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Lee Bergus, Chairman  
Town of Goshen Planning Board  
41 Webster Avenue  
Goshen, New York 10924

RE: LEGOLAND PROJECT TRAFFIC IMPACTS

Dear Mr. Bergus and Honorable Members of the Board:

By way of introduction, I am a transportation and environmental engineer, formerly VP of Konheim & Ketcham and Executive Director of Community Consulting Services. I have prepared and/or reviewed hundreds of detailed environmental impact statements over the last four decades, focusing primarily on traffic and transportation issues. I have been asked to prepare this review on behalf of the Concerned Citizens for the Hudson Valley. My assignment has been to evaluate this traffic analysis to insure that it reflects the full impact that the Goshen community can expect from so large a development. The focus of my review has been pages 72 to 96 of the Legoland DEIS plus Appendix G.

**INTRODUCTION**

The Draft Environmental Impact Statement (DEIS) for Legoland is a huge document. The traffic analysis alone totals more than 6,000 pages. Most of the information about traffic is contained in appendices. The DEIS itself introduces the traffic analysis and summarizes baseline conditions, but fails to present no-build and build conditions, or conditions with proposed road improvements leaving that information for the reader to comb through 6,000 pages for answers. This failure to summarize all project impacts in the DEIS itself is a fatal flaw that must be corrected.

As a result, reviewing this document is something like trying to find “Waldo”. It is incredibly difficult for me to locate the information I need as a traffic engineer, which would therefore make it essentially impossible for a lay person concerned about the traffic impact in Goshen to read the analysis, and comprehend anywhere near enough to perform a reasonable review of their own. This is completely contrary to the purpose of the State Environmental Quality Review Act (SEQRA). Appendix G is more than 6,000 pages long, but none of the sub-appendices is referenced by page number making a review very difficult. Whether intentional or not, this comes across as a clever trick intended to waste the time of any reviewer and discourage detailed analyses. The DEIS should stand on its own and not require hundreds of “lookups” in order to fully understand the claims that are being made regarding impacts. The entire DEIS document

should be revised to include all pertinent information required for decision making and not repeatedly cross referencing with Appendix G, making review that much more difficult.

The DEIS claims Legoland will generate at most 4,500 to 5,000 daily 2-way auto trips under worst case conditions, or about 10,000 vehicle trips per day (DEIS, Appendix G, page 75). Their own data (see Table 2 below), however, shows that the project itself will generate more than 15,000 new auto trips per day for summer Fridays and Saturdays. It is not clear whether or not these totals include trucks and buses servicing the Legoland facility; their impacts are simply not discussed. For comparison, the Town of Goshen with its 13,300 inhabitants generates on average about 30,000 auto trips per day, a quarter of which are work trips. Assuming a projection of 15,000 trips per day is correct, Legoland would therefore increase traffic in and around the Goshen area by about 50% over “baseline” conditions.

But this is not the whole story. According to the Legoland DEIS Traffic Appendix G, “Other Development” is estimated to generate an additional 18,000 new daily trips on a typical weekday to as much as 33,000 new auto trips on a summer Sunday (and perhaps a great deal more since no details are provided on how these numbers were derived). Based on data presented in the DEIS, Goshen is looking at a huge increase in traffic over the next couple of years.

The Legoland study area in and around Goshen appears to have plenty of intersection capacity for existing conditions. However, as the DEIS demonstrates, available capacity will not be sufficient for “Other Development” traffic, let alone trips generated by Legoland.

The DEIS suggests severe traffic congestion at the I-87/Rt. 17/6 interchange for existing conditions. 58.5% of Legoland traffic is projected to use I-87 arriving from and departing to the south (another 4% is assumed to travel along Route 6 east and west). Yet, mysteriously, the I-87 Exit 16 has not been analyzed in the DEIS. Exit 16 is a critical part of the puzzle in trying to sort out how Legoland will affect the area.

## **TRIP GENERATION**

Trip generation is made up of three parts: a 1% per year growth rate between 2016 and 2021 for existing traffic, “Other Development” trips that are included in no-build conditions, and project generated trips (build condition).

The appendix entitled “NYS Route 17 Mainline Traffic Volume Projections” (Tables TC-1 through TC-11) (a sub-appendix of Appendix G) provides insights into the magnitude of future traffic volumes on Route 17 without the Legoland project in place. For example, Table TC-8 (Route 17 Mainline Traffic Volume Summary, Summer Friday) reports total traffic along Route 17 from what the DEIS characterizes as “Other Development” in and around Goshen. “Other Development” (listed on page 86 of the DEIS) is reported to produce between 15,000 trips on a typical weekday to 33,000 trips on a summer Sunday. (Table 1<sup>1</sup>) It should be emphasized that this is new future traffic not traffic already carried by Route 17.

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<sup>1</sup>Table 1 summarizes the number of hourly trips along Route 17 just west of Exit 130 for no-build conditions including what is referenced as “Other Development” trips in the DEIS. Data is taken directly from that reported for

Taken together “Other Development” and “Legoland Site Generated” traffic could total more than 30,000 new vehicle trips on an average weekday to as many as 50,000 auto trips on a summer weekend day east of the Legoland site, traffic not only moving along Route 6 and 17 but connecting with NY Interstate 87 to and from the south (completely ignored in the DEIS). Again, to put this into some perspective, residents in the Town of Goshen are estimated to produce about 30,000 auto trips on weekdays, only a quarter of which are work trips.<sup>2</sup> Since these impacts are not discussed in the Legoland DEIS, it is not clear how Goshen will handle these impacts, of which will travel on local town roads.

