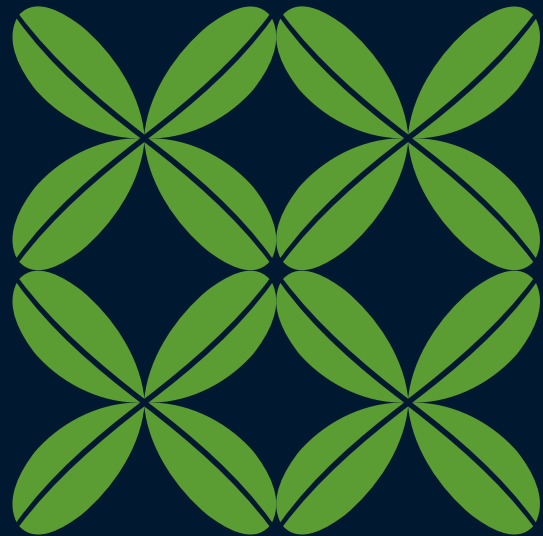
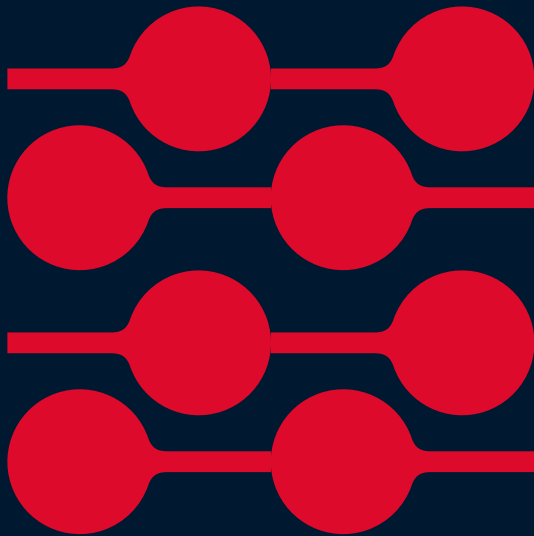




Open Space Cost Modelling Method

Documentation for cost modelling of Open Space Acquisition and Development of those parks, with a focus on greenfields cost projections.

The model is an input for budgeting, prioritisation and the Development Contribution Policy (DC charges update).

11 August 2022



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Purpose

This document provides an overview for how Auckland Council projects the costs of open space acquisition and costs of subsequent development of those open spaces. Along with analysis about *who benefits* these projections for OS acquisition and development are combined into the Development Contribution Policy (DC Policy).

This document will be released with the revised DC policy for Drury, which is a greenfield area. The document focuses on costing for greenfields areas. A future update of this method will include the brownfield areas.

Other references

This methodology refers to the *Open Space Acquisition Policy*, *Open Space Provision Policy*, and Auckland Future Urban Land Supply Strategy (FULSS) available online.¹

Refer also to the DC Policy and overall consultation document for developing the DC Policy for details about how the cost projections and analysis of users and benefits are combined in the DC Policy, and how revenue and costs for funding areas are recorded and monitored.

Refer also to the land price modelling documentation, including *Cost Estimation Factors and Interest Rates 2022*.

Land price projection for Drury

The Open Space Acquisition Cost Model applies council's common land price projection for Drury. This projection uses:

- common growth assumptions for the FULSS Areas (sub-areas in Drury: Auranga, Drury West Stage 1, Drury West Stage 2, Drury East/Opakehe)
- professional independent valuation advice on land prices, as at February 2022, including the structural price escalation experienced as the development moves through observed stages, coupled with council information about land prices in Drury to form council's view of the land price for Drury in 2022
- standardised phasing for greenfields developments (assumed phasing for time spent in each stage of development)
- land price escalation over time (inflation) outside of the structural price escalation.

The land price projection method and these sources are described in more detail in the overall DC consultation document.

¹ <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/housing-plans/Documents/future-urban-land-supply-strategy.pdf>
<https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-policies/Pages/open-space-provision-policy.aspx>
<https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-policies/Pages/parks-open-space-acquisition-policy.aspx>

Scope of this document

In scope

The document focuses on Open Space Acquisition and Development Costing, with a section on a related exercise to assess the 'cause of growth' and 'who benefits' as inputs to the Development Contribution Policy.

This document focuses on the application of policies, collation of inputs, model processes (costing calculations), and describes at a high level how the cost projections are an input to further analysis for outputs like budgeting, prioritisation, or the Development Contribution Policy.

Out of scope

This document does not cover:

- how the number and type of parks are determined by location - including the development of structure plans that inform that. Structure plans are one of the primary model inputs.
- how annual or long-term budgets may consider and apply the cost projections
- how the cost projection inputs and methods are aligned with or consistent with modelling produced by other council assets, and how the cost projections are combined, aggregated or phased for the Development Contribution Policy DC rates. The overall Drury DC consultation document will describe these matters.

Introduction to Open Space Cost Projections

Document overview

Introduction

Includes the context for open space acquisition and its subsequent development. It gives a brief introduction to the benefits of open space and the policy context, including the application of the Open Space Acquisition Policy and Provision Policy.

Open Space cost modelling overview

Outlines the approach to costing open space acquisition and development. Both acquisition and development costs are projected using a relevant *price per square metre x area*. This section provides an overview of the inputs as base costs and escalation factors, and the approach to managing risk and uncertainty.

As the cost projections are an input to the Development Contribution Policy, some additional analysis is undertaken to determine the proportion of acquisition costs and development costs applicable to new users, as residents of new dwellings.

The approach to quality assurance and approvals is also described.

Definitions and timing observations

Introduces the terms used in the method including the core concepts of development staging and phasing, describing how different land prices are assumed to apply at different times in the development life cycle.

Specialist advice to council described developments as progressing through four stages, with a phasing of number of years and observations made that trigger assumed escalation in land price. As the acquisition of parks in a location can take up to 15 years, the cost model also applies a purchase profile over the development lifecycle that varies according to park type.

Costing limitations

This section describes how aggregate region-wide cost projections over 30 years will be periodically updated, such that those aggregate costings cannot be easily compared with local more detailed costings that will likely have updated data.

In particular council's land price that is used in this model only applies for costing exercises, as applicable for broad areas (in this case four sub-areas of Drury defined by the FULSS). It is expected that specific site acquisitions will be informed by negotiation and valuations specific to each site and the contemporary events at that time of negotiation for that site.

Policy parameters

Introduces the policies of Open Space Provision Policy, Future Urban Land Supply Strategy (FULSS), and Structure Plans (or other spatial plans) to be applied.

Martin Jenkins Review and model development 2019

The algorithm applied for open space acquisition costs was developed by Martin Jenkins in 2019. This section outlines the review findings and key concepts used in current modelling.

Growth assumptions

Describes the growth assumptions applied to the FULSS areas.

Modelling – inputs, calculations and outputs

Detailed open space cost modelling methods for both acquisition and development. It details the inputs and shows an example of how they are combined to produce a phased acquisition cost over 15 years for two example parks.

Development costs being simpler to calculate as price x area, have detailed base cost input information in this section. Development costs are calculated as per the overview on p14.

The output is compiled for several uses, one being the Development Contribution Policy.

Cause and beneficiary analysis

Describes the analysis to determine:

- the drivers behind the need for open space to be acquired and developed (i.e. what triggers the acquisition and development of each park)
- the level of service or benefits apportioned to residents of new dwellings
- the proportion of benefits realised by new residents since 2021.

Benefits of open space

The Auckland Plan sets out a 30-year strategy to achieve this vision. Auckland's parks and open space make a major contribution towards Auckland's quality of life and are integral to making Auckland the world's most liveable city. This is recognised in the Auckland Plan, which includes a target to:

“maintain and extend an integrated network of quality open space across the region that meet community needs and provide a diverse range of recreational opportunities by 2040”.

To achieve the vision and strategy of the Auckland Plan, Auckland Council will acquire new land for parks and open space, as well as making better use of the parks we already have. The benefits of parks and open space, and how they contribute to our quality of life, are summarised in the diagram below:



Figure 1 – Benefits of open spaces

Policy framework

The key policy and legislation for parks and open spaces are:

Parks and Open Spaces Strategic Action Plan² sets out actions for Auckland over the 10 years from 2013. On p12 it outlines related strategies and plans:

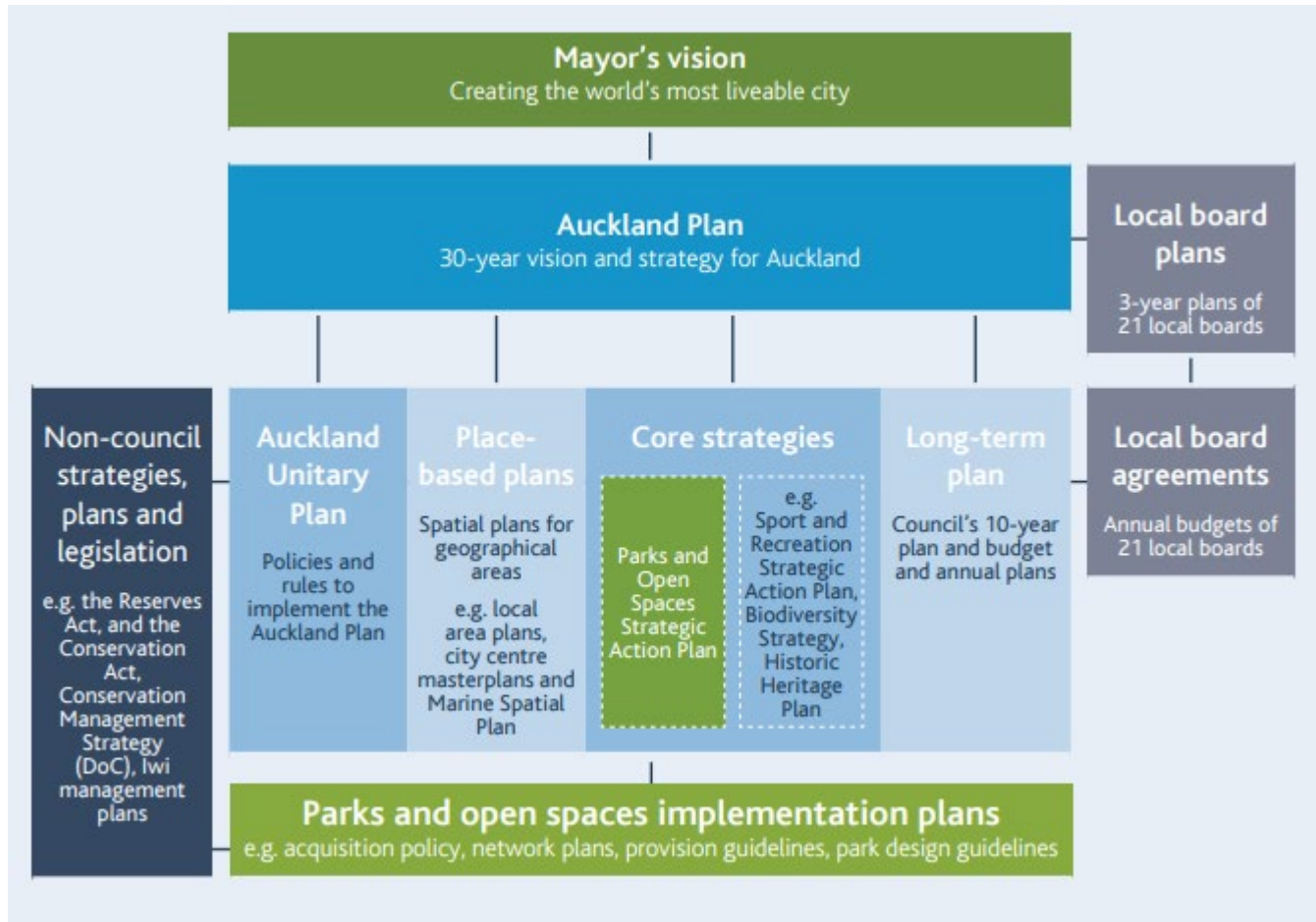


Figure 2 – Open Spaces policy framework

Figure 2 refers to important policies for costing open space acquisition and development:

- **The Open Space Provision Policy¹** assists developers, planners and designers about the provision of open space sought by council, provides a framework for assessing open space provision across the region, clarifies the types of parks to be acquired using development contributions³, and informs council's investment. The costing method focuses on neighbourhood, civic, suburb parks and sport parks which can be funded by DCs. (See footnote p2 for links to policies)

The policy considers the inter-related network of open space, and provides provision metrics. The metrics are described later in this document as an input to the costing.

