

Scope of Services

MEETING DATE: 10/08/2026
ITEM NO.: 3.
ATTACHMENT 2

Task 1. Project Management and Coordination

This task includes necessary activities to manage the Town and City-Wide Evacuation Plan with Simulation-Based Modeling project, including correspondence, invoicing, oversight, and quality assurance/quality control tasks to be conducted by the Dudek project manager and/or designee over the project period. If requested, Dudek will provide the necessary documentation to the Town of Los Gatos (Town) to support grant reporting. Project invoices will be submitted monthly and will include the supporting documentation required by the Town. Dudek Project Manager Jeremy Cawn will oversee Dudek's successful completion of all tasks and deliverables for this contract. Jeremy will direct Dudek's efforts in accordance with the project schedule and budget. We believe that frequent, responsive communication is the best management practice to keep the project moving forward, and we will apply this approach to this project. As the project manager, Jeremy will do the following:

- Establish a regular reporting and communication process for project status, budget, and schedule updates, and problem/resolution identification
- Hold a kickoff meeting with the project team
- Hold regular project management meetings with key project staff to coordinate work efforts, check on task completion, and review budget conformance
- Update the project scope, schedule, progress reports, and inventories of available data, as necessary, so that all team members are aware of information that may affect their work products and schedules

Deliverables

- Project plan (digital Word or PDF)
- Kickoff meeting agenda and minutes (digital Word or PDF)
- Monthly progress report and invoice (digital Word or PDF)

Assumptions

- The kickoff meeting will be scheduled for 60 minutes
- Weekly meetings will be scheduled for 30 minutes, unless otherwise requested by the Town

Task 2. Existing Conditions Report

To support the work in Task 4, Traffic Simulation Modeling, Dudek-CRA will develop an existing conditions report that will provide background and foundational research upon which to build evacuation and resilience strategies. This report will begin with an introduction, purpose, regulatory review, and relationship to existing plans. This will be followed by a high-level overview of Town-wide information, including socioeconomic characteristics and the natural and built environment. Dudek will utilize census data, land use and parcel data, and the existing safety element to understand community characteristics. Dudek will describe major wildfire events from the last ten years and discuss the impacts of these events on the Town's transportation network.

Additionally, as part of the existing conditions report, Dudek-CRA will evaluate the Town and City's existing evacuation zones to identify opportunities to improve zone structures during phased evacuations, in particular considering zones with constrained roadways and parcels and populations with access and functional needs. After an audit of the evacuation zones, as described in Task 2.3 below, Dudek-CRA will coordinate updated signal timing plans for the Town along key evacuation corridors. The following describes the regulatory and policy review,

community infrastructure risk assessment, and evacuation zone assessment that will be incorporated into the existing conditions report.

Task 2.1 Regulatory and Policy Review

As part of the overall existing conditions report, Dudek will conduct a literature review of applicable federal, state, regional regulations, and local hazard mitigation and emergency plans and will summarize preparedness documents in the report. Dudek will meet with the Town and City to identify existing programs and initiatives that are successful, as well as gaps in mitigation and emergency management. An analysis of agency emergency functions, communication, and coordination networks will include governance structures, social media, neighborhood watch programs, and federal, state, regional, local, and transit agency roles and responsibilities.

Task 2.2 Community Infrastructure Risk Assessment

Dudek will develop a localized Los Gatos Travel Demand Model to evaluate transportation infrastructure capacity from an organizational and planning perspective. For purposes of the evacuation modeling in Task 4.2 below, the City of Monte Sereno's streets and land uses will be incorporated into the Town's model. We will conduct a transportation network identification exercise that includes a description of the roadway network, network capacity (including during contraflow conditions if applicable), bottleneck/pinch points due to roadway capacity, one-way in/out access, poor road conditions, bridges with known increased risk for scour, bridges that serve as the single access point in rural areas, difficult topography (steep grades), and potential points of catastrophic failure during a major evacuation event. To support the policies and actions in the Safety Elements of the General Plan for the Town of Las Gatos and the City of Monte Sereno's, and the evacuation planning criteria in the following codes:

- Gov. Code § 65302(g), including the SB 99 two-route requirement
- Gov. Code § 65302.15, added by AB 747 and amended by AB 1409
- wildfire/fire-hazard Safety Element updates under SB 379 and SB 1241
- Public Resources Code § 4290.5

The existing conditions report will identify residential developments in hazard areas that do not have at least two emergency evacuation routes, as well as existing subdivisions in the state responsibility areas or very high fire hazard severity zones without secondary egress routes (Public Resource Code Section 4290.5).

