RESIDENTIAL LOT PERFORMANCE (RLP) MODELLING

Study Report

commongroundSTUDIO

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1. EXECUTIVE SUMMARY

Subdivision Performance (RSP or SP) modelling measures subdivision 'design quality' ie the potential residential amenity (quality and value) and urban functionality enabled by the subdivision design.

Lot Performance (RLP or LP) modelling measures the extent to which the *lot design* surpasses or diminishes the potential value determined by the *subdivision design*.

The underlying purpose of both tools is to:

- Reveal what is creating or diminishing amenity and value
- Provide baseline levels of amenity and value for:
    - Comparison with competing schemes
    - Predicting the benefit or otherwise of design changes

Essentially, LP assessment adapts the SP modeller for use at a different scale. It uses the same data structure:

- Data records are attached to plan geometry
- Record criteria capture data from (8) matters for which there is reliable evidence of urban design benefit
- Field values record presence and extent of criteria elements
- Field values are reported numerically (-2>6) expressing the position on a bad>best continuum
- Criteria totals are normalised to 100 to enable comparative analysis

The obvious differences between the two modellers are the criteria able to be measured and the geometry able to be applied to them.

Section 1 of this report establishes the use case and then details and explains the working of the RLP modeller. It also considers the relationship between performance modelling at the subdivision vs. lot scales.

Section 2 applies LP analysis to two small blocks (5 and 6 lots respectively) in separate developments in the Whangarei District. The subdivisions share many characteristics and are both high-functioning in urban design terms. The point of making a comparative analysis of these sample blocks is to demonstrate the extent that internal lot design is the ultimate determinant of urban quality. Subdivision design and implementation can establish the framework and potential for residential quality, but individual lot design is responsible for either diminishing or augmenting that quality.

An important conclusion that was drawn from this comparison was that the dominant determinant of outcome is the way that architects and builders approach the design of the house itself. All other outcomes on the lot and the impact these have on the surrounding neighbourhood come from how the house works and how it's placed on the site. House design that responds well to site and planning conditions will produce quality urban environments. House design that doesn't respond will produce low quality urban environments.

Section 3 tests this conclusion by using an adaptive rather than impositional approach to house design and putting up an alternative for comparison with the low performing scheme. The result demonstrates that the design methodology itself (as opposed to just the house plan) is the critical issue.

In addition, it showed that a better approach to built-form in a 'lesser quality' subdivision is able to at least equal that generated from a 'better quality' subdivision, with the small difference shown here being within the margin explained by a single outlier lot being included that has significantly different vehicle access conditions to all the others in the samples.

SECTION 1

2. LOT PERFORMANCE MODELLING

2.1. WHY BOTHER?

Most developments are tiered. The company who plans and consents the subdivision is not usually the company who puts houses on sections.

Ask any subdivision developer who risks a lot to achieve a higher quality environment what their biggest problem is and they'll say controlling the built-form. It's not so much the buildings in this case that are the problem – sometimes they're fine. The problem comes from the structure of the industry where the skills required to produce quality subdivision are not transferred to the people who get to give it final expression.

This problem is much worse the closer subdivision approaches medium density. At medium densities building design should ideally precede and then generate the subdivision lot plan. That's never going to happen in a two-tier industry.

Lot performance modelling is a first stab at passing the urban design values of subdivision through to the level of lot layout and building design in a way that can be picked up quickly by designers, architects and landscape designers without them having to do a post-graduate degree. Similar tech using data visualisations generated in the background have proved to be invaluable design-aids for self-learning among urban design professionals. So long as the tech is simple and transparent there's no reason to think it can't be just as useful for the people delivering the final stage of a development.

The trigger for doing this work was a 'design' checklist requested by an architect being pushed into doing things by his builder client that he thought were wrong. The checklist addressed a number of alternative planning rules that underpinned the subdivision design and have since become part of an alternative consenting process for similarly 'non-complying' developments.

2.2. RLP MODEL OUTPUT

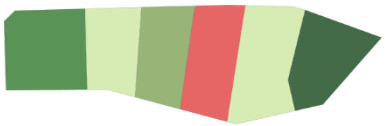
Three types of output are generated by model:

- Visual (data visualisation planset)

- Scores
- Quantitative measures

Visual Output

Data visualisations are rendered for each criterion. The basic colour schema used throughout is red = bad, grey = neutral (no change), green = good (darker the better). Weak areas in the design, or when the design performs badly in any respect, can therefore be seen at a glance.



Score Output

Each criteria visualisation is accompanied a table that maps the distribution of field values and is transparent in the application of numerical values for each. Tuning of a model to respond to particular conditions can be made at this level to impose a bias. This can be done by either by altering the distribution gradient in the record itself or by changing the numerical value returned by the field. Values are summed and normalised to 100 for each criterion in the model. Criterion totals are reported to a worksheet that calculates the overall performance expressed as a number.

COVERAGE EFFICIENCY				
	Lots	Value	Total	Score
> 45%	1	-2	-2	
41 - 45%	0	1	0	
36 - 40%	2	2	4	
31 - 35%	1	3	3	
26 - 30%	1	4	4	
< 26%	1	6	6	
TOTALS:	**6**		**15**	**42**

Raw Data Output

Geometry properties and data field classifications are also returned in other worksheets for further analysis. Referencing the Field Values individually in this way provides access to the specific quantitative measures underpinning each total.

