Rodrigo I. Silveira

Maike Buchin

Maarten Löffler

Boris Aronov

Tom de Jong

Feed Links for Network Extensions

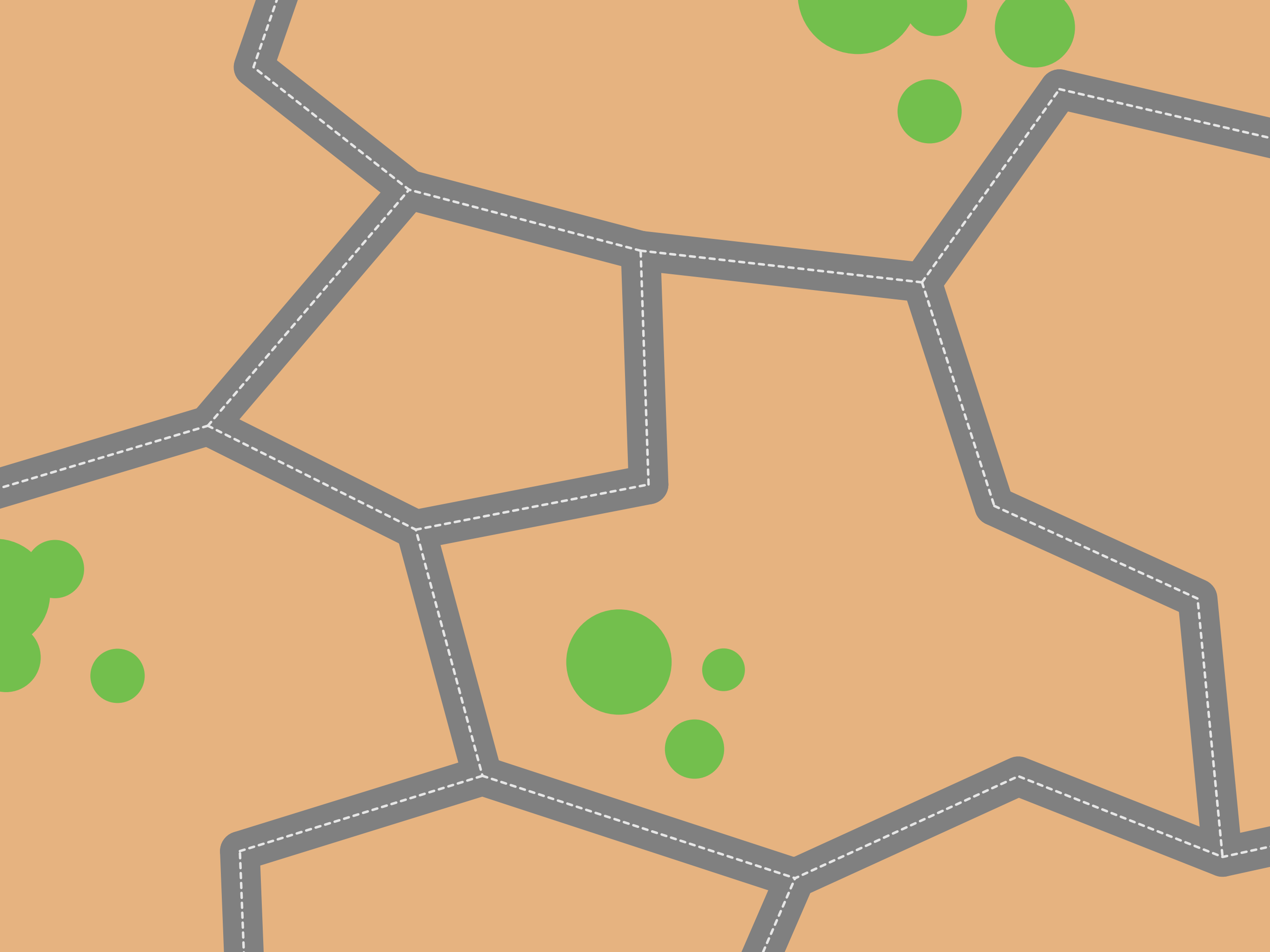
Jun Luo

Bettina Speckmann

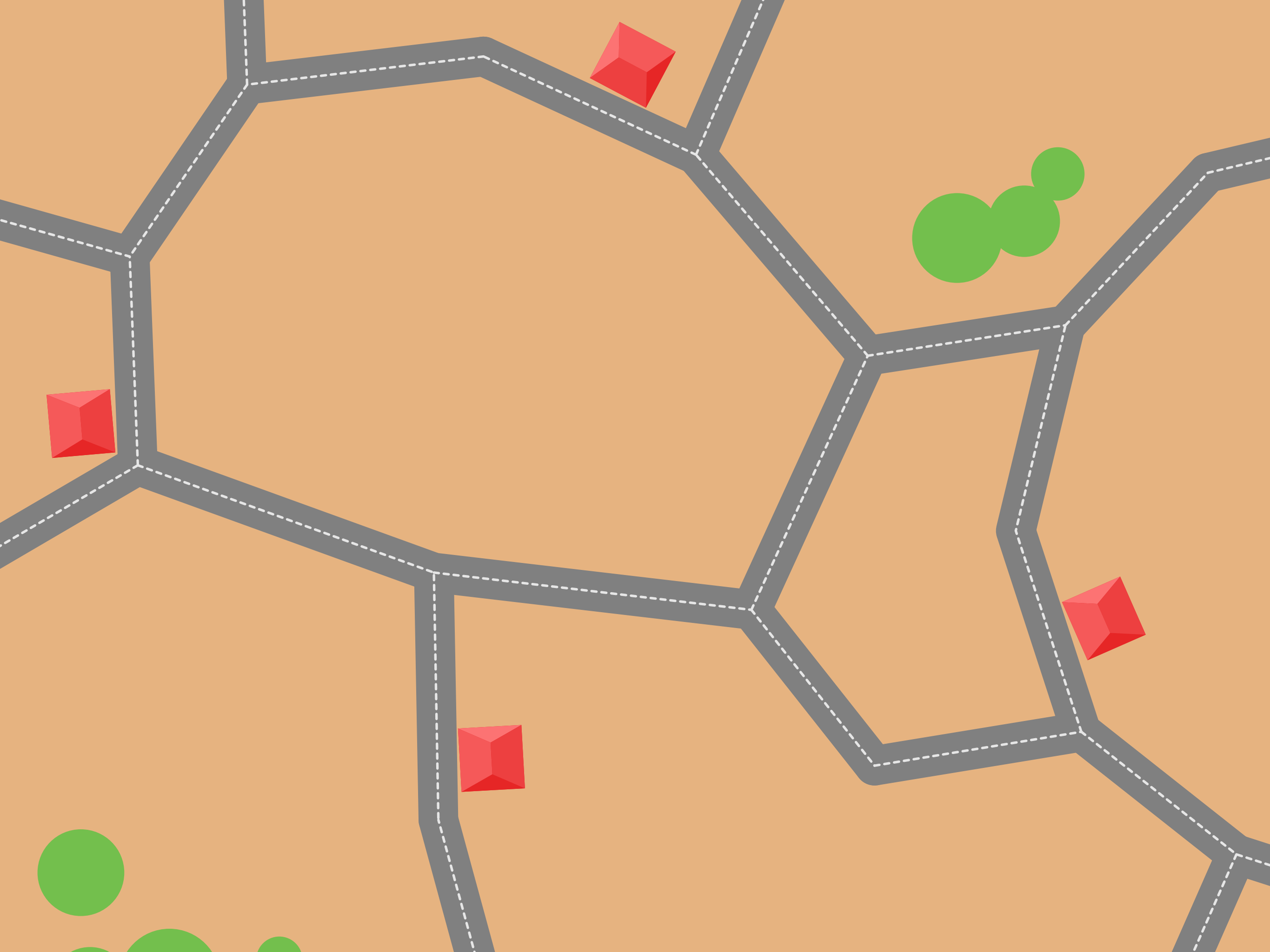
Bart Jansen

Kevin Buchin

Marc van Kreveld



Consider a network of roads.



