Module 5 Speaker Notes: Building Transformation Strategies

Please refer to the [how-to guide](https://www.circuit-project.eu/academy) which explains how to use these speakers notes.

Total estimated time: 65mins

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**Time:** 10 **Total time:** 0 (not part of full time)

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| Facilitation / Alterations | Script |
| If in person, get everyone settled into the room. If possible, provide the group with refreshments etc. Review any housekeeping required of the space – fire exits etc. If online, wait a few minutes for everyone to arrive. Run through how you will use the technology, when/how to use the chat box, explain how they should get your attention if they would like to speak or ask a question.  |  |

1. **Introductions and CIRCuIT Background**

**Time:** 10 **Total time:** 10

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| Facilitation / Alterations | Script |
| Introduce yourself, tell the group how you have worked with circular building issues in the past / why you are the one delivering training. Provide a brief background to the CIRCuIT project (see script) for those who may not be familiar. Invite everyone in the room to briefly introduce themselves. Ask them to share how they have previously worked with circular construction. This is a good way to get to know everyone, but also allows you as the facilitator to get an insight into who has experience with which areas of learning.Thank everyone for attending.  | [CIRCuIT](https://www.circuit-project.eu/) is a four-year Horizon 2020 project, this means it is funded by the EU’s Research and Innovation arm. The main purpose of the project is to mainstream circular construction in European cities. The project has run across four cities, Copenhagen Hamburg Helsinki and London with over 31 partners. With this many people taking part, you can imagine the range of work that has been completed. We work across three themes: urban mining and material reuse, transformation and life cycle extension, and design for disassembly and adaptability. The consortium has developed pilots and assessed best practice across these themes. The findings and results of these are what we want to share with you via training.  |

1. **Introducing Module 5 – Learning Objectives**

**Time:** 5 **Total time:** 15

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| Introduce the purpose of the session. Connect the learning objectives of the module with the job descriptions and previous experiences learners shared in their introductions. Highlight how some of the learnings might be particularly relevant for some attendees. The full set of CIRCuIT training sessions can be given as stand-alone sessions or as a series to the same group of learners. Contextualise the module accordingly. Highlight any city policies or initiatives that are related to the learning outcomes of the module. Emphasise how these learning outcomes may be able to help further work on these areas.  | The purpose of this session is to provide an overview of the best practice circular building design strategies alongside the city level policies and actions that can foster these. As was mentioned, the CIRCuIT project focuses on three areas of circularity in the built environment:* Urban mining and material reuse
* Transformation and life cycle extension
* Design for disassembly and adaptability

We will be discussing strategies in these three key areas. By the end of this module, you will be able to:* Learn how to identify which buildings are most at risk of demolition in your city and learn from best practice examples
* Understand the different strategies of circular transformation for the built environment
* Learn how you can drive action to make transformation a priority and a reality in your city
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1. **Hierarchy of circular thinking**

**Time:** 5 **Total time:** 20

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| Before introducing the design areas CIRCuIT has focused on, we want to establish the hierarchy of circularity actions from a carbon and resource use perspective. This is not to elevate any one strategy over another as different strategies will be relevant to different contexts, but the hierarchy asks questions in the right sequence. The learners in the room may not be making decisions as to where the city focuses its attention, but we do want to provide them with this context.  | Before we jump into the first of CIRCuIT’s [three key focus areas](https://www.circuit-project.eu/focus-areas):* Urban mining and material reuse
* Transformation and life cycle extension
* Design for disassembly and adaptability

We should establish the hierarchy of circular actions. This is inspired by the waste hierarchy, asking questions in the right sequence. As we can see from this graph, taking action early on makes the real difference. This leads to the following [hierarchy of actions.](https://ce-toolkit.dhub.arup.com/framework)* **Building nothing:** Rethinking the design brief, do we need to build anything at all?
* **Build for long term use:** Designing for future adaptability and demountability
* **Build Efficiently:** Transforming already existing assets, retaining major elements, reduce unnecessary components
* **Build with the right materials:** Using reused and low carbon materials, deconstructing and reusing materials in a new design

