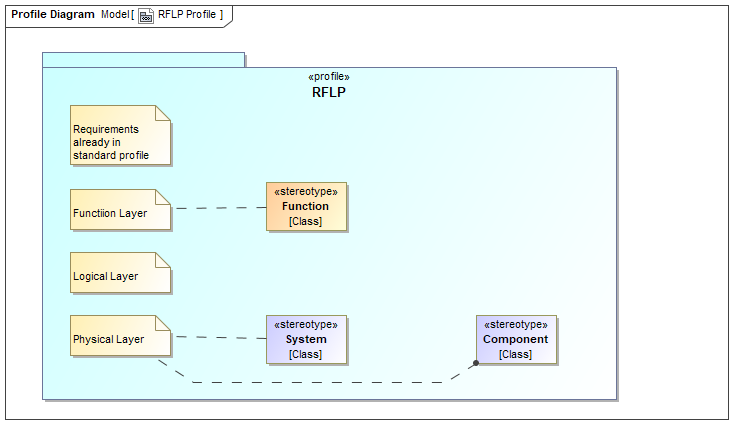
Small Autonomous Vehicle (SmAV)

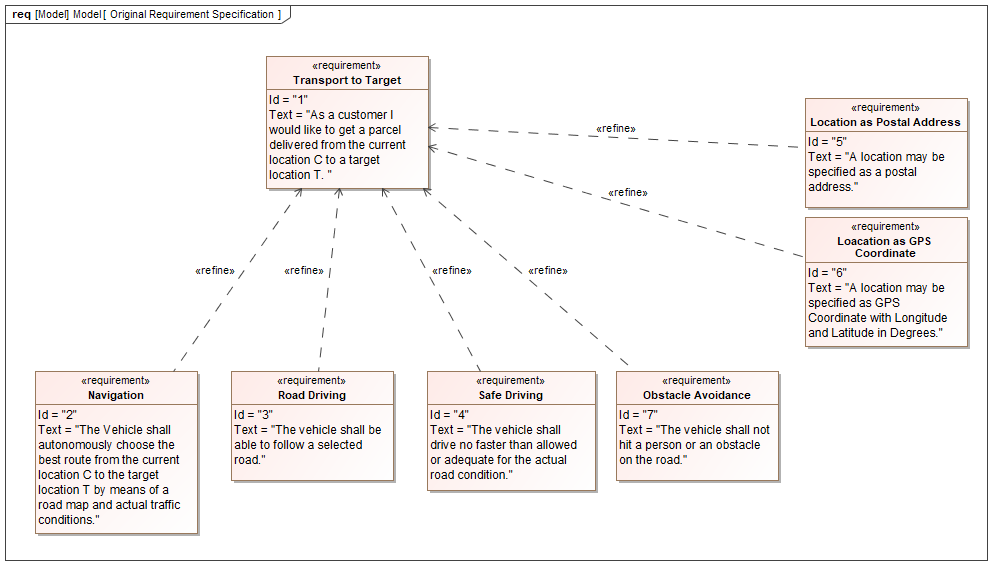
# ▣  RFLP Profile



#### Properties

|  |  |
| --- | --- |
| *Element Type* | uml:Diagram |
| *Notation* | Profile Diagram |

# ▣  Original Requirement Specification



#### Properties

|  |  |
| --- | --- |
| *Element Type* | uml:Diagram |
| *Notation* | Requirement Diagram |

#### Statements

|  |  |  |
| --- | --- | --- |
| ▣  Original Requirement Specification | *shows* | [Road Driving](#N-10644586635)  [Safe Driving](#N-10937367582)  [Navigation](#N-10321871853)  [Obstacle Avoidance](#N-10775375859)  [Transport to Target](#N-11918953963)  [Loacation as GPS Coordinate](#N-11399196336)  [Location as Postal Address](#N-8873798883) |

### Transport to Target

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Navigation](#N-10321871853)  [Road Driving](#N-10644586635)  [Safe Driving](#N-10937367582)  [Obstacle Avoidance](#N-10775375859)  [Loacation as GPS Coordinate](#N-11399196336)  [Location as Postal Address](#N-8873798883) | *refines* | Transport to Target |
| [▣  Original Requirement Specification](#N-10391782996) | *shows* | Transport to Target |

### Navigation

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Navigation | *refines* | [Transport to Target](#N-11918953963) |
| [Navigate](#N-11147535053) | *satisfies* | Navigation |
| [▣  Original Requirement Specification](#N-10391782996)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Navigation |

