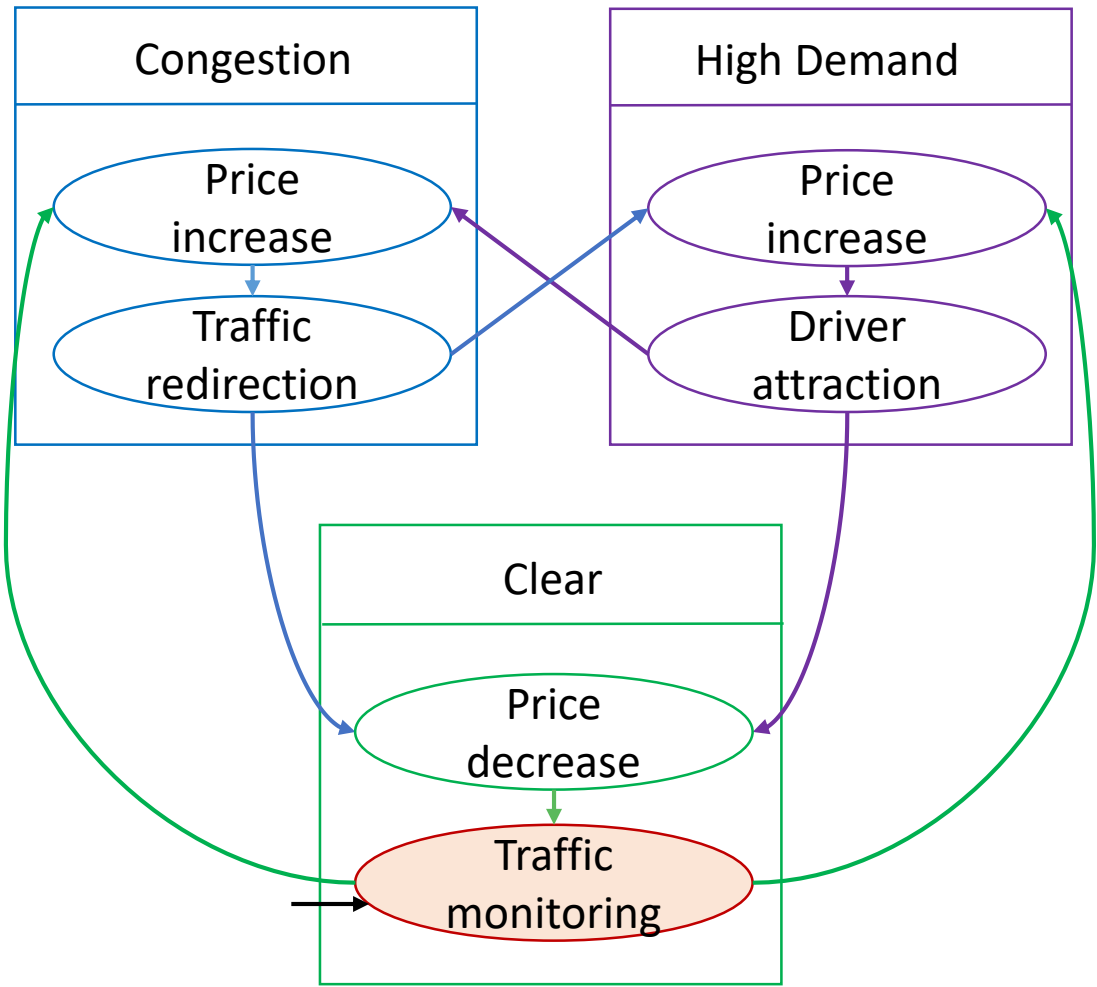


Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))

Rider (id(2),area(1))

Rider (id(3),area(1))

Rider (id(4),area(1))

Rider (id(5),area(1))

Driver (id(6),area(1))

Driver (id(7),area(1))

Driver (id(8),area(1))

Driver (id(9),area(1))

Driver (id(10),area(1))

Rider (id(11),area(1))

Driver (id(1),area(2))

Driver (id(6),area(4))

Driver (id(7),area(3))

Driver (id(8),area(1))

Rider (id(12),area(1))

This query

SET drivers=drivers+1

PATTERN Driver

WHERE area=1

CONTEXT Clear, High demand, Congestion

Increments the number of drivers

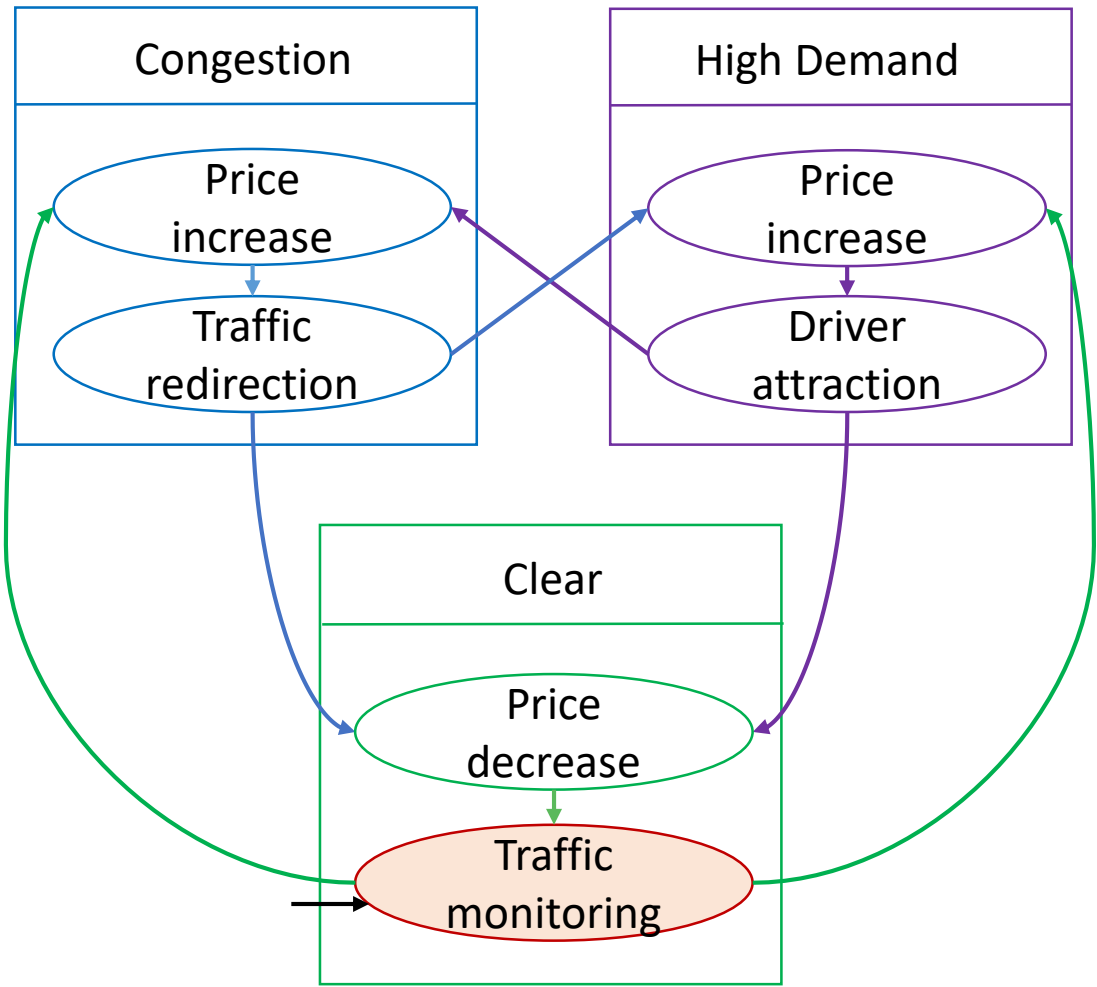
Side panel: Tab “Variables”

Drivers = 1

Riders = 0

Price = 10

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))

Rider (id(2),area(1))

Rider (id(3),area(1))

Rider (id(4),area(1))

Rider (id(5),area(1))

Driver (id(6),area(1))

Driver (id(7),area(1))

Driver (id(8),area(1))

Driver (id(9),area(1))

Driver (id(10),area(1))

Rider (id(11),area(1))

Driver (id(1),area(2))

Driver (id(6),area(4))

Driver (id(7),area(3))

Driver (id(8),area(1))

Rider (id(12),area(1))

