UNLIKELY SIMILAR – FORKING PATHS AND PATH-DEPENDENCY IN TRANSPORTATION STUDIES OF HELSINKI AND MELBOURNE

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Our paper examines the differences between institutional bases and metropolitan scale transportation planning in Helsinki, Finland and Melbourne, Australia. The starting point of the exploration is two transportation studies on opposite sides of the world in the late 1960's by Wilbur Smith & Associates. The Helsinki Metropolitan Transportation Study (1968) and the Melbourne Transportation Study (1969) were produced simultaneously from an almost identical value base. Not only the starting point of the studies, but also their structures, were strikingly similar. All modes of transportation (Cars and Trucks, Heavy Rail, and Buses and Trams) were analysed as a part of a metropolitan long-term development plan and even the proposed freeway/highway system follows the same, more elongated grid-like pattern rather than the currently popular orbital pattern. Differences can be found in the emphases of the work carried out. The Helsinki study is characterized by major restructuring of the highway system, while the Melbourne study appears to focus more clearly on the parking and public transportation side. Since this time the development of these cities has taken different courses. We take a closer look at the key points of decision-making, the institutional characteristics of the planning system and important differences in the starting points. By so doing we seek to understand the uncertainties, dynamics and path-dependency which evidently form the gaps in rational planning studies and systems.

1. Introduction

What stimulated this research was our understanding of public transport accessibility in Helsinki and Melbourne in 2014. We discovered that Helsinki was a leader in delivering a world class public transport system, whereas Melbourne truly the poor cousin. Helsinki provides a public transport network coverage that serves 83% of its population, compared to 46.8% in Melbourne (Curtis and Scheurer – see www.snamuts.com). This prompted us to question how metropolitan transport planning, and its associated institutional base, had influenced this outcome. The starting point of our research is the finding that both cities were subjects of major transportation studies conducted in the late 1960s by Wilbur Smith and Associates, the American consultants. Our questions were – how similar were these studies in character, value base and with regard to existing spatial plans and configuration. How influential was the transportation approach alien to both countries, at that time and now? While this sets us a large research agenda, in this paper we focus only on an examination of the two transportation studies.

There are, and have been, differences in the sheer sizes of the two metropolitan regions and the geographical boundary conditions. The Helsinki study covered some 300 km and the Melbourne study some 500 km of freeway structures across the respective areas (in Melbourne 464 km of other arterial roads were proposed in addition to the freeways). Melbourne is roughly three times the size of Helsinki in terms of population. In the mid 1960s Helsinki had 640 thousand and Melbourne 2 million inhabitants (WSPP 1968, 131). Today the cities are twice as big, but the proportion is roughly the same: the Helsinki study area contains about 1.1 million and Melbourne some 4 million inhabitants. Despite the fact that the Helsinki CBD is located on a peninsula and Melbourne in the centre of a bay, both study areas are roughly semi-circular in shape. The extent of each city's urban development area in the 1960s plans was 77,021 ha in Helsinki and 116,550 ha in Melbourne (MTC 1969). Despite many similarities, in the late 1960s transportation planning in these metropolitan regions developed quite differently.

Figure 1. Urban structure of present-day Helsinki and Melbourne (Modified from Google Maps)

Despite quite obvious differences in the size of the cities, the transportation studies contain striking similarities – likely the result of having been accomplished at around the same time. Both of the proposed transportation plans are formed of a large scale grid of motor and expressways of roughly 5-8 km net size. It is also noteworthy that both studies included an extensive public transportation plan, by far more ambitious than what seems to have been implemented. In the Helsinki study the public transportation plans reflect the work of the Helsinki Metro Planning Office since the late 1950's. Melbourne was already well-supplied with an extensive radial rail network by the end of the 1880s, built ahead of urban development (Mees 2000). The plans included electrification, new express tracks, duplication of single track lines, three new rail lines and the extension of existing lines, together with a CBD underground loop (MTC, 1969). Like Helsinki, some of these proposals had been mooted many years earlier.

The years following the completion of these transportation studies also resemble each other. The studies were completed at the dawn of global political activity against freeway-building. In 1973, inner-city sections of the Melbourne plan were removed (Morton 2014; Mees 2010) and the same happened to the Kuningasavenue/Vapaudenkatu section in central Helsinki a few years later. The era was characterized by massive public transportation investments in the inner city. The Melbourne study introduced the Melbourne Underground Rail Loop that was completed by 1981 and the Helsinki study proposal included a similar circular connection compiled from several intersecting metro lines. For the past 15 years Helsinki has been planning its own loop – Pisararata (*droprail*) – to operate commuter trains under the CBD.

Yet the implementation of the public transport system was slow. In Helsinki the first line towards the east from the CBD was opened in August 1982 after a 13-year construction period. In Melbourne the development was hardly any faster with the underground loop completed in 1981 and the proposed three new lines never realized (although the Doncaster line serving eastern suburbs continues through periods of being on and off the books). In Helsinki the extension towards the west in only now under construction and scheduled for completion in 2016. Two northern branches were never built, but instead covered partially by commuter train connections.

There was great optimism regarding growth that created an overwhelming expectation for transportation investments that only later were realized to be financially unrealistic. The Melbourne study concerned 1985, the Helsinki study 2000, yet both sets of plans contain transportation network sections that are still today under major debate. It appears that in recent decades urban transport planning has transformed from 'solving' problems to lagging behind but continuing to offer outmoded and financially challenging solutions. Despite public opposition to inner city freeways, the sections removed in the 1970s and 80s have returned in tunnelled versions. The Big Dig of Boston has its counterpart in Melbourne's East-West link and in Helsinki's Keskustatunneli (*Centre tunnel*) that some transport planners are expecting once again to solve the assumed congestion problem of the

CBD. Worse, by planning an urban structure in the 1960's predicated on continuing mobility, especially to the CBD, rather than on accessibility and proximity, those freeways plans that have been implemented (based on a philosophy of meeting demand for transportation) have not only fixed a template for urban structure today, but also a 'way of doing' transport planning for those planners.

In spite of these great similarities in the initial metropolitan scale planning exercise, Helsinki and Melbourne took quite different development paths. Curtis and Scheurer in their SNAMUTS studies found that these cities in fact lie at opposite ends in terms of public transportation accessibility. From the present day perspective the alleged major disgrace of both transportation studies is their effect on car-oriented travel patterns and diminishing shares of public transportation. During the 1960s studies the public transportation share of Melbourne was 38% and Helsinki 64% (WSPP 1968, 134). It is important to realize that there was a target: the estimated share of public transportation in Helsinki was to be around 38% (2000) in all planning options evaluated (WSPP 1968, 208). In Melbourne the estimate (1985) was 21.6% (MTC 1969, 22). By the mid-1980s the share of public transportation had decreased in Helsinki to 42% and in Melbourne to 10%, since when the decrease has been minor - the current figures are: Melbourne 7%; Helsinki 41%. Major decisions have thus been made within 10 to 15 years after these transportation studies which steered cities further from public transport use and resulted in higher levels of private car use. Our aim in this paper is to trace where these development paths actually departed and speculate on the proper role of these so-called comprehensive transportation plans in actual development.