### Road Driving

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Road Driving | *refines* | [Transport to Target](#N-11918953963) |
| [Follow the Road](#N-11196316356) | *satisfies* | Road Driving |
| [▣  Original Requirement Specification](#N-10391782996)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Road Driving |

### Safe Driving

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Safe Driving | *refines* | [Transport to Target](#N-11918953963) |
| [Select an adequate Speed](#N-11391029383) | *satisfies* | Safe Driving |
| [▣  Original Requirement Specification](#N-10391782996)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Safe Driving |

### Obstacle Avoidance

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Obstacle Avoidance | *refines* | [Transport to Target](#N-11918953963) |
| [▣  Original Requirement Specification](#N-10391782996) | *shows* | Obstacle Avoidance |

### Location as Postal Address

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Location as Postal Address | *refines* | [Transport to Target](#N-11918953963) |
| [▣  Original Requirement Specification](#N-10391782996) | *shows* | Location as Postal Address |

### Loacation as GPS Coordinate

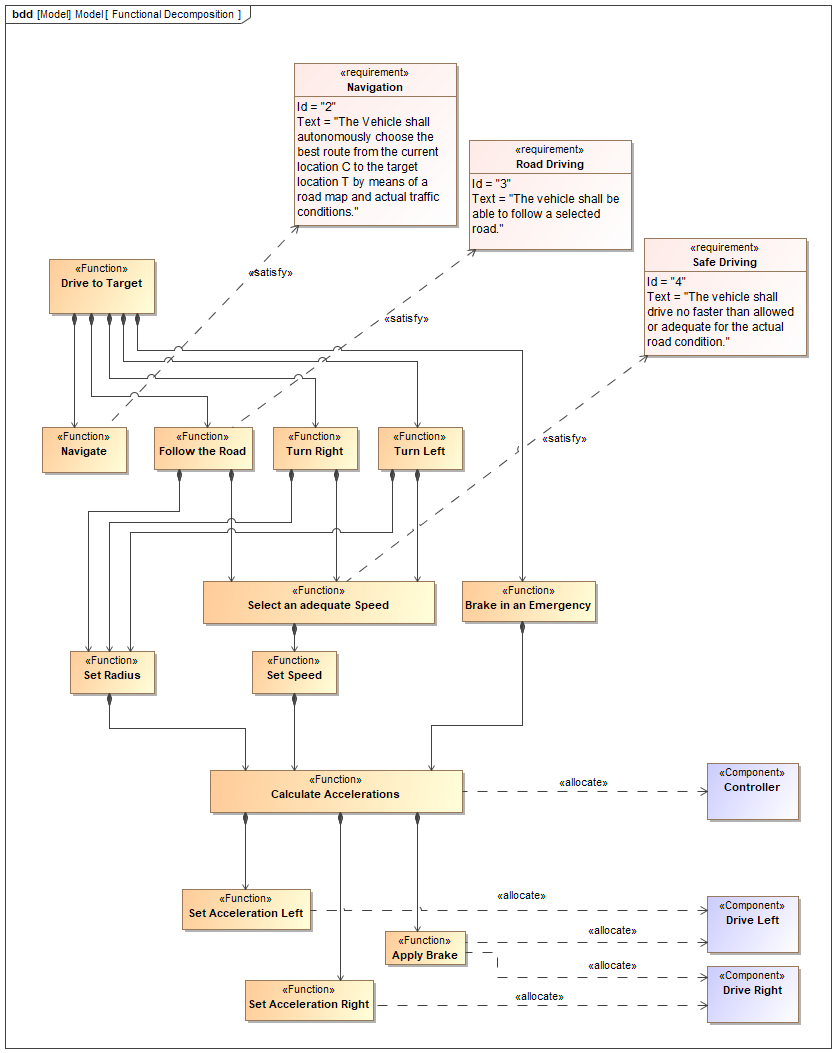
#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Loacation as GPS Coordinate | *refines* | [Transport to Target](#N-11918953963) |
| [▣  Original Requirement Specification](#N-10391782996) | *shows* | Loacation as GPS Coordinate |

# ▣  Functional Decomposition



#### Properties

|  |  |
| --- | --- |
| *Element Type* | uml:Diagram |
| *Notation* | SysML Block Definition Diagram |

