

**Μελέτη Κυκλοφοριακών Επιπτώσεων από την ανέγερση  
Οικιστικής Ανάπτυξης 'Sunset Gardens' στην περιοχή  
Τσερκέζοι, στη Λεμεσό**

**Φεβρουάριος 2020**

## **ΜΕΛΕΤΗΤΕΣ ΕΚΘΕΣΗΣ**

Οι βασικοί Μελετητές του Οίκου Συμβούλων Πολεοδομίας, Κυκλοφορίας, Περιβάλλοντος **A.L.A. Planning Partnership Consultancy L.L.C.** που ετοίμασαν την παρούσα Μελέτη, είναι οι ακόλουθοι:

- Άννα Καραμοντάνη, Πολιτικός Μηχανικός, Πολεοδόμος.
- Λουκάς Ζωδιάτης, Συγκοινωνιολόγος.
- Φοίβη Κυπριανού, Πολιτικός Μηχανικός, Συγκοινωνιολόγος

Η παρούσα μελέτη αποτελεί πνευματική ιδιοκτησία της Εταιρείας **A.L.A. Planning Partnership Consultancy L.L.C.** για τη μοναδική χρήση του εργοδότη. Για οποιαδήποτε χρήση της Μελέτης, ο εργοδότης θα την προβάλλει στο σύνολο της και χωρίς παραποιήσεις και θα περιλαμβάνει τα διακριτικά των Συμβούλων Μελετητών.

## **Περίληψη στα Ελληνικά**

Η παρούσα μελέτη αναλύει τις κυκλοφοριακές επιπτώσεις από την δημιουργία μιας νέας οικιστικής ανάπτυξης στην Λεμεσό. Η προτεινόμενη ανάπτυξη προτείνεται να αναπτυχθεί στο τεμάχιο με αριθμό 1 του Χωρομετρικού Σχεδίου 58/16W2. Ο χώρος της ανάπτυξης του έργου βρίσκεται στα δυτικά του κέντρου της Λεμεσού, εντός των διοικητικών ορίων Τσερκέζοι (Τσερκέζ Τσιφλίκ) και στα νότια της επέκτασης της Λεωφόρου Φραγκλίνου Ρούσβελτ προς την Κοινότητα του Ασώματος. Η προτεινόμενη ανάπτυξη δεν γειτνιάζει με άλλες αναπτύξεις αλλά ούτε με ασφαλτοστρωμένο δρόμο. Επομένως για τη δημιουργία προσβάσεων στο χώρο του Έργου θα υλοποιηθούν και οι ανάλογες εργασίες οδοποιίας, οι οποίες εμπίπτουν σε ξεχωριστή Πολεοδομική Άδεια (ΛΕΜ01281/07B με ημερομηνία 28/06/2019). Σημειώνεται ότι το Έργο προγραμματίζεται να ολοκληρωθεί σε δύο (2) φάσεις: Α' Φάση: Σεπτέμβριος 2021 και Β' Φάση: Δεκέμβριος 2022. Η παρούσα Μελέτη αξιολογεί τη δεύτερη Φάση όταν η ανάπτυξη θα έχει συμπληρωθεί. Ο χώρος της προτεινόμενης ανάπτυξης παρουσιάζεται στο συνημμένο **Σχέδιο 1.1**. Τα αρχιτεκτονικά σχέδια της ανάπτυξης περιλαμβάνονται στο **Παράρτημα Α**.

Μετά από συνεννόηση με το αρμόδιο Τμήμα Δημοσίων Έργων (ΤΔΕ) καθορίστηκαν οι θέσεις των κυκλοφοριακών μετρήσεων (στρέφουσες κινήσεις) και ορίστηκε όπως οι κυκλοφοριακές μετρήσεις πραγματοποιηθούν κατά τις περιόδους 07:30 – 08:30 και 17:00 – 18:30 μιας καθημερινής ημέρας (Φεβρουάριος 2020). Οι κυκλοφοριακές μετρήσεις για στρέφουσες κινήσεις που πραγματοποιήθηκαν στα πλαίσια της παρούσας Μελέτης, έγιναν στις ακόλουθες τέσσερις (4) οδικές συμβολές.

1. Φρ. Ρούσβελτ/ Κάθετος Δρόμος (Κυκλικός Κόμβος)
2. Φρ. Ρούσβελτ/ Ε602 (Δρόμος προς Τραχώνι) (Συμβολή Προτεραιότητας)
3. Κάθετος Δρόμος/Ν. Καββαδιά (Φωτοελεγχόμενη Συμβολή)
4. Κάθετος Δρόμος/Παράλληλος Δρόμος (Κυκλικός Κόμβος)

Οι θέσεις των μετρήσεων παρουσιάζονται στο συνημμένο **Σχέδιο 2.1**.

Το ΤΔΕ ζήτησε επίσης την διεξαγωγή μετρήσεων κυκλοφοριακών ουρών στις πιο πάνω οδικές συμβολές για σκοπούς καλύτερης αξιολόγησης της υφιστάμενης κατάστασης. Τα αποτελέσματα αυτών των μετρήσεων παρουσιάζονται στο **Παράρτημα Β**.

Η παρούσα Μελέτη έχει διερευνήσει όλα τα σχετικά θέματα κυκλοφορίας και μετά από συμφωνία που έγινε με το Τμήμα Δημοσίων Έργων, η κύρια Μελέτη και οι σχετικές αναλύσεις παρουσιάζονται στην Αγγλική γλώσσα με μια συνοπτική περίληψη των κύριων συμπερασμάτων στην Ελληνική γλώσσα.

Τα κύρια συμπεράσματα και οι προτάσεις της Μελέτης για αυτή την ανάπτυξη παρουσιάζονται συνοπτικά πιο κάτω.

Από τη μελέτη των σχεδίων της ανάπτυξης προέκυψαν τα ακόλουθα:

- Η συνολική επιφάνεια της προτεινόμενης ανάπτυξης θα έχει συνολικό εμβαδόν 21.250 m<sup>2</sup>. Η προτεινόμενη ανάπτυξη περιλαμβάνει πολυκατοικίες με μέγιστο αριθμό ορόφων τους 4, οι οποίες θα περιλαμβάνουν συνολικά 310 διαμερίσματα, ενός, δύο και τριών υπνοδωματίων.
- Η ανάπτυξη θα διαθέτει σύνολο 489 χώρους στάθμευσης και για τις δύο Φάσεις. Για την Α' Φάση θα διαθέτει 167 χώρους στάθμευσης, 145 εκ των οποίων για Κάτοικους, 11 εκ

των οποίων για Επισκέπτες και 11 εκ των οποίων για ΑμεΑ. Για την Β' Φάση το έργο θα προσφέρει 322 χώρους στάθμευσης, 280 εκ των οποίων για Κάτοικους, 21 εκ των οποίων για Επισκέπτες και 21 εκ των οποίων για ΑμεΑ.

- Η αξιολόγηση που έγινε βασίστηκε σε κυκλοφοριακές μετρήσεις που έγιναν στο τοπικό οδικό δίκτυο, εκτιμώντας τη γένεση κυκλοφορίας με βάση αποδεκτούς ρυθμούς μετακινήσεων που προσυμφωνήθηκαν με το Τμήμα Δημοσίων Έργων. Για την καθημερινή πρωινή περίοδο αιχμής (07:30 – 08:30), προέκυψε γένεση κυκλοφορίας δύο κατευθύνσεων 182 ΜΕΑ – 43 αφίξεις και 139 αναχωρήσεις. Για την καθημερινή απογευματινή περίοδο αιχμής (17:00 – 18:00) προέκυψε γένεση κυκλοφορίας δύο κατευθύνσεων 373 Μονάδων Επιβατικών Αυτοκινήτων (ΜΕΑ) – 217 αφίξεις και 156 αναχωρήσεις. Η γένεση μετακινήσεων παρουσιάζεται στο **Παράρτημα C**.

Η προτεινόμενη ανάπτυξη θα διαθέτει τέσσερα σημεία πρόσβασης τα οποία θα εξυπηρετούνται από τον προτεινόμενο δημόσιο δρόμο ο οποίος θα κατασκευαστεί για την συγκεκριμένη ανάπτυξη. Συγκεκριμένα για την Φάση Α', προτείνονται δύο σημεία πρόσβασης στο βόρειο και δυτικό σύνορο της Α' Φάσης, οι οποίες εξυπηρετούν την ανάπτυξη, μέσω του νέου οδικού δικτύου. Στο δυτικό σύνορο, η πρόσβαση θα αποτελεί είσοδο και έξοδο, ενώ στο βόρειο σύνορο θα αποτελεί έξοδο μόνο. Για την Φάση Β', προτείνονται δύο σημεία πρόσβασης τα οποία βρίσκονται στο ανατολικό και βόρειο σύνορο της Β' Φάσης. Στο ανατολικό σύνορο, η πρόσβαση θα αποτελεί είσοδο και έξοδο, ενώ στο βόρειο σύνορο θα αποτελεί έξοδο μόνο. Οι πιο πάνω προσβάσεις καθώς επίσης και το προτεινόμενο οδικό δίκτυο εντός του τεμαχίου της ανάπτυξης, παρουσιάζονται στο **Παράρτημα Α**.

Σημειώνεται επίσης, ότι στην περιοχή μελέτης, προγραμματίζεται οδικό δίκτυο, το οποίο θα εξυπηρετεί τις προτεινόμενες αναπτύξεις στην περιοχή οι οποίες παρουσιάζονται στο **Παράρτημα Ε**, καθώς επίσης και την προκειμένη προτεινόμενη ανάπτυξη. Το πιο πάνω οδικό δίκτυο παρουσιάζεται στο **Παράρτημα D**.

Ο μεγαλύτερος βαθμός κορεσμού του χώρου στάθμευσης της προτεινόμενης ανάπτυξης υπολογίστηκε κατά τη διάρκεια της νύχτας, σε 80%. Επομένως, βάσει αυτών των υπολογισμών, φαίνεται ότι η ζήτηση για στάθμευση ικανοποιείται από τις διαθέσιμες θέσεις και επομένως, δεν θα υπάρξει πρόβλημα σε έκτακτες περιόδους αιχμής ή πρόβλημα υπερχείλισης της στάθμευσης στους δρόμους της περιοχής.

Η επίπτωση από τη γένεση κυκλοφορίας στο τοπικό οδικό δίκτυο αξιολογήθηκε για δύο σενάρια, ένα για την χρονιά έναρξης λειτουργίας της ανάπτυξης που θα είναι το 2022 και ένα για τη «μελλοντική χρονιά» που θα είναι το 2032. Η επίπτωση της κυκλοφορίας της ανάπτυξης υποδείχθηκε ελέγχοντας τη χωρητικότητα στις οδικές συμβολές της περιοχής μελέτης. Οι έλεγχοι χωρητικότητας των κόμβων στην περιοχή παρουσιάζονται στο **Παράρτημα G**.

Η κίνηση που θα παραχθεί από την ανάπτυξη δε θα είναι πολύ μεγάλη αλλά λόγω του ότι το οδικό δίκτυο της περιοχής μελέτης είναι ήδη κυκλοφοριακά φορτισμένο και χωρίς την ανάπτυξη, με την υλοποίηση της ανάπτυξης παρουσιάζονται κάποια προβλήματα για τα οποία προτείνονται μέτρα μετριασμού. Σύμφωνα με τις αναλύσεις του **Παρατήματος G**, η συμβολή προτεραιότητας Φρ. Ρούσβελτ/Ε602 (Δρόμος προς Τραχώνι) παρουσιάζει υψηλούς φόρτους κυκλοφορίας με την υφιστάμενη κατάσταση 2020 χωρίς την ανάπτυξη. Ειδικά η αριστερόστροφη κίνηση του Ε602 (Δρόμος προς Τραχώνι) κατά την πρωινή ώρα αιχμής καθώς επίσης και η δεξιόστροφη κίνηση του ανατολικού σκέλους (Φρ. Ρούσβελτ) της πιο πάνω συμβολής κατά την απογευματινή ώρα αιχμής παρουσιάζουν υψηλούς βαθμούς κορεσμού. Στο Σενάριο 2022 'Χωρίς την Ανάπτυξη', οι τρεις προτεινόμενες αναπτύξεις (City



of Dreams Mediterranean Casino, Sky Gardens Development και Lanitis Farm Golf), αυξάνουν σημαντικά την κυκλοφορία, ειδικά στην απογευματινή περίοδο αιχμής. Επομένως, η πιο πάνω συμβολή προτεραιότητας φορτίζεται ακόμα περισσότερο, δημιουργώντας έτσι καθυστερήσεις. Το σενάριο 2022 'Με την Ανάπτυξη', προσθέτει κυκλοφοριακού φόρτους αλλά ελάχιστους σε σχέση με την κατάσταση που επικρατεί στο Σενάριο 2022 'Χωρίς την Ανάπτυξη'. Στο μελλοντικό σενάριο 2032, ο κυκλοφοριακός φόρτος αναμένεται να αυξηθεί ακόμη περισσότερο, δημιουργώντας κάποια προβλήματα και στον Κυκλικό Κόμβο Φρ. Ρούσβελτ/Κάθετος δρόμος. Σημειώνεται ότι στην μελλοντική χρονιά 2032, με βάση το σχέδιο στο **Παράρτημα D**, στη συμβολή προτεραιότητας Φρ. Ρούσβελτ/Ε602 (Δρόμος προς Τραχώνι) επιτρέπονται μόνο οι αριστερόστροφες κινήσεις και προτείνεται ένας νέος κυκλικός κόμβος στα δυτικά της συμβολής ο οποίος θα εξυπηρετεί τις δεξιόστροφες κινήσεις της που έχουν καταργηθεί. Παρόλο που η πρόταση αυτή βελτιώνει την κατάσταση εντούτοις δεν αντιμετωπίζει τα προβλήματα που διαπιστώθηκαν. Για την επίλυση αυτών των προβλημάτων προτείνονται τα ακόλουθα μέτρα μετριασμού.

1. Προτείνεται η διαμόρφωση αποκλειστικής λωρίδας για αριστερόστροφες κινήσεις στο δυτικό σκέλος του κυκλικού κόμβου Φρ. Ρούσβελτ/Κάθετου Δρόμου. Ο έλεγχος χωρητικότητας της πιο πάνω προτεινόμενης συμβολής, που παρουσιάζεται στο **Παράρτημα G**, δείχνει ότι το μέτρο βελτιώνει την λειτουργία του κόμβου.
2. Προτείνεται να εξεταστεί μελλοντικά η τοποθέτηση φώτων τροχαίας στη συμβολή προτεραιότητας Φρ. Ρούσβελτ/Ε602 (Δρόμος προς Τραχώνι), ώστε να αντιμετωπιστεί το θέμα κορεσμού που παρατηρείται στη συμβολή και εάν δικαιολογείται αυτή η εγκατάσταση, να προχωρήσει για το όφελος ολόκληρης της περιοχής.
3. Προτείνονται 50 θέσεις στάθμευσης ποδηλάτων για προώθηση της χρήσης του μέσου.

