

APPENDIX D

NOISE

dBFB ASSOCIATES

NOISE ANALYSIS REPORT

NOISE ANALYSIS REPORT

RIVERSIDE ALIVE

Riverside, CA

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Executive Summary	1
1.0 Environmental Noise Background	3
1.1 Project Summary	6
2.0 Regulatory Framework.....	13
2.1 City of Riverside	13
2.2 State of California	14
3.0 Environmental Setting and Existing Conditions	15
3.1 Existing Conditions	15
3.2 Ambient Sound Level Measurements	15
4.0 Potential Noise Impacts	18
4.1 Vehicular Traffic Noise.....	18
4.2 Operational (Non-Construction) Noise	20
4.3 Construction Noise	21
5.0 Recommendations.....	23
5.1 Vehicular Traffic Noise.....	23
5.2 Operational (Non-Construction) Noise	23
5.3 Construction Noise	23
6.0 References	24
7.0 List of Preparers	25

Tables

Table 1. Sound Levels of Typical Noise Sources and Noise Environments	4
Table 2. Sound Level Measurements (dBA)	16
Table 3. Project Land Use Compatibility	19
Table 4. Project-Generated Traffic Noise Levels.....	21
Table 5. Grading Noise Source Levels.....	22

Figures

Figure 1. Vicinity Map	2
Figure 2. Sound Level Measurement Locations.....	17

Appendices

Appendix A. Roadway Noise Calculations	
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EXECUTIVE SUMMARY

This analysis evaluates noise associated with the implementation of the proposed Riverside Alive project. The project proposes development of a combination of infill residential, office, retail, and hotel uses; a Convention Center expansion; and new parking facilities. The project site is bounded by Third Street, Fifth Street, Orange Street, and Market Street, in downtown Riverside, California (Figure 1).

Future exterior noise levels at project land uses would be as high as 68 dBA Ldn / CNEL, and would be considered Conditionally Acceptable by the City per Figure N-10 in the Noise Element of its General Plan.

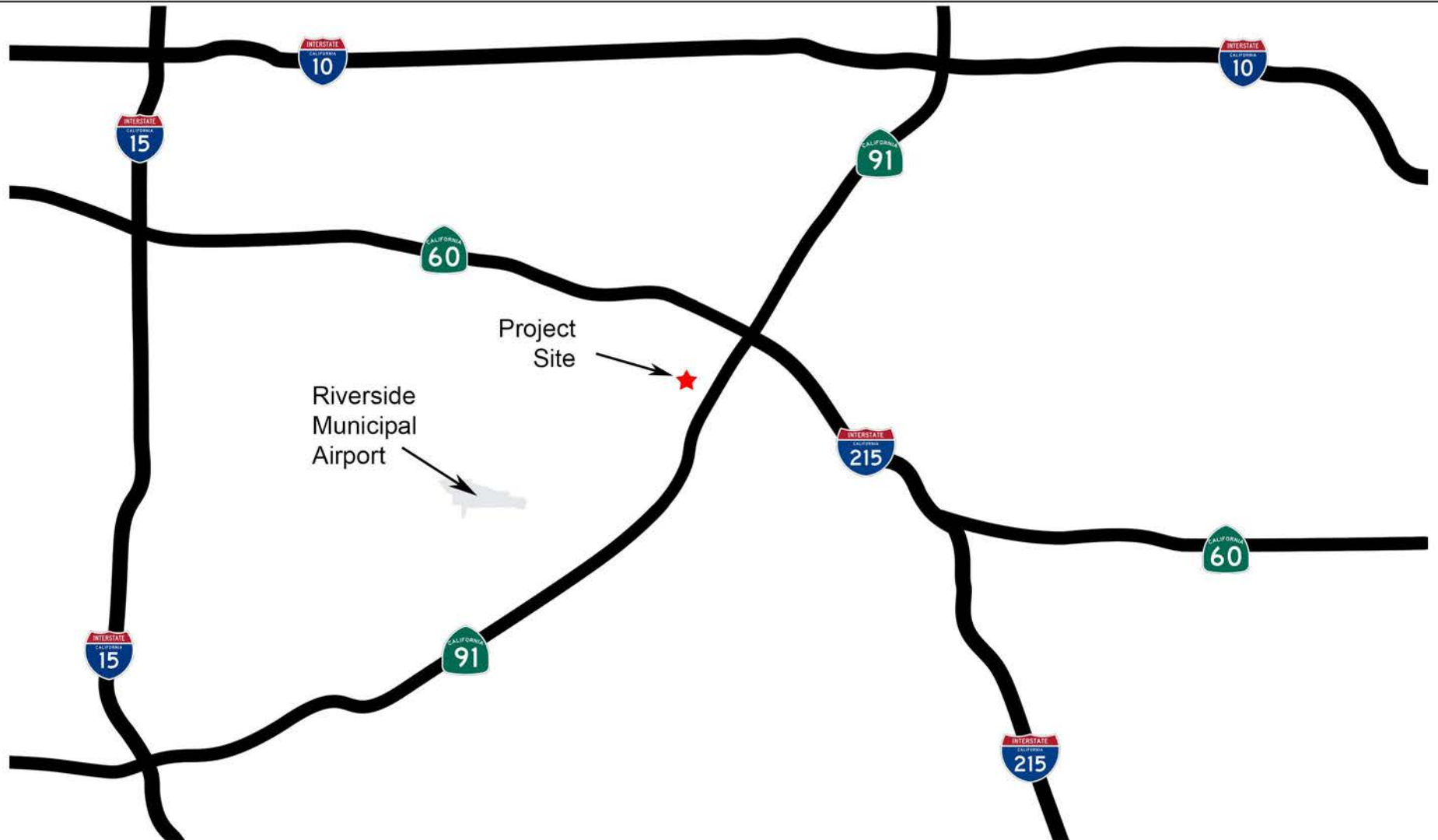
Future exterior noise levels would exceed 60 dBA Ldn / CNEL at some building façades. Therefore, interior noise levels in habitable rooms could exceed the Riverside Municipal Code (RMC) Section 16.08.175 and California Building Code (CBC) Section 1206.4 requirement of 45 dBA Ldn / CNEL. To comply with this requirement, an acoustical analysis shall be conducted prior to the issuance of a building permit to confirm that the final design of project buildings noise incorporates noise reducing measures and insulation such that the interior noise level would be at or below 45 CNEL. These measures may include items such as upgraded building façade elements (windows, doors, and/or exterior wall assemblies) with STC ratings of 35. If the interior noise limit can be achieved only with the windows closed, the building design must include mechanical ventilation that meets CBC requirements. Implementation of these measures would ensure that interior noise levels would be 45 dBA Ldn / CNEL or below in residences, and the project would comply with the RMC Section 16.08.175 and CBC Section 1206.4 requirement. Transportation noise impacts affecting the project site would be less than significant.

