



ENHANCING
IRELAND'S
INFRASTRUCTURE

Construction Industry Federation Report

August 2017

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FOREWORD



“We need to radically change how we deliver infrastructure in this country. Strategic infrastructure projects should be subject to robust cost-benefit analyses and economic modelling. This will help us to identify projects that deliver optimal benefits to Ireland's economy and society. Proper analysis should insulate long-term infrastructure delivery from short-term political meddling and narrow, local prejudices. Rigorous modelling will facilitate holistic regional infrastructure strategies that maximise economic potential and benefit society at community-level in tandem with the national.”

“The final step is to put in place a National Infrastructure Council to support Government decision-making in this area. Its role will be to ensure the delivery of a 10- to 15-year Public Capital Programme to complement an agreed vision of Irish society as part of the upcoming National Planning Framework. We must enhance Ireland's infrastructure delivery for this generation and the next.”

After a decade of underinvestment, Ireland is aiming to increase infrastructure investment from last position in the EU 27 toward the European average. This is an absolute priority as Ireland's population is one of the fastest growing in the EU at a time when our economy is recording the second-highest growth rate in the union.

Previous attempts to strategically deploy infrastructure in Ireland have been rendered obsolete by the vagaries of the political system. There is a very real risk that Ireland's infrastructure investment may never translate into the critical road, rail, broadband, water and social infrastructure required to sustain our rapidly growing economy for the next 40 years.

Ireland needs to fundamentally change the way it prioritises key infrastructure projects. Our current approach is too short-term, and too susceptible to political and local interests. The Government should establish a national infrastructure commission, similar in set-up to the Irish Fiscal Advisory Council, whose role would be to advise on strategic infrastructure.

Currently, investment is allocated through an opaque trade-off based on “wish lists” from government departments, and influenced by special interest groups. Selected projects rarely undergo serious cost-benefit analysis. Similarly, how disparate projects combine or interact is never analysed. To protect investment, a national infrastructure target could be identified along with a special delivery unit to address bottlenecks and blockages in the system. This approach has been

used in Britain and Australia to ensure optimal social, environmental, and economic benefit is derived from all infrastructural investment.

This report shows that in the mid-term review of the Public Capital Programme, of the estimated additional €5.14 billion allocated, €2.2 billion went to housing. Of the remaining balance, only €1.15 billion could be spent on productive social infrastructure. The remainder was spent on depreciation of existing assets. Based on the government's recent Summer Economic Statement announcement, the CIF has identified only €350 million available per year up to 2021 for new and essential infrastructure projects.

The government needs to ensure that a higher proportion of the investment announced is spent on productive infrastructure rather than grants, equipment and "other miscellaneous" items as it is described. Ireland's current capital expenditure ratio is about 10:1 – in other words, we spend 10 times as much on day-to-day spending as we do on investment.

Each €1 billion invested in infrastructure in 2019 will yield lower returns for the economy than if it was invested today in 2017 due to depreciation and tender price increases in the interim. Waiting until 2019 to invest in a major road project such as the M20 means nobody will see that road completed until nearly 2030.

Why wait? Each billion euro invested in infrastructure yields almost 12,000 construction jobs, and generates around €1 billion in the domestic economy. These figures are calculated before improved connectivity, quality of life and attractiveness to foreign direct investment is taken into account.

In this report, we outline the Construction Industry Federation's findings following a Mid-Term Review of the Capital Plan 2017. This report shows the alarming need to increase the amount of investment in infrastructure and create a systemic approach to prioritising infrastructural development.

This report also highlights the fact that much of the current spend is on maintenance rather than expansion. The need for improved planning and the prioritisation of projects is also reinforced, with a broad consensus in the academic literature which shows that infrastructure investment should be undertaken following a thorough cost-benefit analysis, or where this is not possible or advisable, using a framework that clearly demonstrates the social-environmental and financial-economic costs and benefits of particular projects.

Now is the time to invest in Ireland's future. We must make infrastructure a key priority in our approach to capital spending today, or face the consequences of our inaction over decades to come. We need political action - not political meddling - to enhance the infrastructure delivery that Ireland's future deserves.

Tom Parlon

CIF Director General

We need to radically change how we deliver infrastructure in this country

EXECUTIVE SUMMARY AND RECOMMENDATIONS

Infrastructure is a key component of a country's success, and an important determinant of economic growth and competitiveness. Investment in high quality infrastructure which removes existing bottlenecks and adds to the productive potential of the economy can boost productivity and reduce inefficiencies, whilst also supporting jobs and improving the quality of life for all residents.

Chronic underinvestment in infrastructure

There has been a sharp reversal in the rate of change of Ireland's infrastructure capital stock for dwellings since 2005, and for non-residential buildings and structures since 2007/2008. The capital stock of roads has been in decline since 2013. This is clearly an unsustainable trend, particularly given Ireland's strong economic and population growth.

Further evidence of Ireland's low rate of investment is evident from Eurostat data which shows Ireland spent the least on 'general government fixed investment' (voted capital investment) amongst all EU countries as a percentage of GDP, with only 1.7 per cent recorded in 2015¹. The average rate was 2.7 per cent for the EU19, and 2.9 per cent for the EU28.

The CIF recognises that Ireland made considerable progress in some areas in the period up to 2007; notably: the motorway network, airports, Luas and energy infrastructure. The total remaining unallocated provision for investment in infrastructure of €1.52 billion (€378.75 million per annum) is very modest, however, and will not materially add to the Exchequer public capital framework over the next four years².

The total Exchequer capital provision represented 1.9 per cent of GNP in 2016 and is projected to rise marginally to 2.0 per cent in 2017, 2.2 per cent in 2018 and 2.4 per cent in 2019, compared with 5.6 per cent in 2008³. Although the total Exchequer capital provision is projected to reach 2.7 per cent of GNP (€7.3 billion) in 2021, it is still below the average of 3.8 per cent recorded over the 2000-2016 period. The Federation contends that the total Exchequer capital investment provision is insufficient to address the existing infrastructure backlog, and the needs of an expanding economy. This observation is particularly pertinent if the objectives of the National Planning Framework are to be realised.

The benefits of investing in infrastructure

Infrastructure tends to have a positive effect on growth, but this positive effect can be mitigated by an already high level of infrastructure stock. Furthermore, the positive effects of increased infrastructure investment can be severely diminished by poor efficiency in public investment. Conditions such as low growth, an accommodative monetary policy, and financing investment through debt tend to raise the positive output effect of infrastructure investment. Addressing infrastructure gaps ranks highly in terms of options which offer most return on investment, as does investing in 'core' infrastructure. Yet the question of where to invest is a question that cannot be answered easily without understanding government priorities. A thorough ex-ante cost-benefit analysis is a good place to start; particularly to ensure projects are economically sound.

Project prioritisation

Prioritisation is not straightforward within Government departments, and is even more challenging across departments because of the different types of benefits which may apply. It is essential therefore that objective and transparent methods are used to assess candidate projects in order to compare their relative merits, *and* generate a ranking of the best projects to proceed with. A framework that allows analyses of the optimum combination of government departments' prioritised projects from an overall state perspective must be established, and - most importantly - be adhered to when allocating investment.

There is broad consensus in the academic literature that infrastructure investment should be undertaken following a thorough cost-benefit analysis, or, where this is not possible or advisable, using a framework that clearly demonstrates the social-environmental and financial-economic costs and benefits of particular projects. The costs and benefits (including those difficult to quantify) of a particular investment must be outlined, and projects should be selected by criteria reflecting government priorities and rigorous estimations of their capacity to generate social and economic returns.

The process should ensure that projects selected meet stated policy goals and objectives, which may include, for example, regional economic

¹<http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=teina210&plugin=1>

²The CIF understands that €1.14 billion of the total of €2.655 billion is to be allocated to capital grants for the main enterprise agencies, the Department of Agriculture, Food and the Marine and the State tourism bodies.

³Using projections for real GNP to 2021 in the Draft SPU, April 2017, Department of Finance.

development, environmental goals and social inclusion. Infrastructure investments are complex, thus a single methodology which merely ranks projects may not be optimal. Hence the relevant academic literature often recommends a multi-disciplinary approach.

Long-term infrastructure planning

The Capital Plan is an important Government measure which must anticipate economic, population and technological changes in the economy over the long-term. Within this plan, one challenge is to ensure that appropriate and sustainable infrastructure planning strategies are in place for the long-term. The CIF believes that the approach to ascertaining Ireland's infrastructure priorities should, at a minimum, be framed over 15-year period instead of 10 years to take into account the long lead-in time to planning major infrastructure projects. This is essential to ensure alignment with the National Planning Framework.

Based on a review of best-practice approaches to long-term infrastructure planning in Canada, Britain and Australia, the first step necessitates a strategic approach to assessing the nation's infrastructure needs. Ideally this strategic blueprint should inform the development of an 'infrastructure needs statement' which is evidence-based, objective and rigorous.

The common thread in a number of jurisdictions, notably in the UK and Australia, is the move to depoliticise the planning process by establishing an independent statutory body with a mandate to progress, prioritise and reform national infrastructure delivery. This ensures greater transparency in the process of project selection and prioritisation. It further removes any short-term focus dictated by the political cycle.

The CIF believes that the appropriate solution in Ireland is to establish an independent National Infrastructure Commission (NIC) with responsibility for analysing the long-term infrastructure needs of the economy and society. The Irish NIC would assess/ascertain Ireland's infrastructure needs by:

- Setting out the strategic vision of Ireland's long-term infrastructure needs for the next 15 years and beyond;

- Prioritising projects with evidence-based and objective methodologies to ensure selected infrastructure solutions are consistent with the vision set out for the medium-term;
- Producing an infrastructure priority list highlighting key national and regional infrastructure projects.

It is only by undertaking the appropriately rigorous and evidenced-based analyses, including robust economic assessment and early project development studies, that investment proposals may progress onto the Infrastructure Priority List.

Best practice is for the NIC's consultation process with government bodies to be open and transparent. Proposals for infrastructure projects from government departments would have to include indicative costings which the NIC could independently evaluate. The NIC would publish an infrastructure plan, and a priority list of the key national and regional infrastructure projects for the next 10 to 15 years. The list would be submitted to the Department of Public Expenditure and Reform (DPER), which would allocate budgets for the ranked projects within the constraints of the public capital envelope.

Ireland's Public Capital budget needs to focus on infrastructure

- The existing provisions set out for public capital investment focus largely on maintenance and upgrades of existing capital stock, implying limited scope to increase the public capital stock over the medium term⁴. While investment in maintaining quality infrastructure is necessary to avoid future cost increases, investment in new infrastructure is vital as demand patterns change based on population growth, economic expansion and changes in demographic composition.
- The Government intends to cap the aggregate level of annual expenditure on PPP unitary payments, relative to the Exchequer capital envelope, at 10 per cent of the total annual Exchequer capital spending. This is equivalent to almost €3 billion in the 2017 to 2021 timeframe. This reinforces the necessity of ensuring that strategic PPP projects are affordable over the long-term, and not selected because they are regarded as off-balance sheet investments.

⁴Irish Fiscal Advisory Council, Public Capital: Investment, Stocks and Depreciation. June 2016.

- The public capital investment allocations in the Capital Plan cover the whole spectrum of public capital investment across the economy, including investment in the acquisition of land/sites, buildings, machinery and equipment (e.g. trains, buses, school and hospital equipment, traffic signalling, ICT equipment), as well as loans and capital grants (e.g. enterprise and agricultural supports, science and technology grants). More detail on the specific capital provisions for the main types of infrastructure funded from Exchequer and non-Exchequer sources would bring more clarity to the forward-planning of infrastructure provision.
- Whether Brexit impacts on the reprioritisation of projects will depend on the level of risk Brexit is perceived to pose to economic growth over the long-term. However, much of the current debate is on North-South relations post-Brexit negotiations, with tight focus on how a customs border might be implemented. Tariff barriers or border controls would adversely impact Irish businesses which trade with the UK, and in particular the British mainland. In response, the possible transfer of resources to support an all-island infrastructure – especially the road network – will need to be costed and analysed.
- Infrastructure is key for achieving balanced regional development, and the National Plan must recognise this as a driver of higher levels of sustainable economic activity. A prime component for the success of the National Plan will be ensuring that crucial infrastructure required to support the competitiveness of designated growth centres is implemented.
- While the Capital Plan does include some provisions for meeting our climate change and energy efficiency commitments, the cost of meeting our obligations by 2030 will be significant. Given the importance of meeting these obligations, additional funding should be provided and ring-fenced to ensure cost-effective actions are included in the Capital Plan. These should be fully aligned with the forthcoming National Mitigation Plan.

- The population of Ireland is projected to grow to between 5 million and 6.7 million by 2046, compared with a population of 4.761 million in 2016⁵. This is equivalent to an average annual growth rate of between 0.2 per cent (M3F2) and 1.2 per cent (M1F1), depending on the CSO migration and fertility scenarios used. The midpoint of these projections represents a population increase of 1.1 million, or 0.7 per cent on average per annum over the next 30 years. The current regional population projections will need to be updated to reflect population expansion expected in the designated growth centres in the National Plan. The infrastructure priorities in the Capital Plan must be cognisant of these revised regional projections.

Prioritise productive infrastructure within the Public Capital Programme

Ireland experienced a sharply reduced level of public capital investment for infrastructure during the financial crisis. The pick-up in investment since 2013 has been mainly in areas of social infrastructure (+89%), but was much lower (+9%) for productive infrastructure. With investment in productive infrastructure down to 1.6 per cent of GNP in 2017 (from 4.6 per cent at its peak in 2009), this trend highlights the acute situation in the civil engineering sector which has consistently been performing poorly relative to other industrial sectors.

Civil engineering projects are predominantly funded by the public sector. There are immediate actions which can be taken now, particularly with respect to transport projects to ensure the speedy delivery of major projects. The M20 Cork to Limerick motorway, for example, is a project which has attracted widespread attention. Engineering industry sources indicate that it will cost around €15 million to take this project through the 3-4 year planning process, which is equivalent to only 2 per cent of the capital cost. By allocating this funding to Transport Infrastructure Ireland (TII) over 2017-2019, TII would be in a position to appoint contractors in 2019, ensuring the efficient delivery of this project. There are other examples, where projects could be delivered more speedily either directly with Exchequer funding or through PPP arrangements, if the forward planning of many essential projects was progressed rather than deferred.

⁵The scenarios are those prepared by the CSO and reflect different combinations of assumption about the level of net inward migration and fertility rates. See Population and Labour Force Projections 2016-2046, CSO at http://www.cso.ie/en/media/csoie/releasespublications/documents/population/2013/poplabfor2016_2046.pdf

These figures are pre-Brexit figures and it remains to be seen what, if any, impact the decision by the UK to leave the EU may have on inward migration flows.

⁶Presentation by Dr. Christian Kummert, Rubicon Infrastructure Advisors to the CIF Colloquium on Capital Investment in Ireland, 24th April 2017

At present, there is little or no price inflation in civil engineering, indicating that now is a good time for the State to invest in civil engineering projects. There is currently significant liquidity in the capital markets for project finance in Europe, generating an investment environment to fund infrastructure at low interest rates for the next thirty years⁶. Moreover, the industry requires a strong pipeline of projects to ensure that trained staff remain in the Irish construction sector and are not drawn towards other labour markets, such as the UK, where a significant skills gap is projected in the medium-term.

Fiscal rules and flexibility to support investment

The fiscal rules are restricting the ability of the State to invest for productive purposes. They make no differentiation between capital expenditure and current expenditure with regard to their impacts on the budget deficit.

The Department of Finance is exploring how the fiscal rules could be applied more flexibly to support increased investment levels without changing them. These include opportunities to invoke the **Structural Reform Clause** which allows a state to apply for a temporary deviation of up to 0.5 per cent of GDP from the state's Medium-Term Objective (MTO)⁷. This mechanism may be utilised provided the state is not in the Excessive Deficit Procedure (EDP). Another option is the **Investment Clause**.

Whilst the Structural Reform Clause could be invoked until Ireland reaches its MTO, leeway to invest is also available if the health of the economy deteriorates.

Alternative sources of funding

The European Investment Bank opened an office in Dublin in 2016. The Irish public and private sectors have an opportunity to deepen their engagement with the Bank, and win a greater share of the enhanced lending volumes and risk capacity available to the EIB.

A key driver of the Investment Plan is the European Fund for Strategic Investments (EFSI). Since its inception in July 2015, the main beneficiaries have been in the private sector, including PPP companies. Whilst acknowledging that ESFI loan repayments have to be considered in the context of the expenditure benchmark under the EU's fiscal rules, the EFSI funds should be examined to fund infrastructure projects where investment is most needed.

The Irish Strategic Investment Fund was established in late 2014 and has invested around €2.7 billion in Irish firms and investments since its establishment. But Venture Funds and Real Estate have received a combined investment of over €1 billion. Further scope to fund infrastructure from the ESFI and the ISIF should be urgently examined.

Infrastructure is a key component of a country's success and an important determinant of economic growth

⁶The MTO requires achievement of a balanced budget in structural terms by 2018. In Ireland's case, the budgetary deficit can amount to no more than 0.5 per cent of GDP in 2018.

