EDITAL Nº. 01/2019: SELEÇÃO DE CANDIDATOS ÀS VAGAS DO PROGRAMA DE PÓS-GRADUAÇÃO EM TRANSPORTES PARA O CURSO DE MESTRADO PARA O PRIMEIRO PERÍODO LETIVO DE 2020

RETIFICAÇÃO

PROVA DE MÚLTIPLA ESCOLHA (COM GABARITO)

Leia com atenção as instruções abaixo:

1. Será eliminado o candidato que, durante a realização das provas, for surpreendido portando aparelhos eletrônicos, tais como: agendas eletrônicas ou similares, telefones celulares, *smartphones*, *tablets*, *iPod®*, gravadores, *pen-drive*, *mp3 player* ou similar, qualquer receptor ou transmissor de dados e mensagens, *notebook*, máquina fotográfica, controle de alarme de carro etc., bem como óculos escuros, protetor auricular ou quaisquer acessórios de chapelaria, tais como chapéu, boné, gorro etc. e, ainda, lápis, lapiseira/grafite, marca-texto e/ou borracha, utilizar-se de livros, máquinas de calcular ou equipamento similar, dicionário, notas ou impressos que não forem expressamente permitidos.
2. Não será permitida a interferência e/ou a participação de outras pessoas, salvo em caso de candidato que tenha solicitado condição especial, em função de deficiência que impossibilite a redação pelo próprio candidato.
3. Durante a realização da prova, o candidato não deverá se comunicar com outros candidatos nem se levantar sem a autorização do responsável pela aplicação da prova.
4. A folha de resposta deve ser preenchida com caneta esferográfica de tinta azul ou preta fabricada em material transparente.
5. O candidato somente poderá deixar a sala de prova após **30 (trinta) minutos** do início da avaliação.
6. O candidato somente poderá levar o caderno de questões no decurso dos últimos **15 (quinze) minutos** anteriores ao horário determinado para o término da prova. Caso o candidato opte por deixar a sala de prova antes deste horário, o caderno de questões deverá ser entregue juntamente com a folha de resposta.
7. A prova terá duração de **2 (duas) horas**, já incluído o tempo de preenchimento da folha de resposta.
8. A desobediência de qualquer uma das determinações constantes nas instruções acima e no edital implicará o recolhimento imediato da prova e sua anulação.

Identificação do Candidato

Nome completo:

QUESTÃO 1

Tomando por base o livro de Caixeta-Filho e Martins (2007) "Gestão logística do Transporte de Cargas", a participação dos transportes no PIB do Brasil entre 1995 e 2000 ficou em torno de quais porcentagens?

a) 10% a 15%.
b) 3% a 5%.
c) 7% a 8%.
d) 15% a 20%.
e) Nenhuma das alternativas anteriores.

QUESTÃO 2 (ANULADA)

Vários problemas podem ser mencionados decorrentes do uso do carro como meio de transporte, problemas estes que incluem aumento de poluição e do tráfego das cidades. Pode-se assim dizer que, apesar ou por causa destes problemas, a maioria dos países têm tentado, segundo o artigo de Rode e Floater (2014) "Accessibility in cities: Transport and Urban Form":

"*Continuing to ignore the problems intrinsic to conventional car use may no longer just lead to problems of unaccounted externalities, but could also potentially become a liability for the future-proofing of an entire industry sector. The reasons why the automobile sector has had a limited ability to innovate at the scale required are manifold and largely structural in nature. Automobiles have been the ultimate product of 20th century industrialisation and have proven to be remarkably resilient. Together with the significant growth rates in car sales seen over the last decade, a certain inertia and lack of desire to innovate and re-invent is inevitable. At the same time, considerable misjudgements about the future of the automobile market are becoming increasingly evident, as discussed in section 4.2.*"

a) Diminuir a produção convencional de carros por meio de políticas públicas.
b) Diminuir o estímulo a compra de novos carros pelos consumidores.
c) Incentivar a produção de novos veículos, seja de forma direta ou indireta por meio de concessões fiscais, por exemplo.
d) aumentar o imposto dos combustíveis, que é pago pelos consumidores, a fim de diminuir o uso do automóvel.
e) Incentivar apenas políticas públicas que tragam inovações tecnológicas que sejam relevantes para a sociedade.

QUESTÃO 3

The study "Accessibility in Cities: Transport and Urban Form" by Rode and Floater (2014), presents an interesting table related to the CO2 emissions per passenger/km by urban transport mode. Choose the item below according to the ascending order of emissions by transport mode:

a) Walking < Cycling < Metro (NYC) < Small Car (35 MPG) < Medium Car (25 MPG).
b) Walking < Large Car (15 MPG) < Metro (NYC) < Electric Car (Solar).
c) Cycling < Electric Car (Solar) < Large Car (15 MPG) < Metro (NYC).

d) Large Car (15 MPG) < Medium Car (25 MPG) < Small Car (35 MPG) < Cycling.
e) Small Car (35 MPG) < Electric Car (Solar) < Cycling < Walking.

QUESTÃO 4

From the paper of Banister and Hickman (2013) "Transport futures: Thinking the unthinkable", when compared to the baseline of 2010 results (figure bellow), which of the following is correct?