LOT PERFORMANCE - SANDS SAMPLE					
lot	area	coverage	%	living	%
Lot 1	407	114	28%	96	24%
Lot 2	277	101	37%	23	8%
Lot 3	302	101	34%	47	16%
Lot 4	346	161	47%	26	7%
Lot 5	415	152	37%	29	7%
Lot 6	331	82	25%	72	22%
TOTALS	2,080	713		59	
average	347	119	34%	10	14%

2.1.1. What the Scores Mean

Obviously, the numbers returned in the criteria totals don't 'mean' anything in themselves – 73 isn't a particular Open-space 'thing' as opposed to 75. Some criteria measures use AREA, while for others percentage cover of the lot is more appropriate (the spreadsheet report includes both). When lots are different sizes it's quite possible that a score of 73 might contain a bigger area of open-space than 75. But it won't contain more open-space than, for example, a scheme totalling 85 so long as the sample set is approximately homogenous.

Urban functionality and amenity quality are collective values. The relationships between criteria are often more important than an individual criterion result. A high score in one can lead to a low score in another, indicating poor lot design. The design itself is then 'out of balance', meaning the arrangement of spaces has led to inefficiencies that impact overall performance

Criteria totals are all normalised to 100. This is done twice, at the criteria and then at the scheme assessment stages. In part this provides a softening buffer to allow for criteria relationships mentioned above, but it also allows a direct comparison of urban functionality to be made between LP and SP models. The use of the modelling tools is essentially comparative:

- To what extent does the LP design realise the potential of the SP scheme, or does it surpass it?
- Is the lot design failing and can it be made better?
- Much better, or just a little bit?
- Is Scheme A better than Scheme B?

Bad/ good/ best are soft assessors and generally meet with agreement. Subjective opinion enters the fray when it's necessary to ask 'how good', or 'is A *really* better than B?' The criteria employ 4—7 steps of 'goodness', concentrating on gradations of good rather than bad on the basis that if a thing is known to have a negative effect, then it shouldn't be promoted in the first place. There should be no argument that a bad thing can be made acceptable by making it less bad.

Quantitative scales are applied to the 'steps of goodness'. For example, less than $20m^2$ outdoor living area is not enough for suburban residential needs. In any case, it is less than the minimum required by most district plans. At the other end of the scale, $75m^2$ is large enough to contain all needs. 100% satisfaction of function. Beyond this may be nice and some people may value it and take advantage of it, but applying gradations of 'better' to 100% (better than best – a comparative superlative!) has no value in the context of this sort of comparative and predictive modelling.

2.1.2. The Relationship Between RSP and RLP Scores

Both modellers assess urban design quality and amenity value. Their shared methodology and data structure allow a direct assessment of the extent that the detailed design (spatial layout) of the lot meets or fails the potential created by the concept design of the subdivision.

Total scores for both SP and LP models are equivalents on the same amenity/value continuum. They both consider the same sorts of spatial interactions to the extent they influence urban quality. Therefore, it is the *ratio* between these two measures that is the thing to watch – which criteria within the LP are affecting potential (SP) quality for better or worse.

Criteria relationships are not linear, so it is nearly impossible for an LP aggregate score to reach 100 without more complex variables being introduced that could identify eg when density contributes to a criteria value and then the point at which it might diminish that same value.

However, it is certainly possible that an LP score can exceed the SP score – the baseline potential of a subdivision scheme – and thereby increase overall subdivision quality. See (3.2 RSP:RLP Ratio) below.

2.3. MODEL GEOMETRY

A spatial design for the site sufficient to extract data for the model can be accomplished with six polygons:

Building footprint

Living court

Other open-space

Vehicle space

Access/entry

Waste space

The preparation of the spatial plan is therefore a relatively trivial undertaking. Although not including any design detail, realistic and accurate performance assessments are achieved by using the shapes to identify spatial function and capturing relationships between functions within the data record.

The primary driver in the plan is the architectural response and building design. That process will, by its nature, resolve the spatial geometry for the lot required by the modeller. The real-world overhead to produce the geometry and harvest the data is trivial – from experience about 3 minutes per lot.

2.4. MODEL CRITERIA

Rear (private) Living Court

Mandated by district plans, field values record whether it's present and then its size. No private court means there's a serious amenity deficit; an area less than $20m^2$ (the usual DP minimum) is barely acceptable; bigger than $75m^2$ can accommodate any residential activity.

Front (public) Living Court

Front courts are optional but generate considerable social capital when present and done well. A further, less obvious benefit for the property owner is that no matter what the orientation or configuration of the site, it means that in conjunction with the rear court there will always be an outdoor living area that receives the sun.

Whether a successful front court is achievable will depend on being enabled by the subdivision design removing vehicle crossings from the front. When front courts are *not* present because the lots are front accessed, the score is 0. Not having a front court doesn't make the subdivision worse. In this case the lot simply matches the lower quality of the subdivision.

When a front court *is* present when the lots are front accessed, it is unlikely to be used to any great extent (eg see Hobsonville Point). Although it will contribute to the amenity score, it adds no real value to the lot or the public realm. Although not employed in this iteration of the model, a data field capturing this scenario should return a 0 score.

However, a front court in this scenario is usually there because there is *no* private rear living court provided for the lot. In this case the front lot will have some value, but very little (score of 2) as it will be seldom used. The lot without a rear court will return -2; therefore open-space living will have a net value of 0, which feels intuitively correct.

