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VERTICAL TRANSPORT ANALYSIS

ECCLESIA - Coffs Harbour Uniting Church

19A-21 Gordon St, Coffs Harbour NSW 2450

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Document Control

Document prepared by:

Integrated Group Services Pty Ltd

200 Euston Rd, Alexandria

NSW, 2015

Phone: +61 2 8488 4600

Fax: +61 2 9475 4588

Email: admin@igs.com.au

Web: www.igs.com.au



[linkedin.com/company/3213174](https://www.linkedin.com/company/3213174)

ABN: 68 163 019 029

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TABLE OF CONTENTS

1.	EXECUTIVE SUMMARY	1
1.1	INTRODUCTION.....	1
1.2	SITE ANALYSIS	2
1.3	BUILDING ARRANGEMENT.....	3
2.	DESIGN EVALUATION	4
2.1	LIFT QUANTITIES	4
2.2	PERFORMANCE CRITERIA.....	5
2.3	SIMULATION RESULTS.....	6
2.4	REDUNDANCY CONSIDERATIONS	7
2.5	LIFTS SPECIFICATIONS.....	8
3.	CONCLUSION	9

LIST OF FIGURES

Figure 1: Site Aerial (Highlighted in Red – Source: Nearmap and Ethos Urban).....	2
Figure 2: Apartment Design Guide (ADG) - Objective 4F-1.....	4
Figure 3: Residential - Average Waiting Time - 50%/50%/0%.....	6
Figure 4: Residential - Average Waiting Time - 100%/0%/0%.....	6
Figure 5: Office/Commercial - Average Waiting Time – Up-peak	7

LIST OF TABLES

Table 1: Overall Building Matrix (Indicative).....	3
Table 2: Design Criteria – Residential Buildings	5
Table 3: Design Criteria – Office Building	5
Table 4: Lifts' Specification	8

1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

This Vertical Transport Analysis has been prepared by IGS on behalf of The Uniting Church In Australia Property Trust (NSW) ('the Applicant'). It supports a State Significant Development Application (SSDA) and concurrent Rezoning Proposal for a mixed-use development at 19A–21 Gordon Street, Coffs Harbour ('the site').

This report has been prepared to in order to provide a high-level understanding of the quantity and specifications of the lifts required to service the building.

This report accompanies a SSDA that seeks approval for the following:

- Lower ground basement level accommodating plant and building services.
- Ground level incorporating retail premises, a residential and commercial lobby, a church worship hall with administrative rooms, and ancillary spaces including a community kitchen and chapel.
- Ground-level mezzanine containing car parking for 7 vehicles and plant rooms.
- 6-storey podium comprising commercial floor space with an outdoor terrace and car parking for 166 vehicles.
- 18 levels of residential apartments, delivering 152 dwellings in total, including 40 affordable housing units.
- A roof level featuring a communal terrace, lift overrun, and associated building services.
- Associated landscaping and public domain works.
- Associated landscaping and public domain works.

This report should be read in conjunction with the Environmental Impact Statement and Rezoning Report prepared by Colliers Urban Planning, the Architectural Plans, and the other accompanying technical documents that form part of the State Significant Development Application and concurrent Rezoning Proposal.

1.2 SITE ANALYSIS

The site is located at 19A-21 Gordon Street, within the City of Coffs Harbour Local Government Area (LGA). It is approximately 200 meters south-east of the Pacific Highway and approximately 150 meters northwest of Carralls Gully. An aerial of the site is provided in Figure 1.

