by an external company on behalf of "Direktørsamarbejde" by asking 30.000 passengers for their ticket type, the fare zones travelled and the transport combination used (of which there are 35 possibilities).

Trafikstyrelsen then uses this data to calculate the trip revenue for all 35 combinations and the respective shares of the transport companies for each of these combinations.

The final result is the distribution of the common revenue back to the members of the "Direktørsamarbejde". Figure 21 depicts the revenue sharing model in an overview.

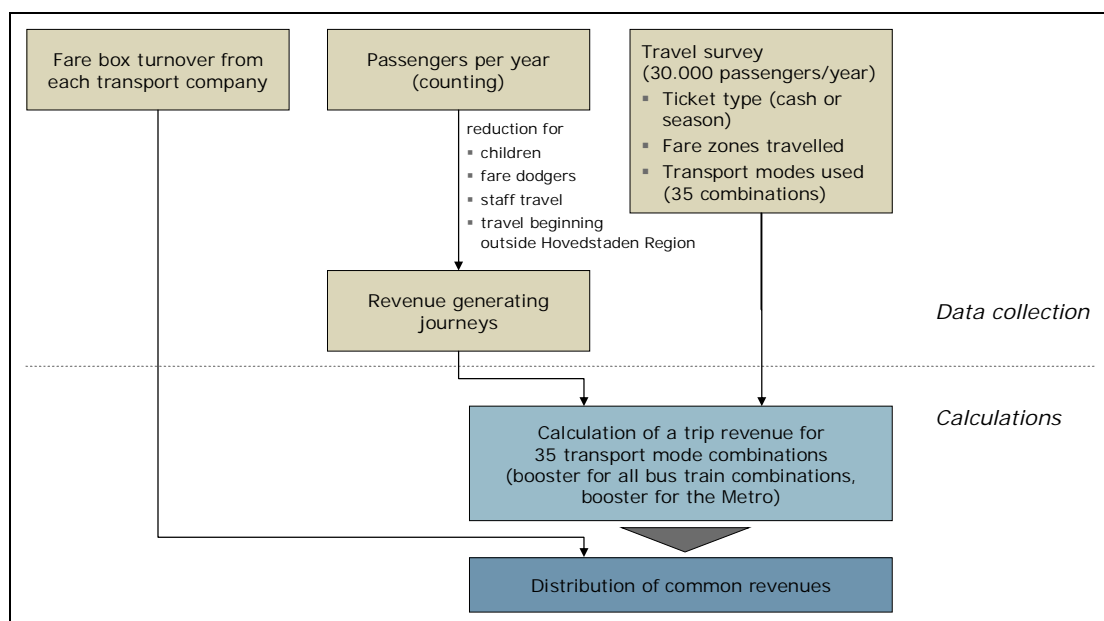


Figure 21: Revenue sharing model

Built into the revenue sharing model are so-called boosters to incentivise certain transport modes. The Metro gets a booster factor of 1.49 meaning that all trip revenues for the metro are multiplied by that factor resulting in a larger share of the common revenues than what would be the case without the booster. Movia gets a booster factor of 1.47 for all feeder services to rail modes with the exception of feeder services to the Metro.

When looking at the relation between combination tickets and solo tickets it becomes apparent that 72.0 % of customers using Movia purchased a solo ticket, whereas this number ranges between 49.9 % and 53.9 % for the rail modes.

On the other hand, the solo ticket revenue in the revenue sharing model amounts to only 10.10 DKK for Movia, but ranges between 16.52 DKK and 23.34 DKK for the rail modes (Metro solo ticket price without the booster being 11.94 DKK, with the booster 17.80 DKK).

The revenue sharing model calculates the ticket shares for each of the transport companies involved in that specific travel combination. We have analysed Movia's share of the combination tickets involving bus travel. As a percentage, these figures make perfect sense. For a solo ticket, Movia of course gets 100.0 % of the trip revenue, for travels with one other transport mode between 36.2 % and 47.3 %, for travels with two other transport modes between 19.7 % and 27.8 % and for travels involving three other transport modes between 13.8 % and 15.2 %. Yet, converting these percentage figures into absolute shares in DKK, the picture changes drastically. Now it suddenly becomes apparent that all combinations involving the Metro yield a considerably lower ticket share than the other combinations in each of the categories (see figure 22 for details).

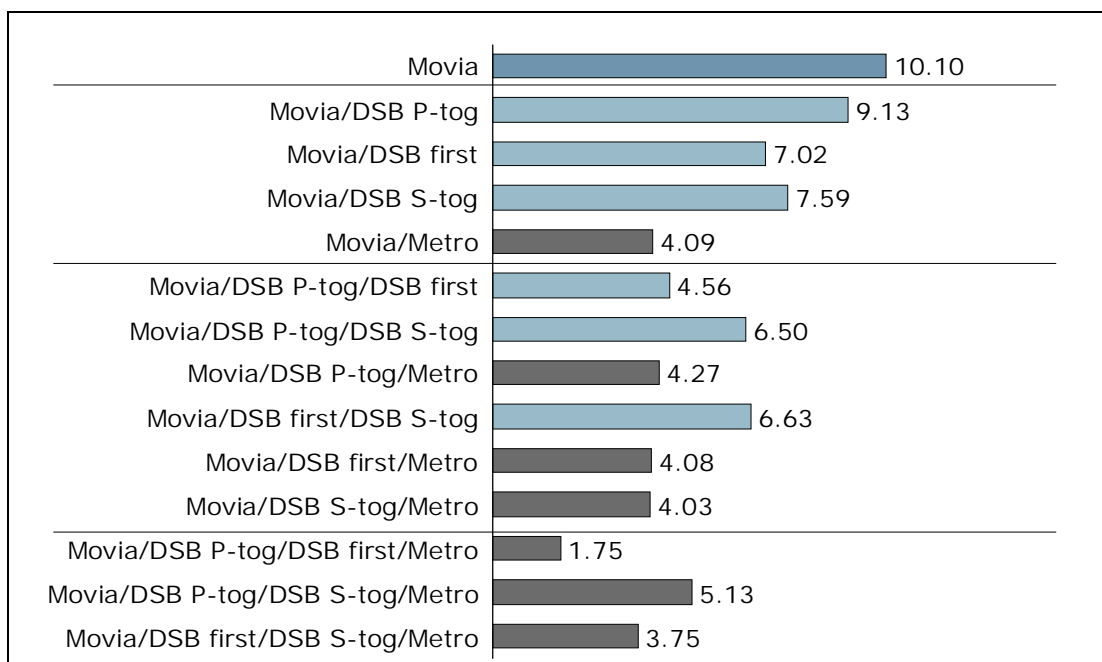


Figure 22: Movia ticket share (in DKK)

