STAGGERED SCHOOL HOURS TO SPREAD PEAK DEMAND FOR PUBLIC TRANSPORT – BENEFITS AND COSTS

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PROBLEM, PURPOSE AND PLAN OF THE STUDY

Staggered working-hours has been studied earlier in different places of the world in order to level out peak demand both on roads and in public transport.1 This study looks at public transport, and takes Linköping, a town in Sweden of 120 000 inhabitants in the built up area, as a case study. The public transport system in Linköping consists of buses on different lines transporting 7 million passengers each year. It is tax-financed to 53%.

In Sweden school-trips of a certain length are financed by the municipalities. These trips are made by school-buses in the country-side and by the regular public-transport system in town. Pupils living further away than 6 kilometres from their school receive a "school-card" financed by the municipality.

School children in the nine-year compulsory school living in the built-up area of the municipality of Linköping mainly attend schools nearby their homes. However, high-school (upper secondary school) pupils have a longer way to school, and many of them go by bus (at least in wintertime) even if they have to pay themselves. There are five large high-schools in Linköping taking 85% of the high-school pupils, which are included in this study.

A large share of bus-passengers in peak hours in Linköping consists of pupils on their way to and from school. According to statistics from the municipality of Linköping, 13% of all passengers on the regular bus lines in 2006, were passengers travelling with a school-card, and during peak hours as many as 20%. Staggered school hours would reduce demand in the most busy peak period, and save costs, or leave space for other peak passengers. This should improve public transport performance, and increase total demand or reduce total bus traffic costs.

The purpose of this study is to investigate the possibility of changing the start and end of the school day in Linköping, and to consider the welfare consequences as well as the financial result of the change.

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[1] Walshe (1970) studied the possibility to level out peak-demand in public transport, and the effects of a staggered start both on working places and in schools were reported. There are also many studies (for example Stadsbyggnadskontoret, 1976; Tannir et al. 1978; Atherton et al. 1982; Giuliano, 1990) that focus on how to reduce road congestion with staggered working hours. A pilot project was conducted by the municipality of Linköping, studying the effects of staggered school hours in two nine-year compulsory schools located at the edge of the municipality (Linköpings kommun, 2007).

In a questionnaire survey of the five large high-schools, preferences and attitudes among pupils, teachers and principals in Linköping have been investigated, supplemented by personal interviews. The questionnaires to the pupils also included questions about their actual bus-travel to/from school, and a question by which a valuation of the possible disadvantage to them of staggered school hours can be made. The information of when and on which bus lines the pupils travel, makes it possible to map the journeys to and from schools in detail. Based on this data it is possible to calculate the change in peak demand as a result of changes in the time of the day when school starts and ends.

The next section of the paper describes the present bus services, and then the survey is presented showing the estimated effects of staggered school hours on bus demand, and the valuation by the pupils. The paper ends with a cost benefit analysis of the changes investigated, followed by a discussion of the results.

Present Bus Travel And Bus Service In Linköping

The demand for bus transport in the built up area of Linköping during a normal weekday varies, as in almost all cities. The total number of buses needed in the bus fleet depends on the peak demand which is at its largest a short period in the morning, when a large share of high-school pupils travels to school at the same time. This peak within the morning peak occurs at the same time as many other bus-passengers are travelling to work. Table 1 shows how the trips in Linköping are spread over the week and in different periods of the day. Monday thru Friday 06-09 and 15-19 are periods with a high frequency of buses, and in the other periods the frequency of buses is lower.

Table 1: Number of bus trips in the built-up area of Linköping 2004/2005

Periods of the week	Boardings per year	Boardings per hour
M-F, 06-09	1 600 093	2 117
M-F, 09-15	2 642 356	1 748
M-F, 15-19	1 702 852	1 689
M-F, 19-23	359 654	357
Saturday	660 589	724
Sunday	374 334	458
TOTAL	7 339 878	

Source: Östgötatrafiken

The number of boarding passengers per hour is quite even during daytime on the week- days despite the difference in frequency of service, and surprisingly enough it is a little higher between 09 and 15 than between 15 and 19. The explanation is that the afternoon peak period is rather short. This is illustrated in table 2 were the number of boarding passengers during weekdays on a main line (line 202), is further divided between periods of the day.