Συμπερασματικά, η γένεση κυκλοφορίας από την ανάπτυξη δεν επιβαρύνει επιπλέον το ήδη κυκλοφοριακά φορτισμένο οδικό δίκτυο της περιοχής μελέτης, ενώ η παροχή θέσεων στάθμευσης της ανάπτυξης, είναι ικανοποιητική για να καλύψει τη ζήτηση. Τα μέτρα που προτείνονται πιο πάνω για βελτίωση του προγραμματιζόμενου οδικού δικτύου της περιοχής, αντιμετωπίζουν ικανοποιητικά τα κυκλοφοριακά θέματα που παρουσιάζονται στην περιοχή με και χωρίς την προτεινόμενη ανάπτυξη. Επίσης, με την ύπαρξη ασφαλών και αποτελεσματικών προσβάσεων στην ανάπτυξη, βελτιώνουν ακόμα περισσότερο την κατάσταση. Συνεπώς, με βάση τα πορίσματα της παρούσας Μελέτης μπορεί να εκδοθεί η σχετική άδεια ανάπτυξης για υλοποίηση της προτεινόμενης ανάπτυξης.

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## 1. INTRODUCTION

### The Study

1.1 The study considers all traffic and parking-related aspects of a proposed residential development in the west of the Limassol urban area. The key components of the study are set out below:

- identification of the existing traffic situation on the surrounding network;
- estimates of traffic generated by the new development;
- assessment of the impact of the development;
- testing of capacity at local junctions;
- recommendations and proposals for any mitigation measures that may be required.

### Development Characteristics

1.2 Site Location - The site is located in the west of the Limassol in Tserkezoi (Tserkez Tsiflik) area. The specific location is shown in **Figure 1.1**, which shows that the site is located to the south of the extension of Fr. Roosevelt Avenue to the Asomatos Community. The area around the site mainly comprises empty plots, however to the east of the site the area is very mixed, with shops (My Mall Limassol), some residential, the new Limassol Port and a variety of old industrial units. Fr. Roosevelt itself is an 'activity spine', which contains many of the aforementioned activities.

1.3 Land Use and Floorspace - The site currently occupies an area of 93.030 m<sup>2</sup>. The proposal will create a new residential development comprising 310 units, configured as blocks with maximum 4 floors per building. The development will be implemented in two phases. Also, the proposed development includes some other uses, which are for the exclusive use of residents. These are a tennis court, basketball court, swimming pool, playground, gym, kiosk and cafeteria. The layout of the site is presented in **Appendix A**.

1.4 Year of Opening - The development will be operational in two Phases. Phase A will be completed by 2021 and Phase B will be completed by 2022, if no undue complications are encountered. However, for the purposes of this study, we have assumed that the entire development will be implemented in 2022.

1.5 Parking Provision – A total of 489 spaces will be provided within the site for both phases, at a surface level parking area. For the Phase A, 167 spaces will be provided, of these, 11 will be allocated for disabled users, 145 for Residents and 11 for Visitors. For the Phase B, 322 spaces will be provided, of these, 21 will be allocated for disabled users, 280 for Residents and 21 for Visitors. The layout plans of the site presented in **Appendix A** show the parking arrangements.

1.6 With specific regard for the provision disabled spaces, the local parking standards were revised in September 2018, under Regulation 61HA. This regulation specifies that disabled space provision should be as follows:

- In developments requiring up to 10 parking spaces, 1 additional space shall be reserved for vehicles for people with disabilities;

- Where 11 to 100 parking spaces are provided, there should be provision for 1 additional space for every 20 parking spaces for people with disabilities;
- Where 101 to 500 parking spaces are provided, an additional 2% provision for disabled persons are required;
- Where more than 500 parking spaces are provided, an additional 1% provision is required for disabled persons.

Taking account of the above, 14 spaces are required for both Phases. As such, the 32 spaces proposed exceeds this requirement.

- 1.7 With regards to cycle parking, none have been included in the current proposals. We would recommend that at least 25 cycle racks (providing 50 spaces) are installed at various locations within the car parking areas and grounds, in safe and secure facilities. We consider this to be an important provision, as it will help to encourage the use of cycling for travel to/from the development and complement the existing cycle infrastructure that exists in the wider area.
- 1.8 Site Access – There are four site access points for the proposed site (both phases) which are served by the proposed road network. Specifically, for Phase A, there will be two access points located to the north and west of the site. The western access point will be in two-way operation and serve the surface-level parking area. The northern access point will be exit-only. With regards to Phase B (based on the current proposed layout), there are also two access points which are located to the east and north of this part of the site. The eastern access point will be in two-way operation, and also serve the surface-level parking area. The northern access point will be exit-only. The proposed road network and these access points are shown in **Appendix A**.
- 1.9 Demand – In terms of activity at the site, it is expected that the Weekday AM and PM periods will be the busiest.

### **Report Structure**

- 1.10 The report is presented in 4 sections. Following this introduction, section 2 considers the traffic analysis, with the impact assessment presented in section 3. The final section outlines our conclusions.

## 2. TRAFFIC ANALYSIS

- 2.1 Existing Road Network – The proposed site is not currently served by any existing road network. The main road in the local area is Fr. Roosevelt Avenue, which runs parallel to the coastal area and connects the western areas of Limassol with the city centre. It is a mainly a dual 2-lane standard road which is a busy route with moderate levels of traffic during peak periods. However, the extension of this road which runs to the north of the proposed site, provides a link to Asomatos, and becomes one lane of each direction. Also, the Vertical Road is an important route in the local area, which provides access to the northern areas of Limassol and connects the New Port with the Motorway. The remaining routes in the local network are less significant in nature. As mentioned above, the proposed development includes a new local road network, which will serve the site and connect it to the existing road network of the area.
- 2.2 This local area network is presented in **Figure 2.1**, and as can be seen, local and strategic access to the site is good.
- 2.3 Road Safety – With regards to road safety, the study area network had only 4 reported accidents in the last 3 years of available data, which are presented in the table below. There was only 1 serious accident at the Vertical Road/ Nicou Kavvadia signalised junction. Hence, the safety record is good.

**Table 2.1: Accidents on the Local Road Network (2016 – 2019)**

Junction	Severity					Vulnerable Road Users		
	Fatal	Serious	Slight	Damage Only	Total	Bicycles	Motor-Cycles	Pedestrians
J1: Fr. Roosevelt/ Vertical Road (Roundabout);	0	0	2	1	3	0	1	0
J3: Vertical Road/ Nicou Kavvadia (Signalised Junction)	0	1	0	0	1	0	0	0
<b>Total</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>0</b>

Source: Cyprus Police

### Traffic Surveys

- 2.4 In discussions with the PWD, it was agreed that the turning counts should be surveyed on a on a weekday during the morning period 07:30 – 09:00 and afternoon period 17:00 – 18:30, and the peak 60 minutes selected for assessment.
- 2.5 The turning count surveys were conducted during February 2020 on the local road network, in order to obtain assessment period traffic volumes and turning movements at the key junctions in the local area. The locations surveyed are shown in **Figure 2.1** and are the following:
1. Fr. Roosevelt/ Vertical Road (Roundabout);
  2. F. Roosevelt / E602 (Road to Trachoni) (Priority Junction);
  3. Vertical Road/ Nicou Kavvadia (Signalised Junction);

4. Vertical Road/Parallel Road (Roundabout).
- 2.6 The counts were classified in terms of the following vehicle types, which were converted to PCU's:
- Cars and Light Vans – (1.0 PCU);
  - Heavy Goods Vehicles – (2.5 PCU's);
  - Buses – (2.0 PCU's);
  - Motorcycles – (0.5 PCU).
- 2.7 In addition to the above surveys, queue surveys were also conducted at the signalised junction and roundabouts. The survey outcomes are presented in **Appendix B**.

### Traffic Flows

#### Traffic Volumes

- 2.8 The outcome of the traffic surveys are outlined in **Figures 2.2a** and **2.2b**, with the traffic volumes on the key roads in the local network summarised in **Table 2.2** below. As can be seen, traffic volumes on the main roads are moderate, with up to 1.900 PCU's on Fr. Roosevelt, up to 1.400 on the Vertical Road and up to 1.000 on the E602 (Road to Trachoni). The remaining routes are far less busy.

**Table 2.2: Existing 2020 Traffic Volumes\* on Key Roads**

Road	Weekday 07:30 – 08:30	Weekday 17:00 – 18:00
Fr. Roosevelt	500 – 1.700	400 – 1.900
E602 (Road to Trachoni)	800	1000
Vertical Road	500 – 1.200	500 – 1.400
Nicou Kavvadia	100	200
Parallel Road	500	600
Port Access	300	500
Road to Lady's Mile beach	200	400

\* 2-way flows in PCU's

#### Assessment Period

- 2.9 The assessment periods for this study were selected as 07:30 – 08:30 for the AM and 17:00 – 18:00 for the PM, which were the highest hourly periods during the surveys. These periods combine the peak hours on the local road network with busy activity periods at the site.

#### Traffic Distribution

- 2.10 The potential catchment area of the site maybe quite widespread. The distribution of traffic to/from the site during the assessment periods therefore, has been identified through the use of the existing traffic patterns, which have been qualified by the local population and settlement patterns. The results of this exercise contained in **Figure 2.3**.

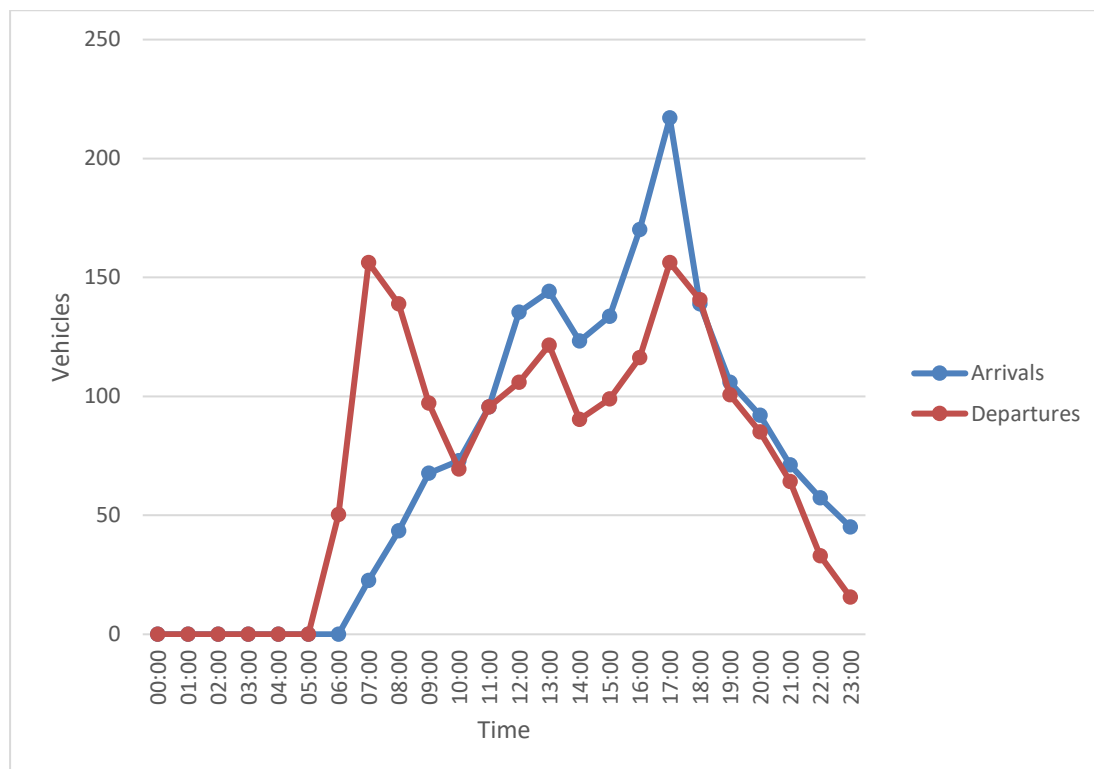
## Traffic Growth

- 2.11 In order to develop future year flow forecasts a general traffic growth rate of 2% per annum has been assumed, which is the rate agreed with the PWD. Therefore, the existing flows in 2020 have been increased by 2% per annum to obtain the 2022 'year of opening' flows. The proposed development will be completed in two phases as described above. However, in this study we have assumed that both phases will be completed by 2022.
- 2.12 To obtain the 2032 'future year' flows, the same annual rate has been applied. However, the PWD have advised that a 5% reduction in traffic could occur by the 'future year', due to the on-going public transport initiatives. As a result, the 2032 traffic have been increased by 17% which caters for the worst (and perhaps unrealistic) scenario

## Traffic Generation

- 2.13 The traffic generation has been based on agreements reached with the PWD on the parameters for the study, with a residential trip generation rate of 7 trips/unit used.
- 2.14 The generated traffic is presented in **Appendix C**, and summarised in **Figure 2.4** below, which shows the hourly arrival and departure profile for the site. There are 2 peak periods of activity at the site, related to arrival and departure of the residents – with the PM peak more pronounced than the AM.

**Figure 2.4: Hourly Arrivals and Departures at the Development – Weekday**



- 2.15 During the assessment period of 07:30 – 08:30, 43 arrivals and 139 departures are estimated. During 17:00 – 18:00 period, there are 217 arrivals and 156 departures.

This results in a total generated traffic of 182 and 373 vehicle trips in the AM and PM periods respectively.

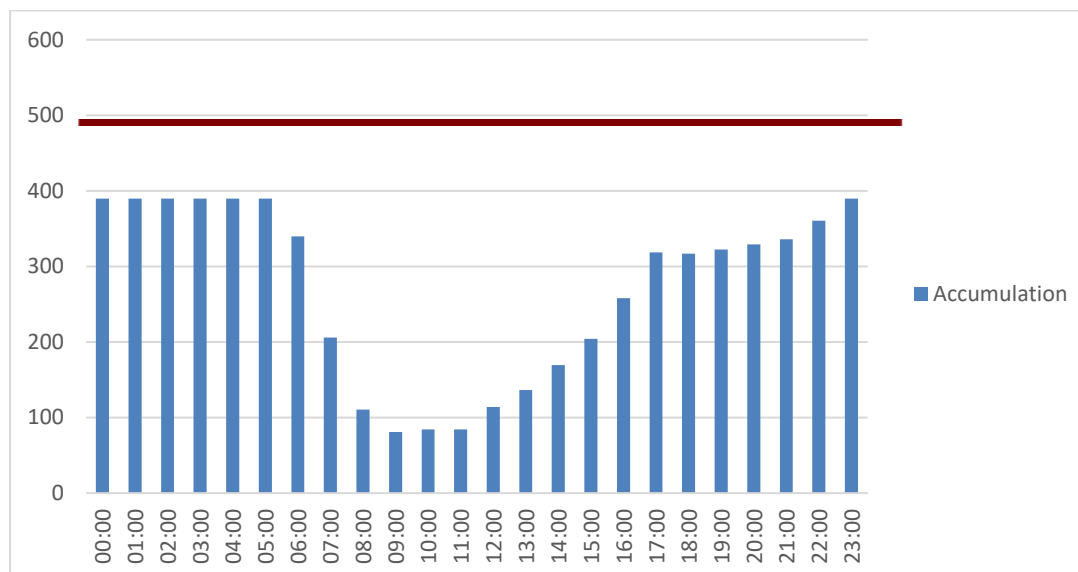
### Diverted/Pass-by trips

- 2.16 Within most estimates of generated traffic, there are a proportion of trips that can be considered as 'diverted' and/or 'pass-by' trips. These are trips that have either been diverted to the development from other similar destinations in the area or are passing by the site. As a result of discussions with the PWD, a diversion rate of 0% is applied.