To sum up, we have identified four major problem areas with the present organisational set-up for the interplay between transport modes in the Greater Copenhagen Area:

1. "Direktørsamarbejde"
2. Integration of all transport modes
3. Lack of customer orientation
4. Revenue sharing model

As the "Direktørsamarbejde" has no formal power to enforce decisions on its members it doesn't come as a surprise that the only integrated part in the current organisational set-up is the revenue sharing agreement which has some problems of its own. The present structure does not cater to essential customers' needs like a real time information system, common rules for the use of transport modes or one common call centre across all transport modes. The figures 23 to 25 describe the four problem areas in more detail:

Figures 23 to 25: Problem areas with current interplay between modes

| Problem areas | Explanation |
|------------------------------------|---|
| Direktørsamarbejde | <ul style="list-style-type: none"> ▪ The cooperation within Direktørsamarbejde is voluntary and depends on the participants' commitment ▪ Trafikstyrelsen as the responsible institution for the steering of Direktørsamarbejde has no formal power to improve the level of cooperation ▪ Cooperation is lacking e.g. in marketing, loyalty programmes and mutual schedule changes <ul style="list-style-type: none"> ▫ Common marketing is limited to a small number of campaigns, yet there are individual campaigns ▫ No common customer loyalty programme exists, but only some separate ones (Movia, DSB and DSB S-Train) ▫ Schedule changes are not proactively communicated |
| Integration of all transport modes | <ul style="list-style-type: none"> ▪ An integrated planning of public transport supply (e.g. coordinated routing of lines, scheduling, optimisation of interchanges) does not exist |

Figure 23: Problem areas with current interplay between modes 1 of 3

| Problem areas | Explanation |
|------------------------------|--|
| Lack of customer orientation | <ul style="list-style-type: none"> ▪ Today there is no common real-time customer information <ul style="list-style-type: none"> ▫ No information on the spot on other transport modes ▫ No real-time customer information on the internet ▪ No common call-centre or proceeding of customer complaints ▪ Common rules for the use of transport modes do not exist, e.g. <ul style="list-style-type: none"> ▫ Free transport of bicycles (all day/certain times of the day only) ▫ Use of special tickets (for senior citizens) during certain times of the day ▫ Free Sunday travel on S-Train only¹⁾ |

1) Selected Sundays

Figure 24: Problem areas with current interplay between modes 2 of 3

| Problem areas | Explanation |
|-----------------------|---|
| Revenue sharing model | <ul style="list-style-type: none"> ▪ The revenue sharing model does not incentivise or foster bus feeder services to the metro ▪ The companies follow their own economic objectives ▪ DSB S-Train (as an example) uses the possibility to issue separate special tickets that are only valid for a trip on DSB S-Train ▪ After the opening of the Metro and the start of DSBFirst operation on the Kyst-/Øresund-line the revenue sharing became more complex ▪ Since December 2008 Trafikstyrelsen is part of the revenue sharing because of the gross cost contract for the Kyst-/Øresund-line, somewhat contradicting its neutral role as coordinator of the Direktørsamarbejde |

Figure 25: Problem areas with current interplay between modes 3 of 3

To finish with the status quo analysis we would like to point out that all travel companies act professionally and rationally within the current organisational set-up. They are very innovative and creative in attracting customers to their specific transport mode.

So the challenge here lies not so much with the different transport companies themselves, but more with the organisational set-up. The first move towards a higher-integrated and integrating umbrella organisation is clearly expected by the interviewees from the ministry.

3.2 Requirements and challenges

The requirements defined were very clear and concise: Interviewees are looking for an integrated approach with customer focus for the interplay between modes. Integration is to be achieved in order to allow for an improved public transport system. The focus of this optimisation can only be the customer as its final user. So, integration should not take place for the sake of the transport companies themselves, but always for the greater good for the target group of all public transport, the inhabitants of the Greater Copenhagen Area. Figure 26 describes the requirements in more detail:

| Requirements | Description |
|---------------------|--|
| Integrated approach | <ul style="list-style-type: none"> ▪ Common objectives/visions ▪ Higher level of cooperation between travel companies ▪ Integrated planning/coordination ▪ Powerful umbrella necessary |
| Customer focus | <ul style="list-style-type: none"> ▪ Framework encouraging customer orientation ▪ Integrated customer information (real-time) ▪ Common marketing across transport modes ▪ Common loyalty programmes ▪ Common customer care services |

Figure 26: Requirements for interplay between transport modes from interviews

3.3 Alternative organisational set-ups

The umbrella organisation's main task is the coordination of the transport companies to provide consistent public transport services to the customer. It ensures common quality standards, sales system and branding. The transport companies then individually and – within the framework of the umbrella organisation- independently operate their respective transport mode.

Depending on the shareholder structure, umbrella organisations exist in three types:

1. Public authorities umbrella (e. g. Oslo, Zurich, Frankfurt)
2. Traffic companies umbrella (e. g. Rostock)
3. Mixed umbrella (e. g. Stuttgart, Kiel)

In the public authorities umbrella the shareholders come from the political level, in the traffic companies umbrella from the operation level, whereas the mixed umbrella shareholders come both from the political and operation level. The umbrella organisation itself is always situated on the coordination level due to its function as a coordinating unit.

