KHSK

ECONOMIC CONSULTANTS

Irish Rail Kildare Route Project Supplementary Development Contribution Scheme

Report to South Dublin County Council

Final Report

July 2007

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Executive Summary

1. This report examines economic estimates and values of relevance to the design of a draft Supplementary Development Contribution Scheme (SDCS) being prepared by South Dublin County Council (SDCC) for the Irish Rail Kildare Route Project (KRP). It provides an estimate of the impact of the infrastructure on relevant property values and recommendations for the design of the scheme. The report was prepared as responses to a set of questions that were posed by SDCC.

2. The relevant property in the study area have been identified as properties suitable for development or redevelopment with the life of a 30 year SDCS that lie within 1 km of the proposed route. A total of 1,807 ha lie within the study area.

3. The research indicated that the KRP will have a positive impact on property prices, although this is difficult to quantify, and is likely to be less than has been found in the case of light rail projects. The impact is likely to be greatest on residential property with a low impact on retail property. The total impact is estimated at between €353 and €603 million. For property that will be subject to the SDCS the range is €281 to €479 million. This range reflects the degree of uncertainty regarding the impact. About 85% of this value arises in residential property.

4. The levy rate set under the scheme must be consistent with other schemes being implemented. It must be set at a level that will raise adequate revenue to part-finance the infrastructure, but must be proportionate to the service that is provided by the KRP and the increase in property values that has been calculated, and must not divert development from South Dublin to other areas.

5. Having assessed the implications of various rates, the following rates are recommended for 2007:

Residential	€1,900 per unit
Commercial	€22.35 per m^2
Retail	€29.00 per m^2

   This commercial rate is the same as the rate for Metro North Schemes in Fingal and Dublin City while the residential and retail rate is 75% and 90% of these rates respectively. These lower rates are warranted on the basis of the lower overall impact of the infrastructure on property prices when compared to the light rail systems.

6. These rates should be indexed at 5% per annum. The estimated present value of the SDCS using these parameters is €57.5 million. This will provide 26% of the estimated cost of the infrastructure to be located in South Dublin but this consideration should be given less emphasis than remaining consistent with the schemes developed elsewhere in terms of their measures and impacts.

1. Introduction

This report has been prepared as an input to the design of a Supplementary Development Contribution Scheme (SDCS) to part finance investment by Irish Rail in the Kildare Route Project (KRP). Under Section 49 (1) of the Planning & Development Act 2000, Planning Authorities may include conditions when granting planning permission requiring the payment of a contribution towards the costs of providing a specified piece of public infrastructure. The legislation requires that the spatial area to which the SDCS will apply is specified in designing the scheme for the contributions. For the purposes of this study, this has been defined as approximately 1km from the route of the rail line and the relevant areas have been identified by South Dublin County Council (SDCC).

Section 49 allows for considerable flexibility in designing schemes but it is important to show that that the projects qualifying for inclusion under such a scheme must provide a direct benefit to any development that is subject to the SDCS. It is also necessary in the interests of good governance that the scheme is designed and is implemented in a manner that is transparent, certain, equitable and efficient, and that it is appropriate to the particular development in question. This is achieved through clearly setting out in advance the basis of the levy and its application. It must also be consistent with other relevant schemes, a number of which have now been developed in the Dublin region.

The report is structured in response to a series of tasks that have been identified by SDCC. These are to:

- Estimate the benefits that will arise as a result of the infrastructure in the form of enhanced property values. This property has been identified by South Dublin County Council. The levy will be applied to areas where development or redevelopment is forecast to be undertaken during the 30 year life of the SDCS[1].
- Identify the percentage of the total cost of the KRP that is applicable to the SDCC area and examine the contribution of the SDCS as a proportion of this value.
- Identify the optimum rate of levy.
- Identify the optimal levy rates to be applied for alternative types of development i.e. residential, commercial and retail.
- Provide advice on appropriate inflation and discount factors to be adopted.
- Identify the appropriate basis of the application of the levy.

Section 2 of this report covers the first of these tasks and discusses the potential impact of the KRP on property values. The rationale is that this is a reflection of the benefit of the KRP. Section 3 identifies levy rates for the different types of development and the basis for their application and provides recommendations on levy rates in year 1 and

[1] Statements and forecasts regarding current and potential land usage are based directly on information provided by South Dublin County Council for the sole purposes of this report and the consultants have not undertaken research on this aspect of the study. As a result, nothing in this report should be interpreted as either a commitment or a recommendation in relation to current or potential aspects of land usage and decisions in this respect remain exclusively within the powers of the Council.

subsequent indexation. Section 4 summarises the results and structures the conclusions according to the tasks identified.

It should be noted that the nature of the data means that precise numerical values are possible for parameters such as the recommended levy and indexation rates, but that estimation of the potential impact of the KRP on property prices and property markets is a more subjective exercise so that a range of values is used.

2. Evaluation of Property Benefits

2.1 Assessment of Impact on Values

Approach and Methodology

Section 49 requires that a planning authority designing a SDCS must clearly identify the new infrastructure and the benefits that will accrue as a result of this infrastructure being in place. The benefit that will arise will depend on the amount of property in question, the current value of this property and the change in value as a result of the KRP. The study area has been defined by South Dublin County Council as property within 1 km distance from the proposed route for the rail line. This is in accordance with international study and experience, and existing Section 49 schemes. As a result, only property within this catchment area that is forecast to be likely to be developed or redeveloped with the 30 year lifetime of the SDCS can be included in calculating the levy.

This section examines the likely impact of the KRP on these property values. Three approaches are used to provide an estimate of the potential impact on property values:

- Review of studies of international experience of the impact of commuter rail on property prices;
- Interviews with estate agents and others along the Luas Lines and the proposed Metro North routes.
- Expert opinion obtained through consultations with estate agents to identify their views on the potential impact of the KRP on property values along its route in South Dublin;

While it is possible that planning applications may be compiled and permission for development granted as a result of the KRP being developed, the valuation of the impact of the infrastructure on property values does not identify this as the basis for increased values. Rather, the value arises as a result of the increased benefits to residents and visitors to the study area and businesses located in the area. These benefits mean that property owners are willing to pay more for their houses and premises as reflected in market prices. The methodology identifies the increase in these values as the benefit for a number of reasons. First, it avoids an assumption that any change of zoning and usage takes place because of, and only because of, the investment in the infrastructure. In the context of a 30 year time horizon and the rapid development of the area, including a number of new transport and other infrastructural developments, any such assumption would certainly be open to question. Second, the purpose of this valuation is to identify a basis for the application of a levy under the SDCS. Under the legislation this levy is applicable when planning permission is finalised and this implies that the decision to allow development has been made in advance. Finally, from the point of view of designing and implementing the SDCS, the levy can be interpreted as a tax. This raises the possibility that it could distort the market thereby potentially leading to the diversion

of development from the area, if it was set at tan inappropriate level. Consequently, the calculation is not based on the increase in the value of land when a decision is made to facilitate development or redevelopment but on the impact of the KRP in increasing the value of the buildings that will be constructed. This approach is in keeping with the rationale for Section 49 which stresses the importance of identifying the direct impact of the infrastructure and with the objectives of this report.

