

Inflation Report Update National Transport Authority May 2025







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001	Final draft for comment	28.04.2025
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1. Disclaimer

This report has been compiled based on historic and forecast price changes up to and including March 2025. It is noteworthy that historical price data is subject to update and revision, consequently, future projections and forecasts may be subject to change at a future date.

In recent years, the construction market has experienced a period of price uncertainty, predominately due to the consequences of the Covid-19 recovery, heightened geo-political risks, an energy crisis and broader economic uncertainty. In the compilation of this report, no further or major shocks are assumed, however, the macroeconomic and geo-political context will be closely monitored and forecasts updated if circumstances warrant it.

Longer term forecasting assumes that the 2% inflation target set by the European Central Bank (ECB) is achieved. It is standard practice in longer range forecasting for inflation to move to target.

It should be noted that this report is intended for use by the National Transport Authority (NTA) and Sponsoring Agencies where the NTA is an Approving Authority.





2. Executive Summary

ChandlerKBS provides independent consultancy services to the National Transport Authority (NTA). Based on proposals presented by ChandlerKBS and accepted by the NTA, ChandlerKBS has produced Tender Price, Cost Price and Land and Property Price Inflation Indices¹. Grant Thornton (Macroeconomic Consultants) has supported ChandlerKBS in the delivery of this commission.

In Executive Summary Table 1, we have provided the annual change in Tender Prices for the period 2021 to 2024 (actual) and 2025 to 2029 (forecast). Given the inherent volatility in forecasting, particularly over the recent past when a pandemic and wars have caused extreme volatility, these forecasts are presented as a range. An example of this volatility is reflected in 2024 actual data where it has come in below the lower range of the previous forecast, reflective of more aggressive interest rate increases and faster unwinding of inflation than previously expected:

Project Type	Range	2021	2022	2023 ²	2024	2025	2026	2027	2028	2029
		Actual	Actual	Actual	Actual					
	Lower					2.80%	1.80%	1.80%	1.80%	1.80%
General	Base	10.90%	12.70%	5.00%	3.10%	3.10%	2.60%	2.50%	2.50%	2.50%
	Upper					3.70%	3.60%	3.60%	3.60%	3.60%
_	Lower					2.80%	1.80%	1.80%	1.80%	1.80%
Highways (Rural)	Base	10.90%	12.70%	5.00%	3.10%	3.10%	2.60%	2.50%	2.50%	2.50%
	Upper					3.70%	3.60%	3.60%	3.60%	3.60%
	Lower					2.80%	1.80%	1.80%	1.80%	1.80%
Highways (Urban)	Base	10.10%	12.70%	5.20%	3.30%	3.10%	2.60%	2.50%	2.50%	2.50%
(0.201)	Upper					3.70%	3.60%	3.50%	3.50%	3.50%
	Lower					2.40%	1.60%	1.60%	1.60%	1.60%
Irish Rail	Base	10.10%	11.80%	4.70%	2.90%	2.90%	2.40%	2.40%	2.40%	2.40%
	Upper					3.20%	3.20%	3.10%	3.10%	3.10%
	Lower					2.60%	1.70%	1.70%	1.70%	1.70%
Civil Engineering	Base	14.30%	14.30%	6.40%	4.20%	2.70%	2.30%	2.20%	2.20%	2.20%
	Upper					3.40%	3.40%	3.30%	3.30%	3.30%

Executive Summary Table 1: Forecast Tender Price Inflation (General and Project Type) Source: Grant Thornton

¹ Tender prices refer to the bidding process to undertake new projects, cost prices refer to a list of factors such as staff costs and materials.

² Indices for 2023 have been updated relative to those included in the report published in 2024. This is due to further data revisions of historical cost data that only became available after the report was published. The approach of reviewing historical cost data is common practice and is undertaken by other reputable sources (e.g. Building Cost Information Service).





In Executive Summary Table 2, we have provided the annual change in Cost Prices for the period 2021 to 2024 (actual) and 2025 to 2029 (forecast). These forecasts are also presented as a range:

Executive Summary Table 2: Forecast Cost Price Inflation (Project Type) Source: Grant Thornton

Project Type	Range	2021	2022	2023 ³	2024	2025	2026	2027	2028	2029
		Actual	Actual	Actual	Actual					
	Lower					1.60%	1.00%	1.00%	1.00%	1.00%
Highways (Rural)	Base	8.60%	10.70%	4.30%	2.90%	1.80%	1.50%	1.50%	1.50%	1.50%
	Upper					2.20%	2.10%	2.10%	2.10%	2.10%
	Lower					1.60%	1.00%	1.00%	1.00%	1.00%
Highways (Urban)	Base	7.90%	10.70%	4.40%	3.10%	1.80%	1.50%	1.50%	1.50%	1.50%
	Upper					2.10%	2.10%	2.10%	2.10%	2.10%
	Lower					1.70%	1.10%	1.10%	1.10%	1.10%
Civil Fngineering	Base	9.80%	9.40%	4.40%	2.90%	1.90%	1.50%	1.50%	1.50%	1.50%
	Upper					2.20%	2.20%	2.10%	2.10%	2.10%

³ Indices for 2023 have changed from those included in the report published in 2024. This is due to further reviews of historical cost data that only became available after the report was published. The approach of reviewing historical cost data is common practice and is undertaken by other reputable sources (e.g. Building Cost Information Service).





ChandlerKBS engaged Grant Thornton to update the Land and Property Price forecasts, previously completed by another Consultant, Avison Young (AY), within the 2023 and 2024 reports. Grant Thornton has replicated the approach that was designed and implemented by AY. A precis of AY's approach is appended. The Capital Value Forecasts prepared by Grant Thornton are included in Executive Summary Table 3.

Project Type	Range	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		Actual	Actual	Actual	Actual						
	Lower					3.50%	2.20%	1.50%	1.30%	1.30%	1.60%
Dublin Residential	Base	7.30%	10.30%	0.60%	8.70%	6.90%	4.60%	2.90%	2.70%	2.60%	3.30%
	Upper					10.40%	6.80%	4.30%	4.00%	3.90%	4.90%
Ireland (Excl	Lower					3.20%	2.20%	1.60%	1.20%	1.00%	0.80%
Dublin)	Base	9.20%	14.00%	5.00%	8.40%	6.40%	4.40%	3.30%	2.50%	2.10%	1.70%
Residential ⁴	Upper					9.60%	6.70%	4.90%	3.70%	3.10%	2.50%
	Lower					2.60%	2.00%	1.70%	1.40%	1.50%	1.20%
Office	Base	0.00%	-6.80%	1.90%	5.70%	5.30%	4.00%	3.50%	2.60%	2.90%	2.30%
	Upper					10.50%	7.90%	7.00%	5.30%	5.90%	4.60%
	Lower					0.70%	0.50%	0.00%	-0.10%	-0.20%	-0.20%
Industrial	Base	20.30%	4.10%	-4.10%	1.00%	1.40%	0.90%	0.00%	-0.30%	-0.40%	-0.40%
	Upper					2.90%	1.80%	0.00%	-0.60%	-0.80%	-0.80%
	Lower					1.60%	0.50%	0.20%	0.00%	0.00%	0.20%
Retail	Base	-6.60%	-4.60%	-7.30%	2.20%	3.30%	1.00%	0.40%	0.10%	0.10%	0.30%
	Upper					6.50%	1.90%	0.80%	0.20%	0.20%	0.60%

Executive Summary Table 3: Capital Value Forecasts

⁴ The Ireland Residential (Excl. Dublin) forecast has been updated in this publication to include the explanatory variable 'National excluding Dublin – all residential properties'. Any variance between historical data in this publication and in previous publications is due to updates and corrections at source.