When building an umbrella organisation the first step is two decide on the desired depth of regulation and the allocation of tasks between the three levels (political, coordination and operation). This first step is depicted in figure 27:

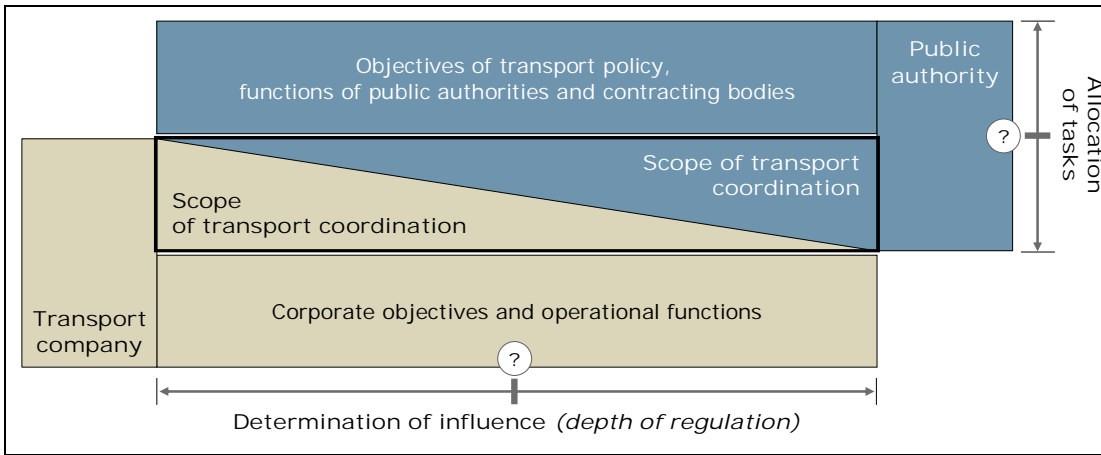


Figure 27: Basis decisions for building an umbrella organisation

When looking at the task allocation we can differentiate three types of tasks:

1. Original public authority tasks
2. Public authority or operator tasks
3. Original operator tasks.

Whereas some of the tasks to be allocated naturally go to public authorities (e. g. strategic planning of transport supply) or to the operators (e. g. the actual operation of transport services), the majority of tasks needs to be allocated to either the public authority on the political level, the operators on the operation level or the umbrella organisation on the coordination level (see figure 28 for details).

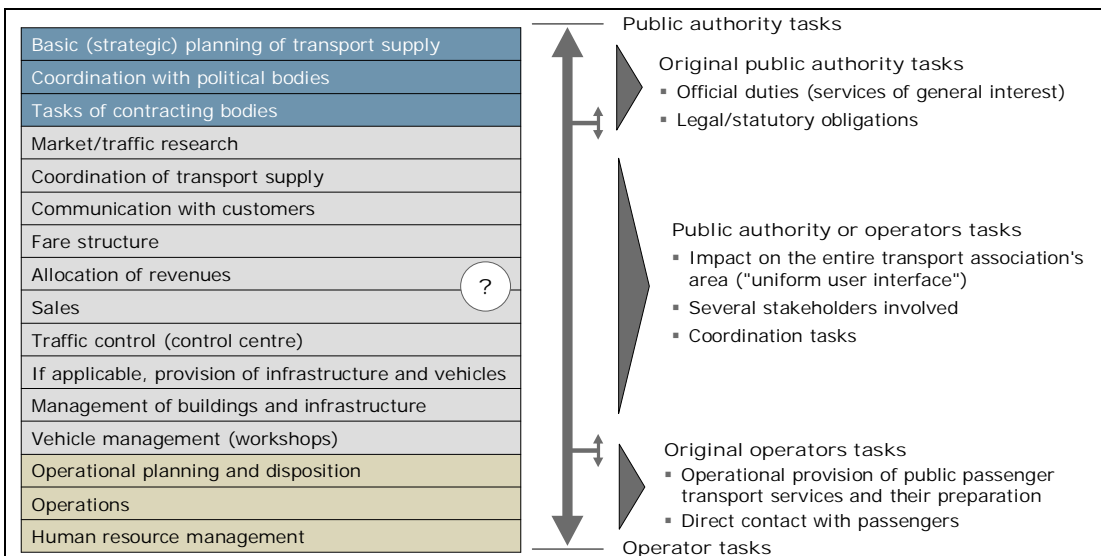


Figure 28: Allocation of tasks

There are not pre-set rules about how to allocate these tasks to the three levels, yet there is a variety of arguments for the public authority to move tasks either to the operation level or leave it with the public authority. Figure 29 describes these arguments in detail. An detailed suggestion for a potential umbrella organisation would make use of these arguments. Due to the short time frame this analysis was not undertaken within this study.

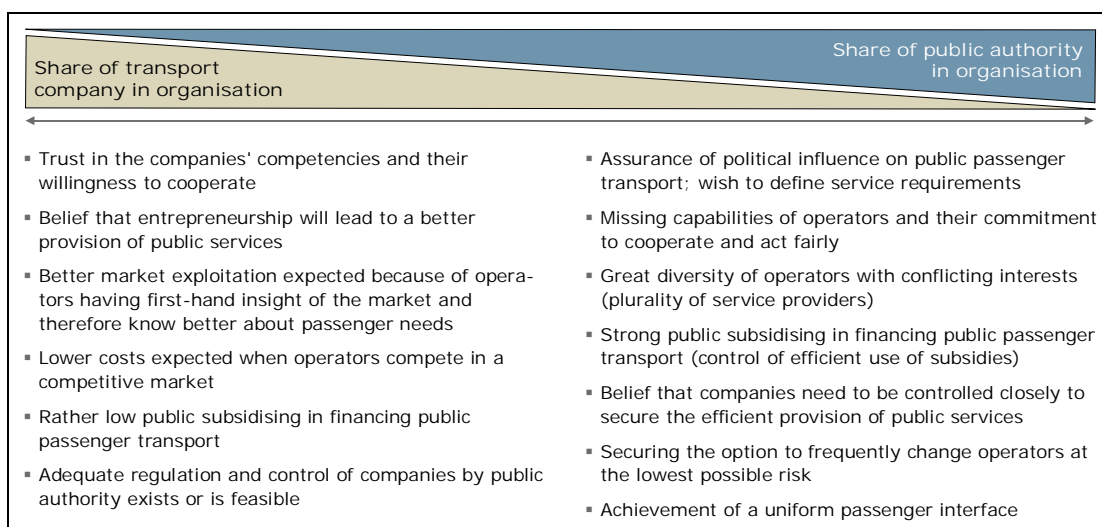


Figure 29: Main arguments for level of regulation

Different cities have taken very different approaches regarding the split of tasks between public authorities and operators (see figure 30).