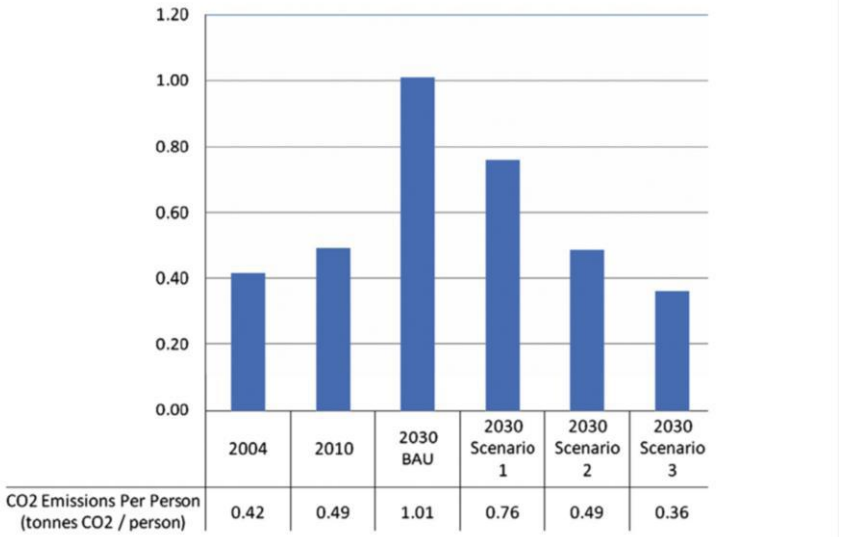


Fig. 4. Transport CO_2 emissions per person.

a) Considering the BAU and three scenarios presented by the authors, if nothing is done, the CO2 emissions per person will remain the same by 2030.
b) Considering the BAU and three scenarios presented by the authors, only scenario 3 forecasts less CO2 emissions per person by 2030.
c) Considering the BAU and three scenarios presented by the authors, the scenario 1 forecasts lower CO2 emissions per person by 2030.
d) Considering the BAU and three scenarios presented by the authors, the scenario 2 forecasts higher CO2 emissions per person by 2030.
e) Considering the BAU and three scenarios presented by the authors, all the scenarios forecast less CO2 emissions per person by 2030.

QUESTÃO 5

From the paper of Guimarães and Silva (2019), "Impact of regulations to control alcohol consumption by drivers: An assessment of reduction in fatal traffic accident numbers in the Federal District, Brazil", the authors made a quantitative assessment of the two laws' impacts regarding the reduction of lethal traffic accidents in the Federal District, Brazil. Regarding these two laws, it is correct to say:

a) The Law n° 11.705/2008, known as Dry Law, does not established zero tolerance for the presence of alcohol in drivers' bloodstreams, while the Law n° 12.760/2012 did.

b) The Law n° 11.705/2008, known as Dry Law, established zero tolerance for the presence of alcohol in drivers' bloodstreams, while the Law n° 12.760/2012 does not.
c) The Law n° 11.705/2008, known as Dry Law, established zero tolerance for the presence of alcohol in drivers' bloodstreams, while the Law n° 12.760/2012 confirmed the zero tolerance and forced in an effort to correct for legal loopholes in the earlier version and make it feasible to produce alternative forms of proof of alcohol impediment against those drivers who refused to take the breath analysis test.
d) The New Dry Law, Law n° 12.760/2012 established parameters completely different from the Law n° 11.705/2008.
e) None of the above.

QUESTÃO 6

Tomando por base o livro de Caixeta-Filho e Martins (2007) "Gestão logística do Transporte de Cargas", assinale a alternativa que contém medidas típicas de nível de serviço em logística:

a) Custos de estoque e custos de transportes.
b) Armazenagem e intermodalidade.
c) Nível de estoque e tempo de entrega.
d) Número de depósitos e quantidade de caminhões.
e) Nenhuma das alternativas.

QUESTÃO 7

In the paper of Figueroa and Tarko (2005), "Speed factors in two-lane rural highways in free-flow conditions", it has been developed free-flow speed models having the same prediction capabilities as traditional ordinary least squares. Based on their paper, it can be said that:

"*This paper presents free-flow speed models that identify factors of mean speed and speed dispersion on tangent segments and horizontal curves of two-lane rural highways. Ten different highway variables, six of them functioning as both mean speed and speed dispersion factors, were identified as speed factors on tangent segments. Four different highway and curve variables, two of them functioning as both mean speed and speed dispersion factors, were identified as speed factors on horizontal curves.*

The developed free-flow speed models have the same prediction capabilities as traditional ordinary least squares models developed for specific percentile speeds. The advantages of the developed models include predicting any user-specified percentile, involving more highway characteristics as speed factors than traditional regression models, and separating the impacts on mean speed from the impacts on speed dispersion."

a) The most of the existing models having been published prior to the work, distinguish the speed factors from the speed dispersion factors.
b) The most of the existing models present the factors of the 65th percentile speed, distinguishing also the speed factors from the speed dispersions factors.
c) The already existing models were able to estimate the entire range of speed variability at a site.

d) According to them, their model is able to predict any-user specified percentile, involving more highway characteristics as speed factors than traditional regression models.
e) The model presented by them, identify only factors of mean speed.

QUESTÃO 8

O artigo de Pitombeira Neto *et al*. (2018) "Statistical models for the estimation of the origin-destination matrix from traffic counts" faz uma revisão dos principais modelos estatísticos utilizados para a estimação de matrizes Origem-Destino (O-D). De acordo com o artigo.

a) Os modelos estatísticos não têm por objetivo estimar a matriz O-D exata, mas sim estimar os parâmetros do modelo da população de matrizes O-D.
b) O objetivo dos modelos estatísticos é estimar a matriz O-D exata.
c) Os modelos estatísticos e os modelos de reconstrução visam estimar a matriz O-D exata em um determinado período de tempo.
d) O método dos momentos é o único método de estimação utilizado no artigo.
e) Nenhuma das anteriores.

QUESTÃO 9

According to the paper of Rode and Floater (2014) "Accessibility in cities: Transport and Urban Form", from the characteristics of smart growth, choose the right alternative:

a) Lower density and clustered activities.
b) Automobile-oriented transportation.
c) Highly connected roads, sidewalks and paths.
d) Emphasis on the private realm.
e) Streets designed to maximize motor vehicle traffic volume and speed.