3. Introduction

ChandlerKBS has been engaged by the NTA to prepare reports on price inflation to include forecasts of the inflation rate during the period from 2025 to 2029.

ChandlerKBS previously prepared inflation forecasts in 2023 and 2024. This report represents an update to the February 2024 publication. ChandlerKBS has focused on providing the following:

- Further information in relation to the forecasting methodology.
- Updated forecasts.
- A brief narrative explaining the updated forecasts.

Those reading and relying upon the information contained in this report are assumed to be familiar with the previous Inflation Reports in May 2023 and February 2024 published on behalf of the NTA by ChandlerKBS, specifically, how they were developed and any assumptions that informed the outputs of those reports.





Table 1 below sets out the data sources that have been used to inform our forecasts:

Table 1: List of Data Sources

Organisation	Database / Variable	Indices Informed
Society of Chartered Surveyors Ireland (SCSI)	Tender Price Index	Tender Prices
Central Statistics Office	Consumer Price Index (CPI)	Tender Prices and Cost Prices
Central Statistics Office	Wholesale Price Index (WPI) - Building and Construction Materials	Cost Prices
Economic & Social Research Institute	Quarterly Economic Commentary – Inflation Forecast	Tender Prices and Cost Prices
Department of Finance	Budget 2025 – Economic & Fiscal Outlook	Tender Prices and Cost Prices
Central Bank of Ireland	Quarterly Bulletin – Inflation Forecasts	Tender Prices and Cost Prices
IMF	World Economic Outlook	Tender Prices and Cost Prices
OECD	Ireland Economic Snapshot	Tender Prices and Cost Prices
EU Commission	Autumn 2024 Economic Forecast – Economic Forecast for Ireland	Tender Prices and Cost Prices
MSCI	Property capital value indices for Dublin offices, retail and industrial	Land & Property Prices
Central Statistics Office (CSO)	Residential property price index (RPPI) for Dublin and Ireland	Land & Property Prices
Oxford Economics	All economic data and forecasts used in the capital value models	Land & Property Prices
Revenue Commissioners	Stamp Duty Returns	Land & Property Prices





4. Tender Price & Cost Price Inflation

4.1. Which Index to Use

Unless otherwise agreed, the NTA requires that the Tender Price Index be used when assessing inflationary allowances for projects where it is the Approving Authority. For guidance on how to use the information and forecasts provided, please refer to the 'NTA Inflation User Guide'.

4.2. Forecasting Modelling & Measures of Fit

ChandlerKBS engaged Grant Thornton to develop the Tender and Cost Price Indices, applying their inflation forecast model. Before noting the approach, it is important to consider that forecasting is inherently difficult, particularly so for inflation given the large external price shocks that the Irish economy has faced over recent years. As such, Grant Thornton has increased the frequency of model updates to capture new information and provided revised outputs accordingly.

To test the models, Appendix A presents a 'goodness of fit' graphic that shows published historical plus forecast data and how the forecast model performs if it had been applied in place of published data. This exercise provides comfort that the forecast model is acting appropriately, with the results highlighting an R-squared⁵ of 81.3% compared to published Tender Price data.

The type of model used was a time-series model, with the model using historical data from the Central Statistics Office (CSO).

Using this historical data, a time-series model, which focused on the relationship between price changes in building materials, macroeconomic factors and Tender Price Inflation, was developed. A core element of the model centres around the trend of the Consumer Price Index (CPI) within the Irish economy and the price change in Wholesale Price Index (WPI), with a specific focus upon building and construction materials.

Data was gathered from the CSO for a range of construction-related items including hardwood, concrete, steel, etc. back to 1975 for the CPI and 2015 for the WPI in relation to building and construction materials. Using this data, the relationship between each building material item and the overall level of inflation within the economy was modelled. Data for both CPI and WPI was available up to December 2024, the latest data point available at the time the analysis was undertaken.

CPI and Harmonised Index of Consumer Prices (HICPHICP) forecasts from a range of forecasters including the Economic and Social Research Institute (ESRI), the Department of Finance, the Central Bank of Ireland, etc. were used to develop a baseline outlook for inflation rates. This 'consensus view' approach was deemed suitable against a backdrop of significant uncertainty. A list of the economic forecasts used can are set out in Table 2 below.

⁵ It is accepted that R² has several limitations as a measure of a model's goodness of fit, not least of which is the addition of more variables never decreases an R². Despite limitations, R² is simple and intuitive, helps identify poor models and is widely used and understood.





Table 2: Inflation Outlook by selection of economic forecasters

Source: ESRI (Quarterly Economic Commentary – Winter 2024); Department of Finance (Budget 2025 – Economic and Fiscal Outlook); Central Bank of Ireland (Quarterly Bulletin – December 2024); IMF (World Economic Database – October 2023); OECD (Ireland Economic Snapshot – December 2024) and EU Commission (Economic Forecasts for Ireland – November 2024)

Organisation	2024	2025	2026	2027	2028
Economic & Social Research Institute (CPI)	2.1%	1.0%			
Department of Finance (HICP)	1.7%	1.9%	2.0%	2.0%	2.0%
Central Bank of Ireland (HICP)	1.3%	1.7%	2%	1.6%	
IMF (HICP)	1.7%	1.8%	2.0%	2.0%	
OECD (HICP)	1.5%	1.9%	1.8%		
EU Commission (HICP)	1.4%	1.9%	1.8%		

Note: Both CPI and HICP are measures of inflation. CPI is the official measure of inflation in Ireland, but HICP allows for international comparisons. HICP excludes mortgage interest, home insurance, and local property taxes.

It should be noted that over the long-term (i.e. post-2027), and in the absence of forecasts, the rate of inflation is held flat at 2%, the medium-term target level of inflation from the ECB. This was done to reflect how forecasts become less reliable the further into the future they seek to look.

The baseline forecasts, alongside wider market insights from consultations and survey analysis, provided the base outlook and expectations for inflation within the economy. Combining these forecasts and insights with the CPI and WPI relationship produced forecasts for each building and materials item for the period 2025-29. Using these forecasts, a forecast of inflation based upon input material cost growth for each project type as well as overall Tender Price was developed.

Scenario analysis provides lower and upper bound inflation forecasts, which captured the impact of a higher for longer inflation environment and the impact of a lower-than-expected inflation environment. The central scenario acts as the main anchor point for the analysis and represents our view on what is the most likely path of inflation for building material goods.