Project operation would not exceed the RMC Section 7.25.010 limits of 55 / 45 dBA during daytime / nighttime hours. Project-generated operational noise impacts would be less than significant.

Project-generated traffic would result in increases of 3 dBA Ldn / CNEL or less along most project roadways and would be not perceptible to the average person. Along roadway segments that would experience more than a 3-dBA increase, the existing + project noise level would not exceed Normally Compatible noise levels as set forth in the Noise Element of the Riverside General Plan. Project-generated traffic noise would be less than significant.

Project construction would occur between 7:00 a.m. and 7:00 p.m. on weekdays or between 8:00 a.m. and 5:00 p.m. on Saturdays. Project construction would comply with RMC Section 7.35.020(G). Project construction noise impacts would be less than significant.

*Riverside Alive
Noise Analysis*



1.0 ENVIRONMENTAL NOISE BACKGROUND

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound typically associated with human activity and that interferes with or disrupts normal activities. The human environment is characterized by a certain consistent noise level which varies with each area. This is called ambient noise. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, perceived importance of the noise and its appropriateness in the setting, time of day and type of activity during which the noise occurs, and sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in cycles per second, or hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and would likely evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would cause a community response [Caltrans 2013a]. Sound levels of typical noise sources and environments are provided in Table 2.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. A simple rule is useful, however, in dealing with sound levels. If a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example, $60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}$, and $80 \text{ dB} + 80 \text{ dB} = 83 \text{ dB}$. The normal human ear can detect sounds that range in frequency from about 20 Hz to 20,000 Hz.

However, all sounds in this wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the range of 1,000 Hz to 4,000 Hz. This frequency dependence can be taken into account by applying a correction to each frequency range to approximate the human ear's sensitivity within each range. This is called A-weighting and is commonly used in measurements of community environmental noise. The A-weighted sound pressure level (abbreviated as dBA) is the sound level with the "A-weighting" frequency correction. In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Table 1. Sound Levels of Typical Noise Sources and Noise Environments

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140 Decibels	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud Threshold of Pain
Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud Very Loud
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Noisy Urban Daytime	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)	Commercial Areas	70	Reference Loudness Moderately Loud
Normal Speech (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud Quiet
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud Just Audible
		0	1/64 as loud Threshold of Hearing

Source: Compiled by dBF Associates, Inc.

Because community noise fluctuates over time, a single measure called the Equivalent Sound Level (Leq) is often used to describe the time-varying character of community noise. The Leq is the energy-averaged A-weighted sound level during a measured time interval, and is equal to the level of a continuous steady sound containing the same total acoustical energy over the averaging time period as the actual time-varying sound. Additionally, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the Lmax and Lmin indicators, which represent the root-mean-square maximum and minimum noise levels obtained during the measurement interval. The Lmin value obtained for a particular monitoring location is often called the “acoustic floor” for that location.

To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. They are the noise levels equaled or exceeded during 10, 50, and 90 percent of a stated time, respectively. Sound levels associated with L10 typically describe transient or short-term events, whereas levels associated with L90 describe the steady-state (or most prevalent) noise conditions.

The Community Noise Equivalent Level (CNEL) is a descriptor representing a 24-hour, time-weighted, annual average noise level based on the “A-weighted” decibel. In the calculation process, noise occurring in the evening time period (7 p.m. to 10 p.m.) is penalized by adding 5 dB, while noise occurring in the nighttime period (10 p.m. to 7 a.m.) is penalized by adding 10 dB. These time periods and decibel increases are intended to reflect a typical person's increased sensitivity to noise during late-night and early morning hours. This descriptor is used by the State of California to evaluate land-use compatibility with regard to noise.

The Day-Night Average Sound Level (Ldn or DNL) is also an adjusted average A-weighted sound level for a 24-hour day, similar to CNEL. It is calculated by adding a 10-dB adjustment to sound levels during nighttime hours (10:00 p.m. to 7:00 a.m.); there is no adjustment applied to evening hours. This descriptor is used by the City of Riverside to evaluate land-use compatibility with regard to noise. DNL is considered to be reasonably equivalent to CNEL.

Sound Transmission Class (STC) is a single-number rating of the effectiveness of a material or construction assembly to impede the transmission of airborne sound.

1.1 Project Summary

Project Location

3637 Fifth Street, Riverside CA 92501

Assessor Parcel Numbers (APNs) 213-111-011, 213-111-012, 213-111-014, 213-111-015, 213-111-016

The Project site comprises approximately 10 acres, bounded by Third Street, Fifth Street, Market Street and Orange Street.

Description of Project

The City of Riverside is considering the development of a new mixed-use entertainment and hospitality Project, referred to as the Riverside Alive Project (Project). The Project proposes to include a combination of residential, office, retail, and hotel uses; a Convention Center expansion; and new parking facilities. No specific development application is currently under consideration. The analysis for the Project described below is being conducted on “development envelopes” based on the maximum areas or densities that could be accommodated on the Project site instead of on specific project details. The intent of the Project Description is to provide the public and decision makers with an idea as to what a future Project could entail, if approved.

Existing Setting and Project Site Conditions

The City of Riverside (City) is in the northwestern portion of Riverside County. The City is bounded on the north by the Cities of Jurupa Valley, Colton, and Grand Terrace and the unincorporated community of Highgrove, to the east by the City of Moreno Valley, to the south by the unincorporated communities of Woodcrest and El Sobrante, and to the west by the Cities of Corona and Norco.

The existing Project site is approximately 10-acres within Downtown Riverside and includes the city-owned Parking Lot 33 (Lot 33), the Riverside Convention Center, and Outdoor Plaza in front of the Riverside Convention Center. The existing Riverside Convention Center offers both indoor and outdoor meeting space. The flexible indoor space of the Convention Center consists of approximately 50,000-square-feet of exhibition/meeting space with additional pre-function area and 40,000 square feet of back-of-house area. The Outdoor Plaza is approximately 48,000 square feet of grass and concrete outdoor gathering space and passive park area.

Lot 33 is a surface parking lot owned and operated by the City of Riverside and provides accessible parking for Convention Center visitors and Downtown visitors while also providing additional parking for Downtown residents, businesses, and employees. Lot 33 is one of four public parking facilities in the Downtown area that provides electric vehicle charging stations (EVCSs). Lot 33 consists of 498 parking stalls, of which 18 are Americans with Disability Act (ADA) accessible stalls and one EVCS stall. Lot 33 can be accessed through two full access driveways, one along Market Street (mainly utilized during event parking) and one along Third Street which is signalized.