QUESTÃO 10

From the paper of Figueroa and Tarko (2005) "Speed Factors on Two-Lane Rural Highways in Free-Flow Conditions", and based on the figure bellow, it is correct to say that:

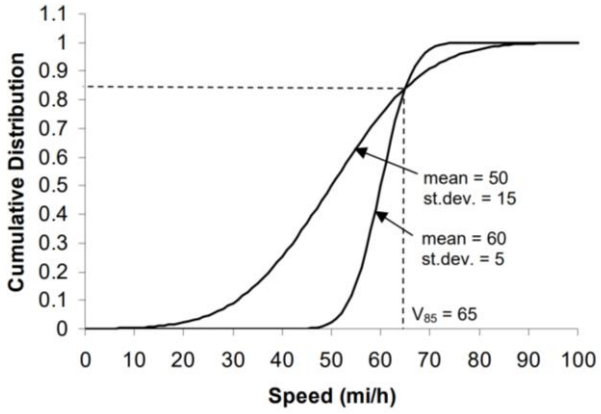


FIGURE 1 A case of two different speed distributions with the same 85th percentile.

a) The probability of speeds less than 45 mi/h is 50% and 60% for each case.
b) The probability of speeds less than 50 mi/h and less than 60 mi/h is 85% and 95% respectively for each case.
c) The probability of speeds less than 65 mi/h is 85% for both cases.
d) The probability of speeds less than 60 mi/h is 70% for both cases.
e) The probability of speeds less than 5 mi/h and less than 15 mi/h is 60% and 50% respectively for each case.

QUESTÃO 11

Pitombeira Neto *et al*. (2018) "Statistical models for the estimation of the origin-destination matrix from traffic counts" conclui o artigo com algumas considerações. Com base no artigo e no texto a seguir, pode-se concluir que:

"*The potential of these methods to support transportation operations and planning has been the main motivation for many years, more than four decades, of research efforts. It is believed that in nowadays, with the possibility of acquiring data of traffic flows at low cost and in real time from traffic monitoring systems, we can finally understand the variation of traffic volumes on a real scale network and explore in what conditions reconstruction and estimation methods can be applied. As discussed here and in Oliveira Neto et. al (2016), all methods suffer from the similar limitations, related to the underspecification problem, model specification, and estimation of the route choice matrix, giving rise to open research questions*."

a) Os modelos descritos no artigo são os mais utilizados e devido à robustez estatística não possuem limitações.
b) Nos dias atuais, mesmo com os recursos computacionais, ainda é caro conseguir dados de fluxos de tráfegos em tempo real.
c) O potencial dos modelos estatísticos para subsidiar as operações de transporte já vem sendo estudado por muitos anos, mais especificamente nas últimas 2 décadas.
d) Os modelos de reconstrução discutidos por Oliveira Neto *et al.* (2016) também sofrem de problemas de subespecificação, especificação do modelo e estimação da matriz de escolha da rota.
e) Nenhuma das anteriores.

QUESTÃO 12

Tomando por base o livro de Caixeta-Filho e Martins (2007) "Gestão logística do Transporte de Cargas", as transportadoras de cargas estão sendo chamadas a desempenhar outras funções logísticas na atualidade. Assinale a alternativa com funções logísticas desempenhadas pelos transportadores.

a) Armazenagem e produção de itens.
b) Armazenagem e administração de estoques.
c) Administração da produção e métodos de localização de fábricas.
d) Transporte intermodal e contabilidade de custos.
e) Rastreamento de veículos e gestão da fabricação de itens.

QUESTÃO 13

According to Figueroa and Tarko (2005) "Speed Factors on Two-Lane Rural Highways in Free-Flow Conditions", the speed factor is relevant for the Rural Highways Safety. Because of this, the modeling speed is an important topic to road safety research. Related to this topic, select the wrong alternative below:

a) The free-flow speed and its variability across drivers are considered important safety factors in setting speed limits and designing roadways.
b) There is a lot research on operating speed, and lot of characteristics are well known, such as relevance of the mean free-flow speed and of the variability across drivers for road safety.
c) Considering the analysis of the road operational characteristics, it is possible that a road with a high mean speed and low speed variability has the same 85th speed percentile as a road with a much lower mean speed but higher speed variability.
d) Most of the existing speed models have the form $V_i = \sum_k b_k X_{ik} + \in$, where, V_i is mean or a specific percentile speed at site *i*; X_{ik} is value of the *k* exogenous variable at site *I;* b_k is a regression parameter associated with variable *k*, and $\in$ is the normally distributed disturbance term.
e) There are studies that found that crash rates from different highway types increased with an increase in the speed variance and that an increase in mean speeds is not necessarily related to an increase in accident rates. They also found that speeds increased with better geometric conditions, regardless of the speed limit.

QUESTÃO 14

The article of Figueroa and Tarko (2005) "Speed Factors on Two-Lane Rural Highways in Free-Flow Conditions" presents some speed models and its analysis. One of the models is related to the sharp curves. This model was calibrated by using the SAS software. All the parameters included in the model are significant with a 95% confidence level. The table bellow presents the calibration results for the tangent model. According to the table bellow, mark the wrong alternative.

Variable	Coefficient	Standard Error	*t*-Value	*p*-Value
Mean speed factors				
Constant	47.6639	0.7038	67.73	< 0.0001
Sight distance, SD	3.4400×10^{-3}	3.8581×10^{-4}	8.91	< 0.0001
Residential development indicator, RES	–2.6388	0.3777	–6.99	< 0.0001
Degree of curvature, DC	–2.5409	0.0722	–35.17	< 0.0001
Superelevation rate, SE	7.9535	0.2564	31.02	< 0.0001
Superelevation rate squared, SE^2	–0.6239	0.0192	–32.57	< 0.0001
Speed dispersion factors				
Constant, Z_p	4.1576	0.4049	10.27	< 0.0001
Degree of curvature, Z_p-DC	0.2358	0.0670	3.52	0.0005
Superelevation rate, Z_p-SE	–0.1987	0.0679	–2.92	0.0038
Goodness-of-fit measures				
Adjusted *R*-square = 0.9322				
Root-mean-square error = 1.757				

NOTE: OLS-PD is related to ordinary-least-squares (OLS) regression applied to panel data (PD).