The Legoland DEIS reports there would be approximately 5,000 cars entering and leaving the project site on a typical day. (DEIS, page 85) However, a review of Table SGT-5, “NYS Route 17 Hourly Site Generated Traffic Volumes East and West of the Study Area,” between 130A and 131 (Appendix G), as many as 7,900 are reported to be entering and 10,750 exiting the site on a typical summer Saturday. While these numbers appear to be in error (they should be approximately the same), Table SGT-5 reports the number of vehicles entering and exiting the site for weekdays and weekends for average days and peak summer days. Correcting for obvious errors, we still find (see Table 2<sup>3</sup>) that Legoland, according to Table SGT-5, would produce about 3,200,000 auto trips annually.

Since these are one way trips and the DEIS suggests car loads of 4 people per car, the number of person-visits per year would total well in excess of 6.4 million, more than double what is reported as a maximum based on reported experience elsewhere. Something clearly is amiss. Either the DEIS is over reporting traffic impacts or it is under reporting annual visitors. So, are the projections wrong? Are the traffic impacts a half of what is reported thereby undermining the financial analysis or are the traffic numbers correct and the number of visitors double what is

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the six days analyzed in the DEIS for Legoland. Besides summarizing the data on one page, it summarizes each column and totals daily traffic for each day demonstrating total daily trips ranging between a low of 14,536 trips on a typical Saturday to 33,051 trips on a summer Sunday. It does not include all no-build trips that are generated to the west of Goshen.

<sup>2</sup> Estimating the auto trips made by households in the Town of Goshen were made using data from the “New York Metropolitan Transportation Council North Jersey Transportation Planning Authority, *2010/2011 Regional Household Travel Survey, Final Report, October 2014*” prepared by the New York Metropolitan Transportation Council. The Village of Goshen has a population of 5,384 with an average household size of 2.4; this provides an estimate of the number of households in the Village. The person trip generation rate reported for Orange County was 10.7 with 83% of these trips being made by auto with an average occupancy of 1.5 people. This resulted in a total of 13,282 daily auto trips. Added to this were the trips made by the Town of Goshen outside the Village with a population of 7,903. The Town of Goshen outside the Village has an average household size of 2.7 people. Using the same assumptions reported above, 10.7 person trips per household per day, 83% of trips by auto and an auto occupancy of 1.5 results in 17,330 auto trips per day for an average total daily auto trips for the Town and Village of 30,612.

<sup>3</sup> Table 2 is an estimate of the daily trips generated by the Legoland project for the six days analyzed in the DEIS by time of day. The figures reported in the DEIS are for travel along Route 17 west of Exit 130 divided by 0.625, the proportion of trips reported in the DEIS Legoland estimates will utilize Route 17, total east and westbound. Like Table 1, the hourly traffic flow is summarized to illustrate the estimated daily trips Legoland might generate. The lower part of Table 2 estimates the total annual number of trips that might be generated by the project and, based on data presented in Table 4, estimate total travel in annual vehicle miles of travel that might be added to study area traffic.

reported? (Table 2) Clearly, the Legoland support team has to sort out this inconsistency and correct the DEIS.

It should be noted that Table SGT-5 is a clear example of a myriad of deficiencies that exist in the Legoland DEIS and the Appendix G Traffic Study. The information contained in Table SGT-5 is critical to understanding the traffic impacts that would be generated by Legoland. As its title states, this is the table that presents the actual projected amount of traffic generated by the proposed Legoland, both arriving and leaving, that would be added onto Route 17. Of all the information that would be generated by an analysis of the traffic impact resulting from the proposed Legoland, the amount of cars arriving and leaving on Route 17 may be of the greatest interest to all involved parties and the public. Accordingly, this table should be presented in the body of the DEIS, where it can be easily found and studied, and the information contained within it should be summarized and discussed in the text of the DEIS. Instead, the table is buried deep within a sub-appendix to an appendix of the DEIS, found on what is electronically page 727 of the 6006-page Appendix G. This is absurd, and it is so out of the ordinary for what is expected in a DEIS, that it is difficult to believe that it is not by design.

Further, even upon achieving the challenging task of finding this needle buried in the haystack, the table only provides the raw data with no summary or interpretation, leaving just those knowledgeable enough to understand its significance to do the math, and add up the columns to get the actual totals. Even then, it appears that there must be some flaw or error in the data. Not only do the totals exceed what is reported in the DEIS, they illustrate and highlight errors in the analysis. For each day, with minor exception to account for some amount of hotel guests and overnight workers, the total number of vehicles estimated to enter the site should obviously equal those leaving the site over a 24-hour period. They do not. Some, for a typical Saturday and a summer Saturday are significantly different, suggesting serious errors in the analysis.

Nevertheless, even with its obvious flaws and deficiencies, Table SGT-5 still does confirm that the impact upon Route 17 will be more than significant. In what may be a further attempt to downplay the traffic impacts of Legoland, the DEIS compares this project to three much larger projects: Woodbury Common, The Galleria at Crystal Run and the Palisades Center reporting that each of these "...facilities generate daily volumes between 15,000 and 25,000 entering vehicles" or two to three times what can be expected from Legoland. (DEIS, page 85 and Table SGT-4 in Appendix G) However, what the DEIS fails to note is that these large retail projects already compete for area wide roadway capacity that the equally large amount of no-build ("Other Development") traffic and Legoland will just make more congested. Moreover, what is also not reported is that large retail developments produce substantially more traffic during heavy shopping periods.