### Parking Accumulation

- 2.17 To determine the adequacy of the overall parking provision, an accumulation analysis has been conducted. The results are contained in **Appendix C** and are summarised in **Figures 2.5** below. The overall accumulation of the car park shows peak occupancy between during the overnight period when residents are back at their homes, when there are 390 parked vehicles. This is within the car parks capacity of 489 spaces and is a peak occupancy of 80%.

**Figure 2.5: Parking Accumulation at the Development – Weekday**



### Committed Road Schemes and Developments

- 2.18 The main change of the local road network is the proposed changes to the Vertical Road. The implementation of this scheme is currently uncertain, but it is likely to be within the next 10 years, so it will be taken into account for Future Scenario of 2032. The details of the scheme are presented in **Appendix D**. Specifically, there are some changes in the priority junction Fr. Roosevelt/ E602 (Road to Trachoni), which becomes left in/left out only. In this way, all right movements will be done through the proposed roundabout to west of the junction. The above are shown in the **Figures 2.9a and 2.9b** and the future layout of this junction has been tested in **Appendix G**.



- 2.19 From research carried out for this study and advice from the PWD, there are three developments in the vicinity of the site that should be taken into account by this study. The details are set out below and the locations are presented in **Appendix E**:
- **City of Dreams Mediterranean (Casino)** - located to the southeast of the proposed site, it is a mixed-use development which includes the following uses: Casino (136 tables and 1.200 game machines), Hotel (500 rooms), Spa (2.657 m<sup>2</sup>), Restaurant (3.844 m<sup>2</sup>) and Retail (4.002 m<sup>2</sup>). The total parking space provision is 1.992. Details of the TIA undertaken were not made available to the study team, but from published results it was understood that a total of 690 vehicle trips would be generated in the PM. Assumptions have been on the proportion of arrivals and departures, as shown below. Also, we have assumed that 20% of the PM development traffic would be generated in the AM period. The traffic generation estimates made are set out below:
    - 07:30 – 08:30: 83 arrivals (60%) and 55 departures (40%);
    - 17:00 – 18:00: 414 arrivals (60%) and 276 departures (40%);
  - **Sky Gardens Development** (ΛΕΜ/00763/2019) - located directly north of the proposed site, on Fr. Rousvelt. It is a residential development configured over 2 buildings and comprising of 185 units. Again, details of TIA were not available to the study team, so traffic generation were made, based on the same parameters that were used to estimate the traffic generated by our development. The estimates are set out below:
    - 07:30 – 08:30: 28 arrivals and 90 departures;
    - 17:00 – 18:00: 141 arrivals and 102 departures;
  - **Lanitis Farm Golf** - located to the southwest of the proposed site. It is a mixed-use development which includes an 18-hole Golf course, residential units (162 apartments and 368 houses), Club House/Gym/Spa/Shops (16.000 m<sup>2</sup>), and Sports Facilities (42.570 m<sup>2</sup>). The TIA produced for this development was made available to the study team, with the traffic generated estimated in that study set out below:
    - 07:30 – 08:30: 81 arrivals and 38 departures;
    - 17:00 – 18:00: 52 arrivals and 87 departures;

These trips have included in the 2022 'without' development scenario.

#### Generated Traffic Flows

- 2.20 The 2022 traffic flows without the development are based on the patterns captured during the traffic surveys factored by 2% per annum. In addition, the committed developments identified above have also been added. The resulting flows are presented in **Figures 2.6a** and **2.6b**.
- 2.21 The traffic generation of 182 in the Weekday AM period and 373 in the Weekday PM period have been added to the 2022 traffic flows to obtain the with development scenario. The actual generated traffic on each link is presented in **Figure 2.7a** and **2.7b**, with the combined traffic in **Figure 2.8a** and **2.8b**.
- 2.22 The 2032 'Future Year' traffic flows are growthed up from the 2022 scenario by 22%, plus a 5% reduction over the same period to take account of public transport initiatives. The resulting flows are presented in **Figures 2.9a** and **2.9b**.

### 3. IMPACT ASSESSMENT

#### Traffic Assessment

- 3.1 This new residential development is a fairly high generator of traffic during its peak periods of activity. Initial observations suggest that the 182 and 373 vehicle trips generated in the AM and PM period in 2022, will certainly increase the traffic flows and may create some capacity issues and delays on the critical junctions of the local road network. The extent of this will be assessed, to establish the scale of any traffic problems that do result directly from the generated traffic.
- 3.2 The impact assessment of this generated traffic on the local road network is conducted by testing the capacities of the critical junctions on the network 'without' and 'with' the generated traffic in the 'year of opening' in 2022. In addition, further consideration is then carried out of the road infrastructure in the future (2032), in order to test its ability to deal with projected traffic volumes generated by development site. Finally, an assessment is then carried out of the likely issues that may arise, and mitigation measures are proposed where necessary.

#### Junction Testing

- 3.3 The junction testing exercise has been conducted by using appropriate capacity testing software. The PICADY programme is used for assessing the priority junctions, the ARCADY for roundabouts and TRANSYT for signals.

#### Saturation Flows

- 3.4 For the testing of signalised junctions in the TIA, the derivation of realistic saturation flows is important. As a result, the saturation flows used in the junction tests have been calculated using the formulae contained in Research Report 67 – 'The Prediction of Saturation Flows for Road Junctions Controlled by Traffic Signals', which was produced by the TRL for the UK Department of Transport in 1986. The results of this exercise are presented in **Appendix F** and have been agreed with the PWD. These saturation flows have also been incorporated into the TRANSYT files.

#### Capacity Testing Results

- 3.5 The outcome of the capacity testing and assessment of impacts is outlined below for the local road network. The actual results are summarised in **Appendix G**. Due to size the junction test files, they are attached to this report in a CD.
- 3.6 During the 2020 existing scenario, there are no real issues in both assessment periods. However, the priority junction of Fr. Roosevelt/ Road to Trachoni is quite busy. Specifically, these are the left-turn out of the Road to Trachoni in the AM, and the right-turn from Fr. Roosevelt (e) in the PM.
- 3.7 In 2022 (which is the year of opening of the development), the road network is generally much busier, especially during the PM assessment period. This is because 3 major committed developments are due to be operational (as outlined in section 2). During the 'without' development scenario, the issues at the Fr. Roosevelt /Road to Trachoni junction become worse, and indeed the critical movements mentioned above are now overcapacity and create a high level of congestion and delay.

- 3.8 The 2022 'with' development scenario adds to the congestion (especially at Fr. Roosevelt/Road to Trachoni junction), but this is fairly minor and is to be expected given the situation experienced during the 'without' development scenario
- 3.9 In the future year of 2032, the general traffic conditions worsen, with some arms of the Fr. Roosevelt/Vertical Road roundabout reaching capacity. The Fr. Roosevelt/Road to Trachoni junction is converted to a left-in left-out operation, with a new roundabout created to the west of this junction to facilitate the banned right-turn movement from the east. Unfortunately, based on the parameters of this study, this improvement scheme is not considered to be effective.
- 3.10 Given the above, it has been concluded that although the development does add traffic to the network, there are pre-existing conditions which are created, that lead to congestion and delays at the locations outlined above. These are not attributable to the development per se, however, it is recommended that mitigation measures are pursued by the local highway authorities to proactively improve conditions. Some recommendations are set out in the following paragraphs.

### Other Impacts

- 3.11 In addition to the traffic impacts outlined above, the effect of the parking provision has to be considered. As proposed, the development will supply a total of 489 parking spaces.
- 3.12 The parking accumulation conducted for the parking area shows a maximum occupancy of 80% during the Weekday scenario between 23:00 – 06:00. This demonstrates that the parking provision for the parking area is sufficient for the needs of the development, with some spare capacity.

### Mitigation Measures

- 3.13 It is recommended that traffic conditions on the local area are monitored, to establish if they actually occur. It should be noted that the traffic growth rate prescribed by the PWD for a peak period scenario is quite high, at 2% per annum. Also, the trip rates and occupancy of the development is also quite high, at 7 trips/unit.
- 3.14 So, it is against this backdrop that we would recommend the implementation of the following measures by the public authorities to mitigate some of the impacts on the local road network:
- The installation of a dedicated left-turn lane at the Fr. Roosevelt/Vertical Road roundabout for the Fr. Roosevelt (w) arm. This has been tested, as shown in **Appendix G**, and shows that it is beneficial and should be considered for the wider benefit of the local area.
  - The conversion of the Fr. Roosevelt/Road to Trachoni Road to signals in the future. This junction should be monitored, and if justified, progressed for the wider benefit of the local area.
  - As for the development, the provision of 50 cycle parking spaces to facilitate this form of travel to/from the site
- 3.15 It should also be noted that as very little information was made available for the committed developments referred to above and in Section 2, that we are unaware of any mitigation measures, if any, that are being progressed by the respective

developers. This is particularly the case for the mixed-use Casino development, which is a large generator of traffic.

## 4. CONCLUSIONS

- 4.1 This study into the traffic impact of this new residential development has considered all the relevant traffic-related, parking and operational issues. Our concluding comments and recommendations on this development are therefore outlined below.
- 4.2 The key characteristics of the development are:
- 310 residential units, for both phases;
  - 489 parking spaces are provided at the surface-level parking area for both phases. Of these, 32 will be allocated for disabled users, which exceed with the current local parking standards.
- 4.3 The assessment conducted has been based on traffic surveys of the local road network, with specific traffic generation estimates. This leads to a 2-way traffic generation of 182 PCU's in the AM period and 373 in the PM. This translates to 43 arrivals and 139 departures in the AM and 217 arrivals and 156 departures in the PM period.
- 4.4 The impact of this generated traffic on the local road network has been assessed for the 2022 'year of opening' and the 2032 'future year' scenarios. The impact of the development traffic is demonstrated by the testing of capacity at local junctions. This exercise shows that although the local road network is busy, especially when 3 major committed developments are operational in 2022, the residual impact of the traffic generated by our development is relatively minor, adding only moderate amounts of traffic to the local road network, easily be absorbed with minimal impact.
- 4.5 The development is served by four main access points for both phases, which are located on the proposed road network through the site. For Phase A, there are two site access points to the west and north. The western access point will operate as a two-way access to serve the surface-level parking area, and the northern access point will be exit-only. For Phase B, there are also two site access points, to the east and north. The eastern access point will be two-way and serve the surface-level parking area. The northern access point will be exit-only.
- 4.6 A total of 489 spaces will be provided within the site for both phases, at a surface level parking area. For Phase A, 167 spaces will be provided. Of these, 11 will be allocated for disabled users, 145 for Residents and 11 for Visitors. For Phase B, 322 spaces will be provided. Of these, 21 will be allocated for disabled users, 280 for Residents and 21 for Visitors. A parking accumulation profile has been developed and shows a maximum occupancy of 80% for the Weekday between 23:00 – 06:00. Hence, the car parking provision will be able to meet the potential demand, with some spare capacity.
- 4.7 As a consequence of the analysis carried out within the study, specific mitigation related to the development are not necessary. However, 2 measures that could be appropriate for the wider benefit of the local area are recommended. These are:
- Fr. Rousvelt/Vertical Road roundabout – dedicated left-turn lane for western arm;
  - Future signalisation of the Fr. Rousvelt/Road to Trachoni junction.
- 4.8 However, prior to the progression of the above 2 measures, it is recommended that local traffic is monitored to ascertain whether the traffic conditions predicted in this

study do occur. This is because it is felt that the annual growth rate prescribed by the PWD of 2% is, is quite high for a peak period scenario.

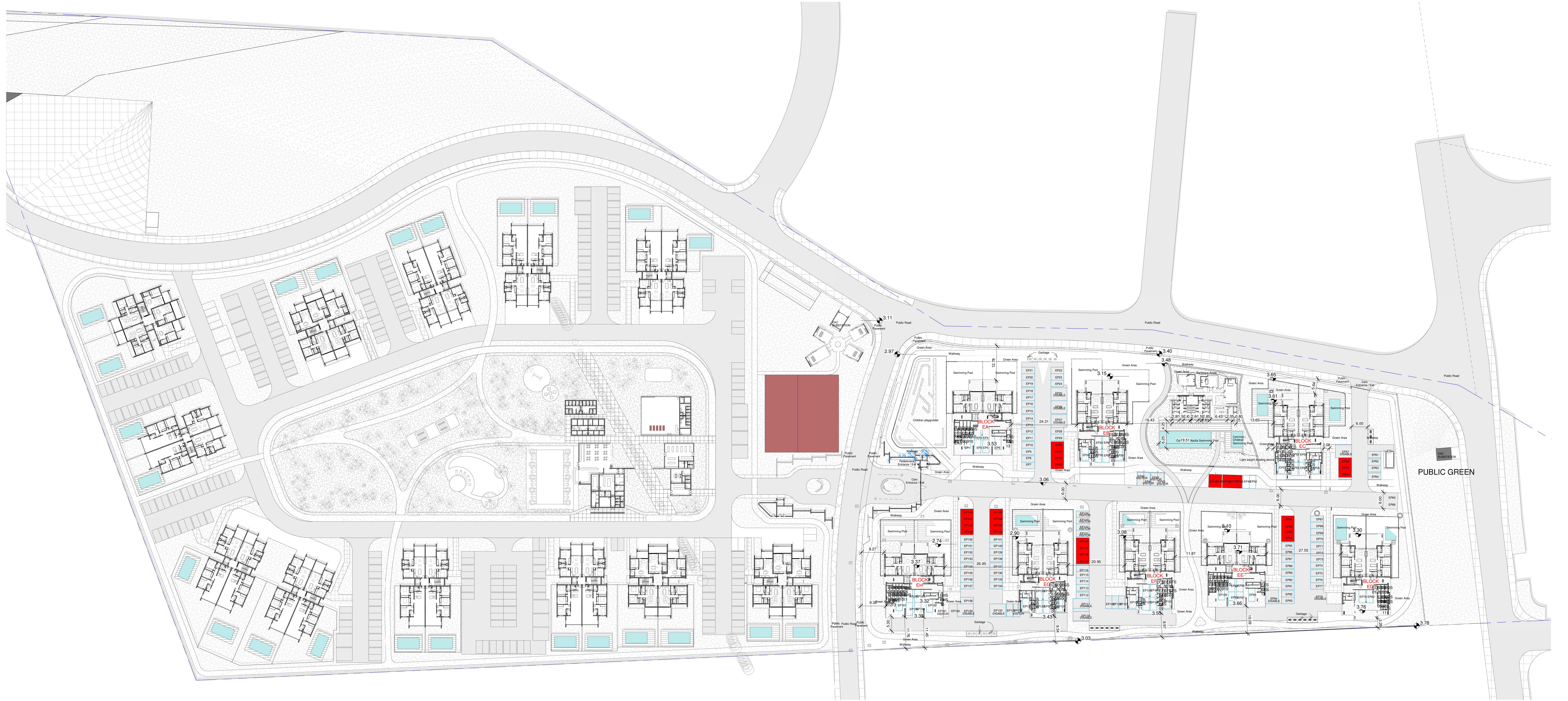
- 4.9 We would therefore conclude that the traffic generated by the site can be accommodated on the local road and the parking demand can also be accommodated within the site. Furthermore, as safe and efficient access to the site has been created, all traffic-related matters have been dealt with. Consequently, we would recommend that permission be granted for the development.