#### Statements

|  |  |  |
| --- | --- | --- |
| ▣  Functional Decomposition | *shows* | [Controller](#N-10769082343)  [Follow the Road](#N-11196316356)  [Set Acceleration Right](#N-8504211148)  [Calculate Accelerations](#N-9831127247)  [Turn Right](#N-10587168985)  [Drive to Target](#N-9427384182)  [Navigate](#N-11147535053)  [Brake in an Emergency](#N-12050367643)  [Safe Driving](#N-10937367582)  [Navigation](#N-10321871853)  [Turn Left](#N-8176010255)  [Set Radius](#N-8614663463)  [Set Acceleration Left](#N-11680251504)  [Drive Right](#N-8115708235)  [Road Driving](#N-10644586635)  [Set Speed](#N-11159357566)  [Select an adequate Speed](#N-11391029383)  [Drive Left](#N-10722618489)  [Apply Brake](#N-10906173310) |

### Drive to Target

Manoevre the vehicle from the current position to the selected target.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| Drive to Target | *has part* | [Navigate](#N-11147535053)  [Follow the Road](#N-11196316356)  [Brake in an Emergency](#N-12050367643)  [Turn Right](#N-10587168985)  [Turn Left](#N-8176010255) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Drive to Target |

### Navigate

Select a path to get from the current position to the target.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Navigate |
| Navigate | *satisfies* | [Navigation](#N-10321871853) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Navigate |

### Follow the Road

Keep the vehicle on the selected road.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Follow the Road |
| Follow the Road | *has part* | [Set Radius](#N-8614663463)  [Select an adequate Speed](#N-11391029383) |
| Follow the Road | *satisfies* | [Road Driving](#N-10644586635) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Follow the Road |

### Select an adequate Speed

Taking into account road condition and weather, select a safe speed.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Turn Left](#N-8176010255)  [Turn Right](#N-10587168985)  [Follow the Road](#N-11196316356) | *has part* | Select an adequate Speed |
| Select an adequate Speed | *has part* | [Set Speed](#N-11159357566) |
| Select an adequate Speed | *satisfies* | [Safe Driving](#N-10937367582) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Select an adequate Speed |

### Brake in an Emergency

Take the vehicle to a full stop in the shortest time possible without loosing control over the trajectory.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Brake in an Emergency |
| Brake in an Emergency | *has part* | [Calculate Accelerations](#N-9831127247) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Brake in an Emergency |

### Set Radius

The (autonomous) driver's steering command (steering wheel position).

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Turn Left](#N-8176010255)  [Turn Right](#N-10587168985)  [Follow the Road](#N-11196316356) | *has part* | Set Radius |
| Set Radius | *has part* | [Calculate Accelerations](#N-9831127247) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Set Radius |

### Set Speed

The (autonomous) driver's speed command (gas pedal position).

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Select an adequate Speed](#N-11391029383) | *has part* | Set Speed |
| Set Speed | *has part* | [Calculate Accelerations](#N-9831127247) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Set Speed |

### Set Acceleration Left

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Calculate Accelerations](#N-9831127247) | *has part* | Set Acceleration Left |
| Set Acceleration Left | *is allocated to* | [Drive Left](#N-10722618489) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Set Acceleration Left |

### Set Acceleration Right

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Calculate Accelerations](#N-9831127247) | *has part* | Set Acceleration Right |
| Set Acceleration Right | *is allocated to* | [Drive Right](#N-8115708235) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Set Acceleration Right |

### Calculate Accelerations

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Set Radius](#N-8614663463)  [Set Speed](#N-11159357566)  [Brake in an Emergency](#N-12050367643) | *has part* | Calculate Accelerations |
| Calculate Accelerations | *has part* | [Set Acceleration Left](#N-11680251504)  [Set Acceleration Right](#N-8504211148)  [Apply Brake](#N-10906173310) |
| Calculate Accelerations | *is allocated to* | [Controller](#N-10769082343) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Calculate Accelerations |

### Turn Right

Take a right turn at a road intersection. Observe the traffic entering the same lane and avoid a collision, if another vehicle does not observe the priority rules.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Turn Right |
| Turn Right | *has part* | [Set Radius](#N-8614663463)  [Select an adequate Speed](#N-11391029383) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Turn Right |

### Turn Left

Take a left turn in a road intersection. Observe the priority rules and avoid traffic on the two lanes you are crossing.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Turn Left |
| Turn Left | *has part* | [Select an adequate Speed](#N-11391029383)  [Set Radius](#N-8614663463) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Turn Left |