Published Material

Although the link between investment in infrastructure and property values is an important issue, particularly given the trend towards the joint sharing of costs that underlies the introduction of Section 49, there is actually very little comparable published research that concludes unequivocally that specified property prices rise as a result of a particular piece of infrastructure let alone research that puts a value on the increase.

Appendix 1 provides a brief review of relevant material. This literature indicates that:

- Improved rail infrastructure does generally provide a gain to landowners in the vicinity although the extent of this gain can vary considerably;
- However, it is very difficult to identify this in respect of a particular parcel of land and a particular investment because the timing may be due to cycles in property prices arising from interest rates changes and economic conditions, and changing tastes and demographics may submerge the effect;
- The impact will depend on associated developments, such as retail opportunities and environmental enhancement, demographics and planning permissions that allow the values to be released.

In other words, the impact is positive in a general sense but the specific effect is difficult to identify due to wider changes in the economy and will depend in any case on associated developments in the area. The major exception is where new development is undertaken and could not have occurred without the new infrastructure. This often applies in the case of roads and utilities but would not be the case for the KRP in South Dublin since the provision of this infrastructure is only one factor that will impact on the potential for development in the area. As discussed above, since zoning remains within the powers of the Council it cannot be assumed that providing this infrastructure will result in development in South Dublin that would not otherwise take place.

Professional Opinion from Areas Served by Other Infrastructure

In consultations for research undertaken in the preparation of the Metro North SDCSs, respondents along the Luas lines expressed difficulties in attempting to identify the precise impact of the infrastructure on property prices in adjacent areas. This is similar to the international literature. It was thought to be particularly difficult to assign a rise in prices to the Luas where developments such as the completion of the M50, the Dundrum

Shopping Centre and the new employment opportunities in the Sandyford area are all very important. There was a strong feeling that the impact of the Luas depended on the total package offered by the area. One observation of relevance is that the Luas made housing in some areas attractive to people who would not have otherwise considered the area i.e. the area comes to be seen as qualitatively superior. Easy access to the city is also a key marketing issue in areas outside the M50. It is expected that the KRP would have a similar impact on the Kildare region. This suggests that significant benefits of the KRP may actually arise towards the city centre and in Kildare rather than in the suburbs.

However, the estate agents were clear that the impact of the Luas had been positive. Proximity to the Luas has been used as a marketing tool although there is no agreement in relation to the distance from the line where this is important with respondents varying between 1km and 3km in terms of the area influenced. All agreed that the impact would extend to at least 1km. There is also general agreement that the greatest impact of the Luas on prices was seen once the infrastructure became operational when a real acceleration in prices was perceived.

The Luas has also had an impact on commercial decisions but not necessarily on the value of commercial premises with the likely exception of the Sandyford area. In this case, a concentration on the development of knowledge-intensive industries means that there is a considerable premium from high quality supporting services such as rapid commuter transport. However, road infrastructure was seen to be a much more important consideration for industry in Tallaght although rents for office space have risen. There is no perception that the levy to fund the Luas Green Line B1 extension would impact negatively on the rate or the type of development given the over-riding perception that the area is now a highly attractive location for knowledge businesses and workers.

Opinion in relation to the impact of the Metro on prices was also somewhat ambiguous although all consultations indicated positive effects. Many estate agents were already using it in their literature although it was thought that the real impact would arise after completion. The general view was that although potential house purchasers are aware of the proposed infrastructure and that it would influence prices, any impact would be relatively small compared to the impact of the wider economic outlook that is driving the market. The main driver of prices in the residential sector in particular will remain the supply of new houses relative to the ongoing levels of demand. In other words, prices will be determined to a much greater extent by factors such as interest rates, the rate of new supply and overall economic conditions.

Views were generally quite conservative in terms of the likely impact of the Metro on commercial and office values in the city but somewhat more positive in Fingal. Infrastructure such as the Metro is seen as likely to have the greatest impact where new office parks are being developed for high value service and knowledge industries. With a few exceptions, these areas will tend to be outside the City area in the suburbs. However, there is greater potential for retailing in the inner city as improved public transport will improve its ability to draw in customers from the suburbs. The impact is likely to be less in the outer city where the benefits of better access to the city will be at

least partly offset by its potential to divert customers towards the city. Table 1.1 summarises the conclusions of this research for the impact of the Metro on property prices. These were expressed as ranges further underlining the equivocal nature of the findings.

Table 1.1: Projected Ranges for Impact of Metro on Property Values in Dublin

	City	Fingal
Residential	5 to 8%	6 to 10%
Office/high tech commercial	3 to 6%	3 to 6%
Retail (Inner city)	6 to 8%	n.a.
Retail (Outer city)	3 to 5%	3 to 7%

Professional Opinion in Relation to the KRP

A number of estate agents and other property professionals were contacted in order to get an insight into the potential impact of the KRP on property values in the study area. There was no clear agreement regarding the potential impact that the KRP might have on property prices. In line with experience elsewhere, respondents said that they would find it very difficult to isolate this effect and were hesitant to identify any particular percentage increase. In addition, some concern was expressed regarding the introduction of a SDCS for the KRP given the prospect that there is likely to be a SDCS for Metro West. This latter infrastructure is viewed as more relevant to property prices in the area in the longer term.

However, when pressed, estate agents are of the opinion that the KRP would be positive for the area as a place to live and do business. In particular it opens up the possibility for integrated high quality residential development along the lines of Adamstown. Thus, the feeling was that it would be new development as opposed to redevelopment that would see the greatest benefits and that these would arise if improved transport had an impact on the nature of the development. Better access to the city was also seen as having a positive impact on commercial development through better integration of South Dublin with the city. This would be particularly important for office type development with no particular benefits foreseen for heavier industry.

Views were somewhat more mixed in the case of retailing, however. A considerable retail base is already in place and a good proportion of the customer base for retail in South Dublin live outside the area. In general, it is not thought that these customers will use the rail system to any great extent and car transport will remain the main mode of transport. The main impact would be as a result of a potentially greater local residential population in higher socioeconomic categories and some passengers from along the line. In all, this will form only a limited part of the customer base. In addition, there is likely to be an offset for retailing as residents of the area and potential customers from Kildare will now have easier access to the city. As a result, caution is required.

While generally viewing the likely impact as positive, respondents were unwilling to identify precise numbers in terms of the likely size of the impact on residential prices but suggested that the impact would be lower than in the case of the Metro for all categories of property. It was generally thought that the impact would be greatest on residential property and many maintained that the impact on much of the property base would be very small particularly in retailing and many commercial activities. A general conclusion is that the real benefit of the KRP would be a reduction in traffic for all residents, and benefits to residents of Kildare and businesses in the city. To a considerable extent, these benefits cannot be assigned to prospective residents of the area who will pay the levy. In this respect, the KRP is unlike the Metro and Luas B1 SDCS areas since there are benefits but these will not accrue exclusively, in terms of increased property values, in the South Dublin area.