Although modern district plans have moved to protect the public realm, traditionally this situation has been resolved for the lot by privatising the front yard with a high fence. If fencing were to be included in the modeller this would reduce the score further, the gain in lot amenity being more than offset by the loss in value transferred to the public realm.

Build To The Front

This criterion calculates an efficiency quotient for design quality. It measures the extent to which the design fills the frontage and takes advantage of min/max setback controls to:

- Increase the value and functionality of the front court and street environments
- To release more open-space to the rear for private living.

Open-space (Living) Efficiency

This is another proxy measurement of design quality that considers the configuration of open-space on the site and then how much can be utilised for living courts. To meet the criterion, living court geometry must be contiguous with internal living spaces, be logical in shape (no pan-handles etc) and have a minimum dimension of 4m.

Open-space (All) Efficiency

This criterion acknowledges that for open-space to have value it need not always be living space. Visual amenity in the form of trees and garden, service courts and so on are all important for adding to overall living quality.

Waste Space

This is a measure of the amount of the site that has no visual or realisable functional purpose. It is the extent the design has been unable to unlock amenity for the whole site.

Driveway (Vehicle Efficiency)

The provision of on-site parking represents amenity for both the resident – proximity, and the public – by decluttering the street. The intention of this criterion is to assess how much open-space lot amenity is given up to vehicles, their manoeuvring and parking. Parking is represented as Coverage when garages or carports are provided. However, that is not always the case, and can even be seen as advantageous in the sense that *not* providing garaging will increase affordability. There might be a case to separate manoeuvrability and parking in some future iteration of the model, but for now the focus is on a total performance score. If parking is by garage, the Coverage score goes down and Driveway up. With no garaging it is reversed – Driveway up, Coverage down – and the total score is generally the same both ways.

Coverage

The lower the coverage, the more open-space amenity for both residents and the surrounding neighbourhood. The current model interprets it this way as a fairly blunt measure, mirroring the maximum coverage rules in district plans.

There is an obvious problem in using Coverage as an indicator of quality (see discussion below), but it has been left in the model at this stage because it tells us something of how the land is being used at the level of individual sections.

2.3.1. Coverage – An Obvious Problem

While lower coverage suggests more space for amenity, the problem is that the same building footprint will return very different Coverage values for different sized lots.

The failure of logic here is that lot size should be determined by inherent amenity at the subdivision and neighbourhood scale. In areas where there is little external amenity, it needs to be compensated by provision within the lot – therefore, larger lots. When inherent amenity is high, then lots should be small to maximise the existing value – ie amenity is a cost, but accrues value in proportion to the number of people who use it.

A well-designed subdivision should have already accounted for that in the lot density, and if the design itself creates even more amenity, the density increased even further in response. How much open-space a particular lot still needs and where the big buildings should go in a subdivision are complex calculations that are expressed at the individual lot level but are informed at the full urban scale.

We think formulae could be developed within the model to capture this subtlety; however, integration of these performance tools with a complete Well-functioning Urban Environment (WFUE) model would be the ideal. In the interim, to link the RLP to the RSP total score which represents amenity/quality for the whole subdivision is a pragmatic solution – near enough is good enough, for now. See (3.2 RSP:RLP Ratio), below.

To test the impact of Coverage on the total LP score it was removed from the calculation of the three sample developments – see below. There was no difference in the result for the least well-performing development (Sands – 45) and a small increase in the other two already very highly performing developments (George – 92>97 and the Sands option – 95>98).

The simple conclusion is that Coverage calculations penalise high performing and more efficient designs, but this is far too small a sample set containing far too few lots to be meaningful. Therefore, for the time being we've decided to leave Coverage in as a criterion because of the other information it provides for site analysis.

SECTION 2

3. A COMPARATIVE STUDY

3.1. THE SAMPLE SCHEMES

To test the usability of the model and whether it produces results roughly consistent with design intuition and experience, geometry was prepared for two small existing schemes. That any comparison should be valid (apples for apples), both schemes are similar sized lot clusters taken from contemporary developments. Both employ pre-existing house designs, though, critically as seen later, they use different design methodologies. Both developments are mews accessed, and both are high RSP performing subdivisions:

- George (5 lots, as reference scheme)
- Sands (Lots 31—36, builder's scheme)