Table 2: Number of bus trips by line 202, 2004/2005

Periods of the weekday	Boardings per year	Boardings per hour
M-F, 06-09	390 123	516
of which 07.30-08.30	176 064	**699**
M-F, 09-15	617 556	408
M-F, 15-19	365 222	362
of which 15.30-17	180 638	**478**
M-F, 19-23	83 005	

Source: Östgötatrafiken

The most busy morning peak period comprises only a few departures which in many cases occur at the same time as high-school pupils travel to school. Besides the common bus lines (201, 202, 210-215), there are also special scheduled bus services in the morning and afternoon peak for high-scool pupils and work commuters from the suburbs (and the train station) to schools and large work places. Figure 1 below shows the school lines, which mainly follow the same routes as the common bus lines. There are 6 different school lines (240, 242-245 and 249), with 17 buses in operation in peak periods.

Figure 1: School bus-routes in the built up area of Linköping

Table 3 shows the number of boardings on each bus line during March 2006 and the share of the passengers travelling with a school-card. The table also shows the number of buses in operation at the same time during different time-periods on each route.

Table 3: Number of boardings, share of school card travellers and buses in operation on each line in Linköping during March 2006

Line	Boardings in March 2006	Share with school-card	Number of buses on the line, Monday-Friday	
			06.00-09.00	09.00-15.00
201	179444	10%	9	5
202	193086	14%	13	6
210	79998	16%	6	4
211	78094	22%	6	3
212	60515	15%	6	4
213	89980	14%	4	3
214	89214	9%	5	4
240	2141	50%	2	n.a
242	1989	48%	2	n.a
243	5123	76%	7	n.a
244	845	21%	1	n.a
245	690	97%	1	n.a
249	8318	87%	4	n.a
Sum	789437	15%	66	29

Source: Östgötatrafiken

Travel to School Survey and Opinion Poll among High School Pupils

The questionnaires (in 2 versions), were handed out to all pupils in a random sample of classes. Version 1 was delivered to pupils in four of the five schools and version 2 to the remaining school. It includes questions about their attitude and preferences about starting and finishing one hour later (version 1) or a half hour staggered start of the school day (version 2). The questionnaires also include questions about the pupils bus travel to and from school in wintertime, if they have a free school-card, about their scheduled leisure time activities (only in version 1) and their gender. As part of finding out the pupils preferences, a binary Contingent Valuation Method (CVM) question about their compensation requirement for accepting a one hour later school day or a staggered start of the school day is also included in the questionnaires.

The data and other information obtained

The random sample of school classes included 1724 pupils from which 1410 answers to the questionnaire were obtained, making the answer frequency as high as 82%. All pupils at the time of visiting the classes did answer the questionnaires.

The distribution of the 1410 respondents in the sample between the different schools (A-E), male and female, etc. is shown in table 4. This represents the actual shares quite well on the schools, except for an overrepresentation of women in school A (actual share is 52%), and first year pupils.

Table 4: Characteristics of the high-school pupils responding to the questionnaire

School	Questionnaire version	N	First year[2]	Second year	Third year	Living in the Built-up area	Women
A	1	309	40%	41%	19%	69%	64%
B	1	237	35%	36%	29%	66%	64%
C	1	415	47%	28%	25%	53%	45%
D	1	242	37%	33%	30%	54%	81%
E	2	207	37%	37%	26%	64%	29%
All		1410	40%	35%	25%	60%	56%

57% of the respondents living in the built-up area go by bus to and from school every day, and 15% go by bus to and from school one to three days a week (in wintertime). Less than a third of those respondents living in the built up area travel for free on the local buses to and from school with a school-card. The average travel-time by bus for the respondents living in the built-up area of Linköping is 23 minutes.