The goal of circular city policy is to guide project development in the city through these points. This hierarchy does not mean you or the city needs to focus only on reducing the amount of construction projects happening within the city, however it is a good gut check to see if where you are spending your energy is the most impactful for carbon reduction and material efficiency. |

1. **Building Transformation: a short introduction activity**

**Time:** 15 **Total time:** 35

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| This activity will introduce transformation and life cycle extension as a strategy. Share the definition of transformation in this context, do not go into the driving forces for transformation at this stage. When asking for examples of transformation encourage the learners not to think of the most special buildings but an emphasis in the local context is preferred. When asking everyone for reasons why their buildings were transformed, write their answers on the digital space or whiteboard and start grouping these into categories as you go. Once the groups have been established introduce the barriers to transformation, the opposition to the drivers. Flip to the slide in the Module 5 pack that shows the parabola. Use this when asking the group what levers the city has to influence the placement of the lines between always demolished/either way/always saved. List these levers before closing out the discussion.  | Transformation can feel like an undefinable term and in some way it is, it encompasses a great deal of different design strategies and motivations but the end result is the same: the same building, or at least the majority of the fabric remains in practical use for decades, maybe centuries.

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| For this first activity please split up into pairs andlist between you at least five – but you are encouraged to think of more – **buildings around the city that have been successfully transformed.** Please share some of your buildings with the group. Return to your list, and for each building write down at least **one reason, motivation, driver**, the reason you think this building was transformed and not demolished. Please share some of your drivers. The groups of transformation drivers:* Cultural – Includes heritage reasons, cultural value etc. there are many existing systems for designating this.
* Economic – It can be cheaper to just transform, for example iconic building in good location, or dimensions of building already fit for purpose.
* Social – Often in relation to housing, promoting liveable neighbourhoods.

Conversely this means the barriers are:* Lack of cultural interest/relevance of some buildings
* Economic incentive for demolition
* Social cohesion not considered relevant/not valued

If we look at this graph [see slide] we see that the factors we have just addressed divide the building stock in this way. The two dividing lines between always demolished/either way and either way/always saved illustrate the levers of influence.What powers does the city have to influence these levers?Further transformation in the city will require harnessing these drivers, and of course adding one that until recently has not been much of a driver at all: carbon reduction/environmental protection.  |

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1. **Furthering transformation on a city level – identifying at risk buildings**

**Time:** 10 **Total time:** 45

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| In this section you will be sharing two policy steps cities can take to increase the prevalence of transformation. You will be reviewing four strategies for measuring at risk buildings at the city level at a high level. The goal is not to go deeply into the methodologies but to illustrate what is possible. Please note that the level of transformation possible or needed will also depend greatly on the make-up and development of the city. Take your city’s specific building profile into consideration when discussing these concepts.If you have senior or specialised people in your training, ask them which of the city level analytical methods is the best fit for the city – what might be possible and what kind of insights would they like to gain. | Now we know that:* Building transformation already occurs during BAU at a certain level
* What some of the key drivers and barriers for transformation are

We also know that to meet our carbon and resource goals we will need to demolish less and transform more. Today we will be focusing on two first steps cities can take to drive transformation in the city, and slow unnecessary demolition. 1. **Set the intention or a target saying you will demolish less and transform more.**

Some examples of cities doing this:* + In March 2021 the [London Plan](https://www.london.gov.uk/programmes-strategies/planning/london-plan/new-london-plan/what-new-london-plan) issued new guidelines that are now in effect. These require developers to prioritize “retaining existing built structures for reuse and retrofit,” and to prove that they have a good reason for any substantial demolition.
	+ The [‘Paris Construction Pact’](https://cdn.paris.fr/paris/2021/03/02/343e9528c3a88309b30920627c486c97.pdf), also launched in March 2021 calls for development in the city to prioritise “Restructuring rather than demolishing, reusing rather than throw away;”

These policies are not strictly enforceable – however they are necessary to set the tone and direction of policy before requirements are put in place.Where does our city drive transformation in policy?1. **After establishing the priority of transformation over demolition, the next step from the city planning perspective is to identify what kind of buildings easily become obsolete.**

