



APPLICATION PRINCIPLES

Dynamic Emergency Exit Signage

A practical working document

A concise guide to turning fire strategy and defined scenarios into cause-and-effect, fire-panel programming and clear sign behaviour.

From fire strategy to a clear, usable dynamic-signage plan

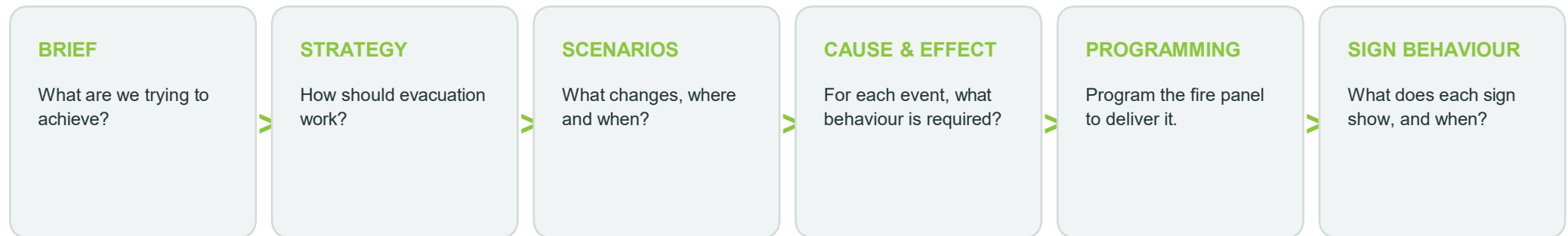
BRIGHTER. QUICKER. SAFER.

Helping people reach safety more quickly..



1 | From brief to sign behaviour

One clear chain: the strategy defines the approach; the system makes it happen; the signage communicates it.



WHAT THE FIRE-STRATEGY EXTRACT SHOWS

The following page is an extract from an actual fire strategy. It is not a template. It shows the information needed to define dynamic-signage behaviour: the evacuation issue or aim, the intended strategy, the relevant scenarios and the required link to fire-alarm cause-and-effect.

THE PRINCIPLE

Strategy -> scenarios -> cause & effect -> fire-panel programming -> sign behaviour Dynamic signage sits on top of the compliant emergency-signage application and allows the displayed route to change when the fire strategy requires it.

2 | Fire-strategy example

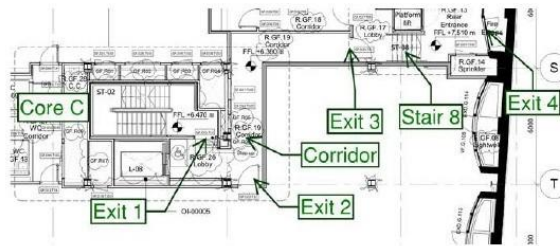
A real project extract showing the route from evacuation strategy to dynamic-signage cause and effect.

Merging flows within discharge corridor from Core C

As previously discussed, a phased evacuation strategy will need to be provided for the building (2 floors at a time. Floor of fire origin and floor above) in order to avoid from both flights of Core C (upward and downward) discharging simultaneously at ground floor.

As such, the corridor at ground floor level for Core C would need to accommodate occupants using one flight of the core, as well as (potentially) occupants exiting through Exit 2 shown below.

Based on the occupancy identified in the fire strategy, a widening of the Core C final exit corridor on the Ground floor would be necessary. As this is impractical to implement in an existing building this solution is not preferred, and therefore the solution adopted is to implement dynamic signage in lieu of adjustments to the corridor.



Dynamic signage at storey exits at LG,G and UG to prevent merging flows at the base of the stair. Dynamic signage would be linked to smoke detectors within the office floor plates.

This would allow us to prevent from providing further adjustments to Exit 2 and Exit 3. Would still require Exit 1 to be adjusted to achieve at least 1.03m clear width. The goal is to always only have either the stair or the ground floor exit discharging into the corridor (but not both).

Scenarios would be as follows:

LGF Fire – LGF and GF evacuate together as part of phased evacuation strategy:
 Fire affecting exit towards Core A at LGF: All LGF occupants going to Core C. All GF occupants directed towards the Core A exit by dynamic signage.
 Fire affecting exit towards Core C at LGF: All LGF occupants going towards Core A. GF occupants may use either of the two exits.