| | Level of involvement | | Explanation |
|---------------------|--------------------------------|--------------------------------|---|
| | Level of involvement operators | Level of involvement authority | |
| Level of regulation | | | |
| Berlin | ← [] → | | Transport contract provides operators with relative freedom of decision within given boundaries |
| Dublin | ← [] → | | High entrepreneurial freedom for operators, transport authority with objective to improve integration bus, without power to enforce transport operators |
| Frankfurt | ← [] → | | Strong authority unit with significant scope of functions Tendering of all bus and regional train services |
| Hamburg | ← [] → | | Public umbrella organisation responsible for entire public transport, but transport companies provide functions on behalf of public authorities |
| Oslo | ← [] → | | Planning, coordination, promotion and cash management at public authority Tendering of transport services (buses and boats) |
| Stockholm | ← [] → | | Gross contract with incentives Revenue risk with authority |
| Zurich | ← [] → | | Gross contract with incentives Revenue risk with authority, very few services tendered |

Figure 30: European examples for level of regulation

We have taken a closer look at the cities Oslo, Frankfurt and Zurich.

Organisational set-up of public transport in Oslo

Ruter AS in Oslo, Norway, is a good example of a strong public transport authority with extensive competencies in the coordination across all transport modes. The following figure 31 illustrates the structure of the market organisation in Oslo:

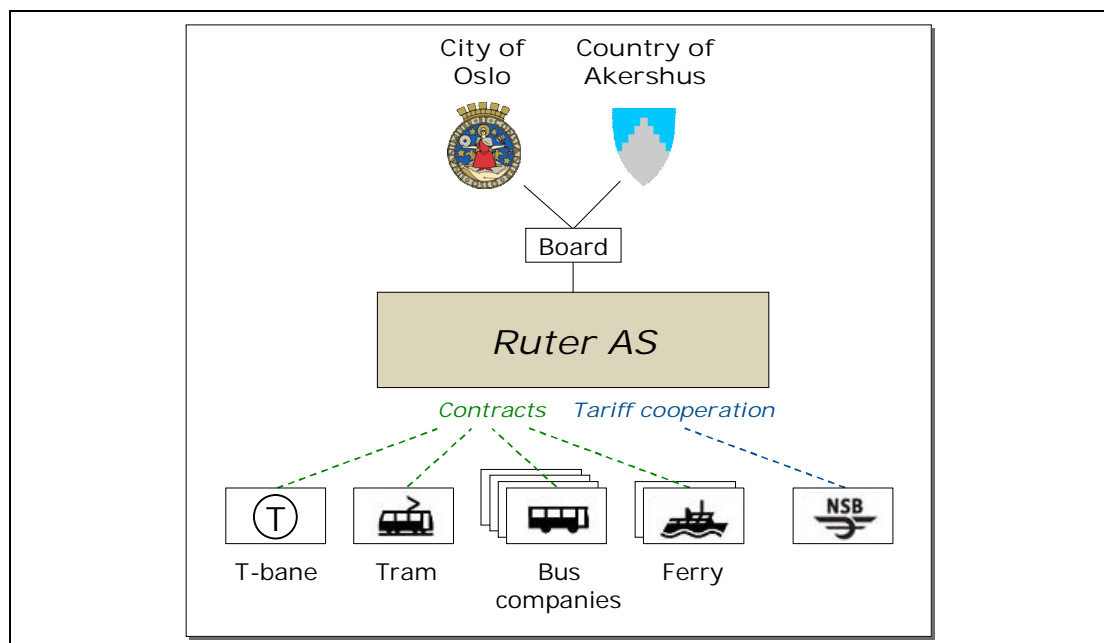


Figure 31: Organisational set-up of public transport in Oslo

Ruter is an umbrella organisation across all transport modes in Oslo. It is fully owned by public authorities. A 60% share is held by Oslo and a 40% share is held by Arhus County, thus integrating both local and regional transport. Ruter AS singlehandedly plans, coordinates and promotes public transport and moreover, manages all cash flows in the system. The operation of public transport is tendered out via competitive bidding.

This centralised organisation is ideally geared towards a comprehensive public transport system, which is fully integrated and provides good value for public money. Public transport management is lean and efficient with only one player integrating all relevant tasks. Competition among the operators facilitates low prices, while at the same time Ruter has been assigned sufficient authority to ensure quality by drafting and controlling transport contracts.

Organisational set-up of public transport in Frankfurt

In Frankfurt, Germany, the city has established a public transport authority traffiQ with the goal to foster competition. Traditionally, the city of Frankfurt owns a pub-

lic transport company VGF which used to provide all traffic operations in Frankfurt. TraffiQ was founded as a first step into the direction of competition by enabling the tendering of busses. Thus, the market organisation is an example of public transport in a transitioning phase between state-owned operations and competition. The following figure 32 shows this new set-up.