And, to further illustrate the problem, NYSDOT recently issued a "Blocked Lanes Alert" for the most recent Black Friday shopping splurge near Woodbury Commons: "W/B State Hwy 17 Ramp to Exit 131 Route 32 Ramp" closed. (See Figure 1<sup>4</sup>) With the growth in traffic through the Woodbury Commons area predicted in the Legoland DEIS, and reported on herein, these occurrences of over-capacity roads can be expected to increase. Legoland has got to take these

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<sup>4</sup> A copy of the actual NYSDOT blocked lanes alert dated November 25, 2016.

matters into consideration. Even with the expansions proposed by Legoland and NYSDOT (when Route 17 becomes I-86), there will quickly come a time when traffic volume will exceed reasonable roadway capacity if unlimited growth continues.

It should be noted that use of the trip generation factors reported in the Institute of Transportation Engineers *Trip Generation Manual*, Land Use 480, Amusement Parks, suggest much greater traffic impacts than reported in the DEIS and discussed above. Using ITE rates for a 140 acre amusement park, an average Saturday would generate 25,228 vehicle trips a day and 2,640 for the average Saturday peak hour; for an average Sunday, ITE rates generate 23,943 trips per day and 2,486 trips for an average Sunday peak hour. All figures are greater than reported in the DEIS Appendix G even for a summer weekend peak period.

### **TRIP DISTRIBUTION**

The distribution of Legoland trips looks reasonable with 22% to and from the west through I-84/Route 17 where there appears to be capacity to accommodate these trips. And, while the DEIS reports plenty of capacity for current traffic volumes, commuters traveling along this segment of Rt. 17 report significant delay today west of Goshen. However, more than 62.5% of project traffic will move to and from the east most using I-87 to and from the south (of which 4% pass over Exit 16 and move east and west of I-87 along Route 6). This is a problem that Legoland does not address and perhaps for good reason: The NYS I-87 Exit 16 interchange with NY Route 6/17 is huge and complicated and would require a sophisticated simulation to fully understand the impact from no-build and project traffic. But, first, they would have to secure detailed traffic counts that neither NYSDOT nor the Thruway Authority appear to have at any level of detail (hourly, seasonal, up-to-date).

Legoland engineers attempt to make it appear that this project will have little impact on the Goshen community. However, they have proposed a flyover connecting the project directly with Route 17 westbound as well as proposing direct access to Route 17 eastbound. According to the NYSDOT, installation of the proposed flyover would likely prevent Route 17 from becoming I-86 as proposed, so it is unlikely NYSDOT will permit such a crossing. As a backup and to try to minimize project impacts, Legoland proposed directing 45% of peak hour Sunday traffic exiting onto Route 17M eastbound (Appendix G, Figure 43-D), a road with limited capacity that is one lane in each direction for much of its length and 25 miles from Exit 15A to the south, the nearest SB entrance to I-87. Plus, from the terminus of 17M motorists would have to travel Route 17 through Southfields, Tuxedo and Sloatsburg, which are not designed to handle heavy traffic flows. Moreover, motorists with any knowledge of the local road system, may head west to 17A, and take that south through Florida, Warwick and Greenwood Lake, getting on 17 at Tuxedo. This possibility has not been investigated in the Legoland DEIS.

### **TRAFFIC MODELING**

Sub-appendix L, Appendix G, Sample of Traffic Simulation Outputs, provides snapshots of the project area surrounding the South Street Bridge. It is impossible to tell the difference, let alone to show how the model demonstrates effects of no-build and build traffic on the area. Legoland should provide a full simulation zooming into specific problem intersections to see these effects

and to demonstrate the effectiveness of mitigation using the SYNCHRO/SIMTraffic model. What is shown appears to be existing conditions and not, for example, conditions with project traffic or with the proposed traffic circle off of Exit 125.

Regarding the level of service (LOS) calculations, what you do not see, and what is not reported, are the effects of spill back from one intersection to the next. Spillback will block nearby intersections and, over time, can bring on area wide gridlock. LOS calculations by themselves can be misleading. Simulation modeling done with SYNCHRO/SIMTraffic must be provided for public review to insure the surrounding traffic network can actually accommodate no-build and Legoland traffic combined.

## **POTENTIAL IMPACTS**

The Legoland DEIS provides an enormous data base (more than 6,000 pages) some of which provides insights that are not discussed in the report, either in the DEIS proper or in the traffic appendices. But, as the Legoland DEIS demonstrates, Legoland will produce a very significant impact in and around Goshen and particularly along Route 17 and at its intersection with NY State Route 87 at Exit 16. Table TC-9 (Route 17 Mainline Traffic Volume Summary, Summer Saturday)

The DEIS does not present the traffic impacts of no-build (5% back ground growth plus traffic from “Other Development”) or for Legoland traffic impacts. These effects are buried in Tables 1 to 9, Appendix G, pages 597 to 679, along with the effects of project mitigation. No-build and Build traffic impacts must be summarized in the DEIS in a Table like that presented on page 83 of the DEIS (Table III-2: Existing Level of Service). In addition, no-build and build project impacts must be flagged for intersections where any intersection approach demonstrates a LOS D or worse and/or that exhibit spill back conditions that might interfere with traffic moving through a nearby intersection. The same reporting must be done for Route 17 mainline weaving movements near the site where Appendix G reports LOS F for certain locations.

