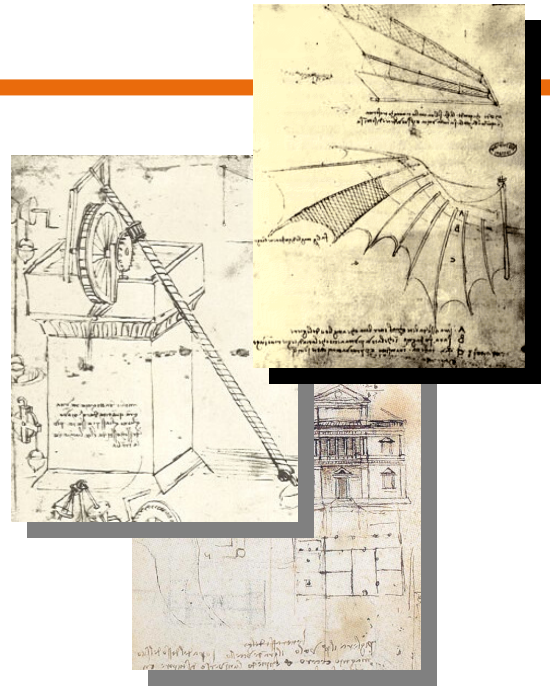
Contradiction is not a sign of falsity, nor the lack of contradiction a sign of truth.

Blaise Pascal

Defining Contradictions in TRIZ:

Introductory Tutorial



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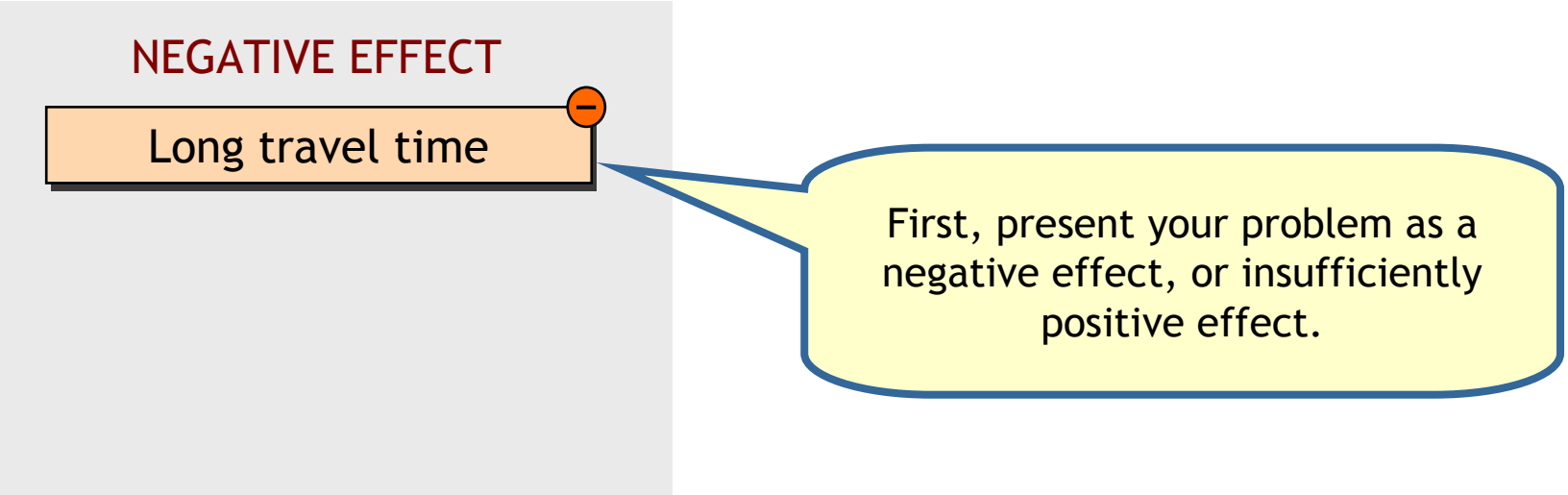
Is it difficult?

- Defining a technical contradiction in TRIZ IS NOT difficult when it is done in a right way.
- How to do it properly? Have a look at the following slides.