a) The adjusted R^2 value of the curve model is also high, indicating that 93.2% of the variability is explained.
b) The specification of the OLS-PD model to calculate speeds on horizontal curves, in mph, is $V_p = 47.664 + 3.44 \times 10^{-3} \times SD - 2.639 \times RES - 2.541 \times DC + 7.954 \times SE - 0.624 \times SE^2 + 4.158 \times Z_p + 0.236 \times (Z_p \times DC) - 0.199 \times (Z_p \times SE)$ where DC is the degree of curvature (degrees) and SE is the maximum super elevation rate (percent).
c) The model standard deviation is 1.7 mph (2.8 km/h).
d) The curve model includes four variables; two of them working as both mean speed and speed dispersion factors. The first intercept term and the following five variables apply to the mean speed, while the second intercept *Zp* and the two variables whose names start with *Zp* apply to the standard deviation.
e) An increase in the curve sight distance decreases the mean speed. The decrease in mean speed, in this case, is not constrained, but occurs on curves due to the presence of high residential development in the segment.

QUESTÃO 15

As it is said: "Access to people, goods, services and information is the basis of economic development in cities". The better and more efficient this access, the greater the economic benefits through economies of scale, agglomeration effects and networking advantages. Therefore, by a study cited in the paper of Rode and Floater (2014) "Accessibility in cities: Transport and Urban Form" described bellow, it can be stated that:

"On the basis of current trends, the world's urban population could double in little more than 40 years but urban land in less than 20 years (Angel 2011). Some estimates (Table 3) suggest that, under a business as usual urban development scenario, the area of urbanised land will triple between 2000 and 2030 (Seto, Güneralp et al. 2012). The continuation of sprawl at the levels seen in China would require developing an area equivalent to the size of the Netherlands over the next decade and a tripling of urban land in China by 2030 (World Bank 2014b). In some countries, including China, urban sprawl is increasingly compromising food security and stretching municipal budgets (Chen 2007; World Bank 2014b)."

a) The total amount of urbanized land would stay the same between 2000 and 2030.
b) The total amount of urbanized land would double between 2000 and 2030.
c) The total amount of urbanized land would decrease by twofold (two times) between 2000 and 2030.
d) The total amount of urbanized land would increase three times between 2000 and 2030.
e) The total amount of urbanized land would decrease by three times between 2000 and 2030.

QUESTÃO 16

From the paper of Calvey *et al.* (2015) "Engineering condition assessment of cycling infrastructure: Cyclists' perceptions of satisfaction and comfort", and considering the table below, which of the following alternatives is correct?

Table 4
Survey questions in order of found importance.

Nr.	Variables	Mean	Median	Mode	Standard deviation	Overall respondent breakdown (%)				
						1	2	3	4	5
6	Path is free from debris (broken glass, stones)	4.4	5	5	0.90	2.67	1.33	8.00	29.33	58.67
3	Path is free from surface defects (potholes, root damage, broken up surface)	4.18	4	5	0.96	1.35	5.41	13.51	33.78	45.95
19	Path links to key destination (city centre, place of work, shopping district, etc.)	4.11	4	5	1.11	4.00	9.33	4.00	37.33	45.33
23	Safety	4.05	4	5	1.02	1.35	8.11	16.22	32.43	41.89
18	Path links to other parts of the off-road network	3.93	4	5	1.09	1.33	13.33	14.67	32.00	38.67
1	The vegetation is maintained to a suitable standard (signage not blocked, path width not reduced, sight lines not reduced)	3.85	4	5	1.09	2.67	9.33	22.67	30.67	34.67
2	Surface roughness	3.83	4	4	0.98	1.33	9.33	21.33	41.33	26.67
24	Personal Satisfaction	3.72	4	4	0.93	2.70	5.41	28.38	44.59	18.92
20	Path is direct (cutting down travel time)	3.69	4	5	1.23	5.33	14.67	18.67	28.00	33.33
8	Air quality	3.65	4	4	1.05	2.67	10.67	29.33	33.33	24.00
21	Attractiveness	3.55	4	4	1.02	2.67	13.33	28.00	38.67	17.33
22	Comfort	3.53	4	4	1.02	4.00	12.00	25.33	44.00	14.67
11	Path has direction signs	3.49	4	4	1.26	6.85	20.55	13.70	34.25	24.66
12	Path has lighting for cycling at night	3.47	4	5	1.38	10.67	17.33	18.67	21.33	32.00
4	Path is free from standing water (puddles)	3.41	4	4	1.15	4.00	22.67	20.00	34.67	18.67
16	Path is segregated from pedestrians	3.38	3	3	1.26	6.76	20.27	27.03	20.27	25.68
15	The surface type	3.36	4	4	1.30	12.16	14.86	17.57	35.14	20.27
7	Path free from vandalism (signage graffiti, damaged lighting)	3.32	3	4	1.07	6.76	13.51	32.43	35.14	12.16
14	The path width	3.29	4	4	1.22	8.00	22.67	17.33	36.00	16.00
10	Path has vegetation running along it (trees, bushes, grass)	3.24	3	3	1.11	6.76	17.57	33.78	28.38	13.51
9	Sound levels (noise pollution)	3.17	3	3	1.11	6.67	21.33	32.00	28.00	12.00
5	Path is free from fallen leaves	2.95	3	3	1.20	13.33	22.67	30.67	22.67	10.67
13	The incline of the path (flat, hilly)	2.72	3	3	1.25	18.67	26.67	30.67	12.00	12.00
17	Path has facilities (parking, seating)	2.41	2	2	1.26	28.00	32.00	20.00	10.67	9.33

a) The mean is the sum of the variables divided by the number of answers.
b) The mean is the sum of all values of Likert Scale (1 to 5) divided by the number of answers.
c) The mean is the standard deviation multiplied by the mode.
d) The mean is the sum of the chosen values of Likert Scale (1 to 5) multiplied by the percentage of answers.
e) The mean is the standard deviation multiplied by the median.

