Chapter 2: Land Use Projections

Cork Harbour is not static, but constantly changing. While this change takes numerous forms, the prime factor driving change in the Harbour - particularly during the last century or so - has been human construction activity, and its consequences for land and water use. Despite the Harbour's long history and extensive built heritage, 70% of developed areas adjoining it were first developed from the 1930s onwards, and 17% since the mid-1990s.

The overall rate at which development occurs around the Harbour is raised as an issue at this early stage in the Study, because it provides the context for many other aspects. It is difficult to discuss the future of local areas within the Harbour, or the various activities and land uses, or how they can co-exist with each other in reasonable comfort, without some sense of what the overall rate of development can or should be in future, and how this relates to experience in the past

Areas

The inner Study Area is defined by a boundary 0.5 kilometres inland of the Harbour shoreline, and – including water - covers 134 square kilometres. This can be broken down as follows:

Table 2.1: The Inner Study Area

Land/Water Status in 1934:	Km2
Areas of Water below Low Water Mark (LWM)	39.1
Areas of Water between High and Low Water Mark	22.4
Areas on landward side of HWM, within 0.5km of it	72.2
Total	133.7

The position of shorelines change over time, in response to natural processes (eg erosion) and human intervention (eg land reclamation). If they are to be used as a baseline, they have to be dated. For our purposes, we have used the 1934 shoreline shown. This is partly because of the availability of data - the necessary information is available in the form of a series of Ordnance Survey maps. It is also a convenient date to take as a starting point, as it precedes most post- independence development on the Harbour.

Past Rates of Development

The amount of land developed and/or reclaimed since then can be measured (Table 2.2), giving an average long-term rate of development (Table 2.3).

Table 2.2: Development in the Inner Study Area (km2)

	1934	1995	2005
Developed land inland of 1934 HWM	7.61	19.95	23.98
Land reclaimed after 1934	-	2.06	2.41
Total Developed Land	7.61	22.01	26.39

Table 2.3: Average Rate of Development in the Inner Study Area ***(km2 per decade)***

	1934-95	1995-2005
Development of pre-1934 land	2.02	4.02
Reclamation	0.34	0.36
Total Land Developed	2.36	4.38

Both tables are based on comparisons between the 1934 OS series and County Council Orthophoto satellite photography for 1995 and 2005. They highlight the rapid rate of development of land adjoining the Harbour during the recent boom.

Projections

A long time horizon has been used for projecting these trends forwards, as planning for Cork Harbour differs in several ways from a normal land use plan:

(a) The existing state of Cork Harbour is the product of a long process of development, which was linear but 'lumpy'. The process was linear in the sense that, from around 1700, port facilities started to move downstream from the old walled city around North and South Main Streets, marshes and inter-tidal areas were reclaimed, and secondary waterways culverted. The consistent move down harbour over three centuries reflected the stability of marine transport technology (relative to land based transport), involving progressively larger ships that required progressively deeper berths further down the Harbour. It was 'lumpy' in the sense that it involved development of large facilities at irregular intervals. A short term perspective may thus be misleading, in focusing on one or two large facilities in prospect at a particular time, while neglecting the longer term trend. As the same basic dynamic is still in operation, a long time perspective may validly be applied to the future as well as the past.

(b) Coastal zone management is focused on a limited area along the coastline, subject to unusual and diverse pressures for development, and normally also of special ecological importance. The issue of sustainability is unusually relevant for these reasons. The sustainability of trends in spatially limited areas can be assessed in a literal sense, by projecting them forwards and seeing how long they could in fact be sustained, in the absolute sense, or until they cause drastic change to their environment. However, if the situation is not immediately critical, and the resources involved not likely to be exhausted in the short term, these projections may take us some distance into the future.

Figure 2.1 illustrates how long it would take for land adjoining the Harbour to become predominantly or overwhelmingly developed, at these rates of development. Currently, slightly over 30% of this land is developed. Depending on the rate of development used, this percentage would double to 60% by

- 2100, at the rate experienced in the period 1935-95
- 2055, at the rate experienced in the period 1995-2005
- 2090, at the rate experienced in the period 1935-2005