Defining the buildings at risk will help articulate and necessary city policy and support programs necessary to drive transformation action. The CIRCuIT team has compiled a range of analysis methods to do so. These techniques work well for strategic city-level urban planning, practical urban planning of specific development areas, as well as for the decision-making of professional property owners aiming to manage their real-estate portfolio in a sustainable and circular manner.At the city level:* Building stock pattern analysis
* Planning data analysis
* Qualitative analysis of stakeholder interviews
* Multi Method Approach

Please refer to *‘D5.1 How to identify buildings for life-cycle extension? Guide for case selection via the mapping of transformable neighbourhoods and buildings’* for [full research report](https://www.circuit-project.eu/post/latest-circuit-reports-and-publications) on all these techniques including those for assessments at the neighbourhood and building level. We will be focusing on the city level techniques today. **Building stock pattern analysis** What, how, why?* Allows you to identify what kind of buildings are typically demolished and what they are replaced with in a city.
* Methodology – uses the data available in the city, in some cases it is comprehensive (e.g. ready-made registers of demolished and existing buildings) and in other cases there is less available information. The data is then analysed for patterns and key trends.
* It can also identify post codes of interest – i.e. where the highest concentration of vulnerable buildings are.

Case studies and examples* In the CIRCuIT project, Hamburg and Vantaa (Helsinki Region) implemented this analysis using geographical information systems (GIS). London also completed this analysis with non – geocoded data. It is best with geocoded data however, cities that do not have this information can refer to the London case study.
* In Hamburg, public open-source data of buildings was used to find the key characteristics of demolished buildings – this information can be used to predict existing buildings at risk of future demolition. It was found that a typical demolished residential building is a single-storey, detached, single building, located in lower density, middle to outer ring postcodes. The study found that a preference for high quality public transport access increases building replacement pressure along public transport routes which leads to increased rates of demolition and densification.

**Planning data analysis** What, how, why?* It is important to look at a wide range of factors that may influence whether a building is demolished or not. Planning data analysis does this by looking at external factors such as transport access, distance and quality of facilities and services and cultural status. External factors are then compared with historical redevelopment data to identify any common trends.

Case studies and examples* In London an analysis used data from the ‘London Planning Map’ to map 10 different types of planning zones: opportunity areas, central activity areas, conservation areas etc.
* Higher demolition activity was found in the economic centre (London’s Central Activities Zone), as well as in areas that have business to residential change of use restrictions. This type of analysis is more manual and intensive than accessing one data base.

**Qualitative analysis of stakeholder interviews** What, how, why?* To gain further insight and information on desirability and redevelopment that may not be publicly available, it is useful to engage borough planning experts and developers
* Great to use when the data isn’t as high quality, it does consist of more manual work, but you can explore more specific areas that you would like to look into.

Case studies and examples* London case study. To explore how planning decisions around redevelopment and demolition are made and which types of information would be useful at what point in the process, in-depth discussions were held with borough planning experts.
* interviews and workshops could be conducted with developers, investors, clients, consultants and designers to discuss building obsolescence and highlight the most influential factors when deciding if to demolish or refurbish a site. In London, developers, investors, clients, consultants and designers were interviewed, and discussions centred around questions such as: how do you define a building as ‘obsolete’?; What are the key factors that guide decisions to demolish or refurbish?; Is the impact on social value and communities included in your analyses?.
* The findings from stakeholder interviews were generally in alignment with previous literature and reports on building transformation analysis. The factor most influential on whether to demolish or refurbish is cost, and short-term returns are still mostly prioritized over longer-term and/or whole life considerations.

**Multi Method approach** What, how, why?* Copenhagen City Cluster’s methodology to identify buildings at risk for demolition is to use a mapping approach with multiple viewpoints that is then supplemented by stakeholder insights from the practice-focused partner group. This is essentially a combination of the previously mentioned methods into a multi-method approach.