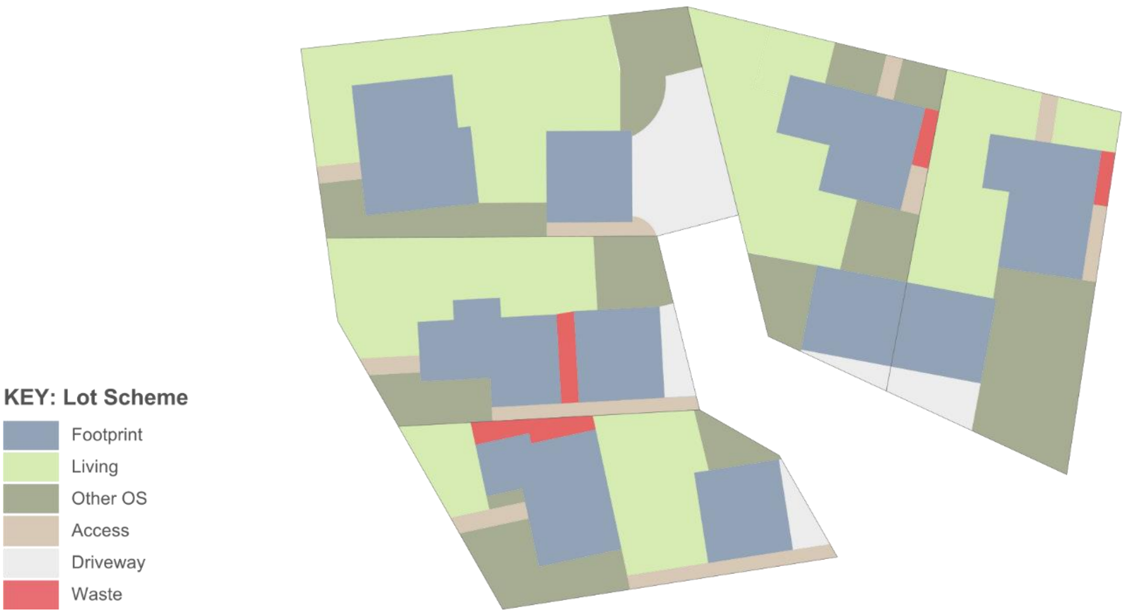


Figure 1: George RLP scheme

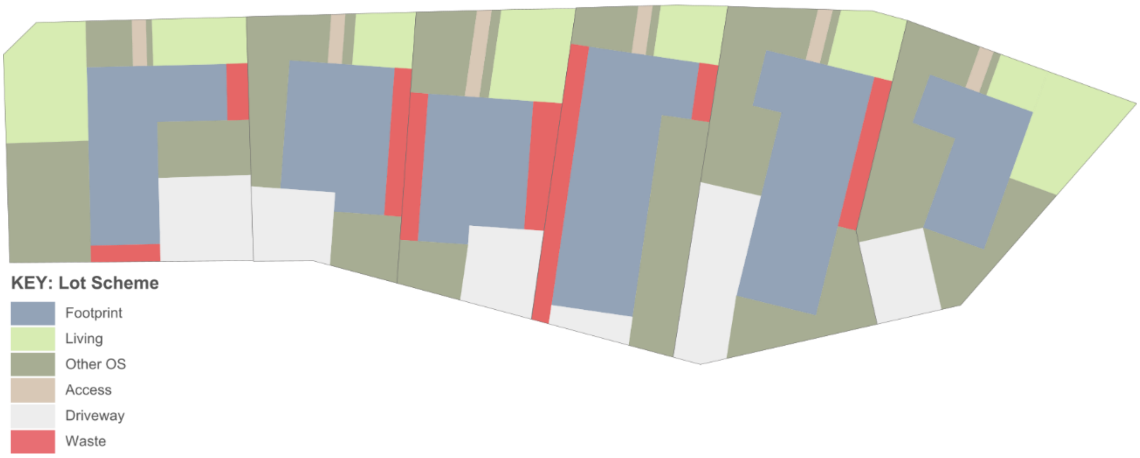


Figure 2: Sands RLP scheme

COMPARATIVE DATA (1)

	SANDS			GEORGE			SANDS		GEORGE		SANDS			GEORGE		
lot	*area*	*coverage*	*%*	*area*	*coverage*	*%*	*living*	*%*	*living*	*%*	*other l/s*	*all OS*	*%*	*other l/s*	*all OS*	*%*
Lot 1	407	114	28%	327	103	32%	96	24%	103	25%	126	222	55%	100	322	79%
Lot 2	277	101	37%	309	101	33%	23	8%	122	44%	95	117	42%	75	192	69%
Lot 3	302	101	34%	426	112	26%	47	16%	165	54%	71	119	39%	89	207	69%
Lot 4	346	161	47%	303	97	32%	26	7%	117	34%	103	129	37%	71	199	58%
Lot 5	415	152	37%	301	103	34%	29	7%	100	24%	146	175	42%	78	253	61%
Lot 6	331	82	25%				72	22%			138	210	63%			
TOTALS	2,080	713		1,666	515		293		606		679	972		411	1,173	
average	347	119	34%	333	103	31%	49	14%	121	36%	113	162	46%	82	235	67%
		1 garage only			*incl garaging*											

COMPARATIVE DATA (2)

	SANDS		GEORGE		SANDS		GEORGE		SANDS		GEORGE		SANDS	GEORGE	SANDS	GEORGE	SANDS	GEORGE
lot	*waste*	*%*	*waste*	*%*	*driveway*	*%*	*driveway*	*%*	*access*	*%*	*access*	*%*	*beds*	*beds*	*parking*	*parking*	*house gfa*	*house gfa*
Lot 1	17	4%	4	1%	55	13%	17	5%	5	1%	9	3%	3	4	2	2+1	112	128
Lot 2	18	6%	5	1%	40	15%	6	2%	5	2%	8	3%	2	3	2	2+1	109	123
Lot 3	40	13%	0	0%	42	14%	61	14%	9	3%	12	3%	2	5	2	2+2	95	144
Lot 4	43	12%	8	3%	14	4%	11	4%	5	1%	19	6%	3	3	2	2+2	95	114
Lot 5	20	5%	12	4%	68	16%	9	3%	5	1%	21	7%	3	3	2	2	144	126
Lot 6	0	0%			39	12%			4	1%			2		2		95	
TOTALS	137		28		258		105		33		70		15	18	12	10-16	538	635
average	23	7%	6	2%	43	12%	21	6%	5	2%	14	4%	2.5	3.6	2	2-3	90	127