Using the Central Scenario, a range of confidence intervals, based on the inflation forecasts noted above, were applied to the Central Scenario to provide both an Upper and Lower Scenario.

4.3. Updated Inflation Forecasts

Tender Price and Cost Price Indices are provided in Tables 3 and 4 respectively:

Table 3: Forecast Tender Price Inflation (General and Project Type) Source: Grant Thornton

Project Type	Range	2021	2022	2023	2024	2025	2026	2027	2028	2029
		Actual	Actual	Actual	Actual					
	Lower					2.80%	1.80%	1.80%	1.80%	1.80%
General	Base	10.90%	12.70%	5.00%	3.10%	3.10%	2.60%	2.50%	2.50%	2.50%
	Upper					3.70%	3.60%	3.60%	3.60%	3.60%
	Lower					2.80%	1.80%	1.80%	1.80%	1.80%
Highways (Rural)	Base	10.90%	12.70%	5.00%	3.10%	3.10%	2.60%	2.50%	2.50%	2.50%
(Upper					3.70%	3.60%	3.60%	3.60%	3.60%
	Lower					2.80%	1.80%	1.80%	1.80%	1.80%
Highways (Urban)	Base	10.10%	12.70%	5.20%	3.30%	3.10%	2.60%	2.50%	2.50%	2.50%
(0.24.1)	Upper					3.70%	3.60%	3.50%	3.50%	3.50%
	Lower					2.40%	1.60%	1.60%	1.60%	1.60%
Irish Rail	Base	10.10%	11.80%	4.70%	2.90%	2.90%	2.40%	2.40%	2.40%	2.40%
	Upper					3.20%	3.20%	3.10%	3.10%	3.10%
	Lower					2.60%	1.70%	1.70%	1.70%	1.70%
Civil Engineering	Base	14.30%	14.30%	6.40%	4.20%	2.70%	2.30%	2.20%	2.20%	2.20%
	Upper					3.40%	3.40%	3.30%	3.30%	3.30%

Table 4: Forecast Cost Price Inflation (Project Type)

Source: Grant Tho	rnton									
Project Type	Range	2021	2022	2023	2024	2025	2026	2027	2028	2029
		Actual	Actual	Actual	Actual					
	Lower					1.60%	1.00%	1.00%	1.00%	1.00%
Highways (Rural)	Base	8.60%	10.70%	4.30%	2.90%	1.80%	1.50%	1.50%	1.50%	1.50%
	Upper					2.20%	2.10%	2.10%	2.10%	2.10%
	Lower					1.60%	1.00%	1.00%	1.00%	1.00%
Highways (Urban)	Base	7.90%	10.70%	4.40%	3.10%	1.80%	1.50%	1.50%	1.50%	1.50%
(01241)	Upper					2.10%	2.10%	2.10%	2.10%	2.10%
	Lower					1.70%	1.10%	1.10%	1.10%	1.10%
Civil Fnaineerina	Base	9.80%	9.40%	4.40%	2.90%	1.90%	1.50%	1.50%	1.50%	1.50%
	Upper					2.20%	2.20%	2.10%	2.10%	2.10%





Long-term inflation forecasts are included in Appendix B. Beyond a five-year horizon, forecasts for inflation revert to the ECB target of 2% per annum as predictions become less reliable as they extend further into the future.

4.4. Tender Prices

To understand the volatility of recent price changes, Figure 1 below sets out the SCSI Tender Price Index for the period H1 2011 to H1 2024. The level of the Tender Price Index has risen markedly over the past decade - with the price of tenders more than doubling (110.9%) between H1 2011 and H1 2024. This increase reflects the sharper rise in costs across the economy generally, with the level of the tender price rates being 21.1% higher in December 2024 relative to December 2020. Much of this increase is attributable to increasing labour and material costs contributing to the increased pace of increases. To reflect this rise in costs, tender prices have grown by 10.9% in 2021 and by a further 12.7% in 2022, whereas previously, between 2012 and 2020, growth averaged 5.0% per annum. Most recently, however, the level of growth in tender prices has tapered off, with growth between H1 2022 and H1 2024 averaging 3.3%.

The easing in the rate of growth of Tender Prices is a positive development following the sharp price increases of the past couple of years, driven by rising material costs and rising labour costs. This 'easing' shows that the market and price increases are returning to some normality, with annual growth rates falling to 5% in 2023 down from 12.7% in 2022.

Analysis of the Wholesale Price Index for building and construction materials relative to the SCSI Tender Price Index shows much of the recent rise in tender prices correlates with material price increases. For example, between H1 2020 and H1 2024, the cost of materials rose by 12.5%, which has, at least in part, led to the level of Tender Prices rising by 35.2% over the same period.









Our assessment highlights a strong relationship between the level of building material change and the rise in Tender prices. Any change in materials costs, up or down, will transfer to the cost of Tenders. Therefore, our forecast suggests that Tender Prices, in light of easing material costs will grow by 3.1% in 2025. Growth rates in Tender Prices will ease further as material cost growth eases in 2026 and beyond, with growth expected to average 2.7%.

All projects funded by the NTA should follow the approvals process and numbered gateways as set out in the Project Approval Guidelines 2024. The indices may be used as a guide to make provision for inflation at each approval point or Gateway as set out in the guidelines. Percentages within the range for the relevant project type can be applied to profile inflation for the proposed programme duration of the project. It is important to be aware and note that the forecast indices will fluctuate up and down year on year. Where the inflation forecast trend is decreasing in the forecast from previous inflation bulletin indices, future project outturn costs could be less than previously expected. Similarly, where the inflation forecast trend is increasing future project outturn costs could be greater than previously expected and may present a risk to project funding.

For example, Figures 2, 3, and 4 set out the average price changes per year as forecast in 2023, 2024 and 2025 respectively.

When looking at the average increase across the General and Highways Rural sectors the forecast increase in 2023 was 6.6% in 2024, 4.1% in 2025, 4.1% in 2026 and 4.1% in 2027.



Figure 2: General & Highways Rural inflation forecast 2023





As illustrated in Figure 3, the 2024 General and Highways Rural sectors forecast increase is 3.5% in 2025, 3.4% in 2026, 3.4% in 2027 and 3.4% in 2028.

Figure 3: General & Highways Rural inflation forecast 2024



Figure 4 shows the 2025 General and Highways Rural sectors forecast with an increase of 3.1% in 2025, 2.6% in 2026, 2.5% in 2027 and 2028 annually.







Figure 4: General & Highways Rural inflation forecast 2025

Material Prices

Given the significant change in project costs brought about by different levels of material inputs, Grant Thornton have profiled inflation for a selection of key inputs. This is important to note given the knock-on effects of supply chain. Table 5 presents the aggregate impact of the various factors that are presented in Table 6. We forecast that for 2025 material costs will increase by 2.0% before falling further back to average 1.7% to 2029. Tariffs, and the risk of trade wars are likely to have an influence over future inflation rates but at the time of writing it is not certain if tariffs will increase prices, reduce margins, or collapse demand.