GF Fire – GF and UGF evacuate together as part of phased evacuation strategy:
Fire affecting exit towards Core A at GF. All GF occupants going to Core C corridor exit. All UGF occupants directed to evacuate only towards Core A by dynamic signage.
Fire affecting exit towards Core C at GF. All GF occupants going towards Core A. UGF occupants may use either of the two exits.

The dynamic signage would be linked to the fire alarm system and would require additional programming of the fire alarm cause and effect to identify the direction

WHY THIS EXAMPLE HELPS

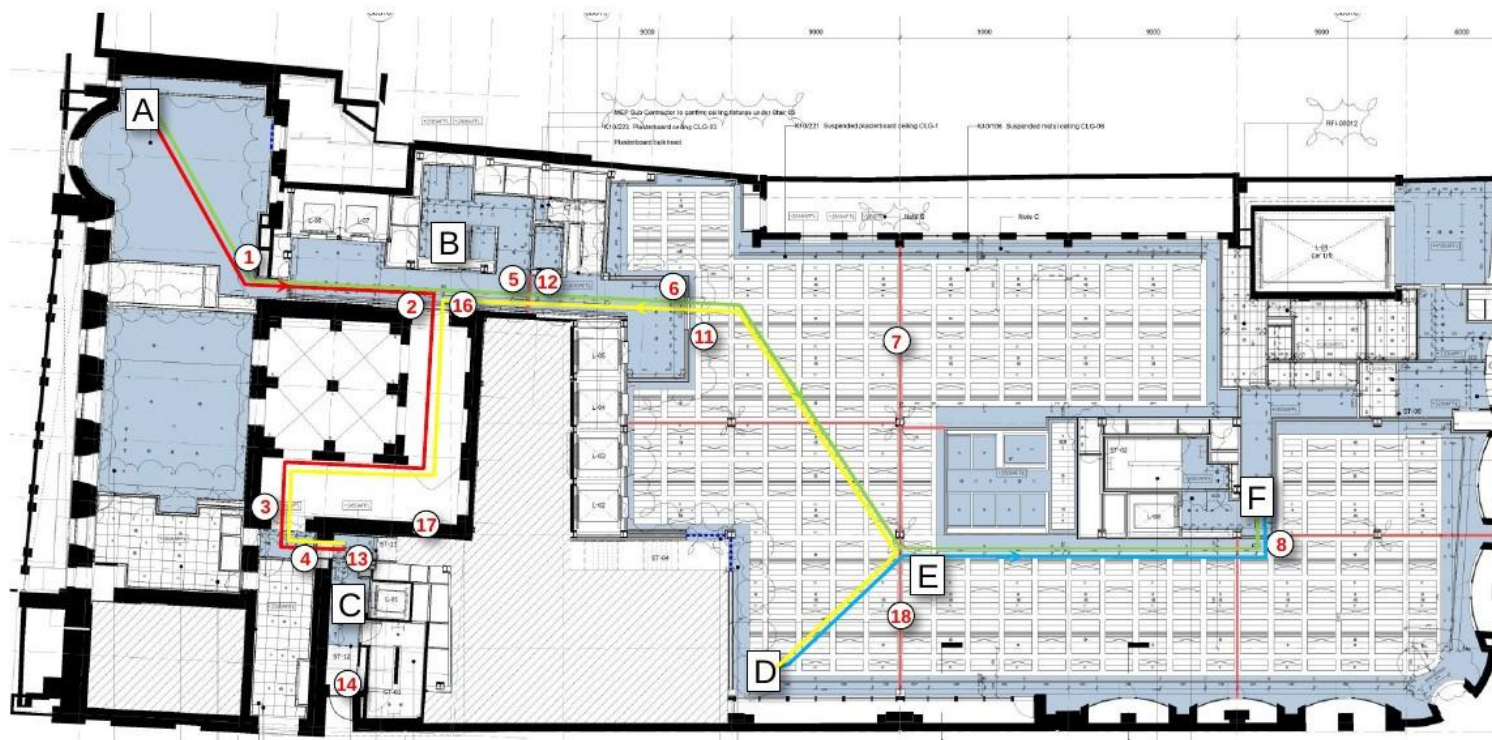
It starts with an evacuation strategy and a specific flow/capacity issue. It proposes dynamic signage as part of the solution. It defines different fire scenarios and changes the required route accordingly. It links the signs to the fire alarm system and requires cause-and-effect programming.

THE PRINCIPLE

Strategy -> scenarios -> cause & effect -> sign
behaviour

3 | Make the plan walkable

Show the required route and sign behaviour clearly enough for the project team to follow each scenario in 2D.



