

DOKAR

project

for every Ukrainian

Ukraine-2050

Only large projects are able to make the country majestic

Social Impacts

Great project creates social cohesion. Unites not genetic relationship, not the language, not the law. Unites only common activity (large) target. Some psychologists say that true love occurs in joint ventures, and it is not a gift.

Great project creates a common language. Tower of Babel was not completed because of the confusion of languages, but everybody now are available to learn a second language. During the implementation of (large) project participants inevitably learn the language of each other, because there is no time for discussion, whose language is better - you need to do business, to achieve the goal.

Great project inspires, gives purpose of life to many people, displacing petty and minor, does participants happier in result.

Political Impacts

Great project takes a lot of resources and effort to create, they simply does not remain for conflict. Great project unites.

Political forces, if they are interested in a great project, will inevitably find a way to negotiate..

The political force that will lead the large project will unite around a critical mass of voters and will win the presidential first (if make it in time), and then the parliamentary elections. The main thing is do not dissipate force, to discuss the past, to criticise others, and simply build Present.

Great people did not argue - just were doing their job. Political power which simply are doing his job, provides the welfare of their people, very quickly will become Great.

Economic Impacts

Any large project at least through the causes that were mentioned above, attracting investors and brightest heads. Anyone willing to entrust their money to people, inspired the idea - these will exactly reach it, anyone willing to join the team, inspired by the purposes – they support each other.

Systematic, long-term, predictable activity even one industry attracts resources, encourages the development of all relevant sectors (suppliers) and they, in turn, encourage their suppliers. Workers are getting more and consume more. Even one industry can create widespread industrialization. In many countries, such a stimulant was MIC, now is the time to change it to a more efficient in result - the industry that produces consumer values.

Roadmap association.

How to turn Ukraine from obstacle to way.

Part 1

Is Ukraine? No and never has not been. Flare of Ukrainian statehood always remained just short bursts, visibility, created and signed papers, but not the will union of the citizens.

Why in this way? Previously - I do not know, did not live, but I believe that every century was with its difficulties and problems are usually - objective. Why is in this way now? I think, because too little people within Ukraine, more population.

To become a citizen – is difficult and easy in the same time. Simple - because it does not require external circumstances, for this formation suits every day and any conditions. A citizen can become right now. And difficult - because the hardest work there is work on yourself, develop themselves, their moral and ethical qualities, forming their own, not imposed, ideas about the world, taking on responsibility for its own destiny.

The current population of Ukraine was formed , on the one hand, as a paternalistic legacy of the Soviet state in which the king was replaced by the Secretary General. As the population of the State, which did not have to think and decide and respond owned only by the thoughts and decisions. On the other hand , the public, and not citizens, Ukraine emerged in the last 20 years of senseless work of redistribution of wealth created earlier . Steal , sell and share - the formula that kills people in public, is in Ukraine's economy ever since. In this formula, there is no realization of the human person and no future. Senseless employment multiplied by a constant balancing act on the edge of poverty , stupidity being converted people in the population, people in mass.

There is not Ukraine on world map. In order to be, Ukraine must be the subject - a country whose role in the global economy is beyond any doubt, a country whose role is important and is not recognized by others, a country that creates unique value, which again is not given to anyone . Each country was given advance the chances of such uniqueness - or natural resources, or history, or geography. A variety of work created uniqueness truly unlimited.

Civil society and unique place in the world order for Ukraine were lost forever. Present press the time - something that previously required century now happening for decades, if not for years. Ukraine could become in the world in full force and its beauty even before this year were born would become older. It is only important to choose the right direction and work. Moreover, the recipe development of civil society has long been produced by mankind, and the chances that were presented to Ukraine, are obvious.

Multiple practice of mankind shows that civil society is formed with a regular and productive employment for everyone, however, as one becomes the creator of real wealth. So people become citizens - aware of their value to society and their own, first financial independence from the state. A key opportunity for Ukraine provides its geographical location. This is the opportunity that presented by nature and can be implemented in just a few years.

Ukraine, its country, where meet roads from East to West, from North to South. Ukraine - the country that has a chance to unite Asia and Europe, Scandinavia and the Middle East. Ukraine - the country that is able to create a new world order by bringing together until separated by a space country and culture.

Just a few years can turn Ukraine from obstacles to way. This transformation , of course , requires force , forces of many people, their inspiration and unity. Ukraine transformation requires productive work for the creation of real wealth from many people. After all , such a transformation requires and stimulates the formation of civil society. Society citizens, creators, who understand their own value and worth of other public citizens who believe in themselves , people who are responsible for themselves and their destiny, earn enough for their lives and the lives of their closest persons, people who are not dependent on the state and do not wait for a state help.

To become the way of association, Ukraine lacks only roads - good, high-speed , reliable, with good infrastructure . The roads from East to West, from North to South. Good roads are what will transform our country to unite and create a way in civil society. Great Roads - thousands of people, providing themselves and their closest persons, thousands of people confident in its future and its importance to the country's values . Good roads - a high standard of their construction, advanced technologies that require educated personnel turn ordinary workers on human intellectual work, work is not routine, monotonous and labor master machine that knows and is able to, make decisions.

Good roads – is a symbol of liberation from fools, confirmation of ability and gaining autonomy and independence. Good roads - a daily, obvious to anyone validate his personal choice Homeland.

Roads will join not only other countries, but also the citizens of our country. Ukraine is divided out of the city-state , beyond which leave harder than to Turkey or Egypt. Roads open Ukrainian grandeur, diversity and attractiveness of single Ukraine - extensive fields and forests, scenic landscapes and unusual proximity of the citizens of the " other part ". Roads unite East and West Ukraine by making people just physically closer, reducing the travel time from Lugansk to Lviv, from Chernihiv to the Black Sea coast. Roads unite Ukrainian love for beauty, variety and uniqueness of Ukraine nature. Yes, the road will be able to convince anyone that the Ukraine - is the country which is worth for living

Those, who can transform Ukraine from obstacles to way, will be those, who create real Ukraine, the State and its society for centuries.

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Part 2

If to realize and admit a requirement in transformation of Ukraine from an obstacle on a way, benefits and acquisition of such transformation, then it will be simpler to admit acceptable and reasonable and volumes of investing in such transformation of country, real cost and value of creation of the real state.

It as confession of erroneous habit or illness that takes place from our mind: realization of her fact with large authenticity results in opening of doors and ways to recovery, heavy, sometimes sickly, but in the end successful.

First does it cost to understand - and in what, actually, obstacle?

On feeling of citizens in relation to the roads of Ukraine (especially to the 87% roads of local value) and in accordance with Ministry of Infrastructure and UkrAvtoDor, there is not sense even separately widely stopped. Emotions and end-point them usually identical is a bad language and feeling of weakness, feeling yourself not worthy for the own state, feeling of the depressed territory, feeling of wall, obstacle inter se and by the future. Moreover, everybody every day feels the load of additional charges - on permanent repair of transport, on more long time in a road, and on an additional fuel, on maintenance for the account of benefits of monopolists and corruption, on treating of the illnesses got as a result of direct harm from road-transport adventures, and load of permanent stress for the use of the so-called roads. And all repeat day by day.