Table 5: Material Costs Price Inflation Forecast, 2022-2029

Description	2022	2023	2024	2025	2026	2027	2028	2029
	Actual	Actual	Actual					
Building and Construction Material Price Forecast	11.40%	3.60%	2.00%	2.00%	1.70%	1.70%	1.70%	1.70%





Cost Prices

Turning to a disaggregation of inputs, Table 6 below shows the level of cost inflation by each of the construction and material components assessed for this study. We expect that the level of building and cost material inflation will peak at 2.0% in 2025 before falling back to 1.7% from 2026 onwards. The strongest increases in 2025 are expected in professional services, site overheads, and fuel/transportation costs.

Table 6: Cost Price Inflation Forecast, 2022-2029

Cost Input	2022	2023	2024	2025	2026	2027	2028	2029
	Actual	Actual	Actual					
1) People Costs	3.70%	3.90%	5.00%	1.30%	1.20%	1.10%	1.10%	1.10%
2) Professional Services	11.20%	5.80%	4.80%	3.90%	3.50%	3.20%	3.20%	3.20%
3) Equipment	8.50%	2.80%	0.90%	1.80%	1.50%	1.50%	1.50%	1.50%
4) Aggregates	9.00%	5.30%	7.30%	1.80%	1.40%	1.50%	1.50%	1.50%
5) Cement and Ready Mixed Products	14.70%	8.20%	5.30%	1.80%	1.40%	1.50%	1.50%	1.50%
6) Bituminous Products	16.80%	2.00%	0.40%	1.80%	1.40%	1.50%	1.50%	1.50%
7) Plastic Products	22.60%	5.60%	1.00%	1.80%	1.50%	1.50%	1.50%	1.50%
8) Fuel / Transportation Costs	9.40%	6.70%	2.00%	2.40%	2.00%	2.00%	2.00%	2.00%
9) Timber	5.30%	- 14.60%	-2.20%	1.80%	1.40%	1.50%	1.50%	1.50%
10) Steel	8.10%	1.20%	-7.00%	1.80%	1.40%	1.50%	1.50%	1.50%
11) PC Concrete	18.90%	9.30%	3.50%	1.80%	1.50%	1.50%	1.50%	1.50%
12) Other Materials	12.20%	5.20%	1.40%	1.80%	1.40%	1.50%	1.50%	1.50%
13) Site Overheads	8.10%	5.50%	3.90%	2.50%	2.20%	2.10%	2.10%	2.10%

For a more in-depth understanding into how the level of cost inflation outlined in Table 6 above plays into construction projects, we have applied these costs to the Project Types; Highways Sector Only (Rural), Highways Sector (Urban) and Civil Engineering Sector Only (Non-Roads and Heavy Infrastructure). Our forecasts suggest that based upon the relative composition of project costs:

- Highways Sector Only (Rural) will see costs grow by 1.8% in 2025 before falling back to 1.5% from 2026 and beyond.
- Highways Sector Only (Urban) will increase by 1.8% in 2025, before falling back to 1.5% in 2026.
- Civil Engineering projects, will see a price inflation of 1.9% in 2025, before dropping back to 1.5% over the longer term (2026-29).





5. Land & Property Price Inflation

5.1. Forecasting Modelling & Measures of Fit

Forecasting is an inherently uncertain activity, which is subject to unexpected changes in the macroeconomic and geo-political environment. Events that are unknown at the time of the forecast exercise or were viewed as low risk at the time but subsequently escalated, could significantly impact the forecast outcome.

Grant Thornton carried out visual inspections of the data with correlation analysis to identify likely relationships between the capital value indices and "independent" variables for which 5-year forecasts were available, which were therefore used in the model.

For consistency with the approach applied in previous reports, Grant Thornton replicated the work undertaken by Avison Young to forecast future changes in the indices over the forecast period 2024 to 2030. Avison Young's work explored a range of variables and settled on those models that displayed the highest R-squared statistic: The R² displays the explanatory power of the variables to account for variation in capital values. For example, an R² of 0.8 means that the variables included in the analysis (regression) explain 81.3% of the historical variation in residential/ commercial price indices. Grant Thornton mirrored these models to generate the information below. A precis of AY's method paper is appended.





5.2. Updated Inflation Forecasts

Property Price Inflationary Forecasts are provided in Table 7:

Table 7: Property Capital Value Forecasts

Project Type	Range	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		Actual	Actual	Actual	Actual						
	Lower					3.50%	2.20%	1.50%	1.30%	1.30%	1.60%
Dublin Residential	Base	7.30%	10.30%	0.60%	8.70%	6.90%	4.60%	2.90%	2.70%	2.60%	3.30%
	Upper					10.40%	6.80%	4.30%	4.00%	3.90%	4.90%
Ireland (Excl	Lower					3.20%	2.20%	1.60%	1.20%	1.00%	0.80%
Dublin)	Base	9.20%	14.00%	5.00%	8.40%	6.40%	4.40%	3.30%	2.50%	2.10%	1.70%
Residential	Upper					9.60%	6.70%	4.90%	3.70%	3.10%	2.50%
	Lower					2.60%	2.00%	1.70%	1.40%	1.50%	1.20%
Office	Base	0.00%	-6.80%	1.90%	5.70%	5.30%	4.00%	3.50%	2.60%	2.90%	2.30%
	Upper					10.50%	7.90%	7.00%	5.30%	5.90%	4.60%
	Lower					0.70%	0.50%	0.00%	-0.10%	-0.20%	-0.20%
Industrial	Base	20.30%	4.10%	-4.10%	1.00%	1.40%	0.90%	0.00%	-0.30%	-0.40%	-0.40%
	Upper					2.90%	1.80%	0.00%	-0.60%	-0.80%	-0.80%
	Lower					1.60%	0.50%	0.20%	0.00%	0.00%	0.20%
Retail	Base	-6.60%	-4.60%	-7.30%	2.20%	3.30%	1.00%	0.40%	0.10%	0.10%	0.30%
	Upper					6.50%	1.90%	0.80%	0.20%	0.20%	0.60%





6. Methodology for Calculating Inflationary Allowances in Cost Estimates

6.1. User Guide & Worked Examples

The NTA has provided a detailed user guide and worked examples on its <u>webpage</u>. Those estimating the cost of inflation are expected to consider the most recent inflation estimate forecasts as part of their assessments.





7. Inflation Ranges

7.1. Reporting Inflation as a Range

It may be appropriate to report some projects in a range, where completion of the project is programmed several years after the base date of the estimate, or alternatively, it may be part of an Organisation's policy to report cost estimates in a range.

In instances where a range is being reported, it is our opinion that the estimator should use the lower and upper boundary of the inflation forecast from the relevant sector.

7.2. Reporting Inflation as a Single Point Estimate

The alternative to reporting inflation as a range is to prepare a single point estimate for inflation. This is particularly the case where projects will be completed in the short to medium term (i.e. within 2 years of the estimate being produced), the scope and nature of the project is relatively straight forward, or alternatively, where it is an Organisation's policy. The NTA's Cost Management Guidelines currently require the production of a single point estimate for inflation, however it has adopted the 'range approach' where has been considered appropriate.