Despite this, there was general agreement that a levy along the lines implemented in the Luas B1 area would not have any noticeable detrimental impact on the property market in South Dublin. General economic conditions are of much greater importance and proximity to the KRP would add to the attractiveness of the area. While these views are expressed against the background the market currently, the easy acceptance of the idea in principle is important and underlines the strongly held view that property purchasers would be willing to pay for improvements in public transport.

Conclusions

Internationally, it is widely accepted that there are benefits in terms of higher property values when transport infrastructure improves, but these have been difficult to identify in practice and estimates have varied widely. While changes in property prices will depend on general developments in the economy, it is expected that areas close to the KRP will fare better than the market in general. The views of estate agents in the area and evidence from the Luas and Metro research support the expectation that the KRP will have some positive impact on property prices, albeit to a lesser extent than in the case of the light rail projects. However, this impact is difficult to quantify. This main positive will be seen in residential values and office and commercial property values where high-tech services are located. The impact on property prices for retailing is less certain. The overall impact will depend on the ongoing development of South Dublin, of which KRP is just one element. New, high quality residential development will benefit but there is some concern regarding the potential impact of introducing an SDCS for the KRP with the prospect of Metro West in the future.

This analysis suggests that the impact on property prices will be somewhat less than in the case of the Metro project and limited in the case of retail property. The calculation below uses two rates of 3% and 5% for residential property reflecting the uncertainty regarding the extent to which the KRP will actually service residents of South Dublin as distinct from merely passing through the area. The higher rate reflects the fact that new development along the lines of Adamstown – which in itself is not subject to the SDCS – will be able to use the new transport infrastructure as a marketing tool.

The impact on commercial property will depend on the type of property in question. For office and similar commercial properties, rises close to those for residential property are likely. The calculation uses high and low rates of 2% and 4% in the calculation. Assessing the likely impact on retailing is more complex as car transport will remain important and there is also potential for diversion from local business to the city centre as access is improved. Accepting that there are particular difficulties in estimating the impact that should be attributed to the KRP on retail values the calculation below uses a range of 1% to 2% for the impact.

These estimates are summarised in Table 2.2.

Table 2.2: Projected Ranges for Impact of KRP on Property Values in South Dublin

Residential	3 to 5%
Office/commercial	2 to 4%
Retail	1 to 2%

2.2 Property Base and Valuations

Property Stock in Study Area

The study area totals 1,807 hectares. A total of 1,150 ha, or just under 64% of this area, has been identified by South Dublin County Council as having potential for development or redevelopment. These areas can be categorised by use and potential use as residential, commercial and retail. The details for the study area are shown in Table 2.3. This shows potential development of 25,000 housing units to which the SDCS may be applied. Potential commercial development of 350,000m^2 have been identified along with 75,000m^2 of retail space[2].

Table 2.3: Property in Study Area by Category

	Category of Use		
	Residential (units)	Commercial (m^2)	Retail (m^2)
Total Property Base	31,477	418,000	90,203
Developed, no redevelopment	6,477	68,000	15,203
Property Base for SDCS	25,000	350,000	75,000

This projected level of development is used for the core calculations in this report as the required land areas are available and it approximates the rate of development seen over the past decade projected for the duration of the proposed SDCS. Some additional lands

[2] These data have not been assessed by the consultants. The number of housing units and areas of commercial and retail space are based on projections of plot ratios and densities prepared by SDCC.

within 1 km of the rail line may become available for development during this period. This would increase the potential to 35,000 residential units, 500,000 m^2 of commercial space and 100,000 m^2 of retail space. However, this level of development would require an accelerated pace relative to what has been achieved in recent years. As a result, while this level of development cannot be ruled out, neither would it be prudent to use this projection for calculating the potential value of the SDCS. This calculation was undertaken for information purposes and the results are contained in Appendix 2.

Property Values

Existing residential property has an assessed density of 25 per ha but the much higher projected density for future development – the data infer residential densities of 100+ housing units per ha in some sites – means that the new residential development foreseen in the study area will comprise a large number of apartments. It is assumed that the average existing residence is a 3 bed semi-detached house. However, it is assumed that 75% of new residences will be 2 bedroom apartments and the other 25% of residential development will be 3 bed-roomed semi-detached houses. A survey was undertaken of such properties currently on sale and recently sold in South Dublin. The average price was €310,000 for apartments and €340,000 for a 3 bed semi-detached. This is in line with the average price of new apartments in Adamstown although slightly below the average of around €380,000 for houses in that development. The Adamstown value is used for new housing. This gives an average price of €327,500 per unit for new residential development.

Commercial property prices are based on properties around Dublin's suburbs for office and retail, with a distinction between retail properties in town centres and retail parks. Annual yields for these types of properties are currently estimated at 4.5% for office, and 3.4% for retail in Ireland as a whole[3]. Vacancy rates for offices have fallen to 11% in Dublin and rents have been buoyant. Rents in suburban locations are in the range €125 to €270 per m^2. At 4.5% yield this translates into a sale value of €2,750 to €5,800 per m^2. Locations close to good transport infrastructure are towards the upper end for high specification offices for information-intensive businesses. However, this would be too high a figure to apply to all the areas assigned for commercial development since the development on these areas will include elements of both office and manufacturing/service activities. Thus, a mid-point estimate for the suburban range is used giving a figure of €4,275 per m^2.

In the case of retail it is necessary to distinguish between the relatively small scale units that are typical of a town centre and the larger units in retail parks. Prime smaller retail outlets are renting at over €500 per m^2 inferring a market price of about €14,700 per m^2 at the average yield. Looking wider to include a range of retail properties indicates that an appropriate value for town centre retail property would be in the region of €11,500 per m^2 with €6,000 per m^2 for other retail property. It is assumed that 10% of existing retail

[3] Society of Chartered Surveyors (2007) *SCS/IPD Irish Property Index, 4th Quarter 2006*.

space is in the higher category giving an average retail value of €6,550 per m^2. For new retail, it is assumed that 10,000m^2 of the projected area to be developed will be valued at the higher rate with other retail development at the lower rate[4]. On the basis of commercial property currently available for rent and for sale this would give the values contained in Table 2.4.

Table 2.4: Commercial & Retail Property Values (€ per m^2)

Commercial	4,275
Retail (in town centres)	11,500
Retail (outside town centres)	6,000

Potential Increase in Value

Applying these estimates to the property base that is subject to the SDCS, as contained in Table 2.3, provides the estimates of the potential impact of the KRP for the high and low range. The results are contained in Table 2.5 if the impact is at the low end of the range identified in Table 2.2.

Table 2.5: Estimated Impact of KRP on Values with Low Impact (€m)

	Residential	Commercial	Retail	Total
Developed, no redevelopment	66.07	5.81	1.00	72.88
Property Base for SDCS	245.63	29.93	5.05	280.60
Total Property Base	311.69	35.74	6.05	353.48

This calculation concludes that if the impact of the infrastructure on property prices is towards the low end of the range identified in Table 2.2 then the total value created will be just over €353 million for the area as a whole and just under €281 million in property to which the SDCC levies can be applied.

However, as shown in Table 2.6, when the impact is at the high end of the range identified, the increase in values is considerably greater. In this case, the value created in all property in the study area is €603 million and €479 million in property to which the SDCS will apply.