And for a man from at a border - investor, businessman, shipper Ukraine appears such to the soba by a «black hole». Custom, and then the roads of Ukraine do not abandon chances on the prognoses of delivery to the load. How many will stand, how many will be transported, how many it in the end will cost on the whole, taking into account grafts and charges on indemnification for ill-timed delivery, - a question is always open.

Gradually for 20 years Ukraine became territory on that the rules of existence and conduct of business relationships are beforehand unknown and not forecast. Does it promote to development of business relationships with Ukraine and into a country, or promotes the commonwealth of population? No. Does prevent? Yes.

For throughout the years of independence of our state substantial degradation of level of acceptance of state decisions took place - holding power try to find all more simple decisions for the all greater amount of all more thorny problems. The mirror of such approach is the state of infrastructure on the whole and roads in particular. State administration for us became the system of the crooked mirrors, where really necessary and healthy ideas are in their real embodiment of corruption, perverted and lose connection with initial intentions.

With all of it, Ukraine is an obstacle to the development and development of the citizens. And must become a way.

That is why it is finally needed to try to go out from the virtual conduct of auto travelling economy in the real, to step back from virtual modernization of network of highways and come to the real. If to say it is simple - it is needed to leave off constantly to repair pits and loudly to name it modernization. And

secondly, it is necessary to realize all difficult and developed system of economic and public influences and stimulations that are base on system of highways of country.

That does not get stuck in difficult and deep analyses that can be stretched on years, it costs to depict to the soba simple, and that is why the most evident chart of basic streams of money that is constrained or can be related to the highway of national value:

Charges	Incomes
Charges on building, reconstruction, repair, exploitation of road : <ul style="list-style-type: none"> • technique • materials • work of people 	Incomes are from passage requiring payment roads
Charges are on maintenance of administrative vehicle (officials)	
Charges on building and exploitation of travelling and satellite infrastructures(farther together is an infrastructure) : <ul style="list-style-type: none"> • filling stations • establishments of feed • shops and other trade • hotels, resting-places • logistic centers • but other 	Incomes from an infrastructure, in thereby from a sale or grant in the lease of earth
Charges are on the production of materials into a country	Incomes are from the sale of materials
Charges are on the production(or collection) of technique into a country	Incomes are from a sale and grant in the lease of technique
Charges are on the corresponding studies of people for the works related to the road	Incomes are from requiring payment studies
Charges are on the equipment of advertisement areas/of channels	Incomes are from an advertisement on roads and infrastructure
Other tangent charges	Incomes from the expense of salary of workers(roads, infrastructure, production of materials, technique, educational establishments), from disposal of revenues of proprietors of corresponding enterprises
Taxes and collections	

Now here speech not about allocation of charges and incomes on state or private. We speak on the whole about realization of scale of the system of money streams and accordingly public benefits, which run around in a country round building and service, use of roads. Does examine guidance of country of question of development of road-transport network as strategic question of the scale state-creative system on present moment?

In spring in 2013 guidance of government declared, that all required the almost 170 thousand kilometers of roads of Ukraine to modernization, and 500 milliards of UAH approximately \$ 61 milliard) will cost it at least.

However according to ratified by a government the Government having a special Purpose Economic Program of development of highways of the general use on 2013-2018 farther - GPEP) is envisage building and reconstruction 1,5 thousand kilometers of roads, repair more than 24 thousand kilometers of highways, at the whole 15% of that requirement in modernization, about that marked in spring on meeting of government.

But, from data of private auto travelling enterprises, that does not want to have businesses with government businesses, taking into account opacity of their terms and procedures, but work in the real market terms, the real modernization of present road net at real price of building of middle road will cost about \$ 102,1 milliards(speak about the cost of building of new «conditional middle» roads of network in a 170 thousand kilometers).

Such number striking contrasts with the results of calculation on the rates of building and reconstruction of roads, stopped up in GPEP, after that it will cost about \$ 554,3 milliards!

Coming from the chart of basic streams of money, resulted here, fully obviously, that the volume of «illness of patient» far more than he think and convinced wider public. Building of new roads - it only one constituent from minimum eight basic large-sized types of charges, that had to be overcome by the national program of development of road-transport network, corresponding infrastructure and tangent industries.

Necessity of Ukraine as the state that is open to the free and comfort internal and transit movement, consists now not only in modernization of present road-transport network but also in the construction of fully new internal ways, renewal destroyed or to the construction of new home production of corresponding materials(bitumen, macadam, bituminous concrete, fuel and other), conditioning for organization of production of quality technique, proceeding in formation of necessary personnel, creation of quality infrastructural service round roads and other Fully Obviously, that it envisages mastering a country in transport and tangent industries of money by a volume that can exceed \$ 1 trillion on a modest enough prognosis. However, it follows marks especially, we does not speak about charges, but about investments.

However, question here is not so in money, as in joint efforts of search of possibilities, mutual honesty and respect, efficiency and really state approach. A question is for all us - to the workers, businessmen and officials - to leave off living only present time, in space from the doors of dwelling to the toilet. It is necessary to understand that a way is our fate that determines our actually future, future of our children and next generations. It is needed by joint efforts to begin to put in order our general way and our house, beginning from small and from large at the same time, - from roads, quality and new that will become the ways of fates of coming generations of citizens in course of time. Thus, Ukraine will be able to grow into consciousness of own citizens from an obstacle on a way to realization of their dreams.

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Part 3

Macro- and Micro- economic effects.

ENTRY

In Ukraine for today there is an about 170 thousand km¹ motor-car ways of the general use, inferior to UkrAvtoDor, and about 100 thousand km² roads that lie municipal and rural streets. Exactly about the first part of the Ukrainian roads speech will go along (though second no less problem), as realization of a transport potential of country, not only internal but also external(international, transit), depends on her.

The key problems of motor-car ways of Ukraine are old and well-known:

- The Transport-operating state of ways does not answer the requirements (of 51% - after equality, 39% - after durability³), what is caused by the protracted absence of adequate repairs and reconstructions from the deficit of financing;
- Passport quality of highways does not answer the necessities of economy. Yes, in Ukraine only of 1% roads have the greatest first category, 8% - the second category, 17% - the third category, 63% - fourth category.

Basic consequences the brought problems over:

- Middle rate of movement of Ukraine motorways- substantially below, than in the developed countries;
- The carrying capacity of the Ukrainian ways is not ready to the high rates of economic development;
- Transporting of loads and passengers entails mega scopes expenses the Ukrainian roads on a fuel and maintenance of transport vehicles;
- The consequence of previous three points is a too high cost of motor-car transportations by territory of Ukraine that increases the prime price of commodities of the Ukrainian production and cost of the imported commodities, and also results in re-orientation of transit transport streams in the round of Ukraine.

Thus, motor-car ways are the factor of subzero competitiveness of economy of Ukraine, and also narrow place in realization of transit potential of country - one of the most important and effective directions of development of economy.

BUILDING AND RECONSTRUCTION OF THE ROADS.

Upgrading and carrying capacity of highways is a strategic question of national safety of Ukraine foremost economic. Taking into account the above-mentioned facts it does not arise up in the necessity of his decision of doubts. A just the same aim is put by Project of DOKAR, realization of that will allow to get corresponding economic and social effects.

