



**GFCC**

Global Federation of  
Competitiveness Councils

# Innovation through Infrastructure Best Practices in Competitiveness Strategy

2015



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## Best Practices in Competitiveness Strategy

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## INFRASTRUCTURE AS A DRIVER OF COMPETITIVENESS National Competitiveness Council, Ireland<sup>1</sup>

### INTRODUCTION

As a small, open, trade dependent economy, Ireland's economic growth and sustainable employment depend on the ability of businesses to trade successfully in increasingly competitive global markets. The availability of competitively priced world-class infrastructure (e.g., energy; telecommunications; transportation such as roads, public transport, airports, and seaports; and waste and water systems) and related services are critical to support competitiveness, which in turn determines the sustainability of living standards, employment, wage rates and the financing of public services. Ireland's island status reinforces the absolute necessity of ensuring world-class connectivity.

This paper summarizes the National Competitiveness Council's (NCC) views on capital investment, making the case in support of increased public funding. It also provides a framework for prioritizing investment. Special attention is given to the importance of investing in intelligent infrastructure as a means of maximizing returns on investment. Finally, the role of cities in driving competitiveness is considered and the Council's four "cornerstones" for driving city competitiveness are briefly summarized.

### THE CHALLENGE: INCREASING INVESTMENT WHILE MAINTAINING FISCAL STABILITY

As a result of the global financial crisis and subsequent economic recession, Irish GDP declined by approximately 8 percent between 2007 and 2009. Following a period of stabilization, the Irish economy is for now the fastest growing economy in Europe with GDP increasing by 4.8 percent in 2014, and Ireland's GDP per capita remains well above the euro area average and is the fourth highest in the OECD-32.

There was a significant reduction in public capital expenditure over the course of the economic downturn, from approximately €9bn in 2008 to €3.4bn in 2013, although weaker demand for infrastructural services (e.g., reduced road traffic, and declines in energy demand) partially mitigated the impact of this reduction.

The Council believes that there is now a need to increase public capital expenditure, and that public investment in infrastructure should be prioritized and targeted at those areas that can have the greatest positive impact upon Ireland's competitiveness.<sup>2</sup>

There is also a vital private sector dimension to consider as many economic infrastructure areas receive little, if any, Exchequer funding – including energy, telecommunications, waste, and air and seaports infrastructure. Such investment, however, is largely beyond the scope of this paper.

### HOW IRELAND PERFORMS

At present, Ireland is investing significantly less in capital infrastructure than many of our peers and countries against whom we compete for trade and investment. Overall, Irish investment fell by more than 50 percent between peak levels in 2007 and 2013, coinciding with the global recession, although gross fixed capital formation began to recover in 2014 (Figure 1).<sup>3</sup>

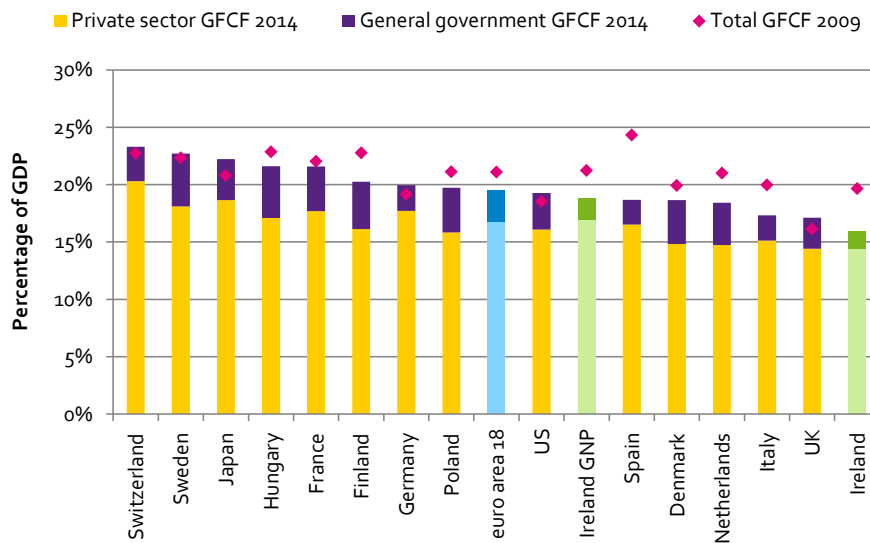
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<sup>1</sup> Through the Minister for Jobs, Enterprise and Innovation, Ireland's National Competitiveness Council reports to the Taoiseach (Prime Minister) and the Government on key competitiveness issues facing the Irish economy and offers recommendations on policy actions required to enhance Ireland's competitive position. The Strategic Policy Division of the Department of Jobs, Enterprise and Innovation provides the Council with research and secretariat support.