QUESTÃO 17

Tomando por base o livro de Caixeta-Filho e Martins (2007) “Gestão logística do Transporte de Cargas”, a decisão sobre a escolha modal é importante no gerenciamento do transporte de cargas. Assinale a alternativa que não representa uma variável importante na decisão da escolha da modalidade de transporte de carga.

a) Custo da operação.
b) Confiabilidade.
c) Segurança e perdas e danos.
d) Liquidez.
e) Acessibilidade e flexibilidade de integração intermodal.

QUESTÃO 18

Em virtude da importância do Transporte na economia mundial, vários trabalhos têm sido publicados a fim de fazer um melhor planejamento a respeito das diferentes tendências futuras nos meios de transporte. Em particular, o trabalho de Banister e Hickman (2013) “Transport futures: thinking the unthinkable”, objetiva, por meio de cenários, prever as possíveis tendências principais do transporte. Baseado no trabalho destes dois pesquisadores, pode-se dizer que:

a) Os cenários em que os estudos sobre o futuro de transporte são baseados devem ser rígidos, a fim de não permitir desvios do que foi combinado.
b) Um dos pontos fortes da metodologia sugerida por eles é que o método aplicado não deve ser flexível.
c) Apenas o pessoal especializado (*experts*) deve guiar o desenvolvimento e a implantação da metodologia sugerida por eles.
d) Os cenários não deveriam ter passos intermediários para medir se houve progressos ao longo da sua implantação.
e) Os cenários deveriam ser adaptáveis a fim de permitir que sejam mudados devido às mudanças externas ou às aplicações de inovações.

QUESTÃO 19

In the article of Banister e Hickman (2013) "Transport futures: Thinking the unthinkable", the authors use four key descriptors to describe the underlying rationale for scenario building. In this regard, choose the correct answer that represent these four elements descriptors:

I) Shaping and adapting;
II) Single futures or multiple futures;
III) Normative or exploratory;
IV) Robustness and adaptability of policy portfolios.

a) All statements are correct.
b) Only one statement is correct.
c) Only three statements are correct.
d) Only two statements are correct.
e) All statement are incorrect.

QUESTÃO 20 (ANULADA)

O artigo de Guimarães e Silva (2019), "Impact of regulations to control alcohol consumption by drivers: An assessment of reduction in fatal traffic accident numbers in the Federal District, Brazil", utilizou uma modelagem de séries temporais para a análise. De acordo com os autores (texto abaixo), essa técnica foi utilizada porque:

"*The literature identifies various ways of analyzing the effect of an intervention in a univariate time series among which are: i) application of the Student t-test to compare measures prior to and after the intervention; ii) adjusting models to pre-intervention data and post-intervention data and then applying the Chi-squared test (χ2) to compare the estimates obtained by the pre-intervention model with the real values obtained after the intervention; and iii) using the procedure described by Box and Tiao (1975) to impute a dummy variable associated to a transfer function to the model at the moment of intervention. In the case of the Student t-test, one of the assumptions is that the observations are independent so that makes the test unsuitable for application to any series that presents a tendency. In the case of the Chisquared test it is important that there should be a large number of observations (Agresti, 2002). Accordingly, the present study opted to apply method (iii) based on the inclusion of a dummy variable associated to an ARIMA-type model as recommended*

by Box and Jenkins. SAS 9.4. software was used to analyze the monthly figures registering fatal traffic accidents in the Federal District for the period January 2000 to December 2017"

a) É a única que permitia tal análise.
b) A análise também poderia ter sido feita pelo teste *t* de *Student* visto que as observações eram independentes, mas os autores optaram por um modelo de série temporal.
c) A análise também poderia ter sido feita pelo teste Qui-Quadrado, uma vez que ele requer apenas uma grande quantidade de dados, mas os autores optaram por um modelo de série temporal.
d) O modelo de série temporal do tipo ARMA é o mais indicado.
e) Nenhuma das anteriores.

QUESTÃO 21

From the paper of Jacques *et al.* (2018). "Study of drivers? salient beliefs and intention to comply with speed limits on urban roads", and based on the tables bellow, which of the following is correct?

Table 3
Analysis 1: factor titles.

Factor	Name
AT – Factor 1	Advantages for the driver and other road users
AT – Factor 2	Disadvantages for driver
SN – Factor 3	Influence of society
SN – Factor 4	Influence of family
PC – Factor 5	Road environment
PC – Factor 6	Urgent situations

AT = Attitude; SN = Subjective Norm; PC = Perceived Control.

Table 4
Correlation matrix for Analysis 1 based on factor scores.

	AT Factor 1	AT Factor 2	SN Factor 3	SN Factor 4	PC Factor 5	PC Factor 6
AT Factor 1	**1.000**	−0.520**	0.400**	0.209**	0.651**	0.297**
AT Factor 2	−0.520**	**1.000**	−0.196**	−0.104**	−0.513**	−0.320**
SN Factor 3	0.400**	−0.196**	**1.000**	0.410**	0.279**	0.317**
SN Factor 4	0.209**	−0.104**	0.410**	**1.000**	0.220**	0.057
PC Factor 5	0.651**	−0.513**	0.279**	0.220**	**1.000**	0.171**
PC Factor 6	0.297**	−0.320**	0.317**	0.057	0.171**	**1.000**

Note:
** $p < 0.01$.

a) There is a strong correlation between Factor 1 and Factor 5.
b) There is a weak correlation between Factor 1 and Factor 2.
c) There is a strong positive correlation between Factor 4 and Factor 6.
d) There is a strong negative correlation between Factor 4 and Factor 2.
e) There is a weak correlation between Factor 1 and Factor 2.