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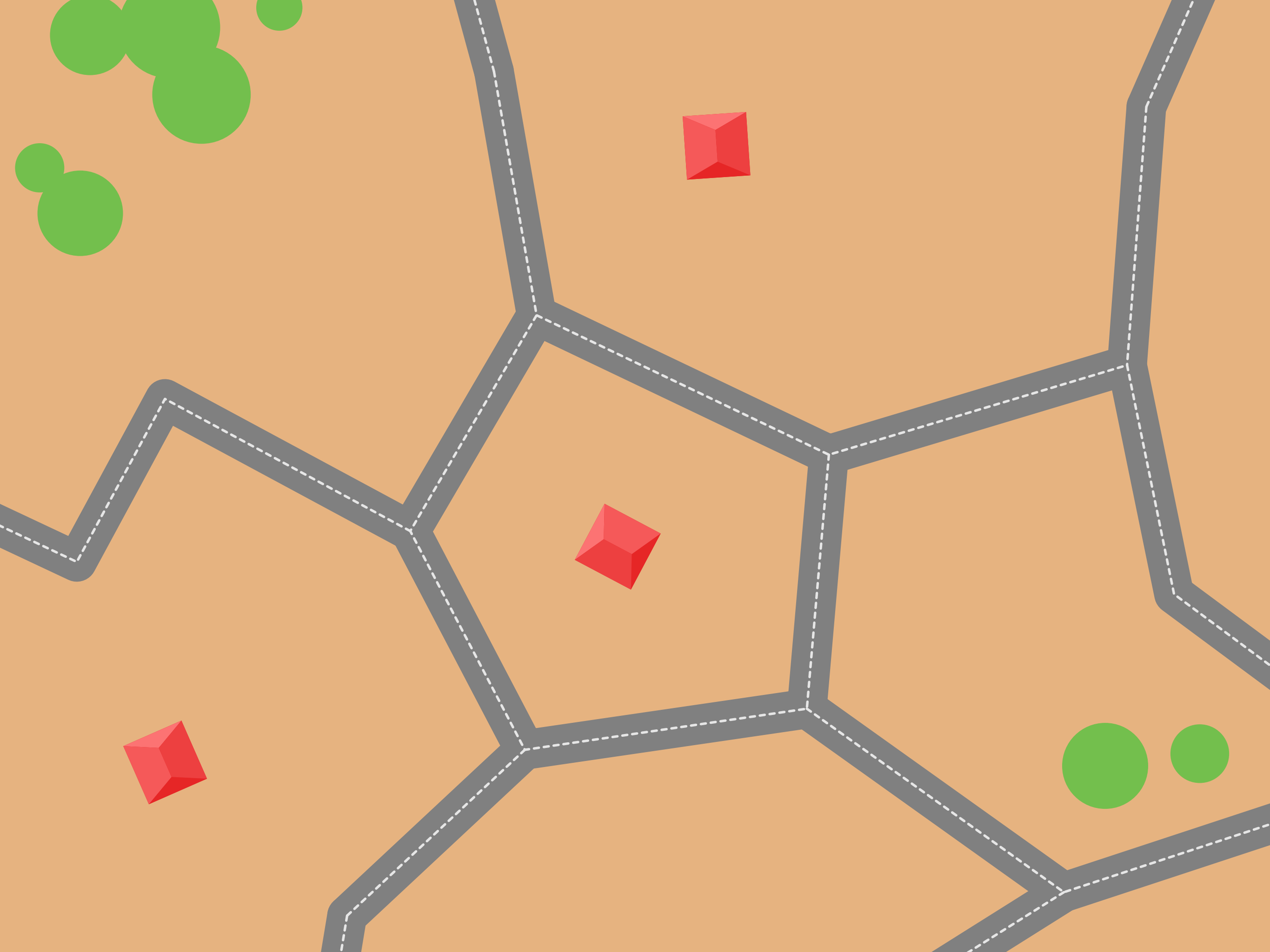
These are well known and easy to compute.



What to do if the road network data is not complete?

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Locations may be disconnected from the network.

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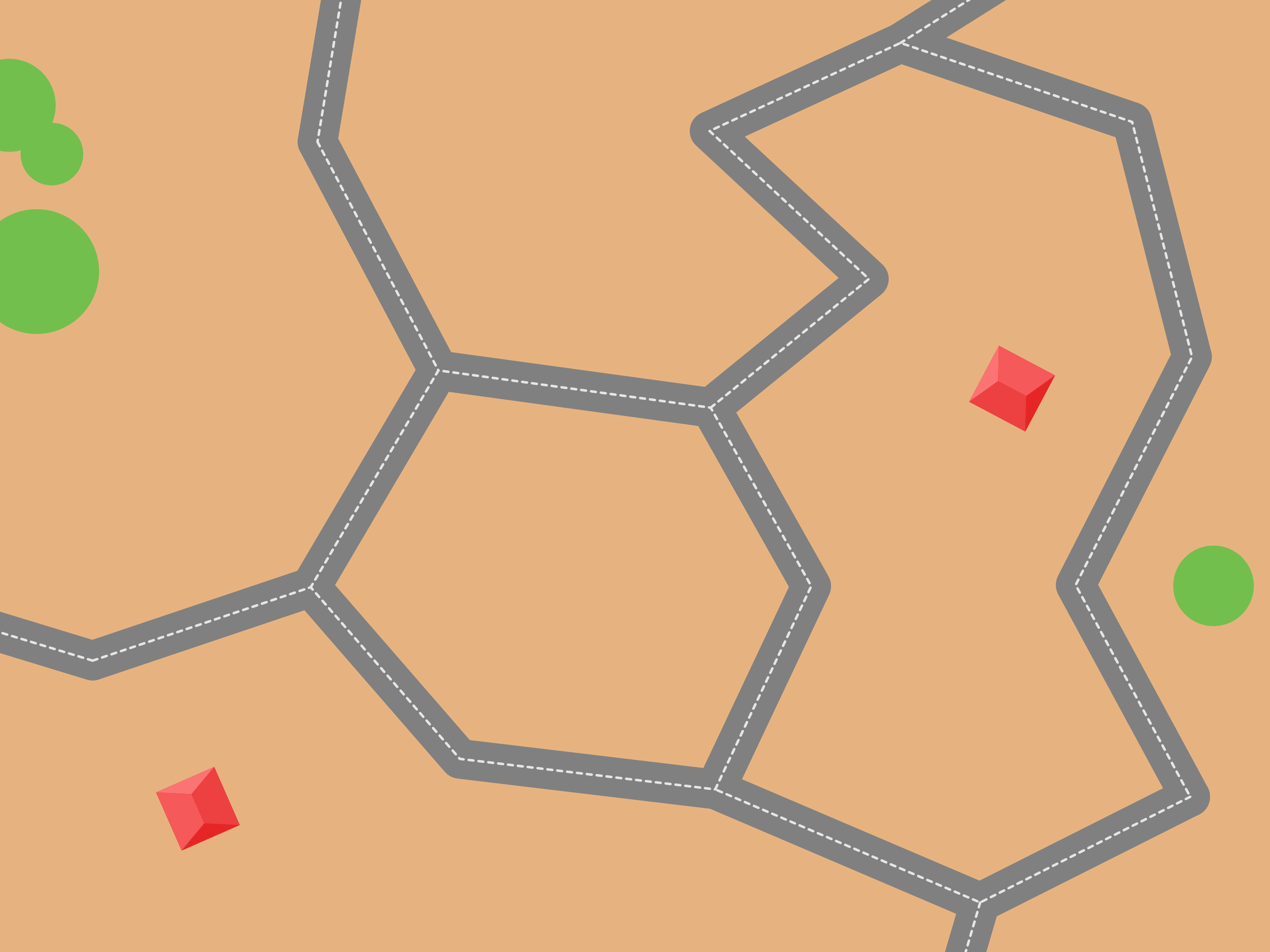
Still, we often know that some connection must exist.



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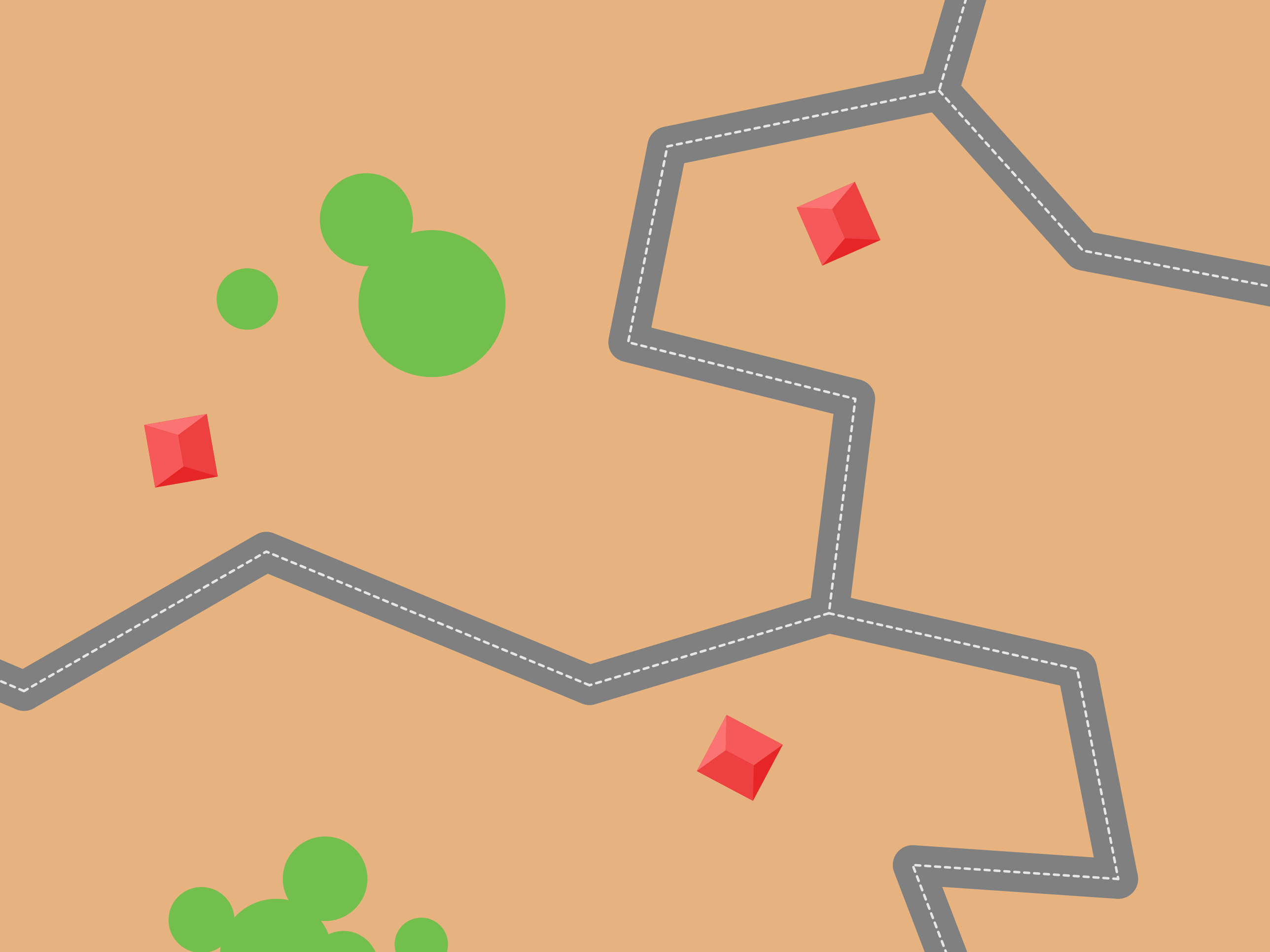
What can we do?