This query

SET riders=riders+1

PATTERN Rider

WHERE area=1

CONTEXT Clear, High Demand, Congestion

Increments the number of riders

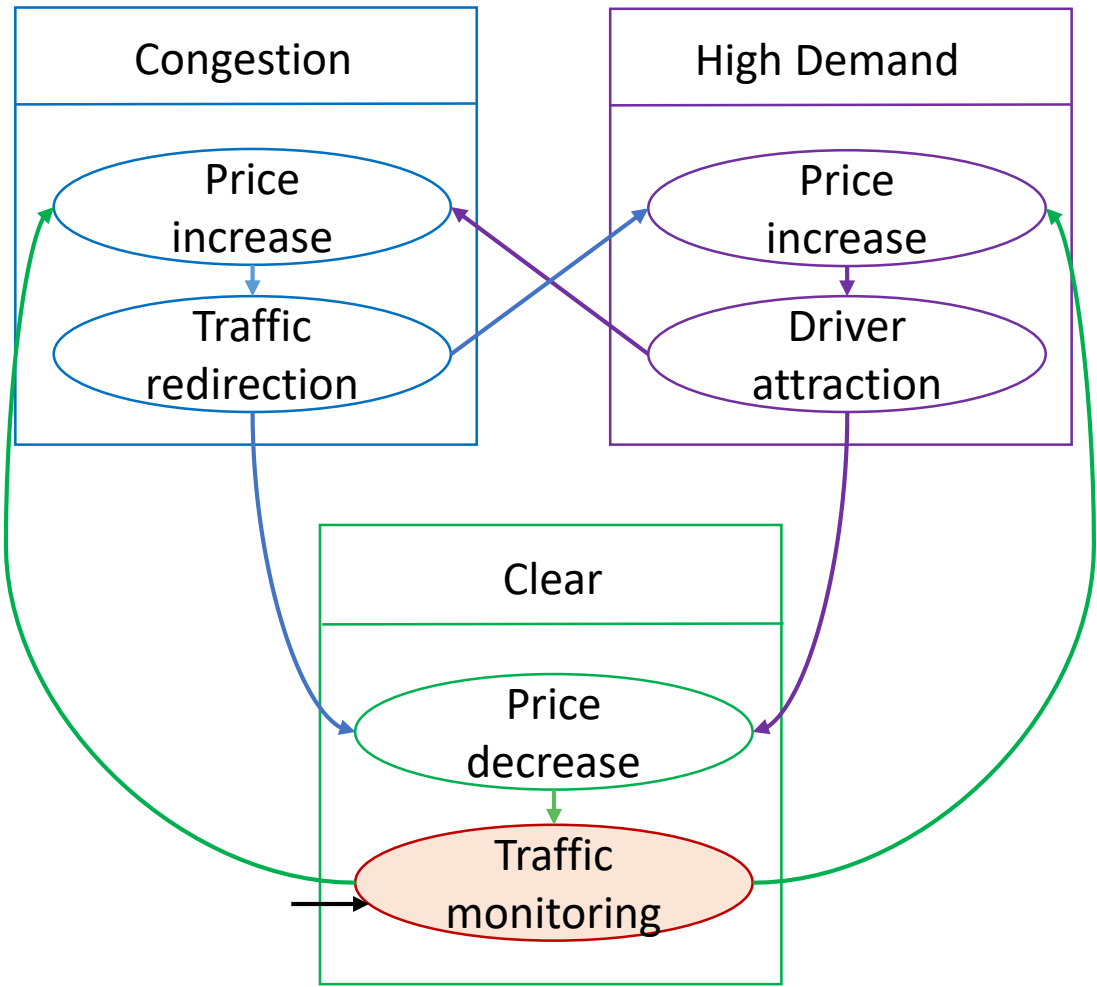
Side panel: Tab “Variables”

Drivers = 1

Riders = 1

Price = 10

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

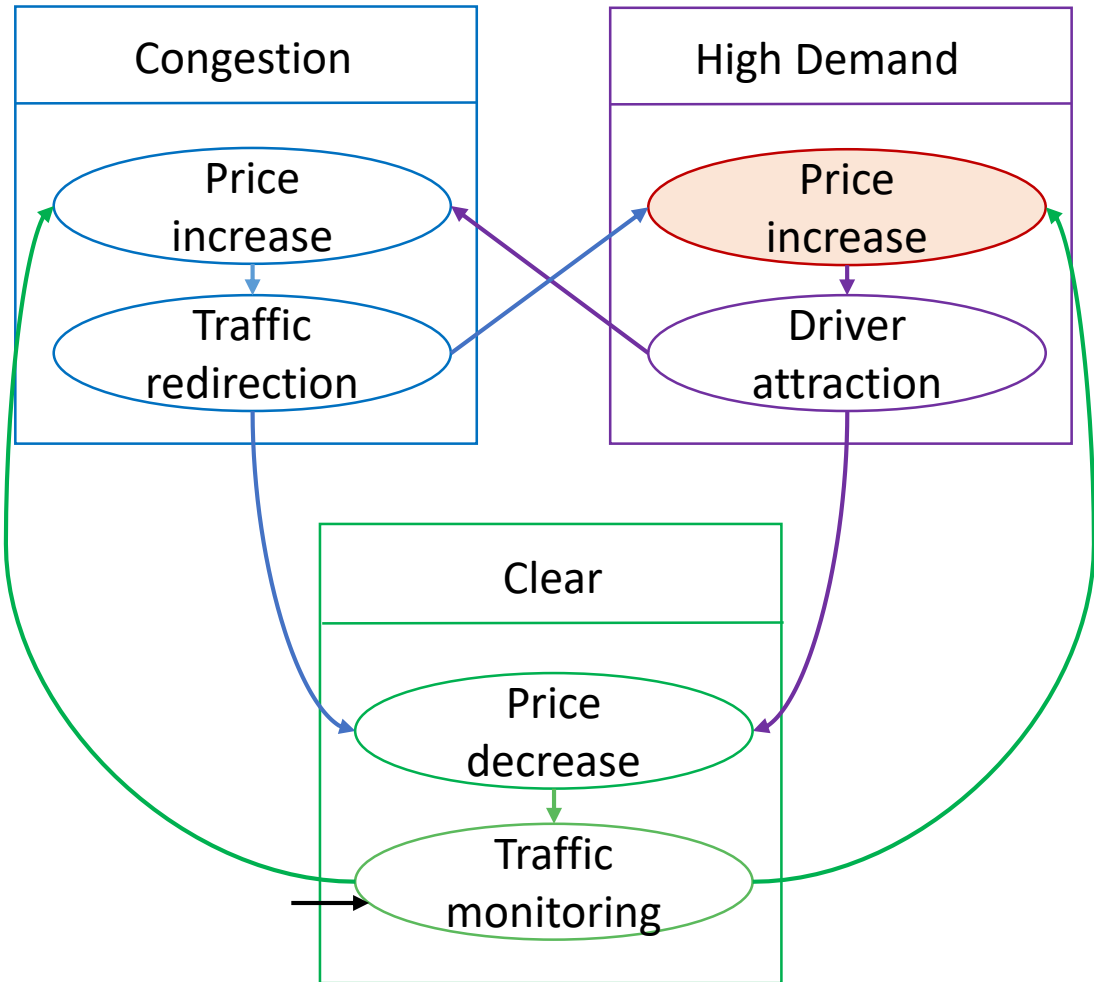
This query

```
SET riders=riders+1
PATTERN Rider
WHERE area=1
CONTEXT Clear, High Demand, Congestion
Increments the number of riders
```

Side panel: Tab “Variables”

Drivers = 1
Riders = 2
Price = 10

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query

SET riders=riders+1

PATTERN Rider

WHERE area=1

CONTEXT Clear, High Demand, Congestion

Increases the number of riders

This query

SWITCH High demand: Price increase

PATTERN *

WHERE riders>drivers*2

CONTEXT Clear: Traffic monitoring

switches the context

This query

SET price=price*1.1

CONTEXT High Demand: Price increase,

Congestion: Price increase

Increases the price

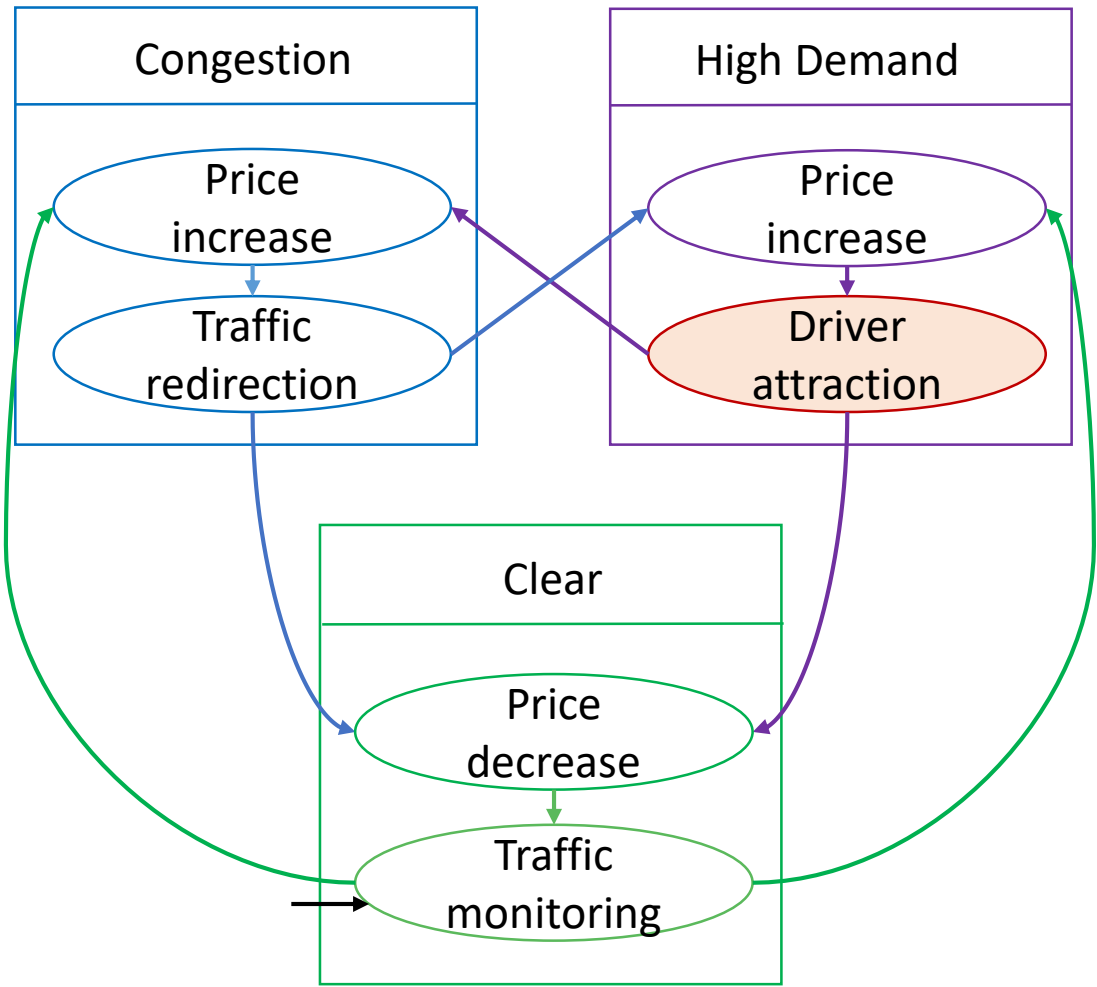
Side panel: Tab “Variables”