Table 1: Raw data extraction returned from geometry

LOT PERFORMANCE GEORGE

Measure	*Crit. Score*	*Final Score*
Front Living Court	100	
Rear Living Court	100	
Build to Front	100	
Coverage Efficiency	53	
Living Space Efficiency	93	
OS (overall) Efficiency	100	
Waste Efficiency	100	
Vehicle Efficiency	87	
LOT PERFORMANCE SCORE		92

LOT PERFORMANCE SANDS

Measure	*Crit. Score*	*Final Score*
Front Living Court	100	
Rear Living Court	3	
Build to Front	28	
Coverage Efficiency	42	
Living Space Efficiency	6	
OS (overall) Efficiency	72	
Waste Efficiency	72	
Vehicle Efficiency	36	
LOT PERFORMANCE SCORE		45

Table 2: RLP Scores

Figure 3: George RLP data visualisation

Figure 4: Sands RLP data visualisation

3.2. RSP:RLP RATIO

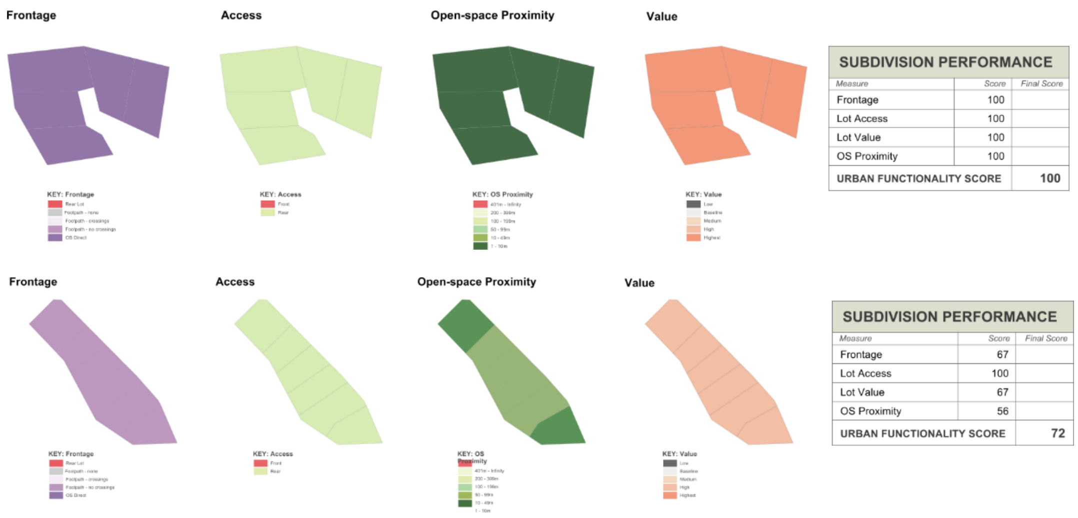


Figure 5: RSP assessment for sample lots (George top, Sands bottom)

The **RSP** values for the sample lots are:

- George – (90)100:92
- Sands – (69)69:45

Where:

- The bracketed RSP value is the RSP score for the whole subdivision
- The unbracketed value is the calculated RSP score for the sample block only
- The third number is the RLP score for the sample

Interpretation:

- The ratio shows that the George sample is one of the best lot clusters in the subdivision (100 vs 90 overall); the Sands sample lots are about average (69 vs 69) for what is, nonetheless, a very high-performing subdivision. Note: traditional subdivision design usually scores around 20.
- The difference in RSP values between George and Sands samples is largely the result of the Sands block fronting a road and the George block fronting open-space reserves.
- The George ratio is exemplary, values being high and almost equal. The lower RLP is mostly a function of Coverage efficiency where it is more difficult to release a larger area of on-site amenity as lot sizes decrease.
- The Sands RLP realises only about two thirds of the subdivision potential (45 vs 69), suggesting this layout will diminish the value of the whole subdivision. Furthermore, there is a large opportunity in the margin above the RSP (between 69 and 100) for optimal lot design to increase the value of the whole subdivision.

3.3. WHERE THE SANDS RLP FALLS DOWN

Whereas the George RLP result is more or less consistent with both the block and subdivision RSP scores, the Sands result suggests a design response that doesn't come close to meeting the potential quality of the subdivision or block. The extreme spread of criteria scores (from 3 to 100) indicates an internal lot design that is severely 'out of balance'. For example:

- Overall OS Efficiency 72
- Front Court 100
- Rear Court 3
- Living Space Efficiency 6

This tells us that:

- There's a high level of total open-space provision
- All lots contain good front (public) living courts
- BUT, most lots contain ***no*** rear (private) living court
- There is an unacceptably low level of outdoor living amenity

3.4. DATA COMPARISON SUMMARY

Lot size (average) is more or less the same for both schemes:

George (G) = 333m^2

Sands (S) = 347m^2

Open-space provision (average/lot) is broadly similar for both schemes, and certainly enough for most uses in the lesser case (Sands):

G = 203m^2 – 61% of the lot

S = 162m^2 – 46% of the lot

Living Space (average/lot) – G provides nearly 2.5x more outdoor living-space than S:

G = 121m^2 – 36% of the lot

S = 49m^2 – 14% of the lot

The show-stopping issue with S is revealed in the Rear Court analysis and data visualisation. Only the two end lots are shown to provide satisfactory (and compulsory in the District Plan) private living courts.

