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MEMORANDUM

To:	Kathleen Kennedy, City of Santa Barbara Planning Division
From:	Adam Poll, Dudek
Subject:	Risk of Upset/Train Safety Analysis for the Hotel Project located at 101 Garden Street
Date:	May 19, 2022
cc:	Shaun Gilbert and Amanda Mauceri, Dauntless Development; Carolyn Groves, Dudek
Attachment:	A, Risk Calculations

This risk of upset/train safety analysis was prepared in response to the City of Santa Barbara's (City's) Pre-Applications Review Team Comments letter for 101 Garden Street, MST2019-00052, APN: 017-630-008; 009; -018; -021; -024; and -027, dated March 6, 2019 (letter). This analysis specifically addresses item IV.2.(k) Public Safety in regards to the proposed hotel project located at 101 Garden Street (project). This analysis was also updated to address comments in the City's Land Development Team Application Response Letter, dated December 15, 2021.

This study provides information and analysis pertinent to potential public safety impacts of the Union Pacific Railroad (UPRR) line which runs from east to west just beyond the southerly boundary of the project site. Evaluation of the proposed project is based on the public safety thresholds and significance criteria established by the County of Santa Barbara (County) Environmental Thresholds and Guidelines Manual (County 1995).

1 Introduction

The project site is located at 101 Garden Street at the corner of Garden, Yanonali, and Santa Barbara Streets in an area of the City commonly referred to as the Funk Zone (see Figure 1). The site is comprised of six separate Assessor Parcel Numbers (APN) for a total of 4.53 acres. The site is currently developed with a storage yard consisting of five structures totaling approximately 15,200 square feet. These structures would be demolished as a part of the project. Adjacent land use includes a residential condominium development to the north (Villa del Mar), a warehousing facility to the east, restaurants and other commercial uses to the west and the UPRR tracks to the south. The Pacific Ocean is approximately 0.10 miles south of the site.

The subject property is described as "Area A" within the Cabrillo Plaza Specific Plan, approved by the City in 1983. The Cabrillo Plaza Specific Plan or SP-2 was established through a culmination of several years of site design/development and City planning review toward future development of the approximate 11 acre area with a hotel and associated ancillary uses (Area A), a restaurant and parking (Area B), a boat storage yard (Area C), and general industrial/commercial use (Area D). In 1996, the City and the Wright Family entered into an Owner Participation Agreement to enable the extension of Garden Street from Yanonali Street to the beach. The City

completed the construction of the Garden Street Extension Project, which is considered to be the initial development phase implementing SP-2.

For Area A, the Specific Plan allows several uses, including a hotel or motel with up to 250 rooms, and ancillary uses such as meeting rooms (not to exceed 350 persons); restaurants and/or cocktail lounges with service note to exceed 250 persons; stores or shops; health club; and other similar uses. The proposed project is consistent with all uses allowed by the Cabrillo Plaza Specific Plan.

The project includes 250 guestroom Dual Brand Extended Stay and Lifestyle three story hotel with approximately 190 car underground parking structure and 60 on grade parking spaces (see Figure 2). The proposed hotel project includes restaurants, bar, lounge, library, media salons, meeting rooms, fitness rooms, market, guest laundry, and roof top deck. The amenities include a motor court, Extended Stay courtyard with potential pool and hydrotherapy spa, lifestyle terrace with potential pool and hydrotherapy spa along with associated landscaping and site utilities.

2 Impacts Discussion

It is the intent of this report to: 1) determine the threats and/or impacts associated with the public's health and safety as a result of the regular railway activity adjacent to the property; 2) estimate the probability of an accident or an incident involving a train; 3) ascertain the risks of an accident or incident; and 4) identify appropriate mitigation for any potentially significant health and public safety issues identified as a result of the analysis which would be associated with the proposed project. The existing site and proposed project have been analyzed and compared using data and statistics provided by the Department of Transportation's Federal Railroad Administration, Office of Safety Analysis. The objective of this analysis is to estimate and describe the risks involved with such an occurrence, and to determine appropriate mitigation measures and/or solutions to any potential significant health and safety impacts which could result. The County has indicated that in the area of public health and safety, injury or death to any member of the public (those not directly employed in the construction or operation of the project) is defined to be a significant consequence.

2.1 Significance Criteria

The Safety Impacts Thresholds and Potential Impacts Matrix presented below have been extracted from the County of Santa Barbara Environmental Thresholds and Guidelines Manual (January 1995). Although there have been updates to the public safety thresholds of the Guidelines (2021), these updated thresholds do not apply to the proposed hotel project.

