

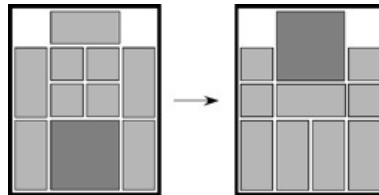
Traffic Jam / Let Me Through



Shafir Games 1981.

(cardboard cover, plastic tray, and 10 plastic pieces, 4.8 by 4 by 3/8 inches)

Uses 1x1, 1x2, 2x1, and 2x2 pieces on a 4x5 board in the theme of *Dad's Puzzler* and *Red Donkey*. This puzzle is described in *Hordern's book* (puzzle C28); it is also shown in Figure 1 of a 1990 patent of *T. Monoyios*. From the start position shown on the left, slide pieces (without picking them up) to form the end position shown on the right:



Here are the directions from the back of the box:

Traffic Jam
The Fire Brigade wants to reach the other side. Start with the tiles as in position (1) in the diagram. Slide the tiles and see how all the cars must move to get to position (2). No, don't lift the tiles out of the tray. Have fun!

L'embouteillage "Traffic Jam"
La Brigade des Pompiers désire atteindre l'autre côté. Commencez avec les jetons selon l'indication de la position (1) figurant dans le diagramme. Faire glisser les jetons et observez la façon dont toutes les voitures doivent se déplacer afin de se mettre en position (2). Non, ne pas soulever les jetons en dehors du plateau. Amusez-vous bien!

DESIGN ARI RON
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Age: 6-Adult

Let me through
The lady in green wants to reach the door which is located on the other side of the bus. Find out how every body must move in order to let her through. Have fun!

Lass mich durch
Die Dame in Grün will die Tür erreichen, die sich auf der anderen Seite befindet. Wie muss jeder Passagier wegrücken, um die Dame durchzulassen. Viel Spaß!

Laissez-moi passer
La dame en vert veut atteindre la porte qui se trouve de l'autre côté du bus. Trouvez comment chacun doit se déplacer pour la laisser passer. Amusez-vous bien!

Lasciatemi passare
La signora in verde vuole arrivare alla porta che si trova dall'altra parte dell'autobus. Trovate come ognuno deve muoversi per lasciarla passare. Buon divertimento!