¹ From data of UkrAvtoDor

² From data of <http://news.finance.ua/ua/~2/0/all/2013/04/26/301107>

³ From data of http://uk.wikipedia.org/wiki/Автомобільні_шляхи_України

As from all network of highways of proceeding in one ways will have a greater economic effect (but, as a result, more subzero term of recoument and higher attractiveness for bringing in of private investors), than other - it is expedient to break up Project on a few stages.

The highways of the general use are divided into the roads of state value(international, national, regional, territorial), the extent of that presents 28% from all roads, and local value (regional and district), - 72%. The present extent of international highways of Ukraine presents an about 8,3 thousand kilometers or 4,9% from length of all motorways. Majority from them coincides with the routes of International Transport Corridor (ITC), however an appropriation to them of international value took place ten of years back case-insensitive necessities that arise up for realization of transit potential. Consequently dividing of roads into international, national, regional and others like that does not answer present time and prospects of economy of Ukraine that is why can not be the criterion of establishment of priority of building and reconstruction of roads within the limits of Project of DOKAR. It is expedient to choose correlation of incomes and charges related to the new roads such criterion - both within the limits of individual projects of building of separate roads and within the limits of all economy of Ukraine. As charges on building a 1 kilometer of road have less variation, than incomes from her introduction to exploitation (depend on the category of road and from many parameters that neutralize each other on the average), then the key criterion of Project dividing on the stages will be the expected incomes (an economic effect or economy is on the charges of economic contractors) related to the new roads. They depend on intensity of motion, potential of her increase (taking into account the increase of streams of transit transport), middle speed (differences are between the rates of movement on old and new roads) and other, of less importance factors. Taking into account this criterion Project DOKAR it is expedient to break up on 3 stages.

Stage 1. Building and reconstruction of roads within the limits of International Transport Corridors (ITC).

On results researches of the English institute of «Rendell», after the coefficient of transit Ukraine occupies the first place in Europe⁴. However for today the degree of the use of this potential is very subzero. One of the main reasons (it is not only important reason - it follows to talk separately!) there is the incongruous state of highways. In the total Ukraine during great while loses transit transport streams. For example, for period 2007-2012 Ukraine lost 68% of transit cargo transportation the volume of that diminished from 387 to 125 million tons for this period and was in 2012 less on 32% from the index of 2000. And although for indicated five-year period the volume of transit transportations grew a motor transport on 7,9%, but he presents only 10% from all transit of loads by territory of Ukraine⁵. To Tom, on the estimations of experts, transit potential of Ukraine is used on 50-70%⁶ (has potential join at least in one and a half-two times, and if to be oriented on the values of spades of 2007th - in three times)and to the motor transport - yet less than.

Thus, development of motor-car ways within the limits of ITC must be priority. Firstly, he will allow to a full degree to expose transit potential of Ukraine in the motor-car segment of transportations. Secondly, will absorb considerable part of internal transport streams on long distances. Thirdly, intensity of motion on motorways within the limits of ITC is most, due to what in theory possible is introduction of fare transport that will do a construction and reconstruction of corresponding roads attractive for private investors by separate categories.

Therefore, within the limits of the first stage of Project DOKAR is suggested to concentrate on a construction and reconstruction of motorways within the limits of international transport corridors.

⁴ From data of http://uk.wikipedia.org/wiki/Міжнародні_транспортні_коридори

⁵ Modernisation priorities of reformation of transport-travelling complex are in Ukraine. - К. of:НІСД, 2013. are 32 p.s

⁶ From data of www.asmap.org.ua/info/cont_uts.doc

Foremost we speak about present motor-car transport corridors general length of that presents 5,3 to the thousand km⁷ but about transport corridors set for building, general length 3,0-4,5 thousand km⁸ depending on the presence of sufficient intensity of motion.

Actually within the limits of the first stage of Project it is suggested to build the 8-10 thousand roads of 1 category kilometers of motorways. They will overcome most and part roads of international value - national value, but in accordance with the necessities of modern structure of economy of Ukraine. Such network of speed roads will put Ukraine almost in one level with the developed countries of Europe: France (12,0 thousand km), Germany (12,8 thousand km), Italy (6,7 thousand km) and Spain (15,2 thousand km)⁹ after the extent of express roads. However density of the West-European roads will remain higher, that predefined by higher density of population and, accordingly, orientation of road net in the developed European countries foremost on motorists-amateurs and passenger cars.

An offer length of express roads will have a row of advantages and defects analyzed farther. However it follows to mark two key moments. Firstly, such network breaks up territory of country on the average on squares by a side a 200 km. It allows absorbing not only international transportations but all internal streams of motor transport on distance an over 200-300 km. Secondly, her economic parameters allow to expect a few sources of incomes, that can do her building/reconstruction repaying.

Stage 2. Building and reconstruction of entrances from ITC to the cities with a population over 50 thousand persons and detour roads round such cities.

From data of State Statistic¹⁰ in Ukraine on the end of 2012, 89 cities are counted from a population over 50 thousand persons. A total population that lives in these cities presents over 21 million Ukrainians - it over 45% of all population of country. Approximately through 40-45 cities from this list pass ITC, that is why for providing of high-rate of motion on ITC it is necessary to build and reconstruct detour ways in the round of these cities. It is the first reason of necessity of construction of roads within the limits of this stage of Project DOKAR.

The second reason consists in an economy. The point is that a middle gross regional product that is produced in the adopted cities presents 5-10 milliards of UAH on a year (varied from 1-2 milliards of UAH for a city with the quantity of population 50 thousand persons to 224 milliards of UAH for Kyiv¹¹). If to use middle proportions after a country, then this number answers the incomes of industry of motor-car transportations of middle city at the level of 50-150 million UAH on a year. The order of this sum coincides with the order of annual sum of depreciation of the built or reconstructed road. So, such ways can finance itself on 10-50%. This prospect is attractive not enough for private investors, that they took up the project of building of corresponding areas independently, but at the correct formula of combination of money streams from the side of investors and state of financing of building or reconstruction of such areas it is possible also to take away outside a budget.

Taking into account density of the roads built on the first stage of Project DOKAR, the middle remoteness of the densely populated cities from ITC presents 40-50 kilometers, it is possible approximately such to accept and length of detour ways in the round of cities that lie on the way of passing of motor-car transport corridors. In a result within the limits of the second stage of Project it is planned to build about 4,0 thousand kilometers of similar roads, that will have the second and third

⁷ "Критський №3, Критський №5, Критський №9, ЧЕС, Європа-Азія, the Baltic sea is the Black sea; from data of "Conception of creation and functioning of the national network of international transport corridors in Ukraine", ratified by resolution of KМУ from 04.08.97 №821

⁸ Above-mentioned list with other branches plus a corridor North-south, there

⁹ From data of http://en.wikipedia.org/wiki/Controlled-access_highway

¹⁰ Statistical annual Ukraine for 2012. - K.: Government service of statistics of Ukraine, 2013. are 552 p.s

¹¹ Statistical annual Ukraine for 2012. - K.: Government service of statistics of Ukraine, 2013. are 552 p.s

categories that answer intensity of motion in cities and from cities with the quantity of population over 50 thousand persons at peak-load time. Completion of the second stage of Project will form in Ukraine the modern network of highways, capable on 70-90% to satisfy requirements, countries put by development, on a long-term perspective (10-15).