- **The Parks and Open Space Acquisition Policy¹** covers why council acquires land for parks and open spaces, the methods to fund and acquire land, how council assess whether land should be

² <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/parks-sports-outdoor-plans/Documents/parks-open-spaces-strategic-action-plan.pdf>

³ Berms, pocket parks, conservation open space, stormwater areas, esplanade reserves, riparian space and margins between roads and stormwater management areas cannot be funded by development contributions.

acquired, how opportunities are prioritised, and when council will consider disposing of open space. This policy provides the delegations and approval process applied in the acquisition work plan described in the next section.

Open Space Acquisition Policy

This policy sets out the framework for acquisitions. Important sections include:

- The changes and influences over the next 30 years on p5
- The scope and nature of open space acquired by council, p6
- The key legislation relevant to the acquisition of open space, p8
- The decision making roles p9, including that only the governing body has legal authority to acquire, hold or dispose of property.
- The need for consultation and confidentiality, p10.
- Methods to acquire land (p11), including the willing seller-willing buyer principle and associated negotiation, which is the primary method assumed for the costing model.
- Funding options p13. This document does not describe the choices made to use one funding method or another. This method covers the process for costing open space needs for the next 30 years, the output of which can be used for different funding options.
- Management of the acquisition plan and programme p24, including moving quickly to take advantage of natural occurring opportunities, or a protracted negotiation over several years.
- Preparing for development p25.
- Disposal, p26
- See p14-23 about the opportunity assessment, and detail about the prioritisation process. The four acquisition criteria are:
 - meeting community needs now and future
 - connecting open spaces
 - protecting and restoring Auckland's unique features and meanings, and
 - improving the open spaces council already has.

The opportunity assessment workflow is shown on the next page.

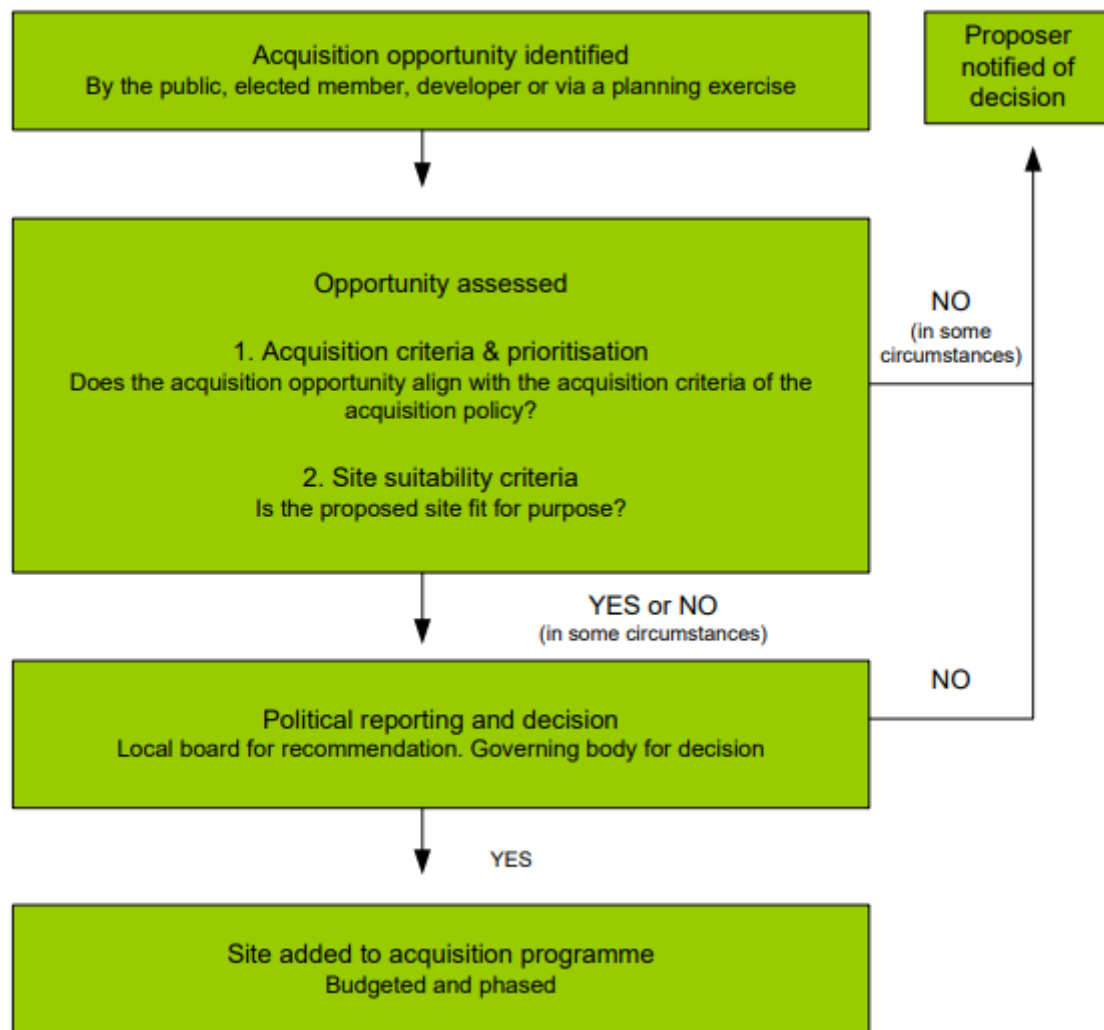


Figure 3 – Acquisition opportunity assessment process from the OS Acquisition Policy

The steps in Figure-3 are further described as follows:

- **Region and sub-region needs analysis of open-space needs:** the existing open space network and needs are analysed against the *acquisition* and *provision* policy criteria. Prospective park locations are indicated through precinct plans in the *Auckland Unitary Plan Operative in part* or a publicly consulted council structure plan. Park locations can also be indicated through private plan changes, subdivision consents and resource consents.

Park locations are indicated in locations that support policy although that indication in a plan does not obligate the council to acquire that site or the landowner to sell as RMA1991 planning processes cannot pre-empt governing body decision-making under the Local Government Act 2002. An example of indicated park locations from a structure plan is shown later in this document.

- **Approval by elected decision-makers:** advice is prepared for elected decision-makers recommending that council acquire a group of related open spaces describing the area, type of parks, general locations, and estimated costs considered. Such advice and approval is needed for the acquisition (or disposal) of any open space. Elected decision-makers consider the proposed parks as part of the overall network of open spaces and related costs.

As described in the Acquisition Policy p24, acquisitions could relate to development to occur over the next decade or more, with extended negotiations to occur. Elected decision-makers delegate staff to negotiate and complete acquisitions aligned with the type, size, and proximal location approved as the greenfield area develops.

In small greenfield areas or existing urban areas approval can be sought for one or more parks in a specific location with applicable costs with acquisition expected in the near-term. Council's advice is conscious of the commercially sensitive process of land purchase negotiations, and ensuring the privacy of landowners' transactions with the council until the settlement is complete. (see p10 of the Acquisition Policy).

- **Operational process to complete the acquisition and plan development:** Council staff and Eke Panuku work with developers and land owners, negotiating one of more options to confirm acquisitions aligned with delegated approvals. Council seeks advice including third-party valuation advice to inform negotiations for the sale on a 'willing buyer- willing seller fair value basis'.
- **Acquisition workplan:** Acquisitions can take many years to complete, especially when greenfield and substantial brownfields areas are being developed. Open space is not an enabling infrastructure, needed in time for dwellings to be developed, like roads, water services and other utilities. The open space acquisition workplan schedule is managed with the intent for parks to be available for use alongside new residents occupying new dwellings.

Council prioritises acquiring larger land parcels for sport and suburb parks early in the development cycle. Larger sites are also easier to define and negotiate earlier in the development cycle, and developers are able to organise other suburb aspects around those known sites. Conversely neighbourhood parks, being smaller, are naturally acquired later in the development lifecycle when detailed layout and infrastructure is known. Once titles and sizes of land are known the price, location, and size of the land can be negotiated with land owners.

- **Workplan for park development:** The programme for development and renewal of parks considers existing parks to be renewed and upgraded, recent acquisitions, and yet-to-be acquired parks. The parks in use, and recently acquired are known by type of park, size, location, condition, and how they are used by communities in relation to other proximal parks in the network. The renewal and development workplan is scheduled and costed, and the draft plan is recommended to elected decision-makers for approval. (Acquisition Policy p25).

Open space cost modelling overview

What is “open space”?

The Open Space Cost Acquisition Model (the “model”) is designed to cost acquisition and/or development of parks (neighbourhood, suburb, sport), civic spaces, and riparian spaces that will be acquired, developed and maintained **by council**. The model is not routinely used to cost speciality park costs (e.g. regional parks) as the output can be supplemented by bespoke costings for specific instances.

Spaces owned and operated by other parties are not included.

Analysts observe that almost all parks considered by the model relate to the acquisition of neighbourhood, suburb, sport, or civic parks, and development of those and riparian spaces. Most parks are purchased (by exception, some are vested at no cost), and riparian spaces are expected to be vested.

The costs for providing open space include:

- Capital costs for acquisition
- Capital costs for development and renewal
- Operational costs for maintenance and servicing

Cost modelling is conducted for several uses: advice to elected decision-makers about acquisition or development of open spaces, budgeting, and funding options.

Projections used for development contributions

Development contributions can be used for the costs associated with common parks: neighbourhood, civic, suburb and sport parks. The cost of developing riparian spaces is not included in the cost projection provided for the Development Contribution Policy.

Civic parks are provided in town centres and smaller centres called local centres. Aside from civic parks in commercial areas, suburb, sport and neighbourhood parks are only provided for in residential urban areas.

Development contributions can only be applied to the costs of park acquisition and development and renewal according to the proportion of those costs attributable to the residents of new dwellings.

The terms ‘parks’ and ‘open space’ can be considered synonymous for this document.

Open space acquisition cost modelling approach

Since the review in 2019 the method for costing open space has costed a portfolio of parks as $\text{land price} \times \text{area}$. The cost model makes assumptions about the proportion of costs to be expensed over time depending on the assumed timing for the staged development in each FULSS sub-location and timing of acquisition in those stages by park type. The cost model applies a higher price for land area acquired at later stages of the development cycle reflecting the improving value of the land as it develops.

The projected cost for a development location comprising several parks is calculated as $\text{price} \times \text{area}$ spread over up to 15 years. Park numbers, size, and land price are modelled for sub-areas of the Auckland region, for example considering the timing and costs for land at different stages in four sub-areas of Drury (Auranga, West Stage 1, West Stage 2, and Opaheke-East). The model aggregates locations (number of

parks, type, timing) across the region projecting acquisition costs over a 30 year period. The inputs for this DC Policy update focused on Drury updated the parameters to be modelled for Drury only.

The inputs for land acquisition costs are:

- The number and type of parks in a location - FULSS greenfields areas are further divided up into tranches expected to be development ready at different timings over 10-15 years. The number and type of parks in each of those areas is found by overlaying structural plans with the FULSS. (There are four sub-areas in Drury)
- The expected size of those parks – the area to be acquired is the total area of those parks (number of parks by type x standard area for park type)
- The timing for each development sub-area tranche from the FULSS (the 4 sub-areas in Drury).
- The expected price for land at different stages of the development cycle. Some land is acquired early when land is cheaper, some is acquired later. Inputs needed are the price of land expected at each stage of the development cycle, and the proportion of land expected to be acquired at each stage (this is the expected phasing of land acquisition, and varies by park type).
- The expected inflation of land price due to market changes over time.
- Transaction costs for acquisitions, aside from land price paid to the seller, and the labour cost inflation factor on that.