Table 1 Criticality Classification

Classification	Description of Public Safety Hazard
Negligible	No significant risk to the public, with no minor injuries
Minor	Small level of public risk, with at most a few minor injuries
Major	Major level of public risk with up to 10 severe injuries
Severe	Severe public risk with up to 100 severe injuries or up to 10 fatalities
Disastrous	Disastrous public risk involving more than 100 severe injuries or more than 10 fatalities

Table 2 Frequency Classification

Type	Frequency Per Year	Description
Frequent	Greater than once	An event which would occur once a year on average
Likely	Between one a year & once in one hundred years	An event which would probably occur during the project lifetime
Unlikely	Between once in a hundred and once in ten thousand years	An event which is not expected to occur in the project lifetime
Rare	Between once in ten thousand and once in one million years	An event which occurred on a worldwide basis, but only a few times
Extraordinary	Less than once in a million years	An event which has never occurred, but could occur

Table 3 County of Santa Barbara Significant Impacts Matrix[1]

		Severity of Consequences				
		Negligible	Minor	Major	Severe	Disastrous
Frequency Of Occurrence	Frequent					
	Likely					
	Unlikely					
	Rare					
	Extraordinary					

1 Shaded areas show Significant Impacts

2.2 Environmental Baseline

The site is currently developed with a storage yard consisting of five structures totaling approximately 15,200 square feet. Based on the traffic assessment for the site, the existing site generates 710 average daily trips (ADT) per day (Swanson pers. comm. 2019). As data is limited on the existing site, the ADT is conservatively assumed to represent the existing site capacity. Based on the existing non-conforming use of the site it is very likely that the capacity is much higher than this. For the purposes of environmental analysis, this study analyzes the net change in severity of train safety impacts between the existing use of the site and the proposed project. The proposed hotel project is estimated to have an ADT of 1,050 (Swanson pers. comm. 2019).

According to the LOSSAN Rail Corridor Agency, 25 trains cross the Garden Street crossing per day, 12 passenger trains and 13 freight trains (LOSSAN Rail Corridor Agency 2007). The Garden Street crossing has active warning devices, including acoustic, flashing lights, and physical gate barriers activated when a train approaches. The railroad tracks running through the City are rated for speeds of 60 mph and 40 mph, for passenger and freight trains respectively. Observed actual train speeds through the Garden Street crossing, however, appear to range between 20 mph and 40 mph (FRA 2019).

2.3 Existing Impacts Discussion

There are three major train accident/incident categories which were determined to have the potential to occur on-site, and therefore require analysis. These include: 1) risk of a pedestrian(s) being struck whilst crossing the tracks; 2) risk of a vehicle being hit whilst crossing the tracks; and 3) risk of a train wreck or derailment. Railroad accident/incident information was derived from the Federal Railroad Administration, Office of Safety Analysis (FRA-OSA), the Public Utilities Commission of the State of California (PUC), the County of Santa Barbara Office of Emergency Services (OES) and the Union Pacific Railroad (UPRR). The FRA-OSA databases (2018) provide statistical train accident/incident data used in the analysis. It should be noted that the pedestrian activity and vehicular-train accident impact discussions are provided for informational purposes only as the property itself is not bifurcated by the rail-line. The rail-line runs adjacent to the southernmost portion of the property.

In 2017-18, there were 923 reported railroad-related incidents in California, up from 840 in the previous fiscal year (CPUC 2018). Each incident falls into one or more categories: 403 were related to crossing or trespasser incidents; 297 were material spills, of which 115 involved hazardous materials; 194 were derailments; and 34 were in other categories. These incidents resulted in a total of 217 fatalities and 141 injuries (up from 174 and 132 in the previous year, respectively), mostly to trespassers. CPUC railroad safety supervisors determined that 146 incidents required further investigation.

2.3.1 Category #1 Pedestrian Activity

The FRA-OSA provides the public with an array of train safety statistics on-line. There are two statistical categories which are applicable to a pedestrian being struck while crossing the tracks: 1) individuals struck while illegally crossing the tracks; these people are referred to as “Trespassers”; and 2) individuals who are struck as a result of misjudgment, machinery malfunction and/or other reasons while passing over illegal railroad crossings; these are referred to as “Highway-Rail Crossing Incidents”. For the Trespasser assessment, the length of track adjacent to the property line was assumed to be approximately 140 feet. For the Highway-Rail Crossing Incidents assessment, the width of crossing over Garden Street (including the sidewalks) was estimated to be 100 feet.