Demolition

The proposed Project would include the demolition of the existing surface parking lot (Lot 33) and Outdoor Plaza. The area being demolished would be fenced with windscreen material to obscure views of the site during construction. The Project may reuse crushed concrete and asphaltic concrete materials from demolition during Project construction. The existing Riverside Convention Center building would not be demolished as part of this Project; it would be joined with the proposed building in a minimally invasive way so that the existing building could remain open during construction which would eliminate the need to cancel or reschedule events.

Project Characteristics

The Project proposes a combination of residential, office, retail, and hotel uses; a Convention Center expansion; and new parking facilities. No specific development application is currently under consideration; however, in order to determine a logical land use mix and buildout of the approximately 10-acre site, conceptual-level buildout details have been compiled. The following description is based on assumptions of the maximum size of the proposed land uses within the Project, but also tempered with some detail in size and intensities for use in the analysis. These maximum “development envelopes” along with some of the reasonable details for the residential and non-residential uses are presented in Table A – Proposed Project Uses.

Table A, Proposed Project Uses

Land Use Type		Maximum Dwelling Units/Rooms/Spaces	Maximum Square Footage
Residential Units (168 total)	Condominiums	55	
	Multi-Family Residential	113	
Non-Residential	Hotel	376	
	Office		220,000
	Commercial Retail Uses		
	<i>Restaurant-Focused Retail</i>		12,875
	<i>Grocery Store</i>		20,690
	<i>Fitness Center</i>		28,416
	Parking Facilities	Up to 5 levels	
	Convention Center Expansion		189,000

Residential

The residential component of the proposed Project would include the development of up to 168 residential units. The 168 residential unit total would consist of a mix of for-sale (condominiums) and for-rent housing (multi-family apartments) products. To be as specific as possible for the analysis, it is presumed that 113-units of multi-family residential would be located within one building at the southeast corner of Market Street and Third Street. The multi-family apartment building is expected to be 9 floors and approximately 95-feet tall. The multi-family building would also include a ground floor lobby and space for a restaurant. The 55 condominium units are proposed to be located on the top two levels of the

full-service hotel building, which is proposed to be located along Third Street. The Hotel building, described below, and the two floors of condominiums would be approximately 95-feet tall. A rooftop pool and deck may also be included to accompany the condominiums.

Hotel

The proposed Project would include two full-service hotel buildings which would provide a total of up to 376 guest rooms and extended stay accommodations. A 208-room full-service hotel would be located within one building along Third Street expected to be approximately 95-feet tall. The full-service hotel would include a lobby and restaurant space on the ground floor and five floors of guest rooms. A second, 168-room extended stay hotel would be within a separate building expected to be approximately 95-feet tall located on the interior of the Project site south of the full-service hotel and east of the multi-family residential building. The 168-extended stay hotel would also include a small, local-serving grocery store and a fitness center on the first two levels.

Office

The proposed Project would also include up to approximately 220,000 square feet of Class A office space in a building up to 14 stories tall / approximately 155-feet tall. The office building would be clad in high-performance glass and is located on the interior of the Project site south of the extended stay hotel building and across from the existing Riverside Convention Center building.

Commercial Retail Uses

The Project proposes up to 62,000 square feet of commercial retail uses that may include a combination of retail, restaurant, entertainment and personal services. Although detailed site plans and tenants are not available and would be defined during the subsequent entitlement process, the mix of potential uses currently presumed is described below.

Restaurant-Focused Retail

Approximately 12,875 square-feet of restaurant-focused retail space is presumed, which can accommodate several restaurant users to complement the existing dining options in the Downtown area. These restaurant uses would be integrated into the first floor of the proposed buildings for residential, office, and hotel uses.

Grocery Store

An approximately 20,690 square-foot grocery store is presumed on the ground floor of the extended stay hotel building that would be accessible for both the proposed Project's residential uses and visitors and the existing community.

Fitness Center

An approximately 28,416 square-foot fitness center is presumed on the second level of the extended stay hotel building (above the proposed grocery store).

Subterranean Parking Facility

The Project includes a subterranean parking structure below the proposed residential, office, and hotel buildings that would include up to five levels and be a maximum depth of 53 feet below ground surface (bgs).

Convention Center Expansion

The existing Riverside Convention Center is approximately 108,000-gross-square-foot building that offers approximately 50,000 square-feet of indoor space for exhibit hall, ballroom, and meeting areas, plus additional area for pre-function and concourse space. The building also includes back-of-house storage space, service corridors, administration area, kitchen facilities, and a loading dock. The proposed Project includes a new 189,000-gross-square-foot expansion that would be joined to the existing 108,000-gross-square-foot building. The new building would add 100,000 square-feet of rentable function space for exhibit, ballroom and meeting areas increasing the total Convention Center function space to approximately 150,000 square feet and the overall gross square footage of the Convention Center to approximately 297,000 square feet.

Vehicular Circulation and Site Access

Regional access to the Project site is provided via State Route 91 (SR-91) and State Route 60 (SR-60). The nearest SR-91 ramps are located at Mission Inn Avenue located approximately 0.3 miles to the southeast. The nearest SR-60 ramps are located at Main Street approximately 0.90 miles north of the Project site. Safety improvements are planned by the City as part of a separate project on Main Street from the proposed Project site to the SR-60, approximately 0.90 miles, to reduce the road from 4-lanes to 2-lanes divided by a traffic median with additional parking, landscaping, and pedestrian walkways. Construction of these improvements is scheduled to be complete by February 2027.

Local access to the Project site is provided via Main Street, Third Street, Fifth Street, Market Street and Orange Street. These streets are fully improved with sidewalks, curbs and gutters on both sides of the streets.

With the demolition of Lot 33, the two existing driveways at the intersection of Third Street and Main Street and on Market Street would be removed. Vehicular access into the Project site and proposed parking structure is proposed via the driveways that serve the existing Marriot Hotel on Market Street and Fifth Street. There would be three new vehicle loading and drop-off/pick-up areas along Third Street and Market Street in front of the new convention center building, hotel, and multi-family residential building. Existing vehicle loading and drop-off/pick-up areas along Fifth Street would remain in place. The vehicle loading area that serves the existing Convention Center building on Orange Street would remain. No new vehicle loading, and drop-off/pick-up areas are proposed on Orange Street.

