



COMMONWEALTH GRANTS COMMISSION

DRAFT ASSESSMENT PAPER CGC 2003/27

TRANSPORT OF RURAL SCHOOL CHILDREN

Prepared for the Commission's 2003 Conferences on Draft Assessments

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NOTE

Included in this paper are the results of preliminary calculations based on the methods proposed throughout the paper and using the data currently available. Those results are indicative only and should be seen as work in progress. Ongoing changes are being made to standards and factor calculations as new data come to hand. Moreover, the calculations have been done using a prototype assessment system and are subject to ongoing revision as checking processes proceed.

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INTRODUCTION

1. This paper presents a draft assessment for the Transport of Rural School Children category for the 2004 Review. This was a 'no-change' category and a discussion paper was not circulated to States in 2002. This paper takes account of State comments in State main and rejoinder submissions.

BACKGROUND

Scope of the category

2. In the 1999 Review, the Transport of Rural School Children category comprised expenditure on the provision, administration, inspection and support of transportation services to students in areas not serviced by urban public transport. It included expenditure on contract bus services and conveyance allowances to parents, but excluded expenditure on:

- (i) transport of students with disabilities; and
- (ii) reimbursement of public transport authorities for concessional fares offered to school children and subsidies to private bus operators for conveyance of school children in urban areas.

3. Table 1 shows the standard expenses for six financial years. In 2001-02, this category represented 0.66 per cent of total gross standard expenses.

Table 1 TRANSPORT OF RURAL SCHOOL CHILDREN — GROSS STANDARD EXPENSES, 2003 UPDATE

	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02
\$pc	26.35	26.32	29.03	30.46	31.63	32.89
% of total gross standard expenses	0.72	0.68	0.64	0.66	0.65	0.66

Structure of the assessment

4. The structure used in the 1999 Review is summarised in Table 2.

Table 2 ASSESSMENT STRUCTURE FOR TRANSPORT OF RURAL SCHOOL CHILDREN, 1999 REVIEW

Factors	Basis of calculation
Dispersion	Average distances travelled by rural school children, adjusted to take account of the proportion of kilometres travelled on unsealed roads and sinuosity.
Socio-demographic composition	The number of students residing in rural areas, excluding those enrolled in distance education.

5. This category was assessed as a whole because all expenses were associated with the provision of one type of service —school transport for rural students.

PROPOSED CATEGORY DEFINITION AND ASSESSMENT STRUCTURE

6. The States did not comment on the definition of this category or the assessment structure.

7. **Commission decisions.** The Commission’s decisions are summarised in Table 3.

Table 3 COMMISSION DECISIONS – CATEGORY DEFINITION, ASSESSMENT STRUCTURE AND COMPONENT WEIGHTS

Recommendation/Decision	Reason
Retain the same category definition as used in the 1999 Review	Represents an important aspect of State services.
Assess the category as a whole.	All expenses were associated with the provision of one type of service —school transport for rural students.

SCHOOLS COMPONENT

8. This is the only component in this category. It deals with the expenses associated with the provision of transportation services to students in areas not served by urban public transport. Dispersion and socio-demographic composition factors are assessed for this component.

Dispersion — schools component

9. **1999 Review.** The dispersion factor measured the disability experienced by the States due to the geographic distribution of students and the nature of the terrain that those students had to traverse to get to school. The factor was based on average distances travelled by rural school children, adjusted to take account of:

- (i) the proportion of kilometres travelled on unsealed roads; and
- (ii) differences between States in the sinuosity of their roads.

Attachment A sets out the steps involved in the calculation of this factor.

10. **State views.** South Australia supported the 1999 Review assessment, and acknowledged the requirement for some judgement by the Commission in designing this factor. It said that it was important that the factor calculation continued to include an allowance for travel on unsealed roads.

11. Tasmania supported the need for this factor, but said that the present method did not reflect the differences in the cost of delivering the service in each State. It said that the differences in the average distance travelled per rural pupil did not reflect the differences in the costs incurred in providing the service. It advocated a measure of time per bus route as a more accurate basis for the factor. This would build in costs due to sinuosity and unsealed roads, as well as terrain and distance travelled. It said that an index of travel time could be calculated by comparing travel times per kilometre between centres and the national average. This index could be applied to the maximum distance to be travelled by each bus to derive the travel time for each bus route.