Better yet, Route 17 weaving, and on and off ramps should be modelled using SYNCHRO/SIMTraffic to better show the effects of increasing traffic volumes along Route 17 for a summer PM hour from 6,085 vehicles per hour (VPH, both directions) for baseline conditions to 8,565 VPH (+41%) for no build conditions to 9,690 (+18%) with Legoland traffic (Figures 7-B, 31-B and 49-B, Appendix G Sub-Appendix A, Figures). This is typical for summer conditions with other time periods showing traffic growth in similar or greater proportions (see below).

With traffic growth like what is reported in Appendix G, it is difficult to believe Legoland will not have traffic impacts much greater than reported and scattered throughout Appendix G. Moreover, as one example, Figure 49-B reports 5,155 vehicles traveling in the westbound direction, approaching Exit 125. Much of Route 17 is two lanes in each direction and may accommodate 2,000 vehicles an hour per lane but at speeds of about 30 to 40 MPH with luck. What is reported in the DEIS with 3 lanes WB east of Goshen, travel speeds would be significantly reduced and weaving movements attempting to exit Route 17 WB would be impeded to a far greater degree than reported.

The Legoland DEIS reports on page 86 that "...background developments results in total background (traffic) increases on NYS Route 17 of between 18% and 48%." It would be helpful if Legoland provided both a map showing the locations of the 13 developments listed on page 86 but also describe how they derived and distributed "Other Development" generated trips. Moreover, total trip generation from both background traffic growth, "Other Development" and project generated trips produces even greater impacts than discussed in the DEIS reported above. The attached Tables 3 and 3A summarize the resulting overall growth in traffic along Route 17 west of Exit 123 and east of Exit 125 as presented in Appendix G, Sub-Appendix A. Table 3<sup>5</sup> summarizes the overall growth in traffic for the time periods studied. Table 3A presents the data taken from Sub-Appendix A and how Table 3 was developed. Table 3 shows that total growth in traffic along Route 17 could exceed 100% for some locations. Given the totals reported from Appendix G, Sub-Appendix A, one has to question how all of these numbers were derived. Legoland must undertake a reassessment of all projections for both no-build conditions and for project generated traffic.

Level of Service (LOS) calculations for intersections, freeways, freeway weaving movements and on and off-ramps appear to under report traffic volumes, assume 3 lanes where 2 exist, and thereby under report Project impacts. LOS calculation sheets also under report the percentage of heavy trucks and buses when compared with NYSDOT ATR counts. Calculations for expressway, weaving and ramp movements generally assume 5% trucks; for intersection LOS calculations the DEIS generally assumes 2% trucks and 2% recreational vehicles. In comparison, the NYSDOT traffic counts report bus and truck numbers between 10% and 25% including heavy truck proportions of between 6% and 8% along Rt.17 in 2012 (note also that these figures are greatest during the times Legoland claims are peak Project traffic volumes). And these truck numbers are likely conservative as internet shopping has skyrocketed in the past four years and with this trend the number of heavy delivery trucks has increased significantly as well.

The effect of the proportion of heavy trucks along Route 17 and at connecting intersections is significant. Under reporting the proportion of heavy trucks will make expressway, weaving movements and on and off ramp and intersection performance appear much better than if more accurate proportions of trucks and buses were utilized. There is every indication that the Legoland DEIS traffic analysis suffers from this error. See DEIS Appendix G, NYSDOT ATR Count Data, electronic page 5584. Note also that other NYSDOT counts included in Appendix G were taken in 2008 right at the early stages of the Great Recession when the economy tanked and truck traffic was likely under reported.

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<sup>5</sup> Table 3 and 3A. Table 3 summarizes total number of vehicle trips that are reported in various parts of the DEIS along Route 17 west of Exit 130 for baseline, no-build and build conditions for each time period and day analyzed in the Legoland DEIS demonstrating precisely how much traffic will increase along this section of Route 17 as a consequence of both no-build and project generated traffic. Table 3A simply provides the data taken directly from the DEIS used to generate the growth rates reported in Table 3.

## ESTIMATED IMPACT ON THE NYS I-87/ROUTE 6/17 INTERCHANGE

As noted elsewhere, the DEIS fails to consider project impacts at Exit 16 of the I-87 interchange with Routes 6/17. The following is an attempt to fill this gap. It has been difficult to secure a detailed set of traffic counts for this location, and the following analysis should be replaced by one that uses actual physical traffic counts taken in the field as part of this SEQRA analysis. Appendix G, NYS Route 17 between Exit 131 and Exit 131A, beginning on electronic page 5489 provides detailed NYSDOT counts for the primary study area reported on in the DEIS. While data for the Exit 16 interchange that is available from the Thruway Authority has not been formatted in a usable manner, I have been able to piece together an approximation of an annual average daily traffic network for existing conditions sufficient to approximate the effects of no-build and Legoland traffic impacts. These impacts are significant and are presented in the attached Figures 2, 3 and 4. Note: Data for I-87 traffic was not available north of exit 16, so this analysis is limited by the absence of information regarding traffic coming from or turning onto I-87 towards Newburgh.

Assuming the assignments in the Legoland DEIS, 4% of traffic is assigned through to and from Rt. 6 EB and WB crossing over I-87 and 58.5% to and from I-87 to and from the south and assuming no-build traffic has the same approximate distribution as for Legoland, we can estimate project impacts. Figure 2<sup>6</sup> reports the approximate average daily baseline traffic volumes for this interchange based on very limited data.