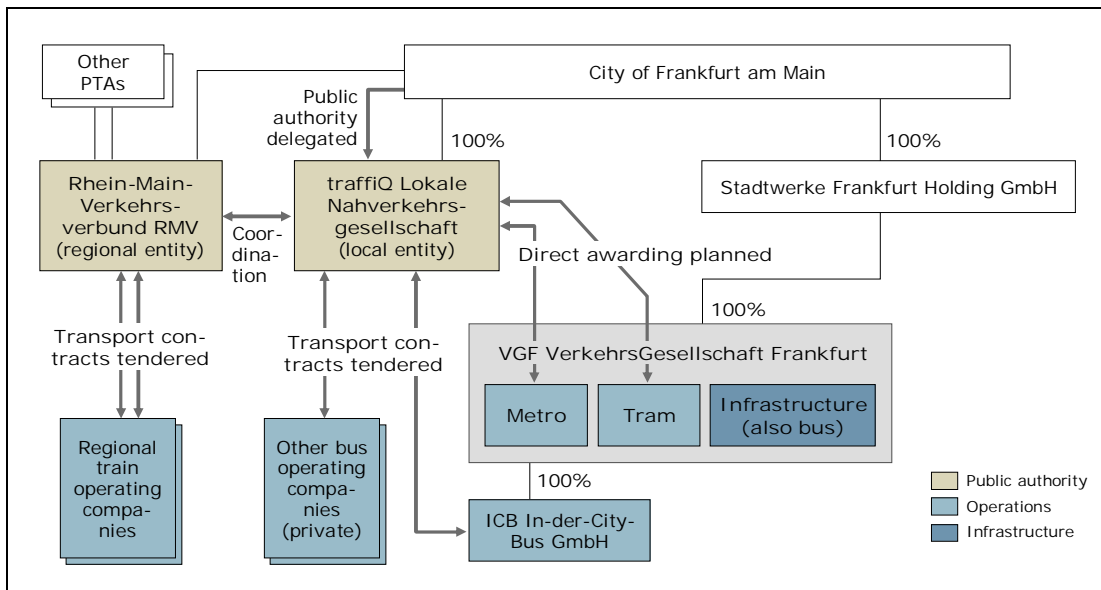


Figure 32: Organisational set-up of public transport in Frankfurt

The overall market organisation is rather complex: There are two public authorities, the regional authority RMV and the local authority traffiQ, with responsibilities in tendering public transport. Both authorities have responsibilities in planning, funding, tendering and controlling public transport as well a strategic marketing. Beside these authorities there is a strong publicly owned company: the former monopolist VGF. Metro, tram and parts of the bus infrastructure are all still owned and maintained by VGF. Competition is only enforced in the bus transport, rail bound traffic is directly awarded. This leaves the strong position of VGF within the market organisation to a large extent intact. However, in comparison with the former set-up competition has already triggered VGF to form a competitive bus subsidiary.

For Copenhagen this model leaves little to learn. This set-up has been developed very much based on the status quo of having a publicly owned monopolist. The new market model with traffiQ has many players, interfaces and overlapping realms of interest. Decision processes take long in order to take into account the many parties involved. TraffiQ is primarily a model for cities that find themselves in a similar initial situation and is not readily transferable to Copenhagen.

Organisational set-up of public transport in Zurich

The Zürich Verkehrsverbund (ZVV) in Zürich, Switzerland, is a model of a successful integrated market organisation with strong transport companies. Despite having a public umbrella organisation for the public transport with competencies in marketing, transport planning and financing, the main task of transport coordination and supply planning is in the hand of eight so-called "Market responsible transport operators" as shown in the following figure 33.

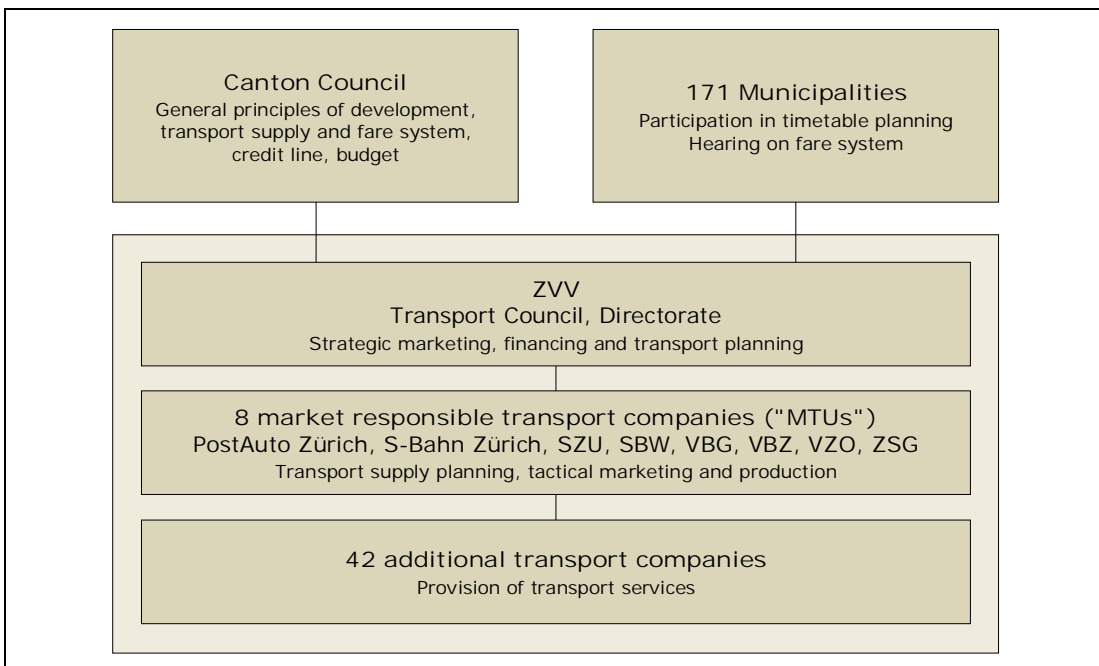


Figure 33: Organisational set-up of public transport in Zurich

The ZVV is the traffic association of the Canton Zürich and 171 municipalities, thus representing a high number of public authorities. Its responsibilities include marketing the overall association and mobility offer. On a strategic level it is involved with transport and infrastructure planning. It organises the funding of the companies. However, on a tactical level liberties are given to 8 regional transport companies to both coordinate and provide transport operations. Successfully, they ensure both the promotion of public transport and a high level of quality. In return all public transport is directly awarded to these companies, which can then choose to tender to other smaller public transport companies.

Again, the market organisation can only be evaluated against the background of the status quo in Zürich. First, there is a high level of acceptance for public transport among the citizens of Zürich. Public transport is growing. Second, there is a comfortable amount of money in the system and little pressure to introduce competition. Third, this market organisation relies on the fact that there are eight

companies that coordinate and cooperate efficiently and provide high quality services at reasonable prices. Would these companies fail to work together out of their own interest to secure direct awarding, the system as a whole would fail. From our perspective these three prerequisites are not given in Copenhagen, which is why we believe the market model is not readily transferable.

Summary on umbrella organisations

From the experience with umbrella organisations in Germany ("Verkehrsverbund") we can see that there is something like a roadmap for the development of umbrella organisations. It usually starts with an integrated fare system in the form of a fare alliance, continues to grow into a transport alliance with common planning of transport supply, then adding common marketing and passenger information and as the last step introducing coordination of sales. The last two steps mostly are already organised using an umbrella organisation.