<sup>2</sup> Land transport accounts for the bulk of publicly-funded economic infrastructure. A Strategic Framework for Investment in Land Transport is currently being developed; in August 2014, the Department of Transport, Tourism and Sport published a draft strategic framework for consultation.

<sup>3</sup> Gross fixed capital formation (GFCF) measures the value of acquisitions of new or existing fixed assets by the business sector, governments and households less disposals of fixed assets. GFCF is a component of GDP, and illustrates how much of the new value added in the economy is invested rather than consumed.

Figure 1: Gross fixed capital formation (GFCF), current prices (% GDP), 2014

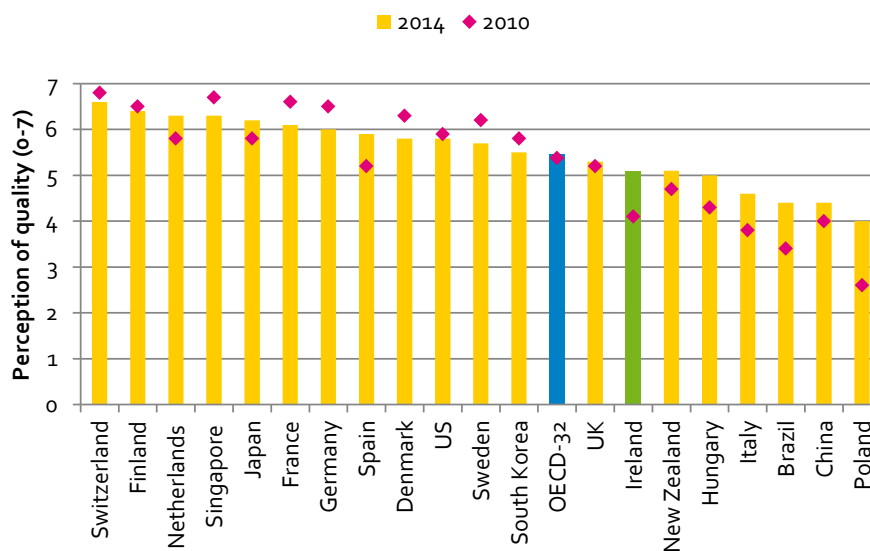


Growth in investment resumed in 2014 and further growth is forecast for 2015, likely to be driven primarily by increases in private sector investment. In GNP terms, Irish private investment (17 percent) exceeds the euro area average (16.8 percent), while public investment (1.8 percent) is significantly below average (2.8 percent).

Source: European Commission, AMECO Database

In terms of the impact of this investment, a range of international benchmarks, mostly qualitative in nature, are available comparing the stock and quality of infrastructure in Ireland against our key competitors.<sup>4</sup> The WEF’s Executive Opinion Survey assesses perceptions about the quality of Ireland’s infrastructure vis-à-vis perceptions in other countries (Figure 2).

Figure 2: Perception of the quality of overall infrastructure, 2014



Ireland’s score has improved (from 4.1 to 5.1) since 2010, but perceptions of quality in Ireland still lag the OECD average (5.5) and are well behind leading performers. In the IMD’s World Competitiveness Yearbook 2015, Ireland’s infrastructure ranking dropped 4 places to 24<sup>th</sup>.

Source: World Economic Forum

## THE POLICY CHALLENGES

### Increasing Investment

As the economy returns to strong growth, the Council has argued that it is time to reverse some of the cuts to the capital expenditure budget imposed over recent years. Capital investment (as a percentage of GDP) should at least mirror levels in competitor countries that are at a similar stage of infrastructural development.