For no-build conditions, including the “Other Development” traffic volumes reported along Route 17/6 we find that no-build traffic will increase EB traffic through the Exit 16 toll booths by 24%; traffic SB along I-87 will increase by 16%. In the northbound direction approaching Exit 16, no-build traffic along I-87 will increase by 17%; traffic exiting the I-87 ramp to Route 6/17 WB will increase by 28%. According to the Legoland DEIS, these figures could double for a summer weekend (see attached Table 1, Figure 3<sup>7</sup>).

The Legoland project will add about 3,500 daily EB vehicle trips and 3,500 WB vehicle trips through the Exit 16 toll booths and onto I-87 south of Exit 16. Those figures are 58.5% of total daily auto trips reported in the DEIS for average weekdays. These figures could double for a summer Sunday (Table 2, Figure 4<sup>8</sup>). The resulting increase in daily traffic at the Exit 16 toll

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<sup>6</sup> Figure 2 is a rough attempt to illustrate baseline traffic at the NYS I-87/Exit 16 interchange for baseline conditions that have been ignored in the Legoland DEIS. Limited data included in Legoland Appendix G provided by the New York Department of Transportation and data provided by the New York State Thruway Authority for average daily travel are presented for those sections of the interchange most affected by Legoland traffic. This interchange will be more impacted by Legoland traffic than any other location in the region, yet Legoland ignores it.

<sup>7</sup> Figure 3 provides an estimate of the daily impact along those links of the I-87/Exit 16 most impacted by no-build and “Other Development” traffic. Again these impacts are ignored in the Legoland DEIS.

<sup>8</sup> Figure 4 provides an estimate of Legoland traffic impacts along the links reported in Figures 2 and 3 estimating the resulting total daily traffic and reporting the percentage growth in traffic volume from the Legoland project. Because the growth in traffic at this interchange from both no-build and Project traffic is so severe, a detailed study

plaza would be 11%. The increase along the NB exit ramp to Route 6/17 WB would increase by 13% from no-build conditions. WB trips will increase the Exit 16 on ramp to I-87 southbound traffic volume by 12%.

The overall impact of the combined no-build and build traffic added to I-87 Exit 16 interchange would be as follows: Combined, the no-build and Legoland project will add about 9,550 EB vehicle trips and 10,550 WB trips along Route 17/6. All of these trips are expected to travel to and from the south via I-87 (as noted earlier, data to and from the north via I-87 was unavailable). The resulting increase at the Exit 16 toll plaza would be 40%. The increase along the NB exit ramp from I-87 NB to Route 6/17 WB would increase by 53% from baseline conditions. The combined effect on I-87 south of Exit 16 would increase traffic in both directions by 24% from baseline conditions.

Given these impacts, looking at the complexity of the Exit 16 interchange, it is no mystery why the Legoland traffic analysis ignores NYS I-87 Exit 16. It is complicated and difficult to analyze but with approximately 2/3rds of Legoland traffic flowing through this interchange combined with a large proportion of “Other Development” traffic flowing through the interchange as well, one would expect at least the New York State Department of Transportation and the New York State Thruway Authority might be concerned.

This is particularly troubling when the Rt. 84/Rt. 17 interchange is included in the analysis when just 22% of Legoland traffic moves through the Rt.84/Rt. 17 interchange, compared with about 58.5% of Legoland traffic through the I-87 Exit 16 interchange. The entry/exit ramps for the Exit 16 Thruway ramps are at or near capacity during peak hours today and the impact as demonstrated above could be significant. Again, these effects are not included in the Legoland traffic analysis, Appendix G. The DEIS reports no significant project impact at the I-84/Rt. 17 interchange. As demonstrated above, this is not the case with the I-87/Rt. 17 interchange. The impact will be significant. The DEIS must be augmented with a full traffic analysis including simulation for all Exit 16 ramps and I-87 through traffic movements.

The Legoland DEIS reports that a large part of departing trips will be rerouted from Route 17 to Route 17M via South Street. This is because under existing conditions traffic backs up from the I-87/Route 17/6 toll plaza at Exit 16. How no-build traffic (i.e., “Other Development” traffic) will impact this toll plaza is not described. How diverted trips will gain access to I-87 is also not described. Considering the hourly magnitude of the combination of “Other Development” traffic with Legoland traffic, it can be expected that a significant amount of traffic will divert onto Route 17 south of Harriman, either directly, or via Route 17M. This additional traffic could easily exceed the capacity of the existing Route 17 south of Exit 16. If so, the DEIS cannot ignore this problem. And, since the DEIS already reports the use of the SYMCHRO/SIMTraffic simulation model to check other locations, the entire roadway network including Route 17 and

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for hourly impacts is required before any action is taken on the Legoland project. Based on data provide in the DEIS and by NYSDOT, it is likely project impacts will be greater during peak travel hours than for daily averages.

the ramps and through traffic along I-87 must be simulated as well and reported to the Goshen community.

The description of Interstate 87 (DEIS, page 74) is misleading. It reports an AADT of approximately 49,000 vehicles per day south of Exit 16. The New York Thruway Authority reports 2-way traffic volumes as much as 95,000 daily trips for this section of I-87. Perhaps the DEIS is referring to traffic volumes north of Exit 16 connecting with Route 6/17. As noted above background growth, “Other Development” growth and project growth will add about 20,000 vehicles per day to I-87 south of Exit 6 (in the north and southbound directions), more than a 20% increase, yet no evaluation or analysis is provided for these impacts at the I-87 Exit 16 location along I-87 itself.