The introduction of umbrella organisations after regionalisation in Germany in 1996 has yielded impressive results. The transport km increased by 14 %, the passengers carried by 20 % and the fare revenue by 35 % (all numbers referring to 1996 – 2008). The passenger numbers of umbrella organisations in Germany have grown steadily over the years: RMV (Greater Frankfurt Area) by 1 % annually, VRR (Rhine Area) by 3 % annually and MVV (Greater Munich Area) by 2 % annually.

To sum up, the necessary decision steps for organising a public transport system are:

1. Desired degree of regulation
2. Allocation of coordinative and administrative tasks between operations and public transport authorities
3. Internal organisation of administrative units within public transport authority (umbrella organisation)
4. Establishment of control mechanisms between public entities, public authorities and operators.

3.4 Evaluation and recommendation

We start our recommendations with the revenue sharing agreement and will then suggest two options for an alternative organisational set-up for public transport in the Greater Copenhagen Area.

Revenue sharing agreement

The revenue sharing agreement is rather good from our point of view with the exception of the missing booster for bus feeder services to the Metro. The current model builds upon reliable and trusted input data and represents an established, coordinated and working system. There are some legal issues pending, but they are not impeding its proper functioning. The model allows a high degree of flexibility about what to incentivise. These possibilities will be further enlarged with the introduction of the travel card. Within this very area incentives we have identified the one area of improvement for the model itself. We would advocate to apply the booster for Movia also for feeder services to the Metro. This would largely even out the disadvantage Movia presently faces when offering bus feeder services to the Metro as can be seen in figure 34.

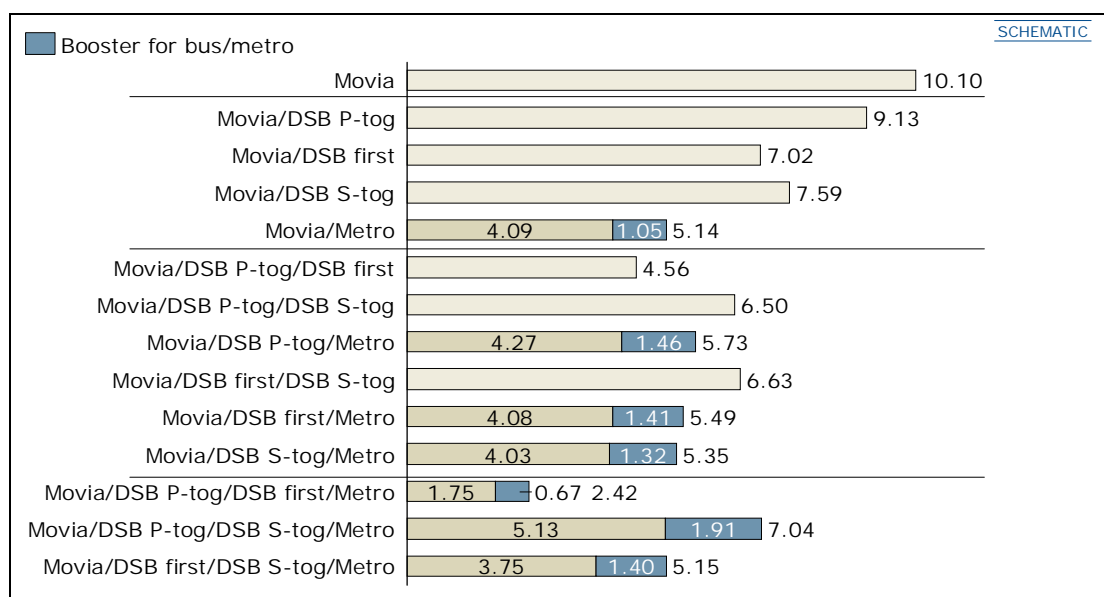


Figure 34: Movia ticket share (in DKK) – with booster applied also for Metro

Furthermore, Trafikstyrelsen's double role as administrator of revenue sharing as well as recipient of revenue should be clearly split to ensure neutrality and objectivity towards the other transport companies.

In any case, the problem of companies following their own economic objectives cannot be solved within the realm of the revenue sharing model, but only within an umbrella organisation.

Umbrella organisation

We have identified two options for an alternative set-up of the public transport system in the Greater Copenhagen Area:

1. "Transport for Greater Copenhagen" (TGC) - light version
2. "Transport for Greater Copenhagen" (TGC) – full version

"Transport for Greater Copenhagen" (TGC) – light version

In the first option Movia, Metro and Trafikstyrelsen together constitute the coordination level. The major change to the status quo is combining all rail services except Metro into one authority. Until the contracts for DSB Regional train and DSB S-Train are to be renewed, Trafikstyrelsen could act as an interim holder of that position. Yet we would recommend to separate this part of Trafikstyrelsen from its other many tasks in any case. The umbrella organisation "Transport of Greater Copenhagen" (TGC) is comprised of the coordination level and is responsible for revenue sharing, long term transport planning, design of overall passenger information system (PIS) and marketing and communication. The operators on the operation level would be chartered with short term transport planning, the feeding of the PIS and the implementation of marketing and communication within the framework from TGC. Figure 35 depicts the overall set-up of the light version of TGC:

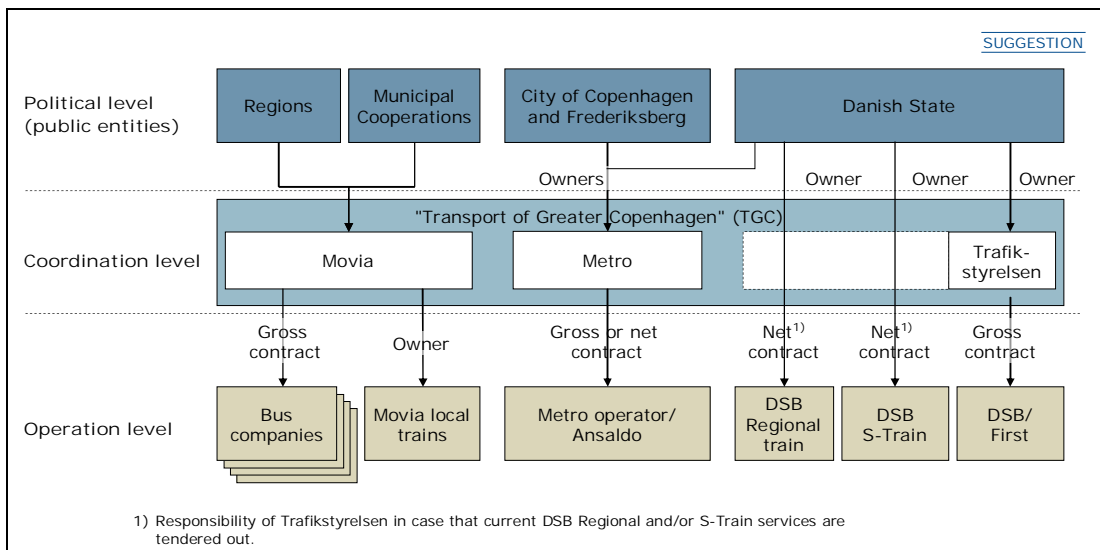


Figure 35: Overview "Transport for Greater Copenhagen" – light version

"Transport for Greater Copenhagen" (TGC) – full version

In the second version of "Transport for Greater Copenhagen" the umbrella organisation itself is the only organisational entity on the coordination level, directly interacting with the transport companies on the operation level. The task sharing between TGC and the operators would be somewhat different. In addition to the tasks attributed to TGC in the light version already, TGC in the full version would additionally be responsible for short term planning, a common sales system in-

cluding unified customer care, tendering of services and quality control. Whether these tasks would then be executed by TGC itself or by other entities on TGC's behalf leaves to be decided later on.

When deciding for the full version we advocate attributing a minor share for Sjaelland to represent interests for Køge and Røskilde catchment areas and for interfacing with commuter traffic into Copenhagen.

The net contract between TRM and DSB should be kept as long as current contracts are still valid.

Trafikstyrelsen's role in the public transport system would be taken over by TGC itself in the full version.

Figure 36 depicts the overall set-up of the full version of TGC:

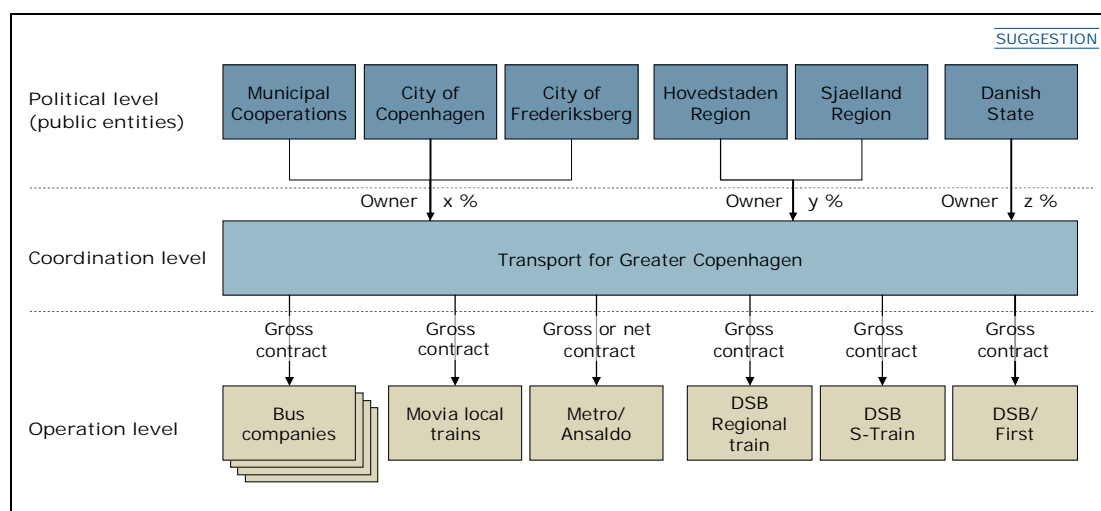


Figure 36: Overview "Transport for Greater Copenhagen" – full version

In both versions we recommend using gross contracts on principle as only this contract type is likely to stop the "tunnel vision" of separate organisations thus allowing for a common welfare perspective. Our previous project experience tells us that whenever transport companies keep the full revenue responsibility – and therefore the full revenue risk – egoistic and opportunistic behaviour is a probable – and completely rational – outcome. This could also be observed in the status quo analysis of the present set-up in the Greater Copenhagen Area. Yet, in order to counteract the potential quality problems with gross contracts, an appropriate incentive model needs to be included.

The one exception to this rule might be considered for the Metro, as not all shareholders, that is the municipalities not connected to the Metro, benefit from its services. Therefore the revenue risk might be excluded from the revenue sharing agreement between the shareholders either by using a net contract or by another

special arrangement keeping the revenue risk within the circle of beneficiaries of Metro services. The latter alternative seems preferable as it would abolish the need for any revenue sharing agreement altogether while allowing for a high degree of flexibility when dealing with a potential revenue risk from the Metro.

All gross contracts should possess incentives for high quality service provision and increasing passenger numbers to stimulate improvements also by the operators themselves.

Recommended option for improving the public transport system

We consider it preferable to introduce the somewhat more radical option 2: the full version of "Transport for Greater Copenhagen" (TGC). It seems unlikely that the cooperation already organisationally possible today within the "Direktør-samarbejde" will suddenly change in a positive direction simply by introducing option 1 as the light version still depends on a certain level of willingness on the part of the transport companies. Plus, as option 1 still uses three entities on the coordination level, more energy will be directed to internal issues between these three than focusing all efforts on the customers of TGC. Furthermore, the power and influence of the transport companies active today are not equally distributed, so power gaming might continue even when implementing the light version of TGC. But especially the "tunnel vision" of the transport companies, thinking of "their" customers instead of customers of the public transport system lets us promote the full version more than the light one.

Internal organisation of "Transport of Greater Copenhagen" (TGC)

Regardless of which option is to be introduced, the internal organisation of TGC itself is a key success factor to achieve the goal of more efficient and more attractive public transport. Three elements seem essential in this regard:

1. Staffing of TGC should predominantly draw upon the current employees of Movia, Metro, DSB and Trafikstyrelsen in order to avoid loss of know-how and to gain political acceptance.
2. Some of TGC's functions can be kept in current organisations and be executed on TGC's behalf in order to avoid synergy losses with services outside of Greater Copenhagen area and again to gain political acceptance.
3. The departments within TGC should be organised by function, not by transport mode in order to avoid a reiteration of "tunnel vision" thus leading to the highest possible degree of cooperation and integration.

