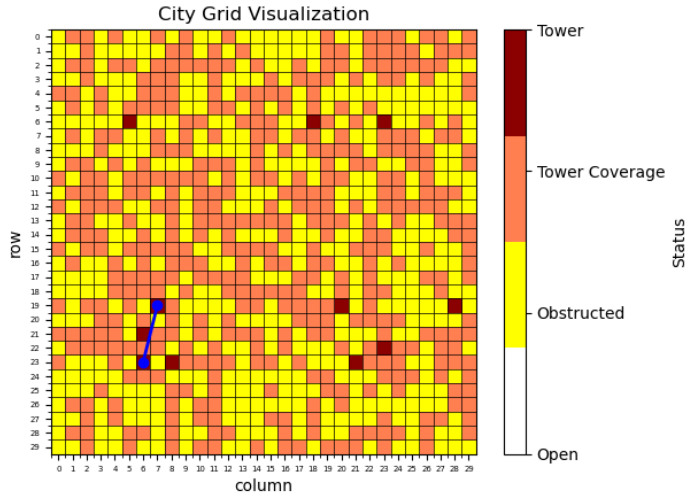
City Grid class 1.pdf

Task 5: Visualization

Implement functions to visualize the CityGrid, including obstructed blocks, towers, coverage areas, and data paths. Use any Python plotting library of your choice, such as matplotlib or seaborn.

In [12]:
```
city.display(path)
```

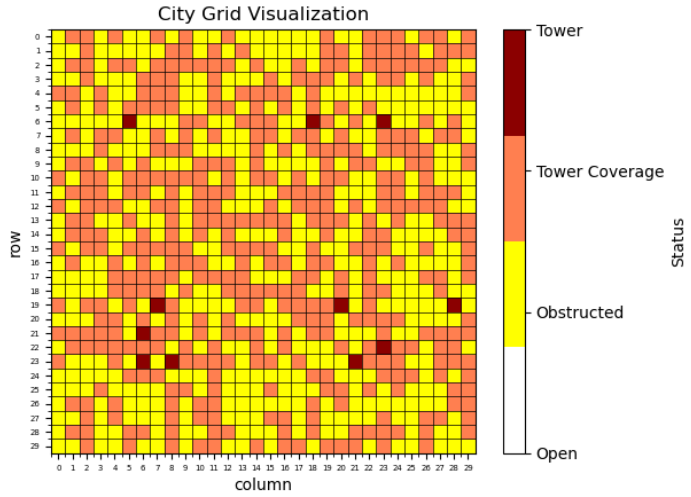


Bonus tasks (optional):

1. Extend the optimization problem:

Now towers have a cost, and you have a limited budget. Modify your algorithm to maximize coverage while staying within the budget.

```
City before optimization
Total number of towers is: 11
```

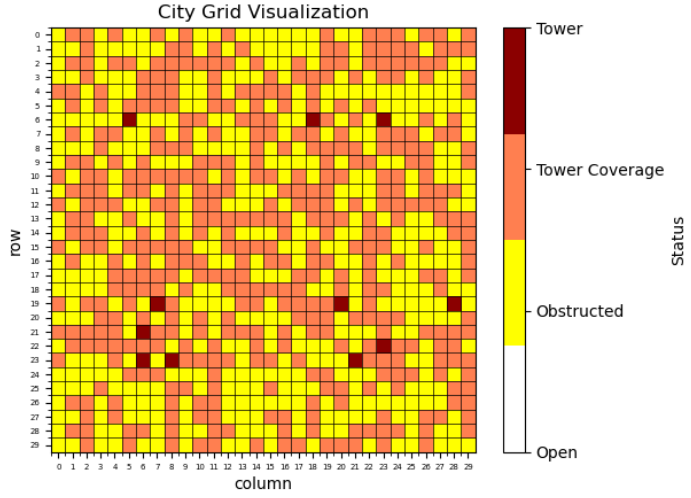



```
Automatically selected tower cost: 12
Automatically selected budget: 203

The maximum number of towers budget allows: 16

The budget is enough

Optimized city № 1:
```