An illustration of the extreme concentration of bus trips to school

On the assumption that the sample represents the bus travel habits of all high-school pupils, it is possible to estimate the structure of demand for bus transport to and from the high-schools in detail. In table 5, all bus trips to high-schools in Linköping are estimated for each particular bus line.

Most of the bus lines in Linköping are diametrical, start in one suburb, and go via the city centre to another suburb at the other side of town. In this study the bus lines are divided into two radial parts, for example 201:1 between an eastern suburb and the city centre, and 201:2 between a western suburb and the city centre.

The figures in table 5 give daily averages of the trips as well as the number of high-school trips by the most busy departure in the morning and the afternoon respectively.3 The trips in the morning are very concentrated in time, while the trips in the afternoon are more spread, and the departure with the largest number of high-school pupils varies from one day to another.

[2] High school consist of three years.

[3] The maximum bus load is less than one hundred passengers, so it is common that one extra bus accompanies the regular bus in the critical section during the most busy round.

Table 5: Number of bus trips to and from the high schools per day, and by the most crowded buses

Bus line	Trips to school in the morning		Trips from school in the afternoon	
	By the most crowded bus(es)	Total trips to school	By the most crowded bus(es)	Total trips from school
201:1	86	214	56	183
201:2	85	202	36	154
244	24	24	n.a.	
202:1	105	255	39	198
202:2	80	184	45	176
249	59	76	2	2
210:1	86	154	41	127
210:2	35	94	17	70
211:1	23	35	16	65
211:1[4]	61	171	15	60
243	119	229	-	13
211:2	14	27	7	12
212:1	14	42	37	126
240	110	110	n.a.	
212:2	17	31	8	18
213	86	165	24	137
242	62	62	n.a.	
214:1	32	68	14	42
214:2	39	70	13	46

Based on the same questionnaire data, figure 2 below pictures total travel demand by high school pupils on line 202:1 on a Tuesday in the morning and in the afternoon. The distribution of the trips by departures during the day seems to be representative for all weekdays and all lines, except for the school-lines with only a few departures each day.

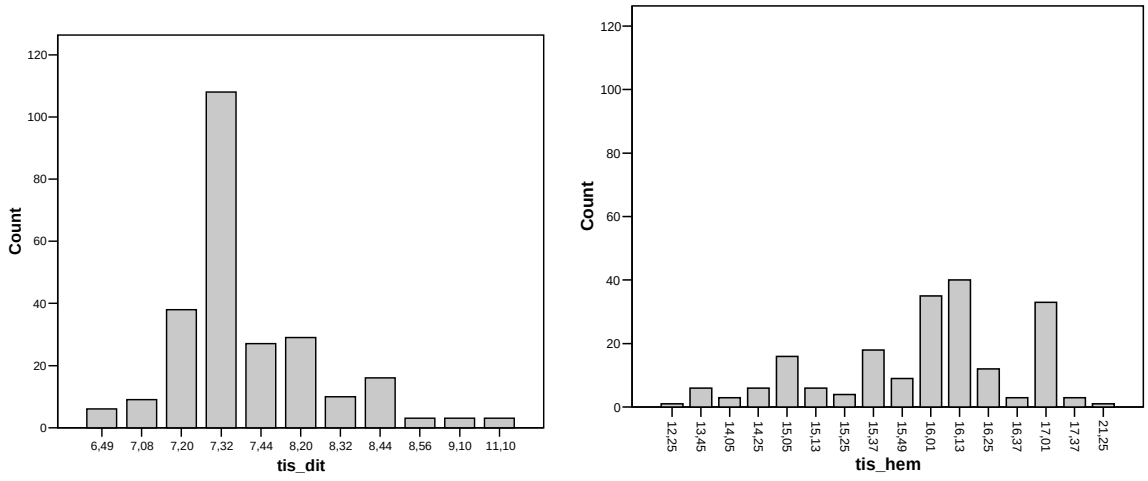

Figure 2: Distribution by departure of bus trips by high-school pupils on line 202:1 in the morning and afternoon

[4] Travel against the tide is quite substantial on this particular section of the line.

