

**Macedonian Railways (Makedonski Železnici)
Macedonia Rail Corridor VIII:**

Track Access Charges Methodology Review

May, 2015

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1 Principles of the new track access charging methodology

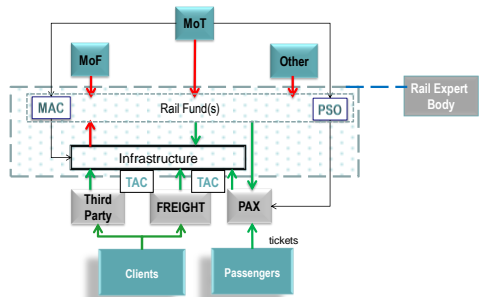
EU LEGISLATION basic principles and objectives

- Directive 2001/14/EC
- Directive 2012/34/EC (recast)

EU Directive 2012/34/EC Article 31 paragraph 3

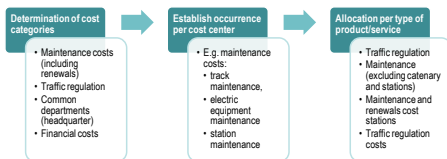
"the charges for the minimum access package and for access to infrastructure connecting service facilities shall be set at the cost that is directly incurred as a result of operating the train service."

1 Structure of rail financing



2 Calculation of direct costs for the minimum access package

Direct costs for minimum access package – Allocation of direct costs



2 Calculation of direct costs for the minimum access package

Determination of full costs based on the accounts for 2010-2013

- Maintenance costs (including renewals):
 - Track maintenance
 - Electric equipment maintenance
 - Station maintenance
- Traffic regulation
- Common departments (headquarter)
- Financial costs

Full Costs*
1.464.110.000 MKD
24.402.000 EUR

*average 2010 - 2013

2 Calculation of direct costs for the minimum access package

Direct costs

- Maintenance Direct costs are defined as the cost difference incurred from a small variation of the level of operations on the network of an infrastructure manager with a given level of usage
- Exclusion from the direct costs:
 - overheads,
 - costs of depreciation not related to usage,
 - costs for the handling of requests and
 - certain other costs

Direct Costs (84,3%)
1.233.950.000 MKD
20.565.833 EUR

2 Calculation of direct costs for the minimum access package

Average 2010-2013 of costs relevant for direct costs

Category/Item/Line	Average 2010-2013 in million MKD
Maintenance and renewals costs (excluding catenary and stations)	856.69
Maintenance and renewals costs catenary	76.38
Maintenance and renewals cost stations	5.56
Traffic regulation costs	295.32
Total	1.233.95

2 Calculation of direct costs for the minimum access package

Calculation of direct costs per train-km basis:

- Realistic picture: figures for 2014 (first 6 months) were used
- Calculation per track section and type of service and track
- Train-km on the Macedonian network 2014 (based on Jan to June figures)

	Track section	train km passenger	train km freight	train km total
Electrified lines	Tabanovci - Skopje	211.878,44	123.760,60	335.639,04
	Skopje - Veles	406.664,56	108.262,24	514.926,80
	Veles - Grevgija	200.223,73	408.344,12	608.567,85
	Trilazovo - Rancina	15,13	35.954,48	35.919,35
	Total electrified lines	818.881,86	677.171,44	1.496.053,30
Non-electrified lines	Skopje - Blace	43.395,02	22.268,98	65.664,00
	GoricePeltovo - Kicovo	147.718,08	14.448,20	162.164,28
	Veles - Bitola	374.733,09	10.424,10	385.157,19
	Veles - Kocani	61.851,42	508,42	62.359,84
	Non-electrified lines total	627.697,61	47.647,70	675.345,31
	Total lines in use	1.446.579,47	724.819,14	2.171.398,61

2 Calculation of direct costs for the minimum access package

Modulation

Component 1: Train weight

- Less than 600 t, mainly passenger trains, with modulation factor 1.0
- 600-1200 t, mainly freight trains, with modulation factor 1.1
- Heavy trains with more than 1200 t, have 1.2 modulation factor due to high impact on track wear

Component 2: Permissible train speed

- Less than 100km/h, currently applicable for Macedonia, modulation factor 1.0
- 100 km/h and more, modulation factor 1.2, taking into consideration corridor X is currently being upgraded

3 Proposed charging system

Determination of mark-ups

- Ensure the track access charge level
- Support international freight transit traffic on Corridor X

	EUR per train km
Access charges for electrified lines	2.90 €
Access charges for non-electrified lines	2.75 €
Additional charges for station use	0.06 €

3 Proposed charging system

TAC formula

$$F = [(L_{EF} * C_E + L_{NF} * C_N) * K_{3F} + (L_{ES} * C_E + L_{NS} * C_N) * K_{3S}] * K_2 + K_1 * (L_E + L_N) * C_S$$

- F = sum of track access charges
- L_{EF} = length of actual driven kilometre on electrified lines
- L_{NF} = length of actual driven kilometres on non-electrified lines
- C_E = Basic price per train kilometre on electrified lines
- C_N = Basic price per train kilometre on non-electrified lines
- C_S = basic price per train-km for station use
- K_1 = Coefficient for station use
- K_2 = Coefficient for train mass
- K_{3F} = Coefficient for permissible speed of trains (Speed >100 km/h)
- K_{3S} = Coefficient for permissible speed of trains (Speed < 100 km/h)

Proposed charging system

TAC proposed basic prices

	Unit (per train km)
C ₁ Basic Price electrified lines	2.90 €
C ₂ Basic Price non-electrified lines	2.75 €
C ₃ Basic price station use	0.05 €

Proposed charging system

TAC proposed coefficients

Category	Engineering Metric	Coeff.
K ₁ Station use	Passenger trains	1.0
	Freight trains	0.0
K ₂ Train mass	Less than 600 t	1.0
	600 - 1200 t	1.1
	More than 1200 t	1.2
K ₃ permissible speed	Less than 100 km/h (K _{3,low})	1.0
	100 km/h and more (K _{3,high})	1.2

Proposed charging system

Resulting income of PERI by track access charges

	Current system	Proposed system	Difference
Income from passenger TAC	2,804,150 €	4,678,943 €	+1,874,792 €
Income from freight TAC	3,660,188 €	2,241,466 €	-1,418,722 €
Total income from TAC	6,464,338 €	6,920,409 €	+456,070 €

Summary / Conclusions

- Proposed methodology for the determination of the Track Access Charges follows the European Commission preferred direct cost approach
- The methodology proposed with the attached excel sheet is designed to be used also when the railway invites other operators to use the track
- Additional services can be easily catered for and fields such as reservation and cancellation policies are also provided for

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