Engineers Ireland
Submission to 'Ireland 2040 - Our Plan'
National Planning Framework

For the attention of the Department of Housing, Planning, Community and Local Government
Custom House, Dublin 1

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Introduction

Engineers Ireland welcomes the consultation process approach taken by the Department of Housing, Planning, Community and Local Government (DHPCLG) to the National Planning Framework. Infrastructure planning is the key to enabling prosperity, wellbeing and long-term growth, and should be divorced from the electoral cycle. Current planning in Ireland has been inadequate for the country's needs and frequently based on a short-term and local view. Engineers Ireland welcomes a new approach based on long-term modelling and evidence-based solutions. This approach is required to ensure the country has a sustainable platform to support and enhance the recent economic recovery. We also know that a long-term mindset in the order of 20 years is required to make this kind of commitment possible.

There are a large number of Key Questions raised for discussion under Chapters 3 to 7 of the Issues and Choices document, and we will respond to a number of those questions, particularly focussed on the areas where Engineers Ireland has had a history of engagement and policy development.

People's Health and Wellbeing

In a simple way, the key elements of quality of life in society revolve around

- Where the people are living
- Where the jobs are located
- Where health, education, cultural and retail services are located
- How to connect the people to the jobs and services

Ideally, everybody would live close to their place of work, and also close to all essential services. In reality, compromises must be made based on cost and availability of housing, age and size of the family unit and type and range of employment on offer.

Are there key priorities the NPF can identify to ensure better or improved health and wellbeing of people and places in Ireland?

We strongly support the assertion in Chapter 3 that the built environment is an important determinant of health. As clearly set out in section 3.2.5, very low levels of housing,

particularly higher-density, city-located housing, have been constructed since 2008. Appropriate planning for the location of housing to be provided in the coming years and decades is critical.

Emphasis is placed in the Alternatives to Business As Usual section on reducing car dependence, and on greater policy integration and joined up investment decisions across the planning, health and transport policy sectors to generate more attractive alternatives to the private car. Engineers Ireland strongly supports the need for, and emphasis on greater policy integration in this respect, and in relation to many of the other infrastructure provisions that will be required to produce the desired positive impacts on health and wellbeing for the citizens of Ireland. Within the cities, and particularly in the largest population centres of Dublin and Cork where the health and social impacts will be greatest and alternative transport solutions are feasible, a clear focus on reducing car dependence is welcome. Engineers Ireland is strongly supportive of the National Transport Authority document, "Transport Strategy for the Greater Dublin Area 2016-2035" which deals with a timeframe similar to that of the National Planning Framework and clearly lays out the key transport infrastructure developments needed in the GDA to support continued economic growth over the next 20 years.

Reference is made in sections 3.2.8 to 3.2.10 to our high car dependency rate, with 69% of commuters currently travelling to work by car. It must be recognised that outside of the cities, the relative low densities of population that have evolved in Ireland dictate, and will continue to dictate, that a roads-based transport solution is the only feasible approach to facilitate movement of people and freight. Ireland has a low population density by international standards, at 67 persons per square kilometre compared to the EU28 average of 117 persons/km^2. Households, firms, public and private transport service providers (passenger and freight), emergency services and cyclists will all continue to share road space to undertake activities and meet their mobility needs.

Accordingly, a clear focus on the early and continued development and adoption of electrically powered vehicles, with electricity generated from renewable sources, is vitally important in simultaneously addressing the over-riding challenges of Chapters 3, 4 and 5, viz. Health and Well-Being, Place-Making Strategies and Sustainability as they relate to Ireland outside of the large cities.

A Place-Making Strategy

Rural living is characterised by a particularly low density of population. A significant attraction of rural living, particularly post-2000, has been the relatively low direct cost of housing provision on a square metre basis and on a plot size basis when compared to the cost in larger and more densely populated cities and large towns, particularly Dublin, Galway and Cork. Accordingly, there have been economically rational decisions by individual home owners to move to the rural areas relatively close to surrounding large cities, giving reasonably quick access to employment and the various services provided by the large cities, without the additional direct cost to the home owner of purchasing housing units at higher rates. The evidence is clear that outside of the Greater Dublin Area, most of the population increase between 2001 and 2011 has been equally shared between rural areas and medium size towns, with lower population growth in the second tier cities.