The inputs and cost calculation are explained in more detail later in the method.

Price escalation factors

Land prices escalate in two ways:

- The land price increases as developers invest in development on the land, including infrastructure being installed and other land improvements, and off-land improvements like planning, zoning, compliance certification, and titles being issued. Council starts with a professional independent land valuation survey and adds its own observations of land price to determine the base land price by stage of development in 2022.
- The land price is subject to inflation affects over time. Inflation factors advised by council's Chief Economist Unit are applied to the 2022 base land price by development stage over time. See *Cost escalation factors and interest rate, 2022*.

Transaction costs are labour costs to enable the sale, comprising administrative functions and specialist advice. The base costs for 2022 are informed by recent sales and labour cost inflation assumptions are applied over time.

Managing uncertainty and risk

Rather than build in a contingency for managing risk of price increases, land acquisition modelling for open space intends that the cost projection represents median cost, informed by sensitivity analysis.⁴ There are two main factors that inform this practice:

⁴ <https://www.treasury.govt.nz/publications/guide/guidelines-setting-charges-public-sector-2017-html>

- *Portfolio costs balance unders and overs:* The acquisition cost exercise considers a portfolio of parks with a weak interdependency between each park. Several non-cost methods are used to manage the risk of cost increases: negotiating with several sellers with land in the desired vicinity with different needs about timing and certainty of sale, and options about the specific site and area of land to be acquired. Some parks in the portfolio may cost more than the average price psm and others less than the average price.
- *The cost exercise is costing a portfolio of items:* Best practice⁴ is to set a median price and update when new information comes known, including information from operational monitoring about revenue collected and cost expense.

Park acquisitions can take several years from the time of elected decision-makers' approval to confirming an agreed price with the seller. The cycle of updates is less than the typical period for an acquisition providing a natural opportunity to update cost projections and increase or decrease the charge.

Use of land price cost contingency across the asset groups – open space, community facilities, and transport

The risks of price increases for open space can be managed with the above methods. This open space method considered the difference between open space, community facilities, and transport land requirements.

Both the open space and community facilities requirements can rely on the weak interdependency between items in the asset portfolio and the use of non-cost contingency measures about the size and location of the land.

Roads and public transport infrastructure are more specific about the size and configuration of land requirements and location. Transport projects apply willing buyer/seller and Public Works Act mechanisms to acquire property. The announcement of, and commencement of land acquisitions in a transport corridor results in council negotiation over land needs that are well defined and understood by sellers.

The transport modelling method will discuss the use of a cost contingency to manage cost risks due to the high dependency between one site and next to form a contiguous road network, as well as the highly specific size of land parcels needed.

Open space development cost modelling

Costing development of yet-to-be acquired land

The assumptions for park acquisitions are also inputs for costing the development of that same land. The park type, area, location, and timing of land acquisition is determined by modelling land acquisition costs.

The additional inputs for costing development of yet-to-be-acquired parks are:

<https://www.treasury.govt.nz/information-and-services/state-sector-leadership/investment-management/better-business-cases-bbc/bbc-methods-and-tools/approaches-sensitivity-analysis>

- The average cost of development for parks by type. This is based on past experience of park developments, applying nominated standard park specifications and averaging to produce a cost psm by park typology. Line item costs in the specification list apply quantity surveyor advice.
- The timing and length of time for development by park type.
- The expected inflation of labour and materials due to market changes over time.

The base price can be determined by price x area, with costs phased over time based on timing assumptions that extend from the acquisition modelling.

Price escalation factors

Development costs can increase due to the increases in labour and materials prices over time. Council's Chief Economist advised inflation factors to apply to the 2022 base price psm by park type over time used to cost yet-to-be-acquired park development costs. See *Cost escalation factors and interest rates, 2022*

The development of recently acquired land, and renewal of existing parks are costed park by park according to the design specification developed. Line item costs are escalated from the 2022 base over time using the inflation assumption.

Managing uncertainty and risk

Development costs are also uncertain as specifications may change due to site circumstances. Per cost estimation advice a 10% cost contingency is applied to project costings of recently acquired and existing parks, and the projection of costs for yet-to-be-acquired parks.

Costing development of recently acquired and renewals of existing parks

The costs for recently acquired greenfields land and renewals of existing parks are developed project by project for parks known by location, condition, park type and timing. Each project is specified and costed using the itemised base cost list that is escalated using labour and materials cost inflation and 10% contingency.

The park development workplan is publicly consulted and approved by elected decision-makers.

Beneficiary analysis - Apportioning costs for new dwellings for the DC Policy

The Local Government Act 2002 requires an assessment of any project being funded by Development Contributions to determine the percentage of the project that is attributable to either renewals, a level of service increase or growth. This assessment includes the 'cause' and 'benefit' attributable to growth.

Analysis of prospective park acquisitions and the development workplan provides proportionate factors that are combined to apportion the costs. See the DC Policy overall method for how the parameters discussed in this method are combined with the cost projections into the eventual DC charges.

Park acquisitions

Cause: the proportion of the cost associated with new open space acquisitions for relevant parks (neighbourhood-civic, suburb, and sport parks) are analysed and reported by cause. The key question is about what triggers the acquisition: *what need does the acquisition respond to?* Or more specifically: *To what extent is the new open space needed by the existing community or is needed because the occupants of new dwellings require park spaces under the OS provision Policy?*

Benefit: these parameters describes who benefits from the park acquisition, with two parameters:

- the proportion of the proposed park catchments that apply to new dwellings or existing residential areas. This is the 'Level of service' experienced by those populations.
- the level of service over time, determined by the difference between the existing population in the greenfield area at 2021 compared to the expected population in that area by 'full-build-out'.

Park development

Park development applies the same parameters to the yet-to-be-acquired parks as acquisition, and then combines that analysis with the parameters for existing parks.

Existing parks have another factor. Analysts must also consider the cost associated with upgrading the park due to standard renewal needs, and that needed to appropriately serve an additional population. With more users in the park catchment the upgrade may need more resilient surfaces, for example artificial sports turfs to relace grass surfaces. The portion of those costs need to be apportioned to existing residential areas and the new growth areas.



Figure 4 - factors applied to apportion costs for existing parks

These factors are explained in more detail in the *Application to DC Policy* section.

Quality assurance and approvals

Acquisition base costs

Council forms a view of the base land price in 2022 by development stage. This work includes analysis of land prices assumed over time with the price for recent nearby negotiations completed over the least few years.

The expected size of parks modelled in the projection are also compared with recent and current negotiations with land owners.

Transaction costs form a small part of acquisition costs, determined by analysis of recent acquisitions.

Acquisition phasing

The assumed dates that sub-locations in the FULSS are assumed to be development ready are defined by analysis across council, aligned across the assets and with the population projections for other asset groups.

The timing for development stage transitions and the proportion of land cost spread over the stages (park acquisition phasing) were determined by the external review of open space cost modelling in 2019 by Martin Jenkins.

Acquisition cost escalation

The land price escalation by stage is determined by council's 2022 base land price.

This is validated against the small number of recent proximal acquisitions.

The land price inflation factors and labour inflation factors are determined by the council Chief Economist Unit with reference to long-run inflation observations.

Acquisition cost modelling reviews and approvals

The base assumptions about number and type, park size, and location are reviewed by council investment analysts. These assumptions and base costs are approved by the Manager Community Investment Policy.

As part of the Open Space Acquisition Cost Model a land price projection combined the base land price by development stage, transaction costs, inflation factors, and the timing and phases of development by areas in the FULSS. This land price model was reviewed by the council Chief Economist Unit.

The projected land price over time is combined with the number and size of park area needed and park acquisition phasing assumptions to produce the cost projection for open space. This model is checked using in-model check-sums, and is peer reviewed, as is the beneficiary analysis.

Sensitivity analysis is conducted including:

- attribution analysis – comparing the most recent cost projection with previous projections, with key changes reviewed including changes to timing and phasing, base land-price assumptions, and inflation.
- Sensitivity analysis – attribution analysis provides some switched value what-if scenarios. Other scenarios investigated include delay in land purchase (land purchased later or earlier stages at

higher/lower rates), variation in cost price informed by the independent valuers and council land price assessments, and inflation assumptions.

The inputs for the cost projection and beneficiary parameters and the model output for open space acquisition costs is approved by the Manager Community Investment Policy. The input parameters about base land price, inflation, phasing assumptions, number of parks yet-to-be acquired, global assumptions of park sizes, actual data about recent acquisitions are reviewed for each projection exercise, including the update that feeds into the LTP. Updates have historically been completed each 12-18 months.

Development base costs

The number and type of parks to be costed is cross-checked against acquisition modelling.

The park infrastructure base costs reference set is developed by Community Facilities specialists and peer reviewed. Average park costs and psm rates are compared with recent parks developed. Line items in the base cost reference list are advised by a quantity surveyor.

Park development projects costed are also compared against recent park projects completed. Quantity surveyors review park specifications that require uncommon specification. As a basis for park development costing the team will continue to update costs to inform future modelling.

Development cost phasing, cost escalation, and approvals

Project costs by specification for already acquired parks are compiled with applied inflation factors and cost contingency. The workplan is peer reviewed, and the upcoming delivery programme and cost is approved by the Head of Asset Management and Investment Programmes and the General Manager Community Facilities prior to being provided to elected decision-makers for their approval.

The cost projection for development of already acquired parks, and the cost modelling for yet-to-be-acquired parks are combined. That cost projection and beneficiary parameters for open space development is approved by the Head of Asset Management and Investment Programmes as an input for the DC Policy.

Definitions and timing observations

Greenfields/brownfields

The focus for February 2022 cost projections considers the urban (residential, not industrial) development areas defined by the FULSS 2017 as the greenfields areas to be included, although other areas can be included and costed in a similar way.

The Open Space Acquisition Cost Model does provide for brownfields acquisition and development costs. Brownfields is interpreted as locations inside the Rural Urban Boundary (RUB) that is not undergoing greenfields development. This method document is intended for release with the updated Development Contributions Policy for Drury. There are no parks to be acquired in brownfields areas relevant to the area defined for Drury.

Sub-region, and location

Six greenfields land valuation reports have been commissioned from professional independent valuers between 2015 and 2022. The reports noted that price variations between subregions are observed with consistencies within the large developments in those sub-regions. Independent valuers reported land prices for sub-regions of north, north-west, west, south, and east are inputs to the region-wide cost model. The term subregion means these points of the compass. The independent valuer reported subregions align well with the sub-regions reported for the DC policy. (See *method for overall DC Policy*).

Stage of development

The development lifecycle consists of land transitioning from grassed paddocks to urban lots with housing. Council determines the land price for modelling by development stage, representing ‘structural price increases’ caused by additional investment in the land and other market factors.

The completion of each of these stages has a discernible effect upon the value of the underlying land however the exact effect is not consistent across either the stages nor between greenfield areas. This is because there are a number of idiosyncratic factors at play including geographic location, construction costs and projected densities, as well as wider market influences such as end lot values, financing costs and timing. – Independent Valuation Report, 2015.

The model applies four stages of development. These were defined in 2015 as observable categories where land transactions occurred.

Stage 1: Future Urban Zone (FUZ)

Greenfield land is rezoned to an ‘intermediary’ zone (Future Urban) that indicates its potential for future urbanisation / development. Note that the timeframes involved in the rezoning of Future Urban land to urban uses can vary markedly, depending on location.

Stage 2: Urban Zoned (UZ)

The land is rezoned to some form of urban zone, however the land and surrounding area require infrastructure upgrades.

Stage 3: Infrastructure Installed (II)

Infrastructure including network utilities and roading is constructed to the boundary of land to allow for its

development. Earthworks, roads within the block and other infrastructure installed to the edge of the urban lots is yet to be developed.

The land is Development Ready (DR) when the rezoned and has major infrastructure installed. DR is analogous with the start of the Infrastructure Installed stage.