2. Proposed transportation networks

2.1 Characteristics of alternatives assessed in the Melbourne study

The Melbourne study led with public transportation analysis and proposals and coined the term 'balanced transport' as a euphemism to downplay the major role of road-building. Two preliminary scenarios were tested – one for "maximum development of roads and freeways, together with a relatively smaller expansion of the existing public transport services"; one for "considerably less development of roads and freeways but greater expansion of public transport" (MTC 1969, 32). The outline of the survey on existing transport conditions was carried in the same way as in the Helsinki study (WSLT 1969a). It was supported with an extensive study on parking (WSLT 1969b), which played only a minor role in the Helsinki case, where most of the suburban area was still undeveloped. It is interesting to note that at the time of study the public transportation situation was considered fairly good and the main focus was on capacity. The study notes,

> "Because Melbourne already had this comprehensive rail network, one of the prime objectives of planning was to introduce improvements to the rail system to enable it to effectively carry out its 1985 transport task" (MTC 1969, 33).

Little or no effort was invested in arranging active suburban characteristics predicted as non-CBD person trips (MTC 1969, Figure 4-8), commercial vehicle trips (MTC 1969, Figure 4-12) or private transport travel desires (WSLT 1969b, Figure 5-11).

A critical issue was pedestrian congestion at Flinders Station in the CBD. This problem, however, had been around for decades. In the Plan for General Development 1929 it was stressed:

> "The Commission considers that the most suitable way of overcoming the present pedestrian congestion in the vicinity of the Flinders-street Station, and as a means or avoiding much more acute conditions of congestion in this area, is by the construction of further city stations which will encourage a distribution of the pedestrian traffic, not only in the vicinity of the stations themselves, but also on the footpaths in the whole of the city area" (MTPM 1929, 130).

The proposed underground loop would spread the load and deposit people closer to work locations in the CBD. The loop needed to cope with in increase in trains (service frequencies – from 108 trains in 1964 to 181 in 1985) in the rush hour through the two main stations (MTC 1969).

Besides the Underground Loop, the Melbourne study proposed three larger new rail connections: the 9½-mile East Doncaster Line, the 12-mile Huntingdale to Ferntree Gully Line, the 14-mile Frankston to Dandenong Line. The last two of these were peripheral loops connecting radial rail branches. The

parking study supported a park-and-ride principle that made station areas mainly for transfer use - "It is part of the recommended plan that parking facilities at railway stations should be kept under regular review and expanded as demand for parking grows" (MTC 1969, 39). From the image below it is easy to realize that the rail network had been planned prior to the 1969 Melbourne study.

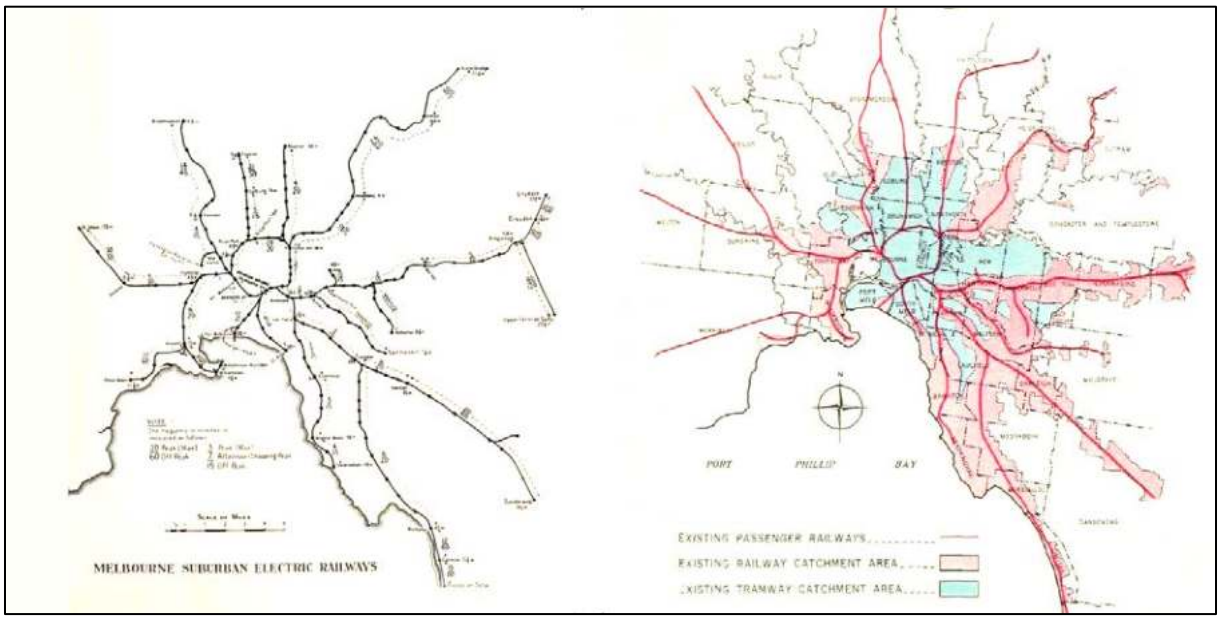

Figure 2. Rail network of Melbourne Plan for General Development 1929 (left) and Melbourne Metropolitan Planning Scheme 1954 (right). (Modified from MTPM 1929, 129; MMBW 1954, 108)

The road network was designated for major change. A three-fold increase in the number of private cars was predicted,

> "…road proposals assume that the public will want road construction to keep pace with travel demand…" (MTC 1969, 47).

The number of person trips by car each day was expected to grow to more than three times the 1964 figure. From 1964 to 1985 the average trip lengths were expected to grow from 4.8 miles to 7.1 miles (MTC 1969, 47). Based on these assumptions a novel freeway road typology was introduced to Melbourne. In the 1954 plan the intersections of the main arteries were mainly imagined to be roundabouts and occasionally flyovers, while the 1969 plan introduced fully matured multi-level clover-leaf intersections to retain flow capacity and speed. While the design and speed represented a significant change, as with public transport much of the road network had already been mooted in earlier plans - half of this road network follows reservations already in the 1954 metropolitan planning scheme. As we later learn, the shape of Melbourne owes much to the influence of these road proposals rather than to the influence of land-use planners at this strategic level (McLoughlin 1992). Indeed, it is odd that, despite the 1954 Metropolitan Planning Scheme proposing District Centres as a means of decentralizing from the CBD, this direction is not addressed in the 1969 Plan.