LEGEND



defined scenario / routes



sign / installation reference – can be useful to use images of proposed sign configuration rather than numbers

THE SIMPLE TEST

Can someone unfamiliar with the building follow the intended route for each scenario, understand what changes, and see the nearest safe way out?

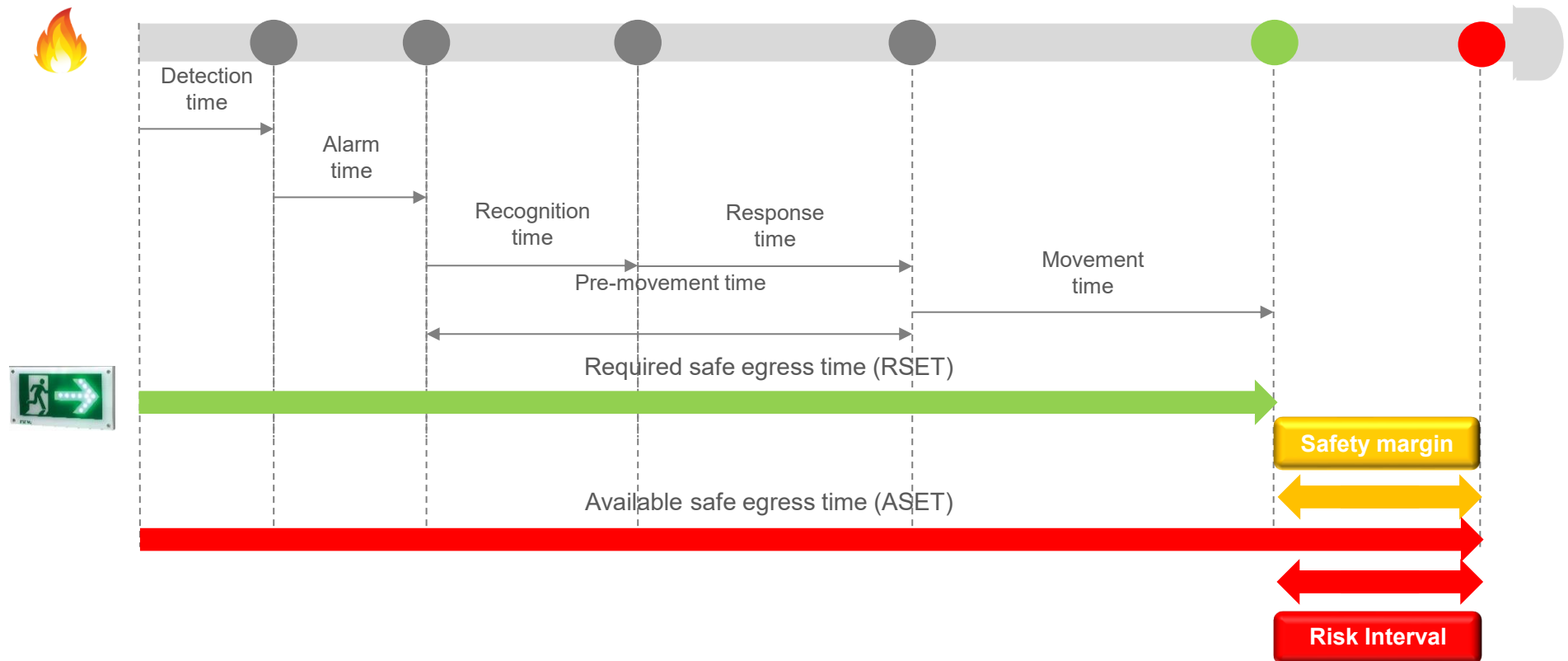
A USEFUL PLAN SHOULD SHOW

- The route at each decision point.
- What changes for each defined scenario.
- Where each sign is located.
- The direction or behaviour required from each sign.
- Enough building context to follow the route.

Route colours and sign numbers are project graphics, not a universal convention. Every issued plan must define its own legend.

4 | Increase the safety margin

The evacuation-time principle: how long you have versus how long you need.



Dynamic signage acts on RSET: by making the appropriate route easier to see and understand, it helps people recognise, decide and move sooner - increasing the safety margin between the time needed to escape and the time available eg how long you have versus how long you need.