The proposed transportation improvements listed below modify existing two-way stop-controlled intersections with right-turn only restrictions:

- Market Street at Eleventh Street Intersection
 - Implement a right-turn-only restriction on Eleventh Street during peak AM and PM hours, at a minimum, with clearly indicated pavement markings and signage.
- Market Street at Thirteenth Street Intersection
 - Implement a right-turn-only restriction on Thirteenth Street during peak AM and PM hours, at a minimum, with clearly indicated pavement markings and signage.

Public Transit

The Project area is currently served by the Riverside Transit Agency (RTA). Routes 12, 29 and 204 all travel along Market Street; however, only Routes 12 and 29 have a stop both north and southbound along Market Street. The nearest bus stops along Market Street and Third Street (along the Project frontage), Market Street and Fourth Street and Market Street and Sixth Street. The existing bus shelter near the corner of Market Street and Third Street would be protected in place; this stop may be temporarily relocated or closed during construction of the Project and would be coordinated with Riverside Transit Authority (RTA).

Pedestrian Circulation and Site Access

The Project would provide several pedestrian pathways to facilitate the movement of pedestrians within the site and provide connection to the existing sidewalks along Third Street, Fifth Street, Market Street and Orange Street. These pathways would be lit to ensure security.

New Outdoor Plaza

The Project proposes an Outdoor Plaza that connects residents and visitors to the existing and proposed uses and would contain flexible outdoor gathering space. The outdoor plaza area may be partially covered or wholly uncovered and is intended to be fully programmable for outdoor events on an intermittent basis. Partially covered structures may include an amphitheater.

Lighting

The proposed Project would include exterior building lights and pedestrian lighting for safety and security purposes within parking facilities, along pathways, and on buildings. All light sources would be shielded so that the light is directed away from streets and adjoining properties. Further, all light fixtures would be required to be consistent with the City of Riverside Municipal Code – Title 19, Zoning Code for illumination. Existing streetlights are located along Third Street, Fifth Street, Market Street and Orange Street within the right-of-way, no changes are anticipated.

Utilities

As the Project is an existing developed site in Downtown Riverside there are existing utilities within and around the site. The site is served by Riverside Public Utilities (RPU) for water and electric, discussed below and Southern California Gas for natural gas. Existing utility facilities on-site may be removed, replaced or relocated to provide connection to the new buildings proposed by the Project. No new services are expected; rather moving around utility connections are expected and would be determined as specific buildings and facilities undergo specific entitlement and engineering processing in the future. The potential off-site improvements anticipated for this Project are further described below.

Water

Public water service would be provided by RPU via connection to existing pipelines on Third Street with possible connection within other streets. To serve this Project, off-site upgrades would be required to the existing water main within Third Street and it would be upsized to an 18-inch diameter water main (between Orange Street and Market Street).

Wastewater

Wastewater treatment for the Project would be provided by the City Public Works Department at the Riverside Regional Water Quality Control Plant. The proposed Project would connect to an existing 12-inch sewer line located on Market Street. Given the potential demand from the Project, approximately 1,700 feet of the existing 12-inch sewer line may need to be upsized to 15-inch from 11th Street to Mission Inn Avenue.

Stormwater Facilities

The proposed Project would provide new on-site drainage facilities and would be required to reduce pollutants in urban runoff through implementation of best management practices (BMPs) and low-impact development (LID) principles outlined in project-specific Water Quality Management Plans (WQMPs) for future development proposals.

Electricity

RPU provides electrical services to the Project site. All electrical facilities would connect to existing connections along Orange Street or Third Street. RPU has sufficient capacity to serve the estimated electrical load of the Project site, but would require electrical network reconfiguration to maintain reliability and resiliency. This would require civil and electrical infrastructure improvements to existing facilities such as pad-mounted switches, transformers, pad-mounted capacitor bank and other related utility distribution equipment on-site or along the Project frontage and would be determined during subsequent entitlement and engineering processing for future development applications.

Natural Gas

Southern California Gas provides natural gas service to the Project site. The City requires building electrification in certain newly constructed buildings (RMC, Ch. 16.26). New building permits filed after January 6, 2023 for buildings three stories or less require electrification and buildings four or more stories are subject to this requirement in January 2026. However, the City Council adopted an Ordinance on July 2, 2024, repealing Chapter 16.26 of the Riverside Municipal Code. As such, natural gas may be utilized in all buildings.

Construction

Project construction is anticipated to occur in one phase over a 3-year time span. Due to the subterranean parking facilities, the Project may require approximately 500,000 cubic yards of soil excavation and export. The construction fleet may vary due to project needs at the time of construction; however, typical construction equipment and vehicle usage is anticipated may include, but not be limited to excavators, rubber-tired dozers/loaders, cranes, scrapers, motor graders, forklifts, concrete trucks, and other material-delivery vehicles.

Offsite Improvements

Offsite improvements are related to water and sewer facility upgrades, as described above.

2.0 REGULATORY FRAMEWORK

2.1 City of Riverside

2.1.1 Project Noise Exposure

The Noise Element of the Riverside General Plan [2018] does not provide Noise / Land Use Compatibility Criteria for multifamily residential land uses. It was assumed that the criteria for Infill Single Family Residential could be considered applicable; at this land use, noise levels up to 65 dBA Ldn / CNEL are considered Normally Acceptable, and noise levels between 65-75 dBA Ldn / CNEL are considered Conditionally Acceptable.

At Commercial – Motels, Hotels, Transient Lodging land uses, the Noise Element indicates that noise levels up to 60 dBA Ldn / CNEL are considered Normally Acceptable, and noise levels between 60-70 dBA CNEL are considered Conditionally Acceptable.

At Amphitheater and Meeting Hall land uses, the Noise Element indicates that noise levels up to 65 dBA Ldn / CNEL are considered Conditionally Acceptable.

Riverside Municipal Code (RMC) Section 16.08.175(B)(2) specifies noise standards for new dwellings:

Interior day-night average sound levels (Ldn) with windows closed, attributable to exterior sources shall not exceed an Ldn of forty-five decibels (dBA) in any habitable room.

Section 16.08.175(B)(5) requires submittal of an acoustical analysis report with the application for a building permit.

2.1.2 Project Noise Generation

RMC Section 7.25.010 specifies standards for operational noise sources. At the property line of residential land uses, the noise limit is 55 dBA during daytime hours of 7:00 a.m. to 10:00 p.m. and 45 dBA during nighttime hours of 10:00 p.m. to 7:00 a.m. At the property line of office / commercial land uses, the noise limit is 65 dBA at any time.

RMC Section 7.35.020(G) indicates that construction between 7:00 a.m. and 7:00 p.m. on weekdays or between 8:00 a.m. and 5:00 p.m. on Saturdays is exempt from noise limits.

RMC Section 7.35.020(E) indicates that work in City rights-of-way causing traffic congestion and/or hazardous or unsafe conditions is exempt from noise limits.