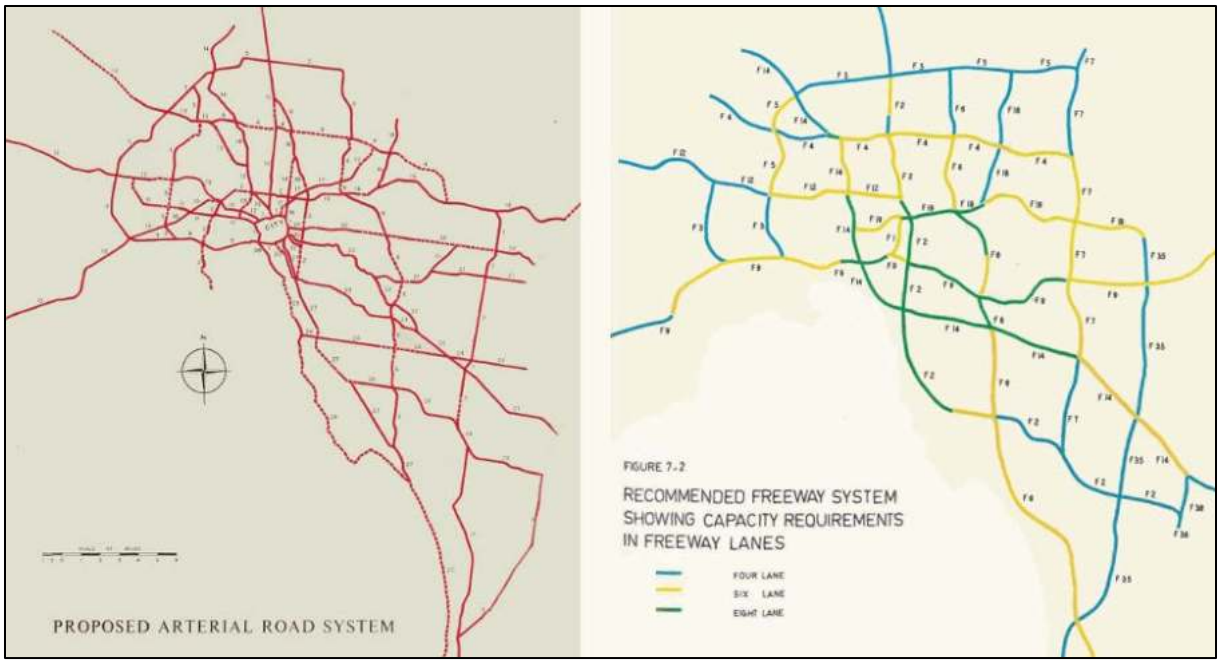

Figure 3. Road network of Melbourne Metropolitan Planning Scheme 1954 (left) and the Melbourne study 1969. (Modified from MMBW 1954, 97; MTC 1969, Figure 7-2)

2.2 Characteristics of assessed alternatives in the Helsinki study

The Helsinki study consists of three preliminary options named 0, A and B (WSPP 1968, 224). These planning options were created as combinations of wide and shorter alternatives of road network and public transportation networks. The option where both road and public transportation networks were short was not introduced. Options C and D were created to alleviate the problems found in the three earlier options. It is important to realize that there was no variation in the land use even in the improved versions C and D (WSPP 1968, 231), as was also the case in Melbourne. Table 1 presents a summary of all assessed options.

Table 1. Size of transportation networks in the Helsinki study alternatives (WSPP 1968, 243)

Size of road network	**0**	**A**	**B**	**C**	**D**
Large (329 km)	X	X			
Medium (309 km)				X	X
Small (236 km)			X		

Size of public transport network (rail + bus lines)	**0**	**A**	**B**	**C**	**D**
Large (90 + 560 km)	X		X		
Medium (60 + 710 km)				X	X
Small (37 + 345 km)		X			

The assessment criteria serve as a perfect example of how the desired planning alternatives of planners themselves can always be made to look the most favourable. The created multi-criteria frame of assessment looks ambitious and professional containing separate sections for efficiency, performance, community impact and financial consideration. At first sight the evaluation frame looks extremely detailed, but when tabulated as we have done in Table 2 the true nature of evaluation becomes apparent. Most of sub-criteria in each category become meaningless and a single evaluation criterion may dominate the result of the entire category.

Table 2. Weights of various assessment criteria in the Helsinki study (WSPP 1968, 243)

Criteria	**Criteria impact**	**Category impact**	**Overall impact**

1. Efficiency criteria		30%	-
1.1. User Costs	~80%		**24%**
1.2. Public transport operating costs	~9%		**2,7%**
1.3. Road maintenance costs	~0,1%		**0,03%**
1.4. Parking costs	~1,9%		**0,57%**
1.5. Capital costs	~9%		**2,7%**
2. Performance criteria		25%	-
2.1. Reliability	30%		**7,5%**
2.2. Flexibility	30%		**7,5%**
2.3. Preservation of capacity	10%		**2,5%**
2.4. Comfort and convenience	15%		**3,75%**
2.5. Mode option	15%		**3,75%**
3. Community impact criteria		20%	-
3.1. General economic benefits	30%		**6%**
3.2. Employment opportunities	25%		**5%**
3.3. Temporary disruptions	5%		**1%**
3.4. Relocation of families	5%		**1%**
3.5. Neighbourhood identity	10%		**2%**
3.6. Aesthetic considerations	10%		**2%**
3.7. Noise and fumes	10%		**2%**
3.8. Opportunities for social interaction	5%		**1%**
4. Financial considerations	25%	25%	**25%**

An additional difficulty of the assessment is seen in the rank-based evaluation. Even though the differences in each category are small, the planning options are graded from 1 to 5. So, for example, in the category Efficiency, the cheapest alternative was 95% of the costs of the most expensive one but got five times more points in the final evaluation round. Not that this was an overly generous benefit; it was doubled in the category Financial considerations, which analysed largely exactly the same costs.

Two other assessment criteria were topics of more subjective evaluation. Even though performance may sound like a very rigid transportation quality less than half a page was devoted to describing what it meant. Finally the phrase somewhere in-between seems to indicate what type of assessment they were talking about: “Table 10-12 indicates the rating and evaluation of each system in a subjective evaluation based on the Consultant's opinion” (WSPP 1968, 278). The community impact category is equally subjective, but the stated emphasis is said to be on general economic benefits and employment opportunities, which in fact are completely outside the study focus and also left undiscussed in the report. This is interesting since this category became a dividing criterion between options C and D. It looks very much as if option 0 had to be better than option D merely to avoid a tie.