Task 2.3 Evacuation Zone Assessment

Dudek-CRA project team will review and incorporate the Town and City's existing evacuation zones (e.g., Genasys Protect-compatible) into modeling and operational planning, while also evaluating whether alternative or supplemental zone structures may better support phased evacuation strategies and clearance time analysis. This assessment will also consider constrained areas and access and populations with access and functional needs, specifically to identify how to improve evacuation for special and at-risk populations.

Deliverables

- Existing conditions report
- Evacuation plan goals and objectives

Task 3. Signal Timing Plans

Dudek-CRA understands that the Town is currently moving forward with the implementation of the Los Gatos Smart Signal Adaptive Signal Control and Advanced Traffic Management Systems project. This initiative provides

Town staff with the capability to operate traffic signals remotely and supports a system that can adapt to emergency conditions. Our team intends to fully utilize the capabilities of the Centrac system to support the development of an effective evacuation plan and corresponding evacuation signal timing strategies.

To begin, Dudek-CRA will coordinate with Town and City staff to gather the most current resources, including as-built plans, existing traffic signal timing sheets, equipment specifications, and the traffic interconnect plan. Following this information gathering, we will conduct a brief interview with key Town and City staff and, if needed, representatives from law enforcement to better understand the procedures followed during an activation of the Emergency Operations Center.

Building upon this foundation and the results of preliminary evacuation analysis, the project team will prepare up to two evacuation signal timing plans for each intersection. These timing plans will be tested using the evacuation model to evaluate their effectiveness in improving clearance times. Based on the results, adjustments will be made to optimize the timing recommendations as needed. Because emergencies involve multiple unpredictable variables, we will also provide a summary sheet that outlines various signal timing strategies, including operating signals in free mode or implementing green waves along specific corridors. Each strategy will be paired with guidance on when it may be most applicable.

Our intent is not to provide an exhaustive catalog of solutions. Instead, we aim to equip the Town's Emergency Operations Center with a practical set of tools that support flexible and informed decision-making during emergency situations.

Deliverables

- Signal timing plans

Assumptions

- Up to 2 signal timing plans per signal (66 total)

Task 4. Traffic Simulation Modeling

As detailed previously, by developing the Town's travel demand model (based on the Valley Transportation Authority's [VTA] model) and our deep understanding of evacuation analysis, we propose a Town model that will serve dual purposes: a refined transportation model and a flexible evacuation model. As part of this effort, the GIS analysis tools developed will be designed to function either as a standalone model using Network Analyst or as an integrated add-on to the Town of Los Gatos model. This innovative modeling approach emphasizes reasonable and probable scenarios and leverages AI-supported GIS Network Analyst tools alongside Vissim microsimulation to evaluate the transportation network's capacity, safety, and emergency response under various wildfire conditions and background traffic scenarios (e.g., typical weekday, weekend, and beach traffic conditions).

Task 4.1 Los Gatos Travel Demand Model

Dudek will develop a localized Los Gatos Travel Demand Model that is consistent with VTA's Local Transportation Model Consistency Guidelines. For purposes of the evacuation modeling in Task 4.2 below, the City of Monte Sereno's streets and land uses will also be incorporated into the Town's model. The following are the tasks needed to complete the work.

Dudek will conduct **traffic data collection** for various scenarios: weekday, typical weekend, and beach traffic weekend to support the Los Gatos Travel Demand Modeling effort. Daily traffic counts for the various scenarios will be collected at a selection of up to five gateways around the Town and City boundaries to capture a snapshot of typical traffic entering and leaving the Town and City. The traffic counts collected will be used to validate the

highway and street network in the model, along with making sure external trips going in and out of the Town and City are validated. If needed, Big Data (Bluetooth data from vehicles) will be used to update trip matrices in the model and to optimize travel patterns within the Town.

