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WAIKOLOA MAUKA, LLC

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAII

In the Matter of the Petition of

DOCKET NO. A06-767

WAIKOLOA MAUKA, LLC

To Amend the Agricultural Land Use District  
Boundaries into the Rural Land Use District for  
Approximately 731.581 Acres in South Kohala  
District, Island of Hawaii, Tax Map Key No. (3)  
6-8-02:016 (por.)

**WAIKOLOA MAUKA, LLC'S  
WRITTEN DIRECT TESTIMONY OF JULIAN NG**

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**WRITTEN DIRECT TESTIMONY OF  
JULIAN NG**

**BACKGROUND QUESTIONS**

1. *Please state your name and business address for the record.*

Julian Ng  
P.O. Box 816  
Kaneohe, Hawaii 96744

2. *What is your current occupation?*

President, Julian Ng, Inc.  
Traffic Engineering Consultant

3. *How long have you been an engineer by profession?*

35 years.

4. *Do you presently belong to any professional organizations or associations?*

Member of the Institute of Transportation Engineers (ITE),  
a past President of the ITE Hawaii Section.  
Member of American Society of Civil Engineers (ASCE)

5. *Did you provide a copy of your curriculum vitae for purposes of this hearing?*

Yes.

6. *Is Petitioner's Exhibit "35" a true and correct copy of your curriculum vitae?*

Yes.

7. *Could you briefly describe your training and work experience relevant to your expertise in this matter?*

Bachelor of Science in Civil Engineering, University of Hawaii, 1972.  
Worked as project engineer on traffic and highway alignment studies for various projects on Oahu and Hawaii (1974-1981)  
Prepared paper and attended ASCE Transportation conference (1979)  
Managed traffic engineering services out of the Honolulu office of an international engineering firm (1981-1990)  
Attended ITE Technical conferences (1987, 2005)  
Attended ITE course on Site Impact Analysis (1987)

1 Conducted various traffic and transportation studies as principal of Julian Ng, Inc.  
2 (1991-present)

3 Attended Transportation Research Board conference on Highway Capacity (2000)

4 Attended Northwestern University course on Arterial Capacity (2001)

5 Attended Federal Highway Administration class on Roundabouts (2003)

6 Attended American Association of State Highways and Transportation Officials  
7 Roadside Design Guide class (2004)

8 Attended ITE Bus Rapid Transit seminar (2005)

9 Attended ITE seminar on ADA requirements (2006)

10 Attended Federal Highway Administration class on construction traffic analysis  
11 (2006)

12  
13 **8. *Do you specialize in a particular area in your field of work?***

14  
15 Yes - transportation and traffic engineering. This work involves estimating traffic  
16 volumes and evaluating impacts of proposed projects on traffic conditions or  
17 evaluating existing and future traffic operations.

18  
19 **9. *Could you briefly describe what a traffic operations engineer does?***

20  
21 A traffic operations engineer uses engineering principles in evaluating conditions  
22 related to the interaction of motorized and non-motorized vehicular traffic and  
23 pedestrians within the physical infrastructure provided for the transport of people  
24 and goods. As part of the evaluation, mitigation measures are developed and  
25 analyzed in the context of safety, efficiency, and feasibility.

26  
27 The Transportation Professional Certification Board, Inc., affiliated with the  
28 Institute of Transportation Engineers, has established several certifications for  
29 transportation professionals. The first certification, started in 1998 for  
30 Professional Traffic Operations Engineers<sup>TM</sup> (PTOE), has, as of August 1, 2007,  
31 1,804 certified professionals, located in the United States, Canada, and several  
32 other countries (seven in Hawaii). Certification requires professional registration  
33 such as the professional engineering license issued by the State, documented  
34 experience in traffic operations, completion of a written examination, and  
35 continuing education. I received the PTOE certification in 1999.

36  
37 **10. *How long have you been the principal of Julian Ng, Inc.?***

38  
39 16 years.

40  
41 **11. *Could you briefly describe the type of work you currently perform as the***  
42 ***president of Julian Ng, Inc.?***

43  
44 All technical services, including the preparation of traffic impact reports and  
45 assessments, sight distance and other studies related to access to public roadways,

1 traffic volume studies and analyses to determine existing and future adequacy of  
2 streets and highways.

