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The rail theory of everything - part two: What's stopping housing for good

In part two of our investigation into urban planning, we explain how a concerted effort to get the most out of our assets would solve Ireland's knottiest problem. However, it is dependent on certain things.

24th Mar, 2022 - 17 min read

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Looking south over Chatswood, to St Leonards and Sydney City in the distance.

Sean Keyes
Finance Correspondent



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esterday, we published the first part of **The rail theory of everything: a plan to make billions for the state, cut emissions, improve health, create nice places – and fix the housing crisis for good.** (<https://thecurrency.news/?p=72658>)

The basic idea is that it's easier to build a city around a high-performing transit network than it is to build a high-performing transit network around an existing city. So that's what we should do.

Building around a rail network has some big advantages. It scales, so you can house ten or hundreds of thousands of people in relatively few locations. It results in high quality, low emissions, mixed-use communities. And putting together the development, by installing the rail infrastructure and loosening zoning rules – can be richly profitable for the state. These places are called transit oriented developments, or T.O.D.'s.

Today, I want to talk about the three building blocks to a successful T.O.D.: getting the planning rules changed; getting the right collaboration between government agencies and private builders; and getting the rail infrastructure in place.

The rail bit

A commuter rail line can move up to 50,000 people in each direction per hour. By comparison, the M50 motorway can move about 8,000.

But a rail line moving 50,000 per hour is a seriously high-performing rail line. You're talking about each carriage with a built-in electric motor for fast acceleration and deceleration, and no turnaround time (since electrified trains can go forward or backward); and separated tracks so the trains can run up to 24 times per hour. 50,000 people per hour is the limit of what's possible, *if* we do everything right. So what would we have to do?

The biggest investment is separating commuter trains from the other lines. To maximise frequency, every train on the line has to be running on the exact same schedule. When commuter trains have to share tracks

with intercity trains, their frequency and capacity drops by 60 per cent or more.

Ideally, you'd want double-tracked lines, so the intercity trains could do their thing and the commuter trains could do theirs. And as luck would have it, Ireland already has a couple of double-tracked lines close to Dublin City. The Dublin-Cork Line, Dublin-Belfast Line and the DART are double-tracked.

That's a great start. But there are two further problems. One is that the big stations, like Heuston, are a bottleneck. The other is that Heuston Station is at the edge of the city — it's a further journey from Heuston to most places of work.

To solve both of these problems, we need the DART interconnector tunnel. The tunnel would allow trains to move through bottleneck points like Heuston Station uninterrupted. It would unlock job-heavy areas at new stations across Central Dublin. And it could link up with the existing DART, which would dramatically increase the number of locations served by the network.



Kings Cross in Central London: will be home to 40,000

Instead of building a full-on interconnector tunnel, what we're doing is making use of the Phoenix Park rail tunnel, which will connect Heuston to the North Quays via Glasnevin and Cabra. This tunnel is good in that it already exists. It's also good in that it expands the network a fair bit. But since the tunnel shares track with other services, it suffers from the bottleneck problem, and its capacity will be limited. "The problem with [the Phoenix Park tunnel] isn't really proximity, it's more of the frequency. It does help, but it will have limited growth potential because it is tangled up in the regular Cork service and the Maynooth line as well," said Dermot Hanney, an Irish planner based in London. A fully separated interconnector tunnel could be expected to run up to 20 trains per hour. Whereas the Phoenix park tunnel will allow around six to ten trains per hour.

Capacity hasn't been such a big deal up to now, because there isn't a huge excess demand for commuter rail. But if we're talking about intentionally maximising demand for commuter rail by building homes along rail lines, capacity matters a great deal. "If you take your current service versus maximum capacity, there's actually quite a big gap there, and that leaves a lot of potential for what you could do with that spare capacity," said Hanney.

If we wanted to max out the potential of the line between Heuston and Naas, or along the new DART Plus around Maynooth, we'd be looking at building multiple new stations with 10,000 or more homes at each one. For that to work, we'd need the capacity and the expanded reach provided by the interconnector.

Rail-based developments are good because they fit naturally with a bunch of other good things. I've already talked about the benefits to health, walkability and placemaking. Another is that rail development lends itself to mixed uses.

A T.O.D. wants to have mixed uses because it wants to maximise the value of the rail network. Unless the stations have a mix of both homes and jobs, you get everybody travelling in one direction to get to work in the morning and the opposite direction to get home in the evening, with nobody travelling its the other direction.