Coverage

Relying on 1-storey houses only, S covers much more of each lot with buildings. In addition, 1 lot is non-compliant for coverage, meaning this scheme is unlikely to get consent. When S is configured for the provision of double garages (as per G), only 1 lot complies with District Plan coverage rules.

With garages (average/lot):

G = 103m^2 – 31% of the lot

S = 152m^2 – 44% of the lot

Without garages (average/lot):

G = 63m^2 – 19% of the lot

S = 119m^2 – 34% of the lot

Driveway – Both samples are mews accessed blocks, therefore the area of the site required for vehicle manoeuvring should be similar for both. Results returned by both samples are not particularly useful for comparison because:

- G includes an exception site (Lot 3). There will be one per block in cases where a mews requires a cul-de-sac stub and manoeuvring must occur within the lot.
- S includes vehicle standing area where G returns this value as coverage (garages – see above)

Waste – There is 3.5x the amount of waste (unusable) space per lot in S.

G = 6m^2 – 2% of the lot

S = 23m^2 – 7% of the lot

Other Measures:

Bedrooms

G = 3.6 /lot

S = 2.5 /lot

On-site Parking

G = 2—3 spaces /lot

S = 2 spaces /lot

3.5. CONCLUSION

As well as providing more building amenity – more bedrooms, garaging – G provides considerably more usable outdoor living space per lot. The raw open-space provision, although a third more for G, is not at issue in S since even the smallest amount (117m^2 for Lot 35) is more than sufficient for residential needs.

The problem is that the S house designs force placement on the lots that result in very little available area for usable site amenity.

The Sands Lot Performance score (45) is particularly and unacceptably low. This is made worse by the fact the underlying subdivision design for the block promotes a high score, as shown in the RSP score of 69. To put this in perspective, traditional modern subdivisions usually score in the range of 17—23. It is not unreasonable therefore to expect the lot design to respond to the greater potential generated by the subdivision design so that a development of high value can be achieved.

The essential issue causing the low RLP score is that the house designs aren't responding to their specific sites but are rather designs created, apparently, in the abstract or for another purpose. While this is not a problem in itself when lots are sensibly shaped and large (eg 1,000m^2 in size), it is simply the wrong approach to house design as lot size reduces towards medium density levels. The Sands example shows graphically how it is the house designs themselves that are largely negating lot value.

There is certainly an advantage for a builder constructing several houses within the same subdivision to be able to draw on pre-prepared designs, especially when these share materiality, aesthetics and characteristics that enable them to be delivered more efficiently and at a lower cost.

Houses are always constructed and assembled as individual objects; they are not manufactured widgets where there are substantial economies of scale when you produce a million identical pieces. However, there are a range of design/manufacturing methodologies in current use, from a collection of individual house designs through to generative systems capable of (theoretically) generating an infinite number of unique buildings from the same 'Type' design. The latter approach shares the same characteristics with the former of certainty, economy, constructability etc, but differs in the ability to respond to unique site and market conditions.

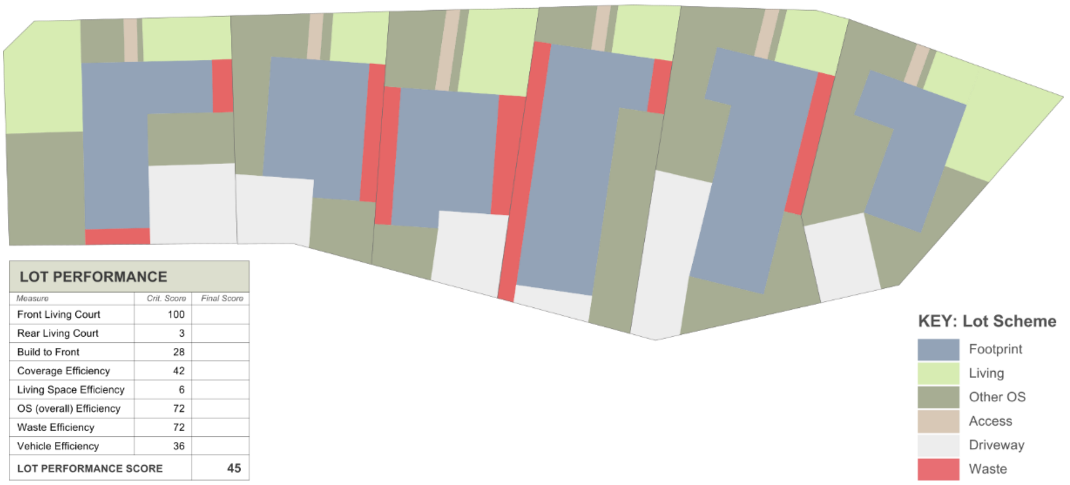
The house designs used in G are produced by such a system (see Comon Ground *'Typology Design'*).

