RoadQuake Guidebook

Temporary Portable Rumble Strip

TRICEL

GENERATIONS OF INNOVATION

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Purpose of our guidebook

We have produced our best-practice guidebook to provide users with:

- The safest known methods to deploy RoadQuake TPRS.
- The information necessary to achieve optimum performance.

In our guidebook, you will the find information Tricel (Gloucester) Ltd has obtained through internal and external field testing. To this, we have added information derived from tests carried out by the Transport Research Laboratory (TRL) on behalf of Highways England.

That said, our recommendations are guidelines. They may not be appropriate for all applications. DFT traffic plans and sound engineering judgement should prevail with worker safety always the foremost priority.

Our guidebook provides a source of practical information for the optimal use of RoadQuake TPRS.

Evolution of RoadQuake TPRS

RoadQuake TPRS, designed to reduce accidents and save lives, alerts drivers, especially distracted drivers to changing road conditions like upcoming roadworks.

This product is one of the very few traffic control devices that communicate to several senses. Unlike an arrow sign or portable changeable sign which communicates to drivers through sight only, RoadQuake TPRS alerts drivers through sight, sound and vibration.

How does RoadQuake work?

RoadQuake TPRS is a transverse rumble strip, installed perpendicular to the direction of travel with the purpose of alerting drivers three senses:

- **See** an array of strips across the road.
- **Feel** the vibration caused by the tyres travelling over the strips.
- **Hear** the familiar thump-thump sound of the tyres travelling over the strips.

The sound and vibration generated by RoadQuake are significant, a study by the University of Kansas Transportation Centre determined that the RoadQuake system conveys both sound and vibration at levels similar to that of permanent rumble strips.

RoadQuake strips are explicitly designed to alert drivers to changes in road conditions while also conforming to the road surface without the need for adhesives or fasteners. These temporary countermeasures must show little movement when in use and are required to perform at the extremes of -5 to +30 degrees effeciency.

Transporting & handling RoadQuake TPRS

RoadQuake is designed to fold flat for easy transportation and handling. Each strip weighs 50kg and is a two-man lift; each has built-in handles for ease of lifting.

Deployment of RoadQuake TPRS

Before deployment, examine the deployment site:

Examine the following to determine the effectiveness of RoadQuake TPRS at the site:

- Identify the road surface type (RoadQuake is for use on asphalt or concrete surfaces).
- Ensure the surface is free of loose stone, gravel and debris.

Do not use RQ TPRS on these roads or surfaces:

Surfaces with a fresh seal coat, bleeding asphalt, soft pavement like fresh asphalt, heavily rutted roads or gravel and stone surfaces.

Do **not** use RoadQuake TPRS on horizontal bends. The force and angle of the vehicle travelling in the bend could force strips to move to the outside of the bend.

- Identify traffic speeds in advance of deployment at the worksite.
- RoadQuake TPRS are tested to perform at speeds up to 80mph efficiently.

RoadQuake TPRS perform on roads with slopes. However, the strips move more when positioned on an incline/slope than when on relatively flat roads. The steeper the slope, the more the strips may move. Engineering judgement should prevail with this type of application.

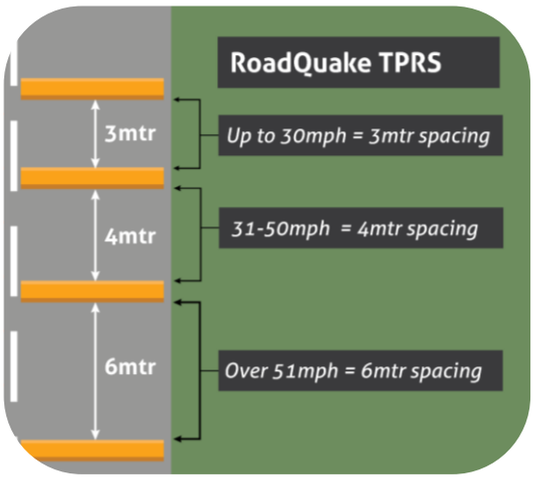
The deployment of RoadQuake TPRS

1. Determine a safe location from which to deploy the strips. Safety of workers is paramount, Tricel recommends the use of the hard shoulder or a closed lane.
2. Before deployment ensure the area is clear of any loose debris that prevents the strips making proper contact with the road surface. Failure to do this may result in the strips moving more readily.
3. Determine the correct spacing of the strips from your traffic management plan, pre-mark the road surface with correct spacing to speed up final deployment.