Drivers = 1

Riders = 3

Price = 11

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

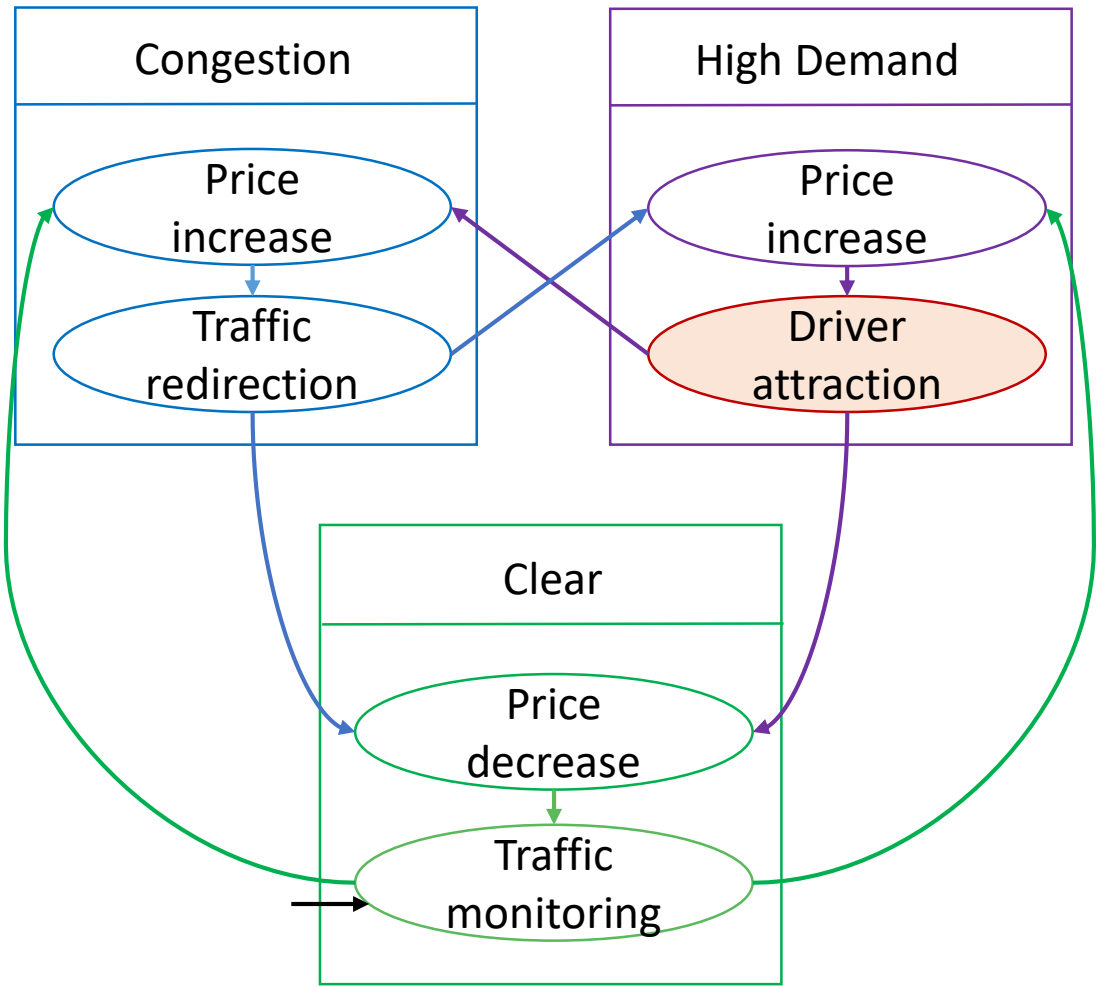
Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query
SWITCH High demand: Driver attraction
PATTERN *
CONTEXT High demand: Price increase
switches the context

Side panel: Tab “Variables”

Drivers = 1
Riders = 3
Price = 11

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

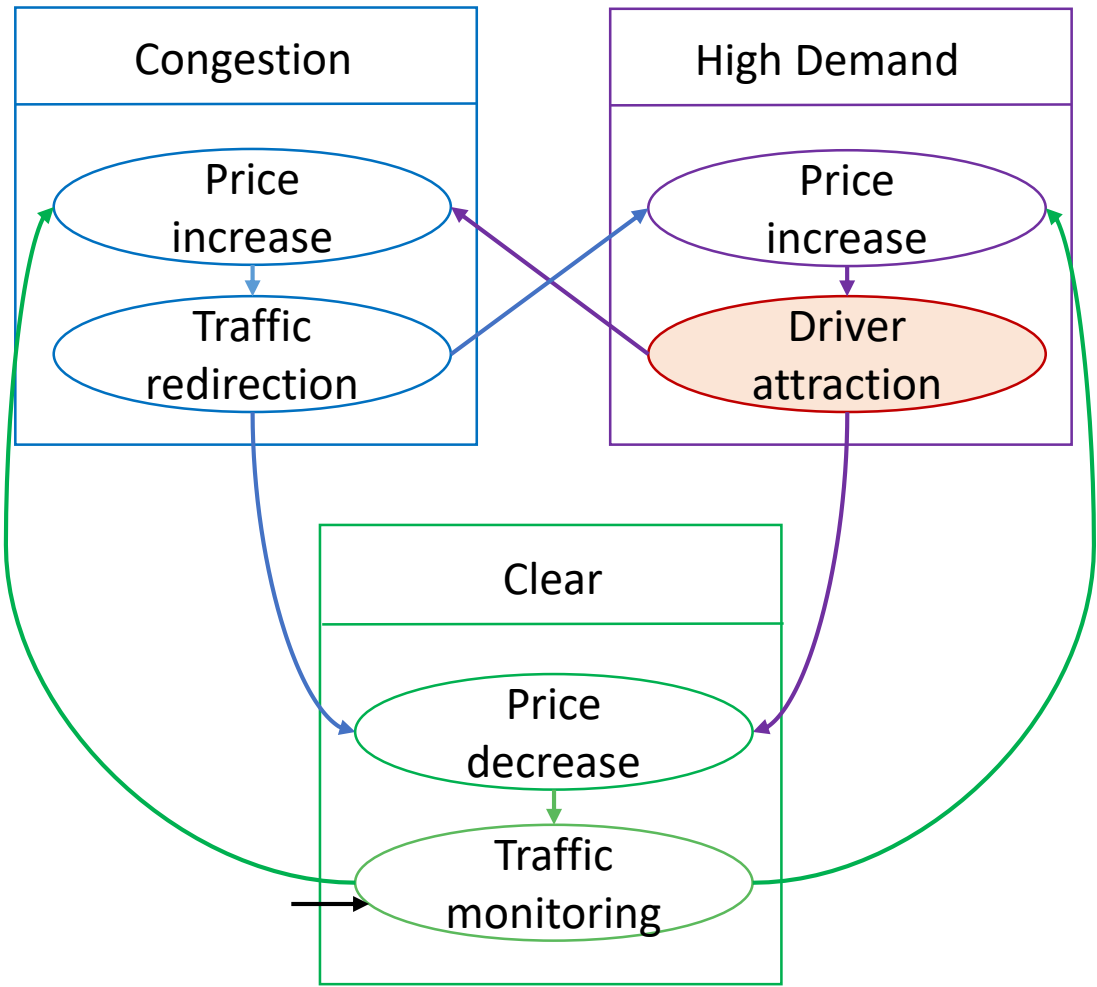
This query

```
SET riders=riders+1  
PATTERN Rider  
WHERE area=1  
CONTEXT Clear, High Demand, Congestion  
Increments the number of riders
```

Side panel: Tab “Variables”