RECOMMENDATIONS

The financing of public infrastructure projects

- 1) Currently Ireland spends relatively little on public capital investment when compared to other EU countries. Although the total Exchequer capital provision is projected to reach 3 per cent of GNP in 2021 (compared with 2.1 per cent currently), it is still below the average of 3.8 per cent recorded over the 2000-2016 period. Every effort should be made to examine scope for securing additional funding for infrastructure investment by **exploring how existing fiscal rules of the Stability and Growth Pact (SGP) could be applied more flexibly** without changing them.
- 2) All other **alternative sources of funding** available to Government should be investigated, including the European Investment Bank, the Irish Strategic Investment Fund and the European Fund for Strategic Investment. The Vice President of the European Investment Bank (EIB), Mr. Andrew McDowell, stated earlier this year that "Ireland can do more" to access EIB funds, and that "now is a good time to be putting up projects" as the EIB has "more money under the Investment Plan for Europe than it has projects to finance." There is also significant liquidity in the capital markets for project finance in Europe, generating the opportunity to fund infrastructure at low interest rates for the next thirty years. The time to invest is now.

An independent National Infrastructure Commission

- 3) Establish an independent **National Infrastructure Commission** with responsibility for analysing the long-term infrastructural needs of the economy and a modern society. The assessment of needs would be informed by the development of a strategic vision – in accordance with the agreed National Planning Framework - which would inform the development of an infrastructure needs statement. This should use a rigorous, evidence-based and objective methodology to ensure appropriate national and regional infrastructure solutions are identified.

National investment target for infrastructure investment

- 4) The construction industries in other EU countries have called for the introduction, via legislation, of **national investment targets** (e.g. as a percentage of GDP). This would set in stone the rate of investment that the government would be obliged to meet over, for example, a 10-year period. Confirming a target would allow progress to be assessed against it, and would help

shape expectations amongst stakeholders. Alternatively, investment rate floors can be set so that investment does not fall below a certain level.

- 5) The Irish Fiscal Advisory Council has expressed concern that Ireland's quantum of capital expenditure is barely covering the depreciation costs of the capital stock. If additional finance does not become available, this increases costs in the economy in the short-term (as poorer infrastructure reduces efficiency) and in the medium- and long-terms (due to the need to upgrade). At a minimum, **the quantum of expenditure allocated to capital projects should be sufficient to cover depreciation and tackle the backlog in a number of sectors**, notably housing, transport, health and education, and deliver strategic infrastructure projects.

Project prioritisation

- 6) Proper prioritisation of public infrastructure investment is essential to optimising long-term economic and societal returns. There is broad consensus that **infrastructure investment should be undertaken following a thorough cost-benefit analysis**, or, where this is not possible or advisable, using a framework that clearly demonstrates the social-environmental and financial-economic costs and benefits of specific projects. While this consensus approach is worthwhile, because of the complexities of infrastructure investments it is recommended that **a prioritisation exercise should also be based on multidisciplinary analysis to ensure a robust outcome**.
- 7) **There would be value in having cost benefit analyses undertaken by the independent National Infrastructure Commission, which would follow best international practice.** It is more important that a single body, separate from the promoting agencies, evaluates the CBAs of all candidate projects side-by-side, to firstly ensure correct methodology and, secondly, to produce a ranking of candidate projects.
- 8) By allocating the task of project prioritisation to a National Infrastructure Commission, the process is more open, transparent and less subject to political influence. It is recommended, as part of the NIC's public consultation process to identify eligible projects, that **Government departments would submit their project proposals, with indicative costings, to the NIC which would independently evaluate them.** The NIC would publish an infrastructure priority list of the key national and regional infrastructure projects for the next 10 to 15 years. This list could be prepared for swift Government approval.

Advance forward planning on transport projects

9) In relation to the situation in civil engineering, a sector experiencing reduced Exchequer capital allocations for infrastructure, consideration should be given to the forward planning of projects. It can take up to four years to complete planning for a transport project before any contractual commitment to construct is entered into. There are immediate actions which can be taken now, particularly with respect to transport projects and their budgets allocations. The M20 Cork to Limerick motorway, for example, where the estimated cost is €800 million and the forward planning costs are €15 million, is equivalent to 2 per cent of the capital cost. **There is no reason why the forward planning of many essential projects should not be progressing rather than deferring essential planning which will only cause further unnecessary delays to commencement of essential projects.**

Cross Departmental Committee for monitoring public sector projects

10) **A centralised database of all capital projects** being undertaken by the Exchequer and by semi-state bodies would provide stakeholders such as the CIF with greater certainty and clarity about work in progress, and future projects. In this regard a Cross Departmental Committee should be established to monitor progress on public sector construction projects on a quarterly basis. This body may address barriers impeding the delivery of projects on time. This oversight role would remain with government departments following the establishment of the NIC. The NIC would provide a clear and long-term pipeline for priority projects.

11) Population growth in the period 2011-2016 was greatest in Dublin, its surrounding counties, and Cork and Galway, suggesting that urbanisation increased during the recession. It is expected that this trend will continue over the coming years, with Dublin and the Mid-East likely to grow at faster rates than other regions. Although investment should be needs-based and should focus on the regions where demand is highest, the establishment of the National Infrastructure Commission will ensure that **projects are selected to meet the policy goals and objectives of the agreed regional vision set out in the National Planning Framework.**

Increasing levels of unitary payments

12) We understand that the increasing level of unitary payments which arise on PPP projects is becoming an issue of concern in some areas (e.g. Education). We further understand that since the Plan was published, some unitary payments, previously classified under current expenditure, have been reclassified as capital expenditure. In regard to PPP projects, the Government intends to cap the aggregate level of annual expenditure on PPP unitary payments, relative to the Exchequer capital envelope, at 10 percent of the total annual Exchequer capital spending. This is equivalent to almost €3 billion during 2017-2021 which will not be available for direct Exchequer investment in infrastructure projects. This reinforces the necessity to **ensure that PPP projects are selected not because they are regarded as off-balance sheet investments, but because they need to be strategic, appropriate and affordable over the long-term.**

Level of information provided in the Capital Plan

13) The public capital investment allocations published for the medium-term show the provisions for each Government department for construction and non-construction related investments in the aggregate. The allocations cover the whole spectrum of public capital investment across the economy, including investment in the acquisition of land/sites, buildings, machinery and equipment (e.g. trains, buses, school and hospital equipment, traffic signalling, ICT equipment) as well as loans and capital grants (e.g. enterprise and agricultural supports, science and technology grants). The CIF would welcome **more detail in the Capital Plan on the specific capital provisions for the main types of infrastructure, and construction-related investments.**

Establish an independent National Infrastructure Commission

1. INTRODUCTION

1.1 THIS REPORT

This report is based on findings from the Construction Industry Federation (CIF) analysis on the Mid-Term Review of the Capital Plan 2017. Infrastructure is a key component of a country's success and an important determinant of economic growth and competitiveness. Investment in high quality infrastructure which removes existing bottlenecks and adds to the productive potential of the economy can boost productivity and reduce inefficiencies, while also supporting jobs and improving the quality of life for all residents.

The focus of this report is on the recent near stagnation in the public capital stock, the poor performance of Ireland in terms of capital investment relative to other European countries, inadequate capital resources over the medium-term, and alternative funding solutions. There is a discussion on a number of key issues for consideration in the mid-term review, including project prioritisation guidelines and frameworks, and the assessment of capital projects. There is also a proposal to improve Ireland's long-term infrastructure planning based on international best practice. The CIF is of the view that providing DPER with a list of ranked sectors/projects/programmes and priority areas is not the most appropriate way to proceed, in the absence of detailed analysis.¹⁰ The latter would require taking a strategic approach to establish the country's infrastructure needs, including an assessment of the country's existing infrastructure, current and prospective gaps, as well as a rigorous economic assessment and a clear vision of the policy goals, objectives and challenges over the medium-term.

The vast majority of Ireland's infrastructure is provided by the public sector. The State plays a critical role in planning the framework for public capital investment over the long-term. The Capital Plan is therefore an important tool of Government which must anticipate economic, population and technological changes in the economy over the long-term.

The types of infrastructure projects in question can be any combination of productive, social and economic infrastructure. Productive infrastructure investment includes spending on the national and non-national road network, water services, public transport, airports, seaports and broadband, as well as investment by the respective semi-State organisations responsible for transport, energy and telecommunications.¹¹

Social infrastructure includes, for example, social housing, educational buildings, hospitals, prisons, courthouses, garda stations, local authority offices and libraries. There is also other sectoral economic investment, which includes capital funding for the main enterprise agencies, the Department of Agriculture, Food and the Marine, and the State tourism bodies. In addition to direct provision by the Exchequer, there is a Public Private Partnership (PPP) programme which augments the level of infrastructure which may be provided by entering into contractual arrangements with the private sector.

The CIF recognises that Ireland made considerable progress in some areas in the period up to 2007. Considerable public sector investment was made with respect to, for example, the motorway network, airports, Luas and energy infrastructure. The record levels of investment made during the Celtic Tiger years brings its own challenges, as that infrastructure needs to be maintained over time. However, while a lot has been done, there remains much more to do. Paschal Donohoe T.D, Minister for Public Expenditure and Reform recently acknowledged *"we are faced with significant bottlenecks in a number of areas that have a clear potential to erode our medium-term growth potential"*.¹²

The current situation was succinctly summarised at the same conference, when another contributor noted: *"We are one of the wealthier countries in the world, but suffer from traffic congestion, an inefficient and often decrepit water supply system, raw sewage being discharged into open waters, a housing shortage, inadequate broadband provision, many substandard roads, we are short of schools in the right places, we need better flood protection, we've needed a new children's hospital for decades..."*¹³

¹⁰In a ranking of sectors, for example, some may not be the highest priority sector, but a project within a sector could be a high priority. Only a detailed analysis, including a rigorous economic assessment at project level can address this issue.

¹¹There is also some private sector investment by private companies operating in the energy and telecommunications sectors.

¹²Delivering a Long-Term Investment Plan to Increase Productivity and Growth, Conference Speech at the Sunday Business Post Infrastructure Summit by Paschal Donohoe T.D, Minister for Public Expenditure and Reform, 5th April 2017; available at <http://www.per.gov.ie/en/speeches/>

¹³Presentation at the Sunday Business Post Infrastructure Summit by Mr. Fred Barry, Former CEO, National Roads Authority, 5th April 2017.

1.2 THE CHALLENGES

The premise for this report is the general consensus on the merits of investing in quality infrastructure which can add to the productive potential of the economy. The economy is growing at a solid pace, and the quantity and quality of infrastructure will play an important role in that economic growth. The public sector has a key role to play in the funding of such infrastructure which is important for sustainable and balanced economic development.

With Irish GDP growth forecast to grow at around twice the corresponding rate in the Eurozone area to 2022, there are number of challenges with regard to addressing the infrastructure deficit.¹⁴ A key challenge is the constraint imposed by the fiscal rules under the Stability and Growth Pact which restricts the Government's ability to increase expenditure, including capital expenditure.

The Public Consultation document has stated that the mid-term review is an opportunity to "reaffirm priorities" and to determine "how the remaining unallocated capital funding should be allocated over the remaining period of the Plan". In this regard, the Government has committed an additional capital investment of €5.14 billion in its 2016 Summer Economic Statement. A total of around €2.5 billion has already been allocated to tackle the housing crisis, leaving around €2.65 billion to be allocated over the period 2018-2021 in the mid-term review of the Capital Plan. According to the Public Consultation document on the Mid-Term Review of the Capital Plan, €1.14 billion of this total is for unallocated capital grants.¹⁵ **The CIF considers that the total remaining unallocated provision for capital formation (i.e. investment in infrastructure) of €1.52 billion is very modest (€378.75 million per annum), and will not materially add to the Exchequer public capital framework over the next four years.** The Federation further contends that the total Exchequer capital investment provision, which is

currently forecast at around 3 per cent of GDP by 2021, is insufficient to address the infrastructure backlog and the needs of an expanding economy, particularly if the objectives of the National Planning Framework are to be realised.

Ireland experienced a sharply reduced level of public sector investment in infrastructure during the financial crisis, with the result that there are many who have been calling for an increased level of public capital investment in infrastructure to sustain the economic recovery.

Former taoiseach Enda Kenny acknowledged that: "An island of 10 million people by 2050 presents a challenge for all of us. But if we are to turn this challenge into real opportunities we need to work together, in planning and investing in the infrastructure necessary for the medium to longer term."

The National Competitiveness Council meanwhile has stated that: "Economic growth, demographic pressures and a sustained period of underinvestment in infrastructure mean there is a manifest and urgent need to increase investment in essential infrastructures". It further acknowledges that the scope to improve the infrastructure stock "must be guided by adequate levels of investment and by identifying and prioritising those investments which contribute most to Ireland's long term competitiveness", while also addressing "enterprise needs and bottlenecks."¹⁶

The Vice President of the European Investment Bank, Mr. Andrew McDowell, stated in 2016 that: "Few places justify enhanced support for infrastructure investment as much as Ireland. The strength of the Irish recovery has highlighted significant planning and infrastructure bottlenecks, including but not limited to transport, housing, water and broadband, which threaten to hold back both the continued pace of the recovery and its regional impact."¹⁷

¹⁴IMF World Economic Outlook Database, April 2017. <https://www.imf.org/external/pubs/ft/weo/2017/01/weodata/weoselgr.aspx>

¹⁵Capital grants would include, for example, capital provisions for agricultural programmes and rural development, for marketing and processing in the food sector, for forestry and the enterprise development agencies, for science and technology programmes and tourism.

¹⁶Competitiveness Challenge 2016, National Competitiveness Council, available at <http://www.competitiveness.ie/Publications/2016/Competitiveness-Challenge-2016-NCC1.pdf>

¹⁷European Movement Conference: Investing in Ireland's Infrastructure, Mr. Andrew McDowell, Vice President EIB, 30th September 2016.

A second challenge is funding new infrastructure where it is required, unless there are alternative ways of addressing the requirement.¹⁸ The existing provisions set out for public capital investment focus largely on maintenance and upgrading of the existing capital stock. This issue was highlighted by the Irish Fiscal Advisory Council which concluded that public investment over the forecast horizon of the Capital Plan 2016-2021 “is barely adequate to cover the estimated cost of depreciation of public capital, based on historic depreciation rates.” This implies limited scope to increase the public capital stock over the medium term.¹⁹ All options need to be explored to find alternative mechanisms to fund infrastructure investment which are compatible with the fiscal rules. A number of alternative funding options to increase capital investment are set out in this report.

The third challenge is ensuring that appropriate and sustainable infrastructure planning strategies are put in place for the long-term. These are necessary to deal with changes which are likely to take place in the economy during the next decade and beyond. Major emphases must be made toward, for example, the development of cities and regions, existing and new environmental challenges, and changes in technology. These issues and others are addressed in this report.

The economy is growing at a solid pace, the quantity and quality of infrastructure will play an important role in that economic growth

1.3 REPORT STRUCTURE

The report is structured as follows:

The remainder of *Section 1* reviews trends in Ireland's infrastructure stock and examines the level of Ireland's stock per capita versus other European countries.

Section 2 raises some concerns regarding construction activity levels and the civil engineering sector and considers relevant information which might be published in the Capital Plan. It also deals with the core issues of the report and identifies a number of key issues for consideration in the mid-term review of the Capital Plan, including:

- The rationale for investing in infrastructure;
- The implications for infrastructure priorities as a result of Brexit;
- The National Planning Framework;
- The investment requirements in the context of meeting out climate and energy targets, and
- The role of demographics.

Section 3 contains a literature review on the economic and welfare effects of investing in public infrastructure. It presents numerical analyses of short- and medium-term output effects of public capital investment and sets out the conditions which generate a strong case for infrastructure investment. This section also examines literature on approaches to project prioritisation, which notes, amongst other points, that any infrastructure prioritisation exercise should be based on a multidisciplinary approach to provide robust outcomes.

Section 4 examines project prioritisation in an Irish context. It notes that the questions on what to invest in, and where to invest, necessitate an understanding of a country's priorities, economic growth and welfare objectives. It also provides a review of public capital investment trends and discusses the fiscal rules and alternative sources of funding, including the role of Public Private Partnership (PPP) arrangements.

Section 5 examines approaches to infrastructure planning in other countries and considers the lessons learnt appropriate for an Irish context.

The *Executive Summary* contains the main conclusions and recommendations.