Case studies and examples* Copenhagen carried out two case studies, building statistics and GIS analysis, and gathered experience and insights from various stakeholders, to investigate which indicators are used to choose which buildings are preserved and which are demolished.
* See the slides for a summary of the results of the research:

**Once we know which areas or types of buildings are likely to be threatened with demolition soon – what action do we take?**  |

1. **Transformation design strategies and how they can be driven through policy**

**Time:** 15 **Total time:** 55

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| Facilitation / Alterations | Script |
| This is a content overview. In this section you will be sharing techniques that can be used to extend the life of a building. Connect the techniques mentioned to local examples where relevant.  | We can now identify which buildings are at the highest risk of demolition in our cities. But for them to be transformed, what are some of the strategies we can use? And what can we do at the city level to drive action in this direction? The CIRCuIT project included research on 36 different demonstration projects, 12 of which were transformation-oriented projects. These projects were assessed, and the various transformation designs strategies analysed. They found transformation activities fell into these categories:* **Renovation**
* **Adaptive reuse**
* **Densification**
* **Listing**
* **Urban Planning**

Let's dive into what they mean and how we can drive action in each of these areas. **Renovation** The most direct way to promote life cycle extension is simply taking care of built structures by regular and timely renovation activities: maintaining and technically upgrading buildings as necessary. In this sense renovation becomes the most straightforward strategy for lifecycle extension. It is straightforward but often not done well, with poor maintenance and quality being a main reason for demolition. Often demolition is also completed for energy savings purposes, with the assumption being that an energy efficient and comfortable space is by definition a new one. The recommendation here is encourage or require whole life carbon assessment of the renovation option and the new build option. Often the operational savings do not make up for the embodied carbon input in new construction, especially when considering the short window, we have for carbon reduction. CIRCuIT does not have a tool for this but we recommend looking at the [CARE tool](https://carbonleadershipforum.org/care-estimator/) by the Carbon Leadership Forum if you would like to explore that aspect. This does not mean energy upgrades need to be subpar. There are great examples of energy efficiency renovations taking place on notoriously difficult social housing blocks. We’ll watch a [short video](https://vimeo.com/523814981) to learn about a great example. Example: La Tour Bois* The transformation of [La Tour Bois](https://www.pritzkerprize.com/laureates/anne-lacaton-and-jean-philippe-vassal#laureate-page-2301) le Prêtre by Architects Anne Lacaton and Jean Philippe Vassal. They transformed a 17-story, 96-unit city housing project originally built in the early 1960s. They did this by removing of the original concrete façade extending the footprint of the building to form bioclimatic balconies. The transformation resulted in a dramatic reinvention of the social housing complex, the modernization of elevators and plumbing, and the generous expansion of all units, some nearly doubling in size, without the displacement of any residents and for one third of the cost of demolishing and building new.

**Adaptive reuse**This is a transformation strategy that encompasses both the physical conversion like renovation, but also a functional change, and social/cultural transformation. There is an opportunity to get creative with the spaces available in the city here. The key to allowing these types of developments to flourish is to remove policies that are found to be barriers. Reviewing local and national planning policies and speaking to developers identifying which certain use changes are not possible on sites that seem like they should be suited. This may mean reducing the requirements for things like parking or sound insulation to enable the use change. Sometimes there are larger financial forces that disallow transformation of these types of spaces. For example, currently in the UK a standard [20% VAT rate](https://www.gov.uk/vat-builders) is charged on renovation and repair work, including retrofit, while the majority of new build projects attract a zero rate. This has existed since VAT was introduced in 1973. There are exemptions, e.g. for charitable buildings and commercial properties being converted to residential dwellings, but these could be expanded to incentivise a transformation-first approach. Examples [Port House in Belgium](https://www.zaha-hadid.com/architecture/port-house/): the transformation of an old fire station into headquarters for the port of Antwerp[Peckham plex](https://www.peckhamplex.london/about-us): an old car park in London becomes an affordable multi-plex cinemaTransformation of NorthrowOne of the CIRCuIT demonstrators focussed on extending the building life of Northrow in Mayfair, central London through transformation and refurbishment. The objective was to explore adaptive reuse strategies by maximising the retention of an existing and underutilised building on an inner-city site.The demonstrator redeveloped a series of adjoining building plots, a mix of residential and commercial spaces, into premium residential development, while retaining as much of existing buildings as possible and maximise recovery and reuse of materials from existing buildings to be demolished. There are expected to be many positive outcomes such as reduced carbon intensity, as well as positive economic and social outcomes.* Barriers – lack of onsite material storage, limits commercial viability of retaining material on site for reuse, temp local storage could be acquired.
* Need - Embodied carbon needs to be regulated. Tax on refurbishment projects removed to incentivise the market to adopt a retro-fit (adaptive reuse first approach to development.