12. **Analysis.** The factor assessed for the previous review was data intensive requiring data for rural school children at the CD level and measurement of the distances between each CD and the nearest UC/L. Its derivation also involved intensive use of the roads data included with CDATA to identify unsealed roads and to apply a cost weight of 1.2 to one-third of their length in each State. Although complex and resource intensive to do so, the calculation can be updated to include:

- (i) new student location data;
- (ii) new estimates of average distances travelled by rural school children;
- (iii) new estimates of average distance travelled on unsealed roads; and
- (iv) new estimates of the sinuosity differences between States.

13. The method proposed by Tasmania using travel times and bus route distances would be similarly resource intensive, if the data were available. The Commission is not aware of an appropriate database of travel times per kilometre between centres and bus routes distances. It is not available in CDATA.

14. **Commission decision.** We consider that there is a strong case for the location of students to affect the differential costs of providing school transport for rural

school children. Consequently, the unit cost of providing this service can be affected by the need to traverse unsealed roads and by the additional time taken to travel on winding roads. There are no data available which would enable a direct calculation of the relative cost of providing these services on an Australian average basis in each State. In the absence of comprehensive data, it seemed plausible that a proxy measure of the combined effect on costs of population spread and of factors affecting unit costs is justified. The Commission's decision is summarised in Table 4.

Table 4 COMMISSION DECISION — DISPERSION, SCHOOLS COMPONENT

Proposal	Reason
Retain the same approach to the calculation of dispersion factor for this category as used in the 1999 Review.	Gives States the capacity to provide the average level of services by assessing the additional costs that States face because of the geographic spread of school-aged populations in rural areas

15. **Proposed method and results.** We adopted the method used for the 1999 Review to recalculate the dispersion factor for this category. In the recalculation we used updated population location data — but assumed that the changes that have occurred since the last review were not of a magnitude that would warrant resource intensive recalculation of:

- (i) average distance travelled by rural school children;
- (ii) average distance travelled on unsealed roads; and
- (iii) the sinuosity differences between States.

16. Table 5 shows the comparison between the recalculated dispersion factor with that used for the 1999 Review assessment.

Table 5 DISPERSION FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
1999 Review	0.99752	0.86223	1.02752	1.24394	1.10949	0.85741	0.34653	1.73791
2004 Review	0.98298	0.85980	1.04421	1.24568	1.09235	0.88247	0.38852	1.87325

17. **Updateability.** The factors cannot be updated annually for changes in student location. These data come from the Census.

18. **Reality check.** The factors are similar to those used in the 1999 Review. They have been updated to reflect changes in student location only. They reflect the fact that relatively more rural school children in Queensland, Tasmanian and Northern Territory now require transport to school.

Socio-demographic composition — schools component

19. **1999 Review.** The socio-demographic composition factor was based on estimates of the number of students who lived in rural areas, excluding distance education enrolments.

20. **State views.** Tasmania supported the continued assessment of socio-demographic composition to measure the relative demand for this type of service in each State.

21. No other State commented on this factor

22. **Analysis.** The demand for transport services for rural school children varies between the States according to the relative size of the school-aged population in rural areas in each State. The 1999 Review method for calculating factors to reflect this disability was based on the estimation of the primary and secondary school students in the rural areas surrounding urban centres and localities (UC/Ls). The data required for this calculation were derived from the calculation of the service delivery scale factors for Government Primary and Secondary Education. We consider that this approach gives a good estimate of the differences between States in the standardised use of school transport by rural school children.

23. **Commission Decision.** The Commission accepts that a conceptual basis exists for inclusion of a use factor in this assessment, based on the relative size of the rural school-aged population in each State. The conceptual case is supported by data derived from the calculation of the service delivery scale factors for the Schools Education categories. We are satisfied these data are comparable and representative, and provide an adequate basis for calculating the impact of socio-demographic composition on use of transport services for rural school children. We propose to use the 1999 Review approach to calculate this factor.