Table 3. Total rating of alternative transportation systems (WSPP 1968, 282)

CRITERIA	**WEIGHTING**	**RANK ORDER**					**EVALUATION**				
		0	**A**	**B**	**C**	**D**	**0**	**A**	**B**	**C**	**D**
Economic evaluation	30	1	3	2	4	5	30	90	60	120	150
Performance rating	25	2	3	1	5	4	50	75	25	125	100
Community impact	20	4	2	1	5	3	80	40	20	100	60
Financial considerations	25	1	3	2	4	5	25	75	50	100	125
TOTAL SYSTEMS RATING	**100**	**8**	**11**	**6**	**18**	**17**	**185**	**280**	**155**	**445**	**435**

In addition to this clearly unsound overall assessment, a typical error in transportation assessment caused by a static land use alternative is clearly pointed out in the Helsinki study Figure 9-7 (WSPP

1968, 244). It shows that the overall costs of road building remain static regardless of the proportion of public transportation and exaggerates the estimated travel time costs. Since public transport in a non-congested optimal planning situation is always slower, the higher the proportion of public transport the higher the costs lost in travelling. In these single-constrained model settings (see e.g. Joutsiniemi 2010, 119-125) it is possible to seek optimal network configurations as the Helsinki study options C and D clearly indicate. In the real- life adaptive land use settings this is naturally nonsense.

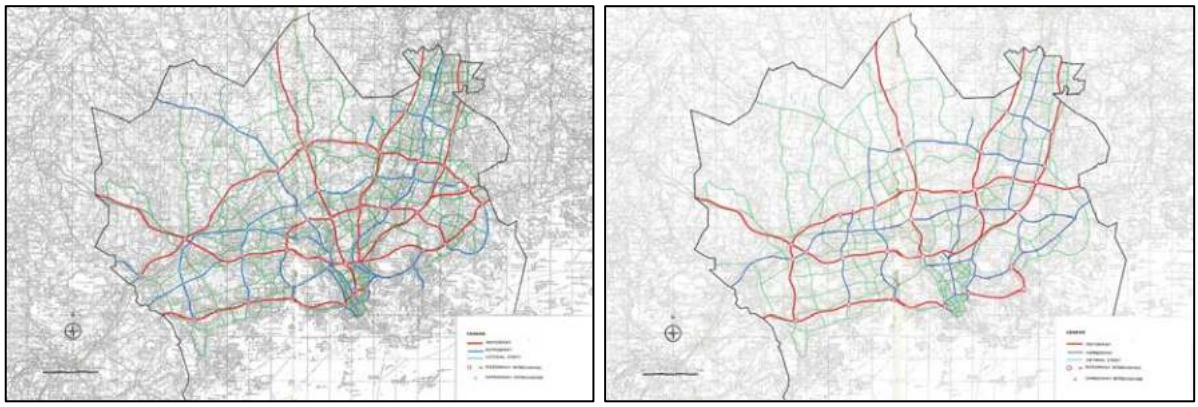

Figure 4. Options A and D of the Helsinki Transportation Study (WSPP 1968)

3. Transportation networks realized

Comparison of the Helsinki and Melbourne studies reveals some differences in the transportation systems realized and the proposed and existing road categories. In the Melbourne 1954 plan the road categories and geometry are slightly different from those proposed in the 1969 study. In the 1960's maps the emphasis in both cities is on 4-, 6- and 8-lane highways and the smaller Expressway category seems to indicate a minor road. Closer scrutiny of the proposed road sections (WSPP 1968) and detailed plans (WSPP 1969) shows that these both are main arteries with multi-level intersections where the right-of-way varies between 50 and 100 metres – not so very different from the roads actually built in Helsinki or Melbourne.

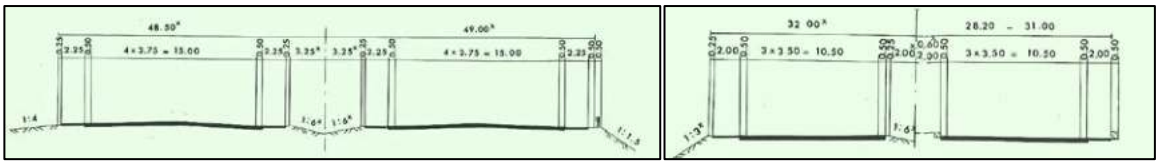

Figure 5. Variations of a 98-metre wide highway cross-section (left) and a 63-metre expressway road cross-section (right) in the Helsinki study (WSPP 1968, 300)

Melbourne in its 1929 plan had already shown its appetite for large-scale road widenings in the central area based on Haussman's Paris (Mees 2000, 170). The 1969 Recommended Plan does not provide cross-sections but indicates an adopted design standard of 49 metres (160 feet) for the freeways (MTC 1969, 49). The Melbourne study also recognized the following lower standard arteries: Major Divided Arterials, New Arterials, Widened Arterials, Widened Arterials to accommodate both public transport movement and increased travel by private car. A comparison of these two study areas shows how the Helsinki study tried to adapt road widths from American highway standards, while the existing land subdivision forced the consultancy group to use narrower road types. Therefore the width of the selected road type and its actual capacity to accommodate traffic flow do not go hand in hand.

In its day the Helsinki study was considered extremely radical and was in fact never brought into the official decision-making process. Similar to the Melbourne plan, a major public concern was the inner city highway connections that were later removed. In 1967 planning for the Helsinki metro was

transformed to become more characteristically a heavy rail system and adapted as such in the ongoing Helsinki transportation study.

It is unknown to most of the critic that option D of the Helsinki study was almost identical to the proposed option C, the only difference being a reduction to car-based traffic in the CBD (WSPP 1968a, 231; see also Figures 9-5 and 9-8) i.e. to avoid suggesting the destructive solution shown in Figure 6. Moreover, it is disturbing to realize that the difference between options C and D is marginal and closely connected to the assessment frame based on a comparative ranking of options (WSPP 1968, 282). It is ironic that in the Helsinki study the proposed option C was ranked best in the assessment category "Community Impact". With a just a little bit more game-sense and alternative tweaking in favour of option D, the development of Greater Helsinki might have been different.