Prof Renne said: "Getting the jobs / housing balance correct along the corridor is important — not necessarily trying to put all the jobs in the city centre, and all the housing on the outside. Because if you intersperse both jobs and housing along the entire corridor, you won't have full

trains in one direction in the morning and empty trains going in the other direction. You'll have trains that are more balanced going in each direction.”

Each stop needs more than just houses and apartments. It needs jobs and services too. “Generally, you need a really strong employment base. So it's not just the 12 or 15,000, or 20,000 households near the station, but it gets into the number of jobs nearby also. You'd probably want to see at least half that number — or more — of jobs,” said Professor Renne.

If you have thousands of people passing through these stations every day, on their way home or on their way to work, the obvious next step is to sell them things. In Japan and Hong Kong, the big rail stations are like public squares. They have meeting spaces, shopping centres, bars and restaurants. They are the focal point for the local community.

In order to justify the investments in tunnels, electrification, and rolling stock, it would make economic sense to do all these things along the rail corridor. The more homes, jobs, and services the better. The stretch of rail between Heuston to Naas could become, not just a place to store people, but a significant new business and cultural centre for the entire country.

I'm using the Heuston to Naas stretch as an example because it's the spot where there's practically unlimited potential. It is empty, and it's on a double-tracked rail line (apart from a 5km stretch outside Heuston), and hundreds of thousands of people could be accommodated there easily.

But it's far from the only example. The metro, when it's built, will have huge capacity, and will create huge value in North Dublin (provided we, unlike Los Angeles, develop densely along the route). The other west Dublin rail lines, which are being electrified for the DART Plus scheme, have huge potential too. The land around Heuston, Connolly, Colbert and Ceannt stations have huge potential. Any of the smaller cities of Ireland could take a lead on this, if they were permitted to.



Chatswood, outside Sydney: jobs, shops, culture and homes in a small area

Another reason I'm using the Heuston to Naas example is that, most of the way, it's green fields. Green fields have two big advantages over infill development.

First, it's easier to get them through planning (important when we're talking about giant developments). The problem with building near established neighbourhoods is that nobody likes development near to where they live.

Big developments within our towns and cities are either flatly banned (developments over seven stories in most places in Dublin), or hard to get through planning (up to five years for big schemes). In our planning regime, building within cities is like pulling teeth. Realistically, it doesn't look like we're going to get 1.4 million additional homes through planning unless we build on green fields.

Dermot Hanney said: "When you [try to build densely in an] established area — especially where the residents have been there for a long time — it just gets bogged down in planning issues."

And if we're going to build on green fields, let's do it right. Instead of sprawling suburbs, let's build small pockets of high quality, high-density mixed-use developments around our existing rail network. The small footprint will annoy fewer locals, while housing lots of people and delivering all the benefits we've already seen.

It might be I'm overestimating the difficulty of infill development. Maybe you don't need to build in green fields outside Naas in order to get high density. But if that's true, that's not an argument against T.O.D. — it's an argument for building eight and ten story buildings all along the east coast, near the DART line. The same goes for the new metro line. But it seems to me, if it were a realistic option, it would have happened already. The DART is 37 years old.

The second reason I'm focusing on the Heuston to Naas stretch is that nearly the whole stretch is zoned for agricultural use. That makes it interesting from the perspective of land value.

T.O.D. deals can be highly profitable

The basic principle behind land value capture is that an acre of land can support far fewer people without a train station than with one. The addition of a train makes the acre of land much more valuable. So the people to profit from the value uplift should be the ones who built the train.

If you take the land beyond Adamstown station, it's zoned agricultural the whole way to Naas. Agricultural land is worth between €4,000 and €9,000 per acre.

How much might it be worth? Well, the 37 acres of the Irish Glass Bottle site, which is to be developed at 100 homes per acres, were valued in 2020 at €250 million. That's €6.75 million per acre.

The Glass Bottle Site is nicely situated on the DART line, near to the sea, near to the city. If land near the station beyond Adamstown could be developed at the same density as the Glass Bottle site, let's say it's worth about half as much as it — €3.4 million per acre.

You're talking about land that's worth €9,000 per acre for its current use, being worth up to €3,500,000 per acre once it's hooked up to a functioning rail system, and once the planning rules have been loosened

up. The difference between €9,000 and €3,500,000 is what's on offer here. It's a surplus can be divvied out to the landowner, developer, or social housing provider.