Step 3. Reconstruction of the other roads.

At this stage, should be started the reconstruction of national roads, which were not included in the list of the first two stages, and also most of regional local roads. At this stage it is reasonable to reconstruct 30-50 thousand km of roads in total (mostly 4th, rarely 3rd or 5th categories), which will cover the country with the network of modern roads, and divide the territory of Ukraine into relative squares with the length of sides 25-50 km.

The peculiarity of this stage will be the fact that almost all of its financing burden will fall on the budget so the amount of the budget at the beginning should be suchlike that the cost of its implementation will not overload state finances and will be not more than 1-3% of the budget expenditures. As for today a good speed of road construction within the first two phases of the Project DOKAR requires funding, which is 10-30 % of Consolidated budget of Ukraine. So definitely financing of the project within Stage 1 and 2 should be beyond the budget.

This stage will be the longest and requires the prioritization of reconstruction of roads under the new economic conditions that will arise as a result of the implementation of the first two stages of the project. It should be realized that the reconstruction of roads within this stage will have the least effect, and because of the depopulation tendencies and deceleration of economic development it can be miserable, and Stage 3 may actually become a waste of money.

Stage 1.

On the first stage will take place the construction of new and reconstruction of existing roads within the international transport corridors. Totally scheduled for construction and reconstruction about 9 thousand km of category 1 roads. This figure correlates with the length of high-speed roads planned for construction in accordance with the Law of Ukraine "About high-speed roads" that was developed by UkrAvtoDor in 2009 (there is no reference because the bill is not published for free access)¹². According to this bill the cost of 1km of the road was \$ 5.2 million, and more recent figure is \$ 5.6 million.

Microeconomic grounds

The sources of revenue and funding.

Stage 1 of the Project DOKAR requires a list of potential cash flows that can receive the newly built road. They will arise from a number of fundamental areas - savings on high quality roads, alternative transport cost to relative transportation corridors that run outside the Ukraine, the strategic interests of individual investors in the construction of the first stage of the Project, access to modern transport infrastructure.

Lower maintenance costs. According to the American Association of State Highway and Transportation Officials (AASHTO)¹³, due to bad roads, the average driver in USA spends extra \$ 335 per year for the operation of the car (because of intensive tire wear and breakage of the car body, higher maintenance costs and fuel, etc.) and the loss of city residents even more - \$ 746 per year for

¹² From data http://www.kmu.gov.ua/control/uk/publish/article?art_id=243090448&cat_id=244314797

¹³ From data <http://en.wikipedia.org/wiki/Road>

one car. For Ukraine, the figure is slightly less (based on approximately the same value of cars, lower average car running, the lower the cost of maintenance, higher fuel prices, and worse road conditions in Ukraine), but its order is the same. If we accept the average loss of Ukrainian drivers because of bad roads at \$ 300 per year, the country annually loses \$ 3.0 billion per year. This is considerable scope for saving. This figure is one order lower than the annual rate of depreciation of roads that would be built according to the DOKAR Project, so it does not allow fixing the fare for all types of transport. However, the specific annual trucks' losses (including passenger transport - buses) are significantly larger. Therefore, this category of vehicles may pay tolls of new highways without additional cost burden on producers. In addition, the truck weighing 36 tons makes 7800 times more damage to the roadway than passenger car weighing 1.8 tons¹⁴.

Calculation. If you take a fleet of trucks of Ukraine (1.4 million cars¹⁵), and accept the loss of a single car on maintenance because of the bad roads at \$ 1,000 per year (the average value of the truck 2-3 times higher than the average value of the passenger car plus average annual mileage 1.5 - 2 times higher, the difference in fuel consumption is even higher), so the loss of all Ukrainian fleet of trucks is \$ 1.4 billion per year or \$ 0.01 USD (0,7-1,2 cents) per kilometer. This is the average price that could be fixed for trucks for using new motorways taking into consideration cost savings for maintenance (fees may vary depending on the weight of the cargo or the curb weight of the truck). What effect it may bring? If you plan average traffic on ITC on the level 10 thousand vehicles per day (a significant number of ITC sections now have higher intensity, and the intensity of traffic at entrances to Kyiv is 30-40 thousand cars per day¹⁶) and 30% (15% of the fleet, multiplied by twice the average annual mileage) of this amount set aside for trucks, then charging trucks at \$ 0.01 per kilometer, revenue per kilometer of the new road within the ITC per year will be \$ 10,950 - it is about 1/500 part of the cost of one kilometer of the roads and 4% of the annual amount of its depreciation. That is to say savings on maintenance of trucks could potentially generate sufficiently low cash flow to be a reliable source of income. However, this figure does not take into consideration annual growth of traffic (by 5-17 %¹⁷), the potential increase in transit traffic that will start when there will be new roads, and other economic conditions, which are referred below. We will take this figure only as a guide. (In developed countries toll of the paid roads is 16-28 cents per kilometer¹⁸, which would be almost enough at present intensity of the traffic to finance the construction of new road 1a category in Ukraine only by payment received from trucks. if it would be too expensive for carriers and manufacturers).

- **Higher average speed.** The average speed of vehicles on the roads in Ukraine with good condition of surface is 55-70 km/h - data as of 2007¹⁹. On secondary roads is significantly lower and reaches 25 km / h for buses and 45 km/h for passenger cars²⁰. But if on the secondary roads a major cause of low average speed is the poor condition of the road surface, then on the roads within the international transport corridors on the first place come up another factor: almost all of them pass through the populated areas in which Ukraine has a speed limit to 60 km/h. That is why the key Ukrainian roads cannot be full-fledged highways that should not intersect with other roads at the same level and serve the surrounding area. Therefore, they cannot equally complement the part of the international transport corridors that runs through European countries, so the country cannot realize its transit potential.

¹⁴ From data <http://en.wikipedia.org/wiki/Road>

¹⁵ From UkrAvtoDor data to the end of 2010, http://ukrautoprom.com.ua/wp-content/uploads/2013/10/stat-book_2010.pdf.

Оновлення парку у 2011-13 рр. було незначним.

¹⁶ The same

¹⁷ The same

¹⁸ From data <http://news.finance.ua/ua/~2/0/all/2013/04/26/301107>

¹⁹ According to calculation <http://ena.lp.edu.ua:8080/bitstream/ntb/6752/1/24.pdf>

²⁰ The same

By 2006, the average speed on German highways for passenger cars was 142 km/h (no speed limits) and 117 km/h (with a speed limit at 120 km/h) for buses - about 95 km/h, truck - 88 km/h.²¹ Similar figures for average speed on highways of United Kingdom of Great Britain, where there is the speed limit of 70 miles/hour (113 km/h) for passenger cars and 60 miles/hr (97 km/h) for trucks and buses is 69, 62 and 54 miles/h (111, 100 and 87 km/h) respectively for passenger cars, buses and trucks²². In fact, the speed of trucks on the highways in developed countries is limited by electronic limiters, which are set on each more or less new truck. But even this limited level is 35-45% higher than the average speed of trucks in Ukraine on ITC and by 2-2.5 times higher (and sometimes more) than the average speed on secondary roads.