DYNAMIC SIGNAGE IS DESIGNED TO INCREASE THE SAFETY MARGIN

SEE SOONER -> DECIDE SOONER -> MOVE SOONER -> CLEAR THE SPACE SOONER

5 | See. Decide. Move. Exit.

FSEG* performed a real-life trial and developed a microsimulation model using buildingEXODUS to assess how dynamic exit signage performs compared with conventional, signage.

SEE

X2 as easily

77% dynamic vs 38% conventional

Seen by more than twice as many people.

DECIDE

X2 as quickly

2.6 sec vs 5.6 sec

People decide more than twice as quickly.

MOVE

1/2 the time

less than half the time

Faster recognition and decision making
get people moving sooner.

EXIT

1/3+ less

36% less congestion delay

Less time is lost through congestion at
exits.

REAL-LIFE TESTING

Independent real-life trials measured whether people noticed Evaclite dynamic signs and how quickly they made route decisions. The results above show how dynamic signage performed. FSEG also performed a real-life trial in partnership with Evaclite at a train station in Spain.

FSEG BUILDINGEXODUS MICROSIMULATION

The FSEG evacuation model tested the effect at whole-building level. In the modelled supermarket scenario, dynamic signage reduced total clearance time from 127 sec to 104 sec (18%), reduced average congestion delay from 11.5 sec to 7.4 sec (36%), reduced average personal evacuation time by 13%, and shortened average distance travelled by 12%. The modelling demonstrates that Evaclite dynamic signage can improve evacuation performance by influencing where and when and how people move.

6 | Why use dynamic signage?

The motivation may be a problem, an operational need, an ambition - or simply a desire to make evacuation safer and clearer.

STRUCTURAL PROBLEM

Resolve confused routes or structural limitations and bring clarity without costly physical change.

OPERATIONAL NEED

Add control to help manage people flow, complex spaces, temporary routes or phased evacuation.

PERFORMANCE AMBITION

Support a performance-led solution using a smarter, safer and more responsive approach.

SAFETY OBJECTIVE

Help keep people safe and provide greater confidence and peace of mind.

THE COMMON PURPOSE

Dynamic signage enables smarter control in an emergency. It can guide people away from a compromised route and towards the appropriate safe route, reduce uncertainty, support more efficient people movement and help improve evacuation performance. The objective is simple: make the right route more obvious, at the right time, for the scenario that is actually occurring.

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Helping people reach their nearest, safest exit.

Diagram 1

Straight corridor

Dynamic signage adapts to the available escape routes.

EVACLITE

A

NORMAL CONDITION

No alarm - route ahead available



B

ALARM / EVACUATION

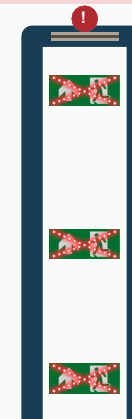
Alarm - location not yet confirmed



C

CONFIRMED INCIDENT

Route ahead unsafe



2D plan view

(from above)

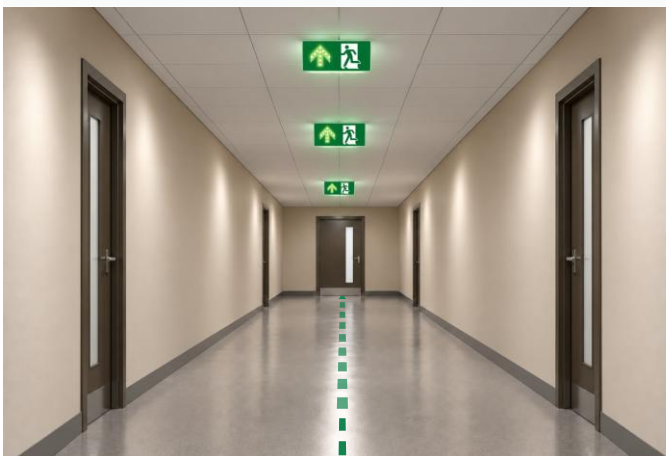
View for occupant

(looking forwards)



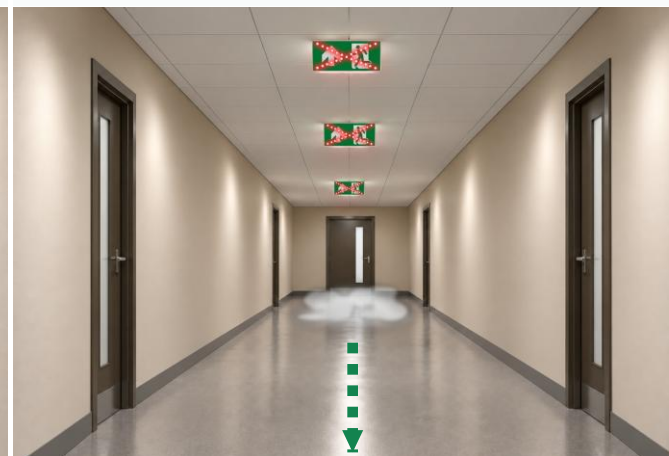
Conventional guidance.