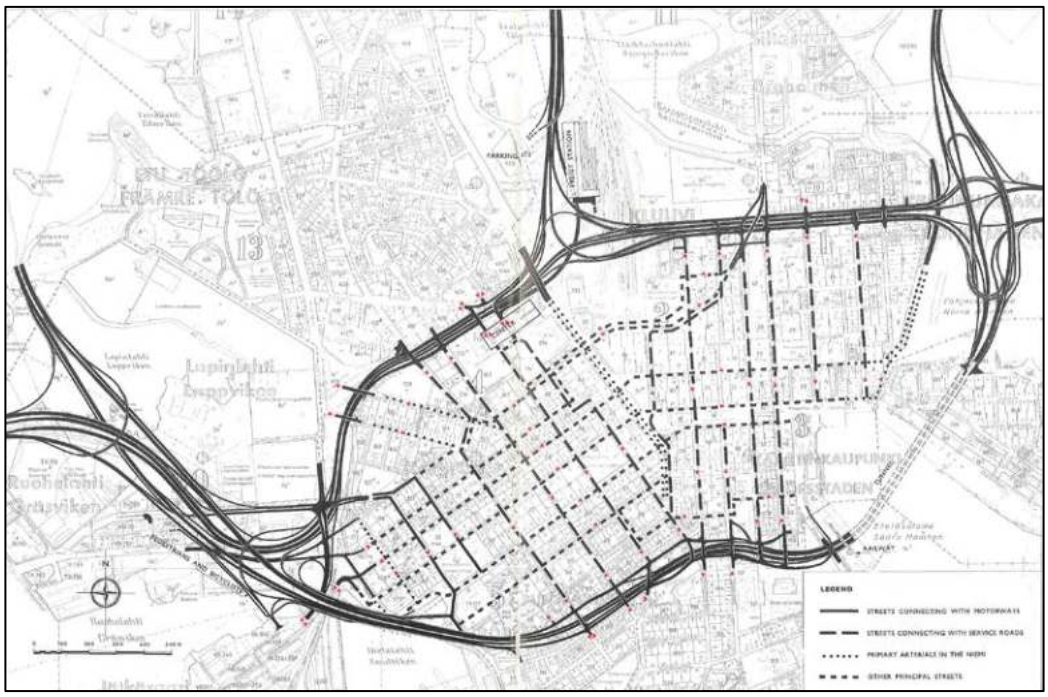

Figure 6. Proposed street circulation plan for Helsinki CBD (WSPP 1968, Figure 11-4)

It is interesting to note that even though there is general agreement among planners and planning historians that the Helsinki plan was never realized, one of authors of this text has shown elsewhere (Joutsiniemi 2006, 145) that the development of the road network in Helsinki has taken a course nearly identical to that of option A proposed in the Helsinki study. Option A was characterised in the study as follows: "The road component of the transportation system (...) was developed by combining a conglomeration of local roadway plans from various planning authorities, which were generally prepared in conjunction with individual neighbourhood plans. Since many of these planned street systems were not wholly compatible, numerous adjustments in alignment and standards were necessary to achieve a practical network for the whole metropolitan region" (WSPP 1968, 225). It is easy to see that the option A road network was mainly documenting the existing incremental planning phases rather than offering a comprehensive understanding of large-scale transportation needs.

In the following images we have highlighted the road sections included in the Helsinki and Melbourne studies that have been realized in the course of time. Both cities have created a highway structure that resembles a more orbital than a gridded structure. The larger number of "completed" sections in Helsinki is natural, since the Helsinki study had several alternatives – one of which was documenting the ongoing institutional trends. In Melbourne, too, several of the realized sections are those which can already be found in the 1954 plan. In Melbourne some of the suggested freeway segments have been built in using a lower arterial road standard or adjusted to the existing road structure which follows the chess board like land subdivision pattern typical of Australia and the USA. Therefore it

seem that the greatest impact on the road network introduced by the Helsinki and Melbourne studies is not to be found in large scale road geometry, but in novel high velocity standards that were adapted to existing route plans.

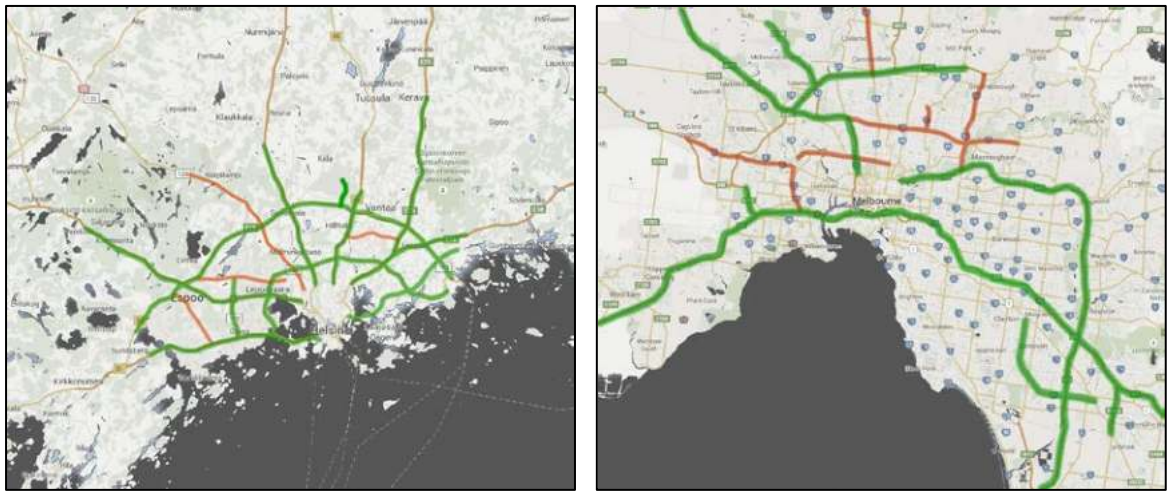

Figure 7. Road sections in the Helsinki and Melbourne studies overlaid with present day road network. Green lines indicate Highway, Expressway and Freeway sections included in the studies. Red lines are sections that are included in a study but eventually built according to lower arterial road standards.

4. Crucial assumptions made in the studies

After cross-reading multiple documents by the Wilbur Smith Associates it seems clear that the novel theory of car-based transport had made a couple of major shortcuts. In the Helsinki studies there is a well-documented section on the background theories the consulting group had created. This is clearly indicated in Figure 8. In this scheme it is very difficult to achieve a comprehensive transportation perspective. Highway design that originates from the demands of inter-city movement is mute to several intra-metropolitan movement characteristics like public transport and polycentricism. In the Helsinki study two items of this theory are found. In Figure 8 we have included two major background assumptions derived from the profoundly static land use scenarios and congestion-free transportation ideal. The only important variable for the road network size is the size of the CBD and increased time cost of accessing it if public transportation is chosen.

In addition to these oversimplified assumptions, an overview of the Helsinki and Melbourne transportation studies finds three types of assumptions that had a significant impact on the implementation of the transport plans: false expectations regarding traffic growth, an exaggerated role of long-distance transport, and a monocentric urban structure. In the following sections we summarize these briefly.