Therefore, increasing of the average speed (especially trucks, because they are the subject of special interest because of their ability to pay for passage, although the increasing of the average speed of passenger cars is also relevant and can provide even higher growth) – is a key issue that must be resolved within the Project DOKAR. There are two ways to resolve this issue. First, the construction of new roads to bypass the populated areas, which increases the expenditures of the Project. Secondly, the construction of multi-level intersections, overground and underground pedestrian crossings, various walls (acoustic insulation, etc.), to fence off the traffic flow within the ITC from the populated areas through which it runs. Obviously, the best solution is a combination of the two options (for example, the new branches of ITC will be built, bypassing settlements and old ones, that are active – will be reconstructed in current terms). This provides significant space savings.

Calculation. Assume that the current average speed of truck in transport corridors is 65 km/h. With implementation of DOKAR Project it will increase to 88 km/h, i.e. 35%. What effect it may bring? Because the truck will 35% faster meet the same distance, the working hours required for the transportation of cargo to the same distance will be reduced by 26%. If this convert into annual savings from the previous calculation parameters (length of roads - 9000 km; traffic - 10,000 cars, trucks proportion - 30%, average annual truck mileage - 100,000 miles, and the average salary of the driver - 3750 USD per month, two drivers in the car), it turns out that the savings on wages of drivers is \$ 32,028 per kilometer of transport corridor, which is almost three times higher than the savings on the cost of maintenance and is 12% of annual depreciation of the road, or about \$ 0.03 for a truck on one the highway kilometer. This economy is considerably more substantial than in previous paragraph. In a result, due to the economy of charges on maintenance of trucks and salaries of drivers (and the number of drivers, respectively) carriers and producers will be willing to pay \$ 0.04 per mile passage of the new motorway without any loss. It provides the cash flow that over the lifetime of the road will provide about 16% (4% +12%) of the cost of its construction. If we take into account the reconstruction rather than building a new road with taking measures for providing necessary high average speed, the cash flow will be 20-24% of the cost of reconstruction, because it is cheaper on 25-35% than building new roads. This is a good number for start and attractive to private investors.

- ***Differentiation of fares depending on the weight of the cargo, truck curb weight or axle load.*** The greater curb weight of the truck, the more damage it causes to the road surfaces with a remark on the number of axles. It is known that Ukrainian carriers and producers tend to overload the trucks, which has devastating effects on roads designed for Soviet standards of cargo transportation (weight of the vehicle, axle load, etc.). In addition, the higher tonnage vehicles have a higher value, so they have relatively higher maintenance costs because of bad roads. And a certain level of carrying capacity is accessible for trucks of international brands are relatively expensive. All these factors justify the differentiation of fares for vehicle on the new or reconstructed roads. Parameters of differentiation should be calculated separately in details. However, comparing with the first point (Lower maintenance costs), where the corresponding savings allow carriers to pay \$ 0.01 per mile

²¹ From data http://en.wikipedia.org/wiki/German_autobahns

²² From data https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/9069/free-flow-vehicle-speeds-2011.pdf

without increasing costs, we can expect that the same principle for individual trucks such savings will allow to pay \$ 0.02 -0.05 per kilometer without losses. Moreover, with updating of the fleet of trucks of Ukraine, their average cost and tonnage will increase. This will increase the potential amount of that savings, which will allow the new motorways receive increased cash flow.

- **Transit fees.** Questions of transit fees for goods transportation by vehicles should be studied separately (if there is/can be introduced such charges, if it's not contradict the international law, etc.). If it is impossible to introduce a fee for transit, then the issue can be resolved in other way - to introduce separate fees for using international transport corridors for foreign trucks. While this approach is worse than the transit fees, for example, on the border because transit on various ITC will be uneven, so some investors would benefit more, some of them less, which in some cases will increase the payback period of investment in the construction of transport corridors and reduce their investment attractiveness. Another problem - the difference in the rates of Ukrainian highways tolls (between Ukrainian and foreign carriers) have to be eliminated by the extent that Ukraine integrates into the EU (under the terms of the Association Agreement, although there may be a transitional period), but for some period of time the effect can be significant - and this may be enough in investment and financial context.

In 2012 was transported 4.85 million tons of transit cargo in Ukraine²³. It is too little in comparison to the domestic freight transportation (179 million tons), but the transit occurs at a much greater distance. If international carriers operate in Europe at the rates of paid European highways, then this level of tolls (16-28 cents or \$ 0,21-0,38 per kilometer) would be completely acceptable for them in Ukraine, if there will be constructed or reconstructed high-speed roads. At first, you can set the "dumping" tariff, for example, \$ 0,10-0,15 to attract traffic and reorient them from expensive - and I must say overloaded - European highways.

Calculation. We accept that the tolls for transit trucks on Ukrainian transport corridors will be at \$ 0.10 per kilometer, and the average transit distance through the territory of Ukraine - 500 km, with an average tonnage of transit trucks - 25 tons. It turns out that today Ukraine has about 100 (or rather 97) million truck-a-mile of transit good from which highways of Ukraine could get \$ 10 million per year. In fact, it's quite a small amount, because it is only 0.4% of the annual depreciation of that 9000 highways that are planned to build on Stage 1 of the DOKAR Project. However, it adequately reflects the current situation of transit in Ukraine and can be significantly increased with the creation of appropriate conditions for the development of such transportation (increase in times has no doubt, increasing potential on one-two points require additional studies and comparison with countries that implemented their transit potential). Moreover, in prospect by increasing fares and bring it up to European values it may increase this figure by 2-4 times. All of these changes - the implementation of transit potential, so they require a certain transition period and ensure adequate cash flow only in medium-term or long duration.

- **International passenger cars fees.** As GDP per capita of all of Ukraine's neighbors, except for Moldova, higher than in Ukraine, the drivers of passenger cars that were registered in those countries could easily pay the fee for usage of Ukrainian road transport corridors. In addition, the drivers of the EU completely loyal to the toll roads, so they are also ready to pay the toll psychologically. Organization of fees for foreign cars for the usage of new highways in Ukraine could be in two ways. First, determine an appropriate rate per kilometer on a highway. This option has one very significant advantage. The fact is that in recent years in Ukraine has considerably increased the number of passenger cars with foreign numbers registered on Polish, Lithuanian and other false companies. In fact, this is a form of buying foreign cars without paying the import duties. Until Ukraine sign an Association Agreement with the EU - this form of car import from Europe will prosper. If there will be the fees for new roads - could at least partially restore the status quo. This option will increase the

²³ Modernization priorities for reforming of the transport system in Ukraine. – К.:НІСД, 2013. – 32 с.

cash flow that comes from foreigners to investors to the road directly within specific projects of construction or reconstruction. Secondly, establishing target bonuses for hotel accommodation of foreigners who came by cars. It will provide the revenue for the development of roads from tourists , such as Belarusians or Russians in the Crimea in Lviv or Bukovel. Perhaps this version is quite complicated to implement, but it would allow to direct cash flow through the state , which in prospect can be used to focus on financing of Phase 2 and 3 DOKAR Project that have a much lower return.

Assessment of planned revenues from the introduction of such a tax (fee) should be carried out separately. And, at first glance, its effectiveness should be high, especially paying attention on the development of the recreational potential of Ukraine and dispersed location of recreational areas in the country.