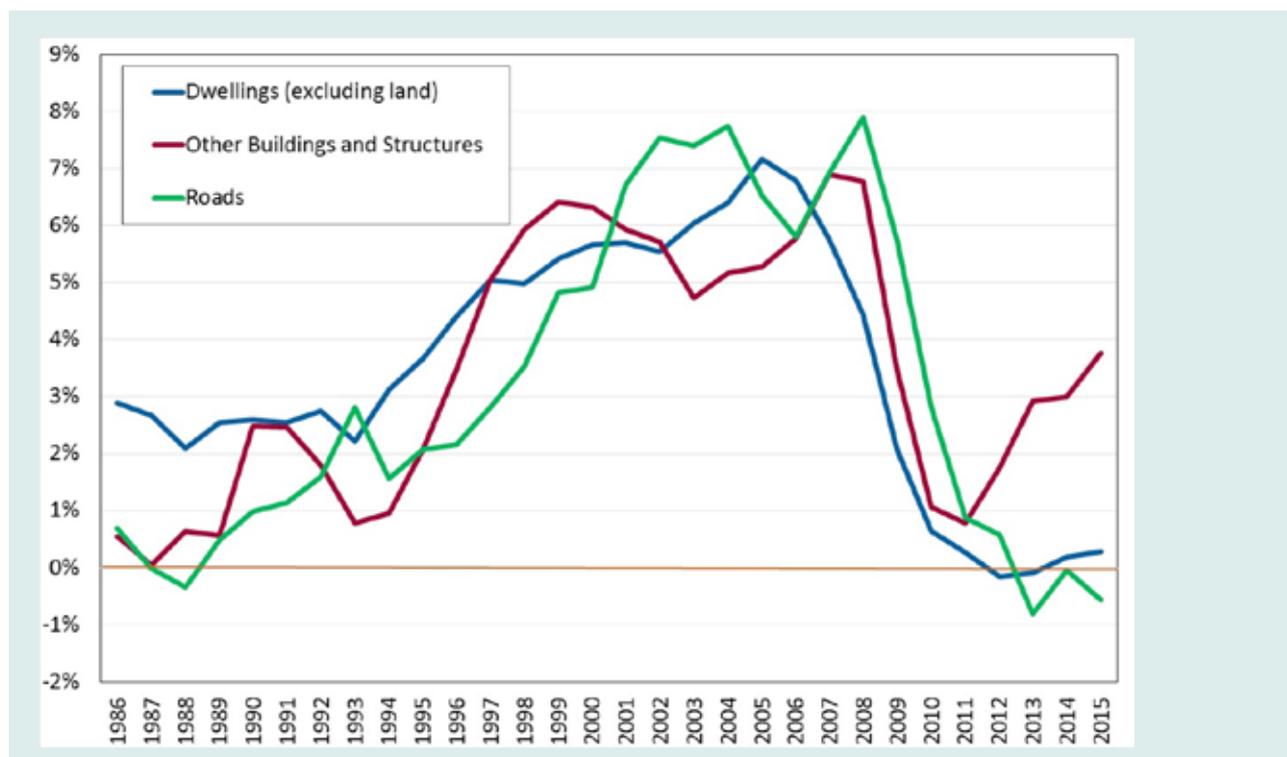
¹⁸There may be more efficient ways of meet demand by, for example, demand management, through pricing, regulation or provision by the private sector.

¹⁹Irish Fiscal Advisory Council, Public Capital: Investment, Stocks and Depreciation. June 2016.

1.4 TRENDS IN IRELAND'S CAPITAL STOCK

The following chart shows the percentage changes in the value of the stock of Ireland's fixed infrastructure assets over a thirty year period.²⁰

Figure 1.1:
Annual Percentage Change in Ireland's Net Capital Stock of Infrastructure Assets (constant 2014 prices)



Source: CSO.

The changes reflect the levels of investment made each year. The values used to determine the changes are net of depreciation and thus include the decline in value over time due to use, wear and tear, and obsolescence. The total net capital stock was €479.4 billion in 2014, of which almost 72 per cent represented residential and non-residential buildings and structures.²¹

The chart visibly portrays the sharp acceleration in the infrastructure capital stock until the mid-2000s, the sharp reversal in that trend since 2005 for dwellings, and the decrease since 2007/2008 for non-residential buildings and structures. **Worryingly, the chart shows that the capital stock of roads has been in decline since 2013.** This is clearly an unsustainable

trend, particularly given Ireland's strong economic and population growth.

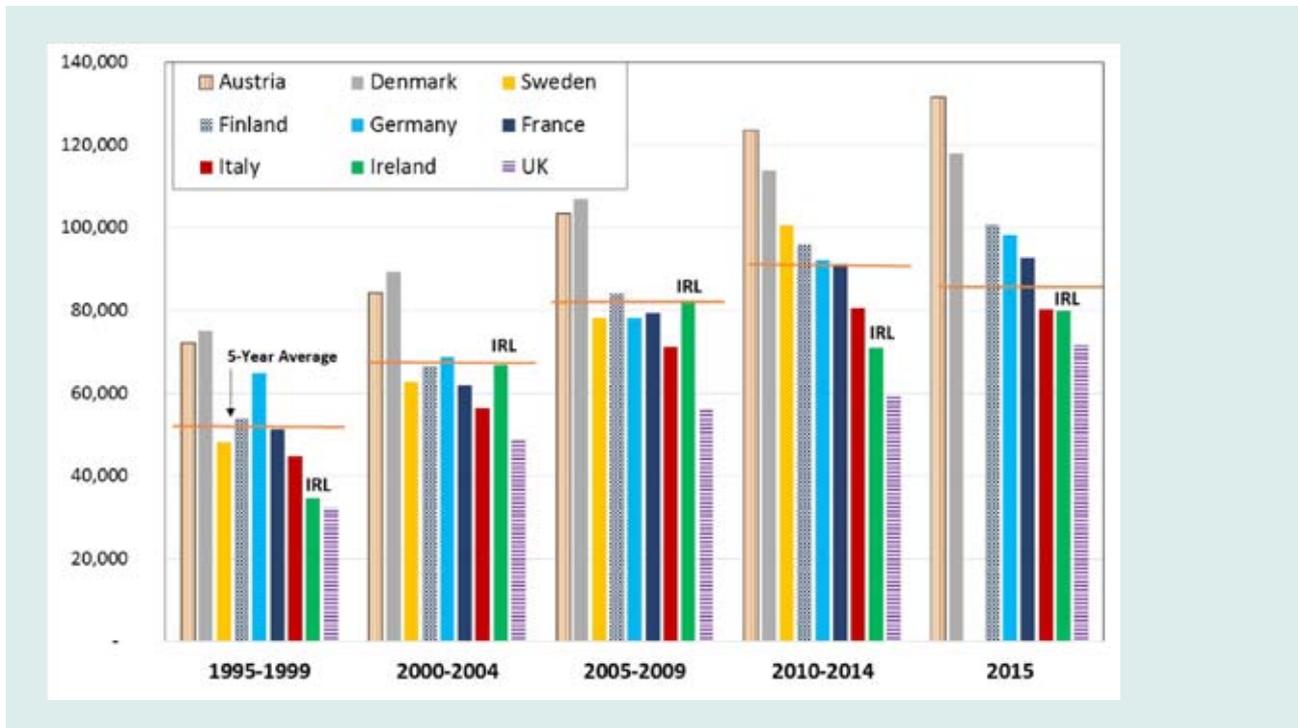
Looking at Ireland's position relative to other countries, the level of infrastructure investment per capita is compared to a number of appropriate European countries. The average value of infrastructure stock (dwellings and other building structures) per capita over five year periods since 1995 is shown in Figure 1.2.

While Ireland's infrastructure stock made significant progress and was converging on the average in the 2000-2005 and 2005-2010 periods, this trend reversed in the most recent five-year period 2010-2015, with Ireland's stock falling in both relative and in absolute terms.

²⁰ The chart excludes other assets such as Machinery and Equipment (including Transport), Cultivated assets (Livestock) and Intangibles (R&D, Computer Software, original works of Arts/Music and Mineral exploration).

²¹ The corresponding figures in 2015 (latest available) were €734.4 billion and 47.3 per cent, reflecting the substantial upward shift in the value of intangibles which arose with the 2015 methodological changes to the National Accounts.

Figure 1.2:
Infrastructure Stock per Capita in Selected European Countries, Current Prices (Average levels over 5 year periods, Euro)



Source: Eurostat. 2015 figures not available for Sweden.

Nine countries were selected including the big four, Germany, France, Italy and the UK.²² Austria and Denmark have had some of the highest levels of infrastructure stock investment per capita over the entire twenty year period, while levels in Germany have been around the average since 2000, except in 2015. The UK has consistently been the worst performer over the entire period.

Ireland's stock level per capita is well below the average for the nine countries shown above. This gap needs to be addressed if Ireland's economic recovery is not to be derailed over the medium-term. The economy faces a number of external challenges (e.g. Brexit) which are outside of its control. Notwithstanding the restrictions on State spending, alternative sources of funding should be explored if Irish capital stock levels are to improve significantly over the medium-term. This is important not just for our competitiveness, lowering costs and improving efficiency, but also for achieving the objectives of the National Planning Framework.

²²Four countries with a population between 5 and 10 million were selected which were considered to be reasonable comparators for Ireland, together with the four larger countries.

2. CONSIDERATIONS FOR THE MID-TERM REVIEW

The mid-term review of the Capital Plan is welcomed by the CIF and provides an opportunity to raise a number of issues for consideration during this review process. Some of these issues are discussed below. The section begins with a reminder of the rationale for public investment in infrastructure.

2.1 WHY INVEST IN INFRASTRUCTURE?

Investment in infrastructure is important in a small open economy which has an expanding population, and for which competitiveness is central to economic growth. Secondary effects, such as the job creation that accrues from different kinds of investment projects, are also important, but are not the defining rationale for investment.

It is important that the case for public investment in infrastructure is justified, as there are limited public sector funds and thus choices have to be made. In circumstances where the private sector fails to provide the investment, due to a perceived market failure or where a market does not operate efficiently, Government intervention may be warranted. In this instance, the option for addressing a market failure should be fully evaluated to establish costs and benefits.²²

The quantum of capital investment provided will be determined by the infrastructure needs of the economy and by ensuring that the infrastructure delivered meets national and regional Government policy objectives. These policies aim to create the following benefits:

- Adds to the productive potential of the economy;
- Caters for the growth in population;
- Addresses bottlenecks or cost inefficiencies in the economy;
- Provides value for money;
- Generates an economic rate of return above the cost of funding the infrastructure; and
- Generates direct employment, which in turn leads to the creation of indirect employment in Irish firms through the supply chain, and through induced employment in the wider economy as wages and profits from the direct and indirect employment are spent on Irish goods and services in the wider economy.

The provision of social infrastructure such as education and housing can also improve the quality of life for citizens in locations where the private sector may fail or is unwilling to invest in such services.

Public investment in infrastructure is not always the most cost-effective method of meeting increases in infrastructural demand. Alternatives to investing in new public infrastructure must also be considered. In these instances, consideration may be given to demand management instruments as a cost-effective alternative to increasing capacity. Such instruments are used in the case of transport, for example, and have the capacity to deliver better environmental outcomes and increase the use of public transport, where it is available.

Infrastructure investment has a positive effect on economic growth and jobs

In terms of the employment impact of construction projects, an analysis from the Government Economic & Evaluation Service estimated that a minimum of 12 job years are created in the construction sector for every €1 million of construction investment.²⁴ Whilst this should not be its primary focus (infrastructure investment is not an end in itself), it is of course relevant. All being equal, an investment that entails more Irish employment should be favoured.

In a separate analysis undertaken by DKM, it was estimated that 10 direct and indirect FTE (full-time equivalent) work years are generated per €1 million of construction investment. This increases to almost 12 FTE work years when induced impacts are taken into account. Furthermore, DKM has estimated that the direct and indirect multiplier associated with a €1 investment in construction raises economic activity by €0.7, where there is spare capacity in the construction sector. When induced impacts are included, the multiplier increases to €0.9. Thus a €1 million construction projects will, on average, increase economic activity by almost another €1 million euro, after all direct, indirect and induced impacts as well as imports are taken into account. These figures exclude the economic impact of the infrastructure put in place during its operational lifetime.

²³ Section 4 examines the current approach to project prioritisation while Section 5 proposes a new approach to planning for infrastructure over the long-term.

²⁴ *Public Capital Programme 2016 to 2021: Labour Intensity of Public Investment*, Irish Government Economic & Evaluation Service (December 2015), p.4

2.2 ISSUES FOR THE CAPITAL PLAN

Construction activity and civil engineering

The construction industry has been in recovery for almost four years, albeit from an exceptionally low base. The value of output in the industry was €15.6 billion in 2016, or 5.9 per cent of GDP (7.1% of GNP). This is less than half of the value recorded in 2006 when the total output in the industry reached almost €34 billion, or 18 per cent of GDP.²⁵ Although this level was unsustainable, the industry is currently operating well below what is deemed to be a sustainable level of activity: around 10 per cent of GDP.²⁶ Current activity is also predominantly occurring in the building sector, and is concentrated in the Dublin region.

But activity in the Irish construction industry is growing at a robust pace with very encouraging developments from, for example, the Ulster Bank Purchasing Managers Index (PMI) Survey. It is noteworthy that residential construction activity continues to rise at a rapid pace, while commercial activity is also expanding, although the pace of growth had eased in recent months. In comparison, civil engineering has continued to lag behind the other sectors, with PMI respondents reporting a fifth consecutive monthly decline in activity in March 2017.

Civil engineering projects are predominantly funded by the public sector. Representatives of the industry are concerned that the absence of new public infrastructure projects on any significant scale in recent years has adversely impacted the sector. While some of the larger players can internationalise, many Irish civil engineering firms are reliant on a pipeline of medium-sized public sector infrastructure projects. In particular, investment levels in water infrastructure have been poor, reflecting policy uncertainty and Irish Water's continued dependence on government funding. Moreover, with the bulk of the investment in roads (c.73%) in the Capital Plan 2016-2021, projected to represent 'steady state' investment in maintenance and renewal of the road network, there is limited scope for investment in new road projects.

There is little or no inflation in civil engineering, indicating that now is a good time for the State

to invest in civil engineering projects. There is also significant liquidity in the capital markets for project finance in Europe, generating the opportunity to fund infrastructure at low interest rates for the next thirty years.²⁷ The Vice President of the European Investment Bank (EIB), Mr. Andrew McDowell stated earlier this year that *"Ireland can do more"* to access EIB funds and that *"now is a good time to be putting up projects"* as the EIB has *"more money under the Investment Plan for Europe than it has projects to finance."*²⁸ The economic, societal and welfare effects of investing in sound public infrastructure projects are well established (Section 3). Moreover, the industry requires a strong pipeline of projects to ensure that trained staff remain in the Irish construction sector and are not drawn towards the UK (or elsewhere) where significant skills gaps are projected in the medium-term.

Advance forward planning on transport projects

In relation to the civil engineering sector, the forward planning of projects should be considered a priority. There are immediate actions which can be taken now, particularly with respect to transport projects and the allocation of budgets for same, in order to ensure the speedy delivery of major projects. The M20 Cork to Limerick motorway, for example, is a project receiving widespread attention. Engineering industry sources indicate that it will cost €15 million to take this project through the 3-4 year planning process, which is equivalent to just 2 per cent of the capital cost. By allocating this funding to Transport Infrastructure Ireland (TII) over 2017-2019, TII would be in a position to appoint contractors in 2019, ensuring the efficient delivery of this project. There are other examples, such as the new Luas lines and the Dart expansion programme, which if early planning could be commenced and funded over the short-term, these projects could be delivered speedily via direct Exchequer funding, or through PPP arrangements. A core issue is that public capital programme (PCP) funding levels for transport have reduced significantly from 2.1 per cent of GDP, to 0.6 per cent of GDP between 2014 and 2016. This reduction is expected to remain in 2017.²⁹ Clearly a significant funding gap has emerged in transport which needs to be addressed if projects are to be planned and delivered more efficiently.

²⁵ The output figures quoted for construction exclude the costs associated with the transfer of land and building, which amounted to €929 million in 2016. This figure is included under building and construction output for National Account purposes, generating a total value for construction output of €16.5 billion in 2016.

²⁶ 10% of GDP (12% of GNP) compares with the current average of around 10% of GDP for the 19 member countries of Euroconstruct

²⁷ Presentation by Dr. Christian Kummert, Rubicon Infrastructure Advisors to the CIF Colloquium on Capital Investment in Ireland, 24th April 2017.

²⁸ Presentation by Mr. Andrew McDowell, Vice President of the EIB, to the CIF Colloquium on Capital Investment in Ireland, 24th April 2017.

²⁹ Figures derived using the PCP provisions for Transport in the Revised Estimates for Public Service 2017 and GDP figures from the CSO and the Draft SPU, April 2017, Department of Finance.

New investment versus Repair and Maintenance

Investment in infrastructure consists of a combination of investment in maintenance, an upgrade of the existing capital stock, and investment in new infrastructure. The sharply reduced level of public sector investment in infrastructure during the financial crisis meant public capital provisions have focused largely on maintenance and upgrading of existing capital assets. This has left limited scope to increase the public capital stock. This issue has been highlighted by the Irish Fiscal Advisory Council.³⁰ While investment in maintaining quality infrastructure is necessary to avoid future cost inflation, investment in new infrastructure is vital when demand patterns are evolving, the economy is expanding, and population is both increasing and its composition is changing.

Increasing levels of unitary payments

A related issue which impacts on the quantum of capital investment available for infrastructure is the increasing level of unitary payments which arise on PPP projects. We understand that this is an issue of concern for the Education budget, given the large unitary charge in the budget for 25 schools built using the PPP model capital. In 2016, for example, of the total Education capital expenditure of €704 million³¹, €85 million (12 per cent) was allocated to PPP projects. The total annual cost of unitary payments projected to fall due on all existing and planned PPP projects over the period 2016-2021, according to the Capital Plan, is almost €2 billion. This is close to 6 per cent of the gross voted capital expenditure provided over the same period. We further understand that since the Plan was published, some unitary payments, previously classified under current expenditure, have been reclassified to capital expenditure. The Government intends to cap the aggregate level of annual expenditure on PPP unitary payments, relative to the Exchequer capital envelope, at 10 per cent of the total annual Exchequer capital spending. This is equivalent to almost €3 billion in 2017-2021. This reinforces the necessity of ensuring that PPP projects are selected because they are affordable and strategic over the long-term, not because they are regarded as off-balance sheet investments.