3  
4 **12. What types of services does Julian Ng, Inc. perform?**

5  
6 Engineering consultation related to traffic and transportation issues. Advise  
7 planners and other engineers on issues related to roadway, transit, pedestrian and  
8 bicycle impacts of projects. Conduct analyses and prepare studies related to  
9 project traffic impacts, driveway sight distance, future traffic volumes and street  
10 design. Assist in the preparation of traffic management plans.

11  
12 **13. Do you typically perform the assessments yourself, or do you mainly act in a**  
13 **supervisory capacity?**

14  
15 As the only employee of the company, I perform the assessments myself.

16  
17 **14. Have you ever previously qualified and/or testified as an expert witness?**

18  
19 Yes.

20  
21 **15. If yes, on how many occasions have you qualified to testify as an expert?**

22  
23 Approximately 25, including about 15 times before the Land Use Commission.  
24 The last time I was qualified was before the Land Use Commission in 2006 for  
25 the hearing on Docket No. A05-755 for the Hale Mua project at Waiehu, Maui.

26  
27 **16. If yes, on how many occasions have you actually testified under oath as an**  
28 **expert witness in front of an administrative or judicial body?**

29  
30 Approximately 15, mostly before the Land Use Commission. The last time I  
31 testified before the Land Use Commission was in 2006 for the hearing on Docket  
32 No. A05-755 for the Hale Mua project at Waiehu, Maui.

33  
34  
35 **WAIKOLOA HIGHLANDS**

36  
37 **17. Are you familiar with the petition area and the existing characteristics of this**  
38 **area located in the South Kohala District on the island of Hawai‘i?**

39  
40 Yes.

41  
42 **18. Are you familiar with Waikoloa Mauka, LLC’s (“Petitioner”) Waikoloa**  
43 **Highlands (“Project”)?**

44  
45 Yes.

1 **19. How did you familiarize yourself with the Project?**  
2

3 Reviewed plans and relevant data, site visit.  
4  
5

6 **ANALYSIS**  
7

8 **20. Could you please describe your involvement in the Project?**  
9

10 Provided traffic consultation services for the Project planner and civil engineer.  
11

12 **21. Have you reviewed the Environmental Impact Statement (“EIS”) for this**  
13 **Project?**  
14

15 Portions of the EIS.  
16

17 **22. Did you prepare a Traffic Impact Analysis Report for the Project?**  
18

19 Yes. A Traffic Impact Analysis Report was prepared.  
20

21 **23. Was this study conducted by you or under your supervision?**  
22

23 By me.  
24

25 **24. Is Petitioner’s Exhibit “36” a true and correct copy of your report?**  
26

27 Yes.  
28

29 **25. Have there been any subsequent changes to your report since the version which**  
30 **is included in the EIS?**  
31

32 Yes. The version in the EIS was pieced together from a draft prepared in July  
33 2006 and supplemental text prepared in January 2007 to address impacts to the  
34 Queen Kaahumanu Highway and to Mamalahoa Highway.  
35

36 **26. What are those changes?**  
37

38 The version in the EIS did not include the engineer’s stamp and signature that the  
39 County of Hawaii requires. The version in the EIS used pages 1 through 17 of the  
40 draft traffic report, and the following is a list of the changes that were made  
41 between the draft and final report:  
42

43 The table of contents and the footer on each page of the report were updated;  
44

45 On page 7, in the paragraph between Figure 4 and Table 3, typographical  
46 errors were corrected (“60” was corrected to “39” and “80” was corrected to

1 “45” (the discussion summarized the findings reported in Table 3 on page 8,  
2 which did not change);

3  
4 On page 12, the phrase “at the intersection of Waikoloa Road, Pua Melia  
5 Street, and Paniolo Avenue” was inserted into the paragraph introducing  
6 Figure 6 to add clarification;

7  
8 On page 13, in the paragraph immediately preceding Table 8, “westbound”  
9 was corrected to read “eastbound”;