- **Fee for access to the updated transport infrastructure.** Enterprises (gas stations, dining, logistics centers, hotels, shops) that will serve the road transport corridors will have higher revenues and profits in comparison to the others, in fact they get territorial rents. So it is logically that there should be the introduction of fees for access to the updated transport infrastructure, that will be paid by the relevant companies. The rate of fees should be assessed separately, it should be differentiated depending on the conditions of access to proper roads. Fees must be on a yearly basis and can go to budget (the most logical, though not very effectively), and to the accounts of investors or the public body , which will be directed through public sources of funding of the construction of roads .

- **New traffic police.** Today SAI is a significant factor in traffic of Ukraine. First, it effectively organizes shadow tolls, taking bribes for absence of registration of violations on the road. Second, it has a negative impact on average speed, stopping drivers, especially for trucks. Obviously, with the construction of new highways in Ukraine SAI will try to establish its impact on traffic flow. This cannot be allowed in any case! In Ukraine should be created a special "traffic police " that will serve first road transportation corridors , and eventually the rest of the reconstructed and newly constructed roads. Thus it should be banned to stop vehicles at ITC. This will provide another space-saving point, the value of which is difficult to calculate because no data on shadow money flows that earns the traffic police on the roads (such information exists, but it should be looked up in different ways). If you create a "traffic police" that would be completely separated from SAI and will serve at a starting point only ITC, it could be the basis of the revised traffic police, who would not take bribes like the one organized in Georgia. However, due to the small size of Georgia, the country could completely dissolve the old traffic police and create new one. We just need to create an alternative, which eventually replace the old traffic police. This alternative may well be "traffic police" created by the project DOKAR.

- **The annual fees for expensive cars, other revenues to the budget.** If the fare from road transport corridors advisable to withdraw because of the overall low purchasing power of the Ukrainian population, including the driver, the higher property taxes and first registration of expensive cars and should be maintained. In 2012, the year consolidated budget received UAH 26 million. tax from vehicle owners , 660 million for the first registration of the vehicle, 1259 million excise taxes on vehicles, 11104 million excise tax on petroleum products, 2381 million duty on petroleum products, vehicles and tires for them. Totally 15.4 billion. - is that broad base of revenue from car owners that now can be made to finance the construction of roads within the Project DOKAR. These funds are 75% of annual depreciation of highways identified for construction and reconstruction within the first phase of the project. If you see the differentiation of tax rates and fees that provide revenue of these funds you rich100-120 % annual depreciation of roads built within the first phase of the project. It is important that these funds were targeted to the organization that will finance the construction work performed by private companies in fact, and which will not allow to use them at its discretion.

- **Trust fundraising. China.** It should also consider the option of finding investors for the construction of separate branches of motor transport corridors internationally among the parties,

which will upload specific ITC the most. The first candidate for investment can be China, which according to the memorandum, signed in December 2013, plans to build a deep water port in the Crimea which will annually process 140 million tons of cargo²⁴.

Calculation. From the Crimea towards European Chinese will carry these loads on a distance over 1000 km through Ukraine. If at least 10% of the port capacity will transport by road (proportion of road transport of goods in transit structure is 10%, and in the structure of domestic traffic - 28 % - figures excluding pipelines), the territory of Ukraine for the year will take place 560 million vehicle -to-kilometer with tolls \$ 0.1 will bring 56 million per year or 20% of annual depreciation of specific branch of road corridor. If the fare will be 2-3 times greater or part of loads that will be transported by cars will be 20-30% of the capacity of the port, it will be beneficial for the Chinese to undertake the construction of at least one motor corridor.

In a result the only one economy on the expenditures, that are related to the bad roads, grounds establishment for trucks fare on speed roads in the size of \$0, 04, that allows to finance the 16% costs of building of roads of 1a category. If to increase this level by 2-3 times, then a level of fees will be in times below, than in Europe, and here income from its reconstruction will provide financing of building of new road on 32-48%(if we take a reconstruction to the calculation - a percent will be yet higher). Adding here increased fare for motorways for foreigners, we get, that motor-car transport corridors at the present level of intensity of traffic can cover a cost itself more than half. If a transport industry will develop, and intensity of traffic will grow, then the brought numbers will grow in one and a half-two time, which at an optimistic scenario will do the Stage of a 1 Project repaying, at least on the separate areas of roads. Taking into account solid income to the budget from the proprietors of motor transport of Ukraine, building of roads within the Project of DOKAR gets another powerful financing source that at presence of adequate legal form (state-private partnership) allows fully providing Project financing on the stage 1. Except it, presence of the third parties, interested in to development of ITK of Ukraine, in particular China, allows to expect another powerful source of financing of the first stage of Project

Charges, resources and bottlenecks :

From data of State road SRI named after Shulgin, average cost of construction of 1 kilometer of new road of the first category in Ukraine is \$5, 6 millions²⁵ This number is adequate enough taking into account components of the prime prices described below, and correlations, with the average cost of building of motorways in the developed countries. But it is necessary to notice that it can become reality only in case that a private investor that will control the construction of roads. Except it, if the state will provide part of money flow on financing of construction or reconstruction of road next to a private investor, then it needed to legislatively limit this sum in a proportion to the average cost of kilometer of road in order to avoid bribes and other shadow charts. From data of the same source, the cost of major repairs of road of the first category presents \$3, 4 millions, although other source gives the number of \$1, 8 millions²⁶ (maybe, first number means reconstruction). If to take into account that on the first stage of Project DOKAR approximately 9000 kilometers of roads of the first category will be constructed, then a construction cost will be \$50, 4 milliards

Global bottleneck of Project DOKAR, in particular his first stage consists in that producers of sand, macadam, asphalt, bitumen and builders-road-workers can master in one year no more than 40 milliards of UAH²⁷ id est internal powers of construction of motorways are at about 1000 kilometer in a year; reconstruction or major repairs something increases this number. Therefore for construction of the 2-3 thousand kilometer of new roads it needs to double or triple corresponding powers. There are

²⁴ From data <http://lvivexpres.com/news/2013/12/07/55393-ukrayina-kytay-spilno-zbuduyut-glybokovodnyy-port>

²⁵ From data of <http://news.finance.ua/ua/~1/0/all/2013/06/27/304520>

²⁶ From data of <http://news.finance.ua/ua/~2/0/all/2013/04/26/301107>

²⁷ The same

large doubts concerning that such increase of internal powers is economically advantageous. More expedient can conduct about increasing power on 50-70% on redistributions that are the most bottlenecks of all process, and annual combining of building 1 thousand km of new roads with a reconstruction 1-1,5 thousand km of existent motor-car transport corridors on the stage 1 of Project DOKAR. It will allow covering a cost expansion of powers, and providing the import of factors of production only on the basis of their top quality, but not through the shortage of internal resources. We should mark that with such limitations 3000 of new highways within ITC per year, the majority of which will be new, looks unattainable or economically unprofitable. It will be more expedient to talk about 2-2,5 thousand roads, at least the half of that will be reconstructed in the contours of present ITC.