## APPENDICES

## **APPENDIX A**

### **Site Layout**







## **APPENDIX B**

### **Queue Surveys**

Vertical Road/Fr. Roosevelt Roundabout

Vertical Road/Parallel Road/ Port Access Roundabout

Vertical Road/N. Kavvadia/Road to Mall/Casino

Fr. Rousvelt/Road to Trachoni

Time Interval	Vertical Road (n)	Fr. Roosevelt (e)	Vertical Road (s)	Fr. Roosevelt (w)	Vertical Road	Parallel Road	Port Access	Road to Lady's Mile	Vertical Road (n) - Right	Vertical Road (n) - Straight	Vertical Road (n) - Straight & Left	Nicou Kavvadia- Right	Nicou Kavvadia - Straight & Left	Vertical Road (s) - Right	Vertical Road (s) - Straight	Vertical Road (s) - Straight & Left	Road to Casino & Mall - Right	Road to Casino & Mall- Straight& Left	Road to Trachoni - right	Road to Trachoni - left	Fr. Rousvelt (e)- right	
<b>Friday</b>																						
07:30 - 07:45	1	2	1	5	2	1	1	1	2	2	0	1	1	2	3	0	1	2	0	4	3	
07:45 - 08:00	3	3	2	4	2	2	2	0	4	3	1	0	0	1	2	0	2	2	0	6	3	
08:00 - 08:15	4	3	3	5	2	0	1	0	3	1	0	1	1	1	2	1	1	1	1	6	2	
08:15 - 08:30	3	2	1	4	1	2	2	1	2	1	1	1	0	0	2	0	1	1	1	5	1	
08:30 - 08:45	2	3	0	4	0	1	1	0	2	2	1	1	0	1	2	1	1	2	1	4	1	
08:45 - 09:00	1	1	1	2	1	0	1	0	2	1	0	1	1	1	1	0	0	1	0	4	1	
<b>Average Queue</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>2</b>	
<b>Friday</b>																						
17:00 - 17:15	2	3	2	2	0	3	1	2	2	2	2	1	1	0	2	1	1	2	1	3	1	
17:15 - 17:30	3	4	4	3	0	3	1	2	3	3	3	2	1	0	4	0	2	1	0	4	5	
17:30 - 17:45	4	5	4	3	1	2	2	1	3	2	3	0	0	1	4	1	1	2	1	4	5	
17:45 - 18:00	1	3	5	2	0	3	2	2	4	2	4	1	1	0	2	0	1	2	0	3	4	
18:00 - 18:15	2	3	3	3	1	2	2	1	4	2	2	1	0	0	2	1	2	2	1	4	5	
18:15 - 18:30	2	2	2	2	0	1	0	0	2	1	3	0	0	1	2	1	1	1	0	3	3	
<b>Average Queue</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>4</b>	

## **APPENDIX C**

### **Traffic Generation & Parking Accumulation at the Development**

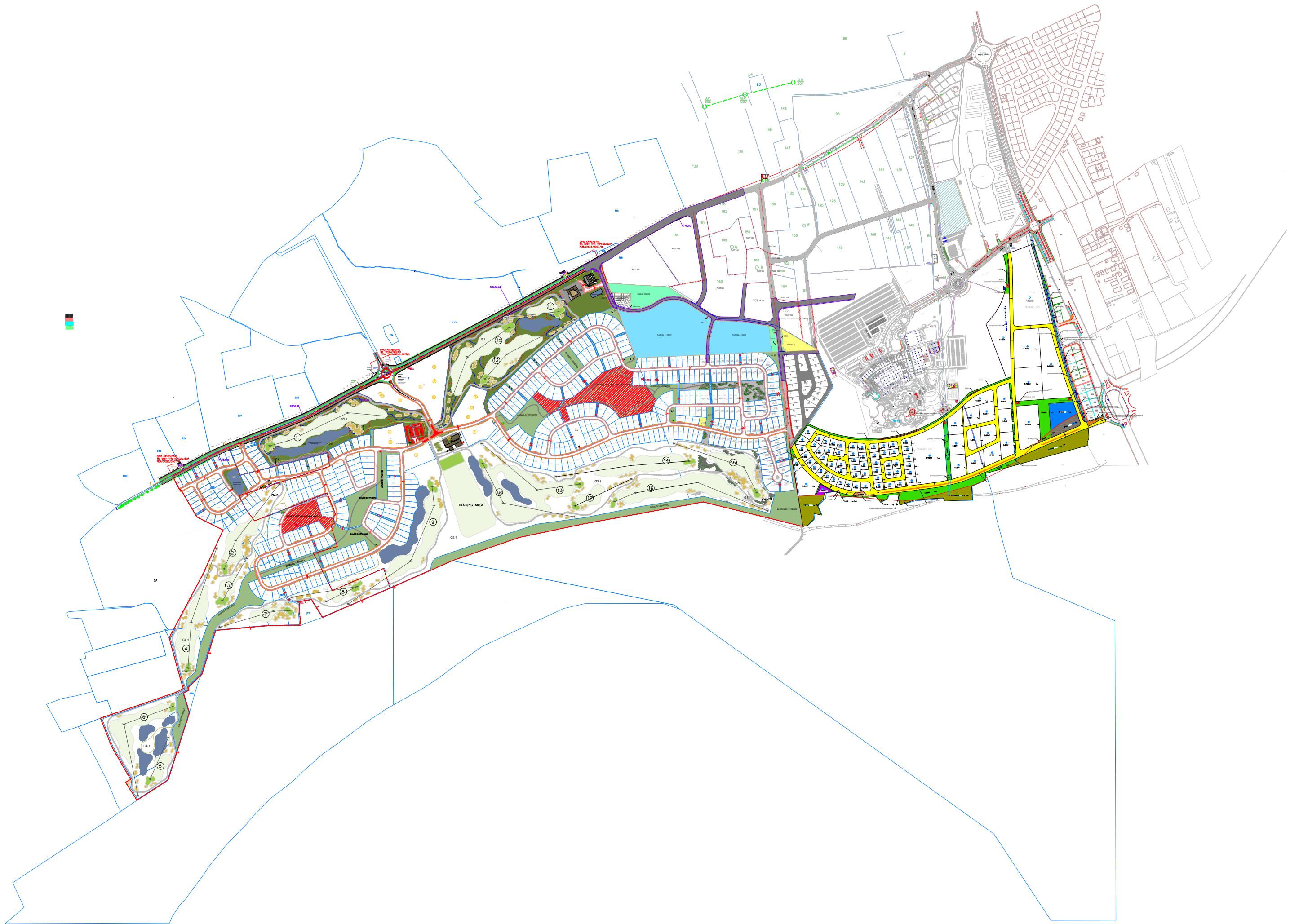
# TRAFFIC GENERATION AT THE SUNSET GARDENS RESIDENTIAL DEVELOPMENT

## WEEKDAY

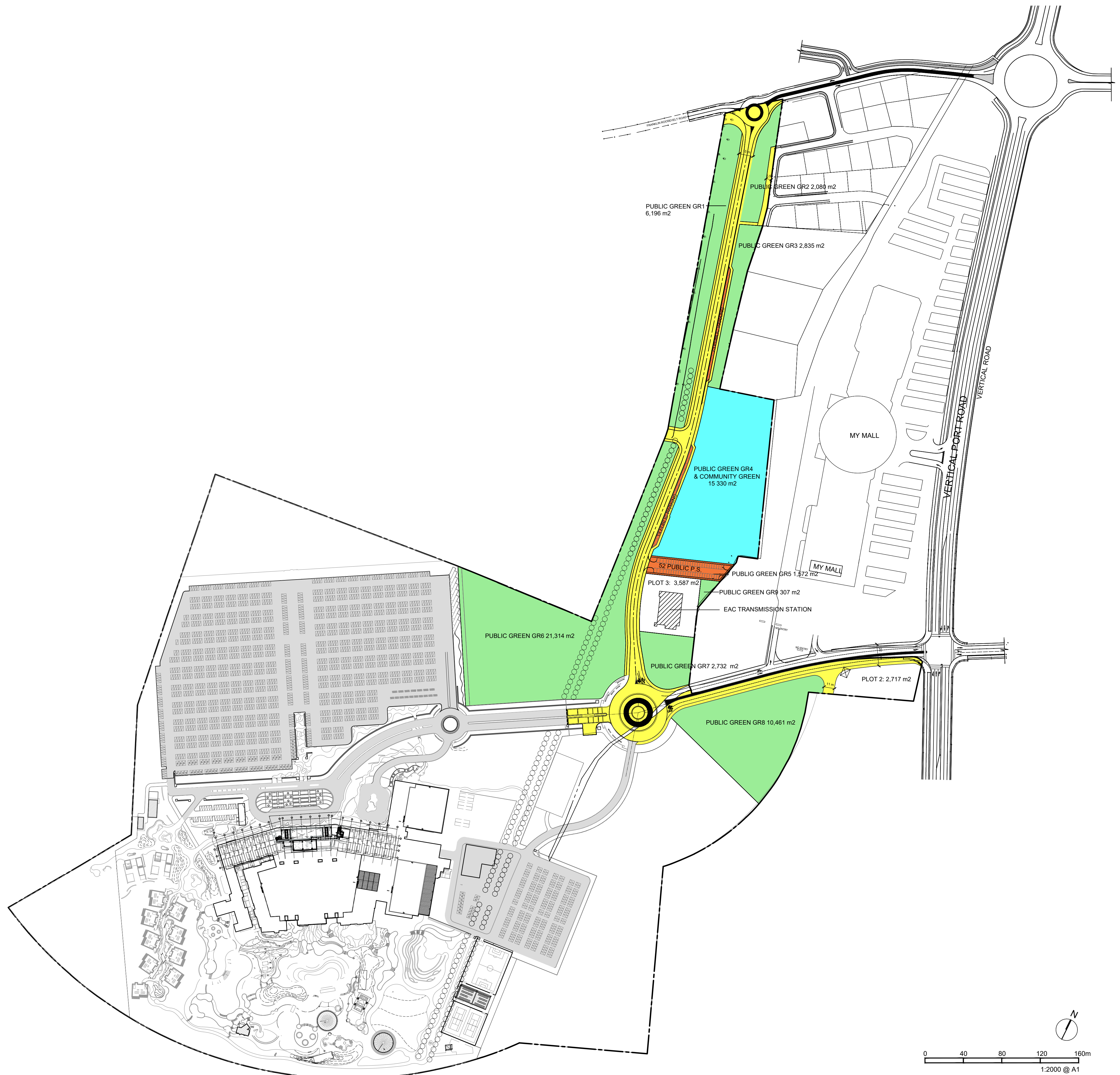
SUNSET GARDENS RESIDENTIAL DEVELOPMENT			
Start Hour	Arr	Dep	Accumulation
0:00	0	0	390
1:00	0	0	390
2:00	0	0	390
3:00	0	0	390
4:00	0	0	390
5:00	0	0	390
6:00	0	50	340
7:00	23	156	206
8:00	43	139	111
9:00	68	97	81
10:00	73	69	84
11:00	95	95	84
12:00	135	106	114
13:00	144	122	137
14:00	123	90	170
15:00	134	99	204
16:00	170	116	258
17:00	217	156	319
18:00	139	141	317
19:00	106	101	322
20:00	92	85	329
21:00	71	64	336
22:00	57	33	360
23:00	45	16	390
<b>Total</b>	1736	1736	-

## **APPENDIX D**

### **Future Road Network**







KEY PLAN

NOTE:

LEGEND

- RESORT SECURITY FENCE
- 1. AFTER DEDUCTION OF PUBLIC ROADS, PUBLIC GREEN 15% OF SITE AREA AND COMMUNITY GREEN = 3% OF SITE AREA.