When an organisation report inflation as a single point estimate, we would suggest using the base inflation data for the relevant sector.

Appendix A

Goodness of Fit graphic

The chart below illustrates set out below shows the predictive capability of the model relative to the published Tender Price Index data from the Society of Chartered Surveyors Ireland. Using historical data from before 2016, Grant Thornton assessed the trend the model would have predicted versus the actual trend in the level of Tender Princes since

2016. Our analysis shows that the trend predicted by the model closely follows the trend in

Tender Price Growth, demonstrating consistency. Regarding the model's reliability in predicting trends, the comparison revealed an R-squared value of 81.3% between the official figures and the modelled trend, indicating a strong correlation.



It is, nevertheless, important to highlight that the SCSI TPI is largely based upon new-build commercial projects while the corresponding NTA measure is broader, including commercial, highways, civil engineering, housing as well as industrial projects Appendix B

Indices

Cost Price Index - 2025 Issue

	Highways Rural							
		Lower		Base		Upper		
Year	Indice	Annual Increase	Indice	Annual Increase	Indic	ce Annual		
2020	100.00		100.00		100.00			
2021	108.60	8.60%	108.60	8.60%	108.60	8.60%		
2022	120.22	10.70%	120.22	10.70%	120.22	10.70%		
2023	125.39	4.30%	125.39	4.30%	125.39	4.30%		
2024	129.03	2.90%	129.03	2.90%	129.03	2.90%		
2025	131.09	1.60%	131.35	1.80%	131.86	2.20%		
2026	132.40	1.00%	133.32	1.50%	134.63	2.10%		
2027	133.73	1.00%	135.32	1.50%	137.46	2.10%		
2028	135.06	1.00%	137.35	1.50%	140.35	2.10%		
2029	136.41	1.00%	139.41	1.50%	143.29	2.10%		
2030	139.14	2.00%	142.20	2.00%	146.16	2.00%		
2031	141.92	2.00%	145.04	2.00%	149.08	2.00%		
2032	144.76	2.00%	147.94	2.00%	152.07	2.00%		
2033	147.66	2.00%	150.90	2.00%	155.11	2.00%		
2034	150.61	2.00%	153.92	2.00%	158.21	2.00%		
2035	153.62	2.00%	157.00	2.00%	161.37	2.00%		
2036	156.70	2.00%	160.14	2.00%	164.60	2.00%		
2037	159.83	2.00%	163.34	2.00%	167.89	2.00%		
2038	163.03	2.00%	166.61	2.00%	171.25	2.00%		
2039	166.29	2.00%	169.94	2.00%	174.68	2.00%		
2040	169.61	2.00%	173.34	2.00%	178.17	2.00%		

	Highways Urban						
		Lower		Base		Upper	
Year	Indice	Annual Increase	Indice	Annual Increase	Indic	ce Annual	
2020	100.00		100.00		100.00		
2021	107.90	7.90%	107.90	7.90%	107.90	7.90%	
2022	119.45	10.70%	119.45	10.70%	119.45	10.70%	
2023	124.70	4.40%	124.70	4.40%	124.70	4.40%	
2024	128.57	3.10%	128.57	3.10%	128.57	3.10%	
2025	130.62	1.60%	130.88	1.80%	131.27	2.10%	
2026	131.93	1.00%	132.84	1.50%	134.02	2.10%	
2027	133.25	1.00%	134.84	1.50%	136.84	2.10%	
2028	134.58	1.00%	136.86	1.50%	139.71	2.10%	
2029	135.93	1.00%	138.91	1.50%	142.65	2.10%	
2030	138.65	2.00%	141.69	2.00%	145.50	2.00%	
2031	141.42	2.00%	144.52	2.00%	148.41	2.00%	
2032	144.25	2.00%	147.41	2.00%	151.38	2.00%	
2033	147.13	2.00%	150.36	2.00%	154.40	2.00%	
2034	150.07	2.00%	153.37	2.00%	157.49	2.00%	
2035	153.08	2.00%	156.44	2.00%	160.64	2.00%	
2036	156.14	2.00%	159.57	2.00%	163.85	2.00%	
2037	159.26	2.00%	162.76	2.00%	167.13	2.00%	
2038	162.45	2.00%	166.01	2.00%	170.47	2.00%	
2039	165.69	2.00%	169.33	2.00%	173.88	2.00%	
2040	169.01	2.00%	172.72	2.00%	177.36	2.00%	

	Civil Engineering							
		Lower		Base		Upper		
Year	Indice	Annual Increase	Indice	Annual Increase	Indio	ce Annual		
2020	100.00		100.00		100.00			
2021	109.80	9.80%	109.80	9.80%	109.80	9.80%		
2022	120.12	9.40%	120.12	9.40%	120.12	9.40%		
2023	125.41	4.40%	125.41	4.40%	125.41	4.40%		
2024	129.04	2.90%	129.04	2.90%	129.04	2.90%		
2025	131.24	1.70%	131.50	1.90%	131.88	2.20%		
2026	132.68	1.10%	133.47	1.50%	134.78	2.20%		
2027	134.14	1.10%	135.47	1.50%	137.61	2.10%		
2028	135.62	1.10%	137.50	1.50%	140.50	2.10%		
2029	137.11	1.10%	139.56	1.50%	143.45	2.10%		
2030	139.85	2.00%	142.36	2.00%	146.32	2.00%		
2031	142.65	2.00%	145.20	2.00%	149.25	2.00%		
2032	145.50	2.00%	148.11	2.00%	152.24	2.00%		
2033	148.41	2.00%	151.07	2.00%	155.28	2.00%		
2034	151.38	2.00%	154.09	2.00%	158.39	2.00%		
2035	154.41	2.00%	157.17	2.00%	161.55	2.00%		
2036	157.49	2.00%	160.32	2.00%	164.78	2.00%		
2037	160.64	2.00%	163.52	2.00%	168.08	2.00%		
2038	163.86	2.00%	166.79	2.00%	171.44	2.00%		
2039	167.13	2.00%	170.13	2.00%	174.87	2.00%		
2040	170.48	2.00%	173.53	2.00%	178.37	2.00%		

Tender Price Index - 2025 Issue

	General							
		Lower		Base		Upper		
Year	Indice	Annual Increase	Indice	Annual Increase	Indice	e Annual		
2020	100.00		100.00		100.00			
2021	110.90	10.90%	110.90	10.90%	110.90	10.90%		
2022	124.98	12.70%	124.98	12.70%	124.98	12.70%		
2023	131.23	5.00%	131.23	5.00%	131.23	5.00%		
2024	135.30	3.10%	135.30	3.10%	135.30	3.10%		
2025	139.09	2.80%	139.50	3.10%	140.31	3.70%		
2026	141.59	1.80%	143.12	2.60%	145.36	3.60%		
2027	144.14	1.80%	146.70	2.50%	150.59	3.60%		
2028	146.74	1.80%	150.37	2.50%	156.01	3.60%		
2029	149.38	1.80%	154.13	2.50%	161.63	3.60%		
2030	152.37	2.00%	157.21	2.00%	164.86	2.00%		
2031	155.41	2.00%	160.35	2.00%	168.16	2.00%		
2032	158.52	2.00%	163.56	2.00%	171.52	2.00%		
2033	161.69	2.00%	166.83	2.00%	174.95	2.00%		
2034	164.93	2.00%	170.17	2.00%	178.45	2.00%		
2035	168.22	2.00%	173.57	2.00%	182.02	2.00%		
2036	171.59	2.00%	177.04	2.00%	185.66	2.00%		
2037	175.02	2.00%	180.59	2.00%	189.37	2.00%		
2038	178.52	2.00%	184.20	2.00%	193.16	2.00%		
2039	182.09	2.00%	187.88	2.00%	197.03	2.00%		
2040	185.73	2.00%	191.64	2.00%	200.97	2.00%		

