ADAPTIVE SIGNAL CONTROL

**Kimley»Horn**
Expect More. Experience Better.

Simple setup and operation

MODERN SOFTWARE ARCHITECTURE

No risk of controller skipping phases

Effectively Delays Over-Saturation

Inexpensive to deploy/expand

High-speed IP comm.

CLEARS CONGESTION after peak period

Proven and reliable

Windows 10/11

Windows Server 2016+

Reacts to incident conditions

User-definable parameters

Fully compatible with transit priority, preemption, and pedestrian operations

Adjusts to long-term changes in traffic patterns

25% FEWER STOPS

Balances Progression and Safety

**»Kadence**

**»Kadence**

A Kimley-Horn Software Solution

## Adaptive Signal Control, Now With:

Deep Learning + Queue Management + Safety Adaptive

The Kadence system optimizes traffic signal timing to balance performance benefits for safety and efficiency. Kadence is a powerful tool in a traffic engineer's toolbox, handling fluctuations in demand and short- and long-term changes in land use and traffic patterns.

## Key Features

➤ Use any field controller and detection technology
➤ System learns over time
➤ Highly scalable and cost effective
➤ Signal system performance measures
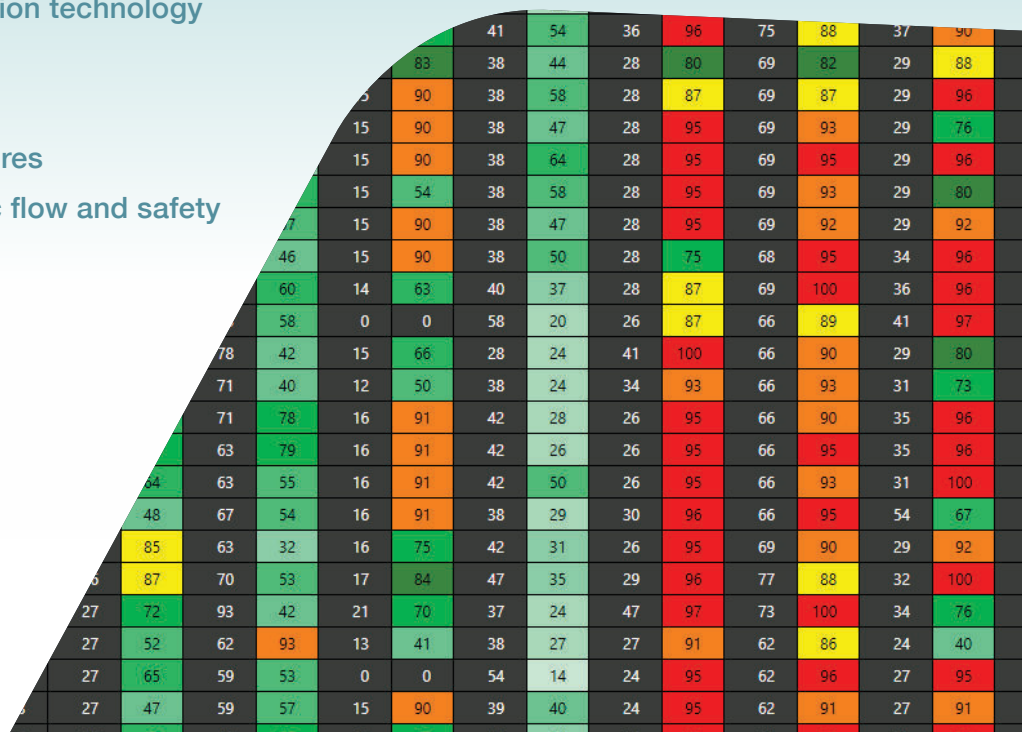➤ Optimizations consider both traffic flow and safety

## Real-Time Signal Parameter Tuning
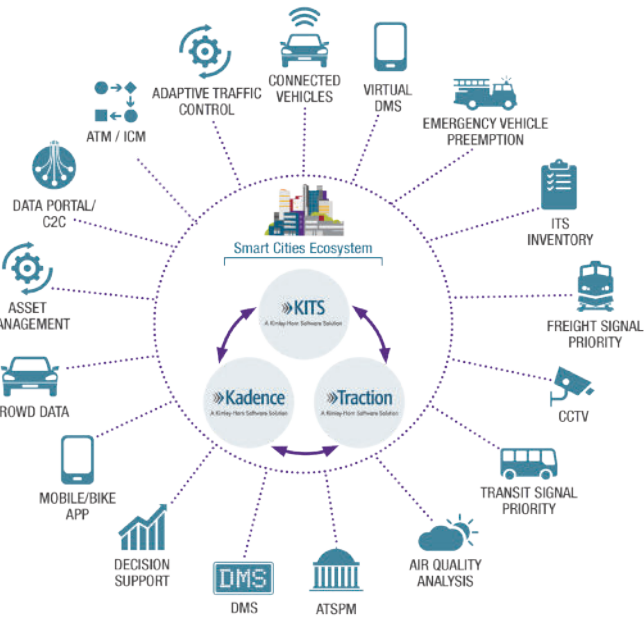
➤ Cycle
➤ Splits
➤ Offsets
➤ Sequence
➤ TOD Schedule