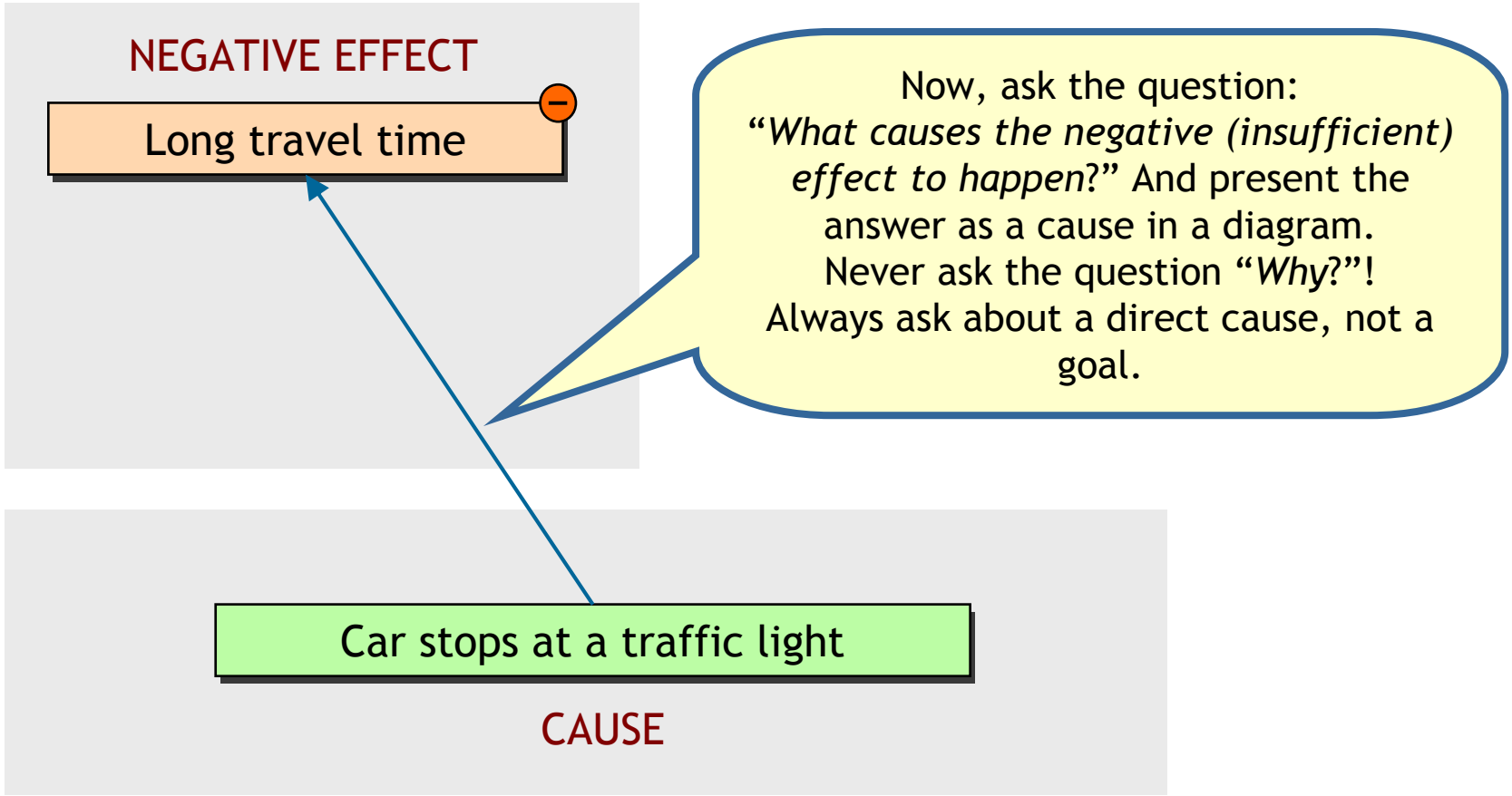
Specification of a contradiction

Step 1. Define your problem as a negative (insufficient) effect



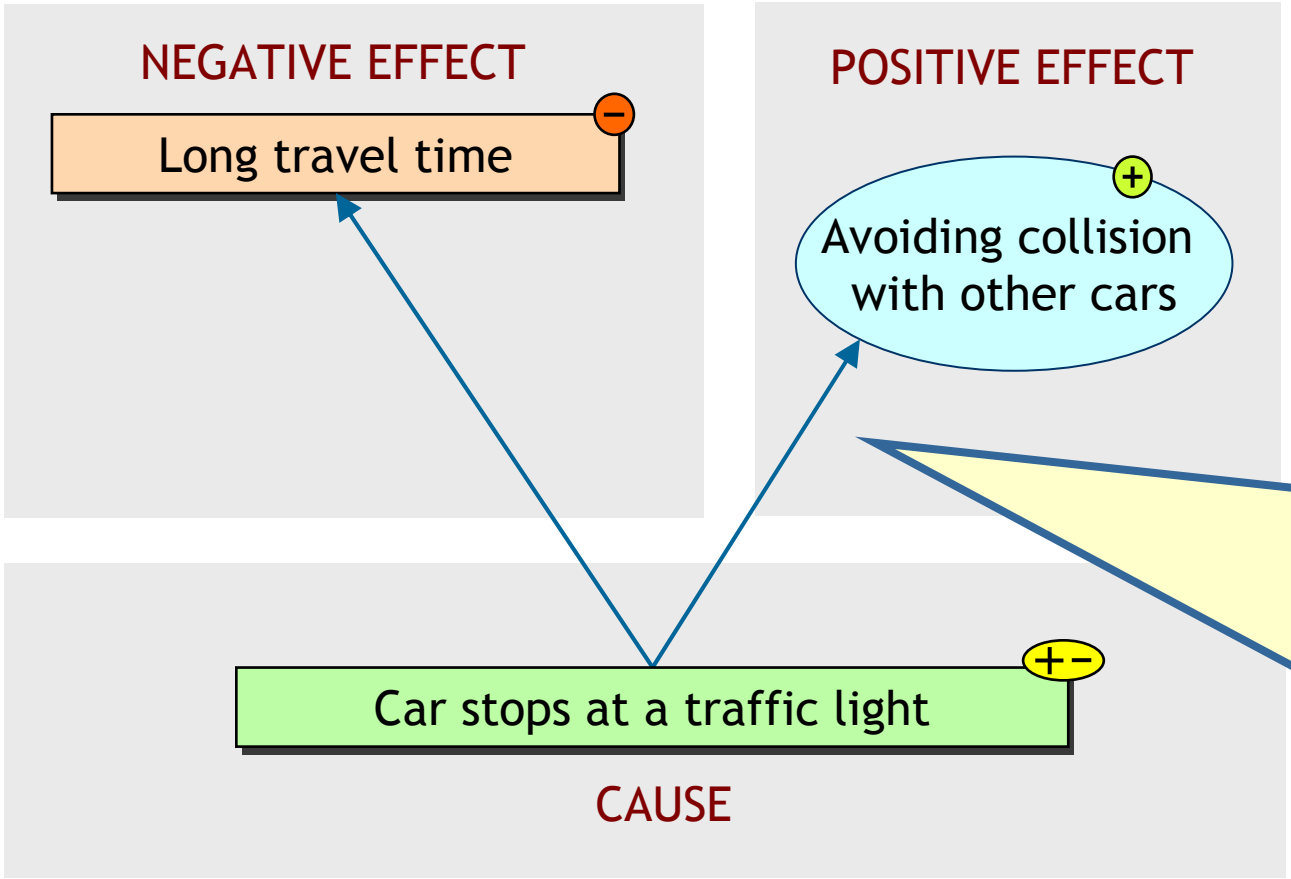
Specification of a contradiction

Step 2. Define a cause of your negative (insufficient) effect



Specification of a contradiction

Step 3. Define a positive effect

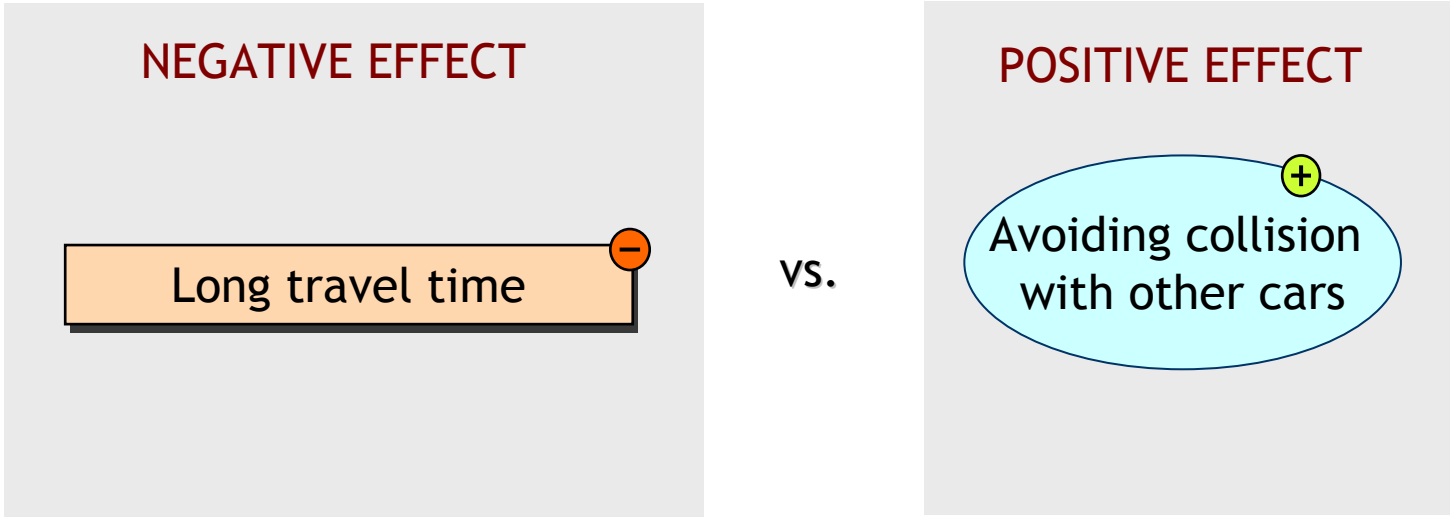


Now, ask the second question: "*Is there any positive effect from the cause presented*?" And present it as a positive effect in your diagram.

In case you have no any positive effect, than you do not have a contradiction – just eliminate the cause to solve the problem!

Your Technical Contradiction

- And now, this is your technical contradiction:



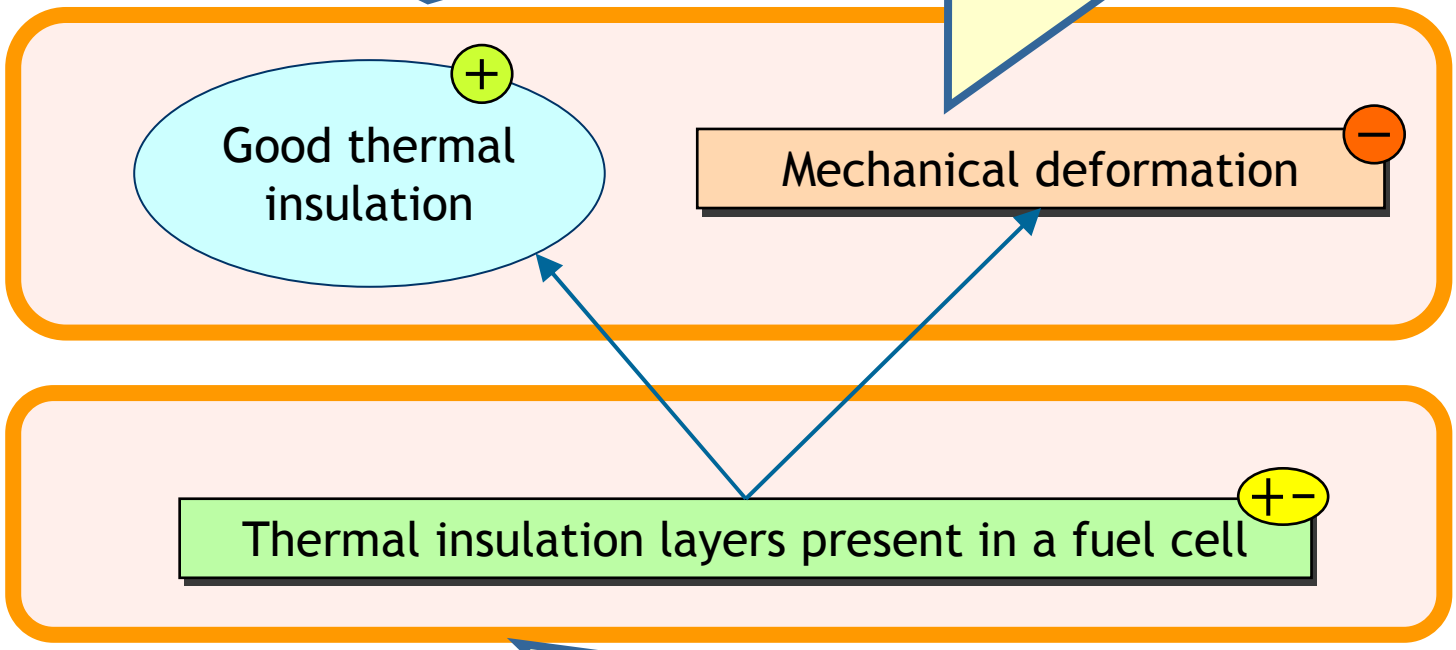
Notes

- Note, in this case we have specifiied both technical contradiction and one side of a physical contradiction (the cause).
- Also remember: there NEVER can't be a situation when you have a physical or a technical contradictions only (unfortunately many TRIZ publications tend to make this mistake). Both