Level of information provided in the Capital Plan
The public capital investment allocations published

for the medium-term show the provisions for each Government department for construction and non-construction-related investments in the aggregate. The allocations cover the whole spectrum of public capital investment across the economy, including investment in the acquisition of land/sites, buildings, machinery and equipment (e.g. trains, buses, school and hospital equipment, traffic signalling, ICT equipment), as well as loans and capital grants (e.g. enterprise and agricultural supports, science and technology grants). Accordingly, it is not possible to ascertain the specific allocations for investment in residential, social and productive infrastructure. The CIF would welcome more detail in the Capital Plan on the specific capital provisions for the main types of infrastructure. The Plan should also differentiate between Exchequer and non-Exchequer investment. This information was published in the past in the form of the annual Public Capital Programme (PCP) publication. This publication provided detailed information on the sectoral (Economic, Social and Productive) and funding (Exchequer, non-Exchequer, PPP) composition of the PCP. It also identified the multi-annual capital envelopes, as well as detailed information on the programmes within each sector for the current and previous years.

The CIF would also welcome publication of a priority list of national and regional projects for the long-term, which should be established following robust economic analysis and be aligned with Government national and regional policy objectives. This report contains a number of recommendations in regard to the long-term infrastructure planning process (Section 5), which would facilitate the production of such a list.

Centralised database of capital projects

A centralised database of all capital projects being undertaken by the Exchequer and by semi-state bodies would provide stakeholders such as the CIF with greater certainty and clarity about work in progress. In this regard a Cross-Departmental Committee should be established to monitor progress on public sector construction projects on a quarterly basis, and address any barriers which are impeding the delivery of projects on time. This Committee should include representatives of the construction industry and business community.

³⁰ Irish Fiscal Advisory Council, Public Capital: Investment, Stocks and Depreciation. June 2016.

³¹ Presentation from the Department of Education and Skills at the Government Construction Projects and Capital Spend Conference, February 2017.

2.3 BREXIT IMPLICATIONS FOR INFRASTRUCTURE PRIORITIES

The Public Consultation document is seeking comments on the potential impacts of Britain leaving the EU, and whether this should drive a reprioritisation of projects.

The scenario which will emerge with regard to North-South relations post-Brexit negotiations is unknown at the time of writing. While the hope is that the Republic's unique relationship with Northern Ireland is recognised in the Brexit-EU negotiations, the outcome may well be one which weakens North-South links. Much will depend, however, on how a customs border is implemented. Tariff barriers or border controls would adversely impact Irish businesses which trade with the UK. Much discussion has centred on the impacts on the food and agricultural sectors. This may necessitate a need for the transfer of resources to support the sectors most affected.

Brexit may have implications for land and sea transport between Ireland, Northern Ireland and Britain.

The prospect of some form of customs checks on the Border, for example, would give rise to delays and increased travel times, thereby reducing the productivity of cross-border road users. As a result there have been calls for improvements to the road network in the border region to mitigate these losses to productivity, whilst also increasing road quality in a broader sense. Specifically, there have been calls for an A5 upgrade (Derry to the N2 near Aughnacloy) and related improvements in Donegal to be given heightened priority and urgency.³²

Much progress has been made with the single electricity market, but post-Brexit Ireland will have no electricity connection with the EU. This may focus attention on whether Ireland should enhance its security of supply by connecting the European continent.

Whether Brexit impacts on the reprioritisation of projects will depend on the level of risk Brexit is perceived to pose to economic growth over the long-term. In this regard, analysis by the ESRI and the Department of Finance concluded that the impact on the Irish economy could be severe in the medium to long term. Ten years after a UK exit, the level of Irish output is projected to be almost 4 percent (i.e. WTO scenario) below a baseline of a non-Brexit scenario. The level of employment would be 2 percentage points below the baseline after a decade while, in the absence of a policy response, the national debt to GDP ratio would be around 10 percentage points higher after a decade.³³

2.4 THE NATIONAL PLANNING FRAMEWORK³⁴

The CIF report to the Department of Housing, Planning, Community & Local Government (DHPCLG) on the National Planning Framework 2040 underlines the necessity for a twenty-year plan laying out the future direction of the country. This plan is predicated on population growth that has increased by 26.5 per cent over the past twenty years. In particular, it notes the need for prioritising development of a small number of key regional locations in order to maximise Ireland's growth potential.

The CIF welcomes the National Planning Framework consultation paper and supports the development of a national plan as essential for Ireland's long-term future in achieving balanced regional development and higher levels of sustainable economic activity. The Federation believes an interdepartmental steering group should be established to oversee implementation of the plan. A key component of the success of the National Plan will be ensuring that the key infrastructure required to support the competitiveness of designated growth centres is put in place.

Brexit may have implications for land and sea transport between Ireland, Northern Ireland and Britain

³² Presentation at the Sunday Business Post Infrastructure Summit by Mr. Fred Barry, Former CEO, National Roads Authority, 5th April 2017.

³³ Draft SPU, Department of Finance, April 2017, p32, available at http://finance.gov.ie/sites/default/files/20170410%20Draft%20SPU%20final_0.pdf

³⁴ This section is informed by the CIF's Report on the National Planning Framework Ireland 2040 Our Plan, 15th March 2017.

The CIF report identifies a number of nationally strategic infrastructural priorities:

1. Infrastructural investment to connect the existing economic clusters in Ireland's regional cities/large towns as a prerequisite for the continuing development of these regional cities/large towns.
2. Connectivity, including high-speed broadband, is crucial to rural Ireland maintaining social contact and to the development of business models to sustain and grow local communities.
3. Maintaining and supporting current growth-enhancing infrastructure, particularly in light of Brexit. The report specifically mentions upgrades to ports, in particular those servicing Continental Europe, and all related connectivity.
4. In terms of other infrastructure to equip Ireland for future development, the CIF report mentions water and waste water services, national and regional roads, broadband connectivity, health projects, educational projects and recreational/amenity projects. It highlights in particular the need for a regional road network to support regional development and to avoid further congestion around the Greater Dublin area.

In any assessment of strategic locations, the CIF report proposes four key factors to consider:

- The selected locations should play pivotal regional geographic roles in relation to the future development of the country over the next twenty years;
- Locations with proximity to UK and Continental ports/airports and transport infrastructure will be important for businesses in the agri-food, pharmaceutical and med-tech industries, following the Brexit decision, as will proximity to important tourism and cultural centres.
- The scope for attracting further foreign direct investment (FDI) by offering locations that is likely to have a lower cost base when compared with Dublin.

The CIF report also noted that social infrastructure and/or services in key growth centres would be required so that these locations can offer services and facilities at a lower cost base than in Dublin. In terms of the types of services, the report notes how each of the growth centres must have the scale to be serviced with the required health and social/community service facilities

to cater for the expected growth in population, and also notes the need for government policy to support investment in recreational facilities, where appropriate. The provision of these facilities should be based on demonstrating the economic justification for same.

In terms of policy integration including the transport sector, the CIF report underlined the need to develop infrastructure to connect economic clusters in cities and large towns.

2.5 MEETING CLIMATE CHANGE AND ENERGY COMMITMENTS

Ireland has signed up to a number of EU initiatives to tackle climate change by 2030, including a 40 per cent reduction in greenhouse gas (GHG) emissions compared to 1990 levels. We are pledged to generate 27 per cent of energy from renewable sources, and achieve a 27 per cent improvement in energy efficiency compared with the 2000-2005 period. In July 2016, the EU announced binding targets for reductions in GHG emissions in the non-Emissions Trading Scheme (ETS) sector for all EU member states.³⁵ The target set for Ireland was a reduction of 30 per cent compared with 2005. Ireland will have the flexibility to reduce its 30 per cent emission reduction target to 20.4 per cent by transferring emission allowances between sectors, and by earning credits from certain land use changes.

The CIF is aware that the Minister for Communications, Climate Action and Environment must submit Ireland's first National Mitigation Plan to Government for approval. A public consultation process has just completed and will help inform development of the draft National Mitigation Plan to be submitted to Government in 2017. The plan will set out the Government's approach to tackling greenhouse gas emissions, particularly in key sectors such as Electricity Generation, the Built Environment, Transport and Agriculture.

In terms of the built environment, many actions have been taken to deliver on the above commitments, including the promotion of energy efficiency through strengthening building regulations and incentives to upgrade the energy insulation of the existing residential, public and commercial building stock.

Despite these measures, significant investment is likely to be required to reach the binding targets set for Ireland by 2030. In a recent assessment of the

³⁵ ETS emissions are GHG emissions associated with large industry and electricity generation installations. Non-ETS emissions are GHG emissions associated with heating in buildings, transport, agriculture, etc.

likely costs of meeting Ireland's GHG emission targets by 2030, the Irish Academy of Engineering estimated the cost of fully meeting the targets at more than €35 billion by 2030.³⁶ These costs include €6.5 billion for the shallow retrofit of 1.3 million homes, and a further €7.5 billion for a deeper retrofit upgrade of 300,000 homes by 2030. The largest cost element is for the reduction of carbon intensity in the electricity sector by 80 per cent per MW on 1990 levels (€10.8m).

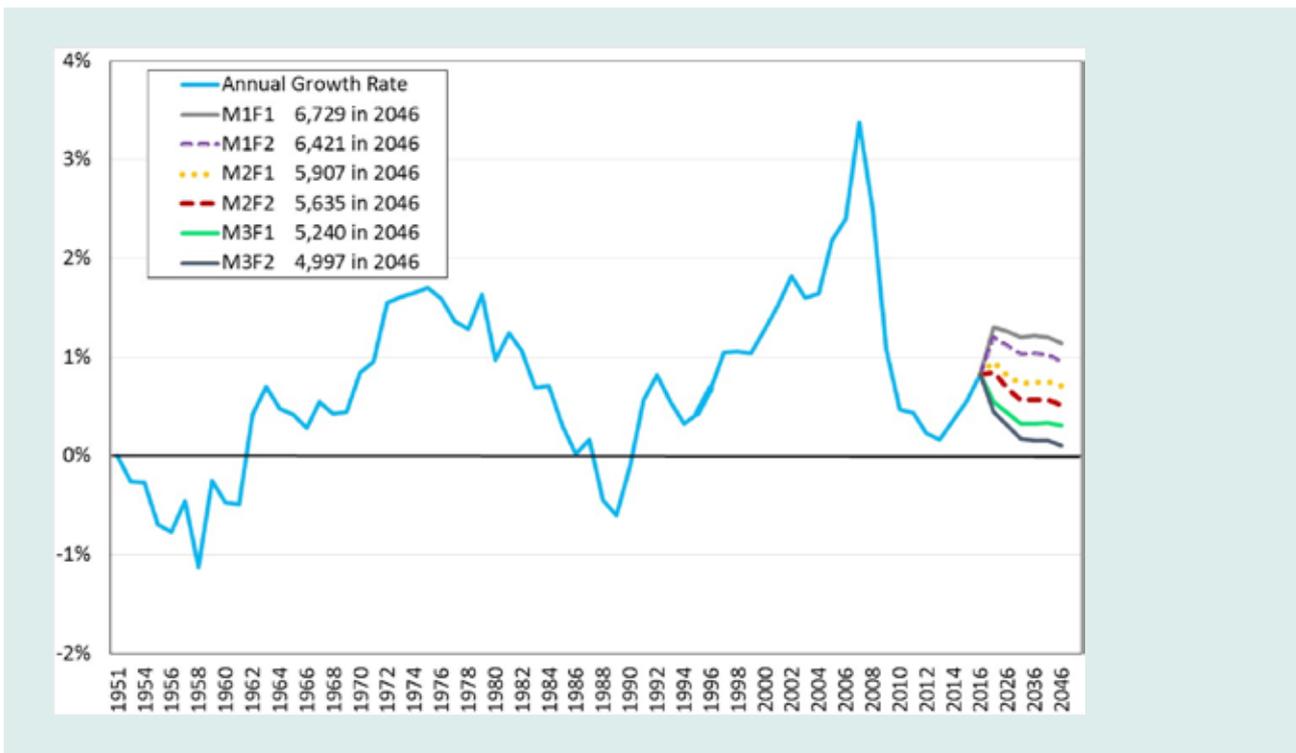
Clearly, significant actions will be required across each sector and will impose substantial costs on the State, although the private sector will also have a role to play. The CIF recommends that the National Mitigation Plan should include a fully-costed roadmap, supported by appropriate environmental analysis, of the necessary actions to be taken over the next decades to meet our obligations by 2030. The Capital Plan should include additional funding on top of the funding already

provided in the Plan for reducing GHG emissions. All of the funding should be ring-fenced for those immediate actions which can deliver the most cost-effective solutions in the short-term.

2.6 THE ROLE OF DEMOGRAPHICS

The population of Ireland is projected to grow to between 5 million and 6.7 million by 2046, compared with a population of 4.761 million in 2016.³⁷ This is equivalent to an average annual growth rate of between 0.2 per cent (M3F2) and 1.2 per cent (M1F1), depending on the migration and fertility scenario used. The midpoint of these projections represents a population increase of 1.1 million, or 0.7 per cent on average per annum, over the next 30 years.

Figure 2.1:
Projected Change in Population to 2046
(Annual average growth rates)



Source: CSO Population and Labour Force Projections 2016-2046, April 2013.

³⁶ Some costs were not estimated due to the lack of cost information for some measures, including the cost of reducing emissions in the agriculture sector and for large industry. IAE report available at: <http://www.engineersjournal.ie/wp-content/uploads/2017/03/IAE-Report-Irelands-2030-Greenhouse-Gas-Emissions.pdf>

³⁷ The scenarios are those prepared by the CSO and reflect different combinations of assumption about the level of net inward migration and fertility rates. See Population and Labour Force Projections 2016-2046, CSO at http://www.cso.ie/en/media/csoie/releasespublications/documents/population/2013/poplabfor2016_2046.pdf
These figures are pre-Brexit figures and it remains to be seen what, if any, impact the decision by the UK to leave the EU may have on inward migration flows.

This demographic growth will require a significant investment in infrastructure. Former taoiseach, Enda Kenny stated that: *An island of 10 million people by 2050 presents a challenge for all of us. But if we are to turn this challenge into real opportunities we need to work together, in planning and investing in the infrastructure necessary for the medium to longer term.*"

The number of people and the age composition of the population will have a direct impact on the demand for infrastructure services. How many people there will be, where they will live and work, and age and household composition are all key drivers of the demand for infrastructure. Businesses too can have heavy demands for certain types of infrastructure such as energy and broadband, and more recently housing supply has come to the fore as an issue for attracting FDI. Ireland has experienced a clustering of industrial sectors in specific locations, such as pharmaceuticals in Cork and medical technology in Galway, which also influences the pattern of population growth.

Where it can be shown that bottlenecks are actively constraining the economic output of the economy, and thus holding back the recovery and employment growth, investment in infrastructure to tackle those bottlenecks should be prioritised. This includes, for example, housing, transport and water, where such bottlenecks can increase living costs and thus wages, and make areas less desirable as places to live and work.

The ageing of the population over the coming years will increase demand for services for older people. Whilst the private sector is likely to build nursing homes and retirement communities to cater for private demand, the State should ensure that public demand is catered for too. Capital investment that addresses these coming bottlenecks will free up housing stock and prevent old-age inequalities.

3. THE ECONOMIC IMPACTS OF INVESTING IN INFRASTRUCTURE

There is extensive literature on the economic and welfare effects of investing in public infrastructure. Some of it has produced varying results. Since David Aschauer sparked academic interest in quantifying infrastructure's returns in terms of total factor productivity in 1989,³⁸ recent studies have tended to show smaller (and, according to the World Bank, more plausible) positive effects of public investment in infrastructure.³⁹ The different estimates across studies of the benefits of investing in public infrastructure have been attributed to the use of diverse data, different empirical models and unaligned estimation methods. However, one study by Andraz and Pereira (2010) which reviewed public investment literature noted that:

*While there is little consensus about the magnitudes of the effects of public investment in infrastructures (sic), there is also little doubt that they are positive and significant but substantially smaller than the earlier estimates.*⁴⁰

This section presents a review of some of the recent literature on the short- and medium-term output effects of public capital investment and sets out the conditions which generate a strong case for infrastructure investment.

3.1 SUMMARY OF THEORETICAL AND EMPIRICAL LITERATURE

Infrastructure has been described as the essential facilities and services on which the economic productivity of a community or organisation depends.⁴¹ This broad definition of infrastructure includes capital assets in areas including transportation, communications and utilities in addition to social infrastructure such as hospitals, schools, prisons and courthouses.