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In real road networks, the dilation is typically around $1\frac{1}{2}$.

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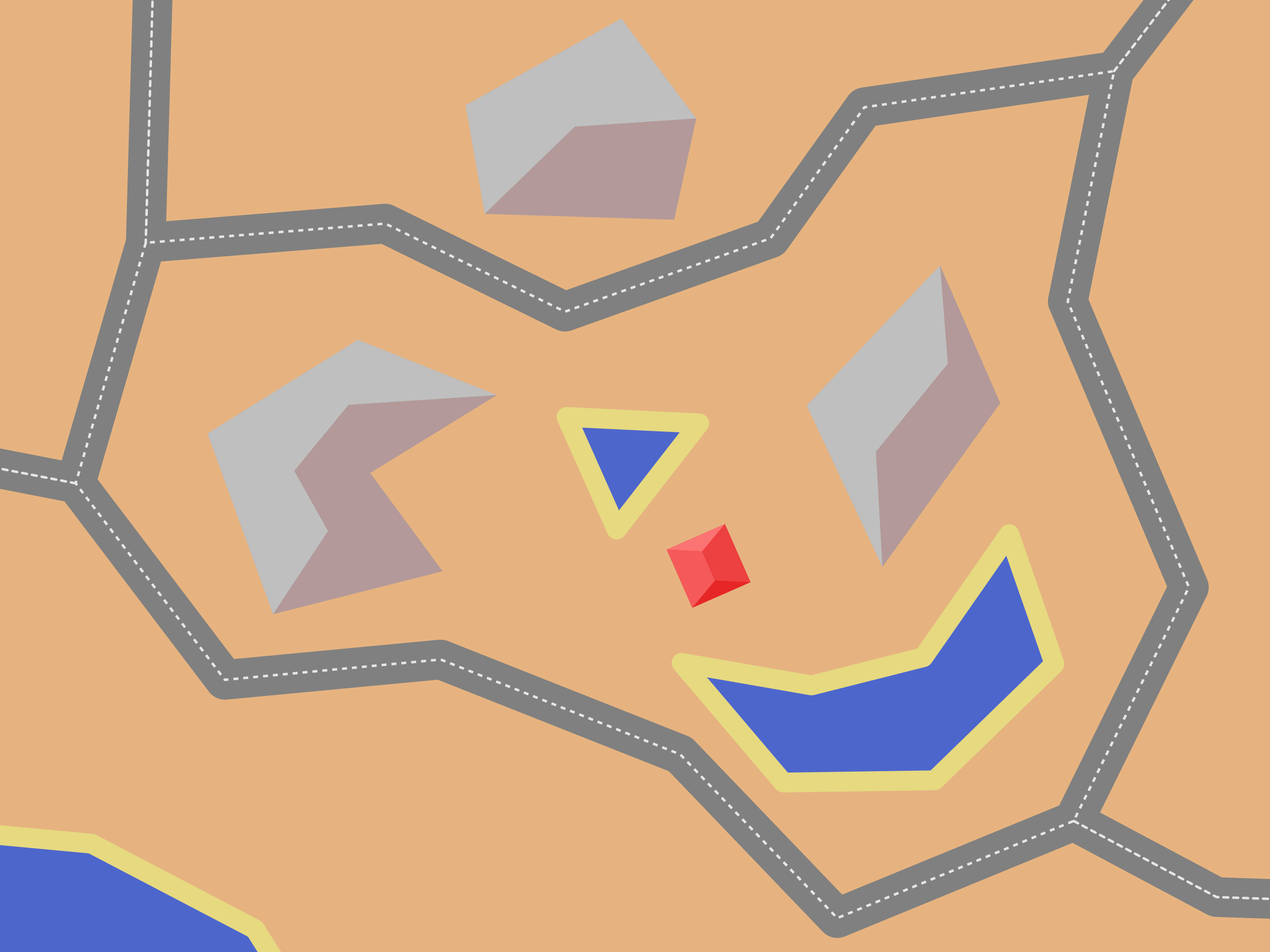

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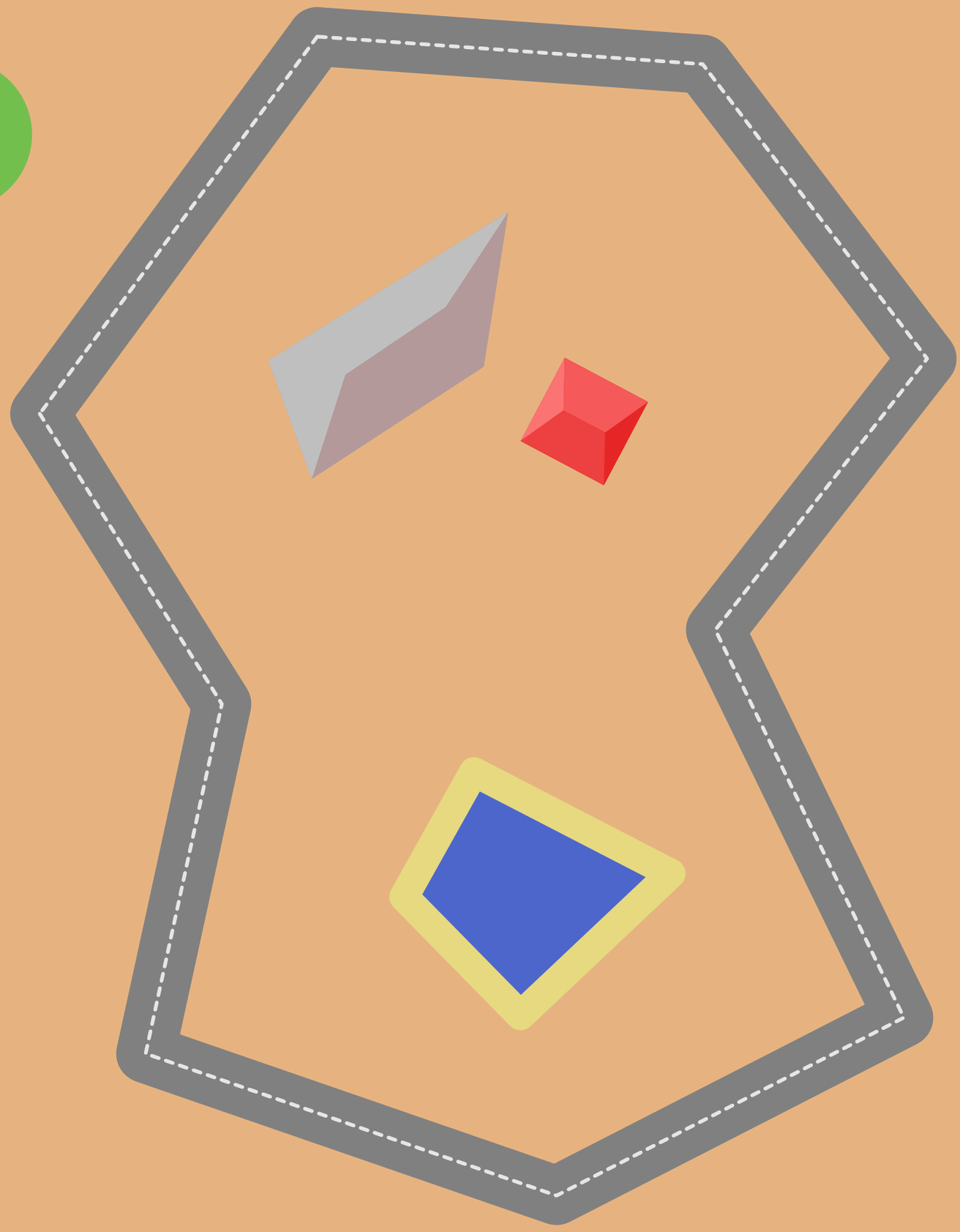
Problem definition.

Given are a polygon P, a set of obstacles $\mathcal{B}$, and a point p inside P.

Add k feed links from p to P such that the worst dilation between p and any point on P is minimal.