10  
11 The lower third of Table 11 on page 17 was deleted. This part of the table  
12 provided the results of the unsignalized intersection analyses for a single  
13 connection from the Project site to Waikoloa Road. This information was  
14 provided at the draft report for consideration of that alternative, but deleted in  
15 the final report when the site plan to include two connections to Waikoloa  
16 Road was adopted. Since there was no text discussion for this, no changes in  
17 the text were made. Note: at the bottom of page 15 (in both the EIS and final  
18 versions), the reference to “Table 4” should be to “Table 11”;

19  
20 The line spacing was increased in Tables 6, 7, 8, and 9 for clarity and to take  
21 advantage of blank spaces at the bottom of sheets. The changes in spacing  
22 affected the placement of some of the text, but had no other effect.

23  
24 **27. Do these changes have any substantive affect on your analysis of the traffic**  
25 **conditions of the Project?**

26  
27 No. The conclusions and recommendations do not change as the changes in the  
28 report between the two versions are minor.

29  
30 **28. Could you describe the methodology used to conduct your study of the impact**  
31 **on traffic conditions from the Project?**

32  
33 We collected and reviewed the available traffic count data (and supervised the  
34 collection of manual counts that were made by R. M. Towill Corporation), made  
35 estimates of existing peak hour traffic volumes at critical locations, made  
36 projections of future peak hour traffic volumes, conducted analyses, and  
37 developed alternatives to mitigate unacceptable or undesirable future conditions.

38  
39 **29. Is the methodology you employed consistent with generally accepted industry**  
40 **standards?**

41  
42 Yes.  
43

1 **30. *Are there any regulatory or advisory bodies that publish guidelines in an***  
2 ***attempt to summarize these generally accepted practices?***  
3

4 The Institute of Transportation Engineers has a publication that provides  
5 guidelines (*Traffic Access and Impact Studies for Site Development, A*  
6 *Recommended Practice*), published in 1991. At the time the report was prepared,  
7 a proposed revision was out for comment but had not yet been adopted as a  
8 “Recommended Practice”.  
9

10 **31. *If so, is your methodology consistent with these guidelines? If not, why?***  
11

12 Yes.  
13

14 **32. *Could you please summarize the scope of your study?***  
15

16 The study included the analyses of existing and future conditions at the  
17 intersection of Waikoloa Road, Pua Melia Street, and Paniolo Avenue. Future  
18 conditions at each of three proposed connections of Project roadways to the  
19 existing street system were also analyzed. Project impacts to Waikoloa Road to  
20 the west and to the east of Waikoloa Village were identified and compared with  
21 growth that would otherwise be expected on Waikoloa Road. The region is  
22 depicted in Exhibit “37”.  
23

24 In response to comments on the draft report that we prepared, the evaluation of  
25 future conditions at the Waikoloa Road intersections with Queen Kaahumanu  
26 Highway and with Mamalahoa Highway were added, as well as discussion of the  
27 potential impacts of the Project to traffic volumes on these highways north and  
28 south of Waikoloa Road.  
29

30 **33. *Could you please summarize your findings?***  
31

32 The proposed Project road connections to Pua Melia Street and Waikoloa Road  
33 were found to be adequate (Exhibit “38”). A simple connection to Pua Melia  
34 Street would suffice; widening or restriping to add lanes on Pua Melia Street  
35 would not be needed. A separate left turn lane should be provided on Waikoloa  
36 Road so that a westbound vehicle turning left would not have to wait in the  
37 westbound through lane. Left turns from the Project roads should be provided a  
38 median shelter lane to increase opportunities to safely enter Waikoloa Road.  
39

40 At the intersection of Waikoloa Road, Pua Melia Street, and Paniolo Avenue, the  
41 Project is expected to increase traffic, but the impact will not be significant  
42 enough to change the levels of service. Traffic signals at the intersection will  
43 mitigate existing poor levels of service during peak hours for left turns onto  
44 Waikoloa Road (Exhibit “39”). Use of existing paved areas on Waikoloa Road  
45 approaching the intersection that are now striped as shoulders as separate right  
46 turn lanes, along with the new traffic signals, will provide adequate capacity at the