Economic theory and empirical literature on public investment in infrastructure indicates that such investment has both short-term and long-term effects on output. First, like all public expenditure, infrastructure investment will boost demand in the short-term (demand effect), particularly in areas such

³⁸ D. Aschauer, 1989. 'Is Public Expenditure Productive?' *Journal of Monetary Economics*, vol. 23, no. 2, 177-200, available at <https://pdfs.semanticscholar.org/7a3b/b091d95f0944b1e03d44b581f0d5d64ecd1d.pdf>

³⁹ See World Bank, 2011. *World Bank Research Digest*, Vol. 5(4). Washington, p.7, available at <https://openknowledge.worldbank.org/handle/10986/20963>

⁴⁰ A. Pereira and J. Andraz, 2013. 'On the economic effects of public infrastructure investment: A survey of the international evidence' *College of William and Mary Department of Economics Working Paper Number 108*, available at http://economics.wm.edu/wp/cwm_wp108rev1.pdf

⁴¹ M. Weisdorf, 2007. M. Weisdorf, 2007. 'Infrastructure: A Growing Real Return Asset Class'. *CFA Institute Conference Proceedings Quarterly* (September 2007), 17-20, available at <http://www.cfapubs.org/doi/pdf/10.2469/cp.v24.n3.4849>

as construction. There is subsequently a longer-term supply effect, where an improvement in core infrastructure is likely to lead to increased supply through more efficient supply-chains or increased capacity to produce goods or services.⁴²

Capital investment can also directly and indirectly generate employment – in the short term through construction work, and also in the long term, by creating the capacity for job creation and growth.⁴³

In addition to, and by virtue of, the benefits of infrastructure to economic growth, infrastructure investment is a means to improve the welfare of individuals and communities. A paper by Andres et al. (2015) of the Water Global Practice Group at the World Bank emphasises three mechanisms through which infrastructure investments help improve welfare. First, physical infrastructure provides services that directly contribute to improving the quality of life (such as roads, electricity, and water supply and sanitation systems), thus increasing household welfare. Second, infrastructure services help increase household income (and therefore welfare) through providing construction jobs or market access. And third, infrastructure investment boosts economic growth, which leads to an increase in individual and household welfare.⁴⁴

There is also an increased focus on the conditions under which investment in infrastructure will reap significant long-term economic gains. For example, the IMF highlights the importance of efficient public investment⁴⁵ and estimates that the gap between the most efficient and least efficient countries can be twofold in terms of returns in growth.⁴⁶ The IMF and Mourougane et al. of the OECD also underline the importance of having an identifiable infrastructure need (or an initially low level of public capital) as imperative to securing significant positive long-term effects.⁴⁷

3.1.1 Effects of infrastructure investment on economic growth

Most recently, there has been a focus on the potential benefits of infrastructure investment as a means to boost growth in the period of weak recovery following the global financial crisis of 2008. For example, the IMF 2014 World Economic Outlook questions whether it is time for an infrastructure push by looking at the macroeconomic effects of public infrastructure investment.⁴⁸ Similarly, an OECD working paper by Annabelle Mourougane et al. (2016) investigates whether an increase in public investment can sustainably lift economic growth.⁴⁹

- The IMF World Economic Outlook (WEO) concludes that there is a strong case for investment in public infrastructure for economies with clearly identified infrastructure needs and efficient public investment processes, and where there is economic slack (unemployed resources in an economy) and monetary accommodation (very low real interest rates).
- In their empirical analysis (looking at short- and medium-term impacts), the IMF finds that an exogenous investment shock of 1% GDP raises output by 0.4% that year and 1.5% four years after the investment.
- The IMF finds the impact on output to be larger in an environment of accommodative monetary policy (low borrowing costs); the 1% investment stimulus generating a 2% increase in GDP the same year, increasing to 2.5% in the long term.
- The results of the simulations by Mourougane et al. suggest that countries where the initial level of public capital is low are likely to benefit most from the stimulus, on the assumption that additional investment has a high rate of return in these economies.

⁴² For explanation see IMF, 2014. 'Is it time for an infrastructure push? The macroeconomic effects of public investment', World Economic Outlook, Chapter 3, 75-114, pp.77-78, available at <http://www.imf.org/external/pubs/ft/weo/2014/02/>

⁴³ V. Duggan, 2013. p.16. 'Ireland's Investment Crisis: Diagnosis and Prescription', NERI Working Paper Series, available at http://www.neri.institute.net/download/pdf/neri_wp201303.pdf

⁴⁴ L. Andres et al., 2015. 'A Methodological Framework for Prioritizing Infrastructure Investment', Policy Research Working Paper Series, no. 7433, World Bank Group, pp.5-6, available at <http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-7433>

⁴⁵ The IMF defines efficient public investment as public investment that meets two conditions: first, investment must be allocated to projects with the highest ratio of benefits to costs, and second, its aggregate level must align with fiscal sustainability; IMF, 2014. op. cit., p.105.

⁴⁶ IMF, 2015. 'Making public investment more efficient', IMF Policy Papers, available at <http://www.imf.org/external/np/pp/eng/2015/061115.pdf>

⁴⁷ See IMF, 2014, op. cit.; and Mourougane et al., 2016. 'Can an increase in public investment sustainably lift economic growth?', OECD Economics Department Working Papers, no. 1351, p.7, available at <https://www.oecd.org/eo/Can-an-increase-in-public-investment-sustainably-lift-economic-growth.pdf>

⁴⁸ In its analysis, the IMF defines infrastructure as "core" infrastructure, i.e. telecommunications, utilities and transport; IMF, 2014. op. cit.

⁴⁹ A. Mourougane et al., 2016. op. cit.

- Mourougane et al. also found that the case for an investment-led stimulus is reinforced if persistent demand weakness gradually undermines the productive capacity of the economy.

3.1.2 Sustainable ways of financing infrastructure investment

Both the IMF World Economic Outlook and the OECD working paper by Mourougane et al. demonstrate how different types of investment financing effect on output. Furthermore, they investigate the effects of an investment stimulus on a country's debt-to-GDP ratio.

- In their study for the OECD, Mourougane et al. estimate the short-term impact on growth of a debt-financed stimulus to be almost twice that of a budget-neutral stimulus.⁵⁰
- IMF studies suggest a debt-financed investment increase has a greater positive effect on output than budget-neutral investment in advanced economies, with both options delivering similar declines in the debt-to-GDP ratio.
- A sustained rise in the stock of public capital is found by Mourougane et al. to reduce the public debt-to-GDP ratio, most notably in peripheral European economies where it helps them move away from the critical debt threshold. Ireland is found to receive the most significant reduction in debt uncertainty from such a stimulus.
- Mourougane et al. also find that the Irish economy has the most room for funding a permanent growth-enhancing investment increase (of 0.5% GDP) through temporary deficits, as it can temporarily finance such increases for a period of six years without increasing the long-term public debt-to-GDP – compared to the OECD average of three to four years.

3.1.3 Investment return from different sectors

Many studies have found that core infrastructure is the most productive in terms of output.⁵¹ Other studies have found education and health to add significantly to long-term growth, as these areas are seen to increase human capital.⁵² One body of literature emphasises the return on maintaining current infrastructure. For example, the National Transport Commission notes that investment in maintaining high quality infrastructure and removing capacity bottlenecks is likely to be more beneficial to the economy than investment in new infrastructure, unless patterns of demand are expected to change significantly.⁵³

The IMF, WEO and OECD working paper would suggest investment is most beneficial **where there is an identifiable need or where public capital stock is low**. In terms of Irish infrastructure deficits, Duggan (2013) indicates that Irish infrastructure is particularly lacking in the areas of green energy, next generation broadband, secondary roads, water treatment, and waste management. He further argues that refurbishing, rebuilding and retrofitting schools and the social housing stock are activities that promise a high social and economic dividend in the current environment.⁵⁴

Andres et al. (2015) highlight that although it is important to assess the infrastructure gap to understand overall needs and potential financing requirements, **infrastructure gap assessments does not necessarily determine which investments are priorities**. Neither do they focus on core infrastructure as the go-to for investment. On the contrary, Andres et al. note that the departure for priority-setting exercises is the goals decision makers are attempting to achieve.⁵⁵ Thus, in addition to depending on the specific infrastructure needs of a country, infrastructure decisions must also take into account policy goals (whether this be economic growth or otherwise) and choose accordingly.

⁵⁰ A. Mourougane et al., 2016. op. cit., p.7 and p.23

⁵¹ V. See P. Bom and J. Ligthart, 2014. 'What have we learned from three decades of research on the productivity of public capital?' *Journal of Economic Surveys*, vol 28, no. 5, pp.889-916.

⁵² See N. Gemmel et al. 2015. 'Does the Composition of Government Expenditure Matter for Long-run GDP Levels?' Working Papers in Public Finance, Victoria, University of Wellington, available at http://www.victoria.ac.nz/sacl/about/cpf/publications/pdfs/2015/WP10_-2014_Does-the-Composition-of-Government-Expenditure-Matter-for-Long-run-GDP-Levels_revised.pdf and JM Fournier, 2016. 'The Positive Effect of Public Investment on Potential Growth', OECD Economics Department Working Papers no.1347, available at <https://www.oecd.org/eo/The-positive-effect-of-public-investment-on-potential-growth.pdf>

⁵³ IMF, 2014. op. cit.; National Infrastructure Commission, 2017. 'Strategic Infrastructure Planning: International Best Practice', Report of roundtable organised by International Transport Forum, p.20, available at <https://www.gov.uk/government/publications/strategic-infrastructure-planning-international-best-practice--2>

⁵⁴ V. Duggan, 2013. op. cit.

⁵⁵ L. Andres et al., 2015. op.cit.p.12

3.2 PROJECT PRIORITISATION – REVIEW OF LITERATURE

The literature review on the benefits or otherwise of investing in infrastructure acknowledged core infrastructure to be the most economically productive. There is, however, little consensus concerning what type of infrastructure project would bring most benefit to a given society, or which projects should be prioritised. Many would argue that this is because the best infrastructure investment decision largely depends on the society or country in question. As Andres et al. (2015) note, there is “no rule” to infrastructure investment decisions: they depend on “a country’s priority, economic growth and welfare objectives”.⁵⁶

Yet guidelines and frameworks for project selection and prioritisation do exist. The IMF’s focus on increasing investment efficiency could be considered an example of one such guide. The IMF observes that to be efficient, the aggregate level of investment must align with fiscal sustainability, and that investment must be allocated to projects with the highest cost-benefit ratio. For the IMF, efficiency entails not only the proper allocation of investment to sectors, but also the production of public assets at the lowest possible cost.⁵⁷ It demonstrates both theoretically and empirically how inefficient public investment severely reduces the positive impact of infrastructure investment.

Andres et al. (2015) offer a methodological framework for prioritising infrastructure investment. These experts advocate a multi-disciplinary approach, and propose a methodological framework for prioritising infrastructure projects that builds on existing decision-making literature. The framework they propose ranks infrastructure services according to input intensity of use, degree of spatial manifestation (e.g. urban, rural), typical development outputs (e.g. economic growth, welfare), and commonly debated market failures (e.g. pollution).⁵⁸ Under these headings, it uses existing literature on infrastructure to rank each service with regards to specific factors of interest, providing a guide to the decision-maker vis-à-vis which project would be in line with governmental priorities.

3.3 CONCLUSIONS

Overall, it can be concluded from the literature that infrastructure tends to have a positive effect on growth, but that this positive effect can be mitigated by an already high level of infrastructure stock. Furthermore, the positive effects of increased infrastructure investment can be severely diminished by poor efficiency in public investment. And conditions such as low growth, an accommodative monetary policy and financing investment through debt tend to raise the positive output effect of infrastructure investment. In terms of areas which reap the most return on investment, addressing infrastructure gaps would appear advisable, as would investing in ‘core’ infrastructure. Yet the problem of where to invest is a question that cannot be answered easily without understanding government priorities. A thorough ex-ante cost-benefit analysis is a good place to start (particularly to ensure projects are economically sound). The decision on which projects to allocate societal resources toward based on the perceived weight of differing benefits is, however, an issue beyond academic economic theory.

There is broad consensus that infrastructure investment should be undertaken following a thorough cost-benefit analysis, or, where this is not possible or advisable, using a framework that clearly demonstrates the social-environmental and financial-economic costs and benefits of particular projects. The costs and benefits (including those difficult to quantify) of a particular investment must be outlined, and a project chosen based on how well it fits with government priorities and its capacity to generate social or economic return. While this approach is very worthwhile, it is recommended that a prioritisation exercise should also be based on a multidisciplinary approach to provide a robust outcome, because of the complexities of infrastructure investments.

⁵⁶ L. Andres et al, 2015. p.2.

⁵⁷ IMF, 2014. p. 105

⁵⁸ L. Andres et al., 2015.

4. PRIORITISATION AND CAPITAL INVESTMENT TRENDS

This section examines the approach in an Irish context. It notes that answers to questions such as what to invest in, and where to invest, need an understanding of Government policy goals and objectives. It also reviews trends in public capital investment and future prospects, and addresses fiscal space constraints and alternative funding options for infrastructure.

4.1 PRIORITISATION IN AN IRISH CONTEXT – ASSESSING CAPITAL PROJECTS

Proper prioritisation of public infrastructure investment is essential to optimising long-term returns to the economy and society where available resources (time as well as finance) are insufficient to meet all identified needs. A number of recent statements by the relevant public bodies confirm significant infrastructure deficiencies across many sectors, beyond the scope of the Capital Plan's budget to address. The Assistant National Director of Capital and Property in the HSE has stated that the sector would need a total investment of €9 billion over the next ten years if healthcare policies are to be implemented and existing outdated facilities are to be replaced.⁵⁹ In terms of construction projects, the Capital Plan is investing some €2.3 billion up to 2021. On the basis of a further estimated €2.5 billion in the following five years to 2026, this would still leave a gap of €4.2 billion to be funded.

Prioritisation is not straightforward even within sectors, and is even more challenging across sectors, because of the different types of benefits that apply. It is essential therefore that objective and transparent methods are used to assess candidate projects, in order to be able to compare their relative merits and generate a ranking of the best projects to proceed with.

A number of methodologies exist for this purpose, and are detailed in DPER's *Public Spending Code*. The most important methodology is Cost Benefit Analysis (CBA), which the Code requires to be applied to all proposed capital projects costing more than €20 million. CBA seeks to identify all the costs and benefits of a project from society's point of view, and convert them to monetary values. Measures of the net benefit of a project can then be generated, namely Net Present Value (NPV), Internal Rate of Return (IRR) and Benefit Cost Ratio (BCR). The most relevant of these is NPV,

which is akin to society's "surplus" from the project (the sum of the benefits minus the sum of the costs, taking into account the time value of money).

If the Net Present Values of candidate projects are calculated on a consistent basis, then it is in theory possible to compare them across sectors, and rank them objectively, leading to a rational prioritisation of investment for society as a whole. Consistency is essential, especially concerning the calculations of:

- time savings,
- injuries and deaths avoided,
- employment generated,
- future versus current benefits,
- environmental impacts, and
- risk.

The *Public Spending Code* attempts to promote consistency in measurements as much as possible.

Currently, CBAs tend to be undertaken for, or on behalf of, the project promoter, whether it is a public agency or Government Department. There would be value in having CBAs undertaken by an independent body, as occurs in some other countries.⁶⁰ It is more important that a single body, separate from the promoting agencies, evaluates the CBAs of all candidate projects side-by-side. This is important primarily to ensure correct methodology, and secondarily, to rank candidate projects. We understand that DPER currently undertakes this function but further recommendations in this regard are presented in Section 5.

Some benefits and costs of candidate projects are less easily monetised than others (although there are well-established methodologies for evaluating for instance human years of life, climate change and other environmental impacts). A case in point might be regional policy objectives. As an example, a road project in the west of Ireland might generate a lower NPV than a similar project in the Greater Dublin Area, but regional policy considerations might cause Government to favour the project in the west of Ireland. In these circumstances, Multi-Criteria Analysis (MCA) can supplement CBA, by identifying the full range of criteria, including those not possibly incorporated in the CBA. The MCA process can score criteria and applying weights to the scores, thus producing a second ranking process. It is however equally important -if not more so -that consistency and objectivity are observed in undertaking an MCA.

⁵⁹ Presentation by the Assistant National Director of Capital and Property in the HSE at the Government Construction Projects and Capital Spend Conference, February 2017.

⁶⁰ See Section 5 for a discussion on the approach to long-term infrastructure planning in other countries.

It should go without saying that regional or other qualitative considerations do not justify proceeding with a project that generates a negative NPV; as such projects will leave society as a whole less well-off.

The process should ensure the projects selected meet stated policy goals and objectives, which may include, for example, regional economic development, environmental goals and social inclusion. As the previous section acknowledged (Section 2.2), infrastructure investments are complex and thus it may not be desirable to have a single methodology providing a single ranking of projects. In much academic literature, a multi-disciplinary approach is recommended.

4.2 PUBLIC CAPITAL INVESTMENT REVIEW

Table 4.1 provides a breakdown of Exchequer voted capital expenditure and total expenditure on capital (including both Exchequer and non-exchequer spending) as provided for in the Public Capital Programme (PCP) during the period 2008 to 2017. Voted capital expenditure in 2017 is roughly half what it had been in 2008, whilst total expenditure on capital in 2017 is almost two-thirds what it had been in 2008.

The total Exchequer capital provision represented 1.8 per cent of GNP in 2015 and 1.9 per cent in 2016, compared with 5.6 per cent in 2008. In terms of the larger PCP, it accounted for 8.4 per cent of GNP at the peak, and then fell to 3.3 per cent where it has remained since 2015.