QUESTÃO 22

Tomando por base o livro de Caixeta-Filho e Martins (2007) "Gestão logística do Transporte de Cargas", são fatores determinantes do valor do frete no transporte de cargas:

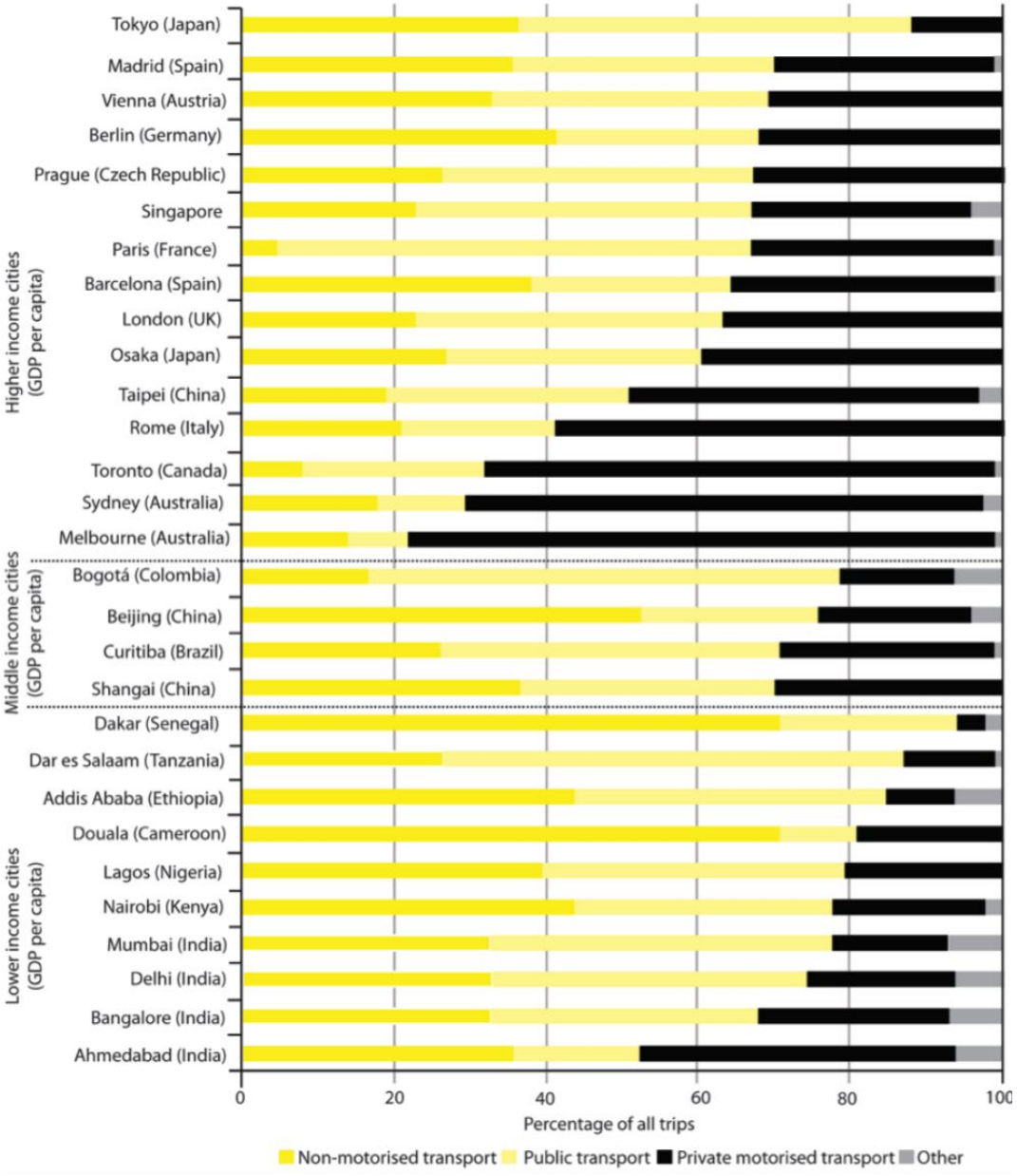
a) Prazo de entrega e custos operacionais.
b) Quantidade de fornecedores e existência de operadores logísticos.
c) Distância percorrida e contabilidade gerencial.

d) Localização de facilidades e indicadores de desempenho.
e) Nenhuma das alternativas.

QUESTÃO 23

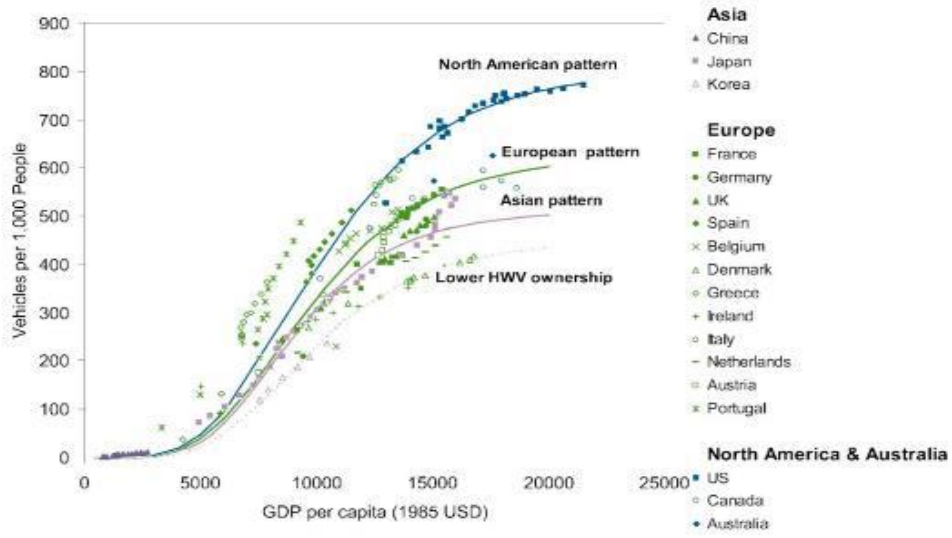
From the paper of Rode and Floater (2014) "Accessibility in cities: Transport and Urban Form", the analysis of the paper based on figures bellow, it is correct to say that:

Figure 12
Modal shares of selected cities



Source: LSE Cities 2014 adjusted from UN Habitat 2013

Figure 13
Evolution of motorisation pathways



Source: Huo et al 2007

a) Economically Developed countries tend to have less motorized cars per capita and more public transport.
b) Economically Developed countries tend to have less motorized cars per capita with higher GDP.
c) Low income countries tend to have higher private car ownership per capita than Economically Developed countries.
d) In Cities like Curitiba there is a public transport use equivalent to the Economically Developed countries.
e) Low income countries tend to have higher public and non-motorized transport share than Economically Developed countries.