While this approach is economically rational at the individual home owner level, it has a number of negative consequences at societal level. There is the economic reality that the provision of key infrastructure – transport, water, wastewater, waste disposal, energy and communications – is much cheaper to provide when land use densities are high and the resultant networks are dense. The growth in rural housing, particularly one-off housing, dictates that the cost of provision of key infrastructural services becomes much more expensive and impractical. This reality is often not appreciated with demands for service levels in low density population areas aligned with the service levels provided in densely populated cities.

In addition, the growth in population outside of the city and large town areas significantly reduces the growth of population within the city boundaries. In turn, it becomes much more difficult to attain a significantly larger critical mass of population with the associated civil, cultural and retail services supported by the larger population that is required to attract national and international employers to the city regions. Additionally in this scenario, provision of a range of sustainable and attractive transport options is not possible, due to the low absolute number of people within the city. Planning and providing key infrastructure services is much more difficult, with longer payback periods and uncertainty around appropriate future capacity.

Taking on board all of the relevant environmental and physical capacity issues, what role should our cities have as part of the NPF?

The data outlined in Tables 4.1.1 and 4.1.2 is compelling. Dealing only with the Republic of Ireland, it is clear from table 4.1.1 that in comparison to other countries of broadly similar population, Dublin has a very high share of national GDP (48%) compared to a range of values from 33% to 43% for Denmark, New Zealand, Scotland and Finland.

An examination of Table 4.1.2 shows that there is only one city (Cork) with a population of greater than 100,000 compared with a range between 3 and 6 cities for the comparable countries. Further, there are only three cities in the Republic of Ireland with populations of between 50,000 and 100,000 (Limerick, Galway and Waterford) compared with a range of between 6 and 11 in the comparable countries. Engineers Ireland strongly supports the use of appropriate planning and infrastructure investment decisions to “scale up” our existing cities as centres of regional economic growth. This managed growth, allied with appropriate land-use planning and employment creation, should be the primary means of catering for the projected population increase of c. 750,000.

How might we develop one or more strong regional complements to Dublin that can address their whole-city region, including interactions between settlements?

Engineers Ireland is strongly supportive of an all-island approach to connectivity and growth. In particular, a strong emphasis on the growth of our key coastal city regions is advocated. These centres, Dublin, Dundalk/Drogheda, Belfast, Derry-Londonderry, Sligo, Galway, Limerick, Cork and Waterford must be developed to act as regional magnets for population and employment growth, generating a critical mass of employment and housing to attract further industry and services growth as well as supporting an enhanced range of local services and attractions.

We are in agreement with the vision for a broad connection between Limerick/Shannon, Galway, Cork and Waterford set out in the "Atlantic City Regions: Development and Connectivity" document produced in 2015 by the Irish Academy of Engineering. This document analyses in considerable detail, both the potential for, and current obstacles to, enhanced growth through improved connectivity across a range of areas including energy, transport, water/wastewater and complementary employment growth through industry concentration.

In addition, significantly improved connectivity between Galway, Sligo, Derry-Londonderry, Belfast and Dundalk would similarly enhance the attractiveness of all of these centres, providing focal points for growth throughout and between the regions. It should also be pointed out that these centres already have many of the attributes required for locational advantage with port facilities, regional hospitals and third level institutions already in place.

In summary, we believe that the National Planning Framework must:

1. Support growth in Dublin and the Greater Dublin Area, as Dublin is already of a sufficiently large scale with many of the positive location attractors to continue to prosper as an internationally significant city;
2. Focus on stimulating growth in a limited number of cities with the aim of very significantly scaling up these cities in terms of population, employment and social, cultural and retail services, and improving their location attractors;
3. Facilitate commuting to larger cities from urban centres in the regions, and support growth in larger towns;
4. Sustain quality of life for rural areas. If further development is to happen in rural areas it should be confined to towns and villages.

Ultimately, we are still dealing with the same key urban areas identified in the Buchanan Report and in the National Spatial Strategy, but we must link these urban areas to one another and to their regional hinterlands much more effectively than in the past.

Unique Environment - Sustainability

What strategic energy infrastructure is needed to support the economy and society and realise the transformation of Ireland's energy system to meet climate change and energy obligations?