The project site currently has a pedestrian walkway that starts at the corner of Mason Street and Santa Barbara Street and parallels the train tracks, exiting to Garden Street. The existing pathway has a 3-foot high partially vegetated fence that blocks pedestrian access to the railway up to 20 feet from the Garden Street sidewalk.

Trespasser Incidents

Approximately 140 feet of railroad is adjacent to the southern boundary of the property (excluding the crossing over Garden Street). Based on the national FRA statistics, there was an average of 1.49 Trespasser fatalities and/or injuries per one million miles of track in 2018 (FRA 2018). Thus, as the property is adjacent to approximately 140 feet of track, this would equate to 3.95×10^{-8} trespasser fatalities/injuries per year. To extrapolate, a pedestrian being struck or killed by a train while illegally trespassing on the tracks was likely to occur once every 2,782 years. Per the Frequency Classification (based on the County’s thresholds listed in Table 2, above), the probability of such an event would be classified as *Unlikely*. Based on Table 1, the Criticality Classification, such an event would be *Major*. Thus, the likelihood of a Trespasser pedestrian being struck while leaving the property was considered a *potentially significant impact* associated with the existing site.

Highway-Rail Crossing Incidents

Similarly, for "Highway-Rail Crossing Incidents", there was an average of 3.10 Highway-Rail fatalities and/or injuries per one million miles of track in 2018. Thus, as the property is adjacent to approximately 100 feet of track at the Garden Street crossing, this would equate to 5.87 x 10^{-8} Highway-Rail fatalities/injuries per year. To extrapolate, a pedestrian being struck or killed by a train whilst crossing on the tracks was likely to occur once every 1,872 years. Per the Frequency Classification (based on the County's thresholds listed in Table 2, above), the probability of such an event would be classified as *Unlikely*. Based on Table 1, the Criticality Classification, such an event would be *Major*. Thus, the likelihood of a Highway-Rail pedestrian being struck while leaving the property was considered a *potentially significant impact* associated with the project.

2.3.2 Category #2 Vehicular-Train Incidents

There are two classifications of Highway Rail Grade Crossings. These are public and private. The FRA-OSA recognizes private grade crossings as an at-grade crossing where the highway (roadway) is privately owned and it is intended for use by the owner's licensees and invitees. It is not intended for public use, nor is it maintained by the public highway authority. It should be noted that traffic associated with these private highway (roadway) rail grade crossings is significantly less than experienced at public crossings. The crossing over Garden Street is considered a public crossing. For the Vehicular-Train Incidents assessment, the width of crossing over Garden Street (including the sidewalks) was estimated to be 100 feet.

National FRA-OSA statistics indicated that 8.80 accidents occur for every million train miles traveled in 2018 (FRA 2018). Thus, the existing sites 100 feet of track across the Garden Street crossing would equate to 1.67 x 10^{-7} Vehicular-Train Incidents per year. By extension, therefore, the probability of a vehicle being struck and/or an individual being killed whilst crossing the public Highway-Railway crossing on Garden Street was likely to occur once in every 658 years. Per the Frequency Classification (based on the County's thresholds listed in Table 2, above), the probability of such an event would be classified as *Unlikely*. Based on Table 1, the Criticality Classification, such an event would be *Major* as there would be a limited number of injuries and/or fatalities. Therefore, the likelihood of a vehicle or an individual being struck whilst on the Garden Street crossing was considered a *potentially significant impact* associated with the existing site.

2.3.3 Category #3 Train Accidents/Derailments

Railway cars carrying hazardous materials such as flammable gas, flammable liquid, corrosive material and other material, travel through the County. The effects of a worst-case scenario release of these toxic materials into the environment caused by a train accident are difficult to predict given the unique circumstances surrounding each and every "catastrophic failure" train accident. Railroad safety experts, however, indicate that a worst-case scenario hazard footprint for a release of toxic materials caused by a train accident could extend, for example, as a cloud of toxic vapor, as far as a mile in any given direction.[1] For the Train Accident/Derailment assessment, the length of track adjacent to the property line was assumed to be approximately 140 feet.