Spacing guidelines

Calculate the distance/spacing between rumble strip placement based on speed limit:

- Up to 30mph = 3 meter spacing on centre
- 31mph-50mph = 4 meter spacing on centre
- Over 51mph = 6 meter spacing on centre



RoadQuake TPRS

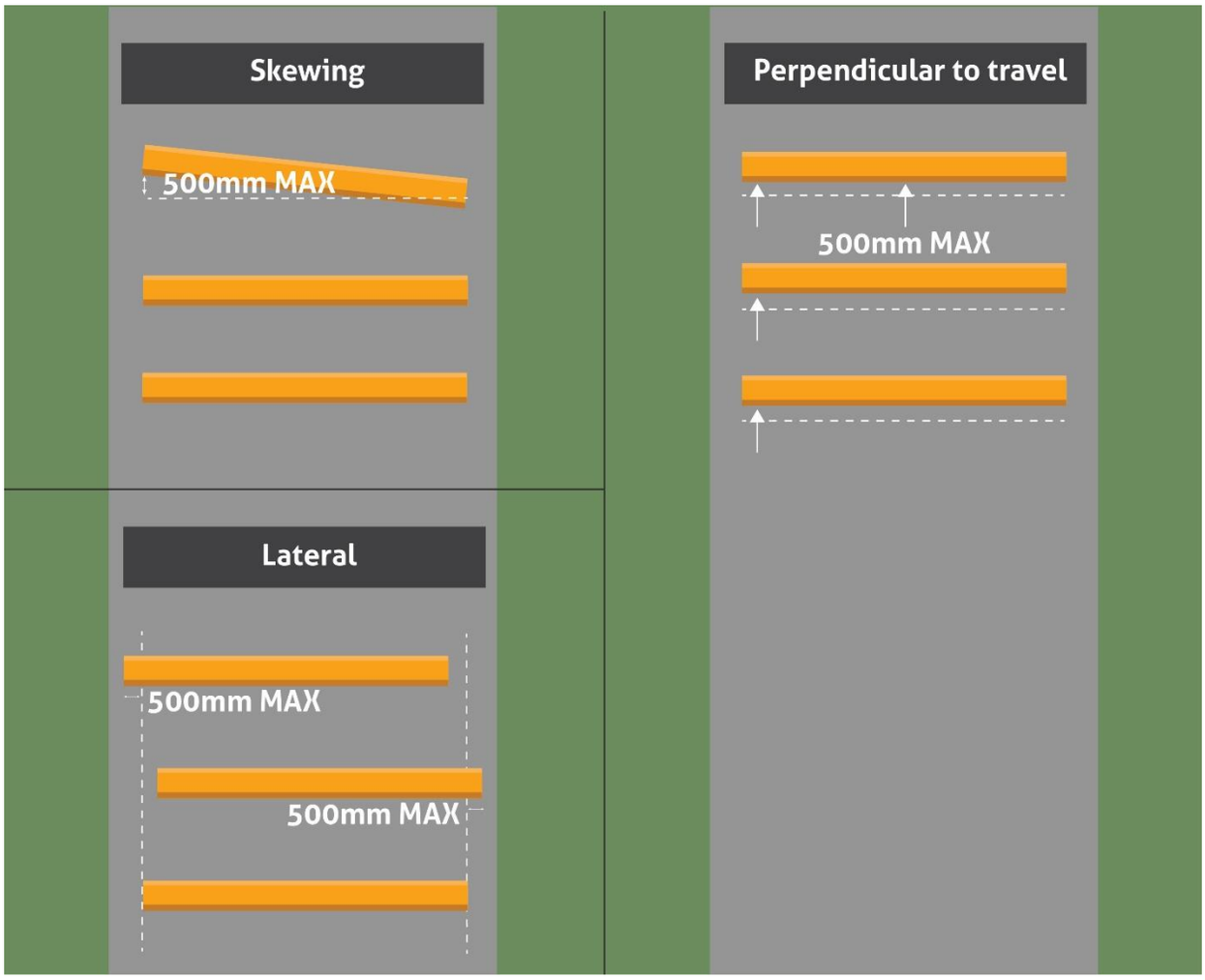
Monitor deployed RoadQuake TPRS

Each road is different as are the variables of each deployment. It is important to carefully monitor RoadQuake deployment under varying conditions such as road user volumes and weather. Multiple factors can contribute to position movement:

- A mix of vehicle types
- Worksite speed limit
- Road surface type

NOTE: It is the responsibility of the user/deployer always to monitor RoadQuake TPRS arrays.

Example of possible position movements



Tricel recommends

Users should closely monitor rumble strip positioning at the very beginning of each project, adhering to a strict schedule with regular visits. Such an approach allows for the calculation of time between initial positioning and any rumble strip movement beyond an allowable distance. This period becomes the monitoring schedule for the project.

- In no case should this period exceed four hours.

RoadQuake TPRS arrays efficiently alert drivers to changes in road conditions, like lane closure or slowing/stopped traffic.

Removal and security

Contractors should follow the same procedures for removing RoadQuake TPRS arrays as when deploying them. These are a temporary device, and Tricel recommends that rumble strips should not be left out at the worksite after workers leave. If you choose to leave them on site, we advise that you stack the RoadQuake strips and use a lock and chain to secure several units together.

Care and maintenance

The life expectancy of RoadQuake TPRS under normal application is three years. This product is for everyday use, periodic care and attention is required to maintain optimum effectiveness. Regular inspection of the underside of the RoadQuake strips is necessary to remove any debris that could affect performance. Use a water-based cleaner and a stiff brush to scrub the strips clean. We caution users to avoid oil-based cleaners and solvents, as they can degrade engineered polymer products.

RoadQuake testing and approvals

RoadQuake has successfully undergone rigorous trials by:

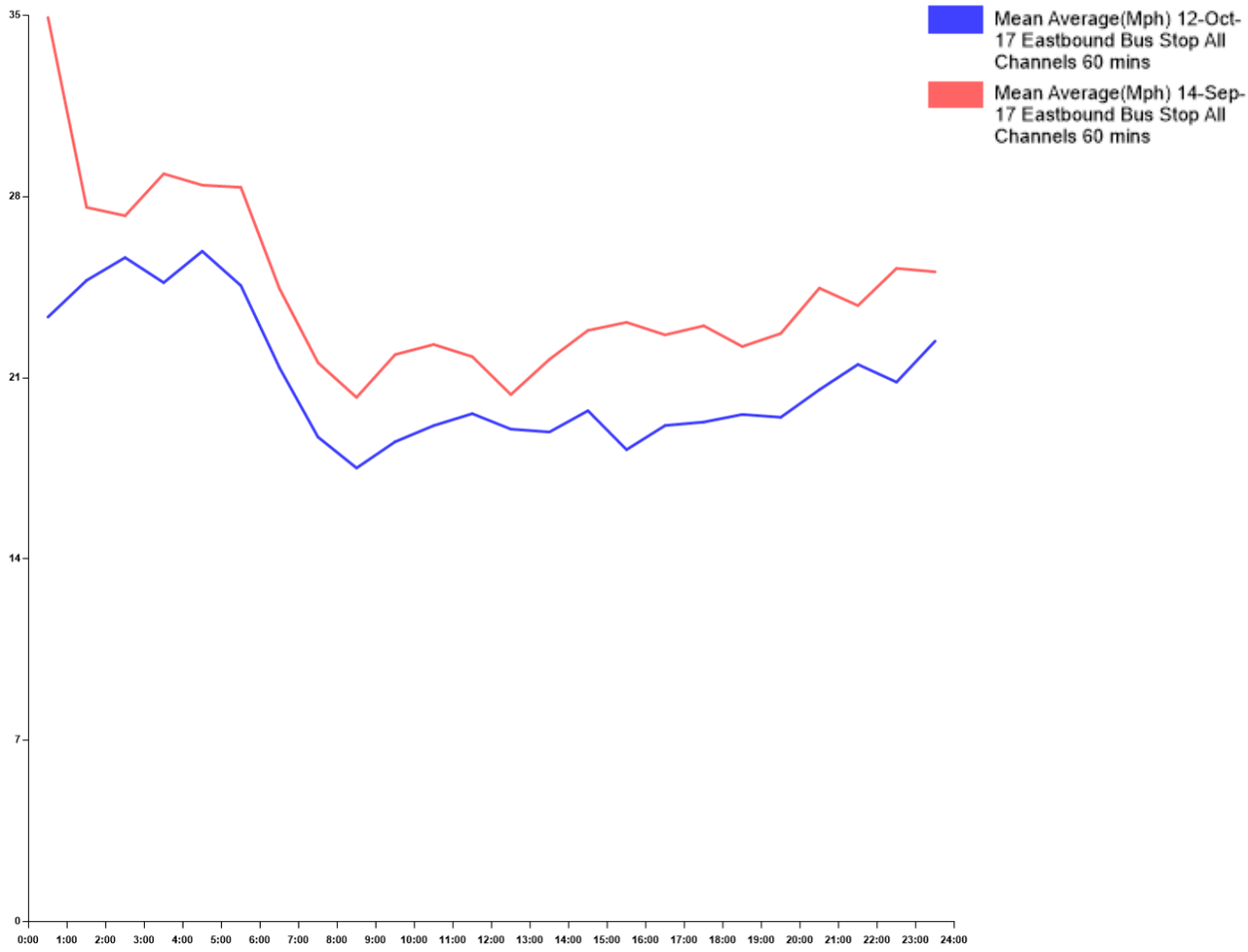
- Transport for London (TFL), Highways England, Transport Scotland, Transport Research Laboratory (TRL), Aberdeenshire County Council, City of Aberdeen Council and Durham Constabulary.