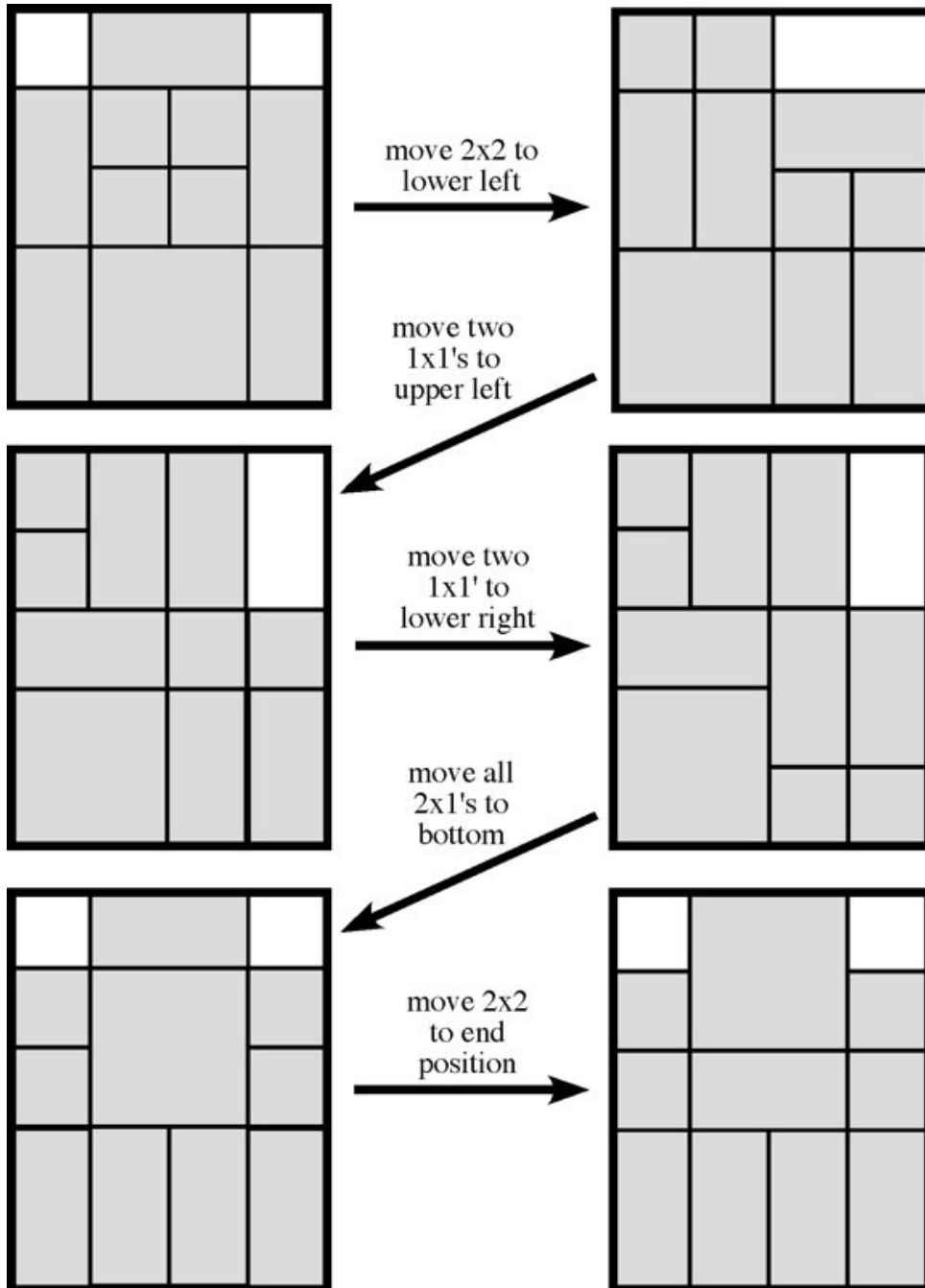
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A Traffic Jam Solution Idea

The basic steps for one approach to solve Traffic Jam are shown below, although there are many shorter solutions (the following page shows a minimal length solution).



A Minimal Length Traffic Jam Solution

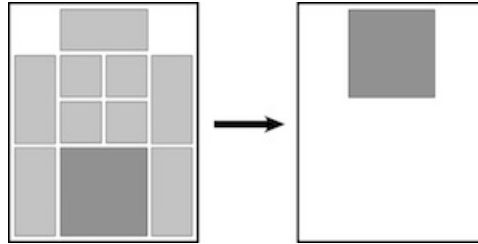
Here is a solution of 69 straight-line moves; it can be converted to 61 rectilinear moves by combining steps 4/5/6 to 2 moves (rename 243 to 324) and combining steps 2/3, 12/13, 20/21, 26/27, 29/30, 53/54, and 62/63 (89 unit moves are used, although 87 unit moves are possible):