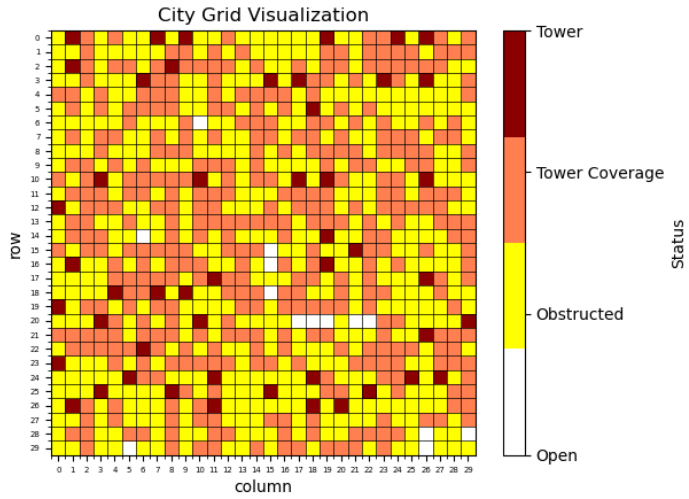
2. Consider different types of towers with different ranges and costs.

How would this change your optimization approach?

```
Sorted towers from the most profitable to the less profitable
Tower 1: Range = 3, Cost = 6, Ratio = 0.5
Tower 2: Range = 5, Cost = 10, Ratio = 0.5
Tower 3: Range = 5, Cost = 45, Ratio = 0.111

Automatically selected budget is 356
Tower type (range: 3, cost: 6): 49 towers.

Optimized city № 2:
```

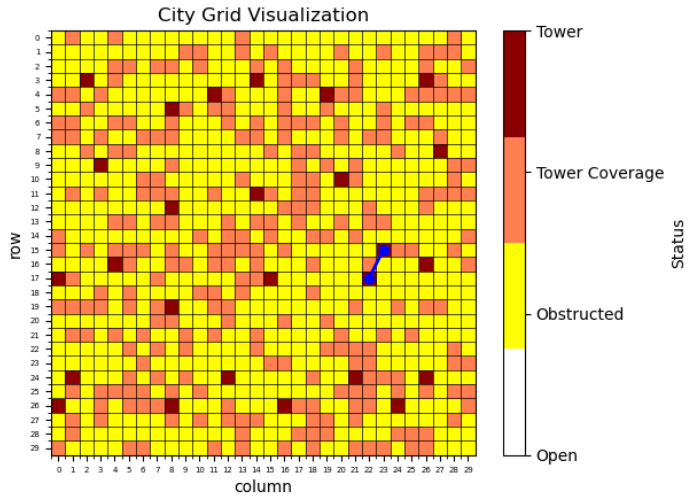


City Grid class 2.pdf

Task 5: Visualization

Implement functions to visualize the CityGrid, including obstructed blocks, towers, coverage areas, and data paths. Use any Python plotting library of your choice, such as matplotlib or seaborn.

In [29]:
```
city.display(path)
```

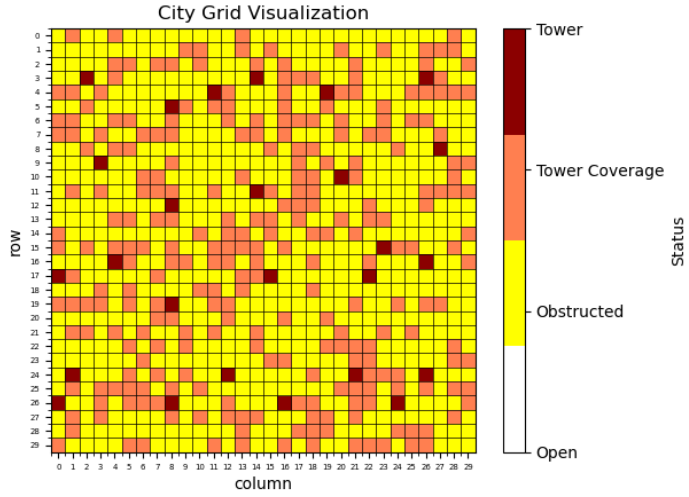


Bonus tasks (optional):