**Densification approach**It may appear as a contradiction that densification – that is, new construction – can be considered a strategy for life cycle extension. New construction can work alongside the old structure and in some cases provide additional income which may be the economic foundation for transformation activities. Example: Residential Infill Project in Portland, Oregon, USA* One great example of densification policy driving the better use of existing buildings is the [Residential Infill Project in Portland, Oregon, USA](https://www.portland.gov/bps/planning/rip). This is a city with a lot of single-family units on the outskirts of a popular city with a serious housing unit shortage. The Infill Project allowed large single-family units on single unit zoned land to be split into apartments, or to add a new building on the lot. This approach respects the existing buildings but allows for densification and the reduction of urban sprawl.

Example: Auckland Plan 2050 Development Strategy, Auckland, New Zealand* [Auckland’s 2050 development strategy](https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/Pages/default.aspx) aims to improve residents’ wellbeing and minimise environmental impact of urban sprawl by favouring high rise, quality infill developments in existing urban areas. It especially encourages developments in transit corridors and within walking distance of urban centres. Since it was adopted in 2018, 82% of new dwellings have been incorporated in the existing urban area which has protected local biodiversity, reduced car dependency and lowered GHGs emissions and pollution.

Example: Copenhagen - urban densification through circular roof conversions of 1900s housingIn Copenhagen there is the potential to develop 11,000 housing units - housing 22,000 Copenhagers - under the roofs. However, only 100 building permits for rooftop apartments are given every year by the municipality. This CIRCuIT demonstrator aimed to avoid new construction by examine ways to reuse materials from existing roofs when converting roof spaces. This was with the aim to change the norm by using reused materials, and to develop recommendations to improve regulatory action to support more rooftop apartments. This case study is applicable to European cities with similar dense urban settings. The project targeted saddle roofs with red tile cladding, it was found that the space was a sufficient height to accommodate new housing without changing the load bearing construction. Local tile cladding was taken down gently by the demolition crew, each tile was checked for cracks and faults, healthy tiles were kept (about 20%) and shipped to the tile manufacturer for cleaning and transformation into new bricks.**Listing** – Listed structures are traditionally preserved for their architectural historical value. Until now, listings aim to protect the cultural heritage. There is scope to use similar processes and value judgements to preserve buildings of significant environmental value due to their embodied carbon content. While traditional protection systems such as SAVE highlight originality as a quality for protection, future listing strategies could add transformational potentials as a strategy to promote *diversity* in cities and as an added benefit of protecting buildings (see figure 10 on slide).It is also important to consider relational data, by that we mean the relations between a building and the environment that it is in. Let’s take a look at an example…Case study: DIVENorwegian guides have offered inspiration as to how listing as a transformation strategy could take shape. The [DIVE analysis](https://ra.brage.unit.no/ra-xmlui/bitstream/handle/11250/176994/dive_veileder_engelsk.pdf?sequence=1&isAllowed=y) is a method for mapping cultural environments and their development potentials. ( see table on slide)**Urban planning -** As we found during the CIRCuIT project, certain designations of planning areas have a significant impact on the rates of demolition and development. By considering the assessment of at risk buildings and the planning designations that can be allocated, cities can influence the areas of the city that see the most development. For each of the transformation design strategies we heard a relevant action that can be taken:* Championing consistent renovation to maintain building quality.
* Requiring a whole life carbon calculation comparing demolish and rebuild to retrofit and renovation.
* Examining existing policy to remove blockers to adaptive reuse – strict performance metrics on e.g. acoustics that cannot be met by older buildings or financial incentives
* Allow for densification of relevant areas, splitting larger units into two or increased heights if built on top of existing structures.
* Learn from the cultural listing process.
* Consider planning designations around the city, use these to drive development strategically.