Table 2.6: Estimated Impact of KRP on Values with High Impact (€m)

	Residential	Commercial	Retail	Total
Developed, no redevelopment	110.11	11.63	1.99	123.73
Property Base for SDCS	409.38	59.85	10.10	479.33
Total Property Base	519.38	71.48	12.09	603.05

[4] Again, it is necessary to note that these assumptions are used for the purposes of the calculations undertaken in this report so as to incorporate the fact that retail property in developed areas has a market value well in excess of commercial property and no additional implications should be inferred.

This range of €281 million to €479 million for value created in the property base to which the levy can be applied reflects the considerable uncertainty that exists in relation to the impact of the infrastructure. In itself, the infrastructure will not have a great impact but if it facilitates high quality development such as in Adamstown then it is to be expected that the impact will be comfortably within this range. However, the lower estimate of below €281 million creates a potential difficulty since, as discussed further below, it means that some care must be taken with the levy that is applied so that an excessive proportion of the value created is not 'taken'. This is particularly the case as residential property accounts for about 85% of the total value that is created.

3. Recommended Levy Rates

3.1 Basis for Application of Levy

The levy can be applied either as a fixed flat rate across the area or it can be related to underlying property values within the area as reflected in property types i.e. residential, commercial and retail. However, only one rate for each type of property can be identified in the scheme. Given the considerable differences in property values according to their use, it is recommended that different rates should be used according to the category of the development proposed, as has been the case in other SDCSs. Three rates are proposed below representing residential, commercial and retail development.

It is necessary to decide whether the levy should be applied on the basis of the underlying property i.e. € per hectare, or on the basis of the actual area developed i.e. € per housing unit or per m^2 for commercial property. The former approach provides some degree of certainty in relation to projections of future revenue streams since the areas to which the levy will be applied are known. With the latter, the revenue stream would be related to the plot ratios and densities achieved and these are somewhat less certain in advance. In the Fingal Metro North and Luas B1 schemes the former approach was adopted as it provides an incentive for developers to increase the plot ratios and densities of development. However, this was not considered to be as important in the city area where high densities are likely to be achieved due to the shortage of development space and the areas in question are small. As a result, the Dublin City scheme adopted a per unit basis for residential development and a m^2 basis for commercial and retail.

In deciding on the most appropriate scheme for South Dublin it is necessary to clearly identify the interests of the Council and particular features of the area subject to the scheme. The Council's interest, given that the investment is going to proceed, is to ensure that the provisions of the scheme do not interfere with the achievement of planning targets. Crucially, the data on the property base makes it clear that, particularly in the case of commercial property, plot ratios are intended to vary considerably between different areas, for example, development in Clondalkin Town Centre will be at much higher ratios than in Grange Castle. Thus, the levy must recognise this. This can be done by adopting the per unit approach for residential and per m^2 for commercial/retail property. In addition to reducing the possibility of the levy interfering with the implementation of planning objectives, this will also assist in maximising the potential take of the scheme as higher densities will increase its value. Based on Table 2.3 the forecasts of future development to which the levies will be applied are shown in Table 3.1.

Table 3.1: Areas for Application of Levies

Residential Units	25,000
Commercial (m^2)	350,000
Retail (m^2)	75,000

3.2 Levy Rate

Criteria for Consideration

Although there is no ideal comparable situation for 'pricing' the levy, it is possible to identify a number of standards that the levy adopted must meet. In line with general principles of taxation the levy must:

- be set at an appropriate level to raise the finance required;
- be justified in terms of the service provided;
- be enforceable without undue diversion of activity and distortion of the economy; and
- be proportionate so as to recognise the realities of the tax base and the risks and uncertainties that exist.

In terms of the project under consideration, these can expressed as a number of criteria that the levy rate set under the scheme must meet. These are:

- The levy must be set at a level that will raise revenue with a present value that is adequate to finance an appropriate percentage of the cost of the infrastructure;
- The amount raised must be proportionate to the service that is provided in terms of the number of passengers that will use the KRP when compared to other systems;
- The levy must not inhibit the ongoing development of South Dublin given the high probability that there will be at least one complete property cycle during the 30 year time horizon when the area will have to compete for investment;
- The present value of the projected revenue must be a portion of the increase in property values that has been calculated so as not to distort locational decisions.

Level of Finance Required:
The first criterion that the levy must raise a particular proportion of the cost is not used in this report as a basis to identify any particular levy as appropriate. The legislation only requires that the funds that are raised by the SDCS do not exceed the cost of the investment. Adopting a particular target as a criterion would raise 2 problems. First, to design the levy when emphasising a particular final value would risk working back from the conclusion to see what rate might provide this value rather than analysing what rate the area can be expected to bear so as to provide a revenue stream taking due recognition of the potential and risks involved. For this reason, this criterion should be applied *ex post* only. It may be appropriate for this to be a matter for consideration by the Council in reviewing the conclusions of this report and in subsequent decisions relating to the design of the Scheme.

Second, this criterion requires that the cost of the infrastructure be appropriately identified and this raises an important issue in the case of the KRP. Estimates produced by Irish Rail allow for the costs to be identified and allocated according to the location of the infrastructure. These indicate that the cost of infrastructure located in the SDCC area will be just under €220 million, not including construction that is being provided by

private property developers under planning conditions. It could therefore be argued that this cost should be divided – say 50:50 – between public fund sources and the SDCS. This would provide a 'target' value for the SDCS of €110 million in present value.

The problem with applying this estimate is that the KRP passes through Dublin City, South Dublin and Kildare administrative areas. The assessment above of the benefits produced suggests that much of the value that is created will arise towards the main origin and destination termini i.e. Kildare and the City, will benefit mostly. Commuters living in Kildare will provide the primary customer base that will use the infrastructure located in the SDCC area but with no benefit to residents of South Dublin other than a general reduction in road traffic. This benefit is widespread and cannot be allocated to the study area alone. Thus, this approach allocates costs to the SDCC area that provide benefits to commuters originating in Kildare with the City as their destination and to the City by providing a labour pool. This would indicate that a different allocation of costs than a straightforward application of the cost of the infrastructure on the basis of location would be more appropriate but would require detailed projections of origin-destination flows on a station by station basis. These are not currently available.