## Contacts
Seth Searle ☎ 303.481.0450 ✉ seth.searle@kimley-horn.com
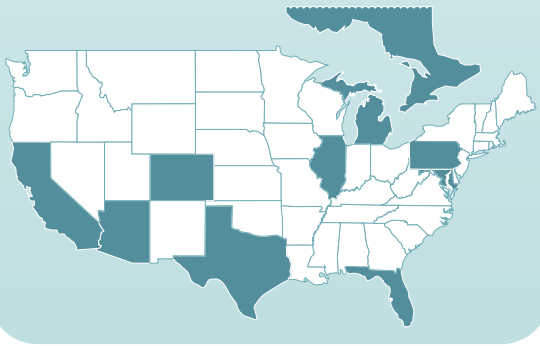Douglas Gettman, Ph.D. ☎ 602.906.1332 ✉ doug.gettman@kimley-horn.com

**Kimley»Horn**
Expect More. Experience Better.

## »Kadence

### Meets All USDOT Model Systems Engineering Requirements for ASCT
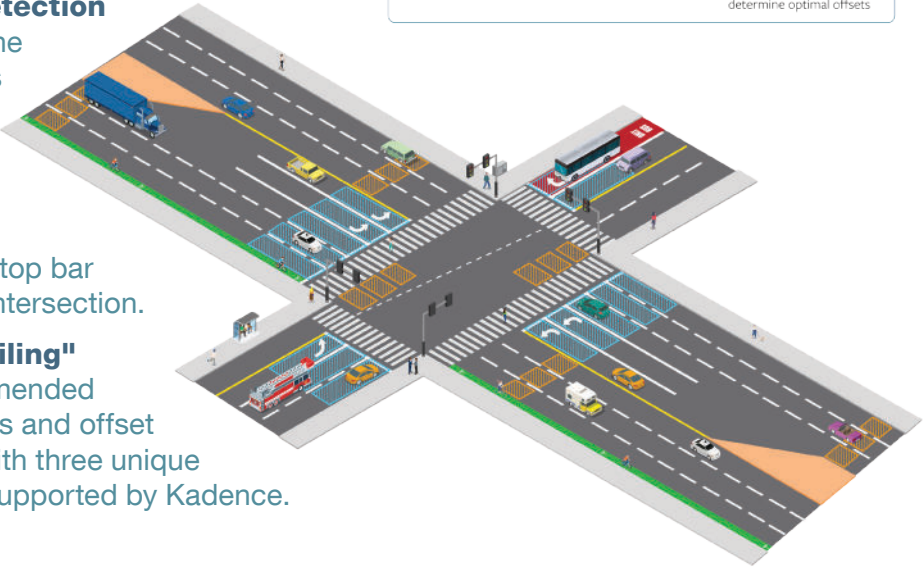


### Signal Controller Types

- Econolite ASC/3, Cobalt, and EOS
- Siemens SEPAC NTCIP
- McCain 233/Omni
- Fourth Dimension D4
- Q-Free
- LACO4E
- Caltrans TSCP
- Siemens NextPhase
- Any other NTCIP 1202 compliant controller

### Kadence Detector Requirements

Kadence supports all detection technologies as long as the detection system interfaces directly with the traffic signal controller.

For optimal operation, lane-by-lane detection should be provided at the stop bar of each adaptive-enabled intersection.

Lane-by-lane "Flow Profiling" detectors are also recommended where queue measurements and offset adjustments are desired, with three unique placement configurations supported by Kadence.



### Implementation

■ States/Provinces where Kimley-Horn has deployed Kadence signal system projects



Kadence is *fully integrated* into Kimley-Horn's Smart Cities Ecosystem and is *fully compatible* with KITS and all Traction Modules

| »TractionTravel | »TractionLive |
|---|---|
| »TractionPriority | »TractionMetrics |
| »TractionConnect | »TractionWorkflow |

### Adaptive Control Methodology

- Data-driven parameter tuning
- No calibration
- No specific detector length
- No field hardware
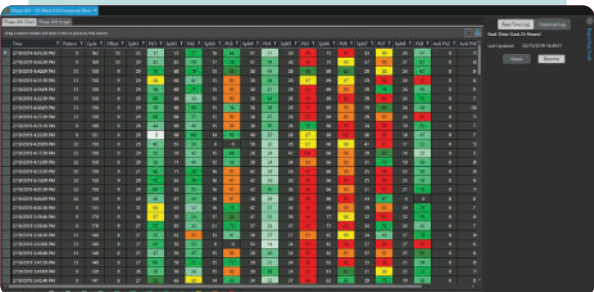
### Adaptive Control Process