In contrast to the above scenarios, train accidents/derailments are usually attributed to the train and/or railroad operation, as opposed to the actions of a member of the general public. Train accidents occur either as a collision with another vehicle or train and/ or a derailment. Typically, accidents are attributed to human error, equipment

[1] Hazardous Materials Department, Southern Pacific Transportation Company, Public Utilities Commission of the State of California General Order Number 161, Report for Santa Barbara County, CA (1997).

failure, acts of nature and/or damaged track. FRA statistics indicate that 1,835 train accidents occurred nationwide in 2018 and that there is an average of 2.58 accidents per million miles traveled (FRA 2018). As there are approximately 140 feet of track which traverse the southern border of the property, this equates to 6.84 x 10^{-8} train-related accidents per year. Based on the previous figures, the probability of an accident involving a train at the existing site would likely occur once in every 1,607 years. Per the Frequency Classification (based on the County's thresholds listed in Table 2, above), the probability of such an event would be classified as *Unlikely*. Based on Table 1, the Criticality Classification, such an event would be *Major*. Variation in the classification rating is due to factors associated with individual train trips which cannot be reasonably foretold, such as train velocity and hazardous materials content. There would be, in either a severe or disastrous situation, a great potential for injuries and/or fatalities, thus a *potentially significant impact*.

Hazardous Materials Release

Based on FRA statistics, for the years 2005-2014, there was an average of approximately 7,722 cars/containers carrying hazardous materials that passed through Santa Barbara County (FRA 2018). The hazardous materials are classified by UPRR into over fifty separate categories, including butane, inhibited vinyl acetate, ammonium nitrate, chlorine, hydrochloric acid, and sulfur dioxide. Detailed information regarding these materials is provided regularly by UPRR to the County of Santa Barbara Office of Emergency Management (OEM) to assist that office in emergency response planning. Many of these materials are considered to be explosive, flammable, and/or poisonous.

Given that the specific factors associated with an individual hazardous materials release cannot be reasonably foretold, such as train speed, hazardous materials content, rail conditions, equipment failure, etc., it is difficult to accurately describe the impacts which would be associated with any one incident.

Table 4 Hazardous Materials Train Accident Data (California, 1988-1999)

Year	Number of Accidents	Releases*	Evacuated	Injured	Killed
1988	22	3	4,720	3	0
1989	21	3	202	1	0
1990	26	3	43	1	0
1991	27	3	300	53	0
1992	28	0	100	1	0
1993	31	0	30	6	2
1994	38	6	0	7	0
1995	28	1	200	2	0
1996	33	7	54	1	2
1997	19	0	35	0	0
1998	30	1	0	3	0
1999	38	4	9	2	4**
Total	**341**	**31**	**5,693**	**80**	**8**
Average	**28.4**	**2.6**	**474.4**	**6.7**	**0.7**

Source: CPUC 1999
Notes:
* Releases due to derailments, collisions, and fires.
** Accident was at a highway-rail grade crossing, not due to hazardous material exposure.

Although a reasonable worst-case situation would likely result in a great potential for injuries and/or fatalities both on and off the subject property, the California Environmental Quality Act (CEQA) requires that a project be evaluated under the reasonable worst-case scenario. The information contained within the Table 4 above is used to establish the reasonable worst-case and is based on the most recent data published by the California Public Utilities Commission—Rail Safety and Carriers Division (CPUC 1999). It should be noted that the statistics from 1988-1999 above are the most current available from the PUC published materials.

Based upon information contained within Table 4 above, there was an average of 6.7 injuries and 0.7 deaths for every 2.6 hazardous materials releases. This equates statistically to an average of 2.58 injuries (6.7/ 2.6) and 0.27 deaths (0.7/2.6) per accident occurrence.

National FRA statistics indicate that there is an average of 0.03 hazardous materials releases (associated with train accidents) per million miles traveled (FRA 2018). It may be estimated, therefore, that with the approximate 140 feet of railroad track adjacent to the subject property that 7.95×10^{-10} accident-related hazardous materials releases would have the potential of occurring at any one given time. Using this figure, the likelihood of a hazardous materials release occurring adjacent to the subject property would be once in 138,227 years. The Frequency Classification (based on thresholds listed in Table 2 above) of such an event would thus be classified as Rare. Based on Table 1, the Criticality Classification, such an event would be *Major.* Variation in the classification rating is due to factors associated with individual train trips which cannot be reasonably foretold, such as train velocity and hazardous materials content. According to Table 3, this would be a less than significant impact.

100 Foot Hazard Footprint

According to the CPUC, a reasonable worst-case hazard footprint for physical and/or structural damage from a train accident/derailment is 100 feet from the railroad tracks, while an accidental release of hazardous materials could result in hazards to persons as far as a mile away (von Ibsch, pers. comm. 1998). This analysis is meant to identify buildings, structures and/or other areas within 100 feet of the railroad tracks where persons associated with the existing site might be subject to heightened risks due to close proximity of the railway to these areas. The area within 100 feet on the current site is used for storage only and is not assumed to be occupied. Therefore, the risk associated with existing site would be considered Negligible (based on thresholds listed in Table 1 above). As the frequency was concluded to be classified as Rare, this would be a *less than significant* impact.