Figure 2.1 Alternative Projections of Land Developed within 0.5km of Shoreline

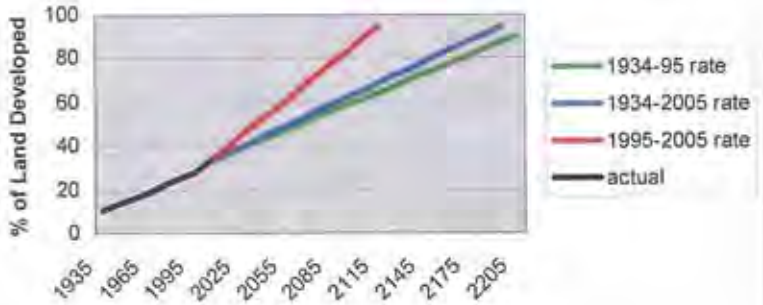
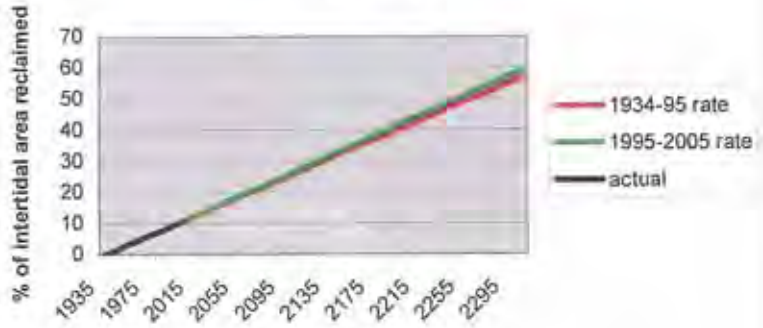


Figure 2.2 Projected % of Intertidal Areas Reclaimed



A similar exercise is carried for out for reclaimed land in Figure 2.2. In that figure, reclamation is expressed as a percentage of inter-tidal areas in 1934. Figure 2.2 differs from 2.1, in that the rate of reclamation was more or less the same in the periods for which we have data (ie 1934-95 and 1995-2005), generating a single projection, rather than widely differing ones. Around 12% of the 1934 inter-tidal area has been reclaimed to date. At current rates, this would treble (to 35%) by 2160.

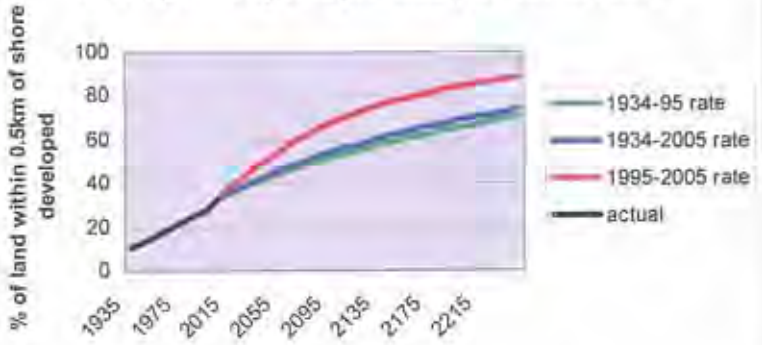
Redevelopment of Brownfield Land

The assumptions underlying these projections are crude, and inter alia do not take account of the likelihood that as the percentage of developed land rose, the proportion of new development which took place on land which had already been developed once (ie 'brownfield land') would also rise. However, this qualification applies more strongly to slower rates of development, which leave more time for uses to mature, become obsolete, and for their sites to then be redeveloped.

Figure 2.3 illustrates this point. It assumes that from 2005 onwards, new development will split between greenfield land, and brownfield land first developed at least 80 years previously, in proportion to the total amount of land in each category adjoining the Harbour. Inserting this assumption has little effect on the red line (1995-2005 rate) projection, and only delays the date by which 60% of land adjoining Cork Harbour is developed by around 15 years. However, it delays the date by which the middle projection (1935-2005 rate)

reaches this point by 40 years, and the low one (1935-95 rate) by half a century:

Figure 2.3 As Fig. 2.1, but treating land 1st developed 80+ years previously as developable



Until the mid 1990s, redevelopment in the Harbour inner study area was largely confined to the E. end of the city centre. Since then, there has been small scale redevelopment of quayside sites in the County (eg in Passage and Midleton). There are much more ambitious plans for brownfield development, primarily in the City Docklands, but also on intermediate sized sites, such as the Dockyard site in Passage.

The largest current brownfield project – the City Docklands – involves redevelopment of c.70 hectares, ie 1% of land in the Harbour inner study area[1]. This is roughly the amount of brownfield development assumed in the period 2005-2030 in the blue line projection in Figure 2.3, or around 40% of that assumed in the red line one.

Alternative Interpretations of Land Use Trends

One obvious difficulty with the historical series used in this chapter is that the most recent data, for the period 1995-2005, coincided with a rate of development subsequently shown to be economically unsustainable. Even if one uses long run data (eg 1934-2005), ending the series at the peak of a boom is liable to give an upward bias to any projections based on it. One way of coping with this is by

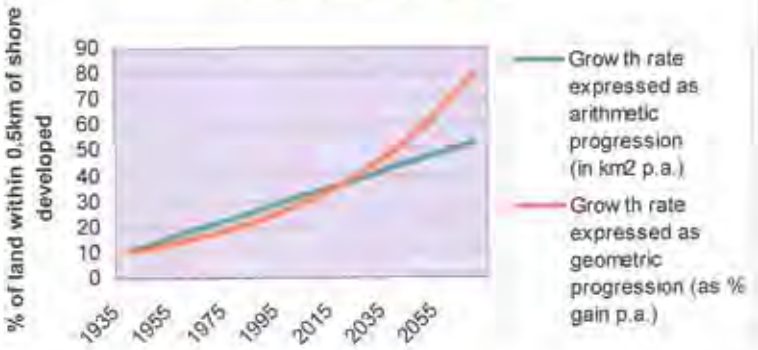
- updating overall developed area figures to 2010 (it is estimated that around 2 km2 were developed between 2005 and 2010)
- (having regard to current conditions) allowing a very modest c.0.5 km2 for development between 2010 and 2015
- using the resulting 1934-2015 series for long run aggregate projection purposes