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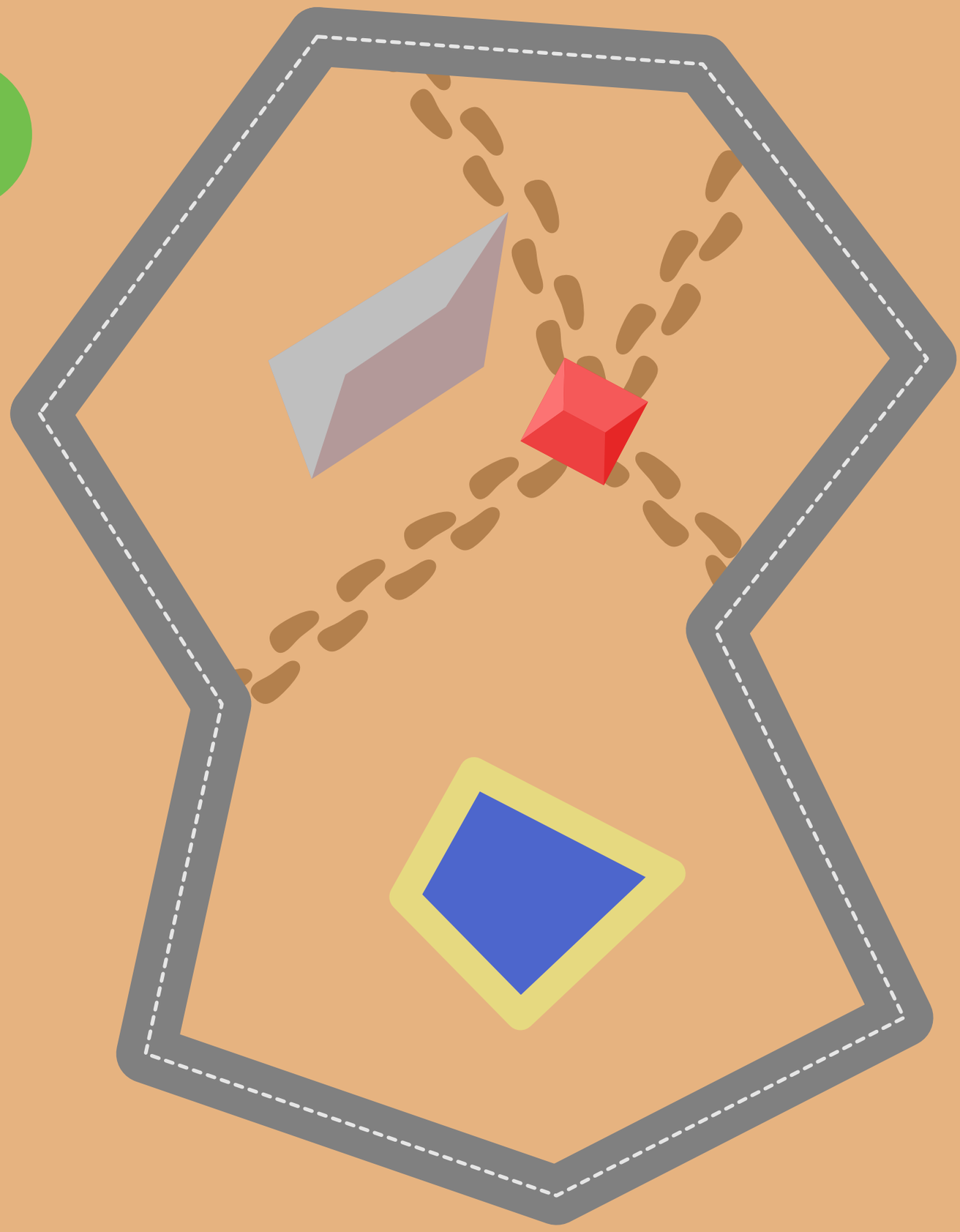

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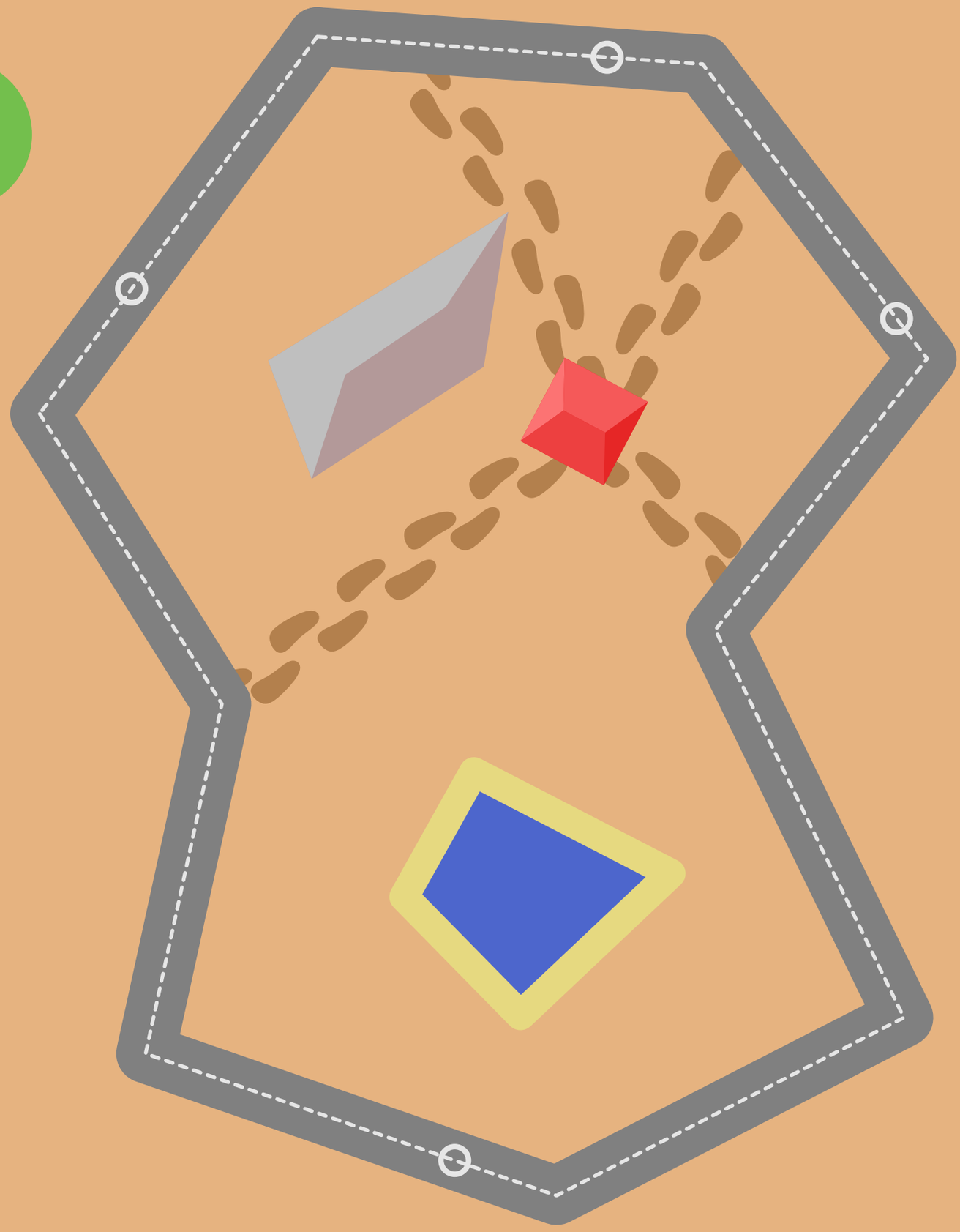

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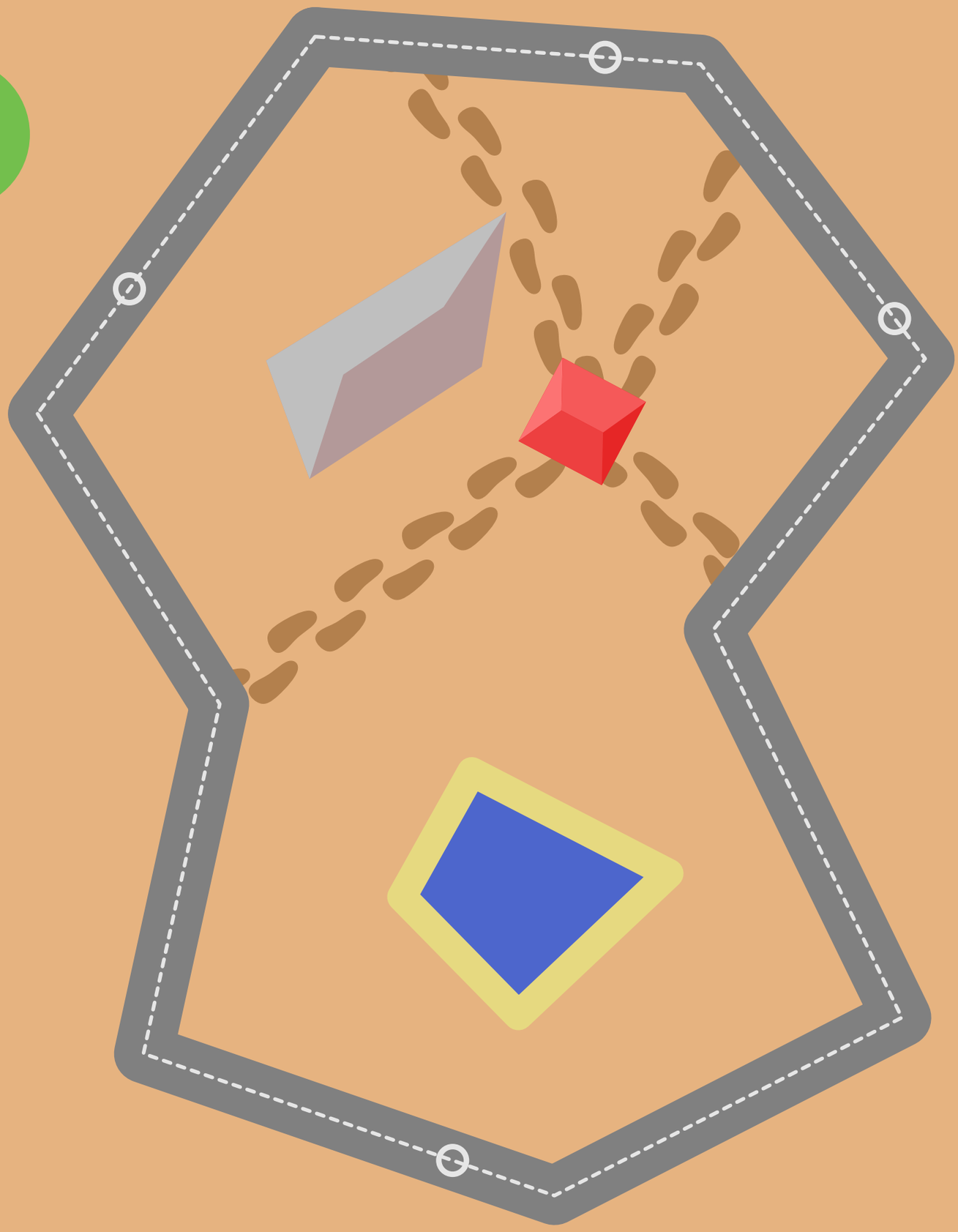
We cannot solve the problem exactly in reasonable time.