Drivers = 1
Riders = 4
Price = 11

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query

SET drivers=drivers+1

PATTERN Driver

WHERE area=1

CONTEXT Clear, High demand, Congestion

Increments the number of drivers

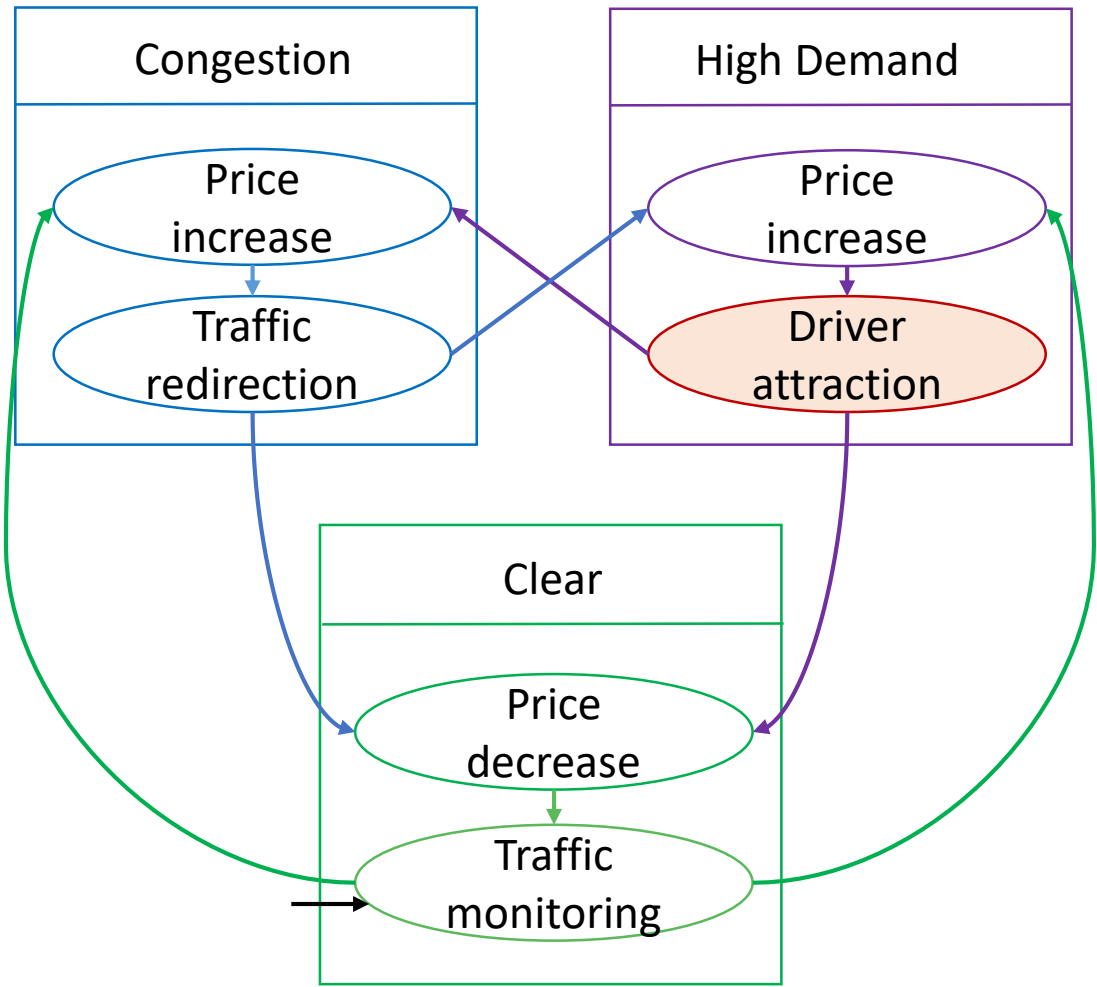
Side panel: Tab “Variables”

Drivers = 2

Riders = 4

Price = 11

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

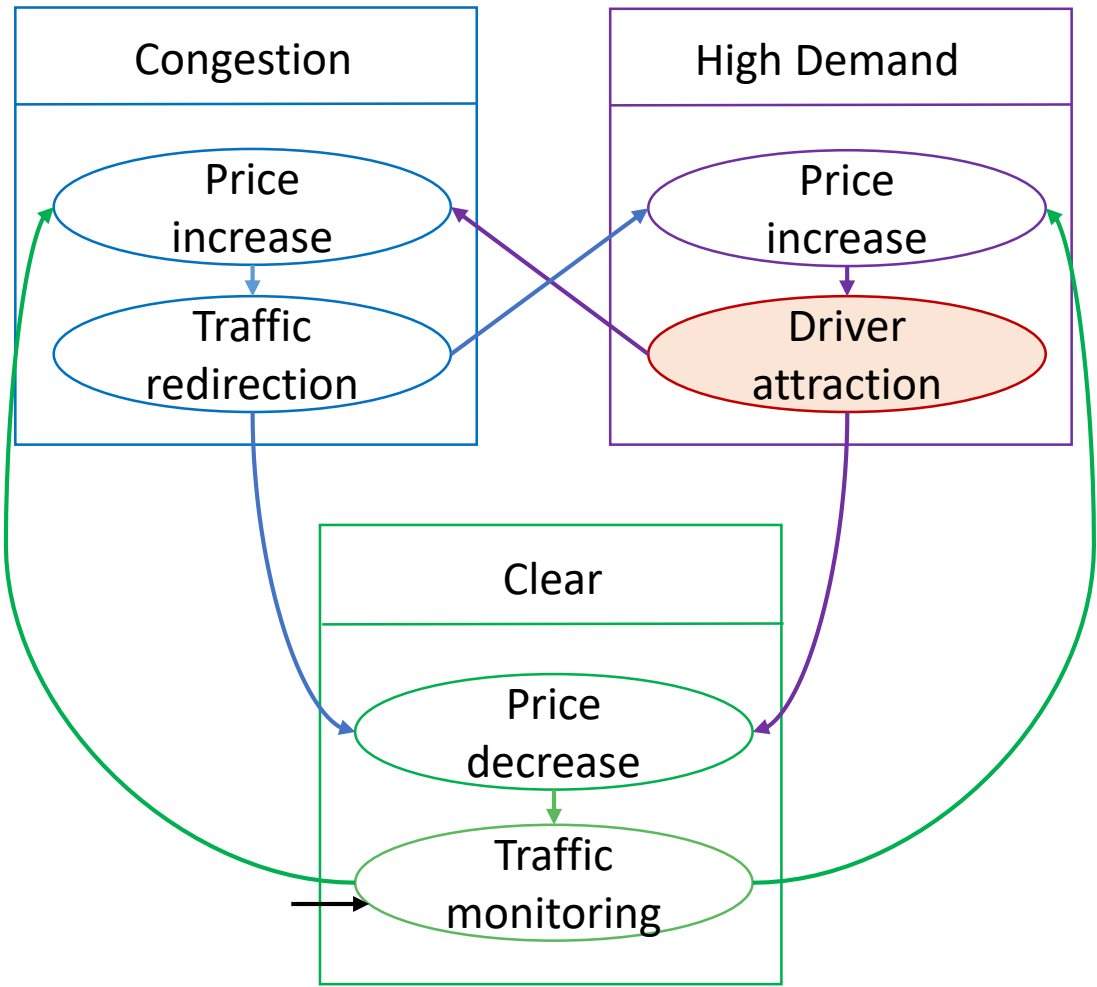
This query

```
SET drivers=drivers+1
PATTERN Driver
WHERE area=1
CONTEXT Clear, High demand, Congestion
Increments the number of drivers
```

Side panel: Tab “Variables”

Drivers = 3
Riders = 4
Price = 11

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

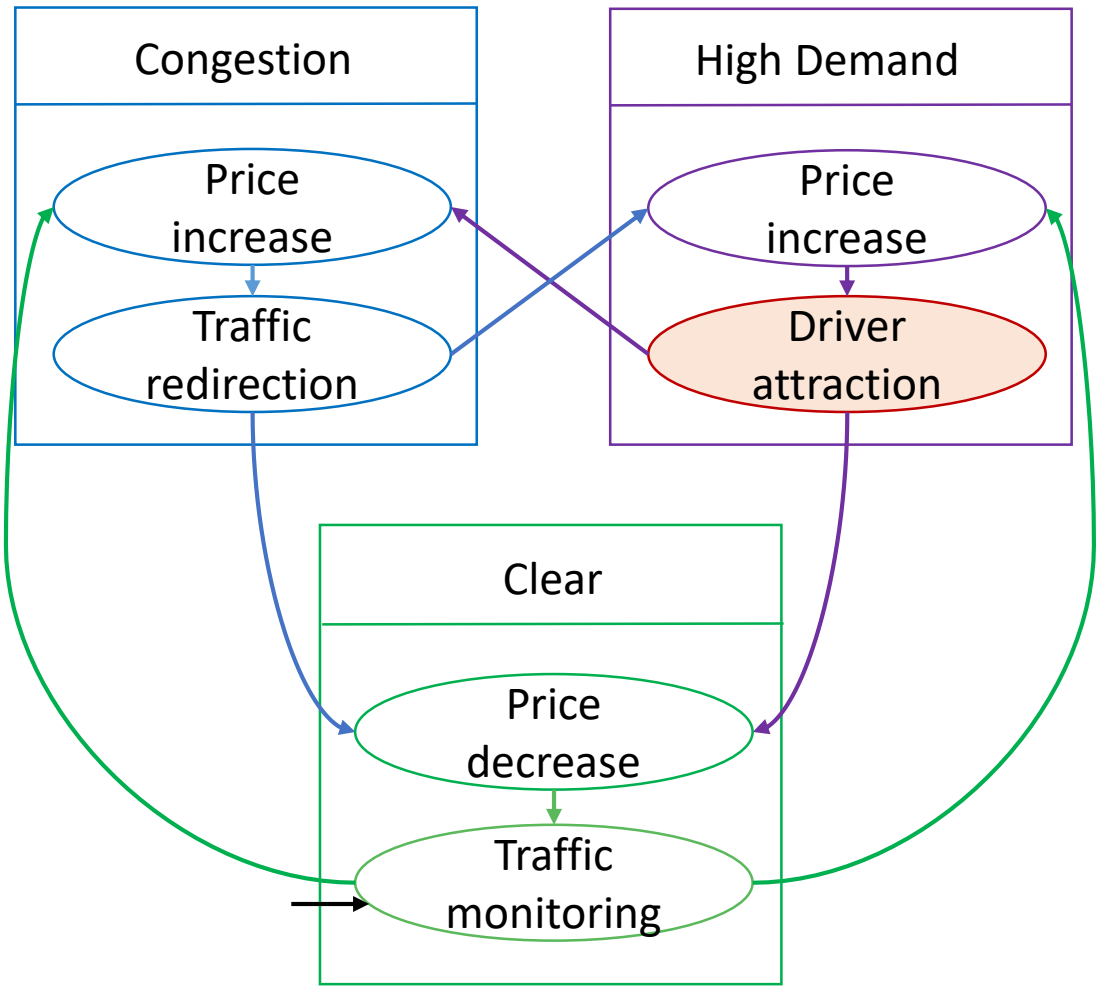
Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query
SET drivers=drivers+1
PATTERN Driver
WHERE area=1
CONTEXT Clear, High demand, Congestion
Increments the number of drivers