Table 4.1:
Public Capital Expenditure 2008-2017

SOURCE	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017E
Exchequer Voted Capital (€m)	9,011	7,333	6,385	4,515	3,809	3,387	3,597	3,730	4,215	4,540
Total PCP (€m)	12,495	11,849	10,365	6,963	5,699	5,699	6,166	6,746	7,452	7,636
Exchequer as % of PCP	72	62	62	65	67	59	58	55	57	59
Exchequer as % of GNP	5.6	5.2	4.6	3.2	2.7	2.2	2.2	1.8	1.9	2.0
PCP as % of GNP	7.8	8.4	7.5	5.0	4.0	3.8	3.8	3.3	3.4	3.3

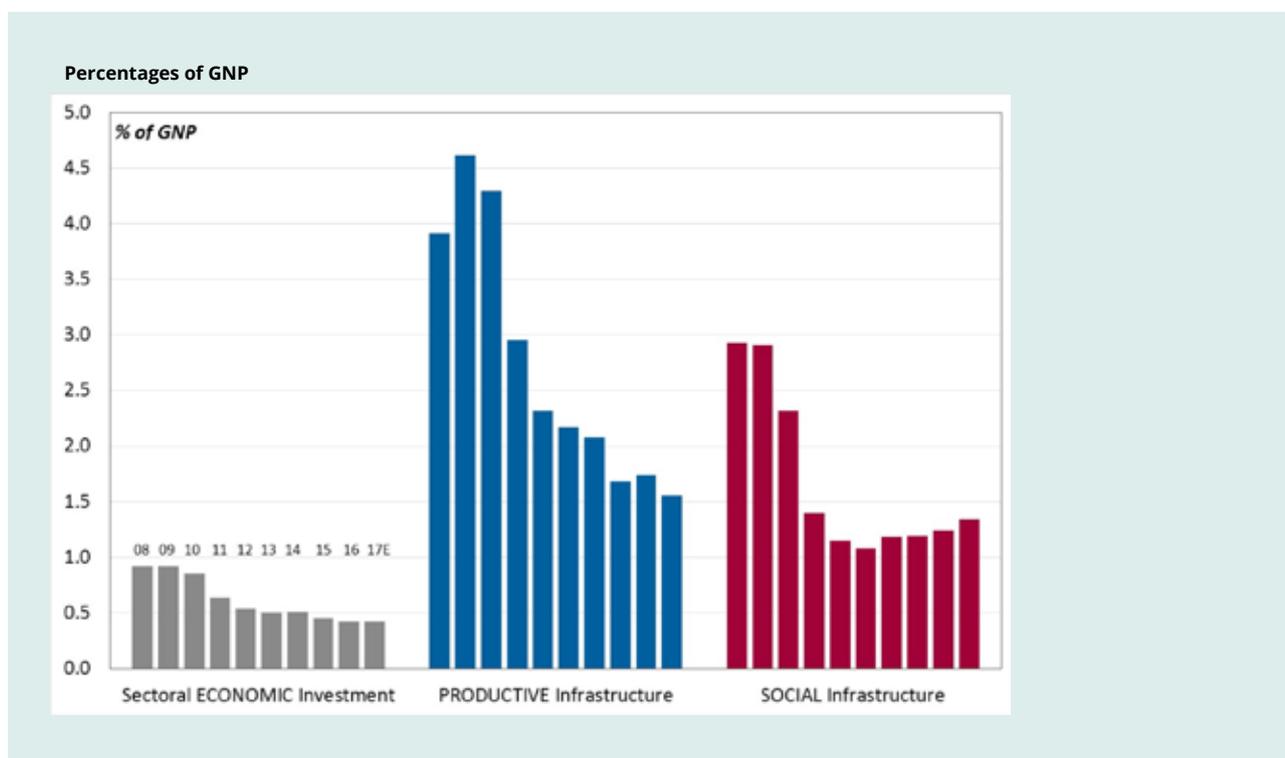
Source:
Revised Estimates for Public Services 2017, Department of Public Expenditure & Reform and Draft Stability Programme Update April 2017, Department of Finance. CSO.
PCP = Public Capital Programme. E = estimate.

Figure 4.1 opposite shows the total public capital investment on a sectoral basis as a percentage of GNP since 2008. Whilst the recession led to a contraction in the total quantum of investment made in all sectors, since the recovery the pickup in investment has been mainly in the area of social infrastructure. Since 2008, total capital investment was at its lowest in 2012 and 2013. Since 2013, the level of investment in social infrastructure has increased strongly (+89%) and has been much larger than the corresponding increase in investment in productive infrastructure (+9%).

In GNP terms, social infrastructure investment increased from 1.1 per cent of GNP in 2013 to an estimated 1.3 per cent in 2017, but is well down from almost 3 per cent of GNP at the peak. In contrast, investment in productive infrastructure declined to 1.7 per cent of GNP in 2015 and is estimated to represent 1.6 per cent in 2017, compared with 4.6 per cent at its peak. The trend in productive infrastructure investment highlights the acute situation in the civil engineering sector which has consistently been performing poorly relative to other sectors in the industry.

Total expenditure on capital in 2017 is almost two-thirds what it had been in 2008 and Voted capital expenditure is roughly half

Figure 4.1:
Public Capital Programme Allocations by Sector
2008-2017E⁶¹



In the following section we compare the Capital Plan 2016-2021, as published in September 2015, with the latest allocations for capital investment over the period 2016-2021, published in the Draft Stability Programme Update (SPU) in April 2017.⁶² This allows us to assess the extent to which changes to planned capital spending have been made since the Capital Plan was launched.⁶³

4.3 PUBLIC CAPITAL INVESTMENT PROSPECTS

The Multi-Annual Capital investment Framework

The Capital Plan allocated €27 billion of Exchequer funding to gross voted capital expenditure over the period 2016-2021 (€4.5 billion on average per year).⁶⁴ Of the total Exchequer funding of €27 billion, 29 per cent is allocated to transport, 13 per cent to housing, 14 per cent to education, and the remainder to other sectors.⁶⁵

There is an additional €14.5 billion of non-Exchequer funding allocated to capital investment from the own resources of semi-state bodies. Of this investment, 40 per cent is allocated to investment in energy, 27 per cent to water services, 5 per cent to transport, and the remainder (28%) to other areas.⁶⁶

Since publication of the Capital Plan in September 2015, the total funding allocated to capital expenditure has been increased in the Draft SPU (Table 4.2).

- An extra €7.1 billion has been allocated for the period 2016 to 2021. The additional €7 billion allocated for the period 2017 to 2021, is on top of the €27 billion already allocated in the Capital Plan, implying the Exchequer envelope for this period is now increased to €34 billion.

⁶¹ Sectoral Economic Investment: Agriculture and Food, Industry, Tourism, Fisheries, Forestry; Productive Infrastructure: Energy, Transport, Environmental Services, Communication; Social Infrastructure: Housing, Education & Skills, Health & Children, Government Construction

⁶² http://finance.gov.ie/sites/default/files/20170410%20Draft%20SPU%20final_0.pdf

⁶³ Appendix 1 contains a summary of the main capital investment priorities in the Capital Plan for the period 2016-2021.

⁶⁴ Appendix 2 reviews the specific Exchequer allocations across a number of core infrastructure spending departments in 2017-2019.

⁶⁵ Op cit., Capital Plan, p.9

⁶⁶ Op cit., p.10.

- The corresponding figure for the period 2017 to 2021 is almost €30 billion, which is an increase of €6.66 billion between 2017 and 2021.
- We understand that the additional €6.66 billion needs to be adjusted to reflect the impact of the reclassification of certain PPP unitary payments to capital expenditure from current expenditure, as well as an increase in the 2016 base reflecting the supplementary estimates for the Department of Transport, Sports and Tourism, and the Department of Education and Skills toward the end of 2016. These two factors amount to around €1.52 billion, leaving a total of €5.14 billion, which is the additional capital investment which the Government has committed to in the Summer Economic Statement (2016).

The Public Consultation document for the mid-term review of the Capital Plan indicates that of this €2.65 billion, €1.14 billion is to be allocated to capital grants. These include capital funding for the main enterprise agencies, the Department of Agriculture, Food and the Marine and the State tourism bodies. Accordingly, **this leaves an unallocated provision of only €1.515 billion for new investment in infrastructure over the four years 2018-2021 or €378.75 million per annum. The CIF would contend that the remaining unallocated provision for capital formation (i.e. investment in infrastructure) of €1.515 billion is very modest, coming on top of what is an overall inadequate provision to address the needs of the expanding economy, particularly if the objectives of the National Planning Framework are to be realised.**

Table 4.2:
Exchequer Gross Voted Capital Expenditure
(2016-2021, €m)

Date	Publication	2016	2017	2018	2019	2020	2021	Total 2016-2021	Total 2017-2021
Sep-15	Capital Plan	3,800	3,971	4,230	4,600	5,000	5,400	27,001	23,201
Apr-17	Draft SPU	4,215	4,540	5,295	6,070	6,675	7,285	34,080	29,865
	Difference	415	569	1,065	1,470	1,675	1,885	7,079	6,664
Exchequer as % of GNP		1.9	2.0	2.2	2.4	2.5	2.7		

Source: Capital Plan, Draft SPU 2017.

The total Exchequer capital provision represented 1.9 per cent of GNP in 2016 and is projected to rise marginally to 2.0 per cent in 2017 (Table 4.1), 2.2 per cent in 2018 and 2.4 per cent in 2019, compared with 5.6 per cent in 2008.⁶⁷ Although the total Exchequer capital provision is projected to reach 2.7 per cent of GNP in 2021, it is still below the average of 3.8 per cent recorded over the 2000-2016 period.

Just €1.515 billion remains unallocated for infrastructure 2018-2021

However, €2.5 billion of the additional capital of €5.14 billion has already been allocated to the Government's initiatives aimed at tackling the housing crisis, as detailed in the Action Plan on Housing and Homelessness. This leaves approximately €2.65 billion to be allocated in the mid-term review of the Capital Plan over the period 2018-2021.

Present levels of investment are inadequate

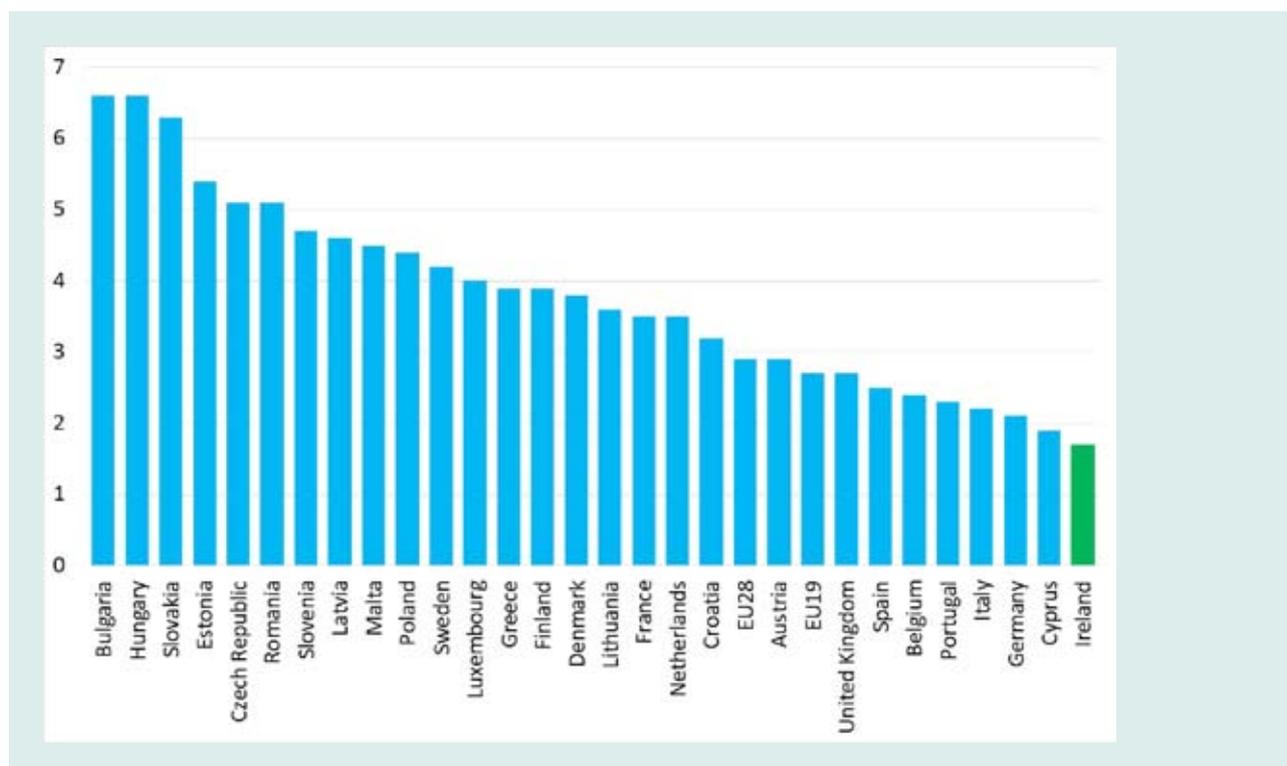
In regard to the Capital Plan, the National Competitiveness Council has remarked that: *"The availability of world-class infrastructure in telecommunications, energy, water and transport is necessary to support sustainable growth. The Capital and Investment Plan 2016-2021 is welcome but not enough to ensure we have the infrastructure to support growth without costs rising rapidly."* The Council further expresses concern about the low levels of investment projected over the medium-term: *"While recent capital expenditure commitments in Ireland are welcome – present levels of investment are insufficient to close the knowledge and economic infrastructure gap between Ireland and our key competitors which still persist. Indeed, as previously noted by the Council, current expenditure plans may be insufficient to maintain and add to the existing infrastructure stock allowing for depreciation. The relatively low levels of net investment projected over the medium term represent a significant challenge in light of demographic pressure, EU budgetary commitments and clear infrastructure deficits in housing, health, education, innovation, transport and water."*

⁶⁷ Using projections for real GNP to 2021 in the Draft SPU, April 2017, Department of Finance.

Further evidence of Ireland's low rate of investment is evident from Eurostat data which shows that Ireland spent the least on 'general government fixed investment' (voted capital investment) amongst all EU countries, as a percentage of GDP, at 1.7 per cent in 2015.⁶⁸ The average rate was 2.7 per cent for the EU19 and 2.9 per cent for the EU28.

period. It would also allow stakeholders to measure government progress against stated objectives. Alternatively, investment rate floors can be set so that investment does not fall below a certain level. This proposal has been made in the UK context.⁷¹ In both of these cases, investment targets would give rise to a greater level of accountability by Government.

Figure 4.2:
General Government Fixed Investment⁶⁹
(% of GDP, 2015)



Source: Eurostat ⁷⁰

Notwithstanding the uncertainties with regard to Ireland's GDP as a measure of economic output, Ireland spends the lowest amount of Exchequer capital investment as a percentage of GDP. One option open to the Government to guarantee capital investment year-on-year would be legislate ex ante for **public investment targets, as a ratio of GDP**. This would set in stone the rate of investment that the government would be obliged to meet over, for example, a 10-year

4.4 FISCAL SPACE AND FLEXIBILITY IN THE FISCAL RULES⁷²

Typically, funding for infrastructure can be increased by unlocking new funding streams such as increasing user charges, capturing property value, and selling assets and recycling the proceeds for new infrastructure. The fiscal rules that were introduced during the economic crisis in Europe are aimed at ensuring that spending is sustainable over the medium- and long-term. However, they also restrict the ability of the State to invest for productive purposes.

⁶⁸ <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=teina210&plugin=1>

⁶⁹ General government gross fixed capital formation (ESA 2010 code P.51g) consists of resident producers' acquisitions, less disposals of fixed assets during a given period plus certain additions to the value of non-produced assets realised by the productive activity of government producer or units. Fixed assets are produced assets used in production for more than one year (Eurostat website).

⁷⁰ General Government Fixed Investment: Annual Data, Eurostat (2016), <http://ec.europa.eu/eurostat/web/products-datasets/-/teina210>

⁷¹ *Securing our Economy: The Case for Infrastructure*, Civil Engineering Contractors Association (May 2013) p.5

⁷² This section is a summary from the CIF Report to the Budgetary Oversight Committee on 28th March 2017. The full report is available at <http://cif.ie/news-feed/reports-publications.html>

The fiscal rules make no differentiation between capital expenditure and current expenditure with regard to their impact on the budget deficit: each euro spent on capital and current expenditure is treated equally. The **'Golden Rule'** is a fiscal principle according to which deficits are allowed if they have been driven by capital investment. Under this approach, current expenditure should match normal revenue, and capital expenditure would be isolated from consideration with respect to the deficit. The Rule would therefore provide member states with greater leeway to borrow for investment. Applied sensibly, the Rule could result in leeway for countries such as Ireland. As it stands, the principle has no basis in European rules.

In order to support increased investment levels and to encourage structural reforms, the European Council agreed in June 2014 that there was a need to explore how the existing rules of the Stability and Growth Pact (SGP) could be applied more flexibly without changing them. Following the European Council's guidance, the European Commission issued a communication on *'Making the best use of the flexibility within the existing rules of the SGP'* in January 2015.⁷³

The outcome of this process was that the Commission emphasised the **Structural Reform Clause**, which allows a state to apply for a temporary deviation of up to 0.5 per cent of GDP from the state's Medium-Term Objective (MTO), provided the state is not in the Excessive Deficit Procedure (EDP). **The state's planned reforms must be major, have a long-term impact on growth and budgetary sustainability, and must be fully implemented.** If leeway is granted, the MTO must be reached within four years. This clause rewards past fiscal discipline by giving countries not in the EDP more flexibility.

Whilst the Structural Reform Clause could be invoked when Ireland reaches its MTO, leeway to invest is also available if the health of the economy worsens. The **investment clause** allows a state to deviate temporarily from its path toward its Medium-Term Objective in case of recession.

Under the investment clause, therefore, leeway is available if there is a negative output gap, the deviation does not put the state in the EDP, and the investment

has a long-term impact on growth and budgetary sustainability. At present Ireland does not fit the criteria that would allow the Government to apply for the investment clause. If, in the coming years, the State's budgetary and economic situation deteriorates such that the country is eligible to invoke the clause, leeway could be applied to invest in projects that might bolster the economy.

4.5 OTHER SOURCES OF FUNDING FOR PUBLIC INFRASTRUCTURE

Alternative sources of funding are available to the Government to increase capital investment. These include securing finance for projects via the European Investment Bank and the Irish Strategic Investment Fund.