2.2 State of California

2.2.1 Residential / Lodging

California Building Code (CBC), Chapter 12: Interior Environment, Section 1206: Sound Transmission regulates noise levels in buildings with multiple habitable units [State of California 2022]. Relevant portions are reproduced below.

1206.4 Allowable interior noise levels. Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan.

3.0 ENVIRONMENTAL SETTING AND EXISTING CONDITIONS

Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise.

3.1 Existing Conditions

The project site is currently developed with a convention center, parking lot, and plaza. Noise-sensitive land uses in the project area include single- and multi-family residences and hotels in various directions. The primary existing noise source in the vicinity of the project is vehicular traffic on surface streets.

3.1.1 Vehicular Traffic

Third Street is adjacent to the project site on the north, with one westbound and two eastbound through lanes. Its posted speed limit is 30 miles per hour (mph). The existing vehicle mix is approximately 93.5% cars, 4% medium trucks, and 2.5% heavy trucks, based on observations made during the site visit.

Fifth Street is adjacent to the project site on the south, with one westbound and one eastbound through lane. Its speed limit is unposted; typical traffic was observed at 25 mph. The existing vehicle mix is approximately 95% cars and 5% medium trucks, based on observations made during the site visit.

Orange Street is adjacent to the project site on the east, with one northbound and one southbound through lane. Its posted speed limit is 25 mph. The existing vehicle mix is 100% cars, based on observations made during the site visit.

Market Street is adjacent to the project site on the west, with two northbound and two southbound through lanes. Its posted speed limit is 35 mph. The existing vehicle mix is approximately 98% cars, 1% medium trucks, and 1% heavy trucks, based on observations made during the site visit.

3.2 Ambient Sound Level Measurements

Ambient sound level measurements were conducted to estimate the existing acoustical environment on the project site. A RION Model NL-31 American National Standards Institute (ANSI) Type 1 Integrating Sound Level Meter (SLM) was used as the data-collection device. The meter was mounted on a tripod roughly 5 feet above ground to simulate the average height of the human ear. The microphone was fitted with a windscreen. The sound level meter was calibrated before the measurement periods. Simultaneous traffic counts were conducted during the measurement periods. The measurement results are summarized in Table 2 and correspond to the locations depicted on Figure 2.

Table 2. Sound Level Measurements (dBA)

Measurement Location		Date / Time	Leq	Lmin	Lmax	L10	L50	L90	Traffic
ML1	Southeast corner	2024-03-27 12:20 – 12:35	57.4	49.0	72.7	59.7	53.4	50.5	Fifth Street: 44 / 2 / 0 Orange Street: 20 / 0 / 0
ML2	Southwest corner	2024-03-27 12:40 – 12:50	55.4	48.8	69.2	58.2	52.6	50.2	Fifth Street: 14 / 1 / 0
ML3	Northwest corner	2024-03-27 13:15 – 13:25	68.5	57.7	87.5	70.0	65.0	59.9	Market Street: 165 / 2 / 2 Third Street: 85 / 1 / 1
ML4	Northeast corner	2024-03-27 13:30 – 13:40	67.0	52.1	90.2	69.4	64.5	56.9	Third Street: 127 / 8 / 4 Orange Street: 10 / 0 / 0

Note: Traffic reported in cars / medium trucks / heavy trucks.

*Riverside Alive
Noise Analysis*



FIGURE 2
Sound Level Measurement Location

4.0 POTENTIAL NOISE IMPACTS

4.1 Vehicular Traffic Noise

The Federal Highway Administration (FHWA) Traffic Noise Model (TNM) version 2.5 was used to estimate traffic noise levels. The modeling effort considered the peak-hour traffic volume, average estimated vehicle speed, and estimated vehicle mix, i.e., percentage of cars, medium trucks, heavy trucks, buses, and motorcycles. The peak hour traffic noise level is considered equivalent to the Ldn / CNEL [24 CFR §51.106]. The model was calibrated using actual traffic counts and sound level measurements. Modeled sound levels were within 2 dBA of measured sound levels; accordingly, no adjustment was made to future modeled levels. Future vehicular traffic calculations are summarized in Appendix A.

Sound levels caused by line sources (i.e., variable or moving sound sources such as traffic) generally decrease at a rate of 3 to 4.5 dBA when the distance from the road is doubled, depending on the ground surface hardness between the source and the receiving property [Caltrans 2013a]. The model assumed “pavement” propagation conditions, which corresponds to a drop-off rate of approximately 3 dBA per doubling of distance. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures (walls and buildings), barriers, and topography. The noise attenuating effects of changes in elevation, topography, and intervening structures were not included in the model. Therefore, the modeling effort is considered a worst-case representation of the roadway noise.

4.1.1 Traffic Noise Affecting the Project Site

The future noise environment would continue to be a result of vehicular traffic.

Third Street is projected to carry a future (Cumulative Conditions plus Project 2045) PM peak-hour volume of 1,638 vehicles between Market Street and Main Street, and 1,950 vehicles between Main Street and Orange Street [WEBB 2024]. The existing speed limit of 30 mph and traffic mix of approximately 93.5% cars, 4% medium trucks, and 2.5 % heavy trucks were assumed to remain constant in the future.

Fifth Street is projected to carry a future (Cumulative Conditions plus Project 2045) PM peak-hour volume of 621 vehicles west of Orange Street [WEBB 2024]. The existing speed of 25 mph and traffic mix of approximately 95% cars and 5% medium trucks were assumed to remain constant in the future.

Orange Street is projected to carry a future (Cumulative Conditions plus Project 2045) PM peak-hour volume of 293 vehicles between Third Street and Fourth Street, and 359 vehicles between Fourth Street and Fifth Street [WEBB 2024]. The existing speed limit of 25 mph and traffic mix of 100% cars were assumed to remain constant in the future.

Market Street is projected to carry a future (Cumulative Conditions plus Project 2045) PM peak-hour volume of 2,152 vehicles between Third Street and Fourth Street [WEBB 2024]. The existing speed limit of 35 mph and traffic mix of approximately 98% cars, 1% medium trucks, and 1% heavy trucks were assumed to remain constant in the future.

Future exterior roadway noise levels at proposed project land uses are shown in Table 3.