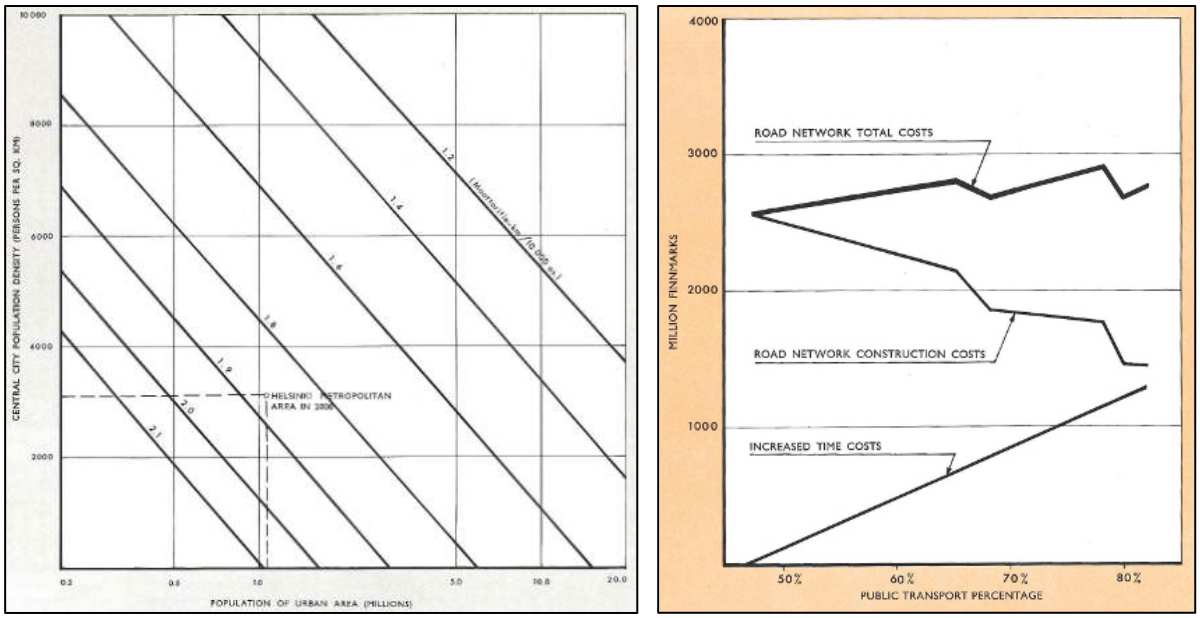

Figure 8. Illustrated correlations between the size of the city (x-axis), the CBD density (y-axis) and required freeway kilometres per 10,000 inhabitants (diagonals) shown on the left. (WSPP 1968, 388) and on the right the correlation between the share of public transportation (x-axis) and the transportation costs (y-axis). The upper graph illustrates the overall costs of the road network, the middle one the construction costs of the road network and lowest the cost of time expenditure on travel. (WSPP 1968, 242)

4.1 Erroneous traffic growth expectations

The Melbourne Plan, like many transport studies of that time, was focused on catering for travel demand for car use (Gleeson et al 2003; Curtis and Low 2012). Indeed, the Melbourne Plan itself alerts us to the problems of other western cities and affirms that road construction is the only viable solution. Traffic congestion and the cost of time lost in slow moving traffic were held up as concerns only to be addressed by road construction rather than any other transport or indeed land use solution,

> "The recommended plan has the task not only of making provision for the expected trebling of 1964 volumes, but also of providing the means by which these greatly increased volumes can be handled at higher service standards. This is not a matter in which there are alternatives…traffic congestion and greatly increased transport costs would become chronic features of the metropolitan road system. Other western cities faced with the same rapid growth have had to cope with similar rapid rises in the demand for road travel. They have had to become involved in major road construction problems. Now Melbourne has to face the same problem" (MTC 1969, 47)

The Melbourne Transportation Study was based on a plan to increase the area of urban development by 49% – presumably this was based on the 1954 Metropolitan Plan although this is not specifically stated. There is no debate as to whether this is the best way forward or if other choices are considered. With population of 3.7 million by 1985 forecast in the Plan, this suggests an average gross density of 21.3 persons per ha in the 1985 urban development area. The predicted average household size in 1985 was 3.3 persons, implying an average housing density of 6.4 dwellings per ha, although this is never directly articulated. Designed in this way the study not only locked in extensive road proposals that proved financially unrealistic, but it also locked the city into extensive urban sprawl which has also proved financially unsustainable (among other measures of unsustainability). The cost of the Melbourne Transport Plan proposals was $2.6 million (based on 1968 costs) of which 86% was allocated to highways and parking. It is interesting to note that there was no discussion of different urban form or land use configurations – this was very much an era of assumptions based on demand-led planning – for both housing and modes of transport – but it is nowhere evident that the public were apprised of this. McLoughlin's (1992) account sheds some light on the trends at that time when the

population was deserting central Melbourne in favour of the suburbs, but what role should urban planners have played in restricting this in favour of more sustainable development?

The Melbourne Committee estimated that this population of 3.7 million would make 2.5 times more daily trips by 1985 and that the average trip length would be longer. While it is clear that trip lengths would be longer, given the planned extensive spread of the urban area, it is unclear why trip making per capita was expected to rise. People's daily activity patterns remained constant.

4.2 Priority for long distance transport.

Following on from above, with the urban area forecast to spread, the priority was on longer distance transport – this despite land use plans of the 1954 Metropolitan Plan arguing for decentralisation and the creation of District Centres,

> "the recommended plan places major emphasis on bus/rail coordination and the complementary role of feeder buses in making rail more attractive to the public" (MTC 1969, 41).
>
> "It is part of the recommended plan that parking facilities at railway stations should be kept under regular review and expanded as demand for parking grows." (MTC 1969, 39)
>
> "Experience shows that construction of commuter car parks leads to additional demand…this further emphasises the need to keep parking facilities under continuing study" (MTC 1969, 9).

In both cities trams were considered obsolete and an impediment to car travel. In Helsinki only planning options O and B preserved the existing 17 km tram system. In Melbourne the existing 323 km tram network was more difficult to tackle. The committee considered scrapping trams but decided this was unrealistic. They were concerned that,

> "a fixed rail system in the middle of streets already inadequate to handle motor traffic, contributes materially to street congestion (MTC 1969, 42)"

They cited the example in Swanston Street, a major CBD, where free-flowing trams would place limitations to cars on cross-street movements. Six options were considered, some aimed at removing trams but interestingly not cars (which is the case today). The policy recommendation of the 1969 Plan was that trams be placed underground or replaced by underground trains in the future and that trams be have their own separate right-of-way, including,

> "Provision for such rights-of-way will be made in appropriate cases in the widening of arterial roads proposed in the plan (MTC 1969, 42)."

The tendency seems to be that cars must be kept moving and public transport moved out of the way of cars.

Again the theoretical background of the consultancy group reveals some major differences between the Helsinki and Melbourne proposals and gives some indications to why public transport fared better in Helsinki than Melbourne. The schematic representation of suburban transportation alternatives also summarizes our previous findings. If the ultimate aim of public transport is to access the CBD then the alternatives shown in Figure 9 all seem equally feasible. Both the studies discussed emphasize the structure shown as number 1. In both studies the backbone of public transport was a heavy rail system that was to be supported by local buses and trams. In the Melbourne study it was explicitly mentioned that,

> "the recommended plan places major emphasis on bus/rail coordination and the complementary role of feeder buses in making rail more attractive to the public" (MTC 1968, 41).