The Engineers Ireland "State of Ireland 2016"report examined in detail current and future energy requirements in Ireland with a clear focus on the individual areas of electricity, heating and transport energy. As a member of the European Union and the global community, our commitments under the EU renewable energy directive and COP21 mean that we have to develop a more efficient and sustainable energy system, moving away from fossil fuels and greenhouse gas (GHG) emissions. This type of shift to renewable fuels requires investment in new technologies and infrastructure to support the transition from a high-carbon, fuel import economy to one that is carbon free and practically self-sufficient. This transition period will require leadership and long-term planning to develop and build the infrastructure required. Courageous decisions will have to be made now to ensure that future generations enjoy a carbon-free society by 2100.

Engineers Ireland recommends that to support the aim of the National Planning Framework in creating conditions for sustainable development on a regional and national basis, we need to diversify the electricity fuel generation mix, expand the renewables base, explore technology solutions such as energy storage and further interconnection, and maintain investment in the transmission and distribution networks.

The decarbonisation of Ireland's electricity is happening gradually and inexorably but the move away from the predominant use of fossil fuels in transport and heating energy towards electricity as the primary energy source in these areas will have a major impact on electricity generation and distribution in Ireland. Capital expenditure will be required to build the infrastructure necessary to supply the energy to power a larger electric vehicle fleet for example, while a 'smart grid' network is essential to manage Ireland's future energy fuel mix and consumer demand. Continued investment in additional network and smart network strategies is essential to meet customer needs so they can decide how they consume their electricity**.**

District heating is a goal of the new Energy White Paper and is a proven method of increasing energy efficiency. While it has been successfully implemented in many other European countries it has not been deployed to any significant extent in Ireland. One of the key advantages of district heating networks is the efficient use of surplus heat from "low grade" combined heat and power plants (CHP), waste incineration plants, waste heat from industrial processes, natural geothermal heat sources, and fuels which are more easily used centrally, including renewables like wood waste and residues. The development of district heating networks when coupled with CHP and the use of indigenous fuels could help meet Ireland's renewable heat target (RES-H) and lead to a reduction in Ireland's greenhouse gas emissions and external energy dependency.

Significant economies can be achieved with the right applications, such as high heat densities in towns and cities using biomass fuel. There are opportunities for combined heat and power systems (CHP) which can, with proper thermal storage, become part of the smarter electricity grid. However, suitably high population densities will be required to make district heating economically viable, and this will only be achieved through a clear focus on enhanced development of the targeted cities outlined in the Place Making discussion.

Future Development - Infrastructure

How can we ensure that the provision of infrastructure can be planned to match future demand and how can the NPF reflect this?

It is of paramount importance that the country has the necessary capital infrastructure to meet economic demand in the coming years, as well as a skilled labour force ready to create and fill the jobs of the future.

The TASC report "The Need to be Ambitious: Greater Investment Ensures Prosperity" clearly sets out that investing sensibly in infrastructure gives a positive return on expenditure. The provision of infrastructure in the energy, transport, water/wastewater and communications areas are already subject to economic benefit/cost analysis, and this must continue to be the case for all planned or proposed infrastructure projects. However, with existing levels of

investment at 2 per cent of GDP, it is clear that current and planned infrastructural spending is far too low and the TASC report estimates, based on international comparisons, that investment must be in the order of 4 per cent of GDP to meet our infrastructural needs and adequately support future growth and prosperity.

Infrastructural development will be an essential contributory factor to Ireland's future growth and prosperity. High-quality infrastructure is a critically important element of a modern society and economy. Engineers Ireland firmly believes that our public investment programme must increase significantly if we are to meet increased demands for a modern European public infrastructure that can support the 2040 National Planning Framework goals and aspirations.

The 2016 Global Competitiveness Review (GCR) report examining Ireland's relative competitiveness has ranked "Inadequate supply of infrastructure" as the most problematic factor for doing business. The GCR suggests that "*Well developed physical and digital infrastructures affect productivity directly by connecting economic agents, reducing transaction costs, easing the effects of distance and time, facilitating the flow of information, and facilitating integration of markets into global value chains*". Ireland's infrastructure ranking has declined each year since 2012 in these rankings.

Any barriers to the free movement of people or goods impact on the quality of life of citizens, their health and well-being, and the economy. Maintaining this capability of free movement necessitates forecasting for future events. Investment in infrastructure improves accessibility and promotes economic growth often through attracting increased tourism and creating employment.