Side panel: Tab “Variables”

Drivers = 4
Riders = 4
Price = 11

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

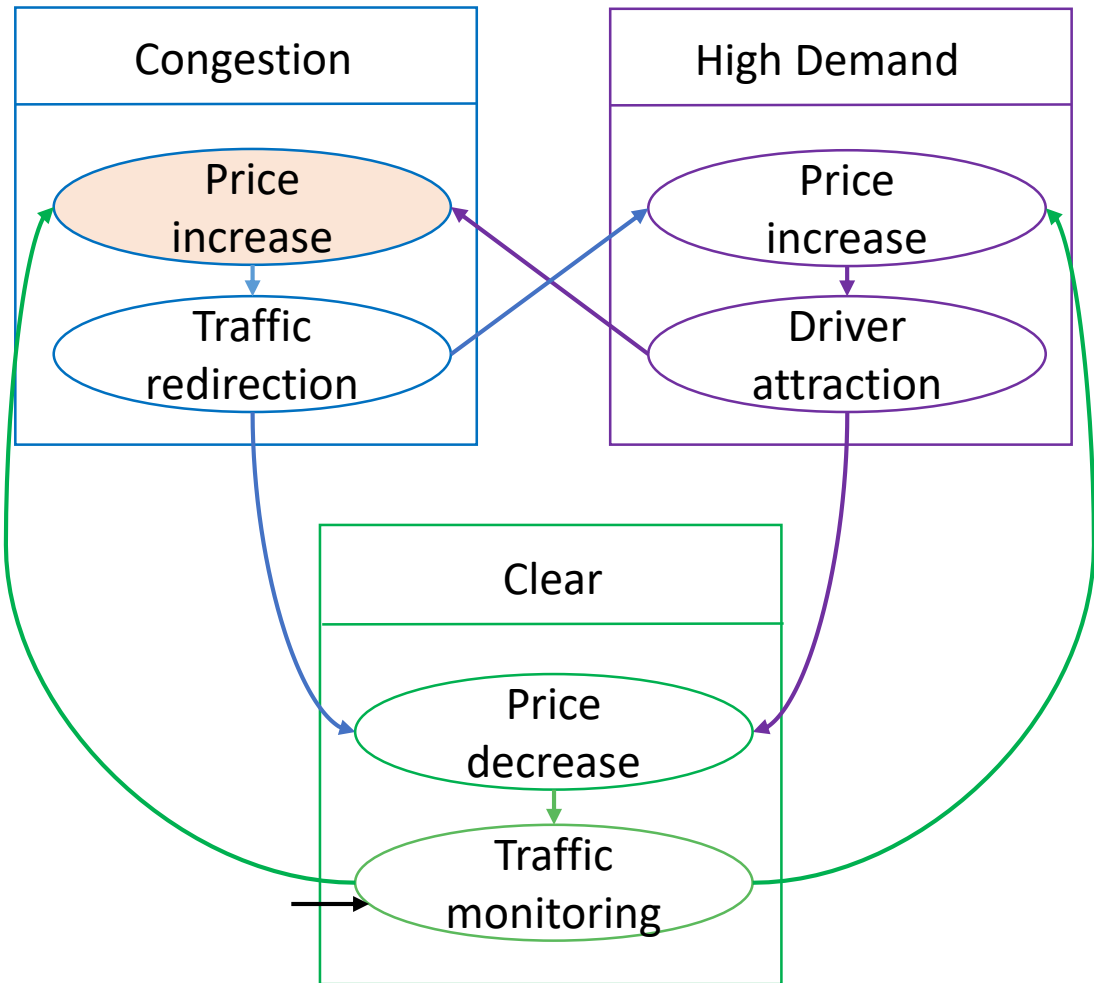
Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query
SET drivers=drivers+1
PATTERN Driver
WHERE area=1
CONTEXT Clear, High demand, Congestion
Increments the number of drivers

Side panel: Tab “Variables”

Drivers = 5
Riders = 4
Price = 11

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query

SET drivers=drivers+1

PATTERN Driver

WHERE area=1

CONTEXT Clear, High demand, Congestion

Increments the number of drivers

This query

SWITCH Congestion: Price increase

PATTERN *

WHERE drivers>5, riders<=drivers*2

CONTEXT Clear: Traffic monitoring

Switches the context

This query

SET price=price*1.1

CONTEXT High Demand: Price increase,
Congestion: Price increase

Increase the price

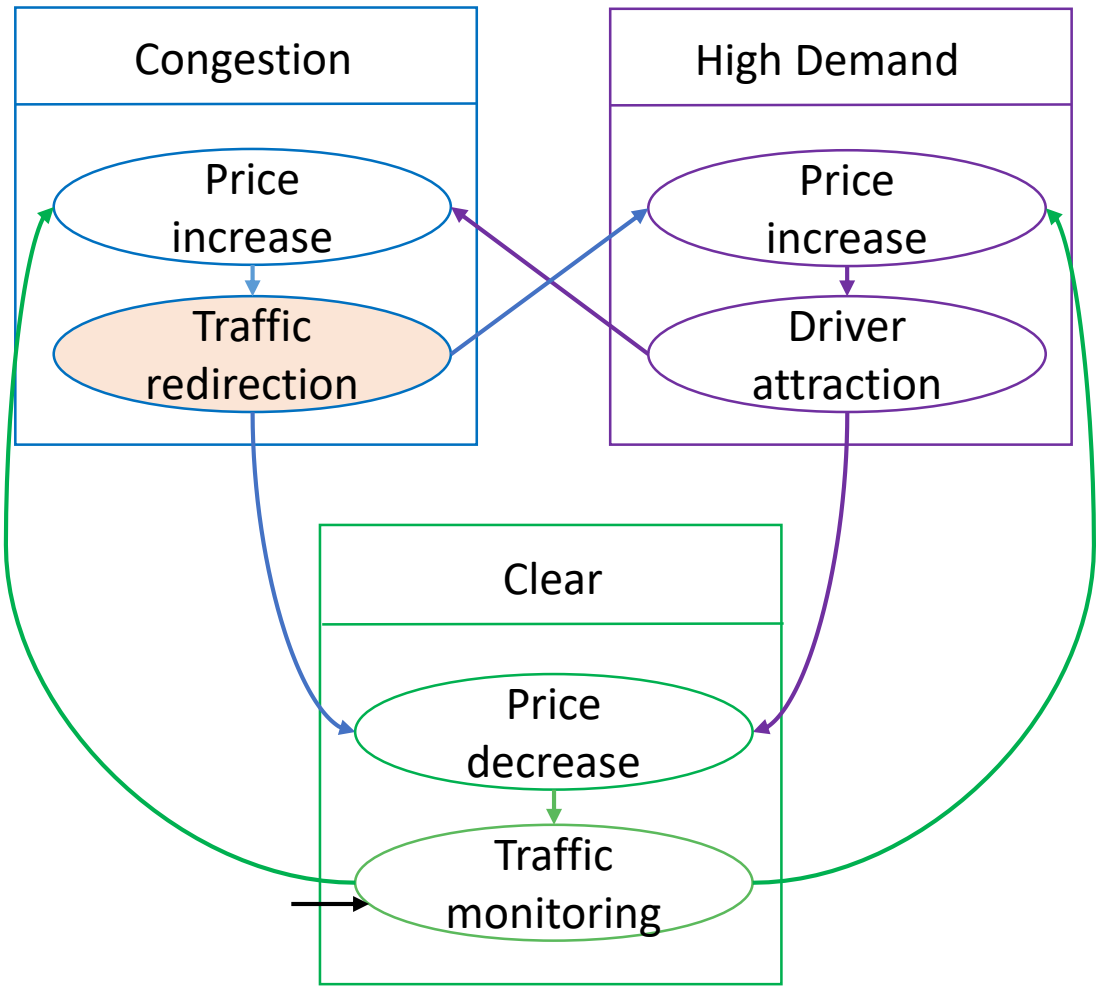
Side panel: Tab “Variables”