All signs show the standard escape route ahead. The route is available and safe to use.



All signs switch to dynamic green.

The alarm has sounded. The nature and location of the incident are not yet confirmed. Green arrows reinforce the available route ahead.



Route ahead inhibited.

The incident location is confirmed. Do not continue ahead. Withdraw and seek an alternative route indicated by a green arrow.

Key to sign states



Static legend

Normal escape route



Dynamic green arrow

Reinforced escape route



Red X

Route not to be used

Diagram 2 | Straight corridor with side corridor right

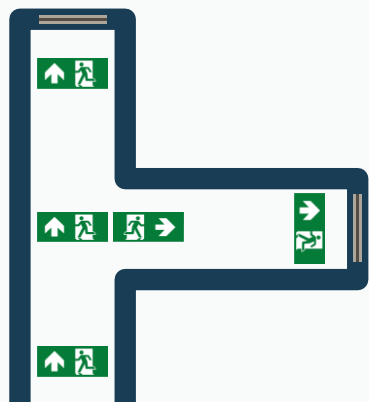
Dynamic signage adapts to the available escape routes.

2D plan view
(from above)

View for occupant
(looking forwards)

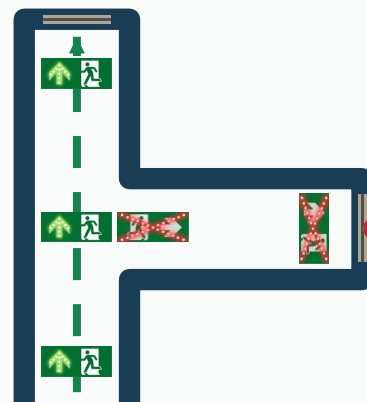
A NORMAL CONDITION

All shown routes available



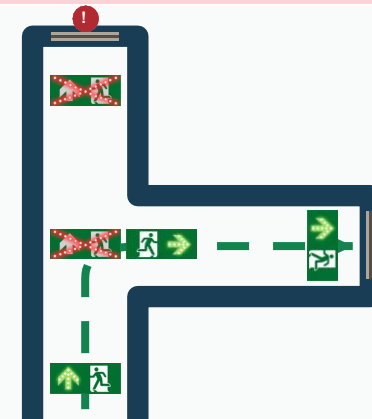
B RIGHT ROUTE INHIBITED

Continue ahead



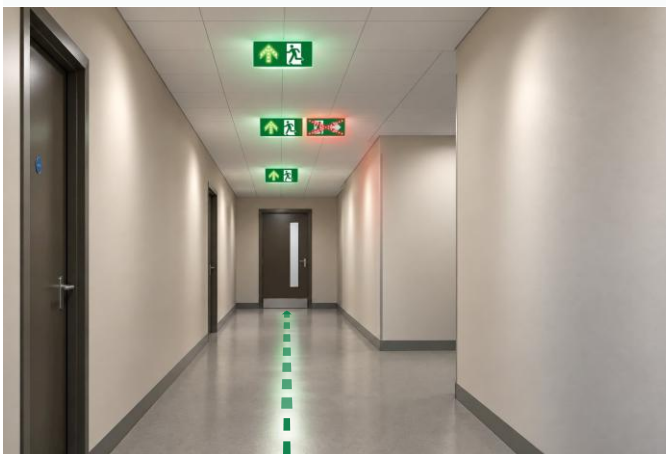
C AHEAD ROUTE INHIBITED