	Highways Rural							
		Lower		Base	Upper			
Year	Indice	Annual Increase	Indice	Annual Increase	Indio	ce Annual		
2020	100.00		100.00		100.00			
2021	110.90	10.90%	110.90	10.90%	110.90	10.90%		
2022	124.98	12.70%	124.98	12.70%	124.98	12.70%		
2023	131.23	5.00%	131.23	5.00%	131.23	5.00%		
2024	135.30	3.10%	135.30	3.10%	135.30	3.10%		
2025	139.09	2.80%	139.50	3.10%	140.31	3.70%		
2026	141.59	1.80%	143.12	2.60%	145.36	3.60%		
2027	144.14	1.80%	146.70	2.50%	150.59	3.60%		
2028	146.74	1.80%	150.37	2.50%	156.01	3.60%		
2029	149.38	1.80%	154.13	2.50%	161.63	3.60%		
2030	152.37	2.00%	157.21	2.00%	164.86	2.00%		
2031	155.41	2.00%	160.35	2.00%	168.16	2.00%		
2032	158.52	2.00%	163.56	2.00%	171.52	2.00%		
2033	161.69	2.00%	166.83	2.00%	174.95	2.00%		
2034	164.93	2.00%	170.17	2.00%	178.45	2.00%		
2035	168.22	2.00%	173.57	2.00%	182.02	2.00%		
2036	171.59	2.00%	177.04	2.00%	185.66	2.00%		
2037	175.02	2.00%	180.59	2.00%	189.37	2.00%		
2038	178.52	2.00%	184.20	2.00%	193.16	2.00%		
2039	182.09	2.00%	187.88	2.00%	197.03	2.00%		
2040	185.73	2.00%	191.64	2.00%	200.97	2.00%		

	Highways Urban							
		Lower		Base		Upper		
Year	Indice	Annual Increase	Indice	Annual Increase	Indio	ce Annual		
2020	100.00		100.00		100.00			
2021	110.10	10.10%	110.10	10.10%	110.10	10.10%		
2022	124.08	12.70%	124.08	12.70%	124.08	12.70%		
2023	130.54	5.20%	130.54	5.20%	130.54	5.20%		
2024	134.84	3.30%	134.84	3.30%	134.84	3.30%		
2025	138.62	2.80%	139.02	3.10%	139.83	3.70%		
2026	141.11	1.80%	142.64	2.60%	144.87	3.60%		
2027	143.65	1.80%	146.20	2.50%	149.94	3.50%		
2028	146.24	1.80%	149.86	2.50%	155.18	3.50%		
2029	148.87	1.80%	153.60	2.50%	160.62	3.50%		
2030	151.85	2.00%	156.68	2.00%	163.83	2.00%		
2031	154.89	2.00%	159.81	2.00%	167.10	2.00%		
2032	157.98	2.00%	163.01	2.00%	170.45	2.00%		
2033	161.14	2.00%	166.27	2.00%	173.86	2.00%		
2034	164.37	2.00%	169.59	2.00%	177.33	2.00%		
2035	167.65	2.00%	172.98	2.00%	180.88	2.00%		
2036	171.01	2.00%	176.44	2.00%	184.50	2.00%		
2037	174.43	2.00%	179.97	2.00%	188.19	2.00%		
2038	177.92	2.00%	183.57	2.00%	191.95	2.00%		
2039	181.47	2.00%	187.24	2.00%	195.79	2.00%		
2040	185.10	2.00%	190.99	2.00%	199.70	2.00%		

	Irish Rail							
		Lower		Base		Upper		
Year	Indice	Annual Increase	Indice	Annual Increase	Indi	ce Annual		
2020	100.00		100.00		100.00			
2021	110.10	10.10%	110.10	10.10%	110.10	10.10%		
2022	123.09	11.80%	123.09	11.80%	123.09	11.80%		
2023	128.88	4.70%	128.88	4.70%	128.88	4.70%		
2024	132.61	2.90%	132.61	2.90%	132.61	2.90%		
2025	135.80	2.40%	136.46	2.90%	136.86	3.20%		
2026	137.97	1.60%	139.74	2.40%	141.24	3.20%		
2027	140.18	1.60%	143.09	2.40%	145.62	3.10%		
2028	142.42	1.60%	146.52	2.40%	150.13	3.10%		
2029	144.70	1.60%	150.04	2.40%	154.78	3.10%		
2030	147.59	2.00%	153.04	2.00%	157.88	2.00%		
2031	150.54	2.00%	156.10	2.00%	161.04	2.00%		
2032	153.56	2.00%	159.22	2.00%	164.26	2.00%		
2033	156.63	2.00%	162.41	2.00%	167.54	2.00%		
2034	159.76	2.00%	165.66	2.00%	170.89	2.00%		
2035	162.95	2.00%	168.97	2.00%	174.31	2.00%		
2036	166.21	2.00%	172.35	2.00%	177.80	2.00%		
2037	169.54	2.00%	175.80	2.00%	181.35	2.00%		
2038	172.93	2.00%	179.31	2.00%	184.98	2.00%		
2039	176.39	2.00%	182.90	2.00%	188.68	2.00%		
2040	179.92	2.00%	186.56	2.00%	192.45	2.00%		

	Civil Engineering							
		Lower		Base		Upper		
Year	Indice	Annual Increase	Indice	Annual Increase	Indi	ce Annual		
2020	100.00		100.00		100.00			
2021	114.30	14.30%	114.30	14.30%	114.30	14.30%		
2022	130.64	14.30%	130.64	14.30%	130.64	14.30%		
2023	139.01	6.40%	139.01	6.40%	139.01	6.40%		
2024	144.84	4.20%	144.84	4.20%	144.84	4.20%		
2025	148.61	2.60%	148.76	2.70%	149.77	3.40%		
2026	151.14	1.70%	152.18	2.30%	154.86	3.40%		
2027	153.71	1.70%	155.52	2.20%	159.97	3.30%		
2028	156.32	1.70%	158.95	2.20%	165.25	3.30%		
2029	158.98	1.70%	162.44	2.20%	170.70	3.30%		
2030	162.16	2.00%	165.69	2.00%	174.12	2.00%		
2031	165.40	2.00%	169.01	2.00%	177.60	2.00%		
2032	168.71	2.00%	172.39	2.00%	181.15	2.00%		
2033	172.08	2.00%	175.83	2.00%	184.78	2.00%		
2034	175.52	2.00%	179.35	2.00%	188.47	2.00%		
2035	179.03	2.00%	182.94	2.00%	192.24	2.00%		
2036	182.61	2.00%	186.60	2.00%	196.09	2.00%		
2037	186.27	2.00%	190.33	2.00%	200.01	2.00%		
2038	189.99	2.00%	194.13	2.00%	204.01	2.00%		
2039	193.79	2.00%	198.02	2.00%	208.09	2.00%		
2040	197.67	2.00%	201.98	2.00%	212.25	2.00%		