Effects on the time-profile of trip demand by staggered and shifted school hours

It is now assumed that 1/3 of the pupils start school half an hour earlier than today, 1/3 of the pupils start their school day half an hour later than today and the rest start the same time as today. The effect on line 202:1 is exemplified in figure 3. On this route half a peak bus could be saved if a staggered school start like that is introduced. The overall effects in the morning peak on all lines corresponds to a reduction of no less than 18 buses. However, in order to maintain the existing frequency of service, the number of buses should only be reduced by 13. Östgötatrafiken confirms this would be possible, and informs that the bus fleet in the built-up area of Linköping could not be reduced that much. Some of the peak buses used on the shorter lines of the built up area in the morning are buses used in regional traffic, which after a complete journey from a village in the country side of Linköping carry out some extra traffic work within Linköping. Only 8 of the above mentioned 13 buses will be a reduction of the bus fleet in Linköping if staggered school hours are introduced. The cost savings of the other buses are considered to be less than the full cost of five peak buses.

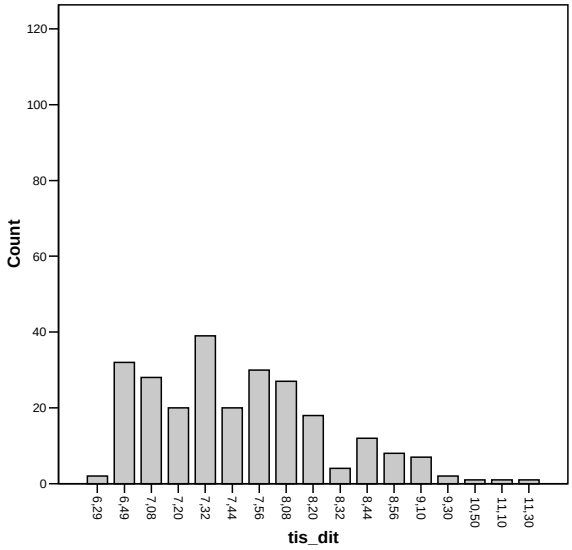

Figure 3: Distribution by departure of bus trips by high-school pupils on line 202:1 after an assumed staggered school start

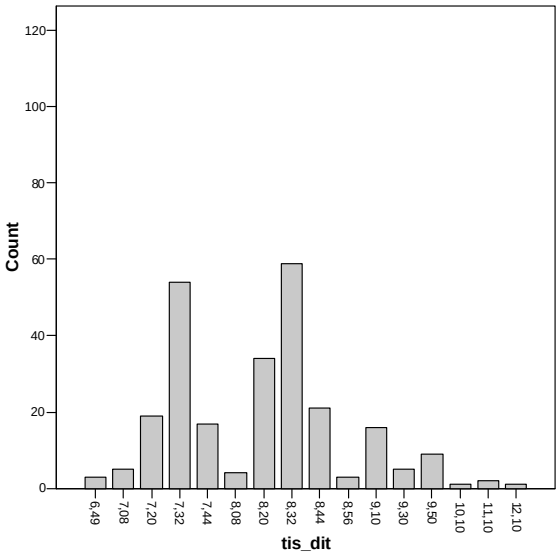

Figure 4: Distribution by departure of bus trips by high-school pupils on line 202:1 after an assumed one hour shifting forward of the school day for half the pupils

On the different assumption that the school day is shifted one hour forward for half the pupils, figure 4 shows the effects on the demand time-profile in the morning. Based on separate calculations for all the lines, this will reduce the required number of peak buses by more than is possible on the condition that the existing frequency of service is maintained. Like in the previous case of staggered school hours, the bus fleet could be reduced by 8 buses, and 5 hired buses would no longer be needed.

Attitudes of the pupils to shifted and staggered school hours

A majority of the pupils would not like to start and end their school days one hour later, as is clear from table 6. Third year pupils are somewhat more positive to a later school day, but the negative attitude is strong.