Results from TFL trials at Nine Elms Road London

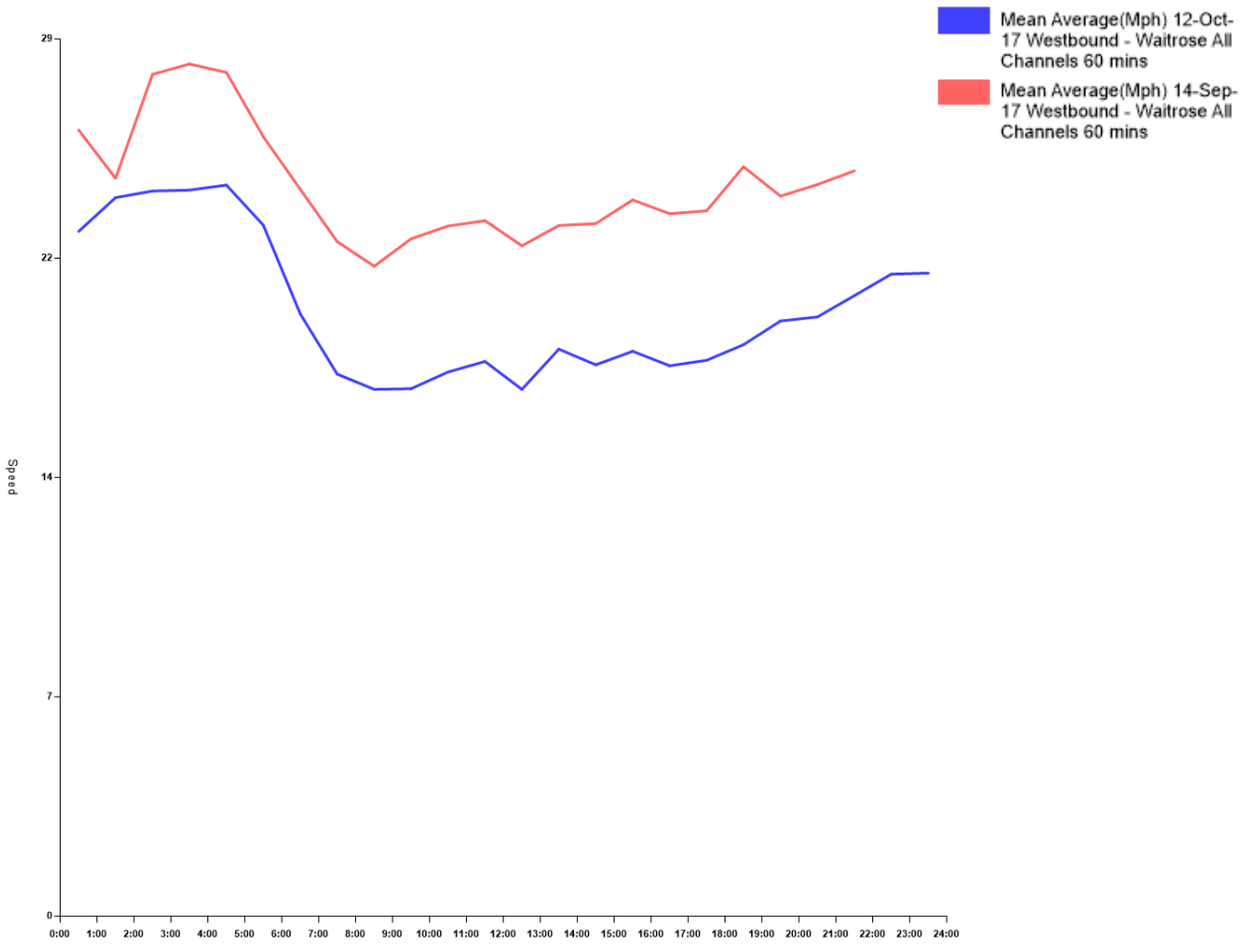
The graphic below shows the speed reduction following deployment of the RoadQuake.