Table 3. Project Land Use Compatibility

Project Land Use	Noise Level at Property Line	Threshold(s)	Compatibility
Hotel and apartments along Third Street west segment	68 dBA CNEL	<u>Hotel</u> Normally Compatible = up to 60 dBA CNEL Conditionally Compatible = 60-70 dBA CNEL <u>Apartments</u> Normally Compatible = up to 65 dBA CNEL Conditionally Compatible = 65-75 dBA CNEL	Conditionally Compatible
Hotel, apartments, and convention center along Third Street west segment	68 dBA CNEL	<u>Hotel</u> Normally Compatible = up to 60 dBA CNEL Conditionally Compatible = 60-70 dBA CNEL <u>Apartments</u> Normally Compatible = up to 65 dBA CNEL Conditionally Compatible = 65-75 dBA CNEL <u>Convention Center</u> Conditionally Compatible = up to 65 dBA CNEL	Conditionally Compatible
Amphitheater along Fifth Street	62 dBA CNEL	Conditionally Compatible = up to 65 dBA CNEL	Conditionally Compatible
Multi-family housing along Market Street	68 dBA CNEL	Normally Compatible = up to 65 dBA CNEL Conditionally Compatible = 65-75 dBA CNEL	Conditionally Compatible
Convention center along Orange Street	60 dBA CNEL	Conditionally Compatible = up to 65 dBA CNEL	Conditionally Compatible

Future exterior noise levels at proposed project land uses would be considered Conditionally Compatible.

4.1.2 Interior Noise

Because future exterior noise levels would exceed 60 dBA Ldn / CNEL at some residential and lodging building façades, interior noise levels in habitable rooms could exceed the RMC Section 16.08.175 and CBC Section 1206.4 requirement of 45 dBA Ldn / CNEL.

Per RMC Section 16.08.175, an acoustical analysis report must be submitted at the time of building permit application to provide evidence of compliance with the 45 dBA Ldn / CNEL requirement. To comply with this requirement, upgraded building façade elements (windows, doors, and/or exterior wall assemblies) with Sound Transmission Class (STC) ratings of 35 or higher may be necessary however, these ratings cannot be determined without substantially-complete building plans.

If the interior noise limit can be achieved only with the windows closed, the building design must include mechanical ventilation that meets CBC requirements.

Implementation of these measures would ensure that interior noise levels would be 45 dBA Ldn / CNEL or below in habitable rooms, and the project would comply with the RMC Section 16.08.175 and CBC Section 1206.4 requirement.

The project would result in a less than significant interior noise impact with project features incorporated in accordance with the interior noise analysis.

4.2 Operational (Non-Construction) Noise

4.2.1 Mechanical Equipment

The mechanical systems for the project have not been designed. They would be selected and positioned such that the noise levels would be lower than the allowable levels of 55 dBA during daytime hours and 45 dBA during nighttime hours. It was assumed that there would be no more than 10 pieces of mechanical equipment within any 100 square feet, each piece would be limited to 59 dBA at 3 feet, placed no closer than 25 feet from any property line, and shielded by a parapet wall with a minimum height equal to the equipment. Mechanical noise would be in compliance with RMC Section 7.25.010. Project mechanical noise impacts would be less than significant.

4.2.2 Outdoor Plaza / Amphitheater

The plaza is expected to be utilized for low-intensity community events, generally during daytime hours of 7:00 a.m. – 10:00 p.m. Occasional low-level public address / sound amplification equipment may be used; the event coordinator would be required to ensure that sound levels do not exceed 65 dBA at the surrounding commercial land uses, or 55 dBA / 45 dBA at residential land uses beyond during daytime / nighttime hours. Project event noise impacts would be less than significant.

4.2.3 Traffic

On all but five segments, the project would add a peak-hour volume of less than the existing volume. These growths in traffic would result in traffic noise increases of less than 3 dBA Ldn / CNEL; as such, they would be not perceptible to the average person and less than significant.

The remaining segments are detailed in Table 4. Along all segments, the existing + project noise level would not exceed a level considered Normally Compatible with the adjacent land use. Project-generated traffic noise would be less than significant.

Table 4. Project-Generated Traffic Noise Levels

Roadway	Segment	Existing Peak-Hour Traffic Volume	Existing Noise Level at 50'	Project Peak-Hour Traffic Volume	Existing + Project Noise Level at 50'	Significant?
Orange Street	Third Street – Fourth Street	122 (AM)	50 dBA	133	53 dBA	No
	Fourth Street – Fifth Street	120 (AM)	50 dBA	214	55 dBA	No
		162 (PM)	51 dBA	168	55 dBA	No
	Fifth Street – Sixth Street	73 (AM)	48 dBA	413	56 dBA	No
		136 (PM)	51 dBA	354	56 dBA	No
	Sixth Street – Mission Inn Avenue	85 (AM)	49 dBA	412	56 dBA	No
185 (PM)		52 dBA	354	57 dBA	No	
Fifth Street	Market Street – Orange Street	198 (AM)	54 dBA	438	60 dBA	No
		222 (PM)	55 dBA	360	59 dBA	No

4.3 Construction Noise

The primary noise source from project construction would be from site preparation. Grading could require the use of heavy equipment such as bulldozers, loaders, and scrapers. No blasting would be necessary. Haul trucks could be used to import or export fill to or from the project site.

Construction of the project would generate a short-term temporary increase in noise in the project area. The increase in noise level would be primarily experienced close to the noise source. The magnitude of the impact would depend on the type of construction activity, noise level generated by various pieces of construction equipment, duration of the construction phase, acoustical shielding and distance between the noise source and receiver.

Construction activity and delivery of construction materials and equipment would be limited to between 7:00 a.m. and 7:00 p.m. on weekdays, or between 8:00 a.m. and 5:00 p.m. on Saturdays, except on holidays.

This project would implement conventional construction techniques and equipment. Standard equipment such as scrapers, graders, backhoes, loaders, tractors, cranes, and miscellaneous trucks would be used for construction of most project facilities. Sound levels of typical construction equipment range from approximately 65–95 dBA at 50 feet from the source (U.S. Environmental Protection Agency [U.S. EPA] 1971). Worst-case noise levels are typically associated with grading. Noise sources associated with grading of the proposed project, and associated noise levels, are shown in Table 5.

Table 5. Grading Noise Source Levels

Noise Source	Noise Level	Number
Rubber Tired Dozer	80 dBA at 10 meters	1
Rubber Tired Loader	75 dBA at 10 meters	1
Excavator	78 dBA at 10 meters	2
Grader	80 dBA at 10 meters	1
Tractor / Loader / Backhoe	82 dBA at 10 meters	3
Scraper	80 dBA at 10 meters	2

Source: DEFRA 2005

During shoring of the underground parking structure, a percussion or vibratory hammer or a hydraulic driver / ram may be used; these generate noise levels of up to approximately 88 dBA at 10 meters. During building construction, there would be two cranes; these generate a noise level of up to approximately 78 dBA at 10 meters.