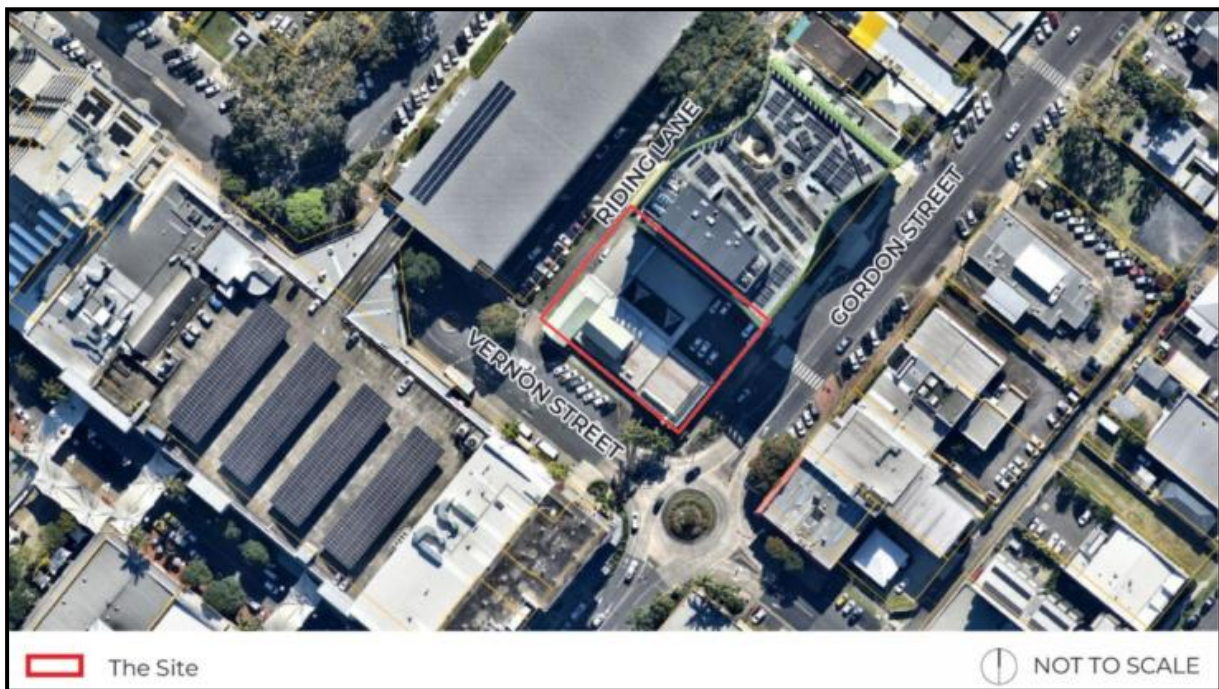


Figure 1: Site Aerial (Highlighted in Red – Source: Nearmap and Ethos Urban)

The subject development site is located on Lot 21/DP 880214. As part of the proposed SSDA, the development is envisioned to provide a total of 152 apartment units, in a mix of 26 one-bedroom, 106 two-bedroom and 16 three-bedroom apartments, in addition to 173 carspaces.

1.3 BUILDING ARRANGEMENT

The SSDA includes optimal configuration of the lifts in order to achieve maximum efficiency with the proposed number of lifts. It is assumed that the parking spaces on the Ground Mezzanine Level and Level 1 will be dedicated to commercial and worship spaces, whilst the parking spaces on Levels 2 to 5 will be allocated to the residential tenancies and associated visitor parking.

Table 1: Overall Building Matrix (Indicative)

Levels	1 BR (Qty)	2 BR (Qty)	3 BR (Qty)	Commercial (sqm)	Carpark (Qty-TBC)
Lower Ground	Plant				
Ground	Worship				
Ground Mezz	-	-	-	-	7
Level 1	-	-	-	-	35
Level 2	-	-	-	-	33
Level 3	-	-	-	-	36
Level 4	-	-	-	-	36
Level 5	-	-	-	-	34
Level 6	-	-	-	713	-
Level 7	5	5	-	-	-
Level 8	5	5	-	-	-
Level 9	1	6	1	-	-
Level 10	1	6	1	-	-
Level 11	1	6	1	-	-
Level 12	1	6	1	-	-
Level 13	1	6	1	-	-
Level 14	1	6	1	-	-
Level 15	1	6	1	-	-
Level 16	1	6	1	-	-
Level 17	1	6	1	-	-
Level 18	1	6	1	-	-
Level 19	1	6	1	-	-
Level 20	1	6	1	-	-
Level 21	1	6	1	-	-
Level 22	1	6	1	-	-
Level 23	1	6	1	-	-
Level 24	1	6	1	-	-
Level 25	-	-	-	-	-
Roof	-	-	-	-	-

2. DESIGN EVALUATION

2.1 LIFT QUANTITIES

The tower comprises a total of 26 storeys plus roof level in the following configuration:

- Ground Floor
- Mezzanine level
- 5 levels of carparking
- 1 level of Commercial
- 18 levels of residential apartments,

From a compliance perspective, considering the tower is over 10 storeys, Objective 4F-1 of the ADG will be applicable.