<sup>4</sup> Perception-based indicators do not necessarily reflect the progress made in recent years, or take relativities between countries into account.

Boosting investment would help address competitiveness bottlenecks, and would increase potential growth in the medium term, while also increasing aggregate demand in the short term. Investment can also contribute towards unlocking the potential of regions to grow.

Ireland's likely demographic profile also necessitates an increase in investment. Ireland's population is expected to increase from 4.57 million in 2011 to between 4.85 and 5.31 million by 2026, and to between 5.0 and 6.7 million by 2046.<sup>5</sup> Additional infrastructure will be required to meet the demand generated by this larger population.

Government must also be ambitious in tapping external sources to fund infrastructure (e.g., the European Investment Bank, and institutional lenders such as pension funds, etc.).

### Leveraging Private Sector Investment

The State has a critically important role to play in encouraging private service providers to improve infrastructure capacity and deliver more cost-effective, higher-quality services to business users. We need to ensure the right policy framework is put in place to stimulate investor confidence in long-term projects (e.g., regulatory and planning certainty), and ensure the supply chain has the certainty and tools to deliver effectively.

### Evaluating, Prioritizing and Targeting Investment

Well-targeted capital investment can influence economic growth performance by boosting long term potential output, and by improving productivity and competitiveness through efficiency gains and reduced average production costs. The Council recommends that investment be prioritized to maximize impact; while the short-term stimulus effect of capital spending is welcome, it is critical that the current review (referenced above) prioritizes investment based on long-term competitiveness gains.

Clarity is required regarding the evaluation process for prioritizing capital spending. The Council believes that this should be evidence-based, using a sound methodology based on benefit-cost principles. The methodology, evaluation and results should be available for public scrutiny.

Targeted investment should anticipate future demands to the greatest extent possible. The development of a new national spatial strategy should also support prioritization. The range of infrastructures to support competitiveness includes:<sup>6</sup>

- *Urban Transport:* An efficient and integrated national transport system with adequate capacity and service levels is vital to move goods and people quickly, effectively and in environmentally sustainable ways. We need to enhance urban mobility in Dublin<sup>7</sup> and the other city regions by ensuring existing resources are focused on providing public transport services that best meet changing customer needs and provide high quality access to, from and within the main cities.
- *Inter-urban Transport:* A number of bottlenecks in the road network should be addressed to capture the full benefits of previous investments in road and other infrastructures. In particular, there remains a need to improve access between and around the main regional urban centers and to enhance access to the regions, critical for supporting the tourism sector.
- *Telecommunications:* Enhancing Ireland's international and national connectivity is critically important to support the future needs of existing and new companies in ICT, digital media and other data intensive sectors. The Council recommends that Ireland prioritize the investment required to deliver the Government's commitment to provide fiber-based broadband services to all parts of the country. In

<sup>5</sup> The CSO has produced projections of both the total population (classified by age and sex) at five-year intervals for the period 2016 to 2046 and of the total labor force (classified by age, sex and female marital status) for the years 2016, 2021 and 2026. These ranges reflect various assumptions relating to future trends in fertility, mortality, migration and labor force participation. Two sets of assumptions were chosen for fertility, one for mortality and three for migration up to the year 2046, giving six sets of results. See CSO, Population and Labour Force Projections, April 2013.

<sup>6</sup> While energy and waste infrastructure is not funded directly from public capital expenditure budgets, public policy has a critical role to play in ensuring that the private sector invests in a timely manner to ensure that the current and future needs of enterprise are met. Energy investment is required to ensure adequate regional/local spare network capacity, especially in the main urban centers. Greater interconnection is also a priority, while a range of integrated and diversified waste treatment options are required along the waste hierarchy.

<sup>7</sup> Within Dublin, delivery of the actions outlined in the National Transport Authority's investment plan for the Greater Dublin Area should be prioritized to fully capture the benefits of existing infrastructure (e.g., Luas Cross City and the re-opening of the Phoenix Park Tunnel).

particular, it is recommended that Ireland accelerates (through market reform and, where necessary, State investment) the availability of competitively priced, advanced broadband services that offer significant upload capability (including widespread availability of symmetric services for enterprise), low latency and low contention ratios in all urban centers where they are not or will not be available in the short term. Mandatory sharing of specified infrastructures (e.g., mobile phone masts) should be considered.