1. Extend the optimization problem:

Now towers have a cost, and you have a limited budget. Modify your algorithm to maximize coverage while staying within the budget.

```
City before optimization
Total number of towers is: 26
```

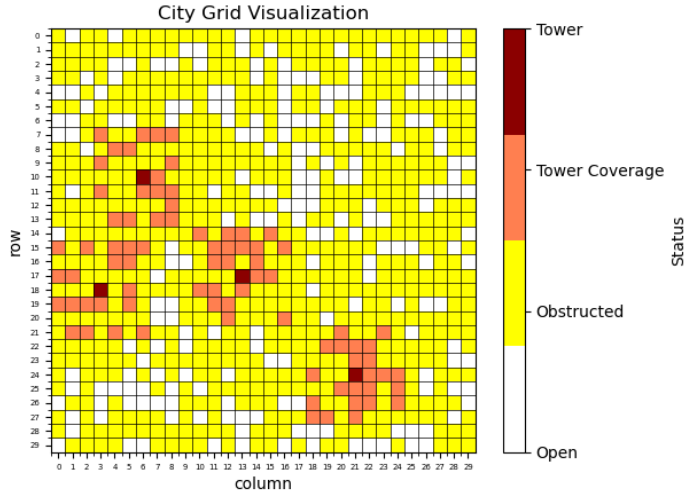



```
Automatically selected tower cost: 15
Automatically selected budget: 74

The maximum number of towers budget allows: 4

Need to review the city grid for towers

Optimized city № 1:
```



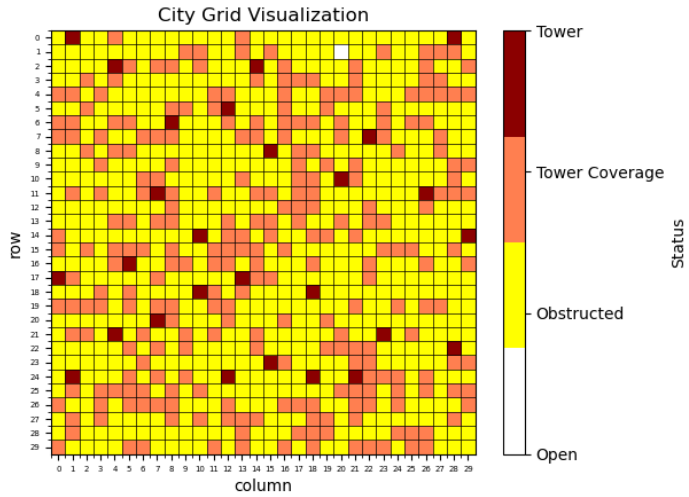
2. Consider different types of towers with different ranges and costs.

How would this change your optimization approach?

```
Sorted towers from the most profitable to the less profitable
Tower 1: Range = 5, Cost = 10, Ratio = 0.5
Tower 2: Range = 5, Cost = 15, Ratio = 0.333
Tower 3: Range = 5, Cost = 50, Ratio = 0.1

Automatically selected budget is 495
Tower type (range: 5, cost: 10): 27 towers.

Optimized city № 2:
```

