Skydio

Highway DFR: Accelerating safer, smarter road response

The challenge

When something happens on a highway, minutes matter. A stalled vehicle, a jackknifed semi, or a crash—every minute the roadway stays blocked increases risk to responders and drivers alike.

Today's Departments of Transportation (DOT) and State Police rely on stationary pole cameras for visibility. But those cameras can't see around a curve, over a hill, or into the blind zones between interchanges. Fixed cameras show where the problem was reported, not necessarily where it is, leaving Traffic Management Centers uncertain, lengthening queues, and increasing risk for everyone on the road.

The gap

Fixed cameras provide persistent eyes on key choke points, but when incidents occur between them, responders lose the real-time context they need most. Fire, EMS, and tow operators are often dispatched without a clear picture of lane blockages, debris, or the best ingress route.

Without timely documentation of scene conditions and infrastructure damage—from guardrails to signs and barriers—agencies struggle to assess repairs, assign responsibility, and reopen lanes faster. The result: delays that add both cost and risk.

Some agencies have achieved near-complete camera coverage across their interstate networks—a major milestone for visibility and safety. Yet even the best fixed systems can't see around every curve or over every hill.

The solution

Highway DFR transforms how transportation agencies and public safety partners see and respond to highway incidents. It is a network of autonomous, docked drones pre-positioned at state-owned infrastructure (rest areas, weigh stations, district yards), toll plazas, and long-term construction sites, ready to launch the moment a call comes in.

Remotely piloted from a centralized Traffic Management Center, drones can:

- ☑ Arrive on scene faster than ground units
- ☑ Verify details instantly: vehicle count, lane blockages, debris, fire hazards, and damage
- ☑ Guide responders to the correct ingress route and staging lane
- ☑ Capture high-resolution scene documentation for after-action reports, reconstruction, maintenance, and inspection
- ☑ Eliminate dispatch-then-recall delays
- ☑ Activate digital message signs with verified, live information

$340B

per year

Annual cost of U.S. roadway crashes (NHTSA, 2019)

$350

per minute

Each minute of delay costs $350 and compounds risk (FHWA incident management cost estimates)

+3%

per minute

Likelihood of a secondary crash increases by about 3% for every minute a lane remains blocked (FHWA incident management cost estimates)

3x

higher rural costs

3x more economic loss than those in urban areas (NHTSA 2019)

All live feeds can stream into the same Traffic Management System interface used for CCTV, giving every agency—from DOT to State Police—the same operational picture in real time.

The result: faster, safer, and more informed decision-making—before the first responder even arrives.

Highway Drone as First Responder (DFR) builds on this foundation through a phased evolution of roadway visibility:

- ☑ Installation site surveys
- ☑ Project management for flight system installation and initial deployment
- ☑ Communications with organizational stakeholders (Facilities, IT, Networking, etc.)

Each DFR flight turns blind spots into actionable intelligence in seconds, without adding new poles, fiber, or roadside infrastructure.

Who feels this gap: DOT/TMC, State Police, Fire/EMS, towing, and concession operators (e.g., toll roads), all making lane, staging, and ingress decisions with partial or outdated information.

The broader impact and value

By connecting aerial visibility directly to decision-making, Highway DFR delivers measurable outcomes:

Faster verification: Know exactly what's on scene before sending units

Smarter dispatch: Send the right resources the first time

Quicker clearance: Reopen lanes sooner, prevent secondary crashes, and document infrastructure damage for faster repairs and reimbursement

Safer operations: Reduce responder exposure on high-speed roadways

Together, these outcomes mean safer roads, faster recoveries, and greater return on every taxpayer dollar.

Highway DFR creates a shared aerial infrastructure connecting DOTs, Police, Fire/EMS, and towing partners in one unified response network. From crash response and storm recovery to bridge strikes and construction monitoring, it gives agencies the autonomy, awareness, and speed they need to keep roads open and people moving.

Highway DFR aligns with the DOT Safe System and National Roadway Safety Strategy, leveraging autonomous technology to save time, lives, and resources.

Beyond incident response

Event-driven response justifies the investment, but department-wide use multiplies the impact. Highway DFR sites aren't just for emergencies—they extend everyday value across transportation operations. Between incidents, docked drones can be dispatched for inspection, monitoring, and compliance tasks, reducing costs, improving safety, and maximizing the value of each drone site.

Complementary use cases

Asset inspection (guardrails, high-mast lighting, gantries): identify and document infrastructure wear

Construction site mapping: enable remote field verification to ensure projects are built to design and calculate material quantities

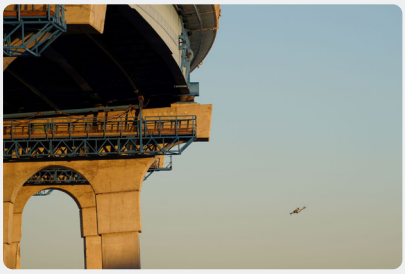
Truck parking: monitor and share real-time parking availability to inform freight operators and reduce shoulder stops

Work zone safety & staging compliance: audit contractor activity and maintain safe, compliant work zones

Bridge strike response: provide live visual verification to state bridge inspectors to assess damage immediately

Detour and route assessment: survey alternate routes to inform signage, routing, and emergency detour planning

Together, these capabilities turn every docked drone into a shared aerial resource for both real-time response and proactive maintenance—amplifying the return on investment in every corridor.



Caltrans avoided more than $100k in work order costs with a single drone flight

TxDOT achieved 83% greater efficiency inspecting high-mast light poles with UAS versus manual methods