The potential for land value capture is greatest when you go from green fields to high-density T.O.D. But even in London, which is already densely developed, the addition of a rail line had a huge impact on land values near the station. Cathal Fitzgerald said: "Transport for London ran studies on eight projects they had in London. The projects cost £36 billion and the total land value uplift was £87 billion – over 240%."



Kowloon Station: Hong Kong exists in its present form because of aggressive development by its train company

Capturing the land value uplift is easier said than done, though. First, speculators can get wind of development plans, and bid up the land accordingly. Second, an obvious way to capture the uplift is with the increase in local taxes. But Ireland doesn't have much by way of local taxes.

Capturing the increase in land value gets at the difficult thing about T.O.D.s. Capturing the value uplift requires a lot of coordination between bodies that aren't good at coordinating. You need a government body of some kind to take the lead — to come up with a master plan and a vision. That's hard enough on its own, since master plans touch on the housing, transport, development and utilities. The body then has to take the plan to the local authority and convince it to change the planning rules to permit development at high density. Simultaneously, the body has to acquire the land at its original value.

There's so much value being created — by my rough estimates, €1.7 billion in additional land value *per station* — that there's plenty of space to land a deal. But the groups who'd need to work together to drive the deal are not designed to work together. Capturing some of the uplift in value would go a long way toward helping the government get around EU state aid rules.

Efficient cities power the economy

Modern economies run on ideas. The way a service-oriented country like Ireland gets richer is by figuring out new ways of doing things and combining old ideas in a novel way.

Ireland took a shortcut to riches by importing US technology and pharma companies — the best idea factories in the world. But the principle still stands. A country grows when people swap ideas and come up with new ways of doing things. Products, companies and eventually industries spring from these interactions. And the interactions take place in cities.

This trend has been particularly pronounced for the last thirty years. Cities with lots of knowledge workers have roared back to life, and have taken over the global economy. Around the 1980s, cities like London, Boston, Paris and New York were stagnating. They were all losing population. Now they're richer than ever. Tokyo too — as the rest of Japan's population shrinks, Tokyo keeps getting bigger. The economist Enrico Moretti calls these places “**brain hubs**

(<https://www.gsb.stanford.edu/insights/enrico-moretti-geography-jobs>)”. Sarah Colenbrander calls cities the “**engines of**

economic growth

(<https://pubs.iied.org/sites/default/files/pdfs/migrate/108011IED.pdf>)”.

Brain hubs are close concentrations of highly educated people. They're the making or breaking of modern service-based economies.

These places succeed, in part, because they bring people close together. When people are closely packed, workers can find the perfect job for their skills (and employers can find the perfect workers for their roles). When people are closely packed, a smart technology person can go for a pint with a smart finance person, and maybe the outcome is a fintech startup.

For all this cross-pollination to work, though, you need literal proximity. The more other human beings a person can reach in a forty-five minute journey, the better.

A report from the UK think tank the Centre for Cities tried to measure the relationship between proximity and the productivity of cities. Among others, it compared the UK city of Leeds to the French city of Marseille. Both cities are about equal in size. But Leeds is shaped differently — it has sprawling, Dublin-style low-density suburbs. In Marseille, more people live in apartments closer to the centre. That density means Marseilles is better suited to public transport, which means that the average Marseillais can reach more people than the average person from Leeds. And since proximity is how brain hub cities do their stuff, it makes Leeds poorer than Marseilles.

The Centre for Cities argues UK cities' low density makes them unsuitable for efficient public transport, which in turn makes them less productive. That's because a city built around cars will have fewer accessible people nearby than a similar city built around public transit. The Centre for Cities estimates UK cities' low density costs the UK economy £23 billion per year in lost productivity.

Ireland doesn't have any heavy industry or natural resources. It's not at a natural crossroads, like Rotterdam, Copenhagen, Chicago, or Minneapolis. It doesn't have a big domestic market. And it's not cheap. For Ireland, the only show in town is to make its brain hubs as brainy and as well-connected as possible. That's why we need to think about our national economy at the scale of the city.

Why the Irish state is particularly unsuited to delivering T.O.D.

There's a saying in the technology industry: you ship your org chart. What this means is a technology company's products are a function of the way the company organises itself.

It was first observed by a computer programmer called Melvin Conway in 1967, and is sometimes known as Conway's Law. As he put it:

“Any organization that designs a system (defined broadly) will produce a design whose structure is a copy of the organization's communication structure.”

Harvard and MIT scholars MacCormack, Rusnak and Baldwin tested Conway's law by looking at the outputs of different types of software companies and found “strong evidence” for it.