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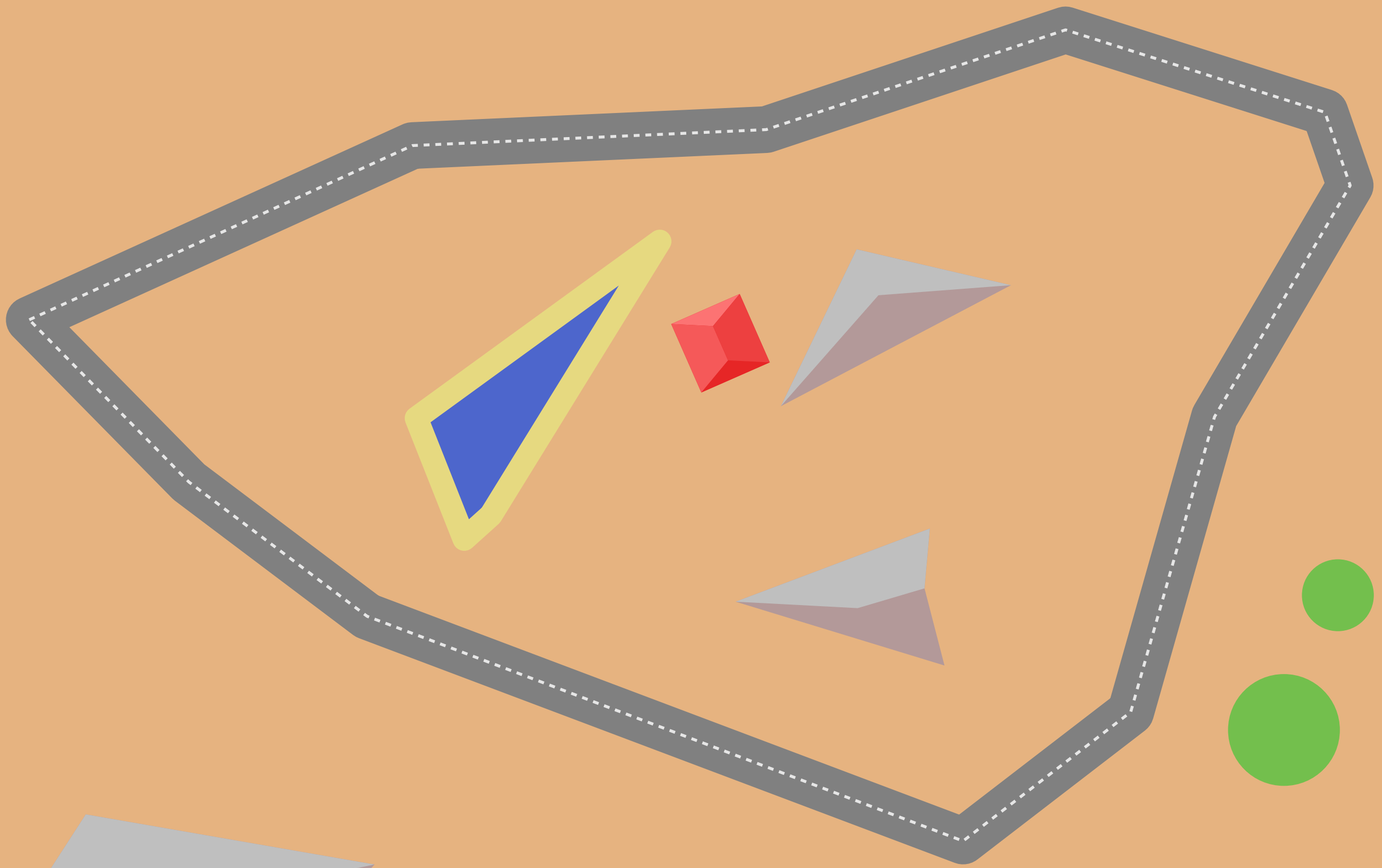
We implemented two heuristics for placing k feed links, and analysed the results.



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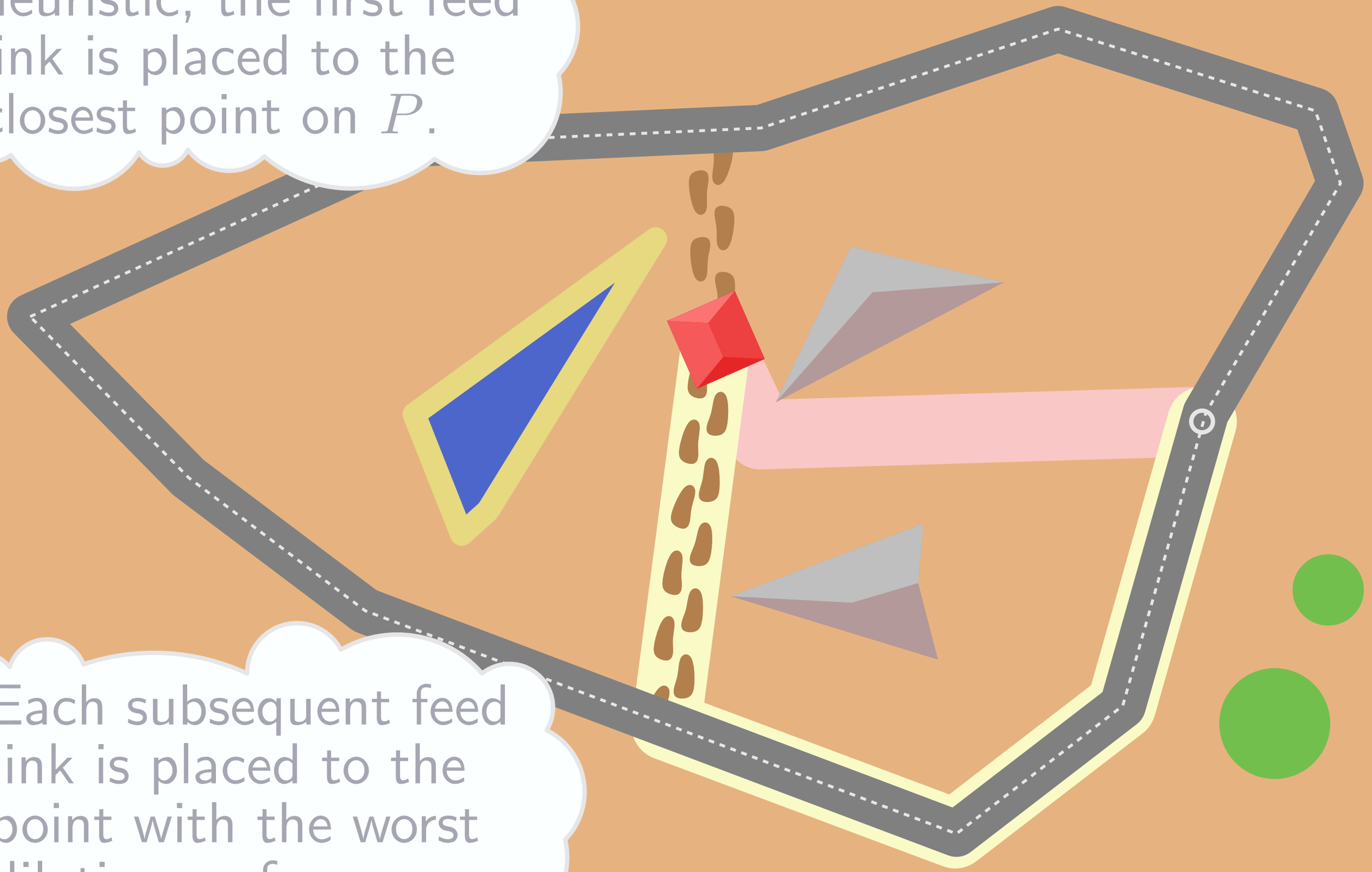