For the **data processing** step, Dudek will use current and proposed land use information from the VTA regional model and review employment and household data within Los Gatos and stratify them by types of employment and household income/size. In addition, Dudek will develop a refined roadway network within Los Gatos to include additional local streets and roads that are not present in the regional VTA model. To validate the land use information, control totals from the Town and City's General Plans and the VTA model will be used to establish the existing conditions base year model. For future land use data, Dudek will gather input from local land use plans, the Town and City's General Plans, and the VTA regional model. If necessary, Dudek will expand the number of traffic analysis zones within the Town in the updated model for increased detail.

Regarding the software used for the Los Gatos Model, Dudek will utilize the CUBE software for its development to stay consistent with the VTA travel demand model. The Los Gatos Model will be validated using guidance from the Federal Highway Administration's (FHWA) Travel Model Validation and Reasonability Check Manual, 2nd Edition. Root mean squared error analysis (RMSE) of selected highway volumes in the model network will be compared to the traffic counts for validation purposes. Land use data will also be validated against general plans, VTA's land use data, and U.S. Census data.

During the development of the Los Gatos Model, technical memorandums on these steps, including traffic data collection, data processing, model software selection, and calibration/validation, will be created by Dudek and reviewed by Town staff before their implementation and deployment. Upon completion of the travel demand model, Dudek will submit it to VTA for review and for consistency approval.

Task 4.2 Evacuation Simulation Modeling

The Dudek-CRA team understands that the Town and City-Wide Evacuation Plan needs to result in the identification of deficiencies in the transportation network and effective strategies to increase resiliency to mitigate the wildfire hazard risk. Effective modeling of wildfire-related hazards requires a tailored approach, as different hazards demand distinct mitigation strategies. Our hybrid approach will build upon existing conditions and model real-world scenarios by integrating an AI-supported GIS Network Analyst with Vissim microsimulation to assess the transportation network's capacity, safety, and emergency response under various hazard conditions.

Rather than relying on worst-case scenarios, which often overwhelm local networks and lead to inaction, our approach prioritizes reasonable and probable scenarios. By comparing risk factors against historical fire data and catastrophe models, we ensure a more pragmatic analysis. The GIS component will map high-risk zones for wildfires; fire progression using FlamMap based on vegetation (fuels), slope, aspect, elevation, wind speed, wind direction, and fuel moisture; and road network data to identify evacuation bottlenecks and vulnerable infrastructure. Additional layers will include population density, vehicle ownership, and demographic data to estimate evacuee distribution and assess accessibility to community resilience hubs, emergency shelters, and alternative evacuation routes, incorporating real-world terrain and road grade factors.

Vissim microsimulation will complement GIS analysis by dynamically modeling traffic flow under different evacuation scenarios. The simulation will assess congestion, stop-and-go conditions, contraflow operations, and emergency-vehicle prioritization while testing traffic-control strategies, signal-timing adjustments, and phased evacuations based on hazard severity, warning time, and network capacity. The models will operate in a feedback loop — Vissim will identify congestion points, which will then be refined in the GIS analysis, enhancing the

accuracy of evacuation planning. Evacuation destinations will be based on various factors, including availability of evacuating spaces, characteristics of the evacuee (i.e., ages, ability, income, as recent historical fires have shown that not all evacuees head toward an evacuation center; those with ability to do so would evacuate toward friends/family outside of the evacuation zones, hotel, temporary lodging, and other options) and identification of those most vulnerable to climate risks. Our team has extensively studied these factors and will factor them into our evacuation modeling.

To ensure compliance with Assembly Bill (AB) 747 and AB 1409, multiple hazard-based evacuation scenarios will be developed that are applicable to both the Town of Los Gatos and the City of Monte Sereno. The wildfire model will integrate the California Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zones and Dudek's extensive understanding of fire progression to determine evacuation pace/notification, among other factors.