The Datakustik Cadna/A industrial noise prediction model was used to estimate construction noise levels. It was assumed that up to four pieces of equipment at any given time would operate continuously within the grading area boundary. No correction was applied for downtime associated with equipment maintenance, breaks, or similar situations. No noise reduction related to ground effects, atmospheric absorption, or intervening topography was included in the model.

The closest occupied residential properties are adjacent to the project site on the north and east. Without noise abatement, under the assumptions detailed above, project construction activity could produce noise levels ranging up to approximately 78 dBA Leq at the property lines of the residences.

Construction would occur between 7:00 a.m. and 7:00 p.m. on weekdays or between 8:00 a.m. and 5:00 p.m. on Saturdays. Therefore, per RMC Section 7.35.020(G), project construction is exempt from noise limits. Potential offsite improvements are exempt from noise limits per RMC Section 7.35.020(E). Project construction noise impacts would be less than significant.

5.0 RECOMMENDATIONS

5.1 Vehicular Traffic Noise

To comply with the RMC Section 16.08.175 and CBC Section 1206.4 requirement of 45 dBA Ldn / CNEL in residences, the necessary STC ratings of building façade elements will be determined in the required acoustical analysis report. Mechanical ventilation will be required as necessary. As such, interior noise levels would be 45 dBA Ldn / CNEL or below in residences, and the project would comply with the RMC Section 16.08.175 and CBC Section 1206.4 requirement.

No recommendations, mitigation, or project features are required.

5.2 Operational (Non-Construction) Noise

No recommendations, mitigation, or project features are required.

5.3 Construction Noise

No recommendations, mitigation, or project features are required.

6.0 REFERENCES

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7.0 LIST OF PREPARERS

Steven Fiedler, INCE
Principal, dBF Associates, Inc.

INPUT: ROADWAYS

Riverside Alive

dBF Associates, Inc. SPF				2 December 2024 TNM 2.5								
INPUT: ROADWAYS							Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA					
PROJECT/CONTRACT:		Riverside Alive										
RUN:		Measured - ML1 & ML3										
Roadway Name		Points		Coordinates (pavement)			Flow Control			Segment		
		Width	Name	No.	X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
		ft			ft	ft	ft		mph	%		
Third Avenue EB1		12.0	point1	1	0.0	734.0	0.00				Average	
			point2	2	1,000.0	734.0	0.00					
Third Avenue EB2		12.0	point3	3	0.0	724.0	0.00				Average	
			point4	4	1,000.0	724.0	0.00					
Third Avenue WB		12.0	point15	15	1,000.0	758.0	0.00				Average	
			point16	16	0.0	758.0	0.00					
Fifth Avenue EB		12.0	point17	17	0.0	-30.0	0.00				Average	
			point18	18	1,000.0	-30.0	0.00					
Fifth Avenue WB		12.0	point19	19	1,000.0	-42.0	0.00				Average	
			point20	20	0.0	-42.0	0.00					
Market Street NB1		12.0	point21	21	-40.0	-500.0	0.00				Average	
			point22	22	-40.0	1,200.0	0.00					
Market Street NB2		12.0	point23	23	-30.0	-500.0	0.00				Average	
			point24	24	-30.0	1,200.0	0.00					
Market Street SB1		12.0	point25	25	-60.0	1,200.0	0.00				Average	
			point26	26	-60.0	-500.0	0.00					
Market Street SB2		12.0	point27	27	-70.0	1,200.0	0.00				Average	
			point28	28	-70.0	-500.0	0.00					
Orange Street NB		12.0	point29	29	747.0	0.0	0.00				Average	
			point30	30	747.0	700.0	0.00					
Orange Street SB		12.0	point31	31	725.0	700.0	0.00				Average	
			point32	32	725.0	0.0	0.00					

INPUT: TRAFFIC FOR LAeq1h Volumes

Riverside Alive

dB Associates, Inc.			2 December 2024									
SPF			TNM 2.5									
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:			Riverside Alive									
RUN:			Measured - ML1 & ML3									
Roadway	Points											
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
			Autos									
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Third Avenue EB1	point1	1	170	30	2	30	2	30	0	0	0	0
	point2	2										
Third Avenue EB2	point3	3	170	30	2	30	2	30	0	0	0	0
	point4	4										
Third Avenue WB	point15	15	170	30	2	30	2	30	0	0	0	0
	point16	16										
Fifth Avenue EB	point17	17	88	25	4	25	0	0	0	0	0	0
	point18	18										
Fifth Avenue WB	point19	19	88	25	4	25	0	0	0	0	0	0
	point20	20										
Market Street NB1	point21	21	248	40	3	40	3	40	0	0	0	0
	point22	22										
Market Street NB2	point23	23	248	40	3	40	3	40	0	0	0	0
	point24	24										
Market Street SB1	point25	25	248	40	3	40	3	40	0	0	0	0
	point26	26										
Market Street SB2	point27	27	248	40	3	40	3	40	0	0	0	0
	point28	28										
Orange Street NB	point29	29	40	25	0	0	0	0	0	0	0	0
	point30	30										
Orange Street SB	point31	31	40	25	0	0	0	0	0	0	0	0
	point32	32										

INPUT: RECEIVERS

Riverside Alive

dBF Associates, Inc.												
SPF												
INPUT: RECEIVERS												
PROJECT/CONTRACT:	Riverside Alive											
RUN:	Measured - ML1 & ML3											
Receiver												
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active	
			X	Y	Z	above	Existing	Impact Criteria		NR	in	
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.	
			ft	ft	ft	ft	dBA	dBA	dB	dB		
ML1	1	1	700.0	0.0	0.00	5.00	57.40	66	10.0	8.0	Y	
ML2	4	1	300.0	0.0	0.00	5.00	55.40	66	10.0	8.0	Y	
ML3	5	1	0.0	700.0	0.00	5.00	68.50	66	10.0	8.0	Y	
ML4	6	1	700.0	700.0	0.00	5.00	67.00	66	10.0	8.0	Y	

RESULTS: SOUND LEVELS

Riverside Alive

dBF Associates, Inc.										2 December 2024			
SPF										TNM 2.5			
										Calculated with TNM 2.5			
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		Riverside Alive											
RUN:		Measured - ML1 & ML3											
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.					
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name		No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Increase over existing		Type	With Barrier		Noise Reduction		
					Calculated	Crit'n	Calculated	Crit'n	Impact	Calculated LAeq1h	Calculated	Goal	Calculated minus Goal
				dB	dB	dB	dB	dB		dB	dB	dB	dB
ML1		1	1	57.4	57.4	66	0.0	10	----	57.4	0.0	8	-8.0
ML2		4	1	55.4	59.2	66	3.8	10	----	59.2	0.0	8	-8.0
ML3		5	1	68.5	67.2	66	-1.3	10	Snd Lvl	67.2	0.0	8	-8.0
ML4		6	1	67.0	62.2	66	-4.8	10	----	62.2	0.0	8	-8.0
Dwelling Units			# DUs	Noise Reduction									
				Min	Avg	Max							
				dB	dB	dB							
All Selected			4	0.0	0.0	0.0							
All Impacted			1	0.0	0.0	0.0							
All that meet NR Goal			0	0.0	0.0	0.0							