Section 3

4. ALTERNATIVE SANDS DESIGN

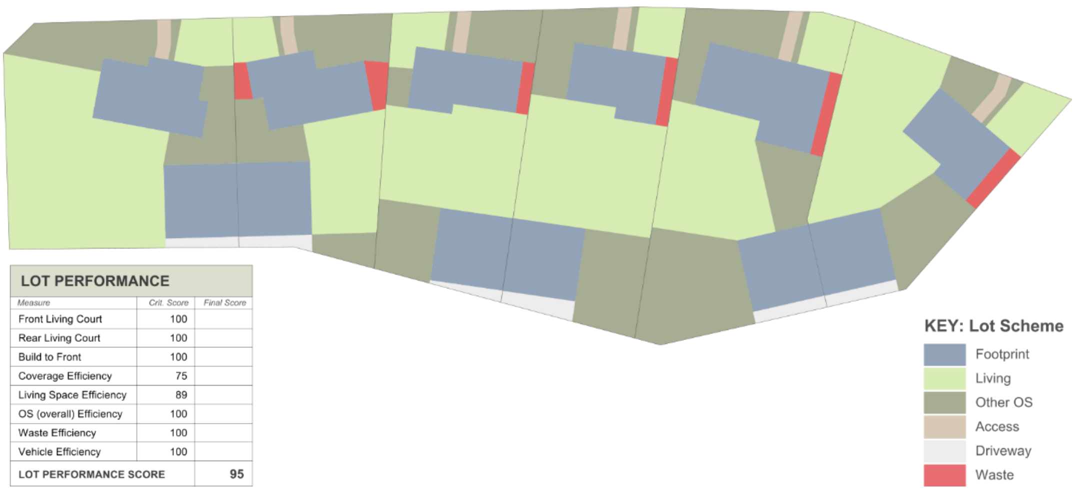
4.1. SANDS (2) SCHEME

To illustrate the effect on performance using an alternative design methodology, a second analysis of the Sands block was undertaken using same sized houses (bedroom-count) produced by the same typology-based design system used for the George sample.



LOT PERFORMANCE		
Measure	Crit. Score	Final Score
Front Living Court	100	
Rear Living Court	3	
Build to Front	28	
Coverage Efficiency	42	
Living Space Efficiency	6	
OS (overall) Efficiency	72	
Waste Efficiency	72	
Vehicle Efficiency	36	
LOT PERFORMANCE SCORE		45

Figure 6: Sands Scheme 1



LOT PERFORMANCE		
Measure	Crit. Score	Final Score
Front Living Court	100	
Rear Living Court	100	
Build to Front	100	
Coverage Efficiency	75	
Living Space Efficiency	89	
OS (overall) Efficiency	100	
Waste Efficiency	100	
Vehicle Efficiency	100	
LOT PERFORMANCE SCORE		95

Figure 7: Sands Scheme 2

The data visualisation sheets emphatically show the performance difference. The schemes as they appear in the total performance sheets reveal totally different development patterns. It is the pattern that underpins and explains the very high-performance score of the alternative design approach.