Land & Property Price Index - 2025 Issue

	Dublin Residential						
		Lower		Base		Upper	
Year	Indice	Annual Increase	Indice	Annual Increase	Indic	ce Annual	
2020	100.00		100.00		100.00		
2021	107.30	7.30%	107.30	7.30%	107.30	7.30%	
2022	118.35	10.30%	118.35	10.30%	118.35	10.30%	
2023	119.06	0.60%	119.06	0.60%	119.06	0.60%	
2024	129.42	8.70%	129.42	8.70%	129.42	8.70%	
2025	133.95	3.50%	138.35	6.90%	142.88	10.40%	
2026	136.90	2.20%	144.71	4.60%	152.60	6.80%	
2027	138.95	1.50%	148.91	2.90%	159.16	4.30%	
2028	140.76	1.30%	152.93	2.70%	165.52	4.00%	
2029	142.59	1.30%	156.91	2.60%	171.98	3.90%	
2030	144.87	1.60%	162.09	3.30%	180.41	4.90%	
2031	147.77	2.00%	165.33	2.00%	184.01	2.00%	
2032	150.72	2.00%	168.63	2.00%	187.69	2.00%	
2033	153.74	2.00%	172.01	2.00%	191.45	2.00%	
2034	156.81	2.00%	175.45	2.00%	195.28	2.00%	
2035	159.95	2.00%	178.96	2.00%	199.18	2.00%	
2036	163.14	2.00%	182.54	2.00%	203.17	2.00%	
2037	166.41	2.00%	186.19	2.00%	207.23	2.00%	
2038	169.74	2.00%	189.91	2.00%	211.37	2.00%	
2039	173.13	2.00%	193.71	2.00%	215.60	2.00%	
2040	176.59	2.00%	197.58	2.00%	219.91	2.00%	

	Irish (Excluding Dublin)							
		Lower		Base		Upper		
Year	Indice	Annual Increase	Indice	Annual Increase	Indi	ce Annual		
2020	100.00		100.00		100.00			
2021	109.20	9.20%	109.20	9.20%	109.20	9.20%		
2022	124.49	14.00%	124.49	14.00%	124.49	14.00%		
2023	130.71	5.00%	130.71	5.00%	130.71	5.00%		
2024	141.69	8.40%	141.69	8.40%	141.69	8.40%		
2025	146.23	3.20%	150.76	6.40%	155.29	9.60%		
2026	149.44	2.20%	157.39	4.40%	165.70	6.70%		
2027	151.83	1.60%	162.59	3.30%	173.82	4.90%		
2028	153.66	1.20%	166.65	2.50%	180.25	3.70%		
2029	155.19	1.00%	170.15	2.10%	185.84	3.10%		
2030	156.43	0.80%	173.05	1.70%	190.48	2.50%		
2031	159.56	2.00%	176.51	2.00%	194.29	2.00%		
2032	162.75	2.00%	180.04	2.00%	198.18	2.00%		
2033	166.01	2.00%	183.64	2.00%	202.14	2.00%		
2034	169.33	2.00%	187.31	2.00%	206.19	2.00%		
2035	172.72	2.00%	191.06	2.00%	210.31	2.00%		
2036	176.17	2.00%	194.88	2.00%	214.52	2.00%		
2037	179.69	2.00%	198.77	2.00%	218.81	2.00%		
2038	183.29	2.00%	202.75	2.00%	223.18	2.00%		
2039	186.95	2.00%	206.80	2.00%	227.65	2.00%		
2040	190.69	2.00%	210.94	2.00%	232.20	2.00%		

	Office Market							
		Lower		Base		Upper		
Year	Indice	Annual Increase	Indice	Annual Increase	Indi	ce Annual		
2020	100.00		100.00		100.00			
2021	100.00	0.00%	100.00	0.00%	100.00	0.00%		
2022	93.20	-6.80%	93.20	-6.80%	93.20	-6.80%		
2023	94.97	1.90%	94.97	1.90%	94.97	1.90%		
2024	100.38	5.70%	100.38	5.70%	100.38	5.70%		
2025	102.99	2.60%	105.70	5.30%	110.92	10.50%		
2026	105.05	2.00%	109.93	4.00%	119.69	7.90%		
2027	106.84	1.70%	113.78	3.50%	128.07	7.00%		
2028	108.34	1.40%	116.74	2.60%	134.85	5.30%		
2029	109.96	1.50%	120.12	2.90%	142.81	5.90%		
2030	111.28	1.20%	122.89	2.30%	149.38	4.60%		
2031	113.51	2.00%	125.34	2.00%	152.37	2.00%		
2032	115.78	2.00%	127.85	2.00%	155.41	2.00%		
2033	118.09	2.00%	130.41	2.00%	158.52	2.00%		
2034	120.45	2.00%	133.02	2.00%	161.69	2.00%		
2035	122.86	2.00%	135.68	2.00%	164.93	2.00%		
2036	125.32	2.00%	138.39	2.00%	168.22	2.00%		
2037	127.83	2.00%	141.16	2.00%	171.59	2.00%		
2038	130.38	2.00%	143.98	2.00%	175.02	2.00%		
2039	132.99	2.00%	146.86	2.00%	178.52	2.00%		
2040	135.65	2.00%	149.80	2.00%	182.09	2.00%		

	Industrial Market							
		Lower		Base		Upper		
Year	Indice	Annual Increase	Indice	Annual Increase	Indi	ce Annual		
2020	100.00		100.00		100.00			
2021	120.30	20.30%	120.30	20.30%	120.30	20.30%		
2022	125.23	4.10%	125.23	4.10%	125.23	4.10%		
2023	120.10	-4.10%	120.10	-4.10%	120.10	-4.10%		
2024	121.30	1.00%	121.30	1.00%	121.30	1.00%		
2025	122.15	0.70%	123.00	1.40%	124.82	2.90%		
2026	122.76	0.50%	124.10	0.90%	127.06	1.80%		
2027	122.76	0.00%	124.10	0.00%	127.06	0.00%		
2028	122.64	-0.10%	123.73	-0.30%	126.30	-0.60%		
2029	122.39	-0.20%	123.24	-0.40%	125.29	-0.80%		
2030	122.15	-0.20%	122.74	-0.40%	124.29	-0.80%		
2031	124.59	2.00%	125.20	2.00%	126.77	2.00%		
2032	127.08	2.00%	127.70	2.00%	129.31	2.00%		
2033	129.62	2.00%	130.26	2.00%	131.90	2.00%		
2034	132.21	2.00%	132.86	2.00%	134.53	2.00%		
2035	134.86	2.00%	135.52	2.00%	137.22	2.00%		
2036	137.56	2.00%	138.23	2.00%	139.97	2.00%		
2037	140.31	2.00%	140.99	2.00%	142.77	2.00%		
2038	143.11	2.00%	143.81	2.00%	145.62	2.00%		
2039	145.98	2.00%	146.69	2.00%	148.54	2.00%		
2040	148.90	2.00%	149.62	2.00%	151.51	2.00%		