CLIENT

Melco Resorts & Entertainment  
City of Dreams, Cotai Strip, Macao  
melcoresorts.com

ARCHITECTURE & INTERIOR DESIGN, MEPF, STRUCTURAL ENGINEERS, LANDSCAPE & ACOUSTICS

Member of the SNC-Lavalin Group

ARCHITECT OF RECORD

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Website: www.dishes.com.my

Interior Design

Westar Architects International Limited  
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P. 04-01/02/03/04

CIVIL, STRUCTURAL & BUILDING FACADE ENGINEERS

TRAFFIC ENGINEER

BUILDING SERVICES ENGINEER

NO.	DESCRIPTION	DATE
TP1	Town Planning Submission (Replacement)	06.07.2018
TP	Town Planning Submission	18.01.2018

OWNER'S SIGNATURE:

LOCAL ARCHITECT'S SIGNATURE:

LOCAL ENGINEER'S SIGNATURE (STRUCTURE):

LOCAL ENGINEER'S SIGNATURE (BUILDING SERVICES):

PROJECT

CITY OF DREAMS MEDITERRANEAN

TITLE

OVERALL SITE PLAN

SCALE 1:2000 DWG. SIZE A1

JOB NO./STAGE CODE REV TP1

CAD REF. ATK-ICR-ARC-0101\_dwg

DWG NO. ATK-ICR-ARC-0101\_



## **APPENDIX E**

### **Committed Developments**



Residential Development  
«Sky Gardens»

Site

Golf Development  
«Limassol Golf Greens»

ΤΣΕΡΚΕΖΟΙ

Casino

«City of Dreams Mediterranean»

Φρανγκο

Alexou Sakellariou

Syrou

Roxanis

Kyriakou Chapesi

Serfou

Ayaplo

Vertical port Rd

157

## **APPENDIX F**

### **Saturation Flow Summaries**

# CALCULATION OF SATURATION FLOWS

Project:

Sunset Gardens, Limassol TIA

Junction, Link & Lane Name

Movement

PWD

## J3: Vertical Road/Nicou Kavvadia/ Road to Casino Signalised Junction

Vertical Road (n) - Offside	R	1.782	1760
Vertical Road (n) - Middle	S	2.105	1901
Vertical Road (n) - Kerbside	S & L	1.847	1816
Nicou Kavvadia- Offside	R	1.827	1804
Nicou Kavvadia- Kerbside	S & L	1.840	1795
Vertical Road (s) - Offside	R	1.782	1761
Vertical Road (s) - Middle	S	2.105	1911
Vertical Road (s) - Kerbside	S & L	1.902	1856
Road to Casino & Mall- Offside	R	1.808	1769
Road to Casino & Mall- Kerbside	S & L	1.853	1794

### Input Variables

### Values

Gradient (DV)	0 or 1
Gradient (%)	1 to 100
Lane Width (m)	
Base Sat. Flow	2080
Nearside (DV)	0 or 1
Turning Vehicles	0.0 to 1.0
Radius of Turn (m)	

## **APPENDIX G**

### **Junction Test Summaries and CD**

## AM PEAK PERIOD: 07:30 - 08:30

### Capacity Tests at Roundabouts

Junction and Link Movements	2020 Existing		2022 Without Devt.		2022 With Devt.		2032 With Devt.	
	Q	RFC	Q	RFC	Q	RFC	Q	RFC
<b>J1: Vertical Road/Fr. Roosevelt Roundabout</b>								
Vertical Road (n)	1	0,402	1	0,475	1	0,494	2	0,604
Fr. Roosevelt (e)	1	0,392	1	0,458	1	0,472	1	0,575
Vertical Road (s)	0	0,118	0	0,158	0	0,162	0	0,201
Fr. Roosevelt (w)	1	0,562	3	0,745	5	0,823	33	1,016
<b>J1: Vertical Road/Fr. Roosevelt Roundabout - Mitigation dedicated left-turn lane</b>								
Vertical Road (n)	-	-	-	-	-	-	2	0,611
Fr. Roosevelt (e)	-	-	-	-	-	-	1	0,577
Vertical Road (s)	-	-	-	-	-	-	0	0,201
Fr. Roosevelt (w)	-	-	-	-	-	-	3	0,715
<b>J4: Vertical Road/Parallel Road/Port Access Roundabout</b>								
Vertical Road	0	0,179	0	0,212	0	0,225	0	0,267
Parallel	0	0,063	0	0,072	0	0,074	0	0,09
Port Access	0	0,028	0	0,031	0	0,032	0	0,038
Road to Lady's Mile	0	0,021	0	0,23	0	0,023	0	0,028
HGVs Access	0	0,000	0	0,000	0	0,000	0	0,020

Q – Queue in PCU's RFC – Demand/Capacity Ratio

### Capacity Tests at Signalised Junctions

Junction and Arms	2020 Existing		2022 Without Devt.		2022 With Devt.		2032 With Devt.	
	Q	DoS	Q	DoS	Q	DoS	Q	DoS
<b>J3: Vertical Road/N. Kavvadia/Road to Casino Signalised Junction</b>								
Vertical Road (n) - right	1	12	2	18	2	18	2	21
Vertical Road (n) - straight & left	3	15	4	18	4	19	5	22
Nicou Kavvadia - right	1	12	1	12	1	12	1	14
Nicou Kavvadia - straight & left	1	24	1	22	1	22	2	25
Vertical Road (s) - right	0	1	0	1	0	1	0	1
Vertical Road (s) - straight & left	1	4	1	5	1	6	2	7
Road to Casino & Mall - right	0	5	1	9	1	9	1	10
Road to Casino & Mall - straight & left	1	18	2	35	2	35	3	40

### Capacity Tests at Priority Junctions

Junction and Link Movements	2020 Existing		2022 Without Devt.		2022 With Devt.		2032 With Devt.	
	Q	RFC	Q	RFC	Q	RFC	Q	RFC
<b>J2: Fr. Roosevelt/E602 (Road to Trachoni) Priority Junction</b>								
E 602 (Road to Trachoni) - left	5	0,836	21	1,015	37	1,094	141	1,438
E 602 (Road to Trachoni) - right	0	0,013	3	1,020	4	1,101	-	-
Fr. Roosevelt (e) - right	1	0,510	2	0,609	2	0,648	-	-
<b>Site Access/Fr. Roosevelt Priority Junction</b>								
Site Acces - left	-	-	-	-	0	0,219	0	0,266
Site Acces - right	-	-	-	-	0	0,049	0	0,077
Fr. Roosevelt (w)- right	-	-	-	-	0	0,012	0	0,015

Q – Queue in PCU's RFC – Demand/Capacity Ratio



## PM PEAK PERIOD: 17:00 - 18:00

### Capacity Tests at Roundabouts

Junction and Link Movements	2020 Existing		2022 Without Devt.		2022 With Devt.		2032 With Devt.	
	Q	RFC	Q	RFC	Q	RFC	Q	RFC
<b>J1: Vertical Road/Fr. Roosevelt Roundabout</b>								
Vertical Road (n)	1	0,383	1	0,541	1	0,593	3	0,721
Fr. Roosevelt (e)	1	0,379	1	0,531	1	0,582	2	0,711
Vertical Road (s)	1	0,439	2	0,626	2	0,686	6	0,868
Fr. Roosevelt (w)	1	0,448	3	0,751	6	0,870	<b>96</b>	<b>1,18</b>
<b>J1: Vertical Road/Fr. Roosevelt Roundabout - Mitigation dedicated left-turn lane</b>								
Vertical Road (n)	-	-	-	-	-	-	3	0,761
Fr. Roosevelt (e)	-	-	-	-	-	-	3	0,711
Vertical Road (s)	-	-	-	-	-	-	6	0,871
Fr. Roosevelt (w)	-	-	-	-	-	-	<b>13</b>	<b>0,959</b>
<b>J4: Vertical Road/Parallel Road/Port Access Roundabout</b>								
Vertical Road	0	0,073	0	0,122	0	0,138	0	0,178
Parallel	0	0,134	0	0,175	0	0,188	0	0,231
Port Access	0	0,075	0	0,098	0	0,105	0	0,137
Road to Lady's Mile	0	0,081	0	0,098	0	0,103	0	0,128
HGVs Access	0	0,000	0	0,000	0	0,000	0	0,061

Q – Queue in PCU's RFC – Demand/Capacity Ratio

### Capacity Tests at Signalised Junctions

Junction and Arms	2020 Existing		2022 Without Devt.		2022 With Devt.		2032 With Devt.	
	Q	DoS	Q	DoS	Q	DoS	Q	DoS
<b>J3: Vertical Road/N. Kavvadia/Road to Casino Signalised Junction</b>								
Vertical Road (n) - right	6	36	17	78	17	78	<b>24</b>	<b>90</b>
Vertical Road (n) - straight & left	1	5	2	9	3	11	4	13
Nicou Kavvadia - right	0	3	0	4	1	6	1	6
Nicou Kavvadia - straight & left	2	19	3	20	3	20	3	23
Vertical Road (s) - right	0	2	0	3	0	3	0	3
Vertical Road (s) - straight & left	5	19	0	30	10	32	11	38
Road to Casino & Mall - right	1	8	2	16	2	16	2	19
Road to Casino & Mall - straight & left	7	52	15	80	14	80	<b>21</b>	<b>92</b>

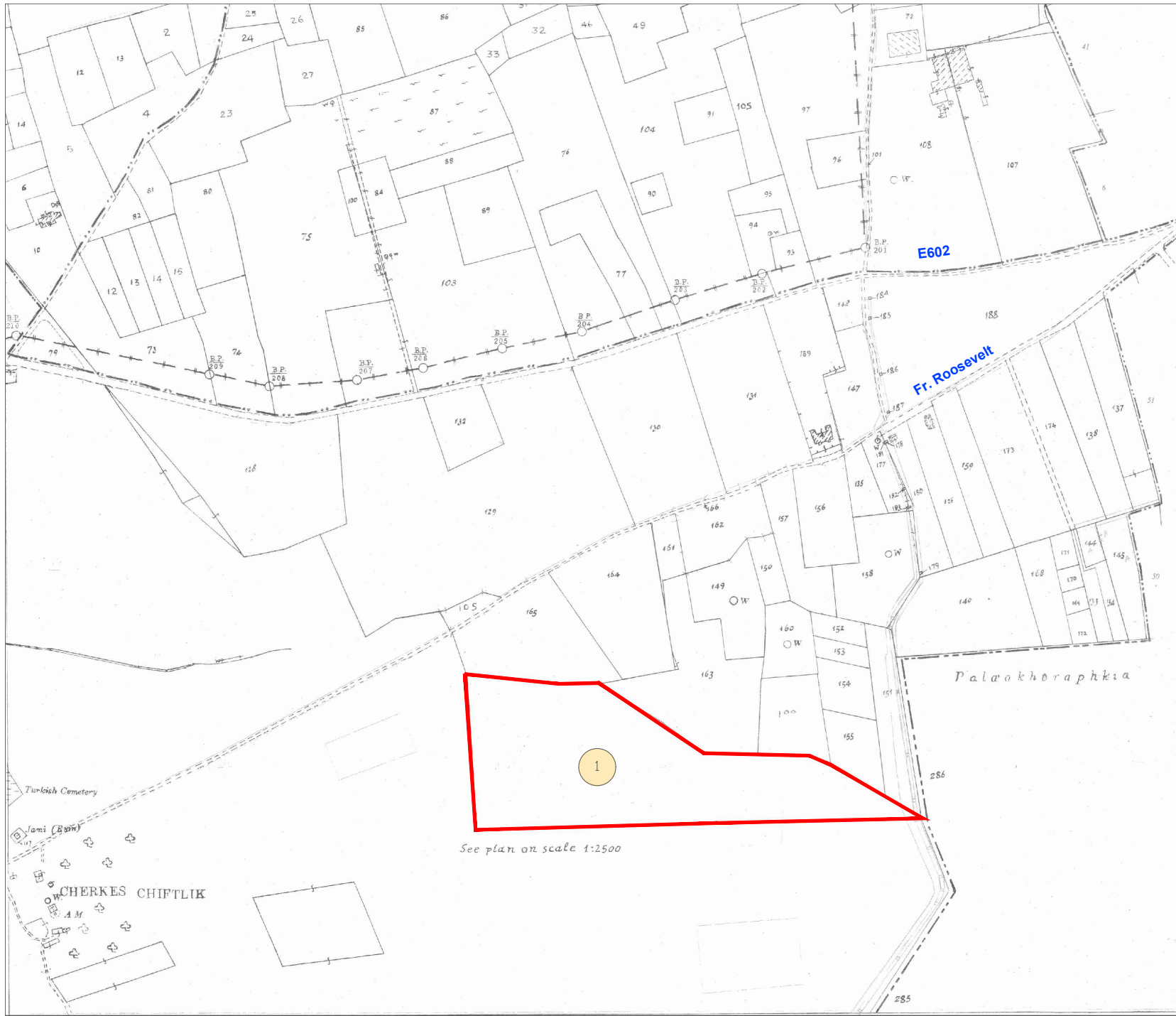
### Capacity Tests at Priority Junctions

Junction and Link Movements	2020 Existing		2022 Without Devt.		2022 With Devt.		2032 With Devt.	
	Q	RFC	Q	RFC	Q	RFC	Q	RFC
<b>J2: Fr. Roosevelt/E602 (Road to Trachoni) Priority Junction</b>								
E 602 (Road to Trachoni) - left	1	0,490	2	<b>0,686</b>	<b>16</b>	<b>1,085</b>	<b>33</b>	<b>1,105</b>
E 602 (Road to Trachoni) - right	0	0,025	0	<b>0,263</b>	<b>4</b>	<b>1,010</b>	-	-
Fr. Roosevelt (e) - right	6	0,871	31	<b>1,083</b>	<b>48</b>	<b>1,163</b>	-	-
<b>Site Access/Fr. Roosevelt Priority Junction</b>								
Site Acces - left	-	-	-	-	0	0,255	0	0,315
Site Acces - right	-	-	-	-	0	0,063	0	0,083
Fr. Roosevelt (w)- right	-	-	-	-	0	0,057	0	0,070

Q – Queue in PCU's RFC – Demand/Capacity Ratio

## FIGURES





[See Plan on Scale 1:1000]



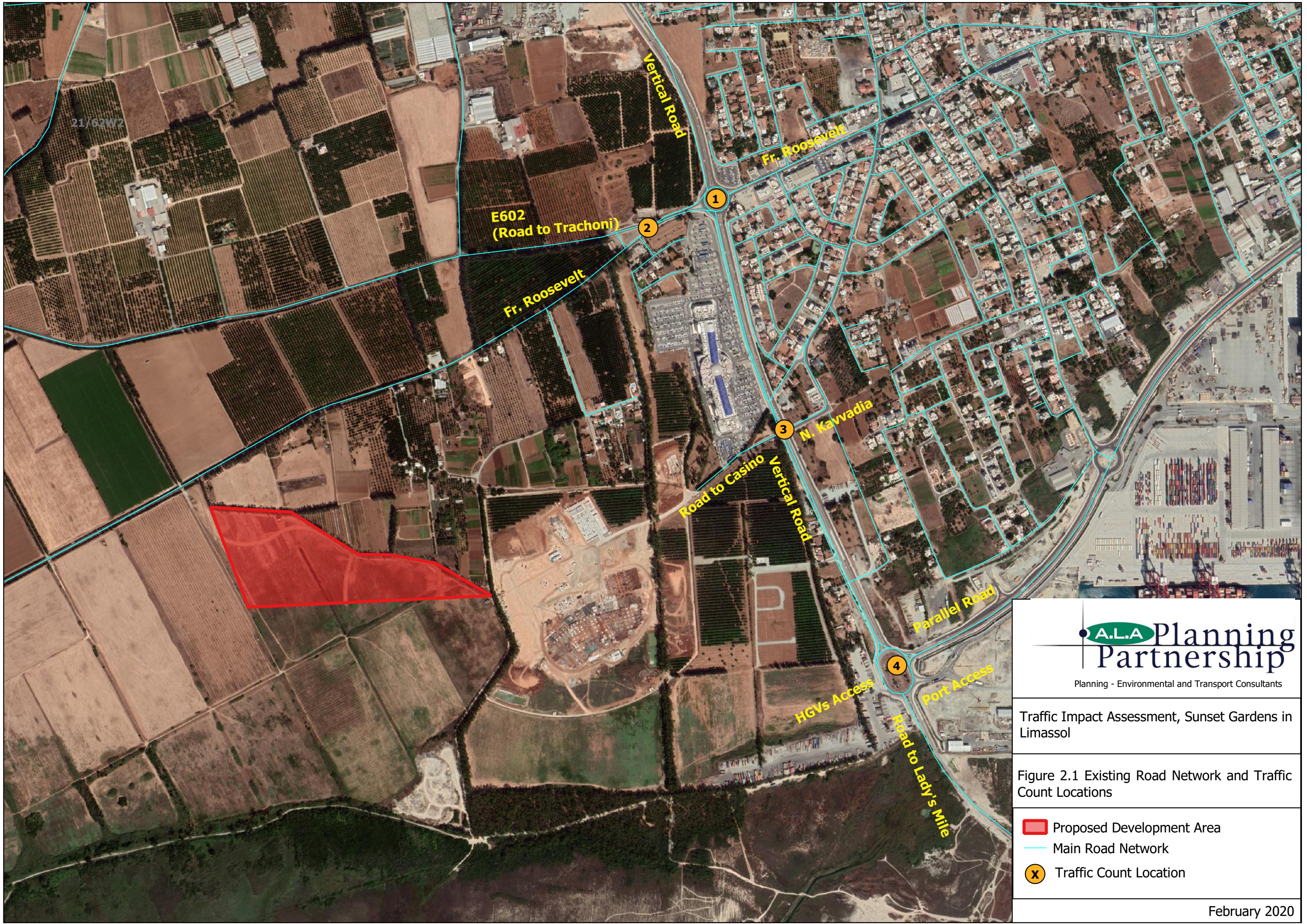
Traffic Impact Assessment, Sunset Gardens in Limassol