24. Table 6 summarises the Commission decision for the socio-demographic composition factor for the 2004 Review.

Table 6 COMMISSION DECISION — SOCIO-DEMOGRAPHIC COMPOSITION FACTOR

Recommendation/Decision	Reason
A socio-demographic composition factor will be assessed, based on the numbers of rural school children estimated by the method of calculating service delivery scale factors for the Schools Education categories.	The relative size of the user population will affect levels of demand for this service.

25. ***Proposed method and results.*** The socio-demographic factor was calculated by the following steps:

- (i) the numbers of primary and secondary school students in the rural areas surrounding urban centres and localities (UC/Ls) were extracted from the calculation of service delivery scale for the Government Primary and Secondary Education categories (the numbers excluded students deemed under the service delivery scale method to be receiving out-of-school tuition under standard policies);
- (ii) for each State, these numbers were used to calculate the proportions of total primary and secondary school students who lived in rural areas surrounding UC/Ls;
- (iii) the State proportions for primary schools were applied to total standardised numbers of students in Government and Non – government primary schools and the State proportions for secondary schools were applied to total standardised numbers of students in Government and Non - government secondary schools;
- (iv) standardised numbers of primary and secondary students in rural areas derived at (iii) were summed to derive total standardised students in rural areas;
- (v) a ratio was calculated for each State and Australia by dividing total standardised students by State populations; and
- (vi) a factor was calculated for each State by dividing its ratio by the Australian ratio.

26. Data and information used in the calculation of the socio-demographic composition factor for the 2004 Review assessment are in Table 7. The socio-demographic composition factors proposed for the 2004 Review are shown in Table 8. Table 9 compares the 2003 Update and the 2004 Review factors for 2001-02.

Table 7 CALCULATION OF SOCIO-DEMOGRAPHIC COMPOSITION FACTOR FOR TRANSPORT OF RURAL SCHOOL CHILDREN, 2001-02

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Primary students in rural areas (%)	9.71	10.86	14.87	9.51	12.93	25.17	0.78	10.06	11.39
Secondary students in rural areas (%)	11.73	13.03	16.53	9.57	14.54	28.34	0.60	13.07	13.15
Enrolments									
Govt Primary	474949	339639	277205	137209	102546	39708	22521	21022	1414799
Non-Govt Primary	188608	150233	87350	47961	41360	11471	12001	4382	543366
Govt Secondary	283833	194634	179745	97378	66816	22321	13541	9311	867578
Non-Govt Secondary	156581	124708	100171	55326	36588	9213	9746	3614	495947
Notional numbers of rural school children									
Govt Primary	46100	36884	41216	13054	13254	9993	175	2114	162790
Non-govt Primary	18307	16315	12988	4563	5346	2887	93	441	60939
Govt Secondary	33279	25360	29704	9317	9717	6327	82	1217	115003
Non-govt Secondary	18359	16249	16554	5293	5321	2611	59	472	64919
Total notional rural enrolments	116046	94808	100461	32227	33638	21819	410	4244	403651
Per capita notional rural enrolments	0.01747	0.01953	0.02737	0.01680	0.02215	0.04611	0.00127	0.02123	0.02060
Socio-demographic composition factor	0.84846	0.94816	1.32893	0.81574	1.07549	2.23887	0.06164	1.03061	1.00000

Source: CDATE 2001 and Special Data Collection from States.

Table 8 SOCIO-DEMOGRAPHIC COMPOSITION FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
1997-98	0.84959	0.94411	1.32001	0.82586	1.07508	2.27150	0.06333	1.02976
1998-99	0.84879	0.94541	1.32356	0.82319	1.07539	2.26398	0.06258	1.02822
1999-00	0.84826	0.94705	1.32650	0.82109	1.07411	2.25319	0.06200	1.02627
2000-01	0.84713	0.94834	1.32840	0.81892	1.07560	2.24989	0.06182	1.03086
2001-02	0.84846	0.94816	1.32893	0.81574	1.07549	2.23887	0.06164	1.03061

Table 9 SOCIO-DEMOGRAPHIC COMPOSITION FACTORS

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
2003 Update	0.84230	0.95404	1.42225	0.82686	0.92790	1.93557	0.06270	1.10950
2004 Review	0.84846	0.94816	1.32893	0.81574	1.07549	2.23887	0.06164	1.03061

27. **Updateability.** The factors can be updated annually for changes in student numbers.