European Investment Bank (EIB)

Lending to infrastructure projects is a cornerstone of the EIB's lending objectives. The EIB is active across the spectrum of infrastructure providing financing for viable projects in Transport, Energy, Water, Health, Education and Urban sectors.

EIB investments cover a broad range of sectors in Ireland. A total of €350 million was provided to upgrade outdated buildings and build state of the art new education and research facilities at primary and post-primary schools and at third level institutions. The investment also included the N25 New Ross Bypass, which was the first project in Ireland to be funded under the Project Bond Credit Enhancement initiative intended to stimulate capital market financing for large scale infrastructure projects. Further opportunities to avail of this initiative for other large projects should be examined.

Speaking in 2016, the Vice President of the EIB, Mr. Andrew McDowell said *"Ireland is still not yet at the forefront of EU countries in deploying EIB financial instruments to support investment, particularly under the Investment Plan for Europe. Notwithstanding the evident infrastructure gaps and other pent-up investment requirements, total EIB exposure to Ireland remains, as a % of GDP, below the EU average. Our first term report would probably read "could do better".*⁷⁵

⁷³ Making The Best Use Of The Flexibility Within The Existing Rules Of The Stability And Growth Pact, Communication from the Commission to the European Parliament, the Council, the European Central Bank, the Economic and Social Committee, the Committee of the Regions and the European Investment Bank (December 2015), <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52015DC0012>

⁷⁴ The MTO requires achievement of a balanced budget in structural terms by 2018. In Ireland's case, the budgetary deficit can amount to no more than 0.5 per cent of GDP in 2018.

⁷⁵ European Movement Conference: Investing in Ireland's Infrastructure, Mr. Andrew McDowell, Vice President EIB, 30th September 2016.

With the EIB having opened an office in Dublin in 2016, the Irish public and private sectors need to deepen their engagement with the Bank to gain a greater share of the enhanced lending volumes and risk capacity available to the EIB. **The EIB President has stated that they plan to invest over €1 billion on various investment projects in Ireland in 2017.⁷⁶ More recently he indicated that “Ireland can do more” to access EIB funds and that “now is a good time to be putting up projects” as the EIB has “more money under the Investment Plan for Europe that it has projects to finance.”⁷⁷ There is also significant liquidity in the capital markets for project finance in Europe, generating the opportunity to fund infrastructure at low interest rates for the next thirty years.⁷⁸**

Irish Strategic Investment Fund (ISIF)

A joint European Commission and European Investment Bank initiative, known as the Investment Plan for Europe [the “Juncker Plan”], was introduced in 2014 to encourage investment in the real economy in order to boost job creation and economic growth; meet the long-term needs of the economy and increase competitiveness; and help strengthen Europe’s productive capacity and infrastructure.

A key driver of the Investment Plan is the European Fund for Strategic Investments (EFSI), which encourages investment in key areas, including transport, broadband, energy, innovation, renewable energy and energy efficiency as well as SME financing. By providing a total guarantee of €21 billion for business and infrastructure projects, of which €16 billion is from the EU budget and €5 billion is from the European Investment Bank, the EFSI aims to unlock additional investment of at least €315 billion over 3 years.

The Irish Strategic Investment Fund was established in late 2014 and has invested around €2.7 billion in Irish firms and investments since its establishment. Venture Funds and real estate have received the greatest level of investment, amounting to a combined investment of over €1 billion. Further scope to fund infrastructure from the ISIF should be examined.

Public Private Partnerships

PPP arrangements provide for long-term strategic planning of infrastructure projects. They provide an opportunity to fund major long-term infrastructure projects competitively off balance sheet while also facilitating social and economic development. In the context of the fiscal constraints which exist, it is understood that a group within DEPR is reviewing the future of PPPs. This group should investigate the timely pre-procurement process involved for PPP projects to improve their efficiency.

Given concerns about the increasing unitary payments associated with PPP projects, this reinforces the necessity to ensure that PPP projects are not just selected because they are regarded as off balance sheet investments, but because they need to be affordable over the long-term.

Alternative sources of funding are available to the Government to increase capital investment

⁷⁶ <https://www.rte.ie/news/business/2016/1209/837631-european-investment-bank-dublin/>

⁷⁷ Presentation by Mr. Andrew McDowell, Vice President of the EIB, to the CIF Colloquium on Capital Investment in Ireland, 24th April 2017.

⁷⁸ Presentation by Dr. Christian Kummert, Rubicon Infrastructure Advisors to the CIF Colloquium on Capital Investment in Ireland, 24th April 2017.

5. INFRASTRUCTURE PLANNING FOR THE LONG-TERM

The Public Consultation document has asked for views and evidence on infrastructure investment beyond the period of the current Capital Plan (2021). It also asks that consideration be given to the factors, in order of priority, which should be taken into account when considering Ireland's long-term capital investment framework. The Document notes the comments by former taoiseach Enda Kenny that the National Planning Framework Ireland 2040 will be complemented by a new 10-year National Capital Plan.

The CIF believes that the approach to ascertaining Ireland's infrastructure priorities should be framed over a longer period to take into account the long lead-in time to planning major infrastructure projects. Given also the changes which are likely to take place in our economy over the long-term with respect to, for example, the development of our cities and regions, existing and new environmental challenges and changes in technology, the CIF recommends an infrastructure planning horizon of 15 years at a minimum. This would provide greater certainty to industry, potential specialist skilled employees, businesses and investors on a well-researched pipeline of projects. It would demonstrate a commitment to better planning for dealing with any changes in demand or emerging challenges over the longer time horizon. It would also support economic growth and an improved quality of life for all citizens.

5.1 APPROACHES TO INFRASTRUCTURE PLANNING

A **Canadian** Infrastructure Summit (October 2016) which considered long term strategic infrastructure for growth, observed that the approach to planning infrastructure in Canada was not a 21st century approach, and that other countries manage their infrastructure needs in a much more sophisticated way:

"New Zealand plans its infrastructure with an eye fixed on a generation from now. Australia separates politics and policy so that poor spending decisions are pointed out publicly by experts with clout. The United Kingdom prices infrastructure appropriately to limit demand and relieve the taxpayer."

"We need to begin by putting infrastructure at the heart of Canada's economic development. The approach must be strategic and far-reaching,"

*"Infrastructure can only be done well when it is done with due deliberation."*⁷⁹

A stated government intention is that the National Planning Framework will be complemented by a 10 year capital investment framework to provide the opportunity to examine the approach to planning for infrastructure investment over the long-term. As stated above, the CIF recommends an infrastructure planning horizon of 15 years at a minimum.

The OECD has identified global best practice in strategic infrastructure planning, which provides useful insights into how one might develop the approach to long-term infrastructure investment planning in Ireland.⁸⁰ The common thread in a number of jurisdictions, most notably in Britain, and Australia, is the move to depoliticise the process by establishing independent statutory bodies with a mandate to progress and prioritise national infrastructure. These bodies also deal with the reforms needed to address infrastructure gaps.

Australia established Infrastructure Australia in July 2008 to provide advice to the Australian Government under the Infrastructure Act 2008. In 2014 the legislation was amended to create an independent board with responsibility for strategically auditing Australia's nationally significant infrastructure and developing 15-year rolling infrastructure plans that specify national and State level priorities. The Act specifically states that the Minister must not give directions about the content of any audit, list, evaluation plan or advice provided by the independent board. This ensures greater transparency in the process of project selection and prioritisation. It further removes any short-term focus dictated by the political cycle.

The long-term infrastructure investment planning process followed by Infrastructure Australia involves taking a strategic approach to ascertaining infrastructure requirements and has a number of key tasks, as follows:

⁷⁹ Building the Future - Strategic Infrastructure for Long-Term Growth in Canada, available at <https://medium.com/canada-growth-summit/building-the-future-5acb9b9db014>

⁸⁰ Strategic Infrastructure Planning, International Best Practice, OECD 20-17 available at <http://www.itf-oecd.org/sites/default/files/docs/strategic-infrastructure-planning.pdf>

- Preparation of the **Australian Infrastructure Audit** takes a strategic approach to assessing the nation's infrastructure needs by providing a review of the country's infrastructure, current and prospective infrastructure gaps and future needs in the areas of energy, telecommunications, water and transport.⁸¹ The Audit identifies key challenges and opportunities to sustain economic growth over a 15-year period and examines the drivers of future infrastructure demand, particularly population and economic growth. Other specific considerations addressed include governance and policy reforms and funding as well as regional, social and sustainability considerations.
- The Infrastructure Audit is put out for public consultation and all feedback received is considered by Infrastructure Australia in developing the **Australia Infrastructure Plan**. The 15 year Plan outlines a suite of recommended reforms as well as a comprehensive list of the nation's priority large infrastructure projects. It also addresses the key challenges raised in the Audit.
- The final task is publication of the **Infrastructure Priority List** consisting of the most important infrastructure investments Australia needs to make over the next 15 years. The list includes projects and initiatives, each of which is identified as a High Priority or a Priority. Each project and initiative on the Priority List includes a broad indication of timeframe, ranging from expected within 5 years (near term) to expected to be more than 15 years (future):
 - ▶ The projects are advanced proposals that have undergone a full business case assessment by Infrastructure Australia. Separately, Infrastructure Australia publishes a list of projects that are under construction, ensuring progress on all projects on the Priority List is tracked through to completion.
 - ▶ Initiatives are proposals that have been identified as having potential to address a nationally significant problem, but which require further development and rigorous assessment to determine if they are the most appropriate solution.

Since the establishment of Infrastructure Australia, a number of State-based infrastructure advisory bodies have been established including, for example, Infrastructure NSW and Infrastructure Tasmania. These bodies were established to assist the Government in each State to identify and prioritise the delivery of critical public infrastructure. One of the main tasks of each body is to publish a 20-year **State Infrastructure Strategy** (SIS) which is a prioritised and costed long-term strategy for consideration by government. The SIS is implemented through an annual Five-Year Infrastructure Plan, which identifies specific major infrastructure projects to be undertaken as a priority. We understand each State works closely with Infrastructure Australia to identify priority infrastructure projects.

In the **UK**, there is a National Infrastructure Commission (NIC) which provides the government with impartial, expert advice on major long-term infrastructure challenges. The Commission has been operating in interim form since October 2015 and was established permanently as an Executive Agency of HM Treasury on 24 January 2017. It describes itself as 'forward-thinking' as it takes a strategic approach, linking *"long-term priorities with short-term action and considers infrastructure as a system, not as a collection of silos."*⁸²

There are two stages involved in developing the UK's long-term infrastructural needs:

- Firstly, the NIC will determine a 'vision' of the UK up to 2050 to identify long-term needs and highlight priority areas for action in the medium-term. This report will be published in summer 2017.
- The NIC will publish a National Infrastructure Assessment in 2018 which will contain its final conclusions and recommendations on the UK's infrastructure needs and priorities to 2050. The Government will be required to respond to the recommendations made.

As with Infrastructure Australia, the British NIC's focus is on productive infrastructure only and long-term social infrastructure needs are outside the scope of its remit. The NIC's remit, however, does include consideration of the demand and supply of infrastructure services and assets, and approaches to demand management that enables more effective use of existing and new assets. This includes the adoption of new technologies to track performance and reduce cost.

⁸¹ It is noted that Infrastructure Australia's remit deals with productive infrastructure only and excludes social infrastructure which is a major shortcoming as all infrastructure projects should be considered in terms of their interdependencies.

⁸² <https://www.nic.org.uk/>

Rigorous evidence base for project selection

Infrastructure Australia was created to address an inconsistent approach to planning infrastructure and its necessary investment. Previous to the establishment of Infrastructure Australia, attention was focussed at the level of individual projects, without an adequate assessment of need or defining infrastructural problems from a national perspective. Amongst other challenges, infrastructure investments were sometimes announced in the absence of an appropriate business case and underpinning economic assessment.

Infrastructure Australia's Assessment Framework methodology involves a rigorous evidence-based process to inform better infrastructure decision-making. The Audit is intended to define the problem that needs to be addressed, following which a range of early project development studies and consultations are undertaken to ensure that the right infrastructure solution is selected, and that community benefits are maximised. These studies include:

- **Strategic options assessments:** which demonstrate the nature and scale of the problem(s) and identify solutions which may or may not involve the delivery of new infrastructure;
- **Feasibility studies:** which undertake engineering, environmental and economic assessments to develop solutions into fully-scoped projects; and
- **Project business cases:** which provide more detailed economic assessments, including a cost-benefit analysis.

It is only by undertaking the above project development studies that investment proposals can progress onto the Infrastructure Priority List.

We have previously highlighted the importance of a robust economic assessment, including cost-benefit analysis, in regard to the prioritisation of projects (Section 2).

5.2 IMPLICATIONS FOR IRELAND

Ireland can learn many lessons from the experience of other countries where best practice is adopted. Any long-term infrastructure planning process must have at its centre a strategic vision over the next 15 to 20 years, which sets out the policy goals and objectives for building a sustainable, competitive and modern economy and society. The vision must be aligned with

regional policy objectives and any emerging known challenges (e.g. Brexit, ageing population) which are expected to impact future economic growth. This approach avoids issues which arise due to the short-term nature of the political cycle, such as the likelihood of a change in government or change in policy direction every five years.

The CIF believes that the appropriate solution in Ireland is to establish an independent National Infrastructure Commission (NIC) with responsibility for analysing the long-term infrastructure needs of the economy and society. The Irish NIC would assess/ascertain Ireland's infrastructure needs by:

- Setting out the strategic vision of Ireland's long-term infrastructure needs for the next 15 or more years;
- Ascertaining Ireland's national infrastructure priorities using a rigorous evidence-based and objective methodology. This will ensure appropriate infrastructure solution selection, and consistency in terms of medium-term vision; and
- Producing an infrastructure priority list setting out the key national and regional infrastructure projects.

Ideally the strategic vision should inform the development of an infrastructure needs statement which is evidence-based, objective and rigorous.

The NIC would seek submissions on infrastructure projects and would be responsible for undertaking a robust assessment of all investment proposals. By giving the task of prioritisation of projects to a National Infrastructure Commission, the process will be more open, transparent and less subject to political influence.

It is recommended, as part of the NIC's public consultation process to identify eligible projects, that Government departments would submit their project proposals, with indicative costings, to the NIC. The NIC would independently evaluate such proposals. The NIC would publish an infrastructure plan and a priority list of the key national and regional infrastructure projects for the next 10 to 15 years. The list would be submitted to the Department of Public Expenditure and Reform (DPER), which could allocate budgets for the ranked projects, within the constraints of the public capital envelope. Where projects are not selected, due to the limited funds available, there would be an opportunity to review the priority list every two years.

6. APPENDIX 1: CAPITAL PLAN ALLOCATIONS FOR 2016-2021

Main Areas of Investment	Investment	Priority Areas/Key Projects 2016-2021
Public Sector Infrastructure <ul style="list-style-type: none"> • Exchequer Funding • State-owned investment • PPPs 	€42bn (+€4bn) €27bn €14.5bn €0.5bn	Total Capital Plan is expected to support in the region of 45,000 jobs over six years, excluding the additional €7bn allocated in the 2017 Budgetary projections to 2021. This excludes the additional €7bn in the 2017 Budget. The total capital investment associated with the key areas/projects listed below amounts to €32.7bn over the six years 2016-2021, including an updated figure for housing from the Housing Action Plan.
Energy Transmission and Distribution Networks	€5.75bn by ESB, Ervia, Bord Na Móna, Eirgrid	<ul style="list-style-type: none"> • North-South Transmission Line – a second electricity interconnector between Ireland and Northern Ireland; Smart Metering; Grid Link and Grid West – to increase the grid capacity and secure electricity supply to the south and east of Ireland and the west of Ireland, respectively;
Water and Wastewater quality and capacity	€4bn by Irish Water	<ul style="list-style-type: none"> • To address the deficits in drinking water quality and capacity, wastewater quality and capacity, and repair much of the infrastructure;
Flood Relief	€430m	<ul style="list-style-type: none"> • Of which €348m will be directed towards major schemes; • 6 major flood relief schemes under construction, including Ennis, Bray, Waterford, River Dodder and South Campshires Co Dublin; • A further 30 schemes at the planning/design stage, including Cork City, Arklow Co Wicklow, Enniscorthy Co Wexford, River Poddle Co Dublin, Morrell River Co Kildare and Midleton Co Cork;
Road Improvement and Maintenance – National, Regional and Local Roads	€6bn	<ul style="list-style-type: none"> • €4.4bn for road maintenance and €1.6bn for new projects; • The majority of 'shovel ready' National roads projects will not commence construction until 2019/20 due to funding constraints;
Education – Primary, Secondary and Third Level	€3.82bn	<ul style="list-style-type: none"> • To provide 19,000 primary school places by 2018 and an extra 43,000 secondary school places by 2022; • €110 million for 3rd level facilities plus an extra €200 million via PPP's; • Notable projects in the 3rd level sector include, the Trinity College Business School, student accommodation at NUI Galway, a Library Building at the University of Limerick and the DIT Grangegorman campus development;
Healthcare Infrastructure	€3.1bn	<ul style="list-style-type: none"> • Projects to commence in the next three years: the National Children's Hospital; a new 120-bed National Rehabilitation Hospital in Dún Laoghaire; the Central Mental Hospital in Portrane; and oncology centres in Dublin, Cork and Galway; • A new emergency department (ED) to open in Limerick in 2017; two further ED's planned in Galway Hospital and Beaumont Hospital;
Public Transport	€3.6bn	<ul style="list-style-type: none"> • Projects either under construction or expected to be advanced over the coming years include: Luas Cross City project; Reopening of the Phoenix Park Tunnel; the multi-phase DART expansion programme (to Balbriggan, Maynooth and Hazelhatch); upgrading of Quality Bus Corridors; new and replacement buses; • Metro North – construction to commence in 2021;
State and Regional Airports, Seaports		<ul style="list-style-type: none"> • A new €320m runway for Dublin Airport due to start mid-2017; • Investment in upgrading regional airports of around €38m; • A number of seaports have expansion plans;
Third Phase of PPP's – Transport, Education, Justice.	€500m	<ul style="list-style-type: none"> • Roads – 3 PPP projects underway: M17/M18 Gort to Tuam; M11 Gorey to Enniscorthy; N25 New Ross Bypass; New Road PPPs are not anticipated in the 2016-2021 period • Education: • DIT Grangegorman campus - 50% of funding from PPPs – a 73-acre education and health campus development comprising a primary school; a public library; sports and recreation facilities; student accommodation; Primary Care Centre; Community Nursing Unit; • A fifth schools PPP bundle under construction comprising five schools. • Courthouses and Garda Stations - €160m provision;
Social Housing and Housing Infrastructure – as per Action Plan	€5.5bn (Action Plan figure)	<ul style="list-style-type: none"> • Address Homelessness; • Accelerate Social Housing delivery; • Build more private housing; • Improve the Rental sector; • Utilise existing housing stock.