It follows also to take into account that for 5 last years about 5000 kilometer of roads were repaired²⁸. Part from that (approximately 2-3 kilometers) belongs to ITC, in particular route Kyiv-Chop and others like that. Considerable part from the repaired areas keeps high quality of travelling coverage and to this day. Taking into account it, the Stage 1 of the Project DOKAR will last 3,5-4,5 years and on the average will need the annual financing at the level of \$9-11 milliard

If to compare the Stage 1 of the Project DOKAR on parameters with construction of speed roads in Ukraine in accordance with the project of Law of Ukraine "On speed highways", offered by UkrAvtoDor in 2009, then the volume of works is alike²⁹. The project of UkrAvtoDor envisaged building 7075 kilometers of speed highways in Ukraine, on that 300 milliards of UAH, from that 100 milliards of UAH – income to the budget, 170 milliards of UAH - charges on the purchase of raw material, materials and technique. On the estimations of UkrAvtoDor, such scale of works must be during 10-15 years and involve 50-100 thousand of people directly on building of roads and 400-800 thousands persons - in contiguous industries of economy. On our estimations, the number of duration/of amount of employment is overpriced in 3-4 times, an order is correct however.

What about resources, necessary for such rate of conducting of works, then their list is following:

- **Bituminous concrete.** If to construct in a year 2000 kilometers of motorways of the first category, there will be needed 23,2 million tons (9,7 million m³ bituminous concrete) to a total value of approximate 23,2 milliards of UAH Capacity from the production of bituminous concrete in Ukraine need to be estimated separately, however it is known that in Russia in 2007- the last year before a crisis - a production volume of bituminous concrete was 34 million tons³⁰ that allows to talk about the bottleneck on this section of building of roads.

Calculation. The road of 1a category provides two road lines of traffic in both ways 3,75 m width plus one stopping line 2,5 m width from each side and on one fortified line on a separated line 1m width from each side. Together a 22 m of the asphalt-paved transversal cut. Total thickness of bituminous concrete that will be put in three layers with different properties, take even a 22 cm³¹. Taking into account the closeness of bituminous concrete of a 2,4 ton/of m³; length of the roads built per year, at the level of a 2000 kilometer; average cost of bituminous concrete at the level of an approximately 1000 UAH/ton, will carry out on 23,2 milliards a UAH- is a sum of annual necessity of asphalt for the Stage 1 of the Project DOKAR

- **Bitumen.** Usually a bitumen makes 4,5-9,0% from bituminous concrete mixture mass. Consequently every year within the limits of realization of the first stage of Project it will be necessary about 1,4 million tons of bitumen from the calculation of mass part in the bituminous concrete of 6%. The cost of necessary volume of bitumen will present about 11,5 milliards of UAH on a year. It

²⁸ Modernisation priorities of reformation of transport-travelling complex are in Ukraine. - K. of: НІСД, 2013. - 32 c

²⁹ From data of http://www.kmu.gov.ua/control/uk/publish/article?art_id=243090448&cat_id=244314797

³⁰ From data of <http://www.stroyka.ru/Rynok/66/asfalt-i-asfaltobetn-v-dorozhnom-stroitelstve/>

³¹ From average data of <http://news.finance.ua/ua/~2/0/all/2013/04/26/301107> and other resources

includes in the cost of bituminous concrete, mentioned in the previous point, but it is necessary to notice that on 2013 Ukraine did not produce a bitumen³⁴ (although there was a commission of vice-prime Minister O.Vilkula to Ministry of Infrastructure of Ukraine to organize such production in Ukraine, it is planned to organize in Odessa) and bought a bitumen In Russia and Belarus, that is why this sum will go on payment of the imported bitumen.

▪ **Macadam-sandy mixture.** Within the limits of the first stage of Project DOKAR, the annual necessity of macadam-sandy mixture of different factions for arranging of basis of travelling clothing will make 27,5 million cubic meters to a total value of 2,5 milliards of UAH.

Calculation. Parameters: length of roads is 2000 kilometers; a total height of the layers celled from macadam-sandy mixture is a 46 cm³²; a total width of macadam-sandy layers is a 23 m; coefficient of supply on a compression - 1,3; average cost of cubic meter of mixture - a 90 UAH. In a result get 27,5 million cubic meters of macadam-sandy mixture by a cost about 2,5 milliards of UAH

○ **Macadam.** During the buildings of roads the macadam of different factions is used for preparation of bituminous concrete, and also macadam, macadam-sandy and macadam-ground mixtures in bases and coverage of roadbed. Going out that part in a bituminous concrete presents 50% a macadam mass, and in macadam-sandy mixture - 75% mass, get, that annual requirements in a macadam on the first stage of Project present 26,4 million m³ to a total value of 3,5 milliards of UAH

▪ **Sand.** During the buildings of roads sand is used separately as one of layers of basis³³ and also in composition a bituminous concrete and macadam-sandy mixture. For building 2000 kilometers of roads of the first category are on a year it is necessary 42,8 million tons of sand only on the separate sandy layer of basis. The cost is 2,1 milliards of UAH. Taking into account sand that is included in a bituminous concrete and macadam-sandy mixture and, then it follows to add yet 14,7 million tons by a cost 0,7 milliards of UAH.

Calculation. Parameters: length of roads is 2000 kilometers; a total height of the layers celled from sand is a 33 cm³⁴; a total width of macadam-sandy layers is a 23 m; coefficient of supply on a compression - 1,3; average cost of cubic meter of mixture - 90 UAH. In a result get 27,5 million cubic meter of macadam-sandy mixture by a cost about 2,5 milliards of UAH.

▪ **Equipment.** On the first stage of Project for building 2000 motorways on a year need 15000 units of equipment by the total worth of \$1, 5 milliards or 12 milliards of UAH. Annual depreciation of this technique will present 1,2 milliards of UAH. If the question is about the reconstruction of present road, wherever a road bed needs a considerable after treatment - the amount of units of necessary equipment diminishes to one third due of trucks necessary for transportation of earth. From all volume of technique of 50-65% are trucks for transportation of soil, sand, to the macadam, bituminous concrete and mixtures. This type of technique can be provided by production capacities Ukrainian car manufacturers. Other technique is need import because of the best operating descriptions.

Calculation. In order that from a zero to build the kilometer of road, about 150 units of technique and 6 mechanized detachments are needed³⁵ (clearing of right-of-way, earth works - preparation of stripe line, covering three glowed bases of travelling clothing, that is executed by three detachments, and conclusion three layers of bituminous concrete, that is executed by one detachment or three small). The number of changes, necessary for building of road of 1 category, is 11. Taking into

³² From average data of <http://news.finance.ua/ua/~2/0/all/2013/04/26/301107> and other resources

³³ From average data of <http://news.finance.ua/ua/~2/0/all/2013/04/26/301107> and other resources

³⁴ There

³⁵ To average data of different sources, in particular <http://www.gosthelp.ru/text/PosobieSpravochnikdorozhn.html>

account that the covering of roadbed need the special weather (positive temperatures for crushed stone and sand mixtures and dry warm (>5-10 degrees on Celsius) weather for the bituminous concrete) in a calculation undertakes 110 working days on a year (5 months with 22 working days). It allows for one brigade to cover 20 kilometers of road of the first category on a year. It means, for providing of the pre-arranged rate of realization of the first stage of Project DOKAR it follows to have 100 brigades in composition of that will enter for 150 units of technique. Together are 15000 units of technique for a construction 2000 kilometers of new roads.