This problem does not arise in most other instances where an SDCS has been designed. The Metro North and LUAS B1 schemes have no intermediate administrative areas and relate to light rail projects where journeys tend to be shorter and less structured in terms of origin and destinations. The East Cork Commuter Rail project links Cork County and City areas but both gain i.e. there is clearly a benefit to residents in East Cork and to businesses in Cork City. The Navan-Dublin Rail SDCS applied a levy at 50% of the Luas B1 rate on the basis that passenger capacity would be approximately 50% of the Luas. On the basis of land currently identified for development, the value of the SDCS would fall well short of 50% of the cost of the infrastructure. However, lands to which the levy could be applied in the future if planning zones where to be altered were identified to the extent that the levy rate adopted would achieve 50% of the projected cost of the infrastructure. The restricted area means that SDCC will not have this flexibility and, unlike in the case of the KRP, there are no intermediate administrative areas along the Navan-Dublin rail line. The Metro North SDCSs designed by Fingal County Council and Dublin City Council did not place any emphasis on achieving a particular percentage of the cost of the investment. Indeed, an actual cost estimate had not been provided by the RPA at the time of the design of the Schemes. An indicative estimate of €1 to €1.2 billion for the investment had been adopted in Fingal as a working assumption. The Fingal SDCS for Metro North has a present value of €525 million which is close to 50% of the assumed cost. In the case of Dublin City, the SDCS has a present value of €113 million. While no indicative estimate was provided at the time the scheme was being designed, the infrastructure requirements are broadly similar in terms of the length of track and number of stations. As a result, the proportion raised in the city would be far less than in the case of Fingal and probably in the region of 12 to 15% of the actual cost of the investment[5].

[5] The lower proportion raised in the case of the city is simply a reflection of the relatively small areas available for development and not the rates applied.

Clearly, these schemes do not provide a simple benchmark against which the proposed SDCS can be assessed. For this reason, the criterion that the levy should raise a particular proportion of the cost should be applied conservatively and simple comparisons with the proportions raised in other schemes should be avoided. This means that it would be inappropriate to adopt a simple 50% of cost requirement as a basis for designing the SDCS although obviously this does not mean that any levy rate should be rejected just because it may achieve these returns. A better approach is the generally adopted criterion that the SDCS should be designed to raise the maximum amount of the cost while minimising the potential disruption of the levy and achieving consistency with proximate schemes. This is fully in line with the legislation and with guidance that has been provided by the Department.

Service Provided:

To ensure consistency, it can be argued that the levy should be set at a level that reflects the service that will be provided relative to the service provided by infrastructure where Section 49 schemes have been used to provide finance. This approach was used to identify a levy rate for the for Phase 1 of the Navan-Dublin Railway Line. In this case, capacity was based on 4 trains per hour which could rise at peak times to 6 trains per hour – 50% of the Luas B1 estimate – so the levy was set at 50% of the Scheme for Luas B1.

Planning for the Luas B1 Scheme modelled demand with a 5-minute headway at peak and 10 to 15 minutes at off-peak times using the DTO model. This identified hourly demand of 6,629 persons in peak times and 1,967 off-peak with incremental demand as a result of the extension estimated at 1,238 per hour peak and 367 off-peak[6]. Projections placed an estimate of 7,500 trips one way for Metro North in both the morning and evening peaks with a total daily ridership of 37,500 on the average weekday[7]. This work estimated that the potential for total annual ridership would be over 1.5 times updated projections for the Luas Green Line and other estimates have suggested figures above this. This analysis would indicate that the appropriate levy for Metro North would have been up to twice those used for Luas B1. However, this was rejected by Fingal and Dublin City Councils on the basis that it would risk placing these areas at a disadvantage in terms of their attractiveness as a location for development.

Irish Rail projections estimate that the KRP will result in a service of 44 dedicated local commuter trains each way each day through the stations in the SDCC area with a total daily capacity of 105,600. This compares with 13 daily trains each way currently through South Dublin stations at Clondalkin and Park West with capacity of 15,600. Thus, there is additional capacity of 90,000 passengers with 62 extra trains (31 each way) per day.

The immediate problem that arises is similar to above namely that this is total capacity on these trains and, while the possibility exists in the future that trains may be provided on

[6] *An Economic and Planning Assessment of an Extension to LUAS Line B to Cherrywood & Shankhill*. Report by Peter Bacon & Associates, McHugh Town Planners and Steer Davies Gleave, January 2000.
[7] Private correspondence with Roughan & O'Donovan Consulting Engineers.

this line with origins and destinations in South Dublin, most of this capacity will relate to journeys with origins and destinations outside the SDCC area. Thus, only an unknown fraction of this capacity can be used to identify the service that will be provided to residents of the area.

If it is assumed that trains run for 16 hours per day i.e. 6 am to 10 pm, then the additional service will amount to 4 trains per hour on average. This is comparable to the Navan-Dublin service suggesting a levy at 50% of the Luas B1 rate. The Metro levies in Fingal and Dublin City are broadly consistent with Luas B1 so it would also be approximately 50% of these rates. However, estimated passenger capacity at 90,000 on these trains would suggest the levy should be higher. The question is what proportion of this passenger service relates to residents of South Dublin. If it is assumed that 40% of passengers using the additional service have an origin/destination within the SDCC area i.e. the people who would pay the levy, then passenger service could be deemed to be a suitable basis for setting the levy in comparison with the rates set for the Luas and Metro. However, this may be too high a percentage given the likely importance of origins in Kildare with destinations in Dublin and the basic difference that this is a mainline service where travel distances are expected to be greater than the light rail Luas and Metro systems.

In conclusion, this criterion does not provide a good basis on which the levy can be identified but does provide some indications. The number of additional trains projected indicate that the levy should be in line with the Navan-Dublin rail project i.e. at 50% of what has been adopted for the light rail Luas and Metro SDCSs. Likely passenger numbers suggest a higher rate but most of these passengers will not be from South Dublin. In conclusion, this analysis indicates that the rate should be somewhat below that adopted for the Luas and Metro but certainly more than 50% of these rates as was used for the Navan-Dublin SDCS.

Minimise Diversion and Distortion:

The value of the Scheme will depend on the levy rate applied and on the amount of development that takes place. While the purpose of the levy is to raise finance, it is relevant to view it in terms of the overall competitiveness of South Dublin as a location for future development. This might be particularly relevant in a period of relative downturn in property markets.

The burden of the levy in a dynamic property market will fall on the ultimate purchaser in the case of residential property and the leaseholder for commercial property. Consultations with estate agent indicate that the impact of the levy in the current market would be small and would be absorbed in the residential sector although there could be some impact in the commercial sector. The retail sector could be sensitive as it competes with the growth of the city and other suburban centres but this should not be excessive provided the levy is not set excessively high. As a result, the potential for the wider economic environment to change would appear to be far more important in determining the rate of development with only a limited direct impact from introducing the levy

assuming that recent conditions are maintained. However, in a weaker market an increasing share of the burden would fall on the property developer. There would therefore be an incentive to delay development or to divert investment to other areas where the levy is lower or does not exist if the property market was weak. It is to be expected that there will be years of weak property markets during the 30 year lifetime of the SDCS. In either case, this would have implications for development and planning and could place an undue burden on South Dublin. As a result, it is desirable that the levy rate is set at a level that does not divert development from South Dublin.

This leads to the conclusion that it is not the levy as such that will affect development but it level relative to other areas. As a result, the need to ensure the relative competitiveness of South Dublin needs to be emphasised. This issue have been recognised by the Department of the Environment heritage and Local Government and provide the strongest argument for consistency between schemes in adjacent areas. In this context, the potential for a further SDCS to finance the Metro West in the area becomes relevant and the potential for the full impact must be recognised.

The rates set for adjacent SDCSs are set out in Table 3.2. The rates are per hectare unless stated and have been indexed to 2007 prices at 5% per annum as per each of these schemes.