In some cases, your city or municipality may not have the power to influence certain policies directly. There is always one element that can be leveraged to some degree: procurement. This is how you apply these lessons to procurement at the city: * Maintain existing stock in your portfolio first through renovation
* Require a retro-first approach in procurement
* For new buildings, require future adaptability be built in (more on this later in the module)
* Drive policy change in own policies where relevant to allow for further transformation
* Support campaigns to challenge policies
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1. **Wrap up**

**Time:** 10 **Total time: 65**

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| Facilitation / Alterations | Script |
| Invite attendees to consider what they have just learned and how they can contribute to building transformation in the city. | Thank you all for your attention today. We just reviewed core design strategies, and how the city can take action to integrate these into practice.

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| Answer the following questions to yourself and when you are ready share with the person sitting next to you. * Which design interventions are best suited to your city's needs?
* Which intervention are you able to champion in your role?
* What is the next step or the key missing piece of information you need to take the next step?
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# Sources

1.1 CIRCuIT sources

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| --- | --- | --- | --- |
| WP5 | D5.1 | D19 | Guide for case selection via the mapping of transformable neighbourhoods/buildings |
| WP5 | D5.2 | D20 | Developing and applying replicable design strategies and principles |
| WP5 | D5.3 | D21 | Policy brief and business case of building transformation |
| WP4 | D4.1 | D16 | Documentation with audit result, inventory and demolition guide for execution |
| WP6 | D6.2 | D23 | Circular building concepts for concrete, hybrid concrete-wood, and volume construction |
| WP6 | D6.3 | D24 | Set up of demonstrators and scenarios for four partner cities |
| WP6 | D6.4 | D25 | Threefold ROI assessment of building concepts and threefold ROI of urban plan |

1.2 Other sources

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| Circuit’s three focus areas | <https://www.circuit-project.eu/focus-areas> |
| Arup circular design framework | <https://ce-toolkit.dhub.arup.com/framework> |
| The London Plan | <https://www.london.gov.uk/programmes-strategies/planning/london-plan/new-london-plan/what-new-london-plan> |
| The Parisian Construction Pact |  <https://cdn.paris.fr/paris/2021/03/02/343e9528c3a88309b30920627c486c97.pdf> |
| CARE tool by the Carbon Leadership Forum | <https://carbonleadershipforum.org/care-estimator/> |
| Short Video: The Pritzker Architecture Prize – Anne Lacaton and Jean Philippe Vassal | <https://www.pritzkerprize.com/laureates/anne-lacaton-and-jean-philippe-vassal> |
| La Tour Bois Case Study | <https://www.pritzkerprize.com/laureates/anne-lacaton-and-jean-philippe-vassal#laureate-page-2301> |
| News article - The Butterfly Effect: Retrofitting Low-Income Housing | <https://archinect.com/features/article/150265182/the-butterfly-effect-retrofitting-low-income-housing> |
| Case Study: Port House, Belgium | <https://www.zaha-hadid.com/architecture/port-house/> |
| Case Study: Peckham Plex | <https://www.peckhamplex.london/about-us> |
| Case Study: Cecil Hotel | <https://secretlosangeles.com/cecil-hotel-affordable-housing-la/> |
| ‘For example, currently in the UK a standard 20% VAT rate is charged on renovation and repair work, including retrofit, while the majority of new build projects attract a zero rate.’ | <https://www.gov.uk/vat-builders> |
| Case Study: Portland Residential Infill Project, Oregon, USA | <https://www.portland.gov/bps/planning/rip> |
| Case Study: Auckland Plan 2050 Development Strategy, Auckland, New Zealand | <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/Pages/default.aspx>  |