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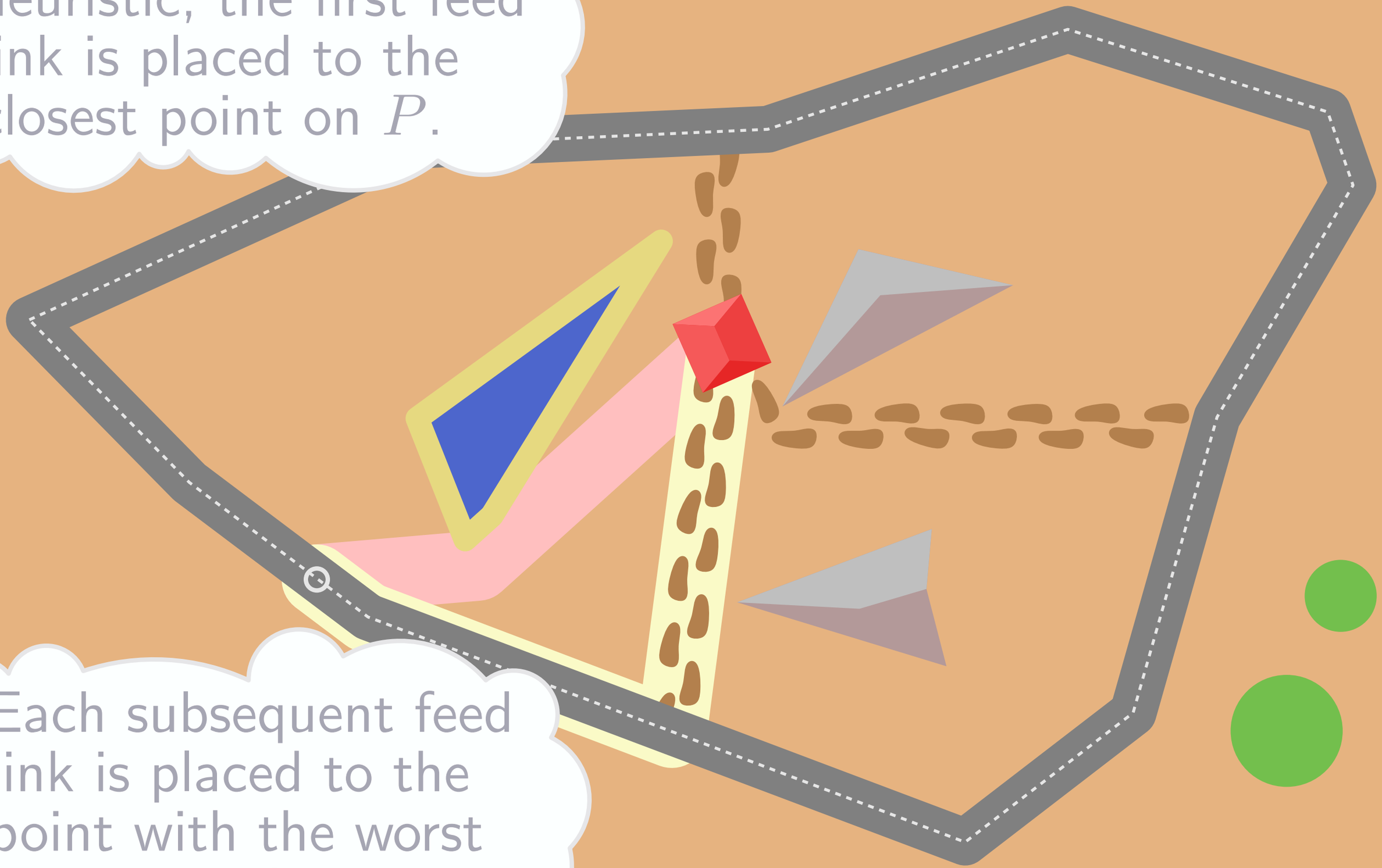

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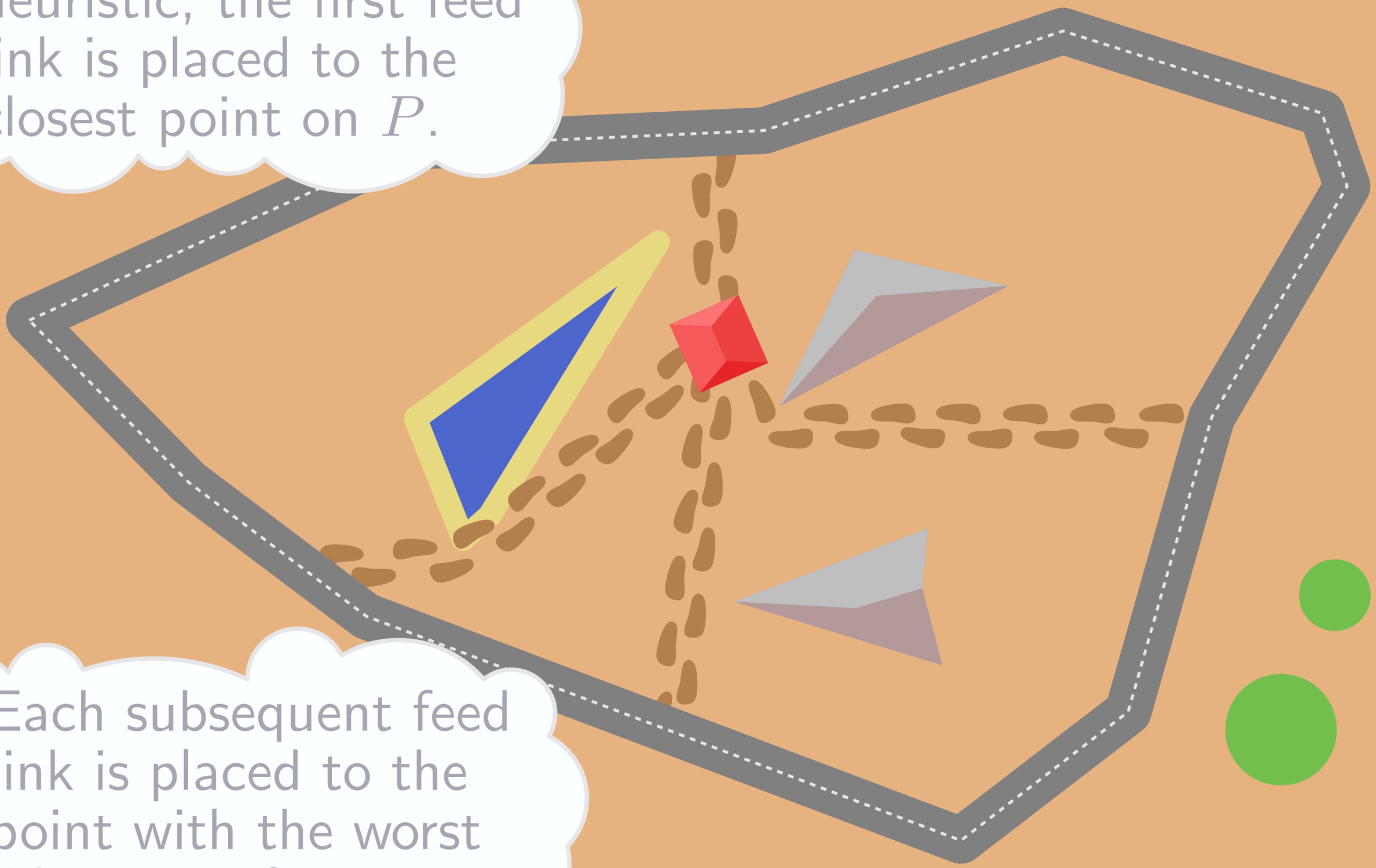

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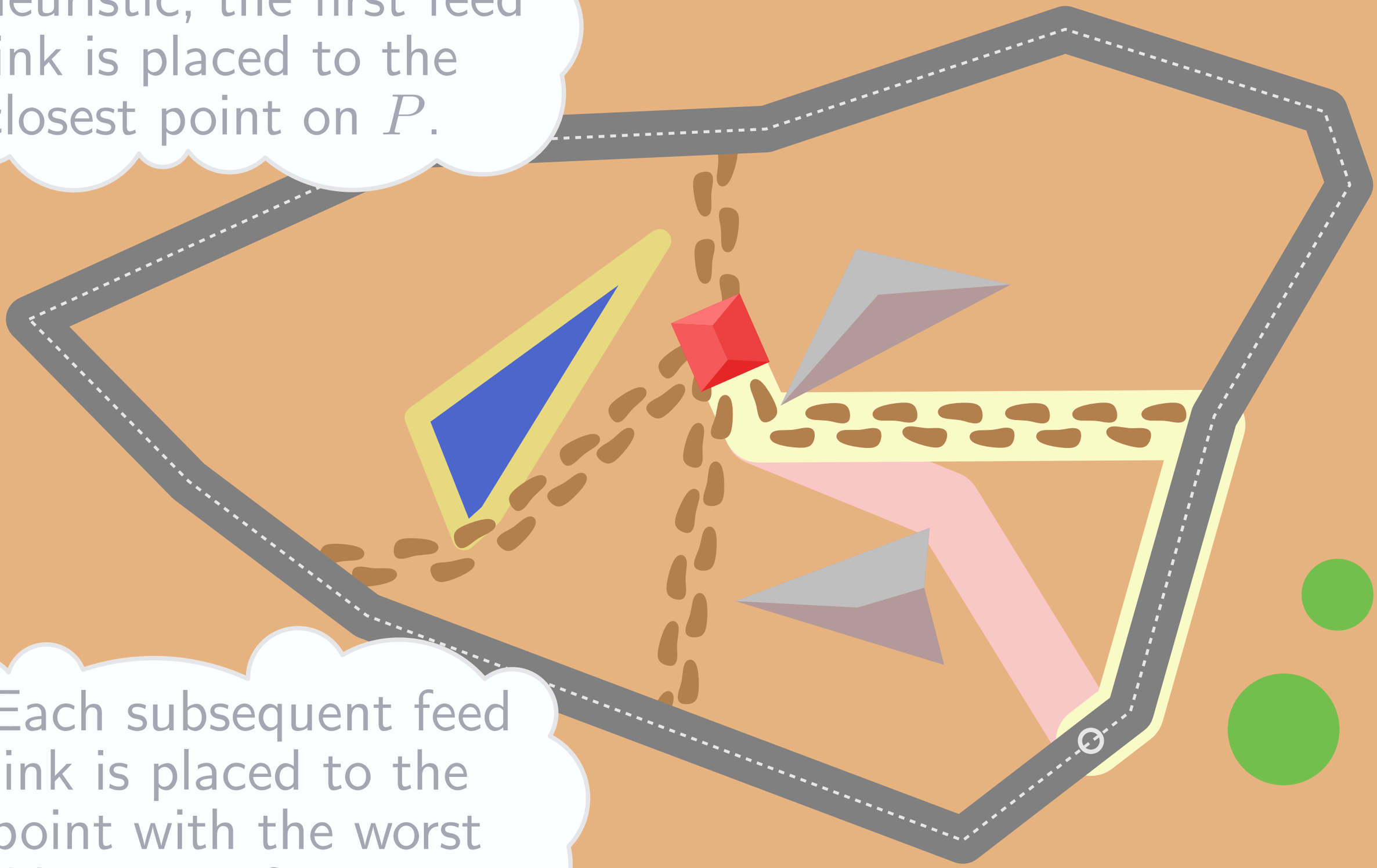