A more important question arises on how historic trend data should be interpreted. The data available can be interpreted either as average arithmetic rate of development (c. ¼ km2 per annum) or as an average growth rate (c. 1.7% p.a.). They coincide for 1934 and 2015, and yield fairly similar amounts of

[1] This is the area indicated as being likely to be subject to change in the 2001 Cork Docklands Development Strategy (p.42). The overall Dockland area is 166 hectares.

development for the 2nd half of the 20th century, but they have radically different results if projected forwards, as Figure 2.4 shows:

Figure 2.4 Alternative Interpretations of Land Use Trends on Cork Harbour



The projections in Figures 2.1-2.3 used an arithmetic rate of growth, but this is actually quite a conservative assumption, which implies that the rate of development would remain at c.¼ km per annum for the foreseeable future. By contrast, a percentage rate yields a steadily increasing rate of development of land, when translated into hectares or km2.

For economic purposes, growth rates are normally related to the current size of the variable under consideration. A discussion of GNP usually refers to (say) a 3% growth rate, rather than growth of €5bn per annum, and demographic change (births, deaths and migration) are usually expressed in rates per 1000 population. These habits reflect the experience that this is the most meaningful way of expressing variations in such items over time. A 'trend' scenario is thus more likely to imply relatively constant average percentage growth rates.
On the other hand, the Harbour area is a finite resource, in which one would expect the more readily developable or available areas to be developed first, and their progressive depletion to have a braking effect on the rate of development. As with 'peak oil', there may be a peak rate of Harbour development. The first approach is a more plausible way of expressing likely growth in demand, the second outlines what might happen if supply constraints prevent demand exceeding historical average rates of development of land, and in effect treats the 1995-2005 period as representing the peak rate of Harbour development.

If one takes the view that actual outcomes may be roughly midway between the two projections, this implies that the average rate of development between 2015 and 2055 will be similar to that experienced between 1995 and 2005, in terms of km2 developed. The red line projections in Figures 2.1-2.3 reflect this intermediate scenario.

Development Rates and the Character of the Harbour

Figure 2.1 shows the developed area increasing at a fixed rate, while Figure 2.3 shows a fixed rate of development. Up until now, with most development on greenfield sites, and relatively little redevelopment of previously developed land, they have amounted to much the same thing, but this will change once brownfield development becomes more significant.

Should we be planning primarily for an expansion of the developed area, or placing more emphasis on recycling land which has already been developed? Arguments can be advanced on both sides. On one hand, total population and employment in the Harbour area is likely to be greater if the greenfield land continues to be developed rapidly. On the other hand, a steady increase in the amount of land under buildings is not sustainable if applied to a finite area, such as that within 0.5km of the Harbour. Eventually, all areas within it capable of development would be developed, and long before that, the Harbour would be dominated by buildings and other structures.

This would conflict with two of the goals of the COREPOINT Strategy, namely *protection of the Harbour's unique natural environment (2)*, and its *economic development in line with the principles of sustainable development (4)*. It would probably also be unnecessary, as, for most purposes, there is no shortage of alternative locations. Harbour side land represents less than 10% of land in the Cork Metropolitan Area, and less than 1% of County Cork. For uses which do need to be located beside the Harbour, brownfield land may be equally suitable, and in some cases more so, as such land is likely to be better served by land based and marine infrastructure.

The implication of COREPOINT environmental and sustainable development goals is that greenfield development around the Harbour should be limited to relatively high priority, high benefit types of development which could not readily be located away from the Harbour, nor on brownfield land adjoining it. A similarly sparing approach would need to apply to reclamation of inter-tidal areas, which on current trends are also liable to become heavily developed in the longer term, as the projection on Figure 2.2 illustrates. Reclamation for marine related uses or other infrastructure is sometimes unavoidable, but in other cases there may be different ways of meeting needs, some of which are much more dependent on reclamation than others.

In balancing the need for greenfield development with environmental and sustainable development considerations, we need to go beyond a purely quantitative approach to the rate of development around the Harbour, and how it is split between greenfield and brownfield land. The qualitative dimension is at least as important. Some undeveloped areas are more worthy of protection than others, and architectural heritage and settlement character considerations makes redevelopment of some areas were first developed a century or more ago undesirable. To do justice to the qualitative diversity of the Harbour area, Part II subdivides it into bodies of water, and into the main blocks of developed and undeveloped land adjoining each, and then assesses them individually.