QUESTÃO 24

From the paper of Pitombeira Neto *et al*. (2018) "Statistical models for the estimation of the origin-destination matrix from traffic counts", the assumption of the Poisson distribution is frequently used for the O-D flows. Based on that and the text bellow, it is incorrect to say:

"*For analytical convenience, many researchers have assumed that OD flows follow independent Poisson distributions, with the implication that traffic volumes will also follow Poisson distributions with mean values equal to their variances. Nevertheless, Hazelton (2003) has argued that link volumes may be overdispersed, i.e., the variances may be greater than the mean values. This empirical finding poses the following research question: Do we incur severe errors if we assume Poisson distributions in the presence of overdispersion? In case link volumes depart considerably from the Poisson assumption, we should consider the use of more flexible probability distributions for OD flows which can accommodate the possibility of overdispersion or underdispersion*."

a) The Poisson model has the same mean and variance.
b) Some authors empirically found that the link volumes possibly are overdispersed, that is, the variances may be greater than the mean values.
c) Overdispersed models have variances greater than the mean values and by consequency Underdispersed models have variances lesser than the mean values.
d) From the study, a possible research question is consider the use of more flexible probability distributions for origin-destination flows.
e) None of the above.

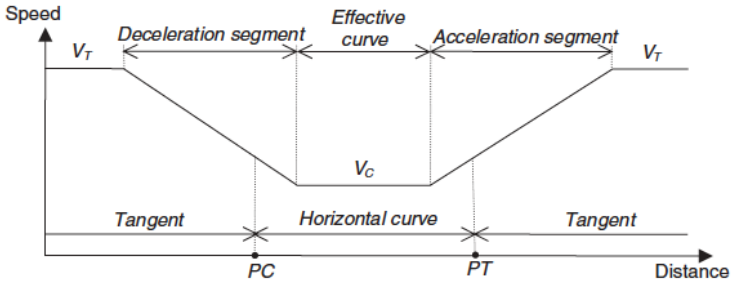
QUESTÃO 25

No artigo de Cardoso e Campos (2016) "Metodologia para planejamento de um de sistema cicloviário", os autores desenvolveram a metodologia do estudo tendo como base a revisão bibliográfica. Esta última aponta como fatores relevantes para estudos sobre sistemas cicloviários os seguintes elementos.

a) Segurança e velocidade.
b) Velocidade e conforto.
c) Segurança e conforto.
d) Sinalização e tempo de viagem.
e) Tempo de viagem e velocidade.

QUESTÃO 26

According to Figueroa and Tarko (2005) "Speed Factors on Two-Lane Rural Highways in Free-Flow Conditions", the figure bellow shows a model of a speed profile in the vicinity of a horizontal curve. The road section is divided from the speed point of view into four segment types: tangents, deceleration segments, effective curves, and acceleration segments. Select the wrong alternative below:



a) Based on the figure, the effective curve segment is the part of the horizontal curve at which drivers maintain a constant speed.
b) The deceleration and acceleration segments are used by drivers to change speeds between the tangent (VT) and effective curve (VC) segments.
c) According to the figure, the horizontal curve designed is correspondent to VC segment, that is, slightly smaller than the segment PC and PT.
d) One way for modelling is by homogeneous segments, where separate models is developed for each type of segment. The models developed for the deceleration and

acceleration segments, can allow determining the spots where an average driver starts and ends changing speed.

e) Is possible to develop a type of speed model that quantify the impacts of the variables on mean speed and on speed standard deviation. It can be doing by using the entire speed distribution, instead of focusing on a particular percentile, and representing the percentile speed as a linear combination of the mean and the standard deviation.

QUESTÃO 27

From the paper of Galvão et al. (2014) "Desenho automático de mapas octalineares de rede de transporte público utilizando algoritmo genético", the octa linear maps are:

a) They are an informative tool for a public transportation system.
b) They are the exact map of the routes of the public transportation system.
c) They are a map of some the routes of the public transportation system.
d) They are an interactive map with the real time of the vehicles of the public transportation system.
e) None of the above.

QUESTÃO 28

According to the paper of Rode and Floater (2014) "Accessibility in cities: Transport and Urban Form".

I) More compact urban growth, aligned with the increased provision of public transport infrastructure and services and pro-active support for non-motorized transport use, is likely to deliver substantial net economic and social benefits;
II) In many key emerging economies, private motorized vehicle use and modal share is expanding rapidly, with a range of negative economic and social implications;
III) Cities continue to sprawl excessively, with some estimates suggesting that total urban land area could triple between 2000 and 2030;
IV) As a result of socio-demographic change, shifting public opinion, strong political leadership and technological innovation, some cities are moving towards a more compact and public-transport oriented urban development model with increasing shares of non-motorized transport.

a) All statements are correct.
b) Only one statement is correct.
c) Only two statements are correct.
d) Only three statements are correct.
e) All statements are incorrect.

QUESTÃO 29

From the paper of Guimarães and Silva (2019), "Impact of regulations to control alcohol consumption by drivers: An assessment of reduction in fatal traffic accident numbers in the Federal District, Brazil", the table below shows the results of the tests for the dummies, Law n° 11.705/2008 ($X_{t,1}$), Law n° 12.760/2012 ($X_{t,2}$) and CONTRAN Resolution n° 430 ($X_{t,3}$). For a significance level of

5% and considering the hypotheses H0) there is no reduction in lethal accidents, H1) there is reduction in lethal accidents, it is correct to say:

Table 3
Results obtained for the models.