Figure 1.1: Site Location

Proposed Development Area (Plot Number: 1 S/P.58/16W2)

Parcel Number





**A.L.A. Planning Partnership**

Planning - Environmental and Transport Consultants

Traffic Impact Assessment, Sunset Gardens in Limassol

Figure 2.1 Existing Road Network and Traffic Count Locations

- Proposed Development Area
- Main Road Network
- x Traffic Count Location



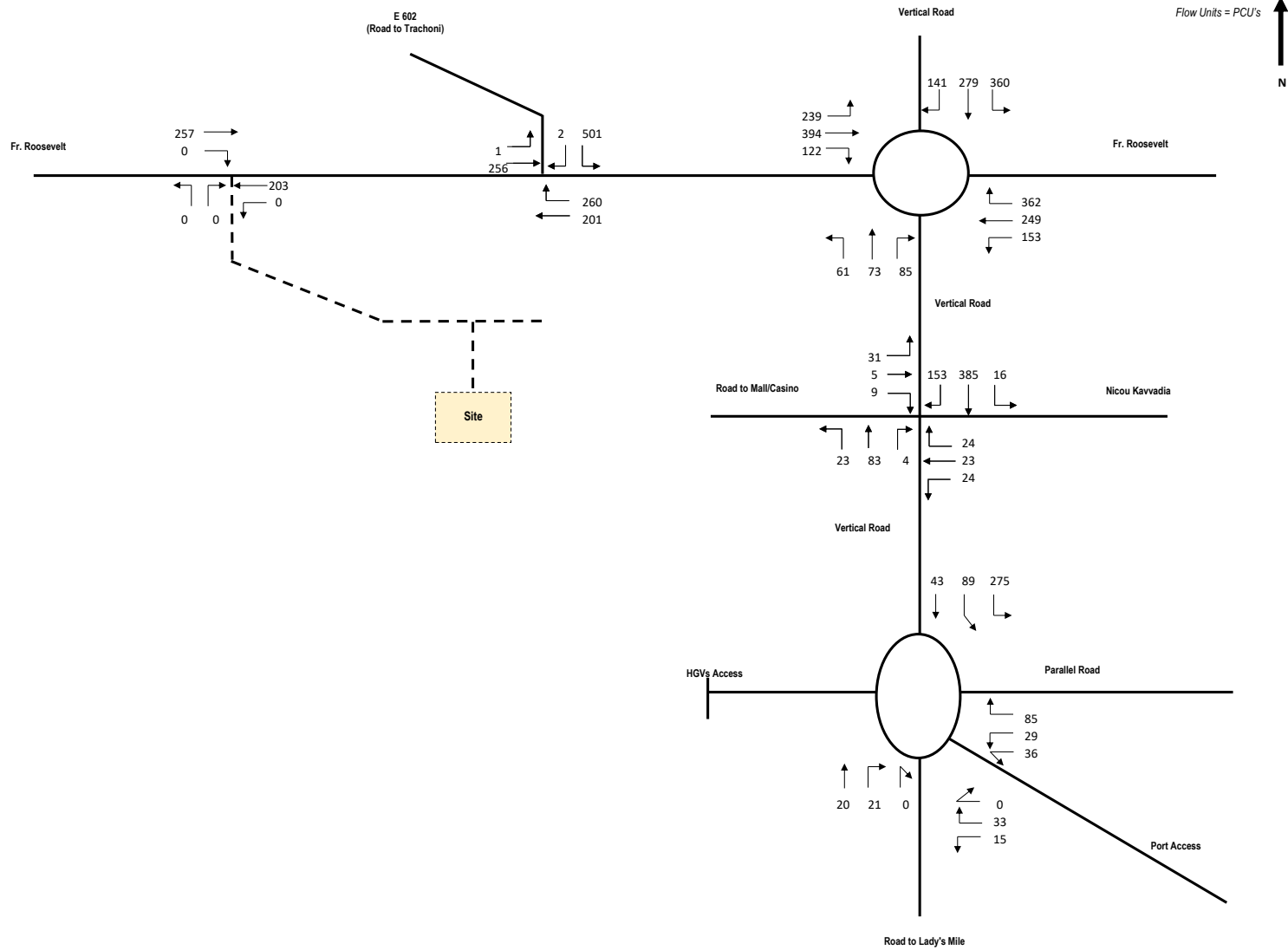


Figure 2.2a: 2020 Existing Traffic Flows, Weekday 07:30 – 08:30

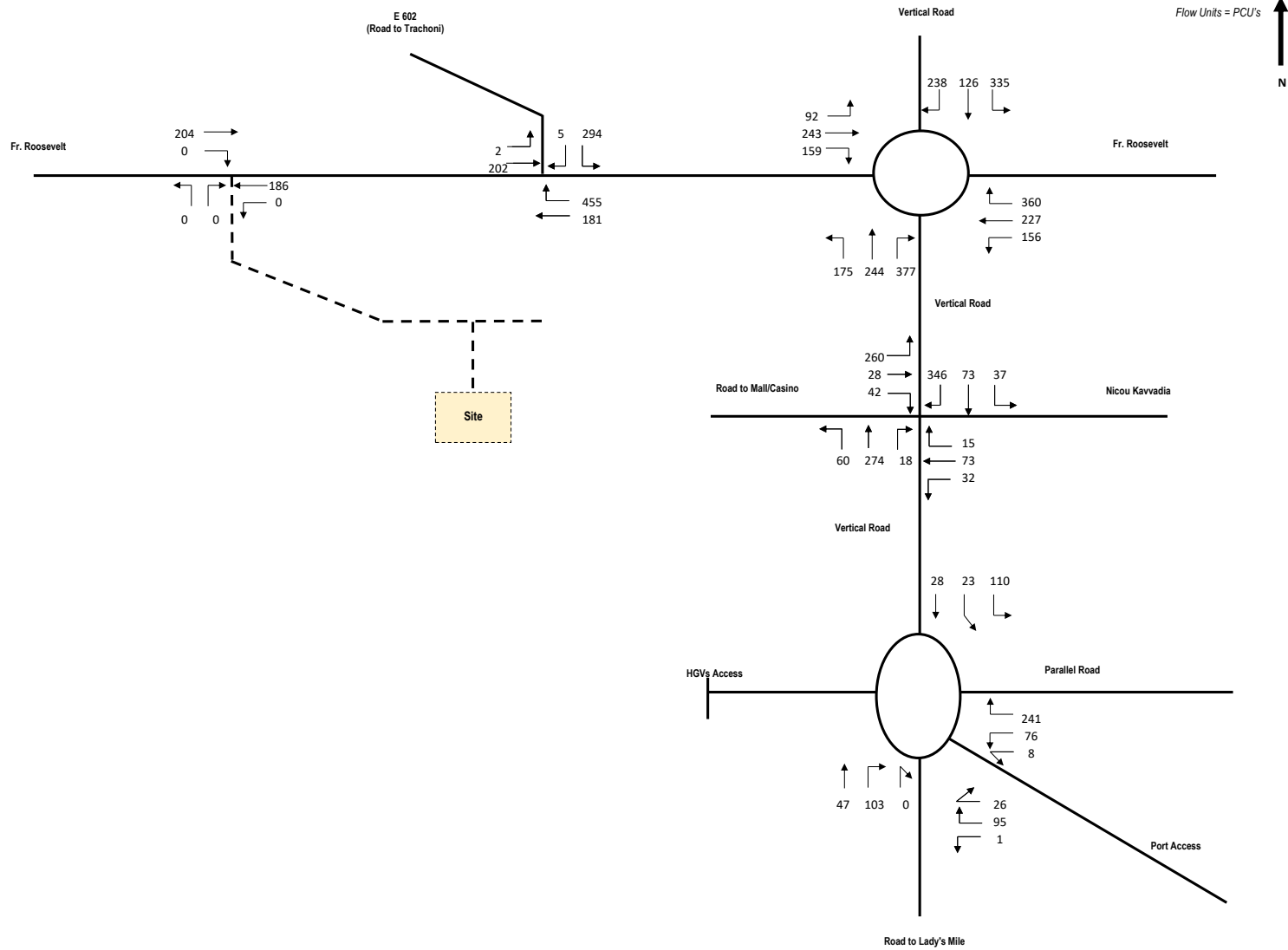