Turn right at the junction



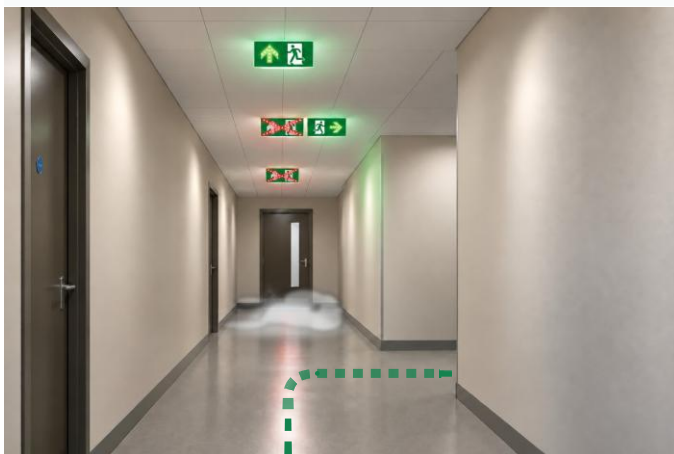
Conventional guidance.

Static signs indicate the available escape routes ahead and to the right.



Route ahead remains available.

Green arrows reinforce the route ahead. Red crosses inhibit the right-hand route.



Alternative route to the right.

Green arrows lead to the junction and direct occupants right. Red crosses inhibit continuing ahead.

Key to sign states



Static legend
Normal escape route



Dynamic green arrow
Reinforced escape route



Red X
Route not to be used

Diagram 3

Crossroads / four-way intersection

Dynamic signage adapts to the available escape routes.

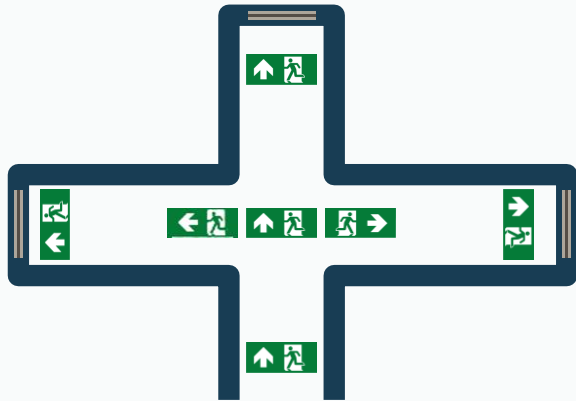
EVACLITE

2D plan view
(from above)

View for occupant
(looking forwards)

A NORMAL CONDITION

All shown routes available

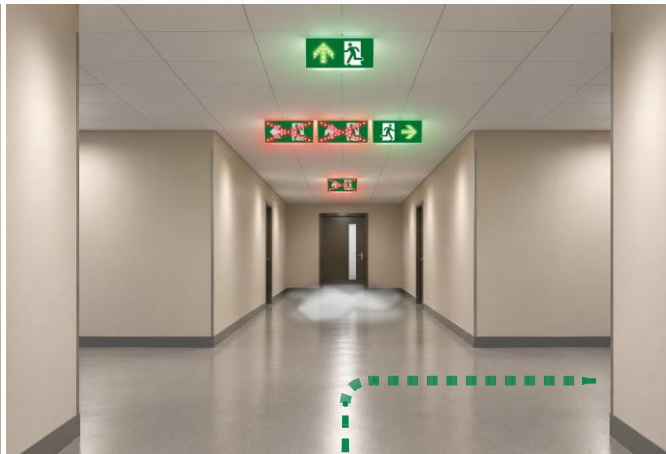
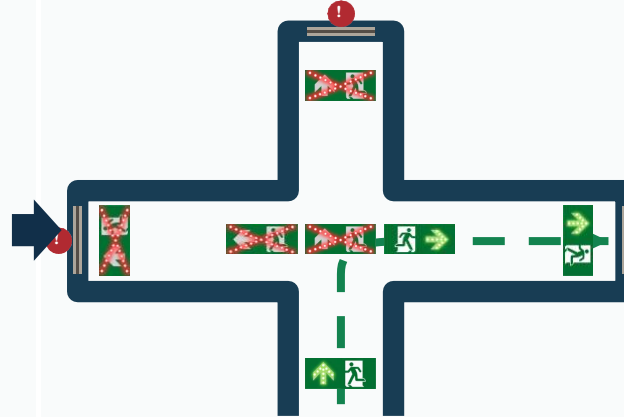


Conventional guidance.

Static signs indicate the available escape routes left, ahead and right.