- **Labor force.** In every building brigade for the complete cycle of building of road except 150 units of technique there must be 2 changes for 160-180 workers in each³⁶. On these two changes is 30-50% more from their quantity of workers that work for a salary (deskmen, land-surveyors, engineers and others like that). In a sum it gives about 480 workers brigade or 48 thousand workers for providing of the pre-arranged rate of works on the first stage of Project at the level of a 2000 kilometers for a year. 1,9 milliards of UAH for their earnings need on a year, taking into account a middle salary 3400 UAH on a month³⁷ (professional road builders get more, but as they work a limit time on a year, then on the average the annual level of salary differs a little).
- **Fuel.** Taking into account the middle expense of fuel by different units of technique within the limits of building brigade at the level of 120 L. on one change³⁸, 220 changes in a year and 15000 units of technique fuel expense on a year will present 396 million Liters on a year that presents 5,1 milliards of UAH on a year.
- **Incomes to budget.** According to UkrAvtoDor, incomes to budget and off-budget funds make close the third part of cost of building of new road³⁹. It means that taxes and withholdings during the first stage of Project DOKAR will present about 30,6 milliards of UAH - it is over 5% from the volume of money that for a year pass through the sector of state administration (budget and off-budget funds).
- **Other materials.** Also for building and reconstruction of roads there are necessary pipes, metal (for a protection, illumination, sign-boards and others like that), paint for causing of marking, reinforced concrete, lime, cement and others like that. These materials are needed in considerably less, than ingredients of prime price, after that a calculation is done, however in a sum they, probably, provide the 10-15% costs of building of road.

In a result have, that at moderate and economically reasonable expansion of production capacities in building of roads and contiguous industries during the first stage of Project DOKAR 1000 kilometers will be built and 1500 kilometers of motor-car transport corridors will be reconstructed during 4 about. It will allow an exit to have 9000 kilometers of modern speed roads of the first category and provide the closeness of coverage of territory of Ukraine motor-car transport corridors, mentioned higher.

Macroeconomic effect

Realization of the Stage 1 of the Project DOKAR will have a macroeconomic effect in many planes. The basic are:

- **Incomes got on building and reconstruction of roads.** From \$9-11 milliards that annually will accustom under building of roads within the limits of the first stage of Project, only some ingredients of prime price will be spent on the imported commodities. We speak about a bitumen (if will not organize an internal production) - 11,5 milliards of UAH on a year, technique (as all trucks will be the Ukrainian

³⁶ The same

³⁷ From data of http://www.dorndi.org.ua/sites/default/files/aktualni_pitannya_normativno-koshtorisnogo_zabezpechennya_bezugliy_a.o.ppt

³⁸ From data of http://ua-referat.com/Проект_будівництва_дороги

³⁹ From data of http://www.kmu.gov.ua/control/uk/publish/article?art_id=243090448&cat_id=244314797

production - 8 milliards of UAH (need to be bought in the first year), different materials - let 10 milliards of UAH (a number needs clarification). The partial import of labor force (is also possible if foreign contractors) and fuels (will build if home objects will not have a source) of raw materials - let yet 2,5 milliards of UAH. Together charges on an import will present maximally \$4 USD in the first year of action of the first stage of Project and \$3 milliard - in next years, that will present the additional loading on the deficit of checking account (that in a moment will increase on 20-30%). But almost 55 milliards of UAH on a year will remain in Ukraine. These incomes will do a multiplicative effect on GDP with a coefficient 2 (coefficients are subzero taking into account high part of import in the pattern of internal consumption). This multiplicative effect practically fully will be realized within the limits of one year, therefore directly from building of roads within the limits of Project of DOKAR nominal GDP will grow on 110 milliards of UAH on a year that presents 7,8% of nominal GDP for 2012.

- **Incomes from the transit volume increasing.** With completion of the Stage 1 of the Project DOKAR the volumes of transit of loads substantially will grow(including through a subzero base) motor-car transport corridors. Taking into account only the Chinese project from building of deep-water port(on condition of transportation a motor transport in direction of Europe only 10% of annual power of port), then the volumes of transit can grow in 4 times. It is an enormous number reality of that complicates prognostication of dynamics of transit streams within the limits of motor-car transport corridors. If to assume that the volumes of transit will grow twice to 10 million tons of loads, only charges on a meal, spending the night and fuel of new drivers, that will transport the additional amount of load, present a 300 million UAH on a year. If the volumes of transit will grow higher rates (for example, the Chinese will build port in Crimea), then a base effect for wayside business will cross through a 1 milliard a UAH on a year.

- **Incomes from an economy.** It is set at the count of microeconomic effect, that the economy of cargo transporters from the higher rate of movement and more subzero charges on maintenance of cars due to motion new roads together presents close \$42 thousand on the kilometer of new motorway. Taking into account passenger cars this number will grow in one and a half-two times, that after realization of the Stage of a 1 Project of DOKAR annually will free close \$0, 5 milliards and taking into account a cartoonist additional 8,5 milliards of UAH (or 0,6%) will give annually to GDP. Except it, such economy will help to increase efficiency and competitiveness of the Ukrainian economy on the whole.

- **Incomes of industry power increasing of roads building and contiguous industries.** As Ukrainian industry of roads building and contiguous industries have limit powers in order that in a normal rate to realize the first stage of Project, then there will be a question about the increase of corresponding powers, forming or construction them. On the first stages this question foreign contractors and imported ingredients of prime price can close, however strategically Ukraine needs expansion of own powers. Actually we speak about their increase in 1,8-2,0 times, that activates the processes of building, forming of the fixed and circulating assets in corresponding enterprises on a lump sum 40-60 milliards UAH during 1-3 years. Taking into account a cartoonist it will provide the additional increase of nominal GDP on 2-4% during the first years of action of Project depending on the rates of increase of powers.

- **Incomes from development of infrastructure.** Development of enterprises that will serve the necessities of ferrymen, (gas station, restaurants, hotels, logistic centers, shops and others) during the first years of realization of Project DOKAR fully depends on growth of volume of motor-car transit of loads rates, as hoping on the increase of volumes of internal transportations in default of other points of increase of economy and, accordingly, incomes of population will not be. And the wayside infrastructure of Ukraine is developed enough for today, though continues to develop in future. Prognostication of rates of increase of transit within the limits of ITC, that pass territory of Ukraine, as said higher, has certain complications through a subzero base. He can be conducted additionally, taking into account the indexes of the developed countries. Now clear that at ambiguous growth of

transit rates the annual rates of building of infrastructure will be limited to hundreds of millions of UAH, that gives a subzero enough effect. However there are all grounds to hope that the volume of motor transport transit in a medium-term period will grow territory of Ukraine in times. It is also expedient to talk that at the end of the first stage of Project DOKAR due to the present system of speed roads a push for development will get recreational infrastructure of Ukraine that, probably, will fix the high rates of increase of visitors.

In a result during realization of the Stage of a 1 Project of DOKAR taking into account a cartoonist nominal GDP of Ukraine must get an additional increase in a size from 15% in the first years to 10% in recent year. It does Project of DOKAR already on the first stage project of national priority that is in strength to give a push for modernization of all economy and country on the whole.