Figure 2.2b: 2020 Existing Traffic Flows, Weekday 17:00 – 18:00

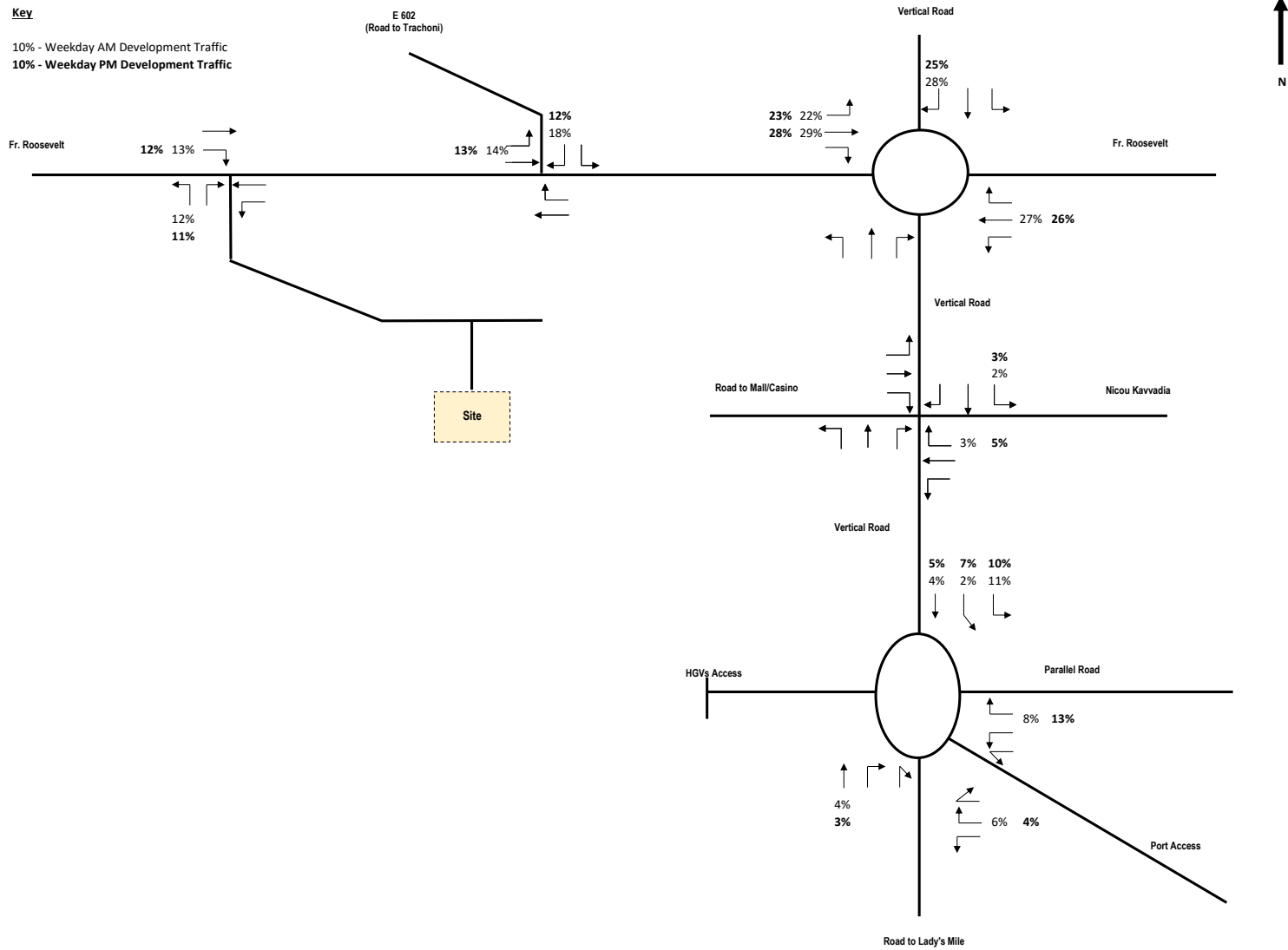


Figure 2.3 Traffic Distribution

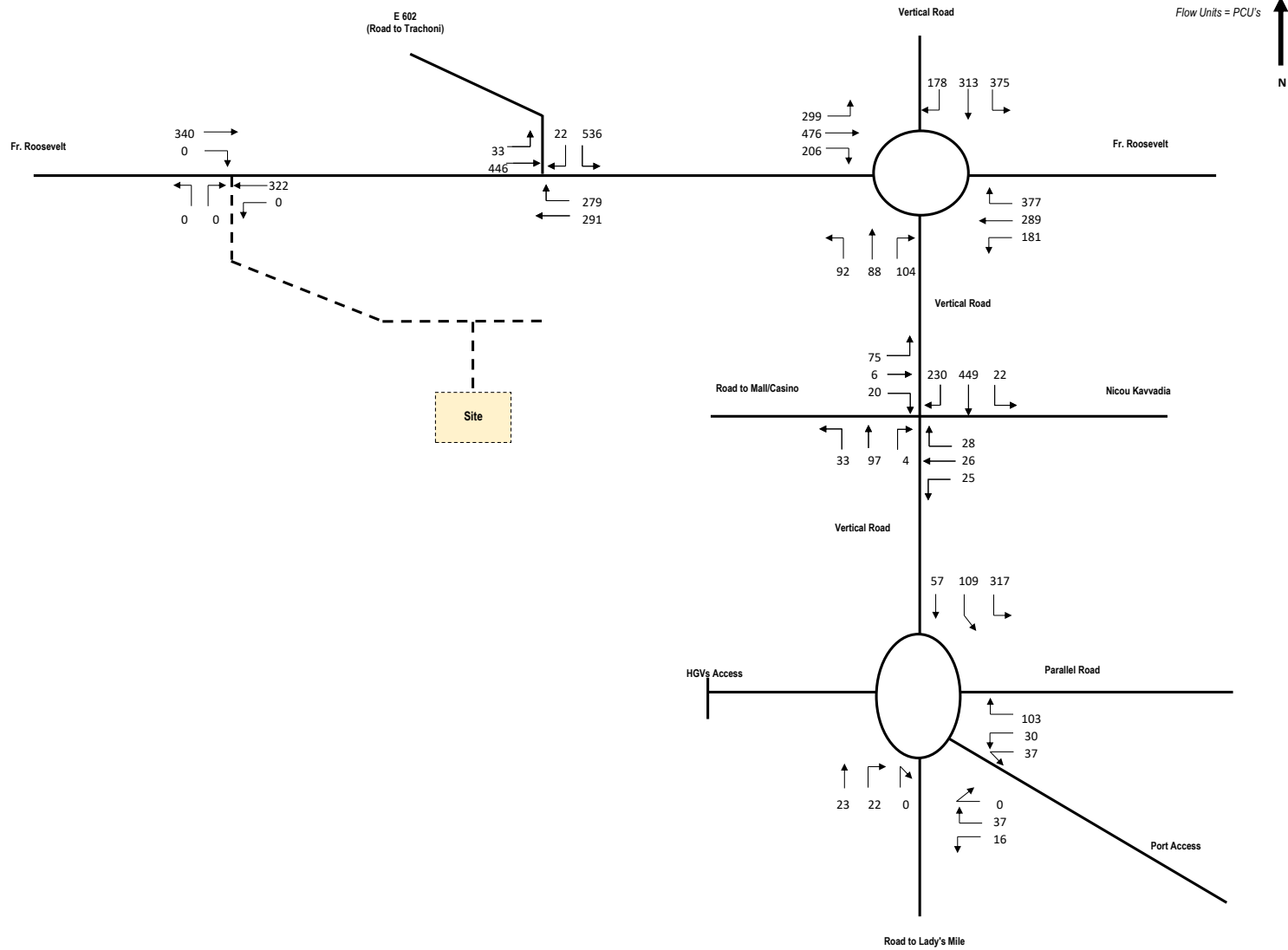


Figure 2.6a: 2022 Traffic Flows Without Development, Weekday 07:30 – 08:30

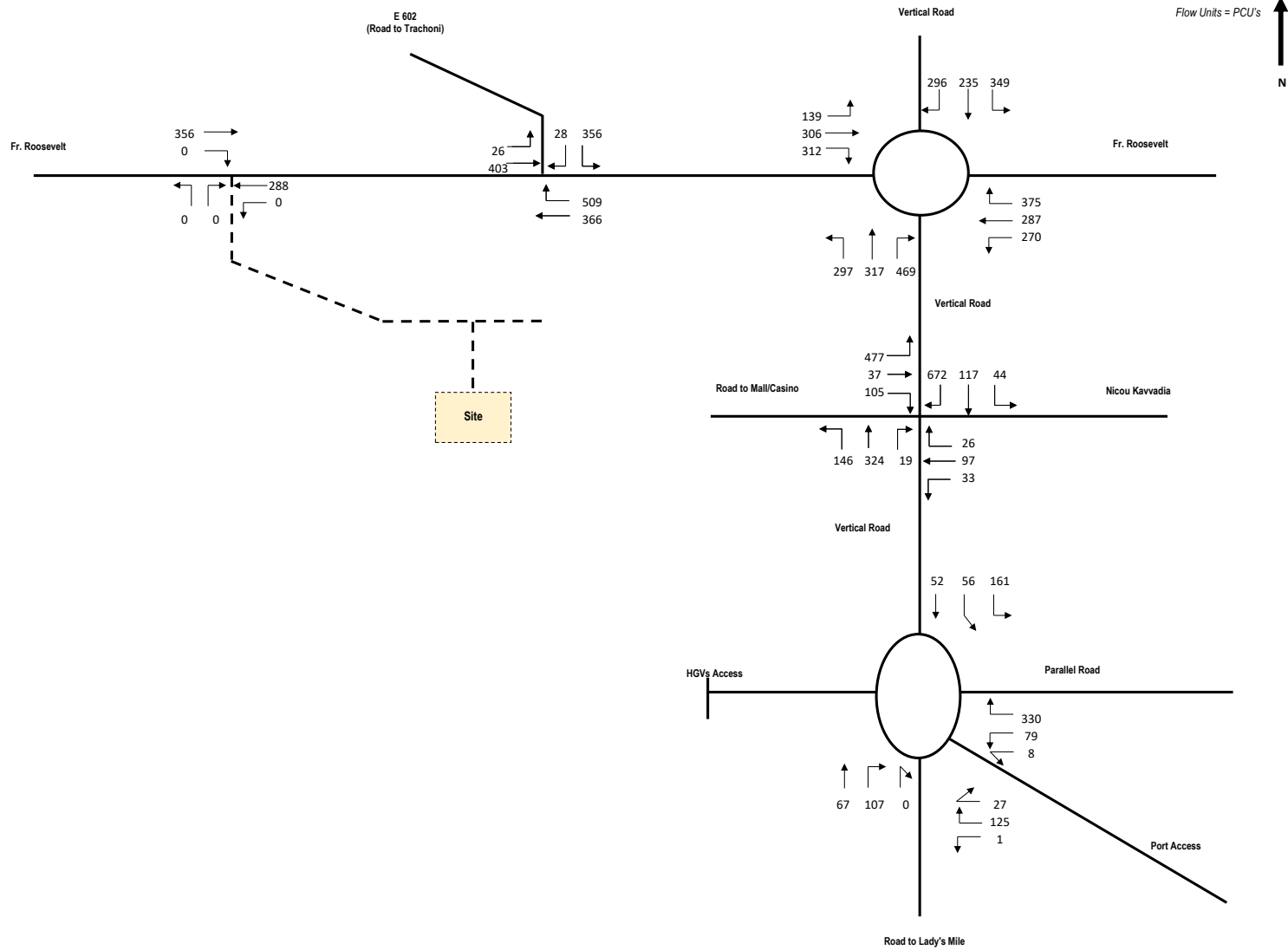


Figure 2.6b: 2022 Traffic Flows Without Development, Weekday 17:00 – 18:00

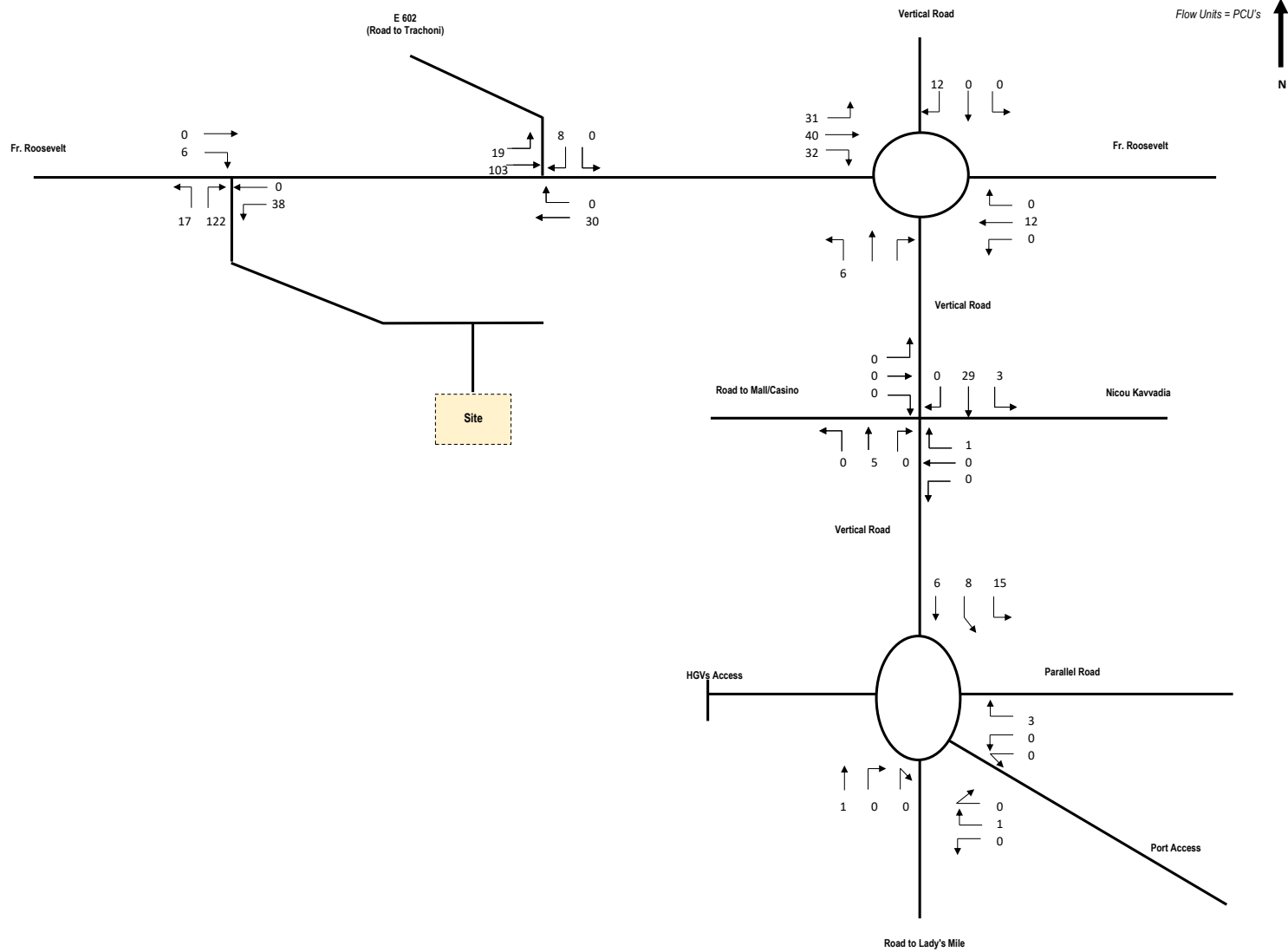


Figure 2.7a: 2022 Development Traffic, Weekday 07:30 – 08:30



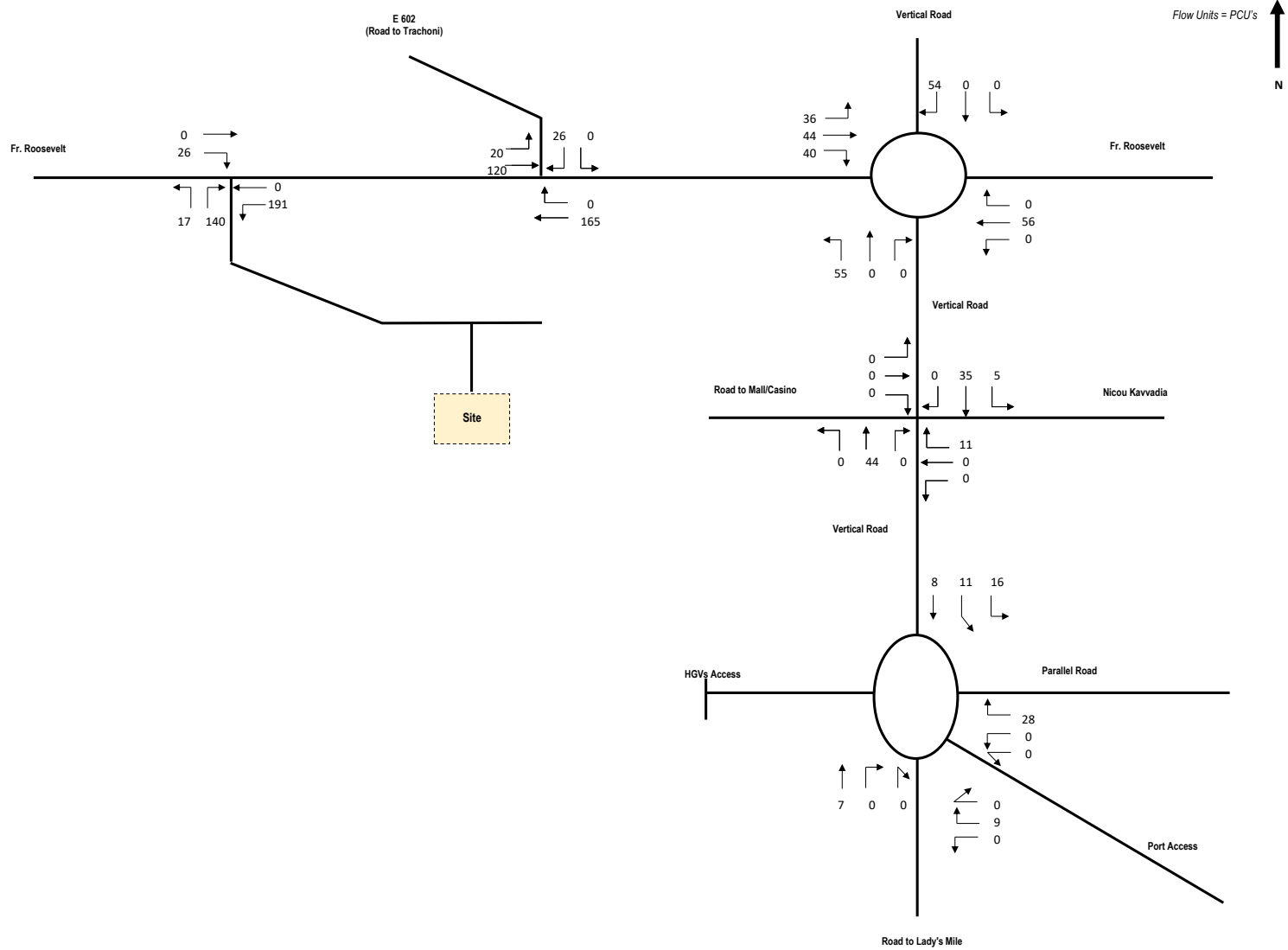