- Poll controllers for phase and detector data
- Calculate new splits, cycle, offset, sequence
- Download new pattern data to controllers
- Controller responsible for all traffic functions
- Kadence does not override operation with holds/force off
- Fully compatible with transit priority, emergency vehicle preemption, and all pedestrian modes
- Where speed sensor data is available, safety-based adjustments to mitigate excessive speeding can be enabled
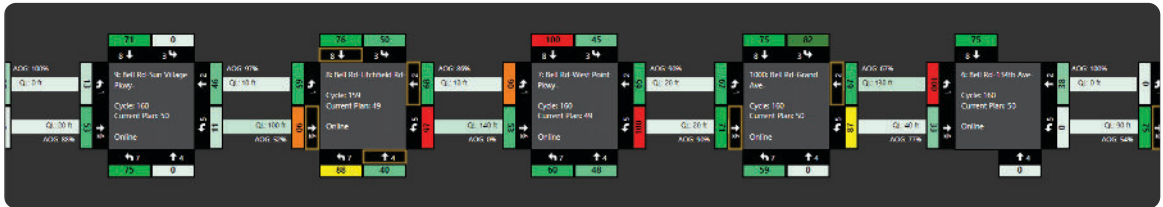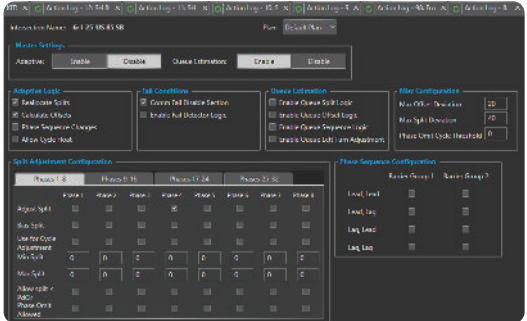


### Modern Graphical User Interface
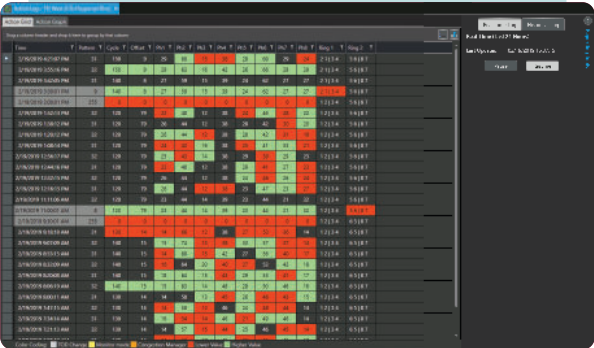

*Action Log*
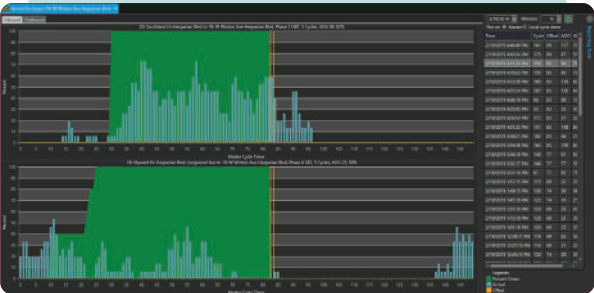

*Arrivals On Green*


*Phase Utilization*


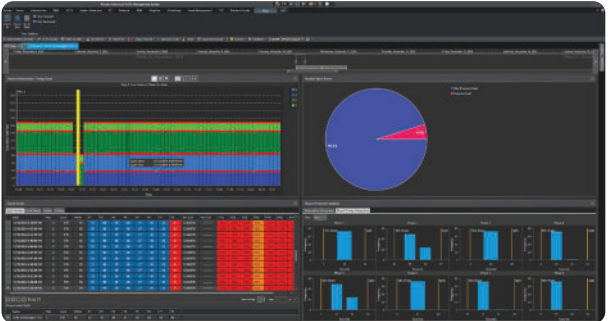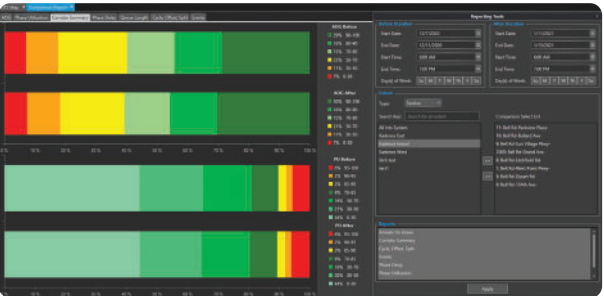*Status Map*


*Detailed Intersection Configuration*


*Historical Intersection Timing Report*


*Before and After Corridor Summary*


**Multi-monitor Support**