Stage 4: Completed Subdivision to Urban lots (SUL)

Finally, the land is developed and subdivided into urban lots ready for sale to third parties. Earthworks and civil works have been completed, with services provided to each lot and titles issued.

Phasing or phasing profile:

The phasing profile refers to the spread of costs because the park itself may be split into several tracts of land acquired over several years or the transactions to acquire one site are spread in installments.

A location like Drury consists of several sub-locations where development will move from Future Urban to Live Zoned at different times. The sub-locations are owned by various large developers producing hundreds or thousands of dwellings. Developers do not progress at the same pace through the stages.

The base model assumes a standard lifecycle for acquisitions of three years in stage 1, 4y in stage 2, 5y in stage 3, and 3y in stage 4, according to different acquisition phasing profiles for types of parks. These base assumptions were established by Martin Jenkins' recommendations in the model review in 2019. While a single developer will not necessarily conform to this stage schedule, in aggregate this assumed staging schedule is applied across each location.

Parks operate as a network of provision, but unlike roads and pipes do not need to be contiguous and developers are not as dependent on the assets being in place before they can proceed with the next stage of development. Parks have some flexibility about where they are located and when they are acquired.

As a suburb development progresses negotiations take place to acquire open space to optimise value for money within the constraints of available budget, willing sellers, and the ability to identify the plot of land by title to transact the sale. As suburbs take shape the larger sport parks (can be 10 Ha) and to a lesser degree suburb parks (3 Ha) are 'locked in' early and the developer works around those known sites. 'Locked in' can mean commitments to acquire, commitments including a price, or actual transactions. Parts of sport parks (10 Ha) can be acquired from different sellers, and close proximity of the parts is desired.

Neighbourhood parks are smaller with more flexibility about location. At approximately 0.4Ha they are naturally negotiated later in the development lifecycle, because the locations and titles of the plot must be defined to conclude the negotiation. Within this constraint a similar range of negotiation outcomes are possible from early commitments to end-stage negotiations.

The park types experience a different acquisition phasing profile. The costing model does not assume a park acquisition transaction occurs in a single year. It assumes that 40% of Sport Park costs will be transacted in Future Urban Zone stage 1, 40% in Urban Zoned (stage 2), and 20% in Infrastructure installed (stage 3). However for neighbourhood parks it assumes 20% of the expenditure would be expensed in stage 2, 30% stage 3, and 50% in stage 4. Subdivided into lots. The model does this by phasing spend by park type over up to 15 years.

The actual assumptions for Drury are described on p27-29 in Growth Assumptions.

Development costs phasing

The Open Space Cost Model also calculates development costs as price x area, inferring phasing of spend over time and cost assumptions according to park-type. The phasing approach for development costs also differs by park type and is linked to stage 4 housing development so the parks are modelled to be user-ready when residents are moving in. Park development is expected to start two years after the acquisition phase in the model and be complete within two-four years depending on park type.

This is explained further in the model detail.

Land negotiation and transaction policy applied: the land value in negotiation is determined by applying 'greatest and best use' and 'willing buyer-willing seller' practices in negotiations. Hence the costing assumes the price paid \$psm is determined by the stage of development and the phasing profile for the type of park. Developers (sellers) are typically very amenable to negotiations within these principles as the park adds amenity value to the suburb and parks require less infrastructure than the 'greatest and best use' policy implies when transacted in the later lifecycle stages.

Use of actual or 'in negotiation' transaction data

A location can typically require one or two parks, or up to 40 parks of various types. For developments already underway, some of these will be in various stages of acquisition negotiation or may have recently been acquired. The costing considers and applies this information from the first two of these scenarios:

- Recently acquired parks provides actual timing and cost information
- to-be acquired-in-negotiations has some cost and/or transaction timing information
- to-be acquired parks in the acquisition pipeline with no additional information.

Known information is applied, overwriting global assumptions for applicable parks, as well as informing and confirming global assumptions for the timing and cost of nearby impending acquisitions.

Costing limitations

Costing period and granularity limitation

The model projects the overall cost for open space acquisitions for the region, phased over the 30 years. The standard output can be disaggregated by location, park type, and year. However the model is intended to be an aggregate model operating on a regional level that can be used as an aggregate model by areas like those defined in the FULSS.

Analysts are often asked to provide acquisition cost projections over a small timeframe of one to three years, in a small location, comprising a couple of parks. This is better considered as a bespoke calculation using the same *price x area* principles, updated with any new details about that location. Different costings at different times presents challenges about version control and consistency of information. A macro 'whole of region' model can not apply the very granular assumptions about individual parks, without compiling that same information about all of those parks. Hence, the whole of region model output and more specific analyses that have included later-known information or more specific location-based information will present inconsistencies that can not be reconciled.

Specific analyses must be reported with a caveat that they may differ from applicable whole region cost projections due to the updated and more granular information typically included in a bespoke calculation.

In particular council's land price projection is only suitable for area-wide costing. It is expected that specific acquisitions will be informed by negotiation and valuations specific to each site and time.

Policy parameters

The policies described earlier provide the following parameters:

Open Space Provision Policy

Greenfields

The OS Provision Policy provides provision parameters for greenfields acquisition planning. It presents two planning considerations: [1] network principles, and [2] proximity metrics. Network principles include distribution and function of the open space relative to other features like ecological features like coasts, waterways, and bush reserves, as well as the urban environment, connections, and functionality and features planned for the space.

The provision metrics provide for configuration, type, size, and location relative to community users. The metrics are not a target, but a guide, as follows:

Pocket Park (these are not costed in the model): Voluntarily provided at no capital cost, upon agreement with council. They can remain in private ownership. Suitable for urban centres or high density residential areas. Not to be located within 100m of other open space. Typically 0.1-0.15 Ha.

Neighbourhood park: Informal recreation and social opportunities. 0.3-0.5 Ha. 400m walk in low density areas, 600m in high density areas. *Structure plans use 300m radial catchment to model this.*

Suburb Park: Larger than a neighbourhood park, for larger gatherings. Help form a suburb identity. 3.0-5 Ha. 1000 m walk in high/medium density and 1500 walk in other density areas.

Sport Park: described as a large suburb park in the policy. A 5Ha suburb park can host sports fields, i.e. football fields are approx 1 Ha. In practice council seeks co-locating many sports fields together to assist sport administration and community engagement. The provision policy says a “large suburb park suitable for sports can be up to 10Ha”.

The Drury cost projection is for a greenfield area. Analysis of sport park provision concluded that additional sport park space was not needed.

The existing urban area

The existing urban area of Auckland has an established, well distributed open space network. The ability to expand the urban network is constrained due to land supply and budget constraints. Council’s investment in open space in the existing urban area prioritises improving the existing network. The focus in the existing urban area is:

- Investing in the established open space network to offer a wider range of activities for more people
- Improving the links between open space, such as establishing greenways
- Optimising assets through land exchanges and reconfiguration
- Acquiring new open spaces as opportunities allow, particularly in large brownfield developments.

The open space provision metrics primarily guide the nature of open space in greenfield areas. They can be used for comparisons of provision between existing urban areas, relative to other urban areas in Auckland.

2017 Future Urban Land Supply Strategy

The Future Urban Land Supply Strategy 2017 is the primary determinant of where greenfields development will occur and timing. Per Figures 5 and 6 the FULSS indicates the geographical area to be included and the timing expected in FULSS 2017. Later in growth assumptions we describe the timing that is applied.

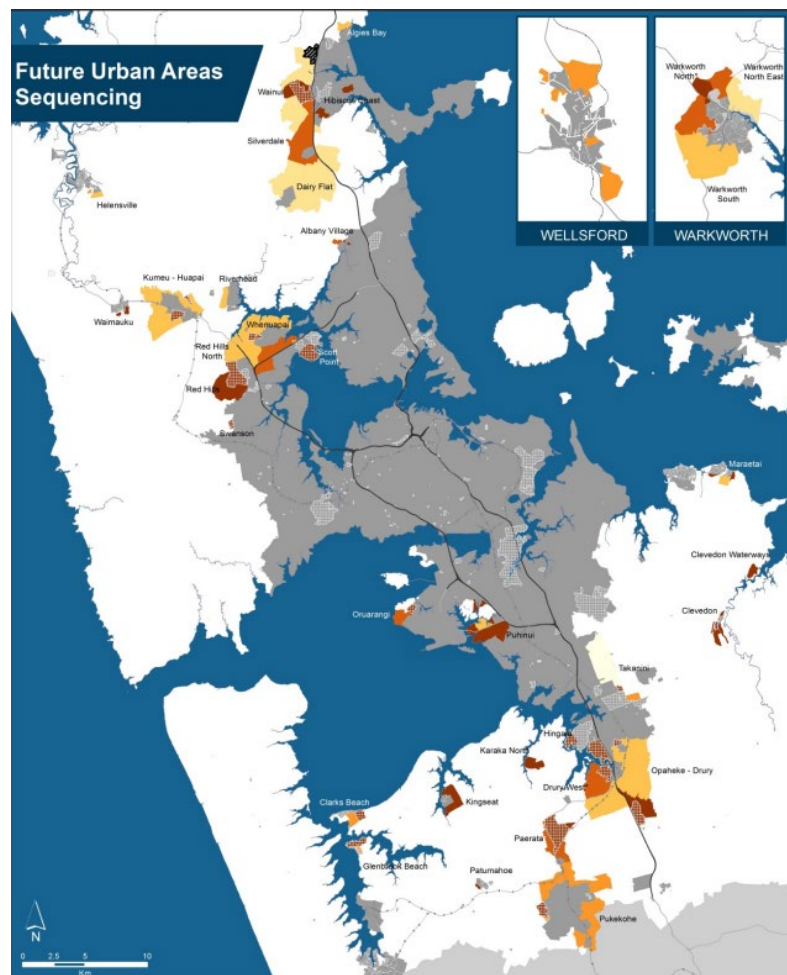


Figure 5 - Map of FULSS locations

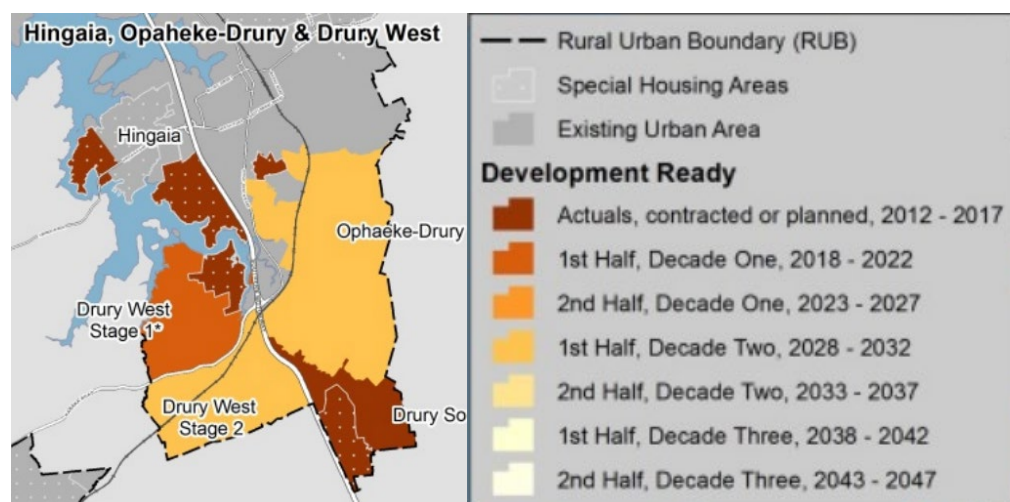


Figure 6 - detailed phasing

Spatial plans

The large development areas in the FULSS have structure plans or formal consultation documents (Whenuapai, Opaheke-Drury, Pukekohe-Paerata, Warkworth), or in the case of Redhills and some other areas precinct plans in the Auckland Unitary Plan Operational in Part are applied to detail the number and types of parks (i.e. maps of planned parks).

The existing parks are noted. The number, type and location of new parks is overlaid onto the FULSS for timing of park development, and collated for modelling. The analysis for Figure 6 for Drury is discussed later in the Growth Assumption section.