There are basically two ways of organising a business: around functions or around divisions. Small companies organise themselves around functions. They have a Head of Finance, Marketing, Engineering. And they all coordinate with the CEO at the top.

But as a company gets bigger, that shape starts to break down. There's too much going on underneath each head of function. And the head of each function only cares about their own area – the head of engineering doesn't care if the head of marketing is in trouble. Not their problem.

So as companies grow, they tend to split into divisions. Each division is like a mini-company, with its own engineering, marketing, or finance teams.

A key advantage is that each division has a leader whose responsibility cuts across different functions. So the leader of each division can bash heads together among their various heads of function to get things done. If there's a problem with marketing that cuts across to engineering, the head of the division can make sure everybody works together to solve the problem.

The alternative to organising around divisions is to organise around functions. When it works, the benefit is that all functions work together nicely. But the downside of this kind of organisation is that there's a bottleneck at the top of the company. Everything has to go through the CEO.

So there are drawbacks to whichever structure a company uses. Either the heads of function don't care about the problems of other functions, or the heads of division don't care about the problems of other divisions. Organisations have to pick one.

The Irish Government isn't a company, but the same principle applies. It has to decide how much power to run through the cabinet, and how much to delegate to lower levels.

Most countries have multiple layers of government. The US is the obvious example: it has a Federal Government, State Governments and City Governments. The city has a mayor, the state has a governor and the country has a president.

The mayors and governors act like divisional heads at a big company. They take responsibility at their level for multiple government functions. They get fired if their city or state is performing poorly. And they have the power to bash heads together across multiple functions to get things done.

You might say the US is unusual, as a continent-sized country with a population of 330 million. But it's not just a matter of population. Denmark is the same size as Ireland, with the same population and the same level of wealth. Yet 65 per cent of Danish government spending goes through local government. In Ireland, by comparison, about six per cent of government spending goes through local authorities, of which the majority is accounted for by the housing assistance program.

Ireland, on the other hand, is one of the most centralised states in Europe. Our local authorities have no taxing power, and no meaningful decision making power.

In theory, the beauty of the centralised model is that all functions get coordinated at the top, so that everything works nicely with everything else. But remember, that model only works with a limited set of functions. And the Irish state is not like that — it has a thousand functions. Far too many to coordinate at the top. So what we end up with is a giant “not my problem” problem, in which none of the functions of the state can coordinate with each other.

Conway's law says the outputs of Ireland's government should mirror its organisational structure. And that's what we see. Housing builds houses without thinking too hard about people's commutes, transport builds roads without thinking too hard about traffic's effect on street life, health

builds hospitals on Dublin beaches without thinking too hard about how people will get there. The decisions make sense within the domain of each department, but when you step back they don't make sense.

Ireland's highly centralised system worked ok for most of the last 100 years. But for most of that time, Ireland's big challenge was managing contraction and emigration. Since the mid-1990s, Ireland has had the other type of problem — dealing with growth and immigration.

“We inherited a system from the UK, which was designed to run an empire. So it entrusted nobody, except the centre. We just took that and made it our own version of it,” said John Moran.

You might even say that the Irish state is itself an advertisement for devolution. 101 years ago Ireland was a neglected province of the UK. Since independence, Ireland's economy has caught up with and then surpassed that of the UK.

Ireland had three million people for 75 years. Now all of a sudden there are five million of us, and the forecast is for another 1 to 2 million in the coming decades. Our population is one of the fastest-growing in the EU.



Vauban in Freiburg, Germany

Housing is the canary in the coal mine for our centralised system of government. It's a multifaceted problem. To solve housing you need to solve transport, planning, and housing all at once. But the responsibility for each of these is in separate silos that don't talk to, or report to, one another.

John Moran said: "In Ireland, you have to get to the Taoiseach's office before you get to someone who works across multiple areas. And by the time it gets there, it's simplified. Because realistically, the Taoiseach should not be dealing with [each individual problem]."

Building homes for one hundred thousand people around ten train stations is a challenge for the Irish system because it cuts across multiple areas. It needs the LDA to take the lead in assembling the land, and master planning it. But the LDA reports to the Minister for Housing. “The LDA was an agency created out of the Department of Housing. But it actually needs to report to a higher authority to drive the outcomes and resolve the inevitable conflicts,” said John Moran.

The other side is the National Transport Authority and CIE. CIE, led by Lorcan O’Connor, has been very supportive of T.O.D.s around its existing rail network. It has actively sought to use its land portfolio for high-density T.O.D. style development. O’Connor said: “Public transport is in our DNA, so we’re insisting that [developments on CIE lands] are done on a T.O.D. basis. And we would see that as being beneficial for us because obviously, greater dependency and usage of public transport helps our core business.”