1 intersection in the short term (Exhibit “40”). As traffic volumes increase due to  
2 other development expected in Waikoloa, additional improvements, such as  
3 conversion of a striped island to a second eastbound left turn lane, could increase  
4 capacity to maintain acceptable conditions for all movements.  
5

6 The Project impact to Queen Kaahumanu Highway and to Mamalahoa Highway  
7 (Highway 190) would be to accelerate the need for improvements on the State  
8 Highway facilities by approximately one year. These improvements include the  
9 widening of Queen Kaahumanu Highway to four lanes, and the creation of a  
10 shelter lane for left turns from Waikoloa Road to Mamalahoa Highway, followed  
11 by installation of traffic signals at that intersection, when warranted and needed.  
12

13 **34. *What is the current Level of Service (LOS) of the petition area?***  
14

15 At the intersection of Waikoloa Road, Pua Melia Street, and Paniolo Avenue, left  
16 turns onto Waikoloa Road are at LOS F from Pua Melia Street in the morning or  
17 AM Peak Hour, and from Paniolo Avenue in the afternoon or PM Peak Hour.  
18 Other turning movements are at LOS D or better.  
19

20 On Waikoloa Road to the west (makai) of Waikoloa Village (toward Queen  
21 Kaahumanu Highway), the two-lane highway operates at between LOS D and  
22 LOS F (on two-lane highways, poor levels of service result from the inability to  
23 pass any slow-moving vehicles, but existing volumes are less than 40% of  
24 theoretical capacities on Waikoloa Road). East (mauka) of Waikoloa Village,  
25 LOS D describes existing peak hour conditions, with volumes being less than  
26 20% of capacity.  
27

28 The signalized intersection of Waikoloa Road and Queen Kaahumanu Highway  
29 operates at “under capacity” condition, generally considered LOS D or better, in  
30 both peak hours (Exhibit “41”). The stop-controlled left turn from Waikoloa  
31 Road to Mamalahoa Highway has poor level of service in the PM Peak Hour.  
32

33 **35. *What is the projected LOS taking into consideration the proposed Project?***  
34

35 Traffic volumes were projected for year 2010 peak hours, accounting for  
36 additional traffic not only from the proposed Project, but also other projects that  
37 are being developed and expected changes in the roadway system. At the  
38 intersection of Waikoloa Road, Pua Melia Street, and Paniolo Avenue, reductions  
39 in right turns from Paniolo Avenue to Waikoloa Road and the complementary left  
40 turn from eastbound Waikoloa Road to Paniolo Avenue will result in improved  
41 LOS for traffic from Pua Melia Street. The southbound left turn from Paniolo  
42 Avenue to eastbound Waikoloa Road, already at LOS F but currently under  
43 capacity, will have its capacity exceeded in the afternoon peak hour.  
44

45 Our analyses indicate that a traffic signal will be warranted (i.e., meet minimum  
46 requirements for the installation of traffic signals). With traffic signals, the



1 existing striped shoulder areas at the Waikoloa Road approaches to the  
2 intersection are assumed to be restriped to provide separate right turn lanes. The  
3 intersection would operate at an overall LOS C in the morning and LOS D in the  
4 afternoon in 2010 without the Project traffic. With the addition of Project traffic,  
5 average delays will increase but the LOS in both peak hours will be unchanged.  
6

7 Traffic at the intersection is expected to continue to increase at an average rate of  
8 2.5% per year. Conditions at a signalized intersection in year 2025 were  
9 evaluated without and with the Project traffic. Without the Project traffic, overall  
10 intersection level of service was LOS C in the morning peak hour and LOS D in  
11 the afternoon peak hour, with LOS D or better for each movement. With the  
12 addition of Project traffic, the overall levels of service were unchanged, but the  
13 southbound and eastbound left turns would be LOS E during the afternoon peak  
14 hour.  
15

16 Levels of service on the two-lane Waikoloa Road in the 2025 peak hours would  
17 be similar without or with Project traffic, with volumes being less than 50% of  
18 capacity west (makai) of Waikoloa Village and less than 35% of capacity east  
19 (mauka) of Waikoloa Village.  
20