In the Helsinki study the improved planning options C and D contained a 150 to 200% larger bus network than the other options. In reality the choice was not so clear. The Melbourne study contained major parking facilities in transfer terminals so in schematic representation it was much closer to option number 2 in Figure 9. The private car and feeder station combination unfortunately did not prove very successful and people already sitting in cars saw no major point in changing to the train unless major congestion occurred, the catering for parking demand in the CBD also facilitated car over public transport choices. In Helsinki the high investments required to build the extensive metro network were postponed and only partially resolved with commuter trains when funding was available

from central government. Large portions of the Helsinki metropolitan region were operated using schemes numbers 3 and 4 in Figure 9, since it was considered the only feasible way to operate on the low density suburban fringe. It is also noteworthy that these assumptions remain valid only if assumed trip origins and destinations are either at the CBD or the remotest branches of suburbia.

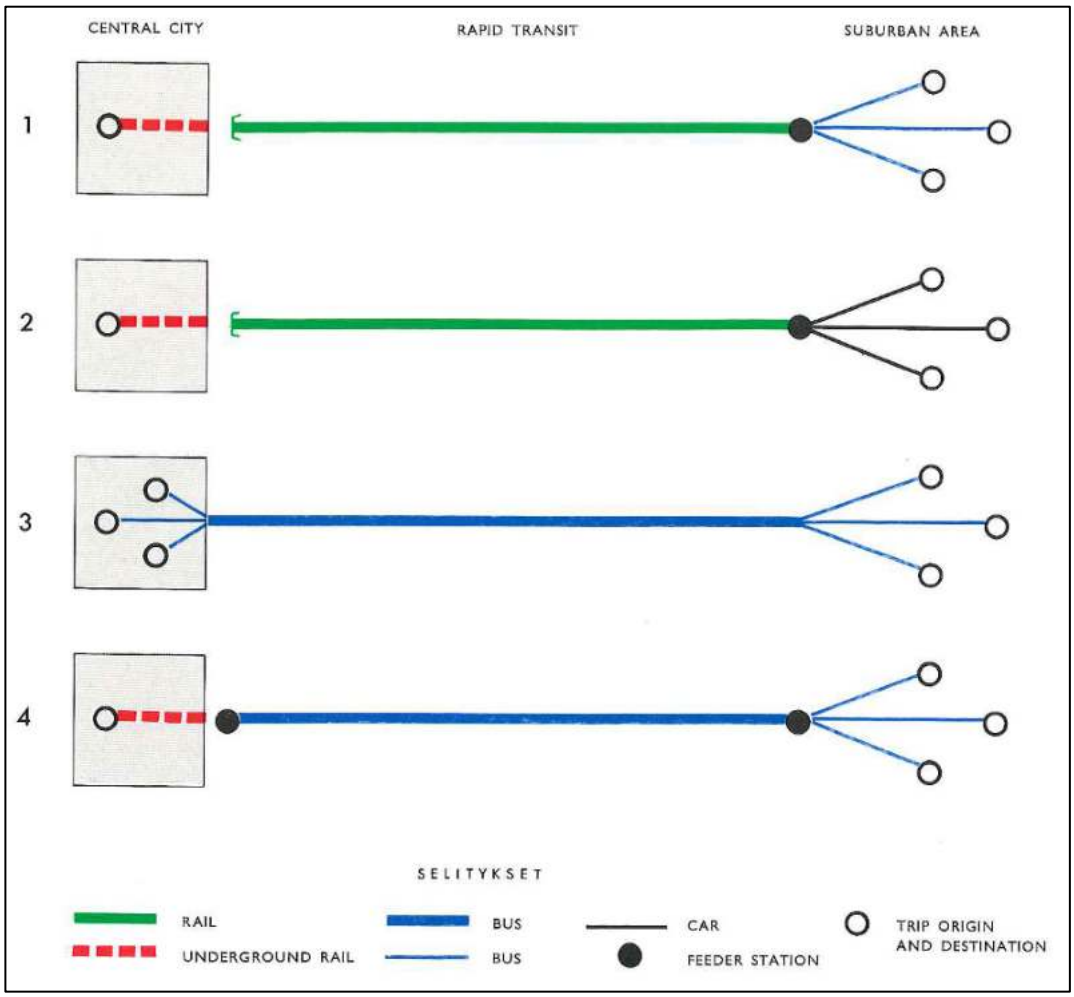

Figure 9. Schematic representation of public transportation system alternatives (WSPP 1968, 390)

4.3 Monocentric urban land use structure

In Melbourne there was already a firm intention to decentralize the congested city and develop local district business centres (MMBW 1954, 51), yet the preference for the American type of mall development was not kept secret (MMBW 1954, 60). The railway system is radial, with all routes leading to the CBD, and this is still the case today. The freeway proposals that have been constructed (Figure 3) are also predominantly leading to the CBD. Thus despite the Melbourne study being initiated ten years later than the 1954 land use plan, which argued for decentralization, the public transport system continued to focus on the CBD.

The same assumptions are to be found in the Helsinki study area. In fact, they are here even more evident since in the 1960s major parts of the current metropolitan area were in agricultural use. The only assumption the consultancy group was able to make was that in 1966 the monocentric city would only grow into a bigger monocentric city by the year 2000. This is clearly seen from the assumed location of workplaces that were used to populate the transportation network (Figure 10). Unfortunately the reality could not be more different. Somehow the simplified assumption made in the studies on land use size seem strange. In their 1961 book (WSA 1961, 37) the consultants seemed to have a clear understanding of how accessibility changes land use, so possibly the limitations on the

computation side or the demands of the client determined the course of the study. This is especially interesting in the case of Melbourne, which ten years earlier already had a strong drive for district centres. The proposed freeway grid structure of the study obviously served other areas but the CBD.