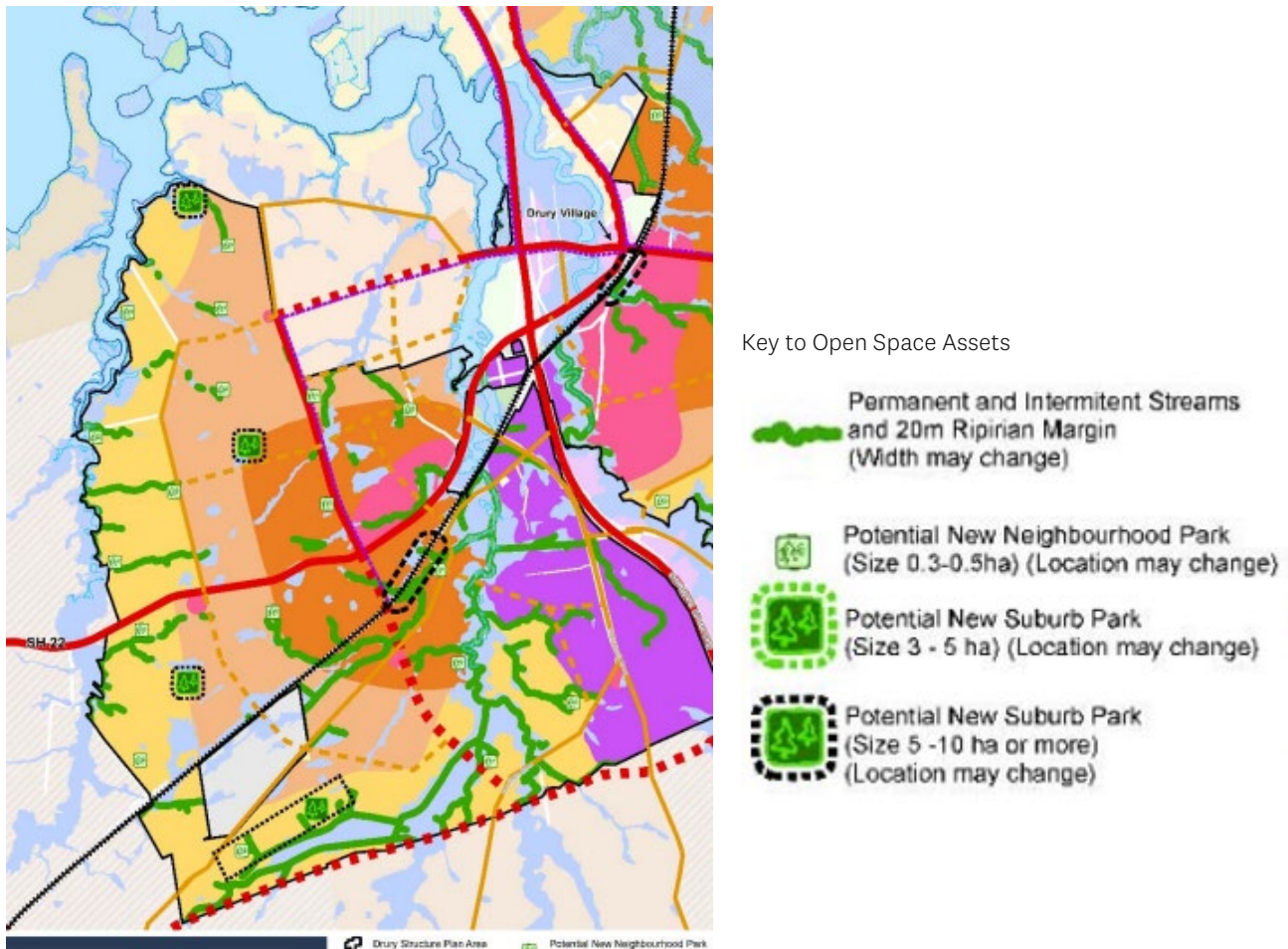


Figure 7 - Part of the Drury Structure Plan, August 2019

Note: this structure plan is aligned to Figure 8 shown later in the document. Figure -8 shows all the open-spaces for Drury-Opaheke including those in the 'actuals, contracted or planned, 2012-2017' phase of the FULSS. As the Fig-7 Drury-Opaheke Structure Plan was released in August 2019 it shows plan for the Future Urban Zone expected to be development ready from 2018 onwards. The 2012-2017 area of Auranga region is not shown in detail in Fig-7 but is in Fig-8.

MartinJenkins review & model development

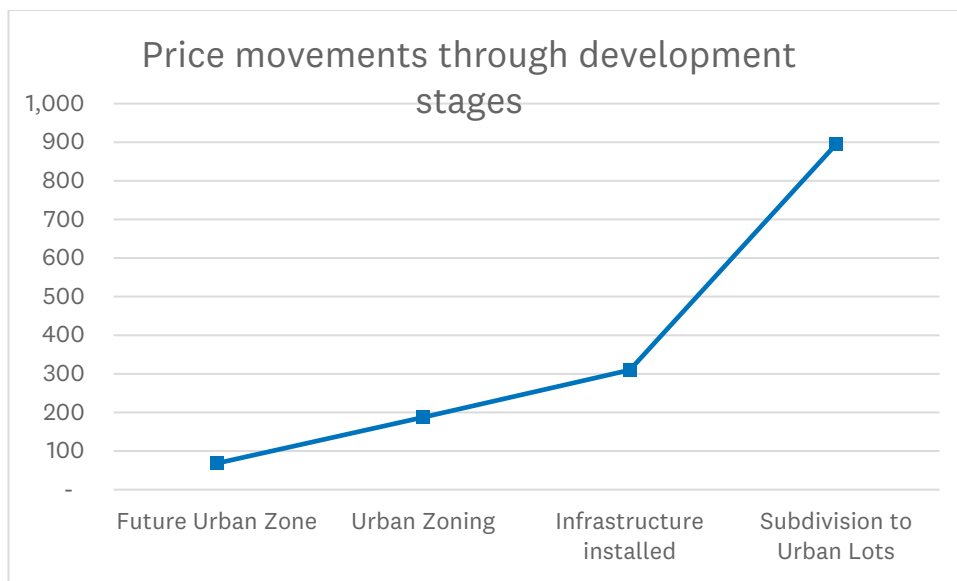
This section describes the review performed by MartinJenkins to inform the model currently used.

Past models applied between 2013-2018 also applied *price x area* assumptions.

In 2015 council commissioned a professional independent valuer to investigate the structural price increases that result as more infrastructure is installed (including off-land improvements like zoning changes and titles being issued).

Reporting on observed land transactions, the valuer observed distinct stages per the Definitions section of this document.

Graph 1: Price movement through development stages observed in the 2015 report



Similar shifts in land price by stage were observed in all valuer reports from 2015 to 2022 and council observations of land price.

Between 2017 and 2019 Martin Jenkins reviewed the Open Space Acquisition Cost model and updated it to the form currently used. The primary changes were:

- Model park types differently – the different park types are modelled in the MJ 2019 version with applicable phased acquisition through land development stages
- Costs (price and typical area of parks acquired) – MJ 2019 model aggregated recent acquisitions and known parameters to feedback about, and inform global assumptions.
- Enable sorting and filtering of the output – the 2019 MJ model used larger data sets than previously so provided for sorting and filtering to provide sub-region information.

The 2019 model

The 2019 OS Acquisition Model developed by Martin Jenkins included all of these changes, producing a top-down model of price x area for multiple parks in a sub-area. The algorithm from this model is still used in 2022 as described in the detailed section. Key parameters introduced then included (as described in the Definitions):

- The model adopted stages as described by 2015 independent professional advice for price shifts, and expected council price inputs to be applied.
- The 2019 MJ model was the first to use this sequence and timing of the stages:
 - 3 years of potential acquisitions in Future Urban Zone (FUZ):

If council has the opportunity to negotiate early enough, for the larger park types, the model assumes land will be acquired for 3 years while in Future Urban Zone.
 - 4 years of potential acquisitions in Urban Zoned (UZ).

When Urban Zoning is complete Council is assumed to neogotiate and acquire land at the “Urban Zoned” stage over the next 4 years, even while the developer is completeing plans, securing financing, applying for resource consents, and installing main infrastructure (roads and pipes) up to the edge of the suburb etc.
 - 5 years of infrstaructure installed (II)

Once land has main infrastructure installed to the edge of the suburb, it is asumed to be Development Ready. The developer may chose to sell land as large plots for hundreds of potential dwellings, or they may choose to further develop land into the “subdivided into Urban Lots stage 4 (installing minor infrastructure to the edge of the future Urban lots). Council has 5 years of land transactions in the infrastructure installed stage.
 - 3 years of Subdivided into Urban Lots (SUL)

Once the resource consent is issued, land has been dressed for urban lot sale, and titles are issued, land can be sold as urban lots. Council is primarily interested in Superlots of 1000-4000 sqm for parks. Land in this stage can be sold to “builder developers” to build houses. Council is essentially competing at any stage here with other buyers on the market. The model assumed that a further 3y of acquisitions occurs, even though this stage is open-ended.

MartinJenkins (2019) also applied a phased approach to land acquisitions as follows:

Table 1- Martin Jenkins’ and council agreed acquisition cost phasing to apply in the cost model

Park type	% spent in FUZ	% in UZ	% in II	% in SUL
Suburb	15%	50%	25%	10%
Neighbourhood		20%	30%	50%
Organised Sport	40%	40%	20%	
Civic			50%	50%

Other park types like Destination Parks are expected to incurr all expenditure in the FUZ stage.

The rationale for Table 1 is explained in Definitions, simply the larger and more suburb-centric parks need to be ‘locked in’ early and can be as they require larger tracts of land, whereas neighbourhood park locations can be adjusted later and actually need titles to be issued before the small plots can be acquired.

These principles also consider that land acquisitions are not all transacted in any one year. Transactions can actually be negotiated early at a low price, and transacted over a couple of years in tranches. The phasing assumes the costs to acquire land in each stage is spread evenly within each of the stages of 3,4,5,3 years nominated above. See an example cost calculation later in this document.

The MJ 2019 model stages, timing and phasing align with council expectations of acquisition patterns. While the assumptions have been tested against field observations, the number of parks acquired is small so this phasing can only be tested at a high level.

The MJ model also assumed that should the land not be acquired by the ideal phasing, so more acquisitions are pushed to later years, that the proportions for those years would apply. For example if a neighbourhood park was to be acquired and the land was projected to be in the infrastructure installed stage when consideration of acquisition begins, then the model will concatenate the phasing to 3/8 of the costs expected spread evenly over 5 years of infra-install, and 5/8 of the cost over 3 years of Urban Lots (i.e. the 30%/50% phasing expected for the last two phases, see Tables 4 and 5 in the detailed Model inputs section.)

Quality assurance and council enhancements to the model

The MJ model delivered in 2019 was thoroughly tested by MJ before delivery, and tested by council before use. The MJ model was built in excel, and intended to be used by a user informed about the open space context but uninformed about the computational algorithm. The documentation with the model covered the use by a council analyst who understands the park environment, but lacked the detailed explanation in this document about the calculation as the formula did the calculations behind the scenes. The user would operate adjust inputs and export the outputs. Council developed this method document to also detail the acquisition cost inputs that the MJ user documentation did not describe because it assumed council analysts already understood those parameters.

The Council team receiving the model reverse engineered the model and rebuilt it using different algorithms focusing on the few park types actually needed, running multiple inputs and outputs for quality assurance. Although the model is now constructed for the size and scale of each costing, the primary principles remain the same. The primary algorithm calculates price x area, phased by years 3,4,5,3 through the stages, with costs spread evenly inside each stage, with development timing determined by the end of the land acquisition phasing.

Tailoring the model to specific circumstances whilst reusing parts of prior model runs uses smaller arrays, and simpler formulae. Council analysts have introduced iterative checks (checksums, and formula tracing review) for additional quality assurance from 2020 onwards. A quality assurance script is followed for peer review of costings.

Growth Assumptions

The open space acquisition cost model considers growth assumptions from first principles – i.e. *what growth is expected and when* according to the pace of development at locations applying common growth assumptions.