Table 3.2: Levy Rates per ha in SDCSs in Dublin

	Residential	Commercial	Retail
DLR Luas B1 (2003)	€250,000 in 2003 = €303,900 in 2007	€570,000 in 2003 = €693,000 in 2007	
Navan-Dublin rail (2004)	€131,250 in 2004 = €151,940 in 2007	€299,250 in 2004 = €346,420 in 2007	
Fingal Metro (2006)	€290,000 in 2006 = €304,500 in 2007	€660,000 in 2006 = €693,000 in 2007	€900,000 in 2006 = €945,000 in 2007
Dublin City Metro (2006)	€2,540 per unit in 2007 = €304,800 @ 120 units per ha	€22.35 per m^2 in 2007 = €782,000 in inner city and €650,500 in outer city*	€32.20 per m^2 in 2007 = €1,127,000 in inner and €966,000 in outer city*

*Projected plot ratios for non-residential development are different in the inner and outer city.

It is immediately obvious from the table that achieving consistency has been a key issue in drafting Section 49 schemes with recognition also of the service provided in the case of the Navan-Dublin rail SDCS. As a result, it is necessary to ensure that the rate set for KRP would not be perceived in a difficult economic environment as placing the area at a relative disadvantage that could displace the development. These rates therefore provide indicative estimates for the scheme.

Proportionality:

The legislation is designed to allow the providers of infrastructure to access part of the value created in property. As a result, the revenue obtained must be a percentage of the value created for the people who ultimately pay the levy. Failure to do so would greatly

increase the risks associated with the potential for development to be displaced. It is necessary to keep the proportion of the overall value that accrues to the Council not only below the overall amount but well below it. The levy might be viewed as akin to a capital gains tax and, as such, it could be argued that the rate should not exceed 20% of the value created in property. However, it should be lower in the case of residential property given that capital gains tax is not charged on primary residences. Consistency with other schemes also requires that the proportion of the value created that is 'taken' as a levy is similar to other areas.

Estimates of the property benefits arising from the relevant infrastructure have not been published in the case of Luas B1 or the Navan-Dublin rail. However, studies for Metro North SDCSs indicate that the arguments above have been emphasised. The Dublin City Metro North SDCS has a present value of €113 million with benefits estimated at €1.4 billion using mid-point values. This means that the SDCS yields 8% of the value created. In the case of Fingal County Council, the property benefit was estimated at €2.1 billion while the SDCS has a present value of €525 million giving a 'take' of 25%. Once again, the difference is due to the relatively low proportion of the relevant property that will be developed and therefore subject to the levy in the city. The projected proportion of the benefit that would be paid as a levy in Fingal would average around 12% in the case of residential property and 30% for commercial property[8]. This is the more relevant for South Dublin where reasonable tracts of land are available for development.

This criterion is clearly important in the case of the KRP. The analysis above estimated that the value created in the area subject to the SDCS will lie in the range of €281 to €497 million. If the Fingal percentages are adopted then the SDCS would yield between €40 and €70 million. This indicates that the 50% of cost figure - €110 million – would mean that the SDCS in South Dublin would need to 'take' a much higher percentage of the value that is created than is the case with this comparable scheme.

Levy Rate in Year 1

The conclusions of this discussion are that:

- An *a priori* target for the SDCS to raise 50% of the cost of the infrastructure that will be located in South Dublin is inappropriate and would result in a scheme that aimed to acquire a considerably higher proportion of the value that is created than has been the case in other schemes. This is particularly important in respect of residential development where most of the value is created.
- The need to ensure that the levy reflects the service provided relative to other schemes suggests that the levy should be higher than has been determined for the Navan-Dublin rail line but somewhat below the rates adopted in relation to Metro North.

[8] The actual percentages varied depending on whether the impact of the infrastructure on values is at the high or low end of the estimates. The actual values are used here in the calculations.

- Consistency of rates has been deemed to be an important consideration across different administrative areas in Dublin and has taken precedence over other considerations in relation to the light rail schemes. However, The KRP is likely to have a smaller impact on property values than research on the light rail schemes has indicated although there is a wide range. Consistency requires that various SDCSs have similar impacts as well as similar measures.
- The proportion of the value created has varied between the Metro North schemes designed in Dublin and Fingal due to the very different amounts of property that are available in each area. The Fingal scheme, which aims to take about 12% of the value created in residential and 30% in commercial property, is a suitable benchmark for the KRP scheme. This provides a target value for the KRP scheme of €40 to €70 million.

The calculation of the value of the SDCS has been done using 2 alternative levy amounts. The first – described as the standard levy – uses levy rates similar to those that were used in the Luas B1 and Metro North schemes discussed in Table 3.2 above[9]. The second – described as the target levy – is designed to raise revenue that would be more in line, as a proportion of the total value created, with what is being implemented in other schemes. The discounted present value of the SDCS under both approaches is shown in Table 3.3. Additional details relevant to the following discussion are shown in Table 3.4.

Table 3.3: Discounted Present Value of SDCS under Alternative Levies

	Standard levy		Target levy	
	Levy (€)	Value (€m.)	Levy	Value (€m.)
Residential	2,540	€63.50	1,900	€47.50
Commercial	22.35	€7.82	22.35	€7.82
Retail	32.20	€2.41	29.00	€2.17
Total		€73.74		€57.50

Applying the same rates as those used for the light rail SDCSs provides a total of €73.74 million in revenue. However, when this value is compared with the value that is created – as shown in Table 2.5 and 2.6 above – it can be seen that the proportion of residential and retail value, if the impact is low, is well above what has been implemented elsewhere. This is shown in Table 3.4. This indicates that somewhat lower levy rates for these two categories are required. Overall, the scheme using these rates would take 20.8% of the value created.

The commercial rate remains unchanged at €22.35 per m^2 under the alternative scenario. The residential rate is set at 75% of the rate used in relation to light rail giving a rate of €1,900 per unit. The retail rate is set at 90% of the rate used elsewhere giving a rate of €29 per m^2. Total revenue is €57.5 million, just over the mid-point of the range identified above. If the impact on property is at the low end of the range identified than the

[9] The rates are adjusted according to the residential densities and plot ratios assumed in Fingal and Dublin City so as to express them in rates per unit for residential and per m^2 for other development.

percentage take is 19.3% for residential and 43.1% for retail property. Overall, the take is 16.2% using mid-range estimates.

Table 3.4: SDCS Value as proportion of Total Value Created.

	Residential	Commercial	Retail	Total
Property values created (Table 2.5 & 2.6)				
Low impact	245.63	29.93	5.05	280.61
High Impact	409.38	59.85	10.10	479.33
Levy as % of value created using standard rates				
Low impact	25.9%	26.1%	47.8%	26.3%
High Impact	15.5%	13.1%	23.9%	15.4%
Levy as % of value created using target rates				
Low impact	19.3%	26.1%	43.1%	20.5%
High Impact	11.6%	13.1%	21.5%	12.0%

The recommended rate must achieve a balance between raising adequate finance, remaining proportional to the value created and not diverting development from the area by remaining consistent with other areas with a SDCS in place. The recommended rates on the basis of these considerations are those identified under the target scenario above and shown in Table 3.5.