Objective 4F-1 Common circulation spaces achieve good amenity and properly service the number of apartments	
Design criteria	
1.	The maximum number of apartments off a circulation core on a single level is eight
2.	For buildings of 10 storeys and over, the maximum number of apartments sharing a single lift is 40

Figure 2: Apartment Design Guide (ADG) - Objective 4F-1

Given the total of 152 apartments, four lifts are required to serve the residential levels in order to satisfy this objective. However, it should be noted that this requirement is a generic guideline and does not consider specific lift characteristics—such as capacity, speed, and control methodology—when determining the appropriate number of lifts for the building.

For the purpose of this analysis, it is assumed that three of the four lifts will be dedicated to residential use under normal operating conditions. The fourth lift will primarily serve commercial traffic during standard commercial hours but will supplement residential demand when not in use by commercial passengers.

2.2 PERFORMANCE CRITERIA

The benchmark performance criteria for vertical transportation in residential buildings, as defined in Clause 3.12.9 of the Chartered Institute of Building Services Engineers (CIBSE) Guide D: 2010, are presented in Table 3.

Table 2: Design Criteria – Residential Buildings

Parameter	Basic	Standard	Prestige
Average Waiting Time (s)	70	60	50
Two-way Handling Capacity	5%	6%	7%

Furthermore, benchmark performance criteria for vertical transportation of commercial/office buildings, as defined in Clause 3.12.9 of the Office Building Quality Guide by Premium Council Australia (PCA), are presented in Table 4.

Table 3: Design Criteria – Office Building

Parameter		Grade B Buildings	Grade A Buildings	Premium Buildings
Average Waiting Time (s)	Up peak	≤35	≤30	≤25
	Lunch peak	N/A	≤40	≤35
Two-way Handling Capacity	Up peak	≥12%	≥13%	≥14%
	Lunch peak	N/A	≥11%	≥12%
Car Capacity	PAX	≥13	≥16	≥21

It shall be noted that the requirements set-out in Table 4 are above and beyond regular commercial building operational requirements. Hence, this vertical transport analysis aims to comply with the Up-peak requirements of Grade B Buildings.

2.3 SIMULATION RESULTS

A Waiting Time calculation was performed with Elevate9 for the residential traffic over a 2-hr time period, under two (2) traffic conditions, 100%/0%/0% and 50%/50%/0% (in/out/interfloor traffic). The results of the two simulations are provided in figures 3 and 4 respectively.