Applying growth assumptions

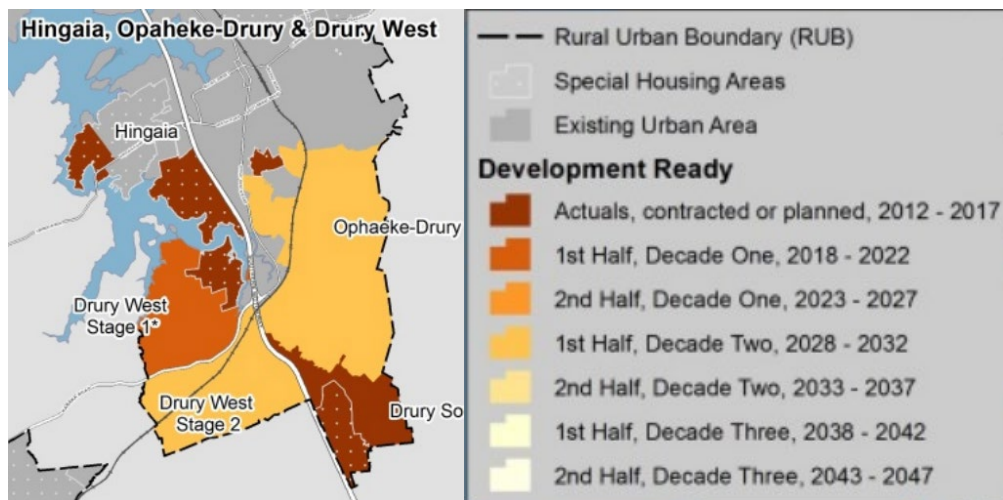


Figure 5 and 6 (reshown): Part of the FULLS 2017 showing intended phasing for Drury

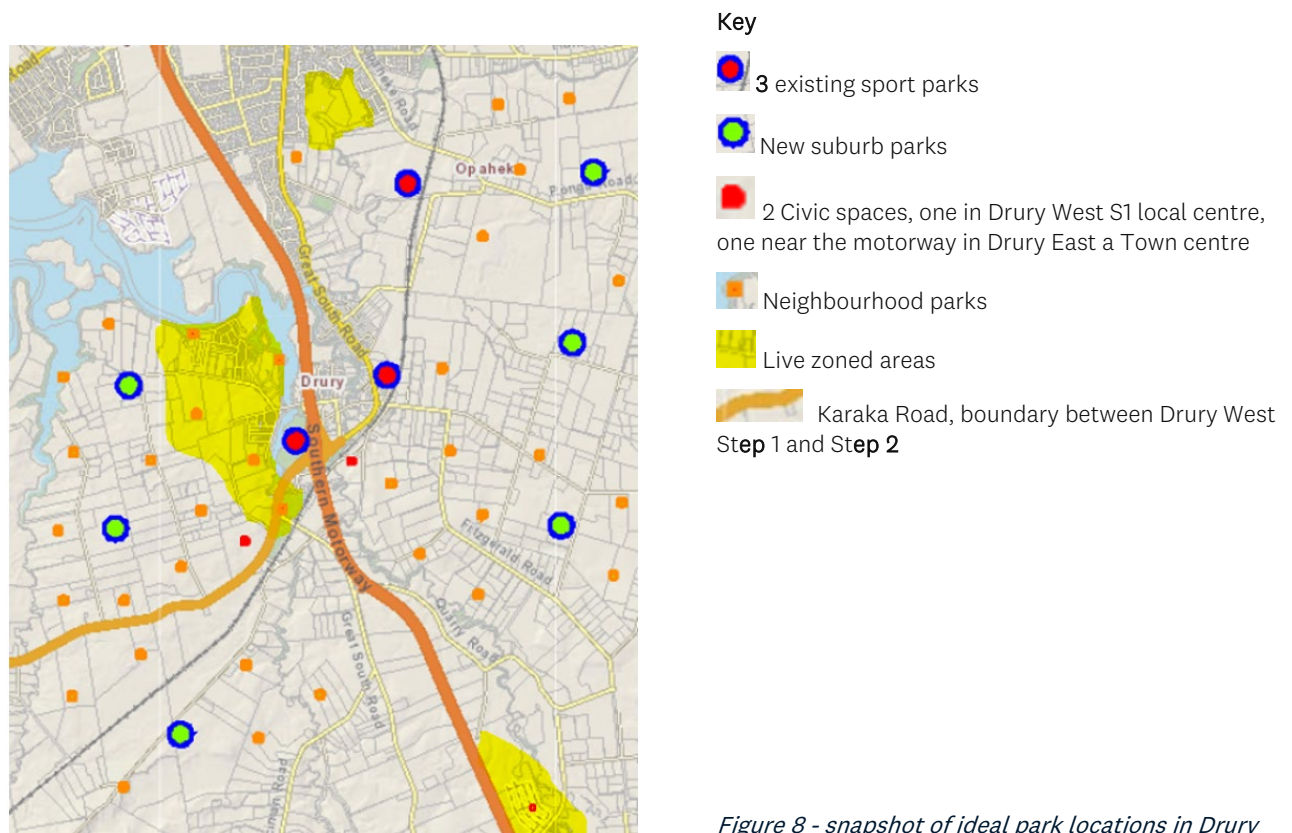


Figure 8 - snapshot of ideal park locations in Drury

The June 2022 modelling exercise considered 43 parks in Drury-Opaheke. Figure 8 is overlaid on Fig-5. Around half of them are in the southern Drury West Step 2 and Opaheke area (mustard colour of Fig-5). The

FULSS expected these locations to be 'development ready' in 2028-2032. Twelve are in the Drury West Step 1 area (FULSS DR 2018-2022) and five are in the Auranga/Bremner Road area (the  area east of Drury West). The Auranga area has housing development well underway.

The land price part of the OS Acquisition Cost Model phases developments through the four stages: Future Urban Zone (FUZ), Urban Zoned (UZ), Infrastructure Installed (II), and Subdivided into urban Lots (SUL). Development Ready (DR) aligns with the start of the Infrastructure Installed stage (that is when land is expected to have to be acquired at the infrastructure installed stage due to market forces). The starting assumption for modelling is that DR would occur during the range of dates in FULSS range, i.e. 2018-2022 etc. The FULSS date range signals at the time of FULSS 2017 that DR would occur progressively across the sub-area with the locations close to existing infrastructure ready for development first, and that the area would progressively obtain all the bulk infrastructure it needs for the future build-out.

Live zoned Auranga/Bremner Rd area: Council's common growth assumption defines Auranga to be in stage 4: Subdivided into Urban Lots. This is consistent with observations from satellite photos in Google Maps 2022 showing several streets with housing completed and empty subdivided lots available.

Council already owns land in Ngakaroa Reserve for which the development costs of a planned neighbourhood park will be included. Information about four parks approved by the Parks, Arts Community, and Events Committee for the live zone area around Bremner road shows known/expected dates for settlement in the near future, with known or negotiated price information.

A multifactor analysis compares the known price and timing of those parks with previous council assumptions for land price relating to the years in which those prices were negotiated.

Other sub-areas in Drury

The phasing for development for the other sub-areas in Drury shown by the FULSS apply the phasing on p26 (Table 1) and expanded on in the following Modelling costs section⁵. The following assumptions inform the timing for price transitions:

- Zoning – the FULSS sub-areas of Drury are not expected to become live zoned all on a particular date. Some plan changes have occurred.
- Expected timing for infrastructure projects
- The above factors are considered for the population projections by MSM (i11 Drury DC version) – in particular the timing for when new residents are expected to be present in new dwellings.

Aligned with common growth assumptions for Drury council adopted the transitions in Table 2. These transitions denote when council might expect to pay more for land, as aligned with the characteristics of the land as observed and reported by independent land valuers and council observations.

It's important to note that price is determined by negotiations between a well-informed buyer and seller who consider the availability (excess or scarcity of supply), what has been invested in the land, and the uncertainty ahead in terms of ultimately transitioning the phases of development activity to an end product sold to a home owner. Price for land is expected to rise when sellers and buyers agree that higher

⁵ Assumed three years of possible land acquisition at Future Urban Zone, four years at Urban Zoned, five years at Infrastructure Installed, and although land stays at the Subdivided into Urban Lots stage indefinitely, council assumes three further years to complete acquisitions where needed.

prices are warranted as land with the characteristics of investment and associated certainty is becoming in short-supply.

The following timing assumptions also consider the natural delay between a price being agreed and the actual settlement and funding transfers. The price transitions dates assumed here are not the same as when council assumes the sub-areas to transition to Urban Zoned or Development Ready. Parcels of land will move at different stages within sub-areas.

Table 2 - assumed phases for sub-areas of Drury

Sub-Area	MSM definition	new residents year <i>note</i> ¹	1st year UZ, for 4 years	1 st year II, for 5 years <i>note</i> ²	1 st year SUL
Auranga	Part of 561		Assumed 2023 onwards is at SUL		
DWest Stage 1	Part of 561, 562	2022	2023 (then just 2024)	2025	2030
DWest Stage 2	560, 559, 557, 558	2032	2031	2035	2040
Drury East	554 & 555	2031	2030	2034	2039
Opapeke	550, 551	2031	2030	2034	2039

¹ New residents year – the year the i11 Drury DC population model shows start of large population increases, signaling the first new residents in homes

² is assumed to be ‘new residents year’ plus three years

Modelling – inputs, calculation, outputs

Park sizes and standard costs

The standard parks sizes to be applied (unless park area is known) are shown in Table 3.

Table 3 - assumed park sizes

PARK TYPE	Park sizes (sqm)
Suburb Parks	30,000
Neighbourhood Parks	4,000
Riparian*	as measured
Organised Sport	100,000
Local centre	2,000
Town centre	4,000

* not counted for development contributions

Park sizes in Table 3 are drawn from the Open Space Provision Policy. Where the policy describes ranges, Table 3 applies historical practice and advice from Policy team members who engage with developers about provision of parks.

In 2022 the assumed size of neighbourhood parks for modelling was reduced from the upper range 5,000 sqm used in prior years to 4,000 sqm to sit in the middle of the range indicated in the policy.

Suburb parks can be up to 5Ha (policy range 3-5Ha) but it is very common for them now to be 3Ha.

Recent sport parks have been 10Ha.

Recent experience of local and town centre parks varies simply by nature of the small number of them actually planned. The size assumed in the model is at the upper range of the policy based on staff experience and advice.

The number and types of parks

The number and types of parks are specified by structure plans, or agreed acquisition plans approved by the relevant Committee (Parks Arts Community and Events Committee). In the absence of structure plans, advice from policy team members is sought and applied, or a pro-rata analysis of the number of parks is completed. The most notable area for which no structure plan exists is the large Dairy Flat area slated for development from 2035. For this area the number and type of parks can be extrapolated from other areas, noting the presence of large sport parks at Silverdale, Millwater, and in the South-West corner of the Future Urban Zone area to offset sport park needs.

Riparian areas are vested. Development area is estimated by inspection of the lengths in the structure plan maps, noting whether the waterway was a dual sided or one sided coast. The development of riparian areas is not included in Development Contributions Policy.

Phasing and timing of park acquisition

The assumptions developed for the 2019 Martin Jenkins model version are applied, assuming the phasing as preported in Table 1:

Table 1 (reshown): Martin Jenkins' and council agreed acquisition cost phasing to apply in the cost model

Park type	% spent in FUZ	% in UZ	% in II	% in SUL
Suburb	15%	50%	25%	10%
Neighbourhood		20%	30%	50%
Organised Sport	40%	40%	20%	
Civic			50%	50%

When acquisitions commence later in the development lifecycle, the proportions are applied prorata so that if acquisition starts in Urban Zoned (Table 4) or Infrastructure Installed (Table 5)

Table 4 - Prorata application of table 1 if acqisitions start later, in Urban Zoned stage.