are two different but interrelated views of **the same** problem and therefore they can't exist separately!

3 Types of contradictions in TRIZ

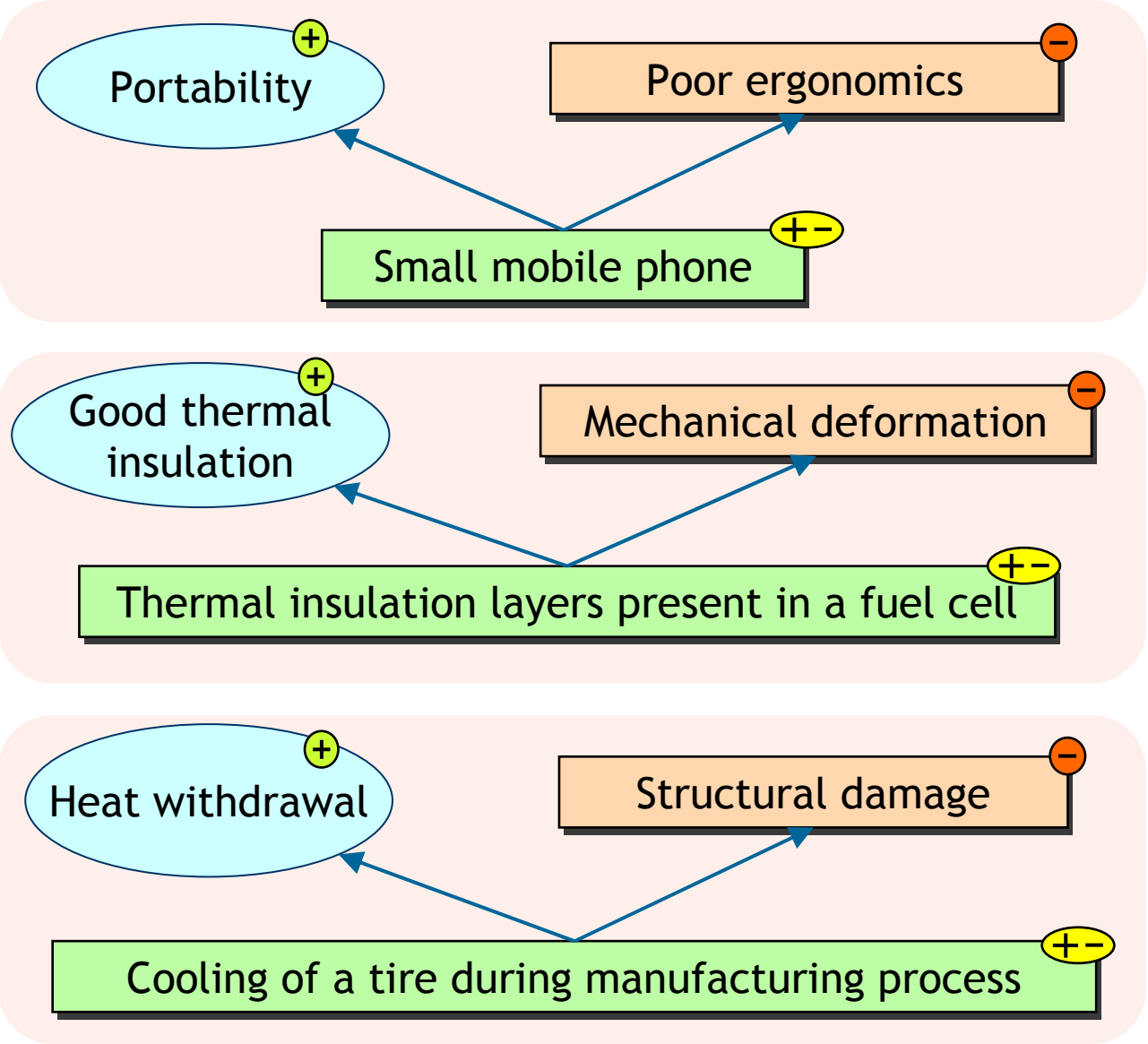
Technical contradiction: formed by a *couple of different contradicting parameters*. Usually resolved with Contradiction Matrix and 40 Inventive Principles

