Key purposes and social needs that our app will solve

- Allow users to express their frustration openly with the community of new blockages and communicate information like why there is a blockage, what kind or blockage, or approximately how long it'll last.
- Help users mark which roads are blocked and which ones are unsafe to travel for local bikers in the Boston area community.
- Facilitate communication between citizens and local government about potential improvements to bike routes local to the Boston area.

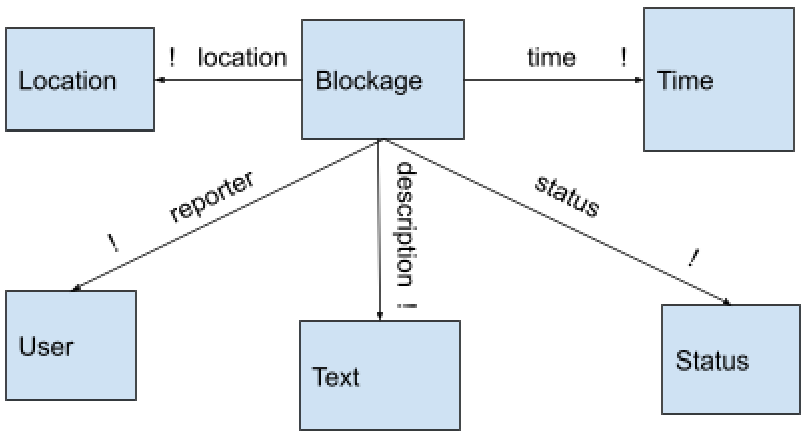
Description of future design work

- Design how edits and deletes of Blockages will be handled. We want users to be able to rectify mistaken Blockages or Comments, but to avoid confusion, we also want some kind of permanence on the site. This might be challenging to implement since we might want to set a time limit for the edit time window after a user initially reports a blockage so that they can no longer delete or edit the blockage after 2 minutes or 30 minutes, for example. Also, it'll be challenging to determine the time window span for editing and deleting after a report since we don't know which one is optimal yet without any user testing reports.
- (Blockage as an uncommon concept) Design how/when Blockages will be resolved (voting system?) such as when two people have reported the blockage as resolved and only one said it was unresolved. Maybe the unresolved person has mistaken the wrong road or thought that it was no longer blocked when it was still blocked or a malicious user trying to mess up the system of blockages or everyone else. This will likely be challenging to implement since we'll have to come up with a reasonable voting system and some kind of threshold to determine which blockage reports or status changes are legit vs trolling/mistake.
- (Karma as a non-CRUD concept) Karma will incentivize users to be active on the site, and post legitimate reports of blockages. Some possible patterns we could use are displays of total Karma in users' accounts, and badges next to posts of top users. Some challenges will be developing the algorithm for gaining Karma (without users gaming the system in unproductive ways), and interfacing between Karma and weighting for votes on bike route status.

<u>Concept: Blockage</u>

Purpose: To track unsafe or unusable bike routes

State:



Actions:

create (l: Location, d: Text, t: Time, u: User, s: Status): Blockage // creates a new Blockage instance

edit (b: Blockage, d: Text, t: Time, u: User, s: Status) // updates relations of Blockage instance

delete (b: Blockage, u: User) // deletes an existing Blockage instance

Operational Principles:

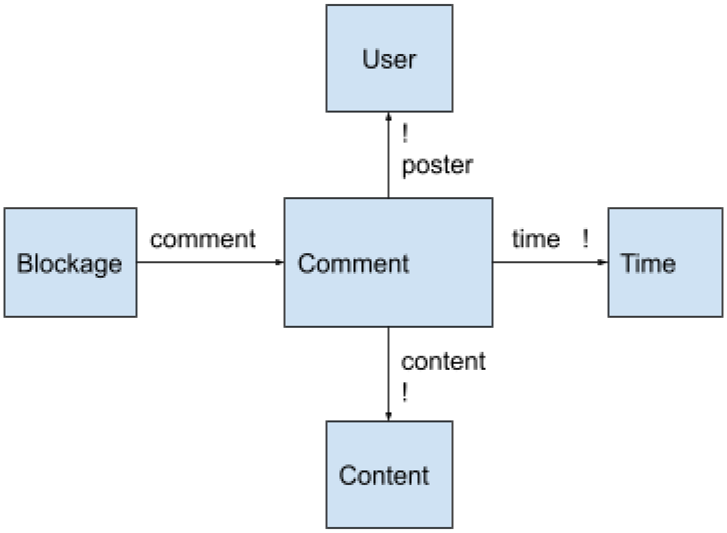
create(l, d, t, u, s, b); edit(b, d’, t’, u’, s’) => u = u’ // users can only edit their own Blockages

create(l, d, t, u, s, b); delete(b, u’) => u = u’ // users can only delete their own Blockages

Concept: Comment

Purpose: For users to discuss blockages

State:



Actions:

create (b: Blockage, u: User, c: Content t: Time): Comment // creates a new Comment instance

edit (k: Comment, c: Content, t: Time) // updates relations of Comment instance

delete (k: Comment) // deletes an existing Comment instance

Operational Principles:

create(b, u, c, t, k); edit(k, c, t) => u = u' // users can only edit their own Comments

create(b, u, c, t, k); delete(k, u') => u = u' // users can only delete their own Comments

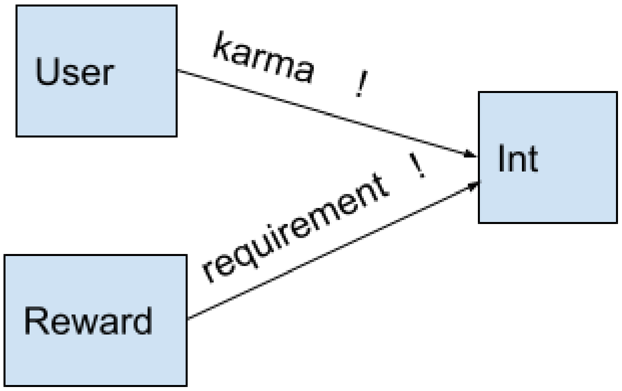
after create(b, u, c, t, k) and delete(b) => not k in Comment

// after you delete a blockage, all of its comments should disappear

Concept: Karma

Purpose: To privilege good users

State:



karma: User -> one Int
requirement: Reward -> one Int

Actions:

```
modifyKarma (u: User, n: Int): Int // modifies a user’s Karma value
        u.karma += n
setRewardReq (r: Reward, n: Int)
        r.requirement = n
getReward (u: User, r: Reward)
        u.karma > r.requirement
```

Operational Principles:

```
If u.karma = 0 (u in User):
        setRewardReq(r, n); modifyKarma(u, n’); getReward(u, r) => n’ > n
        // if a user receives a reward, they must have gained more karma than its requirement
```