- *Water services:* A strategic medium to long-term approach to investment planning is required, one that balances the need for quality water services with the need for cost competitiveness. In the short term, it is vital that the current water services constraints in Dublin are addressed urgently to ensure that the region has sufficient supply to meet future demand. To support regional development, Ireland needs to establish sufficient capacity to support expansion plans and new developments, especially in the large regional urban centers. In particular, providing the required water services capacity and quality levels in enterprise agency strategic sites, business parks and strategic development zones should be a priority. The Council also recommends a strong focus on reducing leakage nationally.<sup>8</sup>
- *Housing:* In the context of rapidly increasing rents and residential property prices, an expansion in the supply of housing is urgently required, particularly in Dublin. This will help alleviate pressures elsewhere in the housing market. Innovative approaches to funding (including off-balance sheet funding) should be developed, and mechanisms to harness private institutional and charitable investment in social housing should be considered, in addition to enhanced direct provision.

## NCC FOCUS: MAXIMIZING RETURNS ON INVESTMENT THROUGH INTELLIGENT INFRASTRUCTURE

The NCC believes that the public capital program should recognize the impact that investment in intelligent infrastructure can have on national competitiveness.<sup>9</sup>

The significant economic challenges facing Ireland and the need to address infrastructure deficits have focused attention on the potential for using smart technology to fulfill infrastructure objectives. By optimizing the capacity of assets that are already in place as well as future assets, intelligent infrastructure can play a substantial role in reducing the burden on the Exchequer and freeing up scarce capital resources.

In addition to reducing the need for capital expenditure, smart technology can be used to create revenue-raising opportunities for the Exchequer, and improve national competitiveness through reduced business costs (e.g., less congestion) and more productive use of resources.

### What is Intelligent Infrastructure?

“Intelligent infrastructure” or “smart infrastructure” is the application of technology to deliver a more effective and efficient infrastructure service. It uses a layer of technologies, which can be embedded in the design of new infrastructure or applied to existing infrastructure.

Intelligent infrastructure can apply to a systemwide application, for example, the development of smart electricity grids. It can also be targeted at a specific element within the infrastructure chain, for example, the use of sensors to detect the presence of a toxin at a landfill site.

While the ability to apply technology to infrastructure assets has existed for some time, rapid advancements in sensor, communications and analytical technologies mean that intelligent infrastructure is a relatively new phenomenon. Research, development and deployment of smart technologies are ongoing in a wide range of infrastructures.

Across the world, policymakers, infrastructure providers, researchers and enterprises are working to develop solutions that use advanced technologies to address infrastructure challenges in more efficient ways. It is not surprising, however, that infrastructure solutions usually emerge in response to a particular issue or deficit faced by a country or region. For example, faced with crippling congestion, Singapore has become a world leader in intelligent transport systems.

<sup>8</sup> Water will be privately funded in the medium term when Irish Water becomes self-funding.

<sup>9</sup> For a more in-depth discussion of this topic, see Forfás, *Intelligent Infrastructure: Delivering the Competitiveness Benefits and Enterprise Opportunities*, 2011.

### Delivering on the Potential of Intelligent Infrastructure

To fully realize the benefits of investment in intelligent infrastructure, a range of barriers must be overcome. At a broad level, the Council recommends that:

- Policymakers explicitly outline the potential for intelligent infrastructures to maximize the value of existing infrastructure and its potential to enhance the value of future investments.
- An assessment of the potential for intelligent infrastructure to substitute for or complement traditional capital investment be undertaken as part of public capital investment appraisal processes.
- Given the cross-infrastructural synergies of smart technology, a more integrated approach to infrastructure planning would facilitate improved efficiency, effectiveness and competitiveness.
- Consumer concerns regarding privacy, data security and costs be addressed through cooperation among consumer and citizens' rights groups, infrastructure providers, utility regulators and the Commissioner for Data Protection.
- The provision of fiber-based broadband services to all parts of the country is progressed to support intelligent infrastructure deployment.