Source: Building on Recovery: Infrastructure and Capital investment 2016-2021, September 2015. Department of Public Expenditure and Reform.

7. APPENDIX 2: CAPITAL PROVISIONS FOR CORE INFRASTRUCTURE 2017-2019

The specific allocations of voted capital expenditure across a number of core infrastructure spending departments in the period 2017-2019 are reviewed below.

A. Education

The total allocation for Education in the Capital Plan is €3.82 billion over the period 2016 to 2021. Looking at the next three years, the Capital Plan allocated €599 million to the Department of Education and Skills for 2017, €623 million for 2018, and €654 million for 2019. Based on Budget 2017, there would be €690 million available to the Department in 2017, €715 million in 2018, and €746 million in 2019. The Revised Estimates marginally increased the allocations for the respective years. Altogether, an additional €185 million has been allocated to the Department since the Capital Plan was published in 2015.

Table 7.1:
Department of Education & Skills:
Voted Capital Expenditure (€m)

	2017	2018	2019
Capital Plan	599	623	654
Budget 2017	690	715	746
Revised Estimates	693	714	745
<i>Difference (v Capital Plan)</i>	<i>+94</i>	<i>+91</i>	<i>+91</i>

Source:
Capital Plan, Budget 2017,
Revised Estimates for Public Services 2017

Within Education, the programme comprises a lot of relatively small projects compared, for example, to Transport. There are 310 major school building projects in the Capital Plan, which include 156 at primary level, 124 at post-primary and 30 special schools. In total, 62,000 additional school places will be provided, comprising 19,000 primary and 43,000 post-primary places. Subsequent to the Capital Plan, Minister Bruton announced patronage of 9 new post-primary schools to be established in 2017 and 2018, providing 8,200 additional places.⁸³

Issues of concern for the Education budget

There are three issues of concern for the Education budget:

- The limited amount allocated for third-level facilities;
- The large unitary charge in the budget for 25 schools built using the PPP model; and
- Construction inflation with the average build cost for schools currently around €1,210/sqm, compared with €1,230/sqm in 2006 and €930/sqm in 2009.

In 2016, for example, of the total capital expenditure of €704 million⁸⁴, just €32m was allocated to higher education, and €85m (12 per cent) was allocated to PPP projects.

The development of primary and post-primary education facilities is also procured via Public Private Partnership (PPP) arrangements. A total of 25 post primary and two primary schools have already been delivered by the NDFA in four separate school bundles over the period 2011-2016. The contract for the fifth school bundle comprising four post primary schools and one primary school was signed in July 2016. These are expected to be completed in 2018. There are currently no further school bundles in the pipeline due to the level of unitary payments already committed to in the Department Education and Skills' budget.

There is a provision of €200m in the Capital Plan for higher education PPP projects and proposals are currently being assessed by the Higher Education Authority (HEA) both in the context of the PPP programme and for the mid-term review of the Capital Plan. This limited investment in third-level education facilities over the past decade is leading to a drop in the rankings of Irish universities which is likely to have adverse implications for our ability to attract international students and FDI.

⁸³ <http://www.education.ie/en/Press-Events/Press-Releases/2016-Press-Releases/PR16-11-03.html>

⁸⁴ Presentation from the Department of Education and Skills at the Government Construction Projects and Capital Spend Conference, February 2017.

7. APPENDIX 2: CAPITAL PROVISIONS FOR CORE INFRASTRUCTURE 2017-2019 *Continued*

B. Health

The total allocation for Health infrastructure in the Capital Plan is €3.06 billion over the period 2016-2021. Looking at the next three years, the Capital Plan allocated €454 million, €473 million, and €550 million to the Department of Health in 2017, 2018, and 2019 respectively. Neither Budget 2017 nor the Revised Estimates increased this allocation in the intervening period.

Table 7.2:
Department of Health:
Voted Capital Expenditure (€m)

	2017	2018	2019
Capital Plan	454	473	550
Budget 2017	454	473	550
Revised Estimates	454	473	550
<i>Difference (v Capital Plan)</i>	0	0	0

Source:
Capital Plan, Budget 2017,
Revised Estimates for Public Services 2017.

The key issue with the Health budget is that it is currently funding a small number of very large projects, many of which will require significant funding up to 2020. This leaves limited funding, if any, for smaller projects.

The Assistant National Director of Capital and Property in the HSE recently stated that the sector would need a total investment of €9 billion over the next ten years if healthcare policies are to be implemented and existing outdated facilities are to be replaced.⁸⁵ In terms of construction projects, the Capital Plan is investing some €2.3 billion up to 2021. On the basis of a further estimated €2.5 billion in the following five years to 2026, this would still leave a gap of €4.2 billion to be funded.

Current Investment Priorities for Health

- The 473-bed **National Children’s Hospital**, which is currently under construction on the 50 acre campus shared with St. James’s Hospital in Dublin, will be a facility of approximately 160,000 square metres. It is expected that the hospital will open in 2020 and will cost around €1bn.
- The **National Plan for Radiation Oncology** involves four large oncology centres delivered in two phases. Following completion of Phase 1 in Dublin (St. James and Beaumont), Phase 2 involves two additional oncology centres which will be completed in Cork in 2018 and in Galway in 2019.
- The **National Forensic Mental Health services facilities project** was due to commence construction in Q1 2017 at a cost of €170 million. When completed in two years, the facilities will comprise a 120-bed adult forensic hospital, together with a 10-bed forensic child and adolescent unit, and a 10-bed forensic mental health intellectual disability unit on the same site within the St. Ita’s Hospital campus in Portrane, County Dublin.
- The new **National Maternity Hospital** to be provided at St. Vincent’s University Hospital in Dublin will cater for 10,000 births. This project is expected to go to tender in late 2017/early 2018 and is expected to take around 42 months to build at an estimated cost of €300 million.
- The development of **Primary Care Centres (PCCs)** continues with 99 centres already in operation and a further 20 under construction. Thirty PCCs are due to open in 2017/2018. A total of 14 PCCs, comprising a total gross floor area of 40,753 square metres, are being delivered under PPP schemes over the next twelve months.
- Separately, there is also a medium-term requirement to upgrade/replace existing **Community Nursing Units** to meet HIQA (Health Information and Quality Authority) accommodation standards, plus a need for additional capacity. The potential investment required is of the order of €800 million.

⁸⁵ Presentation by the Assistant National Director of Capital and Property in the HSE at the Government Construction Projects and Capital Spend Conference, February 2017.

7. APPENDIX 2: CAPITAL PROVISIONS FOR CORE INFRASTRUCTURE 2017-2019 *Continued*

C. Housing

The total allocation for the Department of the Environment, Community and Local Government in the Capital Plan is €3.96 billion over the period 2016-2021. Within this total, €3 billion is provided for social housing.

Following the 2016 General Election, Budget 2017 allocated €702 million to the restructured Department of Housing, Planning, Community and Local Government for capital expenditure in 2017. €655 million of this allocation is for housing. Altogether, since the Capital Plan, there has been an additional €240 million allocated to the Department for the period 2017 to 2019.

Table 7.3:
Housing, Planning, Community & Local Government:
Exchequer Capital Expenditure and PCP Housing (€m)

	2017	2018	2019
Capital Plan ⁸⁶	623	709	685
Budget 2017	702	788	764
Revised Estimates	705	788	764
<i>Difference (v Capital Plan)</i>	+82	+79	+79
Revised Estimates – Housing (Exchequer only)	655		
PCP – Housing (incl. non-Exchequer)	1,004		

Source:
Capital Plan, Budget 2017, Revised Estimates 2017.

The total PCP provision for Housing, inclusive of non-Exchequer funding, is expected to be €1,004 million in 2017, which is 29 per cent (€226 million) above the corresponding provision for 2016.⁸⁷

The Public Consultation document for the Mid-Term Review of the Capital Plan refers to the additional €2.2 billion of capital investment allocated to the Government initiatives aimed at tackling the housing crisis, as detailed in the Action Plan on Housing and Homelessness. It is expected that the above figures, when updated in the Capital Plan, will include this provision.

D. Transport

The total allocation for the Department of Transport, Tourism and Sport (DTT&S) in the Capital Plan is €8.06 billion during the period 2016-2021, or €10.065 billion when 2022 is included. The total investment in Roads and Public Transport over the seven years is projected at around €6 billion and €3.6 billion respectively.

The Capital Plan allocated €1,015 million to DTT&S in 2017, €1,167 million in 2018, and €1,238 million in 2019. Based on *Budget 2017*, €1,130 million will be available to the Department in 2017, €1,281 million will be available in 2018, and the allocation will be €1,328 million in 2019. These allocations remained the same in the Revised Estimates 2017, but are in total €329 million above the corresponding provisions in the Capital Plan.

Table 7.4:
Department of Transport, Tourism & Sport:
Voted Capital Expenditure (€m)

	2017	2018	2019
Capital Plan	1,015	1,167	1,238
Budget 2017	1,130	1,281	1,328
Revised Estimates	1,130	1,281	1,328
<i>Difference (v Capital Plan)</i>	+115	+114	+100

Source:
Capital Plan, Budget 2017, Revised Estimates for Public Services 2017.

Including non-Exchequer investment, the total PCP provision for TT&S is €1.584 million in 2017, down 1 per cent on the corresponding provision in 2016, and roughly 40 per cent of what it had been in 2008. Within this total, the construction and improvement of roads is allocated €547.1 million, which is 7 per cent below the corresponding provision in 2016.

Of the €6 billion for road investment, steady state funding, which is the funding necessary to maintain, manage and renew the existing road network to keep it in an adequate condition, together with known capital commitments, is estimated at €4.4 billion. After the €600 million allocated to develop the existing pipeline of PPP road projects, and the €100 million for smarter

⁸⁶ Refers to the Exchequer allocation for the Department of the Environment, Community & Local Government.

⁸⁷ *Revised Estimates 2017*, Appendix 9.

7. APPENDIX 2: CAPITAL PROVISIONS FOR CORE INFRASTRUCTURE 2017-2019 *Continued*

travel initiatives, this leaves just €860 million for new priority roads over the seven years. This figure will likely decrease after adjustment for inflation. With no new PPP road projects contemplated in the Capital Plan, the scope for new projects is expected to be delayed until 2020. This implies that shovel-ready schemes cannot be progressed in the short-term, and a surge of procurement and design projects are expected in 2019.

There is a notable absence of the M20 Limerick to Cork motorway in the Capital Plan, which is a key route in the context of the Atlantic Economic corridor and would be important to provide greater connectivity between two major urban centres, and - more generally - between economic clusters in the south-west region. This project is estimated to cost in the region of €800 million, which is roughly equivalent to the total amount (€860m) allocated for new projects in the Capital Plan. Similarly, there are no alternative routes currently in the Capital Plan to address the congestion on the M50. While

some initial research was done on the route proposed by Transport Infrastructure Ireland (TII), the Leinster Orbital Route, this route has been shelved due to cost considerations and the focus on public transport.

The above issues are of immediate concern to the civil engineering sector, as they imply that there is limited scope for new capital investment in road projects until 2020.

As already noted, the total investment in Public Transport over the seven years is projected at €3.6 billion, of which €2.6 billion represents steady state investment. Within the total PCP provision for TT&S in 2017 is €1.584 million; the total investment in public transport is €406.95m in 2017, which is 9.3 per cent below the corresponding provision in 2016.⁸⁸

Pipeline of transport projects

The following National Road projects have planning but most are unlikely to start until 2019 or later:⁸⁹

Project	Status	Start	Finish
M7 Naas Newbridge upgrade	Combined with Sallins B/P & Osberstown Interchange	2017	2020
N8/N25/N40 Dunkettle	ECI contract	2019	2021
N4 Collooney/ Castlebaldwin	Advance works underway	2019	2021
N22 Ballyvourney to Macroom	Advance works underway	2020	2022
N5 Westport to Turlough	Advance works underway	2021	2023
N59 Moycullen Bypass	Section of on-line improvement completed	2021	2022
N56 Mountcharles to Inver	Timescale relates to Phase 1	2017	2019
N56 Dungloe to Glenties	Timescale relates to Phase 1	2018	2019

Other national roads projects which require planning, according to the NRA, include the

- **N72 Mallow Relief Road,**
- **N2 Slane Bypass**
- **N6 Galway City Transport Project,**
- **N21//N69 Adare to Foynes, and the**
- **N28 Cork to Ringaskiddy.**

⁸¹ It is noted that Infrastructure Australia's remit deals with productive infrastructure only and excludes social infrastructure which is a major shortcoming as all infrastructure projects should be considered in terms of their interdependencies.

⁸² <https://www.nic.org.uk/>

7. APPENDIX 2: CAPITAL PROVISIONS FOR CORE INFRASTRUCTURE 2017-2019 *Continued*

The following Public Transport projects are either under construction or are expected to be advanced over the coming years:

- The Luas Cross City project which is under construction and is expected to be open in 2017.
- Green Line Capacity Enhancement project, including platform extensions.
- The first phase of a multi-phase DART expansion programme which includes the extension of the Dart line to Balbriggan in North County Dublin by 2022.
- Further upgrading of the core bus network infrastructure and development of a regional cities programme, with planning and design work to be progressed for two Bus Rapid Transit routes, Blanchardstown to UCD and Clongriffin to Tallaght routes, although these two projects are unlikely to be delivered until after 2021.
- A range of projects under the Smarter Travel initiative, including cycling infrastructure and greenways.

The most substantial project in the Capital Plan is the 16.5km metro rail link in Dublin, Metro North (€2.5bn), to address the transport needs of the Swords/Airport/City-Centre Corridor. This project, if it proceeds, will not commence until 2021 and is expected not to be in operation until 2027.

E. Water

*"The poor state of water services in Ireland is the result of decades of underinvestment combined with a highly fragmented industry structure. As with all Government dependent funding, historically, water services experienced constrained and variable year-on-year funding, resulting in significant underinvestment over many decades."*⁹⁰

According to Irish Water, Ireland's water services are severely stressed and do not meet the needs of a modern economy. The size and scale of the challenge with respect to water and wastewater infrastructure is such that it will take substantial investment and considerable time. Under Irish Water's current capital investment plan, total investment is set to double from 2014 to around €730 million in 2021. The Plan predicts a total investment of the order of €3.2 billion in the period 2017-2021, with a further €8.5 billion investment identified up to 2033. This investment raises a significant challenge as funding will now have to be on balance sheet. The projected investment between 2018 and 2021, at around €2.7 billion, is 1.8 times the unallocated GFCF investment figure (€1.515bn.) to be added in the mid-term review of the Capital Plan.

F. Broadband

The broadband sector is largely privatised but the State has an important role to play in delivering a high quality and reliably connected society. The roll-out of broadband is currently being delivered through the National Broadband Plan. The Plan aims to provide high-speed broadband to 1.6 million (70%) of 2.3 million premises across the country. The remaining 700,000 (30%) of premises are to be covered by State intervention, but will take up to 4 years to roll out.

The Department of Communications, Climate Action and Environment has recently stated that consumers in Ireland are spending €10 per person per day online. With online spending projected to reach €20 billion by 2020, the roll out of a reliable and high-speed broadband infrastructure across the country is critically important to support consumers and SMEs, as well as regional economic growth and job creation. Farming, education, business, health, tourism, communities and government should all benefit from better connectivity

⁹⁰ Irish Water Business Plan to 2021, available at www.water.ie/docs/Irish-Water-Business-Plan.pdf



CIF Headquarters

Construction House

Canal Road
Dublin 6

Phone 01 406 6000

Email info@cif.ie

CIF Cork

Construction House

4 Eastgate Avenue
Little Island
Cork

Phone 021 435 1410

Email Cork@cif.ie

CIF Galway

Construction House

8 Montpelier Terrace
The Crescent
Galway

Phone 091 502680

Email Galway@cif.ie

www.cif.ie

@CIF_Ireland



DKM Economic Consultants

Office 6
Grand Canal Wharf
South Dock Road
Ringsend
Dublin 4

Phone 01 667 0372

Fax 01 614 4499

Email info@dkm.ie

www.dkm.ie