But the challenge for CIE and the NTA would be to make huge investments, over a twenty-year horizon, based on developments that don’t yet exist. “I would categorise that as being at the speculative end — property development. And it isn’t an area we’re involved in,” said Lorcan O’Connor.

And if the NTA and the LDA teamed up, they’d still have to convince local authorities to rezone the land. And they’d have to partner with developers and housing bodies to build out the actual homes.

Professor Renne, who has put together T.O.D. developments of his own, said: “There are three legs in the stool. One is zoning rules. The other is getting the infrastructure in place. And the third leg is the interaction

between the private and public sector.”

Our existing institutions aren't designed to work cooperatively in this way and it doesn't seem like they'd be up to the challenge. We need something different.

The first step is to convince people T.O.D. is a good idea. Not easy, when you're talking about billions in investment, on a model that's never been tried successfully before in this country. “It's not so much that people are opposed to transit-oriented development, it's just I don't think their minds have been opened to its potential. And the path of previous actions seems just so much easier to take,” said John Moran.

Then you need to deliver it. Cathal Fitzgerald of the National Economic and Social Council (NESC) has been working on T.O.D.s since 2018; it briefed the Oireachtas Housing Committee on T.O.D.s in February. Fitzgerald said:

“The bigger issue is that the transport company is just one part of it. It doesn't have responsibility for planning, it doesn't have responsibility for public capital investment.

“What you really need is an institution that brings into one place the responsibility for land management, master planning, prepping the land for development, maybe repackaging different units to realise value for landowners, and to actually manage the project delivery.”

One way of doing it would be to create a souped-up LDA, maybe giving it CPO power to give it a bit of leverage in negotiations with landowners. “It would be able to negotiate with local landowners on this site, in the

shadow of the law. It could develop the site in a way that benefits the institution and the landowners,” said Cathal Fitzgerald. That would help.

Professor Renne said: “In Australia, they have quasi-public development companies, known in Western Australia as Land Corp. There are these massive redevelopment agencies, they come in, they buy the land, they reposition it, they build the public amenities like the streets and the plazas, and then they sell off development parcels to private developers that come in and build the buildings.”

John Moran’s proposed solution is for stronger local governments to take the lead. He’s pushing hard for a new mayor of Limerick, with real power and real responsibility. As we’ve seen, the idea would be to break Ireland into divisions, so that all our cross-functional problems don’t end up in the bottleneck at the Taoiseach’s office.

A strong mayor is someone who’d have the incentive and the budget to bring housing, transport, property development and planning together, for the good of all. Local government has been a key player in most successful T.O.D. schemes overseas. “In the Freiburg case, the city indicated that it would not give planning permission to a developer on an important site, and the owner had no choice but to sell the land to the city. The city decided it was important to create a bigger plot of land for a transport orientated development,” said Cathal Fitzgerald.

It’s an open question whether our political system would allow this change to happen. It would be a big lift. And delivering tens or hundreds of thousands of homes would involve a high degree of collaboration with profit seeking private developers. Cathal Fitzgerald said: “It’s hard to imagine [Ireland building] the Semitan institution they have in Nantes.

It's owned by the local authority, the transport company, the bank, and the Chamber of Commerce and local interests. It's hard to imagine an Irish institution that's involved in planning, that's a private company, and that is bidding for some of the contracts that are rolled out by that same institution. That would be a major ideological leap.”

For the 150 years, Ireland has been an outlier in Western Europe: less wealthy and less densely populated. We've already converged with Western European wealth, and now we're converging in population density.

The convergence process started in the 1990s, and it still has a long way left to run. In the next twenty years Ireland is going to get one to two million more people. They're mostly going to live in cities.

“Preventing population growth is like trying to prevent the tide coming in,” said Dermot Hanney. “So you can put your head in the sand, and just see what happens – which generally doesn't work out very well. Or you can plan it and say, ‘we want it the growth to be focused here’. And then that takes the pressure off the areas where you don't want development.”

It's reasonable to ask whether our institutions are up to the challenge of delivering the infrastructure for several million more people. “From independence to joining the European Union, Ireland's population was about three million,” said John Moran, “Then we got to four and a half million without really noticing it. And we've continued to climb even higher. Only now, are the problems of not enough proper advance planning really biting. We cannot continue to use old structures that served us well for three million people.”



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