B LEFT / AHEAD INHIBITED

Turn right at the junction

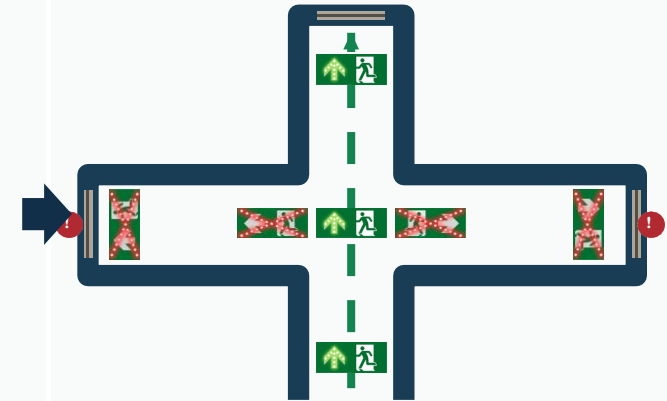


Alternative route to the right.

Green arrows lead to the junction and direct occupants right. Red crosses inhibit the left and forward routes.

C SIDE ROUTES INHIBITED

Continue straight ahead



Route ahead remains available.

Green arrows reinforce the route straight ahead. Red crosses inhibit both side routes.

Key to sign states



Static legend
Normal escape route



Dynamic green arrow
Reinforced escape route



Red X
Route not to be used

Diagram 4

T-junction

Dynamic signage adapts to the available escape routes.

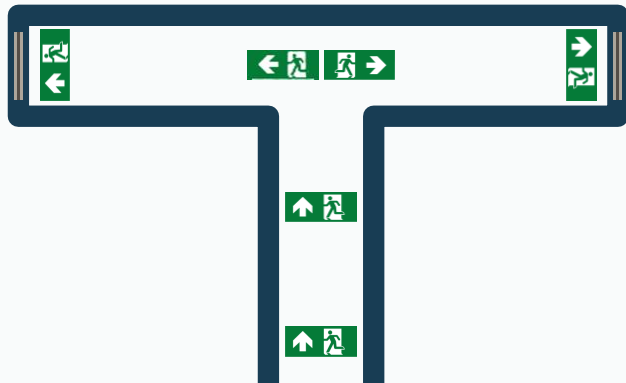
EVACLITE

2D plan view
(from above)

View for occupant
(looking forwards)

A NORMAL CONDITION

Routes left and right available

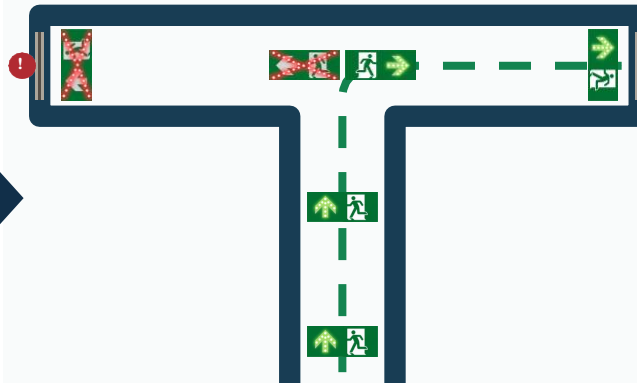


Conventional guidance.

Static signs lead to the T-junction and indicate the available escape routes left and right.

B LEFT ROUTE INHIBITED

Turn right at the junction

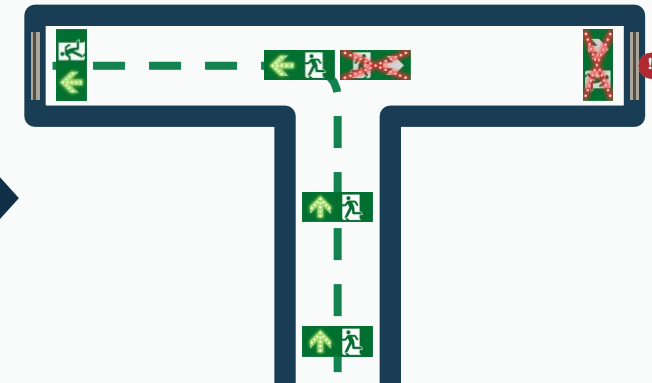


Alternative route to the right.

Green arrows lead to the junction and direct occupants right. Red crosses inhibit the left-hand route.

C RIGHT ROUTE INHIBITED

Turn left at the junction



Alternative route to the left.

Green arrows lead to the junction and direct occupants left. Red crosses inhibit the right-hand route.

Key to sign states



Static legend
Normal escape route



Dynamic green arrow
Reinforced escape route



Red X
Route not to be used



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Dynamic & Adaptive Emergency Exit Signage

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