Given the inadequate level of investment in infrastructure in recent years, coupled with the high economic growth rates over the past few years, it is inevitable that current congestion and future lack of capacity will hamper growth and employment in the coming years without swift, targeted action. Existing bottlenecks across the full spectrum of public infrastructure can be dealt with quickly if resources are made available, as these bottlenecks are already recognised and defined in strategic plans produced by Government, semi-state and local authority bodies.

There must be a clear understanding that we should be providing civil (transport, energy, water/waste water, communications, waste) and social (education, social housing, health, leisure) infrastructure in advance where possible to facilitate growth and orderly land use planning. It is much more difficult and costly to have to retrofit infrastructure solutions into a congested and expensive urban environment.

Implementation and Governance

What barriers exist to implementation?

Planning and delivery of our infrastructure is spread across Government departments, each competing for finite funding with little central oversight. Engineers Ireland believes that an independent assessment of our long-term infrastructure needs is required, together with the establishment of a single infrastructure unit, charged with sustainably planning and integrating investment in key critical areas like transport, education, health, energy and the digital economy.

Engineers Ireland has advocated for the establishment of a single entity charged with prioritising integrated infrastructure development in this country. There are many examples internationally of how such an entity could be structured to best support the determination and implementation of policy on infrastructure – decoupled from the electoral cycle. This entity would also be responsible for co-ordinating a long-term, cross-sectoral approach to building political and public consensus and understanding on national infrastructure performance, under a range of possible futures.

A culture change in how we approach long-term planning and infrastructure is undoubtedly required. We can learn from other jurisdictions, such as the UK, which has established the National Infrastructure Commission (NIC). The Commission was set up on an interim basis in 2015 and looks at the UK's future needs for nationally significant infrastructure, taking a long term approach to the major investment decisions facing the country. It was established permanently as an Executive agency of HM Treasury in January 2017.

The aim of the NIC is to enable long term strategic decision making to build effective and efficient infrastructure for the United Kingdom. A new report, "Strategic Infrastructure Planning: International Best Practice" produced by the OECD for NIC and published in March 2017 sets out and elaborates on the following key points:

1. Systemic risks can be reduced where projects form part of a broad and long-term strategic plan;
2. Strategic infrastructure planning nevertheless carries its own risks;
3. When it works well, strategic planning can set out a stable set of priorities for future investment with durable cross-party support;
4. A successful infrastructure planning process balances a stable framework with maintaining flexibility;
5. The planning process requires clear objectives, a degree of independence and an open, collaborative approach;
6. The planning methodology needs to address risks and uncertainties, take into account binding policy constraints and include considerations of pricing the use of infrastructure;
7. A top-down approach to infrastructure planning to complement traditional project-by-project assessment is essential to a strategic assessment of long-term economic infrastructure needs across sectors;
8. Infrastructure planning across sectors can help identify the most important systemic risks early;
9. Using analytical methods such as a scenario-based approach to analysis can be helpful in future-proofing infrastructure plans;
10. It is important to consider how demand for scarce infrastructure can be managed;
11. A top-down approach could foster the development of an analytical framework for investment decisions reflecting both demand and supply side considerations.

Engineers Ireland supports a top-down approach to infrastructure planning to complement and enhance the sectoral and project-level approaches currently undertaken in Ireland. This would greatly assist both in the development of integrated plans aligned with the ultimate vision of the National Planning Framework, and as a means of consistently reviewing the progress of the NPF over time. It would also facilitate alignment of the NPF vision and goals

with the Government multi-annual Capital Plan, an essential requirement if the NPF is to move forward beyond plan development and into implementation.

ENDS

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Background to Engineers Ireland

With over 23,000 members from every discipline of engineering, Engineers Ireland is the voice of the engineering profession in Ireland. Engineers Ireland was established in 1835 making us one of the oldest and largest professional bodies in the country.
Members come from every discipline of engineering, and range from engineering students to fellows of the profession.

Our responsibility is to

- Promote knowledge of engineering
- Establish and maintain standards of professional engineering and engineering education
- Provide opportunities for Continuing Professional Development (CPD)
- Maintain standards of professional ethics and conduct
- Ensure that professional titles are granted to qualified candidates
- Act as the authoritative voice of the engineering profession in Ireland

Our Vision Statement

Engineers Ireland: a community of creative professionals delivering solutions for society.

Our Mission Statement

Engineers Ireland is an organisation that enables the engineering community to progress their professional development, make an impact on society and encourage and educate the future generations of engineers.