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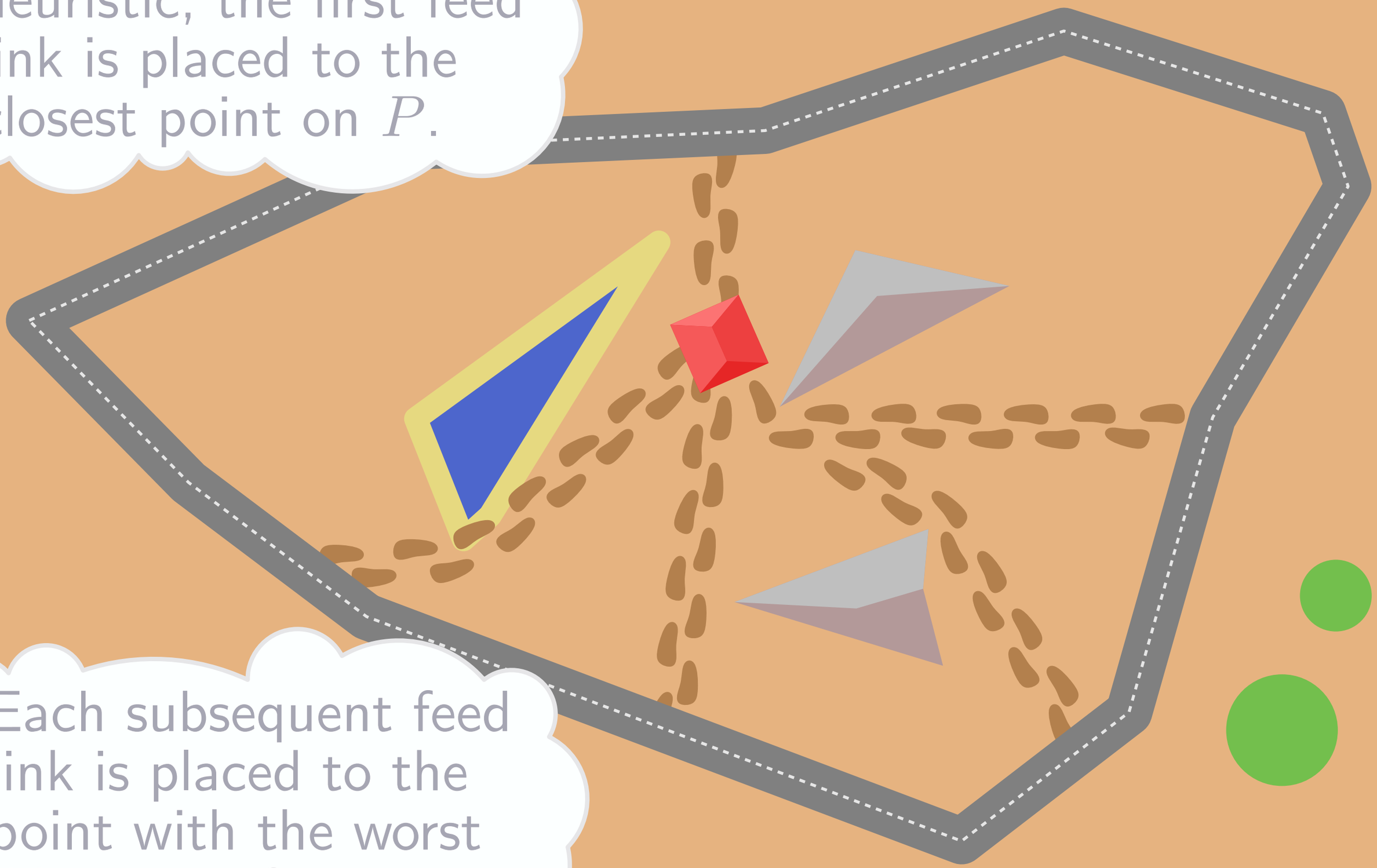

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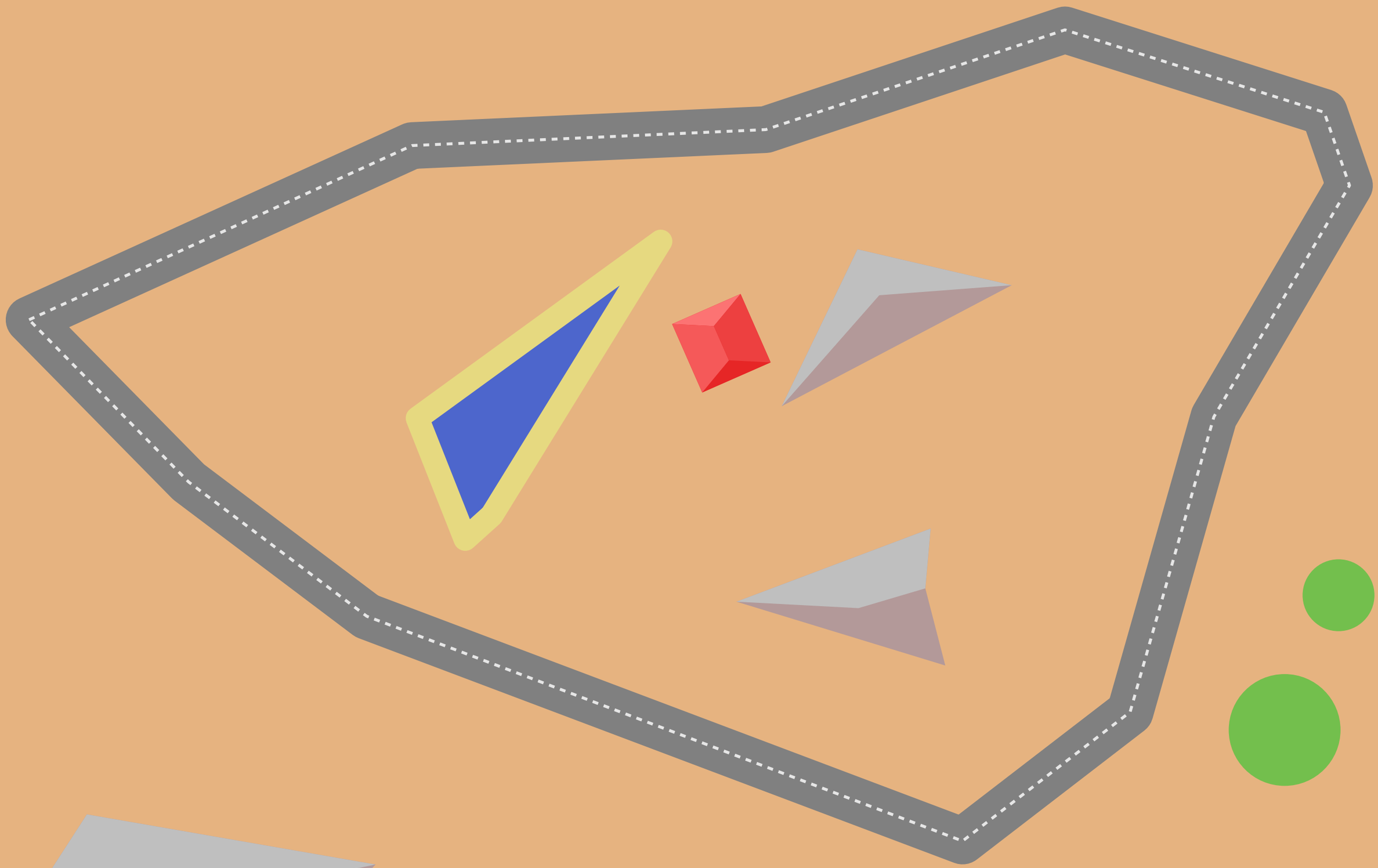

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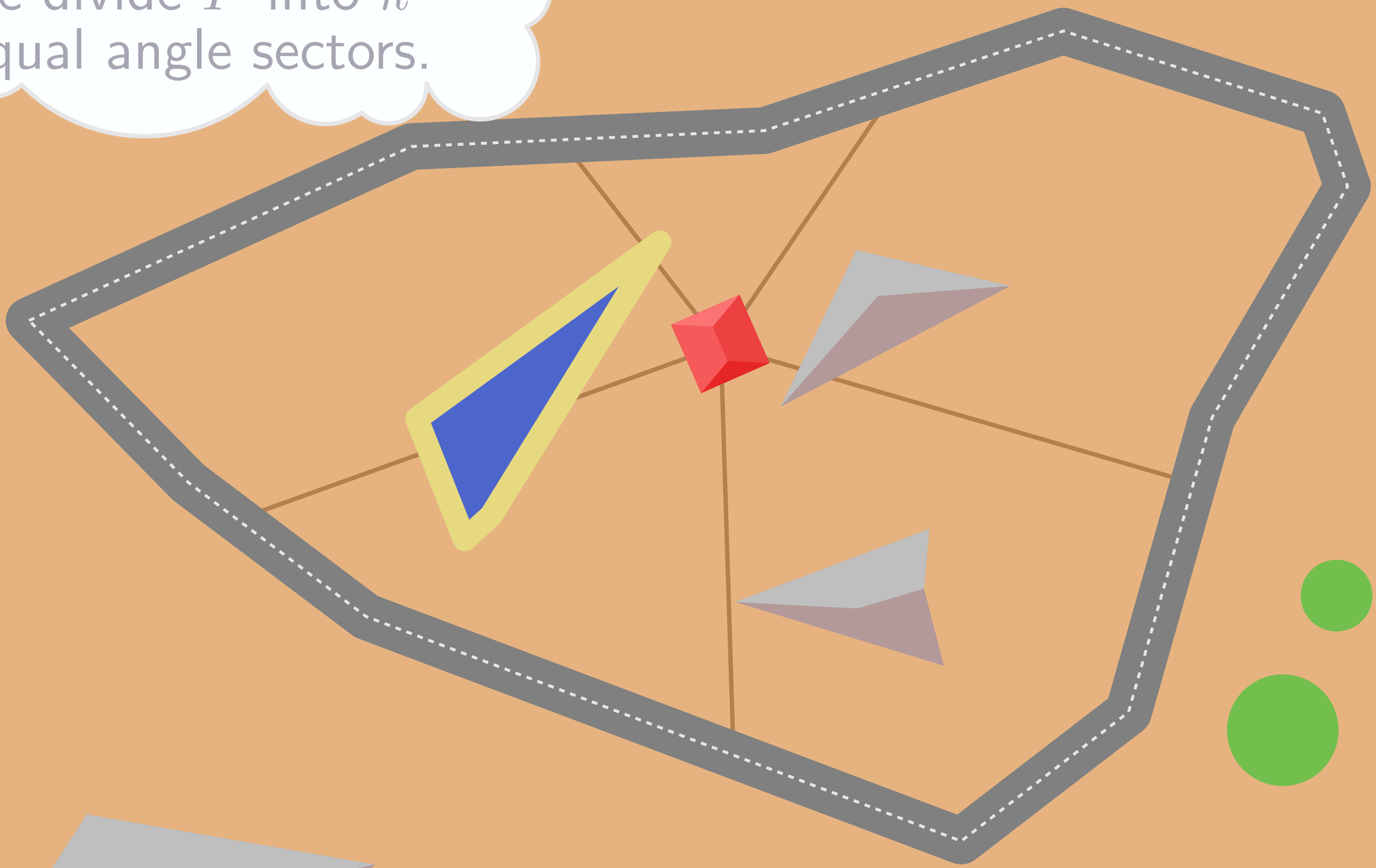