Drivers = 6

Riders = 4

Price = 12.1

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

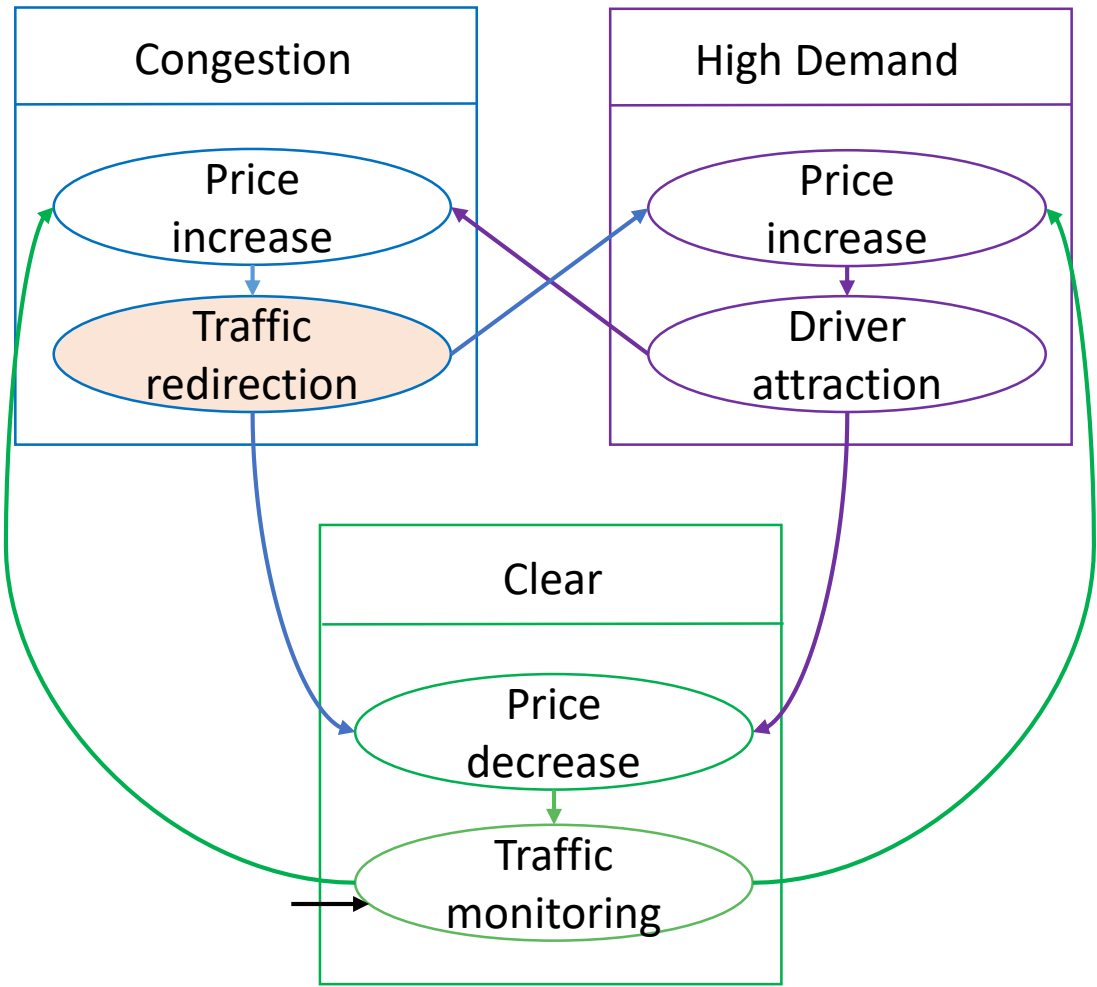
Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query
SWITCH Congestion: Traffic redirection
PATTERN *
CONTEXT Congestion: Price increase
Transitions to other context

Side panel: Tab “Variables”

Drivers = 6
Riders = 4
Price = 12.1

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

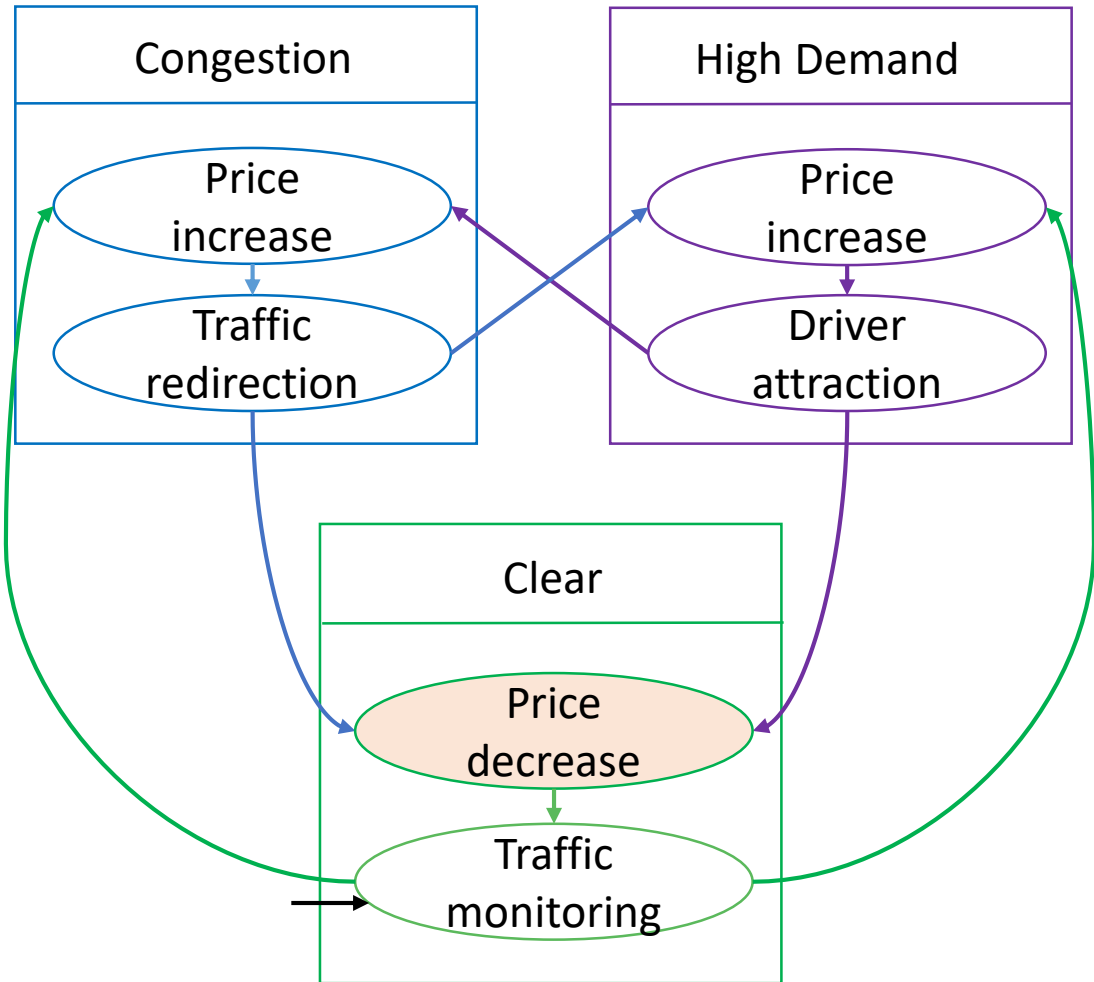
Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query
SET riders=riders+1
PATTERN Rider
WHERE area=1
CONTEXT Clear, High Demand, Congestion
Increments the riders

Side panel: Tab “Variables”

Drivers = 6
Riders = 5
Price = 12.1

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query

SET drivers=drivers-1

PATTERN Driver

WHERE area!=1

CONTEXT Clear, High demand, Congestion
decrements the drivers

This query

SWITCH Clear: Price decrease

PATTERN *

WHERE riders<=drivers, drivers<=5

CONTEXT High demand: Driver attraction,
Congestion: Traffic redirection

Transitions to other context

Side panel: Tab “Variables”

Drivers = 5

Riders = 5

Price = 10

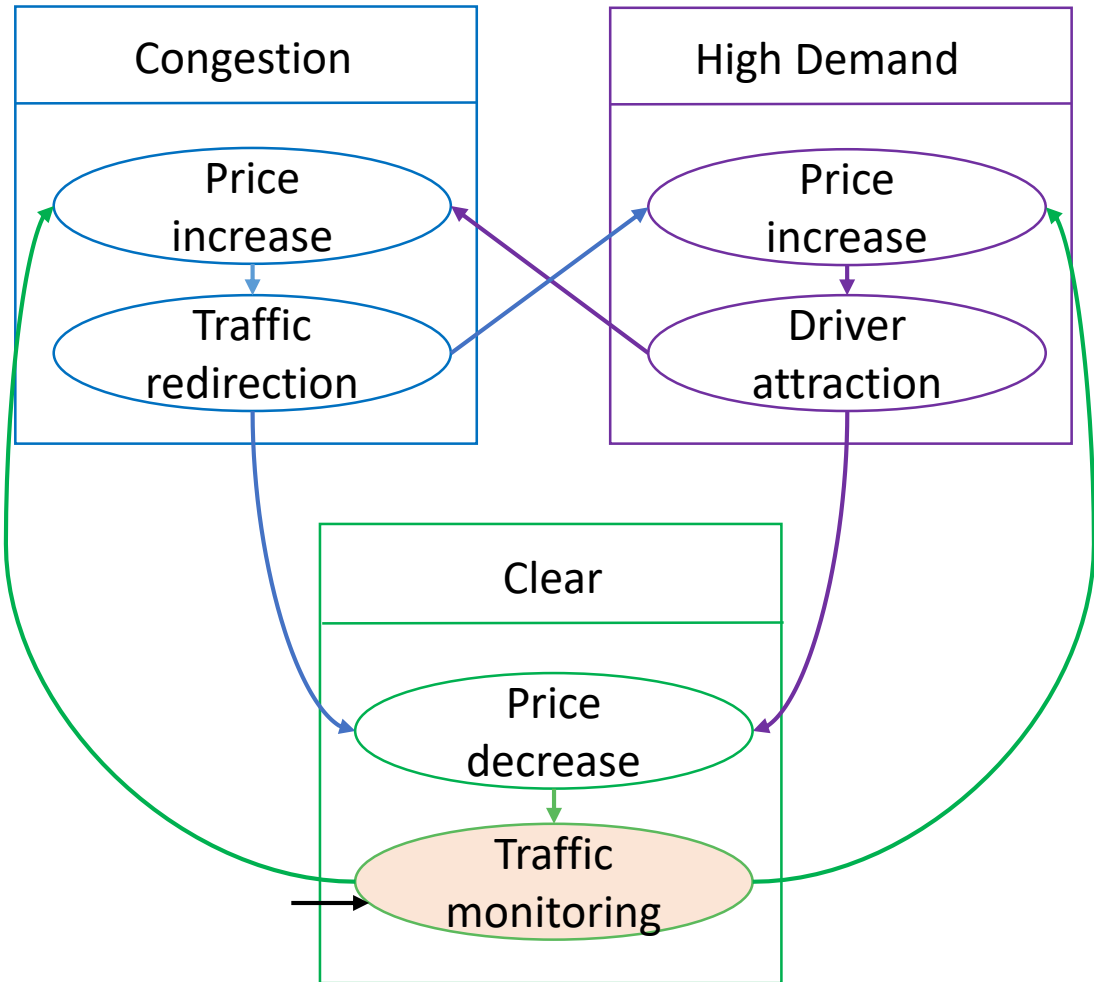
This query

SET price=10

CONTEXT Clear: Price decrease

Decreases the price

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Driver (id(8),area(1))
Rider (id(12),area(1))