5 5	5 5	1 5 5	1 5 5	1 3 5 5	1 3 5 5	1 3 5 5	1 3 5 5
6 1 2 7	6 1 2 7	6 2 7	6 2 7	6 2 7	6 2 7	6 2 7	6 2 7
6 3 4 7	6 3 4 7	6 3 4 7	6 3 4 7	6 4 7	6 4 7	6 4 7	6 4 7
8 X X 9	8 X X 9	8 X X 9	8 X X 9	8 X X 9	8 X X 9	8 X X 9	8 X X 9
8 X X 9	8 X X 9	8 X X 9	8 X X 9	8 X X 9	8 X X 9	8 X X 9	8 X X 9
1 3 5 5	1 3 5 5	1 3 5 5	1 3 5 5	1 5 5	1 5 5	5 5	5 5
6 2 7 9	6 2 7 9	6 2 7 9	6 7 9	6 7 9	6 7 9	6 1 7 9	6 1 7 9
6 4 7 9	6 4 7 9	6 7 9	6 7 9	6 3 7 9	6 3 7 9	6 3 7 9	6 3 7 9
8 X X	8 X X	8 X X	8 2 X X	8 2 X X	8 2 X X	8 2 X X	8 2 X X
8 X X	8 X X	8 4 X X	8 4 X X	8 4 X X	8 4 X X	8 4 X X	8 4 X X
5 5 7	5 5 7 9	5 5 7 9	5 5 7 9	5 5 7 9	5 5 7 9	5 5 7 9	5 5 7 9
6 1 7 9	6 1 7 9	6 1 7 9	6 1 7 9	6 1 7 9	6 1 7 9	6 1 7 9	6 1 7 9
6 3 9	6 3	6 3 X X	6 3 X X	6 3 X X	6 3 X X	6 X X	6 X X
8 2 X X	8 2 X X	8 2 X X	8 2 X X	8 X X	8 X X	8 X X	8 X X
8 4 X X	8 4 X X	8 4	8 4	8 2 4	8 2 4	8 3 2 4	8 3 2 4
5 5 7	5 5 7	5 5 7	5 5 1 7	5 5 1 7	5 5 1 7	5 5 1 7	5 5 1 7
6 1 7	6 1 7	6 1 7	6 7	6 X X 7	6 X X 7	6 X X 7	6 X X 7
6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9
8 X X 9	8 X X 9	8 X X 9	8 X X 9	8 9	8 3 9	8 3 9	8 3 9
8 3 2 4	8 3 2 4	8 3 2 4	8 3 2 4	8 3 2 4	8 2 4	8 2 4	8 2 4
5 5 1 7	5 5 1 7	5 5 1 7	5 5 1 7	5 5 1 7	5 5 1 7	5 5 1	5 5 1
X X 7	X X 7	X X 7	X X 7	X X 7	X X 7	X X 7	X X 7
X X 9	X X 9	X X 3 9	X X 3 9	X X 3 9	X X 3	X X 3 7	X X 3 7
6 8 3 9	6 8 3 9	6 8 9	6 8 2 9	6 8 2 9	6 8 2 9	6 8 2 9	6 8 2 9
6 8 2 4	6 8 2 4	6 8 2 4	6 8 4	6 8 4	6 8 4 9	6 8 4 9	6 8 4 9
5 5 3 1	5 5 3 1	5 5 3 1	5 5 3 1	5 5 3 1	5 5 3 1	5 5 3 1	5 5 3 1
X X 7	X X 7	6 X X 7	6 X X 7	6 X X 7	6 X X 7	6 X X 7	6 X X
X X 7	X X 7	6 X X 7	6 X X 7	6 X X 7	6 X X 7	6 X X 7	6 X X
6 8 2 9	6 8 2 9	8 2 9	8 2 9	8 2 9	8 2 9	8 2 9	8 2 9 7
6 8 4 9	6 8 4 9	8 4 9	8 4 9	8 4 9	8 4 9	8 4 9	8 4 9 7
5 5 3 1	5 5 3 1	5 5 3 1	5 5 3 1	5 5 3 1	5 5 3 1	5 5 3 1	3 1
6 X X	6 2 X X	6 2 X X	6 2 X X	2 X X	2 X X	X X	5 5 X X
6 X X	6 X X	6 4 X X	6 4 X X	4 X X	4 X X	2 4 X X	2 4 X X
8 2 9 7	8 9 7	8 9 7	8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7
8 4 9 7	8 4 9 7	8 9 7	8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7
3 1	3 1	3 1 X X	3 1 X X	3 1 X X	3 1 X X	3 X X	3 X X
5 5 X X	5 5 X X	5 5 X X	5 5 X X	5 5 X X	X X	1 X X	1 X X
2 4 X X	2 4 X X	2 4	2 4	2 4	5 5 2 4	5 5 2 4	5 5 2 4
6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7
6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7
3 X X	3 X X	3 X X	3 X X	3 X X	X X		
1 X X	1 X X 4	1 X X 4	1 X X 4	X X 4	3 X X 4		
5 5 2 4	5 5 2	5 5 2	5 5 2	1 5 5 2	1 5 5 2		
6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7		
6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7	6 8 9 7		