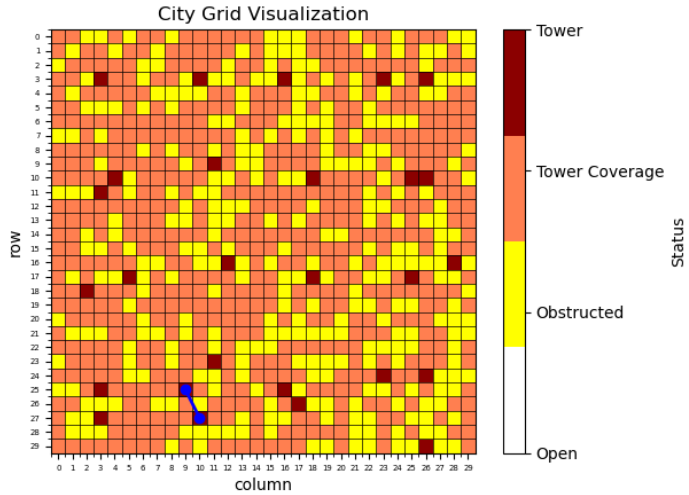


City Grid class 3.pdf

Task 5: Visualization

Implement functions to visualize the CityGrid, including obstructed blocks, towers, coverage areas, and data paths. Use any Python plotting library of your choice, such as matplotlib or seaborn.

In [12]:
```
city.display(path)
```

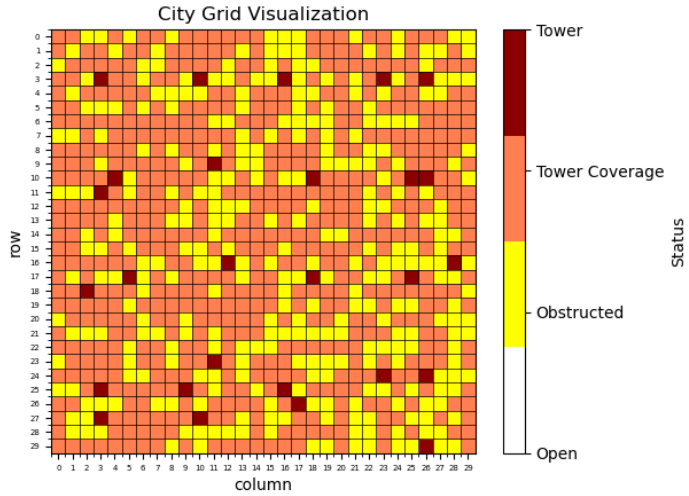


Bonus tasks (optional):

1. Extend the optimization problem:

Now towers have a cost, and you have a limited budget. Modify your algorithm to maximize coverage while staying within the budget.

```
City before optimization
Total number of towers is: 27
```

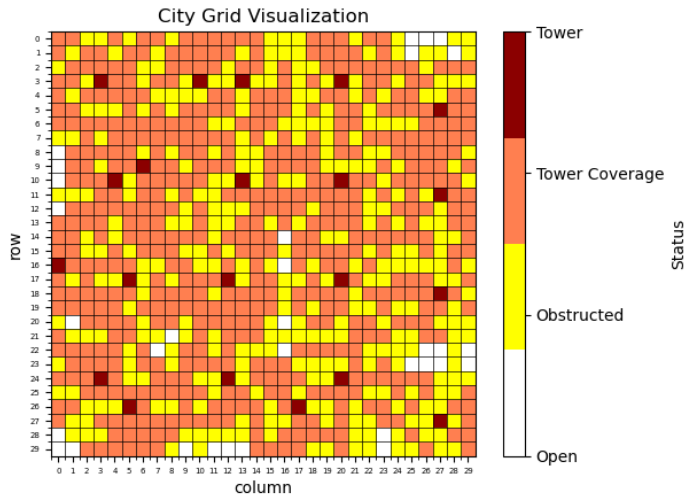



```
Automatically selected tower cost: 21
Automatically selected budget: 447

The maximum number of towers budget allows: 21

Need to review the city grid for towers

Optimized city № 1:
```



2. Consider different types of towers with different ranges and costs.

How would this change your optimization approach?

```
Sorted towers from the most profitable to the less profitable
Tower 1: Range = 6, Cost = 30, Ratio = 0.2
Tower 2: Range = 4, Cost = 20, Ratio = 0.2
Tower 3: Range = 4, Cost = 28, Ratio = 0.143

Automatically selected budget is 673
Tower type (range: 6, cost: 30): 14 towers.

Optimized city № 2:
```