Table 6: Preferences regarding shifting the school day forward by one hour in four high schools of Linköping

Sample	Number	Yes	No	Do not know
All	1201	16%	72%	12%
Pupils living in town	708	18%	71%	11%
All first year pupils	492	11%	74%	15%
All second year pupils	409	18%	71%	11%
All third year pupils	302	22%	71%	7%
First year pupils in town	269	15%	73%	12%
Second year pupils in town	278	18%	71%	11%
Third year pupils in town	161	25%	68%	7%

A common reason for being against a later school day is that "it will be to late and the leisure time in the afternoon will be to short" as 80% of the no-sayers argue. Some minor objections are that "bus-times not will fit the new school schedule" (1.5%), and some pupils seems to prefer an earlier school start than today (1.5%). Of those positive to a later school day, 69% "want to sleep more, be more alert, and be in time to school".

In one high-school the question was about spreading the school start between different weekdays. A majority of the pupils there was against the idea of staggered school hour as table 7 shows.

Table 7: Attitudes towards a staggered start of the school day in one high school of Linköping

Sample	Number	Yes	No	Do not know
All	207	15%	74%	11%
Pupils living in town	147	13%	75%	12%
All first year pupils	76	17%	75%	8%
All second year pupils	76	13%	79%	8%
All third year pupils	55	15%	67%	18%

The reason against a staggered start of the school day was mainly "I don´t want to go up earlier than today" as 48% of those against comment. Of those positive to a staggered school hour, 22% argue that it "would make the trip to school more pleasant", and some respondents also think it will be nice to wake up later two days a week.

Compensation requirements for the pupils

Later school day

Table 8 shows that 63% of all respondents attend some sort of scheduled activity during their leisure time after school at least one day per week. The majority of these (77%) are engaged in sport activities, 9% practice music, and 14% are busy with other activities (scouting, church, work etc).

Table 8: Intensity of scheduled leisure time activities after school

Number of scheduled leisure time activities per week	Share of the respondents
0	37%
1	9%
2	13%
3	18%
4	12%
5	11%

Although leisure time after school is not "free" for most high-school pupils, it does not mean a one hour later school day would infringe on the scheduled activities in all cases.

In the binary CVM question in this questionnaire, the respondents were given a particular bid in the range of 30 SEK5 to 350 SEK to accept one hour later start and end of the school day. Eight different bids were used. In table 9a the shares of the respondents accepting the different bids are shown. The table also includes the share of the respondents accepting a later school day even without compensation, that is all respondents answering "yes" in table 6. Table 9b shows the bids adjusted according to Ayer et al (1995), implying that if a higher bid results in a lower share of yes-answers, it is assumed that the respondents who got the lower bid also accepts the higher bid.

Table 9a: Bids and yes-percentage to accept one hour later start and end of the school day

Sample size	Bid SEK per month	Share yes
1201	0	16%
122	30	19%
79	50	28%
139	70	32%
75	90	19%
149	110	40%
49	150	41%
83	250	70%
48	350	54%

[5] 1 US$ = 7 SEK

Table 9b: Bids and yes-percentage to accept one hour later start and end of the school day, adjusted according to Ayer et al (1995)

Sample size	Bid SEK per month	Share yes
1201	0	16%
122	30	19%
79	50	28%
214	90	28%
149	110	40%
49	150	41%
131	350	64%

It seems like the bids were to close to each other. Two or three higher bids should also have been used in the study in order to get the "tail" right.

There might be some pupils with a very high compensation requirement for a later school day. On the assumption that 85% of the pupils would have accepted the bid 600 SEK, and that all pupils would have accepted a bid of 1500 SEK, table 9b can graphically be illustrated in figure 5.