Table 3.5: Recommended Levy Rates in 2007 Prices

Category	Rate
Residential	€1,900 per unit
Commercial	€22.35 per m^2
Retail	€29.00 per m^2

3.3 Indexation and Discounting

These rates will be indexed and this has been built into the calculations above. Different indexation factors are available. The Luas B1 scheme, the Metro North Schemes and the Navan-Dublin rail have adopted a flat rate of 5% per annum with no reference to wider developments such as the possibility that inflation might exceed this rate. On the other hand, Cork County Council has indexed the levy to the rate of consumer inflation. However, there is no definitive reason why the index should be the CPI and property prices have outperformed this index for a prolonged period. Furthermore, services inflation is higher than the CPI and the KRP is a service.

It is necessary to discount all future flows to a base year when assessing the yield from the SDCS. A discount rate of 5% per annum has been recommended by the Department

of Finance since the early 1990s[10]. This has approximated the rate paid on public debt in Ireland in the past – repayment of which is assumed to represent the alternative use, and thus the opportunity cost, of public funds. While it is possible to argue a case for alternative rates, these arguments do not provide a definitive reason to conclude that the 5% per annum discount rate recommended by the Department of Finance is not appropriate, although an argument can be made for a lower rate. The recommended discount rate is 5% per annum.

On balance, there would appear to be a no persuasive argument that the index rate should be linked to the CPI or a similar index. A key issue is the wish to preserve the real value of revenue i.e. to try to ensure that the impact of discounting is offset by the indexation. As a result, the recommendation is that the levy rates should be indexed at 5% per annum. However, it is also recommended that the design of the Scheme should incorporate an option for the Council to suspend indexation for a period should overall economic conditions at some point mean that the area was being placed at a disadvantage in terms of attracting development.

[10] Department of Finance (1994) *Guidelines for the Appraisal and Management of Capital Expenditure Proposals in the Public Sector*

4. Conclusions

The Terms of Reference for this project were based on providing the answers to a number of questions set by South Dublin County Council. These questions centred on identifying the potential impact of the proposed construction of the KRP on property prices along its route and providing advice and estimates to be used in designing a SDCS to part finance this infrastructure. The methodologies employed are described in detail in the text and are summarised in this section along with the conclusions drawn from the results obtained.

Task 1: Estimate the benefit arising in terms of increased property values as a result of the construction of KRP

Three approaches were used to provide an estimate of the potential impact on property values:

- Review of material from other studies.
- Views of property professionals in other areas of Dublin where major investments in transport infrastructure have been completed or are proposed.
- Consultations with property professionals to identify their views on the potential impact;

The study area is defined in accordance with international study and experience and existing Section 49 schemes as property that will be suitable for development or redevelopment within the next 30 years and is within 1 km distance from the proposed KRP route. A total of 1,807 ha will be subject to the SDCS.

The research indicated that the KRP will have a positive impact on property prices, although this is difficult to quantify leading to wide range for the estimates. This analysis suggests that the impact will potentially be greatest on residential property prices with somewhat lower impacts on commercial property. The research produced the estimates shown in Table 4.1.

Table 4.1: Projected Increase of Property Values Subject to SDCS

	Percentage	€m, low impact	€m, high impact
Residential	3 to 5%	245.63	409.38
Office/commercial	2 to 4%	29.93	59.85
Retail	1 to 2%	5.05	10.10
Total		280.61	479.33

The actual property benefit in South Dublin, including all property in the study area, is estimated at €353 to €603 million and €281 to €497 million for property subject the levy.

Task 2: Identify the percentage of the total cost of the KRP that is applicable to the SDCC area and examine the contribution of the SDCS as a proportion of this value

The KRP Passes through Dublin City, South Dublin and Kildare administrative areas. Irish Rail have provided estimates that the cost of the infrastructure to be located in South Dublin will be just under €220 million. However, it is not appropriate to use this as a basis against which the value of the SDCS should be assessed other than, in order to comply with the legislation, as an upper limit that the SDCS value cannot exceed.

Significant benefits that result from this infrastructure will arise outside the SDCC area mostly towards the main origin and destination termini i.e. Kildare and the City will benefit mostly. There will also be additional benefits arising in a wider area as a result of the contribution of this infrastructure to improving the overall connectivity of the mainline rail network. In this respect, this mainline rail based project differs significantly from the light rail projects in the city for which SDCSs have been developed. As such, when providing an estimate for comparing costs and benefits in the context of designing the SDCS, a straightforward application of the cost of the infrastructure on the basis of location is inappropriate. In effect, it allocates costs to the SDCC area that provide benefits to commuters originating in Kildare with the City as their destination. These use the infrastructure located in the SDCC area but there is no benefit to residents of South Dublin. This would indicate that a different allocation of costs would be more appropriate but no methodology is readily available that would provide an unbiased estimate of the costs that should be allocated for the purposes of providing a comparator to indicate an appropriate level of contribution that should be raised. For this reason, the criterion as discussed below that the levy should raise a particular proportion of the cost should be applied conservatively and simple comparisons with the proportions raised in other schemes should be avoided. An additional point that also arises in the context of the contribution of this infrastructure to areas outside South Dublin is that it is important that South Dublin County Council is not out of pocket in terms of the administrative costs of implementing this SDCS. This issue should be considered in the overall design of the Scheme.

Task 3: Identify the optimum rate of levy to maximise revenue within market constraints

The levy rate set under the scheme must meet a number of criteria. These are:

- It must be set at a level that will raise revenue with a present value that is adequate to finance in part construction of the infrastructure;
- The amount raised must be proportionate to the service that is provided by the KRP;
- It must not inhibit the competitive position of South Dublin by diverting development to other areas;
- The present value of the projected revenue must be an appropriate portion of the increase in property values that has been calculated.

The requirement for the levy to raise a particular percentage of the cost of the infrastructure is not used to identify an appropriate rate for the reasons discussed above. In terms of the service provided, the analysis indicates that the rate should be above the rates used on the Navan-Dublin rail but somewhat below those applied in the light rail schemes that have been developed for the Luas and Metro North. The levy must also not exceed an appropriate percentage of the value created in any property category and must not place South Dublin at a disadvantage relative to other areas where a SDCS is proposed. This issue of remaining consistent with other areas has been stressed in recently developed SDCSs. However, consistency requires that a similar impact is achieved as well as similar measures.

Task 4: Advise on the appropriate levy rates for alternative types of development

The recommended rates on the basis of these considerations are shown in Table 4.2.

Table 4.2: Recommended Levy Rates in 2007 Prices

Category	Rate
Residential	€1,900 per unit
Commercial	€22.35 per m^2
Retail	€29.00 per m^2

This commercial rate is the same as the rate for Metro North Schemes in Fingal and Dublin City while the residential and retail rate is 75% and 90% of these rates respectively. These lower rates are warranted on the basis of the lower overall impact of the infrastructure on property prices when compared to the light rail systems.