Umbrella organisation and bus funding model

Coming back to the question how to improve the current bus funding model we would like to point out that also with an umbrella organisation municipal funding

and service levels need to be related with one another. Thus, a fair, simple, transparent and target-oriented bus funding model is still essential.

And even when building the umbrella organisation we recommend to implement certain options identified in the analysis of the bus funding model (see figure 37).

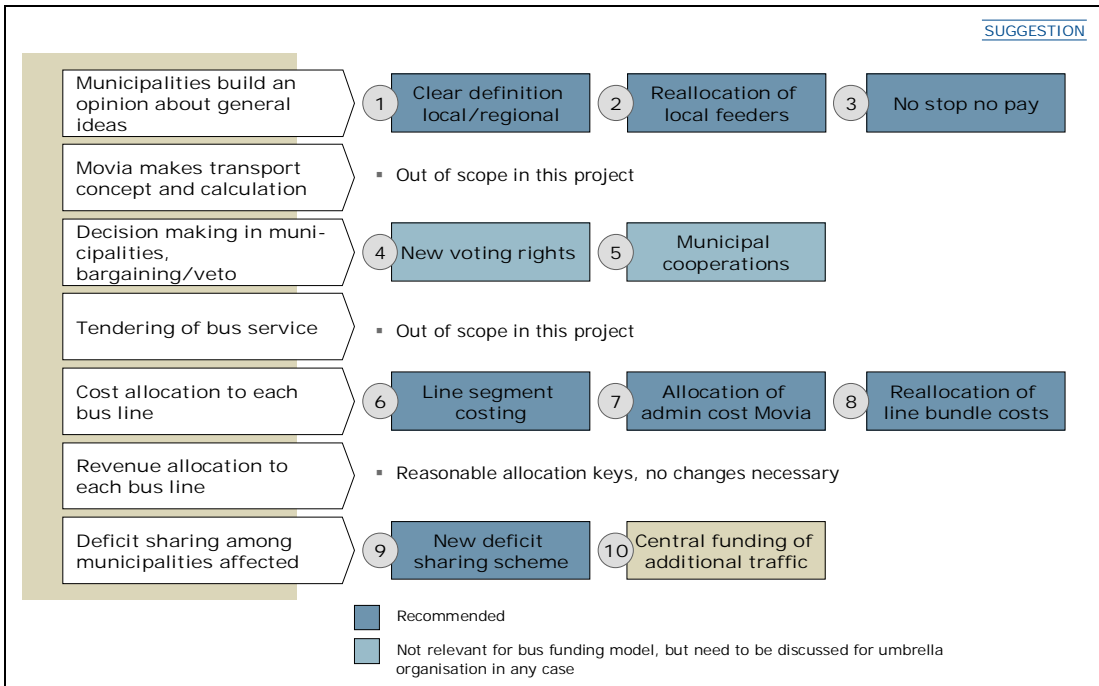


Figure 37: Umbrella organisation and bus funding model

4. Outlook

As a follow up certain political decisions need to be taken in order to move ahead with improving the public transport system in the Greater Copenhagen Area:

- Derivation of quantified objectives for Greater Copenhagen area from Danish "green transport policy"
- Decision on desired level of local responsibility
- Decision on desired level of common welfare / overall service level for public transport
- Decision on desired level of cost proportionality

When deciding to build an umbrella organisation for the Greater Copenhagen Area a certain set of elements requires further investigation: strategy, organisation, financing, decision making and legal design. The details are outlined in the following figure 38:

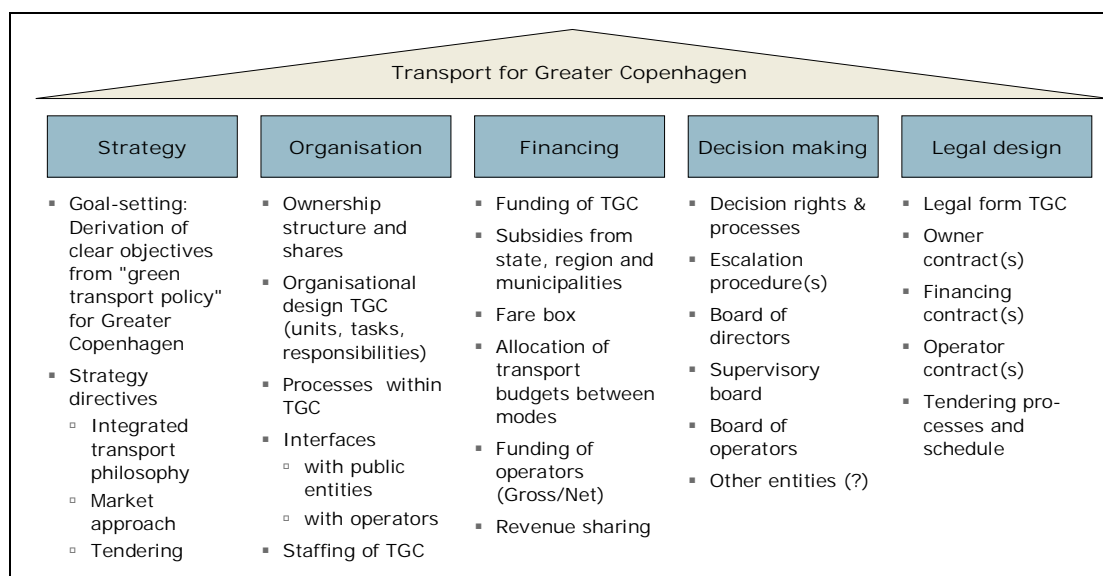


Figure 38: Elements of umbrella organisation in Greater Copenhagen

Final Remarks

We would like to express our thanks to our client, the Danish Transport Ministry, for the cooperation.

Furthermore, we would like to thank our interview partners at Movia, Municipality of Copenhagen, KL, Vestegnssamarbejde, Danske Regioner, Hovedstaden Region and Trafikstyrelsen for their contribution to our work by providing essential data and insights.

Hamburg, Berlin, Copenhagen, March 8th 2009

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