2.4 Proposed Project Impacts Discussion

The project includes 250 guestroom Dual Brand Extended Stay and Lifestyle three story Hotel with approximately 190 car underground parking structure and 60 on grade parking spaces. The proposed hotels include restaurants, bar, lounge, library, media salons, meeting rooms, fitness rooms, market, guest laundry and roof top deck. The amenities include a motor court, Extended Stay courtyard with potential pool and hydrotherapy spa, lifestyle terrace with potential pool and hydrotherapy spa along with associated landscaping and site utilities. The proposed project would have an increased ADT compared to the existing site. The project would have pedestrian access points at the walkway between Mason Street and Garden Street, on Garden Street, and on Yanonali Street. However, as the probability of an accident is based on actual data it is qualitatively assumed that an increase in ADT may result in an increase in pedestrian and vehicular traffic. Further, Table 5 provides a comparison of the existing 2007 daily train volumes compared to the projected train volumes in 2025 (LOSSAN Rail Corridor Agency 2007). The increase

in daily train volume between 2007 and 2025 is assumed to increase the potential risk for rail related incidents. Therefore, the increase in train frequency is included in the risk estimates for the project.

Table 5 2007 Daily Train Volumes vs. 2025 Potential Daily Train Volumes

Train Line	2007	2025
Amtrak – Pacific Surfliner	10	14
Amtrak Coast Starlight	2	2
Coast Daylight (proposed)	N/A	2
Ventura – Santa Barbara Intercounty Commuter Rail	N/A	8
Union Pacific Freight Services	13	17
Total	**25**	**43**

Source: LOSSAN Rail Corridor Agency 2007

2.4.1 Category #1 Pedestrian Activity

As discussed in Section 2.3.1, the existing site would result in a trespasser fatality or injury rate of 3.95×10^{-8} trespasser fatalities/injuries per year or one every 2,782 years and 5.87×10^{-8} Highway-Rail fatalities/injuries per year or one every 1,872 years. The proposed project would not install barriers that would impede the line of sight at the Garden Street crossing. The proposed project is 46 feet from the edge of the crossing and as pedestrians move beyond the property and into the railroad right of way, there is no visual obstruction east or west along the train tracks.

Accounting for the increase in daily trains, the proposed project trespasser fatality or injury rate would not change compared to the existing site. However, after accounting for the increase in anticipated train traffic, one trespasser fatality or injury would occur every 1,617 years and one highway-rail fatality/injury ever 1,029 years. Per the Frequency Classification (based on the County's thresholds listed in Table 2, above), the probability of such an event would be classified as *Unlikely*. Based on Table 1, the Criticality Classification, such an event would be *Major*. Thus, the likelihood of a pedestrian being struck while leaving the property was considered a *potentially significant impact* associated with the project. Therefore, mitigation is required.

2.4.2 Category #2 Vehicular-Train Accidents

As discussed in Section 2.3.2, the existing sites 100 feet of track across the Garden Street crossing would have equated to 1.67×10^{-7} Highway-Railway Incidents per year. By extension, therefore, the probability of a vehicle being struck and/or an individual being killed whilst crossing the public Highway-Railway crossing on Garden Street was likely to occur once in every 658 years. The probability of a vehicle being struck and/or an individual being killed whilst crossing the public Highway-Railway crossing on Garden Street from the project was likely to occur once every 383 years. Per the Frequency Classification (based on the County's thresholds listed in Table 2, above), the probability of such an event would be classified as *Unlikely*. Based on Table 1, the Criticality Classification, such an event would be *Major*. Thus, the likelihood of a vehicle being struck and/or an individual being killed whilst crossing the public Highway-Railway crossing on Garden Street was considered a *potentially significant impact* associated with the project. Therefore, mitigation is required.

2.4.3 Category #3 Train Accidents/Derailments

As discussed in Section 2.3.3, there are approximately 140 feet of track which traverse the southern border of the property, this equates to 6.84 x 10^{-8} train-related accidents per year. Based on the previous figures, the probability of an accident involving a train at the existing site would likely occur once in every 1,607 years. Accounting for the increase in train frequency of the project, the probability of a train-related accident at the project was likely to occur once every 934 years. Per the Frequency Classification (based on the County's thresholds listed in Table 2, above), the probability of such an event would be classified as *Unlikely*. Based on Table 1, the Criticality Classification, such an event would be *Major*. Thus, the likelihood of an accident involving a train was considered a *potentially significant impact* associated with the project. Therefore, mitigation is required.