The value of the scheme using the recommended rates is €57.5 million i.e. 26% of the capital costs incurred in South Dublin. The levy amounts to 16.2% of the value created using mid-range estimates. This is not out of line with other recently developed SDCSs and is a more appropriate basis for comparison than comparing infrastructure costs in South Dublin with the value of the scheme as the benefits do not arise for the most part in South Dublin.

Task 5: Provide advice on appropriate inflation and discount factors to be adopted.
The rates quoted are in 2007 prices and should be indexed at 5% per annum. All calculation of present values adopt a discount rate of 5% per annum in line with recommended practice. However, in order to ensure that South Dublin is not placed at a disadvantage in terms of attracting development it is recommended that the design of the Scheme should incorporate an option for the Council to suspend indexation for a period, should this be required.

Task 6: Identify the appropriate basis of the application of the levy.
The levy should be applied on a per unit basis for residential and per m^2 for commercial and retail development. The main reason is that the introduction of the levy on the basis of gross underlying areas would not reflect the fact that densities and plot ratios will vary considerably across different parts of the study area. This approach will also help maximise the value of the scheme.

Appendix 1: Review of International Studies on the Impact of Rail Transport Infrastructure on Property Values

There is a long standing general acceptance that, in theory, "*any improvement in transportation infrastructure is capitalized into land values in a short – term urban partial equilibrium*" (Mills, 1972). In other words, the value of property rises as adjacent transport infrastructure improves. Many empirical studies have tested this theoretical premise using different techniques in a range of locations and have provided contrasting results. Some studies have found a significant positive impact of commuter rail on property values while others have either failed to identify such effects or have seen negative impacts.

In the UK, the Manchester Metrolink was found to have had only a marginal impact on prices of nearby houses with adverse effects thought to have counteracted the gains[11]. The same study found a more complicated picture in Sheffield. Prices were estimated to have risen modestly before construction work began on the Supertram system but this had disappeared by 1993 and a fall in values of 3% was recorded. However, a later study found that by 1996 a small rise in prices could be attributed to the new transport infrastructure[12]. It is notable that this cycle would appear to be correlated with house prices in the UK in general in this period suggesting that the impact of new infrastructure may be to magnify gains in a rising market but that there may be little impact in a relatively quiet market.

The strongest effects appear when the transport infrastructure is in place over a considerable period. Research found that distance from a station was a key determinant of rents for apartments in Washington DC with each one-tenth of a mile extra distance resulting in a decrease in rent of 2.5%[13]. However, elsewhere in the US, it was found that development of the Miami Metrorail had only a marginal effect on house prices over the longer term. In this case it would appear that accessibility was only marginally improved and subsequent development did not take place as expected emphasising the point that the investment in itself might not provide the expected benefits.

It has been estimated that the Helsinki Metro, developed in the 1980s, increased house prices within a 1km limit by 6% but that the increase was less in the immediate vicinity of stations due to noise and congestion[14]. In the case of Hong Kong it has been estimated that the commuter rail system increased apartment prices by 3% within an equivalent

[11] Forest, F., J. Glen and R. Ward (1996) 'The Impact of a Light Rail System on the Structure of House Prices'. *Journal of Transport Economics and Policy*, Vol. 30, pp. 15-29

[12] Henneberry, J. (1998) 'Transport Investment and House Prices' *Journal of Property Valuation and Investment*, Vol 16 pp. 144-158

[13] Benjamin, J. and G. Stacy Sirmans (2001) 'Mass Transportation, Apartment Rent and Property Values'. *Journal of Real Estate Research* Vol. 12, pp. 1-12

[14] Laakso, S. (1992) 'Public Transportation Investment and Residential Property Values in Helsinki'. *Scandinavian Housing and Planning Research*, Vol. 9, pp. 2170229

radius of a 10 minute walk from a station[15]. A study in Taipei also found that there was a significant impact of new infrastructure on prices but that the impact of the subway system on prices varied from location to location depending on factors such as distance from the city centre and building type[16].

Some work has also been undertaken in advance of investment in the proposed Crossrail project in London. This study estimated that the value of the property stock in the relevant area would increase by 5-10% once completed[17]. The study appears to see this as a once-off effect on the area and did not examine the enhanced development opportunities for the area, presumably since the route was through an already developed area where considerable redevelopment had already taken place or would occur in any case. This estimate would appear to be towards the upper end of the results found by researchers for operational systems. However, considerable positive price effects have been found in relation to the Jubilee Line Extension on London Underground in 1999[18].

The available literature indicates that improved infrastructure does generally provide a benefit to property values in the vicinity, but that it is very difficult to identify this in respect of a particular parcel of land and a particular investment because the timing may be due to cycles in property prices arising from interest rates changes and economic conditions. Changing tastes and demographics may also submerge the effect. Overall, the impact will depend on associated developments, such as retail opportunities and environmental enhancement, and planning permissions that allow the values to be released.

[15] So, H., R. Tse, and S. Ganaesan (1998) 'Estimating the Influence of Transport on House Prices: Evidence from Hong Kong. *Journal of Property Valuation and Investment*, Vol. 15, pp.40-47

[16] Lin, J. J., and C. H. Hwang (2004) Analysis of Property Prices Before and After the Opening of the Taipei Subway System. *Annals of Regional Science*, Vol. 38 pp687-704

[17] Hillier Parker (2002) *Crossrail: Property Value Enhancement*. Report prepared for Canary Wharf Group

[18] *Rail Business Intelligence*, Issue 247 June 2005 and Jones Lang La Salle Report for Transport for London (2004). The former report provided estimates of increased property values of £2.1 billion within 1km of the Canary Wharf station but the latter estimated only £78 million in the case of the Southwark station.

Appendix 2: Potential Value of SDCS with Accelerated Development

As discussed in Section 2.2 above, the land area within 1 km of the rail line mean it is possible that a higher level of development, than used in the core calculations in this report, could take place should the rate of development that has been seen in recent years accelerate during the period of the SDCS. Should this occur, then the underlying property base from which levies would be generated would be expanded. The projected total potential level of development if an accelerated rate is assumed is shown in Table A2.1.

Table A2.1: Property Subject to SDCS with Accelerated Development

Category of Use		
Residential (units)	Commercial (m^2)	Retail (m^2)
35,000	500,000	100,000

This higher level of development means that the potential aggregate impact of the KRP on property values is also increased. This is shown in Table A2.2. The total value created is increased by just over 40% if this higher level of development is assumed.

Table A2.2: Projected Increase of Property Values Subject to SDCS with Accelerated Development

	Percentage	€m, low impact	€m, high impact
Residential	3 to 5%	344.88	573.13
Office/commercial	2 to 4%	42.75	85.50
Retail	1 to 2%	6.55	13.10
Total		394.18	671.73

See Table 4.1 for comparison with core projections.

Finally, the potential value of the SDCS with this higher level of development is shown in Table A2.3. This shows an increase of €23 million or 40% when compared with the value calculated on the basis of the core projection.

Table A2.3: Discounted Present Value of SDCS with Accelerated Development

	Target levy	
	Levy	Value (€m.)
Residential	1,900	66.50
Commercial	22.35	11.17
Retail	29.00	2.90
Total		80.57

See Table 3.3 for comparison with core projections.