### **TRAFFIC MODELLING**

Since the DEIS reports that the developer has already shared SYNCHRO/ SIMTraffic results with the Town of Goshen, it should be easy to share these results with the public especially for the South Street corridor where Legoland will add more than 1,000 vehicle trips an hour to no-build conditions (plus a modest additional amount of “Other Development” traffic) for much of the day. Level of service calculations using SYNCHRO/SIMTraffic that are provided in Appendix G are complicated to review, and without more refined intersection drawings with traffic volumes and turning movement assignments, are hard to compare with the way existing data is presented (Appendix G, Sub-Appendix D). Without simulation it will be hard to convince anyone that adding upwards of 3,500 vehicles an hour to the affected roadway network can be accommodated with the limited alignment and capacity improvements that have been suggested.

### **MITIGATION: PROPOSED ROAD CHANGES**

Because the traffic analyses presented in the DEIS cover a large area, we have decided to focus on the two intersections that appear to be the most impacted by Legoland traffic: South Street at Rt. 17M and South Street at Harriman Drive. And we will pick the time period during which Legoland may have the greatest impact, Sunday afternoons (although other time periods produce equal or greater traffic volumes when combined with no-build development traffic). For baseline conditions, these two intersections are reported to operate at acceptable Levels of Service (LOS). This is also true for no-build conditions since few no-build trips are assigned to South Street although it should be noted that during the period in question, traffic volumes along Route 17 will increase by more than 2,400 vehicles (total, both directions) during that single hour taking up a great deal of any available capacity along Rt. 17. Still, for the intersections in question, service levels appear acceptable.

For build conditions, Legoland will add another 1,691 vehicle trips, 1,538 exiting with the rest entering the site. Because of congestion problems along Rt. 17 EB and at the Exit 16 toll booths described in the DEIS, Legoland is proposing to divert about 45% of exiting traffic from Rt. 17 EB to South Street and onto Rt. 17M EB. The DEIS describes capacity changes at both intersections in minimalist detail along with tiny sketch drawings of proposed roadway changes. No proper engineering drawings are included but one proposed change, widening the bridge

connecting these two intersections, is critical to the success of this proposal. It is not clear that NYSDOT will actually approve the proposed changes, and there are significant indications that the proposed flyover would in fact be denied in order to allow the conversion of Route 17 to I-86.<sup>9</sup> Even if the flyover was approved, Legoland diverted traffic will cause breakdown conditions (LOS F) at the South Street/Route 17M intersection with traffic backing up through the South Street/Harriman Drive intersection.

As noted elsewhere in this report, it would help to see the SYNCHRO/SIMTraffic models to more precisely visualize these conditions. And, of course, this is true for all locations analyzed in the DEIS including intersections, freeway movements, weaving movements and on and off ramp conditions. Without the South Street reconstruction (widening) the diversion scheme proposed by Legoland will not work,<sup>10</sup> and Legoland will have to return to assigning departing EB vehicles to the Exit 125 scenario adding to the huge amount of EB no-build (mostly “Other Development”) traffic facing heavy EB travel delays that are inferred in the DEIS. One final note, “Other Development” traffic along Route 17 in both directions is particularly heavy from about 10 AM to about 8 PM, the same time periods for peak Legoland traffic. Moreover, as noted elsewhere, NYSDOT classification counts included in Appendix G show very heavy truck traffic on Route 17 for this same time period, especially for weekdays. The intersection LOS calculations for the period in question assume 2% or no truck traffic compared to a much greater proportion of trucks and buses reported by NYSDOT elsewhere in this report. All DEIS LOS calculations must be conformed to actual NYSDOT traffic data. Doing so will reveal just how much greater Legoland traffic impacts are likely to be.

### **WHO WILL PAY FOR THE COST OF MITIGATION?**

The question of who pays for infrastructure improvements is not stated clearly. However, on page 93 of the DEIS, it states “The Project Sponsor plans to pursue any available funding for the study area infrastructure improvement...the Project Sponsor has requested that New York State and Orange County fund the cost of these improvements.” So it is apparent that Legoland is looking to taxpayers to pay for road improvements needed to accommodate the proposed changes listed on pages 93 to 96 in the DEIS. Many of these intersection and Route 17 capacity increases appear reasonable, but all are subject to NYSDOT approval especially those that might be very costly like the proposed westbound overpass that would exclusively service Legoland.

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<sup>9</sup> In a letter report prepared by the NYSDOT dated September 19, 2016, in reference to the Legoland traffic study, DOT provided comments challenging some of the results presented in the DEIS including this statement about the proposed Route 17 flyover that would provide direct access to the Legoland Project: “The Flyover would not meet the federal interstate standards, and could preclude this section of route 17 from becoming I-86.”

<sup>10</sup> The South Street Bridge currently operates with 2 lanes southbound and one northbound. The only way Legoland will work with considerable traffic diverted across the South Street Bridge to Route 17M is with two lanes in each direction. Table 9, Appendix G, shows the results of the Level of Service calculations; it reports that for conditions with two lanes northbound at Route 17M the intersection operates at LOS F for a summer Sunday peak hour. With a single northbound lane LOS is F but spillback to the south would run nearly a quarter mile past the Legoland Harrison Drive entrance to the Project.