Speed Camera Monitoring

Mean average motor traffic speed (eastbound, 12-17 December) confirming a reduction of speed following the start of the trial:

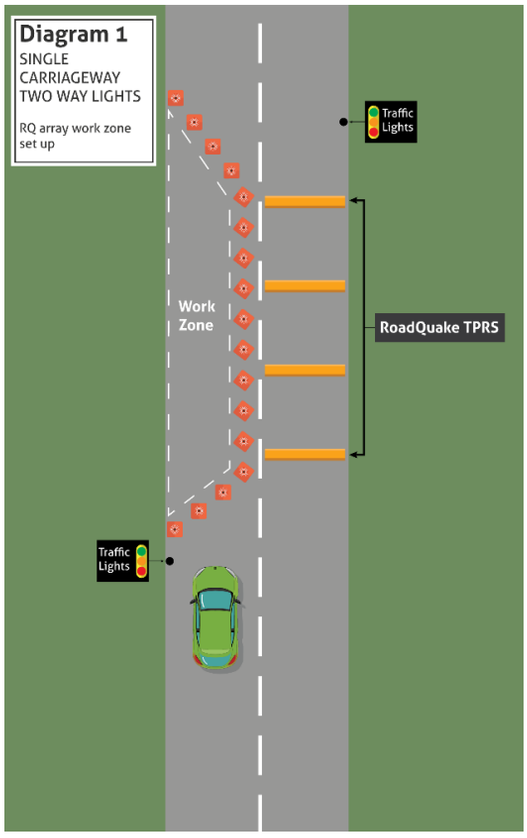


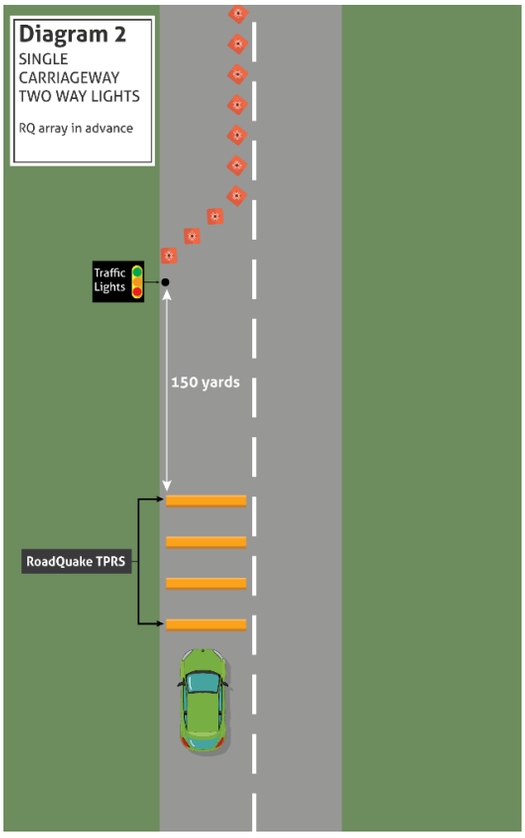
Mean average motor traffic speed (westbound, 12-17 December) confirming a reduction of speed following the start of the trial:

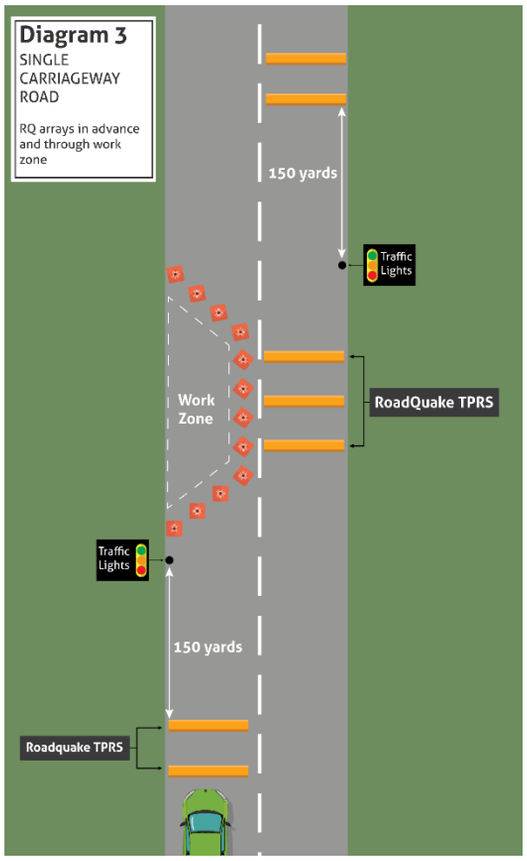


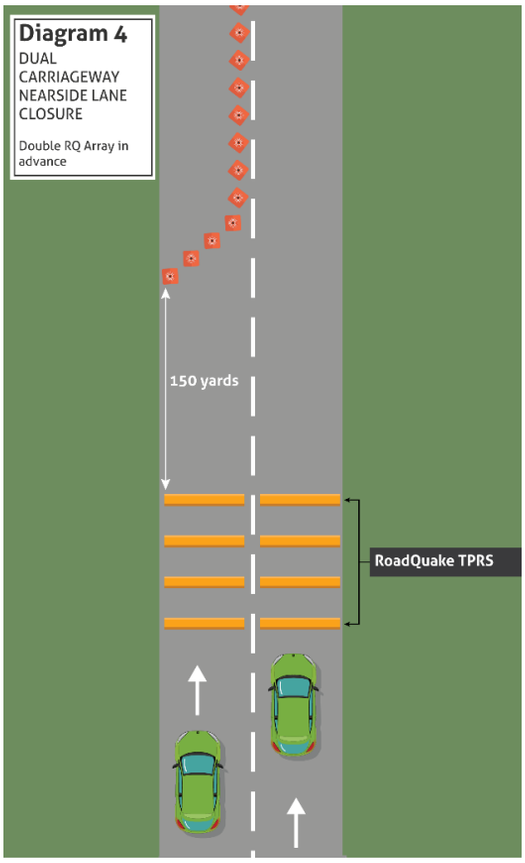
Examples of RoadQuake TPRS arrays

For spacing guidelines see page 5.









About Tricel

Tricel is a global provider of high-performance, innovation-based solutions for the Water, Environmental, Construction and Distribution industries. Our manufacturing capabilities include a range of composite materials which are produced in-house using our team of engineering experts.

Over 60 years of successful operations have made Tricel a highly-trusted supplier of a range of products to the construction industries. Our vast experiences in the production of plastics and Sheet Moulding Compound (SMC) based products make us one of the most trusted and innovative suppliers in operation today.

Today, Tricel has operating facilities located throughout the UK and Europe and deliver products to many of industries leading organisations globally. We supply many of the largest Construction and M&E companies within the UK as well as many of the most extensive Building Merchants.

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