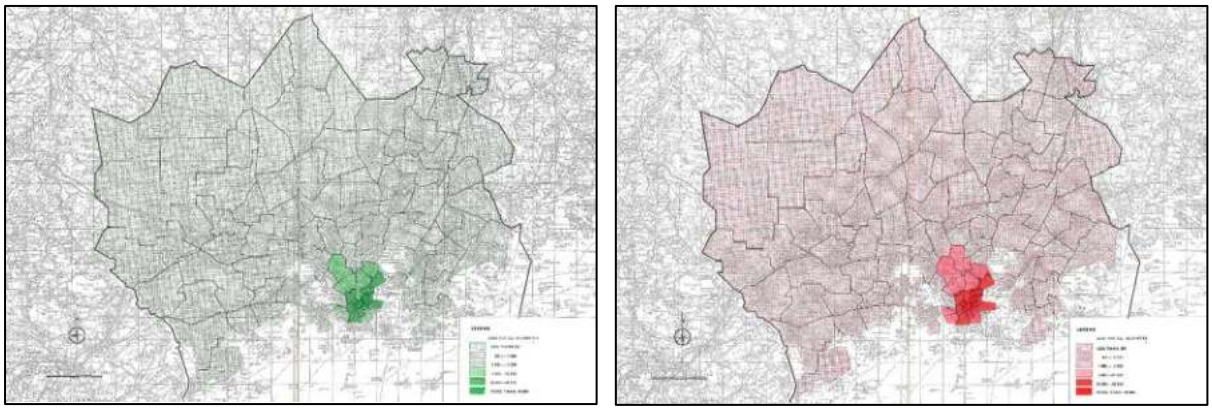

Figure 10. Workplace locations in 1966 (left) and 2000 (right) Helsinki (WSPP 1968, Figures 7-8 and 7-10)

5. Discussion and Conclusion

We entitled this paper 'Unlikely Similar', and in many respects it seems that the two cities, despite being both peripheral and on opposite sides of the world, have experienced similar trajectories in both transportation planning and the institutional response, at least in the past. We find three key points of interest.

First, we find that path dependence of planning solutions was present in both cities. However this is not so much the primary result of the Wilbur Smith studies. It seems that it did not matter entirely what the Wilbur Smith studies proposed, ultimately the institutions in the respective countries did what they had already planned to do – they continued to implement transportation plans devised prior to the Wilbur Smith studies. In the case of Helsinki this was true of both the road and the metro system, even though the plans back then were extremely weak; in the case of Melbourne this was a road network based on a system of arterial and orbital roads quite similar to that proposed in the 1954 Plan.

Second, we find that the notwithstanding the above, the Wilbur Smith studies had a major impact on the approach to road design which was to have far-reaching consequences for both cities by locking in the car as a major transport mode. Excessive designed standards adopted as high speed, friction-free roads in the form of freeways were new to both cities and saw the car given priority as a mode of transport over everything else. In Helsinki public transport remained important in radial connections, but the service in the orbital direction is practically non-existent, and despite being partially recognized in the Melbourne Plan it was never implemented. The tram was questioned for its suitability since it held up car travel. Cars were selected as the mode to interchange with rail – likely resulting in the choice to travel by car for the whole journey rather than to transfer to rail. Even road designations included "widened arterials to accommodate both public transport movement and increased private car travel". The attitude to urban structure largely ignored the possibility of polycentricity even though district centres were proposed and favoured by some local governments. That railway stations were seen as transfer points from car to rail rather than destinations in their own right also supports this. Clearly this new approach to road design and network structure has seen a new path-dependence locked in and maintained today. This approach had a profound effect on car dependence.

Third, we find the first major difference between the two cities. In public transport Helsinki's local government were able to promote their own policies. Helsinki was eager to keep its CBD liveable and

made a major decision only five months after the Helsinki study was made public to finance the construction of the first metro line even without support from central government. In Greater Helsinki the local government consisting of only three cities has relatively greater power over infrastructure investments and they were able to compete with regional level planning, which for its part has only a minor role in the national legislation, whereas in Melbourne the regional tier of planning was much stronger than the local level, at least as regards transportation planning.

From this analysis, triggered by the Wilbur Smith studies, we have yet to find the full set of reasons as to why, today, Helsinki and Melbourne are at opposite ends of the spectrum on public transport accessibility. What is clear is that the initiation of a major freeway network via these Wilbur Smith studies resulted in a profound turnaround in the mode share. Both plans assumed a drop in the public transport mode share, but it plummeted in both cities and in Melbourne it has not recovered. Groenhart and Mees (2014) note that,

> "Melbourne has built more lane-kilometres of freeway and tollways since 1976 than any other Australian city, but has not constructed a new suburban line since the Glen Waverley line opened in 1930 (although some lines have been extended)" (MTC 1969, 125).

Funding has been more easily obtained for road projects, with considerable support from the federal government (Curtis and Low 2012). Public transport has suffered from a lack of federal funding and an attitude by the State government of 'public transport deficits' (Curtis and Low 2012) since the 1970 'Lonie' inquiry into public transport, which proposed radical public transport service reductions (Mees 2000, 276). At the institutional level the Melbourne road agency has consolidated whereas the myriad of public transport agencies has seen fragmentation and weak financial support (Curtis and Low 2012).

In Helsinki the situation appears different, at least institutionally, since the municipalities have pressed ahead with joint public transportation planning throughout the Greater Helsinki area. In Helsinki all modes of public transport now have unified ticketing, priority lanes on main arteries and highways since the beginning of the 1980s. It is also important to realize that in Helsinki car-oriented development started much later than in Australia – after World War II private cars remained a regulated good and were not released onto the open markets until the early 1960s. Therefore the public transportation share was very high when the Helsinki Transportation Study was initiated. It would be an exaggeration – although probably favourably for some – to say that the Greater Helsinki Area succeeded in its public transportation policy because they did not implement the proposed planning solution of the late 1960's. As we have shown, Helsinki in fact chose an alternative that was not only among the worst of the alternatives assessed, but also the one which by rough measures contained most highway kilometres and effectively supported a sprawling urban structure.

These are only preliminary conclusions, further research questions arise relating to the role of path-dependency and organizational structure that, in both cities, have constantly over-ruled the seemingly rational argumentation of the comprehensive transportation plans of the 1960s and 70s. There seems not to have been a single ideological feature introduced in the two studies examined here. More likely there were certain aspects of the plan that were adopted only if there were fertile institutional grounds for it.

No matter how distorted the assessment of the Helsinki study was, a detailed analyses of it indicated that the priorities of transportation consultants are not necessarily those of the decision-makers or even planners in their role as civil servants. It is clear that in the municipal decision-making process road maintenance costs play a more important role than 0.03% of overall costs. In the Helsinki study it became painfully clear that in a democratic political process the societal impact was playing a far greater role in evaluation. During the Helsinki study this was completely surreal to the team of professionals, as can be sensed from the following quotation from their proposed planning option C considering the CBD location at Niemi.

> "Disadvantages of the »C» system are noted to be temporary disruption of normal activities during the construction period and the relocation of families caused by the southern motorway in the Niemi. However, in the Consultant's opinion these disadvantages will be far outweighed

by all of the advantages gained from other community impact criteria, so as to become minimal" (WSPP 1968, 280).

In Melbourne it is not so easy to separate the role of the transportation consultants from the decision-makers in this desk-top study since the Transportation Plan is a product of a committee composed of decision-makers from the various transport modes and land use planning. Wilbur Smith Consultants effectively reported their surveys and modelling through this committee.

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