### NCC FOCUS: PUTTING CITIES ON THE COMPETITIVENESS MAP

Cities play an increasingly crucial role in enhancing competitiveness in modern knowledge-based economies.<sup>10</sup> As people become more mobile and firms more selective about where they locate, competitive cities have emerged as magnets for talent and investment.

The majority of the population, businesses, jobs, innovation systems and higher education institutions are concentrated within Ireland's cities and their hinterlands. They are hubs of international trade, transport and communications, and attract higher numbers of immigrants and tourists than other more rural areas. Our cities, therefore, play a critical role in driving national competitiveness and national income levels.

The concentration of more and more of the Irish population, enterprise activity, innovation networks and cultural amenities in cities and their hinterlands, as well as the presence of higher education institutions, has unfortunately created a sense of ambivalence about the central role our cities play in supporting national economic growth and standards of living.

The National Competitiveness Council has played a key role in the debate about the role of cities, arguing that it is critical that both national and regional policies support the development of Dublin (the capital city) and Ireland's other main cities. Central to this work has been the idea that the development of our cities is fully understood as being in the national interest. The challenge is not the redistribution of resources between Dublin and the rest of the country, but rather of enhancing the competitive advantages of Dublin and other major urban centers as drivers of overall national prosperity, and contributors to social cohesion and wellbeing.

In seeking to enhance our understanding of the role they play driving competitiveness, the Council has outlined four cornerstones for city competitiveness, each of which is outlined briefly below.

#### Enterprise

The development of an enterprising city is influenced by a sectoral mix of firms weighted towards high value industries, the availability of a skilled workforce and competitive costs of doing business. As Ireland has targeted high-tech, high-value internationally trading sectors, Irish cities have developed sectoral specialisms, for example, medical technology in Galway, software and financial services in Dublin, pharmaceuticals and chemicals in Cork, and ICT hardware in Limerick.

Given the small size of Irish cities and their proximity to one another, the NCC believes that Irish cities should endeavour to have a relatively wide sectoral mix. Building on significant progress in recent decades, further potential exists to enhance the depth of local education and innovation systems in Irish cities. Despite improvements, third level institutions in Irish cities are not yet among the best in the world and there are significant disparities in secondary level student performance among neighborhoods within our cities.

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<sup>10</sup> The NCC has previously written on cities in more detail in NCC, *Our Cities: Drivers of National Competitiveness*, April 2009.

### Connectivity

Successful cities have the physical and electronic infrastructure to facilitate trade and business, and to move goods, services and people quickly, efficiently and in environmentally sustainable ways. External connections, such as airports, seaports and adequate internal road and public transport are vital. The airport and seaport in Dublin are significant national assets. The completion of the inter-urban motorway network will improve travel times and the connectivity of national air and seaports.

However, Irish cities are highly car dependent and average peak hour speeds in Dublin are very low by international standards. It is critical that infrastructure systems are integrated and that ICT is utilized.

### Sustainability

A sustainable urban environment enhances the competitive performance of our cities in a variety of areas. It improves quality of life, maximizes land use potential, attracts more overseas talent and tourists, and reduces negative environmental costs. Policy areas of specific importance to ensure sustainable city competitiveness include land use policy and planning, and transport and environmental sustainability.

Much of the city development of recent years has been extremely positive, for example, modernizing and revitalizing previously dilapidated and abandoned areas in the center of cities. However, urban development has been accompanied by sprawl, as growing numbers of people have located in expanding commuter belts around our cities. Poor planning decisions and a failure to properly coordinate private development with public infrastructure and service needs have affected the quality of life and competitiveness of our cities. This has also previously resulted in excessively high house prices, severe traffic congestion, long commuting times, and increased pressure on local authority services such as water and waste. These risks can re-emerge as the economy returns to growth.

### Attractiveness and Inclusiveness

Cities are competing for citizens, workers and investment. Competitive cities are attractive and inclusive, and these characteristics are nurtured when disparities are minimized and social exclusion is avoided. A cohesive society enables all of its members to be active participants and contributors, enabling individuals to achieve their goals and communities to exploit their economic and social potential. It also reduces criminality and negative reputational effects. Vibrant recreational, entertainment, cultural and sporting infrastructures are also key to enhancing city attractiveness. Irish cities perform relatively well in terms of international benchmarks.