## **PARKING**

The Legoland DEIS fails to provide a parking occupancy analysis for worst case conditions demonstrating sufficient parking capacity. Parking analysis should include a simulation of exiting vehicles that will have to pay for parking as they leave Legoland. The DEIS must demonstrate how they can accommodate 1,500 departing vehicles in one hour along a single lane and how 2 lanes of access road 3,000 feet long can accommodate 500 vehicles. DEIS, page 92.

## **SOCIETAL COST OF INCREASED LEGOLAND TRAVEL**

### **TRAFFIC ACCIDENTS (DEIS P. 84/85, Accident Data, Appendix G, Sub-Appendix F)**

Traffic accident data provided by the New York State Department of Transportation are summarized in Table III-3: Accident Data (DEIS, Page 85). The data shows that accident rates in and around the Goshen area are considerably greater than state-wide averages for similar highway facilities. As reported “Based on a review of the accident summaries, a significant portion of the observed accidents were found to be left turn and rear-end accidents as well as a result of excessive speed.” That is it. That is the sum total of accident reporting for this project. What is reported is bad enough (that is, accidents rates considerably higher than state-wide averages). What is not reported are the number and severity of accidents that project-generated traffic will produce and their resulting societal costs born not only by motorists but by all residents of the region affected by this Project.

However, the DEIS provides just enough information to estimate these impacts. Table SGT-5, “NYS Route 17 Hourly Site Generated Traffic Volumes East and West of Study Area”, provides site generated trips along Route 17 between Exit 130A and Exit 131. As noted earlier, while the data is flawed (there are significant errors for “Typical Saturday” EB and “Summer Saturday” EB)<sup>11</sup> these data represent about 62.5% of total project generated trips. Thus, dividing the numbers by 0.625 you get an approximation of total project generated trips by time of day. There is sufficient data here to estimate average annual trips associated with this project (assuming the data is accurate—a summation of the columns demonstrates this project will generate considerably more trips than reported in the DEIS). Still, a reasonable estimate can be made from this data to estimate the total number of trips this project might generate. Table 4<sup>12</sup> presents the results. Since the DEIS fails to provide a month by month summary of activity at the Legoland site, we have made some conservative estimates: 16 weeks of summer activity, 20 weeks of “typical” activity and 16 weeks of a significantly reduced winter activity. It is understood that the Legoland Park will be closed for winter months leaving only the hotel and aquarium open for business. The results are presented in Table 4.

In order to estimate annual vehicle miles of travel, the DEIS also provides a lead: Table GM-1, Gravity Model, provides sufficient data to estimate average regional trip length: 70 miles one

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<sup>11</sup> Note that Table SGT-5 has some serious flaws. Table 2 highlights these in red. The problem is that the total number of trips east and west should be roughly equal. For a Typical Saturday, EB total trips does not match WB trips; the same is true for a Summer Saturday. These errors need to be corrected.

<sup>12</sup> Table 4 shows how the average Legoland trip distance (70 miles one way) was estimated using data taken from the Gravity Model reported in Appendix G of the Legoland DEIS.

way. Multiplying 3.2 million one-way trips by 70 results in annual project generated vehicle miles of travel of 224 million. And, as the DEIS suggests, this can be expected to grow as Legoland becomes better known regionally and visitations increase. (Table 4)

Based on NYSDOT traffic accident rates for the New York Metropolitan Area, Legoland will increase auto and truck accidents by more than 1,800 a year within a 200 mile radius of the project site. Adding 3.2 million auto trips a year entering or leaving the Legoland site will increase the number of auto accidents to 1,822 crashes annually with 3 dead and 609 persons injured and approximately 1,210 more cars and trucks damaged. Including the cost of property damage the cost to motorists and society would total \$79 million in 2021. Table 5<sup>13</sup> summarizes this data. These numbers are conservative when compared with the accident rates presented in Table III-3 of the DEIS (Page 85) are compared with the rates used in Table 5 to compute direct and indirect costs of accidents generated by Legoland traffic.<sup>14</sup>

### **EXTERNALITY COSTS OF ADDED LEGOLAND TRAVEL**

Auto accidents are just one element of the societal costs of adding 224 million miles of travel to the Legoland study area. As Table 6<sup>15</sup> shows these costs, including traffic accident costs, would total \$301 million each year born by both motorists and non-motoring taxpayers. The external or hidden costs to motorists, their passengers, and visitors, residents and workers within the study area due to increased vehicular use by travel to and from Legoland include the costs of lost travel time (congestion), physical injury, health effects, noise impacts, damage to our roads and utilities.

Other costs related to Legoland traffic are paid through taxes such as the control of water pollution, oil spills, greenhouse gas emissions, the lost value of highway land removed from tax rolls, and, most apparent today, the foreign policy and defense costs of protecting the supply of imported oil. But taking them together, even using a low range of vehicle related costs due to Legoland, car and truck use greatly reduce the realistic local economic benefits of the project. The costs are based on the well-documented costs per vehicle of mile of travel published by the Victoria Transport Policy Institute (VTPI)<sup>16</sup> as well as independent cost accounting that I have undertaken over the last three decades. For this report, the most conservative (i.e., lowest) results have been reported for the social costs of Legoland traffic. These totals significantly

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<sup>13</sup> Table 5 estimates the total number of traffic accidents by accident type resulting from the additional traffic generated by Legoland; also estimated is the societal cost associated with accidents born by motorists and society within the Project study area.

<sup>14</sup> Regarding Table III-3: Accident Data. It is not clear how Legoland is using the term "Rate per Vehicle". NYSDOT rates are specified in terms of accidents per hundred million vehicle miles of travel. That is how they have been used in this analysis.