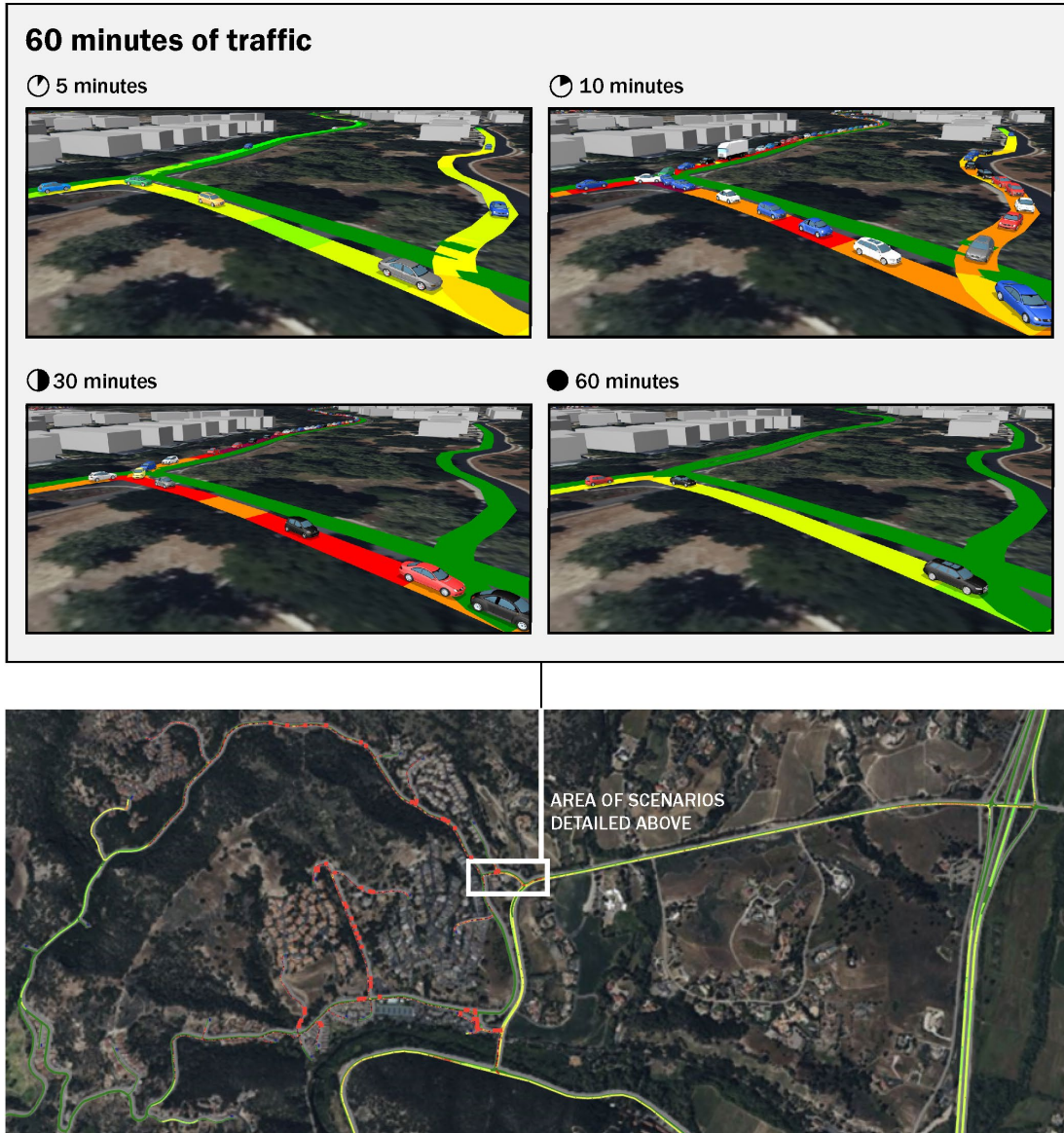
The Dudek team will prepare a report that includes a series of GIS-based wildfire hazard and evacuation vulnerability maps, identification of critical corridors, at-risk road segments, hot spot areas, location for potential improvements, evacuation time, and next steps. Additionally, 3D visualizations of evacuation scenarios will support public outreach and stakeholder engagement, providing decision makers with a clear understanding of evacuation strategies. **Figure 1** shows an example of 3D vehicle flow during a Vissim simulation from a regional network and individual intersection perspective. The Dudek team will ensure that the report's findings are aligned with and build upon the current planning process for the Local Hazard Mitigation Plan and Community Wildfire Protection Plan.