Hazardous Materials Release

It was estimated (as shown in Section 2.3.3) with the approximate 140 feet of railroad track adjacent to the subject property that 7.95 x 10^{-10} accident-related hazardous materials releases would have the potential of occurring at any one given time at the existing site. Using this figure, the likelihood of a hazardous materials release occurring adjacent to the subject property would be once in 138,227 years. The Frequency Classification (based on thresholds listed in Table 2 above) of such an event would thus be classified as Rare. Accounting for the increase in train frequency of the project, the probability of an accident-related hazardous materials releases at the project was likely to occur once every 80,364 years. Per the Frequency Classification (based on the County's thresholds listed in Table 2, above), the probability of such an event would be classified as *Rare*. Based on Table 1, the Criticality Classification, such an event would be *Major*. Thus, the likelihood of an accident-related hazardous materials release was considered a *less than significant* impact associated with the project.

100 Foot Hazard Footprint

According to the CPUC, a reasonable worst-case hazard footprint for physical and/or structural damage from a train accident/derailment is 100 feet from the railroad tracks, while an accidental release of hazardous materials could result in hazards to persons as far as a mile away (von Ibsch, pers. comm. 1998). This analysis is meant to identify buildings, structures and/or other areas within 100 feet of the railroad tracks where persons associated with the project might be subject to heightened risks due to close proximity of the railway to these areas. The following areas of the proposed project fall within the 100-foot hazard footprint: a portion of two of the lifestyle suites in the hotel (S-3 and S-4). With an assumed occupancy rate of 1.7 persons per suite, this would a result in a total of 3.4, or rounded up to 4 persons within the 100-foot hazard footprint. Within the existing site, there is not expected to be any occupancy within the 100-foot hazard footprint as that area is used for boat and equipment storage. The additional 4-person increase is not considered a substantial increase in the existing significant train safety impact. Therefore, the risk associated with existing site would be considered Minor (based on thresholds listed in Table 1 above). As the frequency was concluded to be classified as Rare, this would be a *less than significant* impact.

2.4.4 Project Construction

During construction of the proposed project, it is estimated that upwards of 200 workers would be onsite at any one time. Similar impacts to those discussed in Sections 2.4.1, 2.4.2, and 2.4.3 would apply during construction. Although construction is temporary, the safety of the workers onsite should be preserved through the use of typical construction techniques. Temporary fencing around the entire project site should be installed to keep pedestrian

ingress and egress to the vehicle entrance. The vehicle entrance, if possible, should be located on Yanonali street the furthest point away from the Garden Street railroad crossing. Workers should be properly trained for rail safety and aware of the proximity to the railroad and crossing. Signage should be placed at the construction site entry point alerting vehicles and pedestrians of the railroad crossing and hazards. Any work performed on the pedestrian pathway at the southern end of the property should be coordinated with CalTrans and other appropriate authorities to ensure worker safety.

3 Mitigation

3.1 Category #1 Pedestrian Activity

As discussed in Section 2.4.1, the project would result in one trespasser fatality or injury would occur every 1,617 years and one highway-rail fatality/injury ever 1,029 years. In order to reduce the likelihood of pedestrian incidents, the following mitigation is proposed:

MM-RR-1: The project shall construct a 5-foot high vegetated fence along the Garden Street sidewalk. Signage shall be placed at the corner of the pathway and Garden Street to alert pedestrians of the railroad and crossing. The same signage shall be placed on the property at the Garden Street pedestrian access. The project site shall have a perimeter barrier (fence, vegetation, etc.) preventing pedestrians from accessing Garden Street or the pedestrian pathway outside of designated pedestrian entryways.

With implementation of mitigation measure **MM-RR-1**, impacts associated with pedestrian incidents would be reduce to less than significant levels.

3.2 Category #2 Vehicular-Train Accidents

As discussed in Section 2.4.2, the probability of a vehicle being struck and/or an individual being killed whilst crossing the public Highway-Railway crossing on Garden Street from the project was likely to occur once every 383 years. In order to reduce the likelihood of a vehicular-train accident resulting from the project, the following mitigation is proposed:

MM-RR-2: The project shall install train safety signage at the vehicle entry and exit on Garden Street to alert drivers of nearby railroad crossing. The vehicle entry and exit on Yanonali Street shall also include consistent signage for the rail crossing on Garden Street. Signage shall also be placed throughout the street-level parking and subterranean parking alerting drivers of the rail crossing on Garden Street.

With implementation of mitigation measure **MM-RR-2**, impacts associated with vehicular-train accidents would be reduce to less than significant levels.