28. **Reality check.** The factors for a number of States have changed substantially. In particular the factors for South Australia and Tasmania have increased and those of Queensland and the Northern Territory have decreased relatively more than for the other States. These trends reflect the changes in the number of rural school children requiring transport in the States.

PROPOSED ASSESSMENT FOR THE 2004 REVIEW

29. Table 10 summarises the proposed assessment for the 2004 Review.

Table 10 PROPOSED ASSESSMENT STRUCTURE FOR THE 2004 REVIEW

Component	Component Weight	Factors	Basis of calculation
Transport services	%	100	Dispersion
			Socio-demographic composition
			Based on average distances travelled by rural school children, adjusted to take account of the proportion of kilometres travelled on sealed and unsealed roads and sinuosity.
			Based on the target population of primary and secondary school students in rural areas adjusted for students deemed to be receiving distance education under standard policies.

Derivation of the category factor

30. Table 11 summarises the disability factors assessed for each component of this category for 2001-02, and shows the derivation of the category factor.

Table 11 TRANSPORT OF RURAL SCHOOL CHILDREN — DERIVATION OF CATEGORY FACTOR, 2001-02

Factors	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Schools (SCH) (component weight = 100%)								
Dispersion (d)	0.98298	0.85980	1.04421	1.24568	1.09235	0.88247	0.38852	1.87325
Socio-demographic composition (sdc)	0.84846	0.94816	1.32893	0.81574	1.07549	2.23887	0.06164	1.03061
Component factor	0.83177	0.81304	1.38395	1.01342	1.17164	1.97043	0.02388	1.92539
Cont. to category factor	0.83177	0.81304	1.38395	1.01342	1.17164	1.97043	0.02388	1.92539
Category Factor	0.83177	0.81304	1.38395	1.01342	1.17164	1.97043	0.02388	1.92539

Calculation formula

31. The following formula was used to calculate the overall category factor.

$$\text{Category factor} = 1.0 * (d * \text{sdc})$$

Category factors and standardised expenses

32. Table 12 compares the category factors derived for the 2004 Review draft assessment within the 2003 Update.

Table 12 COMPARISON OF CATEGORY FACTORS, 2003 UPDATE AND THE DRAFT ASSESSMENT FOR THE 2004 REVIEW

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
2003 Update	0.83795	0.82040	1.45748	1.02581	1.02674	1.65514	0.02167	1.92303
2004 Review draft assessment -	0.83177	0.81304	1.38395	1.01342	1.17164	1.97043	0.02388	1.92539

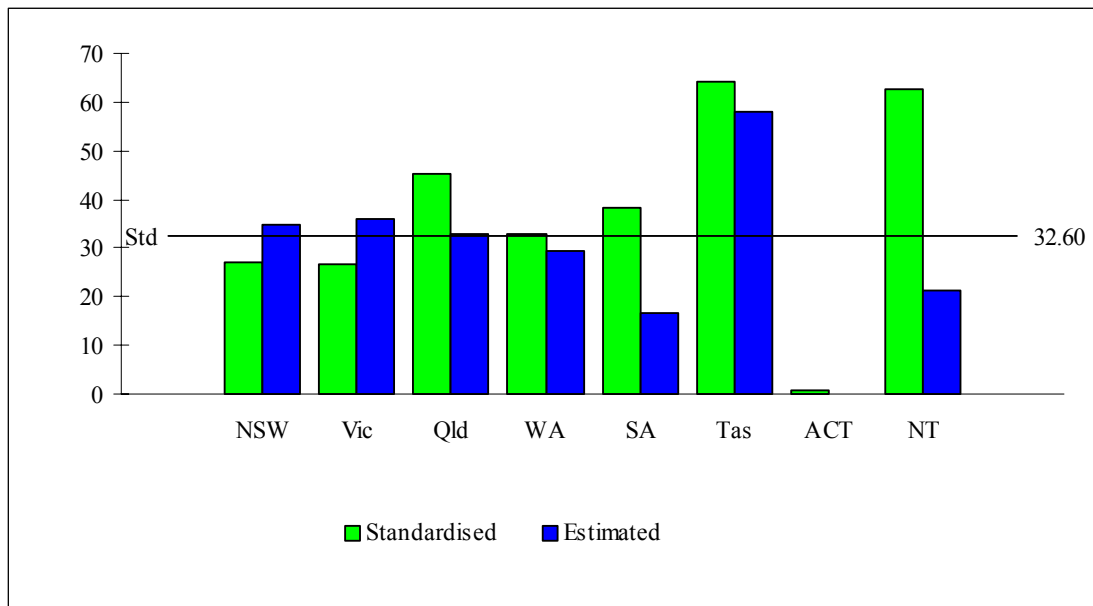
33. Table 13 presents, for 2001-02, the draft assessment standardised expenses for the 2004 Review and compares them with the 2003 Update results.