### Apply Brake

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Calculate Accelerations](#N-9831127247) | *has part* | Apply Brake |
| Apply Brake | *is allocated to* | [Drive Left](#N-10722618489)  [Drive Right](#N-8115708235) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Apply Brake |

# ▣  Physical Decomposition

#### Properties

|  |  |
| --- | --- |
| *Element Type* | uml:Diagram |
| *Notation* | SysML Block Definition Diagram |

#### Statements

|  |  |  |
| --- | --- | --- |
| ▣  Physical Decomposition | *shows* | [Controller](#N-10769082343)  [Support Front](#N-10253681079)  [Drive Right](#N-8115708235)  [Body](#N-11158160288)  [Chassis](#N-8290461777)  [Collision Alarm Sensor](#N-8284145650)  [LEGO Mindstorms Set](#N-8358573071)  [Support Rear](#N-10503288951)  [Track Sensor](#N-10377513647)  [LEGO Mindstorms Vehicle](#N-10499547381)  [Drive Left](#N-10722618489) |

## LEGO Mindstorms Set

The wheel with motor and brake on the left side. The motor can accelerate and decelerate. The motor controller is "4-quadrant" and can supply electrical current for recharging the batteries.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | Package |

#### Statements

|  |  |  |
| --- | --- | --- |
| LEGO Mindstorms Set | *contains* | [LEGO Mindstorms Vehicle](#N-10499547381)  [Chassis](#N-8290461777)  [Body](#N-11158160288)  [Drive Left](#N-10722618489)  [Support Front](#N-10253681079)  [Support Rear](#N-10503288951)  [Controller](#N-10769082343)  [Track Sensor](#N-10377513647)  [Collision Alarm Sensor](#N-8284145650)  [Drive Right](#N-8115708235) |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | LEGO Mindstorms Set |

### LEGO Mindstorms Vehicle

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:System |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | LEGO Mindstorms Vehicle |
| LEGO Mindstorms Vehicle | *has part* | [Chassis](#N-8290461777)  [Body](#N-11158160288)  [Drive Left](#N-10722618489)  [Support Front](#N-10253681079)  [Support Rear](#N-10503288951)  [Controller](#N-10769082343)  [Track Sensor](#N-10377513647)  [Collision Alarm Sensor](#N-8284145650)  [Drive Right](#N-8115708235) |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | LEGO Mindstorms Vehicle |

### Chassis

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Chassis |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Chassis |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Chassis |

### Body

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Body |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Body |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Body |

### Drive Left

The wheel with motor and brake on the left side. The motor can accelerate and decelerate. The motor controller is "4-quadrant" and can supply electrical current for recharging the batteries.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Drive Left |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Drive Left |
| [Set Acceleration Left](#N-11680251504)  [Apply Brake](#N-10906173310) | *is allocated to* | Drive Left |
| [▣  Physical Decomposition](#N-9962820602)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Drive Left |

### Support Front

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Support Front |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Support Front |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Support Front |

### Support Rear

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Support Rear |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Support Rear |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Support Rear |

### Controller

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Controller |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Controller |
| [Calculate Accelerations](#N-9831127247) | *is allocated to* | Controller |
| [▣  Physical Decomposition](#N-9962820602)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Controller |

### Track Sensor

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Track Sensor |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Track Sensor |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Track Sensor |

### Collision Alarm Sensor

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Collision Alarm Sensor |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Collision Alarm Sensor |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Collision Alarm Sensor |

### Drive Right

The wheel with motor and brake on the right side. The motor can accelerate and decelerate. The motor controller is "4-quadrant" and can supply electrical current for recharging the batteries.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Drive Right |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Drive Right |
| [Set Acceleration Right](#N-8504211148)  [Apply Brake](#N-10906173310) | *is allocated to* | Drive Right |
| [▣  Physical Decomposition](#N-9962820602)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Drive Right |

# Model Elements (Glossary)

#### Properties

|  |  |
| --- | --- |
| *Element Type* | Model Elements (Glossary) |

### Apply Brake

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Calculate Accelerations](#N-9831127247) | *has part* | Apply Brake |
| Apply Brake | *is allocated to* | [Drive Left](#N-10722618489)  [Drive Right](#N-8115708235) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Apply Brake |

### Body

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Body |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Body |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Body |

### Brake in an Emergency

Take the vehicle to a full stop in the shortest time possible without loosing control over the trajectory.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Brake in an Emergency |
| Brake in an Emergency | *has part* | [Calculate Accelerations](#N-9831127247) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Brake in an Emergency |