3.3 Category #3 Train Accidents/Derailments

As discussed in Section 2.4.3, the probability of a train-related accident at the project was likely to occur once every 934 years. In order to reduce the impact of a train accident/derailment, the following mitigation is proposed:

MM-RR-3: The project shall adopt and maintain an evacuation plan in the event a derailment occur near the property. The plan shall lead guests and employees safely away from the tracks, preferably towards Yanonali Street. The plan shall be prepared in accordance with the County of Santa Barbara's Office of Emergency Management guidelines for emergency response plans. The hotel staff shall be properly trained in emergency procedures consistent with what is outlined in the evacuation plan. Hotel guests shall be notified upon check-in of the railroad crossing at Garden Street and the safety measures put in place to prevent incidents.

With implementation of mitigation measure **MM-RR-3**, impacts associated with train accidents/derailments would be reduce to less than significant levels.

4 Conclusion

This risk of upset/train safety analysis showed that impacts associated with the proposed project would be potentially significant with respect to pedestrian activity, vehicular train accidents, and train accidents. Impacts associated with hazardous material releases would be considered less than significant for the proposed project. With implementation of mitigation measures **MM-RR-1**, **MM-RR-2**, and **MM-RR-3**, potential impacts with respect to pedestrian activity, vehicular train accidents, and train accidents would be reduced to less than significant levels. Furthermore, the proposed project has been designed to limit the number of people within the 100-foot hazard footprint. Therefore, the proposed project would result in a **less than significant** impact to public safety.

Sincerely,

Adam Poll, QEP, LEED AP BD+C
Senior Environmental Specialist

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Attachment A

Risk Calculations

Existing Impacts

Category #1: Pedestrian Activity – Tresspasser Calculation

- $\frac{1.49\ injuries}{1{,}000{,}000\ miles}\ X\ \frac{140\ feet}{5{,}280\ feet/mile} = 3.95\ x\ 10^{-8}\ injuries$
- $\frac{1}{3.95\ X\ 10^{-8}\ injuries} = 25{,}316{,}456\ trips/injury$
- $\frac{25\ \text{trains}}{\text{day}}\text{X}\frac{7\text{days}}{\text{week}}\text{X}\frac{52\ \text{weeks}}{\text{year}}$=9,100 train trips/year
- $\frac{25{,}316{,}456\ trips/injury}{9{,}100\ train\ trips/year} = 2{,}782\frac{years}{injury}$

Category #1: Pedestrian Activity – Highway Rail-Crossing Calculation

- $\frac{3.10\ incidents}{1{,}000{,}000\ miles}\ X\ \frac{100\ feet}{5{,}280\ feet/mile} = 5.87\ x\ 10^{-8}\ incidents$
- $\frac{1}{5.87\ X\ 10^{-8}\ incidents} = 17{,}035{,}775\ trips/incident$
- $\frac{25\ \text{trains}}{\text{day}}\text{X}\frac{7\text{days}}{\text{week}}\text{X}\frac{52\ \text{weeks}}{\text{year}}$=9,100 train trips/year
- $\frac{17{,}035{,}775\ trips/incident}{9{,}100\ train\ trips/year} = 1{,}872\frac{years}{incident}$

Category #2: Vehicular Train Incidents Calculation

- $\frac{8.80\ train\ incidents}{1{,}000{,}000\ miles}\ X\ \frac{100\ feet}{5{,}280\ feet/mile} = 1.67\ x\ 10^{-7}\ train\ incidents$
- $\frac{1}{1.67\ X\ 10^{-7} train\ incidents} = 5{,}988{,}024\ trips/incident$
- $\frac{25\ \text{trains}}{\text{day}}\text{X}\frac{7\text{days}}{\text{week}}\text{X}\frac{52\ \text{weeks}}{\text{year}}$=9,100 train trips/year
- $\frac{5{,}988{,}024\ trips/incident}{9{,}100\ train\ trips/year} = 658\frac{years}{incident}$

Category #3: Train Accidents/Derailments Calculation

- $\frac{2.58\ train\ accidents}{1{,}000{,}000\ miles}\ X\ \frac{140\ feet}{5{,}280\ feet/mile} = 6.84\ x\ 10^{-8}\ train\ accidents$
- $\frac{1}{6.84\ X\ 10^{-8} train\ accidents} = 14{,}619{,}883\ trips/accident$

- $\frac{25 \text{ trains}}{\text{day}} \text{X} \frac{7\text{days}}{\text{week}} \text{X} \frac{52 \text{ weeks}}{\text{year}} = 9{,}100 \text{ train trips/year}$
- $\frac{14{,}619{,}883\ trips/accident}{9{,}100\ train\ trips/year} = 1{,}607 \frac{years}{accident}$