Table 13 ESTIMATED, STANDARD AND STANDARDISED EXPENSES, 2001-02

	Standard	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
2003 Update -									
Estimated expenses									
\$m		239.678	159.689	121.540	67.056	22.111	29.927	0.000	4.590
\$ per capita		36.09	32.89	33.11	34.96	14.56	63.25	0.00	22.75
Standardised expenses									
\$m		183.018	130.998	175.943	64.716	51.282	25.758	0.230	12.645
\$ per capita	32.89	27.56	26.98	47.93	33.74	33.77	54.44	0.71	63.25
2004 Review									
Estimated expenses									
\$m		230.412	175.192	120.661	56.040	25.017	27.419	0.000	4.219
\$ per capita		34.70	36.08	32.87	29.21	16.47	57.95	0.00	21.10
Standardised expenses									
\$m		180.082	128.688	165.608	63.375	58.008	30.396	0.251	12.550
\$ per capita	32.60	27.12	26.51	45.12	33.04	38.20	64.24	0.78	62.77

34. Figure 1 shows the gross expenses per capita for 2001-02 in terms of standardised, estimated and gross standard expenses.

Figure 1 TRANSPORT OF RURAL SCHOOL CHILDREN — GROSS EXPENSES PER CAPITA — STANDARDISED, ESTIMATED AND STANDARD, 2001-02



Effect of assessment on grants

35. Table 14 shows the redistribution of grants resulting from the assessment in the 2003 Update and in the draft assessment for the 2004 Review.

36. Compared to an equal per capita assessment, the draft assessment redistributed \$81.3 million away from New South Wales, Victoria and the Australian Capital Territory to the other States, \$12.8 million more than in the 2003 Update.

37. Compared with the 2003 Update, the grant shares of South Australia and Tasmania have increased and those of the other States have fallen or remained unchanged. The main reason for the change in grants was the change in the numbers of rural school children. This change contributed largely to the redistribution of grants to South Australia and Tasmania from the other States — particularly, Queensland.

Table 14 EFFECT OF ASSESSMENT ON GRANT DISTRIBUTION —
TRANSPORT OF RURAL SCHOOL CHILDREN

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total ^(a)
	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m	\$m
Contribution to 2003 Update relativities ^(b)	-37.3	-30.9	58.2	2.1	1.3	10.9	-10.7	6.4	78.9
Contribution to 2004 Review draft assessment relativities ^(b)	-38.6	-32.0	48.7	1.3	8.9	16.0	-10.7	6.4	81.3
Total change	-1.3	-1.1	-9.5	-0.8	7.5	5.1	0.1	0.0	12.8 ^(c)

(a) Total redistribution.

(b) Assuming same pool and a constant population.

(c) This figure shows the change in the amount redistributed among the States between the 2003 Update and the 2004 Review Draft Assessment. It does not necessarily equal the difference in the total contributions to the relativities between the two inquiries.

USER CHARGES

38. There were no user charges associated with this category.

ATTACHMENT A

CALCULATION OF THE DISPERSION FACTOR — 1999 REVIEW

1. *Average distance travelled by rural school children.* This part of the factor is calculated as follows.