### Calculate Accelerations

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Set Radius](#N-8614663463)  [Set Speed](#N-11159357566)  [Brake in an Emergency](#N-12050367643) | *has part* | Calculate Accelerations |
| Calculate Accelerations | *has part* | [Set Acceleration Left](#N-11680251504)  [Set Acceleration Right](#N-8504211148)  [Apply Brake](#N-10906173310) |
| Calculate Accelerations | *is allocated to* | [Controller](#N-10769082343) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Calculate Accelerations |

### Chassis

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Chassis |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Chassis |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Chassis |

### Collision Alarm Sensor

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Collision Alarm Sensor |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Collision Alarm Sensor |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Collision Alarm Sensor |

### Controller

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Controller |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Controller |
| [Calculate Accelerations](#N-9831127247) | *is allocated to* | Controller |
| [▣  Physical Decomposition](#N-9962820602)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Controller |

### Drive Left

The wheel with motor and brake on the left side. The motor can accelerate and decelerate. The motor controller is "4-quadrant" and can supply electrical current for recharging the batteries.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Drive Left |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Drive Left |
| [Set Acceleration Left](#N-11680251504)  [Apply Brake](#N-10906173310) | *is allocated to* | Drive Left |
| [▣  Physical Decomposition](#N-9962820602)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Drive Left |

### Drive Right

The wheel with motor and brake on the right side. The motor can accelerate and decelerate. The motor controller is "4-quadrant" and can supply electrical current for recharging the batteries.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Drive Right |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Drive Right |
| [Set Acceleration Right](#N-8504211148)  [Apply Brake](#N-10906173310) | *is allocated to* | Drive Right |
| [▣  Physical Decomposition](#N-9962820602)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Drive Right |

### Drive to Target

Manoevre the vehicle from the current position to the selected target.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| Drive to Target | *has part* | [Navigate](#N-11147535053)  [Follow the Road](#N-11196316356)  [Brake in an Emergency](#N-12050367643)  [Turn Right](#N-10587168985)  [Turn Left](#N-8176010255) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Drive to Target |

### Follow the Road

Keep the vehicle on the selected road.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Follow the Road |
| Follow the Road | *has part* | [Set Radius](#N-8614663463)  [Select an adequate Speed](#N-11391029383) |
| Follow the Road | *satisfies* | [Road Driving](#N-10644586635) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Follow the Road |

## LEGO Mindstorms Set

The wheel with motor and brake on the left side. The motor can accelerate and decelerate. The motor controller is "4-quadrant" and can supply electrical current for recharging the batteries.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | Package |

#### Statements

|  |  |  |
| --- | --- | --- |
| LEGO Mindstorms Set | *contains* | [LEGO Mindstorms Vehicle](#N-10499547381)  [Chassis](#N-8290461777)  [Body](#N-11158160288)  [Drive Left](#N-10722618489)  [Support Front](#N-10253681079)  [Support Rear](#N-10503288951)  [Controller](#N-10769082343)  [Track Sensor](#N-10377513647)  [Collision Alarm Sensor](#N-8284145650)  [Drive Right](#N-8115708235) |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | LEGO Mindstorms Set |

### LEGO Mindstorms Vehicle

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:System |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | LEGO Mindstorms Vehicle |
| LEGO Mindstorms Vehicle | *has part* | [Chassis](#N-8290461777)  [Body](#N-11158160288)  [Drive Left](#N-10722618489)  [Support Front](#N-10253681079)  [Support Rear](#N-10503288951)  [Controller](#N-10769082343)  [Track Sensor](#N-10377513647)  [Collision Alarm Sensor](#N-8284145650)  [Drive Right](#N-8115708235) |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | LEGO Mindstorms Vehicle |

### Loacation as GPS Coordinate

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Loacation as GPS Coordinate | *refines* | [Transport to Target](#N-11918953963) |
| [▣  Original Requirement Specification](#N-10391782996) | *shows* | Loacation as GPS Coordinate |

### Location as Postal Address

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Location as Postal Address | *refines* | [Transport to Target](#N-11918953963) |
| [▣  Original Requirement Specification](#N-10391782996) | *shows* | Location as Postal Address |

### Navigate

Select a path to get from the current position to the target.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Navigate |
| Navigate | *satisfies* | [Navigation](#N-10321871853) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Navigate |