Administrative contradiction: We recognize the need for a change but do not know how to do it.



Physical Contradiction: formed by two contradicting demands put *on the same object/parameter*. This model represents one demand, another one is obtainer by inversion.

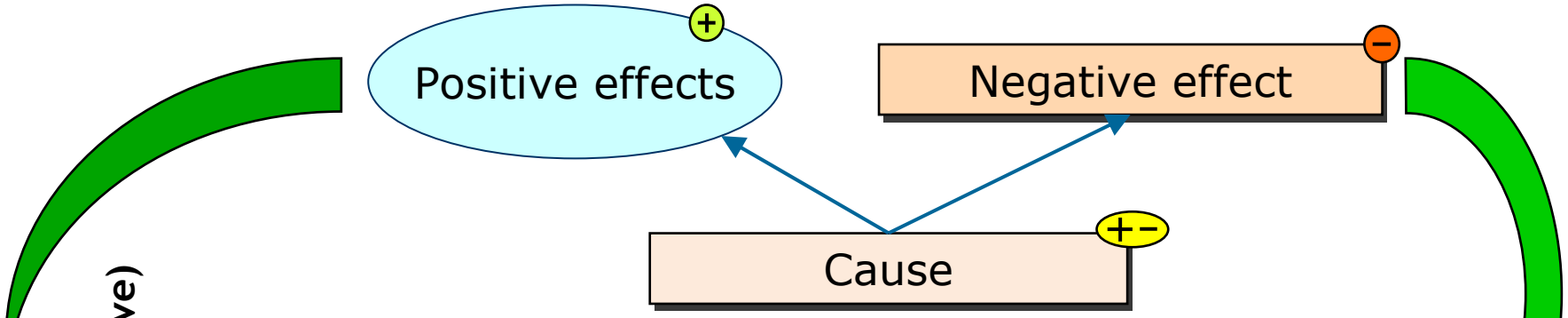
Examples of defined contradictions:



Translation of defined contradiction

- Now, we have to translate our contradiction to the Contradiction Matrix and 40 Principles.
- It is rather straightforward:
  - Identify your Negative (Insufficient) Effect with a “worsening feature” (or negative parameter) in the Contradiction Matrix.
  - Identify your Positive effect with a “feature to improve” (or positive parameter) in the Contradiction Matrix.

Translating to Contradiction Matrix



Positive effects (features to improve)