Figure 1. 3D Vehicle Flow

Traffic Simulation Modeling in Vissim

Multimodal, microsimulation software with dynamic traffic assignment methodologies and numerous data output and visualization capabilities to model traffic for any scenario, at any scale.

TRAFFIC DENSITY (Vehicles per mile)



By integrating GIS for hazard identification and Vissim for real-time traffic modeling, this hybrid approach will result in meaningful, data-driven, adaptable evacuation strategies for recommendation in the Town and City-Wide Evacuation Plan. This methodology enhances preparedness and informs long-term infrastructure investments to improve

transportation resiliency, ensuring that emergency response plans align with the Town's resiliency goals and state-level mandates.

Task 4.3 Fire Progression Modeling

GIS-based fire behavior modeling is a cost-effective means for estimating potential fire behavior and appropriate evacuation trigger points. Modeling fire behavior in a GIS interface through the use of FlamMap fire behavior modeling systems requires various GIS and non-GIS input data files, including vegetation (fuels), slope, aspect, elevation, wind speed, wind direction, and fuel moisture. The following summarizes our approach to fire behavior modeling in the Town.

The initial task when conducting fire behavior modeling in a GIS-based environment, such as FlamMap, is the development of a landscape (.lcp) file that serves as the base for the modeling runs. The base files that ultimately are used to create the landscape file will be generated in the ArcGIS software package and include a minimum of five distinct data sets:

- **Elevation:** The elevation data set will be derived from the highest-resolution data set available for the Town or from one that will work appropriately given the extent of the analysis area. The resulting elevation grid file will represent units of feet above mean sea level.
- **Slope:** Using ArcGIS Spatial Analyst tools, a slope grid file will be generated from the elevation grid file. The resulting slope grid file will represent units of percent of inclination from horizontal.
- **Aspect:** Using ArcGIS Spatial Analyst tools, an aspect grid file will be generated from the elevation grid file. The resulting aspect grid file will represent azimuth degrees.
- **Fuel Type:** Dudek will evaluate the availability of public fuel model data sets. Should a public data set be determined to be unsuitable for inclusion in the modeling runs, Dudek would use vegetation coverage data in the form of a GIS shapefile to create a fuel model file. Vegetation types will be classified into fuel models. Fuel model classifications will be based on field observations and comparison with other available data sets. Once fuel model values are assigned to vegetation types, the vector-based vegetation data file will be converted to a grid file.
- **Canopy Cover:** Using ArcGIS Spatial Analyst tools, a canopy cover grid file will be generated from the fuel grid file. Canopy cover will be assigned based on fuel type and may vary depending on field observations. Canopy coverage units will range from 0 to 4 (representing 0%–25% canopy coverage, 25%–50% canopy coverage, and so on).

Following file conversions, the five necessary input grid files will be exported to ASCII format. The FlamMap software package will then be used to create the landscape file (.lcp) from these ASCII files. All files will be created in the following coordinate system: NAD 83, California State Plane, Zone 5, with units in feet.

The other necessary input files for performing fire behavior analysis in FlamMap are fuel moisture (.fms) and custom fuel (.fmd) files. Historic weather data will be derived from local Remote Automated Weather Stations (RAWS) and processed using the FireFamily Plus software package to determine 97th percentile weather values for fuel moisture, 20-foot wind speed, and wind direction. The resulting data will be used to create the necessary fuel moisture files for inclusion in fire behavior modeling efforts. The custom fuel file will be created based on standard fuel model variables. Finally, wind direction and speed data (derived from RAWS analysis) will be noted as these variables are entered directly at the time of modeling analysis.

Following completion of the landscape, weather, and fuel moisture files, Dudek will run up to three fire behavior scenarios near the Town and City.