INPUT: TRAFFIC FOR LAeq1h Volumes

Riverside Alive

dB Associates, Inc.			2 December 2024									
SPF			TNM 2.5									
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:			Riverside Alive									
RUN:			Measured - ML2 & ML4									
Roadway	Points											
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
			Autos		V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Third Avenue EB1	point1	1	254	35	16	35	8	35	0	0	0	0
	point2	2										
Third Avenue EB2	point3	3	254	35	16	35	8	35	0	0	0	0
	point4	4										
Third Avenue WB	point15	15	254	35	16	35	8	35	0	0	0	0
	point16	16										
Fifth Avenue EB	point17	17	42	25	6	25	0	0	0	0	0	0
	point18	18										
Fifth Avenue WB	point19	19	42	25	6	25	0	0	0	0	0	0
	point20	20										
Market Street NB1	point21	21	248	35	3	35	3	35	0	0	0	0
	point22	22										
Market Street NB2	point23	23	248	35	3	35	3	35	0	0	0	0
	point24	24										
Market Street SB1	point25	25	248	35	3	35	3	35	0	0	0	0
	point26	26										
Market Street SB2	point27	27	248	35	3	35	3	35	0	0	0	0
	point28	28										
Orange Street NB	point29	29	30	25	0	0	0	0	0	0	0	0
	point30	30										
Orange Street SB	point31	31	30	25	0	0	0	0	0	0	0	0
	point32	32										

RESULTS: SOUND LEVELS

Riverside Alive

dB Associates, Inc.													2 December 2024	
SPF													TNM 2.5	
													Calculated with TNM 2.5	
RESULTS: SOUND LEVELS														
PROJECT/CONTRACT:													Riverside Alive	
RUN:													Measured - ML2 & ML4	
BARRIER DESIGN:													INPUT HEIGHTS	
													Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.	
ATMOSPHERICS:													68 deg F, 50% RH	
Receiver														
Name		No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Increase over existing		Type	With Barrier					
					Calculated	Crit'n	Calculated	Crit'n	Impact	Calculated LAeq1h	Noise Reduction		Calculated	Goal
								Sub'l Inc			Calculated	Goal	Calculated minus Goal	
				dB	dB	dB	dB			dB	dB	dB	dB	dB
ML1		1	1	57.4	57.2	66	-0.2	10	----	57.2	0.0	8	-8.0	
ML2		4	1	55.4	58.4	66	3.0	10	----	58.4	0.0	8	-8.0	
ML3		5	1	68.5	67.9	66	-0.6	10	Snd Lvl	67.9	0.0	8	-8.0	
ML4		6	1	67.0	67.3	66	0.3	10	Snd Lvl	67.3	0.0	8	-8.0	
Dwelling Units			# DUs	Noise Reduction										
				Min	Avg	Max								
				dB	dB	dB								
All Selected			4	0.0	0.0	0.0								
All Impacted			2	0.0	0.0	0.0								
All that meet NR Goal			0	0.0	0.0	0.0								

INPUT: TRAFFIC FOR LAeq1h Volumes

Riverside Alive

dBF Associates, Inc.		2 December 2024										
SPF		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		Riverside Alive										
RUN:		Future										
Roadway	Points											
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
			Autos		V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Third Avenue EB1	point1	1	612	30	26	30	3	30	3	30	6	30
	point2	2										
Third Avenue EB2	point3	3	612	30	26	30	3	30	3	30	6	30
	point4	4										
Third Avenue WB	point15	15	612	30	26	30	3	30	3	30	6	30
	point16	16										
Fifth Avenue EB	point17	17	295	25	16	25	0	0	0	0	0	0
	point18	18										
Fifth Avenue WB	point19	19	295	25	16	25	0	0	0	0	0	0
	point20	20										
Market Street NB1	point21	21	528	35	5	35	5	35	0	0	0	0
	point22	22										
Market Street NB2	point23	23	528	35	5	35	5	35	0	0	0	0
	point24	24										
Market Street SB1	point25	25	528	35	5	35	5	35	0	0	0	0
	point26	26										
Market Street SB2	point27	27	528	35	5	35	5	35	0	0	0	0
	point28	28										
Orange Street NB	point29	29	180	25	0	0	0	0	0	0	0	0
	point30	30										
Orange Street SB	point31	31	180	25	0	0	0	0	0	0	0	0
	point32	32										

INPUT: RECEIVERS

Riverside Alive

							2 December 2024					
dBF Associates, Inc.												
SPF												
INPUT: RECEIVERS												
PROJECT/CONTRACT:		Riverside Alive										
RUN:		Future										
Receiver												
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active	
			X	Y	Z	above	Existing	Impact Criteria		NR	in	
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.	
			ft	ft	ft	ft	dBA	dBA	dB	dB		
N	1	1	350.0	700.0	0.00	5.00	0.00	66	10.0	8.0	Y	
S	4	1	400.0	0.0	0.00	5.00	0.00	66	10.0	8.0	Y	
E	5	1	700.0	350.0	0.00	5.00	0.00	66	10.0	8.0	Y	
W	6	1	0.0	450.0	0.00	5.00	0.00	66	10.0	8.0	Y	

RESULTS: SOUND LEVELS

Riverside Alive

dBF Associates, Inc.										2 December 2024			
SPF										TNM 2.5			
										Calculated with TNM 2.5			
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:										Riverside Alive			
RUN:										Future			
BARRIER DESIGN:										INPUT HEIGHTS			
										Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.			
ATMOSPHERICS:										68 deg F, 50% RH			
Receiver													
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Increase over existing		Type	With Barrier		Noise Reduction			
				Calculated	Crit'n	Calculated	Crit'n	Impact	Calculated LAeq1h	Calculated	Goal	Calculated minus Goal	
			dB	dB	dB	dB	dB		dB	dB	dB	dB	
N	1	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0	
S	4	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0	
E	5	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0	
W	6	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		4	0.0	0.0	0.0								
All Impacted		2	0.0	0.0	0.0								
All that meet NR Goal		0	0.0	0.0	0.0								