21 At the intersection of Waikoloa Road and Queen Kaahumanu Highway, peak hour  
22 conditions in 2010 will not change with the addition of Project traffic. At the  
23 intersection of Waikoloa Road and Mamalahoa Highway, the stopped left turn  
24 onto the highway would be 90% of capacity with delays in the LOS F range in the  
25 2010 PM Peak Hour with the Project traffic (Exhibit "42").  
26

27 **36. *What is the projected LOS taking into consideration the proposed mitigation***  
28 ***measures under Project conditions?***  
29

30 At the intersection of Waikoloa Road, Pua Melia Street, and Paniolo Avenue, a  
31 second left turn lane from Waikoloa Road to Paniolo Avenue could be provided  
32 by removing the striped island that currently exists between the single left turn  
33 lane and the through lane on the eastbound approach. The second left turn lane  
34 will allow for retiming of the traffic signal and allow more time for the  
35 southbound approach, thereby mitigating the LOS E conditions for the left turns.  
36

37 The poor conditions at the intersection of Waikoloa Road and Mamalahoa  
38 Highway will be mitigated with traffic signals at the intersection. However,  
39 traffic signals may not be warranted (meet minimum requirements) immediately  
40 and the restriping of the existing median on Mamalahoa Highway to provide a  
41 shelter lane would change the LOS F for the left turn onto the highway in the  
42 2010 PM Peak Hour to LOS D.  
43

44 In the longer term, widening of Queen Kaahumanu Highway would be needed to  
45 serve the expected 5% annual increase in traffic volumes on the highway (the  
46 Project impact, in comparison, would be equal to one to two years' growth).

1 Assuming widening of the highway occurs, conditions at the intersection of  
2 Waikoloa Road and Queen Kaahumanu Highway would not be significantly  
3 affected by the addition of Project traffic.  
4

5 **37. *What other mitigation measures, if any, have you identified to neutralize the***  
6 ***impacts on traffic conditions the Project will have?***  
7

8 If the widening of Queen Kaahumanu Highway cannot be completed in a timely  
9 manner, construction of a loop roadway opposite Waikoloa Road would allow for  
10 a simpler operation of the signalized intersection, increasing its capacity.  
11 However, subsequent to completion of the report, we have learned that there are  
12 plans by the resort to change the intersection from the current “T” configuration  
13 to a cross-intersection, which will alter the loop concept. However, we did not  
14 evaluate the impacts of this new roadway, which could reduce the high volume of  
15 left turns from Waikoloa Road to Queen Kaahumanu Highway, thereby reducing  
16 the conflicting movements at the intersection.  
17

18 **38. *After the mitigation measures are implemented, will this be sufficient to***  
19 ***maintain the current levels of service in the area?***  
20

21 The proposed mitigation measures will accommodate increases in traffic, not only  
22 due to the Project, but due to other development that is occurring or is expected to  
23 occur in the South Kohala district.  
24

25 **39. *Is there anything else that you would like to add to your testimony?***  
26

27 In reviewing our report, we also note that an unnamed chart at the bottom of page  
28 two has typographic errors for the limits of LOS E and LOS F for unsignalized  
29 intersections (“55” should be “50” in both cases).  
30

31 After completion of the traffic study, we were asked to evaluate a roundabout at  
32 the intersection of Waikoloa Road, Paniolo Avenue, and Pua Melia Street, in lieu  
33 of traffic signalization of the intersection. An analysis procedure developed by  
34 the Federal Highway Administration (FHWA) was used to estimate delays  
35 incurred by drivers using a roundabout at this intersection. For the 2025 peak  
36 hour volumes, acceptable (LOS D or better) conditions were found for each  
37 approach with a single-lane roundabout. Daily volumes, however, exceed the  
38 recommendations from FHWA’s roundabout guide for a single-lane roundabout.  
39 Our preliminary review of the traffic demands and the number of lanes on each  
40 leg of the intersection, indicate a modified single-lane roundabout may be  
41 appropriate (modifications would be additional right turn lanes from Waikoloa  
42 Road mauka to Paniolo Drive and from Paniolo Drive to makai Waikoloa Road).  
43