- (i) All children aged 5-11 years who live within 60 km of an urban centre or locality (UCL), and all children aged 12-17 years who live within 80 km of a UCL with a population of greater than 1000 persons, were selected.
- (ii) Distances are calculated from the centroid of the collection district in which the school aged children reside to the centroid of the relevant UCL. The threshold distances of 60 kms for primary education and 80 kms for secondary education were used for several reviews. They have been confirmed by examination of the *1996 Policies and Practices Special Data Collection for Schools Education* as commonly used estimates of the maximum distance students travel to school. School aged children who actually reside *within* UCLs were not included in the calculation.
- (iii) The average distance that these selected students travel to school was calculated. For convenience all students are considered to reside at the centroid of the collection district in which they live and the school was considered to be located at the centroid of the UCL.
- (iv) In the ACT, the method used in (iii) gives an average distance which the Commission considered artificially high. This was because (apart from one collection district, which is closer to Hall) all the rural collection districts were associated with Canberra-Queanbeyan (Canberra part). The consequence of this was that the distance to the centroid of the urban centre (Canberra) was larger. The reason that this is not noticeable for other capital cities was that very few collection districts are associated with them. Rather, rural collection districts contiguous with other capital centres actually tend to be closer, centroid to centroid, with smaller urban centres near the capital city. To compensate for this, in the ACT, the distance from the centroid of the rural collection district to the nearest government school of the appropriate level was used. To make this adjustment for all capital cities was considered to be an overly onerous task given the minimal effect of results.

2. *Adjustment for travel on unsealed roads.* The average distances calculated above were then adjusted to take account of the nature of the road surfaces over which these selected students must be transported to school. This adjustment was based on the total

road length in the 'selected areas' around each UCL. ABS CDATE96 allow these 'selected' roads to be identified and measured in groups of:

- (i) highways;
- (ii) arterial and main roads;
- (iii) other sealed roads; and
- (iv) unsealed roads.

3. Using this CDATE96 disaggregation of roads in the selected areas, the adjustment for rural school children travel on unsealed roads is based on the following calculations.

- (i) The highways group comprise both National and State highways. The total length of the National highways (which are all sealed¹) in the selected areas, is estimated by multiplying the proportion of highways (National and State) which fall in the selected areas by the total length of National highways in the country (which is equivalent to assuming that highways are uniformly distributed within, and beyond the selected areas, in each State).
- (ii) The balance of highways (assumed to be State operated) are grouped together with State arterial and other main roads. Data on the proportion of arterial roads sealed (derived from the report of the Commission's roads data consultant) were then used to determine the length of State highways, arterials and other main roads which were sealed in the selected areas.
- (iii) The length of National highways, the sealed proportion of State highways, arterials and other main roads and other sealed roads were summed, to give the total length of sealed roads in the selected areas of each State.
- (iv) The length of the unsealed proportion of State highways and the length of unsealed roads are also summed to give the total length of unsealed roads in each State.
- (v) The Commission judged that school buses use only one third of the total length of unsealed roads to transport school children in rural areas.
- (vi) The roads used in selected areas were then calculated as the sum of the sealed roads in the selected areas and the 'used' proportion of unsealed roads. The proportion of unsealed roads was weighted by 1.2 to

¹ National Association of Australian State Road Authorities.

account for the additional costs of transport on unsealed roads (an unchanged assumption from the last review).

- (vii) The ratio of total weighted road lengths used to total unweighted road lengths used, for each State and Australia, was then computed.
- (viii) The dispersion factor was calculated by dividing the State ratios by the Australian ratio.

4. *Adjustment for sinuosity differences between States.* This adjustment is calculated using the ratio of actual road distance and straight-line distance, in the selected areas, between UCLs with a population of less than 1900 and the nearest UCL with a population of more than 1900.

5. As UCLs in the Northern Territory are more than 60 km apart, the derivation of this sinuosity index is not possible. The Commission therefore assessed a sinuosity index for the Territory equal to that of Western Australia - that is 1.14.

6. The sinuosity index for each State is set out in Table A1.

Table A1 SINUOSITY INDEX

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Sinuosity index	1.23	1.20	1.29	1.14	1.21	1.37	1.00	1.14	1.23