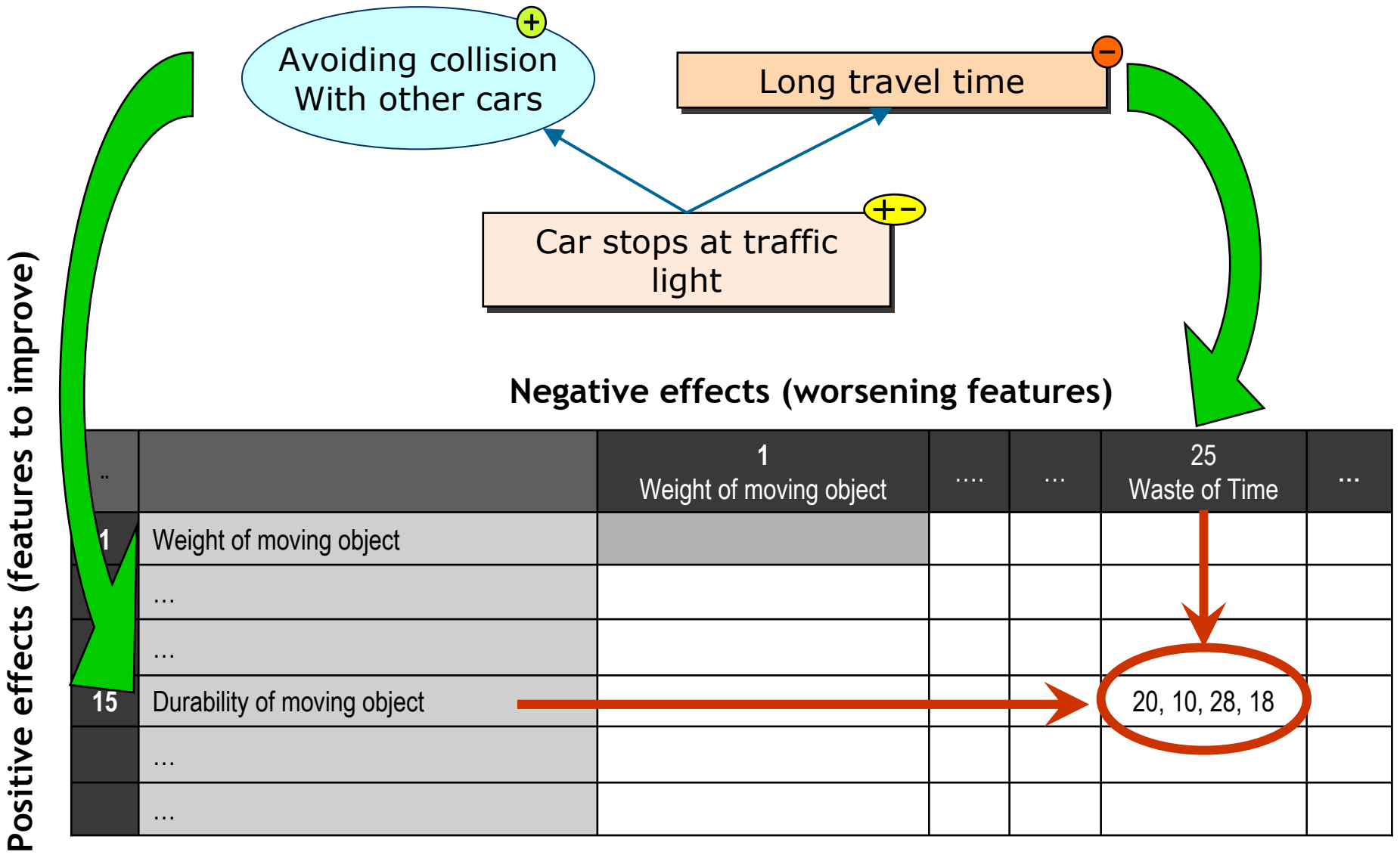
Negative effects (worsening features)

		1	2	3	4	5
1	ight of moving object		-	15, 8, 9,34	-	29, 17, 38, 34
2	t of immobile object				10, 1, 29, 35	-
3	ngth of moving object	8, 15, 29, 34	-		-	17, 4
4	Length of immobile object		35, 28, 40, 29	-		
5	Area of moving ob				-	
6	Area of immobile object				26, 7, 9, 39	-
7	Volume of moving object				-	1, 7, 4, 17

The same specific positive or negative effect can be translated to several effects in Contradiction Matrix. In such cases several combinations of Inventive Principles have to be checked

Selected Inventive Principles

Case with long travel time:



Tips

- A specific contradiction can be translated to more than one contradiction between the generic parameters in the Contradiction Matrix. Check possible alternatives and see if there are common inventive principles proposed by different alternatives.
- When generating ideas, apply recommendations given by an inventive principle to a **system's part** which is involved to causing **both** positive and negative effects.
- Always check resources available – can they be used to solve a problem according to a selected inventive principle?
- Use combinations (e.g. a morphological box) of generated ideas to produce new ideas.

Problem Solving

- Now check if identified principles can solve your problem. If not, a more sophisticated analysis of your problem and reformulation of a contradiction might be required; or a problem has to be solved at the level of a physical contradiction.
- In many problems, there might be more than a single technical contradiction. For instance, several causes might contribute to the same negative effect. For these more complex situations if you want to get a full picture, use RCA+ (Root Conflict Analysis).
- Good luck!

For questions:

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