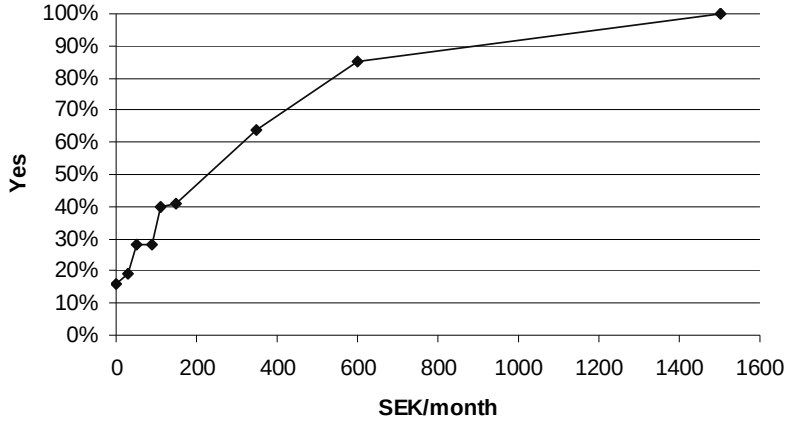

Figure 5: Bids and yes-share to accept one hour later school day (adjusted according to Ayer et al (1995), including an extrapolation from the bid 350 SEK)

The average compensation requirement for the respondents can be calculated as the area above the curve in figure 5, adding up to 359 SEK per month, of which 131 SEK are calculated based on the extrapolation. This is just an approximation of the average costs for the pupils, bearing also in mind that the respondents who want to start one hour later without compensation might in fact have a positive willingness to pay for it. (Which could equal the area under an extension of the curve to the left of the vertical axis down to 0%).

Staggered start of the school day

A staggered school start would not conflict with afternoon activities, and hence is no cost for the pupils imposed because of that. However, many pupils do not want to start school half an hour earlier two days a week, because they have to wake up earlier.

In the binary CVM question to the respondents answering the one questionnaire where staggered school hours were at issue, the respondents were given one of four bids between 50 SEK and 600 SEK to accept half an hour staggered start of the school day. In table 10 the shares of the respondents accepting the different bids are shown, (as well as the share of the respondents accepting a staggered start of the school day even without compensation.)

Table 10: Bids and yes-percentage to accept half an hour staggered start of the school-day

Sample size	Bid SEK per month	Share yes
207	0	15%
71	50	49%
40	150	70%
52	350	82%
38	600	84%

Table 10 can graphically be illustrated in the same way as table 9. It is, as before, assumed that all respondents accept a bid of 1500 SEK.

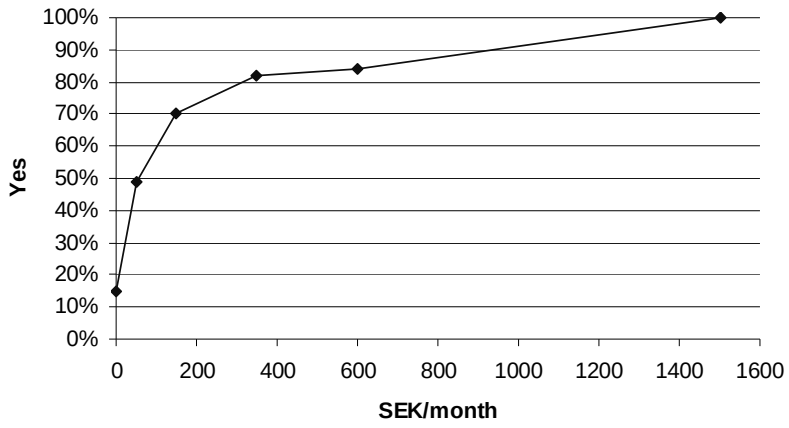

Figure 6: Bids and yes-share to accept half an hour staggered start of the school-day

The average compensation requirement for the respondents can be calculated as the area above the curve in figure 6, adding up to 237 SEK per month, of which 72 SEK are calculated based on the extrapolation. Also in this case the compensation requirement should be seen as a rough approximation of the costs for the pupils. Like in the previous case there is probably a willingness to pay for the introduction of staggered school hours on the part of the minority agreeing to staggered school hours.

Interviews with Teachers and Principals

Most of the interviews with the teachers were made in two of the schools, and interviews with principals were made in three schools.