Parameter	Estimate	Standard Error	t value	p-value	Variance Estimate	AIC	Models
θ_1	0.879	0.035	24.97	< 0.0001	44.90	1431.60	$Z_t^* = -0.068X_{t,1} + \frac{(1-0.879B)}{(1-B)}a_t$
$X_{t,1}$	−0.068	0.118	−0.58	0.565			
θ_1	0.999	5.743	0.17	0.8618	42.45	1423.43	$Z_t^* = -0.184X_{t,2} + \frac{(1-0.999B)}{(1-B)}a_t$
$X_{t,2}$	−0.184	0.029	−6.90	< 0.0001			
θ_1	0.999	12.62	0.08	0.9369	42.49	1423.60	$Z_t^* = -0.187X_{t,3} + \frac{(1-0.999B)}{(1-B)}a_t$
$X_{t,3}$	−0.187	0.027	−6.86	< 0.0001			

a) The Law n° 11.705/2008 resulted in significant reduction in lethal accidents.
b) The Law n° 12.760/2012 resulted in significant reduction in lethal accidents.
c) The CONTRAN Resolution n° 430 did not result in any significant reduction in lethal accidents.
d) Only the Law n° 11.705/2008 resulted in significant reduction in lethal accidents while the Law n° 12.760/2012 and the CONTRAN Resolution n° 430 did not.
e) None of the above.

QUESTÃO 30

Algumas diferenças entre as abordagens *Forecasting* e *Backcasting* são pontuadas no artigo de Banister e Hickman (2013) "Transport futures: Thinking the unthinkable", como pode ser visto na tabela abaixo. No que se refere aos métodos e técnicas:

Table 1
Comparing forecasting and backcasting.

Measure	*Forecasting*	*Backcasting*
Philosophy	Justification as the context Causality determinism	Discovery as the context Causality and intentions
Perspective	Dominant trends Likely futures Possible marginal adjustments Focus on adapting to trends	Societal problem in need of a solution Desirable futures Scope of human choice Strategic decisions Retain freedom of action
Approach	Extrapolate trends into future Sensitivity analysis	Define interesting futures Analyse consequences and conditions for these futures to materialise
Methods and techniques	Various econometric models Mathematical algorithms Primarily quantitative	Partial and conditional extrapolations Normative models, system dynamic models, Delphi methods, expert judgement Quantitative and qualitative – mixed methods

Based on Geurs and Van Wee, 2000, 2004; and adapted from Dreborg, 1996. See also Banister, Hickman and Stead (2008) and Åkerman and Höjer (2006).

I) A abordagem *Forecasting* é principalmente quantitativa;
II) A abordagem *Backcasting* utiliza tanto as técnicas quantitativas como qualitativas;
III) As duas abordagens usam modelos econométricos;
IV) A abordagem *Forecasting* usa o método Delphi.

a) Todas as afirmativas estão corretas.
b) Apenas uma alternativa está correta.
c) Duas alternativas estão corretas.
d) Três alternativas estão corretas.
e) Nenhuma alternativa está correta.

FOLHA DE RESPOSTA					
Questão 1	○ A	● B	○ C	○ D	○ E
Questão 2 (ANULADA)	○ A	○ B	○ C	○ D	○ E
Questão 3	● A	○ B	○ C	○ D	○ E
Questão 4	○ A	● B	○ C	○ D	○ E
Questão 5	○ A	○ B	● C	○ D	○ E
Questão 6	○ A	○ B	● C	○ D	○ E
Questão 7	○ A	○ B	○ C	● D	○ E
Questão 8	● A	○ B	○ C	○ D	○ E
Questão 9	○ A	○ B	● C	○ D	○ E
Questão 10	○ A	○ B	● C	○ D	○ E
Questão 11	○ A	○ B	○ C	● D	○ E
Questão 12	○ A	● B	○ C	○ D	○ E
Questão 13	○ A	● B	○ C	○ D	○ E
Questão 14	○ A	○ B	○ C	○ D	● E
Questão 15	○ A	○ B	○ C	● D	○ E
Questão 16	○ A	○ B	○ C	● D	○ E
Questão 17	○ A	○ B	○ C	● D	○ E
Questão 18	○ A	○ B	○ C	○ D	● E
Questão 19	● A	○ B	○ C	○ D	○ E
Questão 20 (ANULADA)	○ A	○ B	○ C	○ D	○ E
Questão 21	● A	○ B	○ C	○ D	○ E
Questão 22	● A	○ B	○ C	○ D	○ E
Questão 23	○ A	○ B	○ C	○ D	● E
Questão 24	○ A	○ B	○ C	○ D	● E
Questão 25	○ A	○ B	● C	○ D	○ E
Questão 26	○ A	○ B	● C	○ D	○ E
Questão 27	● A	○ B	○ C	○ D	○ E
Questão 28	● A	○ B	○ C	○ D	○ E
Questão 29	○ A	● B	○ C	○ D	○ E
Questão 30	○ A	○ B	● C	○ D	○ E

Identificação do Candidato	Nº. de acertos	Nota:
Nome completo:		

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Justificativa

QUESTÃO 20 (ANULADA)

A Comissão de Seleção constatou que a presente questão, da maneira como foi apresentada, pode ter induzido os candidatos ao erro, tendo apresentado apenas 13% de acerto, além de ter exigido um conhecimento estatístico mais aprofundado. Assim, durante a reunião para a homologação do resultado da etapa referente à "Prova de Múltipla Escolha", a Comissão de Seleção decidiu por anular a questão.

QUESTÃO 2 (ANULADA)

A partir da análise de recursos interpostos por candidatos, a Comissão de Seleção verificou que tanto a letra (a) quanto a letra (c) poderiam ser consideradas possíveis soluções para o problema. Assim, a questão foi anulada.