	Retail Market					
	Lower		Base		Upper	
Year	Indice	Annual Increase	Indice	Annual Increase	Indi	ce Annual
2020	100.00		100.00		100.00	
2021	93.40	-6.60%	93.40	-6.60%	93.40	-6.60%
2022	89.10	-4.60%	89.10	-4.60%	89.10	-4.60%
2023	82.60	-7.30%	82.60	-7.30%	82.60	-7.30%
2024	84.42	2.20%	84.42	2.20%	84.42	2.20%
2025	85.77	1.60%	87.20	3.30%	89.90	6.50%
2026	86.20	0.50%	88.07	1.00%	91.61	1.90%
2027	86.37	0.20%	88.43	0.40%	92.34	0.80%
2028	86.37	0.00%	88.51	0.10%	92.53	0.20%
2029	86.37	0.00%	88.60	0.10%	92.71	0.20%
2030	86.54	0.20%	88.87	0.30%	93.27	0.60%
2031	88.27	2.00%	90.65	2.00%	95.14	2.00%
2032	90.04	2.00%	92.46	2.00%	97.04	2.00%
2033	91.84	2.00%	94.31	2.00%	98.98	2.00%
2034	93.67	2.00%	96.19	2.00%	100.96	2.00%
2035	95.55	2.00%	98.12	2.00%	102.98	2.00%
2036	97.46	2.00%	100.08	2.00%	105.04	2.00%
2037	99.41	2.00%	102.08	2.00%	107.14	2.00%
2038	101.40	2.00%	104.12	2.00%	109.28	2.00%
2039	103.42	2.00%	106.21	2.00%	111.47	2.00%
2040	105.49	2.00%	108.33	2.00%	113.70	2.00%

Appendix C

Summary of Methodology

AY's Irish Real Estate Capital Value Forecasts: Summary of Methodology

AY settled on the following approach to develop real estate capital value forecasts. Grant Thornton have replicated this approach.

Economic Forecast Scenario

GDP and Employment forecasts purchased from Oxford Economics

Dublin Residential Market

AY examined a range of potential variables that correlated with the observed movements in the capital value index. The variables selected for inclusion in the final model are as follows.

- Dublin working age population growth in the following year, t+1 (correlation coefficient 0.90): Working age population is an intuitive driver of demand for housing. Statistically the variable works best in the model using the growth in the following year to explain movements in the current year.
- National employment growth (correlation coefficient 0.83): National employment growth is an intuitive driver of house prices given that it reflects effective demand (i.e. with an ability to
 - pay) for housing.

These variables together with their associated forecasts from Oxford Economics were then incorporated into an econometric model and used to generate forecasts for the Dublin residential capital value index.

Ireland Residential Market

- Residential price growth in the previous year, t-1 (correlation coefficient 0.73): Housing markets tend to have strong momentum, given that domestic buyers are not always technically analytical or "economically rational" in their behaviour, and can be strongly influenced by media coverage (particularly in a rising market). Rising prices encourage potential buyers into the market in the expectation of future house price growth and/or to "get into the market before prices rise further". Falling prices can have the opposite effect. Value change the previous year is therefore a good predictor of growth or decline in the current year.
 - National employment growth (correlation coefficient 0.84): National employment growth is an intuitive driver of house prices given that it reflects effective demand (i.e. with an ability to pay) for housing.

These variables together with their associated forecasts from Oxford Economics were then incorporated into an econometric model and used to generate forecasts for the Irish residential capital value index.

Dublin Office Market

AY examined a range of potential variables that correlated with the observed movements in the capital value index, although none displayed a coefficient above 0.72. The variables selected for inclusion in the final model are as follows.

- National employment growth in the following year, t+1 (correlation coefficient 0.70): National employment growth is an intuitive driver of occupier demand for office space. Companies make decisions regarding future space requirements in anticipation of future hiring decisions, which impacts rental growth in the current year. Investors are also forward looking and adjust bid-offer prices in anticipation of future demand and rental levels.
- Change in national unemployment rate (correlation coefficient -0.71): Change in

unemployment is also an indicator of changing labour market conditions and hiring activity, and thus of occupier and investor demand for office space.

• Change in Irish 10-year government bonds in the previous year, t-1 (correlation coeff -0.46): Investors assess the pricing of most asset classes, including real estate, on a risk-adjusted basis against the "risk free rate of return", the best proxy for which is the relevant 10-yr government bond yield. International analysis conducted previously by Avison Young shows that movements in bond yields feed through into real estate yields with a typical lag of 9-15 months depending on the country and market conditions. Thus falling (or rising) bond yields drive subsequent declines (or increases) in property yields which puts upward (or downward) pressure on capital values – hence the negative correlation. The direct correlation between bps movements in bond yields and capital values is only - 0.46, which is not particularly strong, but including them in the multivariable regression equation does help increase its explanatory power and seems intuitively logical.

Dublin Industrial Market

AY examined a range of potential variables that correlated with the observed movements in the capital value index. The variables selected for inclusion in the final model are as follows.

- Retail sales volume growth (correlation coefficient 0.83): In recent years the industrial market has increasingly been driven by demand for logistics/warehousing space rather than traditional industrial production. The rapid growth of online shopping, coupled with expansion of third-party logistics providers supporting retail and production activity, means that retail sales volumes are intuitively a strong driver of occupier and investor demand and for industrial property and land.
- National manufacturing employment growth in the following year, t+1 (correlation coefficient 0.60): Manufacturing employment growth is an intuitive driver of both direct demand for industrial/warehousing space, and also of expected economic growth and consumer/business demand for goods and warehousing. Companies make decisions regarding future space requirements in anticipation of future levels of activity. Investors are also forward looking and adjust bid-offer prices in anticipation of future demand and rental levels.

Dublin Retail Market

AY examined a range of potential variables that correlated with the observed movements in the capital value index. The variables selected for inclusion in the final model are as follows.

- Retail sales volume growth (correlation coefficient 0.68): This is intuitively likely to be a driver of retail values as the volume of spending in shops as reported in recent official data will be a major influence on how investors view retail property assets. These figures will probably be closely examined during the market research stage of a retail investment transaction and shape the decision whether to acquire or dispose of retail property investments and if so, at what price.
- Retail sales volume % growth, t+1 (correlation coefficient 0.67): As well as current performance of retail sales, forward looking investors will consider future expectations for retail spending, taking into account anticipated events that could further buoy or dampen spending power. Retail sales actually achieved in the following year are likely to be a good indicator of sentiment regarding the future trajectory of the retail sector in the current year.