This query

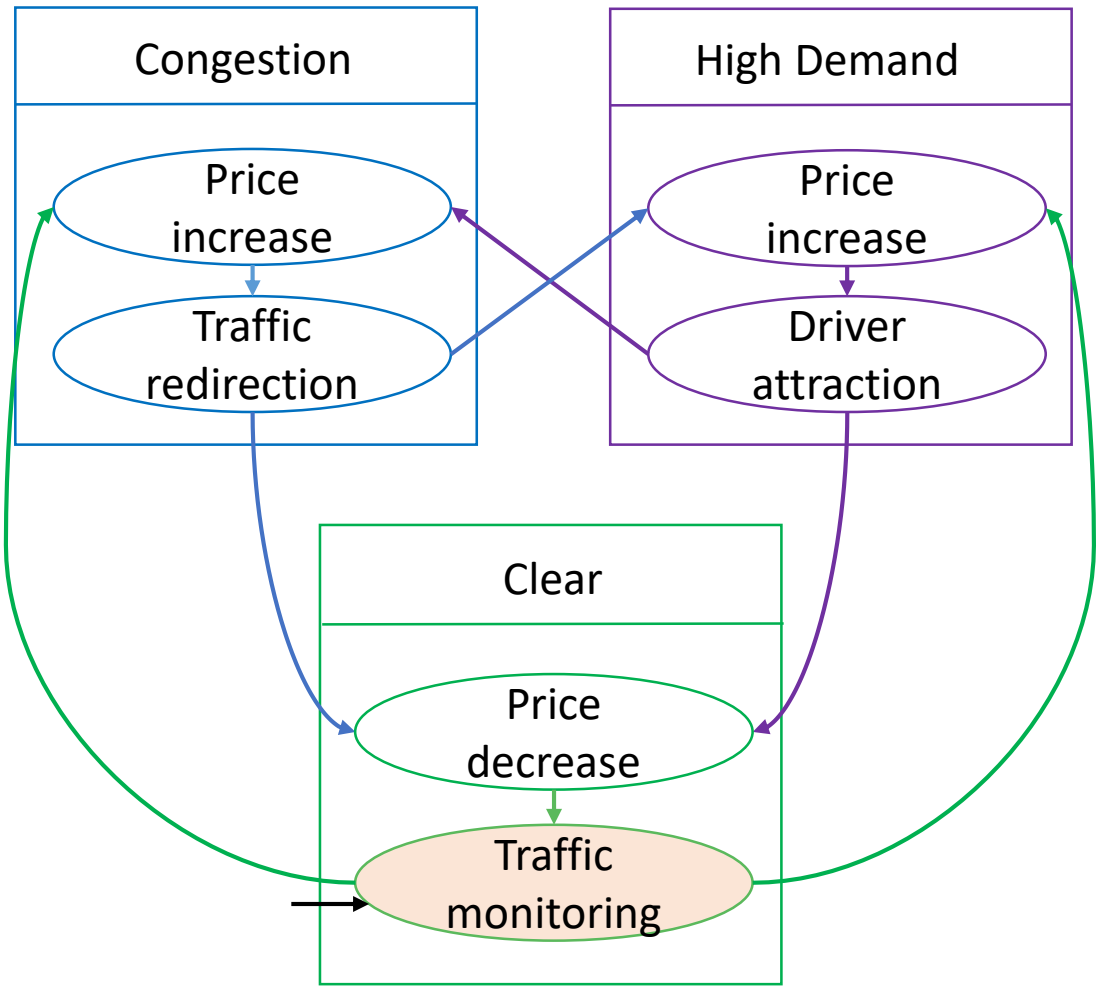
SWITCH Clear: Traffic monitoring
PATTERN *

CONTEXT Clear: Price decrease
Transitions to other context

Side panel: Tab “Variables”

Drivers = 5
Riders = 5
Price = 10

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

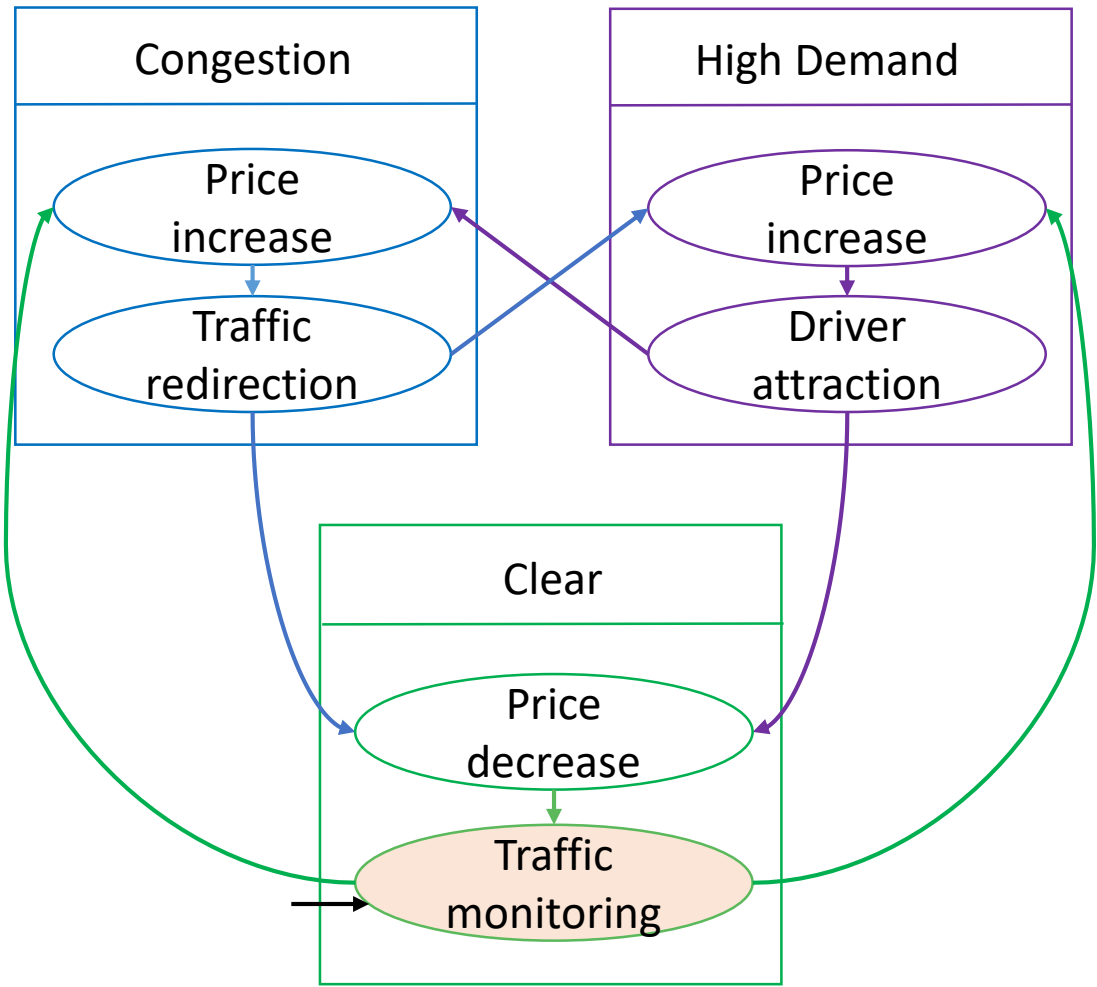
Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Rider (id(2),area(3))
Rider (id(3),area(4))

This query
SET drivers=drivers-1
PATTERN Driver
WHERE area!=1
CONTEXT Clear, High demand, Congestion
Decrements the drivers

Side panel: Tab “Variables”

Drivers = 4
Riders = 5
Price = 10

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Rider (id(2),area(3))
Rider (id(3),area(4))