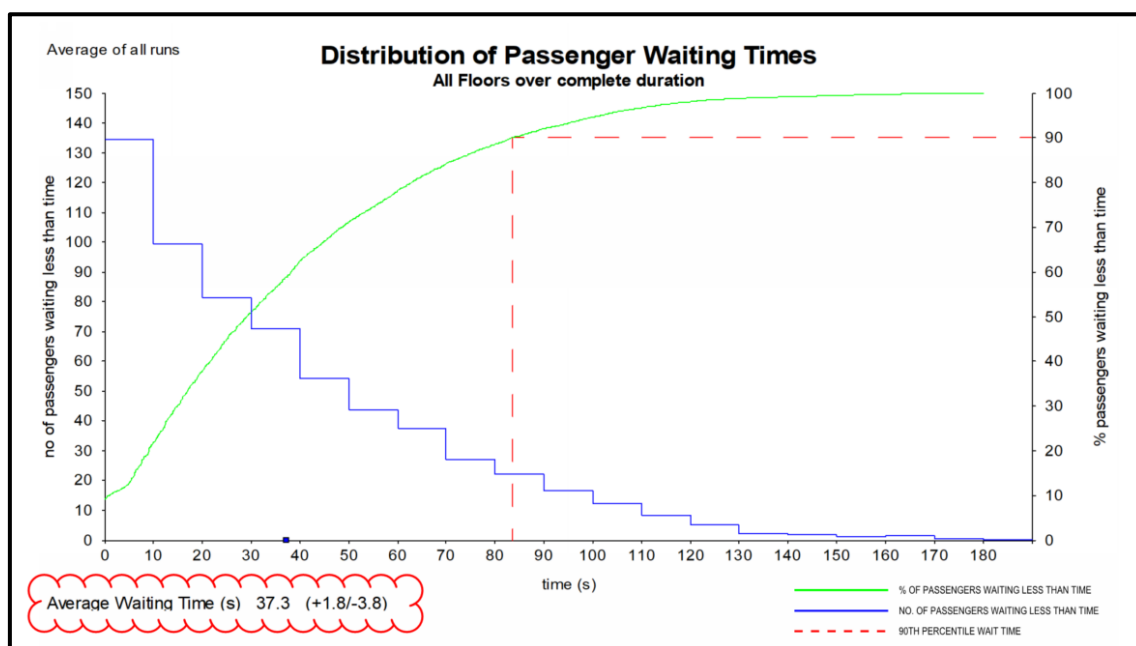


Figure 3: Residential - Average Waiting Time - 50%/50%/0%

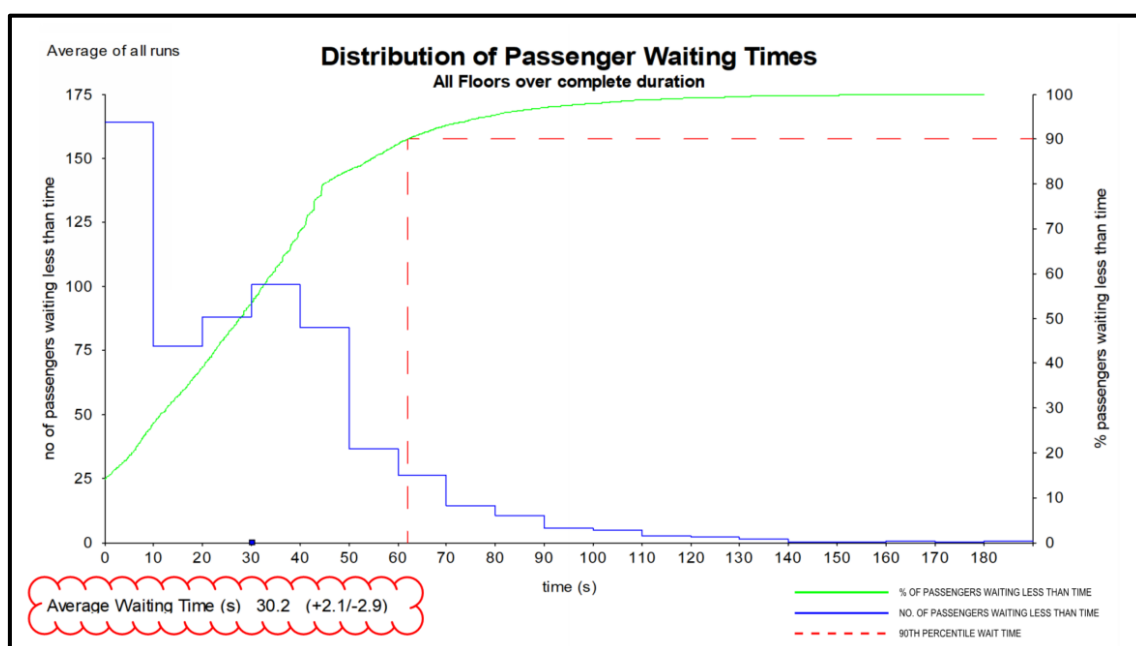


Figure 4: Residential - Average Waiting Time - 100%/0%/0%

The results yield both scenarios demonstrate satisfactory requirements and well below 60s Average Waiting Times, utilising only 3 lifts for the residential traffic load.

Furthermore, A Waiting Time calculation was performed with Elevate9 for the commercial/office traffic utilising Elevate9 PCA 2019 Traffic Load Profile Template with 5-min Handling Capacity set at 12%. The result of the simulation is provided in figure 5.