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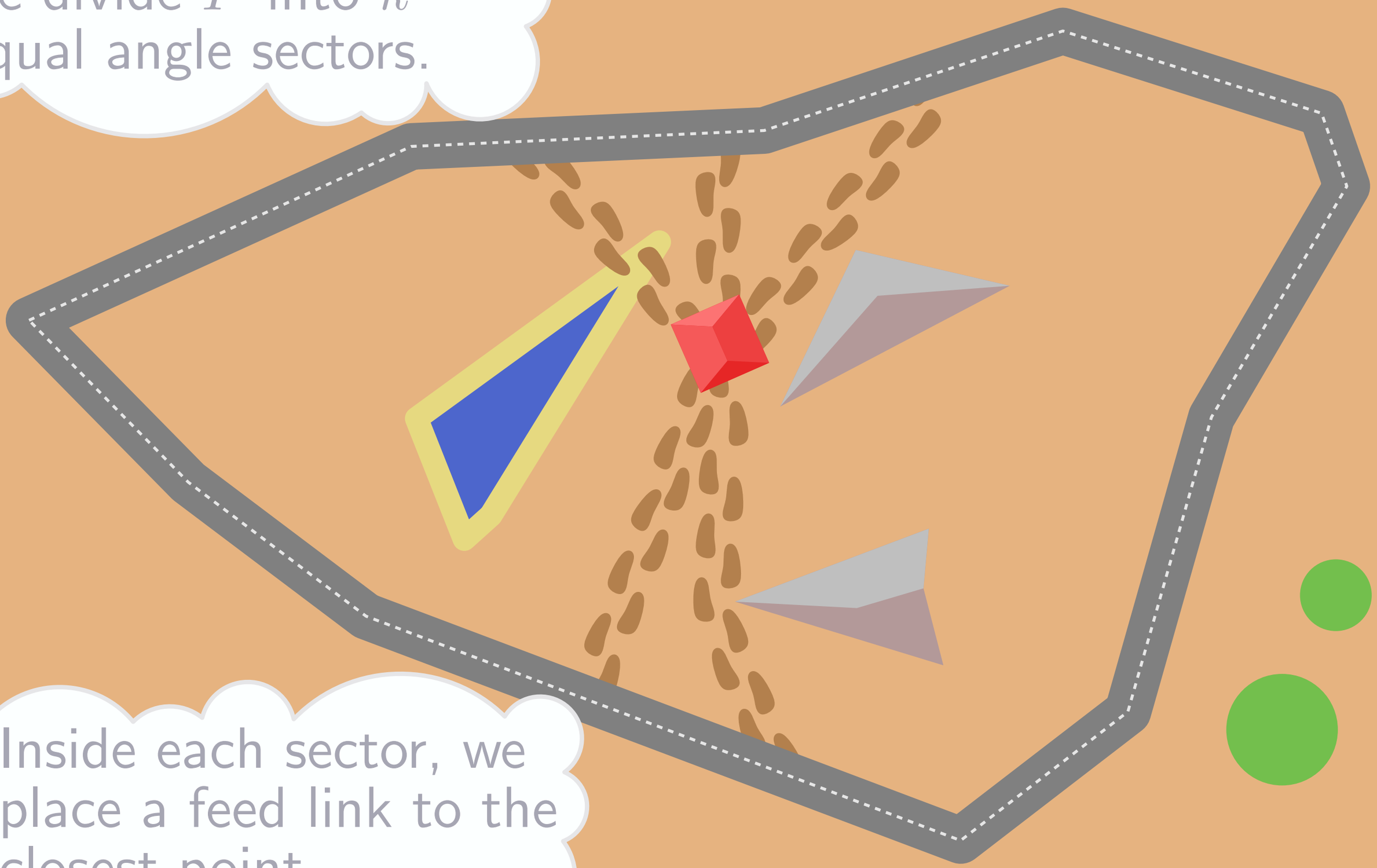

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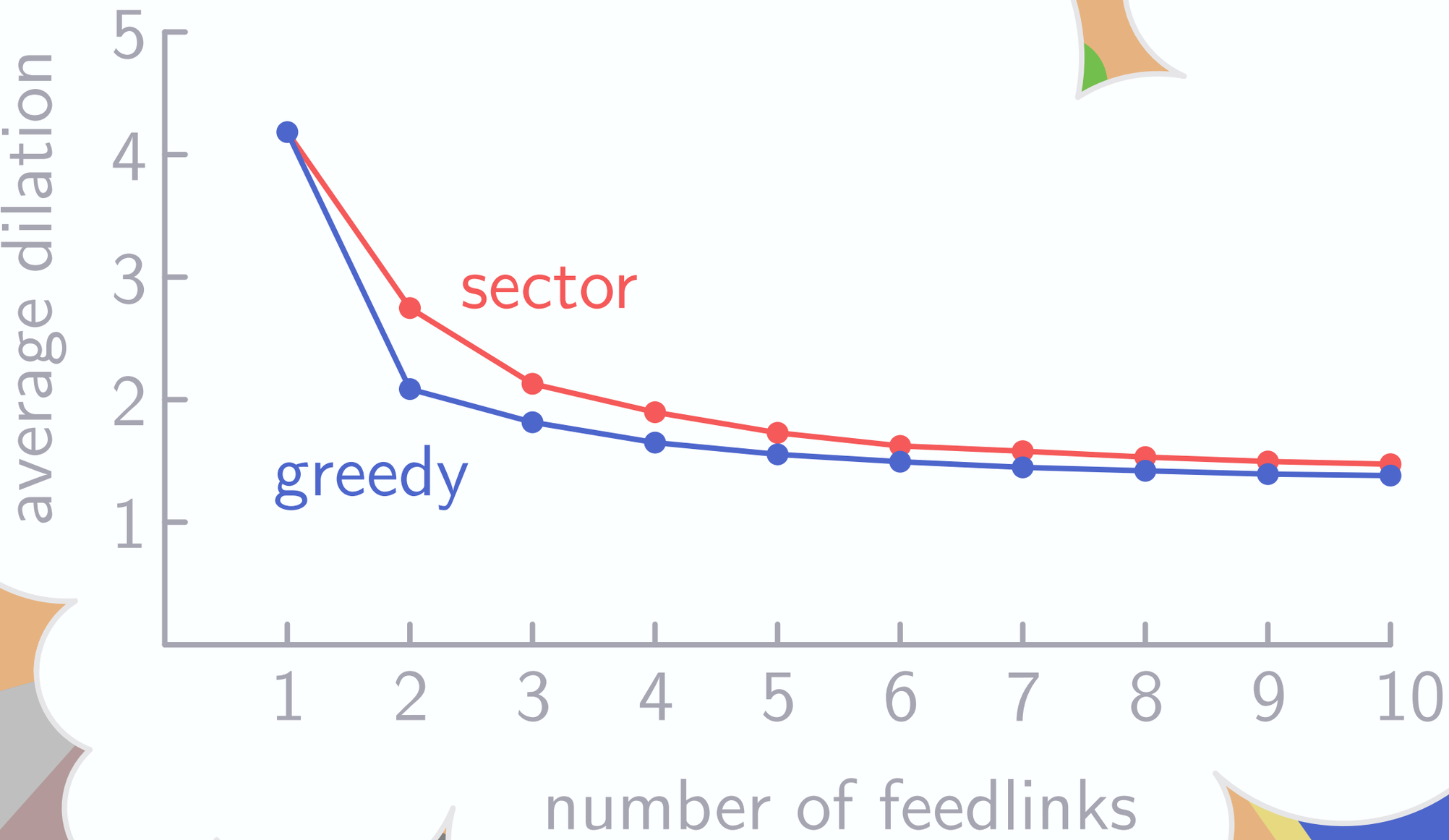
average dilation
5
4
3
2
1
sector
greedy
1
2
3
4
5
6
7
8
9
10
number of feedlinks

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Of the two heuristics, the greedy one appears to perform best.

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Of the two heuristics, the greedy one appears to perform best.

Both heuristics are easy to implement, and produce more realistic networks than ad-hoc methods that do not take dilation into account.

Thank you!

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