Category #3: Train Hazardous Materials Release Calculation

- $\frac{0.03\ material\ releases}{1{,}000{,}000\ miles}\ X\ \frac{140\ feet}{5{,}280\ feet/mile} = 7.95\ x\ 10^{-10}\ material\ releases$
- $\frac{1}{7.95\ X\ 10^{-10} material\ releases} = 1{,}257{,}861{,}635 \frac{trips}{material\ release}$
- $\frac{25 \text{ trains}}{\text{day}} \text{X} \frac{7\text{days}}{\text{week}} \text{X} \frac{52 \text{ weeks}}{\text{year}} = 9{,}100 \text{ train trips/year}$
- $\frac{1{,}257{,}861{,}635 \frac{trips}{material\ release}}{9{,}100\ train\ trips/year} = 138{,}227 \frac{years}{material\ release}$

Project Impacts

Category #1: Pedestrian Activity – Tresspasser Calculation

- $\frac{1.49\ injuries}{1{,}000{,}000\ miles}\ X\ \frac{140\ feet}{5{,}280\ feet/mile} = 3.95\ x\ 10^{-8}\ injuries$
- $\frac{1}{3.95\ X\ 10^{-8}\ injuries} = 25{,}316{,}456\ trips/injury$
- $\frac{43\ trains}{day} X \frac{7\ days}{week} X \frac{52\ weeks}{year} = 15{,}652\ train\ trips/year$
- $\frac{25{,}316{,}416\ trips/injury}{15{,}652\ train\ trips/year} = 1{,}617 \frac{years}{injury}$

Category #1: Pedestrian Activity – Highway Rail-Crossing Calculation

- $\frac{3.10\ incidents}{1{,}000{,}000\ miles}\ X\ \frac{100\ feet}{5{,}280\ feet/mile} = 5.87\ x\ 10^{-8}\ incidents$
- $\frac{1}{5.87\ X\ 10^{-8}\ incidents} = 17{,}035{,}775\ trips/incident$
- $\frac{43\ trains}{day} X \frac{7\ days}{week} X \frac{52\ weeks}{year} = 15{,}652\ train\ trips/year$
- $\frac{17{,}035{,}775\ trips/incident}{15{,}652\ train\ trips/year} = 1{,}029 \frac{years}{incident}$

Category #2: Vehicular Train Incidents Calculation

- $\frac{8.80\ train\ incidents}{1{,}000{,}000\ miles}\ X\ \frac{100\ feet}{5{,}280\ feet/mile} = 1.67\ x\ 10^{-7}\ train\ incidents$
- $\frac{1}{1.67\ X\ 10^{-7} train\ incidents} = 5{,}988{,}024\ trips/incident$
- $\frac{43\ trains}{day} X \frac{7\ days}{week} X \frac{52\ weeks}{year} = 15{,}652\ train\ trips/year$
- $\frac{5{,}988{,}024\ trips/incident}{15{,}652\ train\ trips/year} = 383 \frac{years}{incident}$

Category #3: Train Accidents/Derailments Calculation

- $\frac{2.58\ train\ accidents}{1{,}000{,}000\ miles}\ X\ \frac{140\ feet}{5{,}280\ feet/mile} = 6.84\ x\ 10^{-8}\ train\ accidents$
- $\frac{1}{6.84\ X\ 10^{-8} train\ accidents} = 14{,}619{,}883\ trips/accident$
- $\frac{43\ trains}{day} X \frac{7\ days}{week} X \frac{52\ weeks}{year} = 15{,}652\ train\ trips/year$
- $\frac{14{,}619{,}883\ trips/accident}{15{,}652\ train\ trips/year} = 934 \frac{years}{accident}$

Category #3: Train Hazardous Materials Release Calculation

- $\frac{0.03\ material\ releases}{1{,}000{,}000\ miles}\ X\ \frac{140\ feet}{5{,}280\ feet/mile} = 7.95\ x\ 10^{-10}\ material\ releases$
- $\frac{1}{7.95\ X\ 10^{-10} material\ releases} = 1{,}257{,}861{,}635 \frac{trips}{material\ release}$
- $\frac{43\ trains}{day} X \frac{7\ days}{week} X \frac{52\ weeks}{year} = 15{,}652\ train\ trips/year$
- $\frac{1{,}257{,}861{,}635 \frac{trips}{material\ release}}{15{,}652\ train\ trips/year} = 80{,}364 \frac{years}{material\ release}$