(one move = slide one piece any number of units in one direction)

Traffic Jam Variations

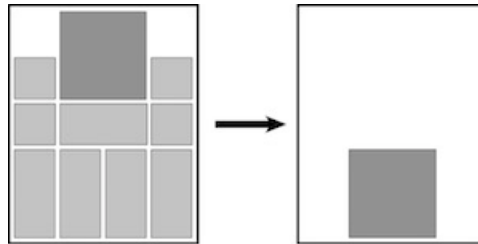
It is natural to consider the simpler puzzle where we only care about the 2x2:



Simple Traffic Jam

It turns out that the first 64 moves of the Traffic Jam solution of the previous page forms a minimal solution for Simple Traffic Jam.

Fewer moves are required if starting from the final position of Traffic Jam:



Reverse Simple Traffic Jam

Here is a 39 straight-line moves solution; it can be converted to 34 rectilinear moves by combining steps 7/8, 16/17, 25/26, 28/29, 30/31:

X X	1 X X	1 X X	1 X X	1 X X	1 X X	1 X X	1 X X	1 X X
1 X X 2	X X 2	3 X X 2	3 X X 2	3 X X 2	3 X X 2	3 X X 2	3 X X 2	3 X X 2
3 5 5 4	3 5 5 4	5 5 4	5 5 4	5 5 4	5 5 4	5 5 4 2	5 5 4 2	5 5 4 2
6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9
6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9
1 3 X X	1 3 X X	1 3 X X	1 3 X X	1 3 X X	1 3 X X	1 3 X X	1 3 X X	1 3 X X
X X	5 5 X X	5 5 X X	5 5 X X	5 5 X X	5 5 X X	5 5 X X	5 5 X X	5 5 X X
5 5 4 2	4 2	4 2	4 2	4 2 X X	4 2 X X	4 2 X X	4 2 X X	4 2 X X
6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9
6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9	6 7 8 9
5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3
4 X X	4 X X	6 4 X X	6 4 X X	6 4 X X	6 X X	6 X X	6 X X	6 X X 9
2 X X	2 X X	6 2 X X	6 2 X X	6 X X	6 X X	6 X X	6 X X	6 X X 9
6 7 8 9	6 7 8 9	7 8 9	7 8 9	7 8 9	7 4 8 9	7 4 8 9	7 4 8 9	7 4 8 9
6 7 8 9	6 7 8 9	7 8 9	7 8 9	7 2 8 9	7 2 8 9	7 2 8 9	7 2 8 9	7 2 8 9
5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3	5 5 1 3
6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9
6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9	6 X X 9
7 4 8	7 4 8	7 8	7 X X 8	7 X X 8	7 X X 8	7 X X 8	7 X X 8	7 X X 8
7 2 8	7 2 8	7 2 4 8	7 2 4 8	7 2 4 8	7 2 4 8	7 2 4 8	7 2 4 8	7 2 4 8
5 5 9	5 5 9	6 5 5 9	6 5 5 9	6 5 5 9	6 5 5 9	6 5 5 9	6 5 5 9	6 5 5 9
6 1 3 9	6 1 3 9	6 1 3 9	6 1 3 9	6 1 3 9	6 1 3 9	6 1 3 9	6 1 3 9	6 1 3 9
6 X X	6 X X	X X	7 X X	7 X X 8	7 X X 8	7 X X 8	7 X X 8	7 X X 8
7 X X 8	7 X X 8	7 X X 8	7 X X 8	7 X X 8	7 X X 8	7 X X 8	7 X X 8	7 X X 8
7 2 4 8	7 2 4 8	7 2 4 8	2 4 8	2 4	2 4	2 4	2 4	2 X X 4

(one move = slide one piece any number of units in one direction)

Further reading:

Monoyios Patent, from: www.uspto.gov - patent no. 4,927,150

Ling Design Patent, from: www.uspto.gov - patent no. 450,356