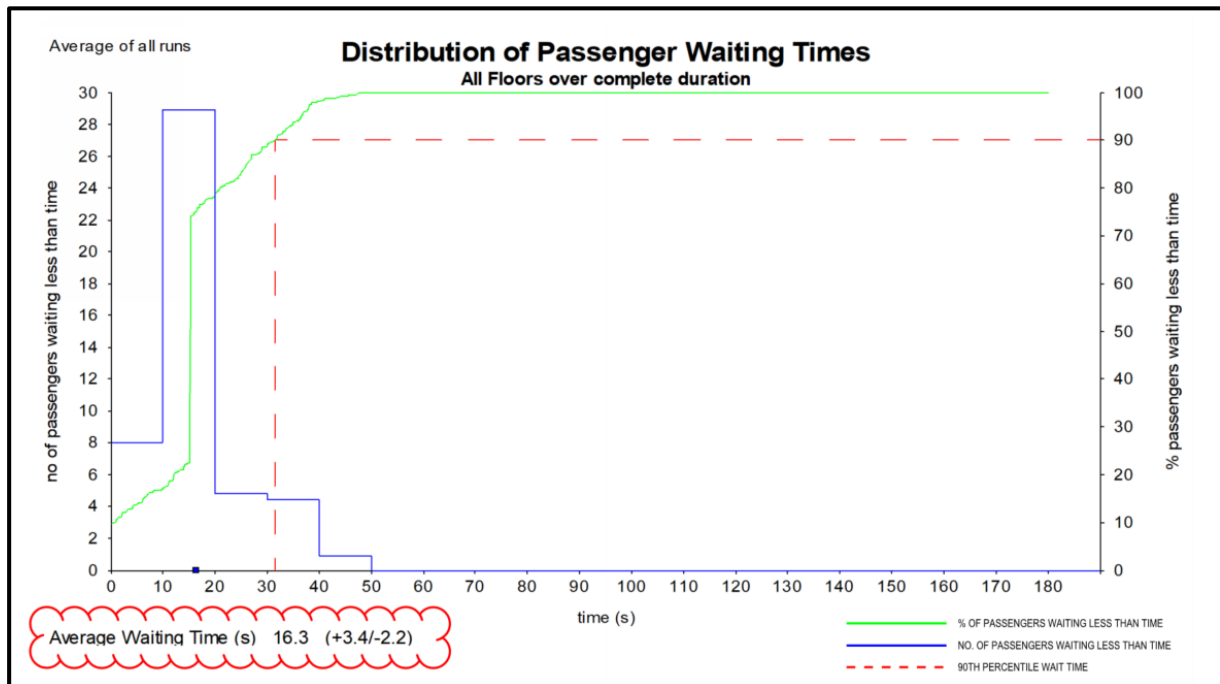


Figure 5: Office/Commercial - Average Waiting Time – Up-peak

The commercial traffic analysis results demonstrate satisfactory performance well above and beyond PCA Grade B requirements Average Waiting Time requirements.

2.4 REDUNDANCY CONSIDERATIONS

The lift configuration comprises two dedicated residential lifts (Residential Lifts N.1 and N.2) located within the northern core and sharing a common shaft. In the southern shaft, Residential Lift S.1 and Commercial Lift S.2 are arranged such that the commercial lift serves office traffic during normal business hours and supports residential traffic outside these hours or when not in office use.

In this arrangement, either Residential Lift N.1 or N.2 can function as the standby (redundant) unit when one is out of service. Similarly, Residential Lift S.1 can act as the redundant lift for Commercial Lift S.2 during periods of commercial lift downtime.

2.5 LIFTS SPECIFICATIONS

Below are the indicative specifications of the lifts used to perform the simulations and deemed to be required to service the development:

Table 4: Lifts' Specification

Elevator	Residential Lift N.1	Residential Lift N.2	Residential Lift S.1	Commercial Lift S.2
Type	MRL	MRL	MRL	MRL
Rated speed (m/s)	2.0	2.0	2.0	2.0
Rated capacity (kg)	1275	1275	1275	1275
Passenger capacity	17	17	17	17
Door opening	Centre	Centre	Centre	Centre
Door width (mm)	1000	1000	1000	1000
Opening configuration	Single	Single	Single	Through
Clear car size (m) (WxDxH)	1.4x2.0x2.5	1.4x2.0x2.5	1.4x2.0x2.5	1.4x2.0x2.5

3. CONCLUSION

Design Criteria 2 of Objective 4F-1 of the NSW ADG provides a guide of 1 lift per 40 dwellings. This is only a guide, however, and gives no consideration to such matters as lift size and speed which impact the performance of a lift. In this regard, an assessment is made during spatial planning based on criteria nominated by the Chartered Institute of Building Services Engineers (CIBSE) Guide D: 2010 which is a more detailed guide for ensuring that the passenger experience within a building will be within acceptable limits. Given the nature of the subject building, the key criteria is an average passenger waiting time of <60 seconds.

The proposed arrangement, with 3 off dedicated residential lifts in normal operations mode, is able to accommodate lift specifications that can maintain the Average Waiting Times (AWT) to below 45s which is well beyond CIBSE's minimum requirements. Furthermore, this analysis demonstrates that the commercial traffic demand can be adequately serviced by a single lift, exceeding the minimum requirements for PCA Grade buildings.