Teachers

Summarizing the interviews with the teachers shows that 26 of 46 (56%) thinks it would be a good idea, or at least ok, with a later start and end of the school day. The teachers main arguments include both potential effects for the pupils like "older pupils are tired in the morning, and needs to sleep" and positive effects for themselves. 19 of 46 teachers are against, and they are mainly against the tiresome late afternoon classes that they believe would be a consequence of a later start and end of the school day. When it comes to a staggered school start, only five teachers have been interviewed, and all of these teachers believe it to be ok with staggered school hours, since the effect for them only would be minor.

Principals

All the principals believe it would make the situation for them harder, since they would have another restriction to consider in their planning of running the school. The principals "optimisation" problem already includes restrictions of classrooms, teachers and so on. Today the schools have the possibility to schedule classes between 8 and 17, with some small variation between the different schools, and if they also have to consider that a certain share of the pupils should start at some given time, it would impose costs for some of the schools. On one school is for example the number of classrooms already very restricted. On other schools would the scheduled times for the teacher be spread over a longer time period of the day.

Cost benefit Analysis

Cost-Benefit Analyses has been made for the same two changes in school hours: (i) one hour later school day for one half of the pupils, and (ii) a staggered start of the school day, implying that 1/3 of the classes starts half an hour earlier, 1/3 half an hour later, and 1/3 starts at the same time as today.

The main costs and benefits can be given a monetary value, but some are harder to monetarize. In the CBA monetary values for saved investment and operation costs of buses are included, as well as the estimated costs for the pupils. Some other costs and benefits are just discussed. Table 11 summarizes the CBA:s, and the main benefits and costs are commented on below. Non valued effects are marked with x in the table.

Table 11: Cost-Benefit analysis of (a) one hour later school day and (b) half an hour staggered start of the school day, Million SEK per year

	Later school day		**Staggered school day**	
Effect	**Benefit**	**Cost**	**Benefit**	**Cost**
Buses not needed	8		8	
Costs for the pupils		8.5		11.3
Benefit for pupils who want the change	x		x	
Costs for the teachers		x		x
Costs for the principal (harder to schedule classes)				x
Sum	**8**	**8.5**	**8**	**11.3**

Bus cost savings

The number of buses in the morning peak can be reduced by 13 with a later school day, of which 8 buses will not be needed at all in the bus fleet. Of the 8 buses 3 are large articulate buses with a yearly cost per bus of slightly more than 1 million SEK including bus, capital and operating costs, the wage cost of the driver, garage and service costs. The other 5 buses not needed in the fleet are of a normal size6 with a yearly cost per bus of 0.9 million SEK, including the same cost items as above. This will mean cost savings of 7.6 million SEK per year.7 The cost savings for the 5 buses still needed in the fleet is much less per buss according to Östgötatrafiken, since it only implies some extra operation costs while in traffic, which is assumed to be about 0.1 million SEK per bus and year.

Taking only the capacity restriction into consideration, it would be possible to reduce the number of buses even more with a staggered start of the school day, but in order not to reduce the frequency of service it is only possible to reduce the number of buses in traffic by 13 also in this case, of which 8 not would be needed in the bus fleet as before.

Cost and benefits of the pupils and the teachers

Only the main cost for the pupils has been valued in monetary terms. The compensation that the pupils want if a later school day is introduced are assumed to correspond to the costs for the pupils of the introduction of one hour later start and end of the school day. With an average compensation requirement of 359 SEK per month this will result in a yearly cost for the pupils of 8.5 million SEK. The calculations are based on that half of the pupils in the public high schools are affected of the monthly cost during 9 month per year.

With a one hour later school day would the pupils have the possibility to sleep longer in the morning, which could make them more effective in their schoolwork during the day. See for example Nordlund et al (2004) referring to studies showing that teenagers have a need to sleep longer in the morning and that a later school day implies a better result in these pupils school work. (Wahlstrom et al. 2001)

The pupils who desire a later start and end of the school day (16%) also benefit from a later school day, but this benefit is not estimated.