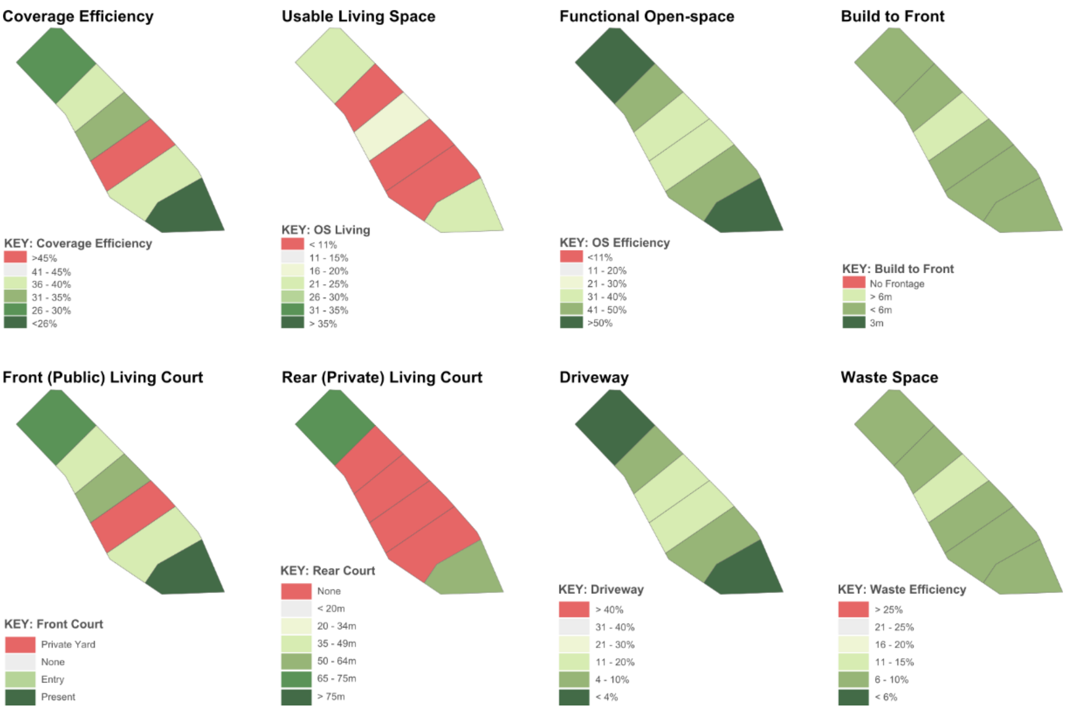


Figure 8: Sands Scheme 1 data visualisation set

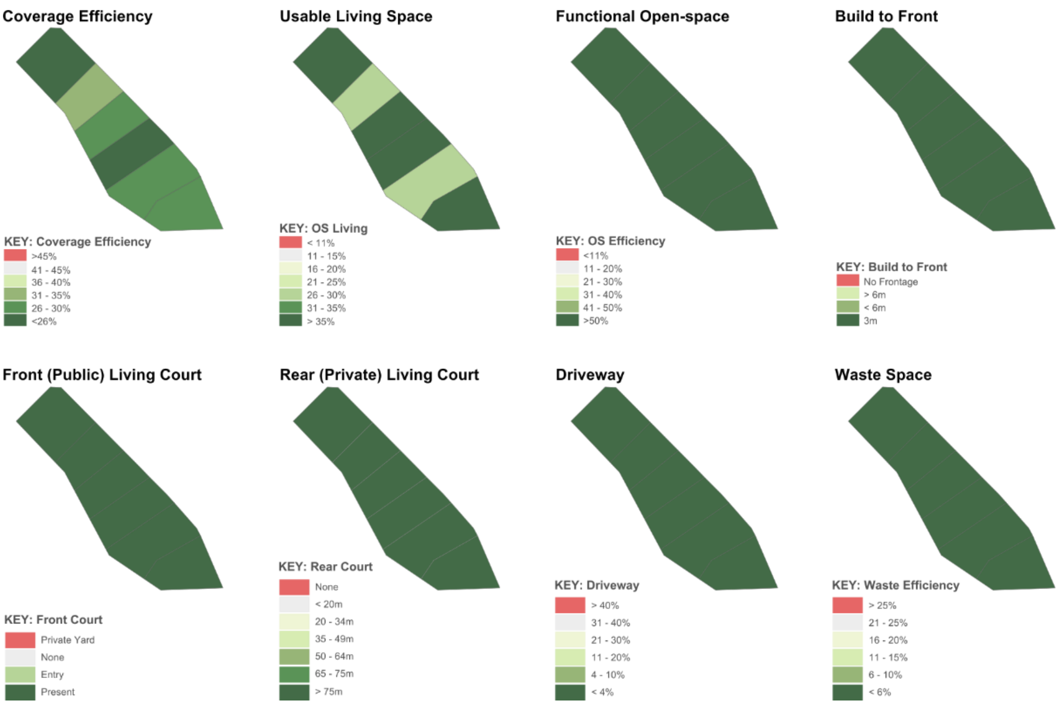


Figure 9: Sands Scheme 2 data visualisation set

To be clear, the overall RLP score of 95 for the alternative Sands scheme is exceptional and goes to show that with good design at the lot level (requiring no extra effort or cost), a good subdivision scheme can generate a response well in excess of its theoretical potential. Lot design can make a good subdivision even better, but, sadly, also has the ability to destroy the value of the same subdivision.

4.2. SUMMARY

In summary, compared to the Sands (1) scheme in Section 2, the alternative Sands (2) scheme has:

2x MORE usable outdoor living space

1.5x MORE total outdoor amenity space

3.5x LESS waste space

6.5x LESS vehicle space

LESS site coverage

MORE on-site parking

ALL lots have garages

5. WHERE TO: WHERE FROM

5.1. NEXT STEPS

This document reports on our first cut of the modeller – a proof of concept if you like. Definitely a beta version. There is, of course, a To Do list, with some low-hanging fruit:

1. Add in extra fields to the Front Court criterion to capture the relationship of front/back courts and front/street conditions.
2. Add Value criterion – data visualisation of RLP scores per lot. Apart from informing the 50% of the sale price that is not the building, it would provide a builder with immediate feedback, relevant to his net return, as to whether he's creating a low-value product or not.
3. RLP addresses lot layout, but as shown in the test schemes above, is driven by building design. Is there a place in the modeller for a building assessment? At least to the extent it contributes to the well-functioning of the streetscape – façade articulation, entry in relation to the street, filling the front, legible form, expressive materiality, and so on.
4. Run the model on a lot of different real-case developments to explore the gradient settings for field values. Do there appear to be different gradients for different development types? If so, is there a consistent transformation methodology that can be applied to the settings? Does this open up the model for potential wider application ie other than residential?
5. Review Coverage criterion. Does % site cover on its own tell us anything useful? Is GFA:Coverage a better indicator of efficiency? Or Bedroom-count:Coverage? Does the same argument apply to usable Open-space? If any of this is not to prejudice large lots, how does Density modify the field values?
6. Density. Integrating a density function also applies to the RSP modeller, and the solution there might well apply here given their common ancestry. Amenity mapping should indicate optimal density down to fine mesh levels with an indication of what factors are driving the overall amenity value. There's an opportunity here to match amenity surplus and deficit to at least the part block level to draw out field modifier functions. As 'interesting' as that might be, it rather drowns the main purpose of the RLP modeller as it stands and smacks of micromanaging a sort of utopia after the event.

5.2. REFERENCES

The RLP tool obviously didn't come out of nowhere. Apart from two decades at least of continuous enquiry and development within the Common Ground office, general principles and data measures have been drawn from a large number of standard sources. A few of them that relate particularly to qualitative assessment are listed below.

Common Ground Studio:

RSP Modelling
Typology Design
Greenway Design
Mews Entry and Subdivision Efficiency
Rear Entry & Lot Efficiency
An Alternative Consenting Pathway
The Well-Functioning Urban Environment
Density As A Function Of Amenity

Other publications:

A Pattern Language – Christopher Alexander
The Nature of Form – Christopher Alexander
Site Planning – Kevin Lynch
Towards An Urban Design Evaluation Framework – Jorges Gil
On the discovery of urban typologies: data mining the many dimensions of urban form – Jorges Gil