Modeling results will be used to create project-related recommendations associated with evacuation procedures, trigger points, and firefighter safety zones and escape routes. All modeling results will be graphically presented in maps and exhibits and will be used to develop criteria for determining lead time needed for notification and evacuation of various areas based on historical fires, modeling results, and traffic modeling results.

Deliverables

- Results of the data analysis with maps and charts that identify high-risk zones and show vulnerable areas of the transportation network
- Evacuation route capacity, safety, and viability report and associated analytical tools
- All GIS data files (shapefiles, grids, images)
- The completed landscape file (.lcp) and associated weather and fuel moisture files (.fms, .fmd)
- Digital copies of all prepared graphics/maps (PDF)

Assumptions

- Asset data will be publicly available or made available by the Town.

Task 5. Evacuation Strategy and Operational Planning

Building upon the findings of Task 4, which identified vulnerabilities in evacuation routes, critical infrastructure, and network capacity under emergency conditions, Task 5 will develop a comprehensive, multi-pronged strategy to improve evacuation effectiveness and overall resilience. Recognizing that infrastructure upgrades alone are insufficient to address the complex challenges posed by climate-related disasters, such as wildfire, this task will integrate technology, emergency response enhancements, and policy-driven solutions to create practical and implementable strategies. Our recommendations will be rooted in real-world experience, drawing from after-action reports of past evacuations to ensure that they are feasible, prioritized, and adaptable based on funding availability and ease of implementation. Rather than relying on a single technological solution, we will propose a toolkit of prioritized strategies (i.e., planning, operational, hardening, and procedural) that can be progressively implemented so that critical improvements are in place before an emergency occurs.

A key focus of Task 5 is enhancing public warning and communication systems to address challenges associated with infrastructure failures during disasters. Traditional wireless-based alert systems are vulnerable to cellular network failures caused by fire damage or congestion from excessive public use. To mitigate this risk, we will explore satellite-integrated mobile alerts, leveraging emerging technologies, such as T-Mobile's partnership with Starlink, to ensure continued access to emergency notifications even in areas with poor reception. This analysis will include an assessment of the required level of integration, cost, cost-sharing agreements, and implementation feasibility. In addition, a multimodal communication strategy will be developed, incorporating geo-targeted SMS, social media alerts, digital highway signage, and automated calls to ensure broad and inclusive outreach, particularly for non-English speakers and individuals with access and functional needs.

Beyond communication, we will examine multiple strategies to assist the Town in managing evacuations effectively. These strategies will include AI-assisted traffic control, smart cameras for evacuation monitoring, redundant bandwidth to support emergency communications, and strategic road widening that can facilitate emergency traffic flow when needed. **Figure 2** provides an example of potential road widening strategies that would support multimodal use, while not inducing additional vehicle demand during day-to-day operations. Additionally, infrastructure for sheltering in place will be considered, with a focus on establishing community resilience hubs equipped with emergency power, electric vehicle charging stations, and essential supplies in high-risk areas. Some improvements can be simple yet highly effective—for example, well-maintained roadside pull-off areas in rural zones can serve as temporary vehicle holding zones during evacuations, allowing firefighters to

control and coordinate traffic flow more effectively. Pull-off areas, while not the only factor affecting evacuation, were shown to be helpful during the 2020 firestorms. These cost-effective solutions can play a crucial role in improving overall evacuation efficiency.

Figure 2. Road Widening Strategies



To further strengthen emergency response capabilities, in coordination with key Town departments, including and not limited to law enforcement, fire, parks, and public works, and utilizing findings from the evacuation simulation and fire progression modeling from Task 4, Task 5 will identify evacuation trigger points and zone-specific phase evacuation strategies for a wildfire evacuation event, to improve overall evacuation safety. As part of this coordination, Dudek-CRA will define primary and secondary evacuation routes, traffic control points, Temporary Evacuation Points (TEPs), and staging areas.

The final deliverables for Task 5 will include a Multi-Pronged Evacuation Strategy Report, to include recommended infrastructure improvements, cutting-edge technology, a response tool-kit, and a robust public communication strategy with supporting graphics. Task 5 will provide a resilient, data-driven, and resource-efficient evacuation framework that ensures preparedness for a range of wildfire scenarios.