With an average compensation requirement of 237 SEK per month for a staggered school start, the yearly costs for the pupils will amount to 11.3 million SEK for all the high-school pupils during 9 month per year. This cost arises since the pupils have to wake up half an hour earlier some mornings each week. It seems high, bearing in mind that the pupils also have the possibility to sleep longer some days each week. However, it could be a problem for them that the start of the school day will differ between weekdays. (This cost is included in the amount of 11.3 million SEK above).

Since the pupils would get some days per week where it would be possible to sleep longer, the school work could be improved these days. There are also pupils (15%) that wish to have a staggered school start, and the benefit for these pupils should also be included in the analysis.

Also the teachers are, of course, affected. A later school day would cause costs for some teachers, since they would have to be in classes later in the afternoon. However, most of the

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[6] The articulate buses have a seating capacity of 45 passengers and space for just as many standing passengers, and the normal-sized buses have a seating capacity of 36 passengers and space for almost as many standing passengers.

[7] That is 1028 000*3 + 899 000*5 = 7579 000 SEK. The calculations are based on information from Östgötatrafiken.

teachers are still at the school most of the late afternoons working with preparations for the next days classes. A majority of the teachers do accept a later school day, and for those teachers that are against a later school day, the main argument is that the late afternoon classes would be very tiresome for the pupils.

A staggered start of the school day could cause problems for some teachers, who would have to start earlier some days per week.

On one school will a later school day result in problems with room, when for example the gym is let out to external users after the school day. It can also be problems to arrange the weekly teacher conference that already are scheduled in late afternoons. With a staggered school hour, it will put some more effort for the principals to schedule the classes.

DISCUSSION

The willingness to accept (WTA) a particular change is usually larger than the willingness to pay (WTP) for the same change (OECD 1989, Horowitz et al 2002). The recommendation is to use WTP in order to estimate a cost or a benefit, since this measure is more restrictive and in most cases results in an estimate closer to actual cost or benefit. The WTA estimate was used in this study since it was assumed that the restricted budget constraint of the pupils would have resulted in a too low (= wrong) WTP estimate of the costs imposed on the pupils. It is possible that the WTA estimate is larger than the actual costs a change in school hours really would cause the pupils. However, it is demonstrated that the costs for the pupils of a change in school hours could be of the same size as the saved bus service costs obtained when the extreme morning peak is levelled out.

Both changes considered are non-profitable from a social economic point of view. This is due to the high cost imposed on the pupils as measured by the pupils compensation requirement (WTA). The question is if some other changes are possible that would reap the benefits in the bus transport system of staggered school hours at the same time as the costs for the pupils could be reduced?

One possible change could result in as large a benefit as that of the two calculated examples evaluated above, and a much reduced costs for the pupils. By introducing a considerable smaller staggered school start it is possible that the benefits become larger than the costs. It would be enough to stagger the school start by only 15 minutes in order to relieve the most crowded departures on the different routes, at least in Linköping, were there is 12 minutes between the buses on the main lines.

Other possibilities would be to change the start of the school day only for the pupils (or classes with pupils) that travels by bus on the most busy lines. This should minimise the costs for the pupils and reap most of the benefits in the bus system estimated above. With existing data and the use of Geographic Information Systems (GIS), it would be possible to plan the start of the school day for different classes carefully in order to obtain still greater cost savings in the bus transport system. (For an introduction to GIS, see for example Bernhardsen, 2002). Data about were the pupils live, and if they have a school-card exists in the computer systems of the schools, and travel statistics about peak travel at specific times are in the data systems of the bus operator (or the public transport authority). Only a complementary question to the classes about how many without a school-card that goes to school by bus is needed.

On one of the high-schools in the survey the principal was interested to cooperate in a project involving GIS. During the interview it also appeared that it could be possible to make 1/3 of the pupils on that school start as much as 1 hour later than normal time. That school has not problems with classrooms, and it would be possible to make the schedule for the classes somewhat tighter (with much less slack) than today. The introduction of a later start of the school day of this school would benefit the public transport system with no extra costs for the pupils. However, some costs would arise for some teachers, and it would take more time to draw up a schedule for all the classes each year.

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