### Navigation

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Navigation | *refines* | [Transport to Target](#N-11918953963) |
| [Navigate](#N-11147535053) | *satisfies* | Navigation |
| [▣  Original Requirement Specification](#N-10391782996)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Navigation |

### Obstacle Avoidance

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Obstacle Avoidance | *refines* | [Transport to Target](#N-11918953963) |
| [▣  Original Requirement Specification](#N-10391782996) | *shows* | Obstacle Avoidance |

### Road Driving

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Road Driving | *refines* | [Transport to Target](#N-11918953963) |
| [Follow the Road](#N-11196316356) | *satisfies* | Road Driving |
| [▣  Original Requirement Specification](#N-10391782996)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Road Driving |

### Safe Driving

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| Safe Driving | *refines* | [Transport to Target](#N-11918953963) |
| [Select an adequate Speed](#N-11391029383) | *satisfies* | Safe Driving |
| [▣  Original Requirement Specification](#N-10391782996)  [▣  Functional Decomposition](#N-11144450601) | *shows* | Safe Driving |

### Select an adequate Speed

Taking into account road condition and weather, select a safe speed.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Turn Left](#N-8176010255)  [Turn Right](#N-10587168985)  [Follow the Road](#N-11196316356) | *has part* | Select an adequate Speed |
| Select an adequate Speed | *has part* | [Set Speed](#N-11159357566) |
| Select an adequate Speed | *satisfies* | [Safe Driving](#N-10937367582) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Select an adequate Speed |

### Set Acceleration Left

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Calculate Accelerations](#N-9831127247) | *has part* | Set Acceleration Left |
| Set Acceleration Left | *is allocated to* | [Drive Left](#N-10722618489) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Set Acceleration Left |

### Set Acceleration Right

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Calculate Accelerations](#N-9831127247) | *has part* | Set Acceleration Right |
| Set Acceleration Right | *is allocated to* | [Drive Right](#N-8115708235) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Set Acceleration Right |

### Set Radius

The (autonomous) driver's steering command (steering wheel position).

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Turn Left](#N-8176010255)  [Turn Right](#N-10587168985)  [Follow the Road](#N-11196316356) | *has part* | Set Radius |
| Set Radius | *has part* | [Calculate Accelerations](#N-9831127247) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Set Radius |

### Set Speed

The (autonomous) driver's speed command (gas pedal position).

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Select an adequate Speed](#N-11391029383) | *has part* | Set Speed |
| Set Speed | *has part* | [Calculate Accelerations](#N-9831127247) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Set Speed |

### Support Front

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Support Front |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Support Front |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Support Front |

### Support Rear

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Support Rear |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Support Rear |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Support Rear |

### Track Sensor

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Component |

#### Statements

|  |  |  |
| --- | --- | --- |
| [LEGO Mindstorms Set](#N-8358573071) | *contains* | Track Sensor |
| [LEGO Mindstorms Vehicle](#N-10499547381) | *has part* | Track Sensor |
| [▣  Physical Decomposition](#N-9962820602) | *shows* | Track Sensor |

### Transport to Target

#### Properties

|  |  |
| --- | --- |
| *Element Type* | sysml:Requirement |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Navigation](#N-10321871853)  [Road Driving](#N-10644586635)  [Safe Driving](#N-10937367582)  [Obstacle Avoidance](#N-10775375859)  [Loacation as GPS Coordinate](#N-11399196336)  [Location as Postal Address](#N-8873798883) | *refines* | Transport to Target |
| [▣  Original Requirement Specification](#N-10391782996) | *shows* | Transport to Target |

### Turn Left

Take a left turn in a road intersection. Observe the priority rules and avoid traffic on the two lanes you are crossing.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Turn Left |
| Turn Left | *has part* | [Select an adequate Speed](#N-11391029383)  [Set Radius](#N-8614663463) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Turn Left |

### Turn Right

Take a right turn at a road intersection. Observe the traffic entering the same lane and avoid a collision, if another vehicle does not observe the priority rules.

#### Properties

|  |  |
| --- | --- |
| *Element Type* | RFLP:Function |

#### Statements

|  |  |  |
| --- | --- | --- |
| [Drive to Target](#N-9427384182) | *has part* | Turn Right |
| Turn Right | *has part* | [Set Radius](#N-8614663463)  [Select an adequate Speed](#N-11391029383) |
| [▣  Functional Decomposition](#N-11144450601) | *shows* | Turn Right |