Deliverables

- Results and their interpretations that identify evacuation vulnerabilities and recommend physical and operational evacuation improvements (i.e., traffic flow improvements, traffic control points,

infrastructure improvements, use of emergency signage, and strategies for single-egress communities)

- Recommended transportation improvements (Multi-Pronged Evacuation Strategy Report) with maps and decision-supporting tools to guide zone activation.

Assumptions

- Up to three Dudek staff members will attend up to two virtual meetings with key Town departments.

Task 6. Public and Stakeholder Engagement

Dudek–CRA will support the Town and City with public and stakeholder engagement, including coordinating a multi-agency workshop, presenting to the Town Council and Planning Commission, and attending key public outreach events to solicit feedback on evacuation strategies and zone coordination developed in the previous tasks.

Task 6.1 Town and Partner Agency Workshop

Dudek–CRA will coordinate and prepare a two-hour virtual workshop to solicit feedback from Town departments and partner agencies. The workshop will include a presentation on the findings from Task 3 to support final deliverables for Task 4 and Task 5.

Task 6.2 Town Council and Planning Commission Meetings

Dudek–CRA will prepare a presentation to solicit feedback from the Town Council and Planning Commission, with the aim of supporting the final deliverables for Tasks 4 and 5. As part of this task, Dudek–CRA will also present final deliverables to the Town Council.

Task 6.3 Public Outreach

Dudek–CRA will attend key public outreach and engagement activities planned by the Town to hear feedback from the public and support final deliverables for Task 4 and Task 5.

Deliverables

- 2-hour virtual multi-agency workshop, with PPT and guided discussions, and an interactive exercise
- 1 slide deck for each Town Council presentation

Assumptions

- Up to three Dudek staff in attendance at up to three in person presentations
- Up to three Dudek staff in attendance at up to three community outreach presentations

Task 7. Final Grant-Ready Deliverables and Formatting

Pulling from the previous tasks, Dudek will assemble all previous deliverables into a high-quality, easy-to-use, and accessible document. Dudek will prepare an Administrative Draft Town and City-Wide Evacuation Plan for one round of consolidated review and comment by the Town and City staff. As part of this effort, Dudek will assist the Town staff in preparing and presenting the revised Draft Town and City-Wide Evacuation Plan to the Town Council. Upon review and receipt of all public and elected official comments, Dudek will prepare the Final Town and City-Wide Evacuation Plan in an Americans with Disabilities Act-compliant format. Similar to that of the Draft Town-Wide

Evacuation Plan, Dudek will assist the Town OES staff in preparation of the Final Town and City-Wide Evacuation Plan for approval to the Town Council.

Dudek will prepare grant-ready materials formatted to meet Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) and CAL FIRE Wildfire Prevention grant requirements. This includes FEMA- and CAL FIRE-compatible narratives, GIS layers, and visual outputs suitable for integration into CalMapper and other grant portals. A summary action matrix will be provided, detailing prioritized actions, estimated costs, and designated responsible parties to support implementation and funding strategies. All outputs will be structured to facilitate seamless inclusion in future grant applications and Town planning initiatives.

Deliverables

- VTA accepted travel demand model
- Updated signal timing plans for key evacuation routes
- All project-related GIS shape files (e.g., zone boundaries, evacuation routes)
- Simulation model outputs and visualization files
- Administrative draft of the executive summary and maps for public distribution
- Administrative draft of the Town and City-Wide Evacuation Plan for the Town staff
- Revised draft of the Town and City-Wide Evacuation Plan for public officials
- Final Town and City-Wide Evacuation Plan
- Meeting agendas and minutes from presentations on the draft and final Town and City-Wide Evacuation Plan
- Summary action matrix
- FEMA HMGP grant compatible project narrative
- CAL FIRE wildfire prevention grant compatible narrative
- GIS layers and visual outputs compatible with CalMapper and other grant portals

Assumptions

- Up to two Dudek staff members will attend the Draft Town and City-Wide Evacuation Plan presentation.
- Up to two Dudek staff members will attend the Final Town and City-Wide Evacuation Plan presentation.