Park type	% UZ	% II	% SUL
Suburb	59%	29%	12%
Neighbourhood	20%	30%	50%
Sport	67%	33%	0%
Civic	0%	50%	50%

Table 5 - Prorata application of table 1 if acquisitions start in Infrastructure Installed stage

Park type	% II	% SUL
Suburb	71%	29%
Neighbourhood	38%	63%
Sport	100%	0%
Civic	50%	50%

Finally, if acquisitions start in Subdivided into Urban Lots, then 100% of expense will be applied in that stage.

Land price

As discussed in the land price method part of the overall Drury DC Policy Consultation Document, council forms a view about land price by development stage for greenfield land (as price psm) (see definitions).

Many factors influence the land price increase observed: Developers have done work on the land, either physically in terms of infrastructure, or off the land in terms of consents and plans, and negotiated arrangements with other developers. The land is more marketable as it moves through the stages as it is a shorter timeframe between a transaction and full value being realised in the form of a finished dwelling (more certainty). As it moves through the stages more possible buyers emerge as larger developers are involved at early stages, and many builders/developers are involved in the final stage – so more competition among buyers.

In February 2022 council received valuation advice from an independent professional valuer about greenfields land sales over the last 12 months with applicable market adjustment according to valuation practices to provide land prices as at February 2022, including for Drury. Where segments had many sales, the focus was on the last four months.

Council then applies its knowledge of land price to apply to land cost modelling for all asset types amounting to a starting assumption and a relative price increase (*development stage adjustment factor*) as land moves through the development stages. The starting assumption can vary depending on the asset type and known information about land to be acquired in a particular area.

Table 6 - land price factors assumed by council as at February 2022

	Future urban zone	Urban Zoned	Infrastructure installed	Sub-divided into Urban lots (superlots)
Relative development stage adjustment factor	1	1.43	1.50	3.87
\$ psm	175	1.43 applied to FUZ \$175 psm	applied to UZ \$psm	applied to II \$psm

Table 6 land price values were applied for open space modelling. Note these land price values are NOT the basis for individual site negotiations – for which site-specific valuations are typically applied. Table 7 shows an example calculation using these figures.

Acquisition cost calculations

The model algorithm determines the number of years, and profile of costs over the years for park acquisitions by spreading the land price x area where the price is per stage from Table 6, and the proportion of spend in that stage is per Table 1 or derivatives using the phasing of the development in the Martin Jenkins model review 2019.

In practice this means that if two suburb parks of 30,000 sqm each are needed in a development area, where council begins negotiating well in advance:

Table 7 - calculating cost of two suburb parks using the standard phasing

	FUZ 3y	Urban Zoned 4y	Infra-installed 5y	Sub-divided 3y
Proportion of cost ¹	15% divided over 3y, so 5% of price by area	50% divided over 4y, so 12.5% of price by area	25% divided over 5y so 5% of price by area	10% divided over 3y so 3.3% of price by area
Price psm from 2022 valuation	175	1.43 x 175	1.50 x 1.43 x 175	3.87 x 150 x 1.43 x 175
Numb parks	2	2	2	2
Area of land needed	30,000	30,000	30,000	30,000
Cost for each year	3 years, each =5%*175*60000	4 years, each =12.5%*250*60000	5 years, each =5%*375*60000	3 years, each =3.3%*1450*60000
Cost each year	\$525,000 for each of 3y	\$1,875,000 for each of 4y	\$1,125,000 for each of 5y	\$2,900,000 for each of 3y

¹ using phasing from the Martin Jenkins 2019 model review

Total cost, in Table 7 for two parks is \$23.4m, (this example doesn't escalate land costs by inflation).

If the two suburb parks in Table 7 were in The Drury West Step 2 area and if that area is expected to be **Development Ready** in 2035* then, the contribution of these two parks to the overall cost would be:

Table 8 - contribution of two suburb parks in OpahekeDrury of Fig-3: FULSS

	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
\$000	525	525	525	1875	1875	1875	2875	1125	1125	1125	1125	1125	2900	2900	2900
	FUZ	FUZ	FUZ	UZ	UZ	UZ	UZ	II	II	II	II	II	SUL	SUL	SUL

* NOTE the timing of Development Ready (2035) is as shown in the Development Ready timings at the end of the Growth Assumptions section p27.

Over the top of the model, some park parameters are hardcoded, for example if the actual size is known, or the price or timing is known, the inputs and calculation can be over-written.

Table 8 suggests costs are spread over as much as 15 years for these two example parks with small amounts of spend every year. Table 8 represents the *expected value* from the phased probability distribution. In reality each park will be acquired with one or more transactions. In aggregate many transactions will produce a spend profile over many years as modelled by this probability distribution.

Table 8 does not have been escalated by market factors (inflation). The inflation escalation parameters are described in the DC Policy Method, *Cost escalation factors and interest rates*, 2022.

Development costing

The costs of developing land into a serviced park is specific to each parcel of land and the needs of the community which will use it. Council models the cost of developing new parks at the macro level based on a standard provision of amenities required for each park typology as indicated by the Open Space Provision Policy (2016). The rates used for these amenities is based on recent experience and real-world costs.

The assumptions which make up the modelled cost per park typology are detailed below, providing a cost per square metre to estimate the total development cost across the proposed network. Costs per square metre have been rounded up for simplicity.



The proposed phasing of the costs is based on experience and the practicalities of delivering new parks. Experience tells us that the larger, more complex suburb parks will take longer to plan, design, and develop compared to the smaller and more straightforward neighbourhood parks.

Specific cases will vary in practice, but a general assumption can be made that the start of development will be two years from the date of acquisition (if known), or the end of the three-year period in stage 4 Subdivided into Urban Lots (if acquisition phasing is estimated). The costs are spread depending on park type.

Development Cost Assumptions: *Neighbourhood Parks*

The Open Space Provision Policy includes the following indicative amenities for a neighbourhood park (which includes local centre/town centre parks) noted in the table below along with a list of anticipated specific amenities to achieve this outcome.

Table 9 - development cost for neighbourhood parks

Neighbourhood Parks	
Indicative Amenities:	Play space; flat unobstructed kick around space for informal games; areas for socialising and respite; landscaping; specimen trees; and furniture.
To implement this level of amenity, council anticipates costs for:	• site clearance and reinstatement, • earthworks (including preparation of lawn areas) • purchase and installation of play equipment • signage • seating • rubbish bins • pathway lighting • cycle racks

	• basketball halfcourt (approx. 25% of new parks) • toilet (approx. 25% of new parks) • boundary treatment/fencing • connecting pathways • plants and trees • professional services costs (site investigation fees, consenting, design, engagement, council direct costs) • contractor costs based on a standard size 3,000m² park
Modelled Cost:	\$600 per square metre (cost in 2022)

The nature of neighbourhood park development is varied and some will have more development than others. It is assumed, for example, that 1 in 4 parks will have toilets and a basketball half courts, whilst some amenities are standard in all parks. A quarter of the expected cost of basketball half courts and toilets has been included in the above calculation to take this into account.

The development of a standard neighbourhood park is assumed to be deliverable over two years, requiring approximately 10% of the total budget in year 1 for investigation and design, and 90% of the budget in Year 2 for construction. This reflects the smaller, less complex nature of these parks.

Development Cost Assumptions: *Suburb Parks*

Suburb parks are significantly more complex and variable spaces than neighbourhood parks. The Open Space Provision Policy includes the following indicative amenities for a suburb park noted in the table below along with a list of anticipated specific amenities to achieve this outcome.

Table 10 - development cost for Suburb parks

Suburb Parks	
Indicative Amenities:	Walking circuits; multiple kick around spaces; socialising spaces including picnic and BBQ facilities; larger and more specialised recreation attractions such as large playground, hard courts and skateparks; beaches and watercraft launching facilities; organised sport facilities; community event space; car parking; and toilets.
To implement this level of amenity, council anticipates costs for:	While there is a lot of variability, we can model a standard park as requiring: • site clearance and reinstatement, • earthworks (including preparation of lawn areas) • purchase and installation of play equipment • basketball half court • a fitness, learn to ride, or waterplay component • signage • seating • rubbish bins • path lighting • a two pan toilet • BBQ and picnic tables

	• cycle racks • boundary treatment/fencing • connecting pathways • plants and trees • carpark • professional services costs (site investigation fees, consenting, design, engagement, council direct costs) • contractor costs based on a standard 5ha park
Modelled Cost:	\$150 per square metre (cost in 2022)

The development of a standard suburb park is assumed to take more time to design and plan than a neighbourhood park and will take up to four years to deliver. This requires approximately 10% of the total budget in years one and two for investigation and design, and 40% of the budget in years three and four for construction.

Development Cost Assumptions: *Sports Parks*

Sports parks are similar in complexity to suburb parks, with the addition of formal sports fields and changing rooms for players.

Table 11 - development cost for Sport parks

Sport Parks	
Indicative Amenities:	Same as a suburb park
To implement this level of amenity, council anticipates costs for:	The primary focus on sport will require the same amenities as a suburb park, with the following changes and additions: • purchase and installation of play equipment • plants and trees • carpark • changing rooms • sports field specific earthworks • sand carpet turf • Irrigation • sports lighting • drainage systems based on a standard 5ha sized park
Modelled Cost:	\$320 per square metre (cost in 2022)

The development of a standard sports park is assumed to take the same time as a suburb park, with four years to deliver, requiring the budget to be spread approximately 10% available in years one and two for investigation and design, and 40% of the budget required in years three and four for construction.

Development costs being simpler to calculate as price x area, have detailed base cost input information in this section. Development costs are calculated as per the overview in p14.

Outputs

The outputs is a cost projection by year, where each year is interpreted as a council financial year (July to June), and collated by development area and park type.

The raw (large array) model outputs of development costs are provided to Community Facilities to combine with known (already acquired) park development cost projections.

See the section: *Application to the Development Contribution Policy*. These cost outputs are reported alongside the proportionate impact of cause, and beneficiary analysis, and aggregated per Table 13.

Table 12– Overall costs for Open Space in Drury

\$m	10y 2031	20y 2051	Total
acquisition	72.4	304.6	376.9
development	13.0	180.0	193.0
Total	85.4	484.5	569.9

Totals do not add in the above Table due to rounding.

Application to Development Contribution Policy

Park acquisition and development costs are an input to budgeting, prioritisation, Development Contributions Policy, and more broadly into policy settings about what community provision is desired and how to enable it.

Regions and sub-regions

Fig-9 shows the reserve subregions: North (blue), NW (green), Brownfields (grey), South (dark-red) and Opaheke-Drury (orange). The projected costs from the OS Acquisition Cost Model are collated and charges are set in the DC policy by one of these sub-regions.

Some DC rates are listed in the DC policy for historical projects from legacy councils in more granular locations, like Hibiscus, North Shore or Rural South West.

The 2022 model only contributes to rates related to the sub-regions in the table below.

Table 13 - The projected costs by year from the OS Acquisition Cost Model are aggregated into these categories of park-type/subregion:

Park type	North	NW	Brownfields	South	Opaheke-Drury
Sport*	Costs are reported regionally				
Suburb					
Neighbourhood					

See the overall DC Policy method document for how the cost projections and beneficiary analysis are combined.