This query

SET drivers=drivers-1

PATTERN Driver

WHERE area!=1

CONTEXT Clear, High demand, Congestion

Decrements the drivers

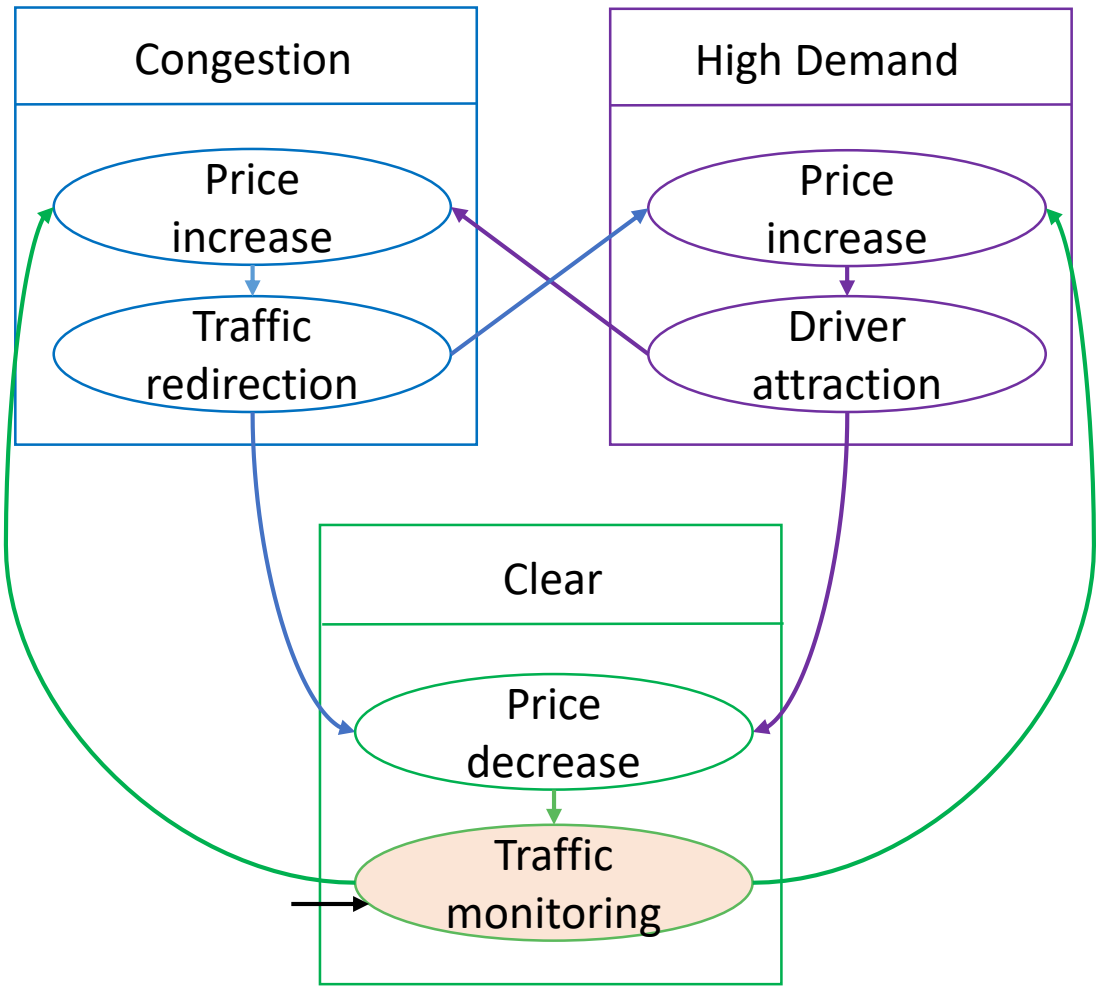
Side panel: Tab “Variables”

Drivers = 3

Riders = 5

Price = 10

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

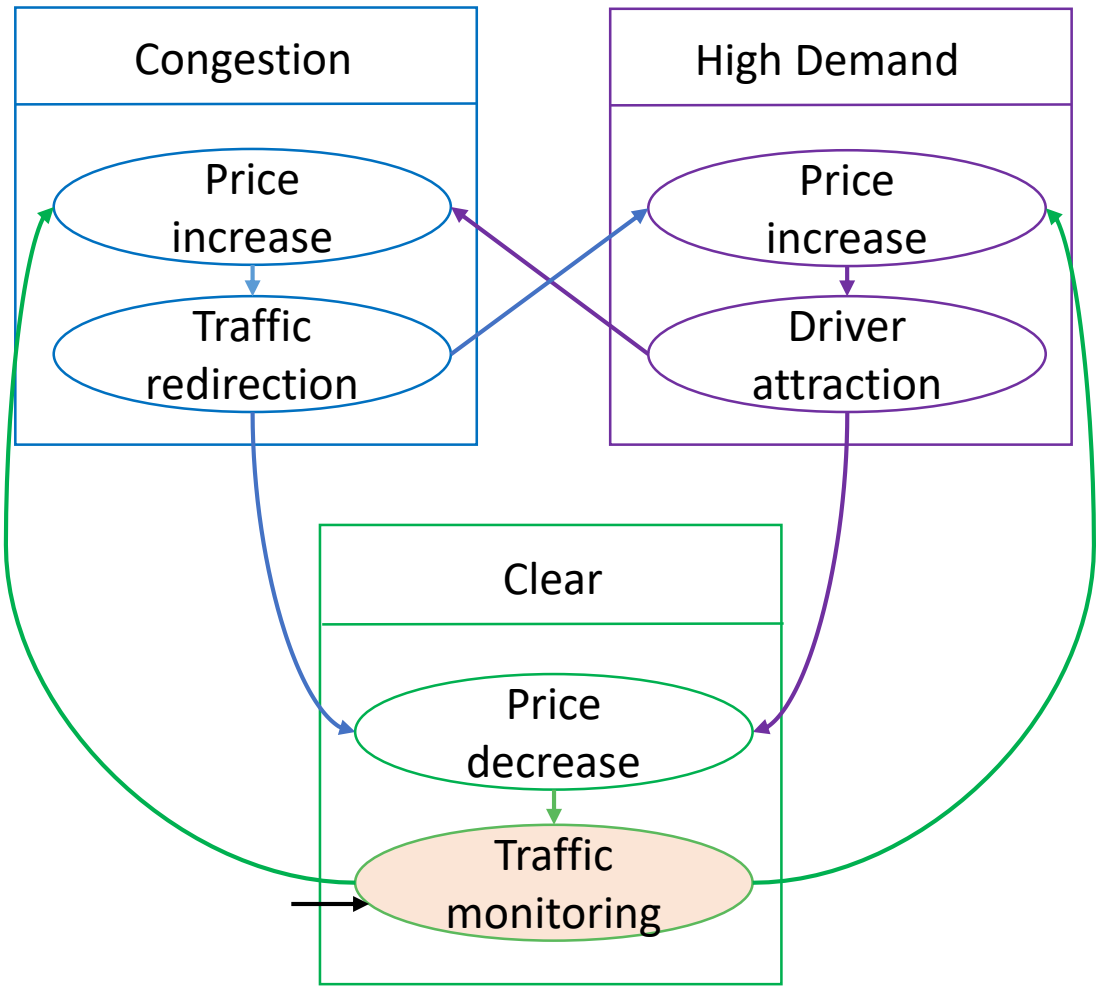
Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Rider (id(2),area(3))
Rider (id(3),area(4))

This query
SET riders=riders-1
PATTERN Rider
WHERE area!=1
CONTEXT Clear, High Demand,
Congestion
Decrements the riders

Side panel: Tab “Variables”

Drivers = 3
Riders = 4
Price = 10

Main panel: Contexts and transitions



Side panel: Tab “Input stream”

Driver (id(1),area(1))
Rider (id(2),area(1))
Rider (id(3),area(1))
Rider (id(4),area(1))
Rider (id(5),area(1))
Driver (id(6),area(1))
Driver (id(7),area(1))
Driver (id(8),area(1))
Driver (id(9),area(1))
Driver (id(10),area(1))
Rider (id(11),area(1))
Driver (id(1),area(2))
Driver (id(6),area(4))
Driver (id(7),area(3))
Rider (id(2),area(3))
Rider (id(3),area(4))

This query
SET riders=riders-1
PATTERN Rider
WHERE area!=1
CONTEXT Clear, High Demand,
Congestion
Decrements the riders

Side panel: Tab “Variables”

Drivers = 3
Riders = 3
Price = 10

Bottom panel: Tab “New query”

Context derivation

SWITCH	High Demand: Price increase ▼
PATTERN	*
WHERE	riders>2*drivers
CONTEXT	Clear: Traffic monitoring ▼

Any event triggers this query (denoted PATTERN *).
If riders > 2*drivers the model transitions from Clear: Traffic monitoring to High Demand: Price increase.

Context processing

SET	riders=riders+1 ▼
PATTERN	Rider
WHERE	area=1
CONTEXT	Clear: Traffic monitoring ▼

An event of type Rider triggers this query (denoted PATTERN Rider).
In the Clear: Traffic monitoring the number of riders is incremented for area 1.

Bottom panel: Tab “Queries per context”

Below, I show all queries for the model

SET drivers=drivers+1

PATTERN Driver

WHERE area=1

CONTEXT Clear, High demand, Congestion

SET riders=riders+1

PATTERN Rider

WHERE area=1

CONTEXT Clear, High Demand, Congestion

SET drivers=drivers-1

PATTERN Driver

WHERE area!=1

CONTEXT Clear, High demand, Congestion

SET riders=riders-1

PATTERN Rider

WHERE area!=1

CONTEXT Clear, High Demand, Congestion

SET price=price*1.1

CONTEXT High Demand: Price increase,
Congestion: Price increase

SET price=10

CONTEXT Clear: Price decrease

SWITCH High demand: Price increase

PATTERN *

WHERE riders>drivers*2

CONTEXT Clear: Traffic monitoring

SWITCH Congestion: Price increase

PATTERN *

WHERE drivers>5, riders<=drivers*2

CONTEXT Clear: Traffic monitoring

SWITCH Clear: Price decrease

PATTERN *

WHERE riders<=drivers, drivers<=5

CONTEXT High demand: Driver attraction,
Congestion: Traffic redirection

Dummy transitions that are triggered by any event once price is updated

SWITCH Congestion: Price increase

PATTERN *

WHERE drivers \geq riders, drivers >5

CONTEXT High demand: Driver attraction

SWITCH High demand: Price increase

PATTERN *

WHERE drivers ≤ 5 , riders $>$ drivers $*2$

CONTEXT Congestion: Traffic redirection

SWITCH High demand: Driver attraction

PATTERN *

CONTEXT High demand: Price increase

SWITCH Congestion: Traffic redirection

PATTERN *

CONTEXT Congestion: Price increase

SWITCH Clear: Traffic monitoring

PATTERN *

CONTEXT Clear: Price decrease