Figure 2.7b: 2022 Development Traffic, Weekday 17:00 – 18:00

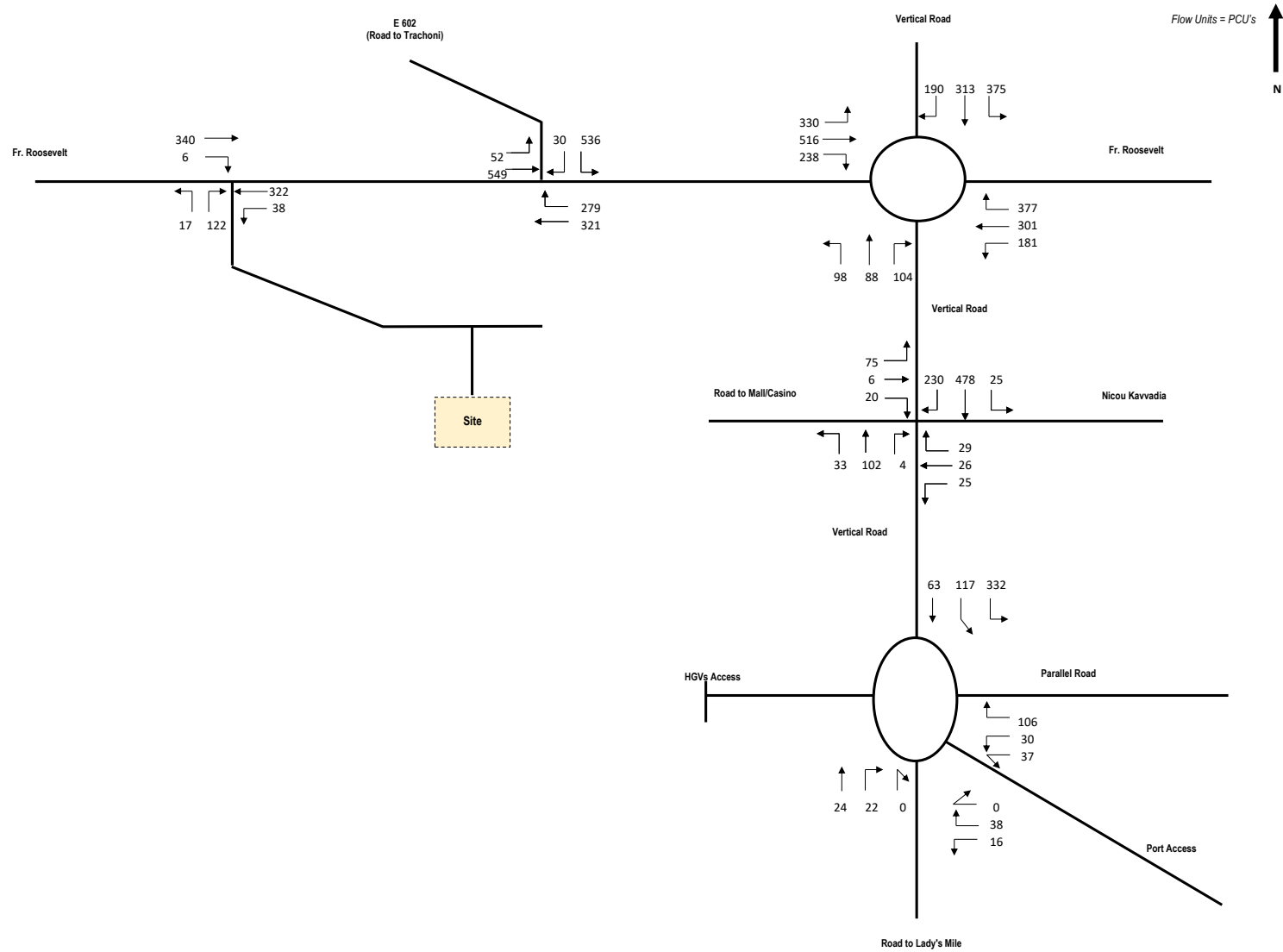


Figure 2.8a: 2022 Traffic Flows With Development, Weekday 07:30 – 08:30

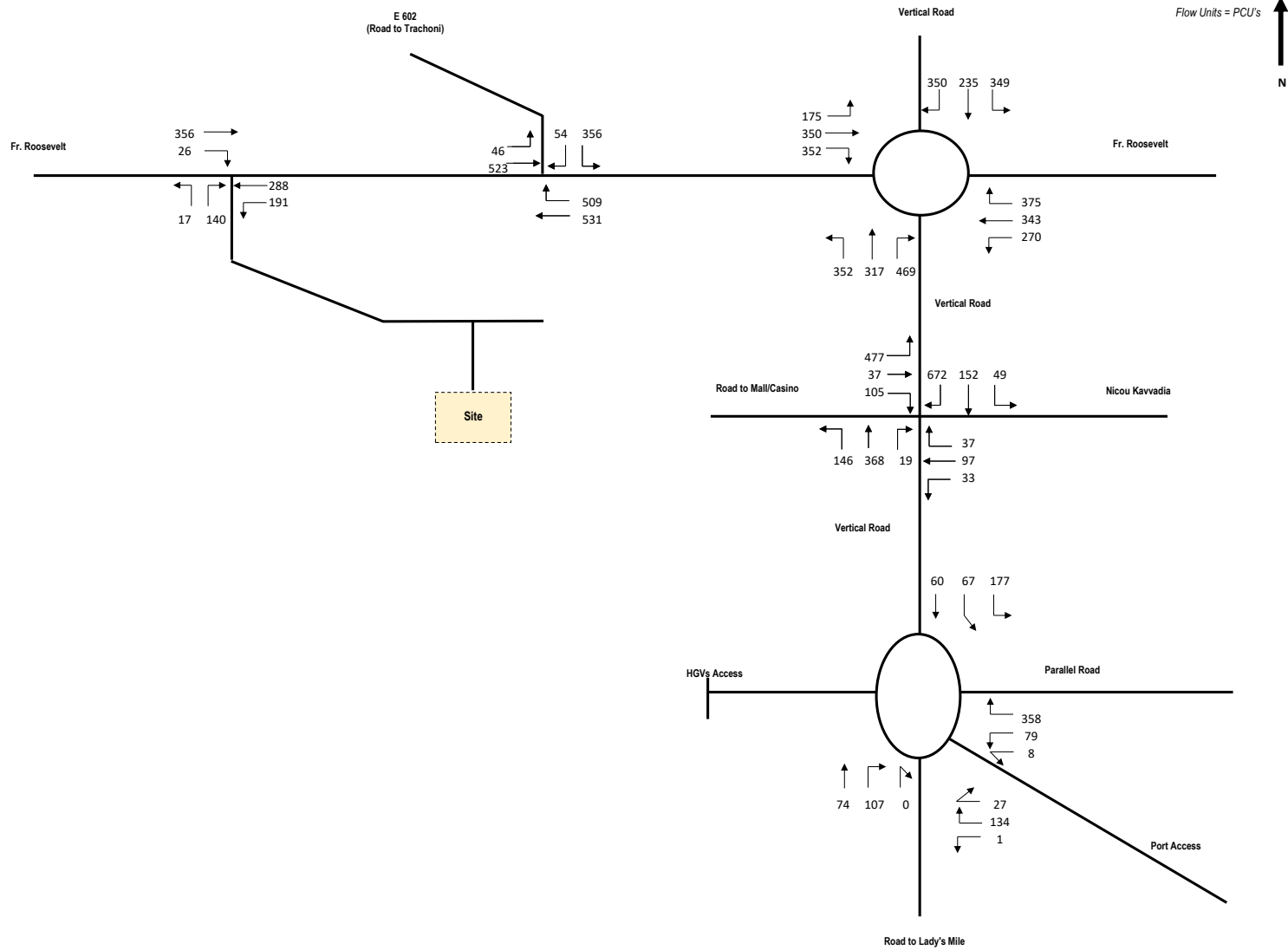


Figure 2.8b: 2022 Traffic Flows With Development, Weekday 17:00 – 18:00

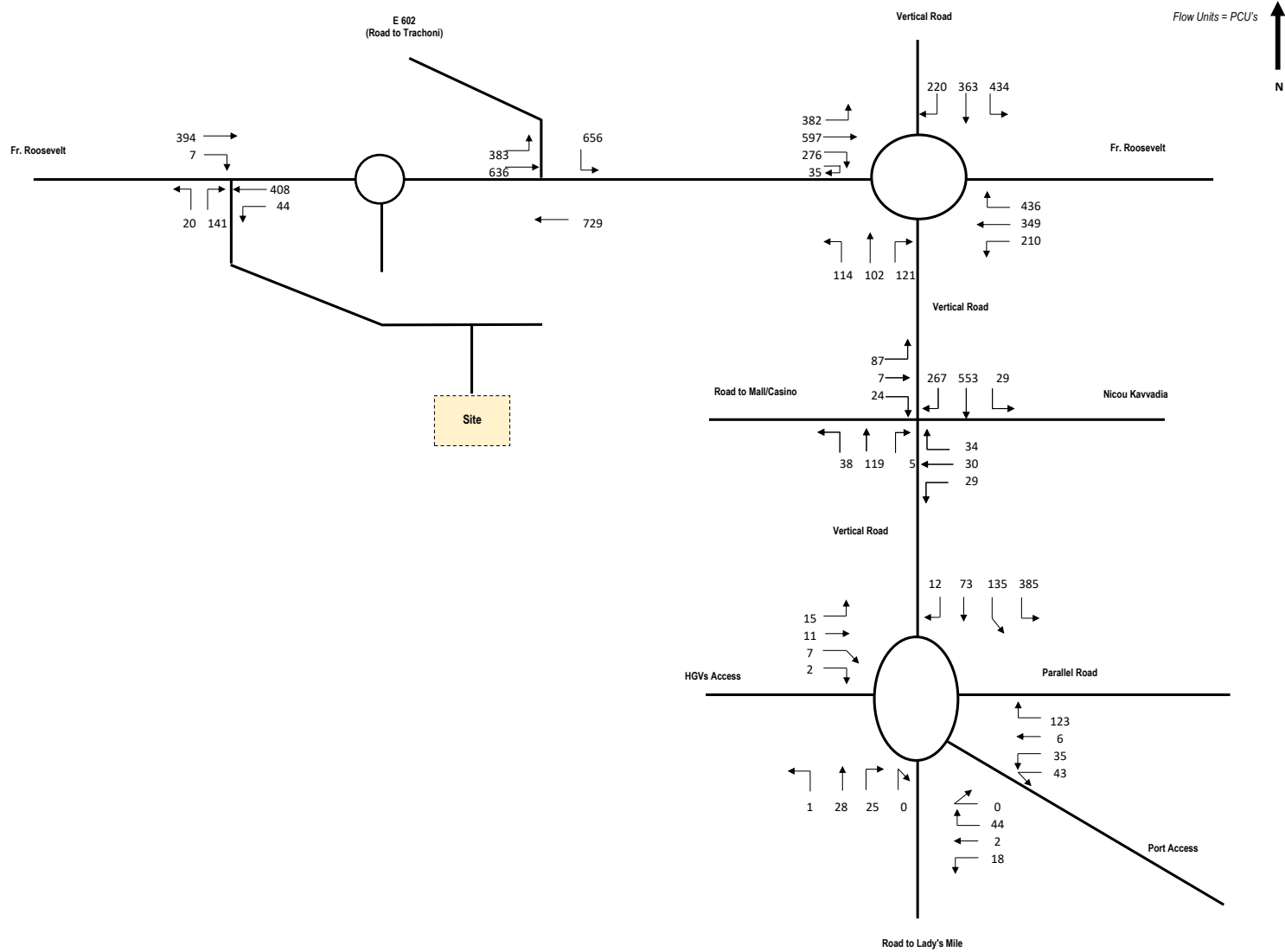


Figure 2.9a: 2032 Traffic Flows With Development, Weekday 07:30 – 08:30

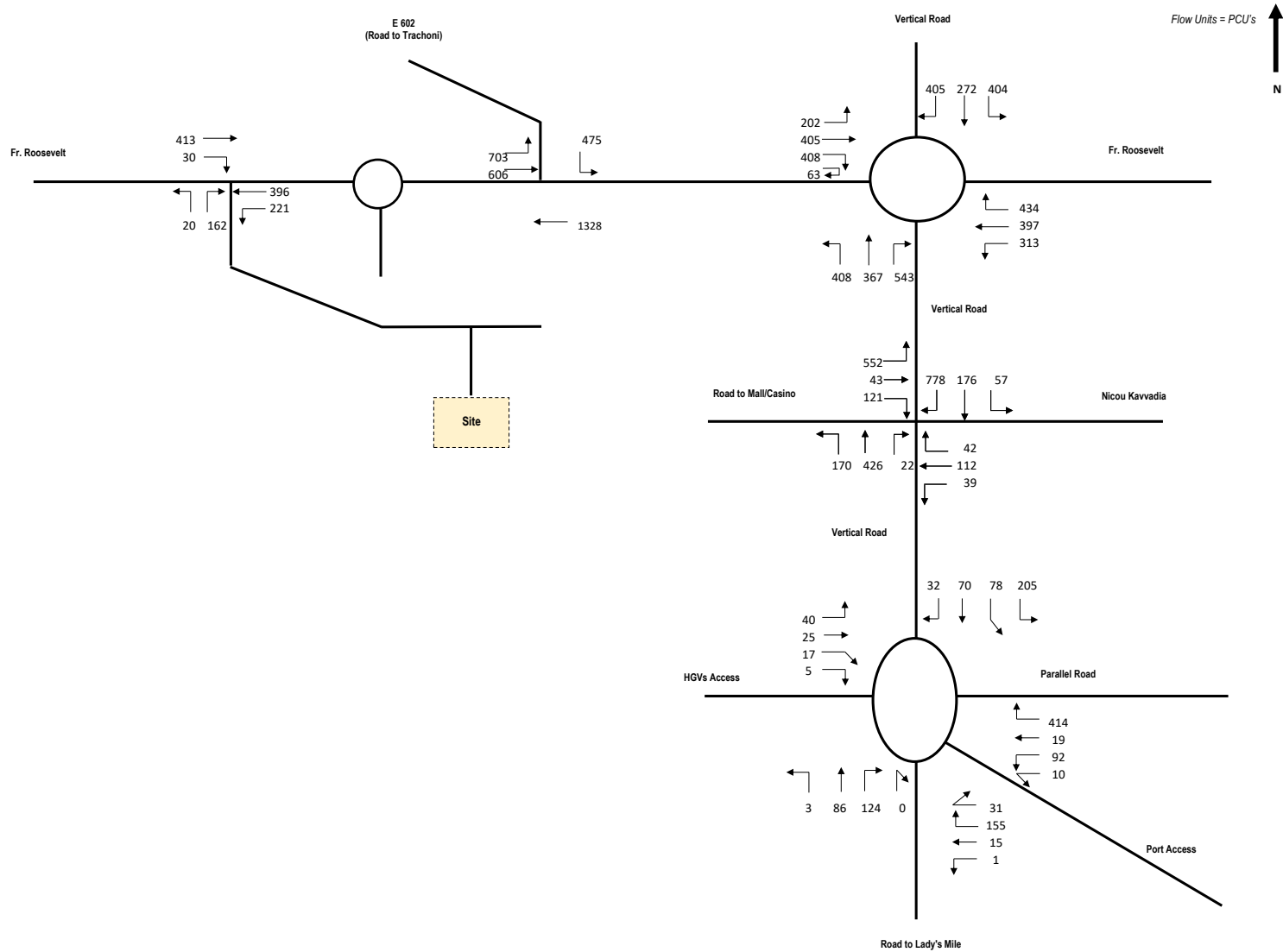


Figure 2.9b: 2032 Traffic Flows With Development, Weekday 17:00 – 18:00