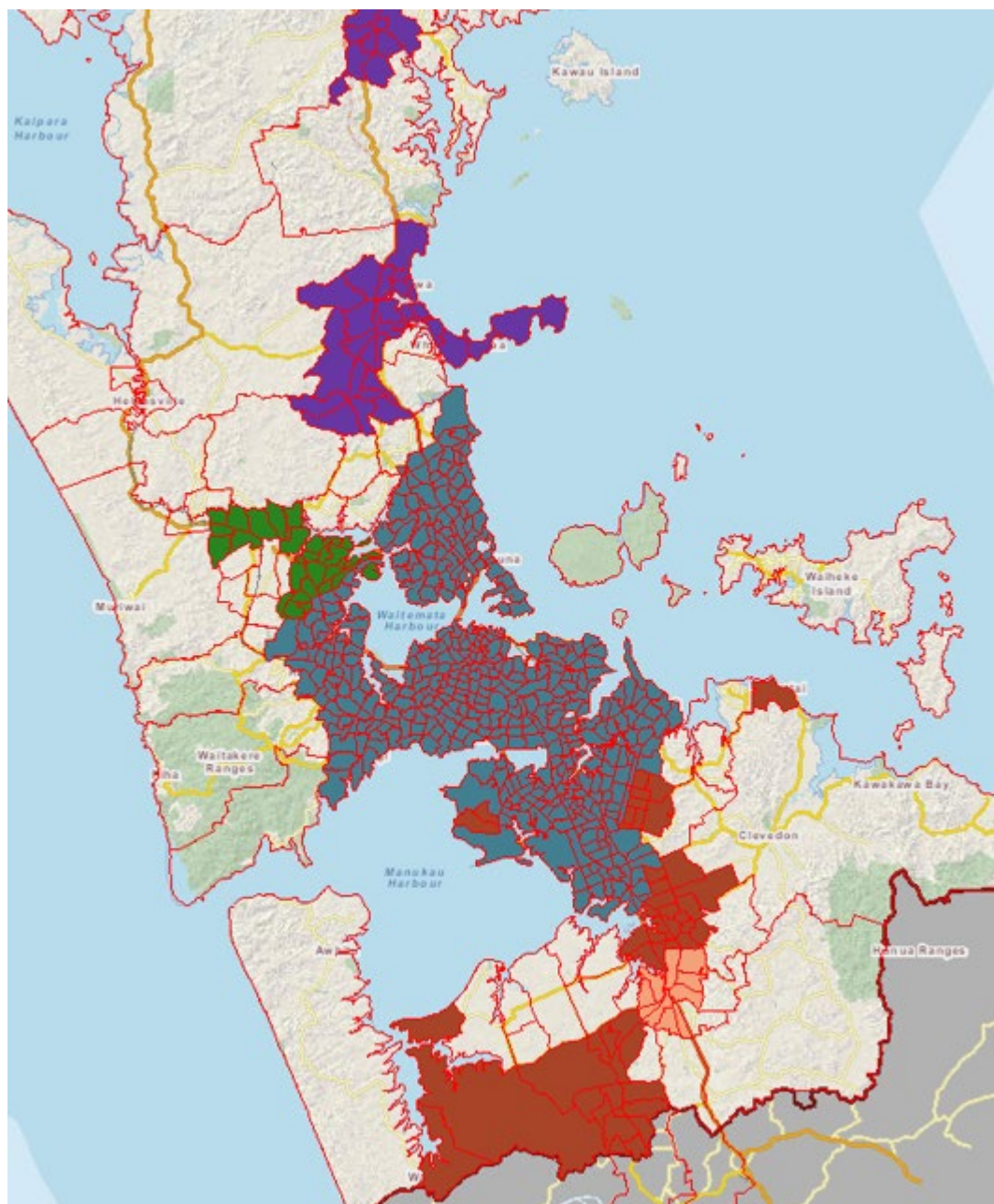


Figure 9 - subregions for reserves: North (blue), NW (green), Brownfields (grey), South (dark-red) and Opaheke-Drury (orange)

Cause and beneficiary analysis

The DC Policy applies 'cause of growth' and who benefits to determine what proportion of the costs of parks are due to growth and should be funded by DCs. The cause of growth and who benefits is analysed for the DC Policy for the local areas in Fig-5. Past needs analyses and spatial plans are reviewed estimate what has driven the need for additional parks and which areas will get benefit by proximity for the parks.

Each of these drivers and beneficiaries is analysed and reported. Cause and beneficiary (level of service experienced by new residents) is reported for each cell in Table 13. The DC Policy combines these results with the cost projections to form the DC charges. The Drury exercise updated the figures for the Drury column.

New parks in greenfield areas

Cause for acquisition and development costs in Greenfields

By definition, the cause of growth in greenfields development is likely to mean that 100% of the costs of acquisition is due to growth. The growth analysis considers if there are any factors that lead to parks being acquired or developed that are NOT due to the new growth. In the absence of any of these factors, cause of park acquisition in greenfield areas is 100% due to new growth.

Beneficiaries for acquisition and development costs for new parks in Greenfields areas

Level of service

Where there are potential users in existing residential areas that are reasonably proximate to the new park then some existing ratepayers will get use of the park. Analysts review needs and inspect spatial plans to assess the reasonable use split between new dwelling areas and existing ratepayer areas. Historical assessments concluded that the users of new parks in greenfields areas comprise around 95% new and 5% of users are existing residents.

Example analysis considers the western edges of the Opaheke-Drury Stage shown in Fig-7. In particular the north-west part of that area is next to existing residential areas. New parks close to the edge of the greenfields area could be accessed by existing residential areas. By inspection a count of parks that are proximal to the residential areas and the proportion of users is calculated, and the result applied to the new/existing %. For example if there are 15 new neighbourhood parks in that sub-area, and analysis concludes that for three of them 25% of their users could be existing residential areas, then of the 15 parks, 0.75 of 15 or 5% is existing and 95% of the users are resident in the new dwellings. These results are combined across the sub-region areas in Fig-5.

$$(0.75 / 15 = 0.05)$$

Similar analysis is undertaken for suburb parks – by inspection to determine the mix of beneficiary users.

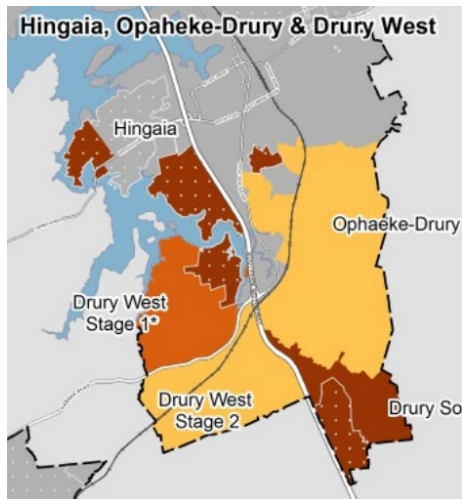


Figure 5 (reshown): Part of the FULLS 2017 showing intended phasing for Drury

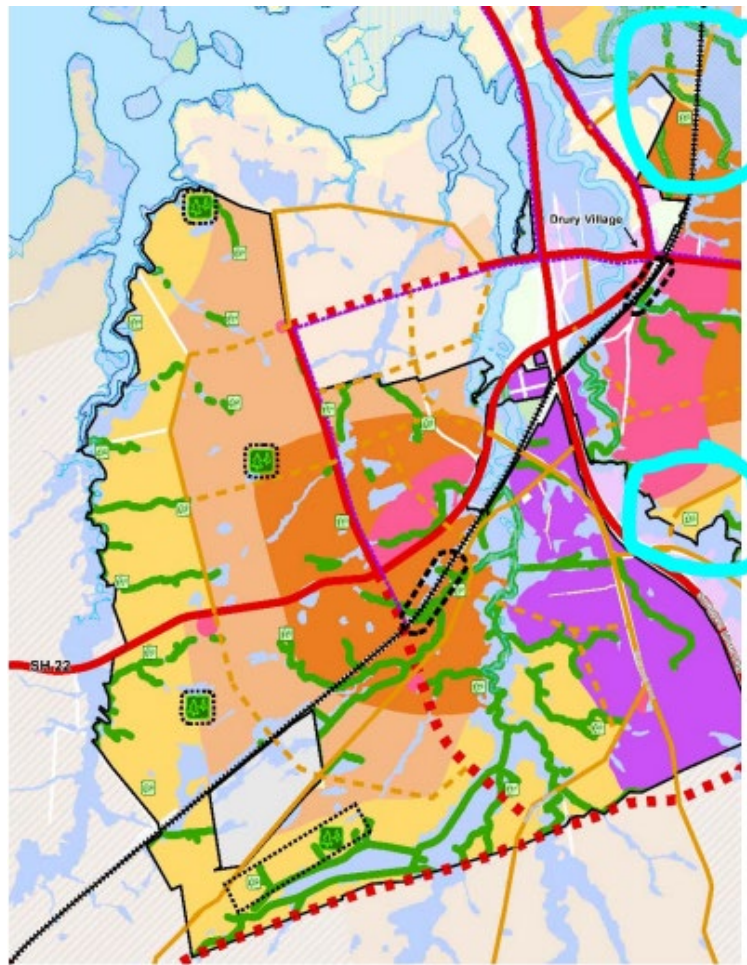


Figure 7 (reshown) –Structure plan for Drury showing two new parks (marked) for which user analysis inspection is required

The population growth for the 10 years to 2031 and 20 years to 2051 are extracted from the common i11v5 to be applied for the Drury area. The costs for each of the park types, by each sub-area in Drury is combined with the area population growth to attribute the costs of new assets between existing residents and new residents.

Cause and beneficiaries for development costs

Analysts must also consider the cost associated with upgrading the park due to standard renewal needs, and that needed to appropriately serve an additional population. The analysis above for new parks is added to analysis of renewals and upgrades to determine the proportion of the proposed project that is attributable to renewal vs LOS increase vs Growth (new and future residents).



The renewal portion includes the percentage of the project that is attributable to replacing an existing asset and its service. The LOS increase portion includes any increase of service level for an asset that is beyond the renewal component and is not attributable to growth i.e. it serves existing resident populations. The 'Growth' portion of any project is that percentage which serves new and future residents.

The proportion of beneficiaries attributable to growth considers:

1. Are there existing assets and services as a part of the project?
2. What area will the asset serve based on the open space provision policy?
3. What is the projected growth for the area?
4. What is the existing population for the area?
5. What is the known service shortfall for the existing population, if any?
6. If available or relevant, what is the existing beneficiary analysis for land acquisition in the area?

More detailed analysis to determine the beneficiaries includes :

7. An investigation to determine if there is an existing asset to be renewed as a part of the project and if so the value of that renewal.

There may be circumstances where the project includes a renewal and an increase level of service i.e. the renewal of a playground and expansion of the play offering including footprint size.

8. Review the i11 model for the existing and future projected population to determine the amount of growth in the area

The granularity of this information is limited to the Macro Strategic Model (MSM) Zones which provides a picture of population change at an area generally much larger than the catchment area of any open space. The amount of change across the entire MSM area needs to be assessed (visually) against the potential catchment area for the proposed open space asset (discussed below - noting that this catchment area may cross MSM zone boundaries).

9. Estimate the population served by the new asset and determine the proportion that the asset serves between existing or future populations based on the above inputs.

Within these "catchment" areas, we assess the existing population/potential user base against the expected new and future population to determine the cause and the benefit of the development attributable to growth. In a pure greenfields area the complete lack of any existing population renders the complete investment attributable to growth (100%), and in an existing urban area, the percentage could be more evenly split.

Calculating the beneficiaries of a development is largely directed by the Open Space Provision Policy which establishes the need for a park and therefore the expected user base. For example, a neighbourhood park should be established within 400m walking metres in medium/high

density areas. The larger the park (i.e. a suburb park) and the more intensive an investment (i.e. a sports park servicing multiple sports codes or recreational activities) the greater the potential pool of beneficiaries.

10. Consider the assessment of beneficiaries completed at the time of land acquisition

There is a strong correlation between the beneficiary analysis for open space acquisition and development, so this information when available is a useful input to any analysis. If the development occurs near in time to the acquisition, the analysis is expected to be essentially the same. However, over time there could be a considerable change in the population depending on the pace of growth. There is a lag of at least two years between acquiring land and council initiating a project to develop it. Further delay in developing open space will mean that some residents will have arrived and established themselves, perhaps for several years before a project is initiated. The beneficiaries of the project attributable to growth will therefore fall overtime.

11. Check for planning or service assessments to research the need and service in the area

These assessments (if any) should confirm if there is an existing shortfall requiring an increased Level of Service (such as a need to meet the needs of older youth in a park that currently caters to pre-school children) or a specific need for a new population.

12. Reasonableness Test

Ultimately, the beneficiary analysis is a reasonableness test, based on the relative amounts of growth modelled for the area, the expected user base, and the experience of the staff involved. These assumptions are then peer reviewed and scrutinised whenever the Development Contributions policy schedules are updated.