<sup>15</sup> Table 6 summarizes all annual externality costs associated with Legoland generated traffic, including the societal cost of traffic accidents reported in Table 5, ignored in the Legoland DEIS. These costs are based on decades of research estimating the full cost of vehicular travel but rarely reported due to institutional impediments to acknowledging these costs thereby under reporting the full costs and benefits of a project.

<sup>16</sup> Litman, T., "Transportation Cost and Benefit Analysis, Techniques, Estimates and Implications," Tables 6, 7 and 8, Victoria Transport Policy Institute, June 2003, [www.vtpi.org/htm](http://www.vtpi.org/htm).

exceed any benefits of this project to the Goshen and other nearby communities. A full cost-benefit analysis must be completed for Legoland before any action can be taken on this project. Without a fully vetted cost-benefit analysis, Goshen cannot, in good conscience, act on this project. The fact that these effects are not even required in a full impact assessment is a disservice to all residents and taxpayers. The costs are real and are borne out by over four decades of research. They cannot be ignored.

## **GLOBAL WARMING**

Finally, the Legoland DEIS must address its effects on global warming and how these effects can be mitigated. At a time when 97% of the scientific community agrees that global warming is serious threat and unless addressed will result in catastrophic effects worldwide, and that nearly 200 nations have committed to reducing CO2 emissions in order to keep worldwide ambient temperatures from increasing by more than 2 degrees Celsius over preindustrial temperatures, Legoland cannot ignore the issue. The only way to accomplish this is to reduce the use of fossil fuels. All new development must be done in support of these goals. The Legoland project will increase gasoline use by about 9 million gallons a year producing 90,000 tons of CO2 emissions annually.

In the final analysis, this project is remote from major population centers. It is auto dependent at a time when the only way we will reduce the staggering effects of global warming is to reduce the use of fossil fuels. We should be building projects that are transit accessible, not dependent on attendees driving up to 200 miles to get to the site. The Legoland DEIS must address this increasingly disruptive development.

## **CONCLUSIONS**

The Legoland DEIS does not make a convincing case that this project will not have a significant traffic impacts on the Goshen and nearby communities that can be mitigated. It is incomplete in that the DEIS itself is not a standalone document: It does not present a full accounting of project impacts but focuses on presenting baseline conditions and presenting potential mitigation measures that may or may not be approved. It relies on extensive appendices that are a jumble of pages (more than 6,000) that are referenced throughout but not summarized in the DEIS proper making review time consuming and cumbersome (and impossible for the general public to review). And those numbers presented in Appendix G for the transportation impacts are inconsistent and incomplete.

Tables presenting trip generation do not add up. Some days, Legoland reports 10,000 vehicles entering and 15,000 leaving the site in a single 24 hour period. They should be approximately the same. Level of service calculations ignore that very high truck volumes reported by NYSDOT and included in Appendix that, if applied, would show project impacts much greater than reported. Indeed, truck and bus activity servicing the Legoland site are ignored. Legoland lists numerous mitigating measures that are poorly illustrated and for which they rely on local and state funding.

No-build traffic that they call “Other Development” is poorly documented and produces huge impacts alone that could dictate widening Route 17 from Goshen to the Exit 16/I-87 interchange. There is no convincing case made that parking is adequate for even the modest demand for parking let alone the much greater demand that the numbers contained in Appendix G reveal. There is no parking accumulation study that supports the claim that parking is adequate and the 3,000 foot long storage area for arriving vehicles will accommodate 300 vehicles, not 500 as claimed. And the greatest impact of all, the route most relied on for access/egress to and from the site is ignored entirely: the NYS I-87 Exit16 interchange that could experience a 25% increase in traffic from the combined impact of no-build and Project impacts is not studied. And, finally, Legoland traffic will produced hundreds of millions of miles of additional vehicle miles of travel adding to the State’s severe accident record and producing externality costs that far exceed the benefits of this project alone to the Goshen community, including adding significantly to global warming’s catastrophic problems that mankind may not be able to stop. The full report goes into more detail about each of these issues. However, it is clear that the Legoland DEIS does not report fully on project impacts and cannot support an approval of this project with the many flaws and omissions now contained in the report.

Thank you for your attention to my comments. I am available by telephone or email should you have any questions regarding this review.

Sincerely,  
  
Brian T. Ketcham

## **TABLES AND FIGURES**

Table 1. Trips Generated by No-build or “Other Development” Along NYS Route 17 West of Exit 130

Table 2. Total Estimated Project-Generated Traffic

Table 3. Percent Growth in Traffic Volumes along Route 17

Table 3A. Summary of Traffic Volumes along Route 17 Reported in the Legoland DEIS, Appendix G

Table 4. Estimation of the Average Auto Trip Length for Legoland

Table 5. Estimation of the Number of Traffic Accidents Annually Generated by 224 Million VMT for Vehicles Traveling to and from the Proposed Legoland Project Site, 2021

Table 6. Annual Externality Cost of Legoland Project Generated Traffic, 2021

Figure 1. NYSDOT Blocked Lanes Alert for Black Friday, November 25, 2016.

Figure 2. Baseline AADT for the I-87 Exit 16 Interchange

Figure 3. No-build Conditions in 2021 Including 5% Annual Growth Plus 60% of the Traffic Reported in the DEIS for “Other Development” Including Percent Increase from Baseline Conditions

Figure 4. Total NYS I-87 Exit 16 Traffic Volume with Legoland Traffic Including Percent Increase from No-build Conditions